



SOUND TRANSIT STANDARD DIVISION 01 SPECIFICATIONS

2023 EDITION



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Project teams shall refer to their advertised or executed project contracts for applicable document versions/revisions.

SOUND TRANSIT STANDARD DIVISION 01 SPECIFICATIONS REVISION RECORD			
Document Title	Approved Change Request No.	Date	Comments
2023 Sound Transit Standard Division 01 Specifications		08/30/24	



FORWARD

This 2023 edition of the Sound Transit Standard Division 01 Specifications has been developed to serve as the baseline for delivering and designing the projects for the public by Sound Transit. The Standard Division 01 Specifications, unless otherwise stated in writing, will be incorporated into the Contract Documents, except where specifically excluded. The decision to exclude, modify or replace any standard specification is made during the design process and is subject to approval by Sound Transit.

While these specifications are to be used as a baseline during the design process, once they have been incorporated into the Contract Documents, they become material and enforceable terms of that Contract. Following the completion of Issue For Bid or Issue For Construction documents, these Standard Division 01 Specifications are subject to revision only through the change order process.



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SECTION 01 01 07

SEALS PAGE

The Professional seals and signatures affixed hereon indicate the professionals' review and participation in the preparation of the Contract Specifications.



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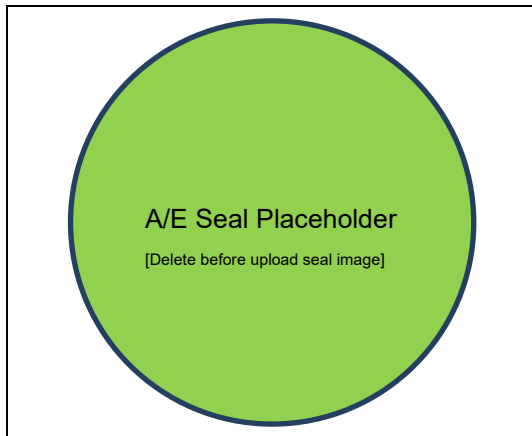
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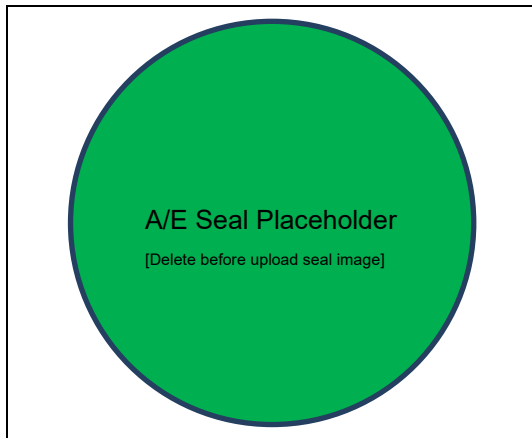
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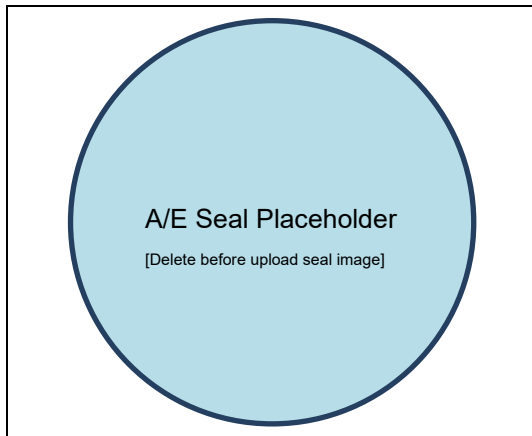
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SECTION 01 11 00

SUMMARY OF WORK

PART 1 - GENERAL

1.01 SUMMARY

- A. The Work of this Contract includes, but is not limited to, construction of:

1.

1.02 SPECIFICATION LANGUAGE

- A. Contract Specifications are written mostly in imperative and streamlined form. Unless indicated otherwise, this imperative language is directed to the Contractor. Additionally, the words "shall be" shall be included by inference where a colon (:) is used within sentences or phrases.

1. Examples:

- a. Aggregate: ASTM C33.
- b. Adhesive: Spread with notched trowel.

- B. Whenever there is wording stating that an item is "as specified," "as indicated," or "as shown," the reference is to all Contract Specifications and all Contract Drawings in the Contract Documents. Stating "as specified," "as indicated," or "as shown" does not refer necessarily to a Contract Drawing or Contract Specification, but refers to either.

- C. Furnish, Provide and Supply: Furnish means to supply and deliver to the Project Site, ready for installation. Provide means to furnish, install, and incorporate into the Work, including all labor, materials, supplies and equipment, including testing and commissioning necessary to do so, complete and ready for intended use. Supply means to acquire, deliver, and transfer the item to Sound Transit as specified.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 12 19
HANDOVER REQUIREMENTS

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section specifies the requirements for handover of facilities and equipment from one contractor to another.

1.02 SUBMITTALS

- A. Handover Staging Plan: Identify the extent and detail of the proposed facilities and equipment to be handed over to the follow-on contractor. The submittal shall include, but is not limited to, the items identified in Article 1.05, herein. Submittal approval must be received [] months prior to Milestone achievement.
- B. Letter of Agreement

1.03 GENERAL

- A. In the transitioning of the Site to the follow-on contractor or Sound Transit, coordinate, cooperate and work with the Resident Engineer in support of the Milestones.
- B. Attend Construction coordination meetings as requested by the Resident Engineer to discuss and meet with the follow-on contractors to review handovers, interfaces and temporary construction activities
- C. Contractor shall participate with Sound Transit and the follow-on contractor in inspection(s) of the equipment and facilities to be handed over. The Contractor shall be responsible to remedy any and all deficiencies discovered prior to handover.

1.04 LETTER OF AGREEMENT

- A. Through the Resident Engineer, the Contractor may coordinate with the follow-on contractor to determine any mutual beneficial amendments to the handover requirements described herein.
- B. If the Contractor proposes any modifications to the handover requirements herein described, a written agreement (Letter of Agreement) between the Contractor and the follow-on contractor, relative to a specific handover requirement, may be accepted by the Resident Engineer as support for achievement of the Milestone. However, if the Contractor-negotiated handover requirements are not acceptable to Sound Transit, the modification will not be allowed.
- C. Details and requirements of the Letter of Agreement shall be at no cost to Sound Transit, but may require a credit to Sound Transit for those equipment and facilities that are not removed or are not handed over as described herein to the follow-on contractor or Sound Transit.

- 1.05 CONDITIONS ON THE EXISTING [SITE] UPON HANDOVER FROM [PREVIOUS CONTRACT UNIT DESCRIPTION (CUD)]
- A. The following Articles represent the Site conditions and items which the [*receiving CUD*] contractor will assume responsibility for after the transfer from the [*previous CUD*] contractor upon Site Access.
- B. Construction power:
1. [CUD] will hand over temporary construction power service in accordance with the Contract Documents.
 2. See Section 01 51 15, Temporary Electrical Power.
- C. Construction water service:
1. [CUD] will provide sub-metering for temporary construction water service in accordance with the Contract Documents.
 2. See Section 01 50 00, Temporary Facilities Controls.
- D. Fire water service:
1. [CUD] will hand over access for temporary construction fire water service in accordance with the Contract Documents.
- E. Construction lighting:
1. [CUD] will hand over temporary perimeter site lighting facilities in accordance with the Contract Documents.
 2. See Section 01 50 00, Temporary Facilities Controls.
- F. Construction sanitary sewer:
1. [CUD] will provide access to piping and special connections for temporary construction sanitary sewer service in accordance with the Contract Documents. See Section 01 50 00, Temporary Facilities Controls.
- G. Site access and security:
1. [CUD] will hand over existing perimeter construction fencing, gates, and noise walls in accordance with the Contract Documents.
 2. See Section 01 50 00, Temporary Facilities Controls.
- H. Site grading and asphalt condition:
1. [CUD] will hand over existing site grading and asphalt surfacing.
- I. Erosion control system to be in accordance with Section 01 57 13, Temporary Erosion and Sediment Control.
1. [CUD] will hand over the temporary erosion and sediment control (TESC) system facilities in accordance with the Contract Documents.

- 1.06 CONDITIONS ON THE SITE UPON SUBSTANTIAL COMPLETION AND DEMOBILIZATION OF [PREVIOUS CUD]
- A. The following Articles 1.06B. through 1.06K represent the Site conditions and items which the [current CUD] contractor will assume responsibility of after the transfer from the [previous CUD] contractor upon Substantial Completion and demobilization of [CUD].
- B. Construction power:
1. [CUD] will handover all temporary construction power service in accordance with the Contract Documents.
 2. See Section 01 51 15, Temporary Electrical Power.
- C. Construction water service:
1. [CUD] will handover all temporary construction water service in accordance with the Contract Documents.
 2. See Section 01 50 00, Temporary Facilities Controls.
- D. Fire water service:
1. [CUD] will handover all access for to temporary construction fire water service in accordance with the Contract Documents.
- E. Construction sanitary sewer:
1. [CUD] will hand over all piping and special connections for temporary construction sanitary sewer service in accordance with the Contract Documents.
 2. See Section 01 50 00, Temporary Facilities Controls.
- F. Construction lighting:
1. [CUD] will handover all perimeter and tunnel temporary lighting facilities as required.
 2. See Section 01 50 00, Temporary Facilities Controls.
- G. Site access and security:
1. [CUD] will handover all existing construction fencing, gates and noise walls in accordance with the Contract Documents
 2. See Section 01 50 00, Temporary Facilities Controls.
- H. Site grading and asphalt condition:
1. [CUD] will handover all existing Site grading and asphalt surfacing.
- I. Wheel wash:
1. [CUD] will handover existing wheel wash(es).
- J. Erosion control system:
1. [CUD] will hand over all temporary erosion and sediment control (TESC) system facilities on Site in accordance with the Contract Documents.
- K. Sound Transit Construction Management Offices:

1. [CUD] will hand over the maintenance of the Sound Transit Construction Management Offices in accordance with the Contract Documents.
2. See Section 01 50 00, Temporary Facilities Controls.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 14 13

ACCESS TO SITE

DESIGN-BUILD

PART 1 - GENERAL

1.01 SUMMARY

- A. This section includes Design Builder responsibilities for the execution of property rights for the Project.

1.02 REFERENCES

- A. Abbreviations and Acronyms
 - 1. ROE – Right of Entry
 - 2. ROW – Right of Way
 - 3. TCE – Temporary Construction Easement

1.03 ADMINISTRATIVE REQUIREMENTS

- A. The Property Commitment Matrix (exhibit to the Special Conditions) contains a list of properties and rights obtained or to be obtained for the project. For parcels listed as available after NTP, Sound Transit will provide notice to the Design Builder when they are available. The Design Builder must identify in its Schedule the dates when access to each property listed in the Property Commitment Matrix will be needed.
- B. The Design Builder must coordinate with the Resident Engineer (60) days prior to occupying any property. This advance notice is to allow the owner time to salvage items if they desire. The Property Commitment Matrix includes any items the property owners intend to salvage, if any.
- C. The Design Builder is solely responsible for the cost to acquire additional property rights for its convenience including additional construction staging. All property rights must be appraised and valued in accordance with the Sound Transit Policy R98-20-1 *Real Property Acquisition and Relocation Policies, Procedures and Guidelines* (Vol. 3, Item 08.31 required) and all current State and Federal law. The Design Builder is solely responsible for compliance with legal requirements including NEPA/SEPA evaluation and permitting for the Design Builder's intended use. If a TCE is to be acquired on a property on which Sound Transit has an unsettled condemnation case, the Design Builder must obtain Sound Transit approval prior to any communication with the property owner.

1.04 SUBMITTALS

- A. Submittals
 - 1. Right-of-Entry Work Plans.
- B. Transmittals
 - 1. As-built property survey documentation

1.05 QUALITY ASSURANCE

- A. Qualifications
- B. Certifications

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 USE OF PROPERTY

- A. Staging Areas
 - 1. The Design Builder may use areas within the Project limits for construction staging. All improvements to staging areas must be constructed and maintained by the Design Builder.
 - 2. Unless otherwise indicated in the Contract Documents, staging areas within the Project limits may not be for the exclusive use of the Design Builder, and may be used by Sound Transit, other Sound Transit contractors, or by public or private utility contractors.
- B. Temporary Construction Easements
 - 1. Occupation of private property is limited by the Temporary Construction Easement (TCE) to a continuous time period(s) starting with the activation of the TCE on the property. The Design Builder must complete all work within the period(s) stated in the TCE.
 - 2. The Design Builder must notify the Resident Engineer a minimum of thirty (30) days and a maximum of sixty (60) days prior to entering a Temporary Construction Easement (TCE) unless otherwise specified in the Temporary Construction Easement. Sound Transit must then set an activation date for the start of the Temporary Construction Easement and must notify the property owner in writing. Prior to entry into a TCE area the Design Builder must meet on site with Sound Transit's Property Management Department and the Resident Engineer and to effect the transfer of the TCE to the Design Builder.
 - 3. Construction activities on TCEs can be non-continuous within the duration of the TCE. The Design Builder must provide temporary restoration to a safe condition with suitable environmental controls whenever the Design Builder is not working within the TCE.
 - 4. The Design Builder must not use short-term TCEs for long-term staging or parking of equipment and vehicles.
 - 5. If the Design Builder damages private irrigation systems in a TCE area, the Design Builder must cut, and cap as needed and restore the irrigation line to functionality outside the TCE area. If the Design Builder encounters tree or shrub roots in the TCE belonging to plants outside the TCE area, the Design Builder must have the removal of the roots performed by a certified arborist and must make efforts to maintain the health of the existing tree.
- C. Rights-of-Entry

1. The Design Builder must submit Right-of-Entry Work Plans for invasive Right-of-Entry (ROE) work, such as geotechnical investigations, potholing, and installation of dewatering wells, etc. or as directed by Sound Transit. The Right-of-Entry Work Plans must be reviewed and approved by the Sound Transit.
 2. The Design Builder must provide the following items on the Right-of-Entry Work Plans:
 - a. Identify property and location in plan-view with aerial photo in the background.
 - b. Photos delineating the work zone for each location.
 - c. Work schedule for each parcel. When the work will take place and how long the work will take.
 - d. Work hours.
 - e. How deep the hole/boring will be and the diameter of the hole/boring.
 - f. Restoration includes the types of fill material that will be put back into the hole/boring for all types of existing surfaces.
 - g. Types and size of equipment to be used for the work.
 - h. All impacts and remedies must be identified and approved by the property owner before start of work.
 3. The Design Builder must notify the Resident Engineer a minimum of 3 working days, or longer if indicated in the ROE, prior to executing a ROE.
 4. The Design Builder is solely responsible for acquiring any additional ROE needed for construction activities. All new ROE must be coordinated with Sound Transit Community Outreach and the Resident Engineer. Sound Transit Standard ROE forms must be used and any deviation from Sound Transit ROE forms must be approved by Sound Transit. The turnaround time for review and approval by Sound Transit ROW Engineering is 14 calendar days.
- D. Property Survey and Mapping
1. The Design Builder must perform and transmit to Sound Transit a property survey of the final as-built project condition. The survey must include data and descriptions required to document, record, or transfer Lot Boundary Adjustments, Street Vacations, easements, and property deeds to AHJ, private parties, and utility companies.
 2. If the Design Builder destroys or removes any existing monuments, the Design Builder must replace and record them in accordance with WA State law.

END OF SECTION

**SECTION 01 20 00.10
PRICE AND PAYMENT PROCEDURES
DESIGN-BUILD**

PART 1 - GENERAL

1.01 SUMMARY

This Section, together with Appendix A, includes requirements and procedures for measurement and payment of Contract Pay Items and Change Orders.

1.02 SUBMITTALS

A. Formats:

1. Hard Copy: 8-1/2 inches by 11 inches in size
2. Electronic Copy: Microsoft Excel and .PDF formats

B. Schedule of Values (SOV):

1. Draft Schedule of Values: Within 30 days of the effective date of the Notice to Proceed (NTP)
2. Final Schedule of Values: Within 60 days of the effective date of the NTP
3. Revised Schedule of Values: As required

C. Conform re-submittals to the same requirements as the original submittals.

1.03 SCHEDULE OF VALUES

- A. The Design Builder shall develop and use a Schedule of Values in accordance with Specification Section 01 32 13 to allocate cost to the Work for measurement and payment.
- B. No payment will be made prior to acceptance of a Schedule of Values.
- C. If not otherwise provided in the Contract Price Schedule, the Design Builder may identify, in the Schedule of Values, a dollar amount for mobilization. This amount shall be represented by cost loaded schedule activities in the Design Builder's 90-Day Look-Ahead Schedule and its Baseline Contract Schedule.
- D. The mobilization payment is intended to compensate the Design Builder for certain start-up expenses associated with performance of design and construction Work to include work associated with proposal development. Items which are not to be included in mobilization include, but are not limited to, profit, interest on borrowed money, overhead, or management costs.

- E. The Design Builder shall include an updated version of the Schedule of Values with each progress payment request. Update the Schedule of Values to include:
 - 1. Dollars earned and percent complete for the current progress payment period
 - 2. Dollars earned and percent complete to-date, excluding the current progress payment period
 - 3. Total dollars earned and percent complete to-date
 - 4. Total dollars remaining
 - 5. Changes resulting from Change Orders
- F. The total value of the line items in the Schedule of Values plus any approved Change Orders shall be equal to the current Contract Price.
- G. The value of stored material shall be identified in the Schedule of Values with both a material-purchase activity and a separate corresponding installation activity in the Construction Schedule(s).
- H. If required by the Resident Engineer, the Design Builder shall present documentation substantiating the cost allocations for line items within the Schedule of Values.
- I. On the 25th of each month or next business day, if the 25th falls on a weekend or holiday, The Design Builder shall meet with the Resident Engineer to review the draft monthly progress payment.

1.04 LUMP-SUM MEASUREMENT

Lump-sum measurement will be for the entire item, unit of Work, structure, Change Order, or combination thereof, as specified and as indicated in the Contract Price Schedule.

- A. If the Design Builder requests progress payments for lump-sum items or amounts in the Contract Price Schedule, such progress payments will be made in accordance with schedule of values for payment-apportioning, prepared by the Design Builder and submitted to the Resident Engineer for approval.
- B. Each applicable lump-sum item shall show fixed, definable and measurable quantities where possible and unit prices as developed and assigned by the Design Builder to the different features of the Work and major subdivisions. The summation of 1) extensions of quantities and unit prices and 2) other related lump sum costs shall equal the lump sum price of the item as shown in the Contract Price Schedule.
- C. Following the Resident Engineer's approval, this price breakdown shall be incorporated into the Schedule of Values, from which progress payments will reflect the progress expressed in earned value that occurred during the payment period as approved by the Resident Engineer.

1.05 PAYMENT FOR MATERIALS PURCHASED AND DELIVERED BUT NOT INSTALLED.

Sound Transit will pay for materials purchased and delivered, but not yet incorporated into the Work Subject to the following:

- A. Materials shall be delivered to the Site, or delivered to the Design Builder and stored in a manner acceptable to Sound Transit. Materials that have not been delivered to or adjacent

to the Site will be eligible for payment only if they were specifically manufactured or produced for the Project, and then only after being irrevocably assigned to Sound Transit. Payment will be made for on the basis of certified bills for such materials with its invoice.

- B. Payment for stockpiled materials will not constitute final acceptance of the materials. At Sound Transit's request, the Design Builder at its own expense shall promptly execute, acknowledge and deliver to Sound Transit actual bills of sale or other instruments in a form acceptable to Sound Transit, conveying and assuring to Sound Transit title to such materials included in any invoice, free and clear of all liens. The Design Builder at its own expense shall conspicuously mark such materials as the property of Sound Transit, shall not permit such materials to become commingled with non-Sound Transit-owned property and shall take such other steps, if any, as Sound Transit may require to secure the material.
- C. The required invoice, billing, title, or assignment documents, furnished by the Design Builder, shall contain complete material description and identification data. The amount shown in an invoice for material which is subsequently lost, damaged or determined to be unsatisfactory will be deducted from succeeding invoices until the material is repaired or replaced (at the Design Builder's expense). The Design Builder shall make payment to Subcontractors or suppliers within 30 days following issuance of payment for materials to the Design Builder or Sound Transit may deduct the applicable payment from the next invoice.

1.06 MEASUREMENT OF QUANTITIES FOR UNIT PRICES

- A. Measurement Standards:
 - 1. All Work to be paid for at a contract price per unit measurement, as indicated in the Contract Price Schedule, will be measured by the Resident Engineer in accordance with United States Standard Measures.
 - 2. A ton shall consist of 2,000 pounds avoirdupois.
- B. Measurement by Weight:
 - 1. Reinforcing steel, steel shapes, castings, miscellaneous metal, metal fabrications, and similar items to be paid for by weight shall be measured by scale or by handbook weights for the type and quantity of material actually furnished and incorporated into the Work.
 - 2. Unless shipped by rail, material to be measured and paid for by weight shall be weighed on sealed scales regularly inspected by the Washington State Department of Agriculture's Weights and Measures Section or its designated representative, furnished by and at the expense of the Design Builder. All weighing, measuring, and metering devices shall be suitable for the purpose intended.
 - 3. Provide or use platform scales of sufficient size and capacity to permit the entire vehicle or combination of vehicles to rest on the scale platform while being weighed. Combination vehicles may be weighed as separate units provided they are disconnected while being weighed. Scales shall be inspected and certified as often as the Resident Engineer may deem necessary to ascertain accuracy. Costs incurred as a result of regulating, adjusting, testing, inspecting, and certifying scales shall be borne by the Design Builder.
 - 4. A licensed weighmaster shall weigh all Design Builder-furnished materials. The Resident Engineer may be present to witness the weighing and to check and compile the daily record of such scale weights. However, in any case, the Resident Engineer will require that the Design Builder furnish weight slips and daily summary weigh sheets. In such cases, furnish a duplicate weight slip or a load slip

for each vehicle weighed, and deliver the slip to the Resident Engineer at the point of delivery of the material.

5. If the material is shipped by rail, the certified car weights will be accepted, provided only actual weight of material will be paid for and not minimum car weights used for assessing freight tariff. Car weights will not be acceptable for material to be passed through mixing plants. Material to be measured by weight shall be weighed separately for each bid item under which it is to be paid.
6. Trucks used to haul material being paid for by weight shall be weighed empty daily and at such additional times as the Resident Engineer may require. Each truck shall bear a plainly legible identification mark. The Resident Engineer may require the weight of the material verified by weighing empty and loaded trucks on such other scales as the Resident Engineer may designate.

C. Measurement by Volume:

1. Measurement by volume will be by the cubic dimension indicated in the Contract Price Schedule. Method of volume measurement will be by the unit volume in place or removed as shown on the Contract Drawings or as specified.
2. When material is to be measured and paid for on a volume basis and it is impractical to determine the volume by the specified method of measurement, or when requested by the Design Builder in writing and accepted by the Resident Engineer in writing, the material may be weighed in accordance with the requirements specified for weight measurement. Such weights will be converted to volume measurement for payment purposes. Factors for conversion from weight measurement to volume measurement will be determined by the Resident Engineer and shall be agreed to by the Design Builder before such method of measurement of pay quantities will be accepted.

D. Measurement by Area: Measurement by area will be by the square dimension shown on the Contract plans or as specified. Method of square measurement will be as specified.

E. Linear Measurement: Linear measurement will be by the linear dimension listed or indicated in the Contract Price Schedule. Unless otherwise indicated, items, components, or Work to be measured on a linear basis will be measured at the centerline of the item in place.

F. Field Measurement for Payment:

1. The Design Builder shall take all measurements by providing equipment, workers, and survey crews as required to measure quantities in accordance with the provisions for measurement specified herein. Unless otherwise specified, all quantities shall be calculated using dimensions shown on the Contract plans. No allowance will be made for specified tolerances.

G. The Resident Engineer will verify all quantities of Work performed by the Design Builder on a unit-price basis, for progress payment purposes.

1.07 PAYMENT ON A TIME AND MATERIAL BASIS

A. Payment for Work performed on a time and materials basis shall be determined as follows:

1. Construction Labor:
 - a. For all labor, foreman and below, compensation will be as follows:

- 1) The applicable prevailing wages paid on the Contract for each hour that labor is actually engaged in changed work or rates paid by name on previously submitted certified payrolls.
 - 2) The cost of the payroll taxes and unemployment compensation premiums.
 - 3) The cost of any health, welfare, pension, or collective bargaining agreement benefits paid, including Worker's Compensation.
- b. Equipment Operators will be paid for as direct labor and are not part of the calculated rate for equipment. Compensation for equipment mechanics, oilers (not assigned to a specific item of equipment on a full time basis), and other indirect support (labor or equipment) for the equipment fleet is included within the equipment rates otherwise established herein.
2. Non-Construction Labor.
- a. The cost of labor for professional services or other non-construction-related work (including design, surveying, utility coordination, professional environmental services and similar aspects of the Work), whether provided by Design Builder or a Subcontractor, will equal the sum of:
- 1) Actual wages (i.e. the base wage paid to the employee exclusive of fringe benefits), plus
 - 2) a labor surcharge of 150 percent on base wages, which shall constitute full compensation for all state and federal payroll, unemployment and other taxes, workers' compensation, fringe benefits (including health insurance, retirement plans, vacation, sick leave and bonuses) and all other payments made to, or on behalf of, the workers, in excess of actual wages, as well as for overhead and profit. This amount shall be considered full compensation for and no further markups will be allowed.
- b. Reimbursement will be made for other direct costs such as travel, specialized equipment, testing, permits, etc., with prior approval from Sound Transit.
3. For Specialized Services:
- a. Compensation for specialized services shall be made on the basis of an invoice from the providing entity. A "specialized service" is a work operation, which is not typically done by worker classifications as defined by the Washington State Department of Labor and Industries and by the Davis Bacon Act, and therefore bills by invoice.
- b. Sound Transit may require the Design Builder to obtain multiple quotations for such services and select the provider with prices and terms most advantageous to Sound Transit.
4. Materials: The Design Builder shall receive the cost of material, including freight charges and Washington State Sales Tax (if applicable), as shown by the receipted bills for materials and freight.
5. Equipment:
- a. Payment for equipment used for Work performed on a Time and Materials basis shall be determined according to the version of the AGC- WSDOT Equipment Rental Agreement which is in effect at the time the extra Work is performed except that the current Rental Rate Blue Book published on-line by EquipmentWatch (formerly Primedia Information, Inc.) shall be

used. The current version of the AGC-WSDOT Equipment Rental Agreement are maintained at www.wsdot.wa.gov.

- b. Compensation for mobilization and standby time for all equipment shall be as provided the AGC-WSDOT Equipment Rental Agreement.

B. Markups-Percentage Allowances:

1. For construction change order work performed on Time and Materials, the markup allowable at the tier for the entity performing the extra work with its own forces, whether the Design Builder or a Subcontractor at any tier, shall not exceed 15% of total direct costs of the changed Work.
2. Mark up for each higher tier shall not exceed 6% of the direct cost of the work.
3. For work performed by lower tier subcontractors, a maximum 6% markup is allowed at each higher tier. No other reimbursement, compensation, or payment will be made for any such services, costs, or other items.

C. Time and Material Records and Invoices:

1. All direct costs related to time and materials work authorized or directed by Sound Transit shall be tracked and verified for each shift that work is performed.
2. The Design Builder shall complete a time and materials report in a form approved by Sound Transit, which details all the labor, services, material and equipment used in the preceding shift. Reports shall be signed by the Design Builder's representative and verified by Sound Transit's representative at the end of each shift that work is performed. The report(s) shall be transmitted to Sound Transit daily by the Design Builder and included with its Progress Payment Request.
3. Invoices for materials and services shall be fully itemized showing dates of delivery, quantities, unit prices, amounts, and discounts.
4. Time and materials Work may, at any time and by agreement of both parties, be converted to unit prices or lump sum prices applicable to the remaining Work.

1.08 ITEM MEASUREMENT AND PAYMENT

The items listed on the Contract Price Schedule will be measured and paid for as described in Appendix A to this Specification Section. Items not listed in the Contract Price Schedule but considered necessary to complete the Work, will be considered incidental to the Work, and no separate measurement and payment will be made.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

APPENDICES

Appendix A: Contract Price Schedule

Appendix B: Contract Price Schedule – For Price Reimbursable Contracts

CONTRACT SPECIFICATIONS

SECTION 01 20 00.10

DESIGN BUILD PRICE AND PAYMENT PROCEDURES

APPENDIX A – CONTRACT PRICE SCHEDULE

Item No.1: All Work of this Contract, excluding Items 2 through XX.

- a. Item Description: The Work of this item includes all work required by the Contract Documents excluding the work required for Items #2 through # XX.
- b. Measurement: This item will be measured as a lump sum unit.
- c. Payment: This item will be paid for at the Contract lump sum price, as specified in the Contract Price Schedule.

Item #2: Trench Safety Systems.

- a. Item Description: The Work of this item includes furnishing, installing and removing adequate trench safety systems that meet the requirements of the Contract Documents.
- b. Measurement: This item will be measured as a lump sum unit.
- c. Payment: This item will be paid for at the Contract lump sum price, as specified in the Contract Price Schedule.

Item #3: Post-Revenue Extended Maintenance Service of Electric Traction Elevators

- a. Item Description: The Work of this item includes all costs for extended maintenance services for all Electric Traction Elevators installed by the Design-Builder in accordance with Specification Section 14 21 00 – Electric Traction Elevators and Appendix A – Extended Maintenance Services Scope of Work.
- b. Measurement: This item will be measured as a lump sum.
- c. Payment: The lump sum for this item will be paid monthly at a rate equal to the lump sum bid amount divided by 60 months.

Item #4: Post-Revenue Extended Maintenance Service of Hydraulic Elevators

- a. Item Description: The Work of this item includes all costs for extended maintenance services for all Electric Traction Elevators installed by the Design-Builder in accordance with Specification Section 14 24 00 – Hydraulic Elevators and Appendix A – Extended Maintenance Services Scope of Work.
- b. Measurement: This item will be measured as a lump sum.
- c. Payment: The lump sum for this item will be paid monthly at a rate equal to the lump sum bid amount divided by 60 months.

Item #5: Post-Revenue Extended Maintenance Service of Escalators

- a. Item Description: The Work of this item includes all costs for extended maintenance services for all Escalators installed by the Design-Builder in accordance with Specification Section 14 31 00 – Escalators and Appendix A – Extended Maintenance Services Scope of Work.
- b. Measurement: This item will be measured as a lump sum.
- c. Payment: The lump sum for this item will be paid monthly at a rate equal to the lump sum bid amount divided by 60 months.

Item # __: Pre-revenue Maintenance Service of Electric Traction Elevators Unit Price

- a. Item Description: The Work of this item includes all costs for maintenance services for all Electric Traction Elevators installed by the Design-Builder in accordance with Specification Section 14 21 00 – Electric Traction Elevators during the period between Acceptance and commencement of revenue service by Sound Transit.
- b. Measurement: This item will be measured per month of performance.
- c. Payment: The lump sum for this item will be paid monthly at a rate equal to the unit price bid amount beginning after Acceptance and continuing until start of revenue service.

Item # __: Pre-revenue Maintenance Service of Hydraulic Elevators Unit Price

- a. Item Description: The Work of this item includes all costs for maintenance services for all Hydraulic Elevators installed by the Design-Builder in accordance with Specification Section 14 24 00 – Hydraulic Elevators during the period between Acceptance and commencement of revenue service by Sound Transit.
- b. Measurement: This item will be measured per month of performance.
- c. Payment: The lump sum for this item will be paid monthly at a rate equal to the unit price bid amount beginning after Acceptance and continuing until start of revenue service.

Item # __: Pre-revenue Maintenance Service of Electric Traction Elevators Unit Price

- a. Item Description: The Work of this item includes all costs for maintenance services for all Escalators installed by the Design-Builder in accordance with Specification Section 14 31 00 – Escalators during the period between Acceptance and commencement of revenue service by Sound Transit.
- b. Measurement: This item will be measured per month of performance.
- c. Payment: The lump sum for this item will be paid monthly at a rate equal to the unit price bid amount beginning after Acceptance and continuing until start of revenue service.

Item # __: Provisional Sum for Unidentified Utility Conflicts

- a. Item Description: The Work of this item includes the requirements to resolve unidentified utility conflicts as directed by the Resident Engineer.
- b. Measurement: No separate measurement will be made for this item.

- c. Payment: This item will be paid for in accordance with the Specification 01 20 00 for Payment on Time and Material Basis for work satisfactorily completed and approved by the Resident Engineer.

Item #__: Provisional Sum for Partnering Facilitator and Facilities

- a. Item Description: The Work of this item includes providing the Partnering facilitator and facilities required by the Contract and as directed by the Resident Engineer. This item does not include costs for employees to attend Partnering sessions.
- b. Measurement: No separate measurement will be made for this item.
- c. Payment: This item will be paid for in accordance with the Specification 01 20 00 for Payment on Time and Material Basis for work satisfactorily completed and approved by the Resident Engineer.

Item #__: Provisional Sum for Contractor Support for Archaeological Investigations

- a. Item Description: The Work of this item includes supporting archeological investigations not otherwise specified in the Contract as directed by the Resident Engineer.
- b. Measurement: No separate measurement will be made for this item.
- c. Payment: This item will be paid for in accordance with the Specification 01 20 00 for Payment on Time and Material Basis for work satisfactorily completed and approved by the Resident Engineer.

Item #__: Provisional Sum for Additional Community Construction Impact Mitigation

- a. Item Description: The Work of this item includes providing additional community construction impact mitigation not otherwise specified in the Contract as directed by the Resident Engineer.
- b. Measurement: No separate measurement will be made for this item.
- c. Payment: This item will be paid for in accordance with the Specification 01 20 00 for Payment on Time and Material Basis for work satisfactorily completed and approved by the Resident Engineer.

Item #__: Provisional Sum for Unknown Hazardous & Contaminated Substances

- a. Item Description: The Work of this item includes removal, disposal and backfill, if necessary, of unknown hazardous and contaminated substances encountered during construction as directed by the Resident Engineer.
- b. Measurement: No separate measurement will be made for this item.
- c. Payment: This item will be paid for in accordance with the Specification 01 20 00 for Payment on Time and Material Basis for work satisfactorily completed and approved by the Resident Engineer.

Item #__: Provisional Sum for Dispute Review Board

- a. Item Description: This item is to reimburse the Contractor for Sound Transit's portion of the Dispute Review Board costs, which is 50 percent of the allowable Dispute Review Board members' costs, as set forth in Special Conditions 11.05 - Dispute Review Board of the Contract.
- b. Measurement: No separate measurement will be made for this item.

- c. Payment: This item will be paid for in accordance with the Specification 01 20 00 for Payment on Time and Material Basis and Special Condition 11.05 - Dispute Review Board, as approved by the Resident Engineer, except that no Markup-Percentage Allowance of any kind will be allowed.

Item # __: Provisional Sum for Fire Department Rescue Training

- a. Item Description: The Work of this item includes the Contractor's support for Fire Department Rescue Training operations, as directed by the Resident Engineer.
- b. Measurement: No separate measurement will be made for this item.
- c. Payment: This item will be paid for in accordance with the Specification 01 20 00 for Payment on Time and Material Basis for work satisfactorily completed and approved by the Resident Engineer

Item # __: Provisional Sum for Art Coordination and Installation.

- a. Item Description: The Work of this item includes providing Art Coordination and Installation not otherwise specified in the Contract as directed by the Resident Engineer.
- b. Measurement: No separate measurement will be made for this item.
- c. Payment: This item will be paid for in accordance with the Specification 01 20 00 for Payment on Time and Material Basis for work satisfactorily completed and approved by the Resident Engineer

Item # __: Provisional Sum for Unsuitable Subgrade Material Excavation and Backfill

- a. The Work of this item includes the excavation and disposal of unsuitable subgrade material, and the backfilling and compacting of areas of excavated unsuitable subgrade materials with suitable backfill material, as directed by the Resident Engineer.
- b. Measurement: No separate measurement will be made for this item.
- c. Payment: This item will be paid for in accordance with the Specification 01 20 00 for Payment on Time and Material Basis for work satisfactorily completed and approved by the Resident Engineer.

Item # __: Provisional Sum for Unexpected Removal of Structures or Obstructions for Drilled Shafts

- a. Item Description: The Work of this item includes the removal of a structure or obstruction unexpectedly encountered during drilled shaft excavation.
- b. Measurement: No separate measurement will be made for this item.
- c. Payment: This item will be paid for in accordance with the Specification 01 20 00 for Payment on Time and Material Basis for Work satisfactorily completed as authorized and approved by the Resident Engineer.

Item # __: Provisional Sum for Reimbursement of Dual Benefits costs

- a. Item Description: This item includes the costs associated with Dual Benefits reimbursement in accordance with the Labor Compliance Manual as approved by the Resident Engineer.
- b. Measurement: No separate measurement will be made for this item.
- c. Payment: This item will be paid for in accordance with the Contract as approved by the Resident Engineer, except that no Markup-Percentage Allowance of any kind will be allowed.

Item # ____: Provisional Sum for Reimbursement of Change Notice Work Directives

- a. This item is to reimburse the contractor for Work performed as a result of Change Notice Work Directive(s) (CNWD), until such time as the CNWD is converted to a Change Order.
- b. Measurement: No separate measurement will be made for this item. The costs reimbursable under this item include the costs associated with eligible work directives as directed by the Resident Engineer.
- c. This item will be paid for in accordance with Specification 01 20 00 for Payment on Time and Material Basis for work approved by the Resident Engineer.

Item # __: XXX

- a. The work of this item includes furnishing and installing XXX as shown on the Contract Documents, or as approved or directed by the Resident Engineer. This item includes all costs of installing XXX including, but not limited to
- b. Measurement: This item will be measured per each XXX that has been satisfactorily installed.
- c. Payment: This item will be paid for at the Contract unit price for the quantity measured as specified above.

EXHIBITS

Exhibit A - [_____]

Exhibit B - [_____]

Exhibit C - [_____]

Exhibit __ - [_____]

SECTION 01 20 00.10

DESIGN BUILD PRICE AND PAYMENT PROCEDURES

APPENDIX B – CONTRACT PRICE SCHEDULE – FOR COST REIMBURSABLE CONTRACTS

1. Cost to be Reimbursed

- a. **Cost of the Work** shall mean costs reasonably and necessarily incurred by design builder in the proper performance of the work. The cost of the work will only include the following items, without markup, and shall not include those items listed in Section 3 (Cost to be recovered by fee)

Design builder's Labor Wages and salaries excluding bonuses/incentives for all labor actually spent performing the Work shall be at the lesser of (i) actual cost incurred by design builder or (ii) the rates (the "Labor Rates") forming part of the relevant Exhibit ("Labor Rates Schedule"). Labor costs will be reconciled in accordance with the foregoing to actual cost incurred by design builder at the end of each calendar year and upon completion of the Work in advance of the final billing. No charges will be accepted by Owner for any salaried staff labor classification or rate not listed in the approved Labor Rates Schedule. Any amendments thereto must be executed by Owner and design builder in writing. All such costs will be substantiated and reconciled to actual cost (without utilizing composite rates) incurred at the completion of the Project and for multi-year projects only, at the end of each calendar year. Billed cost will be for actual time spent and actually paid to nonexempt and other hourly employees only, plus associated labor burden, and may exceed eight hours in any calendar day. Hourly union employees are to be paid per the terms and conditions of collective bargaining agreements, or the terms and conditions negotiated for a new collective bargaining agreement. When direct field labor costs are amended per the collective bargaining agreement, such changes, if any, shall be reimbursable at actual cost incurred by design builder. Nonexempt administrative (nonunion) employees are paid in accordance with their offer letter and subsequent periodic raises. In the event other provisions in this Contract are found to be inconsistent with the PLA and do not expressly supersede the PLA, the more stringent provision shall apply.

- i. Owner Must Approve Design Builder's Staffing Plan. In order to be eligible for payment by Owner, design builder's staffing plan must be approved by Owner's Representative in advance.
- ii. Offsite Personnel. In order to be eligible for payment for Work performed by personnel at design builder's home office or other offsite location, design builder must submit a detailed written estimate for the cost of such Work to Owner for Owner's advance written approval. Design builder's estimate must include the actual names of such personnel, their title, general work description and estimated hours for their work on the Project. If approved by Owner, design builder may only charge for approved offsite Work in accordance with design builder's detailed and approved written estimate. For design builder's employees stationed in the design builder's home office, only those positions as may be necessary for the proper conduct of the Work and also identified in the Owner's

written approval will be reimbursable. All employees who are not approved by Owner shall not be reimbursable and, if appropriate, any prior payment shall be reversed in the subsequent Application for Payment. If requested by Owner's Representative, design builder must provide timesheets, in a form approved by Owner, that demonstrate that those approved offsite personnel's actual time spent on the Project is in accordance with the estimated hours.

- iii. Meal and Rest Breaks. Any waiver or deviation of the Project's lunch hour or rest period requirements allowed under applicable law must be approved in advance and in writing by Owner's Representative.
- iv. Overtime. In order to be eligible for payment, all overtime must be approved in advance and in writing by Owner's Representative and such approval may include authorization for overtime required for specific construction phases or to accomplish specified goals. All overtime incurred by design builder with approval by Owner shall be reviewed on a two-week basis by Owner and design builder.
 - a. Authorized overtime will be charged at the lesser of (a) actual costs or (b) the overtime rates set forth in the Labor Rates Schedule and applied in accordance with the laws of the State of Washington. Design builder's employees' hours worked on projects other than Owner's shall not be credited hours for the purpose of calculating overtime eligibility.
 - b. Overtime shall be deemed to include payroll taxes and insurance premiums actually incurred.
 - c. Unless required by the terms of the applicable collective bargaining agreement, design builder shall not pay shift differential for swing (evening) or graveyard (night) shifts) unless expressly authorized by Owner's Representative's prior written consent.
- v. Design builder will not be reimbursed for any overtime premium if the occasion for such overtime is the result of the negligence of design builder or anyone for whom the design builder is responsible.
- vi. Costs incurred by design builder for employee benefits, premiums, taxes, insurance, contributions and assessments required by law, collective bargaining agreements, or which are customarily paid by design builder, to the extent such costs are based on wages and salaries paid to employees of design builder covered under Section 1 hereof.
 - a. Payroll Burdens. Design builder's Labor Rates Schedule must contain a detailed breakdown of all mark-ups of or additions to base wages for all payroll burdens ("Payroll Burdens") including but not be limited to, workers' compensation, employment insurance, benefits and other taxes and insurances measured by payroll. The Payroll Burdens may only be billed to Owner at the lessor of (i) the estimated mark-up on base wages in the Labor Rates Schedule or (ii) actual cost. Payroll Burdens will be reconciled to actual cost incurred along with the labor reconciliation at the end of each calendar year and at the end of the project before the final billing. Worker's compensation shall be reimbursed at the design builders specific State L&I rate, net of employee deductions with the design builder's specific EMF applied. For self-insured companies, the actual state classification rate net of employee deduction with a .5 EMF applied.

- vii. **Employee Benefits.** Design builder's Labor Rates Schedule must contain an estimate of all mark-ups of base wages for all employee benefits. The employee benefits may only be billed to the Owner at the lesser of (i) the estimated mark-up on base wages in the Labor Rates Schedule or (ii) actual cost. Since benefit expense is a part of payroll burden, it will be reconciled to actual cost incurred along with the labor reconciliation at the end of each calendar year and at the end of the project before the final billing. These terms apply to those employee benefits as submitted by design builder and approved by Owner's Representative, in advance and in writing. Should design builder fail to submit such a listing, it will be assumed that design builder is accepting reimbursement for such expenses as a portion of the design builder's Fee and any Payroll Burden for employee benefits will be removed from the Labor Rates Schedule
- viii. **PTO Expense.** The actual cost of labor paid to design builder's salaried employees as part of the Cost of Work, but that is not included in the hourly rates for such employees, to compensate design builder for paid vacation days, sick leave or other paid time off, and design builder paid holidays (collectively, "PTO") (and associated employer taxes and benefits) to be taken or accrued by those employed on the Work. PTO pay for design builder's salaried employees shall not be otherwise reimbursable. The following terms shall apply: PTO (and associated employer taxes and benefits) to be taken or accrued by those employed full time on the Work shall be direct charged to the Cost of Work and be reimbursed as a Cost of Work. If design builder's employee is not working full time on the Project, PTO actually taken will be direct-charged on a pro-rata share basis. If design builder has a corporate policy whereby PTO can be carried over to the following year, design builder will include PTO within the burden rate applied to design builder staff labor costs and those costs shall not be direct charged to a project except as follows. Design builder shall submit staff billing rates based on actual cost to be recovered over annual billable hours. These rates are subject to prior approval by Owner and will not include any items specifically excluded by Section 3 (Non-Reimbursable Costs) below. Labor is to be reconciled to actual cost incurred at the end of each project.
- ix. **Washington State Paid Sick Leave** is a contingent liability and is to be direct charged as taken.
- x. **Design Builder's Travel Expenses.** All travel expenses must be approved by Owner in writing in advance of the travel. Pre-approved travel will be reimbursed as follows: Expenses of reasonable travel by representatives of design builder incurred in obtaining or inspecting materials, or for other purposes applying to the Work, and by mechanics or laborers and design builder's staff employees in the case it is necessary to secure them at a distance of 50 miles beyond Sound Transit Boundaries referred to as "Travel Expenses." All expenses must be supported by itemized receipts, logs, expense reports etc..

a. **Local Travel:**

- 1) Travel for local firms on Sound Transit business including mileage, parking and meals is not considered a reimbursable cost unless expressly authorized in writing by Sound Transit. Authorization must be received in advance of said travel.

- 2) Sound Transit does not reimburse for travel, parking, etc., to or from Sound Transit's main office or Sound Transit's satellite office for any work related to this agreement. This includes full time and part time employees.
- b. Travel Status (50 Mile Rule): An employee of the design builder, subcontractor, or any other key individual who has been designated as an approved commuter, is entitled to reimbursement of lodging expenses when the temporary duty station is located more than 50 miles (most direct route) of the closer of either the traveler's official residence or official station.
- 1) Local travel shall be by public transportation, taxi, or compact rental car.
 - 2) A maximum approved IRS per-mile rate will be paid for the operation, maintenance, and depreciation costs of the company or individually owned vehicles for that portion of time they are used for Project work.
 - 3) Reimbursement for meals and lodging shall not exceed the per diem rates for Washington State as established by the General Services Administration, Transportation Management Policy Division of the Federal Government (<http://www.gsa.gov/travel.htm>). Meals reimbursed at per diem rates do not require receipts.
 - 4) Air travel shall be by coach class at the lowest price available.
- c. Commuter Status: An employee of the design builder, subcontractor, or any other key individual who has not relocated to the Seattle Metropolitan area and is working full time on a Sound Transit project. Authorization to Commuter Status requires written approval by Sound Transit. Reimbursement of commuter costs is as follows:
- 1) A monthly allowance of \$2,000 per month shall be reimbursed to approved commuters subsequent to the month earned. The allowance shall constitute reimbursement of all costs including, but not limited to: rent, deposits, furniture rental, utilities, hotel parking, rental car, meals, mileage, taxi, airfare, gasoline, etc. A monthly expense report is required for reimbursement, but an itemized list and receipts are not required.
 - 2) The Commuter Status expenses shall not exceed \$20,000 for the position over the life of the contract and subsequent contract extensions, even if the individual(s) in the position(s) change. Once the limit of \$20,000 has been expended for the position over the life of the contract, Commuter Status may not be converted to Relocation Status.
 - 3) The first and last month's commuter allowance shall be prorated.
- d. Relocation Status: An employee of the design builder, subcontractor, or any other key individual who has relocated to the Seattle Metropolitan area to work full time on a Sound Transit project. Authorization to Relocation Status requires written approval by Sound Transit.

- 1) Relocation expenses shall not exceed \$15,000 as defined in the FAR Title 48, Part 31.205-35.
- e. Reasonable expenses for all other approved travel will adhere to the following guidelines.
 - 1) Local travel shall be by public transportation, taxi, or compact rental car.
 - 2) A maximum approved IRS per-mile rate will be paid for the operation, maintenance, and depreciation costs of the company or individually owned vehicles for that portion of time they are used for Project work.
 - 3) Reimbursement for meals and lodging shall not exceed the per diem rates for Washington State as established by the General Services Administration, Transportation Management Policy Division of the Federal Government (<http://www.gsa.gov/travel.htm>). Meals reimbursed at per diem rates do not require receipts.
 - 4) Air travel shall be by coach class at the lowest price available.
- xi. Subcontractors and Subcontracts. Payments properly made by design builder to Subcontractors and Design Consultants for performance of portions of the Work, including any insurance and bond premiums incurred by Subcontractors and Design Consultants. Amounts due under all subcontracts, supply agreements and purchase orders made in accordance with this Contract, including the costs of transportation and storage if approved in advance by Owner. The following terms apply to all Subcontractors and all Subcontracts.
 - a. Compliance with this Contract; GMP Subcontractors shall agree to be bound by all of the terms and conditions of this Contract between the Owner and design builder and assumes toward the design builder all of the obligations and responsibilities that the design builder by these instruments assumes toward the Owner. Design builder will not be reimbursed for any costs of its Subcontractors that were incurred in violation of this Contract or the relevant work order. In the event of a conflict between this contract document and the subcontract, the stricter of the provisions shall prevail.
 - b. Audit Rights. For any Subcontracts awarded on a cost reimbursable basis, design builder shall provide in the Subcontract for Owner to receive the same audit rights with regard to the Subcontractor as Owner has with regard to design builder.
- xii. Related Parties. (a) Definition. "Related Party" means any parent company, subsidiary, affiliate or other entity having common ownership or management with design builder; any entity in which any shareholder in, or management employee of, design builder owns any interest in excess of 10% in the aggregate; or any person or entity that has the right to control the business or affairs of design builder. The term "Related Party" includes any member of the immediate family of any person identified above.
 - a. Reporting. Design builder shall not enter into any transaction with a Related Party without first obtaining Owner's written consent, which

consent will be given in Owner's sole discretion. Design builder shall notify Owner of the specific nature of any contemplated transaction between design builder and a Related Party before any such transaction is consummated or cost incurred.

- b. Any work performed by a related party will be considered self-performed work, subject to the terms and conditions of this contract, with no additional layers markup, fee or tax.
- xiii. Costs, including transportation, inspection, testing, storage and handling, of materials, equipment and supplies incorporated or reasonably used in completing the Work. The material costs shall be based upon the net cost after all discounts or rebates, freight costs, express charges, or special delivery costs, when applicable. No lump sum costs will be allowed except when approved in writing in advance by the Owner. Discounts and rebates based on prompt payment need not be included, however, if the design builder offered but the Owner declined the opportunity to take advantage of such discount or rebate. In addition, Owner shall be entitled to deduct from any payments to design builder, the value of all trade discounts, rebates or other credits not obtained by Owner due to the design builder's failure to notify Owner.
- xiv. Costs (less salvage value) of materials, supplies, temporary facilities, machinery, equipment and hand tools not customarily owned by the workers that are not fully consumed in the performance of the Work and which remain the property of design builder, including the costs of transporting, inspecting, testing, handling, installing, maintaining, dismantling and removing such items. Tools and Equipment with a value less than five hundred dollars (<\$500) shall be direct charged to the project less salvage value.
- xv. At the owner's discretion the design builder will provide a salvage value for items purchased by the owner and will reduce the Cost of Work or provide the purchased items to Owner for its use or disposition. Design builder shall use its best efforts to maintain in good repair all non-consumable tools and equipment and to safeguard said tools and equipment from loss, vandalism, adverse weather conditions and theft.
- xvi. Costs of removal of debris and waste from the Site.
- xvii. Equipment Rental charges and the costs of transportation, installation, minor repairs and replacements, dismantling and removal of temporary facilities, machinery, equipment and hand tools not customarily owned by the workers, which are provided by design builder at the Site, whether rented from design builder or others, and incurred in the performance of the Work. Rental equipment shall be obtained from the lowest cost rental source whether it is the design builder or a third party.
 - a. Design Builder Owned Rental Equipment. The cost of all design builder owned rental equipment (with a cost > \$500), materials or temporary structures including any repair and maintenance costs except normal wear and tear. Repair and/or maintenance of design builder's equipment are/is not intended to restore design builder's equipment to a condition better than it was when it initially came to the Project. If the design builder rents equipment from a third party, then the rate shall be the lowest available rate.

- 1) Design builder shall use its best efforts to maintain and repair all tools and equipment and to safeguard said tools and equipment from loss, vandalism, and theft.
- 2) The rental equipment rate for equipment owned by design builder shall be charged at the lower of seventy-five percent (75%) the current AED Green Book (published by Equipment Watch) published rate, or a similar published market benchmark rate, or the current rate as listed in the design builder's equipment rental schedule identified as the "Design Builder's Equipment Rental Rates" in the attached Exhibit (). Recovery periods should reflect useful life.
- 3) Each item on Exhibit () shall include adequate identifying information such as use, manufacturer, make, model, dimensions/length, blade size, capacity, fuel usage, horsepower, voltage/ampereage, weight, etc., such that accurate identification can be determined. These descriptors shall match design builder's owned equipment rental log.
- 4) With respect to design builder's owned equipment, rental shall be based on monthly rates but prorated on a daily basis (monthly rate divided by 30.4). Days used to prorate monthly rates to daily should be consistent with the calculation of days to charge each piece of rental equipment.
- 5) All rental equipment owned by design builder that has been used to construct the Project and that has accumulated rental charges equal to seventy five percent (75%) of the design builder's current replacement cost, shall be provided for the remainder of the Project at no additional rental cost and shall remain as property of the design builder. Replacement costs on a piece of equipment may not be modified during the term of the Agreement.
- 6) Each piece of design builder owned equipment rented to the Project shall be identified by a unique number and the use of each piece of equipment shall be tracked by that number on design builder's owned equipment rental log for each individual Project under this Master Agreement. The design builder's owned equipment rental log shall include a unique equipment identification number, a definitive equipment description, date on site, date off site, replacement cost, monthly rate pro-rated to daily, days billing per month, this month billing calculation and cumulative billing to date, maximum rental allowed for each rented item. The design builder's owned equipment rental log shall be available in Excel format.
- 7) Prior to the start of construction, a listing of all design builder owned equipment and temporary structures required for the Work exceeding Five Hundred and 00/100 Dollars (\$500.00) in replacement cost, including replacement cost information, rental rates, and applicable duration of use, proposed to be used shall be provided to Owner, and Owner shall have the right to purchase such items through the design builder as part of the Cost of the Work. After commencement of construction, a listing of all other design builder owned equipment with a cost of Five Hundred and 00/100 Dollars (\$500.00) or more (where the reasonably

anticipated rental may exceed fifty percent (50%) of the value) and any office equipment shall be presented to Owner on the same basis, along with replacement cost information, anticipated cumulative rental costs, and rental rates. Such materials, temporary structures, equipment, tools, and supplies that shall have been purchased, when no longer required for the Work, shall, at Owner's discretion, either be sold and the salvage value received shall reduce the Cost of the Work or provided to Owner for its use or disposition.

- 8) Absent such prior written identification of equipment and temporary structures, all such equipment and temporary structures shall not be reimbursable and, if appropriate, any prior payment shall be reversed in the subsequent Application for Payment.
- b. Third-Party Equipment Rental. The actual cost of equipment rental from third parties, provided that no such costs will be chargeable to Owner if equivalent equipment could have been provided as design builder-Owned equipment at a lower rate.
- xviii. The shop burden if applicable, will include shop supervision and all other indirect cost including but not limited to: shop rent, depreciation, non-job-specific material handling, shop tools, repairs and maintenance, shop rentals, shop supplies, consumables, utilities and safety. The shop burden will be applied to total shop labor (base rate + fringes).
- b. General administrative costs not specifically listed in Sections 1.1-1.10 above, including but not limited to the following:
 - i. Shop Drawing Reproduction
 - ii. Construction Schedule & Updates
 - iii. Safety/Security
 - iv. Field Office Set-up (mobilization/demobilization)
 - v. Office Supplies
 - vi. Telephone System
 - vii. Cell Phones, iPads and other mobile technology. List of roles that require mobile/communications technology must be approved in advance by the owner. Rates shall only be charged on regular hours and shall not be applied to overtime. Owned Equipment Rental capping of accumulative rentals at 75% of replacement cost shall apply to all hardware. No additional mobile/communications technology shall be reimbursable.
 - a. Hardware will be reimbursed at \$0.12 per hour, for each Cell phone, iPad or other mobile device. Limit shall be one cell phone and one iPad per approved role.
 - b. Cell phone network service is reimbursable at up to \$0.46 per hour. iPad network service is reimbursable at up to \$0.14 per hour.
 - viii. On site computer Network/System Set-up
 - ix. Courier Service
 - x. Postage (Fed-X, USPS)
 - xi. Furniture/Equipment – subject to salvage

- xii. Office Cleaning
 - xiii. Construction Staff Vehicle – subject to rental provisions/actual cost of auto allowance.
 - xiv. Computers, CADD systems and software shall be reimbursed at the following rates. Rates shall only be for regular time hours and shall not be applied to overtime. Owned Equipment Rental capping of accumulative rentals at 75% of replacement cost shall apply to all hardware. No additional hardware may be charged. Roles requiring computer hardware and software shall be approved in advance by the owner.
 - a. Computer Equipment shall be reimbursed at \$0.60 per hour approved positions.
 - b. Non- Cad Software shall be reimbursed at \$0.86 per hour.
 - c. BIM/CAD software packages shall be reimbursed at \$6.80 per hour.
 - xv. Field network cost and jobsite trailer connectivity.
 - xvi. Copy Machine
 - xvii. Temporary Electric Hook-up/Removal
 - xviii. Temporary Electric Material
 - xix. Project Signage
 - xx. Temporary Water Hook-up/Removal
 - xxi. Drinking Water & Supplies
 - xxii. Chemical Toilets
 - xxiii. O&M Manuals
 - xxiv. Project Record Documents
 - xxv. Field Engineering/Layout Survey
2. **The following shall be recovered from the Fee and shall not be direct charged as a Cost of the Work.**
- a. Compensation for design builder's personnel stationed at design builder's principal or branch offices, except as expressly provided for in Section 1 hereof.
 - b. Overhead, profit and general expenses, except as provided for in Section 1 hereof.
 - c. The cost of design builder's capital used in the performance of the Work.
 - d. Costs that would cause the GMP, or any other NTE or Lump Sum, as adjusted in accordance with the Contract Documents, to be exceeded.
 - e. Profit margins or similar mark-ups on costs for Work performed by subsidiaries or other related entities of the design builder unless specifically disclosed to and approved by the Owner.
 - f. Costs associated with bonuses, incentives, incentive compensation, stock options, deferred compensation and similar employee programs, regardless of where the employee is stationed for the Work.
 - g. Discretionary costs intended to be incentives or recognition for Project team members such as lunches, parties, clothing, alcohol, awards and similar expenses, unless approved in advance by the Owner.

- h. Any accrual cost not identified in the Cost of the Work.
 - i. Costs of centralized and generally shared data processing, information technology and communications equipment, systems and networks maintained at or from the design builder's home office.
 - j. Legal, mediation, and arbitration costs including attorney fees related to disputes or actions between the design builder and its employees, Subcontractors, Suppliers and other third parties (including Owner), unless approved in advance by the Owner.
 - k. Costs the design builder may incur that are not a reimbursable Cost of the Work or costs that exceed the Guaranteed Maximum Price as adjusted by Change Orders.
 - l. training unless owner approved and justified for the project – only for those who commence work at the site
 - m. Capital Expenses or financing costs
 - n. Fault of design builder or Subcontractor
 - o. Premiums for insurance and bonds required specifically by this Agreement or the performance of the Work by the design builder.
3. **Design Builder's Fee.** In consideration of design builder's satisfactory performance of the Work, Owner agrees to pay design builder a construction fee. Fee will be applied as a percentage of certain eligible categories of Cost of Work prior to any other markups.
4. **Calculation of Markups**

		Measurement	Base
A	Cost of Work	A	
B	Fee (Overhead & Incentives)	%	A
C	B&O Tax	%	A+B
	Total Cost		=A+B+C

Additional Requirements:

1. Each Payment Application will show the amount to be held by the owner as retainage calculated on the basis of a percentage of the total requested in each application for payment.
2. Substantiation: Design builder shall provide a cost substantiation on a monthly basis and as part of the final payment application. The Substantiation will include, but not be limited to:
 - a. Substantiation Summary
 - b. Monthly Job Cost History Report Including

- i. Labor by individual employee name for week ending periods –
 - 1. hours (regular, overtime, and double time)
 - 2. Hourly Rates (Billing Rates to be reconciled to actual cost)
 - 3. Total Amounts charged
 - 4. Labor Classification or Project role
- ii. Materials & Equipment
- iii. Subcontracts
- iv. Other costs
- c. Materials and Other Expenses Invoices and Receipts
- d. Copies of all Subcontractor Payment Applications for the month
- e. Equipment Rental Support
 - i. Third Party Rental Invoices
 - ii. If Design Builder Owned: Owned Equipment Rental log with Equipment rental cost reimbursement terms applied
 - iii. Source of Owned Equipment Rental Rate – or applicable comparison (AED Greenbook, NECA etc.)
- f. At the end of the project or at the owner's/owner's auditors request additional support will be required including but not limited to:
 - i. Timesheets
 - ii. Payroll Registers/Certified Payroll (if applicable)
 - 1. Labor Compliance Manual 00 73 33 requirements apply, including frequency and documentation requirements.
 - iii. Cancelled Checks
 - iv. Union Fringe Benefit Detail reports and Proof Of Payment to the Union
 - v. Support of Insurance costs – Premium Notices, Monthly Premium Invoices, Broker Quotes and support of direct project application
 - vi. Staff Fringe Benefit actual cost support
 - 1. 401K Proof of Payment
 - 2. Health and Welfare Benefits & Insurances
 - a. Third Party Premium Invoices
 - b. If Self-Insured – detailed accounting of program components by category (not personally identifiable health information)
 - 3. Other Fringe Benefit invoices
 - vii. Subcontractor Detail Report would include:

1. Name of subcontractor
2. Original contract amount
3. Change orders
4. Amounts billed
5. Retention held
6. Balance to finish

END OF APPENDIX

SECTION 01 20 00.20
PRICE AND PAYMENT PROCEDURES
DESIGN-BID-BUILD

PART 1 - GENERAL

1.01 SUMMARY

This Section includes requirements for measurement and payment as they apply to the Work, including provisions applicable to lump sum, provisional sum and unit price items.

1.02 SUBMITTALS

A. Formats:

1. Hard Copy: 8-1/2 inches by 11 inches in size
2. Electronic Copy: Microsoft Excel and .PDF formats

B. Schedule of Values (SOV):

1. Draft Schedule of Values: Within 30 days of the effective date of the Notice to Proceed (NTP)
2. Final Schedule of Values: Within 60 days of the effective date of the NTP
3. Revised Schedule of Values: As required

C. Conform re-submittals to the same requirements as the original submittals.

1.03 SCHEDULE OF VALUES

- A. Develop and use the Schedule of Values to provide an allocation of the Work for measurement and payment to an appropriate level of detail to ensure accurate payment for the Work accomplished.**
- B. Obtain the agreement of the Resident Engineer on the Schedule of Values. No payment will be made prior to an agreed upon Schedule of Values.**
- C. Include an updated version of the Schedule of Values with each progress payment request. Update the Schedule of Values to include:**
1. Dollars earned and percent complete for the current progress payment period
 2. Dollars earned and percent complete to-date, excluding the current progress payment period
 3. Total dollars earned and percent complete to-date
 4. Total dollars remaining
 5. Changes resulting from Change Orders

- D. The total value of the line items in the Schedule of Values plus any approved Change Orders shall be equal to the current contract price.
- E. The value of stored material shall be identified in the Schedule of Values with both a material-purchase activity and a separate corresponding installation activity in the Construction Schedule(s).
- F. If required by the Resident Engineer, present documentation substantiating the cost allocations for line items within the Schedule of Values.
- G. On the 25th of each month or next business day, if the 25th falls on a weekend or holiday, meet with the Resident Engineer to discuss the monthly progress payment.

1.04 LUMP-SUM MEASUREMENT

Lump-sum measurement will be for the entire item, unit of Work, structure, or combination thereof, as specified and as indicated in the Contract Price Schedule.

- A. If the Contractor requests progress payments for lump-sum items or amounts in the Contract Price Schedule, such progress payments will be made in accordance with a well-balanced, detailed schedule of values for payment-apportioning, prepared by the Contractor and submitted to the Resident Engineer for approval.
- B. Each applicable lump-sum item shall show fixed, definable and measurable quantities where possible and unit prices as developed and assigned by the Contractor to the different features of the Work and major subdivisions thereof. The summation of 1) extensions of quantities and unit prices and 2) other related lump sum costs shall equal the lump sum price of the item as shown in the Contract Price Schedule.
- C. Following the Resident Engineer's approval, this price breakdown shall be incorporated into the Schedule of Values, from which progress payments will reflect the progress expressed in earned value that occurred during the payment period as approved by the Resident Engineer.

1.05 MEASUREMENT OF QUANTITIES FOR UNIT PRICES

- A. Measurement Standards:
 - 1. All Work to be paid for at a contract price per unit measurement, as indicated in the Contract Price Schedule, will be measured by the Resident Engineer in accordance with United States Standard Measures.
 - 2. A ton shall consist of 2,000 pounds avoirdupois.
- B. Measurement by Weight:
 - 1. Reinforcing steel, steel shapes, castings, miscellaneous metal, metal fabrications, and similar items to be paid for by weight shall be measured by scale or by handbook weights for the type and quantity of material actually furnished and incorporated into the Work.
 - 2. Unless shipped by rail, material to be measured and paid for by weight shall be weighed on sealed scales regularly inspected by the Washington State Department of Agriculture's Weights and Measures Section or its designated representative, furnished by and at the expense of the Contractor. All weighing, measuring, and metering devices shall be suitable for the purpose intended and shall conform to the tolerances and specifications as outlined in Washington State Department of Transportation Standard Specifications, Division 1, General Requirements, Article 1-09.2, Weighing Equipment.

3. Provide or utilize platform scales of sufficient size and capacity to permit the entire vehicle or combination of vehicles to rest on the scale platform while being weighed. Combination vehicles may be weighed as separate units provided they are disconnected while being weighed. Scales shall be inspected and certified as often as the Resident Engineer may deem necessary to ascertain accuracy. Costs incurred as a result of regulating, adjusting, testing, inspecting, and certifying scales shall be borne by the Contractor.
4. A licensed weighmaster shall weigh all Contractor-furnished materials. The Resident Engineer may be present to witness the weighing and to check and compile the daily record of such scale weights. However, in any case, the Resident Engineer will require that the Contractor furnish weight slips and daily summary weigh sheets. In such cases, furnish a duplicate weight slip or a load slip for each vehicle weighed, and deliver the slip to the Resident Engineer at the point of delivery of the material.
5. If the material is shipped by rail, the certified car weights will be accepted, provided only actual weight of material will be paid for and not minimum car weights used for assessing freight tariff. Car weights will not be acceptable for material to be passed through mixing plants. Material to be measured by weight shall be weighed separately for each bid item under which it is to be paid.
6. Trucks used to haul material being paid for by weight shall be weighed empty daily and at such additional times as the Resident Engineer may require. Each truck shall bear a plainly legible identification mark. The Resident Engineer may require the weight of the material verified by weighing empty and loaded trucks on such other scales as the Resident Engineer may designate.

C. Measurement by Volume:

1. Measurement by volume will be by the cubic dimension indicated in the Contract Price Schedule. Method of volume measurement will be by the unit volume in place or removed as shown on the Contract Drawings or as specified.
2. When material is to be measured and paid for on a volume basis and it is impractical to determine the volume by the specified method of measurement, or when requested by the Contractor in writing and accepted by the Resident Engineer in writing, the material may be weighed in accordance with the requirements specified for weight measurement. Such weights will be converted to volume measurement for payment purposes. Factors for conversion from weight measurement to volume measurement will be determined by the Resident Engineer and shall be agreed to by the Contractor before such method of measurement of pay quantities will be accepted.

D. Measurement by Area: Measurement by area will be by the square dimension shown on the Contract Drawings or as specified. Method of square measurement will be as specified.

E. Linear Measurement: Linear measurement will be by the linear dimension listed or indicated in the Contract Price Schedule. Unless otherwise indicated, items, components, or Work to be measured on a linear basis will be measured at the centerline of the item in place.

F. Field Measurement for Payment:

1. The Contractor shall take all measurements by providing equipment, workers, and survey crews as required to measure quantities in accordance with the provisions for measurement specified herein. Unless otherwise specified, all

quantities shall be calculated using dimensions shown on the Contract Drawings. No allowance will be made for specified tolerances.

2. The Resident Engineer will verify all quantities of Work performed by the Contractor on a unit-price basis, for progress payment purposes.

1.06 REJECTED, EXCESS, OR WASTED MATERIALS

Quantities of material wasted or disposed of in a manner not called for under the Contract; rejected loads of material, including material rejected after it has been placed by reasons of the failure of the Contractor to conform to the provisions of the Contract; material not unloaded from the transporting vehicle; material placed outside the lines indicated on the Contract Drawings or established by the Resident Engineer; or material remaining on hand after completion of the Work, will not be paid for, and such quantities shall not be included in the final total quantities. No additional compensation will be permitted for loading, hauling, and disposing of rejected material.

1.07 ITEM MEASUREMENT AND PAYMENT

The items listed on the Contract Price Schedule will be measured and paid for as described in Appendix A to this Specification Section. Payment will only be made for work that has been satisfactorily completed. Items not listed in the Contract Price Schedule but considered necessary to complete the Work, will be considered incidental to the Work, and no separate measurement and payment will be made.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

APPENDIX

Appendix A: Contract Pay Item – Measurement and Payment Provisions

SECTION 01 20 00.20

PRICE AND PAYMENT PROCEDURES - DESIGN-BID-BUILD CONTRACTS

APPENDIX A – CONTRACT PAY ITEM - MEASUREMENT AND PAYMENT PROVISIONS

Item No. 1: All Work of this Contract, excluding Items 2 through XX.

- a. Item Description: The Work of this item includes all work required by the Contract Documents excluding the work required for Items #2 through # XX.
- b. Measurement: This item will be measured as a lump sum unit.
- c. Payment: This item will be paid for at the Contract lump sum price, as specified in the Contract Price Schedule.

Item #2: Trench Safety Systems.

- a. Item Description: The Work of this item includes furnishing, installing and removing adequate trench safety systems that meet the requirements of the Contract Documents.
- b. Measurement: This item will be measured as a lump sum unit.
- c. Payment: This item will be paid for at the Contract lump sum price, as specified in the Contract Price Schedule.

Item #__: Provisional Sum for Unidentified Utility Conflicts

- a. Item Description: The Work of this item includes the requirements to resolve unidentified utility conflicts as directed by the Resident Engineer.
- b. Measurement: No separate measurement will be made for this item.
- c. Payment: This item will be paid for in accordance with the General Conditions for Payment on Time and Material Basis for work satisfactorily completed and approved by the Resident Engineer.

Item #__: Provisional Sum for Partnering Facilitator and Facilities

- a. Item Description: The Work of this item includes providing the Partnering facilitator and facilities required by the Contract and as directed by the Resident Engineer. This item does not include costs for employees to attend Partnering sessions.
- b. Measurement: No separate measurement will be made for this item.
- c. Payment: This item will be paid for in accordance with the General Conditions for Payment on Time and Material Basis for work satisfactorily completed and approved by the Resident Engineer.

Item #__: Provisional Sum for Contractor Support for Archaeological Investigations

- a. Item Description: The Work of this item includes supporting archeological investigations not otherwise specified in the Contract as directed by the Resident Engineer.
- b. Measurement: No separate measurement will be made for this item.
- c. Payment: This item will be paid for in accordance with the General Conditions for Payment on Time and Material Basis for work satisfactorily completed and approved by the Resident Engineer.

Item #__: Provisional Sum for Additional Community Construction Impact Mitigation

- a. Item Description: The Work of this item includes providing additional community construction impact mitigation not otherwise specified in the Contract as directed by the Resident Engineer.
- b. Measurement: No separate measurement will be made for this item.
- c. Payment: This item will be paid for in accordance with the General Conditions for Payment on Time and Material Basis for work satisfactorily completed and approved by the Resident Engineer.

Item #__: Provisional Sum for Unknown Hazardous & Contaminated Substances

- a. Item Description: The Work of this item includes removal, disposal and backfill, if necessary, of unknown hazardous and contaminated substances encountered during construction as directed by the Resident Engineer.
- b. Measurement: No separate measurement will be made for this item.
- c. Payment: This item will be paid for in accordance with the General Conditions for Payment on Time and Material Basis for work satisfactorily completed and approved by the Resident Engineer.

Item #__: Provisional Sum for Dispute Review Board

- a. Item Description: This item is to reimburse the Contractor for Sound Transit's portion of the Dispute Review Board costs, which is 50 percent of the allowable Dispute Review Board members' costs, as set forth in Special Conditions 11.05 - Dispute Review Board of the Contract.
- b. Measurement: No separate measurement will be made for this item.
- c. Payment: This item will be paid for in accordance with the General Conditions for Payment on Time and Material Basis and Special Condition 11.05 - Dispute Review Board, as approved by the Resident Engineer, except that no Markup-Percentage Allowance of any kind will be allowed.

Item #__: Provisional Sum for Fire Department Rescue Training

- a. Item Description: The Work of this item includes the Contractor's support for Fire Department Rescue Training operations, as directed by the Resident Engineer.
- b. Measurement: No separate measurement will be made for this item.

- c. Payment: This item will be paid for in accordance with the General Conditions for Payment on Time and Material Basis for work satisfactorily completed and approved by the Resident Engineer

Item #__: Provisional Sum for Art Coordination and Installation.

- a. Item Description: The Work of this item includes providing Art Coordination and Installation not otherwise specified in the Contract as directed by the Resident Engineer.
- b. Measurement: No separate measurement will be made for this item.
- c. Payment: This item will be paid for in accordance with the General Conditions for Payment on Time and Material Basis for work satisfactorily completed and approved by the Resident Engineer

Item #__: Provisional Sum for Unsuitable Subgrade Material Excavation and Backfill

- a.) The Work of this item includes the excavation and disposal of unsuitable subgrade material, and the backfilling and compacting of areas of excavated unsuitable subgrade materials with suitable backfill material, as directed by the Resident Engineer.
- b.) Measurement: No separate measurement will be made for this item.
- c.) Payment: This item will be paid for in accordance with the General Conditions for Payment on Time and Material Basis for work satisfactorily completed and approved by the Resident Engineer.

Item #__: Provisional Sum for Unexpected Removal of Structures or Obstructions for Drilled Shafts

- a. Item Description: The Work of this item includes the removal of a structure or obstruction unexpectedly encountered during drilled shaft excavation.
- b. Measurement: No separate measurement will be made for this item.
- c. Payment: This item will be paid for in accordance with the General Conditions for Payment on Time and Material Basis for Work satisfactorily completed as authorized and approved by the Resident Engineer.

Item #__: Provisional Sum for Reimbursement of Dual Benefits costs

- a. Item Description: This item includes the costs associated with Dual Benefits reimbursement in accordance with the Labor Compliance Manual as approved by the Resident Engineer.
- b. Measurement: No separate measurement will be made for this item.
- c. Payment: This item will be paid for in accordance with the Contract as approved by the Resident Engineer, except that no Markup-Percentage Allowance of any kind will be allowed.

Item #__: Provisional Sum for Reimbursement of Change Notice Work Directives

- a. This item is to reimburse the contractor for Work performed as a result of Change Notice Work Directive(s) (CNWD), until such time as the CNWD is converted to a Change Order.
- b. Measurement: No separate measurement will be made for this item. The costs reimbursable under this item include the costs associated with eligible work directives as directed by the Resident Engineer.

- c. This item will be paid for in accordance with General Provision 9.09 for Payment on Time and Material Basis for work approved by the Resident Engineer.

Item #__ : XXX

- a. The work of this item includes furnishing and installing XXX as shown on the Contract Documents, or as approved or directed by the Resident Engineer. This item includes all costs of installing XXX including, but not limited to
- b. Measurement: This item will be measured per each XXX that has been satisfactorily installed.
- c. Payment: This item will be paid for at the Contract unit price for the quantity measured as specified above.

EXHIBITS .

Exhibit A - [_____]

Exhibit B - [_____]

Exhibit C - [_____]

Exhibit __ - [_____]

END OF APPENDIX

SECTION 01 20 00.30
PRICE AND PAYMENT PROCEDURES
GC/CM

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section includes requirements for measurement and payment as they apply to the Work, including provisions applicable to lump sum and provisional sum items.

1.02 SUBMITTALS

- A. Formats:
 - 1. Hard Copy: 8-1/2 inches by 11 inches in size
 - 2. Electronic Copy: Microsoft Excel and .PDF formats
- B. Schedule of Values (SOV):
 - 1. Schedule of Values: Submit the Schedule of Values, agreed to during the MACC negotiations, within 10 days of the effective date of the Notice to Proceed (NTP)
 - 2. Revised Schedule of Values: As required
- C. Conform revised Schedule of Values to the same requirements as the original submittals.

1.03 SCHEDULE OF VALUES

- A. Develop and use the Schedule of Values to provide an allocation of the Work for measurement and payment to an appropriate level of detail to ensure accurate payment for the Work accomplished.
- B. Obtain the agreement of the Resident Engineer on the Schedule of Values. No payment will be made prior to an agreed upon Schedule of Values.
- C. Include an updated version of the Schedule of Values with each progress payment request. Update the Schedule of Values to include:
 - 1. Dollars earned and percent complete for the current progress payment period
 - 2. Dollars earned and percent complete to-date, excluding the current progress payment period
 - 3. Total dollars earned and percent complete to-date
 - 4. Total dollars remaining
 - 5. Changes resulting from Change Orders
- D. The total value of the line items in the Schedule of Values plus any approved Change Orders shall be equal to the current contract price.
- E. Subcontracts

1. For each Subcontract Package awarded provide a schedule of values.
 - a. For each line item of installed value exceeding 10% of the subcontract bid, show breakdown by major products or operations under each item.
 - b. Breakdown major work efforts by phases or systems as appropriate for ease of review and confirmation of Work completed.
 - c. If Provisional Sum Items are utilized, show each allowance as a discrete line item.
 - d. Coordinate items of the schedule of values so that there is a corresponding item in the Construction Progress Schedule.
 - F. The value of stored material shall be identified in the Schedule of Values with both a material-purchase activity and a separate corresponding installation activity in the Construction Schedule(s).
 - G. If required by the Resident Engineer, present documentation substantiating the cost allocations for line items within the Schedule of Values.
 - H. On the 25th of each month, or the next business day, if the 25th falls on a weekend or a holiday, meet with the Resident Engineer to discuss the monthly progress payment.
 - I. For negotiated work or subcontract bid packages in which trench excavation will exceed a depth of four feet, the negotiated work or subcontract bid package price schedule will include a separate lump sum item for "Trench Safety Systems" as required by 39.04.180 RCW. The cost of trench safety systems shall not be considered as incidental to any other subcontract item.
- 1.04 LUMP-SUM MEASUREMENT
- A. Lump-sum measurement will be for the entire item, unit of Work, structure, or combination thereof, as specified and as indicated in the Contract Price Schedule.
 1. If the Contractor requests progress payments for lump-sum items or amounts in the Contract Price Schedule, such progress payments will be made in accordance with a well-balanced, detailed schedule of values for payment-apportioning, prepared by the Contractor and submitted to the Resident Engineer for approval.
 2. Each applicable lump-sum item shall show fixed, definable, and measurable quantities, where possible, and unit prices as developed and assigned by the Contractor to the different features of the Work and major subdivisions thereof. The summation of 1) extensions of quantities and unit prices and 2) other related lump sum costs shall equal the lump sum price of the item as shown in the Contract Price Schedule.
 3. Following the Resident Engineer's approval, this price breakdown shall be incorporated into the Schedule of Values, from which progress payments will reflect the progress expressed in earned value that occurred during the payment period as approved by the Resident Engineer.

1.05 ITEM MEASUREMENT AND PAYMENT

The items listed on the Contract Price Schedule will be measured and paid for as described in Appendix A to this Specification Section. Payment will only be made for work that has been satisfactorily completed. Items not listed in the Contract Price Schedule, but considered

necessary to complete the Work, will be considered incidental to the Work, and no separate measurement and payment will be made.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

APPENDIX

Appendix A: Contract Pay Item – Measurement and Payment Provisions

SECTION 01 20 00.30

PRICE AND PAYMENT PROCEDURES - GC/CM CONTRACTS

APPENDIX A – CONTRACT PAY ITEM - MEASUREMENT AND PAYMENT PROVISIONS

Item #1: GCCM Fixed Fee

- a. Item Description: This item is the fixed fee to be earned by the Contractor.
- b. Measurement: This item will be measured as a lump sum unit.
- c. Payment: This item will be paid for at the Contract lump sum price as specified in the Contract Price Schedule in accordance with the Contract. The first progress billing will include the cost (supported by surety invoice) of the Contractor's Payment and Performance Bonds. The remaining value of this item will be paid as a percentage based on the percent of the Maximum Allowable Construction Cost (MACC) satisfactorily earned. The MACC is the total value of Item #3 through Item #.

Item #2: Specified General Conditions

- a. Item Description: This item includes all Work to perform the Specified General Conditions as required by the Contract.
- b. Measurement: This item will be measured as a lump sum unit.
- c. Payment: This item will be paid for at the Contract lump sum price as specified in the Contract Price Schedule in accordance with the Contract.

Item #3: Subcontract Bid Package Cost

- a. Item Description: The item includes all the Work associated with the subcontract bid package Work, not including the Electrical Contractor/Construction Manager (ECCM) / Mechanical Contractor/Construction Manager (MCCM) Maximum Allowable Subcontract Cost (Item #4) and the Maximum Allowable Subcontract Cost (MASC) Risk Contingency (Item #5).
- b. Measurement: This item will be measured as a lump sum unit.
- c. Payment: This item will be paid for at the Contract lump sum price as specified in the Contract Price Schedule in accordance with the Contract.

Item #4: ECCM / MCCM Subcontract Cost

- a. Item Description: If the ECCM / MCCM method of contracting is used, this item includes the Work of the ECCM and MCCM subcontracts, not including Negotiated Support Services (if any), Provisional Sums (if any) and the MASC Risk Contingency (Item #5).
- b. Measurement: This item will be measured as a lump sum unit.
- c. Payment: This item will be paid for at the Contract lump sum price as specified in the Contract Price Schedule in accordance with the Contract.

Item #5: Maximum Allowable Subcontract Cost (MASC) Risk Contingency

- a. Item Description: If the ECCM / MCCM method of contracting is used, this item is the MASC Risk Contingency Account for ECCM / MCCM subcontract work.
- b. Measurement: This item will be measured as a lump sum unit.

- c. This item will be paid in accordance with the General Conditions Article 9.11 as authorized and approved by the Resident Engineer.

Item #6: Maximum Allowable Construction Cost (MACC) Risk Contingency Account

- a. Item Description: This item is the MACC Risk Contingency Account for the Contract.
- b. Measurement: This item will be measured as a lump sum unit.
- c. Payment: This item will be paid in accordance with the General Conditions Article 9.11 as authorized and approved by the Resident Engineer.

Item #7: Negotiated Support Services

- a. Item Description: This item includes the Work to perform the Negotiated Support Services as defined in the General Conditions and identified on Attachment A (Negotiated Support Services – Basis of Understanding Document) to the Construction Agreement Form.
- b. Measurement: This item will be measured as a lump sum unit.
- c. Payment: This item will be paid based on Attachment A (Negotiated Support Services – Basis of Understanding Document) to the Construction Agreement Form.

Item #[]: Provisional Sum for Unidentified Utility Conflicts

- a. Item Description: The Work of this item includes the requirements to resolve unidentified utility conflicts as directed by the Resident Engineer.
- b. Measurement: No separate measurement will be made for this item.
- c. Payment: This item will be paid for in accordance with the General Conditions for Payment on a Time and Material Basis for work satisfactorily completed and approved by the Resident Engineer.

Item #[]: Provisional Sum for Partnering Facilitator and Facilities

- a. Item Description: The Work of this item includes providing the Partnering facilitator and facilities required by the Contract and as directed by the Resident Engineer. This item does not include costs for employees to attend Partnering sessions.
- b. Measurement: No separate measurement will be made for this item.
- c. Payment: This item will be paid for in accordance with the General Conditions for Payment on a Time and Material Basis for work satisfactorily completed and approved by the Resident Engineer.

Item #[]: Provisional Sum for Contractor Support for Archaeological Investigations

- a. Item Description: The Work of this item includes supporting archeological investigations not otherwise specified in the Contract as directed by the Resident Engineer.
- b. Measurement: No separate measurement will be made for this item.

- c. Payment: This item will be paid for in accordance with the General Conditions for Payment on a Time and Material Basis for work satisfactorily completed and approved by the Resident Engineer.

Item #[]: Provisional Sum for Additional Community Construction Impact Mitigation

- a. Item Description: The Work of this item includes providing additional community construction impact mitigation not otherwise specified in the Contract as directed by the Resident Engineer.
- b. Measurement: No separate measurement will be made for this item.
- c. Payment: This item will be paid for in accordance with the General Conditions for Payment on a Time and Material Basis for work satisfactorily completed and approved by the Resident Engineer.

Item #[]: Provisional Sum for Unknown Hazardous & Contaminated Substances

- a. Item Description: The Work of this item includes removal, disposal and backfill, if necessary, of unknown hazardous and contaminated substances encountered during construction as directed by the Resident Engineer.
- b. Measurement: No separate measurement will be made for this item.
- c. Payment: This item will be paid for in accordance with the General Conditions for Payment on a Time and Material Basis for work satisfactorily completed and approved by the Resident Engineer.

Item #[]: Provisional Sum for Dispute Review Board

- a. Item Description: This item is to reimburse the Contractor for Sound Transit's portion of the Dispute Review Board costs, which is 50 percent of the allowable Dispute Review Board members' costs, as set forth in Special Conditions 11.05 - Dispute Review Board of the Contract.
- b. Measurement: No separate measurement will be made for this item.
- c. Payment: This item will be paid for in accordance with the General Conditions for Payment on a Time and Material Basis and Special Condition 11.05 - Dispute Review Board, as approved by the Resident Engineer, except that no Markup-Percentage Allowance of any kind will be allowed.

Item #[]: Provisional Sum for Fire Department Rescue Training

- a. Item Description: The Work of this item includes the Contractor's support for Fire Department Rescue Training operations, as directed by the Resident Engineer.
- b. Measurement: No separate measurement will be made for this item.
- c. Payment: This item will be paid for in accordance with the General Conditions for Payment on a Time and Material Basis for work satisfactorily completed and approved by the Resident Engineer

Item #[]: Provisional Sum for Art Coordination and Installation.

- a. Item Description: The Work of this item includes providing Art Coordination and Installation not otherwise specified in the Contract as directed by the Resident Engineer.
- b. Measurement: No separate measurement will be made for this item.
- c. Payment: This item will be paid for in accordance with the General Conditions for Payment on a Time and Material Basis for work satisfactorily completed and approved by the Resident Engineer

Item # []: Provisional Sum for Unexpected Removal of Structures or Obstructions for Drilled Shafts

- a. Item Description: The Work of this item includes the removal of a structure or obstruction unexpectedly encountered during drilled shaft excavation.
- b. Measurement: No separate measurement will be made for this item.
- c. Payment: This item will be paid for in accordance with the General Conditions for Payment on Time and Material Basis for Work satisfactorily completed as authorized and approved by the Resident Engineer.

Item # []: Provisional Sum for Reimbursement of Dual Benefits costs

- a. Item Description: This item includes the costs associated with Dual Benefits reimbursement in accordance with the Labor Compliance Manual as approved by the Resident Engineer.
- b. Measurement: No separate measurement will be made for this item.
- c. Payment: This item will be paid for in accordance with the Contract as approved by the Resident Engineer, except that no Markup-Percentage Allowance of any kind will be allowed.

Item # []: Provisional Sum for Reimbursement of Change Notice Work Directives

- a. This item is to reimburse the contractor for Work performed as a result of Change Notice Work Directive(s) (CNWD), until such time as the CNWD is converted to a Change Order.
- b. Measurement: No separate measurement will be made for this item. The costs reimbursable under this item include the costs associated with eligible work directives as directed by the Resident Engineer.
- c. This item will be paid for in accordance with General Provision 9.09 for Payment on Time and Material Basis for work approved by the Resident Engineer.

Item # __: XXX

- a. The work of this item includes furnishing and installing XXX as shown on the Contract Documents, or as approved or directed by the Resident Engineer. This item includes all costs of installing XXX including, but not limited to
- b. Measurement: This item will be measured per each XXX that has been satisfactorily installed.

- c. Payment: This item will be paid for at the Contract unit price for the quantity measured as specified above.

END OF APPENDIX

SECTION 01 25 00

SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section includes administrative and procedural requirements for requesting substitutions for materials, equipment, or processes for which the Contract does not explicitly allow an "approved equal."
- B. Items which are being submitted under the "approved equal" provision of a specification shall be submitted under the specification section in which an "approved equal" is explicitly allowed and not under this specification section.

1.02 SUBMITTALS

Request for Substitution (Exhibit A).

1.03 QUALITY ASSURANCE

- A. Investigate and document compatibility and performance of the proposed substitution with the Contract required item, process or performance requirement. Where applicable, engage a qualified Independent Testing Laboratory to conduct and document tests demonstrating compatibility, reliability and/or performance.
- B. Coordination: Upon approval, modify or adjust affected work as necessary to integrate the substitution.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 GENERAL

- A. Submit each request for consideration on a separate Request for Substitution form.
- B. Submit a Request for Substitution under this Section 01 25 00, Substitution Procedures and not under the technical specification section containing the originally specified item. Upon Sound Transit's approval of the substitution request, submit product data under the technical specification section of the originally specified item.
- C. Supplement the Request for Substitution Form (Exhibit A) with the following documentation in addition to the requirements stated on the form.
 - 1. Statement indicating reason specified product or fabrication or installation or process cannot be provided, if applicable

2. Description of the differences between the proposed substitution and the specified item.
 3. If this substitution has an effect on other work or the functionality of an assembly or system, provide information, certifications, or test data demonstrating compatibility and coordination requirements, including a list of changes or modifications needed for other parts of the Work or for work performed by other Sound Transit contractors that will be necessary to accommodate the proposed substitution.
 4. Contractor's Request for Change with appropriate credit corresponding to the requested substitution
 5. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and/or other specific features and requirements indicated in the requirements document.
 6. Include annotated copy of all applicable Contract requirements and drawings. Indicate deviations, if any, from the Work specified.
 7. Product data, shop drawings, descriptions of products and installation procedures.
 8. Samples, where applicable.
 9. Certificates and qualification data, where applicable
 10. List of similar installations for completed projects with project location and names, and architects, engineers and owners contact information.
 11. Material test reports from a qualified Independent Testing Laboratory indicating and interpreting test results for compliance with Contract requirements.
 12. Detailed analysis based on the Contractor's Construction Schedule(s) demonstrating the effect of the proposed substitution(s) on the Contract Milestones. If availability of the specified item or equipment impacts a Contract Milestone, include a letter from manufacturer or supplier, on its letterhead, stating the original date of the purchase order, reasons for the lack of availability or delays in delivery, and normal lead-time.
 13. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as may be indicated in substitution request, is compatible with related materials and is appropriate for application.
- D. Submit complete information on changes to Contract Documents that the proposed product substitution will require for its proper installation

END OF SECTION

EXHIBITS

Exhibit A: Request for Substitution Form



EXHIBIT A
SECTION 01 25 00
REQUEST FOR SUBSTITUTION

1. Date of Request:	2. Tracking Number:
3. Specification Section(s):	
4. Specified Requirement to be Substituted:	
5. Proposed Substitution:	
6. Explanation for Substitution (attach documentation as required in 01 25 00):	
<p>Does the substitution affect requirements on the Contract Documents? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Manufacturer's guarantees of the proposed and specified items are: <input type="checkbox"/> Same <input type="checkbox"/> Different (provide explanation) <input type="checkbox"/> N/A</p>	



EXHIBIT A
SECTION 01 25 00
REQUEST FOR SUBSTITUTION

7. The undersigned states that the function, appearance, constructability, interfaces with other contracts and quality of the proposed items are equivalent or superior to the specified requirement.

Signature

Print Name, Title, and Company

Date

8. DOR Concurrence:

☐ Accepted ☐ Accepted as Noted

The undersigned concurs the substitution will have no direct or indirect impact on fit, function, reliability, maintainability, operability, or interfaces with other contracts and/or systems safety aspect of the work product.

Notes:

OR ☐ Rejected

Explanation of Rejection:

Signature

Print Name, Title, and Company

Date

9. Corridor Design Manager Evaluation*:

The undersigned confirms the substitution will have no direct or indirect impact on fit, function, reliability, maintainability, operability, quality, constructability or interfaces with other contracts and/or systems safety aspect of the work product, and has consulted with the appropriate ST Subject Matter Experts.

Substitutions which have a direct or indirect impact on fit, function, reliability, maintainability, operability, quality, constructability or interfaces with other contracts and/or systems safety aspect of the work product shall be evaluated by the Material Review Board (MRB) for acceptance.

☐ Accepted ☐ Accepted as Noted ☐ Rejected ☐ MRB Evaluation Required

Notes:

Signature

Print Name and Title

Date

*Delegation of evaluation authority shall be confirmed with Design and Engineering and documented in the Project Management Plan.

10. Agency Quality Assurance Review

☐ Approved for process

Signature

Print Name and Title

Date

11. MRB Evaluation (if required):

☐ Accepted ☐ Accepted as Noted ☐ Rejected ☐ N/A

Explanation if Rejected:

Signature

Print Name (MRB Chair)

Notes:

END OF EXHIBIT

SECTION 01 31 13
PROJECT COORDINATION

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section includes Coordination of Work of the Contract:
 - 1. Coordination of schedules, submittals and work of the various specification Sections to ensure efficient and orderly sequencing of construction elements, with provisions for accommodating items to be installed later
 - 2. Coordination of work among parts of the Contract Documents to avoid conflicts and omissions, including special care to coordinate work which is normally indicated in some but not all mechanical, electrical, and other major Divisions of the Contract Documents

1.02 SUBMITTALS

- A. Coordination Drawings: Signed drawings consisting of plans, ceiling space drawings, sections, and details as required to coordinate Work addressed in multiple specification Sections. Drawings shall demonstrate that the installation of the aforementioned items have been coordinated prior to commencement of the Work. Submit in accordance with Section 01 33 00 and the Contractor's Submittal Log for Sound Transit's review and approval.
- B. [Coordinated Installation Program (CIP): 3 months, prior to achievement of Milestone [____], in accordance with Section 00 73 00, Special Conditions.]
- C. [Building Information Modeling (BIM): Implementation Plan]

1.03 COORDINATION OF UTILITIES

- A. Coordinate equipment and utility shutdowns in construction schedules(s), as required.
- B. Schedule and coordinate utility shutdowns with applicable agencies:
 - 1. Confirm requests for equipment and utility shutdowns in writing to the Resident Engineer as required in the Contract Documents, but not less than 14 days prior to the proposed date. Include, as a minimum, the following information:
 - a. Equipment or utility services affected
 - b. Reason shutdown is required
 - c. Work to be accomplished during the shutdown
 - d. Proposed date and time of shutdown
 - e. Duration of the shutdown

2. The actual date and time of shutdowns will be subject to approval of applicable agency and Resident Engineer.
3. The duration of shutdowns shall be held to a reasonable minimum as determined by applicable agency and Resident Engineer.
4. Ensure that materials and equipment required for the work to be accomplished during shutdown are completed and available on the job for review by Resident Engineer three (3) days prior to the shutdown, if requested. If not adequately prepared, the shutdown will be canceled and rescheduled.
5. Include all costs associated with equipment and utility shutdowns. Sound Transit will make no extra payment for overtime work, schedule changes, or failure to complete utility connections within authorized shutdown periods.

1.04 COORDINATION OF SITE LOGISTICS

A. Coordination of Space

1. Coordinate use of space and sequence of installation of mechanical and electrical work, which is indicated diagrammatically on Contract Drawings. Route pipes, ducts, and conduits as closely as practicable, with due allowance for available physical space; make runs parallel with lines of building. Utilize space efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
2. In finished areas, except as otherwise shown, conceal pipes, ducts, wiring and the like within the construction. Coordinate locations of fixtures and outlets with finish elements; furring, chases, and soffits not shown on the Contract Drawings are specifically not allowed, unless shown or specified in the Contract Documents.

B. Interferences and Right-of-Way:

1. Make proper provisions to avoid interferences.
2. Where conflicts occur, resolve in the following order: Structural work has right-of-way over mechanical and electrical work; concealed mechanical work has right-of-way over concealed electrical work; exposed electrical fixtures have right-of-way over mechanical fixtures.
3. Submit conflicts, which cannot be resolved by right-of-way to Resident Engineer for instructions

C. Equipment Connections:

1. Verify utility requirement characteristics of operating equipment are compatible with building utilities.
2. Provide motors and equipment for current characteristics as shown on Contract Drawings for electrical work

D. Cooperate and coordinate with all other separate contractors under Contract with Sound Transit.

1.05 DRAWINGS

A. Contract Drawings and Dimensions:

1. The primary structural elements are dimensioned on the Contract Drawings. Not all secondary dimensions are shown, such as exact door and window locations, wall configurations, slab slopes and depression, curbs, and the like. Coordination of the structure with the dimensions as shown on the Contract Drawings and Contract items to be embedded, or attached to the structure, is the responsibility of the Contractor. Dimensional discrepancies between Contract Drawings shall be reported to the Resident Engineer before proceeding with the Work.

B. Coordination Drawings:

1. Prepare coordination drawings to demonstrate coordination of the Work and identify and resolve potential conflicts and as specified by the individual specification Sections.
 - a. Drawings shall depict the interrelationships of components shown on separate shop drawings, the installation sequences, and how work is to be installed or constructed in relation to the work of other trades and existing conditions.
 - b. Include areas to be reserved (kept clear) for code, safety, and maintenance access, showing clearances for all equipment based on manufacturer recommendations.
2. Prepare coordination drawings in accordance with the same requirements as indicated for shop drawings.
 - a. Plans shall be at an appropriate scale to depict the necessary detail, but not less than 1/4" = 1'-0".
 - b. Sections shall be at an appropriate scale to depict the necessary detail, but not less than 1/2" = 1'-0".
 - c. Drawings shall contain elements of the construction in their correct dimensional relationship, including but not limited to, ceilings, roofs, walls, beams, columns, openings, supports, hangers, earthquake bracing, fixtures, and all other appurtenances.
3. Ceiling Space Coordination Drawings:
 - a. Be responsible for the detailed coordination of all trades involved in installation of mechanical and electrical equipment. These trades and related items of work include, but are not limited to the following:
 - 1) Mechanical: Equipment, ductwork, fire sprinkler system, piping, and related devices
 - 2) Electrical: Equipment, panels, lights, conduit, and related devices
 - 3) Systems: Equipment, panels, cabinets, conduit, and related devices.
 - b. Include area from 7'-0" above finished floor line to the bottom of structural slab above. This drawing shall be modified and updated as work proceeds.

4. Concrete Lift Drawings: Submit concrete lift drawings for review prior to placement of all structural cast-in-place concrete.
 - a. Include: Form materials, details of all openings and blockouts, location of all embedments, chamfers, anchor bolts, pipe, and HVAC penetrations, conduit penetrations, sills and thresholds, construction joints, water stops, expansion joints, sequence of placements, dowels, slopes, dams, embedded conduits, conduit penetrations, and all other details inherent to a coordinated concrete placement.
5. Contractor and each Subcontractor shall sign the coordination drawings to indicate their participation in the coordination process and their agreement that the individual systems and components can be installed as indicated in the drawings and in the conformance with the Contract Documents.

1.06 [COORDINATED INSTALLATION PROGRAM (CIP)]

- A. Once Sound Transit has issued Notice to Proceed (NTP) to the [] Contractors in accordance with Section [], commence interface meetings to obtain program requirements from each contractor.
- B. Develop, in consultation with the [] contractors, a CIP.
- C. Develop the CIP to show:
 1. []
- D. Use the finish dates in accordance with Section 00 73 00, Special Conditions, as the basis for developing the CIP.
 1. The Contractor shall not have exclusive access.
 2. The absence of a programmed date or installation period in a specific area forming part of the Site shall not preclude the Resident Engineer from determining a reasonable date or installation period for that area.
 3. The Contractor, with the period indicated in the accepted CIP shall have the first priority of access. It is each contractors' responsibility to ensure that the times and durations of its access requirements are incorporated into the CIP.
- E. Prior to, but no later than the date of [] in accordance with Section 00 73 00, Special Conditions, provide a draft of the format to be used for the CIP to the Resident Engineer. Allow for incorporation of comments from the Resident Engineer prior to submission of the final CIP.
- F. Prior to submission to Sound Transit, certify and have signed by the [] contractors that they are in agreement with the CIP.
- G. Incorporate into the CIP schedule update.

1.07 [BUILDING INFORMATION MODELING (BIM)]

- A. If Contractor uses BIM, then Contractor shall provide an implementation plan for construction phases of a BIM program. All use of BIM and inclusion of BIM into Subcontractor scope for coordination of drawings and field routing must be approved by Sound Transit prior to inclusion into Subcontract scopes.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 31 19**PROJECT MEETINGS****PART 1 - GENERAL****1.01 SUMMARY**

This Section identifies some of the Project meetings that will occur on or after Notice to Proceed and during construction, and the recording of meeting minutes.

1.02 PRECONSTRUCTION MEETING

- A. A preconstruction meeting will be scheduled and conducted by Sound Transit on or within 7 days after the date of the Notice to Proceed. Attendance is required by the Contractor project manager, superintendent and other necessary personnel. Sound Transit will introduce its representatives, key project stakeholders, governmental agencies and public and private Utilities. Sound Transit will provide Notice of this meeting not less than 7 days prior to the date of the meeting.
- B. At this meeting, Sound Transit will discuss:
 - 1. Administrative
 - a. Responsibilities and authorities of the Resident Engineer
 - b. Selected laws, codes, traffic regulations and permit requirements of public agencies and their regulations
 - c. Labor requirements and certified payroll. Equal Employment Opportunity (EEO), Small Business and Disadvantaged Business Enterprises (SBE and DBE) and apprenticeship program requirements
 - d. Major Small Business and Disadvantaged Business Enterprises (SBE and DBE) Subcontractors and their areas of responsibility
 - e. Special Conditions
 - f. Community relations functions
 - g. Partnering
 - 2. Construction quality control requirements, plan and procedures
 - 3. Safety
 - a. Safety Certification process requirements
 - b. Contractor safety and accident prevention program
 - c. Requirements for safety, first aid, emergency actions, security and full-time safety representatives and public safety measures
 - d. Risk management
 - 4. Cost
 - a. Breakdown of schedule of values lump sum items
 - b. Monthly progress payments
 - c. Payment for materials, stored materials and equipment on hand

- d. Final quantities and final payment
- 5. Schedule
 - a. Project schedule including critical path activities
 - b. Three-week look-ahead schedule
- 6. Meetings
 - a. Construction Progress meetings
 - b. Quality Control meetings
 - c. Schedule meetings
 - d. Progress payment meetings
 - e. Change Order meetings
 - f. Construction Work Plan Readiness Review meetings
 - g. Commissioning meetings, if applicable to this Contract
 - h. Coordinated Installation Program (CIP) meetings, if applicable to this Contract
 - i. Instrumentation Coordination and Data Review meetings, if applicable to this Contract
 - j. Dewatering Coordination and Data Review meetings, if applicable to this Contract
 - k. Construction Coordination meetings, if applicable to this Contract
- 7. Work Scope
 - a. Use of office, streets, rights-of-way, haul routes, storage areas, staging areas, construction areas and temporary easements, and the housekeeping requirements thereof
 - b. Construction means and methods
 - c. Anticipated means and methods for worksite layout, erosion and sedimentation control plans, haul routes, noise abatement, vibration monitoring, air and water pollution control, excavation support systems, grading, paving, fencing, site drainage and street restoration
 - d. Coordination and notifications required for Utility work and services
 - e. Mobilization, process of early deliverables and submittals, deliveries and priorities of major equipment
 - f. Document control and management systems requirements
 - g. Procedures for processing Change Notices (CNs), Change Orders (COs), correspondence, Requests for Information (RFIs), shop drawings, Submittals, product data and Samples
 - h. Completion of Work and Contract close out
- 8. Other, if applicable to this Contract, including but not limited to:
 - a. Sustainability program

- b. Art projects
- c. Sound Transit-furnished materials and equipment

1.03 CONSTRUCTION PROGRESS MEETINGS

- A. Construction progress meetings will be scheduled and conducted by the Resident Engineer and held each week during the period of performance of the Contract.
- B. Special meetings will be scheduled and conducted by Sound Transit throughout the course of construction as Sound Transit deems necessary. The Resident Engineer may call special meetings to review pay application, discuss and negotiate Change Order requests, coordinate the Work, answer questions and resolve problems.
- C. The Contractor's relations with its Subcontractors and Suppliers, and discussions relative thereto, and the Contractor's responsibility as described elsewhere in the Contract Documents are not part of Construction Progress meeting content. Should it be necessary to address the relationships and responsibilities described elsewhere in the Contract Document, a separate meeting will be held with select individuals from the Contractor, the Resident Engineering team and Sound Transit, as appropriate to the subject matter.
- D. Attendance will include the Resident Engineer, architect and consultants (as needed), Contractor's project manager and superintendent, major Subcontractors and others as appropriate.
- E. The agenda will generally include the following:
 - 1. Construction safety and report on safety incidents and safety statistics.
 - 2. Community outreach
 - 3. SBE/DBE Utilization and Apprenticeship Program issues
 - 4. Schedule review and projection of work including Contractor's presentation of Contractor's updated three week look-ahead schedule covering the current week and the 2 weeks immediately following. Review critical path activities and corrective measures to maintain progress, if behind schedule.
 - 5. Review previous period look-ahead schedule showing activities accomplished and not completed and discuss the reasons for postponed activities.
 - 6. Outstanding action items, structural, mechanical, electrical, architectural, civil, environmental mitigation, technical concerns, submittals, fabrication, procurement, requests for information and as-built review
 - 7. Quality observations, audit or surveillance reports, failed tests, non-conformances and employee work standards.
 - 8. Coordination of Utility work and Utility strikes
 - 9. Discuss changed or unforeseen conditions, requests for proposals, Change Order requests, time extensions and other relevant subjects as they affect the progress of the Work.
 - 10. Discuss Temporary Erosion and Sedimentation Control open items found on field inspection report and Contract permit compliance.
 - 11. Discuss commissioning work progress and coordination.

1.04 QUALITY CONTROL MEETINGS

As specified elsewhere in the Contract documents.

1.05 PROGRESS PAYMENT MEETINGS

As specified elsewhere in the Contract documents.

1.06 CHANGE ORDER MEETINGS

Meet every 2 weeks at a minimum or more frequently as necessary, with the Resident Engineer to discuss status and negotiate Change Orders.

1.07 CONSTRUCTION WORK PLAN READINESS REVIEW MEETINGS

As specified elsewhere in the Contract documents.

1.08 COMMISSIONING MEETINGS

As specified elsewhere in the Contract documents.

1.09 INSTRUMENTATION COORDINATION AND DATA REVIEW MEETINGS

As specified elsewhere in the Contract documents.

1.10 DEWATERING COORDINATION AND DATA REVIEW MEETINGS

As specified elsewhere in the Contract documents.

1.11 CONSTRUCTION COORDINATION MEETINGS WITH FOLLOW-ON CONTRACTORS

As specified elsewhere in the Contract documents.

1.12 AUTHORITY TO COMMIT

Individuals designated by the Contractor to attend and participate in Project meetings shall have all required authority to commit the Contractor to solutions as agreed upon in the meetings.

1.13 MINUTES

- A. The Resident Engineer will compile minutes (unless otherwise arranged/agreed) of each Project meeting and will distribute copies to all interested parties. Minutes will be prepared in action-item format with named responsible parties and dates for completion indicated for each item.
- B. The minutes compiled by the Resident Engineer will be the record minutes and all clarifications and corrections shall be transmitted in writing to the Resident Engineer within 3 days of date of receipt of the minutes or noted during the next scheduled meeting under the appropriate agenda item, whichever is sooner. Transmitted corrections shall be legibly submitted on company letterhead.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 31 25.10

DOCUMENT CONTROL AND INTERNET-BASED DOCUMENT MANAGEMENT SYSTEM

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section includes the requirements for document control and records management, and the use of an Internet-based document management system (IBDMS) software required for Contract communications and collaboration by the Contractor with Sound Transit.

1.02 REFERENCES

A. Definitions

1. Electronic Documents Written and/or graphic documents produced or converted to electronic files using computer software; Capable of being stored and retrieved:
 - a. From an electronic storage device,
 - b. Through a collaboration system over the Internet,
 - c. Through an electronic system such as email or
 - d. From a CD, DVD or other portable device.
2. Notice Date:
 - a. The date captured in the metadata of the IBDMS (the "created" date) once a document has been uploaded and checked in.
 - b. The receipt date of a hard copy document that is not submitted in electronic format via the IBDMS.
 - c. All documents submitted to Sound Transit through the IBDMS after 3:00 PM will be acknowledged no earlier than the next business day.
3. The IBDMS: Microsoft SharePoint utilized by Sound Transit:
 - a. Handles document management, collaboration, classification, storage and retention.
 - b. Provides secure, permissions-based access which requires identification of all users and their corresponding permission levels.
4. Document Control Desktop Instructions: Sound Transit's Document Control Desktop Instructions for Construction Contractors using a SharePoint Collaboration Portal.

1.04 SUBMITTALS

A. Transmittals:

1. The Contractor's authorized representative is the Contractor's project manager or designee. Submit the name of Contractor authorized representative responsible to send and receive correspondence: Within 14 days of issuance of the Notice to Proceed (NTP).
2. User Identification Information: For each proposed authorized IBDMS user, provide the following information:
 - a. Full Name and company affiliation.
 - b. Work phone number and work email address.
 - c. Specific job-related function.
 - d. Permission level of access requested; Read Only or Read-Update which requires Sound Transit provided training.
3. Request initial user authorizations within 14 days of NTP. Request additional user authorizations as needed to perform the work.
4. Request to Rescind User Access: As soon as possible but not exceeding 30 days of when a user leaves the Project or should no longer have access.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 SOUND TRANSIT RESPONSIBILITY

- A. Provide "Contractor Document Control Desktop Instructions".
- B. Provide IBDMS training for each new user authorized with Read-Update access or as requested.
- C. Provide authorized users access to the IBDMS system for the duration of the Contract.
- D. Manage permissions for all IBDMS users.
- E. Provide technical support (administration) for the IBDMS through Sound Transit Document Control & Configuration group and Sound Transit Information Technology group. The IBDMS System vendor will act solely through and at the request of Sound Transit.
- F. Track history of revisions and activities for documents submitted or managed within the IBDMS, as appropriate.
- G. Sound Transit Document Control will provide guidance as needed if there is disagreement between consultant Field Office Document Control and Contractor during interpretation of the requirements of this specification or Contractor Document Control Desktop Instructions.

3.02 DOCUMENT MANAGEMENT SYSTEM REQUIREMENTS

- A. Provide computer software, hardware, security, and internet access that meets the requirements of the IBDMS, Contractor Document Control Desktop Instructions, and Sound Transit's Information and Design Technology groups, at both field and home office location(s) where documents are generated or processed. Any non-specified software

used by the contractor must meet Sound Transit's requirements and approval. General requirements are as follows:

1. A browser (Chrome or equivalent) with the version being kept up to date in accordance within the support requirements of the manufacturer and is compatible with Sound Transit's IBDMS system.
2. Core set of Microsoft Office 365 Collaboration Tools.
3. Document-Capture Software: Including Optical Character Recognition (OCR) and Virtual Rescan (VRS) for automated image cleanup capabilities, (Such as Adobe) with the version being kept up to date in accordance within the support requirements of the manufacturer.
 - a. Portable Document Format (PDF): Adobe Standard, Bluebeam.
4. A scanning device with OCR capabilities capable of scanning a minimum of 11-inch by 17-inch color document into electronic PDF with a minimum density of 300 dpi
5. Broadband connection using Integrated Services Digital Network (ISDN), Digital Subscriber Line (DSL) or better.

3.03 INTERNET-BASED DOCUMENT MANAGEMENT SYSTEM (IBDMS)

A. Training

1. It is mandatory that each authorized IBDMS user with Read-Update access attend document control training provided by Sound Transit.

B. IBDMS Access Requirements

1. Maintain a current list of authorized users of the IBDMS and provide to Resident Engineer as requested.
2. Protect the security of the IBDMS system by limiting access to authorized users only. Take appropriate precautions to maintain the security of the system. Immediately notify the Resident Engineer of all changes to the list of authorized users.
3. Access will be provided in accordance with permission levels configured by the IBDMS administrator. Resident Engineer reserves the right to deny any user access to the IBDMS.

C. IBDMS Use Requirements

1. Follow the requirements outlined in the "Contractor Document Control Desktop Instructions" and Sound Transit document control training.
2. Comply with applicable laws, regulations, and Sound Transit document control and engineering procedures regarding electronic transmission of documents requiring professional engineering stamps or signatures (wet ink or electronic), including provision of hard copies of such documents, as appropriate.
3. Use of the IBDMS shall not relieve the Contractor of the obligation to provide Sound Transit or Authorities Having Jurisdiction with hard copies as required or specified.

4. In the event the IBDMS system is temporarily unavailable or not functional, notify the Resident Engineer by email. Continue transmitting documents utilizing other electronic means or hard copies. Maintain all records and upload them to the IBDMS once the IBDMS becomes available.

3.04 IMPLEMENTATION OF DOCUMENT CONTROL

A. Document Control

1. Do not change or alter Contract records or documents without Resident Engineer's written approval.
2. Maintenance of paper-based document communications shall meet the requirements outlined in Sound Transit's "Contractor Document Control Desktop Instructions".
3. Establish correspondence routing, filing, classification, control and retrieval methods, which are compatible with the IBDMS, for all project records.
4. Provide access to current revisions of procedures, instructions, Contract Drawings, Contract Specifications and other documents to personnel, Subcontractors and Suppliers on a timely basis.
5. Ensure that all parties are working from current documents.
6. Protect records and documents from damage and loss and maintain backup records.
 - a. Store required hard copy records in secure cabinets at the Site and maintain a duplicate set at another location. The off-site duplicate set may be an electronic image format (i.e. PDF).
 - b. Store backup electronic records not saved to the Sound Transit IBDMS site. Back up electronic records daily. Store electronic record backup(s) off-site at a secure location. Backup storage may be accomplished using a variety of media, including external storage such as DVDs and external hard drives, or on a secure, off-site server. Store in an environment with appropriate temperature and humidity controls for the storage method and media.
 - c. Ensure equipment and software capable of storing, reading and reproducing the stored electronic records are available in the event of a disaster or failed disaster.

B. Document Preparation and Submission

1. Address all Contract correspondence from the Contractor's Project Manager to the Resident Engineer. Delegate in writing, the individual responsible for issuance of Contractor correspondence when the Contractor's Project Manager is not available.
2. Each correspondence package must be submitted as a stand-alone item. Example: A Request for Information (RFI) and a Submittal shall not be submitted in the same package.
3. Address only one subject in each letter, submittal or transmittal or other document addressed to Sound Transit. Clearly identify the subject on the document.

4. Follow requirements provided in Sound Transit's document control training, the "Contractor Document Control Desktop Instructions", and clarifications given by Sound Transit Document Control and Configuration staff, including standard naming and numbering conventions.

C. Electronic Documents

1. Submit and process all documents using the IBDMS. For any documents that have physical characteristics that cannot be uploaded or are not to be uploaded into the IBDMS in accordance with this Section, upload the transmittal for these documents and deliver hard copies with a hard copy of the transmittal to Sound Transit. Written documents not processed and submitted in accordance with this Section will not be recognized.
2. Do not submit documents which contain private information (such as a taxpayer identification number, a financial account number, an individual's social security number or birth date, or the name of person known to be a minor) via the IBDMS or email. Submit in hard copy only or submit an electronic file with the private information redacted.
3. Scanned documents that include a CD/DVD or other electronic media shall be submitted via hard copy transmittal. The electronic media shall be labelled in accordance with the applicable naming and numbering convention as shown in the "Contractor Document Control Desktop Instructions".
4. Scanned documents that include a physical sample shall be submitted via hard copy transmittal. The physical sample shall be labelled with the Contractor's correspondence number and other information identified in the applicable naming and numbering convention in accordance with the "Contractor Document Control Desktop Instructions". The scanned document will include the transmitting document and a picture of the physical sample.
5. Ensure scanned documents include all intended content, with proper content rotation.
6. Submit documents in PDF format as a single file, unless there is a specific requirement to provide a document in its original format (example: Construction Schedule(s) in native file format) or if the single file size is too large to upload to the IBDMS.
7. In instances where a record is required in native file format, upload the native file to the IBDMS as a separate record from the PDF containing the full submittal. In instances where multiple files are required due to the file size, upload each of the files to the IBDMS as a separate record in PDF format following naming conventions in the "Contractor Document Control Desktop Instructions".
8. Electronic files shall not contain embedded links, portfolios, EXE files, or attached files or documents of any file type.
9. Do not upload ZIP files except for electronic files in CAD format.
10. Do not apply password protection on any electronic document. This applies to any file, whether Sound Transit is the intended recipient or not. This includes any electronic document created or uploaded within the IBDMS system, email, or stored by the Contractor as part of the Project records.
11. When possible, convert documents directly from the original format to PDF.

12. Email shall not be used for formal, official communication with Sound Transit and its representatives. Use of email does not waive the requirement to submit documentation through the IBDMS and/or in hard copy and does not meet the requirement for contractual Notice.
13. The subject line for all emails sent to Sound Transit shall begin with the Contract Unit Description, following the standard naming convention in the subject line in accordance with "Contractor Document Control Desktop Instructions" (e.g. E130).

D. Hard Copy Documents

1. Hard copies are required for, but not limited to, the following documents:
 - a. Any documents and correspondence that contain original wet signatures, engineering stamp or seal, etc., in accordance with the ST Document Control Desktop Instructions.
 - b. Operations and Maintenance Manuals
 - c. Training Materials
 - d. Transmittal and Submittal of physical samples, electronic media and other physical items required
 - e. Other hard copy documents identified in the ST Document Control Desktop Instructions or Contract.
2. Exceptions to the hard copy requirements may be submitted to Resident Engineer for consideration and subject to Sound Transit Document Control approval.

3.05 AUDITS

- A. Sound Transit may periodically audit the Contractor's document control system and records in accordance with Sound Transit Document Control requirements.
- B. Respond to audit findings within 10 days of the date of the audit report. Identify root cause of non-conformance with corrective and preventive actions including their corresponding dates.

END OF SECTION

SECTION 01 32 13.10
SCHEDULING OF WORK
DESIGN-BUILD

PART 1 - GENERAL

1.01 SUMMARY

This Section includes requirements for the preparation, revision and submittal of cost-loaded Critical Path Method (CPM) Schedule and an Earned Value Management System (EVMS).

1.02 DEFINITIONS

- A. Scheduler: The individual or entity assigned by Contractor with the responsibility for the development, preparation and management of all required CPM schedules, the EVMS Plan and submittals.
- B. Recovery Schedule: A schedule showing a Work Plan to complete the Work within the required Contract Milestones.

1.03 SOFTWARE REQUIREMENTS

- A. Use Primavera Project Management P6 Release 16.2 or later version, by Oracle.
- B. Use the Claim Digger schedule comparison module provided in Primavera Project Management software bundle or comparable schedule analytics software.

1.04 SUBMITTALS

- A. Preliminary Baseline CPM Schedule: Submit within 14 days after Notice to Proceed (NTP) or Limited Notice to Proceed (LNTP), if a LNTP is issued.
- B. Contract Baseline CPM Schedule and EVMS Plan: Submit within 60 days after NTP or LNTP, if a LNTP is issued.
- C. Monthly Update CPM Schedule: Submit no later than the 5th of each month or with the monthly progress payment request, whichever is sooner .
- D. Earned Value (EV) Report: Submit no later than the 5th of each month or with the monthly progress payment request, whichever is sooner.
- E. Monthly Update Progress Report: Submit no later than the 5th of each month or with the monthly progress payment request, whichever is sooner
- F. Scheduler Qualification: Submit documentation within 14 days of NTP or LNTP, if a LNTP is issued.

1.05 TRANSMITTALS

Three-Week Look-Ahead Schedule: Transmit weekly prior to progress meetings.

1.06 QUALITY ASSURANCE

Scheduler Qualifications: Designate a full time on-Site Scheduler who will be responsible for the development, preparation and management of all required CPM schedules. The designated Scheduler(s) shall have at least 5 years of experience developing, creating, managing and reporting on schedules and EV Systems of similar complexity to this Contract, and experience in the designated scheduling software system. Submit a resume, outlining the qualifications of the Scheduler, to Sound Transit for review. Should the Scheduler leave the employ of the Contractor or leave the Contract, or Sound Transit finds the Contractor's Scheduler to be lacking in qualifications or experience, the Contractor shall, within 30 days, find a replacement who meets all original qualification requirements and is acceptable to Sound Transit. Progress payments will not be processed or authorized until an acceptable Scheduler is provided.

1.07 GENERAL

A. Formats:

1. Hard Copy Formats: One paper copy of each.
 - a. Preliminary and Contract Baseline CPM Schedules: Gantt chart; clearly indicating critical activities; sheets are to be no smaller than 11 inches by 17 inches using landscape orientation and font no smaller than 8.5pt.
 - b. Three-Week Look-Ahead Schedule: Sheets no larger than 11 inches by 17 inches and no smaller than 8-1/2 inches by 11 inches using landscape orientation and font no smaller than 8.5pt.
 - c. Monthly CPM Schedule Update: Gantt chart, clearly indicating critical activities; sheets no smaller than 11 inches by 17 inches using landscape orientation and font no smaller than 85 percent of 10pt.
 - d. Monthly Update Progress Report: Medium 8-1/2 inches by 11 inches in size. Charts may be submitted on sheets up to 11 inches by 17 inches in size for reports.
2. Electronic Copy:
 - a. Preliminary and Contract Baseline CPM Schedules: Electronic backup file in its native form (.XER) and in .PDF format.
 - b. Contract Earned Value Management System Plan: Electronic backup file in its native form .XLS and in .PDF format.
 - c. Monthly Update CPM Schedule: Electronic backup file in its native form (.XER) and in .PDF format.
 - d. Monthly Update Progress Report: Electronic file in its native form (.doc) and in .PDF format.
 - e. Claim Digger reports or comparable schedule analytics software reports: Electronic HTML file and electronic .csv file or native form (.xls) and in .PDF format.;;
 - f. Monthly Earned Value Report: Electronic backup file in its native form (.xls) and in .PDF format.
 - g. Three – Week Look-Ahead Schedule: Electronic file in its native form and in .PDF format.

- B. Within 14 days after NTP (or LNTP, if one is issued), the Contractor shall schedule with the Resident Engineer and attend a pre-scheduling and EVM conference with Sound Transit to review and discuss the Preliminary Baseline CPM schedule, the EVMS and the requirements of this Section. The Contractor shall be prepared to discuss methodology for the schedule development, sequence of operations and the cost loading methodology that will provide early and late cash flow curves.
- C. Schedules shall represent a practical and logical plan to complete the Work within the Contract Milestones and to convey the plan for execution of the Work.
- D. The submittal of schedules shall be understood to be the Contractor's representation that the schedule meets the requirements of the Contract Documents and that the Work will be executed in the sequence and duration indicated in the schedule.
- E. Failure to include any element of Work required for performance of the Contract or failure to properly sequence the Work shall not excuse completing all Work with the Contract Milestones.
- F. All schedule submittals, excluding monthly progress reports, are subject to Sound Transit acceptance. Sound Transit retains the right to withhold appropriate monies (up to the full value of the progress payment) from each progress payment until submittal of the schedule(s) required in accordance with these provisions.
- G. The Contract Baseline CPM Schedule will not be accepted prior to acceptance of the Schedule of Values.
- H. Use the "Retained Logic" of Primavera P6 preference for scheduling activities.
- I. Develop all schedules utilizing industry standard 'best practices' including, but not limited to:
 - 1. All Activities shall have at least one predecessor and one successor, except Contract start and finish milestones.
 - 2. All Activities must have a finish successor (FF) or (FS).
 - 3. All Activities must have a start predecessor (SS) or (FS).
 - 4. Maintain a majority of Finish to Start Relationships.
 - 5. One discipline per activity.
 - 6. No use of constraints other than those defined in the Contract Documents without the prior acceptance by Sound Transit.
 - 7. Leads or lags shall not be used.
 - 8. Use a "Finish on or Before" constraint on all Contract milestones unless agreed to by Sound Transit.
- J. Individual construction activities shall not exceed 14 days in duration without the concurrence of the Resident Engineer.
- K. All concrete cure activities shall be represented separately in the schedule with a 7 day calendar without Holidays applied to each.
- L. Sufficiently describe schedule activities to include that which is to be accomplished in each Work area. Express activity durations in whole days. Clearly identify Work that is to be performed by Subcontractors.

- M. Create all schedules in conformance with the work-hours, constraints and Activity Code Structure as set forth in the Contract.
- N. Contract Calendars
 - 1. Work calendars shall adhere to Contract Specifications.
 - 2. Each activity in the schedule shall adhere to a calendar appropriate for the Work type.
 - 3. Calendars shall be maintained at a project level.
 - 4. Calendar coding structure shall utilize the Contract Package Number. e.g. "[Contract Package Number] – "x" Day "y" hour."
- O. Work Breakdown Structure (WBS) Example:
 - 1. Contract WBS Structure shall provide at a minimum the following (if applicable):
 - a. Design – include 50%, 100%, and IFC submittals for each design package
 - 1) Design Milestones
 - 2) Initial Reports
 - 3) Utilities
 - 4) Demolition
 - 5) Substructure
 - 6) Structure
 - 7) Systems
 - b. Construction
 - 1) Milestones
 - 2) Submittals/Preliminary Activities
 - 3) Mobilization
 - 4) Sitework/Site Utilities
 - 5) Foundations
 - 6) Structures
 - 7) Tunneling
 - 8) Trackwork
 - 9) Train Systems
 - 10) Testing and Commissioning
 - c. Provisional Sums
 - d. Change Orders

e. Deleted Activities

2. Submit the WBS Structure for Sound Transit review and acceptance at the preconstruction scheduling conference.

P. Activity Code Structure:

1. Global codes and Enterprise Project Structure (EPS) codes shall not be used unless approved by Sound Transit.
2. Activity Codes shall be maintained at a project level.
3. Activity Code Identifier shall utilize the Contract Package Number. e.g. "[Contract Package Number] – Responsibility"
4. Each activity shall be identified with codes including as a minimum:
 - a. The party responsible for performing the Work
 - b. Subcontract Package
 - c. Phasing of the Work in accordance with the Contract Documents and associated milestones
 - d. Utilize user defined fields that identifies stationing for each activity. e.g. "L200-loc1" equals start and L200-loc2 equals end.
 - e. Area or location of the Work

Q. Cost Loading:

1. All schedules, with the exception of the Preliminary Baseline CPM Schedule and Three-Week Look-Ahead Schedules shall be cost-loaded.
2. Submit and receive acceptance of the Schedule of Values allocating the total Contract Price, prior to Sound Transit acceptance of the Contract Baseline CPM Schedule. The accepted Schedule of Values shall be used as the basis for progress payments. Payment for Work will be made only for and in accordance with those items included in the Schedule of Values.
3. Each item in the Schedule of Values shall be represented by one or more activity in the Contract Baseline CPM Schedule. The sum of all activities shall equal the sum of the item on the Schedule of Values.
4. Change Orders and Provisional Sums shall be added as separate items to the Schedule of Values and to the Monthly CPM Schedule as they are Accepted by Sound Transit.
5. Resource identifier for costs shall utilize the Contract Package Number, e.g., "[Contract Package Number] - Costs."
6. Update cost-loading monthly with modifications made to the cost-loading taking into account actual payment requests, additions, deletions or revisions to activities in the Monthly Update CPM Schedule.
7. Expense Items shall not be utilized for cost loading.
8. No single schedule activity may be assigned a value greater than \$250,000 without prior justification and concurrence by the Resident Engineer.

1.08 PRELIMINARY BASELINE CPM SCHEDULE

- A. The purpose of the Preliminary Baseline CPM schedule is to depict the detailed Work activities for the first 90 days following NTP (or LNTP) with subsequent activities covering the remaining Contract Work shown in more summary-level detail. The schedule will assist and serve as the basis of payment between NTP (or LNTP) and the acceptance of the Contract Baseline CPM Schedule.
- B. Include with the Submittal a written narrative that describes the schedule in detail and the approach to the Work that will be employed during the initial 90-day period of the Contract.
- C. Include all Submittals for design, and submittal, fabrication and construction activities required to supply or progress the Work for the first 90 days following NTP (or LNTP).
- D. Indicate on the schedule diagram a clearly defined Critical Path.
- E. If, in the opinion of the Resident Engineer, the schedule is determined to be impractical or not in compliance with the Contract Documents, revise the schedule and resubmit within 7 days.
- F. Include detailed design and permitting activities including but not limited to the following:
 - 1. Identification of individual design packages
 - 2. Design submissions
 - 3. Design reviews and conferences
 - 4. Permit submissions
 - 5. Required government submissions
 - 6. Long lead item acquisitions prior to design completion

1.09 CONTRACT BASELINE CPM SCHEDULE AND EVMS PLAN

- A. Contract Baseline CPM Schedule will cover all of the Contract Work from NTP (or LNTP) through Acceptance.
- B. Prior to submitting the Contract Baseline CPM Schedule, the Contractor will schedule with the Resident Engineer and attend a scheduling conference with Sound Transit to present the Contract Baseline CPM Schedule and discuss its contents including schedule assumptions, schedule risk, cost loading methodology, production rates, Contract calendars, shift assumptions, equipment constraints, material procurement concerns, long-lead materials and equipment, risk assumptions, EVMS Plan and Critical Path(s).
- C. If, in the opinion of the Resident Engineer, the schedule or EVMS Plan is determined to be impractical or not in compliance with the Contract Documents, revise the schedule and resubmit within 7 days.
- D. Show clearly on the Contract Baseline CPM Schedule the sequence and interdependence of activities and list specifically:
 - 1. Detailed design and permitting activities including but not limited to the following:
 - a. Identification of individual design packages
 - b. Design submissions
 - c. Design reviews and conferences

- d. Permit submissions
 - e. Required government submissions and approval dates
 - f. Long lead item acquisitions prior to design completion
2. Construction:
- a. All constraints identified in the Contract Documents
 - b. All Milestones identified in the Contract Documents: Ensure that they are logically linked with physical activities and are progress driven.
 - c. All submittal, fabrication and construction activities required to supply and / or progress the Work for the duration of the Contract
 - d. Selection, ordering, manufacturing, factory testing and delivery of all long lead equipment and materials
 - e. Delivery of Sound Transit-furnished equipment and / or materials, if any
 - f. Inspection of the Work activities for Substantial Completion and Acceptance
 - g. Work to be performed by other agencies or utilities that affect the schedule: Include at a minimum, activity durations and completion milestones for Utility's or other agency's work, and shall show when the utility's or other agency's work must be complete to avoid impact to Contractor's work
 - h. Acquisition of construction permits
 - i. Dates for delivery of access to rights-of-way by Sound Transit
 - j. Submittal review and re-submittal review periods
 - k. Traffic control activities
 - l. Environmental compliance activities
- E. Indicate on the schedule diagram a clearly defined Critical Path.
- F. Certify in writing that the Contract Baseline CPM schedules have been discussed in detail with all Subcontractors and major Suppliers as it relates to their respective Work. Include signatures from the major Subcontractors acknowledging that such discussions were conducted with them. Transmit a copy of the certificate with Subcontractor acknowledgements to Sound Transit. An updated certification is required to accompany any Recovery Schedule.
- G. Include with the Contract Baseline CPM Schedule submittal a detailed written narrative describing the approach and methods for completion of the Work. Include all schedule assumptions used in the development of the schedule including but not limited to the following: shift assumptions, crew size, Contract calendars, duration development, Critical Path(s), production rates, long lead material and equipment procurement and specific identified schedule risks. Use understandable narrative language to convey this schedule information to Sound Transit.
- H. A Contract Baseline CPM Schedule showing the Work completed sooner than the Contract Milestone dates, which is found practical by Sound Transit, shall be considered to have

Float (in addition to Sound Transit controlled Float). Impractical early-completion schedules will not be accepted by Sound Transit.

- I. The Contract Baseline CPM Schedule shall be submitted without progress updates to schedule dates and costs.
- J. EVMS Plan: Submit a Contract Earned Value Management System Plan covering the Contract Work through Acceptance, which includes a documented plan for implementing, updating and reporting using the EVMS, including how to process approved changes to the scope, schedule and budget

1.10 MONTHLY UPDATE CPM SCHEDULE

- A. Submit a cost-loaded Monthly Update CPM Schedule.
- B. The Monthly Update CPM Schedule shall be the current approved schedule with all actual progress and costs included. The current schedule shall be the later of:
 - 1. The Contract Baseline CPM Schedule (prior to submittal and acceptance of the first Monthly Update CPM Schedule)
 - 2. The most current accepted Monthly Update CPM Schedule
- C. The Monthly Update CPM Schedule shall have a data date (status) as of the first day of the following month (for example: for schedules submitted at the end of January 20XX the data date shall be 01 February 20XX).
- D. Incorporate accurate actual progress, start dates, completion dates and costs so that the Monthly Update CPM Schedule will act as the Contract's As-Built schedule.
 - 1. If requested, provide documentation to substantiate as-built information.
 - 2. No actual start or finish dates shall be changed or corrected without a narrative explaining the reason for the change and without Sound Transit's acceptance.
- E. If in the opinion of the Resident Engineer the information contained in the Monthly Update CPM Schedule is inaccurate and cannot be substantiated otherwise, revise the schedule accordingly and resubmit within 7 days.
- F. Payment shall not be made without Sound Transit's acceptance of actual progress, start dates, completion dates and costs in the Monthly Update CPM Schedule.
- G. The Monthly Update CPM Schedule will be used as a basis for justifying payment and to measure the impacts to the schedule as a result of actual progress on the Contract.
- H. Incorporate into the Monthly Update CPM Schedule changes to the planned sequence including logic revisions and activity durations, and changes to the cost-loading as required. Sum all the remaining activities to be completed to the remaining cost of the Work.
- I. Address all changes and revisions made in the Monthly Update CPM Schedule in a detailed narrative accompanying the Submittal.
- J. Incorporate Change Orders and Change Notice-Work Directives (CN-WDs) into the Monthly Update CPM Schedule as additional schedule activities, when required.
- K. If in the opinion of the Resident Engineer the schedule is determined to be impractical or not in compliance with the Contract Documents, revise the schedule and resubmit within 7 days.

- L. Submit a Recovery Schedule prior to the next progress payment if, according to the current updated Monthly Update CPM Schedule, the Work is more than 14 days behind a Contract Milestone, considering all granted or agreed to time extensions. Include with the Submittal a detailed narrative describing the means and methods proposed to complete the Work in the prescribed period. Sound Transit may withhold all or a portion of progress payments until a revised schedule, acceptable to Sound Transit, is submitted.
- M. Prior to the submission of the next Monthly Update CPM Schedule, receive approval from the Resident Engineer on the current Monthly Update CPM Schedule and Monthly Update Progress Report.

1.11 THREE-WEEK LOOK-AHEAD SCHEDULE

- A. Transmit the Three-Week Look-Ahead Schedule, in a Gantt chart format, showing the intended Work activities for the upcoming 3-week period plus one retrospective week.
- B. All design and construction activities in the Three-Week Look-Ahead Schedule must correlate to an activity in the current Monthly Update CPM Schedule utilizing the activity id's from the CPM Schedule, either as a one-to-one match or as a subset of activities whose cumulative duration correlates to an activity in the Monthly Update CPM Schedule.

1.12 EARNED VALUE REPORT

Maintain and provide a computer-generated Earned Value Report (EVR). The template will be provided by Sound Transit. Submit a Monthly EVR with each application for payment. All data should be through the last day of the month or approved reporting/invoicing period. The EVR should support and show consistency with the current Monthly Update CPM Schedule. Earned Value Reporting will include:

- A. Identification of cost and schedule variance
- B. Discussion of performance trends through analysis of SPI (Schedule Performance Index), CPI (Cost Performance Index), SV (Schedule Variance), CV (Cost Variance) and ETC (Estimate to Completion)
- C. Identification of variances exceeding 10% (SPI or CPI less than 0.90 or greater than 1.10) with a description of the root cause, impact on the Contract and recommended or implemented corrective action
- D. Identification of potential problem areas that need further explanation or action
- E. Analysis of contract Estimate at Completion (EAC)

1.13 MONTHLY UPDATE PROGRESS REPORT

- A. Sound Transit shall provide the format for the Monthly Update Progress Report at or prior to, the Schedule Meeting.
- B. Include with the Monthly Update CPM Schedule a written narrative (Monthly Update Progress Report) describing the approach and methods for completion of the Work. Use understandable narrative language to convey this schedule information to Sound Transit.
- C. The Monthly Update Progress Report shall at a minimum include the following:
 - 1. Executive Summary
 - 2. Contract Status (percent complete based on cost and percentage of contract time elapsed)

3. Schedule Status (baseline versus current forecast) for each Milestone
4. Work activities accomplished in the reporting period
5. Intended Work activities for upcoming reporting period
6. Work that is being performed out of sequence with the current accepted schedule
7. All changes, additions or deletions that have been made to the schedule since the prior month and, with the exception of adding actual durations, a reason for each of the changes
8. Discussion on activities that were planned to be completed or worked on during the reporting period, but were not, and the actions taken that have addressed adverse impacts to the Contract
9. Discussion and identification of changes, RFIs, CN-WDs or other events that affect the Contract schedule
10. Describe and discuss the Critical Path(s)
11. Problem and risk areas and planned mitigation actions
12. Status of Submittals
13. Status of the Contractor's procurement of long-lead materials and equipment
14. Computer-Generated Log Report listing all the changes made between every submitted schedule and its last submitted predecessor schedule using the Claim Digger schedule comparison module provided in Primavera Project Management software bundle or comparable schedule analytics software. At a minimum, this report shall show changes for
 - a. Added and deleted activities, original durations, remaining durations
 - b. Activity percent complete, total Float, actual Starts/Finishes
 - c. Calendars, activity descriptions, constraints (added, deleted or changed)
 - d. Budgeted and total to date Contract earnings
 - e. Added/deleted relations, changed driving relations
 - f. Changed relationship lags, change critical status

1.14 REVIEW, UPDATE AND REVISIONS

- A. Conform re-submittals to the same requirements as the original submittals.
- B. Allow for Sound Transit review with comments according to the following schedule from the date of receipt:
 1. Preliminary Baseline CPM Schedule: 7 days
 2. Contract Baseline CPM Schedule and Contract EVMS Plan: 14 days
 3. Monthly Update CPM Schedule, Monthly Update Progress Report, Monthly Earned Value Report and Recovery Schedule: 10 days
 4. Three-Week Look-Ahead Schedule: 2 days

- C. Make all corrections to the schedule requested by Sound Transit and resubmit the schedule for acceptance. If disagreeing with Sound Transit's comments, provide written notice of disagreement within 7 days from the receipt of Sound Transit's comments. Disagreement with Sound Transit's comments to the schedules shall be resolved in a meeting held for that purpose, if necessary.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 32 13.15
SCHEDULING OF WORK
DESIGN-BID-BUILD & GC/CM

PART 1 - GENERAL

1.01 SUMMARY

This Section includes requirements for the preparation, revision and submittal of cost-loaded Critical Path Method (CPM) Schedule and an Earned Value Management System (EVMS).

1.02 DEFINITIONS

- A. Scheduler: The individual or entity assigned by Contractor with the responsibility for the development, preparation and management of all required CPM schedules, the EVMS Plan and submittals.
- B. Recovery Schedule: A schedule showing a Work Plan to complete the Work within the required Contract Milestones.

1.03 SOFTWARE REQUIREMENTS

- A. Use Primavera Project Management P6 Release 16.2 or later version, by Oracle.
- B. Use the Claim Digger schedule comparison module provided in Primavera Project Management software bundle or comparable schedule analytics software.

1.04 SUBMITTALS

- A. Preliminary Baseline CPM Schedule: Submit within 14 days after Notice to Proceed (NTP) or Limited Notice to Proceed (LNTP), if a LNTP is issued.
- B. Contract Baseline CPM Schedule and EVMS Plan: Submit within 60 days after NTP or LNTP, if a LNTP is issued.
- C. Monthly Update CPM Schedule: Submit no later than the 5th of each month or with the monthly progress payment request, whichever is sooner.
- D. Three-Week Look-Ahead Schedule: Transmit weekly prior to progress meetings.
- E. Earned Value (EV) Report: Submit no later than the 5th of each month or with the monthly progress payment request, whichever is sooner.
- F. Monthly Update Progress Report: Submit no later than the 5th of each month or with the monthly progress payment request, whichever is sooner.
- G. Scheduler Qualification: Submit documentation within 14 days of NTP or LNTP, if a LNTP is issued.

1.05 TRANSMITTALS

Three-Week Look-Ahead Schedule: Transmit weekly prior to or at progress meetings.

1.06 QUALITY ASSURANCE

Scheduler Qualifications: Designate a full time on-Site Scheduler who will be responsible for the development, preparation and management of all required CPM schedules. The designated Scheduler(s) shall have at least 5 years of experience developing, creating, managing and reporting on schedules and EV Systems of similar complexity to this Contract, and experience in the designated scheduling software system. Submit a resume, outlining the qualifications of the Scheduler, to Sound Transit for review. Should the Scheduler leave the employ of the Contractor or leave the Contract, or Sound Transit finds the Contractor's Scheduler to be lacking in qualifications or experience, the Contractor shall, within 30 days, find a replacement who meets all original qualification requirements and is acceptable to Sound Transit. Progress payments will not be processed or authorized until an acceptable Scheduler is provided.

1.07 GENERAL

A. Submittal/Transmittal Formats:

1. Hard Copy Formats: One paper copy of each.
 - a. Preliminary and Contract Baseline CPM Schedules: Gantt chart; clearly indicating critical activities; sheets are to be no smaller than 11 inches by 17 inches using landscape orientation and font no smaller than 8.5pt.
 - b. Three-Week Look-Ahead Schedule: Sheets no larger than 11 inches by 17 inches and no smaller than 8-1/2 inches by 11 inches using landscape orientation and font no smaller than 8.5pt.
 - c. Monthly CPM Schedule Update: Gantt chart, clearly indicating critical activities; sheets no smaller than 11 inches by 17 inches using landscape orientation and font no smaller than 85 percent of 10pt.
 - d. Monthly Update Progress Report: Medium 8-1/2 inches by 11 inches in size. Charts may be submitted on sheets up to 11 inches by 17 inches in size for reports.
2. Electronic Copy:
 - a. Preliminary and Contract Baseline CPM Schedules: Electronic backup file in its native form (.XER) and in .PDF format.
 - b. Contract Earned Value Management System Plan: Electronic backup file in its native form .XLS and in .PDF format.
 - c. Monthly Update CPM Schedule: Electronic backup file in its native form (.XER) and in .PDF format.
 - d. Monthly Update Progress Report: Electronic file in its native form (.doc) and in .PDF format.
 - e. Claim Digger reports or comparable schedule analytics software reports: Electronic HTML file or electronic .csv file, or native form (.xls) and in .PDF format.
 - f. Monthly Earned Value Report: Electronic backup file in its native form (.xls) and in .PDF format.
 - g. Three – Week Look-Ahead Schedule: Electronic file in its native form and in .PDF format.

- B. Within 14 days after NTP (or LNTP, if one is issued), the Contractor shall schedule with the Resident Engineer and attend a pre-scheduling and EVM conference with Sound Transit to review and discuss the Preliminary Baseline CPM schedule, the EVMS and the requirements of this Section. The Contractor shall be prepared to discuss methodology for the schedule development, sequence of operations and the cost loading methodology that will provide early and late cash flow curves.
- C. Schedules shall represent a practical and logical plan to complete the Work within the Contract Milestones and to convey the plan for execution of the Work.
- D. The submittal of schedules shall be understood to be the Contractor's representation that the schedule meets the requirements of the Contract Documents and that the Work will be executed in the sequence and duration indicated in the schedule.
- E. Failure to include any element of Work required for performance of the Contract or failure to properly sequence the Work shall not excuse completing all Work with the Contract Milestones.
- F. All schedule submittals, excluding monthly progress reports, are subject to Sound Transit acceptance. Sound Transit retains the right to withhold appropriate monies (up to the full value of the progress payment) from each progress payment until submittal of the schedule(s) required in accordance with these provisions.
- G. The Contract Baseline CPM Schedule will not be accepted prior to acceptance of the Schedule of Values.
- H. Use the "Retained Logic" of Primavera P6 preference for scheduling activities.
- I. Develop all schedules utilizing industry standard 'best practices' including, but not limited to:
 - 1. All Activities shall have at least one predecessor and one successor, except Contract start and finish milestones.
 - 2. All Activities must have a finish successor (FF) or (FS).
 - 3. All Activities must have a start predecessor (SS) or (FS).
 - 4. Maintain a majority of Finish to Start Relationships.
 - 5. One discipline per activity.
 - 6. No use of constraints other than those defined in the Contract Documents without the prior acceptance by Sound Transit.
 - 7. Leads or lags shall not be used.
 - 8. Use a "Finish on or Before" constraint on all Contract milestones unless agreed to by Sound Transit.
- J. Individual construction activities shall not exceed 14 days in duration without the concurrence of the Resident Engineer.
- K. All concrete cure activities shall be represented separately in the schedule with a 7 day calendar without Holidays applied to each.
- L. Sufficiently describe schedule activities to include that which is to be accomplished in each Work area. Express activity durations in whole days.

- M. Create all schedules in conformance with the work-hours, constraints and Activity Code Structure as set forth in the Contract.
- N. Contract Calendars
1. Work calendars shall adhere to Contract Specifications.
 2. Each activity in the schedule shall adhere to a calendar appropriate for the Work type.
 3. Calendars shall be maintained at a project level.
 4. Calendar coding structure shall utilize the Contract ID #. e.g. "L200- "x" Day "y" hour w/holidays."
- O. Work Breakdown Structure (WBS):
1. Contract WBS Structure shall provide at a minimum the following:
 - a. Construction
 - 1) Milestones
 - 2) Submittals/Preliminary Activities
 - 3) Mobilization
 - 4) Sitework
 - 5) Excavation
 - 6) Retaining Walls
 - 7) Aerial Structures
 - 8) Stations
 - 9) Parking Garages
 - 10) Trackwork
 - 11) Finishes
 - 12) Landscaping/Flatwork
 - 13) Testing and Commissioning
 - 14) Demobilization
 - b. Provisional Sums
 - c. Change Orders
 - d. Deleted Activities
 2. Submit the WBS Structure for Sound Transit review and acceptance at the preconstruction scheduling conference.
- P. Activity Code Structure:

1. Global codes and Enterprise Project Structure (EPS) codes shall not be used unless approved by Sound Transit.
2. Activity Codes shall be maintained at a project level.
3. Activity Code Identifier shall include the contract/segment ID number. e.g. "L200
4. Each activity shall be identified with codes including as a minimum:
 - a. The party(s) responsible for performing the Work
 - b. Subcontract Package
 - c. Phasing of the Work in accordance with the Contract Documents and associated milestones
 - d. Area or location of the Work
 - e. Utilize user defined fields that identifies stationing for each activity. e.g. "L200-loc1" equals start and L200 - loc 2 equals end.

Q. Cost Loading:

1. All schedules, with the exception of the Preliminary Baseline CPM Schedule and Three-Week Look-Ahead Schedules shall be cost-loaded.
2. Submit and receive acceptance of the Schedule of Values allocating the total Contract Price, prior to Sound Transit acceptance of the Contract Baseline CPM Schedule. The accepted Schedule of Values shall be used as the basis for progress payments. Payment for Work will be made only for and in accordance with those items included in the Schedule of Values.
3. Each item in the schedule of values shall be represented by one or more activity in the Contract Baseline CPM Schedule. The sum of all activities shall equal the sum of the item on the Schedule of Values.
4. Change Orders and Provisional Sums shall be added as separate items to the Schedule of Values and to the Monthly CPM Schedule as they are Accepted by Sound Transit.
5. Resource identifier for costs shall utilize the Contract ID number, e.g., L200 - Costs.
6. Update cost-loading monthly with modifications made to the cost-loading taking into account actual payment requests, additions, deletions or revisions to activities in the Monthly Update CPM Schedule.
7. Expense Items shall not be utilized for cost loading.
8. No single schedule activity may be assigned a value greater than \$250,000 without prior justification and concurrence by the Resident Engineer.

1.08 PRELIMINARY BASELINE CPM SCHEDULE

- A. The purpose of the Preliminary Baseline CPM schedule is to depict the detailed Work activities for the first 90 days following NTP (or LNTP) with subsequent activities covering the remaining Contract Work shown in more summary-level detail. The schedule will assist

and serve as the basis of payment between NTP (or LNTP) and the acceptance of the Contract Baseline CPM Schedule.

- B. Include with the Submittal a written narrative that describes the schedule in detail and the approach to the Work that will be employed during the initial 90-day period of the Contract.
- C. Include all submittal, fabrication and construction activities required to supply or progress the Work for the first 90 days following NTP (or LNTP).
- D. Indicate on the schedule diagram a clearly defined Critical Path.
- E. If, in the opinion of the Resident Engineer, the schedule is determined to be impractical or not in compliance with the Contract Documents, revise the schedule and resubmit within 7 days.

1.09 CONTRACT BASELINE CPM SCHEDULE AND EVMS PLAN

- A. Contract Baseline CPM Schedule will cover all of the Contract Work from NTP (or LNTP) through Acceptance.
- B. Prior to submitting the Contract Baseline CPM Schedule, the Contractor will schedule with the Resident Engineer and attend a scheduling conference with Sound Transit to present the Contract Baseline CPM Schedule and discuss its contents including schedule assumptions, schedule risk, cost loading methodology, production rates, Contract calendars, shift assumptions, equipment constraints, material procurement concerns, long-lead materials and equipment, risk assumptions, EVMS Plan and Critical Path(s).
- C. If, in the opinion of the Resident Engineer, the schedule or EVMS Plan is determined to be impractical or not in compliance with the Contract Documents, revise the schedule and resubmit within 7 days.
- D. Show clearly on the Contract Baseline CPM Schedule the sequence and interdependence of activities and list specifically:
 - 1. All constraints identified in the Contract Documents
 - 2. All Milestones identified in the Contract Documents: Ensure that they are logically linked with physical activities and are progress driven.
 - 3. All submittal, fabrication and construction activities required to supply and / or progress the Work for the duration of the Contract
 - 4. Selection, ordering, manufacturing, factory testing and delivery of all long lead equipment and materials
 - 5. Delivery of Sound Transit-furnished equipment and / or materials, if any
 - 6. Inspection of the Work activities for Substantial Completion and Acceptance
 - 7. Work to be performed by other agencies or utilities that affect the schedule: Include at a minimum, activity durations and completion milestones for Utility's or other agency's work, and shall show when the utility's or other agency's work must be complete to avoid impact to Contractor's work
 - 8. Acquisition of construction permits
 - 9. Dates for delivery of access to rights-of-way by Sound Transit
 - 10. Submittal review and re-submittal review periods

- 11. Traffic control activities
 - 12. Environmental compliance activities
- E. Indicate on the schedule diagram a clearly defined Critical Path.
 - F. Certify in writing that the Contract Baseline CPM schedules have been discussed in detail with all Subcontractors and major Suppliers as it relates to their respective Work. Include signatures from the major Subcontractors acknowledging that such discussions were conducted with them. Transmit a copy of the certificate with Subcontractor acknowledgements to Sound Transit. An updated certification is required to accompany any Recovery Schedule.
 - G. Include with the Contract Baseline CPM Schedule submittal a detailed written narrative describing the approach and methods for completion of the Work. Include all schedule assumptions used in the development of the schedule including but not limited to the following: shift assumptions, crew size, Contract calendars, duration development, Critical Path(s), production rates, long lead material and equipment procurement and specific identified schedule risks. Use understandable narrative language to convey this schedule information to Sound Transit.
 - H. A Contract Baseline CPM Schedule showing the Work completed sooner than the Contract Milestone dates, which is found practical by Sound Transit, shall be considered to have Float (in addition to Sound Transit controlled Float). Impractical early-completion schedules will not be accepted by Sound Transit.
 - I. The Contract Baseline CPM Schedule shall be submitted without progress updates to schedule dates and costs.
 - J. EVMS Plan: Submit a Contract Earned Value Management System Plan covering the Contract Work through Acceptance, which includes a documented plan for implementing, updating and reporting using the EVMS, including how to process approved changes to the scope, schedule and budget.
- 1.10 MONTHLY UPDATE CPM SCHEDULE
- A. Submit a cost-loaded Monthly Update CPM Schedule.
 - B. The Monthly Update CPM Schedule shall be the current approved schedule with all actual progress and costs included. The current schedule shall be the later of:
 - 1. The Contract Baseline CPM Schedule (prior to submittal and acceptance of the first Monthly Update CPM Schedule)
 - 2. The most current accepted Monthly Update CPM Schedule
 - C. The Monthly Update CPM Schedule shall have a data date (status) as of the first day of the following month (for example: for schedules submitted at the end of January 20XX the data date shall be 01 February 20XX).
 - D. Incorporate accurate actual progress, start dates, completion dates and costs so that the Monthly Update CPM Schedule will act as the Contract's As-Built schedule.
 - 1. If requested, provide documentation to substantiate as-built information.
 - 2. No actual start or finish dates shall be changed or corrected without a narrative explaining the reason for the change and without Sound Transit's acceptance.

- E. If in the opinion of the Resident Engineer the information contained in the Monthly Update CPM Schedule is inaccurate and cannot be substantiated otherwise, revise the schedule accordingly and resubmit within 7 days.
- F. Payment shall not be made without Sound Transit's acceptance of actual progress, start dates, completion dates and costs in the Monthly Update CPM Schedule.
- G. The Monthly Update CPM Schedule will be used as a basis for justifying payment and to measure the impacts to the schedule as a result of actual progress on the Contract.
- H. Incorporate into the Monthly Update CPM Schedule changes to the planned sequence including logic revisions and activity durations, and changes to the cost-loading as required. Sum all the remaining activities to be completed to the remaining cost of the Work.
- I. Address all changes and revisions made in the Monthly Update CPM Schedule in a detailed narrative accompanying the Submittal.
- J. Incorporate Change Orders and Change Notice-Work Directives (CN-WDs) into the Monthly Update CPM Schedule as additional schedule activities, when required.
- K. If in the opinion of the Resident Engineer the schedule is determined to be impractical or not in compliance with the Contract Documents, revise the schedule and resubmit within 7 days.
- L. Submit a Recovery Schedule prior to the next progress payment if, according to the current updated Monthly Update CPM Schedule, the Work is more than 14 days behind a Contract Milestone, considering all granted or agreed to time extensions. Include with the Submittal a detailed narrative describing the means and methods proposed to complete the Work in the prescribed period. Sound Transit may withhold all or a portion of progress payments until a revised schedule, acceptable to Sound Transit, is submitted.
- M. Prior to the submission of the next Monthly Update CPM Schedule, receive approval from the Resident Engineer on the current Monthly Update CPM Schedule and Monthly Update Progress Report.

1.11 THREE-WEEK LOOK-AHEAD SCHEDULE

- A. Transmit the Three-Week Look-Ahead Schedule, in a Gantt chart format, showing the intended Work activities for the upcoming 3-week period plus one retrospective week.
- B. All construction activities in the Three-Week Look-Ahead Schedule must correlate to an activity in the current Monthly Update CPM Schedule utilizing the activity id's from the CPM Schedule, either as a one-to-one match or as a subset of activities whose cumulative duration correlates to an activity in the Monthly Update CPM Schedule

1.12 EARNED VALUE REPORT

Maintain and provide a computer-generated Earned Value Report (EVR). The template will be provided by Sound Transit. Submit a Monthly EVR with each application for payment. All data should be through the last day of the month or approved reporting/invoicing period. The EVR should support and show consistency with the current Monthly Update CPM Schedule. Earned Value Reporting will include:

- A. Identification of cost and schedule variance
- B. Discussion of performance trends through analysis of SPI (Schedule Performance Index), CPI (Cost Performance Index), SV (Schedule Variance), CV (Cost Variance) and ETC (Estimate to Completion)

- C. Identification of variances exceeding 10% (SPI or CPI less than 0.90 or greater than 1.10) with a description of the root cause, impact on the Contract and recommended or implemented corrective action
- D. Identification of potential problem areas that need further explanation or action
- E. Analysis of contract Estimate at Completion (EAC)

1.13 MONTHLY UPDATE PROGRESS REPORT

- A. Sound Transit shall provide the format for the Monthly Update Progress Report at or prior to, the Schedule Meeting.
- B. Include with the Monthly Update CPM Schedule a written narrative (Monthly Update Progress Report) describing the approach and methods for completion of the Work. Use understandable narrative language to convey this schedule information to Sound Transit.
- C. The Monthly Update Progress Report shall at a minimum include the following:
 - 1. Executive Summary
 - 2. Contract Status (percent complete based on cost and percentage of contract time elapsed)
 - 3. Schedule Status (baseline versus current forecast) for each Milestone
 - 4. Work activities accomplished in the reporting period
 - 5. Intended Work activities for upcoming reporting period
 - 6. Work that is being performed out of sequence with the current accepted schedule
 - 7. All changes, additions or deletions that have been made to the schedule since the prior month and, with the exception of adding actual durations, a reason for each of the changes
 - 8. Discussion on activities that were planned to be completed or worked on during the reporting period, but were not, and the actions taken that have addressed adverse impacts to the Contract
 - 9. Discussion and identification of changes, RFIs, CN-WDs or other events that affect the Contract schedule
 - 10. Describe and discuss the Critical Path(s)
 - 11. Problem and risk areas and planned mitigation actions
 - 12. Status of Submittals
 - 13. Status of the Contractor's procurement of long-lead materials and equipment
 - 14. Computer-Generated Log Report listing all the changes made between every submitted schedule and its last submitted predecessor schedule using the Claim Digger schedule comparison module provided in Primavera Project Management software bundle or comparable schedule analytics software. At a minimum, this report shall show changes for
 - a. Added and deleted activities, original durations, remaining durations
 - b. Activity percent complete, total Float, actual Starts/Finishes

- c. Calendars, activity descriptions, constraints (added, deleted or changed)
- d. Budgeted and total to date Contract earnings
- e. Added/deleted relations, changed driving relations
- f. Changed relationship lags, change critical status

1.14 REVIEW, UPDATE AND REVISIONS

- A. Conform re-submittals to the same requirements as the original submittals.
- B. Allow for Sound Transit review with comments according to the following schedule from the date of receipt:
 - 1. Preliminary Baseline CPM Schedule: 7 days
 - 2. Contract Baseline CPM Schedule and Contract EVMS Plan: 14 days
 - 3. Monthly Update CPM Schedule, Monthly Update Progress Report, Monthly Earned Value Report and Recovery Schedule: 10 days
 - 4. Three-Week Look-Ahead Schedule: 2 days
- C. Make all corrections to the schedule requested by Sound Transit and resubmit the schedule for acceptance. If disagreeing with Sound Transit's comments, provide written notice of disagreement within 7 days from the receipt of Sound Transit's comments. Disagreement with Sound Transit's comments to the schedules shall be resolved in a meeting held for that purpose, if necessary.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 32 13.20
SCHEDULING OF WORK
DESIGN-BUILD

PART 1 - GENERAL

1.01 SUMMARY

This Section includes requirements for the preparation, revision and submittal of a cost-loaded Contract Critical Path Method (CPM) Schedule and an Earned Value Management System (EVMS).

1.02 DEFINITIONS

- A. Scheduler: The individual or entity assigned by Contractor with the responsibility for the development, preparation and management of all required CPM schedules, the EVMS Plan and submittals.
- B. Recovery Schedule: A schedule showing a Work Plan to complete the Work within the required Contract Milestones.

1.03 SOFTWARE REQUIREMENTS

Use Primavera Project Management P6 Release 8.2 or later version by Oracle or Microsoft Project 2010 or later version scheduling software.

1.04 SUBMITTALS

- A. Preliminary Baseline CPM Schedule: Submit within 14 days after Notice to Proceed (or Limited NTP).
- B. Contract Baseline CPM Schedule and EVMS Plan: Submit within 30 days after Notice to Proceed or Limited NTP, if a Limited NTP is issued.
- C. Monthly Update CPM Schedule: Submit no later than the 5th of each month.
- D. Three-Week Look-Ahead Schedule: Provide at progress meetings or transmit by the Wednesday of weeks without progress meetings.
- E. Monthly Update Progress Report and Earned Value (EV) Report: Submit no later than the 5th of each month
- F. Scheduler Qualification: Submit documentation within 14 days of NTP.

1.05 QUALITY ASSURANCE

- A. Qualifications: Designate an on-site Scheduler who will be responsible for the development, preparation and management of all required CPM schedules and EV Systems. The designated Scheduler(s) shall have at least 5 years of experience developing, creating, managing and reporting on schedules of similar size and complexity to this Contract and experience in the designated scheduling software system.

1.06 GENERAL

A. Submittal Formats

1. Hard Copy Formats: One paper copy of each.
 - a. Preliminary and Contract Baseline CPM Schedules and Monthly Update CPM Schedule: Gantt chart; clearly indicating critical activities; sheets are to be no smaller than 11 inches by 17 inches using landscape orientation and type font no smaller than 8.5 pt
 - b. Three-Week Look-Ahead Schedule: Sheets no larger than 11 inches by 17 inches and no smaller than 8-1/2 inches by 11 inches using landscape orientation and type font no smaller than 8.5 pt.
 - c. Monthly Update Progress Report: Sheets 8-1/2 inches by 11 inches in size. Charts for reports may be submitted on sheets up to 11 inches by 17 inches in size.
2. Electronic Copy:
 - a. Preliminary and Contract Baseline CPM Schedule: Electronic backup file in its native form (.XER, .MPP) and in .PDF format.
 - b. Contract Earned Value Management System: Electronic backup file in its native form .XLS and in .PDF format.
 - c. Monthly Update CPM Schedule: Electronic backup file in its native form (.XER, .MPP) and in .PDF format.
 - d. Monthly Update Progress Report: Electronic file in its native form (.doc) and in .PDF format.
 - e. Monthly Earned Value Report: Electronic backup file in its native form .XLS and in .PDF format.

- B. Within 14 days after NTP (or LNTP, if one is issued), the Contractor shall schedule with the Resident Engineer and attend a pre-scheduling and EVM conference with Sound Transit to review and discuss the Preliminary Baseline CPM schedule, the EVMS Plan and the requirements of this Section. The Contractor shall be prepared to discuss methodology for the schedule development, sequence of operations and the cost loading methodology that will provide early and late cash flow curves. ..
- C. Schedules shall represent a practical and logical plan to complete the Work within the Contract Milestones and to convey the plan for execution of the Work.
- D. The submittal of schedules shall be understood to be the Contractor's representation that the schedule meets the requirements of the Contract Documents and that the Work will be executed in the sequence and duration indicated in the schedule.
- E. Failure to include any element of Work required for performance of the Contract or failure to properly sequence the Work shall not excuse completing all Work with the Contract Milestones.
- F. All schedule submittals, excluding monthly progress reports, are subject to Sound Transit acceptance. Sound Transit retains the right to withhold appropriate monies (up to the full value of the progress payment) from each progress payment until submittal of the schedule(s) required in accordance with these provisions.

- G. The Contract Baseline CPM Schedule will not be accepted prior to acceptance of the Schedule of Values.
- H. Use the "Retained Logic" of Primavera P6 or comparable preference for scheduling activities.
- I. Develop all schedules utilizing industry standard 'best practices' including, but not limited to:
 - 1. All Activities shall have at least one predecessor and one successor, except Project start and finish milestones.
 - 2. All Activities must have a finish successor (FF) or (FS)
 - 3. All Activities must have a start predecessor (SS) or (FS)
 - 4. Maintain a majority of Finish to Start Relationships
 - 5. One discipline per activity
 - 6. No use of constraints other than those defined in the Contract Documents without the prior acceptance by Sound Transit.
 - 7. Leads or lags shall not be used.
 - 8. Use a "Finish on or Before" constraint for all Contract milestones unless agreed to by Sound Transit.
- J. Ensure that all individual construction activities do not exceed 14 days in duration without prior approval of Sound Transit. Subdivide activities exceeding 14 days in duration to an appropriate level of detail.
- K. Subdivide all major concrete activities, as a minimum, into formwork, reinforcement bar placement, placing of embedments, concrete placement and finish, and curing periods, unless agreed to by the Resident Engineer.
- L. Sufficiently describe schedule activities to include that which is to be accomplished in each Work area. Express activity durations in whole days. Clearly identify Work that is to be performed by Subcontractors.
- M. Create all schedules in conformance with the work-hours, constraints and Activity Code Structure as set forth in the Contract.
- N. Project Calendars
 - 1. Work calendars shall adhere to Contract Specifications.
 - 2. Each activity in the schedule shall adhere to a calendar appropriate for the Work type
- O. WBS Structure: Project WBS Structure shall provide at a minimum the following:
 - 1. Design
 - a. Design Milestones
 - b. Initial Reports
 - c. Utilities

- d. Demolition
 - e. Substructure
 - 1) 50%
 - 2) 100%
 - 3) IFC
 - f. Structure
 - g. Systems
 - 2. Construction
 - a. Milestones
 - b. Submittals/Preliminary Activities
 - c. Mobilization
 - d. Site work
 - e. Excavation
 - f. Retaining Walls
 - g. Aerial Structures
 - h. Stations
 - i. Parking Garages
 - j. Trackwork
 - k. Finishes
 - l. Landscaping/Flatwork
 - m. Testing and Commissioning
 - n. Demobilization
 - 3. Provisional Sums
 - 4. Change Orders
 - 5. Deleted Activities
- P. Cost Loading:
- 1. All schedules, with the exception of the Preliminary Baseline CPM Schedule and Three-Week Look-Ahead Schedules shall be cost-loaded.
 - 2. Submit and receive acceptance of the Schedule of Values allocating the total Contract Price, prior to Sound Transit acceptance of the Contract Baseline CPM Schedule. The accepted Schedule of Values will be used as the basis for progress payments. Payment for Work will be made only for and in accordance with those items included in the Schedule of Values.

3. Each item in the schedule of values shall be represented by one or more activity in the Contract Baseline CPM Schedule. The sum of all activities shall equal the sum of the item on the Schedule of Values.
4. Change Orders and Provisional Sums shall be added as separate items to the Schedule of Values and to the Monthly CPM Schedule as they are Accepted by Sound Transit.
5. Update cost-loading monthly with modifications made to the cost-loading taking into account actual payment requests, additions, deletions or revisions to activities in the Monthly Update CPM Schedule.
6. No single schedule activity may be assigned a value greater than \$250,000 without prior justification and approval from Sound Transit

1.07 PRELIMINARY BASELINE CPM SCHEDULE

A. CPM Schedule: Covering the complete Contract Work.

1. The purpose of the Preliminary Baseline CPM schedule is to depict the detailed Work activities for the first 90 days following Notice to Proceed (NTP) (or Limited NTP (LNTP)). Subsequent activities can be in more summary-level detail. The schedule will assist and serve as the basis of payment between NTP (LNTP) and the acceptance of the Contract Baseline CPM Schedule.
2. Include with the Submittal a written narrative that describes the schedule in detail and the approach to the Work.
3. Include all Submittals for design, and submittals, fabrication and construction activities required to supply or progress the Work for the first 90 days following Notice to Proceed (NTP) (or Limited NTP (LNTP)).
4. Indicate on the schedule diagram a clearly defined Critical Path.
5. If, in the opinion of the Resident Engineer, the schedule is determined to be impractical or not in compliance with the Contract Documents, revise the schedule and resubmit within 7 days.
6. Include detailed design and permitting activities including but not limited to the following:
 - a. Identification of individual design packages
 - b. Design submissions
 - c. Design reviews and conferences
 - d. Permit submissions
 - e. Required government submissions
 - f. Long lead item acquisitions prior to design completion

1.08 CONTRACT BASELINE CPM SCHEDULE AND EVMS PLAN

- A. Contract Baseline CPM Schedule: Covering all Work of the Contract through Acceptance.
- B. Prior to submitting the Contract Baseline CPM Schedule, the Contractor will schedule with the Resident Engineer and attend a scheduling conference with Sound Transit to present the Contract Baseline CPM Schedule and discuss its contents including schedule

assumptions, schedule risk, cost loading methodology, production rates, project calendars, shift assumptions, equipment constraints, material procurement concerns, long-lead materials and equipment, risk assumptions EVMS Plan and Critical Path(s).

- C. If, in the opinion of the Resident Engineer, the schedule or EVMS Plan is determined to be impractical or not in compliance with the Contract Documents, revise the schedule and resubmit within 7 days.
- D. Show clearly on the Contract Baseline CPM Schedule the sequence and interdependence of activities and list specifically:
 - 1. Detailed design and permitting activities including but not limited to the following:
 - a. Identification of individual design packages
 - b. Design submissions
 - c. Design reviews and conferences
 - d. Permit submissions
 - e. Required government submissions
 - f. Long lead item acquisitions prior to design completion
 - 2. Construction:
 - a. All constraints identified in the Contract Documents
 - b. All Milestones identified in the Contract Documents. Ensure that they are logically linked with physical activities and are progress driven.
 - c. Include all submittal, fabrication and construction activities required to supply and / or progress the Work for the duration of the Contract
 - d. Selection, ordering, manufacturing, factory testing and delivery of all long-lead equipment and materials.
 - e. Delivery of Sound Transit-furnished equipment and / or materials, if any
 - f. Inspection of the Work activities for Substantial Completion and Acceptance
 - g. Work to be performed by other agencies or utilities that affect the schedule shall include at a minimum activity durations and completion milestones for utility's or other agency's work, and shall show when the utility's or other agency's work must be complete to avoid impact to Contractor's work.:
 - h. Acquisition of construction permits
- E. Indicate on the schedule diagram a clearly defined Critical Path.
- F. Certify in writing that the Contract Baseline CPM schedules have been discussed in detail with all Subcontractors and major Suppliers as it relates to their respective Work. Include signatures from the major Subcontractors acknowledging that such discussions were conducted with them. Transmit a copy of the certificate with Subcontractor acknowledgements to Sound Transit.
- G. Include with the Contract Baseline CPM Schedule submittal a detailed written narrative describing the approach and methods for completion of the Work. Include all schedule

assumptions used in the development of the schedule including but not limited to the following: shift assumptions, crew size, project calendars, duration development, Critical Path(s), production rates, long lead material and equipment procurement and specific identified schedule risks. Use understandable narrative language to convey this schedule information to Sound Transit.

- H. A Contract Baseline CPM Schedule showing the Work completed in less than the Contract Milestones, which is found practical by Sound Transit, shall be considered to have Float (in addition to any required Sound Transit-controlled Float). Impractical early-completion schedules will not be accepted by Sound Transit.

- I. The Contract Baseline CPM Schedule shall be submitted without progress updates to schedule dates and costs.

- J. EVMS Plan: Covering the contract Work through Acceptance

Submit a Contract Earned Value Management System Plan covering the Contract Work through Acceptance which includes a documented plan for implementing, updating and reporting using the EVMS including how to process approved changes to the scope, schedule and budget.

1.09 MONTHLY UPDATE CPM SCHEDULE

- A. Submit a cost-loaded Monthly Update CPM Schedule with each application for payment
- B. Include in the Monthly Update CPM Schedule a data date (status) as of the first day of the following month (for example: for schedules submitted at the end of January 20xx, the data date shall be 01 February 20xx).
- C. Incorporate into the Monthly Update CPM Schedule all progress to date, changes to the planned sequence including logic revisions, changes to activity durations, and changes to the cost-loading as required. Sum all the remaining activities to be completed to the remaining cost of the Work.
- D. Incorporate accurate, actual progress, start dates, completion dates and costs so that the Monthly CPM Schedule will act as the Contract's As-Built schedule.
 - 1. If requested, provide documentation to substantiate as-built information.
 - 2. No actual start or finish dates shall be changed or corrected without a narrative explaining the reason for the change, and without Sound Transit's acceptance.
- E. Address all changes and revisions made in the Monthly Update CPM Schedule in a detailed narrative accompanying the submittal.
- F. Incorporate Change Orders and Change Notice-Work Directives (CN-WDs) into the Monthly Update CPM Schedule as additional schedule activities, when required.
- G. If in the opinion of the Resident Engineer, the schedule is determined to be impractical or not in compliance with the Contract Documents, revise the schedule and resubmit within 7 days.
- H. Submit a Recovery Schedule prior to the next progress payment if, according to the current updated Monthly Update CPM Schedule, the Work is more than 14 days behind a Contract Milestone, considering all granted or agreed to time extensions. Include with the submittal a detailed narrative describing the means and methods proposed to complete the Work in the prescribed period. Sound Transit may withhold approximate progress payments until a revised schedule, acceptable to Sound Transit, is submitted.

1.10 THREE-WEEK LOOK-AHEAD SCHEDULE

- A. Transmit the Three-Week Look-Ahead Schedule, in a Gantt chart format, showing the intended Work activities for the upcoming 3-week period plus one retrospective week.
- B. All design and construction activities in the Three-Week Look-Ahead Schedule must correlate to an activity in the current Monthly Update CPM Schedule either as a one-to-one match or as a subset of activities whose cumulative duration correlates to an activity in the Monthly Update CPM Schedule.
- C. Note and explain in writing all deviations from the most current Preliminary Baseline CPM Schedule, Contract Baseline CPM Schedule or Monthly Update CPM Schedule. Deviations include, but are not limited to, sequences of Work, timing and durations of activities.
- D. Portray all activities clearly and legibly on the schedule and include activity numbers from the current approved Preliminary, Contract or Monthly Update CPM Schedule.

1.11 MONTHLY UPDATE PROGRESS REPORT AND EARNED VALUE REPORT

- A. Include with the Monthly Update CPM Schedule a written narrative describing the approach and methods for completion of the Work. Use understandable narrative language that conveys schedule information to Sound Transit.
- B. Include with the Monthly Update CPM Schedule submittal a written narrative describing:
 - 1. Executive Summary
 - 2. Contract Status (percent complete based on cost and percent of contract time elapsed)
 - 3. Schedule Status (baseline versus current forecast) for each Milestone
 - 4. Work activities accomplished in the reporting period
 - 5. Intended Work activities for upcoming reporting period
 - 6. Community Relations Activities, accomplished in the reporting period and intended in the upcoming reporting period.
 - 7. All changes, additions or deletions that have been made to the schedule since the prior month and with the exception of adding actual durations, a reason for each of the changes.
 - 8. A listing of all activities that were planned on being completed or worked on during the reporting period, but were not and the reason for the lack of activity or inability to complete as scheduled. Discuss the actions taken or to be taken that have addressed adverse impacts to the Contract.
 - 9. Discussion and identification of changes, RFIs, CN-WDs or other events that affect the Contract schedule.
 - 10. Describe and discuss the Critical Path(s)
 - 11. Maintain and provide a computer-generated Earned Value Report (EVR). The template will be provided by Sound Transit. Submit a Monthly EVR with each application for payment or Monthly Update Progress Report
 - a. Earned Value Reporting will include:

- 1) Identification of cost and schedule variance.
 - 2) Discussion of performance trends through analysis of SPI (Schedule Performance Index), CPI (Cost Performance Index), SV (Schedule Variance, CV (Cost Variance) and ETC (Estimate to Completion).
 - 3) Identification of variances exceeding 10% (SPI or CPI less than 0.90 or greater than 1.10) with a description of the root cause, impact on the project and recommended or implemented corrective action.
 - 4) Identification of potential problem areas that need further explanation or action.
 - 5) Analysis of Contract EAC (Estimate at Completion)
- C. Include in all narratives all assumptions that have been made in developing and updating the schedule.
- D. Include in all narratives all major risk items that could potentially have an adverse impact to the schedule and how these risks are to be addressed and mitigated

1.12 REVIEW, UPDATE AND REVISIONS

- A. Conform re-submittals to the same requirements as the original submittals.
- B. Allow for Sound Transit review with comments according to the following schedule from the date of receipt:
1. Preliminary Baseline CPM Schedule: 7 days
 2. Contract Baseline CPM Schedule and Contract EVMS Plan: 14 days
 3. Monthly Update CPM Schedule, Monthly Earned Value Report and Recovery Schedule: 10 days
 4. Three-Week Look-Ahead Schedule: 2 days
- C. Make all corrections to the schedule requested by Sound Transit and resubmit the schedule for acceptance. If the Contractor disagrees with Sound Transit's comments, provide a written notice of disagreement within 7 days from the receipt of Sound Transit's comments on the schedule. Disagreement with Sound Transit's comments to the schedule shall be resolved in a meeting held for that purpose, if necessary.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 32 13.25
SCHEDULING OF WORK
DESIGN-BID-BUILD

PART 1 - GENERAL

1.01 SUMMARY

This Section includes requirements for the preparation, revision and submittal of a cost-loaded Contract Critical Path Method (CPM) Schedule and an Earned Value Management System (EVMS).

1.02 DEFINITIONS

- A. Scheduler: The individual or entity assigned by Contractor with the responsibility for the development, preparation and management of all required CPM schedules, the EVMS Plan and submittals.
- B. Recovery Schedule: A schedule showing a Work Plan to complete the Work within the required Contract Milestones.

1.03 SOFTWARE REQUIREMENTS

Use Primavera Project Management P6 Release 8.2 or later version by Oracle or Microsoft Project 2010 or later version scheduling software.

1.04 SUBMITTALS

- A. Preliminary Baseline CPM Schedule: Submit within 14 days after Notice to Proceed (or Limited NTP).
- B. Contract Baseline CPM Schedule and EVMS Plan: Submit within 30 days after Notice to Proceed or Limited NTP, if a Limited NTP is issued.
- C. Monthly Update CPM Schedule: Submit no later than the 5th of each month.
- D. Three-Week Look-Ahead Schedule: Provide at progress meetings or transmit by the Wednesday of weeks without progress meetings.
- E. Monthly Update Progress Report and Earned Value (EV) Report: Submit no later than the 5th of each month
- F. Scheduler Qualification: Submit documentation within 14 days of NTP.

1.05 QUALITY ASSURANCE

- A. Qualifications: Designate an on-site Scheduler who will be responsible for the development, preparation and management of all required CPM schedules and EV Systems. The designated Scheduler(s) shall have at least 5 years of experience developing, creating, managing and reporting on schedules of similar size and complexity to this Contract and experience in the designated scheduling software system.

1.06 GENERAL

A. Submittal Formats

1. Hard Copy Formats: One paper copy of each.
 - a. Preliminary and Contract Baseline CPM Schedules and Monthly Update CPM Schedule: Gantt chart; clearly indicating critical activities; sheets are to be no smaller than 11 inches by 17 inches using landscape orientation and type font no smaller than 8.5 pt.
 - b. Three-Week Look-Ahead Schedule: Sheets no larger than 11 inches by 17 inches and no smaller than 8-1/2 inches by 11 inches using landscape orientation and type font no smaller than 8.5 pt.
 - c. Monthly Update Progress Report: Sheets 8-1/2 inches by 11 inches in size. Charts for reports may be submitted in on sheets up to 11 inches by 17 inches in size.
 2. Electronic Copy:
 - a. Preliminary and Contract Baseline CPM Schedule: Electronic backup file in its native form (.XER, .MPP) and in .PDF format.
 - b. Contract Earned Value Management System: Electronic backup file in its native form .XLS and in .PDF format.
 - c. Monthly Update CPM Schedule: Electronic backup file in its native form (.XER, .MPP) and in .PDF format.
 - d. Monthly Update Progress Report: Electronic file in its native form (.doc) and in .PDF format.
 - e. Monthly Earned Value Report: Electronic backup file in its native form .XLS and in .PDF format.
- B. Within 14 days after NTP (or LNTP, if one is issued), the Contractor shall schedule with the Resident Engineer and attend a pre-scheduling and EVM conference with Sound Transit to review and discuss the Preliminary Baseline CPM schedule, the EVMS Plan and the requirements of this Section. The Contractor shall be prepared to discuss methodology for the schedule development, sequence of operations and the cost loading methodology that will provide early and late cash flow curves.
- C. Schedules shall represent a practical and logical plan to complete the Work within the Contract Milestones and to convey the plan for execution of the Work.
- D. The submittal of schedules shall be understood to be the Contractor's representation that the schedule meets the requirements of the Contract Documents and that the Work will be executed in the sequence and duration indicated in the schedule.
- E. Failure to include any element of Work required for performance of the Contract or failure to properly sequence the Work shall not excuse completing all Work with the Contract Milestones.
- F. All schedule submittals, excluding monthly progress reports, are subject to Sound Transit acceptance. Sound Transit retains the right to withhold appropriate monies (up to the full value of the progress payment) from each progress payment until submittal of the schedule(s) required in accordance with these provisions.

- G. The Contract Baseline CPM Schedule will not be accepted prior to acceptance of the Schedule of Values.
- H. Use the "Retained Logic" of Primavera P6 or comparable preference for scheduling activities.
- I. Develop all schedules utilizing industry standard 'best practices' including, but not limited to:
 - 1. All Activities shall have at least one predecessor and one successor, except Project start and finish milestones.
 - 2. All Activities must have a finish successor (FF) or (FS)
 - 3. All Activities must have a start predecessor (SS) or (FS)
 - 4. Maintain a majority of Finish to Start Relationships
 - 5. One discipline per activity
 - 6. No use of constraints other than those defined in the Contract Documents without the prior acceptance by Sound Transit.
 - 7. Leads or lags shall not be used.
 - 8. Use a "Finish on or Before" constraint for all Contract milestones unless agreed to by Sound Transit.
- J. Ensure that all individual construction activities do not exceed 14 days in duration without prior approval of Sound Transit. Subdivide activities exceeding 14 days in duration to an appropriate level of detail.
- K. Subdivide all major concrete activities, as a minimum, into formwork, reinforcement bar placement, placing of embedments, concrete placement and finish, and curing periods, unless agreed to by the Resident Engineer.
- L. Sufficiently describe schedule activities to include that which is to be accomplished in each Work area. Express activity durations in whole days. Clearly identify Work that is to be performed by Subcontractors.
- M. Create all schedules in conformance with the work-hours, constraints and Activity Code Structure as set forth in the Contract.
- N. Project Calendars
 - 1. Work calendars shall adhere to Contract Specifications.
 - 2. Each activity in the schedule shall adhere to a calendar appropriate for the Work type
- O. WBS Structure: Project WBS Structure shall provide at a minimum the following:
 - 1. Construction
 - a. Milestones
 - b. Submittals/Preliminary Activities
 - c. Mobilization

- d. Site work
- e. Excavation
- f. Retaining Walls
- g. Aerial Structures
- h. Stations
- i. Parking Garages
- j. Trackwork
- k. Finishes
- l. Landscaping/Flatwork
- m. Testing and Commissioning
- n. Demobilization

- 2. Provisional Sums
- 3. Change Orders
- 4. Deleted Activities

P. Cost Loading:

- 1. All schedules, with the exception of the Preliminary Baseline CPM Schedule and Three-Week Look-Ahead Schedules shall be cost-loaded.
- 2. Submit and receive acceptance of the Schedule of Values allocating the total Contract Price, prior to Sound Transit acceptance of the Contract Baseline CPM Schedule. The accepted Schedule of Values will be used as the basis for progress payments. Payment for Work will be made only for and in accordance with those items included in the Schedule of Values.
- 3. Each item in the schedule of values shall be represented by one or more activity in the Contract Baseline CPM Schedule. The sum of all activities shall equal the sum of the item on the Schedule of Values.
- 4. Change Orders and Provisional Sums shall be added as separate items to the Schedule of Values and to the Monthly CPM Schedule as they are Accepted by Sound Transit.
- 5. Update cost-loading monthly with modifications made to the cost-loading taking into account actual payment requests, additions, deletions or revisions to activities in the Monthly Update CPM Schedule.
- 6. No single schedule activity may be assigned a value greater than \$250,000 without prior justification and approval from Sound Transit

1.07 PRELIMINARY BASELINE CPM SCHEDULE

A. CPM Schedule: Covering the complete Contract Work.

- 1. The purpose of the Preliminary Baseline CPM schedule is to depict the detailed Work activities for the first 90 days following Notice to Proceed (NTP) (or Limited

NTP (LNTP)). Subsequent activities can be in more summary-level detail. The schedule will assist and serve as the basis of payment between NTP (LNTP) and the acceptance of the Contract Baseline CPM Schedule.

2. Include with the Submittal a written narrative that describes the schedule in detail and the approach to the Work.
3. Include all Submittal, fabrication and construction activities required to supply or progress the Work for the first 90 days following Notice to Proceed (NTP) (or Limited NTP (LNTP)).
4. Indicate on the schedule diagram a clearly defined Critical Path.
5. If, in the opinion of the Resident Engineer, the schedule is determined to be impractical or not in compliance with the Contract Documents, revise the schedule and resubmit within 7 days.

1.08 CONTRACT BASELINE CPM SCHEDULE AND EVMS PLAN

- A. Contract Baseline CPM Schedule: Covering all Work of the Contract through Acceptance.
- B. Prior to submitting the Contract Baseline CPM Schedule, the Contractor will schedule with the Resident Engineer and attend a scheduling conference with Sound Transit to present the Contract Baseline CPM Schedule and discuss its contents including schedule assumptions, schedule risk, cost loading methodology, production rates, project calendars, shift assumptions, equipment constraints, material procurement concerns, long-lead materials and equipment, risk assumptions EVMS Plan and Critical Path(s).
- C. If, in the opinion of the Resident Engineer, the schedule or EVMS Plan is determined to be impractical or not in compliance with the Contract Documents, revise the schedule and resubmit within 7 days.
- D. Show clearly on the Contract Baseline CPM Schedule the sequence and interdependence of activities and list specifically:
 1. All constraints identified in the Contract Documents
 2. All Milestones identified in the Contract Documents. Ensure that they are logically linked with physical activities and are progress driven.
 3. Include all submittal, fabrication and construction activities required to supply and / or progress the Work for the duration of the Contract.
 4. Selection, ordering, manufacturing, factory testing and delivery of all long-lead equipment and materials.
 5. Delivery of Sound Transit-furnished equipment and / or materials, if any
 6. Inspection of the Work activities for Substantial Completion and Acceptance
 7. Work to be performed by other agencies or utilities that affect the schedule shall include at a minimum activity durations and completion milestones for utility's or other agency's work, and shall show when the utility's or other agency's work must be complete to avoid impact to Contractor's work.:
 8. Acquisition of construction permits
- E. Indicate on the schedule diagram a clearly defined Critical Path.

- F. Certify in writing that the Contract Baseline CPM schedules have been discussed in detail with all Subcontractors and major Suppliers as it relates to their respective Work. Include signatures from the major Subcontractors acknowledging that such discussions were conducted with them. Transmit a copy of the certificate with Subcontractor acknowledgements to Sound Transit.
- G. Include with the Contract Baseline CPM Schedule submittal a detailed written narrative describing the approach and methods for completion of the Work. Include all schedule assumptions used in the development of the schedule including but not limited to the following: shift assumptions, crew size, project calendars, duration development, Critical Path(s), production rates, long lead material and equipment procurement and specific identified schedule risks. Use understandable narrative language to convey this schedule information to Sound Transit.
- H. A Contract Baseline CPM Schedule showing the Work completed in less than the Contract Milestones, which is found practical by Sound Transit, shall be considered to have Float (in addition to any required Sound Transit-controlled Float). Impractical early-completion schedules will not be accepted by Sound Transit.
- I. The Contract Baseline CPM Schedule shall be submitted without progress updates to schedule dates and costs.
- J. EVMS Plan: Covering the contract Work through Acceptance

Submit a Contract Earned Value Management System Plan covering the Contract Work through Acceptance which includes a documented plan for implementing, updating and reporting using the EVMS including how to process approved changes to the scope, schedule and budget.

1.09 MONTHLY UPDATE CPM SCHEDULE

- A. Submit a cost-loaded Monthly Update CPM Schedule with each application for payment
- B. Include in the Monthly Update CPM Schedule a data date (status) as of the first day of the following month (for example: for schedules submitted at the end of January 20xx, the data date shall be 01 February 20xx).
- C. Incorporate into the Monthly Update CPM Schedule all progress to date, changes to the planned sequence including logic revisions, changes to activity durations, and changes to the cost-loading as required. Sum all the remaining activities to be completed to the remaining cost of the Work.
- D. Incorporate accurate, actual progress, start dates, completion dates and costs so that the Monthly CPM Schedule will act as the Contract's As-Built schedule.
 - 1. If requested, provide documentation to substantiate as-built information.
 - 2. No actual start or finish dates shall be changed or corrected without a narrative explaining the reason for the change, and without Sound Transit's acceptance.
- E. Address all changes and revisions made in the Monthly Update CPM Schedule in a detailed narrative accompanying the submittal.
- F. Incorporate Change Orders and Change Notice-Work Directives (CN-WDs) into the Monthly Update CPM Schedule as additional schedule activities, when required.
- G. If in the opinion of the Resident Engineer, the schedule is determined to be impractical or not in compliance with the Contract Documents, revise the schedule and resubmit within 7 days.

- H. Submit a Recovery Schedule prior to the next progress payment if, according to the current updated Monthly Update CPM Schedule, the Work is more than 14 days behind a Contract Milestone, considering all granted or agreed to time extensions. Include with the submittal a detailed narrative describing the means and methods proposed to complete the Work in the prescribed period. Sound Transit may withhold approximate progress payments until a revised schedule, acceptable to Sound Transit, is submitted.

1.10 THREE-WEEK LOOK-AHEAD SCHEDULE

- A. Transmit the Three-Week Look-Ahead Schedule, in a Gantt chart format, showing the intended Work activities for the upcoming 3-week period plus one retrospective week.
- B. All construction activities in the Three-Week Look-Ahead Schedule must correlate to an activity in the current Monthly Update CPM Schedule either as a one-to-one match or as a subset of activities whose cumulative duration correlates to an activity in the Monthly Update CPM Schedule.
- C. Note and explain in writing all deviations from the most current Preliminary Baseline CPM Schedule, Contract Baseline CPM Schedule or Monthly Update CPM Schedule. Deviations include, but are not limited to, sequences of Work, timing and durations of activities.
- D. Portray all activities clearly and legibly on the schedule and include activity numbers from the current approved Preliminary, Contract or Monthly Update CPM Schedule.

1.11 MONTHLY UPDATE PROGRESS REPORT AND EARNED VALUE REPORT

- A. Include with the Monthly Update CPM Schedule a written narrative describing the approach and methods for completion of the Work. Use understandable narrative language that conveys schedule information to Sound Transit.
- B. Include with the Monthly Update CPM Schedule submittal a written narrative describing:
 1. Executive Summary
 2. Contract Status (percent complete based on cost and percent of contract time elapsed)
 3. Schedule Status (baseline versus current forecast) for each Milestone
 4. Work activities accomplished in the reporting period
 5. Intended Work activities for upcoming reporting period
 6. Community Relations Activities, accomplished in the reporting period and intended in the upcoming reporting period.
 7. All changes, additions or deletions that have been made to the schedule since the prior month and with the exception of adding actual durations, a reason for each of the changes.
 8. A listing of all activities that were planned on being completed or worked on during the reporting period, but were not and the reason for the lack of activity or inability to complete as scheduled. Discuss the actions taken or to be taken that have addressed adverse impacts to the Contract.
 9. Discussion and identification of changes, RFIs, CN-WDs or other events that affect the Contract schedule.
 10. Describe and discuss the Critical Path(s)

11. Maintain and provide a computer-generated Earned Value Report (EVR). The template will be provided by Sound Transit. Submit a Monthly EVR with each application for payment or Monthly Update Progress Report
 - a. Earned Value Reporting will include:
 - 1) Identification of cost and schedule variance.
 - 2) Discussion of performance trends through analysis of SPI (Schedule Performance Index), CPI (Cost Performance Index), SV (Schedule Variance, CV (Cost Variance) and ETC (Estimate to Completion.
 - 3) Identification of variances exceeding 10% (SPI or CPI less than 0.90 or greater than 1.10) with a description of the root cause, impact on the project and recommended or implemented corrective action.
 - 4) Identification of potential problem areas that need further explanation or action.
 - 5) Analysis of Contract EAC (Estimate at Completion)
 - C. Include in all narratives all assumptions that have been made in developing and updating the schedule.
 - D. Include in all narratives all major risk items that could potentially have an adverse impact to the schedule and how these risks are to be addressed and mitigated

1.12 REVIEW, UPDATE AND REVISIONS

- A. Conform re-submittals to the same requirements as the original submittals.
- B. Allow for Sound Transit review with comments according to the following schedule from the date of receipt:
 1. Preliminary Baseline CPM Schedule: 7 days
 2. Contract Baseline CPM Schedule and Contract EVMS Plan: 14 days
 3. Monthly Update CPM Schedule, Monthly Earned Value Report and Recovery Schedule: 10 days
 4. Three-Week Look-Ahead Schedule: 2 days
- C. Make all corrections to the schedule requested by Sound Transit and resubmit the schedule for acceptance. If the Contractor disagrees with Sound Transit's comments, provide a written notice of disagreement within 7 days from the receipt of Sound Transit's comments on the schedule. Disagreement with Sound Transit's comments to the schedule shall be resolved in a meeting held for that purpose, if necessary.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 32 33

PHOTOGRAPHIC DOCUMENTATION

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section includes procedural requirements for digital photographic documentation, including images, video recordings, and web-based photographic documentation.

1.02 SUBMITTALS

- A. Key Plan(s): Submit initial plan(s). Submit updates with each photographic documentation submittal.
- B. General
 - 1. Provide manufacturer and model of each type of camera.
 - 2. Provide copies of photographic documentation on standard digital media, such as files and disks (readable on common Windows-OS and Linux-OS systems).
 - 3. Identify each digital image in accordance with the Photo Naming Convention for Contractor digital photos in document control and internet-based document management system as described elsewhere in the Contract Documents. Label with the following information:
 - a. Name of Contract
 - b. Name of Contractor
 - c. Submittal date, number and description
 - d. Name and address of photographer
 - 4. In addition to submittals required below, provide annually, or as requested by the Resident Engineer, all documentation since the prior annual submittal.
- C. Digital Still Photographs (Still Photos): Submit digital image of each photograph. Submit a colored thumbnail index of photographs with electronic file name of each photo. Provide the following types of still photos:
 - 1. Pre-Construction Photographs: Submit prior to start of construction.
 - 2. Final Complete Construction Photographs: Submit within 14 days of Notice of Acceptance, or prior to occupancy by Owner or another Contractor.
 - 3. Subject-specific construction photographs such as, but not limited to, potential change, non-conformance, quality, and property damage: Submit within three (3) days after photo is taken.
- D. Digital Video Recordings (Video): Submit with an index that includes the following: Identification of each segment by location, time of day, street name, viewing direction, traveling directions, and starting and ending points.

1. Identify each digital image keyed to accompanying key plan.
 - E. Digital Web-Based Photographic Documentation
 1. Web-based photo service provider's name and background
 2. Use multiple files, with consistent file names and consecutive numbers, so that the file sizes do not exceed 3.9 GB.
 - F. Usage Rights Documentation: Obtain and transfer copyright usage rights from photographer and/or videographer to Sound Transit for unlimited reproduction of copyrighted photographic documentation.
 - G. Qualification Data: For videographer and Web-based photographic documentation service provider.
- 1.03 QUALITY ASSURANCE
- A. Videographer Qualifications: An individual who has been regularly engaged in such work on construction projects for not less than three years.
 - B. Web-Based Photographic Documentation Service Provider: A firm specializing in providing photographic equipment, Web-based software and related services for construction projects with a record of providing satisfactory services similar to those required for Project.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Key Plan: Show the layout of the Project Site with notation of vantage points marked for location and direction of each still photo and video recording
- B. All data, image, video and audio, created by cameras and/or microphones, shall be stored on and backed up to different physical media in order to avoid data loss due to equipment failure. Backup data shall be maintained at a different geographical location.

2.02 STILL PHOTOS

- A. Still Photo Camera Specifications:
 1. Minimum sensor resolution: 5 megapixels
 2. Set to produce a digital stamp of the current date and time on each image
 3. Images in JPG format

2.03 VIDEO

- A. Video Camera Specifications
 1. Color digital Video Images: Camera shall be capable of color progressive scan high resolution jpeg digital image output. Camera shall have not less than a C-size lens. Camera output shall use MPEG H.264 data standard.
 2. Resolution and shutter speed: Camera will have a minimum pixel resolution of 4-CIS for the live video stream, and a shutter speed no slower than 1/60 sec.

3. Date and time: Capable of showing a digital stamp on image of current date and current time.

PART 3 - EXECUTION

3.01 GENERAL

- A. Capture all photographic documentation digitally. Submit images exactly as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications.
- B. All non-fixed camera documentation shall be done with sufficient lighting to clearly show the subject matter. No documentation shall be done during periods of visible precipitation or when more than 10 percent of the ground area is covered with snow, unless otherwise authorized by the Resident Engineer.

3.02 STILL PHOTO REQUIREMENTS.

- A. Preconstruction Photographs
 1. Provide pre-construction still photos prior to commencement of work at each Site.
 2. Take sufficient overlapping still photos to show existing conditions of Site and adjacent properties before starting the Work.
 3. No construction shall begin prior to Resident Engineer review and approval of the pre-construction photographs of the construction area.
 4. Take still photos at locations to be disturbed or likely to be affected by construction and at locations designated by the Resident Engineer.
- B. Final Completion Construction Photographs:
 1. Take a sufficient quantity of still photos to thoroughly and accurately document the condition of Site Acceptance.
- C. Subject-specific Construction Photographs
 1. If there are any evident changes in conditions, non-conformance in the Work, or signs of potential damage to property or constructed project take sufficient photographs to document the conditions with no less than ten still photos.
 2. Provide a scale to the area/condition, such as a tape measure to substantiate cracking

3.03 VIDEO RECORDING REQUIREMENTS

- A. Audio:
 1. Begin each recording with the current date, Contract name, videographer name, street location, viewing side, and direction of progress.
 2. End recording with date and time.

3. Narration: Describe scenes on video recording by audio narration. Include description of items being viewed, recent events, and planned activities. At each change in location, describe vantage point, location, direction (by compass point), and elevation.
- B. Video:
 1. Set to continuously record, transparent digital information (date and time of recording).
- C. Pre-construction and Post-construction Video Recordings:
 1. Document the entire Project Site.
 - a. Include all surface features located within at least 300 feet of the construction site and accompany with appropriate audio description. Include all existing curbs, sidewalks, driveways, ditches, paved areas, landscaping, trees, culverts, headwalls, retaining walls, and buildings.
 2. Duration: approximately 120 minutes per alignment
 3. Include time stamp and narrative giving location of the items being shown.

END OF SECTION

APPENDIX

Appendix A: Web-Based Photographic Documentation

SECTION 01 32 33

PHOTOGRAPHIC DOCUMENTATION

Appendix A – Web-Based Photographic Documentation

- A. Camera Specifications: Provide and install a digital camera system meeting the following requirements:
1. Provide 1 exterior, all-weather, viewer-controlled camera, with the following characteristics:
 2. Capable of producing minimum 6.0 megapixel pictures,
 3. Pan/tilt/zoom controlled
 4. Include a timer to automatically start and stop video recorder for recording during construction work hours.
 5. Include power supply, active high-speed data connection to service provider's network and static public IP address for each camera.
- B. Identification: Provide the information listed in 1 through 8 below on each DVD for each camera in order to uniquely identify each and on each Transmittal:
1. Contract Name and Contract Number
 2. Name of Contractor
 3. Transmittal date, Transmittal number and description
 4. Name of photographer
 5. Date(s) and time(s) video recording was recorded
 6. Site location where recording was made
 7. Numbers of DVDs in Transmittal
 8. Serial number of DVDs in Transmittal
- C. Installation:
1. The Exhibits to this Appendix A identify the required number of cameras and the general location / coverage of each camera.
 2. Mount at location(s), approved by Resident Engineer, to provide unobstructed views of Site.
- D. Live Streaming Construction Site Images:
1. Provide Web-access of current site image from camera(s), updated at 15-minute intervals during work hours of operation.

2. Time-Lapse Sequence Construction Site Recordings: Provide video recording from a fixed-location camera to show status of construction and progress. Record one frame of video recording every 15 minutes from same vantage point to create a time-lapse sequence of construction activities.
 3. Web Storage: Post images and / or time-lapsed video recording to an approved Web-based service provider's website.
 4. Web-Based Image Access: Administer password-protected access for project team, providing current and archival image access by date and time with images and video downloadable to viewer's device.
 5. Public Viewer: Provide open access to most recent project camera image and time-lapse display of all images to date.
- E. Maintain cameras and Web-based access until Substantial Completion. Sixty days prior to Substantial Completion obtain from Sound Transit the disposition of the Web-Based services at Substantial Completion: terminate services, transfer services to a follow-on contractor or transfer services to Sound Transit. Within 7 days after Substantial Completion transmit to Sound Transit DVDs of all coverage not previously provided.

EXHIBITS .

Exhibit A - []

Exhibit B - []

Exhibit C - []

Exhibit __ - []

END OF APPENDIX

SECTION 01 33 00**SUBMITTAL PROCEDURES****PART 1 - GENERAL****1.01 SUMMARY**

This Section specifies the general requirements and procedures for preparing and providing construction information including shop drawings, product data, certifications, factory inspection testing, samples, etc.

1.02 DEFINITIONS

- A. Submittal: A Submittal is a document or sample required by the Contract that requires review and response by Sound Transit.
- B. Transmittal: A Transmittal is a document that is required by the Contract to document contract compliance and is provided for information only. Transmittals do not normally require a response by Sound Transit unless Sound Transit identifies a problem with the document or information being transmitted. Transmittals include, but are not limited to: certified payrolls, product certifications, material certifications, welder certification, installer certifications, SBE/DBE utilization reports, pothole or drilling logs, test reports, etc.

1.03 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

- A. Prepare and submit each Submittal and Transmittal via the Selected Software as specified elsewhere in the Contract. One hard copy is required for Submittals. One hard copy is required for Transmittals when a wet signature or seal has been applied to the transmittal or its contents.
- B. For scheduling purposes allow 30 days for the initial review of each Submittal, unless noted otherwise, and allow 21 days for review of each resubmission.
- C. The Contractor shall schedule the submission of Submittals (and, if necessary, the resubmission of Submittals) to assure that the Contractor has received from the Resident Engineer, a minimum of 21 days in advance of starting an activity, acceptance of all Submittals required for that activity. Acceptance means the Submittal has received a classification of "No Exceptions Noted" or "Exceptions as Noted – Resubmittal Not Required". The Contractor shall not start work on an activity for which submittals are required until 21 days after acceptance of all associated Submittals for that activity, unless otherwise specifically permitted by the Resident Engineer.
- D. Prepare separate Submittals for each item in a specification Section.
- E. Submittal Naming and Numbering requirements are specified elsewhere in the Contract.
- F. Provide Submittals of related parts of the Work concurrently such that processing will not be delayed for coordination. The Resident Engineer may withhold action on a Submittal requiring coordination until all related Submittals are received.
- G. Place a permanent label or title block on each Submittal item for identification.
 - 1. Include the Contract name and number; the date of submission/re-submission; reference to the applicable Specification Section and paragraph, and / or drawing number; subject matter or drawing detail to which the Submittal applies; and the revision number and date, if applicable.
 - 2. Include the name of firm or entity that prepared each Submittal.

3. Provide a space approximately 2.5 by 2.5 inches on label or beside title block to record Contractor's review and approval markings and action taken by Resident Engineer.
 - H. Include on each Submittal and Transmittal, whether from the Contractor or a Subcontractor, an approval stamp signed by the Contractor, indicating that the Submittal/Transmittal has been reviewed and approved by the Contractor, and that the Submittal/Transmittal meets the Contract requirements.
 - I. All Submittals/Transmittals shall be submitted with a transmittal form containing the following information:
 1. Contract name and number, the date of submission, the name of the Contractor, Subcontractor, Supplier and/or manufacturer, as appropriate, and the document number. The numbering requirements are specified elsewhere in the Contract
 2. Submittal/Transmittal description
 3. Reference to the applicable specification section and paragraph and/or drawing number and title as applicable
 4. Location(s) where product is to be installed, as appropriate
 5. Identification and documentation of any approved deviations from the Contract Drawings and Contract Specifications. Requests for deviations from the Contract Documents must be approved prior to submitting the corresponding Submittal. Requests for Substitution or deviation shall be submitted as specified elsewhere in the Contract and not under the technical specification section containing the originally specified item. Upon Sound Transit's approval of the substitution request, submit product data under the technical specification section of the originally specified item.
 6. Notation that the Submittal is for a Safety Critical Item, if identified on the Sound Transit Specification Conformance Checklist (SCC). The SCC will be provided by Sound Transit.
 - J. All Submittals/Transmittals will be provided to Sound Transit directly from the Contractor. The Resident Engineer will discard Submittals received from sources other than the Contractor.
- 1.04 SUBMITTAL/TRANSMITTAL LOG
- A. A draft electronic version of the Submittal/Transmittal log will be provided by the Resident Engineer after the Contractor has executed and submitted Appendix A: "REQUEST AND RELEASE FOR USE OF SOUND TRANSIT ELECTRONIC SURVEY AND ENGINEERING MEDIA" form.
 - B. Provide within 21 days after the effective date of NTP.
 - C. Coordinate Submittals with the construction schedule. The log shall reflect the time required for Submittal review, ordering, manufacturing, fabricating and delivery. Include additional time necessary for re-submittals.
 - D. The log shall be arranged in a tabular format by Specification Section. The log shall be created and maintained in Microsoft Excel.
 - E. The log shall include:
 1. Scheduled date for initial item Submittal, review period and "need" date for

acceptance in order to fabricate, deliver and install within its corresponding construction schedule activity

2. Specification Section number, paragraph number and title
 3. Name of Subcontractor and / or Supplier
 4. Type of Submittal (shop drawings, Product Data, Samples or other), description of the item, name of manufacturer, trade name and model number
 5. Intended submission date
 6. For a Safety Critical Item based on Sound Transit's Specification Conformance Checklist (SCC), include the "Item" number and "Section" (paragraph) number, as shown on the Sound Transit SCC.
- F. Highlight Submittals that are on the critical path and that require expedited review to meet the schedule. Indicate lead time from Submittal approval to the date of fabrication and installation.
- G. Update and transmit the Submittal/Transmittal log to the Resident Engineer on a monthly basis. Updates will include revisions or additions to Submittals/Transmittals on the log as well as the actual dates.

1.05 SHOP DRAWINGS

A. General:

1. If specified, shop drawings and calculations as submitted shall be signed and sealed by a professional engineer registered in the State of Washington or where the Work will be performed. The shop drawing shall indicate all pertinent features of the products and the method of fabrication, connection, erection or assembly with respect to the Work. Calculations associated with shop drawing design shall also be submitted.
2. The drawing format of the first drawings submitted by Contractor, Subcontractor or vendor will be reviewed for conformance with this Section. Once accepted by Sound Transit, use as the standard for subsequent drawings.
3. Conform to the following standard sizes (in inches).

WIDTH (Vertical)	by	LENGTH (Horizontal)
8.5		11.0
11.0		8.5
11.0		17.0
17.0		22.0
22.0 Maximum		34.0 Maximum

- B. Dimensioning: Follow applicable dimensioning and tolerance practices as specified in ANSI/ASME Y14.5.

1. Prepare Contract-specific information, drawn accurately to scale. Do not base shop drawings on reproductions of the Contract Documents or standard printed data.
 2. Provide sufficient dimensions on drawings so that size, shape and location may be determined without calculation.
 3. Show each dimension clearly so that only one interpretation is possible. Show each dimension for a feature only once.
 4. Show dimensions between points, lines or surfaces having a necessary and specific relationship to each other or which control the location of mating parts or components.
 5. Select dimensions and arrange to avoid the accumulation of tolerances that might ultimately permit more than one interpretation resulting in unsatisfactory mating of parts and / or failure in use.
 6. When possible, dimension each feature in the view where it appears in profile or the one depicting its true profile.
 7. Include on the shop drawings details necessary for the installation, maintenance and repair of all equipment provided.
- C. Electronic data for portions of the Contract drawings may be available for use as the basis for preparation of shop drawings or planning the Work. Such electronic files are intended for design intent only and not intended for fabrication purposes. The Contractor must be responsible for all subsequent distributions of such information to Subcontractors and Suppliers and assuring compliance with the restrictions on use. The Contractor must request the electronic media by submitting an executed copy of the "REQUEST AND RELEASE FOR USE OF SOUND TRANSIT ELECTRONIC SURVEY AND ENGINEERING MEDIA" form found at Appendix A. Use of such documents implies Contractor's and Subcontractor's/Supplier's agreement to the terms on the form. Fully describe requirements and use for each request.

1.06 PRODUCT DATA

- A. If information must be specially prepared for Submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
- B. Mark up manufacturers' standard drawings, catalog cuts, brochures, diagrams, schedules, performance charts, illustrations, calculations, printed installation, erection, application, placing instructions and other descriptive data to highlight information that is applicable to the Contract. Indicate dimensions, clearances, performance characteristics, capacities, wiring and piping diagrams and controls. Supplement standard information with additional information applicable to this Contract.
- C. Submit Product Data before or concurrent with related Samples.

1.07 SAMPLES

- A. Submit Samples for review of kind, color, pattern and texture for a check of these characteristics with other elements and for a comparison of these characteristics between Submittal and actual component as delivered and installed.
- B. Maintain sets of accepted Samples at Site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine the acceptability of construction associated with each set. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Samples, not incorporated

into the Work or otherwise designated as Sound Transit's property, are the property of and will be returned to Contractor.

- C. Samples for Verification: Submit full-size units or Samples of size indicated, physically identical with material or product proposed for use.
1. Samples include, but are not limited to, the following:
 - a. Partial sections of manufactured or fabricated components
 - b. Small cuts or containers of materials
 - c. Complete units of repetitively used materials
 - d. Swatches showing color, texture and pattern
 - e. Color range sets
 - f. Components used for independent testing and inspection.
 2. Number of Samples:
 - a. Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation and other similar characteristics are to be demonstrated.
 - b. If variation in color, pattern, texture or other characteristic is inherent in material or product represented by a Sample, the Contractor shall submit at least three (3) comparison sets of Samples that show the approximate range limits of the variation.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 CONTRACTOR'S RESPONSIBILITIES

- A. Review each Submittal and Transmittal, including all those provided by Subcontractors and Suppliers of any tier, to check for conflicts and coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions.
- B. Review approval methods and requirements of the various designated approving authorities (i.e. AHJ, permitting agency, etc.). Determine typical review time periods of these approving authorities. Include sufficient time in the Schedule for these reviews and approvals. Obtain their approvals in a timely manner in order to avoid adverse impacts to the Contract Milestones.
- C. Attend meetings requested by the Resident Engineer to address issues related to the condition, review and approval of Submittals

3.02 RESIDENT ENGINEER'S RESPONSIBILITIES

- A. The Resident Engineer receives, reviews and takes other appropriate action on all Submittals and Transmittals that are received from the Contractor.
 1. Shop drawings, Samples and other submission reviews by the Resident Engineer will not include checking of dimensions or openings for potential conflict.

2. The Resident Engineer's acceptance of a specific item will not indicate acceptance of an assembly of which the item is a component.
 3. Submittals not required by the Contract Documents may be returned by the Resident Engineer without action.
 4. Incomplete Submittal packages will be returned without review.
 5. Approval of a Submittal is not approval for substitution for a specified item.
- B. For each Submittal reviewed and requiring response by the Resident Engineer, the Resident Engineer will issue a Submittal review document with one of the following statements:
1. **NO EXCEPTIONS TAKEN:** Denotes the Submittal conforms to the requirements of the Contract Documents and that fabrication and installation may proceed without a resubmittal.
 2. **EXCEPTIONS AS NOTED - RESUBMISSION NOT REQUIRED:** Denotes that the Submittal conforms to the Contract Documents with the reviewer's corrections incorporated. Resubmittal, prior to proceeding, is not required unless the Contractor takes exception to the reviewer's comments.
 3. **EXCEPTIONS AS NOTED - RESUBMISSION REQUIRED:** Denotes the Submittal conforms to the Contract Documents with the reviewer's corrections incorporated. The Submittal must be revised to incorporate the corrections and resubmitted to the Resident Engineer for verification and approval, prior to proceeding with fabrication and installation.
 4. **REJECTED:** Denotes the Submittal is deficient to the degree that the review cannot be completed and that the Submittal must be revised and resubmitted.
- C. Transmittals will be reviewed by the Resident Engineer for conformance with the Contract requirements. The Resident Engineer will not respond to a Transmittal unless there is a defect in the Transmittal document or the Transmittal indicates non-compliance with the Contract. In the case of a defect the Resident Engineer will return the Transmittal with the classification of "Exceptions as Noted – Resubmission Required" or "Rejected" or a non-compliance report will be issued as appropriate. Transmittals found to be acceptable will be so noted in the tracking software program and retained in the Contract Records by the Resident Engineer.

3.03 RESUBMISSIONS, DISTRIBUTION AND USE

- A. Make resubmissions in same form and number of copies as initial Submittal. Note the date and content of previous Submittal. Clearly indicate extent of revision.
- B. Furnish copies of final Submittals to manufacturers, Subcontractors, Suppliers, fabricators, installers, AHJ and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- C. Retain complete copies of final Submittals on Site. Use only final Submittals that are marked with "NO EXCEPTIONS TAKEN" or "EXCEPTIONS AS NOTED – RESUBMISSION NOT REQUIRED" notation from Resident Engineer's action stamp.

END OF SECTION

APPENDIX

Appendix A: Request and Release for Use of Sound Transit Electronic Survey and Engineering Media

APPENDIX A: REQUEST AND RELEASE FOR
USE OF SOUND TRANSIT ELECTRONIC
SURVEY AND ENGINEERING
MEDIA

Name of Firm requests the following Sound Transit electronic CAD/CAE/BIM data for their use for **name/numeric designation of project**.

Purpose: describe the proposed use

Media Requested: (list and describe the required files and format below)

In consideration for receiving the CAD/CAE/BIM data, **Name of Firm** waives and releases Sound Transit from any claim arising out of the **Name of Firm**'s use of the CAD/CAE/BIM data, and further understands and agrees:

1. **Name of Firm** will use the CAD/CAE/BIM data files solely for the purposes stated.
2. Sound Transit does not warrant the accuracy of the CAD/CAE/BIM data files and they may not represent the as-built condition. **Name of Firm** is solely responsible to verify the accuracy of the electronic files and existing conditions for its purposes.
3. Sound Transit makes no representation or warranty that the CAD/CAE/BIM data is complete, appropriate, or fit for the stated purpose, and such determination rests solely with **Name of Firm**.
4. All CAD/CAE/BIM data provided by Sound Transit to **Name of Firm**, including any electronic revisions, shall remain the property of Sound Transit.
5. **Name of Firm** will indemnify, defend, and hold harmless Sound Transit, its consultants, and agent(s) from any and all damages and claims arising from authorized or unauthorized use of these files.

These provisions apply to any subsequent updated information provided to **Name of Firm**.

Requested by:

SIGNED: _____ DATE: _____

NAME (PRINT): _____

FIRM: _____

TITLE: _____

END OF APPENDIX

SECTION 01 35 29.10**HEALTH, SAFETY, SECURITY AND EMERGENCY RESPONSE****PART 1 - GENERAL****1.01 SUMMARY**

- A. This Section sets forth the requirements and expectations with which the Prime Contractor and its Subcontractors will comply. The requirements and expectations of this Section are in addition to the applicable laws, regulations, and codes. In the event of conflict, the most stringent safety and security requirements will apply.
- B. This Section describes the requirements for the submittal of the Site Safety and Security Plan (SSSP), qualifications of the Contractor's Construction Safety Manager (ConSM), other project safety personnel, and special project considerations or requirements.
- C. It is not the intent of Sound Transit or their representatives to develop, manage, direct or administer the safety and health programs of the Contractor, its Subcontractors or Suppliers, or in any way assumes the responsibility for the safety and health of their personnel and the conditions for all work sites under the contract scope of work.
- D. It is not the intent of Sound Transit to list and identify all applicable safety codes, standards and regulations requiring compliance by all contractors, subcontractors, suppliers, and vendors. The Contractor will identify and determine all safety codes, standards and regulations that are applicable.
- E. Failure to comply with these procedures or observed safety deficiencies will require immediate corrective actions with written response to the Resident Engineer within 24 hours of verbal or written notice. Lack of corrective action or sufficient response may result in a Stop-Work Order. The Contractor will be responsible for the cost and time of such stoppage. Any resulting impact to Contract Price and Contract Time will not be recoverable under the contract.
- F. Contractor will submit a progressive disciplinary action plan for employees that fail or refuse to adhere to all safety requirements and regulations established by regulatory agencies, Sound Transit safety policies or the Contractor's SSSP. Sound Transit reserves the right to ensure the plan is enforced equitably and consistently for the contractor and all tiered subcontractors.
- G. All safety and disciplinary related records and documents must be accessible to Sound Transit upon request.

1.02 ABBREVIATIONS, ACRONYMS AND REFERENCE DOCUMENTS

- A. Abbreviations and Acronyms
 - 1. ConSM: Contractor's Safety Manager
 - 2. CSM: Sound Transit Construction Safety Manager
 - 3. CWP: Construction Work Plan refer to Section 01 45 00.10, Quality Assurance/Quality Control
 - 4. DOSH: Washington State Labor and Industries Division of Occupational Safety and Health (Washington State OSHA)

5. JHA: Job Hazard Analysis
 6. PPE: Personal Protective Equipment.
 7. PTA: Pre-Task Analysis.
 8. SDS: Safety Data Sheet
 9. SSSP: Site Specific Safety Plan
 10. SSSR: Contractor's Site Safety and Security Representative
 11. WAC: Washington Administrative Code
- B. Reference Documents: This Section incorporates by reference the latest editions and revisions of the following documents:
1. Revised Code of Washington (RCW)
 2. Washington Administrative Code (WAC)
 3. National Fire Protection Association (NFPA) Standards
 - a. NFPA 70, National Electrical Code
 4. Federal Occupational Safety and Health Administration (OSHA)
 - a. Code of Regulations Parts 1910 and 1926
 5. Federal Railroad Administration (FRA)
 - a. Title 49 Transportation
 6. Federal Transportation Administration (FTA)
 - a. FTA Guidance Circular 5800.1, Safety and Security Management for Major Capital Projects
 7. Washington Department of Transportation (WSDOT)
 - a. WSDOT Traffic Manual M51-02
 - b. WSDOT Work Zones Traffic Control Guidelines M54-44
 - c. Manual on Uniform Traffic Control Devices
 8. Municipal Codes
 - a. Requirements as stated by authorities having jurisdiction or permit requirements, including, but not limited to fire departments, municipalities, utility entities or police departments.

1.03 DEFINITIONS

- A. Contractor's Safety Manager (ConSM): The Contractor's project safety and security manager will ensure the implementation and administration of the Contractor's safety, health and emergency management programs. The Contractor will provide the ConSM with the resources and authority to effectively administer and manage their designated portion(s) of the project safety and emergency management efforts.

- B. Contractor's Site Safety and Security Representative (SSSR): The Contractor will assign a construction safety professional who will support the ConSM's duties and assist with the implementation and compliance of the SSSP, and who will be assigned full time to the job site when work is in progress or for a defined work shift.
- C. Competent Person: An individual identified as having the necessary experience and training to evaluate the presence and control of specific hazards on the site and have authority to implement corrective actions, as necessary. Different activities require specific training and expertise.

1.04 GENERAL REQUIREMENTS

- A. The Contractor's SSSP will apply to all work under this Contract including Subcontractors and vendors performing services on site.
- B. The Contractor will appoint a designated ConSM. The ConSM is key personal and will be assigned only to a single project. The ConSM will report directly to the Contractor's corporate safety director (or the Contractor's equivalent) with a dotted-line responsibility to the Contractor's Project Manager.
- C. The ConSM or Sound Transit approved SSSR will be onsite whenever Contract Work is in progress regardless of crew size.
- D. ConSM Qualifications:
 - 1. The ConSM will have a minimum of 5 years progressive safety experience and demonstrated work experience as a construction safety manager on projects similar in scope and nature to the work to be done on this Contract.
 - 2. Knowledgeable concerning all Federal and State regulations applicable to safety.
 - 3. Provide proof of OSHA 30-hour Construction Safety Training within the last 5 years or current certification from the board of certified safety professionals or equivalent (i.e., CHST, ASP, CSP, or GSP).
 - 4. Competent Person designation in construction safety disciplines related to the work to be performed and be able to identify Competent Persons required by safety standards, codes, and regulations.
 - 5. Current certification for CPR and First Aid.
 - 6. Possess training and be capable of performing incident investigations and developing a concise report in accordance with contract specification requirements.
 - 7. Possess training in the development, presentation, and lead safety meetings.
- E. SSSR Qualifications:
 - 1. Minimum of 3 years progressive experience and demonstrated work experience in a safety role on projects similar in scope and nature to the work to be done on this Contract.
 - 2. Knowledgeable concerning all Federal and State regulations applicable to safety.
 - 3. Provide proof of OSHA 30-hour Construction Safety Training within the last 5 years.
 - 4. Competent Person designation in construction safety disciplines related to the work to be performed.

5. Current certification for CPR and First Aid.
 6. Be capable of performing incident investigations and developing a concise report.
 7. Possess training in the development and presentation of safety training meetings.
- F. Subcontractor Site Safety and Security Representative:
1. Each Subcontractor will assign a site safety and security representative as an Employee-In-Charge of safety for each shift.
 2. If the Subcontractor employs twenty or more people on a work shift assign a full-time site safety and security representative who is not assigned other duties.
 3. Assign a foreman or lead worker as an Employee-In-Charge of safety if the Subcontractor employs less than twenty people on a work shift.
 4. In relation to the Subcontractor's activities, the Subcontractor's safety and security representative will have the same duties and reporting requirements as the SSSR and ConSM.

1.05 DUTIES AND RESPONSIBILITIES

- A. The ConSM and Subcontractors' Safety Manager will not be assigned to work or tasks that interfere with his/her primary functions, i.e., safety inspections, training, and enforcement. It is appropriate for the ConSM and Subcontractors' Safety Manager to participate in functions such as site security, insurance-related issues such as medical case management, general procurement, and similar functions. These functions will be considered safety related activities for purposes of these specifications, and they will be considered as part of the ConSM and Subcontractor's Safety Manager's primary responsibilities.
- B. The Contractor will take immediate and appropriate action, including stopping the operation, whenever an unsafe work procedure or an unsafe condition, where there is a threat to life or property at a work site, is brought to the Contractor's attention. Sound Transit reserves the right to stop the Contractor or its lower-tier subcontractors from working should Sound Transit believe that there is an immediate threat to life or property. In the event Sound Transit takes such action, the cost and time of such stoppage will not be recoverable under the contract.
- C. Prior to the start of construction activities, the Contractor will participate in a pre-construction safety and security meeting with Sound Transit Construction Management team. The primary purpose of this meeting will be to discuss implementation of the Contractor's SSSP.
- D. The Contractor will conduct weekly safety meetings at site, with its own employees and representatives of its lower-tier subcontractors currently performing work on the project. The purpose of the safety meetings will be safety coordination, review of safety procedures and promotion of safety awareness. The Contractor will maintain records of these meetings, such as sign-in sheets and agendas that will be available for Sound Transit review.
- E. The Contractor's and Subcontractors' Foremen/Superintendent will conduct daily pre-task analysis Safety and Security meetings to review the day's work activity associated hazards and applicable safety procedures/equipment.
- F. The ConSM is responsible for on-site safety and emergency management coordination.

- G. The SSSRs will be assigned to a contract full time. The SSSR will not be utilized on any other concurrent Sound Transit contracts without Sound Transit approval. If necessary, employ additional full-time SSSRs to ensure adequate coverage of all on-going project work.
- H. The ConSM and SSSR will have full support from corporate management and the authority to immediately correct unsafe conditions and unsafe practices. The SSSR will be responsible for managing the safety program for the project during their shifts. The SSSR will have the authority to stop work until unsafe conditions or practices are corrected.
- I. In addition, the ConSM will also attend the monthly safety and security meeting between the SSSR, the Resident Engineer and Sound Transit Construction Safety Manager.

1.06 SUBMITTALS

- A. Site Safety and Security Plan (SSSP): Within 21 days of NTP:
 - 1. Submit a complete copy for review and acceptance. All comments or clarification will be incorporated in the most recent version prior to commencing ANY on site activity.
 - 2. Modify the plan as needed as site conditions, identified hazards, number of employees and project site activities change during the project duration.
 - 3. Any review of safety and security submittals by the Resident Engineer and Sound Transit or their designees, will not constitute approval of the safety or security elements, mitigations or hazard/threat precautions employed by the Contractor during construction, or constitute approval of Contractor's means or methods of construction.
- B. Submit Qualifications of the ConSM and SSSR within 15 days of NTP:
 - 1. Submit a resume summarizing the qualifications and work experience of the proposed ConSM and any SSSR proposed for assignment to the Contract.
 - 2. The ConSM and SSSRs will be required to provide references from three (3) previous projects. They may be requested to appear for a personal interview prior to their receiving an acceptable disposition by the Resident Engineer and their deployment on the project. References will include contact information of owners and construction management team members from the previous projects listed.
 - 3. All ConSMs and SSSRs will be on a 90-day probation period starting from the initial date of project field mobilization. Periodic evaluations during and after probation period will be conducted by the Sound Transit Construction Management and Safety team members. If Sound Transit is not satisfied with performance, Sound Transit may request the Contractor to remove and replace an individual receiving written notification from the Resident Engineer.
- C. Submit one (1) copy of each Job Hazard Analysis (JHA) with the corresponding construction work plan (CWP).
- D. General Safety Submittals: Submit to the Resident Engineer:
 - 1. Records of safety and security incidents, as documented on the project occurrence log (Exhibit A).

2. Certifications, inspection, maintenance and testing records for cranes, stair towers, hoisting systems, ventilation systems and other systems as required by Standards.
 3. Submit a copy of all crane certifications, crane operator certifications and annual crane inspection prior to use of the crane. Complete Crane Inspection Record and the Wire Rope Inspection Record on schedule and maintain on-site. Examples of a Crane Inspection Record and the Wire Rope Inspection Record are shown in attached Exhibits E and F.
 4. All required or requested documentation for testing physical or environmental exposures, including air, gases, rail equipment and other hardware that may impact the health and safety or security of workers.
 5. A copy of the attendance list or acknowledgement for all employees receiving awareness training for specific operations and/or equipment.
- E. Weekly Safety and Security Report: Submit one (1) copy of file:
1. Weekly safety and security report detailing issues and inspections of the job site(s) and adjacent public areas to document competent person making the inspections, types of activities, site controls, track set up and work site conditions. Provide detail of the corrective action(s) taken to eliminate unsafe acts and conditions.
- F. Monthly Injury/Illness Report: Submit one (1) copy:
1. As part of the monthly pay application, a Monthly Injury/Illness Report, on forms provided by Sound Transit herein (Exhibit B).
 2. The CSM may request advanced draft copies to support agency reporting requirements.
- G. Incident Report:
1. Incident: Event requiring a documented report from the contractor or an occurrence of the following.
 - a. Injury to an employee performing the work.
 - b. Project activities that create or cause an injury to persons not directly connected with the project (including all alleged injuries reported by a member of the general public).
 - c. Incidents resulting in damage to public, private, or commercial property (including all alleged property damages).
 - d. Events or incidents that may be considered a "Near Miss" including track derailments that could have resulted in any of the above.
 2. The Contractor will make an initial incident report by phone call and follow up with an email. Report information should include the circumstances, extent of injury or damage, name, and trade of the injured and subsequent actions for all incidents:
 - a. Submit the eligible/ineligible status for employees completing a post-accident substance abuse testing.
 - b. Include in the report full information, including testimony of witnesses regarding all incidents.

3. Update the occurrence log included as Exhibit A and the contractor's monthly injury/illness report form (Exhibit B), with relevant incident information and transmit the updated log to the Resident Engineer within 48 hours of an incident and the completed, comprehensive incident report to the Resident Engineer within 72 hours of the incident.
4. Submit a completed written incident report generated by the individuals involved and injured detailing all information related to the incident or injury or possible third-party claim.
5. Submit a written incident report with photographs, witness statements and a Root Cause Analysis within 48 hours of a security or safety incident, property damage or possible third-party claim.

H. Hearing Conservation and Respiratory Protection Program

1.07 SITE SAFETY AND SECURITY PLAN (SSSP)

- A. Security: Refers to the protection of both Sound Transit and Contractor personnel and property from theft, trespassing, vandalism, or other destructive activities.
- B. Provide a written site-specific safety and security procedures to address all tasks and elements of the scope of work to be implemented for each worksite. This SSSP will detail the methods of implementing measures to protect employees and securing the Contractor's construction site. The SSSP will address both active and passive safety and security measures that will be implemented by the Contractor.
- C. The Contractor's SSSP will describe and include procedures for documentation of:
 1. Organizational Chart:
 - a. List of key personnel, title or position, contact information and shift they will be assigned.
 - b. Contractor's full-time ConSM and/or SSSR priorities description.
 - c. Contractor's competent person may be identified on the associated JHAs.
 2. Safety and Security Incident Plan.
 3. Emergency Action (Response) Plan:
 - a. Provide a written Emergency Action Plan as part of the SSSP, including, but not be limited to, actions to be taken for the following:
 - 1) Injuries to personnel requiring first responder assistance.
 - 2) Reported, alleged injuries to the general public on or immediately adjacent to the work site.
 - 3) Property damage with particular emphasis on utilities.
 - 4) Fire.
 - b. The Emergency Action Plan will identify levels of incident with appropriate actions to be taken.
 - c. Include local emergency and medical addresses/numbers (e.g., fire/police), and hospital or medical clinic locations.

d. Communications.

- 1) Provide a current comprehensive list of project representatives available at all times and holidays for security and emergency response events.
- 2) Communicate and coordinate with local Police and Fire, work with emergency services to establish central locations, special access routes or access points to the various construction sites.
- 3) Contact local emergency responders to conduct site walks or regular visits to be familiar with site access points, personnel in charge, emergency response plans and other site-specific information that may be needed during an emergency response or medical event.

4. Fire Prevention and Fire Safety Plan.

5. Hazard Communication Plan including all SDS submitted with applicable work plans.

6. Security inspection plan, including daily and monthly inspections including individuals responsible for addressing closeout of deficiencies found during inspections:

- a. Document weekly safety and security meetings with related topics and instructions for individual personnel and group safety and security training programs to be documented.
- b. ConSM will attend the Monthly Safety and Security Committee meeting with representatives from all trades and crafts on the site.

7. Safety and security procedures and forms: Examples providing minimum requirements, forms and procedures for both JHAs and PTAs are included in the Exhibits K and L.

8. Training:

- a. Summary of the employee indoctrination program including details for the elements of the safety and security orientation sessions.
- b. Training sessions for the use of proper work procedures, equipment, personal protective equipment, mechanical guards, and security devices.
- c. All personnel completing a site safety and security orientation will sign the Acknowledgement of Indoctrination form (Exhibit G) acknowledging the training session and their understanding of the information presented.

D. Construction Site Security Guidelines.

1. General:

- a. The Contractor will write a separate security section as part of the SSSP and utilize the specifications below to accomplish the three basic principles of security, detect, delay, and respond.
 - 1) Detect means-the ability to identify the presence of an intruder using manned security or security technology.

- 2) Delay means-utilizing physical security tools such as fencing and locks to impedances of an intruder.
 - 3) Respond means-once an intruder is detected there must be a response to the intrusion within a reasonable amount of time.
 - b. Notify the Resident Engineer and Sound Transit Security Operations Center (206) 398-5268 of all security incidents involving Sound Transit assets immediately upon discovery or occurrence by the Contractor.
2. Organization:
- a. The Contractor will have a designated SSSR or ConSM who is responsible as the security supervisor.
 - b. The SSSP will detail the chain of command and communications from the Contractor's security representative up through the Resident Engineer and Construction Manager to the Sound Transit Construction Safety Manager.
 - c. The Contractor is responsible for security after working hours and on weekends. Work site access points will be staffed with a dedicated person or secured 24 hours a day, 7 days a week.
 - d. Ensure contracted security personnel are licensed and have received Washington State Department of Licensing minimum security training as specified by guidelines for security personnel selection and training guidelines are available for the American Society of Industrial Security (ASIS) and Washington State. Department of Licensing minimum security training can be found at its website:
<http://www.dol.wa.gov/business/securityguards/sggetunarmed.html>.
 - e. All private security guard will carry the license card whenever he or she is performing the duties of a private security guard and will exhibit the card upon request in accordance with RCW 18.170.070.1b.
 - f. Sound Transit Security may audit the construction site security at any time with no prior notification.
 - g. All lost or stolen Sound Transit assets must be immediately reported to the Sound Transit Security Operations Center, (206) 398-5268.
3. Access Control:
- a. Control access at all times to the construction site.
 - b. Staff or lock all gates after work hours or when unguarded.
 - c. Staff or secure all access points to underground construction areas or tunnel access points 24 hours a day, 7 days a week. Contractor will issue a key to the Resident Engineer for all secured access points.
 - d. Do not allow workers' personal vehicles to access the construction work zone. Designate a separate parking location.
 - e. Clearly post No Trespassing signage with applicable RCW and City Municipal Codes at all entrance points. Space at reasonable intervals along the entire fenced perimeter not to exceed 100 feet between signs.

- f. Designate a point of contact that is responsible for controlling access to the site.

4. Identification Badges:

- a. Issue photo identification badges to all personnel and Subcontractors.
- b. Badges will be readily available on the person for inspection. When possible, the badges will be visible on the outer most garments. Wearing enforcement will take place at all levels.
- c. Badge recipients will sign an acknowledgement that they will report lost, stolen or damaged badges.

5. On-site Vehicles:

- a. Clearly post the personnel and vehicle search policy at all entrances.
- b. All persons and vehicles on the project sites are subject to inspection at any time while on site. An approved vehicle access roster will be kept by the security officers at the access gates. Register all approved vehicles needing access to the site and issue a vehicle placard or a parking pass. Parking passes will be easily recognizable and will be prominently displayed at all times while the vehicle is on site.
- c. Vehicle policies and procedures will include requirements for personnel, visitors, and deliveries.

E. Contractor Physical Security

1. Barriers:

- a. Place a continuous fence around the construction site in accordance with the Contract requirements.
- b. Provide a sturdy fence. At a minimum the fence will be 8 feet high, 2-inch square mesh, 11-gauge wire or heavier, unless otherwise specified.
- c. Maintain the fence in good condition and make needed repairs immediately.
- d. Protect all fence connectors, bands, bolts, and other fasteners to prevent access from the outside of the fence.
- e. Allow no gaps in the fence greater than 2-inches including the gap between the bottom of the fence and the ground, and each side.
- f. Bolt continuous rails to the top and bottom of the fence fabric.
- g. Construct top and bottom rails of the same material with the same diameter and same fastener parts.
- h. The Contractor will not place any materials or equipment within 5 feet of the fence.
- i. The perimeter fencing will be connected together using fence connectors, bands, bolts and other fence fastener materials.

2. Gates:
 - a. Construct gates the same height and manner as the fence.
 - b. Maintain gates in good repair.
 - c. Open gates only when required for operations.
 - d. Lock gates when closed.
 - e. Directly supervise gates when open.
 - f. Install alternate access gates for Emergency egress, when Organized Demonstrations block main access, during Labor Disputes and during Protest Rallies.
3. Posts:
 - a. Fence fabric will be securely connected to the post at intervals to preclude entry.
 - b. Where multiple posts are adjacent, secure together to provide continuous fencing.
 - c. Allow no gaps between posts and fabric, between posts and gates, or between two gates to be greater than 2 inches.
4. Lighting :
 - a. Additional Contract Specifications may dictate varying lighting requirements.
 - b. Illuminate the entire perimeter to a minimum of 10-foot candles at any point within 25 feet from the fence.
 - c. Illuminate both sides of fence in accordance with Contract Drawings.
 - d. Provide additional lighting at access points to eliminate shadows and blind spots and to provide for vehicle inspection.
 - e. Check lights daily, prior to darkness, so that deficiencies may be corrected prior to their use.
 - f. Report intentional damage to light fixtures and equipment immediately to the ConSM and repair within 8-hours.
 - g. Report repeat damage to the Resident Engineer.
 - h. Power source for perimeter lighting will be secured for limited access and be tamper proof.
 - i. Switches and controls will be inaccessible from outside perimeter.
 - j. Adequate lighting will be provided for materials and equipment in shipping, receiving and storage areas.
5. Lock and Key Control:
 - a. Establish a lock and key control policy.

- b. Define and designate in the SSSP who is responsible for lock and key control.
 - c. The ConSM will have overall authority for the issue and replacement of all locks and keys for the construction site.
 - d. Develop a key control register.
 - e. All key recipients will sign a key control register.
 - f. Do not allow non-contractor personnel to sign for keys.
 - g. Key recipients will sign an acknowledgment that they will report lost or stolen keys, and that they may not duplicate keys.
 - h. Master keys will not be identifiable as such.
 - i. Double lock spare locks and keys (i.e., locate in a locked container within a locked room).
 - j. Secure lock padlocks when door or gate is open to prevent substitution.
 - k. If a combination lock is used, never leave the combination visible on the lock.
 - l. The combination on locks must be changed every 30 days or when a termination or security incident occurs.
 - m. Check locks on active and inactive doors and gates regularly for evidence of tampering.
6. Alarms:
- a. The Contractor may decide what, if any, alarm devices are to be used on site for intrusion and fire. The Contractor will also decide, if used, how alarms will be monitored. Alarms will be monitored either by a central monitoring center or local annunciation only.
 - b. All site trailers that contain Sound Transit assets must be alarmed and monitored after hours and 24/7 on holidays and weekends.
7. Communications:
- a. Provide separate communications for security and emergency use.
 - b. Define what type of communication devices are to be used for security and during emergencies.
 - c. Telephone will be Caller ID capable.
 - d. If radios are shared with other users, security will have a separate frequency or the ability to override other users in an emergency situation.
 - e. Describe how emergencies are reported including:
 - 1) Communicating and coordinating with local Police and Fire
 - 2) Working with emergency services to establish central locations or special access routes to the various construction sites.

- 3) Contacting local emergency responders to determine if there is a direct number to contact emergency dispatchers in case of 911 system failure or 911 is overwhelmed during a catastrophic event.

F. Visitors

1. Develop a written site visitor policy stating access procedures, physical requirements for participants and the approving authority for tours. In addition, the policy will include the following elements:
 - a. Contractor will assist and work with the Resident Engineer and Sound Transit when site tours are requested.
 - b. Sound Transit will provide adequate notification and limit the size of such tours as not to create hazards to the Contractors' employees and site visitors.
 - c. All tours will be approved and coordinated through the Project Director and Resident Engineer. All site visitors will be expected, escorted by Sound Transit representative, and have a valid purpose for the scheduled visit.
 - d. Sound Transit Safety or the Contractor will conduct safety orientations and hazard awareness for all visitors to the project.
 - e. All site visitors will comply with the Contractor's and Sound Transit's PPE requirements when in the active work zones or areas.
 - f. A release of liability form, (Exhibit M) will be signed and copies provided to the Resident Engineer and the contractor for all site visitors before they enter the active work sites.
2. Designate an area where visitors report when arriving on-site and muster points in case of emergency during the tour.

1.08 TRAINING

- A. Conduct training classes on a monthly basis or more often, if needed, on safety and security related topics that may include first aid, fire prevention, site security or other areas or topics the Contractor deems appropriate.
- B. The Resident Engineer will be notified of the schedule for the training sessions.
- C. Indoctrination
 1. Newly employed, promoted, or transferred personnel will be fully instructed by audio/visual means in the safety and security practices required for their assignments. Initial indoctrination for all personnel will include, but not be limited to, instruction on the following:
 - a. For each individual, the hazards present in the work assignment and in the general area in which he/she will be working.
 - b. Personal protective equipment required.
 - c. Instructions on the proper procedure for reporting unsafe job conditions that he/she may encounter.
 - d. Reporting of all injuries, incidents and damage, no matter how slight.

- e. Contractor's job rules.
 - f. Location of first aid and medical facilities.
 - g. Toolbox safety and security meeting requirements.
 - h. Emergency service notification procedure for fire, medical emergencies, police problems or other emergency situations.
 - i. An orientation by the foreman or superintendent of the new employee's work area.
 - j. All personnel will sign the form shown as Exhibit G to acknowledge receiving and understanding safety and security indoctrination.
2. All personnel will be required to complete Hazard Communication training during indoctrination and refresher training annually.
3. Worker Hazard Awareness: detailed site-specific procedures for establishing and maintaining safe and healthful working conditions associated with the following:
- a. Air Monitoring
 - b. Check-in/check-out systems
 - c. Compressed air and gases
 - d. Concrete construction
 - e. Confined spaces/permit-required confined spaces
 - f. Control of water
 - g. Control of dust
 - h. Crane operations and maintenance
 - i. Electrical hazards
 - j. Energized equipment
 - k. Fall protection
 - l. Fire protection and prevention
 - m. First aid, CPR and blood borne pathogens
 - n. Hand and power tools
 - o. Hazard communication
 - p. Hazardous material handling
 - q. Housekeeping
 - r. Rigging operations, equipment inspection and testing
 - s. Sanitation on site
 - t. Scaffolding, ladders, and walking and working surfaces
 - u. SEM mining (for workers involved in mining)
 - v. Excavation and trenching

- w. Welding and cutting
- x. Such other activities as are deemed appropriate

D. Subcontractor Indoctrination:

1. The Contractor is responsible for indoctrinating Subcontractor personnel before they begin work. All personnel will sign the form shown as Exhibit G to acknowledge receiving and understanding safety and security indoctrination.

E. Site Orientation

1. This orientation program will introduce the worker to the project and to the project specific safety requirements. Emphasis will be placed on site specific hazards and procedures. This orientation will be provided within the week of the employee's arrival on the project.
2. Provide site orientation training to all Sound Transit, Construction Management Consultant and third-party personnel who need to access the site for job duties including owner site visits.

1.09 OSHA CONSTRUCTION SAFETY (OSHA 30-HOUR):

- A. All on-site supervisor-level personnel above foremen for Contractor are required to complete the OSHA 30-Hour Construction Safety class within the last 5 years. Reporting Requirements
- B. Sound Transit's recordkeeping forms are presented in the Exhibits C, D, H, and I herein and provide administrative instruction and report forms to be used by the Contractor and Subcontractors for all required reports. In addition, specific records as required by DOSH will be completed daily and submitted as required by standard within a reasonable time as determined by Sound Transit.

1.10 EMERGENCY PROCEDURES

- A. The Contractor will address with their employees and subcontractor employees the applicable emergency response procedures for the extent, current scope of work and number of employees for which the plan is intended.
- B. Emergency procedures will be reviewed frequently to ensure that Contractor and Subcontractor personnel are familiar with the proper actions to take and that emergency telephone numbers are current.
- C. Emergency procedures will be tested using tabletop exercises. The emergency procedures will be posted on the Contractor's bulletin board at each work site and office.
- D. Periodically but no less than once a year conduct evacuation drills to assess the adequacy of the emergency plans and familiarize the work force with changes in the nature of the site that impact evacuation.

1.11 FIRST-AID FACILITY AND STAFFING REQUIREMENTS

- A. Provide appropriate first-aid facilities for the treatment of on-the-job injuries. The first-aid facilities and staffing, as a minimum, will comply with the applicable safety and security regulations.
- B. First-aid kit(s) will be available onsite at all times and immediately adequate to serve the crew(s). Discuss the locations of the first-aid kits at the Toolbox Safety and Security Meetings.

1.12 INCIDENTS

- A. All safety and security incidents will be reported immediately to the Resident Engineer.
- B. Designate responsible personnel to make emergency calls to 911 and have standing communication with first responders for coordinating site response and designated work site access points. All personnel on-site will be trained to call 911 in an emergency if a designated caller is not immediately present.
- C. Issue standing orders to all supervisors directly in charge of operations that the scene of the incident will not be disturbed, except for rescue or other emergency measures, until otherwise directed. Personnel, either witnessing or party to the incident, will complete an independent incident report to provide detailed accounting of facts.
- D. Provide such equipment and facilities as are necessary or required, in the case of incident, in order to provide for first aid service to anyone who may be injured in the progress of the work. Have a standing arrangement for the transportation and hospital treatment of any person who may be injured or become ill.
- E. For all types of incidents or potential third-party claims, a Supervisor's Incident Investigation Report, (Exhibit J), will be completed and submitted within 72 hours to the Resident Engineer. All review code comments must be responded to within 10 business days.

1.13 PROTECTION OF THE PUBLIC

- A. Precautions will include, but not be limited to.
 - 1. Temporary barriers and fencing designated to protect the public will be installed immediately when a hazard or exposure is present.
 - 2. When required, maintain safe ingress and egress of the public at all times.
 - 3. Post appropriate warnings, signs and instructional safety and security signs where necessary. Control of the movement of motorized equipment where the public might be endangered will be carried out by the Traffic Control Supervisor.
 - 4. Signs, signals, or other control devices used to regulate vehicular traffic will meet the requirements of applicable jurisdictions requirements and other pertinent rules and regulations.
 - 5. Provide sidewalks, ramps, sheds, canopies, catch platforms and appropriate fences, when necessary, to maintain public pedestrian traffic adjacent to construction.
 - 6. Temporary fencing will be properly provided around the perimeter of aboveground operations adjacent to public areas.

PART 2 - PRODUCTS

2.01 PERSONAL PROTECTIVE EQUIPMENT (PPE)

- A. The Contractor and all subcontractors will be responsible for compliance by their personnel. The ConSM and/or SSSR will make regular field inspections to ensure compliance.

- B. Sound Transit has instituted a mandatory head protection, eye protection, hand protection, safety toed footwear and high visible apparel policy for all construction sites. All Contractor personnel and visitors will comply with this policy when on site.
- C. Head Protection:
1. Hard hat use is mandatory and meets the requirements of ANSI Z89.1 or ANSI Z89.2, as appropriate, as specified by DOSH and Fed/OSHA. Metal hard hats will not be worn on any work under a Sound Transit contract. Both the employee's name and the Contractor's name will clearly appear on the hard hat. Hardhats must be worn according to manufacturer's recommendations.
- D. Eye/Face Protection:
1. Contractor personnel will be provided with and be required to wear eye protection at all times when on project site or in designated work areas. Goggles or face shields will be provided when the tools or operations involved create potential eye hazards resulting from physical, chemical or radiation agents. Eye and face protection, including prescription eyewear and sunglasses, will meet the requirements of ANSI Z87.1.
 2. A face shield will be worn when cutting, grinding or excessive particles are being generated.
- E. High Visibility Apparel:
- F. High Visibility Apparel is defined during daylight hours as a high-visibility safety vest, shirt, or jacket that is fluorescent yellow-green or fluorescent orange in color. During hours of darkness, a high-visibility safety vest, shirt or jacket designed according to ANSI/USEA 107-1999 Class 2 specifications must be worn. WAC 296-155-200
1. Require all personnel (including service providers, Subcontractors, and lower tier Subcontractors) that are on foot in the work zone and that may be exposed to vehicle traffic or construction equipment to wear high visibility clothing described in this section.
 2. Yellow-green and orange rain gear must be compliant with ANSI 107-2004 standard.
 3. High visibility garments (vest, jacket, sweatshirt) will always be the outermost garment. At a minimum, a Class 2 yellow-green or orange safety vest will be worn.
 4. High visibility garments will be in condition compliant with ANSI 107-2004 and will be used in accordance with the manufacturer's recommendations.
 5. All sweatshirts, tee shirts and other outer wear with reflective material and that would not be considered a high visible safety vest will be orange or yellow-green in color. No other color will be permitted.
- G. Foot Protection:
1. All personnel will wear safety toed footwear conforming to ASTM F2413-05.
- H. Hand Protection:
1. Sound Transit has instituted a mandatory glove policy for all construction sites. All site personnel and visitors will wear appropriate gloves when on site.
 2. Gloves appropriate to the hazard/task will be worn.

3. Tasks are only to be performed without gloves where safety is compromised by glove-use or fine finger manipulation is needed to accomplish the activity. Non-glove required tasks will clearly be addressed in the JHA **BEFORE** the work begins.
- I. Other PPE:
 1. PPE to be used under unusual circumstances, such as high-temperature work, handling corrosive liquids or other activities not specifically covered in this Section, will be reviewed with the Resident Engineer and documented in a Job Hazard Analysis.
 - J. Maintenance of PPE:
 1. PPE that has been altered in any manner so as to reduce its effectiveness will be repossessed and then repaired or destroyed. PPE, which has been worn or used previously, will not be reissued to another employee until the article has been cleaned and sterilized.
 - K. Environmental Testing:
 1. The Contractor, when required by the work being conducted, will have onsite at all times, certified to applicable requirements, calibrated equipment for testing that includes, but is not limited to, the following:
 - a. Noise
 - b. Gases
 - c. Air flow
 - d. Lighting
 - e. Air quality
 2. The Contractor is responsible for submitting to the Resident Engineer results with dates and times for testing of these and any other physical or environmental exposures that may impact the health and safety or security of workers. Testing may be necessary on a continuous, task or daily basis depending on the activity and conditions.

PART 3 - EXECUTION

3.01 RESPONSIBILITY

- A. The Contractor is solely and completely responsible for conditions of the site and the safety and security of all persons and property, 24 hours per day, 7 days per week beginning with mobilization on site and ending at Acceptance.
- B. Comply with all safety and security directives and corrective actions required for safety/security issues or violations identified to remedy safety/security deficiencies. These deficiencies may be related to means, methods, work plans, hazards analyses or threat and vulnerability analyses.
- C. The Contractor is responsible for the safe operation of all its motor vehicles. The Contractor will provide a "spotter" or flag person for all backing operations of construction vehicles with restricted rear vision. Back-up alarms will be furnished and will be broadband alarms where required by regulation or code.

- D. The Contractor is responsible for developing a site specific Hearing Conservation and Respiratory Protection Program for all employees who may be exposed to such health hazards associated with site operations.
- E. The Contractor must have all subcontractors work under their plan or have a specific subcontractor supply a site-specific Safety and Health Program.

3.02 INSPECTIONS, MONITORING AND AUDITING

A. ConSM/SSSR Inspections:

1. In addition to the inspection responsibilities required by the Contract, ensure that the ConSM or SSSR makes a weekly inspection and a comprehensive monthly inspection of each of the work areas (including storage, office and shop facilities) to ensure compliance with all applicable requirements.
2. Notify the Resident Engineer of these inspections prior to beginning the inspections to allow the Resident Engineer and Sound Transit Safety staff to participate.
3. For each monthly inspection the ConSM/SSSR will complete the Construction Safety and Security Inspection Checklist (Exhibit D) or a customized form that, at a minimum, includes the elements contained in the form shown in Exhibit D.
4. For daily and scheduled weekly site surveys, record safety or security deficiencies noted during the inspection on the Construction Safety and Security Survey form provided (Exhibit I). Correct those deficient items immediately. Communicate all deficiencies and the completed corrective actions to the Contractor's project management in the weekly safety and security report.
5. The Contractor's project management will be responsible for documenting the corrective action(s) and submit that documentation to the Resident Engineer.
6. Review the issues or safety and security items noted during each subsequent site inspection to ensure the concerns have been adequately addressed.

B. Compliance Inspections:

1. Immediately notify the Resident Engineer of inspections conducted at the work site by the Washington State Department of Labor and Industries Division of Occupational Safety and Health (DOSH), OSHA, the local Fire Department or other federal, State, county, safety, security, health or environmental organizations.
2. Furnish the Resident Engineer with copies of all correspondence, citations, findings, or warnings issued by the agency within 24 hours of receiving.
3. The ConSM will write a Non-Conformance Report (NCR) for each citation or warning of safety violation and perform a safety inspection of the site within 24 hours after each citation to verify that the violations have been corrected.
4. Respond to the Resident Engineer within 3 days with the corrective action taken and a root cause analysis report for each NCR.

C. Safety/Security Staff Inspections:

1. Expect regular auditing of the Contractor's safety and security practices and procedures by the Resident Engineer management staff as well as the Sound Transit Construction Safety Manager.

2. Site audits by Sound Transit will not relieve the Contractor of any of its responsibility for controlling site safety, reporting, documentation, or safety and security obligations.
3. Cooperate fully and correct all safety or security discrepancies noted verbally or in writing by the Resident Engineer.

3.03 INCIDENTS

A. General:

1. Notify the Resident Engineer of every incident to persons or damage to property and furnish the required Supervisor's Incident Investigation Report in writing within 24 hours.

B. Incident Reporting

1. Should a serious incident occur resulting in damage to public or Sound Transit property or bodily injury to the public or personnel of Sound Transit, its consultants, Contractors, or their Subcontractors, it will be reported (after calling 911) immediately by phone to the Resident Engineer and the Sound Transit Construction Safety Manager.
2. The Contractor will forward an email to the Resident Engineer and Sound Transit Construction Safety Manager with a brief summary of the events, injuries, names of those involved and their trade affiliation.
3. The phone call and email notification does not substitute for an incident report containing those elements described in other section of this specification.
4. Take photographs in conjunction with investigations of incidents involving personal injury, third-party personnel injuries, property damage (including motor vehicle) and/or equipment or material failure.
5. Photographs used in reports will be identified as follows: name of injured, (if equipment damage and/or property damage, location); date of incident; photographer's initials and time photographs taken including the date if different from occurrence, direction facing and a brief description of photo.

C. Investigation and Corrective Action:

1. Contractor will notify the Resident Engineer immediately of all occupational injuries or illnesses and, within 24 hours, submit a copy of the Employers Report, supervisor's incident investigation, medical status and any other documentation associated with the incident. The Resident Engineer will immediately notify the Sound Transit CSM.
2. If the media arrives on site or contacts the Contractor, refer questions from the media presentations to Sound Transit Media Relations. Personnel or any other project personnel will not speak to the press.
3. Investigate all incidents thoroughly without delay. Coordinate the investigation with emergency services, the Resident Engineer as well as insurance personnel to ensure a comprehensive approach. Complete a root cause analysis to determine the causes or contributing factors of incidents. The investigation will generate appropriate recommendations for corrective actions to prevent recurrence of similar incidents.

4. Take corrective actions when specific factors of an incident have been accurately determined and the resulting recommendations have been disseminated to the responsible persons.
5. In the event of a serious incident, prompt verbal reporting of the preliminary details is mandatory. Serious injuries are defined as those injuries that are immediately life threatening, those that require hospitalization for any period of time or those injuries that result in time lost from work as prescribed by a physician.
6. Perform a root cause analysis on all incidents.
7. In preparing written reports of an incident, statements and comments will be confined to objective finding of facts.
8. The Contractor's incident report, project records, progress reports and daily time reports may become important evidential material in any ensuing legal action. Accordingly, for the date on which a potential third-party incident has occurred, it is important to be specific and accurate in describing work being performed, crew and equipment being utilized and their exact location.

3.04 WORK PLANNING

A. Job Hazard Analyses (JHA):

1. Prepare and submit a JHA for task evaluation for each construction work plan.
2. A JHA template is provided in Exhibit K.
3. Reconcile all JHA(s) with comments provided by the Resident Engineer.
4. Posting of JHAs and Training:
 - a. The JHA serves as an operating procedure to be reviewed and discussed with each individual performing the work. A copy of the JHA will be at the jobsite and will be retained by the SSSR in the reference file.
 - b. Personnel involved with the operation will be instructed as to the hazards involved, be provided with required PPE and adequate training, be instructed in proper methods required to eliminate the hazards and emergency action to be taken in the event of an incident. Document during daily safety and security tailgate briefings that crew members have reviewed and understand the JHA before work begins.

B. Daily Pre-Task Analysis (PTA) Safety/Security Briefings:

1. General:
 - a. The foreman or superintendent for each crew (Contractor and Subcontractors) will conduct a daily safety and security "tailgate" briefing, to discuss the work activities, potential hazards and preventive measures to each crew performing any work at the beginning of each shift and when conditions change.
 - b. The PTA card (Exhibit L) is the suggested form used to document these meetings. The cards used must, at a minimum, include the elements on the suggested form.

- c. Completed PTA cards (or equivalent) will be available with the crew for review by any of the Contractor's personnel, Sound Transit, and management staff.
- 2. Procedures for the PTA meeting are:
 - a. Work crews are expected to complete a PTA for each new task undertaken.
 - b. The PTA is developed by the crew assigned to perform the work with guidance from their Supervisor. The Supervisor identifies the work area and task to be performed and then leads the crew in developing a PTA.
 - c. Creating the PTA requires the Supervisor to solicit crew participation in identifying hazards and hazard control measures such as PPE, training requirement, permits and procedures.
 - d. Members of the team are required to sign the PTA document to indicate their participation, their understanding of the plan and their agreement to follow the plan.
 - e. The completed PTA will remain on site with the work crew performing the task.
- 3. If conditions, equipment, material, or personnel have changed, the PTA will be updated.
- 4. Work crews will participate in review of the task:
 - a. Before starting a new task
 - b. Before resumption of the task at the start of shift and subsequent
 - c. After a lunch break.
 - d. Resumption of a task after a significant event
- 5. Designate one person for each work crew at each work site that, in addition to their other duties or responsibilities, is responsible for safety and security of the work crew or work site. The designated person will be a foreman, superintendent or other person having job site authority.

3.05 HOUSEKEEPING, JOB ORDERLINESS AND WORK SITE CONDITIONS

- A. Maintain good housekeeping on work sites and adjacent public roadways at all times is required.
- B. The Contractor is solely responsible for maintaining good site conditions and housekeeping policies. When issues or deficiencies are identified, the Resident Engineer will provide the Contractor verbal notification with a follow-up in writing.
- C. Address housekeeping concerns immediately and provide to the Resident Engineer a signed Construction Safety/Security Survey Form (Exhibit I) to acknowledge the items have been corrected.
- D. If housekeeping issues persist or are not addressed to the satisfaction of Sound Transit, the Contractor may be required to conduct daily "wrap-ups" at the end of each shift to collect and disposed of garbage and trash and organize work areas.
- E. Smoking on the project site during construction will be restricted to designated areas approved by the Resident Engineer.

END OF SECTION

EXHIBITS

EXHIBIT A: CONTRACTOR'S PROJECT OCCURANCE LOG

EXHIBIT B: CONTRACTOR'S MONTHLY INJURY/ILLNESS REPORT FORM

EXHIBIT C: SUMMARY OF CONSTRUCTION SAFETY AND SECURITY REPORTS

EXHIBIT D: MONTHLY SAFETY AND SECURITY INSPECTION CHECKLIST

EXHIBIT E: CRANE INSPECTION RECORD

EXHIBIT F: MONTHLY WIRE ROPE INSPECTION RECORD

EXHIBIT G: ACKNOWLEDGEMENT OF SAFETY/SECURITY INDOCTRINATION

EXHIBIT H: SOUND TRANSIT RECORDKEEPING POLICY FOR OCCUPATIONAL INJURIES AND
ILLNESSES

EXHIBIT I: CONSTRUCTION SAFETY/SECURITY SURVEY FORM

EXHIBIT J: SUPERVISOR'S INCIDENT INVESTIGATION REPORT

EXHIBIT K: WORKSHEET FOR JOB HAZARD ANALYSIS

EXHIBIT L: PRE-TASK ANALYSIS

EXHIBIT M: VISITOR'S RELEASE AND HOLD HARMLESS AGREEMENT

SECTION 01 35 29.10 - EXHIBIT A
CONTRACTOR'S PROJECT OCCURANCE LOG

CRE/REC Number	Date of Injury	Time Of Injury	Date Reported	Description	Classification	Shift <input type="checkbox"/> Day <input type="checkbox"/> Swing <input type="checkbox"/> Grave	Classification <input type="checkbox"/> Near Miss <input type="checkbox"/> First Aid <input type="checkbox"/> Recordable <input type="checkbox"/> Loss Time <input type="checkbox"/> Property Damage <input type="checkbox"/> Equip. Damage <input type="checkbox"/> Third Party <input type="checkbox"/> Security <input type="checkbox"/> Other	Craft	Comments & Corrective Action

SECTION 01 35 29.10 - EXHIBIT B

CONTRACTOR'S MONTHLY INJURY/ILLNESS REPORT FORM FOR YEAR OF 20_



Data/Measure	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Recordable Injury/Illness Cases												
Days Away From Work Cases												
Total Days Away From Work												
Restricted/Modified Work Cases												
Total Days Restricted/Modified Work												
First Aid Cases												
Reported Near Misses												
Average Number of Personnel on Worksite												
Labor Hours Worked												
Contractor Company Name:												
Contractor Site Safety and Security Representative Signature:												
Date:												

SECTION 01 35 29.10 – EXHIBIT C

SUMMARY OF CONSTRUCTION SAFETY AND SECURITY REPORTS

TITLE	EVENT(S) GENERATING REQUIRED REPORT	PREPARED BY	REMARK
Report of Safety/Security Meeting	Recording safety/security meeting	Supervisor/ Foreman holding meeting	Subcontractors may hold separate tool box meetings or attend Contractor's.
Construction Safety/Security Survey	Daily Report by Contractor. Random report by Sound Transit (likely weekly).	Contractor Daily. Sound Transit on a random basis (likely weekly).	<p>Filled out daily and submitted weekly by the Contractor's Site Safety and Security Representative or ConSM.</p> <p>Filled out by ST representative based on random site surveys (likely conducted weekly)</p> <p>Observed safety or security deficiencies will require immediate corrective actions with written response to the Resident Engineer within 24 hours of verbal or written notice.</p>
Project Occurrence Log	Any safety, security, property damage or 3 rd party incident to Contractor/ Subcontractor employee or the general public	Contractor	Occurrence log will be updated after each reportable incident and submitted to RE within 24 hours of incident.
Job Hazard Analysis	Known safety hazards and all major construction operations	Contractor	Filled out and submitted based on nature of work before work is started.
Daily Pre Task	Known safety hazards and all major construction operations	Contractor	Filled out and with the crew, available for review.
Monthly Safety/Security Inspection Checklist	Monthly Safety/Security Inspection	Contractor	Filled out and submitted monthly by the Contractor's Site Safety and Security Representative.
Crane Inspection Record & Wire Rope Inspection Record	Monthly report(s)	Contractor	<p>Completed by Rigging Supervisor</p> <p>Crane annual inspections and operator certification(s) submitted prior to use of crane.</p> <p>Crane inspection (Exhibit E) and wire rope inspections (Exhibit F) submitted monthly</p>
Lock and Tag Form	Isolation of energy sources to protect personnel	Contractor	Accounts for all locks and tags issued for energy isolation.

TITLE	EVENT(S) GENERATING REQUIRED REPORT	PREPARED BY	REMARK
Supervisor's Incident Investigation Report	Any safety, security, property damage or 3 rd party incident to Contractor/ Subcontractor employee or the general public	Contractor	Report must be submitted within 72 hours of the event.
Monthly Injury/Illness Report	Monthly report(s)	Contractor	Submitted each month, covering previous month.
Confined Space Entry Permit	Confined space work	Contractor	Posted at job site during confined space work.
Log & Summary of Occupational Injuries & Illnesses	Employee occupation injury or illness	Contractor	Contractor required to retain Form 300 and related records for 5 years.
Distribution: Resident Engineer, with copy to Construction Safety.			

SECTION 01 35 29.10 - EXHIBIT D

MONTHLY SAFETY & SECURITY INSPECTION CHECKLIST

Contractor:	Date:			Time:
Contract No.	Job-site Location:			
Person(s) making inspection:	Observers/Others on Inspection:			
	Column: A = Adequate B = Inadequate			
1. PROGRAM ADMINISTRATION:	A	B	CONDITION AND ACTION PLAN	
(a) Posting job-site warning posters.				
(b) Do you have safety and security meetings?				
(c) Do you have job safety and security training, including first-aid training?				
(d) Are there medical service and first-aid equipment, stretchers, and emergency vehicles available?				
(e) Are job-site injury records being kept?				
(f) Are emergency telephone numbers, such as police department, fire department, doctor, hospital, and ambulance posted?				
(g) Can you provide records of pre-employment, for cause, post-incident, and random drug testing?				
2. HOUSEKEEPING AND SANITATION:	A	B	CONDITION AND ACTION PLAN	
(a) General neatness of working areas.				
(b) Regular disposal of waste and trash.				
(c) Passageways and walkways clear?				
(d) Adequate lighting.				
(e) Projecting nails removed.				
(f) Oil and grease removed.				
(g) Walking/working surfaces free of mud, water and debris.				
(h) Walking/working surfaces free of holes, trip hazards and level changes.				
(i) Waste containers provided and used.				
(j) Sanitary facilities adequate and clean.				
(k) Drinking water tested and approved.				
(l) Adequate supply of water.				
(m) Disposable drinking cups.				

3. FIRE PREVENTION:	A	B	CONDITION AND ACTION PLAN
(a) Fire instructions to personnel.			
(b) Fire extinguishers identified, checked and lighted.			
(c) Fire department phone number posted.			
(d) Hydrants clear, access to public thoroughfare open.			
(e) Good housekeeping.			
(f) "No Smoking" posted and enforced where needed.			
(g) Fire brigades.			
4. ELECTRICAL INSTALLATIONS:	A	B	CONDITION AND ACTION PLAN
(a) Adequate and properly insulated wiring.			
(b) Fuses provided.			
(c) Fire hazards checked.			
(d) Electrical dangers posted.			
(e) Proper fire extinguishing provided.			
(f) Are terminal boxes equipped with required covers? Are covers used?			
(g) Electrical work is conducted de-energized.			
(h) Only electricians are performing work on or near electrical equipment.			
5. HAND TOOLS:	A	B	CONDITION AND ACTION PLAN
(a) Proper tool being used for each job.			
(b) Neat storage, safe carrying.			
(c) Inspection and maintenance.			
(d) Damaged tools repaired or replaced promptly. Are employees' tools inspected and repaired?			
6. POWER TOOLS:	A	B	CONDITION AND ACTION PLAN
(a) Good housekeeping where tools used.			
(b) Tools and cords in good condition.			
(c) Proper grounding.			
(d) Proper instruction in use.			
(e) All mechanical safeguards in use.			
(f) Tool extensions used for repetitive work overhead or at foot-level.			
(g) Right tool being used for the job.			
(h) Wiring properly installed.			
(i) Hand-arm vibration dampening addressed for tools with high vibration levels.			

7. POWDER-ACTUATED TOOLS:	A	B	CONDITION AND ACTION PLAN
(a) Local law and ordinances complied with.			
(b) All operators qualified.			
(c) Tools and charges protected from unauthorized use.			
(d) Competent instruction and supervision.			
(e) Tools checked and in good working order.			
(f) Tools not used on any but recommended materials.			
(g) Safety goggles or face shields.			
(h) Flying hazard checked by backing up, removal of personnel or use of captive stud tool.			
8. LADDERS:	A	B	CONDITION AND ACTION PLAN
(a) Ladders inspected and in good condition?			
(b) Properly secured to prevent slipping, sliding, or falling?			
(c) Do side rails extend above top of landing?			
(d) Stepladders fully open when in use.			
(e) Metal ladders not used around electrical hazards.			
(f) Is the right ladder used for the job?			
(g) Are ladders painted?			
(h) Straight ladders at correct angle?			
9. SCAFFOLDING:	A	B	CONDITION AND ACTION PLAN
(a) Is erection properly supervised? Designated Competent Person			
(b) Will all structural members meet the safety factor?			
(c) Good housekeeping where scaffolds are used.			
(d) Are all connections secure?			
(e) Is scaffold tied into structure?			
(f) Are working areas free of debris, snow, ice, and grease?			
(g) Are foot sills and mud sills provided?			
(h) Are workers protected from falling objects?			
(i) Is the scaffold plumb and square with cross-bracing?			

(j) Are guardrails, intermediate rails, and toe boards in place?			
(k) Is scaffold equipment in good working order?			
(l) Are ropes and cables in good condition?			
(m) Can a personnel lift be used instead?			
10. HOISTS, CRANES and DERRICKS:	A	B	CONDITION AND ACTION PLAN
(a) Inspect cables and sheaves.			
(b) Check slings and chains, hooks, and eyes.			
(c) Equipment firmly supported.			
(d) Outriggers used if needed.			
(e) Power line inactivated, removed or at safe distance.			
(f) Proper loading for capacity at lifting radius.			
(g) All equipment properly lubricated and maintained.			
(h) Signalman where needed.			
(i) Signals understood and observed.			
(j) Are inspection and maintenance logs maintained?			
11. HEAVY EQUIPMENT:	A	B	CONDITION AND ACTION PLAN
(a) Regular inspection and maintenance.			
(b) Lubrication and repair of moving parts.			
(c) Lights, brakes, warning signals operative.			
(d) Wheels chocked when necessary.			
(e) Haul roads well maintained and laid out properly.			
(f) Protection when equipment is not in use.			
(g) Are shut-off device on hose lines in case of those failures?			
(h) Are noise arresters in use?			
12. MOTOR VEHICLES:	A	B	CONDITION AND ACTION PLAN
(a) Regular inspection and maintenance.			
(b) Qualified operators.			
(c) Local and state vehicle laws and regulations observed.			
(d) Brakes, lights, warning devices operative.			
(e) Weight limits and load sizes controlled.			
(f) Personnel carried in a safe manner - seated.			

(g) Personnel carried in a safe manner – non-seated.			
(h) Are back-up signals provided?			
(i) Are fire extinguishers installed where required?			
13. GARAGES AND REPAIR SHOPS:	A	B	CONDITION AND ACTION PLAN
(a) Fire hazards.			
(b) Dispensing of fuels and lubricants.			
(c) Good housekeeping.			
(d) Lighting.			
(e) Carbon monoxide dangers.			
(f) Are all fuels and lubricants in proper containers?			
(g) Proper ventilation.			
(h) Proper grounding and bonding.			
(i) Chemical hazards posted correctly?			
14. BARRICADES:	A	B	CONDITION AND ACTION PLAN
(a) Floor openings planked over or barricaded.			
(b) Roadways and sidewalks effectively protected.			
(c) Adequate lighting provided.			
(d) Traffic controlled.			
(e) Access to site and all entrances controlled and secured at all hours.			
15. HANDLING & STORAGE OF MATERIALS:	A	B	CONDITION AND ACTION PLAN
(a) Are materials properly stored or stacked?			
(b) Are passageways clear?			
(c) Stacks on firm footings, not too high.			
(d) Proper number of workers for each operation.			
(e) Are personnel lifting loads correctly?			
(f) Are materials protected from weather conditions?			
(g) Protection against falling.			
(h) Is dust protection observed?			
(i) Extinguishers and other fire protection.			
(j) Is traffic controlled in the storage area?			
16. EXCAVATION AND SHORING:	A	B	CONDITION AND ACTION PLAN
(a) Are adjacent structures properly shored?			
(b) Is shoring and sheathing used for soil and depth?			

(c) Are roads and sidewalks supported and protected?			
(d) Is material stored too close to excavations?			
(e) Is excavation barricaded and lighting provided?			
(f) Is equipment a safe distance from edge of excavation?			
(g) Are ladders provided where needed?			
(h) Are equipment ramps adequate?			
(i) Is job supervision adequate?			
17. DEMOLITION:	A	B	CONDITION AND ACTION PLAN
(a) Are operations planned ahead?			
(b) Is there shoring of adjacent structures?			
(c) Are material chutes used?			
(d) Is there sidewalk and other public protection?			
(e) Clear operating space for trucks and other vehicles.			
(f) Adequate access ladders or stairs.			
18. PILE DRIVING:	A	B	CONDITION AND ACTION PLAN
(a) Are there proper storage procedures?			
(b) Is unloading performed only by properly instructed worker?			
(c) Are tag lines, slings, etc. in good condition?			
(d) Are pile driving rigs properly supported?			
(e) Are ladders on frames?			
(f) Are cofferdams maintained and inspected?			
(g) Is adequate pumping available?			
(h) Is personnel protection adequate? Hearing protection?			
19. FLAMMABLE GASES AND LIQUIDS:	A	B	CONDITION AND ACTION PLAN
(a) All containers clearly identified.			
(b) Proper storage practices observed.			
(c) Fire hazards checked.			
(d) Proper storage temperatures and protection.			
(e) Proper types and number of extinguishers nearby.			
(f) Carts for moving cylinders.			
20. MASONRY:	A	B	CONDITION AND ACTION PLAN

(a) Proper scaffolding.			
(b) Masonry saws properly equipped, dust protection provided.			
(c) Safe hoisting equipment.			
21. ROADWAY CONSTRUCTION:	A	B	CONDITION AND ACTION PLAN
(a) Laws and ordinances observed. State/local police approval?			
(b) Competent flaggers properly dressed, instructed, and posted.			
(c) Adequate warning signs and markers.			
(d) Equipment not blocking right-of-way.			
(e) Traffic control through construction site.			
(f) Adequate marking and maintenance of detours.			
(g) Dust control.			
(h) Adequate lighting.			
(i) Meets specification requirements.			
22. PERSONAL PROTECTIVE EQUIPMENT:	A	B	CONDITION AND ACTION PLAN
(a) Eye protection.			
(b) Face shields.			
(c) Respirators and masks.			
(d) Helmets and hoods.			
(e) Head protection.			
(f) Gloves, aprons, and sleeves; rubber or plastic, designed to afford protection from alkalis and acids; electrician's rubber gloves with protectors.			
24. SECURITY VULNERABILITIES:	A	B	CONDITION AND ACTION PLAN
(a) Threats from known individuals are controlled.			
(b) Site-specific threats have been analyzed and controlled.			
(c) Property and material are secured at all times.			

<p>(g) Respirators for harmful dust, asbestos, sand blasting, welding (lead paint, silica, chromium and galvanized zinc or cadmium).</p> <p>Compliance with hazmat requirements.</p> <p>Provide adequate ventilation when painting or applying epoxy resins.</p> <p>(When there is a question about injurious exposure, notify superior immediately who in turn will arrange for atmospheric samples to be taken.)</p>			
<p>24. UNSAFE ACTS OR PRACTICES OBSERVED (list):</p>			
<p>25. REPETITIVE VIOLATIONS OBSERVED:</p>			

SECTION 01 35 29.10 - EXHIBIT E

CRANE INSPECTION RECORD

CONTRACTOR: _____			CONTRACT NO.: _____		
CRANE NO: _____		MILEAGE: _____		HOURS: _____ DATE: _____	
A. GENERAL REQUIREMENTS	OK	*REP	C. MAIN MACHINE	OK	*REP
Capacity Charts in cab			Controls		
Special instruction posted			Clutches		
Barricades (tails wing)			Brakes		
Exhaust pipes guarded			Brake locks		
BC fire extinguisher in cab			Main drum		
First-aid kit in cab			Boom hoist		
Safety glass in cab			Boom hoist panel		
Guardrails/hand holds			Boom hoist kickout		
Platform and steps/non-skid			Oil leaks		
Proximity signs, 10 ft. min.			Hook rollers and turret		
B. ATTACHMENTS			D. CARRIER		
*Hooks and blocks (safety latch on hook)			Steering		
Sockets and rope clamps			Brake (whole system)		
Boom and lacing			Lights, horn, wipers		
Boom stops			Transmission		
Spreaders and gantry			Differential		
Jib and stops			Clutch		
Outriggers and pads			Engine		
Counterweights			Tires and wheels		
			Gauges		
USE WIRE ROPE FORM FOR CABLE INSPECTIONS					
Inspected at: (Location) _____					
By: _____					
* Repair or Replace - Respond on reverse side by specific item letter and number. Requires separate, recorded annual inspection for deformation or cracks.					

SECTION 01 35 29.10 - EXHIBIT F
MONTHLY WIRE ROPE INSPECTION RECORD

CONTRACTOR:				CONTRACT NO:				
CRANE NO:		MILEAGE:		HOURS:		DATE INSPECTED:		
WIRE ROPE		(A) NUMBER OF BROKEN WIRES PER:		(B)% DIAMETER REDUCTION (WEAR OR CORE DAMAGE)		(C) KINKED CRUSHED OR CUT, ETC.?	(D) LUBED, CORROSION (INTERNAL OR EXTERNAL) HEAT DAMAGE?	(E) TERMINAL TACKLE, BLOCKS, HOOKS, ETC.?
TYPE	SIZE	(1) LAY?	(2) STRAN D?	(1) IND. WIRE ?	(2) TOT. ROPE ?			
Main Hoist (LD. Line)								
Boom Hoist (Top Lift)								
Jib Hoist (Whip Line)								
Pendants (Main)								
Pendants (150 foot boom +)								
Jib guys (Upper)								
Jib guys (Lower)								
Replacement of hoisting rope will be done in compliance with the equipment manufacturers published replacement criteria and the Washington Administrative Code Chapter 296-155 Part L.								
Inspected at: (Location)								
By:								
Comments:								

SECTION 01 35 29.10 - EXHIBIT G

ACKNOWLEDGEMENT OF SAFETY/SECURITY INDOCTRINATION

Contract No: _____

Date: _____

I, _____, attended the safety and security indoctrination session on _____
given by _____ covering the following information:

- ✓ *Hazards present in the work assignment and in the general area in which I will be working;*
- ✓ *Personal protective equipment required.*
- ✓ *Instructions on the proper procedure for reporting unsafe job conditions that I may encounter.*
- ✓ *Reporting of any and all injuries, incidents and damage (no matter how slight).*
- ✓ *Contractor's job safety and security rules.*
- ✓ *Location of first aid and medical facilities.*
- ✓ *Toolbox Safety and Security Meeting requirements.*
- ✓ *Emergency service notification procedure for fire, medical emergencies, police problems or other emergency situations.*
- ✓ *An orientation by the foreman or superintendent of my work area.*

I affirm and understand the information and will abide by the requirements presented.

Signature: _____

Affiliation: _____

SECTION 01 35 29.10 - EXHIBIT H

SOUND TRANSIT RECORDKEEPING POLICY FOR OCCUPATIONAL INJURIES AND ILLNESSES

Introduction

The methods outlined in this procedure are in compliance with American National Standards Institute (ANSI) Standard Z.16 for recording and measuring work injury and illness experiences, independent of workers compensation laws and rulings, but compatible with the recordkeeping requirements of the Bureau of Labor Statistics and Occupational Safety and Health Administration (OSHA).

The fact that an employer or employee did not have control over the cause of a work-related (occupational) injury or illness will not be a criterion for excluding the case from being recorded under the provisions of this procedure.

Thorough investigation of all factors relating to the occurrence of each reported work-related injury or illness is essential. Determination as to whether or not the case should be considered recordable under ANSI Standard Z.16 will be based upon the evidence developed in such investigations. Unless there is a preponderance of evidence that the injury or illness did not result from the work activity or environment of employment, the injury or illness will be considered a work-related case.

Purpose

The purpose of reporting occupational injuries and illnesses to Sound Transit and the Resident Engineer is to provide an accurate and uniform method for recording, classifying, and reporting as a means of evaluating programs designed to control such injuries and illnesses and establishing training requirements for the project. This procedure will allow management to measure its safety and security program against others and implement incentive and award programs. This procedure is not intended to replace employers' OSHA responsibility for reporting work-related injuries and illnesses.

Scope

This procedure will be followed by all Sound Transit staff, consultants, prime contractors and Subcontractors.

Definitions

1. Employee: Any person engaged in activities for and receiving direct payment for services from an employer associated with the Sound Transit Project.
2. Exposure or Employee Hours: The total number of hours worked by all personnel direct billing to a project or contract including craft workers, clerical, administrative and supervision. This will also include all hours for any Subcontractor, but NOT for suppliers and vendors. Actual hours worked are to be used for calculating incidence rate, frequency rate and severity measure. However, when actual hours cannot be accurately determined, estimated hours may be used. Employee hours will be calculated as set forth below:
 - a. Actual Exposure Hours: Employee hours of exposure for non-exempt personnel are to be taken from certified payroll records and include only actual straight-time hours worked and actual overtime hours worked.
 - b. Estimated Exposure Hours: When actual employee hours of exposure are not available, estimated hours may be used. Such estimated hours should be obtained by multiplying the total employee days worked for the period by the average number of hours worked per Day. If the hours worked per Day vary among departments or crews, a separate estimate should

be made for each department or crew and these estimates added to obtain the total hours. Estimates for overtime hours should be included.

If employee hours are estimated, indicate the reason or basis upon which estimates are made.

- c. Exempt Employee: For executives, project management, supervisors, and other personnel whose working hours are not defined, the employer will use an average of 8 hours per Day for computing exposure hours.
 - d. For Sound Transit, 75 percent of projects direct charge personnel' hours as identified in the monthly labor report maintained by the accounting department will be utilized in determining exposure hours.
3. Work Environment: The work environment is comprised of the physical location, equipment used, and kinds of operations performed by an employee in the performance of work associated with the Sound Transit Project, whether on or off the project premises.
 4. First-Aid Treatment: One-time treatment and subsequent observation of minor injuries that may include minor scratches, cuts, burns, splinters, etc., which do not ordinarily require medical treatment. Treatment and observation for this purpose are considered first-aid even though provided by a physician or registered professional personnel.
 5. Medical Treatment: All non-first-aid treatment of injuries administered by physicians, registered professional personnel, or lay persons. Medical treatment does not include first-aid treatment provided by a physician or registered professional personnel as previously defined.
 6. Diagnostic Procedures: Certain diagnostic procedures performed by medical personnel may be classified as first-aid, such as the following:
 - a. Hospitalization for observation is considered first-aid as long as no medical treatment was provided;
 - b. Visits to a physician or nurse for observation only or for a routine change of dressing;
 - c. X-ray examinations where negative findings and no other medical treatment was performed; and
 - d. Physical examinations yielding no findings and not substantiating subjective complaints.
 7. Preventive Procedures: Certain preventive procedures and treatments may be classified as medical treatment or first-aid treatment.

Tetanus shots or tetanus boosters are considered preventive and not considered medical treatment. However, a tetanus shot administered because of an injury will be considered medical treatment and is recordable.

Prescription medication administered as a single dose is considered not recordable. When prescription medication is administered for more than a single dose, it is considered medical treatment and is recordable.
 8. Work-Related Case: Any occupational injury suffered by an employee which results from a work incident or from an exposure involving a single incident in the work environment, and any illness caused by exposure to environmental factors associated with employment. Work environment is made up of the physical location, equipment and materials used, and kinds of operations performed by an employee in the performance of his work, whether on or off the employer's premises. Therefore, injuries or illnesses occurring in such places as an employee parking lot, lunchroom, restroom or another office or location, and during rest or lunch periods can be work-related. Whether any case is work-related will be determined by the employer.

9. Recordable Case: Any work-related injury case requiring more than first-aid and all occupational illnesses. Recordable cases include:
- Deaths, regardless of the time between occupational injury or illness and death.
 - Injuries resulting in any of the following:
 - Lost work days - Days away from work.
 - Medical treatment other than first-aid.
 - All work-related illnesses.

10. Lost Work Days: Lost Work Days - Days Away From Work: Days away from work are those work days (consecutive or not) on which the employee would have worked but could not work due to an occupational injury or illness. Lost work days will not include the day of injury or onset of illness or any days on which the employee would not normally have worked such as weekends and holidays.

Lost workday cases involving days of restricted work activity are those cases where, because of injury or illness, (1) the employee was assigned to another job on a temporary basis or (2) the employee worked at a permanent job less than full time or (3) the employee worked at his or her permanently assigned job but could not perform all the duties normally connected with it.

Restricted work activity occurs when the employee, because of the job-related injury or illness, is physically or mentally unable to perform all or any part of his or her normal assignment during all or any part of the normal workday or shift. The emphasis is on the employee's inability to perform normal job duties over a normal work shift.

11. Measurability of Recordable Injury and Illness Cases:

- a. Total Recordable Incidence Rate: Total number of OSHA recordable cases for the reporting period.

TOTAL RECORDABLE

INCIDENCE RATE: $\frac{\text{NO. OF RECORDABLE CASES} \times 200,000}{\text{ACTUAL EMPLOYEE HOURS}}$

ACTUAL EMPLOYEE HOURS

- b. Lost Workday Incidence Rate: Total recordable cases that resulted in death or lost work days/restricted duty for the reporting period.

LOST WORKDAY

INCIDENCE RATE: $\frac{\text{NO. OF LOST WORKDAY CASES} \times 200,000}{\text{ACTUAL EMPLOYEE HOURS}}$

ACTUAL EMPLOYEE HOURS

- c. Severity Measure: Total number of work days lost that occurred during the reporting period.

SEVERITY MEASURE: $\frac{\text{NO. OF LOST WORK DAYS} \times 200,000}{\text{ACTUAL EMPLOYEE HOURS}}$

ACTUAL EMPLOYEE HOURS

For the purpose of the above formulas, the allocation of days when a death or a permanent total disability is involved is as follows:

- Each death from an occupational injury or illness is assigned a time of 6,000 days.
- Permanent Total Disability from an occupational injury or illness is assigned a time of 6,000 days.

Procedure

Upon notification of a work-related injury or illness the employer will determine if it is recordable or non-recordable. Employer will use the established guidelines contained in this procedure and ANSI Standard Z.16.

Submitting a Workers Compensation Employer First Report does not alone determine that an occupational injury or illness is recordable. Employer First Reports may be submitted for cases for which only first-aid treatment was rendered by a physician or registered professional.

Employer will notify the Resident Engineer immediately of all occupational injuries or illnesses and, within 24 hours, submit a copy of the Employers First Report, supervisor's incident investigation, medical release form and physician report. These documents assist Sound Transit Safety/Security in determining injury or illness trends, and verification that all work-related injuries and illnesses are properly recorded.

By the 12th Business Day of each month, each employer will submit to the Resident Engineer, the CSM and the ST CSM the Monthly Statistics and the Safety and Security Information Summary with complete information for the previous month. These forms will include, for prime Contractors and Subcontractors:

- Total hours worked.
- Total number recordable cases for that month.
- Total number of recordable lost time cases for that month.
- Total lost work days for that month.
- Lost work days resulting from an injury or illness from a preceding month.
- Information on recordable injuries (name, craft, type injury, disposition, days off and Contractor).

SECTION 01 35 29.10 - EXHIBIT I

CONSTRUCTION SAFETY/SECURITY SURVEY FORM

DATE: _____

CONTRACT NO: _____

CONTRACTOR: _____

SUBCONTRACTOR: _____

SAFETY OFFICER: _____

	OK	LTA	NA		OK	LTA	NA		OK	LTA	NA
				HOUSEKEEPING/ SANITATION				FIRE PREVENTION			
ELECTRICAL INSTALLATIONS				HAND/POWER TOOLS				LADDERS			
SCAFFOLDING				HOISTS, CRANES & DERRICKS				HEAVY EQUIPMENT OPERATIONS			
MOTOR VEHICLE OPERATIONS				TRAFFIC CONTROL / BARRICADES				RESPIRATORY PROTECTION			
MATERIAL STORAGE / FACILITIES				EXCAVATION & SHORING				SITE CONTROLS Safety and Security			
PILE DRIVING				LOTO				FLAMMABLE LIQUIDS/GAS			
MASONRY				FALL PROTECTION				PPE			

THIS SECTION MUST BE COMPLETED BY CONTRACTOR ON DAILY SURVEYS AND MAY BE COMPLETED BY SOUND TRANSIT ON RANDOM SURVEYS

OBSERVATIONS:	
ORIGINATOR SIGNATURE:	DATE:

TO BE COMPLETED BY CONTRACTOR SITE SAFETY/SECURITY REPRESENTATIVE

RESPONSE / CORRECTIVE ACTIONS TAKEN:	
RESPONDENT SIGNATURE:	DATE:

Original: Contractor

Copy: Resident Engineer

Copy: Sound Transit
Construction Safety Manager

SOUND TRANSIT

SECTION 01 35 29.10
EXHIBIT I: CONSTRUCTION
SAFETY/SECURITY SURVEY FORM

2023 STANDARD DIV 01 SPECS

INSTRUCTIONS FOR CONSTRUCTION SAFETY/SECURITY SURVEY FORM

1. The Construction Safety and Security Survey is required for daily site surveys and will be used to record all unsafe conditions and acts noted by the ConSM, SSSR or RE personnel.
2. This form is primarily intended for the use of the Contractor's safety and security personnel in accordance with the requirements of this specification. Unsafe conditions and actions will be corrected immediately and reported daily on this form.
3. Completed copies of all construction safety and security survey forms indicating action taken and date completed will be submitted to the RE on a weekly basis. These forms will be signed by the Contractor's project manager and Sound Transit's RE.
4. This form will be used by the RE and the CSM to document any unsafe act and conditions noted during site surveys conducted by the RE or Sound Transit safety personnel. Recommendations may be made to the Contractor's safety and security representative and project manager or superintendent for immediate corrective action.
5. This form, when filled out by the RE or Sound Transit safety personnel, will be handled in the following manner:
 - a. The original will be given to the Contractor and a copy retained or sent to the RE.
 - b. The Contractor will complete the action taken and date completed section of the original survey and return it signed by the project manager to the RE
 - c. The RE will sign the survey and distribute it in accordance with Exhibit C, Summary of Construction Safety and Security Reports.
6. Observed safety or security deficiencies will require immediate corrective actions with written response to the Resident Engineer within 24 hours of verbal or written notice.
7. Failure to take immediate corrective action in a timely manner may result in a Stop-Work Order issued in accordance with the General Conditions, Section 00 02 00.

SECTION 01 35 29.10 - EXHIBIT J

SUPERVISOR'S INCIDENT INVESTIGATION REPORT

SUPERVISOR'S INCIDENT INVESTIGATION REPORT	
CONTRACTOR: _____	
INCIDENT DATE: _____	TIME: _____ CONTRACT NO: _____
INCIDENT LOCATION (SPECIFIC): _____	
INJURY/ILLNESS _____ NEAR MISS _____ SECURITY BREACH _____ PROPERTY DAMAGE _____ THIRD PARTY _____	
WHAT HAPPENED? (Describe operation, activity, condition and, how incident or loss occurred. Use separate sheet and diagram if necessary.): _____ _____ _____ _____	
PRIMARY CAUSE (Condition or act that caused the incident.): _____ _____ _____ _____	
Recommended correction action: _____ _____ _____	
Equipment involved: _____ #: _____	
Employee involved: _____	
Employee Injury (Describe): _____ _____ _____	
Medical Referral: _____	
Company Property Damage or Loss (Describe): _____ _____ _____	
Property, Damage or Injury to Others (Describe): _____ _____ _____	
Owner/injured (Name, address, phone): _____ _____	
Witnesses (Name, address, phone): _____ _____	

ORIGINAL: Contractor's File

COPY: Sound Transit

1. This form will be submitted by the Contractor for each incident involving any of the following:
 - a. Injury to an employee of the Contractor or any Subcontractor.
 - b. Any injury to persons not directly connected with the project (including all alleged injuries reported by a member of the public).
 - c. Incidents resulting in damage to public, private, or commercial property (including all alleged property damages).
 - d. Incidents that are "Near misses" that could have resulted in any of the above.
2. Submittals will be made within 24 hours of the incident. Pertinent facts not available within the above time will be submitted in a supplemental report.
3. This form will be prepared by the Contractor and distributed in accordance with Exhibit C, Summary of Construction Safety and Security Reports.

Complete investigation of any incident, whether or not injury or damage is involved, is a vital part of effective incident prevention. The investigation is not complete until the causes and proper corrective actions are determined.

The investigation and this report will be completed by you immediately after any incident relating to your job which involves:

- Personal injury to any of our personnel or any other persons.
- Damage or loss to company property, materials, or equipment.
- Damage or loss to property of other; and
- "Near misses" - which could have resulted in any of the above.

If property damage or personal injury to others is involved, do not assume any responsibility, or obligate the company or Sound Transit in any way. Do not sign anything for anyone except your employer's representative. You should politely refer any question to your Project Manager.

In your investigation and preparation of this report, give extra attention to the following areas:

WHAT HAPPENED?

- (a) This does not mean list the injuries or damages that resulted. It means explain the events, which led to the injuries or damages.
- (b) Describe the work or activity involved, the conditions and what the people involved were doing.
- (c) Describe the tools, equipment or materials involved, their condition and how they were involved.
- (d) Describe the unexpected event or occurrence, which resulted in the injury, damage, or loss.
- (e) If more space is needed or if a diagram will help your description, please attach another sheet.

CAUSES

Primary and Secondary - See Common Causes of Incidents

CORRECTIVE ACTIONS

Primary and Secondary

LOCATION

Specific place at job-site (street and city when applicable).

PROPERTY DAMAGE OR INJURY TO OTHERS

Describe the property, extent of damage or nature of injury. If vehicle is involved, show year and model.

DESCRIBE PRACTICES OF EMPLOYEE

Safety equipment provided but not used. Personal protective equipment provided but not used, improper or unsafe tool or equipment used. Horseplay or practical jokes. Instructions or rules disregarded. Inattention. Inexperience. Physical condition of employee. Improper method of doing work. Action of another person. Improper clothing.

UNSAFE EQUIPMENT OR MATERIALS

Ineffectively guarded equipment. Unguarded equipment. Defective materials. Defective tools. Defective equipment (not motor vehicles). Defective motor vehicle equipment. Improper type or poor design. Unsafe equipment or material of another Contractor or a customer.

UNSAFE CONDITIONS

Poor light. Poor ventilation. Congested area. Improper storage of materials. Exits or emergency escapes inadequate or not provided. Faulty layout of plant or facilities. Tools or equipment improperly stored. Poor housekeeping. Unsafe conditions caused by another Contractor or a customer.

- ✓ Submit original and copy to the Resident Engineer
- ✓ Retain copy for your records
- ✓ Use a Medical Referral slip for any injured employee who goes to a Doctor
- ✓ Keep your office advised

SECTION 01 35 29.10 - EXHIBIT K
WORKSHEET FOR JOB HAZARD ANALYSIS

Contractor:	JHA by:	
Craft:	Date of Analysis:	
Briefly Describe the Job or Operation:		
Required and Recommended Personal Protective Equipment:		
Work Operation	Potential Incidents or Hazards	Safe Job Actions Needed

SECTION 01 35 29.10 - EXHIBIT L

PRE-TASK ANALYSIS (PTA)

SOUNDTRANSIT		SOUNDTRANSIT		SOUNDTRANSIT	
PRE-TASK ANALYSIS (PTA) RISK REDUCTION TALK		PRE-TASK ANALYSIS (PTA) RISK REDUCTION TALK		PRE-TASK ANALYSIS (PTA) RISK REDUCTION TALK	
SUPERVISOR:		SUPERVISOR:		SUPERVISOR:	
DATE:		DATE:		DATE:	
JOB DESCRIPTION:		JOB DESCRIPTION:		JOB DESCRIPTION:	
LOCATION:		LOCATION:		LOCATION:	
DOES TASK REQUIRE SPECIAL TRAINING? Y <u> </u> N <u> </u>		DOES TASK REQUIRE SPECIAL TRAINING? Y <u> </u> N <u> </u>		DOES TASK REQUIRE SPECIAL TRAINING? Y <u> </u> N <u> </u>	
JHA REQUIRED Yes <u> </u> No <u> </u> COMPLETED Yes <u> </u> No <u> </u>		JHA REQUIRED Yes <u> </u> No <u> </u> COMPLETED Yes <u> </u> No <u> </u>		JHA REQUIRED Yes <u> </u> No <u> </u> COMPLETED Yes <u> </u> No <u> </u>	
PTA CHECKLIST		PTA CHECKLIST		PTA CHECKLIST	
ELECTRICAL POWER LINES OVERHEAD EMERGENCY PARTS ASSURED GROUNDING EXCAVATION EQUIPMENT CHECKS SHORED/SLOPED LADDER PROVIDED ENTRY LOG/MADE UTILITIES LOCATED HOT/COLD SURFACES CONTAMINATED SOIL HAZARDOUS (BODY) FALL POTENTIAL PUNCH POINTS ELECTRICAL SHOCK HOUSEKEEPING SLIP/TRIP FLYING PARTICLES THERMAL BURNS MANUAL LIFTING SHARP OBJECTS PERMITS CONFINED SPACE CRITICAL LIFT PLAN TRAFFIC PLAN TRACK ACCESS HAZARD LOGGING TRAFFIC/REG CONTROLS VEHICLE TRAFFIC CONTROLS IN PLACE CROSS STREET TRAFFIC ADDRESS SIDEWALK UPEN PED BRIDGES O.K. CROSSINGS LEVEL	EMERGENCY EQUIPMENT FIRE EXTINGUISHER Y <u> </u> N <u> </u> FIRST-AID KIT Y <u> </u> N <u> </u> SAFETY SHOWER Y <u> </u> N <u> </u> EYE WASH Y <u> </u> N <u> </u> THERM RETRIEVER Y <u> </u> N <u> </u> RADIO - PHONE Y <u> </u> N <u> </u> HAZARDOUS (ENVIRONMENTAL) AIRBORNE PART. Y <u> </u> N <u> </u> VAPOURS Y <u> </u> N <u> </u> HOT/COLD SURFACES Y <u> </u> N <u> </u> NOISE Y <u> </u> N <u> </u> TRAFFIC EXPOSURE Y <u> </u> N <u> </u> SUB CONTRACTOR Y <u> </u> N <u> </u> COORDINATION Y <u> </u> N <u> </u> PROPER EQUIPMENT SCHEDULING Y <u> </u> N <u> </u> PERSONAL BAGNET Y <u> </u> N <u> </u> FORKLIFT Y <u> </u> N <u> </u> BOOM LIFT Y <u> </u> N <u> </u> CRANE Y <u> </u> N <u> </u> CHAINFALL Y <u> </u> N <u> </u> HAND TOOLS Y <u> </u> N <u> </u> HAND POWER TOOLS Y <u> </u> N <u> </u> PROPER RIGGING Y <u> </u> N <u> </u> CURRENT INSPECT. Y <u> </u> N <u> </u> OPERATOR Y <u> </u> N <u> </u> NOTES:	ELECTRICAL POWER LINES OVERHEAD EMERGENCY PARTS ASSURED GROUNDING EXCAVATION EQUIPMENT CHECKS SHORED/SLOPED LADDER PROVIDED ENTRY LOG/MADE UTILITIES LOCATED HOT/COLD SURFACES CONTAMINATED SOIL HAZARDOUS (BODY) FALL POTENTIAL PUNCH POINTS ELECTRICAL SHOCK HOUSEKEEPING SLIP/TRIP FLYING PARTICLES THERMAL BURNS MANUAL LIFTING SHARP OBJECTS PERMITS CONFINED SPACE CRITICAL LIFT PLAN TRAFFIC PLAN TRACK ACCESS HAZARD LOGGING TRAFFIC/REG CONTROLS VEHICLE TRAFFIC CONTROLS IN PLACE CROSS STREET TRAFFIC ADDRESS SIDEWALK UPEN PED BRIDGES O.K. CROSSINGS LEVEL	EMERGENCY EQUIPMENT FIRE EXTINGUISHER Y <u> </u> N <u> </u> FIRST-AID KIT Y <u> </u> N <u> </u> SAFETY SHOWER Y <u> </u> N <u> </u> EYE WASH Y <u> </u> N <u> </u> THERM RETRIEVER Y <u> </u> N <u> </u> RADIO - PHONE Y <u> </u> N <u> </u> HAZARDOUS (ENVIRONMENTAL) AIRBORNE PART. Y <u> </u> N <u> </u> VAPOURS Y <u> </u> N <u> </u> HOT/COLD SURFACES Y <u> </u> N <u> </u> NOISE Y <u> </u> N <u> </u> TRAFFIC EXPOSURE Y <u> </u> N <u> </u> SUB CONTRACTOR Y <u> </u> N <u> </u> COORDINATION Y <u> </u> N <u> </u> PROPER EQUIPMENT SCHEDULING Y <u> </u> N <u> </u> PERSONAL BAGNET Y <u> </u> N <u> </u> FORKLIFT Y <u> </u> N <u> </u> BOOM LIFT Y <u> </u> N <u> </u> CRANE Y <u> </u> N <u> </u> CHAINFALL Y <u> </u> N <u> </u> HAND TOOLS Y <u> </u> N <u> </u> HAND POWER TOOLS Y <u> </u> N <u> </u> PROPER RIGGING Y <u> </u> N <u> </u> CURRENT INSPECT. Y <u> </u> N <u> </u> OPERATOR Y <u> </u> N <u> </u> NOTES:	ELECTRICAL POWER LINES OVERHEAD EMERGENCY PARTS ASSURED GROUNDING EXCAVATION EQUIPMENT CHECKS SHORED/SLOPED LADDER PROVIDED ENTRY LOG/MADE UTILITIES LOCATED HOT/COLD SURFACES CONTAMINATED SOIL HAZARDOUS (BODY) FALL POTENTIAL PUNCH POINTS ELECTRICAL SHOCK HOUSEKEEPING SLIP/TRIP FLYING PARTICLES THERMAL BURNS MANUAL LIFTING SHARP OBJECTS PERMITS CONFINED SPACE CRITICAL LIFT PLAN TRAFFIC PLAN TRACK ACCESS HAZARD LOGGING TRAFFIC/REG CONTROLS VEHICLE TRAFFIC CONTROLS IN PLACE CROSS STREET TRAFFIC ADDRESS SIDEWALK UPEN PED BRIDGES O.K. CROSSINGS LEVEL	EMERGENCY EQUIPMENT FIRE EXTINGUISHER Y <u> </u> N <u> </u> FIRST-AID KIT Y <u> </u> N <u> </u> SAFETY SHOWER Y <u> </u> N <u> </u> EYE WASH Y <u> </u> N <u> </u> THERM RETRIEVER Y <u> </u> N <u> </u> RADIO - PHONE Y <u> </u> N <u> </u> HAZARDOUS (ENVIRONMENTAL) AIRBORNE PART. Y <u> </u> N <u> </u> VAPOURS Y <u> </u> N <u> </u> HOT/COLD SURFACES Y <u> </u> N <u> </u> NOISE Y <u> </u> N <u> </u> TRAFFIC EXPOSURE Y <u> </u> N <u> </u> SUB CONTRACTOR Y <u> </u> N <u> </u> COORDINATION Y <u> </u> N <u> </u> PROPER EQUIPMENT SCHEDULING Y <u> </u> N <u> </u> PERSONAL BAGNET Y <u> </u> N <u> </u> FORKLIFT Y <u> </u> N <u> </u> BOOM LIFT Y <u> </u> N <u> </u> CRANE Y <u> </u> N <u> </u> CHAINFALL Y <u> </u> N <u> </u> HAND TOOLS Y <u> </u> N <u> </u> HAND POWER TOOLS Y <u> </u> N <u> </u> PROPER RIGGING Y <u> </u> N <u> </u> CURRENT INSPECT. Y <u> </u> N <u> </u> OPERATOR Y <u> </u> N <u> </u> NOTES:

SECTION 01 35 29.10 - EXHIBIT M

VISITOR'S RELEASE AND HOLD HARMLESS AGREEMENT

Contractor: _____

Contract No: _____ Date: _____

I am voluntarily entering a potentially hazardous Sound Transit Project construction site for my own purposes and interests. As consideration for such entry, it is my intent to release, hold harmless and indemnify Sound Transit, the construction managers, Contractors, Subcontractors, and their agents and personnel from any liability for injury or damages of whatsoever nature to the maximum extent permitted by law.

Specifically, in consideration of being permitted, for my own purposes and interests, to enter upon the premises or construction site of the Sound Transit Project, I hereby release, hold harmless and indemnify Sound Transit, the construction managers, Contractors, Subcontractors from and against, and assume the risk, for and on behalf of myself, my heirs, my survivors and my estate, for all damages, losses, injuries, and any and all other claims of any type whatsoever for personal injury (including death) and other loss or damage of any nature whatsoever including damage to my personal property, sustained or caused while on such premises or site, except (1) those injuries which are caused solely by the negligence of one or more of the Indemnified Parties or (2) those injuries caused by or resulting from the concurrent negligence of one or more of the Indemnified Parties but in such case only to the extent of the negligence of the Indemnified Parties. In the event any clause, term or provision of this agreement will be declared or adjudicated void or invalid, it will in no manner affect the other clauses, terms and provisions hereof, which will remain in full force and effect, as if the clause, term or provision so declared or adjudicated invalid was not originally a part hereof.

Print Name: _____

Signature: _____

Address: _____

Date: _____

END OF EXHIBITS

SECTION 01 35 29.20**HEALTH, SAFETY, SECURITY AND EMERGENCY RESPONSE****PART 1 - GENERAL****1.01 SUMMARY**

- A. This Section includes requirements for complying with applicable laws and regulations related to health, safety, security and emergency response procedures. It is not the intent of Sound Transit to develop or manage the safety, security and health programs of the Contractor, its Subcontractors or Suppliers, or in any way assume the responsibility for the safety and health of their personnel.
- B. Failure to comply with these requirements or observation of safety or security deficiencies will require immediate corrective actions with written response to the Resident Engineer within 24 hours of receiving a verbal or written notice. Lack of corrective action or sufficient response may result in a Stop-Work Order as described elsewhere in the Contract. In the event of a Stop-Work Order, the Contractor shall be solely responsible for any impact to Contract Price and/or Contract Time,
- C. Comply with all applicable federal, state and local laws and regulations as well as requirements outlined in this document. In the event of conflict, the most stringent safety and security requirement shall apply.
- D. Be solely and completely responsible for conditions of the site, and the safety and security of all persons and property, at all times, beginning with the Notice to Proceed (NTP) or the Limited Notice to Proceed (LNTP) and ending with Acceptance of the Work.
- E. Comply with all safety and security directives and corrective actions required to remedy safety/security deficiencies. These deficiencies may be related to means, methods, work plans, hazards analyses or security threats.

1.02 REFERENCES

- A. Acronyms and Abbreviations
 - 1. AED: Automated External Defibrillator
 - 2. AHJ: Authority Having Jurisdiction
 - 3. ANSI: American National Standards Institute
 - 4. CPR: Cardio-Pulmonary Resuscitation
 - 5. CSM: Sound Transit Construction Safety Manager
 - 6. CSSP: Construction Safety and Security Plan
 - 7. CWP: Construction Work Plan
 - 8. DOSH: Washington State Labor and Industries Division of Occupational Safety and Health (Washington State OSHA)
 - 9. EPA: Environmental Protection Agency

10. JHA: Job Hazard Analysis
 11. LEL: Lower Explosive Limit
 12. MSDS: Material Safety Data Sheet
 13. MUTCD: Manual of Uniform Traffic Control Devices
 14. NCR: Non-Conformance Report
 15. NEC: National Electric Code
 16. NFPA: National Fire Protection Association
 17. NIOSH: National Institute of Occupational Safety and Health
 18. OSHA: Occupational Safety & Health Act
 19. PEL: Permissible Exposure Limits
 20. PPE: Personal Protective Equipment
 21. PTA: Pre-Task Analysis
 22. SQA: Sound Transit Safety and Quality Assurance Department
 23. SSSR: Contractor's Site Safety and Security Representative
 24. WAC: Washington Administrative Code
- B. Reference Standards: This Section incorporates by reference the latest editions and revisions of the following documents.
1. United States Code (USC)
USC 651 et seq. Federal Occupational Safety and Health Act
 2. Code of Federal Regulations (CFR)
 - a. 29 CFR 1910 OSHA General Health and Safety Standards
 - b. 29 CFR 1926 OSHA Construction Safety and Health Standards
 - c. 40 CFR 300 Emergency Planning and Community Right-to Know
 3. Revised Code of Washington (RCW)
RCW 49.17 Washington Industrial Safety and Health Act
 4. Washington Administrative Code (WAC): all that are applicable to this Contract.
 5. National Fire Protection Association (NFPA) Standards
 - a. NFPA 70, National Electric Code, current edition
 - b. Others that may apply
 6. Federal Highway Administration (FHA)

7. Washington Department of Transportation
 - a. Standard Specifications for Road, Bridge and Municipal Construction, Washington State Department of Transportation
 - b. Traffic Manual M51-02, Washington State Department of Transportation
 - c. Work Zones Traffic Control Guidelines M54-44, Washington State Department of Transportation

8. Municipal Codes

Requirements as stated by authorities having jurisdiction or permit requirements, including but not limited to fire departments, utility entities and police departments.

1.03 DEFINITIONS

- A. Contractor's Site Safety and Security Representative (SSSR): A Contractor's employee designated as the EMPLOYEE IN CHARGE (EIC) who shall be responsible for the implementation and compliance of the Contractor's Construction Safety and Security Plan, and who shall be assigned full time to the job site whenever work is in progress. The Contractor's safety and security representative (EIC) shall have the experience managing a construction safety program of same scope and authority to direct employees, stop work and implement corrective measures for any contractor or subcontractor deficiencies.
- B. Competent Person: An individual identified as having the necessary experience and documented training to evaluate the presence of and control specific hazards on the site. Different activities require specific training and expertise. WACs reference a Competent Person for different technical activities.
- C. Hot work: Any work involving a flame or sparks, such as a torch, grinder or electric arc welder. A hot work permit is required for all activities requiring welding, cutting or burning.
- D. Incident:
 1. Injury to an employee of the Contractor or any Subcontractor
 2. Any injury to persons not directly connected with the project that alleges the injuries were related to some project activity
 3. Incidents resulting in damage to property, equipment or work products (including all alleged property damages)
 4. A "Near Miss" that could have resulted in any of the above
- E. Personal Protective Equipment (PPE) – Includes all clothing and other work accessories designed to create a barrier against workplace hazards. Examples include safety glasses or goggles, high visibility outer wear, hard hats, hearing protectors, gloves, respirators, aprons and work boots.
- F. Security: Protection of both Contractor, Subcontractor and Sound Transit property and the personnel of the Contractor, Subcontractors, Sound Transit and their consultants from trespass, theft, vandalism, pilfer or other destructive activities
- G. Threat: A potential action or situation that may cause harm to people or property.

- H. **Toolbox Safety and Security Meeting:** Weekly safety and security meeting held by the foremen for their crews which include as a minimum the following activities:
 - 1. Preparation, in advance of the meeting, of a brief summary of meeting topics, issues or events
 - 2. Review reports of walk-around safety and security inspections conducted since the last safety and security meeting
 - 3. Review corrective actions or deficiencies received so that hazards can be corrected and prevented
 - 4. Evaluate incident investigations conducted since the last meeting to determine if the causes of the unsafe situation were properly identified and corrected
 - 5. Discussion on other topics, issues or events of relevance to safety and security
 - 6. Documentation of attendance and the subjects discussed at the meeting
- I. **Track Access Permit:** A Sound Transit form that may be required when work is performed within 10 feet of the active track, on any platform or at any active station. Sound Transit track access permits are approved, signed and issued by Sound Transit rail operations or the authority having jurisdiction, and are issued weekly at the discretion of the Light Rail Operations Chief.
- J. **Volatile Organic Compounds (VOCs):** A very broad category of carbon-based compounds, ranging from those that evaporate easily (e.g., hexane) to those which may be only semi-volatile (e.g., chlorinated hydrocarbons). VOCs most commonly encountered on construction sites include solvents used in adhesives, coatings, sealants, thinners, caulking, fuels, material treatments and preservatives. They may have a strong odor (e.g., aromatic hydrocarbons in gasoline) or they may be nearly odorless (e.g., odorless mineral spirits).
- K. **Vulnerability:** A weakness in the design, implementation or operation of an asset, system or network, that can be exploited by an adversary or disrupted by a natural hazard or technological failure.

1.04 SUBMITTALS

- A. Any review of safety and security documents, plans or submittals by the Resident Engineer and Sound Transit or their designees, shall not constitute approval of the safety or security elements, mitigations or hazard/threat precautions employed by the Contractor during construction, or constitute approval of Contractor's means or methods of construction
- B. **Construction Site Safety and Security Plan (CSSP):** Submit within 30 days of NTP.
- C. **Identification and Qualifications of the SSSR or EMPLOYEE IN CHARGE:** Submit within 15 days of NTP.
 - 1. The contractor and all first tiered subcontractors shall identify an employee(s) as the Employee in Charge of safety and security. The Contractor's EIC shall be onsite any time work is being conducted. A Subcontractor's EIC shall be on site anytime that the work of that Subcontractor is being conducted
 - 2. Provide a contact list of ALL contract EIC personnel with title and contact numbers included. This list shall also include the contact information for the contractor's corporate or senior safety managers.
- D. **Emergency procedures.**

1. Reconcile all emergency response or procedures with any comments provided by the Resident Engineer.
2. No physical work may occur on-site before the emergency procedure document is returned with acceptable disposition.

E. Job Hazard Analysis (JHA)

1. JHA(s) correspond with a specific work activity and meet the requirements of these Specifications.
2. The JHA shall identify:
 1. Foreseeable hazards and threats, planned protective measures, provide drawings or other documentation of protective measures. All contract fabricated hardware or job-built systems must be prepared, signed and stamped by a Professional Engineer..
 2. The SSSR (Competent Person) shall be clearly identified and present on-site and available for workplace inspections when work begins under a specific JHA.
 3. Log and submit all location requests provided by the utility locator service (One Call Center) or utility companies concerning underground utilities and submit with the JHA. Make this log available to the Resident Engineer upon request.
3. The JHA shall emphasize safety considerations for the following hazard events:
 - a. Activities involving electrical, elevated heights, pressure, confined spaces and excessive noises;
 - b. Danger of striking against or being struck by;
 - c. Potential injury from burns, either chemical or thermal;
 - d. Potential for oxygen-deficient environments;
 - e. Limited access or exit conditions;
 - f. Potential of crushing or pinch point between objects;
 - g. Potential injury from strain by pushing, pulling or lifting; and
 - h. Potential for catastrophic property damage or loss of function (i.e., critical lifts, power lines, underground utilities, working at elevated heights or immediately adjacent to major roadways or structures..

F. General Safety Submittals

1. If a crane of one ton capacity or greater will be used. Complete Crane Inspection Record and the Wire Rope Inspection Record as required by WISHA standards and maintain on-site. Submit certification for all cranes prior to use.
2. A procedure for testing physical or environmental exposures (excavations, confined spaces, breathing zones, etc.) that may impact the health and safety or security of workers, as applicable.

3. A Confined Space Program, if applicable, in accordance with requirements of WAC 296-809-300.
 4. Sound Transit's recordkeeping forms are presented in the Exhibits herein and provide administrative instruction and report forms to be used by the Contractor and Subcontractors for all required reports: In addition, specific records are required by DOSH and Fed/OSHA.
 5. Forms are provided in the attached exhibits for use by the contractor and/or subcontractors. The Contractor may use their own corporate forms if the information provided on those forms meets the intent of the Sound Transit submittals. Sound Transit at its discretion may require that Sound Transit forms be used.
- G. Monthly Submittals
1. Submit as part of the monthly pay application, a Monthly Injury/Illness Report, (Exhibit B), provided by Sound Transit herein.
- H. Incident, Accident or Injury Submittals
1. Notify the Resident Engineer or construction safety manager immediately upon initial discovery or awareness of an injury, incidents or event.
 2. Submit a written incident report within 24 hours of an injury, event, security or safety incident, property damage or possible third-party claim.
 3. Include in the report full information, photographs, names, contributing factors and any unusual or special conditions or circumstances including testimony of witnesses regarding all incidents.
 4. Conduct a formal root cause analysis for all injuries, incidents or events using the "5-why" or other applicable methods to determine the source and contributing factors for injuries or incidents. Implement corrective actions as identified under the root cause analysis process.

1.05 CONSTRUCTION SITE SAFETY AND SECURITY PLAN (CSSP)

- A. Provide a written safety and security procedure for review and comment by Sound Transit. This CSSP shall detail the methods of protecting workers and if applicable securing the Contractor's construction site. The Contract specific CSSP need not be extensive but must address all elements identified in this section.
- B. Reconcile comments such that the document receives an acceptable disposition by the Sound Transit Construction Safety Manager.
- C. The Contractor's CSSP shall describe and include procedures for:
 1. List of key personnel, contact information and Contract position or description of responsibilities;
 2. Provide names and contact information for the Contractor's Site Safety and Security Representative (SSSR) and the EMPLOYEES IN CHARGE of safety and security.
 3. Date, time and location of the weekly safety and security meetings;
 4. An outline of the employee indoctrination, that includes safety and security orientation sessions; with emphasis on training or awareness sessions for the use

of proper work procedures, equipment, personal protective equipment, mechanical guards, emergency procedures and security procedures.

5. Provide for daily pre-job or pre-task safety and security meetings and job hazard analyses, job safety assessments, safety and security communications and lessons learned from incidents or events;
6. Outline procedures for investigations and documentation of all safety and/ security incidents to determine root cause and necessary corrective actions;
7. Submit a weekly safety and security report (Exhibit D) detailing issues and inspections of the job site(s) and adjacent public areas to document activities, site controls and conditions. Provide detail of the corrective action(s) taken to eliminate unsafe acts and conditions. These reports may be conducted and completed concurrently with the Sound Transit safety representative.
8. Identify the person(s) that will initiate or be responsible for closeout of deficiencies found during site inspections;
9. Maintenance of records of safety and security incidents, and development of safety, security and loss experience summaries;
10. Emergency Action Plan: The Contract-specific safety and security plan shall provide a written Emergency Action Plan as part of the CSSP, including, but not be limited to, actions to be taken for the following:
 - a. Report all incidents, events or conditions that may impact the health and welfare of employees, construction staff or the general public immediately to the Resident Engineer and the authority having jurisdiction.
 - b. Provide procedures and names of those responsible for calling 911, project personnel in charge for emergency or first responder required events,
 - c. Injuries to personnel or employees or to the general public on or adjacent to the work site that may require special equipment or means to safely mobilize and transport the injured or stabilize the situation.
 - d. Property damage with particular emphasis on utilities;
 - e. Fire response and Contract site evacuation;
 - f. Other exposures or potential security issues or threats that may occur at the work site, i.e. earthquake, severe weather
 - g. Include local emergency and medical addresses/numbers (e.g., fire/police and hospital);
 - h. The Emergency Action Plan shall identify the nearest emergency medical facility with a route map and phone numbers.
 - i. Provide the Emergency Action Plan in a format that ALL site workers can translate and/or understand.
 - j. Should a serious incident occur resulting in damage to public or Sound Transit property; or bodily injury to the public or personnel of Sound Transit, its consultants, Contractors or their

Subcontractors, it shall be reported (after calling 911) immediately by phone to the Resident Engineer and Sound Transit Construction Safety Manager.

- k. All communication with the press shall be handled thru Sound Transit
- l. A phone list shall be assembled for emergency contacts with numbers.

11. Fire Prevention and Safety Plan;

- a. Include a Fire Prevention and Safety Plan as part of the CSSP, which complies with the recommendations of the National Fire Protection Association and applicable local, state and federal rules, ordinances and regulations
- b. Contact local fire and rescue to review Contract and contacts.
- c. Coordinate plan with neighboring Contracts.

12. Control of Hazardous Substances and Hazard Communication Plan;

13. Site Security

Site Security is the responsibility of the Contractor regardless of Contract completion status until care and custody has been formally given to another Contractor entity or Sound Transit. The Contractor's CSSP shall define the duties and responsibilities of Contractor and Subcontractor personnel.

- a. Provide adequate protection, fencing, lighting and security elements to establish protective measures for materials, deter trespass and theft, and to protect employees and their property.
- b. Investigate security incidents and issue reports;
- c. Ensure prompt reporting of security incidents to the Resident Engineer, ST Construction Manager, ST Construction Safety Manager, or Sound Transit Security Dispatch at (206) 398-5268

1.06 TRAINING

- A. Conduct training sessions and awareness discussions during weekly safety meetings, or more often if needed, on safety and security related topics that may include first aid, fire prevention, site security or other areas or topics the Contractor deems appropriate.
- B. Indoctrination
 - 1. Newly employed, promoted or transferred personnel shall be fully instructed by audio/visual means in the safety and security practices required for their assignments. Initial indoctrination for all personnel shall include, but not be limited to, the following:
 - a. For each individual, the hazards present in the work assignment and in the general area in which he/she will be working;
 - b. Personal protective equipment required;

- c. Instructions on the proper procedure for reporting unsafe job conditions that he/she may encounter;
- d. Reporting of all injuries, incidents and damage, no matter how slight;
- e. Contractor's job rules;
- f. Location of first-aid and medical facilities;
- g. Tool box safety and security meeting requirements;
- h. Emergency service notification procedure for fire, medical emergencies, police problems or other emergency situations;
- i. An orientation by the foreman or superintendent of the new employee work area; and

- 2. All personnel shall sign the form shown as Exhibit A to acknowledgement receiving and understanding the safety and security indoctrination.

C. Subcontractor Indoctrination

The Contractor is responsible for indoctrinating Subcontractor personnel before they begin work. All subcontractor personnel shall sign the form shown as Exhibit A to acknowledge receiving and understanding the safety and security indoctrination.

D. Site Orientation

This orientation program shall introduce the worker to the Contract site and to the Contract specific safety requirements. Emphasis shall be placed on site specific hazards and procedures. This orientation shall be provided on the same work day of arrival on the Contract site.

E. Hazard Communication

All personnel shall be required, as needed, to complete Hazard Communication training during indoctrination and refresher training.

1.07 PROTECTION OF THE PUBLIC

- A. Take all reasonable precautions to prevent injury to the public and damage to or theft of the property of others. The public is defined as all persons not employed by or directly or indirectly under contract to Sound Transit. Temporary barriers and fencing designated to protect the public shall be installed immediately when a hazard or exposure is present. Precautions shall include, but not be limited to, the following;

- 1. Do not perform work in any area occupied by the public unless specifically permitted by the Contract or approved in writing by the Resident Engineer.
- 2. When necessary to maintain public use of work areas involving sidewalks, driveways, entrances to buildings and roadways, protect the public in accordance with all applicable laws and regulations.
- 3. Keep sidewalks, entrances to buildings and businesses clear of obstructions, holes, materials, water and other conditions so as to permit safe ingress and egress of the public at all times.

4. Post appropriate warnings, signs and instructional safety and security signs where necessary. Where the public might be endangered by moving equipment, control of such equipment will be carried out by a Certified Traffic Control Specialist.
5. Signs, signals or other control devices used to regulate vehicular traffic shall meet the requirements of MUTCD and the applicable work zone traffic control handbook, Municipal In-Street Use requirements and other pertinent rules and regulations.
6. Provide sidewalks, sheds, canopies, catch platforms and appropriate fences, when necessary, to maintain public pedestrian traffic adjacent to the erection, demolition or structural alteration of walls or any structure is under construction.
7. Semi-permanent site perimeter fencing shall be provided around the perimeter of the site and properly secured and anchored. Perimeter fences shall be at least 6 feet high. Fencing or a construction wall may be constructed of wood or metal and sheathing, chain link or a combination of both, or as otherwise required in the Contract Documents.
8. During working hours supervise all gates and work zone entrances when open, or keep closed and locked when unattended. During non-working hours keep all gates and work zone entrances closed and locked.
9. Provide guardrails on both sides of vehicular and pedestrian bridges, ramps, runways and platforms. Construct guardrails in accordance with applicable standards, codes, laws and regulations.
10. Provide temporary sidewalks when a permanent sidewalk is obstructed by the Contractor's operations. If appropriate provide necessary flaggers or Contract personnel to safely direct or assist the general public when adjacent to or through work activities.
11. Maintain warning signs and lights along guardrails, barricades and temporary sidewalks and at every obstruction to the public. Place lights at both ends of such protection or obstructions, and not over 20 feet apart alongside of such protection or obstruction.

1.08 SUBSTANCE ABUSE

- A. Sound Transit prohibits the use, possession, concealment, transportation, promotion or sale of the following on the worksite:
 1. Alcoholic beverages;
 2. Marijuana and other illegal drugs, look-alikes and designer drugs;
 3. Drug paraphernalia; or
 4. Controlled substances such as medications when usage is abused or when the substance is possessed without proper prescription labeling.
- B. The Contractor shall establish, contract and enforce a Substance Abuse Prevention Program in accordance with all elements and requirements as outlined elsewhere in the Contract.
- C. Maintain required records and submit monthly summaries of employees and subcontractors who have been tested and their eligibility to the Resident Engineer. The Contractor will be notified of periodic audits of the substance abuse program by the Resident Engineer or the CSM for all random, for cause and post-incident testing protocols.

PART 2 - PRODUCTS

2.01 PERSONAL PROTECTIVE EQUIPMENT (PPE)

- A. Only equipment complying with ANSI, ASME, DOSH Safety Orders and Fed/OSHA Safety Standards shall be used. All Contractors shall be responsible for compliance by their personnel. The SSSR shall make regular field inspections to ensure compliance.
- B. Head Protection
 - 1. Hard hat use is mandatory
 - 2. Head protection must meet the requirements of ANSI Z89.1 or ANSI Z89.2, as appropriate, as specified by DOSH and Fed/OSHA. Metallic (metal) hard hats shall not be worn on any work under a Sound Transit contract.
 - 3. Both the employee's name and the Contractor's name shall clearly appear on the hard hat. A sticker or other visible means to identify safety-orientated personnel shall also be present on the employees or subcontractor's hardhat.
- C. High Visibility Apparel
 - 1. General
 - a. All personnel (including service providers, Subcontractors and lower tier Subcontractors) that are on foot in the work zone and that may be exposed to vehicle traffic or construction equipment shall wear type II high visibility clothing described herein.
 - b. Yellow or Orange raingear, unless compliant with the ANSI 107-2004 standard shall not be considered high visible garment.
 - c. High visibility garments shall always be the outermost garments.
 - d. High visibility garments shall be in condition compliant with ANSI 107-2004 and shall be used in accordance with the manufacturer recommendations.
 - e. All sweatshirts, tee shirts and other outer wear with reflective material and that would not be considered a high visible safety vest or jacket shall be ORANGE in color. No other color will be permitted.
 - 2. Traffic Control Personnel

All personnel directing traffic, either inside or outside the site fence, shall comply with the following:

 - a. During daylight hours with clear visibility, workers shall wear a high-visibility ANSI/ISEA 107-2004 Class 2 or 3 vest or jacket, and hard hat meeting the high visibility headwear requirements of WAC 296-155-305; and
 - b. During hours of darkness (1/2-hour before sunset to 1/2-hour after sunrise) or other low visibility conditions (snow, fog and / or rain), workers shall wear a high-visibility visibility ANSI/ISEA 107-2004 Class 2 or 3 vest or jacket, high visibility lower garment meeting visibility ANSI/ISEA 107-2004

Class E and hardhats meeting the high visibility headwear requirements of WAC 296-155-305.

D. Eye/Face Protection

1. Contractor personnel shall be provided with and be required to wear eye protection at all times when in the work area. Goggles or face shields shall be provided when the tools or operations involved create potential eye hazards resulting from physical, chemical or radiation agents. Eye and face protection shall meet the requirements of ANSI Z87.1 as specified by DOSH and Fed/OSHA.
2. A face shield shall be worn when cutting, grinding or excessive particles are being generated.

E. Respiratory Protection

1. Respiratory protection devices approved by the National Institute of Occupational Safety and Health (NIOSH) shall be supplied by the Contractor and worn by all personnel (as required by DOSH and OSHA regulations) when exposed to hazardous concentrations of toxic or noxious dust, fumes or mists.
2. Where respiratory protection is required, have a written respiratory protection program in accordance with applicable DOSH and Fed/OSHA standards.

F. Hearing Protection

1. Hearing protection shall be available and such protection shall be worn by all personnel exposed to sound levels in excess of DOSH's and Fed/OSHA's permissible exposure limits (PEL).
2. Post signs to protect the general public if noise levels exceed 85 dbs during work activities.

G. Fall Restraint Protection

1. Class III Full Body Harness meeting DOSH and Fed/OSHA safety standards shall be worn by all personnel exposed to falls from an unprotected height of 4 feet or more. The use of the fall restraint protection shall conform to the requirements of the applicable safety standards.
2. A fall protection work plan shall be completed, available on-site and submitted to the Resident Engineer.

H. Safety Shoes

All personnel shall wear hard-toed foot wear conforming to ASTM F2413-05.

I. Suitable Clothing

1. All Contractor personnel shall be required to wear full-length pants, free of holes and made of durable material. An employee shall not be permitted to wear clothing that has been saturated by gasoline, diesel fuel, oil or any other flammable or combustible substance. Polyester clothing is not allowed.
2. An employee's shirt shall completely cover his/her shoulders as well as his/her entire mid-section to the waist. Tank tops and shirts with sleeves removed are not allowed. The minimum shirt allowed shall be a standard T-shirt.

3. Workers will not be allowed to wear hardhat stickers, shirts, slogans or pins that express profanity, derogatory or unprofessional statements or images.

J. Gloves

Gloves are to be worn at all times. Specific gloves shall be appropriate to the hazard or task. Tasks are only to be performed without gloves where safety is compromised by glove-use or fine finger manipulation is needed to accomplish the activity.

K. Other PPE

Other PPE to be used under unusual circumstances, such as high-temperature work, high-pressure tools, handling corrosive liquids or other activities not specifically covered in this Section shall be reviewed with the Resident Engineer.

PART 3 - EXECUTION – NOT USED

END OF SECTION

EXHIBITS

Exhibit A: Acknowledgement of Safety/Security Indoctrination

Exhibit B: Contractor's Monthly Injury/Illness Report Form

Exhibit C: Sound Transit Recordkeeping Policy for Occupational Injuries and Illnesses

Exhibit D: Summary of Construction Safety and Security Reports

Exhibit E: Supervisor's Incident Investigation Report

SECTION 01 35 29.20 - EXHIBIT A

ACKNOWLEDGEMENT OF SAFETY/SECURITY INDOCTRINATION

Contract No: _____

Date: _____

I, _____, attended the safety and security indoctrination session on _____
given by _____ covering the following information:

- ✓ *Hazards present in the work assignment and in the general area in which I will be working;*
- ✓ *Personal protective equipment required;*
- ✓ *Instructions on the proper procedure for reporting unsafe job conditions that I may encounter;*
- ✓ *Reporting of any and all injuries, incidents and damage (no matter how slight);*
- ✓ *Contractor's job safety and security rules;*
- ✓ *Location of first aid and medical facilities;*
- ✓ *Toolbox Safety and Security Meeting requirements;*
- ✓ *Emergency service notification procedure for fire, medical emergencies, police problems or other emergency situations;*
- ✓ *An orientation by the foreman or superintendent of my work area.*

I affirm and understand the information and will abide by the requirements presented.

Signature: _____

Affiliation: _____

SECTION 01 35 29.20 - EXHIBIT B

CONTRACTOR'S MONTHLY INJURY/ILLNESS REPORT FORM FOR YEAR OF 20__



Data/Measure	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Recordable Injury/Illness Cases												
Days Away From Work Cases												
Total Days Away From Work												
Restricted/Modified Work Cases												
Total Days Restricted/Modified Work												
First Aid Cases												
Reported Near Misses												
Average Number of Personnel on Worksite												
Labor Hours Worked												

Contractor Company Name: _____

Contractor Site Safety and Security Representative Signature:

Date: _____

SECTION 01 35 29.20 - EXHIBIT C

SOUND TRANSIT RECORDKEEPING POLICY FOR OCCUPATIONAL INJURIES AND ILLNESSES

Introduction

The methods outlined in this procedure are in compliance with American National Standards Institute (ANSI) Standard Z.16 for recording and measuring work injury and illness experiences, independent of workers compensation laws and rulings, but compatible with the recordkeeping requirements of the Bureau of Labor Statistics and Occupational Safety and Health Administration (OSHA).

The fact that an employer or employee did not have control over the cause of a work-related (occupational) injury or illness shall not be a criterion for excluding the case from being recorded under the provisions of this procedure.

THOROUGH INVESTIGATION OF ALL FACTORS RELATING TO THE OCCURRENCE OF EACH REPORTED WORK-RELATED INJURY OR ILLNESS IS ESSENTIAL. DETERMINATION AS TO WHETHER OR NOT THE CASE SHOULD BE CONSIDERED RECORDABLE UNDER ANSI STANDARD Z.16 SHALL BE BASED UPON THE EVIDENCE DEVELOPED IN SUCH INVESTIGATIONS. UNLESS THERE IS A PREPONDERANCE OF EVIDENCE THAT THE INJURY OR ILLNESS DID NOT RESULT FROM THE WORK ACTIVITY OR ENVIRONMENT OF EMPLOYMENT, THE INJURY OR ILLNESS SHALL BE CONSIDERED A WORK-RELATED CASE.

Purpose

The purpose of reporting occupational injuries and illnesses to Sound Transit and the Resident Engineer is to provide an accurate and uniform method for recording, classifying and reporting as a means of evaluating programs designed to control such injuries and illnesses and establishing training requirements for the project. This procedure will allow management to measure its safety and security program against others and implement incentive and award programs. This procedure is not intended to replace employers' OSHA responsibility for reporting work-related injuries and illnesses.

Scope

This procedure shall be followed by all Sound Transit staff, consultants, prime contractors and Subcontractors.

Definitions

1. Employee: Any person engaged in activities for, and receiving direct payment for services, from an employer associated with the Sound Transit's Construction or Maintenance program.
2. Exposure or Employee Hours: The total number of hours worked by all personnel direct billing to a Contract including craft workers, clerical, administrative and supervision. This shall also include all hours for any Subcontractor, but NOT for suppliers and vendors. Actual hours worked are to be used for calculating incidence rate, frequency rate and severity measure. However, when actual hours cannot be accurately determined, estimated hours may be used. Employee hours shall be calculated as set forth below:
 - a. Actual Exposure Hours: Employee hours of exposure for non-exempt personnel are to be taken from certified payroll records and include only actual straight-time hours worked and actual overtime hours worked.
 - b. Estimated Exposure Hours: When actual employee hours of exposure are not available, estimated hours may be used. Such estimated hours should be obtained by multiplying the total employee days worked for the period by the average number of hours worked per day. If

the hours worked per day vary among departments or crews, a separate estimate should be made for each department or crew and these estimates added to obtain the total hours. Estimates for overtime hours should be included.

If employee hours are estimated, indicate the reason or basis upon which estimates are made.

- c. Exempt Employee: For executives, project management, supervisors and other personnel whose working hours are not defined, the employer shall use an average of 8 hours per day for computing exposure hours.
- d. For Sound Transit, 75 percent of Contracts direct charge personnel' hours as identified in the monthly labor report maintained by the accounting department shall be utilized in determining exposure hours.
3. Work Environment: The work environment is comprised of the physical location, equipment used and kinds of operations performed by an employee in the performance of work associated with the Sound Transit's Construction or Maintenance program, whether on or off the Contract site.
4. First-Aid Treatment: One-time treatment and subsequent observation of minor injuries that may include minor scratches, cuts, burns, splinters, etc., which do not ordinarily require medical treatment. Treatment and observation for this purpose are considered first-aid even though provided by a physician or registered professional personnel.
5. Medical Treatment: All non-first-aid treatment of injuries administered by physicians, registered professional personnel or lay persons. Medical treatment does not include first-aid treatment provided by a physician or registered professional personnel as previously defined.
6. Diagnostic Procedures: Certain diagnostic procedures performed by medical personnel may be classified as first-aid, such as the following:
 - a. Hospitalization for observation is considered first-aid as long as no medical treatment was provided;
 - b. Visits to a physician or nurse for observation only or for a routine change of dressing;
 - c. X-ray examinations where negative findings and no other medical treatment was performed; and
 - d. Physical examinations yielding no findings and not substantiating subjective complaints.
7. Preventive Procedures: Certain preventive procedures and treatments may be classified as medical treatment or first-aid treatment.

Tetanus shots or tetanus boosters are considered preventive and not considered medical treatment. However, a tetanus shot administered because of an injury shall be considered medical treatment and is recordable.

Prescription medication administered as a single dose is considered not recordable. When prescription medication is administered for more than a single dose, it is considered medical treatment and is recordable.

8. Work-Related Case: Any occupational injury suffered by an employee which results from a work incident or from an exposure involving a single incident in the work environment, and any illness caused by exposure to environmental factors associated with employment. Work environment is

made up of the physical location, equipment and materials used, and kinds of operations performed by an employee in the performance of his work, whether on or off the employer's premises. Therefore, injuries or illnesses occurring in such places as an employee parking lot, lunchroom, restroom, another office or location, and during rest or lunch periods can be work-related. Whether any case is work-related will be determined by the employer.

9. Recordable Case: Any work-related injury case requiring more than first-aid and all occupational illnesses. Recordable cases include:

- a. Deaths, regardless of the time between occupational injury or illness and death.
- b. Injuries resulting in any of the following:
 - (1) Lost work days - Days away from work.
 - (2) Medical treatment other than first-aid.
- c. All work-related illnesses.

10. Lost Work Days:

Lost Work Days - Days Away From Work: Days away from work are those work days (consecutive or not) on which the employee would have worked but could not due to an occupational injury or illness. Lost work days shall not include the day of injury or onset of illness or any days on which the employee would not normally have worked such as weekends and holidays.

Lost workday cases involving days of restricted work activity are those cases where, because of injury or illness, (1) the employee was assigned to another job on a temporary basis or (2) the employee worked at a permanent job less than full time or (3) the employee worked at his or her permanently assigned job but could not perform all the duties normally connected with it.

Restricted work activity occurs when the employee, because of the job-related injury or illness, is physically or mentally unable to perform all or any part of his or her normal assignment during all or any part of the normal workday or shift. The emphasis is on the employee's inability to perform normal job duties over a normal work shift.

11. Measurability of Recordable Injury and Illness Cases:

- a. Total Recordable Incidence Rate: Total number of OSHA recordable cases for the reporting period.

TOTAL RECORDABLE

INCIDENCE RATE: NO. OF RECORDABLE CASES X 200,000

ACTUAL EMPLOYEE HOURS

- b. Lost Workday Incidence Rate: Total recordable cases that resulted in death or lost work days/restricted duty for the reporting period.

LOST WORKDAY

INCIDENCE RATE: NO. OF LOST WORKDAY CASES X 200,000

ACTUAL EMPLOYEE HOURS

- c. Severity Measure: Total number of work days lost that occurred during the reporting period.

SEVERITY MEASURE: NO. OF LOST WORK DAYS X 200,000

ACTUAL EMPLOYEE HOURS

For the purpose of the above formulas, the allocation of days when a death or a permanent total disability is involved is as follows:

- a. Each death from an occupational injury or illness is assigned a time of 6,000 days.
- b. Permanent Total Disability from an occupational injury or illness is assigned a time of 6,000 days.

Procedure

Upon notification of a work-related injury or illness the employer shall determine if it is recordable or non-recordable. Employer shall use the established guidelines contained in this procedure and ANSI Standard Z.16.

Submitting a Workers Compensation Employer First Report does not alone determine that an occupational injury or illness is recordable. Employer First Reports may be submitted for cases for which only first-aid treatment was rendered by a physician or registered professional.

Employer shall notify the Resident Engineer immediately of all occupational injuries or illnesses and, within 24 hours, submit a copy of the Employers First Report, supervisor's incident investigation, medical release form and physician report. These documents assist Sound Transit Safety/Security in determining injury or illness trends, and verifying that all work-related injuries and illnesses are properly recorded.

By the 12th work day of each month, each employer shall submit to the Resident Engineer, the CSM, and the ST CSM the Monthly Statistics and the Safety and Security Information Summary with complete information for the previous month. These forms shall include, for prime contractors and Subcontractors:

- Total hours worked
- Total number recordable cases for that month
- Total number of recordable lost time cases for that month
- Total lost work days for that month
- Lost work days resulting from an injury or illness from a preceding month
- Information on recordable injuries (name, craft, type injury, disposition, days off and Contractor).

SECTION 01 35 29.20 - EXHIBIT D

CONSTRUCTION SAFETY/SECURITY SURVEY FORM

DATE: _____

CONTRACT NO. _____

CONTRACTOR: _____

SUBCONTRACTOR: _____

SAFETY OFFICER: _____

	OK	LTA	NA		OK	LTA	NA		OK	LTA	NA
				HOUSEKEEPING/ SANITATION				FIRE PREVENTION			
ELECTRICAL INSTALLATIONS				HAND/POWER TOOLS				LADDERS			
SCAFFOLDING				HOISTS, CRANES & DERRICKS				HEAVY EQUIPMENT OPERATIONS			
MOTOR VEHICLE OPERATIONS				TRAFFIC CONTROL / BARRICADES				RESPIRATORY PROTECTION			
MATERIAL STORAGE / FACILITIES				EXCAVATION & SHORING				SITE CONTROLS			
								Safety and Security			
PILE DRIVING				LOTO				FLAMMABLE LIQUIDS/GAS			
MASONRY				FALL PROTECTION				PPE			

TO BE COMPLETED BY SOUND TRANSIT CONSTRUCTION SAFETY SPECIALIST/SAFETY OFFICER

OBSERVATIONS:	
ORIGINATOR SIGNATURE:	DATE:

TO BE COMPLETED BY CONTACTOR SITE SAFETY/SECURITY REPRESENTATIVE

RESPONSE / CORRECTIVE ACTIONS TAKEN:

RESPONDENT SIGNATURE:	DATE:

Original: Contractor

Copy: Resident Engineer

Copy: Sound Transit
Construction Safety Manager

SECTION 01 35 29.20 - EXHIBIT E
SUPERVISOR'S INCIDENT INVESTIGATION REPORT

SUPERVISOR'S INCIDENT INVESTIGATION REPORT	
CONTRACTOR: _____	
INCIDENT DATE: _____	TIME: _____ CONTRACT NO: _____
INCIDENT LOCATION (SPECIFIC): _____	
INJURY/ILLNESS _____ NEAR MISS _____ SECURITY BREACH _____ PROPERTY DAMAGE _____ THIRD PARTY _____	
WHAT HAPPENED? (Describe operation, activity, condition and, how incident or loss occurred. Use separate sheet and diagram if necessary.): _____ _____ _____ _____	
PRIMARY CAUSE (Condition or act that caused the incident.): _____ _____ _____ _____	
Recommended correction action: _____ _____ _____	
Equipment involved: _____ #: _____	
Employee involved: _____	
Employee Injury (Describe): _____ _____ _____	
Medical Referral: _____	
Company Property Damage or Loss (Describe): _____ _____ _____	
Property, Damage or Injury to Others (Describe): _____ _____ _____	
Owner/injured (Name, address, phone): _____ _____ _____	
Witnesses (Name, address, phone): _____ _____ _____	

ORIGINAL: Contractor's File

COPY: Sound Transit

1. This form shall be submitted by the Contractor for each incident involving any of the following:
 - a. Injury to an employee of the Contractor or any Subcontractor.
 - b. Any injury to persons not directly connected with the Contract (including all alleged injuries reported by a member of the public.)
 - c. Incidents resulting in damage to public, private or commercial property (including all alleged property damages).
 - d. Incidents that are "Near misses" that could have resulted in any of the above.
2. Submittals shall be made within 24 hours of the incident. Pertinent facts not available within the above time shall be submitted in a supplemental report.
3. This form shall be prepared by the Contractor and distributed in accordance with Exhibit C, Summary of Construction Safety and Security Reports.

Complete investigation of any incident, whether or not injury or damage is involved, is a vital part of effective incident prevention. The investigation is not complete until the causes and proper corrective actions are determined.

The investigation and this report shall be completed by you immediately after any incident relating to your job which involves:

- Personal injury to any of our personnel or any other persons,
- Damage or loss to company property, materials or equipment,
- Damage or loss to property of other and
- "Near miss" - which could have resulted in any of the above.

If property damage or personal injury to others is involved, do not assume any responsibility or obligate the company or Sound Transit in any way. Do not sign anything for anyone except your employer's representative. You should politely refer any question to your Project Manager.

In your investigation and preparation of this report, give extra attention to the following areas:

WHAT HAPPENED?

- (a) This does not mean list the injuries or damages that resulted. It means explain the events, which led to the injuries or damages.
- (b) Describe the work or activity involved, the conditions and what the people involved were doing.
- (c) Describe the tools, equipment or materials involved, their condition and how they were involved.
- (d) Describe the unexpected event or occurrence, which resulted in the injury, damage or loss.
- (e) If more space is needed or if a diagram will help your description, please attach another sheet.

CAUSES

Primary and Secondary - See Common Causes of Incidents

CORRECTIVE ACTIONS

Primary and Secondary

LOCATION

Specific place at job-site (street and city when applicable).t

PROPERTY DAMAGE OR INJURY TO OTHERS

Describe the property, extent of damage or nature of injury. If vehicle is involved, show year and model.

DESCRIBE PRACTICES OF EMPLOYEE:

Safety equipment provided but not used. Personal protective equipment provided but not used. Improper or unsafe tool or equipment used. Horseplay or practical jokes. Instructions or rules disregarded. Inattention. Inexperience. Physical condition of employee. Improper method of doing work. Action of another person. Improper clothing.

UNSAFE EQUIPMENT OR MATERIALS:

Ineffectively guarded equipment. Unguarded equipment. Defective materials. Defective tools. Defective equipment (not motor vehicles). Defective motor vehicle equipment. Improper type or poor design. Unsafe equipment or material of another Contractor or a customer.

UNSAFE CONDITIONS:

Poor light. Poor ventilation. Congested area. Improper storage of materials. Exits or emergency escapes inadequate or not provided. Faulty layout of plant or facilities. Tools or equipment improperly stored. Poor housekeeping. Unsafe conditions caused by another Contractor or a customer.

- ✓ Submit original and copy to the Resident Engineer
- ✓ Retain copy for your records
- ✓ Use a Medical Referral slip for any injured employee who goes to a Doctor
- ✓ Keep your office advised of incident development and corrective action

END OF EXHIBITS

SECTION 01 35 29.30**HEALTH, SAFETY, SECURITY AND EMERGENCY RESPONSE****PART 1 - GENERAL****1.01 DESCRIPTION:**

- A. Sound Transit does not develop or manage the safety and health programs or environmental management programs of the Contractor, its Subcontractors, or suppliers, or in any way assume the responsibility for the safety and health of their employees or their protection of the environment.
- B. The Contractor shall be responsible for the health, safety, security and personal protective equipment for the Contractor's employees, Subcontractors, vendors and other individuals on the Work Site or the general public that may be impacted or in proximity to the Work. The Contractor shall be responsible for the protection of the environment that may be impacted by or in proximity to the Work.
- C. Sound Transit may stop work for observed non-compliance with safety and environmental codes, standards, rules or contract requirements. Contractor shall bear all costs associated with any Stop Work order.

1.02 SUBMITTALS

- A. Submit to the Resident Engineer for review and approval a complete Site Safety and Security Plan (SSSP - Exhibit A) that meets the intent and requirements of a project-specific safety plan and a corporate Accident Prevention Plan (APP) within seven (7) days after the effective date of Notice to Proceed (NTP). The completed SSSP shall include project specific hazard plans as necessary (i.e. confined space, fall protection).
- B. All Contractor employees and Subcontractors shall have all adequate site and task-specific training as documented on the project-specific SSSP. Sound Transit (ST) is not responsible for content of submitted plans. However, ST reserves the right to comment on and require changes to the submitted plans.
- C. When applicable, all track access permits, ST required training records, activity hazard analyses, all other required and approved documentation, and worker awareness and coordination shall be completed and be readily available for review onsite. All work within or near rail right of way must be coordinated with the Resident Engineer prior to any on-site work to assure proper permits, training and procedures.

1.03 SAFETY PRECAUTIONS

- A. Work on or near (distance dependent on operating line) any light rail or commuter rail tracks requires training of all workers and supervisors prior to conduct of the work. Work on or near rail tracks must be coordinated sufficiently in advance to assure Work Permits and Track Access Permits can be obtained. All workers performing work on or near the Right of Way must carry current and valid Right of Way training certification cards and produce them for verification upon request.
- B. Sound Transit considers all confined spaces on Sound Transit property to be permit required confined spaces. Alternate entry procedures are not allowed. Contractor must submit permits and rescue plan to Sound Transit.

- C. Contractor must submit a complete list of chemical products to be utilized on the project along with a Material Safety Data Sheet for each product. Sound Transit is not responsible for review of submitted chemicals or MSDSs. However ST reserves the right to comment on or deny the use of certain chemicals. Chemicals that are low hazard and sustainable are preferred.
- D. Chemical products that will be utilized on Sounder platforms or within 25 feet of BNSF owned tracks must be approved by BNSF prior to use.
- E. To prevent accidental or uncontrolled release of chemicals to the environment, secondary containment must be provided while they are in use or stored on Sound Transit property. Store chemicals indoors, when practical.
- F. When work is performed in an operating public facility, during hours of operation and when members of the public are present, controls must be in place to protect the public from exposure, including perceived exposures, to chemicals, dust, noise or operating equipment. The Resident Engineer may request additional controls be established if complaints are received.
- G. Contractors must utilize fall protection/prevention when walking /working surfaces exceed heights 4 feet.
- H. Contractors must develop a job specific fall protection work plan for work performed at heights greater than 10 feet, if fall protection other than standard guard rails are used. When developing the job specific fall protection work plan, the Contractor must meet with and receive approval from the Resident Engineer to ensure that anchor points and horizontal life lines are sufficient for its purpose.
- I. Contractor performing electrical work must comply with NFPA 70E and other applicable requirements.
- J. Work zones must be demarcated when mobile equipment or powered tools are used in areas open to the public. Demarcation must be sufficient that members of the public, including disabled persons and children, cannot inadvertently or intentionally enter into the work area.
- K. Equipment operators must be trained and certified (as applicable) on the equipment they will be using and have documentation available on-site for review upon request.
- L. When work is performed in an operating public facility, during hours of operation and when members of the public are present, controls must be in place to ensure that accessible paths as required by the Americans with Disabilities Act are maintained and that sufficient work boundaries are established to prevent members of the public who have visual impairments from entering the work area.

1.04 ACCIDENTS

- A. Provide trained personnel, equipment and facilities in order to provide immediate first aid assistance to any who may be injured in the case of accident during the progress of the work. Have a standing, updated emergency procedure with hospital route map, emergency numbers and location of phones clearly posted to immediately assist any person who may be injured or may become ill, or who is rendering assistance to an injured or ill person.
- B. Report immediately to the Resident Engineer and ST's Construction Safety Manager every injury or accident to persons or damage to property; and furnish a report in writing. An accident, injury or illness is any occurrence that results in medical care or treatment beyond first aid. The report shall include full information and details for any and all

accidents including contributing factors and corrective actions to be implemented to avoid future occurrence.

PART 2 - PRODUCTS

2.01 PERSONNEL PROTECTION EQUIPMENT AND SAFETY DEVICES

- A. 100% eye protection (glasses with side shields) compliant with ANSI z.87.1
- B. 100% head protection (hard hat) compliant with ANSI z89
- C. 100% foot protection (boots) compliant with ANSI z41.1
- D. 100% hi-visibility (safety vest) compliant with ANSI/ISEA 107-2010 Class II
- E. 100% hand protection (gloves appropriate for task)
- F. All other PPE shall be approved by applicable safety standards and authorities

PART 3 - EXECUTION

END OF SECTION

EXHIBITS

Exhibit A: Sound Transit Contractor SSSP.

SECTION 01 35 29.30 – EXHIBIT A
SOUND TRANSIT CONTRACTOR SITE, SAFETY, AND SECURITY PLAN

Date Form Completed _____

IX. GENERAL INFORMATION

Your Name	
Company Name	
Company Address	
Company City	
Company State	
Company Zip	
Contact Number	

Please Detail the Proposed Scope of Work: _____

Location of
Project/Work _____

Anticipated timeframe of project, from _____ (date) to _____

On-site Supervisor (print): _____ Phone: _____

On-site Safety and Security Rep (print): _____ Phone: _____

Sound Transit Resident Engineer (print): _____ Phone: _____

II. Project Specific Safety Hazards

List the minimum required PPE: _____

Check the boxes for the hazards or concerns identified for the tasks associated with the scope of work (i.e., fall hazards, hot work, respiratory hazards, confined space, scaffold). **A plan must be submitted for review by Sound Transit for any of the following that are checked:**

- ☐ Scaffold Safety
- ☐ Cranes/Rigging
- ☐ Excavation
- ☐ Utility Clearance and Overhead Hazards
- ☐ ROW Training
- ☐ Fall Protection/Bridge Worker Safety
- ☐ Confined Space
- ☐ Lockout/Tagout
- ☐ Hazardous Waste
- ☐ Hearing Conservation
- ☐ Respiratory Protection
- ☐ Hazard Communications
- ☐ Fire Protection/Prevention
- ☐ Powered Industrial Trucks and Forklifts
- ☐ Bloodborne Pathogen

Other: _____

Other: _____

List measures or controls the contractor is implementing to mitigate these hazards and safety concerns. _____

III. JOB SAFETY BRIEFINGS

The below statements **must be checked** and implemented within your project safety plan; by checking these statements you affirm that they will be accomplished. This SSSP will not be accepted unless these are checked.

- ☐ Job Safety Briefings will be completed at the start of the work shift and as needed during the course of the day; e.g., personnel changes, weather changes, or changes in assignments.

- ☐ Job Safety Briefings will include Emergency Response Information and summarize the location and emergency contact numbers.

IV. EMPLOYEE TRAINING

The below statements must be checked if they apply, and implemented within your safety plan; by checking these statements you affirm that they will be accomplished. This SSSP will not be accepted unless these are checked.

- ☐ *All employees working on a Sound Transit site have completed a job specific Worker Safety Orientation Program.*
- ☐ *All employees working on Central Link, who will be working within 10' of track, have completed a Sound Transit Roadway Worker Protection/On-Track Safety Training, or who are working within 25' of BNSF or Sound Transit commuter rail track have completed both BNSF Contractor Orientation and Roadway Worker Protection classes.*
- ☐ *All work activities within 4' of Tacoma Link rail, 10' of Central Link rail or within 25' of BNSF or Sound Transit commuter rail track require a completed and approved Track Access/Work permit.*

List below, other required safety training conducted by/through the contractor company in which your employees, who will be working on Sound Transit property. Copies of training programs do not need to be provided. *Safety Training needs to be conducted by/through the contractor company.*

- ☐ Identify the project competent person for those tasks, equipment, or machinery that requires related training.

V. EMERGENCY PREPAREDNESS

Written Emergency Preparedness information needs to be at the job-site with work groups. For projects in fixed work locations complete the following. For work groups that will be on the move during the course of a project this information needs to be updated as necessary and maintained with each work group.

Central Link Control Center Phone Number is: (206) 205-8177

Sound Transit 24-hour Emergency Phone Number is: (206) 398-5268

BNSF ROCC Phone Number is: (800) 832-5452

The below statements must be checked and implemented within your safety plan; by checking these statements you affirm that they have been accomplished. This SSSP will not be accepted unless these are checked.

- ☐ **Job Safety Briefings will include emergency preparedness information.**
- ☐ **Copies, if required, of Material Safety Data Sheets (MSDSs) for hazardous materials will be provided to the Sound Transit Resident Engineer and be maintained on-site.**

Address and street intersections adjacent to the job-site:

For Medical, Fire, or Police **Call 911.**

Inform all employees of the site address and major adjacent intersections.

Attach a hospital route map to this SSSP

Verify project communications: ☐Landline ☐Radio ☐Cellular telephone
and

The below statements must be checked and implemented within your safety plan; by checking these statements you affirm that they will be accomplished. This SSSP will not be accepted unless these are checked.

- ☐ **First Aid and CPR trained employees will be at the job-site(s) and identified during job safety briefings.**
- ☐ **A First Aid Kit and fire extinguisher will be available at the job-site**

Note: Identify and assign where an employee will meet emergency response personnel, i.e. at an intersection, gate/fence, and other location

☐ **The Sound Transit Resident Engineer will be notified immediately after any injury requiring time loss, and within 24 hours for any DOSH recordable injury. All injury or property loss incidents will be investigated using root cause analysis. Investigation reports will be submitted to Sound Transit within seven (7) days and will include root causes and corrective actions.**

☐ **The Sound Transit Resident Engineer will be notified immediately after any spill to soil, storm water systems or a water body, or large enough that it cannot be contained by one on-site**

person, and within 24 hours for any spill greater than 5 gallons that was contained onsite. All spill incidents will be investigated using root cause analysis. Spill reports will be submitted to Sound Transit within seven (7) days and will include root causes and corrective actions.

VI. FIRE PREVENTION

Hot Work activities will be performed?: ☐ Yes ☐ No

The below statements must be checked and implemented within your safety plan; by checking these statements you affirm that they will be accomplished. This SSSP will not be accepted unless these are checked.

- ☐ Hazard Assessment activities and Pre-task safety briefing will identify procedures and equipment available for fire prevention and suppression, as well as, locations where equipment will be staged.
- ☐ In Right-of-Way areas, Sound Transit operations contacted to confirm approval for hot work and document restrictions. Ensure location is known for emergency assistance.

VII. SAFETY AUDITING

Formal safety audits/surveillance of on-site work activities will be conducted at the following frequency (e.g. twice/week, weekly): _____

The below statements must be checked and implemented within your safety plan; by checking these statements you affirm that they will be accomplished. This SSSP will not be accepted unless these are checked.

- ☐ Assessments will include a full list of work activities, safety procedures, hazard mitigation, site controls as well as the identification of physical hazards.
- ☐ Reports of audit findings will be documented and submitted for review by Sound Transit Construction Safety.

Identify which contractor personnel who will conduct and review Safety Audits with the ST safety representative:

Name (print): _____ Phone: _____

VIII. SAFETY COMMUNICATIONS PLAN

In addition to Job Safety Briefings, briefly describe the daily pre-task briefing for safety-related information and a list of all site personnel that participated in the daily site briefing.

Briefing Topic: _____

List All Meeting Attendees (print):

IX. ROADWAY WORKER PROTECTION/ON-TRACK SAFETY INFORMATION

For contractors working near track or on station platforms, mark what applies to your work group and verify that the following items are in place before starting work:

☐ Completed applicable roadway worker protection plan/on-track safety programs

☐ Tacoma Link

☐ Central Link

☐ Sounder/BNSF

☐ Amtrak

☐ Will require and have been assigned a safety watch, flagger or platform lookout

☐ Track Access/Work Permit approved and activated

☐ Will utilize or require on-track equipment with trained and certified operators

☐ Not Applicable (No workers within specified distances by line from track)

THIS COMPLETED SSSP SHALL BE SUBMITTED TO THE ST RESIDENT ENGINEER.
ADDITIONALLY, PRINT A COPY OF THIS SSSP. KEEP A COPY AT ALL WORK SITES AND GIVE ONE TO EACH OF YOUR ON-SITE WORK-GROUPS.

FOR CONTRACTOR WORK GROUPS WORKING WITHIN OR NEAR A RIGHT OF WAY, A COPY OF YOUR ROADWAY WORKER PROTECTION/ON-TRACK SAFETY PROGRAM MUST BE MAINTAINED WITH EACH WORKGROUP.

END OF EXHIBITS

SECTION 01 35 30**HEALTH, SAFETY, SECURITY AND EMERGENCY RESPONSE PROCEDURES - UNDERGROUND
SUPPLEMENT****PART 1 - GENERAL****1.01 SUMMARY**

- A. This Section includes specifications for complying with applicable laws and regulations related to health, safety, security and emergency response procedures. It is not the intent of Sound Transit to develop or manage the safety, security and health programs of the Contractor, its Subcontractors, or Suppliers, or in any way assume the responsibility for the safety and health of their personnel.
- B. Failure to comply with these specifications or observed safety or security deficiencies will require immediate corrective actions with written response to the Resident Engineer within 24 hours of verbal or written notice from Sound Transit or their representatives. Lack of corrective action or sufficient response may result in a Stop-Work Order as described in General Conditions, Section 00 02 00, Stop Work Order. In the event of a Stop-Work Order, in accordance with the General Conditions, the Contractor shall be responsible for any impact to Contract Price and/or Contract Time,
- C. Sound Transit reserved the right to remove employees or require the Contractor to document disciplinary policy or warnings for Contractor employees or Subcontractor employees that fail or refuse to follow and adhere to all safety requirements and regulations established by regulatory agencies, Sound Transit safety policies, and the contractor's site specific safety plan and program.
- D. The Contractor shall have a written disciplinary policy that issues written warnings to employees for safety infractions. Contractor employees receiving second infractions for violating safety policy or incurring a second safety infraction shall be suspended from the Sound Transit project site for a minimum of 5 days.
- E. The Contractor shall provide written documentation for employees and their immediate supervisor that those individuals have received re-training and have drafted corrective actions related to the incident when Contractor employees or subcontractors document a second incidents or mishap on the project site.
- F. All safety and security related project, Contractor, or Subcontractor records or certifications must be accessible to Sound Transit upon request. The documents shall be provided whether the records are specifically mentioned as submittals for Sound Transit review upon request within this specification.

1.02 REFERENCES

- A. Acronyms and Abbreviations
 - 1. AED: Automated External Defibrillator
 - 2. AHJ: Authority Having Jurisdiction
 - 3. ANSI: American National Standards Institute

4. ConSM: Contractor Safety Manager
5. CPR: Cardio-Pulmonary Resuscitation
6. CSM: Sound Transit Construction Safety Manager
7. CSSP: Construction Safety and Security Plan
8. CWP: Construction Work Plan refer to Section 01 45 00, Quality Control
9. DOSH: Washington State Labor and Industries; Division of Occupational Safety and Health (Washington State OSHA)
10. EPA: Environmental Protection Agency
11. TCP: Traffic Control Plan
12. JHA: Job Hazard Analysis refer to 1.04 E. herein
13. LEL: Lower Explosive Limit
14. Link: Link Light Rail Project
15. MEP: mechanical, electrical, and plumbing
16. MSDS: Material Safety Data Sheet
17. MUTCD: Manual of Uniform Traffic Control Devices
18. NCR: Non Conformance Report
19. NEC: National Electric Code
20. NFPA: National Fire Protection Association
21. NIOSH: National Institute of Occupational Safety and Health
22. NTP: Notice to Proceed
23. OCIP: Owner Controlled Insurance Program
24. OSHA: Occupational Safety & Health Act
25. PEL: Permissible Exposure Limits
26. PPE: Personal Protective Equipment
27. PSAPCA: Puget Sound Air Pollution Control Agency
28. PTA: Pre-Task Analysis
29. SQA: Sound Transit Safety and Quality Assurance Department
30. SSSR: Contractor's Site Safety and Security Representative
31. WAC: Washington Administrative Code

- B. Reference Standards: This Section incorporates by reference the latest editions and revisions of the following documents.

1. United States Code (USC)
 - a. USC 651 et seq. Federal Occupational Safety and Health Act
2. Code of Federal Regulations (CFR)
 - a. 29 CFR 1910 OSHA General Health and Safety Standards
 - b. 29 CFR 1926 OSHA Construction Safety and Health Standards
 - c. 40 CFR 300 Emergency Planning and Community Right-to Know
 - d. 49 CFR 659 DOT Rail Fixed Guideway Systems (Traffic Safety)
3. Revised Code of Washington (RCW)
 - a. RCW 49.17 Washington Industrial Safety and Health Act
4. Washington Administrative Code (WAC)
 - a. WAC Chapter 296-24 General Safety and Health Standards
 - b. WAC Chapter 296-27 Recordkeeping and Reporting
 - c. WAC Chapter 296-45 Safety Standards for Electrical Workers
 - d. WAC Chapter 296-46A Safety Standards -- Installing Electric Wires and Equipment -- Administrative Rules
 - e. WAC Chapter 296-62 General Occupational Health Standards
 - f. WAC Chapter 296-155 Safety Standards for Construction Work
 - g. WAC 296-350, DOSH Administrative Rules
 - h. WAC 296-800, Safety and Health Core Rules
 - i. WAC 296-803, Lockout/Tagout
 - j. WAC 296-809, Confined Spaces
 - k. WAC 296-800 to 296-878 Specific DOSH Safety Rules
5. National Fire Protection Association (NFPA) Standards
 - a. NFPA 70, National Electric Code, 2004 Edition
 - b. All NFPA regulations for standpipe installation and testing
 - c. NFPA 130, Standard for Fixed Guideway Transit and Passenger
 - d. NFPA 241, Standard for Safeguarding Construction, Alteration or Demolition
6. Federal Highway Administration (FHA)
 - a. FTA Guidance Circular 5800.1, Safety and Security Management for Major Capital Projects

- b. Manual on Uniform Traffic Control Devices (MUTCD), U.S. Department of Transportation, Federal Highway Administration
- 7. Washington Department of Transportation
 - a. Standard Specifications for Road, Bridge and Municipal Construction, Washington State Department of Transportation
 - b. Traffic Manual M51-02, Washington State Department of Transportation
 - c. Work Zones Traffic Control Guidelines M54-44, Washington State Department of Transportation
- 8. Municipal Codes
 - a. Requirements as stated by authorities having jurisdiction or permit requirements, including, but not limited to fire departments, municipalities, utility entities, or police departments.

1.03 DEFINITIONS

- A. Certified Industrial Hygienist (CIH) – A trained specialist with at least 5 year's of experience in hazardous material processing and working knowledge of selection and use of PPE, air monitoring, regulation, and other health and safety issues.
- B. Contractor's Safety Manager (ConSM) and Site Safety and Security Representative (SSSR): A Contractor's safety and security professional(s) who shall be responsible for the implementation and compliance of the Contractor's Construction Safety and Security Plan, and who shall be assigned full time to the job site whenever work is in progress. The Contractor's safety and security representative(s) cannot be assigned a non-safety or security related task.
- C. Competent Person: An individual identified as having the necessary experience and training to evaluate the presence and control of specific hazards on the site. Different activities require specific training and expertise. Refer to the applicable WAC codes for training and to define a Competent Person for specific technical activities.
- D. Gas Tester: Individual who works directly for the Contractor's Safety and Security Representative and is competent or certified to calibrate and use equipment to monitor ambient and air conditions.
- E. Hot work: Any work involving a flame or sparks, such as a torch, grinder, or electric arc welder. A Seattle Fire Department hot work permit is required before hot work may begin.
- F. Incident: Event requiring a documented report from the Contractor or a usual event or occurrence but not limited to:
 - 1. Injury to an employee of the Contractor or any Subcontractor.
 - 2. A damage, occurrence or injury to persons or damage to public, private, or commercial property as a result of project conditions, site controls, or Contractor activities (including all alleged injuries reported by a member of the general public.)
 - 3. Incidents resulting in first aid to a person, damage to equipment, or property (including all alleged property damages).

4. "Near misses" that could have resulted in any of the above.
- G. Personal Protective Equipment (PPE) – Includes all clothing and other work accessories designed to create a barrier against workplace hazards. Examples include safety glasses, welding goggles, face shields, hard hats, hearing protection, gloves, respirators, capes, aprons, and work boots.
 1. Resident Engineer: The individual responsible for administration of the construction contract.
- H. Security: Refers to the protection of both Sound Transit property and the personnel and property of the Contractor from theft, vandalism, pilfering, or other destructive activities.
- I. Threat: A potential action or situation that may cause harm to people or property.
- J. Toolbox Safety and Security Meeting: Weekly safety and security meeting held by the superintendent for the project staff or foremen for their crews which, at a minimum, comply with the WAC 296-800-130 and include the following activities:
 1. Review reports of walk-around safety and security inspections conducted since the last safety and security meeting
 2. Review corrective actions or deficiencies identified so that similar hazards can be corrected and prevented
 3. Evaluate incidents and associated investigations conducted since the last meeting to determine if the causes of the unsafe situation were properly identified and corrected
 4. Document attendance and the information discussed at the meeting
 5. Submit attendance and minutes of each meeting
- K. Track Access Permit: a form signed, approved, and issued by Sound Transit rail operations for accessing and conducting ANY activity within 10 feet of the active operating track, on any platform, or at any active station. Permits are only issued weekly and at the discretion of the Light Rail Operations Chief.
- L. Volatile Organic Compounds (VOCs): carbon-based compounds, ranging from those that evaporate easily (e.g., hexane) to those which may be only semi-volatile (e.g., chlorinated hydrocarbons). VOCs most commonly encountered on construction sites include solvents used in adhesives, coatings, sealants, thinners, caulking, fuels, material treatments, and preservatives. They may have a strong odor (e.g., aromatic hydrocarbons in gasoline) or they may be nearly odorless (e.g., odorless mineral spirits).
- M. Vulnerability: A weakness in the design, implementation, or operation at the construction site that can create a hazard, initiate a security risk, or cause a severe disruption to site personnel.

1.04 SUBMITTALS

- A. Any review of safety and security documents, plans, or submittals by the Resident Engineer, and Sound Transit, or their designees, shall not constitute approval of the safety or security elements, mitigations, or hazard/threat precautions employed by the Contractor during construction, or constitute approval of Contractor's means or methods of construction

- B. Construction Site Safety and Security Plan (CSSP): Within 30 Days of mobilizing to the site or receiving the contract Notice To Proceed and prior to start of any work. Refer to Article 1.05, herein.
- C. Qualifications of the ConSM and SSSR: Within 15 Days of Notice To Proceed.
 - 1. A resume summarizing the qualifications and work experience of the proposed ConSM and any SSSR proposed for assignment to the Contract. The ConSM and SSSRs shall be required to provide references from three (3) previous projects and they may be requested to appear for a personal interview prior to their receiving an acceptable disposition by the Resident Engineer prior to their assignment to the project. References shall include contact information of owners and construction management team members from projects listed.
 - 2. All ConSMs and SSSRs shall be on a 90 Day probation period starting from the initial date of project field mobilization. Evaluations will be conducted by the Sound Transit Construction Safety Manager, Resident Engineer, and SQA. If any of these parties are not reasonably satisfied with performance, they may request the Contractor remove and replace an individual within 30 Days of written notification from The Resident Engineer.
- D. Emergency procedures.
 - 1. Address applicable emergency response procedures for the extent, current scope of work, and number of employees the plan is intended for.
 - 2. Modify the plan as needed as site conditions, number of employees and project site activities and hazards change.
 - 3. Reconcile all procedures with any comments provided by the Resident Engineer.
 - 4. No physical work may occur on-site before the document is returned with acceptable disposition.
- E. Job Hazard Analysis (JHA)
 - 1. JHA(s) correspond with a specific work activity and meet the requirements of these Specifications and the CSSP.
 - 2. Submit a JHA within 5 Days of beginning the activity associated with the JHA, or a minimum of seven (7) Days before beginning on-site mobilization activities.
 - 3. The JHA shall identify:
 - a. Foreseeable hazards and threats, planned protective measures, provide drawings or other documentation of protective measures prepared, and for any constructed devices, platforms, shall have shop drawings or plans signed and stamped by a Professional Engineer or approved by a Competent Person. The Competent Person shall be clearly identified and present on-site and available for random workplace inspections.
 - b. Log and submit all location request numbers provided by the utility locator service (One Call Center) or utility companies concerning underground utilities and submit with the JHA. Make this log available to the Resident Engineer upon request.
 - 4. The JHA shall emphasize safety considerations for the following hazard events:

- a. Falls from elevation, confined spaces, respiratory protection, excavation/trenching, public exposure, and excessive noises;
- b. Activities with potential for struck by, underground utilities, line braking, high voltage work, MEP issues;
- c. Hot work and other potential injury from burns, either chemical or thermal;
- d. Work involving cranes/rigging, systems requiring LOTO, scaffolds/aerial lifts, hazardous materials,.
- e. Potential for oxygen-deficient environments;
- f. Limited access or exit conditions;
- g. Potential of crushing or pinch point between objects;
- h. Potential injury from strain by pushing, pulling, or lifting; potential back injuries and slip/twist/trip hazards
- i. Potential for property damage or loss of function to non-project third parties (i.e., critical lifts, power outages, roadway work, etc.)

F. General Safety Submittals

- 1. Complete Crane Inspection Record and the Wire Rope Inspection Record on schedule and maintain on-site. Submit a copy of all crane certifications, crane operator certifications, and annual crane inspection prior to use of the crane. Crane Inspection Record and the Wire Rope Inspection Record are shown in attached Exhibits E and F.
- 2. An appropriate schedule and documentation for testing physical or environmental exposures, including air, gases, rail equipment, and other hardware that may impact the health and safety or security of workers
- 3. Submit a Worksite Threat Analyses (WTA) to the Resident Engineer that meet the requirements of this specification, no later than 14 Days after the site perimeter is established.
- 4. Submit a fall protection work plan and applicable emergency rescue plan for all work to be conducted with a fall hazard greater than 10 feet in height.
- 5. Maintain copies of all employee certifications, training records, and lists of competent persons for specific operations, equipment, or safety awareness.
- 6. Submit a Confined Space Program, as needed, in accordance with requirements of WAC 296-809-300.

G. Weekly Submittals

- 1. Submit a weekly safety and security report detailing issues and inspections of the job site(s) and adjacent public areas to document activities, site controls, and conditions. Provide detail of the corrective action(s) taken to eliminate unsafe acts and conditions.

2. Include in the weekly safety and security submittal inspection report of the fall protection systems, job site(s) procedures related to fall protection or fall arrest, and confirmation of inspections of all stair tower or scaffolding systems. Document the competent person making the inspections, the types of activities, site controls, and work site conditions. Provide details of the corrective action(s) taken to eliminate unsafe acts and conditions.

H. Monthly Submittals

1. Submit as part of the monthly pay application, a Monthly Injury/Illness Report, and the Safety and Security Occurrence Tracking Log Summary on forms provided by Sound Transit herein (Exhibit B and Exhibit O).

I. Incident, Accident or Event Submittals

1. Contact the Sound Transit Resident Engineer and Sound Transit Construction Safety Manager immediately of any incident or accident occurring on the site.
2. Incident Report: Submit a detailed written incident report with photographs, witness statements, and a Root Cause Analysis within 48 hours of a security or safety incident, property damage, or possible third-party claim.
3. Submit a completed written incident report generated by the individuals involved and/or injured detailing all information related to the incident or injury or possible third-party claim.
 - a. The Contractor shall make an initial incident report by phone call or email. Report information should include the circumstances, extent of injury or damage, name and trade of the injured and subsequent actions for all incidents.
 - b. Submit the eligible/ineligible status for employees completing a post-accident substance abuse testing for all employees involved in an incident or accident.
 - c. Include in the report full information, including testimony of witnesses regarding all incidents. Submit the report within 48 hours of the incident.
 - d. Update the occurrence log included as Exhibit O, with relevant incident information and transmit the updated log to the Resident Engineer within 24 hours of an incident.
4. Submit requests for use of a crane-suspended work platform or man-cages.
5. Submit prior to use, MSDSs for materials or chemicals proposed for site work; include the product specification sheet or label and an MSDS for the product
6. All safety-related submittals are subject to review by the Resident Engineer. Sound Transit reserves the right to request and review all copies of PTA cards.

1.05 CONSTRUCTION SITE SAFETY AND SECURITY PLAN (CSSP)

- A. Site Safety and security is the responsibility of the Contractor regardless of project completion status until care and custody has been formally given to another Contractor entity or Sound Transit. The Contractor's CSSP shall define the duties and responsibilities of Contractor and Subcontractor personnel

- B. Provide a written safety and security procedures for review and comment by Sound Transit. This CSSP shall detail the methods of implementing measures to protect employees and securing the Contractor's construction site. The CSSP shall address both active and passive safety and security measures that will be implemented and maintained by the Contractor.
- C. Reconcile comments such that the document can receive an acceptable disposition by the Resident Engineer and SQA.
- D. Submit a site-specific safety and security plan to address all tasks and elements of the scope of work to be implemented for each worksite.
- E. Prepare monthly written reports to summarize safety and security related issues, problems, or concerns, to document and assess the effectiveness of the CSSP.
- F. Establish signage on perimeter walls or fencing against trespassing and contact the local law enforcement agency to discuss trespassing and security responses. Submit a security plan and program as part of the CSSP submittal.
- G. The Contractor's CSSP shall describe and include procedures for documentation of:
 - 1. Organizational Chart;
 - 2. List of key personnel, title or position, contact information, and shift they will be assigned.
 - 3. Contractor's full-time Site Safety and Security Representative (SSSR) priorities description. This position is required staffing on-site at all times and shifts that physical work is occurring.
 - 4. Contractor's competent person for completing JHAs and WTAs. The competent person for performing these safety and security analyses shall be identified;
 - 5. Minimum requirements, forms, and procedures for both JHAs, PTAs and WTAs;
 - 6. Safety and Security Incident Plan or emergency response plan;
 - 7. Safety and security requirements shall at a minimum meet all applicable codes, requirements and industry standards;
 - 8. Schedule of safety and security related meetings;
 - 9. Safety and security procedures and forms;
 - 10. Summary of the employee indoctrination program, including details for the elements of the safety and security orientation sessions;
 - 11. A description and schedule of the pre-task safety and security meetings, procedures for hazard analyses development, means and forms for safety and security communications, and documenting and distributing lessons learned;
 - 12. Investigations and documentation of all safety and/ security incidents and to determine root cause and necessary corrective actions;
 - 13. Training sessions for the use of proper work procedures, equipment, personal protective equipment, mechanical guards, and security devices,

14. Safety inspection plan including daily, and monthly inspections, including procedures shall be outlined for closeout of deficiencies found during inspections;
15. Weekly safety and security meetings with related topics and instructions for individual personnel and group safety and security training programs to be documented using forms equivalent to those shown in Exhibit A;
16. Maintenance of records of safety and security incidents, and development of safety, security, and loss experience summaries;
17. Monthly Safety and Security Committee meetings with representatives from all trades and crafts on the site during the month;
18. Employee involvement and input through several different means, which includes readily accessible means for anonymous input related to safety and security issues or concerns;
19. Quarterly meetings between the Resident Engineer, Sound Transit SQA management, ConSM, Contractor corporate management, and the Sound Transit Link Program Senior Management to review safety program, reports, documentation and status;
20. Monthly meetings between the Contractor Site Safety and Security Manager, Representatives (SSSR), project manager, the Resident Engineer, Sound Transit CSM, and, Sound Transit Construction Manager.
21. Emergency Action Plan;
 - a. Provide a written Emergency Action Plan as part of the CSSP, including, but not be limited to, actions to be taken for the following:
 - 1) Injuries to personnel;
 - 2) Injuries to the general public on or adjacent to the work site;
 - 3) Property damage with particular emphasis on utilities;
 - 4) Fire;
 - 5) Natural disasters, such as earthquakes, destructive storms, or snow;
 - 6) Public demonstrations such as protests that impact the job site;
 - 7) Security threats, bomb threats or other destructive threats;
 - 8) Other exposures or potential hazards that may occur at the work site.
 - b. The Emergency Action Plan shall identify levels of incident with appropriate actions to be taken.
 - c. Refer to "Emergency Procedures" article in this section for additional description of Emergency Action Plan content
22. Fire Prevention and Safety Plan;

- a. Provide a written Fire Prevention and Safety Plan as part of the CSSP, which:
 - 1) Complies with the recommendations of the National Fire Protection Association and applicable local rules, ordinances, and regulations of Seattle Fire Department, DOSH and Fed/OSHA regulations. The Contractor's attention is particularly directed to the requirements of WAC 296-155-265, WAC 296-155-400, WAC 296-155-405, WAC 296-155-404, and WAC 296-155-410.
- 23. Control of Hazardous Substances and Hazard Communication Plan; and
- 24. Maintenance and testing records for plants, tools, hoisting systems, ventilation systems, etc.
- H. Additional Safety and Security Elements of the CSSP
 - 1. The Contractor's Security performance against the CSSP will be assessed by the Resident Engineer and the Sound Transit safety representatives.
 - 2. The Contractor's CSSP shall define the duties and responsibilities of Contractor and Subcontractor personnel. In addition to safety requirements, the CSSP will require that each Contractor perform the following security duties:
 - a. Document Subcontractor safety/security practices;
 - b. Assign a Safety and security lead (may be the ConSM and/or SSSR) for all shifts;
 - c. Describe site characteristics, threats or potential vulnerabilities for safety issues related to the surrounding areas or neighborhood and access points;
 - d. Provide site, traffic control, and haul route maps;
 - e. Include the on-site emergency procedures (such as fire, earthquake, chemical spills, social disturbances, and vandalism);
 - f. Include local emergency and medical addresses/numbers (e.g., fire/police and hospital);
 - g. Describe the means and methods for site security (e.g., fencing, guards, and visitor control);
 - h. Provide a method for immediate site personnel identification;
 - i. Investigate security incidents and issue reports;
 - j. Include procedures for adequate daily and emergency site communications;
 - k. Develop a site security audit program;
 - l. Ensure prompt reporting of security incidents to Sound Transit Construction Safety and the Resident Engineer

- m. Evaluate, review and modify safety and security practices to adjust to the changing nature of the work site.
- 3. Construction Site Security Guidelines
 - a. Organization
 - 1) The Contractor shall have a designated SSSR or ConSM who is responsible as the security supervisor.
 - 2) The security elements of the CSSP shall detail the chain of command and communications from the Contractor's security representative up through the Resident Engineer and Construction Manager to the CSM and finally to the Sound Transit Security Officer.
 - 3) The Contractor is responsible for security after working hours and on weekends. Work site access points shall be manned or secured 24 hours a Day, 7 Days a week.
 - 4) Ensure contracted security personnel are licensed and have received Washington State Department of Licensing minimum security training as specified by guidelines for security personnel selection and training guidelines are available for the American Society of Industrial Security (ASIS) and Washington State. Department of Licensing minimum security training can be found at its website:
<http://www.dol.wa.gov/business/securityguards/sggetunarmed.html>.
 - b. Access Control
 - 1) Control access at all times to the construction site.
 - 2) All gates and access points shall be manned when open or locked when not in use. Dedicated personnel shall be in immediate proximity to an open gate during working hours.
 - 3) Minimize workers' personal vehicle parking and vehicle access to the construction site. Designate a separate parking location.
 - 4) Clearly post No Trespassing signage with applicable RCW and City Municipal Codes at all entrance points and space at reasonable intervals along the entire fenced perimeter or sound wall.
 - 5) Designate a point of contact that is responsible for controlling access point personnel, maintaining signage, and site access equipment.
 - c. Identification Badges
 - 1) Issue identification badges to all personnel and Subcontractors.
 - 2) Photo identification is required. Badges shall be worn at all times when onsite and readily available on the person for

inspection. When possible, the badges shall be visible on the outer most garments.

- 3) Badge recipients shall sign an acknowledgement that they will report lost, stolen, or damaged badges.

4. On-site Vehicles

- a. Clearly post at all entrances or convey in site orientations, designated parking areas and if personnel vehicles are allowed onsite.
- b. Register all approved employee vehicles allowed access to the site and issue a vehicle placard or a parking pass. Parking passes shall be easily recognizable and shall be prominently displayed at all times while the vehicle is on site.
 - 1) Address supplier and vendor parking policies as well. Vehicle policies and procedures shall include requirements for visitor vehicles and deliveries.
 - 2) All delivery drivers shall be required to don site required PPE when outside vehicle cabs or other when onsite in active work areas.

5. Contractor Physical Security

a. Barriers

- 1) Place a continuous sound wall or adequate fence around the entire construction site.
- 2) For walls, construct of adequate material, remove graffiti immediately and any damage and maintain timely to retain integrity of the wall.
- 3) If a fence is used the structure shall be sturdy with glare screen along the entire fence. At a minimum the fence shall be 8 feet high, 11-gauge wire or heavier, unless otherwise specified.
- 4) Maintain the fence in good condition and make all necessary repairs immediately.
- 5) Protect all fence connectors, bands, bolts and other fasteners to prevent access from the outside of the fence.
- 6) Allow no gaps in the fence greater than 2-inches, including the gap between the bottom of the fence and the ground, and each side.
- 7) Bolt continuous rails to the top and bottom of the fence fabric. Top and bottom rails shall be of the same material, with the same diameter and same fastener parts.

b. Gates

- 1) Construct gates the same height and manner as the fence.

- 2) Maintain gates in good repair.
- 3) Open gates shall be manned **at all times.**
- 4) Gates should be open only when required for operations.
- 5) Lock gates when closed and when not in use.
- 6) Install alternate access gates for:
 - a) Emergency egress;
 - b) Egress if unforeseen situations or work tasks block main access;

c. Lighting

- 1) Contract Specifications may dictate varying lighting requirements.
- 2) Illuminate the entire perimeter and lighting with shrouds or diffusers. Provide two levels of illumination. Illuminate for safety purposes when the site is active and illuminate for securing purposes when the site is inactive.
- 3) Illuminate both sides of the wall or fence in accordance with Contract Drawings or to provide adequate illumination.
- 4) Provide additional lighting at access points:
 - a) Eliminating shadows and blind spots
 - b) Providing for vehicle and pedestrian safety
- 5) Report intentional damage to light fixtures and equipment immediately to the ConSM and repair or replace light fixtures within 8-hours.
- 6) Power source for perimeter lighting shall be secured for limited access and be tamper proof.
- 7) Switches and controls shall be inaccessible from outside perimeter.
- 8) Adequately lighting shall be provided for materials and equipment storage areas.

d. Lock and Key Control

- 1) Establish a lock and key control policy.
- 2) Define and designate in the CSSP who is responsible for lock and key control.
- 3) The ConSM or designee shall have overall authority for the issue and replacement of all locks and keys for the construction site.
- 4) Do not allow non-Contractor personnel to sign for keys.

- 5) Key recipients shall sign an acknowledgment that they will report lost keys and that they may not duplicate keys.
- 6) Master keys shall not be identifiable as such.
- 7) Check locks on active and inactive doors and gates regularly for evidence of tampering.

e. Alarms

- 1) The Contractor may decide what, if any, alarm devices are to be used on site for intrusion and fire at project offices, storage areas, or other structures. The Contractor shall submit to the resident engineer a plan, if used, how alarms will be monitored.
- 2) Notify the Sound Transit Construction Safety Manager and Resident Engineer if alarms are triggered or activated.

f. Communications

- 1) Provide a communications plan for security and emergency response events.
- 2) Define what type of communication devices are to be used for security and emergency events.
- 3) If radios are used onsite, the employees in charge or incident commander shall have a separate frequency or the ability to override other users in an emergency situation.
- 4) Define how emergencies are reported to:
 - a) Communicate and coordinate with local Police and Fire, and
 - b) Work with emergency services to establish central locations or special access routes, or access points to the construction sites.
- 5) Contact local emergency responders to conduct site walks or regular visits to be familiar with site access points, personnel in charge, emergency response plans and other site-specific information that may be needed during an emergency response or medical event.

- 6. Notify the Resident Engineer and Sound Transit Construction Safety Manager of all security incidents immediately upon discovery or occurrence by the Contractor.

1.06 QUALITY ASSURANCE

- A. Projects with less than 20 field workers on-site during any shift may designate one individual to assume the duties of the ConSM and SSSR and be designated the Employee-In-Charge of safety. In this case, the EIC must be at a supervisory-level position, but may have job duties in addition to specification 01 35 29.30 requirements.
- B. Contractor Safety and Security Manager (ConSM)

1. Appoint a designated Contractor Safety and Security Manager. The ConSM shall report directly to the Contractor's corporate safety director (or the Contractor's equivalent) with a dotted-line responsibility to the Contractor's Project Manager.
2. The ConSM, or SSSR, shall be onsite whenever work is in progress.
3. Qualifications:
 - a. A minimum of 5 years progressive experience and demonstrated work experience on projects similar in scope and nature to the work to be done on this Contract.
 - b. Be knowledgeable concerning all federal and State regulations applicable to safety.
 - c. Provide proof of current OSHA 30-hour Construction Safety Training (OSHA 510) and proof of current certification as an OSHA Construction Safety Outreach Instructor (OSHA 500).
 - d. Competent Person designation in construction safety disciplines related to the work to be performed and be able to identify Competent Persons required by State and federal safety standards.
 - e. Current certification for CPR and First Aid.
 - f. Possess training and be capable of performing incident investigations and developing a concise report.
 - g. Possess training in the development and presentation of safety training meetings.

C. Contractor's Site Safety and Security Representative (SSSR)

1. The Site Safety and Security Representative (SSSR) shall be responsible for on-site safety and security coordination with the full support and cooperation of the Contractor's project manager. The SSSR shall be assigned to a contract and shall not be utilized on any other concurrent Sound Transit contracts or other Contractor projects. If necessary, employ additional full-time SSSRs to ensure adequate coverage of all on-going work sections.
2. The SSSR shall have full support from corporate management and the authority to immediately correct unsafe conditions and unsafe practices. The SSSR shall be responsible for managing the safety and security program for the project during their shifts as the sole Contractor safety and security representative. The SSSR shall have the authority to stop Work until unsafe conditions or practices are corrected.
3. Qualifications:
 - a. A minimum of 3 years progressive safety experience and demonstrated work experience on projects similar in scope and nature to the work to be done on this Contract.
 - b. Be knowledgeable concerning all federal and State regulations applicable to safety.

- c. Provide proof of current certification proof of current OSHA 30-hour Construction Safety Training (OSHA 510).
- d. Competent Person designation in construction safety disciplines related to the work to be performed and be able to identify Competent Persons required by State and federal safety standards.
- e. Current certification for CPR and First Aid.
- f. Possess training and be capable of performing incident investigations and developing a concise report.
- g. Possess training in the development and presentation of safety training meetings.

D. Gas and Noise Tester

- 1. When applicable and necessary, have a Competent Person present on each work shift to perform the required air and noise testing. The Competent Person shall have the authority to shut down any work area when gas concentrations reach a potential action level. This Competent Person shall be under the direct supervision of the ConSM or SSSR.

E. Subcontractor Safety and Security Representative

- 1. Each Subcontractor shall assign a safety and security representative as an Employee-In-Charge of safety for each shift.
- 2. Assign a full-time safety and security representative if the Subcontractor employs more than twenty people on a work shift.
- 3. Assign a foreman or lead worker as an Employee-In-Charge of Safety if the Subcontractor employs less than twenty people on a work shift.
- 4. Develop and submit to the Contactor all Job Hazard and Vulnerability Analyses for tasks assigned to and under direct control of the Subcontractor.
- 5. Conduct, document, and submit to the ConSM a weekly inspection of the Subcontractor's work site.
- 6. Notify the ConSM of the weekly surveys so the ConSM and Resident Engineer may participate in the walkthroughs.
- 7. In relation to the Subcontractor's activities, the Subcontractor's safety and security representative shall have the same duties and reporting requirements as the SSSR and ConSM.

1.07 TRAINING

- A. Conduct training classes on a monthly basis, or more often if needed, on safety and security related topics, that may include first aid, fire prevention, site security, or other areas or topics the Contractor deems appropriate. The Resident Engineer shall be notified of the schedule for the training sessions.
- B. Indoctrination

1. Newly employed, promoted, or transferred personnel shall be fully instructed by audio/visual means in the safety and security practices required for their assignments. Initial indoctrination for all personnel shall include, but not be limited to, instruction on the following:
 - a. For each individual, the hazards present in the work assignment and in the general area in which he/she will be working;
 - b. Personal protective equipment required;
 - c. Instructions on the proper procedure for reporting unsafe job conditions that he/she may encounter;
 - d. Reporting of all injuries, incidents, and damage, no matter how slight;
 - e. Contractor's job rules;
 - f. Location of first-aid and medical facilities;
 - g. Tool box safety and security meeting requirements;
 - h. Emergency service notification procedure for fire, medical emergencies, police problems, or other emergency situations;
 - i. An orientation by the foreman or superintendent of the new employee work area; and
 - j. All personnel shall sign the form shown as Exhibit G to acknowledge receiving and understanding safety and security indoctrination.

C. Subcontractor Indoctrination

1. The Contractor is responsible for indoctrinating Subcontractor personnel before they begin work. All personnel shall sign the form shown as Exhibit G to acknowledge receiving and understanding safety and security indoctrination.

D. Site Orientation

1. This orientation program shall introduce the worker to the project and to the project specific safety requirements. Emphasis shall be placed on site specific hazards and procedures. This orientation shall be provided upon arrival on the project.
2. The Contractor shall also provide site orientation training to all Sound Transit, Construction Management Consultant and third party personnel who need to access the site for job duties including owner site visits.
3. All personnel shall be required to complete Hazard Communication training during indoctrination and refresher training annually.
4. Safety training shall include instruction covering the following topics:
 - a. Air monitoring;
 - b. Ventilation;
 - c. Confined space entry procedures;

- d. Permit-required confined space entry procedures;
- e. Illumination;
- f. Communications;
- g. Mechanical equipment, as appropriate;
- h. Personal protective equipment;
- i. Fire prevention and protection; and
- j. Emergency procedures, including evacuation plans and check-in/check-out systems.

E. OSHA Construction Safety (OSHA 30-Hour)

- 1. All supervisor-level personnel including foremen, superintendents, project managers, and Subcontractor supervision, and those responsible for safety of a crew or shift are required to complete the OSHA 30-Hour Construction Safety class.
- 2. Submit copies of all 30-hour OSHA certification cards to the resident engineer.

1.08 SAFETY PRECAUTIONS

- A. Immediately notify the Resident Engineer if, during the course of the Work, there is a discovery of any undetermined substance.
- B. Take responsibility for the health and safety of the Contractor's personnel, Subcontractors, vendors, and other individuals on the Site of Work or who may be exposed to hazards or impacted by the Work.

1.09 REPORTING REQUIREMENTS

A. Forms and Record Keeping

- 1. Sound Transit's recordkeeping forms are presented in the Exhibits herein and provide administrative instruction and report forms to be used by the Contractor and Subcontractors for all required reports: In addition, specific records are required by DOSH and Fed/OSHA

B. Photographs

- 1. Take photographs in conjunction with investigations of incidents involving personal injury, third-party personnel injuries, property damage (including motor vehicle), equipment or material failure, and all incidents, and all injuries.
- 2. Photographs shall be sufficient in number to show the general area as well as pertinent details from a variety of angles. It is better to take too many photographs than not enough. Take photographs as soon as possible following the incident or occurrence.
- 3. Photographs used in reports shall be identified as follows: name of injured (if equipment damage, type; if property damage, location); date of incident; photographer's initials, and time photographs taken (date if different from occurrence); direction facing; and a brief description of photo.

C. Incident Reporting

1. Should a serious incident occur resulting in damage to public or Sound Transit property; or bodily injury to the public or personnel of Sound Transit, its consultants, Contractors, or their Subcontractors, it shall be reported (after calling 911) immediately by phone to the Resident Engineer and the Sound Transit Construction Safety Manager.
2. The Contractor shall forward an email to the Resident Engineer and Sound Transit Construction Safety Manager with a brief summary of the events, injuries, names of those involved and their trade affiliation.
3. The phone call and/or email notification does not substitute for an incident report containing those elements described in other section of this specification.

1.10 EMERGENCY PROCEDURES

- A. Elements of the Emergency Action Plan shall be compatible with local police and fire department procedures, Fed/OSHA and DOSH standards, and Sound Transit's Emergency Response Plan. Ensure that the Contractor has a well-developed emergency contact, a defined notification procedure, and that an identified Incident Coordinator in their plan that will be charged with coordinating emergency situations with emergency services.
- B. Emergency procedures shall be reviewed frequently to ensure that Contractor personnel are familiar with the proper actions to take and that emergency telephone numbers are current. The emergency procedures shall be tested using tabletop exercises. The emergency procedures shall be posted on the Contractor's bulletin board at each work site and office.
- C. Emergency procedures and actions required shall be discussed regularly with the Contractor's supervisory personnel and regularly at Toolbox Safety and Security Meetings. Emergency rescue plans shall at a minimum be in compliance with all applicable local, State and federal regulations for the work being performed.
- D. Periodically conduct evacuation drills for station construction to assess the adequacy of the emergency escape plans and familiarize the work force with changes in the nature of the site that impact evacuation.

1.11 FIRST-AID FACILITY AND STAFFING REQUIREMENTS

- A. Refer to Section 01 50 00, Temporary Facilities and Controls.
- B. Provide appropriate first-aid facilities for the treatment of on-the-job injuries. The first-aid facilities and staffing, as a minimum, will comply with the applicable safety and security regulations and with Contract Specifications.
- C. Provide first-aid kit(s) adequate to serve the crew(s) immediately available onsite at all times. Discuss the locations of the first-aid kits at the daily Toolbox Safety and Security Meetings.

1.12 INCIDENTS

- A. Provide such equipment and facilities as are necessary or required, in the case of incident, in order to provide for first aid service to anyone whom may be injured in the progress of the work. Have a standing arrangement for the transportation and hospital treatment of any person who may be injured or become ill.

- B. Contractor shall notify the Resident Engineer, and Sound Transit Construction Safety of all safety or security incidents immediately upon discovery. For all types of incidents or potential third-party claims, a Supervisor's Incident Investigation Report, (Exhibit J), shall be completed and submitted within 48 hours to the Resident Engineer.
- C. All safety and security incidents shall be reported immediately to the Resident Engineer.
- D. Issue standing orders to all supervisors directly in charge of operations that the scene of the incident shall not be disturbed, except for rescue or other emergency measures, until otherwise directed. Personnel, either witnessing or party to the incident, shall complete an independent incident report to provide detailed accounting of facts.
- E. Designate responsible personnel to make emergency calls to 911 and have standing communication with first responders for coordinating site response and designated work site access points. All personnel on-site shall be trained to call 911 in an emergency if a designated caller is not immediately present.

1.13 PROTECTION OF THE PUBLIC

- A. Take all reasonable precautions to prevent injury to the public and damage to, or theft of the property of others. The public is defined as all persons not employed by or under contract or subcontract to Sound Transit. Temporary barriers and fencing designated to protect the public shall be installed immediately when a hazard or exposure is present. Precautions shall include, but not be limited to, the following;
 - 1. Do not perform work in any area occupied by the public unless specifically permitted by the Contract or approved in writing by the Resident Engineer.
 - 2. When necessary to maintain public use of work areas involving sidewalks, entrances to buildings, lobbies, corridors, aisles, stairways, and vehicular roadways, protect the public in accordance with all applicable laws and regulations.
 - 3. Keep sidewalks, entrances to buildings, lobbies, corridors, aisles, doors, or exits clear of obstructions, holes, materials, water, and other conditions to permit safe ingress and egress of the public at all times.
 - 4. Post appropriate warnings, signs, and instructional safety and security signs where necessary. Control of the movement of motorized equipment where the public might be endangered to be carried out by a Certified Traffic Control Specialist. Signs, signals, or other control devices used to regulate vehicular traffic shall meet the requirements of MUTCD, University of Washington Safety for work on University property, and the applicable work zone traffic control handbook, City of Seattle In-Street Use requirements, and other pertinent rules and regulations.
 - 5. Provide sidewalks, sheds, canopies, catch platforms, and appropriate fences, when necessary, to maintain public pedestrian traffic adjacent to the erection, demolition, or structural alteration of outside walls on any structure is underway.
 - 6. Temporary fencing shall be properly secured, anchored, and provided around the perimeter of aboveground operations adjacent to public areas, except where a sidewalk, shed, or fence is provided by the Contractor as required by Article 1.13A.5, above. Perimeter fences shall be at least 6 feet high. Fencing may be constructed of wood or metal and sheathing, chain link, or a combination of both, or as otherwise required in the Contract Documents.

7. Supervise all gates and work zone entrances when opened or keep closed and locked when unattended, and closed and latched during all non-working hours.
8. Provide guardrails on both sides of vehicular and pedestrian bridges, ramps, runways, and platforms. Protect pedestrian walkways elevated above adjoining surfaces, or walkways within 4 feet of the top of excavated slopes or vertical banks by guardrails, except where sidewalk, sheds, or fences are provided as required by Article 1.13A.5, above. Construct guardrails in accordance with DOSH, Fed/OSHA standards, and other applicable laws and regulations.
9. Provide barricades when a permanent sidewalk, shed, fence, or guardrail, as referenced above, is not required between work areas and pedestrian walkways, roadways, or occupied buildings. When a barricade is removed temporarily for the purpose of work, place a designated safety and security watch at the opening. Attach reflector tabs or attenuators to K-rail or barricades adjacent to public roadways.
10. Provide temporary sidewalks when a permanent sidewalk is obstructed by the Contractor's operations. If appropriate provide necessary, guardrails on both sides of temporary sidewalks.
11. Maintain warning signs and lights along guardrails, barricades, temporary sidewalks, and at every obstruction to the public. Place lights at both ends of such protection or obstructions and not over 20 feet apart alongside of such protection or obstruction.
12. Maintain adequate traffic control measure when activities or project associated trucks or vehicles impact the public roadway or traffic flows. Maintain traffic barriers ballast, anchors, and proper functioning lighting.

1.14 CONTRACTOR SECURITY DURING CONSTRUCTION AND SITE SECURITY

- A. Provide protection for all property (including equipment and supplies) under the Contractor's care, custody, and control, Security measures shall include, but not be limited to, the following:
 1. Physical barriers such as fencing and barricades. Snow or plastic fencing is not permitted;
 2. On-site security guard service;
 3. Lighting;
 4. Alarm systems;
 5. Video cameras or surveillance;
 6. Perimeter detection system
 7. Law enforcement surveillance;
 8. Inventory control and materials marking; and
 9. Community involvement.
- B. Once the CSSP has received an acceptable disposition, the CSSP shall be implemented by the Contractor. Physical security of the construction site is the responsibility of the

Contractor subject to the concurrence of the Seattle Police Department and any other law enforcement agencies that may have jurisdiction over all or part of a work site.

1.15 SUBSTANCE ABUSE

- A. Sound Transit prohibits on the worksite, the use, possession, concealment, transportation, promotion, or sale of the following:
 - 1. Alcoholic beverages;
 - 2. Marijuana and other illegal drugs, look-alikes, and designer drugs;
 - 3. Drug paraphernalia; or
 - 4. Controlled substances such as medications when usage is abused or when the substance is possessed without proper prescription labeling.
- B. To be under the influence of any of the above substances while working on the site or to use, possess, conceal, transport, promote, or sell any of the above substances will be grounds for disciplinary action, up to and including termination of employment.
- C. Maintain required records and submit to periodic audits of the substance abuse program by the Resident Engineer or the CSM. As required, use a third-party designated by Sound Transit for all random, for cause, and post-incident testing.
- D. Maintain an effective employee substance abuse program in compliance and documentation requirements of the Labor Compliance Manual, Substance Abuse and Prevention Program requirements.
- E. Ensure that the employee substance abuse program administrator and their agents comply with all elements of the employee substance abuse program contained in the Labor Compliance Manual.

1.16 OTHER CONTROLLED ITEMS

- A. Sound Transit prohibits the use, possession, concealment, transportation, promotion, or sale of the following controlled items:
 - 1. Firearms, weapons, and ammunition – except when authorized for security reasons;
 - 2. Switchblades; large knives, and other non-work related cutting devices
 - 3. Unauthorized explosives, including fireworks; and
 - 4. Stolen property or contraband.

PART 2 - PRODUCTS

2.01 PERSONAL PROTECTIVE EQUIPMENT (PPE)

- A. Only equipment complying with DOSH Safety Orders and Fed/OSHA Safety Standards shall be used. All Contractors shall be responsible for compliance by their personnel. The SSSR shall make regular field inspections to ensure compliance.
- B. Head Protection

1. Hard hat use is mandatory and meets the requirements of ANSI Z89.1 or ANSI Z89.2, as appropriate, as specified by DOSH and Fed/OSHA. Metallic (metal) hard hats shall not be worn on any work under a Sound Transit contract. Both the employee's name and the Contractor's name shall clearly appear on the hard hat.

C. High Visibility Apparel

1. General

- a. Require all personnel under their control (including service providers, Subcontractors, and lower tier Subcontractors) that are on foot in the work zone **and are exposed to vehicle traffic or construction equipment** to wear high visibility clothing described in this Section.
- b. Ensure that a Competent Person selects the appropriate high-visibility apparel suitable for the job-site conditions.
- c. High visibility garments shall always be the outermost garments.
- d. High visibility garments shall be in condition compliant with ANSI 107-2004 and shall be used in accordance with the manufacturer recommendations.
- e. All workers not directly exposed to vehicle traffic shall don reflective outerwear or safety vest that is orange or yellow in color. No black or blue reflective gear may be worn.

2. Traffic Control Personnel

- a. All personnel directing traffic, either inside or outside the project fence, shall comply with the following:
 - 1) During daylight hours with clear visibility, workers shall wear a high-visibility ANSI/ISEA 107-2004 Class 2 or 3 vest or jacket, and hard hat meeting the high visibility headwear requirements of WAC 296-155-305; and
 - 2) During hours of darkness (1/2-hour before sunset to 1/2-hour after sunrise) or other low visibility conditions (snow, fog, and rain), workers shall wear a high-visibility visibility ANSI/ISEA 107-2004 Class 2 or 3 vest or jacket, high visibility lower garment meeting visibility ANSI/ISEA 107-2004 Class E, and hardhats meeting the high visibility headwear requirements of WAC 296-155-305.

D. Eye/Face Protection

1. All Contractor personnel and Subcontractor shall be provided with, and shall wear at all times eye protection.
2. Sound Transit has a 100 percent safety glasses policy which shall be enforced at all times. All site personnel and visitors shall wear appropriate eye protection when on site.

E. Respiratory Protection

1. Respiratory protection devices approved by the National Institute of Occupational Safety and Health (NIOSH) shall be supplied by the Contractor and worn by all personnel (as required by DOSH and OSHA regulations) when exposed to hazardous concentrations of toxic or noxious dust, fumes, or mists.
2. Where respiratory protection is required, have a written respiratory protection program in accordance with applicable DOSH and Fed/OSHA standards.

F. Hearing Protection

1. Verify, document and submit to the resident engineer, noise levels for all tasks where potential for hearing impacts are occurring. Including but not limited to chipping, drilling, hammering, and other high level noise producing activities.
2. Make approved hearing protection available and such protection shall be worn by all personnel exposed to sound levels in excess of DOSH's and Fed/OSHA's permissible exposure limits (PEL).

G. Fall Restraint Protection

1. Provide Class III Full Body Harness meeting DOSH and Fed/OSHA safety standards to be worn by all personnel exposed to falls from an unprotected height of 4 feet or more. The use of the fall restraint protection shall conform to the requirements of the applicable safety standards.
2. A fall protection work plan shall be completed when rules apply, and available for inspection by the Resident Engineer.

H. Safety Shoes

1. All personnel shall wear hard-toed (steel or reinforced) foot wear conforming to ASTM F2413-05.

I. Suitable Clothing

1. All Contractor personnel shall be required to wear full-length pants, free of holes, and made of durable material. An employee shall not be permitted to wear clothing that has been saturated by gasoline, diesel fuel, oil, or any other flammable or combustible substance. Polyester clothing is not allowed.
2. An employee's shirt shall completely cover his/her shoulders as well as his/her entire mid-section to the waist. Tank tops and fish-net-type shirts are not allowed. The minimum shirt allowed shall be a standard T-shirt.

J. Gloves

1. Sound Transit has instituted a mandatory glove policy for all construction sites. All site personnel and visitors shall wear appropriate gloves when on site.
2. Gloves appropriate to the hazard/task shall be worn.
3. Tasks are only to be performed without gloves where safety is compromised by glove-use or fine finger manipulation is needed to accomplish the activity. Non-glove required tasks shall clearly be addressed in the Job Hazard Analysis BEFORE the work begins.

K. Other PPE

1. Other PPE to be used under unusual circumstances, such as high-temperature work, handling corrosive liquids, or other activities not specifically covered in this Section shall be reviewed with the Resident Engineer.
- L. Maintenance of PPE
1. PPE that has been altered in any manner so as to reduce its effectiveness shall be repossessed and then repaired or destroyed. PPE, which has been worn or used, previously, shall not be reissued to another employee until the article has been cleaned and sterilized.
- M. The Contractor, for station construction and surface work, shall have onsite at all times, certified to applicable requirements, calibrated equipment for testing that includes, but is not limited to, the following:
1. Noise;
 2. Gases;
 3. Air flow;
 4. Lighting; and
 5. Air quality.
- N. The Contractor is responsible for submitting to the Resident Engineer results with dates and times for testing of these and any other physical or environmental exposures that may impact the health and safety or security of workers. Testing may be necessary on a continuous, task, or daily basis depending on the activity and conditions.

PART 3 - EXECUTION

3.01 RESPONSIBILITY

- A. Be solely and completely responsible for conditions of the site and the safety and security of all persons and property, 24 hours per Day, beginning with the LNTP and ending with Final Acceptance.
- B. Comply with all safety and security directives and corrective actions required for safety/security issues or violations identified to remedy safety/security deficiencies. These deficiencies may be related to means, methods, work plans, hazards analyses, or threat and Vulnerability analyses.

3.02 DUTIES OF CONTRACTOR STAFF

- A. The ConSM, SSSR, or a member of his\her safety and security staff shall at a minimum:
 1. Prepare a weekly safety and security report for submission to the Resident Engineer detailing issues and inspections of the job site(s) and adjacent public areas to document activities, site controls, and conditions. The reports shall also provide detail of the corrective action(s) taken to eliminate unsafe acts and conditions.
 2. Prepare the Monthly Injury/Illness Report shown in Exhibit B.

3. Establish and maintain an appropriate and comprehensive orientation program for all new personnel
4. Assure timely submission to the Resident Engineer safety incident and investigation reports and root cause analysis summaries to initiate corrective action(s) to prevent recurrence.
5. Provide superintendents and foremen with suitable material and topics for weekly Toolbox Safety and Security Meetings, document weekly Toolbox Safety and Security Meetings, and attend or assign a designee to attend all such meetings.
6. Review Toolbox Safety and Security meeting reports submitted by superintendents and foremen to ensure adequacy of training as well as subject matter and the conduct of the safety and security meetings.
7. Notify and assist in incident investigations with Sound Transit to preserve the incident site. Prepare required reports and complete root cause analysis to identify contributing factors.
8. Establish and implement a monthly safety and security training program for supervisors and field managers as applicable to their specific jobs.
9. Attend the Monthly Safety and Security Committee meetings held by the Sound Transit CSM.
10. Ensure that all required safety equipment is available and that a written log for worker training is maintained.
11. Ensure that all Subcontractor personnel comply with job-site safety and security rules and regulations, and that the Subcontractors' reports are completed according to the rules and regulations stated in these Contract Specifications and the requirements of the relevant regulatory agencies.
12. Perform safety and security audits monthly on each work site location.
13. Perform safety and security surveillances weekly on each crew.
14. Respond to Corrective Action Requests and Non-Conformance Reports issued by the Resident Engineer.
15. Conduct, at a minimum, quarterly review of the CSSP effectiveness with the Corporate Safety Manager, which includes identification of corrective actions to improve the implementation of safety and security on the project.
16. For station construction activities, the ConSM shall have the following added responsibilities:
 - a. Provide for control, availability, and use of safety equipment, including employee Personal Protective Equipment (PPE), emergency equipment and first aid units, and adequate means of communication. The ConSM shall ensure that all safety equipment is approved, adequate and readily available for employees.
 - b. Designate and enforce "No Smoking" restrictions in all station areas, and within 25 feet of any work tasks, window, ventilation, doorway or other means of exposure to employees. The Contractor will assure and verify

site compliance with smoking regulations under the Washington State Labor and Industry Standards.

- c. Maintain timely and accurate safety and security and daily monitoring records onsite at all times by a designated Competent Person. These records shall be readily available upon request.
 - d. Ensure all project access points are secure so that unauthorized persons may not gain entry.
 - e. When required, perform atmospheric and environmental testing as required, but at a minimum once for each shift or when conditions change to document noise levels, air flow, and air quality in station areas. Keep written records of such tests and make available upon request.
 - f. The ConSM shall monitor and enforce Contractor compliance with all worker safety, security, and health regulations.
17. Provide copies to the Resident Engineer of all Contractor safety and security reports listed in the Exhibit C, Summary of Construction Safety and Security Reports.
18. Attend progress and relevant project meetings with the Contractor and the Resident Engineer.
19. Supervise all subordinate safety or security personnel, Competent Persons, traffic control supervisor, and all other safety or security personnel.
- B. Contractor Site Safety and Security Representatives
- 1. The SSSR reports to the ConSM. At any time work is being performed with 20 or more workers on site, the ConSM or SSSR shall be physically on-site and shall have no other responsibilities in addition to those required of the ConSM or SSSR.
- C. Gas Tester
- 1. Maintain a hand-written log of all gas tests and measurements taken. At a minimum, the log shall identify the date, time, and location of each test or measurement. Additionally the log shall identify air velocities and the observed gas readings by date, time, and location in the tunnel. Make the log available to the Resident Engineer upon request.
 - 2. Gas Tester may be a SSSR.
- D. Superintendents and Field Managers
- 1. Include at a minimum:
 - a. Field supervisors and field managers must promote, implement, maintain, and sustain an effective safety and security program and safety culture.
 - b. Daily and documented inspections of the assigned job area to ensure that deficiencies in procedures or unsafe acts or site conditions are identified and corrected.

- c. Document that daily pre-task analysis (tailgate safety and security meetings) discussions are conducted and that workers under their supervision attend and participate to ensure site personnel are aware of the safety and security requirements and are reminded that safety and security policies shall adhered to and enforced.
- d. Demonstrate knowledge of safety and security requirements and keep up to date on changes and refresher trainings. OSHA 30-hour training is required at a minimum for personnel at the supervisory level or above.
- e. Provide and require the use of proper personal protective equipment, request or provide proper training, and have available suitable tools for the job.
- f. Set a good example for the crews by working safely and making safety and security a priority over production.
- g. Ensure that good housekeeping is enforced by maintaining orderly work sites.
- h. Note that assigned work crews are properly instructed in safe work practices and physically and mentally prepared for assigned job tasks.
- i. With the Resident Engineer and ConSM, investigate all incidents that occur in areas under their direct control to determine facts necessary for corrective action.
- j. Complete a written incident report within 24 hours of a security or safety incident, property damage, or possible third-party claim.
- k. The project Superintendent shall conduct and document a formal weekly safety and security meeting of at least 20 minutes, with all project personnel to:
 - 1) Present a 10 – 15 minute safety education topic and discuss how it relates to the work at hand;
 - 2) Plan weekly safety meetings in conjunction with the Resident Engineer;
 - 3) Review the CWP's, list of tools needed, and PPE needed for the upcoming week and discuss potential hazards;
 - 4) Discuss unsafe work practices and conditions noted;
 - 5) Review incident experience with crews and discuss corrective action(s);
 - 6) Encourage personnel to make safety and security suggestions and to pass these on to the SSSR for evaluation and possible implementation; and
 - 7) Ensure that fire extinguishers, first aid kits, and other safety equipment are available for each crew and kept in usable condition.

- I. All the above, at a minimum, shall be included and documented in the Contractor's orientation for superintendents and field managers.

3.03 INSPECTIONS, MONITORING AND AUDITING

A. ConSm/SSSR Inspections

1. In addition to the other inspection responsibilities in these Specifications, ensure that the ConSM or SSSR makes a weekly and a comprehensive monthly inspection of each of the work areas (including storage, office, and shop facilities) to ensure compliance with Sound Transit, Federal/OSHA, and DOSH requirements. Notify the Resident Engineer of these inspections prior to completion of the inspections to allow the Resident Engineer to participate. The SSSR shall complete the Construction Safety and Security Inspection Checklist, shown as Exhibit D, for each monthly inspection, or a customized form that, at a minimum, includes the elements contained in the form shown in Exhibit D.
2. Record Safety or Security deficiencies that are noted during the inspection on the form, and correct those deficient items immediately. Communicate all deficiencies to the Contractor's project management in a timely manner. The Contractor's project management shall be responsible for documenting the corrective action(s) and submit that documentation to the Resident Engineer. The ConSM or SSSR shall follow up and note the status of each safety or security deficiency and record the deficiencies on the Construction Safety and Security Inspection Checklist. Review the issues or safety and security items noted during each subsequent site inspection to ensure the concerns have been adequately addressed.

B. Crane Inspections

1. Perform crane inspections and maintain daily, monthly, quarterly, and annual logs. These requirements may change with updates to DOSH standards and crane inspection procedures. The Contractor is responsible for monitoring and complying with all applicable standards.
2. All cranes shall be certified and operated in accordance with WAC Chapter 296-155, Part L

C. DOSH and Fed/OSHA Compliance Officers and Seattle Fire Department Inspections

1. Immediately notify the Resident Engineer of inspections conducted at the work site by the Washington State Department of Labor and Industries Division of Occupational Safety and Health (DOSH), Seattle Fire Department (SFD), or other federal, State, or county safety, security, health, or environmental organization/agency fire department and fire/safety inspectors. Furnish the Resident Engineer with copies of all citations and warnings of safety or security violations within 24 hours of receiving the citations and warnings.
2. The ConSM shall write a NCR for each citation or warning of safety violation and perform a safety inspection of the site within 24 hours after each citation.
3. Respond to the Resident Engineer within 3 Days with a corrective action plan and a root cause analysis report for each NCR.

D. Link Safety/Security Staff Inspections

1. Expect continuous monitoring and auditing of the Contractor's safety and security practices and procedures by the Resident Engineer as well as the Sound Transit CSM and his/her staff and SQA staff. Cooperate fully and correct all safety or security discrepancies noted verbally or in writing by the Resident Engineer. Monitoring and audits shall not relieve the Contractor of any of its responsibility for controlling site safety, reporting, documentation, or safety and security obligations. The Sound Transit CSM and SQA staff has the authority to issue a stop work order to the Contractor upon observation of a hazard that presents an imminent danger, or for failure to correct previously documented safety or security hazards or deficiencies in meeting safety and security requirements.
2. The Resident Engineer and the SQA may at its discretion hire outside consultants or request the Washington State Department of Labor & Industries or other external organizations to perform inspections of any site. Provide access with appropriate warning for scheduling and orientation.

E. Bulletin Board

1. Provide bulletin boards located at all work sites adjacent to the field office or other conspicuous locations. Items including, but not limited to, the following shall be posted on the bulletin board:
 - a. Emergency procedures;
 - b. Emergency phone numbers;
 - c. State Labor required Posters – Job Safety and Health Protection (Form F416-081-000);
 - d. Right to Know – Statement of the results of a hazardous chemical survey;
 - e. OSHA 300 Summary (during February of every year). Summaries, findings, or notices of violations received from DOSH Labor & Industry, inspection agencies, or other AHJ;
 - f. All Notices of Violation, citations, and safety warnings from the Resident Engineer or any of the AHJs;
 - g. All NCRs Corrective Action Plans and Root Cause Analysis; and
 - h. A list of all JHAs including reference to where they are filed.

3.04 INCIDENTS

A. General:

1. Report immediately to the Resident Engineer every incident to persons or damage to property, and furnish the required reports in writing within the specified times. An incident, injury, or illness is any occurrence that results in a bruise, breaking the skin, or loss of time of more than 15 minutes of work time related to such incident, injury or illness; an impairment of vision or mobility; or that adversely affects job performance as a result of equipment, material, vapors, lighting, liquid, or solid materials.

B. Investigation and Corrective Action

1. Contractor shall notify the Resident Engineer immediately, who will notify the CSM, of all occupational injuries or illnesses and, within 24 hours, submit a copy of the Employers First Report, supervisor's incident investigation, medical release form, and physician report.
2. Investigate all incidents thoroughly without delay. Coordinate the investigation with emergency services, the Resident Engineer, as well as insurance personnel, to ensure a comprehensive approach. Complete a root cause analysis to determine the causes or contributing factors of incidents. The investigation shall generate appropriate recommendations for corrective actions to prevent recurrence of similar incidents.
3. Take corrective actions when specific factors of an incident have been accurately determined and the resulting recommendations have been disseminated to the responsible persons.
4. In the event of a serious incident, prompt oral reporting of the preliminary details is mandatory. Serious injuries are defined as those injuries that are immediately life threatening, those that require hospitalization for any period of time, or those injuries that result in time lost from work as prescribed by a physician. Perform a root cause analysis on all incidents.
5. In preparing written reports of an incident, statements and comments shall be confined to objective finding of facts.
6. The Contractor's incident report, project records, progress reports and daily time reports may become important evidential material in any ensuing legal action. Accordingly, for the date on which a potential third-party incident has occurred, it is important to be specific and accurate in describing work being performed, crew and equipment being utilized, and their exact location.

3.05 EMERGENCY ACTION PLAN IMPLEMENTATION

- A. Should an emergency occur:
 1. Immediately secure the area and implement the Emergency Action Plan;
 2. Notify the Resident Engineer; and
 3. Provide information regarding the emergency to authorized Sound Transit representatives only. Refer questions from the press to Sound Transit Media Relations. Personnel or any other project personnel shall not speak to the press.

3.06 WORK PLANNING

- A. Job Hazard Analyses
 1. Prepare a JHA for each work activity for review and disposition by the Resident Engineer, before beginning the stated work.
 2. Reconcile all JHA(s) with comments provided by the Resident Engineer.
 3. Before beginning the stated work, ensure the JHA(s) have been returned with an acceptable disposition.
 4. Posting of JHAs and Training

- a. The JHA serves as an operating procedure to be reviewed and discussed with each individual performing the work. A copy of the JHA shall be at the jobsite, shall be retained by the SSSR in the reference file, and a copy provided to the Resident Engineer.
 - b. Personnel involved with the operation shall be instructed as to the hazards involved, be provided with required PPE and adequate training, and be instructed in proper methods required to eliminate the hazards, including emergency action to be taken in the event of an incident. Document during weekly safety and security tailgate meetings that crew members have reviewed and understand the JHA before work begins.
- B. Daily Pre Task Analysis (PTA) Safety/Security Briefings:
 - 1. General:
 - a. The foreman or superintendent for each crew (Contractor and Subcontractors) shall conduct a daily safety and security "tailgate" briefing for a minimum of 15-minutes, to discuss the work activities, potential hazards, and preventive measures to each crew performing any work at the beginning of each shift and when conditions change. The PTA card (Exhibit L) is the suggested form used to document these meetings. The cards used must, at a minimum, include the elements on the suggested form. Make completed PTA cards (or equivalent) available for review by any of the Contractor's personnel and management staff.
 - 2. Procedures for the PTA meeting are:
 - a. Work crews are expected to complete a PTA for each new task undertaken.
 - b. The PTA is developed by the crew assigned to perform the work with guidance from their Supervisor. The Supervisor identifies the work area and task to be performed and then leads the crew in developing a PTA.
 - c. Creating the PTA requires the Supervisor to solicit crew participation in identifying hazards and hazard control measures such as PPE, training requirement, permits, and procedures.
 - d. Members of the team are required to sign the PTA document to indicate their participation, their understanding of the plan, and their agreement to follow the plan.
 - e. The completed PTA shall remain on site with the work crew performing the task.
 - 3. If conditions, equipment, material, or personnel have changed, the PTA shall be updated.
 - 4. Work crews shall participate in review of the task:
 - a. Before resumption of a task;
 - b. After a lunch break;
 - c. Before resumption of the task at the start of shift; and

d. Resumption of a task after a significant event.

C. Worksite Threat Analyses (WTA):

1. Prepare a Worksite Threat Analysis (WTA) after site mobilization. The WTA shall identify specific personnel security hazards, property security hazards, third-party liability hazards, and planned protective measures designed to minimize exposure to threats.
2. Submit the WTA to the resident engineer.

D. Worker Hazard Awareness

1. General:
 - a. Conduct a documented review and discussion of the approved JHA and prior to field activities. Inform workers of foreseeable hazards and threats, and the required protective measures described within the approved hazard analysis before starting work on the affected construction operation. All required PPE and security measures shall be present and workers trained in proper use prior to beginning JHA-related work.

3.07 WORKPLACE INSPECTIONS AND HAZARD/THREAT ABATEMENT

- A. The ConSM and/or SSSR shall conduct and document daily inspections of the construction activities and job sites to identify and correct hazards, Vulnerabilities, and instances of noncompliance with safety, security, health, and security requirements. All items of noncompliance shall be corrected immediately.
- B. If immediate corrective action is not possible or the hazard/threat falls outside of Contract scope:
 1. Immediately notify affected workers;
 2. Post appropriate warning signs;
 3. Implement needed interim control measures; and
 4. Notify the Resident Engineer both verbally and in writing of the issue and the actions taken.

3.08 CONTRACTOR COMPLIANCE

- A. Designate one person for each work crew at each work site that, in addition to their other duties or responsibilities, is responsible for safety and security of the work crew or work site. Identify this designated person clearly in the JHA, the WTA or CWP. The designated person shall be present at each work site whenever the ConSM, SSSR, or an alternate project safety/security officer is not immediately present. The designated person shall be a foreman, superintendent, or other person having job site authority.
- B. Any safety or security deficiency identified by the Resident Engineer shall be corrected immediately. Deficiencies may be transmitted by either verbal or written notification to the ConSM, SSSR or superintendent. Corrected immediately, deficiencies that put workers in imminent danger of injury or property loss. Correct other safety or security deficiencies within 24 hours of discovery. Failure to correct deficiencies may result in stoppage of those work activities.

3.09 CONSTRUCTION SAFETY AND SECURITY PLAN (CSSP)

- A. Designate the individual(s) responsible for on-site implementation of the plan, specify qualifications for those individuals, and provide a comprehensive list of those activities for which a JHA and WTA has been submitted. Refer to the Contract Specifications, and to Exhibit C, Summary of Reports for additional details.
- B. Coordinate with the Resident Engineer in maintaining, enforcing, and documenting a safety and security program that is effective in practice.
- C. Coordination among contractors
 - 1. Daily meetings between contractors are required when both are performing activities in the same work area. Each Contractor shall detail work schedules and locations to coordinate activities. If a Contractor is working in an area controlled by another Contractor, additional training may be required to comply with procedures on the site under the other Contractor's control. Requirements shall be coordinated among contractors and reported to the Resident Engineer at the weekly meeting.

3.10 VISITORS

- A. Develop a written site visitor policy stating access procedures, physical requirements for participants, and who the approving authority is for tours. In addition, the policy shall:
 - 1. Comply with all provisions of the Sound Transit Site Visitor and Group Tour policy.
 - 2. Develop a written visitor registration procedure, which includes a briefing and signing the Visitor's Release and Hold Harmless Agreement (Exhibit N)
 - 3. Designate an area where visitors report.
 - 4. Escort visitors at all times while on the construction site.
 - 5. Develop a vehicle admittance policy.

3.11 LOCATING UTILITIES

- A. Before the start of underground work, locate all utilities in accordance with RCW 19.122.
- B. Contact the underground utility locator service One Call Center of the Washington Utility Coordination Council at 811 or 1-800-424-5555 and have all utilities within the area of work located. Communicate a request to have utilities located to the underground utility locator service not less than four (4) Days or more than 14 Days before the scheduled date to begin excavation. Periodic re-notification may be required.
- C. The Contract Drawings and Contract Specifications for notations of utility companies that may not be members of an underground service alert group. Directly contact those who are not members of an underground service alert group.
- D. All location request numbers provided by the utility locator service (One Call Center) or utility companies concerning underground utilities shall be logged and submitted with the JHA. Make this log will available to the Resident Engineer upon request. A template of the utility request log is presented in Exhibit O.

- E. Visually check the area and confirm the surface marking of locating services and check for recent underground relocation work by an outside entity. Expose utilities in proximity to underground work to confirm alignment.
- F. Notify the Resident Engineer at the weekly Resident Engineer meeting and at least 48 hours prior to the start of underground work. Verify that all utility arrangements have been made to allow underground work to proceed.
- G. Take necessary steps to protect utilities from damage including identification of utilities with signage.
- H. Do not use motorized equipment to dig, uncover, or excavate within 2 feet of utility until such utility has been physically uncovered and identified.

3.12 TRAFFIC SAFETY MANAGEMENT

A. Requirements

- 1. Contractual requirements are provided in the Contract Specification, 01 55 26, Traffic Control.
- 2. Plan, document and submit changes from normal traffic patterns well in advance of the actual construction to the Resident Engineer and the local jurisdiction. The Contractor making the traffic changes shall warn the motoring public what changes are to be made and when the changes will take place.
- 3. Provide notification to emergency services providers, METRO, school districts, and solid waste collection services if streets are closed or major traffic revisions are required for construction activities. Use a combination of mechanical light signage, posted warning signs, public radio broadcast, direct notifications to businesses and residents, and community outreach briefings to accomplish this notification process.
- 4. Adequate warnings and notifications shall begin at least 1 week in advance of the actual traffic pattern change and continue for the duration of that temporary change, or throughout the establishment of a permanent change in accordance with the Contract Drawings and Contract Specifications.

B. Internal Job-site Traffic Control

- 1. Develop an internal traffic control plan for the jobsite that details movement of vehicles, communication, and control of hazards such as vehicle backing and protection of workers on foot.
- 2. Use warning broadband backup alarms on all equipment in operation at the site, at all times. Tonal alarms shall not be used by project vehicles.

3.13 OFFICE SAFETY AND SECURITY

- A. Address in CSSP office safety and security for project administrative and field office personnel.
- B. Familiarize all project personnel, including office staff, with the CSSP and the included emergency procedures. Provide training for procedures when threats, fire, or medical emergency arise. Provide at least one CPR-certified office employee, a first aid kit, and fire extinguisher present in each project office. Install AEDs to be installed in Contractor field project offices.

- C. Office safety and security elements shall address ergonomics, emergency procedures, and office safety and security rules that may include these office safety and security hints:
1. Do not run in corridors or on stairs.
 2. Use hand rails where provided.
 3. Do not stand in front of closed doors as they may open suddenly.
 4. Do not read correspondence including text messages on handheld electronic devices or other material while walking.
 5. Do not push or crowd at elevators, entrances, exits, or on stairways.
 6. Be careful of swivel chairs. Do not lean back in them without testing your weight gradually.
 7. Electrical or telephone cords shall not be placed across aisles or doorways unless properly protected.
 8. Use handles when closing files, desk drawers, and safe or vault doors.
 9. Keep file drawers, desk drawers, and locker doors closed when not in use. Open only one file or desk drawer at a time. File cabinets and bookcases shall be properly secured to prevent overturning.
 10. Check the office furniture regularly to assess safe conditions.
 11. Be familiar with emergency office procedures for fire, earthquakes, and bomb threats.
 12. Conduct periodic ergonomic assessments of work stations and spaces.
 13. Provide workplace violence and anti-bullying training for personnel.
 14. Provide confidential means for reporting potential domestic violence, which may impact the workplace and other workplace violence issues.
 15. Immediately implement controls to protect personnel from any suspected threat.
 16. Provide secure working facilities and ensure safe access to transportation during all shifts.

3.14 HOUSEKEEPING, JOB ORDERLINESS AND WORK SITE CONDITIONS

- A. Maintain good housekeeping on work sites and adjacent public roadways.
- B. Orderliness and housekeeping mean specifically that, at any time, each and every piece of equipment, tool, material, facility, or apparatus shall be stored, stacked, located, placed, temporarily spotted, or set up for manipulation in such a manner as will render an incident highly improbable. This applies to excavations, station structures, elevated walkways, platforms, maintenance facilities, yards, parking lots, and interiors of bins, tool boxes, cabinets, rooms, cubicles, whole floors, buildings, and all other work areas.
- C. Some tasks where good housekeeping is a major safety and security consideration are:
1. Working surfaces;

2. Hoses and supply lines;
 3. Tight or restricted work spaces; and
 4. Elevated work decks or platforms
- D. The Contractor is solely responsible for maintaining good site conditions and housekeeping policies. When issues or deficiencies are identified, the Resident Engineer will provide the Contractor verbal notification with a follow-up in writing.
- E. Address housekeeping concerns immediately and provide to the Resident Engineer a signed Construction Safety/Security Survey Form (Exhibit 1) to acknowledge the items have been corrected.
- F. Keep walkways and working surfaces free of mud, water, and debris anytime personnel are present. Conveyance systems for debris shall minimize dropping of debris on walkways to prevent slips, trips, and falls, keep walking and working surfaces level and free of holes, gaps, or edges. Maintain all walking and working surfaces so that they are, at a minimum, compliant with DOSH and other applicable standards.
- G. Orderliness Responsibility
1. Responsibility for material or equipment placement belongs to those who will use or install it.
 2. Store or park material and equipment in an orderly manner, in keeping with the character of the material or equipment.
 3. Propose designated storage areas in the CWP's.
 4. When a Contractor begins work in an area, that Contractor is responsible for the orderliness and housekeeping of that area, regardless whether the area was left disorderly by a previous Contractor.
- H. Orderliness and Housekeeping in the Work Areas
1. The following basic requirements shall be expected of Contractors, Subcontractors, and personnel:
 - a. Do not block access ways;
 - b. Clean work areas daily as work progresses;
 - c. Do not leave cables, cords, or loose objects in passageways, stairways, walkways, or underfoot;
 - d. Remove all materials, tools, and equipment such as shackles, slings, ladders, and safety equipment from work areas and return them to storage areas when not needed;
 - e. Return all tools, supplies, materials, and equipment to their proper storage area after completion of job;
 - f. Keep welding rod, nuts, bolts, and round stock in proper containers and not piled on floors, ground, or deck;
 - g. Place trash containers at appropriate locations for disposal of all rubbish, trash, and debris;

- h. Remove rubbish, trash, and debris from the work area daily;
- i. Check the work area daily for the removal of rags, boxes, paper, and other debris for housekeeping and fire prevention; and
- j. Store dunnage in neat storage piles or remove it from the job site daily.

3.15 FIRE PREVENTION

- A. The SSSR shall make fire hazard inspections of the entire site on a regular basis. Immediate correction of substandard conditions is mandatory.
- B. Do not block access to fire extinguishers, exits, hydrants, or other fire-fighting equipment.
- C. Keep all flammable liquids and combustible material away from open flame or spark. Do not store trash, rubbish, or debris in proximity to flammable liquid or combustible material.
- D. Plan all burning and welding operations carefully, and remove all combustible or flammable material from the area before starting the job.

3.16 EQUIPMENT STANDARDS

- A. To prevent personal injury and property damage incidents, adhere to the following standards:
 - 1. Equipment
 - a. Each operator is responsible for the site operation of his/her equipment. Operators shall make daily inspections of the following: steering, brakes, mirrors, lights, horn, seat belts, backup alarm, tires, windshield wipers, and fire extinguishers. Report noted defects for prompt repair.
 - b. Schedule preventive maintenance regularly for all equipment to ensure their safe operating condition. Maintain all equipment and vehicles in compliance with federal and State requirements.
 - c. Never load trucks beyond their rated capacities or in a manner that will obscure the driver's vision. Secure all loads to prevent shifting or loss of material.
 - d. Fuel motor equipment and vehicles only by approved methods. Do not smoke or permit open flames near a vehicle being fueled.
 - e. Do not refuel equipment while engine is running. Shut off all equipment to be re-fueled and let the engine cool before re-fueling. Do not smoke or permit open flames near a vehicle being fueled.
 - f. Equip all mobile construction equipment with broadband back-up alarms that can be heard for a distance of 200 feet, unless otherwise directed by the Resident Engineer. Hub-bells and tonal alarms are not permitted on Sound Transit projects.
 - g. All operators or occupants of equipment provided with seatbelts and operators or passengers of motor vehicles on-site shall wear seat belts. Transportation of personnel in the back of any truck is prohibited.

- h. Drivers shall hold current licenses of the appropriate class to operate the equipment and vehicle, and be named on the Contractor's (or Subcontractors) insurance roster.

2. Cranes

- a. Crane standards and other standards may change prior to the start of construction or during the construction work. Comply with the most stringent current local, State or federal standards and be responsible for compliance under the Contract.
- b. Operators shall be responsible for the exercise of caution necessary for the safe operation of their equipment. Operators shall immediately report unsafe conditions, including defects in the machine, to their supervisor.
- c. Operators shall not permit anyone to ride the hook, headache ball, or load.
- d. When the operator leaves the machine or repairs are being made, it is the responsibility of the operator to set the brakes, secure the boom, take the machine out of gear, and turn off the engine.
- e. Use a standardized set of hand signals while directing crane operations.
- f. When making any lift, the operator shall take operational signals only from the authorized signal person. The only exception is that the operator shall accept an emergency stop signal given by anyone.
- g. It is the joint responsibility of the operator and the riggers to see that all hitches are secure and that all loose material is removed before the loads are lifted.
- h. Use safety hooks, or properly moussed hooks, on all operations where loads are being handled. **Control all suspended loads with tag lines.**
- i. Equip booms with a boom angle indicator and approved boom stops. Paint boom heads, load blocks, and hooks with high visibility paint.
- j. Equip all cranes, except crawler cranes and boom type excavators, with outriggers of a design and strength suitable for the work being performed. Use outriggers in accordance with the manufacturer's instructions. Review the positioning of the crane to verify adequate ground conditions for crane support.
- k. Inspect hooks, wire rope, bearings, gears, friction clutches, chain drives, and other parts subject to wear at regular intervals, and repair or replace as required. Following inspections the color code crane elements mentioned above allowing visual confirmation of the inspection. Records of such inspections shall be maintained by the Contractor.
- l. Provide certification for all cranes over 1.5 tons manufacturer's rated capacity annually in accordance with DOSH.
- m. Consider all overhead electrical lines as high-voltage lines. Do not permit a crane or any part of a crane to work within 20 feet of an energized or ungrounded overhead electrical line.

- n. Do not allow any vehicular or pedestrian traffic to pass beneath the boom of any crane. When the boom of a crane must be placed over a street or pedestrian walkway, stop or reroute all traffic, vehicular and pedestrian.
- o. Do not suspend boatswain's chairs from any crane.
- p. All crane operators shall comply with the requirements of DOSH or Fed/OSHA as applicable.
- q. All crane operators shall have current certification on file with the Contractor and submit to Sound Transit before operating cranes on site.
- r. Have documentation for qualifications or certifications for all riggers, top lander, bottom lander, and lifting (crane) supervisors and identify them in the construction work plans or project safety plan.
- s. Implement a planned maintenance schedule for all cranes on site. Engage the manufacturer or an independent maintenance provider for the maintenance of gantry cranes and hoists.
- t. Prior to any critical lift or lifts requiring a lift plan hold a documented tailgate meeting to define roles of authorized signal person and to define the work that is to be done.

3.17 ELECTRICAL

- A. All electrical work, installation, and wire capacities shall be in accordance with the pertinent provisions of the National Electrical Code (NEC), DOSH, Fed/OSHA, and other applicable codes or regulations.
- B. Enclose and ground all switches. Panel boards shall have provisions for closing and locking the main switch and fuse box compartment.
- C. Cover, elevate, or string cables or cords passing through work areas so as to protect them from damage and eliminate tripping hazards.
- D. Cover cables or cords crossing walkways, access points, roadways to prevent trips and damage from vehicles and equipment.
- E. Do not allow cords to lie in water.
- F. Extension cords used with portable electric tools and appliances shall be heavy duty, of the three-wire grounding type, and shall conform to the type and configuration required by the applicable DOSH and Fed/OSHA regulations and the NFPA.
- G. Provide suitable means for identifying all electrical equipment and circuits, especially when two or more voltages are used on the same job. Mark all circuits for the voltage and the area of service they provide.
- H. All electrical work shall be performed by qualified electricians who are qualified and knowledgeable with the codes. Inspect all electrical work by Subcontractors.
- I. Ground-fault circuit interrupters or an assured grounding program shall be used. Should an assured grounding program be used, submit copies to the Resident Engineer.
- J. Effectively guard live parts of wiring or equipment to prevent contact with personnel or objects.

- K. De-energize all electrical circuits and equipment prior to any work being performed on the circuits and equipment. Exception: When electrical circuits and equipment cannot be de-energized and must be worked hot, then adequate voltage-rated insulated gloves, mats, aprons, and other protective equipment shall be used as required and shall be tested for leaks and insulating capabilities.

3.18 LOCK-OUT/TAG-OUT CLEARANCE PROCEDURE

- A. The following procedure is intended to provide a controlled method for rendering electrical equipment or operating systems inactive (including mechanical or piped) when equipment is down for any reason, such as repair, removal, or replacement of equipment and installation of new equipment, DOSH and Fed/OSHA requirements shall be followed.
- B. Regardless of the operation and the phase or phases involved, observe lock-out/ tag-out clearance procedure to ensure the safety and security of the operation even if all three phases are not required.
- C. Although this procedure generally provides for locking and tagging of equipment, the danger tag alone is to be considered a lock-out device. Do not operate any equipment bearing such a tag under any circumstances.
- D. Before starting any major operation that involves locking and tagging procedures, hold a meeting involving the SSSR and the Resident Engineer. Adopt and review specific procedures with all parties concerned before work begins.
- E. Shutdown of Equipment or System
 - 1. The craft supervisor shall cause equipment to be shut down in a manner consistent with good operating practice.
 - 2. The main disconnect shall be opened in addition to any remote control switches. On electrical work, it is advisable, as a further precaution, that the electrician remove all of the supply fuses. On piped systems, the main valves shall be closed and pressures relieved.
 - 3. After assurance that the equipment has been properly shut down in accordance with prescribed procedures, the craft supervisor shall positively determine that the equipment or system has been locked and tagged.
- F. Repair or Installation
 - 1. Each individual craftsperson assigned to the job shall attach to the equipment or system a separate standard danger tag. Date and sign the tag, and provide a short explanation for the reason for the tag in the provided spaces.
 - 2. The craft supervisor responsible for the work shall ensure that the equipment has been deactivated and properly tagged before permitting his/her personnel to perform any work.
- G. Starting Up Equipment or System
 - 1. As soon as the work is completed, the tags shall be removed only by the individuals installing them.
 - 2. In the event the shift ends before the work is completed, report the status of the work in detail to the oncoming shift personnel and change the names on the tags.

3. Upon completion of the work, the supervisor shall make certain all workers' tags have been removed and that everyone is clear of the equipment or system. The supervisor shall return the equipment to normal operating conditions.

H. General

1. In an emergency, the Contractor's project manager or superintendent shall have the authority to remove the tags and locks only after positively determining whether or not the equipment or system is safe for operation and that all personnel are in the clear.
2. Personnel that are deviating from these instructions or unauthorized persons removing danger tags shall be subject to disciplinary action.

3.19 TOOLS

A. General:

1. All hand tools, power tools and similar equipment, whether furnished by the Contractor or the employee, shall be maintained in a safe condition. Tools shall be inspected upon arrival at the site and tagged as fit for service for a defined period of time. Supervisors and craft personnel shall be responsible for the inspection and repair of tools under their control. The use of many tools requires the use of a variety of PPE.

B. Hand Tools

1. Use insulated or non-conducting tools when working near energized electrical circuits.
2. Tool handles shall be tightly fitted. Carefully check wooden handles: tightened with wedges, if necessary, or replaced if split or splintered.
3. All impact tools, such as chisels, punches, and wedges shall be regularly dressed to eliminate mushrooming or flaring of the point of impact.

C. Power Tools

1. The following shall apply to all types of power tools:
 - a. Only authorized personnel shall be permitted to operate or repair power tools.
 - b. Maintenance of power tools shall be systematic. Promptly repair or replace all worn or damaged tools. Clean, test, and inspect all tools regularly.
 - c. Do not use power tools if permanent safety equipment, such as shields, tool rests, hoods, and guards have been removed the tool have otherwise been rendered inoperative.
 - d. Provide personnel using tools under conditions that expose them to the hazards of flying objects or harmful dust with the required personal protective equipment.

- e. Properly ground or bond all electrically powered tools.
- f. Do not use gasoline-powered tools in subsurface or unventilated areas. Dispense gasoline only in U.S. approved safety cans. Plastic gas cans are not allowed on Sound Transit projects. (Special requirements apply to the use of gasoline and other similar products on underground construction projects.)
- g. Provide portable grinders with hood-type guards with side enclosures that cover the spindle and at least 50 percent of the wheel. Inspect all wheels regularly for signs of fractures.
- h. Equip bench grinders with deflector shields and side cover guards. Tool rests and tongue guards shall have a maximum clearance of 1/8 inch from the wheel.
- i. Hoses supplying pneumatic tools shall have coupling, whip checks, and tie-wires secured to prevent incidental disconnection.
- j. Protect air-supply lines from damage, inspected regularly, and maintained in good condition.
- k. Protect air sources supplying hoses exceeding 1/2-inch inside diameter by excess flow valves to prevent whipping in the event of hose separation or failure.
- l. The pressure of compressed air used for cleaning purposes shall be 30 psi or less (does not apply for cleaning forms).
- m. Equip all hand-held power drills; tapes; fastener drivers; horizontal, vertical, and angle grinders; disc sanders; belt sanders; reciprocating saws; saber saws; and all other similarly operating powered tools equipped with a momentary contact on-off control switch/trigger.
- n. Train all personnel who operate pneumatic, electric, or gasoline-powered chain saws in the safe operation of a chain saw. Maintain documentation attesting to this training on file in the Contractor's office and make available upon request.
- o. Equip all chain saws with at least the following:
 - 1) Safety tip;
 - 2) Hand guard/chain brake;
 - 3) Spark arrester (gasoline only);
 - 4) Chain catcher; and
 - 5) Bumper spikes.
- p. Personnel whose duties require them to operate a power chain saw shall wear chaps, leggings, or other equivalent protection that will protect the vulnerable areas of the legs. In addition they will wear eye and face protection and appropriate gloves.

- q. For repetitive tasks overhead or at foot-level, use tool extensions, where feasible.
- r. Implement control of hand-arm vibration from power tool use through provision of PPE, handle-wraps, or low-vibration tools.

D. Powder-Actuated Tools

- 1. Only personnel who have furnished evidence of having been trained in its use shall be allowed to operate a powder-actuated tool.
- 2. Eye and hearing protection shall be worn by all personnel using powder-actuated tools. Work areas shall have proper signage.
- 3. Do not load tools until just prior to use. Do not leave loaded tools unattended.
- 4. Do not use tools in an explosive or flammable atmosphere. Keep cartridges (power source) separated from all other material.
- 5. Powder-actuated tools used on this Contract shall meet all applicable requirements of DOSH and Fed/OSHA.
- 6. Cleaned up unspent cartages. Do not leave unspent cartages lying on the floor.
- 7. Do not dispose of misfires or unspent cartages in trash cans.

E. Pneumatic Nailers/Staplers

- 1. To prevent incidental discharge, all pneumatically driven nailers and staplers shall have a safety device on the tool, which shall prevent the tool from being operated unless the muzzle of the tool is in contact with the work surface.
- 2. When not in use, disconnect the nailer or stapler from the air supply.
- 3. All personnel who operate pneumatic nailers or staplers shall be trained in their safe operation. Maintain documentation attesting to the training on file in the Contractor's office and make available upon request.

3.20 WELDING AND CUTTING

A. General

- 1. The Fire Prevention and Safety Plan in the CSSP and project Construction Work Plans shall identify the risks and mitigation plans for all work activities involving welding, burning, or cutting including, but not limited to, roles and responsibilities, precautions, detection warning systems, firefighting equipment, fire drills, material storage and inspections.
- 2. Obtain a Seattle Fire Department Hot Work Permit for the project site.
- 3. Develop and operate a Hot Works Permit System. Permits shall be issued by the Contractor's ConSM, or his/her nominated representative, who is competent to identify the hazards posed by the specific works to be performed and the appropriate safety measures to be implemented.
- 4. Three copies of the Permit shall be generated. One copy shall be retained by the ConSM, one copy shall be transmitted to the Resident Engineer and one copy shall be displayed at the location of the Hot Works.

5. Provide a monitoring and fire watch, when required

B. Welding

1. Provide a suitable, approved fire extinguisher for instant use in locations where welding is carried out.
2. Provide screens, shields, or other safeguards at all welding locations for the protection of personnel. Prevent material falling below or otherwise minimize exposure to sparks, slag, falling objects, or the direct rays of the arc.
3. The welder shall wear approved eye and head protection. Persons assisting the welder shall wear protective glasses.
4. The welder shall have suitable protective gear including appropriate gloves and protective clothing.
5. Electric welding equipment, including cable, shall meet the requirements of the National Electric Code. Welding practices shall comply with all applicable regulations.

C. Burning or Cutting

1. When gas cylinders are stored, moved, or transported, the valve protection cap shall be in place. Stored gas cylinders above ground in enclosures and secured with chains.
2. Secure cylinders in an approved upright cage or basket before hoisting.
3. Store, transport and use all cylinders in an upright position. If the cylinder is not equipped with a valve wheel, keep a key on the valve stem while in use.
4. Provide an approved fire extinguisher readily available in the event of fire.
5. Use appropriate personal protective equipment, such as burning glasses, shields, and appropriate gloves.

D. Fire Watch/Guard

1. Post a fire watch to the area for at least 1 hour after welding and cutting has been completed.

3.21 LADDERS

- A. Provide a safe means of access to all work areas. These access ways shall consist of ladders, stairways, elevators, and other approved methods of access, and shall not be blocked by materials or debris.

B. Manufactured Ladders

1. Comply with the regulations of ANSI A14.2-1968, Safety Code for Portable Wood Ladders or ANSI A14.2-1972, Safety Code for Portable Metal Ladders.
2. Do not use ladders with broken or missing rungs, broken or split side rails, or other damage. Immediately removed damaged ladders from the site.

3. All portable ladders shall be equipped with nonskid safety feet and shall be placed on a stable base. The access areas at the top and bottom of ladders shall be kept clear.
4. The side rails shall extend 36 inches above the landing. When this is not practical, grab rails shall be installed. All ladders in use shall be tied, blocked, or otherwise secured to prevent incidental displacement.
5. Do not use stepladders as straight ladders.
6. Do not stand on the top two steps of a stepladder.
7. Extension ladders are not be dismantled and used as straight ladders.
8. At no time shall any employee work from any ladder above 4 feet unless fall protection is used.
9. At no time shall more than one employee work from a single ladder at a given time.

C. Job-Made Ladders

1. Job-made ladders shall be fabricated in compliance with DOSH, Fed/OSHA, and appropriate ANSI standards.
2. The general rules applying to the use of manufactured ladders also apply to the use of job-made ladders.

D. Fixed Ladders

1. All fixed ladders on worksites shall meet ANSI A14.3, American National Standard for Ladders-Fixed-Safety Requirements, in effect at the time they are installed.

3.22 SCAFFOLDING, RAILINGS, STAIRWAYS AND ELEVATORS

A. Scaffolds

1. Scaffolds shall be designed, built, and inspected by competent persons. To avoid the use of makeshift platforms and scaffolding, carefully plan each job to ensure that scaffolding is used where required and that such scaffolding conforms to DOSH and Fed/OSHA Standards.
2. Scaffolds and stair towers shall be inspected **DAILY** by a Competent Person. Clearly mark scaffolds and stair towers with inspection tag certifying "fit for use" visible to those who will be using any scaffolding or stair towers.
3. Install guardrails and toe boards all open sides and ends of scaffolds. Guardrails shall be 2 x 4 inch stock, midrail 2 x 4 inch stock, or equivalent. The top rail shall be approximately 42 inches high and the midrail placed halfway between top rail and the platform.
4. Securely fasten toe boards, 4-inch minimum height, in place.
5. Other forms of employee protection may be used as in accordance with DOSH or Fed/OSHA regulations.

6. Wooden railing posts (verticals) shall be made of at least 2 x 4 inch stock or its equivalent, and be spaced so as not to exceed 8 feet on center.
7. Use a fall arrest system when working from a scaffold, which is not completely decked, or where guardrails are not installed.

B. Railings

2. Other types, sizes, and arrangements of railing construction are acceptable, provided they meet the following requirements:
 - a. A smooth-surfaced top rail approximately 42 inches above the floor.
 - b. Strength to withstand the minimum of 200 lb top rail pressure with a minimum of deflection.
 - c. For specific material requirements, refer to DOSH and Fed/OSHA.

C. Stair Railings

1. Constructed stair railings similar to a standard railing, except vertical height shall be not more than 34 inches or less than 30 inches from the top rail to the surface of the tread in line with the face of the riser at the forward edge of the riser.

D. Stairways

2. Provide stairway or ladder at all personnel points of access where there is a break in elevation of 19 inches or more, and no ramp, runway, sloped embankment, or personnel hoist provided.
3. Place permanent stairways as soon as practical.
4. Keep all parts of stairways free of hazardous projections. Do not allow debris and other loose material to accumulate on stairways.
5. If using permanent steel stairways having hollow-pan-type treads and landings that are to be used prior to concrete placement, temporarily fill pans filled with a solid material to the level of the nosing.
6. Provide temporary stairs with a landing no less than 30 inches wide, in the direction of travel, for every 12 feet or less of vertical rise. Wooden treads for temporary service shall be full width.
7. Riser height and tread width shall be uniform throughout any flight of stairs.
8. Evacuation routes from station construction areas shall include steel stairways sized and located to ensure workforce evacuation in accordance with the evacuation plan.

3.23 CONCRETE AND CONCRETE FORMS

- A. All equipment and materials used in concrete construction and masonry work shall meet the applicable requirements as prescribed in ANSI standard on "Safety Requirements for Concrete Construction and Masonry Work."
- B. Concrete driver and supplier personnel shall comply with all safety requirements for personnel protection equipment and fall protection when on site.

- C. Provided personnel working more than 4 feet above any adjacent working surface, placing reinforcing steel, with fall protection such as a Class III Full Body Harness or equivalent device, or a standard railing.
- D. Personnel shall not be permitted to work above vertically protruding reinforcing steel unless such steel has been protected to eliminate the impalement hazard.
- E. Clearly identify all pick points or rigging locations for concrete forms.
- F. Equip rotating-blade type concrete troweling machines (electrical or otherwise) with a control switch that shall automatically shuts off the power whenever the operator's hand is removed from the equipment handle.

3.24 FLOOR, ROOF, WALL OPENINGS, AND OPEN-SIDED PLATFORMS

- A. To control conditions where there is a danger of personnel stepping into or falling from or materials falling through floor, roof, or wall openings, such openings shall be protected in accordance with DOSH and Fed/OSHA.
- B. Provide hole covers of adequate strength and replace or repair upon discovery of damage.
- C. Guard all floor holes greater than 2 inches in the least dimension.

3.25 STEEL ERECTION

- A. General Requirements
 - 1. Secure bundles of sheets or small material so as to prevent their falling.
 - 2. When setting structural steel, secure each piece with not fewer than two bolts at each connection and drawn up wrench tight before the load is released.
 - 3. Avoid walking on the top flange of beams. Use class III Full Body Harness (fall arrest system) at all times.
 - 4. Avoid walking under the lift or permit an employee to be exposed to the swing of the lift.
 - 5. Use a tag line to control all loads.
 - 6. For the protection of other crafts on the site, post signs in the erection area, "Danger Men Working Overhead."
- B. Install permanent floors as soon as practical following the erection of structural members. At no time shall there be more than four floors or 48 feet of unfinished bolting or welding above the foundation or uppermost secured floor.
- C. Temporary Flooring
 - 1. The erection floor shall be solidly planked over its entire surface except for access openings. Planking shall be not less than 2 inches thick, full-size, undressed, and shall be laid tight and secured against movement.
 - 2. Guard floor openings by a standard railing and toe boards or cover. In general, provide the railing on all exposed sides, except at entrances to stairways.

3. On structures not adaptable to temporary floors, install safety nets and maintain whenever the potential fall distance exceeds two stories or 25 feet.

3.26 EXCAVATIONS, TRENCHING, AND SHORING

- A. Perform all work in accordance with DOSH and Fed/OSHA.
- B. An inspection shall be documented by a Competent Person prior to the start of work and as needed throughout the shift. Inspections shall also be made after every rainstorm or other hazard-increasing occurrence.
- C. Located stairways, ladders, ramps, or other safe means of egress in trench excavations that are 4 feet or more in depth so no more than 25 feet of lateral travel is required for personnel egress.
- D. Determine the design of the supporting system based on careful consideration of the following: depth of the cut; anticipated changes in the soil due to air, sun, and water; and ground movement caused by vehicle vibration or blasting; and earth pressures.
- E. Provide positive barriers or plating when a trench is placed adjacent to any roadway.
- F. Perform a detailed JHA and develop and implement safety precautions and procedures to address the hazards associated with deep excavation works. The analysis shall include, but not be limited to, measures to address lifting and hauling activities, ventilation, lighting, communications, access control, access/egress provisions, audio/visual warning system for evacuation, demarking of lifting areas, provision of dedicated walkways, plant selection, and shoring installation/removal.

3.27 HAZARDOUS SUBSTANCES

- A. Comply with the requirements of the Contract Documents and WAC 296-62, General Occupational Health Standard, and other applicable rules and regulations.
- B. Provide the Resident Engineer with a register of hazardous substances and copies of the MSDS that will be using in work-site operations. Provide a copy of the Contractor's training program to the Resident Engineer for review.
- C. Ensure that all employee training required by applicable laws and regulations is conducted, including requirements contained in DOSH WAC 296-24 and WAC 296-62 and Fed OSHA Safety and Health standards 1926.59.
- D. Develop and implement procedures to monitor the purchase, receipt, storage, training, usage, PPE selection, and ultimately the removal from site or disposal of all hazardous substances.
- E. Hazard Communication
 1. Contractors and Subcontractors shall comply with all requirements of WAC 296-800-170, Hazard Communication, including a written chemical hazard communication program, identification and listing of all hazardous chemicals present at the construction site, obtaining and maintaining MSDSs for each hazardous chemical used, the labeling of containers, and training of personnel.
 2. Hazard communication to personnel, Subcontractors, and visitors may occur individually, at scheduled training sessions, or at pre-construction meetings. Verify training and program requirements through completion of checklists or other documentation records.

3. The CWP shall also include a list emergency response measures the Contractor or Subcontractor plan on following to respond to exposure incidents involving VOCs.

F. Responding to Incidents Involving VOCs

1. In the event that concern is raised among construction personnel regarding VOC exposure, Contractor and Subcontractors shall immediately respond (within 2 hours) by identifying the source and potential exposures to affected personnel and work areas.
2. In responding to exposure concerns, Contractor and Subcontractors shall identify and evaluate the source of VOC exposure, including identifying the source product or process and reviewing product constituents.
3. Where industrial hygiene exposure data is not available or monitoring results are not immediately available, Contractor and Subcontractors shall collect or utilize a Certified Industrial Hygienist (CIH) to collect real-time direct-reading breathing zone measurements using a calibrated photo-ionization detector (PID) or flame ionization detector (FID). Equipment readings above background concentrations may need interpretation by a CIH and may require respiratory protection, ventilation, or a suspension of work activities.
4. PID or FID readings shall be used in combination with known instrument response factors to determine likely airborne VOC concentrations. Measured VOC concentrations shall be compared to applicable DOSH and Fed/OSHA permissible exposure limits to determine whether overexposures have occurred or may occur.
5. Where instrument response factors are not known and the presence of acutely toxic or carcinogenic VOCs (e.g., benzene, phosgene, methylene chloride, or isocyanates) can be ruled out, general PID/FID measurement rules-of-thumb below may apply:
 - a. Less than 5 ppm – Continue to monitor, respiratory protection not required
 - b. 5 - 10 ppm – Ventilate area, continue to monitor, respiratory protection not required
 - c. 10 - 25 ppm – Half-face respirators with organic vapor cartridges shall be worn, in addition to above requirements
 - d. 25 - 100 ppm – Full-face respirators with organic vapor cartridges shall be worn with additional dermal protection, in addition to above requirements
 - e. More than 100 ppm – Stop work and evaluate exposures and engineering controls
1. The Contractor or Subcontractor shall immediately (within 24 hours) report all incident data, including affected personnel, employers, product information, exposure data, PPE, and engineering controls used during an incident response to the Resident Engineer.

3.28 CRANE-SUSPENDED WORK PLATFORMS

- A. The use of crane-suspended work platforms shall be permitted only when permitted by the applicable safety and security regulations. Comply with WAC 296-155 Part L. Request and receive permission from Sound Transit prior to use of a crane-suspended work platform
- B. Request Procedure:
 - 1. Submit requests for use of a crane-suspended work platform to the Resident Engineer for review and comment with the following:
 - a. A statement of why conditions, methods, or operations require the use of a crane-suspended work platform;
 - b. A description of the crane to be used and the manufacturer's requirements in the use of the crane to suspend a personnel work platform;
 - c. Certification, by letter, that the work platform and other components, including hardware, have been designed and reviewed by a qualified registered civil, mechanical, or structural engineer; and
 - d. Documented emergency plan in the event of a crane failure.
- C. Notify the Resident Engineer in writing prior to putting the crane and work platform into service, stating that it has complied with the entire crane and work platform requirements.
- D. Indicate the crane to be used and ensure the latest crane inspection report has been submitted to the Resident Engineer.
- E. Ensure that daily inspections of the crane are made and that the Resident Engineer receives copies of the daily crane inspection reports.
- F. When a crane and work platform is to be used, be responsible for ensuring compliance with the most stringent regulations governing the use of a crane-suspended work platform.
- G. Comply with the crane manufacturer's recommendations and requirements in the selection and use of a crane for suspending personnel on a work platform.

3.29 RAIL SAFETY

- A. Inactive Rail / On-Track Equipment
 - 1. Identify to employees and provide hazard awareness if on-track equipment is being used in proximity during construction operations.
 - 2. Attend a weekly meeting with other contractors with the Resident Engineer, inspectors, and other concerned individuals to coordinate the movement of on-track equipment as to the following:
 - 3. Limits of work area;
 - 4. Interface with other work activities; and
 - 5. Safety devices, audible or visual warnings for hi-rail vehicles.

6. The supervisor or foreman shall make sure the travel route is clear prior to authorizing the movement of on-track equipment.
7. The supervisor or foreman shall contact other supervisors or foremen in the vicinity of the proposed work regarding the track outage prior to rendering a section of track impassable. Flaggers shall be posted.
8. Do not operate on-track equipment without the authorization of the supervisor or foreman.
9. No employee shall ascend or descend equipment, which is in motion.
10. Operate on-track equipment at a safe speed -not to exceed 10 miles per hour and be able to stop safely within half the distance of the operator's line of sight.
11. When approaching individuals on or near the track, slow on-track equipment to 5 miles per hour. The operator shall sound a warning bell/horn as he/she approaches individuals on or near the track. The speed of the equipment shall not exceed 5 miles per hour until it is safely past the individuals.
12. Before starting work on or near the rail tracks, post a flagger at least 100 feet in each direction of the Contractor performing work along the track to warn oncoming equipment to slow down.
13. The foreman shall make sure that each flagger has been instructed in proper flagging procedures, and is reliable and competent.
14. Stationed the flagger in such a manner so that he/she is visible to oncoming equipment.
15. The flagger shall be equipped with the following:
 - a. A paddle with "slow" on one side and "stop" on the other side;
 - b. A horn;
 - c. High Visibility Vest;
 - d. A radio; and
 - e. An orange flag.
16. When approaching a flagger waving an orange flag in a horizontal (side to side) motion, the equipment operator shall stop the equipment and receive instructions from the flagger prior to proceeding.
17. A flagger shall be stationed at all intersections where vehicular and pedestrian traffic might cross. The flagger shall ensure a clear crossing.
18. When working in the vicinity of any rail tracks, personnel shall be alert at all times to the movement of the on-track equipment. This equipment may be located on either track and be moving in either direction. Treat all rail tracks as active.
19. Rail vehicle and train movement shall be anticipated at any time from any direction. Train personnel to look in each direction prior to entering trackway area.

20. When working at a stationary location, a flagger shall be posted to warn on-coming rail equipment, trains, or other vehicles to slow down or stop.
21. Before permitting personnel to be on the track, the foreman in charge of the work crew shall instruct all crew members as to where each person will go when it is necessary to clear the track for rail vehicle or train movement. All personnel shall clear the track on the same side.
22. Personnel working on or near the tracks shall wear orange reflective traffic vests.
23. Keep all air hoses, electrical cords, and other similar equipment clear of the track(s). If such equipment must be placed across any track, run them under the rail.
24. Do not work within 10 feet of any active track without authorization.
25. Do not touch dangling wires or foreign objects hanging from such wires or attempt to move them by any means. Report their location immediately to the supervisor and, if possible, leave someone to protect such wires or foreign objects until removal by a qualified employee. Other persons in danger shall be warned.
26. Regard loose or broken impedance bond connections in the tracks as energized and report them immediately to the supervisor in charge.
27. Notify the immediate supervisor when an overhead wire failure occurs that may obstruct tracks. All personnel in the area shall be protected from the potential danger.
28. Do not walk along track with back to trains, but always face traffic if possible and take an occasional look back. Check the work area for safe locations to go to when tracks must be cleared. Supervisors shall inform all workers as to these locations.
29. Avoid crossing tracks near or at switch points or crossovers. Never step on moving parts of switch points, turnouts, or crossovers, but always walk on ties, invert, or walkways.
30. Do not jump off platforms to gain access to tracks. Use ladders or platform stairs.
31. Adequately insulate all tools used on work on or near electrical equipment or circuits. Use fuse pullers for removing and replacing fuses. De-energized electrical equipment and circuits shall be before any work is done.
32. Only dry cloth or fiberglass measuring tapes may be used in the vicinity of electric lights/power wires in the proximity of operating tracks. Dry cloth tapes shall not contain metallic threads.
33. Carry tools in a non-metallic canvas bags or carryall wooden boxes.
34. The overhead wire is charged with 1750 volts, and shall be treated as energized (hot) at all times.
35. A Sound Transit Rail-qualified employee in charge, having completed the Sound Transit right of way workers training program, shall be posted to monitor and announce oncoming rail traffic and who shall have no other duties. The employee

in charge shall establish and monitor adequate warning devices for train operators entering the work zone and be responsible to observe for approaching trains and provide sufficient warning of any oncoming rail vehicles to workers on or within 10 feet of the active rail right of way so they can clear to an area of safety not less than 1 minute prior to arrival of oncoming rail vehicles. The employee in charge shall maintain adequate communication, by either radio or hand signals with train or rail equipment operators, any time work is occurring within 10 feet of the active rail.

36. Any work to be performed where men or equipment could get within 10 feet of the overhead wire shall require the Contractor to schedule with Sound Transit removal of power from the line. It will be the Contractor's responsibility to verify the removal of power and to ground the overhead line prior to beginning work.

3.30 AERIAL LIFTS

- A. Aerial lifts mounted on the beds of trucks shall be installed by an authorized manufacturer.
- B. Personnel who operate the aerial lifts shall be trained by the manufacturer in the safe operation of the lift.
- C. Wear and use personal fall arrest systems in accordance with the applicable safety regulations while on the lift.
- D. Use aerial lifts only within the guidelines of the manufacturer.

3.31 LASERS

- A. Only qualified and trained personnel shall be assigned to install, adjust, and operate laser equipment.
- B. Personnel shall wear proper eye protection where there is a potential exposure to laser light greater than 0.005 watt.
- C. Locate lasers and targets at levels above the workers' sight, when possible.
- D. Use beam shutters or caps or turn off the laser when laser transmission is not actually required.
- E. Turn off laser when the laser is left unattended for a substantial period of time, such as during lunch, overnight, or at changes of shifts.
- F. Post signs warning all personnel of laser hazards in the area(s) where lasers are being used.

3.32 RADIOACTIVE MATERIAL

- A. In the use, handling, or possession of radioactive material, abide by regulations governing the use of radioactive material. The Contractor's attention is particularly directed to WAC 246-220 through WAC 246-254.

3.33 STREET DECKING

- A. Size all street decking as required by the application.

- B. All wooden street decking timbers shall be appropriate wood type, but in no case shall they be less than 12 by 12-inch timbers.
- C. Fit decking mats closely together to prevent cracks between the mats.
- D. Hooks for lifting and placing the deck mats and other rigging hardware shall have a factor of safety in accordance with the industry standard and be capable of lifting at least five times the deck mat weight.
- E. When deck mats must be removed for any reason, place standard guardrail with toe boards around the mat(s) to be removed prior to removal. If guardrails cannot be installed, then all personnel working within 5 feet of the deck opening shall wear and be securely tied off with a Class III Full Body Harness and lanyard.
- F. Cover all deck mat lifting eye holes and cracks with a suitable material, such as, but not limited to, thin sheet metal to prevent objects from falling through and to prevent pedestrians from stepping into the holes or cracks. In pedestrian walkways, keep material used to cover the holes and cracks flush to prevent tripping.
- G. Coat the wooden street decking with a non-skid material and maintain as required...

3.34 FALSEWORK AND VERTICAL SHORING

- A. Prior to demolition or stripping of false work, a CWP and JHA shall be submitted to the Resident Engineer describing how the Contractor intends to perform the work safely and in compliance with the Contract Specifications.
- B. Where wood shores are bun-spliced, they will be made with square joints and secured on four sides with not less than 2-inch material or 5/8-inch plywood of the same width as the post. The scabs shall extend at least 2 feet beyond the joint.
- C. If metal shore clamps are used, they shall be installed according to manufacturer's specifications.
- D. Standard railing shall be installed and maintained at all perimeters, floor openings, and sides of bridge decking at all times.
- E. Falsework design and erection shall conform to DOSH and Federal OSHA rules and regulations and the Contract Specifications.
- F. Protective sheeting or netting to prevent debris from falling shall be installed along railing where falsework spans a public street or pedestrian walkway.
- G. Material and debris shall not be allowed to accumulate along the soffit walls or the wing walls. At no time shall material or debris be stored at any ladder or stair lower landing.
- H. Proper walkways shall be constructed across wing walls.

3.35 SAFE ACCESS

- A. Provide a safe means of access to all work areas. These access ways consist of ladders, scaffolds, doorways, aisle-ways, and elevators, and shall not be blocked by materials or debris.

3.36 CONFINED SPACE ENTRY PROCEDURE

- A. Comply with the requirements stated in DOSH Rule 296-809, and all applicable Fed/OSHA and local rules and regulations.
- B. Develop and operate a Confined Space Permit System. The Permits shall be issued by the ConSM, or his/her nominated representative, who is competent to identify the hazards posed by the specific works to be performed and the appropriate safety measures to be implemented. Three copies of the Permit shall be generated. One copy shall be retained by the ConSM, one copy shall be transmitted to the Resident Engineer and one copy shall be displayed at the location of the Confined Space Work.
- C. Confined space hazards shall be evaluated before a permit is issued.
- D. Only trained personnel may enter permit-required confined spaces, serve as attendants, or issue permits.
- E. Rescue equipment shall be available for all confined space entries. Rescue equipment shall be maintained in accordance with manufacturers specifications, and all personnel shall be trained and practice use of the equipment at least annually.
- F. Rescue plans shall be developed for all confined space entries in which self-rescue (or retrieval by the attendant using rescue equipment) is not possible. This includes coordination with outside rescue services or agencies.

3.37 UNDERGROUND STATION CONSTRUCTION

- A. All Contractors and Subcontractors constructing stations shall provide adequate access, consisting of stairways, hoists, or ladders.
- B. Station construction, are considered confined spaces but are not classified as tunneling. Emergency response, accountability, and communications shall be established and maintained whenever employees are in or performing work in the station areas.
- C. Station construction may also fall under the auspices of WAC 296-155 Part Q as Underground Construction. The Contractor shall receive a definitive concurrence from DOSH that the station work under this specification is considered a confined space and that safety practices do not conflict with DOSH standards.
- D. Maintain a job site that is organized, free of debris, and kept free of standing water and mud.
- E. Maintain records of gas tests and airflow measurements and other tests or inspections in station areas where the atmosphere or ambient air may be impacted or affected by the work being performed. The SSSR or the Gas Tester shall make available on request to the Resident Engineer, Sound Transit, DOSH, and Fed/OSHA.
- F. The results of the most recent gas testing and velocity measurements shall be posted at the portal in clear view of all entrants.
- G. Transportation and Haulage
 - 1. All equipment used in the station area shall be diesel-powered equipment or shall be either approved by MSHA or shall be demonstrated by the employer to be fully approved equipment, and shall be operated in accordance with manufacturer's requirements.

2. Keep all access ways, platforms, landings, stairways, and walkways free of mud, water, and debris at all times.

H. Personnel Hoist Systems

1. Provide a dedicated personnel hoist/elevator, in addition to access/egress stairs, for station excavations and excavations where the depth of the excavation exceeds 60 feet.
2. When hoists are used for lifting and lowering personnel into and out of the station a person shall be identified and responsible for inspection and maintenance of the hoist. Failure to properly maintain or documented inspections may result in stopping of the hoisting systems.
3. Contractor shall provide documented training of personnel qualified and competent for the safe operation of the hoist.

I. Hoisting and Shafts

1. Do not hoist personnel by crane in or out of the shafts except in the case of an emergency and then only in an approved man-cage or basket stretcher.
2. The top lander shall warn personnel in the shaft, by the use of an air horn, of loads to be lowered into the shaft prior to the load being placed over the shaft.
3. Material hoisting, into and out of a shaft, shall be done by using appropriate hand signals or other approved communications systems such as voice communication with radios and voice-activated headset.
4. A bottom lander shall be present and stand at the bottom of the shaft where he/she can see all vertical movement of the line and material being hoisted.

J. Check-In/Check-Out System or "Brass board"

1. Establish a check-in/check-out system for personnel entering the station work area to identify all personnel who have entered the work zone.
2. All personnel entering the station work environment shall check-in/check-out via the Contractor brass in/brass out board.
3. Brass board system shall consist of a system where the Contractor can quickly check to confirm the presence or absence of site personnel. This system have consist of individual brass pieces, electronic badging, or other tag that is issues or identifies the name of the worker

K. Ventilation and gas monitoring

1. Ventilation shall be provided through a duct system, with intermediate booster fans, if necessary, to provide fresh air where needed into the station areas or specific work zones to ensure adequate air exchanges.
2. The preferred method of ventilation is through vent lines or localized air driving systems to specific work zones or station rooms to remove fumes, mists, particulates, and/or vapors.
3. Gas testing shall be conducted prior to workers entering areas where the atmosphere or ambient air have been changed or compromised by paints,

vapors or fumes. Air monitoring shall be taken at the start of shift and midway through the shift, and when required to adequately monitor air conditions.

4. A record of testing shall be maintained by the Contractor. The record shall show the following, at a minimum: name of the Gas Tester, date, time, location, and elements or compounds tested for or monitored.

L. Communications

1. Install a communication system that will notify all employees in the station area of an emergency evacuation.
2. Locate an information board at the entrance to the station areas with, but not be limited to, the following:
 - a. Emergency Procedures and audible warnings;
 - b. Contact information for project personnel;
 - c. Location of First-aid station;
 - d. Address of the site or Contractor's office; and
 - e. Warnings or Advisories of work activities or hazards those entering the station area should be aware of
3. A clear, unobstructed walkway with adequate lighting shall be maintained throughout the station in accordance with the Contract Specifications.
4. Minimum safety walkway width is 24 inches.
5. Maintain all floors and walkways in good condition.
 - a. Loose or broken components shall be repaired or replaced immediately.
 - b. Secure footing shall be ensured on all floors and walkways.

M. Readiness Review Meetings

1. The Resident Engineer will conduct a readiness review Safety and Security Meeting for each construction work plan before work may start at any station location. Attendees shall include the Resident Engineer, CSM, Sound Transit safety representative, the Contractor's Project Manager, the Contractor's superintendent, ConSM, and the SSSR.
2. The meeting will address the following:
 - a. General contractual safety, security, health, and environmental requirements and responsibilities.
 - b. Roles of the Resident Engineer, the CSM, the OCIP administrator, insurance carriers, and other personnel at Sound Transit.
 - c. Incident reporting requirements.

N. Illumination

1. Offices, workrooms, stairways, corridors, passageways, construction roads, and working areas shall be adequately lighted while work is in progress or when needed to protect the public and construction personnel from construction hazards.
 2. Each worker shall have a portable flashlight or cap lamp wherever natural light is inadequate or no emergency lighting exists.
 3. All wiring shall comply with the latest edition of the National Electrical Code, DOSH, federal, State, and local regulations and requirements, where applicable.
- O. Additional Required Contractor Safety and Security Inspections
1. A daily inspection of all station work areas shall be made by the ConSM or SSSR. Inspection reports shall be prepared and submitted to the Resident Engineer.
 2. Designate a Competent Person to perform daily inspections of stair towers, excavations, scaffolds, and access gates to ensure that they are maintained in a condition to prevent incidents. All defects or deficiencies shall be corrected in a timely manner.
 3. The crane, hoist, or elevator operator shall inspect and record the daily inspection of all hoisting machinery or equipment and related safety appliances. Hazard noted shall be corrected immediately and so documented.
 4. The ConSM or SSSR shall perform and document a shift inspection of the work sites, associated equipment, and assess or measure air or environmental conditions. Hazard noted shall be corrected and those corrective actions documented immediately.
- P. Gas Tester
1. Station areas shall have a Competent Person on each work shift that is qualified to perform atmosphere or ambient air testing. The Gas Tester shall be under the direct supervision of the ConSM.
 2. The Gas Tester shall have the authority to stop work and remove personnel from the work area when gas or toxic levels reach levels as defined by the applicable safety regulations until engineering or worker protective measures are incorporated.

END OF SECTION

EXHIBITS

- Exhibit A: Report Of Safety And Security Meeting
- Exhibit B: Contractor's Monthly Injury/Illness Report Form
- Exhibit C: Summary Of Construction Safety And Security Reports
- Exhibit D: Monthly Safety And Security Inspection Checklist
- Exhibit E: Crane Inspection Record
- Exhibit F: Monthly Wire Rope Inspection Record

Exhibit G: Acknowledgement of Safety/Security Indoctrination

Exhibit H: Sound Transit Recordkeeping Policy for Occupational Injuries and Illnesses

Exhibit I: Construction Safety/Security Survey Form

Exhibit J: Supervisor's Incident Investigation Report

Exhibit K: Worksheet for Job Hazard Analysis

Exhibit L: Pre-Task Analysis

Exhibit M: Safety And Security Occurrence Tracking Summary Log

Exhibit N: Visitor's Release and Hold Harmless Agreement

Exhibit O: Safety And Security Occurrence Tracking Log Summary

SECTION 01 35 30 - EXHIBIT A
REPORT OF SAFETY & SECURITY MEETING

REPORT OF SAFETY & SECURITY MEETING	
DATE:	SHIFT:
CONTRACT NO:	
CONTRACT TITLE:	
CONTRACTOR:	SUBCONTRACTOR:
NO. ATTENDING:	
TOPICS DISCUSSED (attach agenda if possible):	
SUGGESTIONS FOR IMPROVEMENT:	
FOREMAN'S SIGNATURE:	
SITE SAFETY and SECURITY REPRESENTATIVE SIGNATURE:	

Date: _____

Shift: _____

ATTENDANCE ROSTER		
NAME-PRINTED	SIGNATURE	COMPANY NAME
1.		
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		
10.		
11.		
12.		
13.		
14.		
15.		
16.		
17.		
18.		
19.		
20.		

SECTION 01 35 30 - EXHIBIT B

CONTRACTOR'S MONTHLY INJURY/ILLNESS REPORT FORM FOR YEAR OF 20_



Data/Measure	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Recordable Injury/Illness Cases												
Days Away From Work Cases												
Total Days Away From Work												
Restricted/Modified Work Cases												
Total Days Restricted/Modified Work												
First Aid Cases												
Reported Near Misses												
Average Number of Personnel on Worksite												
Labor Hours Worked												

Contractor Company Name: _____

Contractor Site Safety and Security Representative Signature:

Date: _____

SECTION 01 35 30 - EXHIBIT C

SUMMARY OF CONSTRUCTION SAFETY AND SECURITY REPORTS

TITLE	EVENT(S) GENERATING REQUIRED REPORT	PREPARED BY	REMARKS
Report of Safety/Security Meeting	Recording safety/security meeting	Supervisor/ Foreman holding meeting	Subcontractors may hold separate tool box meetings or attend Contractor's.
Construction Safety/Security Survey	Daily Report by Contractor. Random report by Sound Transit (likely weekly).	Contractor Daily. Sound Transit on a random basis (likely weekly).	<p>Filled out daily and submitted weekly by the Contractor's Site Safety and Security Representative or ConSM.</p> <p>Filled out by ST representative based on random site surveys (likely conducted weekly)</p> <p>Observed safety or security deficiencies will require immediate corrective actions with written response to the Resident Engineer within 24 hours of verbal or written notice.</p>
Monthly Safety and Security Tracking Summary Form	Monthly report (s)	Contractor	Submitted each month, covering the previous month.
Job Hazard Analysis	Known safety hazards and all major construction operations	Contractor	Filled out and submitted based on nature of work before work is started.
Monthly Safety/Security Inspection Checklist	Monthly Safety/Security Inspection	Contractor	Filled out and submitted monthly by the Contractor's Site Safety and Security Representative
Crane Inspection Record & Wire Rope Inspection Record	Monthly report(s)	Contractor	Completed by Rigging Supervisor
Lock and Tag Form	Isolation of energy sources to protect personnel	Contractor	Accounts for all locks and tags issued for energy isolation.
Supervisor's Incident Investigation Report	Any safety, security, property damage or 3 rd party incident to Contractor/ Subcontractor employee or the general public	Contractor	Report must be submitted within 24 hours of the event
Monthly Injury/Illness Report	Monthly report(s)	Contractor	Submitted each month, covering previous month

Confined Space Entry Permit	Confined space work	Contractor	Posted at job site during confined space work
Log & Summary of Occupational Injuries & Illnesses	Employee occupation injury or illness	Contractor	Contractor required to retain Form 300 and related records for 5 years
Distribution: Resident Engineer, with copy to Link Construction Safety.			

SECTION 01 35 30 - EXHIBIT D

MONTHLY SAFETY & SECURITY INSPECTION CHECKLIST

Contractor:		Date:		Time:	
Contract No.		Job-site Location:			
Person(s) making inspection:		Observers/Others on Inspection:			
		Column: A = Adequate B = Inadequate			
1. PROGRAM ADMINISTRATION:		A	B	CONDITION AND ACTION PLAN	
(a) Posting job-site warning posters.					
(b) Do you have safety and security meetings?					
(c) Do you have job safety and security training, including first-aid training?					
(d) Are there medical service and first-aid equipment, stretchers, and emergency vehicles available?					
(e) Are job-site injury records being kept?					
(f) Are emergency telephone numbers, such as police department, fire department, doctor, hospital, and ambulance posted?					
(g) Can you provide records of pre-employment, for cause, post-incident and random drug testing?					
2. HOUSEKEEPING AND SANITATION:		A	B	CONDITION AND ACTION PLAN	
(a) General neatness of working areas.					
(b) Regular disposal of waste and trash.					
(c) Passageways and walkways clear?					
(d) Adequate lighting.					
(e) Projecting nails removed.					
(f) Oil and grease removed.					
(g) Walking/working surfaces free of mud, water and debris					
(h) Walking/working surfaces free of holes, trip hazards and level changes					
(i) Waste containers provided and used.					
(j) Sanitary facilities adequate and clean.					
(k) Drinking water tested and approved.					
(l) Adequate supply of water.					

(m) Disposable drinking cups.			
3. FIRE PREVENTION:	A	B	CONDITION AND ACTION PLAN
(a) Fire instructions to personnel.			
(b) Fire extinguishers identified, checked, and lighted.			
(c) Fire department phone number posted.			
(d) Hydrants clear, access to public thoroughfare open.			
(e) Good housekeeping.			
(f) "No Smoking" posted and enforced where needed.			
(g) Fire brigades.			
4. ELECTRICAL INSTALLATIONS:	A	B	CONDITION AND ACTION PLAN
(a) Adequate and properly insulated wiring			
(b) Fuses provided.			
(c) Fire hazards checked.			
(d) Electrical dangers posted.			
(e) Proper fire extinguishing provided.			
(f) Are terminal boxes equipped with required covers? Are covers used?			
(g) Electrical work is conducted de-energized.			
(h) Only electricians are performing work on or near electrical equipment.			
5. HAND TOOLS:	A	B	CONDITION AND ACTION PLAN
(a) Proper tool being used for each job.			
(b) Neat storage, safe carrying.			
(c) Inspection and maintenance.			
(d) Damaged tools repaired or replaced promptly. Are employees' tools inspected and repaired?			
6. POWER TOOLS:	A	B	CONDITION AND ACTION PLAN
(a) Good housekeeping where tools used.			
(b) Tools and cords in good condition.			
(c) Proper grounding.			
(d) Proper instruction in use.			
(e) All mechanical safeguards in use.			
(f) Tool extensions used for repetitive work overhead or at foot-level.			
(g) Right tool being used for the job.			
(h) Wiring properly installed.			
(i) Hand-arm vibration dampening			

addressed for tools with high vibration levels.			
7. POWDER-ACTUATED TOOLS:	A	B	CONDITION AND ACTION PLAN
(a) Local law and ordinances complied with.			
(b) All operators qualified.			
(c) Tools and charges protected from unauthorized use.			
(d) Competent instruction and supervision.			
(e) Tools checked and in good working order.			
(f) Tools not used on any but recommended materials.			
(g) Safety goggles or face shields.			
(h) Flying hazard checked by backing up, removal of personnel, or use of captive stud tool.			
8. LADDERS:	A	B	CONDITION AND ACTION PLAN
(a) Ladders inspected and in good condition?			
(b) Properly secured to prevent slipping, sliding or falling?			
(c) Do side rails extend above top of landing?			
(d) Stepladders fully open when in use.			
(e) Metal ladders not used around electrical hazards.			
(f) Is the right ladder used for the job?			
(g) Are ladders painted?			
(h) Straight ladders at correct angle?			
9. SCAFFOLDING:	A	B	CONDITION AND ACTION PLAN
(a) Is erection properly supervised? Designated Competent Person			
(b) Will all structural members meet the safety factor?			
(c) Good housekeeping where scaffolds are used.			
(d) Are all connections secure?			
(e) Is scaffold tied into structure?			
(f) Are working areas free of debris, snow, ice, and grease?			
(g) Are foot sills and mud sills provided?			
(h) Are workers protected from falling objects?			
(i) Is the scaffold plumb and square with			

cross-bracing?			
(j) Are guardrails, intermediate rails, and toe boards in place?			
(k) Is scaffold equipment in good working order?			
(l) Are ropes and cables in good condition?			
(m) Can a personnel lift be used instead?			
10. HOISTS, CRANES, AND DERRICKS:	A	B	CONDITION AND ACTION PLAN
(a) Inspect cables and sheaves.			
(b) Check slings and chains, hooks, and eyes.			
(c) Equipment firmly supported.			
(d) Outriggers used if needed.			
(e) Power line inactivated, removed, or at safe distance.			
(f) Proper loading for capacity at lifting radius.			
(g) All equipment properly lubricated and maintained.			
(h) Signalman where needed.			
(i) Signals understood and observed.			
(j) Are inspection and maintenance logs maintained?			
11. HEAVY EQUIPMENT:	A	B	CONDITION AND ACTION PLAN
(a) Regular inspection and maintenance.			
(b) Lubrication and repair of moving parts.			
(c) Lights, brakes, warning signals operative.			
(d) Wheels chocked when necessary.			
(e) Haul roads well maintained and laid out properly.			
(f) Protection when equipment is not in use.			
(g) Are shut-off device on hose lines in case of hose failures?			
(h) Are noise arresters in use?			
12. MOTOR VEHICLES:	A	B	CONDITION AND ACTION PLAN
(a) Regular inspection and maintenance.			
(b) Qualified operators.			
(c) Local and state vehicle laws and regulations observed.			
(d) Brakes, lights, warning devices operative.			
(e) Weight limits and load sizes controlled.			

(f) Personnel carried in a safe manner - seated.			
(g) Personnel carried in a safe manner – non-seated.			
(h) Are back-up signals provided?			
(i) Are fire extinguishers installed where required?			
13. GARAGES AND REPAIR SHOPS:	A	B	CONDITION AND ACTION PLAN
(a) Fire hazards.			
(b) Dispensing of fuels and lubricants.			
(c) Good housekeeping.			
(d) Lighting.			
(e) Carbon monoxide dangers.			
(f) Are all fuels and lubricants in proper containers?			
(g) Proper ventilation.			
(h) Proper grounding and bonding.			
(i) Chemical hazards posted correctly?			
14. BARRICADES:	A	B	CONDITION AND ACTION PLAN
(a) Floor openings planked over or barricaded.			
(b) Roadways and sidewalks effectively protected.			
(c) Adequate lighting provided.			
(d) Traffic controlled.			
(e) Access to site and all entrances controlled and secured at all hours			
15. HANDLING & STORAGE OF MATERIALS:	A	B	CONDITION AND ACTION PLAN
(a) Are materials properly stored or stacked?			
(b) Are passageways clear?			
(c) Stacks on firm footings, not too high.			
(d) Proper number of workers for each operation.			
(e) Are personnel lifting loads correctly?			
(f) Are materials protected from weather conditions?			
(g) Protection against falling.			
(h) Is dust protection observed?			
(i) Extinguishers and other fire protection.			
(j) Is traffic controlled in the storage area?			
16. EXCAVATION AND SHORING:	A	B	CONDITION AND ACTION PLAN
(a) Are adjacent structures properly shored?			

(b) Is shoring and sheathing used for soil and depth?			
(c) Are roads and sidewalks supported and protected?			
(d) Is material stored too close to excavations?			
(e) Is excavation barricaded and lighting provided?			
(f) Is equipment a safe distance from edge of excavation?			
(g) Are ladders provided where needed?			
(h) Are equipment ramps adequate?			
(i) Is job supervision adequate?			
17. DEMOLITION:	A	B	CONDITION AND ACTION PLAN
(a) Are operations planned ahead?			
(b) Is there shoring of adjacent structures?			
(c) Are material chutes used?			
(d) Is there sidewalk and other public protection?			
(e) Clear operating space for trucks and other vehicles.			
(f) Adequate access ladders or stairs.			
18. PILE DRIVING:	A	B	CONDITION AND ACTION PLAN
(a) Are there proper storage procedures?			
(b) Is unloading performed only by properly instructed worker?			
(c) Are tag lines, slings, etc. in good condition?			
(d) Are pile driving rigs properly supported?			
(e) Are ladders on frames?			
(f) Are cofferdams maintained and inspected?			
(g) Is adequate pumping available?			
(h) Is personnel protection adequate? Hearing protection?			
19. EXPLOSIVES:	A	B	CONDITION AND ACTION PLAN
(a) Qualified operators and supervision.			
(b) Proper transport vehicles.			
(c) Local laws and regulations observed.			
(d) Storage magazines constructed per regulations or as recommended.			
(e) Experienced personnel handling explosives at all times.			

(f) Cases opened properly.			
(g) "No Smoking" posted and observed where appropriate.			
(h) Detonators tested before each shot.			
(i) All personnel familiar with signals, and signals properly used at all times.			
(j) Inspection after each shot.			
(k) Proper protection and accounting for all explosives at all times.			
(l) Proper disposition of wrappings, waste and scrap.			
(m) Advise residents nearby of blasting cap danger, and inspect potential damage points.			
(n) Check radio frequency hazards.			
20. FLAMMABLE GASES AND LIQUIDS:	A	B	CONDITION AND ACTION PLAN
(a) All containers clearly identified.			
(b) Proper storage practices observed.			
(c) Fire hazards checked.			
(d) Proper storage temperatures and protection.			
(e) Proper types and number of extinguishers nearby.			
(f) Carts for moving cylinders.			
21. MASONRY:	A	B	CONDITION AND ACTION PLAN
(a) Proper scaffolding.			
(b) Masonry saws properly equipped, dust protection provided.			
(c) Safe hoisting equipment.			
22. ROADWAY CONSTRUCTION:	A	B	CONDITION AND ACTION PLAN
(a) Laws and ordinances observed. State/local police approval?			
(b) Competent flaggers properly dressed, instructed, and posted.			
(c) Adequate warning signs and markers.			
(d) Equipment not blocking right-of-way.			
(e) Traffic control through construction site.			
(f) Adequate marking and maintenance of detours.			
(g) Dust control.			
(h) Adequate lighting.			
(i) Meets specification requirements.			

23. PERSONAL PROTECTIVE EQUIPMENT:	A	B	CONDITION AND ACTION PLAN
(a) Eye protection.			
(b) Face shields.			
(c) Respirators and masks.			
(d) Helmets and hoods.			
(e) Head protection.			
(f) Gloves, aprons, and sleeves; rubber or plastic, designed to afford protection from alkalis and acids; electrician's rubber gloves with protectors.			
24. SECURITY VULNERABILITIES:	A	B	CONDITION AND ACTION PLAN
(a) Threats from known individuals are controlled			
(b) Site-specific threats have been analyzed and controlled			
(c) Property and material is secured at all times			
(g) Respirators for harmful dust, asbestos, sand blasting, welding (lead paint, silica, chromium and galvanized zinc or cadmium). Compliance with hazmat requirements. Provide adequate ventilation when painting or applying epoxy resins. (When there is a question about injurious exposure, notify superior immediately who in turn shall arrange for atmospheric samples to be taken.)			
24. UNSAFE ACTS OR PRACTICES OBSERVED (list):			

25. REPETITIVE VIOLATIONS OBSERVED:

SECTION 01 35 30 - EXHIBIT E

CRANE INSPECTION RECORD

CONTRACTOR: _____			CONTRACT NO.: _____		
CRANE NO: _____		MILEAGE: _____	HOURS: _____	DATE: _____	
A. GENERAL REQUIREMENTS	OK	*REP	C. MAIN MACHINE	OK	*REP
Capacity Charts in cab			Controls		
Special instruction posted			Clutches		
Barricades (tailswing)			Brakes		
Exhaust pipes guarded			Brake locks		
BC fire extinguisher in cab			Main drum		
First-aid kit in cab			Boom hoist		
Safety glass in cab			Boom hoist panel		
Guardrails/hand holds			Boom hoist kickout		
Platform and steps/non-skid			Oil leaks		
Proximity signs, 10 ft. min.			Hook rollers and turret		
B. ATTACHMENTS			D. CARRIER		
*Hooks and blocks (safety latch on hook)			Steering		
Sockets and rope clamps			Brake (whole system)		
Boom and lacing			Lights, horn, wipers		
Boom stops			Transmission		
Spreaders and gantry			Differential		
Jib and stops			Clutch		
Outriggers and pads			Engine		
Counterweights			Tires and wheels		
			Gauges		
USE WIRE ROPE FORM FOR CABLE INSPECTIONS					
Inspected at: (Location) _____			By: _____		
* Repair or Replace - Respond on reverse side by specific item letter and number. Requires separate, recorded annual inspection for deformation or cracks.					

SECTION 01 35 30 - EXHIBIT F

MONTHLY WIRE ROPE INSPECTION RECORD

CONTRACTOR:				CONTRACT NO.:				
CRANE NO:		MILEAGE:		HOURS:		DATE INSPECTED:		
WIRE ROPE		(A) NUMBER OF BROKEN WIRES PER:		(B) %DIAMETER REDUCTION (WEAR OR CORE DAMAGE)		(C) KINKED CRUSHED OR CUT, ETC.?		(D) LUBED, CORROSION (INTERNAL OR EXTERNAL) HEAT DAMAGE?
TYPE	SIZE	(1) LAY?	(2) STRAND?	(1) IND. WIRE ?	(2) TOT. ROPE ?			
Main Hoist (LD. Line)								
Boom Hoist (Top Lift)								
Jib Hoist (Whip Line)								
Pendants (Main)								
Pendants (150 foot boom +)								
Jib guys (Upper)								
Jib guys (Lower)								
<p>Replacement of hoisting rope shall be done in compliance with the equipment manufacturers published replacement criteria and the Washington Administrative Code Chapter 296-155 Part L.</p> <p>Inspected at: (Location) _____</p> <p>By: _____</p> <p>Comments:</p>								

SECTION 01 35 30 - EXHIBIT G

ACKNOWLEDGEMENT OF SAFETY/SECURITY INDOCTRINATION

Contract No: _____

Date: _____

I, _____, attended the safety and security indoctrination session on _____
given by _____ covering the following information:

- ✓ *Hazards present in the work assignment and in the general area in which I will be working;*
- ✓ *Personal protective equipment required;*
- ✓ *Instructions on the proper procedure for reporting unsafe job conditions that I may encounter;*
- ✓ *Reporting of any and all injuries, incidents, and damage (no matter how slight);*
- ✓ *Contractor's job safety and security rules;*
- ✓ *Location of first aid and medical facilities;*
- ✓ *Toolbox Safety and Security Meeting requirements;*
- ✓ *Emergency service notification procedure for fire, medical emergencies, police problems, or other emergency situations;*
- ✓ *An orientation by the foreman or superintendent of my work area.*

I affirm and understand the information and will abide by the requirements presented.

Signature: _____

Affiliation: _____

SECTION 01 35 30 - EXHIBIT H

SOUND TRANSIT RECORDKEEPING POLICY FOR OCCUPATIONAL INJURIES AND ILLNESSES

Introduction

The methods outlined in this procedure are in compliance with American National Standards Institute (ANSI) Standard Z.16 for recording and measuring work injury and illness experiences, independent of workers compensation laws and rulings, but compatible with the recordkeeping requirements of the Bureau of Labor Statistics and Occupational Safety and Health Administration (OSHA).

The fact that an employer or employee did not have control over the cause of a work-related (occupational) injury or illness shall not be a criterion for excluding the case from being recorded under the provisions of this procedure.

Thorough investigation of all factors relating to the occurrence of each reported work-related injury or illness is essential. Determination as to whether or not the case should be considered recordable under ANSI Standard Z.16 shall be based upon the evidence developed in such investigations. Unless there is a preponderance of evidence that the injury or illness did not result from the work activity or environment of employment, the injury or illness shall be considered a work-related case.

Purpose

The purpose of reporting occupational injuries and illnesses to Sound Transit and the Resident Engineer is to provide an accurate and uniform method for recording, classifying, and reporting as a means of evaluating programs designed to control such injuries and illnesses and establishing training requirements for the project. This procedure will allow management to measure its safety and security program against others and implement incentive and award programs. This procedure is not intended to replace employers' OSHA responsibility for reporting work-related injuries and illnesses.

Scope

This procedure shall be followed by all Sound Transit staff, consultants, prime contractors, and Subcontractors.

Definitions

1. Employee: Any person engaged in activities for, and receiving direct payment for services, from an employer associated with the Link Light Rail System.
2. Exposure or Employee Hours: The total number of hours worked by all personnel direct billing to a project or contract including craft workers, clerical, administrative, and supervision. This shall also include all hours for any Subcontractor, but NOT for suppliers and vendors. Actual hours worked are to be used for calculating incidence rate, frequency rate, and severity measure. However, when actual hours cannot be accurately determined, estimated hours may be used. Employee hours shall be calculated as set forth below:
 - a. Actual Exposure Hours: Employee hours of exposure for non-exempt personnel are to be taken from certified payroll records and include only actual straight-time hours worked and actual overtime hours worked.
 - b. Estimated Exposure Hours: When actual employee hours of exposure are not available, estimated hours may be used. Such estimated hours should be obtained by multiplying the total employee Days worked for the period by the average number of hours worked per Day. If the hours worked per Day vary among departments or crews, a separate estimate should be made for each department or crew and these estimates added to obtain the total hours. Estimates for overtime hours should be included.

If employee hours are estimated, indicate the reason or basis upon which estimates are made.

- c. Exempt Employee: For executives, project management, supervisors, and other personnel whose working hours are not defined, the employer shall use an average of 8 hours per Day for computing exposure hours.
- d. For Sound Transit, 75 percent of projects direct charge personnel' hours as identified in the monthly labor report maintained by the accounting department shall be utilized in determining exposure hours.
- 3. Work Environment: The work environment is comprised of the physical location, equipment used, and kinds of operations performed by an employee in the performance of work associated with the Sound Transit Link Light Rail System, whether on or off the project premises.
- 4. First-Aid Treatment: One-time treatment and subsequent observation of minor injuries that may include minor scratches, cuts, burns, splinters, etc., which do not ordinarily require medical treatment. Treatment and observation for this purpose are considered first-aid even though provided by a physician or registered professional personnel.
- 5. Medical Treatment: All non-first-aid treatment of injuries administered by physicians, registered professional personnel, or lay persons. Medical treatment does not include first-aid treatment provided by a physician or registered professional personnel as previously defined.
- 6. Diagnostic Procedures: Certain diagnostic procedures performed by medical personnel may be classified as first-aid, such as the following:
 - a. Hospitalization for observation is considered first-aid as long as no medical treatment was provided;
 - b. Visits to a physician or nurse for observation only or for a routine change of dressing;
 - c. X-ray examinations where negative findings and no other medical treatment was performed; and
 - d. Physical examinations yielding no findings and not substantiating subjective complaints.
- 7. Preventive Procedures: Certain preventive procedures and treatments may be classified as medical treatment or first-aid treatment.

Tetanus shots or tetanus boosters are considered preventive and not considered medical treatment. However, a tetanus shot administered because of an injury shall be considered medical treatment and is recordable.

Prescription medication administered as a single dose is considered not recordable. When prescription medication is administered for more than a single dose, it is considered medical treatment and is recordable.

- 8. Work-Related Case: Any occupational injury suffered by an employee which results from a work incident or from an exposure involving a single incident in the work environment, and any illness caused by exposure to environmental factors associated with employment. Work environment is made up of the physical location, equipment and materials used, and kinds of operations performed by an employee in the performance of his/her work, whether on or off the employer's premises. Therefore, injuries or illnesses occurring in such places as an employee parking lot, lunchroom, restroom, or another office or location, and during rest or lunch periods can be work-related. Whether any case is work-related will be determined by the employer.
- 9. Recordable Case: Any work-related injury case requiring more than first-aid and all occupational illnesses. Recordable cases include:
 - a. Deaths, regardless of the time between occupational injury or illness and death.
 - b. Injuries resulting in any of the following:
 - (1) Lost work days - Days away from work.
 - (2) Medical treatment other than first-aid.
 - c. All work-related illnesses.
- 10. Lost Work Days:
 Lost Work Days - Days Away From Work: Days away from work are those work days (consecutive or not) on which the employee would have worked but could not due to an occupational injury or illness. Lost work days shall not include the day of injury or onset of illness or any days on which the employee would not normally have worked such as weekends and holidays.

Lost workday cases involving days of restricted work activity are those cases where, because of injury or illness, (1) the employee was assigned to another job on a temporary basis, or (2) the employee worked at a permanent job less than full time, or (3) the employee worked at his or her permanently assigned job but could not perform all the duties normally connected with it.

Restricted work activity occurs when the employee, because of the job-related injury or illness, is physically or mentally unable to perform all or any part of his or her normal assignment during all or any part of the normal workday or shift. The emphasis is on the employee's inability to perform normal job duties over a normal work shift.

11. Measurability of Recordable Injury and Illness Cases:

- a. Total Recordable Incidence Rate: Total number of OSHA recordable cases for the reporting period.

TOTAL RECORDABLE

INCIDENCE RATE: NO. OF RECORDABLE CASES X 200,000

ACTUAL EMPLOYEE HOURS

- b. Lost Workday Incidence Rate: Total recordable cases that resulted in death or lost work days/restricted duty for the reporting period.

LOST WORKDAY

INCIDENCE RATE: NO. OF LOST WORKDAY CASES X 200,000

ACTUAL EMPLOYEE HOURS

- c. Severity Measure: Total number of work days lost that occurred during the reporting period.

SEVERITY MEASURE: NO. OF LOST WORK DAYS X 200,000

ACTUAL EMPLOYEE HOURS

For the purpose of the above formulas, the allocation of days when a death or a permanent total disability is involved is as follows:

- a. Each death from an occupational injury or illness is assigned a time of 6,000 days.
- b. Permanent Total Disability from an occupational injury or illness is assigned a time of 6,000 days.

Procedure

Upon notification of a work-related injury or illness the employer shall determine if it is recordable or non-recordable. Employer shall use the established guidelines contained in this procedure and ANSI Standard Z.16.

Submitting a Workers Compensation Employer First Report does not alone determine that an occupational injury or illness is recordable. Employer First Reports may be submitted for cases for which only first-aid treatment was rendered by a physician or registered professional.

Employer shall notify the Resident Engineer immediately of all occupational injuries or illnesses and, within 24 hours, submit a copy of the Employers First Report, supervisor's incident investigation, medical release form, and physician report. These documents assist Link Safety/Security in determining injury or illness trends, and verification that all work-related injuries and illnesses are properly recorded.

By the 12th Business Day of each month, each employer shall submit to the Resident Engineer, the CSM, and the Link CSM the Monthly Statistics and the Safety and Security Information Summary with complete information for the previous month. These forms shall include, for prime contractors and Subcontractors:

- Total hours worked
- Total number recordable cases for that month
- Total number of recordable lost time cases for that month
- Total lost work days for that month
- Lost work days resulting from an injury or illness from a preceding month
- Information on recordable injuries (name, craft, type injury, disposition, days off and Contractor).

SECTION 01 35 30 - EXHIBIT I

CONSTRUCTION SAFETY/SECURITY SURVEY FORM

DATE: _____

CONTRACT NO. _____

CONTRACTOR: _____

SUBCONTRACTOR: _____

SAFETY OFFICER: _____

	OK	LTA	NA		OK	LTA	NA		OK	LTA	NA
				HOUSEKEEPING/ SANITATION				FIRE PREVENTION			
ELECTRICAL INSTALLATIONS				HAND/POWER TOOLS				LADDERS			
SCAFFOLDING				HOISTS, CRANES & DERRICKS				HEAVY EQUIPMENT OPERATIONS			
MOTOR VEHICLE OPERATIONS				TRAFFIC CONTROL / BARRICADES				RESPIRATORY PROTECTION			
MATERIAL STORAGE / FACILITIES				EXCAVATION & SHORING				SITE CONTROLS			
								Safety and Security			
PILE DRIVING				LOTO				FLAMMABLE LIQUIDS/GAS			
MASONRY				FALL PROTECTION				PPE			

THIS SECTION MUST BE COMPLETED BY CONTRACTOR ON DAILY SURVEYS AND MAY BE COMPLETED BY SOUND TRANSIT ON RANDOM SURVEYS

OBSERVATIONS:

ORIGINATOR SIGNATURE:

DATE:

TO BE COMPLETED BY CONTRACTOR SITE SAFETY/SECURITY REPRESENTATIVE

RESPONSE / CORRECTIVE ACTIONS TAKEN:

RESPONDENT SIGNATURE:	DATE:

Original: Contractor

Copy: Resident Engineer

Copy: Sound Transit
Construction Safety Manager

INSTRUCTIONS FOR CONSTRUCTION SAFETY/SECURITY SURVEY FORM

1. The Construction Safety and Security Survey is required for daily site surveys and shall be used to record all unsafe conditions and/or acts noted by the ConSM, SSSR or RE personnel.
2. This form is primarily intended for the use of the Contractor's safety and security personnel in accordance with the requirements of this specification. Unsafe conditions and/or actions shall be corrected immediately and reported daily on this form.
3. Completed copies of all construction safety and security survey forms indicating action taken and/or date completed shall be submitted to the RE on a weekly basis. These forms shall be signed by the Contractor's project manager and Sound Transit's RE.
4. This form shall be used by the RE and/or the CSM to document any unsafe act and/or conditions noted during site surveys conducted by the RE or Sound Transit safety personnel. Recommendations may be made to the Contractor's safety and security representative and/or project manager or superintendent for immediate corrective action.
5. This form, when filled out by the RE or Sound Transit safety personnel, shall be handled in the following manner:
 - a. The original shall be given to the Contractor and a copy retained or sent to the RE.
 - b. The Contractor shall complete the action taken and/or date completed section of the original survey and return it signed by the project manager to the RE
 - c. The RE shall sign the survey and distribute it in accordance with Exhibit C, Summary of Construction Safety and Security Reports.
6. Observed safety or security deficiencies will require immediate corrective actions with written response to the Resident Engineer within 24 hours of verbal or written notice.
7. Failure to take immediate corrective action in a timely manner may result in a Stop-Work Order issued in accordance with the General Conditions, Section 000200.

SECTION 01 35 30 - EXHIBIT J
SUPERVISOR'S INCIDENT INVESTIGATION REPORT

SUPERVISOR'S INCIDENT INVESTIGATION REPORT	
CONTRACTOR: _____	
INCIDENT DATE: _____ TIME: _____ CONTRACT NO: _____	
INCIDENT LOCATION (SPECIFIC): _____	
INJURY/ILLNESS _____ NEAR MISS _____ SECURITY BREACH _____ PROPERTY DAMAGE _____ THIRD PARTY _____	
WHAT HAPPENED? (Describe operation, activity, condition and, how incident or loss occurred. Use separate sheet and diagram if necessary.): _____ _____ _____ _____	
PRIMARY CAUSE (Condition or act that caused the incident.): _____ _____ _____ _____	
Recommended correction action: _____ _____ _____	
Equipment involved: _____ #: _____	
Employee involved: _____	
Employee Injury (Describe): _____ _____ _____	
Medical Referral: _____	
Company Property Damage or Loss (Describe): _____ _____ _____	
Property, Damage or Injury to Others (Describe): _____ _____ _____	
Owner/injured (Name, address, phone): _____ _____	
Witnesses (Name, address, phone): _____ _____	

ORIGINAL: Contractor's File

COPY: Sound Transit

1. This form shall be submitted by the Contractor for each incident involving any of the following:
 - a. Injury to an employee of the Contractor or any Subcontractor.
 - b. Any injury to persons not directly connected with the project (including all alleged injuries reported by a member of the public.)
 - c. Incidents resulting in damage to public, private, or commercial property (including all alleged property damages).
 - d. Incidents that are "Near misses" that could have resulted in any of the above.
2. Submittals shall be made within 24 hours of the incident. Pertinent facts not available within the above time shall be submitted in a supplemental report.
3. This form shall be prepared by the Contractor and distributed in accordance with Exhibit C, Summary of Construction Safety and Security Reports.

Complete investigation of any incident, whether or not injury or damage is involved, is a vital part of effective incident prevention. The investigation is not complete until the causes and proper corrective actions are determined.

The investigation and this report shall be completed by you immediately after any incident relating to your job which involves:

- Personal injury to any of our personnel or any other persons,
- Damage or loss to company property, materials or equipment,
- Damage or loss to property of other, and
- "Near misses" - which could have resulted in any of the above.

If property damage or personal injury to others is involved, do not assume any responsibility or obligate the company or Sound Transit in any way. Do not sign anything for anyone except your employer's representative. You should politely refer any question to your Project Manager.

In your investigation and preparation of this report, give extra attention to the following areas:

WHAT HAPPENED?

- (a) This does not mean list the injuries or damages that resulted. It means explain the events, which led to the injuries or damages.
- (b) Describe the work or activity involved, the conditions and what the people involved were doing.
- (c) Describe the tools, equipment or materials involved, their condition, and how they were involved.
- (d) Describe the unexpected event or occurrence, which resulted in the injury, damage, or loss.
- (e) If more space is needed or if a diagram will help your description, please attach another sheet.

CAUSES

Primary and Secondary - See Common Causes of Incidents

CORRECTIVE ACTIONS

Primary and Secondary

LOCATION

Specific place at job-site (street and city when applicable).t

PROPERTY DAMAGE OR INJURY TO OTHERS

Describe the property, extent of damage or nature of injury. If vehicle is involved, show year and model.

DESCRIBE PRACTICES OF EMPLOYEE:

Safety equipment provided but not used. Personal protective equipment provided but not used, improper or unsafe tool or equipment used. Horseplay or practical jokes. Instructions or rules disregarded. Inattention. Inexperience. Physical condition of employee. Improper method of doing work. Action of another person. Improper clothing.

UNSAFE EQUIPMENT OR MATERIALS:

Ineffectively guarded equipment. Unguarded equipment. Defective materials. Defective tools. Defective equipment (not motor vehicles). Defective motor vehicle equipment. Improper type or poor design. Unsafe equipment or material of another Contractor or a customer.

UNSAFE CONDITIONS:

Poor light. Poor ventilation. Congested area. Improper storage of materials. Exits or emergency escapes inadequate or not provided. Faulty layout of plant or facilities. Tools or equipment improperly stored. Poor housekeeping. Unsafe conditions caused by another Contractor or a customer.

- ✓ Submit original and copy to the Resident Engineer
- ✓ Retain copy for your records
- ✓ Use a Medical Referral slip for any injured employee who goes to a Doctor
- ✓ Keep your office advised

SECTION 01 35 30 - EXHIBIT K
WORKSHEET FOR JOB HAZARD ANALYSIS

Contractor:	JHA by:	
Craft:	Date of Analysis	
Briefly Describe the Job or Operation:		
Required and Recommended Personal Protective Equipment:		
Work Operation	Potential Incidents or Hazards	Safe Job Actions Needed

SECTION 01 35 30 - EXHIBIT L

PRE-TASK ANALYSIS (PTA)

SOUNDTRANSIT		PRE-TASK ANALYSIS (PTA) RISK REDUCTION TALK	
SUPERVISOR: _____		SUPERVISOR: _____	
DATE: _____		DATE: _____	
JOB DESCRIPTION: _____		JOB DESCRIPTION: _____	
LOCATION: _____		LOCATION: _____	
DOES TASK REQUIRE SPECIAL TRAINING? Y ___ N ___		DOES TASK REQUIRE SPECIAL TRAINING? Y ___ N ___	
JHA REQUIRED Yes ___ No ___ COMPLETED Yes ___ No ___		JHA REQUIRED Yes ___ No ___ COMPLETED Yes ___ No ___	
PTA CHECKLIST		PTA CHECKLIST	
ELECTRICAL POWER LINES Y ___ N ___ OVERHEAD Y ___ N ___ EMERGENCY PARTS Y ___ N ___ ACQUIRED GRINDING Y ___ N ___ EQUIPMENT CHECKS Y ___ N ___ SHOVED/SLOPED Y ___ N ___ LADDER PROVIDED Y ___ N ___ ENTRY LOG MADE Y ___ N ___ UTILITIES LOCATED Y ___ N ___ CONTAMINATED SOIL Y ___ N ___ HAZARDOUS (ENVIRONMENTAL) ARSON/EXPLOSION Y ___ N ___ VAPORS Y ___ N ___ HOT/COLD SURFACES Y ___ N ___ NOISE Y ___ N ___ TRAFFIC EXPOSURE Y ___ N ___ SUB CONTRACTOR Y ___ N ___ COORDINATION Y ___ N ___ PROPER EQUIPMENT SCISSOR LIFT Y ___ N ___ PERSONAL BUCKET Y ___ N ___ FORKLIFT Y ___ N ___ BOOM LIFT Y ___ N ___ CRANE Y ___ N ___ CRAN/FALL Y ___ N ___ HAND TOOLS Y ___ N ___ PERMITS Y ___ N ___ CONTAINER SPACE Y ___ N ___ CRITICAL LIFT PLAN Y ___ N ___ TRAFFIC PLAN Y ___ N ___ TRACK ACCESS Y ___ N ___ NIGHT LUGGER Y ___ N ___ NOTES: _____ TRAFFIC / PED CONTROLS VEHICLE TRAFFIC CONTROLS IN PLACE Y ___ N ___ CROSS STREET TRAFFIC Y ___ N ___ ADDRESS Y ___ N ___ SIDEWALK UPEN Y ___ N ___ PED BRIDGES O.K. Y ___ N ___ CROSSINGS LEVEL Y ___ N ___		ELECTRICAL POWER LINES Y ___ N ___ OVERHEAD Y ___ N ___ EMERGENCY PARTS Y ___ N ___ ACQUIRED GRINDING Y ___ N ___ EQUIPMENT CHECKS Y ___ N ___ SHOVED/SLOPED Y ___ N ___ LADDER PROVIDED Y ___ N ___ ENTRY LOG MADE Y ___ N ___ UTILITIES LOCATED Y ___ N ___ CONTAMINATED SOIL Y ___ N ___ HAZARDOUS (ENVIRONMENTAL) ARSON/EXPLOSION Y ___ N ___ VAPORS Y ___ N ___ HOT/COLD SURFACES Y ___ N ___ NOISE Y ___ N ___ TRAFFIC EXPOSURE Y ___ N ___ SUB CONTRACTOR Y ___ N ___ COORDINATION Y ___ N ___ PROPER EQUIPMENT SCISSOR LIFT Y ___ N ___ PERSONAL BUCKET Y ___ N ___ FORKLIFT Y ___ N ___ BOOM LIFT Y ___ N ___ CRANE Y ___ N ___ CRAN/FALL Y ___ N ___ HAND TOOLS Y ___ N ___ PERMITS Y ___ N ___ CONTAINER SPACE Y ___ N ___ CRITICAL LIFT PLAN Y ___ N ___ TRAFFIC PLAN Y ___ N ___ TRACK ACCESS Y ___ N ___ NIGHT LUGGER Y ___ N ___ NOTES: _____ TRAFFIC / PED CONTROLS VEHICLE TRAFFIC CONTROLS IN PLACE Y ___ N ___ CROSS STREET TRAFFIC Y ___ N ___ ADDRESS Y ___ N ___ SIDEWALK UPEN Y ___ N ___ PED BRIDGES O.K. Y ___ N ___ CROSSINGS LEVEL Y ___ N ___	

SECTION 01 35 30 - EXHIBIT M

SAFETY AND SECURITY OCCURANCE TRACKING SUMMARY LOG

NUMB ER	REPO RT#	DATE/TIME/ SHIFT	EMPLOYEE NAME	SUMMARY OF INCIDENT	TYPE OF INCIDENT	CORRECTIVE ACTION	SUPERVIS OR

INCIDENT REPORTING DEFINITIONS

I: Recordable: Immediate notice on occurrence log. All reports shall be submitted in an appropriate time frame including employee statement, supervisor report, witness statements and corrective actions form root cause analysis.

II: First Aid: Immediate notice on occurrence log. Addition information may be required once the incident is discussed with ST safety at weekly meeting. *A condition, practice, or vulnerability or practice likely to cause serious injury or illness, resulting in temporary disability or moderate property damage.*

III: Equipment incidents and incidents: Immediate notice on occurrence log. A report is required and shall be submitted with employee and supervisors statements. Report shall include results of post-accident testing and if necessary, re-training

This occurrence log shall be reviewed weekly with the Contractor project manager, ConSM, Resident Engineer, Sound Transit safety and the construction manager

SECTION 01 35 30 - EXHIBIT N

VISITOR'S RELEASE AND HOLD HARMLESS AGREEMENT

Contractor: _____

Contract No: _____ Date: _____

I am voluntarily entering a potentially hazardous Link Light Rail Project construction site for my own purposes and interests. As consideration for such entry, it is my intent to release, hold harmless, and indemnify Sound Transit, the construction managers, Contractors, Subcontractors, and their agents and personnel from any liability for injury or damages of whatsoever nature to the maximum extent permitted by law.

Specifically, in consideration of being permitted, for my own purposes and interests, to enter upon the premises or construction site of the Link Light Rail Project, I hereby release, hold harmless, and indemnify Sound Transit, the construction managers, Contractors, Subcontractors from and against, and assume the risk, for and on behalf of myself, my heirs, my survivors and my estate, for all damages, losses, injuries, and any and all other claims of any type whatsoever for personal injury (including death) and other loss or damage of any nature whatsoever including damage to my personal property, sustained or caused while on such premises or site, except (1) those injuries which are caused solely by the negligence of one or more of the Indemnified Parties, or (2) those injuries caused by or resulting from the concurrent negligence of one or more of the Indemnified Parties but in such case only to the extent of the negligence of the Indemnified Parties. In the event any clause, term, or provision of this agreement shall be declared or adjudicated void or invalid, it shall in no manner affect the other clauses, terms, and provisions hereof, which shall remain in full force and effect, as if the clause, term, or provision so declared or adjudicated invalid was not originally a part hereof.

Print Name: _____

Signature: _____

Address: _____

Date: _____

Uncontrolled Document from Soundtransit.org

[illegible]

SOUND TRANSIT

2023 STANDARD DIV 01 SPECS

SECTION 01 35 31

**HEALTH, SAFETY, SECURITY AND EMERGENCY RESPONSE PROCEDURE -
TUNNEL SUPPLEMENT**

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section includes safety procedures for tunnel construction that are to be used in addition and in conjunction with other safety procedures and requirements included in the Contract Documents.

1.02 REFERENCES

- A. Acronyms and Abbreviations
 - 1. LEL: Lower Explosive Limit
 - 2. NEC: National Electrical Code
 - 3. NFPA: National Fire Protection Association

1.03 TRAINING

- A. Tunnel Safety Training
 - 1. Minimum tunnel safety training shall include at least 4 hours of classroom instruction covering the following topics:
 - a. Air monitoring
 - b. Ventilation
 - c. Confined space entry procedures
 - d. Permit-required confined space entry procedures
 - e. Illumination
 - f. Communications
 - g. Flood control
 - h. Mechanical equipment, including haulage equipment and conveyor systems as appropriate
 - i. Personal protective equipment
 - j. Explosives
 - k. Fire prevention and protection
 - l. Emergency procedures, including evacuation plans and check-in/check-out systems.

- m. Site-Specific Emergency Evacuation Procedures
 - n. Check-In / Check-out Procedures
- B. Safety and Security Training Requirements for Gassy Classified Tunnels
 - 1. For all personnel working in a tunnel classified as "gassy" by DOSH/Fed OSHA standards, provide a minimum of 6 hours of tunnel safety and security training. This training shall be completed within 10 days after the employee starts work. A Certificate of Completion issued by the Contractor and a special numbered hard hat decal provided by Sound Transit shall be issued to those successfully completing this course. This program shall be acceptable by U.S. Department of Labor, Mine Safety and Health Administration, or DOSH/Fed OSHA.
 - 2. A person who holds a Certificate of Completion of an approved safety course in gassy tunnel operations within the prior 12 months shall not be required to take this training program, but shall be required to take a 4-hour refresher course within 24 months of the certificate date and every 24 months thereafter. The 6-hour tunnel safety and security training program shall include, but not be limited to, the following subjects:
 - a. Mine Gases - Explosive and toxic effects, means of detection, identification, analysis, and legal requirements of each gas found in the tunnel atmosphere and methods used to control tunnel gases;
 - b. PPE - Various devices used, why they are needed, where they are needed, and how to use and care for the equipment;
 - c. Construction methods and equipment for the specific project;
 - d. Fire Safety - Procedures to prevent fires and protect life and property when fires do occur. Location of fire extinguishers and how to use;
 - e. First-Aid - Specific measures to control a variety of injuries and disorders. Basic CPR and methods to stop bleeding and control shock;
 - f. Tunnel Incident Prevention -Introduction to the causes and prevention of tunnel incidents;
 - g. Tunnel Rescue and Emergency Training - Show in a step-by-step manner, the proper use of breathing apparatus;
 - h. Site-Specific Emergency Evacuation Procedures;
 - i. Check-in/Check-out Procedures; and
 - j. Use of Self-Rescuer.

PART 2 – PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 PROCEDURE FOR CONTROLLING EXPOSURE TO VOLATILE ORGANIC COMPOUNDS

SOUND TRANSIT

SECTION 01 35 31
HEALTH, SAFETY, SECURITY AND
EMERGENCY RESPONSE PROCEDURE –
TUNNEL SUPPLEMENT

2023 STANDARD DIV 01 SPECS

- A. The Contractor or Subcontractor shall immediately (within 24 hours) report all incident data, including affected personnel, employers, product information, exposure data, PPE, and engineering controls used during an incident response to the Resident Engineer.

3.02 TUNNELS AND UNDERGROUND STATION CONSTRUCTION

A. Check In/Check Out System or "Brass board"

1. Establish a check in/check out system for personnel entering the underground work area to identify all personnel who have entered the work zone.
2. All personnel entering the underground work environment shall check in/check out via the Contractor brass in/brass out board.
3. Brass board system shall consist of a double brass system or equivalent. One brass shall be placed on the board and one on the worker underground. Unless the individual brass pieces include the name of the worker, a list of names assigned to individual brass numbers shall be posted at the brass board.

B. Ventilation and gas monitoring

1. Gas testing shall be conducted prior to workers entering the tunnel, at the start of shift and midway through the shift, and a minimum of four times per shift. Locations for testing shall be at least at the portal, and midpoint of the tunnel. A record of testing shall be maintained by the Contractor. The record shall show the following, at a minimum: name of the Gas Tester, date, time, location, air velocity and direction, O₂, LEL, CO, and H₂S.

C. Communications

1. Provide for two means of communications at all areas at all times underground in accordance with NFPA 241.

D. Safety Walkways and Access

1. Limit pedestrian access through the tunnels to authorized personnel only.
2. A clear, unobstructed walkway with adequate lighting shall be maintained throughout [the tunnel] in accordance with the Contract Specifications.
3. Minimum safety walkway width is 24 inches.
4. Maintain all floors and walkways in good condition.
5. Loose or broken components shall be repaired or replaced immediately.
6. Secure footing shall be ensured on all floors and walkways.

E. Illumination

1. Offices, workrooms, stairways, corridors, passageways, construction roads, working areas, and [tunnels] shall be adequately lighted while work is in progress or when needed to protect the public and construction personnel from construction hazards. Minimum foot candles required for lighting are 10 foot-

candles for indoor work areas and 5 foot-candles for outdoor work areas. Average lighting required is 20 foot-candles for indoor work areas and 10 foot-candles for outdoor work areas.

2. Each [tunnel] worker shall have portable, permissible hand or cap lamp wherever natural light is inadequate or no emergency lighting exists.
3. Comply with WAC 296-840, Respirable Crystalline Silica.
4. Contractor shall make every effort to eliminate dust emissions either by employing wet methods and/or HEPA vacuum when performing dust generating (including concrete dust) activities.

END OF SECTION

SECTION 01 35 32

**HEALTH, SAFETY, SECURITY AND EMERGENCY RESPONSE
AERIAL/ELEVATED STRUCTURES SUPPLEMENT**

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section is a supplement to Section 01 35 29.10, Health, Safety, Security and Emergency Response and sets forth additional requirements and expectations with which the Prime Contractor and its Subcontractors shall comply for work performed on aerial or elevated structures. The requirements and expectations of this Section are in addition to those specified by Section 01 35 29.10, applicable laws, regulations and codes. In the event of conflict, the most stringent requirements shall apply.
- B. The requirements of this Section are to be addressed and submitted under the Site Safety and Security Plan (SSSP).
- C. It is not the intent of Sound Transit to list and identify all applicable safety codes, standards and/or regulations relating to work performed on aerial or elevated structures. The Contractor and its subcontractors are solely responsible for identifying, determining and adhering to all applicable safety codes, standards and regulations.

1.02 DUTIES AND RESPONSIBILITIES

- A. Upon the failure to comply with the requirements or the occurrence of observed safety or security deficiencies, the Contractor shall stop tasks and implement immediate corrective actions followed by written response to the Resident Engineer within 8 hours of the incident.
- B. Failure to implement corrective action or provide a satisfactory response may result in a Stop-Work Order.
- C. If the safety or security deficiency is associated with work being performed over or adjacent to areas open to public access, and there is a lack of immediate appropriate corrective action or there is a failure to provide a sufficient response, a Stop-Work order will be issued for work being performed over or adjacent to areas open to public.
- D. If any object associated with the work falls into an area that is open to public access, a Stop-Work order will be issued for all work over areas open to public access. In such instance, the Contractor shall be responsible for proposing and obtaining Sound Transit's concurrence for methods to complete the work at times when the areas beneath the aerial or elevated structures are not open to the public.

1.03 SITE SAFETY AND SECURITY PLAN (SSSP)

- A. The SSSP shall include sections specifically addressing measures to protect the public when work is occurring above areas that are open to public access, including but not limited to roadways, shoulders, pathways and parking lots. The plan shall address each applicable work location and the activities to ensure that the public is protected at all times and to ensure the prevention of materials, of any type, falling into the public areas. At a minimum, the plan shall include the following:

1. Training and documentation protocol for all Contractor and subcontractor personnel;
 2. Inspection protocol and point of responsibility specific to identifying and mitigating hazards to the public;
 3. Guardrails, toe boards and debris catchment systems such as netting. All catch systems shall be of adequate size and strength to catch or limit the fall of all tools, materials and hardware in use or being installed.
 4. Procedures to ensure all materials, sheeting, plastic, canopies or other objects stored or erected on the aerial or elevated structure shall be secured, tethered, bound or tied down in significant winds and adverse weather conditions, and are secured during and at the end of the work shift.
 5. The contractor shall review and issue appropriate warnings to all staff for weather conditions anticipated for weekends and non-working days, and will take action initiate proper steps and measures. Site conditions during high wind events shall be reviewed and monitored as required.
- B. The SSSP shall also address the work activities related to aerial and elevated structures, including but not limited to the following:
1. Fall protection. (A fall protection work plan template is included as Exhibit A.)
 2. Shoring and Scaffolding.
 3. Lifting and hoisting of materials and/or personnel.
 4. Overhead utility identification and protection.
 5. Emergency access and response

1.04 TRAINING

- A. The Contractor shall provide training regarding proper housekeeping, debris control, securing materials and securing equipment, including small tools, to all personnel working on aerial and elevated structures to ensure nothing falls onto public access areas.

1.05 EMERGENCY PROCEDURES

- A. Provide a written Emergency Action Plan that specifically addresses the aerial or elevated structures, including, but not be limited to, actions to be taken for the following:
1. Injuries to personnel;
 2. Injuries to the general public on or adjacent to the work site;
 3. Property damage including damage to utilities;
 4. Fire;
 5. Natural disasters such as earthquakes;
 6. Structural failures;

7. Rescue;
8. Emergency Management Services (EMS) contact information.

1.06 PROTECTION OF THE PUBLIC

- A. All protection measures and protocols required for working on aerial or elevated structures above areas open to the public shall be fully implemented and inspected, and documentation of such shall be provided in writing to the Resident Engineer prior to commencing associated work activities.

PART 2 - PRODUCTS – NOT USED

PART 3 - EXECUTION

3.01 INSPECTIONS, MONITORING AND AUDITING

- A. ConSM/SSSR shall:
 1. Conduct and document daily safety inspections of the aerial or elevated works, with particular emphasis on housekeeping and public protection measures on aerial or elevated structures above areas open to public access prior to commencing Work and associated Work activities.
 2. Daily inspections shall include reviewing the Job Hazard Analyses (JHA) and Daily Pre-Task Analysis (PTA) of the aerial or elevated work.
 3. Respond to the Resident Engineer within 24 hours with a response or corrective action plan for documented deficiencies or non-compliance issues documented by Sound Transit representatives.
- B. Safety/Security Staff Inspections

Cooperate fully and correct all safety or security discrepancies noted verbally or in writing by the Resident Engineer.
- C. Site Specific Health and Safety Plan Revisions

In the event that the Sound Transit, regulatory agencies or authority having jurisdiction determines that the SSSP or associated documents, or the Contractor's organizational structure is inadequate to protect employees and the public, the Contractor shall:

 1. Modify the SSSP to meet the requirements of said regulatory agencies, authority having jurisdiction and/or Sound Transit, and.
 2. Provide a re-submittal of the SSSP within 7 days of a Notice.
 3. Provide frequent crew and staff training and updates for changes or noted deficiencies with implementation practices.

3.02 WORK PLANNING

- A. Job Hazard Analyses (JHA) shall include evaluation of potential hazards to the public and appropriate preventative measures

- B. Daily Pre-Task Analysis (PTA) and Safety/Security meetings shall cover evaluation of potential hazards to the public and appropriate preventative measures.

3.03 HOUSEKEEPING, JOB ORDERLINESS AND WORK SITE CONDITIONS

The Contractor shall:

- A. Employ specific measures to ensure proper site conditions and good housekeeping are maintained for all work locations above areas open to the public. The Contractor shall inspect and document these work locations at least daily, and correct any deficiencies observed, even if work is not occurring on any particular day.
- B. Employ specific measures that take into consideration adverse weather conditions, such as wind gusts and heavy rainfall, to ensure that materials or equipment are stored and secured in a manner that prevents any objects and materials from falling from the aerial or elevated structure.
- C. Delineate the area below the elevated work for all tasks.
- D. Close active traffic lanes below elevated areas as work tasks mandate and conditions allow.

END OF SECTION

EXHIBITS

Exhibit A: Fall Protection Work Plan Template

SECTION 01 35 32 - EXHIBIT A
FALL PROTECTION WORK PLAN TEMPLATE
FALL PROTECTION WORK PLAN
INSTRUCTIONS

A written fall protection work plan must be implemented by each employer on a job site where a fall hazard of 10 feet or greater exists.

THIS WORK PLAN MUST BE SPECIFIC FOR EACH WORK SITE AND WILL BE
AVAILABLE ON THE WORK SITE FOR INSPECTION.

Below is a sample fall protection work plan that may be filled out by each employer who has employees exposed above 10 feet. The following steps will help you fill out your plan.

1. FILL OUT THE SPECIFIC JOB INFORMATION.

Company Name: _____ Date: _____

Job Name: _____

Job Address: _____ City: _____

Job Foreman: _____

Job Site Phone: _____

2. FALL HAZARDS IN THE WORK AREA
(INCLUDE LOCATIONS AND DIMENSIONS FOR HAZARDS)

Elevator shaft:

Stairwell:

Leading edge:

Window opening:

Outside static line:

Roof eave height:

Perimeter edge:

Roof perimeter dimensions:

Other fall hazards in the work area:

3. METHOD OF FALL ARREST OR FALL RESTRAINT

(For fall protection equipment includes details, such as manufacturer etc.)

Full body harness:

Body belt (Restraint only):

Lanyard:

Drop line:

Lifeline:

Restraint line:

Horizontal lifeline:

Rope grab:

Deceleration device:

Shock absorbing lanyard:

Locking snap hooks:

Safety nets:

Guard rails:

Anchorage points:

Catch platform:

Scaffolding platform:

Safety monitor:

Name of monitor, if used:

Other:

4. ASSEMBLY, MAINTENANCE, INSPECTION, DISASSEMBLY PROCEDURE

Assembly and disassembly of all equipment will be done according to manufacturers' recommended procedures. (Include copies of manufacturer's data for each specific type of equipment used.)

Specific types of equipment on the job are:

A visual inspection of all safety equipment will be done daily or before each use, as stated in the Employee Training Packet. Any defective equipment will be tagged and removed from use immediately. The manufacturer's recommendations for maintenance and inspection will be followed.

5. HANDLING, STORAGE & SECURING OF TOOLS AND MATERIAL

Toe boards will be installed on all scaffolding and guardrail above 4'-0" to prevent tools and equipment from falling.

Other specific handling, storage and securing is as follows:

6. OVERHEAD PROTECTION

Hard hats are required on all job sites. Warning signs will be posted to caution of existing hazards whenever they are present. In some cases, debris nets may be used if a condition warrants additional protection.

Additional overhead protection will include:

Toe boards (at least 4 inches in height) will be installed along the edge of scaffolding and walking surfaces for a distance sufficient to protect employees below. Delineate the area below with warning tape or site controls as required. Paneling or screening will be erected to protect employees or traffic below where tools, equipment or materials are stored, lifted or handled higher than the top of the toe board and fall restraint railing.

7. INJURED WORKER REMOVAL

Normal first aid procedures should be performed as the situation arises. If the area is safe for entry, the first aid should be done by a foreman or other certified individual.

Initiate Emergency Services – Dial 911 (where available)

Phone location: _____

First aid location: _____

Elevator location: _____

Crane location: _____

Other: _____ Location: _____

Rescue considerations. When personal fall arrest systems are used, the employer must assure that employees can be promptly rescued or can rescue themselves should a fall occur. The availability of rescue personnel, ladders, or other rescue equipment should be evaluated. In some situations, equipment that allows employees to rescue themselves after the fall has been arrested may be desirable, such as devices that have descent capability.

Describe methods to be used for the removal of the injured worker(s):

8. TRAINING AND INSTRUCTION PROGRAM

All new employees will be given instructions on the proper use of fall protection devices before they begin work. They will sign a form stating they have been given this information. This form becomes part of the employee's personnel file.

The written fall protection work plan will be reviewed before work begins on the job site. Those employees attending will sign below. The fall protection equipment use will be reviewed regularly at the weekly safety meetings.

Date: _____

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Foreman or Job Superintendent: _____

Prior to permitting employees into areas where fall hazards exist, all employees must be trained regarding fall protection work plan requirements. Inspection of fall protection devices/systems must be made to ensure compliance with WAC 296-155-24.

END OF EXHIBITS

SECTION 01 35 33

HEALTH, SAFETY, SECURITY AND EMERGENCY RESPONSE

RAILWAY SUPPLEMENT

PART 1 - GENERAL

1.01 SUMMARY

- A. This section is a supplement to Section 01 35 29.10, Health, Safety, Security, and Emergency Response and sets forth additional requirements and expectations with which the Prime Contractor and its Subcontractors shall comply for work performed on or near active and inactive railway. The requirements and expectations of this section are in addition to those specified in Section 01 35 29.10, applicable laws, regulations and code. In the event of conflict, the most stringent requirements shall apply.
- B. The requirements in this section shall be addressed and submitted under the Site Safety and Security Plan (SSSP).
- C. It is not the intent of Sound Transit to list and identify all applicable safety codes, standards and/or regulations relating to work performed on or near railways. The Contractor and its subcontractors are solely responsible for identifying, determining, and adhering to all applicable safety codes, standards and regulations.

1.02 DUTIES AND RESPONSIBILITIES

- A. Upon the failure to comply with the requirements or upon the occurrence of observed safety or security deficiencies, the Contractor shall immediately stop associated tasks, notify the Resident Engineer and implement corrective actions. Submit written documentation to the Resident Engineer within 24 hours of the incident.
- B. Failure to implement corrective action or provide satisfactory response may result in a stop work order.
- C. Track Access
 - 1. Live Track Access
 - a. ROW Safety Training provided by Sound Transit is required prior to any project worker, vendor or visitor approaching or performing work within 10-feet from the nearest rail.
 - b. A live track is any track which has been turned over and accepted by Sound Transit and is capable of running Light Rail Vehicles for testing or revenue service.
 - c. Live track access will be coordinated through Sound Transit rail dispatch in accordance with Article 3.02 of the Contract Special Conditions.
 - 2. Construction Controlled Track Access

- a. Track access is coordinated and monitored by the Contractor assigned the railway as its Project Site in the Contract documents. The Contractor shall conduct weekly Construction Controlled Track Access (CCTA) meetings, which will include as participants any entity planning to perform work within 10-feet of the nearest rail. The meeting agenda shall include a mandatory safety briefing outlining worker and equipment safety protocol including the provisions herein.
 - 1) Upon completion of the meeting and safety briefing, the Contractor shall issue Track Access Permits to attendees. The Contractor has the sole discretion to refuse issuance of Track Access Permits.
 - 2) Any unplanned changes must be authorized by the Track Access Coordinator. No in the field permit modifications are allowed.
- b. Any contractor, subcontractor, supplier, etc. planning to perform work within 10-feet of the nearest rail is required to attend weekly CCTA meetings and to obtain a Construction Track Access permit.
 - 1) Contractors working with a CCTA permit are required to provide a safety briefing to all members of their applicable crews, which includes the safety information provided at the weekly CCTA meeting.
 - 2) The contractor shall document details of the safety briefing in its daily pre-task safety plan. The Track Access permit must be at the work location and available for review at all times.

1.03 SITE SAFETY AND SECURITY PLAN (SSSP)

- A. The SSSP plan shall include a Contractor Controlled Track Access Plan which addresses each applicable work location and the activities to ensure that the workers are protected at all times. At a minimum, the plan shall include the following:
 - 1. Training and documentation protocol for all Contractor and subcontractor personnel.
 - 2. Procedures to delineate the work area including visual representation of required delineation.
 - 3. Mandatory use of derail devices with reflective flags at each end of each work zone.
 - 4. Protocol for the installation, custody, and removal of the derail device.
 - 5. Procedures for CCTA Track Access meeting including templates of meeting related documentation (i.e., sign-in sheets, track access permits).
 - 6. Rules of Operation for on-track equipment including, but not limited to rules associated with the following:
 - a. Speed limits
 - b. Communication protocol (both visual and audible)
 - c. Equipment inspection

- d. Equipment use at grades above 2%
- e. Operator training
- f. Riding on equipment
- g. Equipment security (when not in use)
- 7. A supplemental list of all equipment to be used on the tracks with confirmation that the equipment conforms to dynamic envelope constraints. On-track equipment shall also be identified in the associated CWP.
- 8. Track access procedures (for contractors responsible for railway), including procedures for field oversight and monitoring of track access.
- 9. Procedures for monitoring site conditions that could foul the track (including adjacent Project Sites assigned to other Sound Transit Contractors) and mitigating and/or communicating hazards.
- 10. Procedures for coordinating and communicating the movement of on-track equipment.
- 11. Site layout of railway related safety signage.
- 12. Procedures for protecting the public (i.e., road crossings).

1.04 TRAINING

- A. Any Contractor working within 10-feet of the nearest rail shall provide training that includes, but is not limited to the following:
 - 1. Track access,
 - 2. Railway communication protocol,
 - 3. Delineating work areas
- B. ST and/or the CCTA Contractor may require additional training for any individual performing work within 10-feet of the nearest rail.

PART 2 – PRODUCTS – NOT USED

PART 3 - EXECUTION

3.01 INSPECTIONS, MONITORING AND AUDITING

- A. ConSM/SSSR shall:
 - 1. Conduct and document daily safety inspections of the railway to ensure compliance with the SSSP and the Track Access program. Verification will be included on the ConSM's weekly safety report, 01 35 29.10 section 3.02 A. 1.
 - 2. Daily inspections shall also include reviewing the Job Hazard Analyses (JHA) and Daily Pre-Task Analysis (PTA) for any work within the railway.

3.02 CONSTRUCTION ON/NEAR RAILWAYS

- A. Inactive Rail / On-Track Equipment

SOUND TRANSIT

SECTION 01 35 33
HEALTH, SAFETY, SECURITY AND
EMERGENCY RESPONSE RAILWAY
SUPPLEMENT

2023 STANDARD DIV 01 SPECS

1. When working in the vicinity of railway, personnel shall be alert at all times to the movement of the on-track equipment. This equipment may be located on either track and be moving in either direction. Treat all rail tracks as active.
2. Ensure the safe operation and maintenance of all on-track equipment during construction operations.
3. The supervisor or foreman shall make sure the travel route is clear prior to authorizing the movement of on-track equipment.
4. In addition to communicating and documenting track outages through the CCTA permit process, the supervisor or foreman shall contact other supervisors or foremen in adjacent track sections of the proposed track outage work area immediately prior to rendering a section of track impassable.
5. Do not operate on-track equipment without the authorization of the supervisor or foreman.
6. No employee shall ascend or descend equipment which is in motion.
7. Operate on-track equipment at a safe speed -not to exceed 15 miles per hour and be able to stop safely within half the distance of the operator's line of sight.
8. Do not exceed a speed of 10 miles per hour when operating in a reverse movement. On track equipment not equipped with an operational back-up camera is restricted to 5 miles per hour and must have a spotter.
9. Do not exceed a speed of 4 miles per hour for on-track equipment at switches, crossings, and platforms.
10. When approaching individuals on or near the track, slow on-track equipment to 5 miles per hour. The operator shall sound a warning bell/horn as he/she approaches individuals on or near the track. The operator shall not pass until the individual has signaled acknowledgement and is facing the operator.
11. Before starting work on or near the rail tracks, delineate each end of each work area with deraillers with reflective flags placed at least 75 feet from the work areas. Place distinctive red cones or candlesticks 25' outside of work zone (signed with responsible in charge individual's contact information) to alert oncoming personnel and equipment.
12. Delineate potentially shared spaces (i.e., station platforms areas) with orange stanchions and tape/snow fence set back to 10' from the nearest rail. Include signage identifying the responsible in charge individual at all access points.
13. All equipment and rail carts that are stopped and parked shall be chocked and/or chained.
14. Provide run away prevention mechanism that is manufacture approved for all non-motorized on-rail equipment while in motion.
15. Safely store and secure rail equipment that is not in use to prevent unauthorized use.
16. All hi-rail equipment operators must be trained on how to line their route through special track, including inspecting switch position prior to entering special track and manual operation of switch machines.

3.03 DERAILMENT INCIDENT REPORTING

- A. Should a serious incident occur resulting in damage to public or Sound Transit property or bodily injury to the public or personnel of Sound Transit, its consultants, Contractors, or their Subcontractors, it shall be reported (after calling 911) immediately by phone to the Resident Engineer and the Sound Transit Construction Safety Manager.
1. Derailment of On-Track Equipment (OTE) must be reported immediately to the Resident Engineer and the Sound Transit Construction Safety Manager (CSM).
 2. The following information is required during this immediate notification to the CSM:
 - a. Event type (i.e., derailment)
 - b. Location, time, and date of event
 - c. Additional agency notification date and time. Specify what agency was notified
 - d. Fatalities
 - e. Injuries
 - f. Vehicle(s) involved (i.e., type, number, track, direction)
 - g. Other vehicle(s) involved (i.e., type, direction, number)
 - h. Primary person (i.e., investigator) conducting or responsible for the investigation (i.e., name, title, phone and fax numbers, email address, company)
 - i. Short description of the event
 3. The Contractor shall forward an email to the Resident Engineer and Sound Transit Construction Safety Manager with a brief summary of the events, injuries, names of those involved and their trade affiliation.
 4. The phone call and email notification does not substitute for an incident report containing those elements described in other section of this specification.
 5. Take photographs in conjunction with investigations of incidents involving personal injury, third-party personnel injuries, property damage (including motor vehicle) and/or equipment or material failure.
 6. Photographs used in reports shall be identified as follows: name of injured, (if equipment damage and/or property damage, location); date of incident; photographer's initials and time photographs taken including the date if different from occurrence, direction facing and a brief description of photo.
- B. Investigation and Corrective Action:
1. For derailment of OTE the Contractor shall submit within 48 hours:
 - a. Event type (i.e., derailment)
 - b. Location, time, and date of event

- c. Additional agency notification date and time. Specify what agency was notified
 - d. Fatalities
 - e. Injuries
 - f. Vehicle(s) involved (i.e., type, number, track, direction)
 - g. Other vehicle(s) involved (i.e., type, direction, number)
 - h. Primary person (i.e., investigator) conducting or responsible for the investigation (i.e., name, title, phone and fax numbers, email address, company)
 - i. Short description of the event
 - j. Who responded to the accident scene, including rail transit and emergency response agency staff?
 - k. When did normal operations resume?
 - l. What restrictions or special orders, if any?
 - m. OCS inspected prior to resuming operations: Yes, No, N/A
 - n. Track inspected prior to resuming operations: Yes, No, N/A
 - o. Signals inspection prior to resuming operations: Yes, No, N/A
 - p. Event recorder requested: Yes, No, N/A By who:
 - q. Digital video recording requested: Yes, No, N/A By who:
 - r. Vehicle impounded: Yes, No, N/A If yes, held by:
 - s. Impound Location:
 - t. Have/Are the police investigation the accident: Yes, No If yes, what police agency?
 - u. Mitigations already taken:
2. OTE derailment reports shall comply to this final report format:
- a. Event description
 - b. Notification, incident response, and incident command
 - c. Immediate corrective actions
 - d. Operator information, including fatigue and training evaluation
 - e. Investigation:
 - 1) Operator event report
 - 2) Field supervision report

- 3) Employee record and history
 - 4) Post-accident safety inspection
 - 5) Video analysis
 - 6) Communications analysis
 - f. Findings; potential causal factors and root-cause analysis; and recommendations in the format of corrective action plans
 - 1) Corrective Action Plans resulting from these investigations are required to be submitted to the Sound Transit CAP log and require 30 updates of implementation of the corrective action(s)
 - g. Investigator signature
 - h. Date of report
 - i. Persons included in report distribution
3. The Contractor's incident report, project records, progress reports and daily time reports may become important evidential material in any ensuing legal action. Accordingly, for the date on which a potential third-party incident has occurred, it is important to be specific and accurate in describing work being performed, crew and equipment being utilized and their exact location.

END OF SECTION

SECTION 01 35 35**SAFETY AND COORDINATION FOR BNSF RAILWAY****PART 1 - GENERAL****1.01 SUMMARY**

- A. This Section describes additional safety and coordination requirements when working near or in the BNSF Railway right of way. The operating environment of railroads can be inherently dangerous to the general public. Under Federal law, it is illegal to trespass, enter, or remain upon railway property not open to the public, without the permission of the railway. Additionally, there may be state and/or local laws that make trespass on railroad property illegal. Written permission is required for all parties entering BNSF property.
- B. Railroad safety, right of way and signalization is controlled by BNSF Railway in the vicinity of this project. The Design Builder shall comply with BNSF Railway rules and work limitations whenever Work is performed in the vicinity of BNSF Railway track.
- C. Additionally, the Design Builder shall abide by the conditions and procedures for Work provided in the BNSF Right of Entry Agreement for any Work performed within the BNSF Right of Way. If no Right of Entry or other right of access agreement is provided in the Contract Documents, and the Design Builder requires entry to BNSF right of way, the Design Builder shall obtain a Right of Entry or comparable agreement from BNSF and be in full compliance prior to entry and while working within BNSF Railway right of way.

1.02 NCES

- A. Acronyms and Abbreviations
 - 1. WAC: Washington Administrative Code
- B. Reference Standards: This Section incorporates by reference the latest editions and revisions of the following documents.
 - 1. United States Code (USC)
 - a. USC 651 et seq. Federal Occupational Safety and Health Act
 - 2. Code of Federal Regulations (CFR)
 - a. 49 CFR PART 214 – RAILROAD WORKPLACE SAFETY
 - b. 49 CFR 659 DOT Rail Fixed Guideway Systems (Traffic Safety)
 - 3. BNSF Railway Public Projects Manual

1.03 DEFINITIONS

- A. BNSF Flagger ("Flagger"): a BNSF employee that coordinates between BNSF forces, contractor employees, BNSF dispatchers, and BNSF trains.
- B. Competent Person: one who is capable of identifying existing and predictable hazards in the workplace and who is authorized to take prompt corrective measures to eliminate them. (49 CFR 214)

1.04 SUBMITTALS

- A. Identify in the Contract Schedule:
 - 1. Any activity that requires work within 25 feet of the track centerline.
 - 2. Any activity that has the potential to foul the track.
 - 3. Any activity that is within BNSF Railway right of way.
- B. Address the following in the Construction Site Safety and Security Plan (CSSP):
 - 1. Applicable BNSF Railway safety requirements.
 - 2. Control of Work including emergency response procedures for work to be performed in work zones under BNSF Railway control. No work may be performed within 25 feet of the centerline of any track without a track safety plan approved by BNSF.

1.05 QUALITY ASSURANCE

- A. The Design Builder shall designate a Competent Person who shall be present for all Work performed in work zones under BNSF Railway control.

1.06 TRAINING

- A. The Design Builder shall ensure every employee of the Design Builder and its Subcontractors, suppliers, or other individuals whose activities related to the Project require them to work in BNSF controlled work zones complete the BNSF Contractor Orientation Course. Information regarding this course can be found at <https://www.bnsfcontractor.com>. Documentation of successful completion of the course must be submitted to the Resident Engineer a minimum of 5 days prior to the employee entering the BNSF controlled work zone. Photo identification issued by BNSF signifying successful course completion must be worn by all employees working in the restricted zone.
- B. Before beginning any task on Railway right of way, within 25 feet of the track, or whenever there is a potential to foul the track, the Design Builder shall conduct a job safety briefing with all personnel involved and the Flagger. The training shall be repeated whenever personnel or the task changes. The training include a review of the hazards associated with the tasks and proximity to an active railroad and the procedures the Design Builder will use to protect its employees, Subcontractors, agents or invitees and maintain rail operations. Every contractor employee must know:
 - 1. The Competent Person.
 - 2. The Flagger, and how to contact the Flagger,
 - 3. Limits of authority,
 - 4. The method of communication to stop and resume work, and
 - 5. The location of the designated places of safety.
- C. Persons or equipment entering flagging work limits that were not previously job briefed, must notify the Flagger and the Design Builder's Competent Person immediately, and be given a job briefing.

1.07 GENERAL REQUIREMENTS

- A. Every person who enters the BNSF ROW shall comply with applicable portions of the Code of Federal Regulations Title 49, including, but not limited to, 49 CFR Part 214 Roadway Workplace Safety and BNSF Railway safety requirements.
- B. Work in the proximity of railway track(s) is potentially hazardous where movement of trains and equipment can occur at any time and in any direction. All work performed by within 25 feet of any BNSF track must be in compliance with Federal Railroad Administration (FRA) Roadway Worker Protection regulations and BNSF policies.
- C. BNSF Flagging services are required:
 - 1. When any entity is working on, near, or adjacent to active BNSF tracks: A Flagger is required when a contractor's work activities are located anywhere on BNSF Right-of-Way, over, under, and/or within 25 feet measured horizontally from centerline of the nearest track and when cranes or other equipment positioned beyond 25 feet from the track centerline could foul the track in the event of tip over or other catastrophic occurrence.
 - 2. When an outside party is using BNSF property or performing operations that may affect BNSF property or facilities. This includes occasions when a party has been given express permission from BNSF to enter railroad property or perform such operations under the terms of a Construction & Maintenance (C&M) Agreement, Temporary Occupancy Permit (TOP), Right of Entry (ROE) or other appropriate documentation.
 - 3. When off-highway construction equipment is crossing BNSF track at a private or public grade crossing.
 - 4. When oversized equipment or highway vehicles are to cross BNSF track at a private or public grade crossing.
 - 5. Any excavation work adjacent to BNSF tracks or facilities, within the Theoretical Railroad Live Load zone of influence, or where the active earth pressure zone extends within the BNSF property limits.
 - 6. The use of any equipment where, if tipped and laid flat in any direction (360 degrees) about its center pin, can encroach within twenty-five feet (25'-0") of the nearest track centerline. This is based upon the proposed location of the equipment during use, and may be a function of the equipment boom length. Hoisting equipment with the potential to foul must satisfy the required Factor of Safety of 1.5 (150 percent of the maximum load) for lifting capacities.
 - 7. Any work where the scatter of debris or other materials has the potential to encroach within twenty-five feet (25'-0") of the nearest track centerline.
 - 8. Any work where significant vibration forces may be induced upon the Track Structure or existing structures located under, over, or adjacent to the Track Structure.
 - 9. Any other work that poses the potential to disrupt rail operations, threaten the safety of railroad employees, or otherwise negatively impact railroad property, as determined by BNSF.
 - 10. In other instances as determined by BNSF.

- D. Flagging services can only be performed by qualified BNSF personnel or by rules-qualified individuals approved by BNSF. BNSF will provide all flagging services at the Design Builder's expense.
- E. Any person working on BNSF property may be subjected to a safety audit by BNSF personnel and is required to comply with the audit. The results of the audit will be presented to the worker's supervisor immediately upon completion.
- F. The final determination of whether flagging will be required, the number of Flaggers and the cost will be at the sole discretion of the BNSF Roadmaster. The Flagger will typically need to work for one hour prior to the Design Builder starting work and one hour after the Design Builder has completed its shift and is included in the daily rate. Flagger rates will be subject to change and vary depending on the pay scale of the employee performing the work and current labor agreements.

PART 2 - PRODUCTS

2.01 PERSONAL PROTECTIVE EQUIPMENT (PPE)

- A. At a minimum, the Design Builder shall adhere to the more stringent of Sound Transit and BNSF Railway requirements for PPE when working within 25 feet of BNSF track.

PART 3 - EXECUTION

3.01 PROCEDURES

- A. If not already provided in the Contract Documents, coordination with the BNSF for rights to enter BNSF right of way and for flagging services should be initiated a minimum of 6 months prior to required entry. The BNSF Master of Public Projects (MPP) can provide BNSF Roadmaster contact information, or it will be included in the permit or other BNSF contract.
- B. The Design Builder shall request flagging services a minimum of thirty (30) calendar days prior to start of work requiring flagging. Request shall be submitted in writing to the BNSF Railway Roadmaster with a copy furnished to the Sound Transit Resident Engineer. Cancellation of requested flagging services must be provided no less than five (5) working days in advance of the scheduled date.
- C. Prior to conducting any excavation on BNSF property, the Design Builder shall locate all utilities in accordance with RCW 19.122 and the Contract Documents. Additionally the Design Builder shall arrange for a BNSF underground cable locate. BNSF locates can be arranged by calling 1-800-533-2891. A BNSF form "Underground Cable Location & Acknowledge" will be completed by a BNSF representative and copy provided to the Design Builder. The Design Builder must have this completed form in possession at the job site at all times. If a BNSF signal and communication asset is severed or damaged, the contractor must immediately contact BNSF's Emergency Response hotline (1-800-832-5452) and the BNSF Project Representative.
- D. Storage of materials and parking of equipment and vehicles when not used in actual Work performed in the BNSF Railway right of way will not be permitted on railroad property.
- E. BNSF may permit the Design Builder to work without Flaggers if all work occurs behind a temporary 6-foot high chain link safety fence, located at least 12 feet from the centerline of the track. If no flagger is present on the work site, no workers may enter the area between the track and the safety fence for any reason, and all workers must cross the

track at signalized grade crossings. No equipment may operate within the 25-foot fouling zone, nor may any other work occur within a distance that allows materials or equipment to swing over or occupy the area between the track and the fence.

- F. Adhere to the conditions outlined in the attached EXHIBITS A describes BNSF and Sound Transit heavy rail requirements, and EXHIBIT C, which is an agreement that cover liability issues.

3.02 EMERGENCY ACTION PLANS

- A. The Design Builder shall comply with all BNSF Railway requirements for emergency notification and response when working on BNSF Railway right of way or within the BNSF controlled work zone.

END OF SECTION

SECTION 01 35 35.10

SAFETY AND COORDINATION FOR SOUND TRANSIT RAILWAY

PART 1 - GENERAL

1.01 SUMMARY

- A. Railway right of way is owned by Sound Transit in the vicinity of this project. This Section describes additional safety and coordination requirements when working near or in the Sound Transit Railway right of way.
- B. The operating environment of railroads can be inherently dangerous to the general public. Under Federal law, it is illegal to trespass, enter, or remain upon railway property not open to the public, without the permission of the railway.
- C. Although the railway is owned by Sound Transit, railroad safety and signalization is controlled by BNSF. The Design Builder shall comply with BNSF Railway rules and work limitations whenever Work is performed in the vicinity of Sound Transit owned track.

1.02 NCES

- A. Acronyms and Abbreviations
 - 1. WAC: Washington Administrative Code
- B. Reference Standards: This Section incorporates by reference the latest editions and revisions of the following documents.
 - 1. United States Code (USC)
 - a. USC 651 et seq. Federal Occupational Safety and Health Act
 - 2. Code of Federal Regulations (CFR)
 - a. 49 CFR PART 214 – RAILROAD WORKPLACE SAFETY
 - b. 49 CFR 659 DOT Rail Fixed Guideway Systems (Traffic Safety)
 - 3. BNSF Railway Public Projects Manual

1.03 DEFINITIONS

- A. Railroad Flagger ("Flagger"): an employee/subcontractor hired by Sound Transit that coordinates safe access among BNSF, Sound Transit, Amtrak and the Design Builder.
- B. Competent Person: one who is capable of identifying existing and predictable hazards in the workplace and who is authorized to take prompt corrective measures to eliminate them. (49 CFR 214)

1.04 SUBMITTALS

- A. Identify in the Contract Schedule:
 - 1. Any activity that requires work within 25 feet of the track centerline.

2. Any activity that has the potential to foul the track.
- B. Address the following in the Construction Site Safety and Security Plan (CSSP) and applicable Construction Work Plans:
1. Applicable BNSF Railway safety requirements.
 2. Control of Work including emergency response procedures for work to be performed in work zones under BNSF Railway control. No work may be performed within 25 feet of the centerline or that could foul the track without a track safety plan approved by Sound Transit.
- 1.05 QUALITY ASSURANCE
- A. The Design Builder shall designate a Competent Person who shall be present for all Work performed in work zones under BNSF Railway control.
- 1.06 TRAINING
- A. The Design Builder shall ensure every employee of the Design Builder and its Subcontractors, suppliers, or other individuals whose activities related to the Project require them to work in Sound Transit Railway right of way complete the BNSF Contractor Orientation Course. Information regarding this course can be found at <https://www.bnsfcontractor.com>. Documentation of successful completion of the course must be submitted to the Resident Engineer a minimum of 5 days prior to the employee entering the Sound Transit Railway right of way. Photo identification issued by BNSF signifying successful course completion must be worn by all employees working in the restricted zone.
- B. Before beginning any task on Railway right of way, within 25 feet of the track, or whenever there is a potential to foul the track, the Design Builder shall conduct a job safety briefing with all personnel involved and the Flagger. The training shall be repeated whenever personnel or the task changes. The training includes a review of the hazards associated with the tasks and proximity to an active railroad and the procedures the Design Builder will use to protect its employees, Subcontractors, agents or invitees and maintain rail operations. Every contractor employee must know:
1. The Competent Person.
 2. The Flagger, and how to contact the Flagger,
 3. Limits of authority,
 4. The method of communication to stop and resume work, and
 5. The location of the designated places of safety.
- C. Persons or equipment entering flagging work limits that were not previously job briefed, must notify the Flagger and the Design Builder's Competent Person immediately, and be given a job briefing.
- 1.07 GENERAL REQUIREMENTS
- A. Every person who enters the Sound Transit Railway right of way shall comply with applicable portions of the Code of Federal Regulations Title 49, including, but not limited to, 49 CFR Part 214 Roadway Workplace Safety and BNSF Railway safety requirements.
- B. Work in the proximity of railway track(s) is potentially hazardous where movement of trains and equipment can occur at any time and in any direction. All work performed

within 25 feet of any Sound Transit owned track must be in compliance with Federal Railroad Administration (FRA) Roadway Worker Protection regulations and BNSF policies.

C. Flagging services are required:

1. When any entity is working on, near, or adjacent to active Sound Transit owned tracks over, under or within 25 feet measured horizontally from centerline of the nearest track.
2. When off-highway construction equipment is crossing Sound Transit owned track at a private or public grade crossing.
3. When oversized equipment or highway vehicles are to cross Sound Transit owned track at a private or public grade crossing.
4. When performing any excavation work adjacent to Sound Transit owned tracks or facilities, within the Theoretical Railroad Live Load zone of influence, or where the active earth pressure zone extends within the Sound Transit property limits.
5. When the use of any equipment, if tipped and laid flat in any direction (360 degrees) about its center pin, can encroach within twenty-five feet (25'-0") of the nearest track centerline. This is based upon the proposed location of the equipment during use, and may be a function of the equipment boom length. Hoisting equipment with the potential to foul must satisfy the required Factor of Safety of 1.5 (150 percent of the maximum load) for lifting capacities.
6. When performing any work where the scatter of debris or other materials has the potential to encroach within twenty-five feet (25'-0") of the nearest track centerline.
7. When performing any work where significant vibration forces may be induced upon the Track Structure or existing structures located under, over, or adjacent to the Track Structure.
8. When performing any other work that poses the potential to disrupt rail operations, threaten the safety of railroad employees, or otherwise negatively impact railroad property, as determined by Sound Transit.
9. In other instances as determined by Sound Transit.

D. Flagging services can only be performed by qualified personnel or by rules-qualified individuals approved by Sound Transit. Sound Transit will provide all flagging services at the Design Builder's expense.

E. Any person working on Sound Transit owned tracks may be subjected to a safety audit by Sound Transit and is required to comply with the audit. The results of the audit will be presented to the worker's supervisor immediately upon completion.

F. The final determination of whether flagging will be required, the number of Flaggers and the cost will be at the sole discretion of Sound Transit. The Flagger will typically need to work for one hour prior to the Design Builder starting work and one hour after the Design Builder has completed its shift and is included in the daily rate. Flagger rates will be subject to change and vary depending on the pay scale of the employee performing the work and current labor agreements.

PART 2 - PRODUCTS

2.01 PERSONAL PROTECTIVE EQUIPMENT (PPE)

- A. At a minimum, the Design Builder shall adhere to the more stringent of Sound Transit and BNSF Railway requirements for PPE when working within 25 feet of track.

PART 3 - EXECUTION

3.01 PROCEDURES

- A. The Design Builder shall request flagging services a minimum of thirty (30) calendar days prior to start of work requiring flagging. Request shall be submitted in writing to the Sound Transit Resident Engineer. Cancellation of requested flagging services must be provided no less than five (5) working days in advance of the scheduled date.
- B. Storage of materials and parking of equipment and vehicles when not used in actual Work performed in the Sound Transit Railway right of way will not be permitted.
- C. Sound Transit may permit the Design Builder to work without Flaggers if all work occurs behind a temporary 6-foot high chain link safety fence, located at least 12 feet from the centerline of the track. If no flagger is present on the work site, no workers may enter the area between the track and the safety fence for any reason, and all workers must cross the track at signalized grade crossings. No equipment may operate within the 25-foot fouling zone, nor may any other work occur within a distance that allows materials or equipment to swing over or occupy the area between the track and the fence.

3.02 EMERGENCY ACTION PLANS

- A. The Design Builder shall comply with all BNSF Railway requirements for emergency notification and response when working on Sound Transit Railway right of way or within the BNSF controlled work zone.

END OF SECTION

SECTION 01 35 43**HAZARDOUS AND CONTAMINATED SUBSTANCE HEALTH AND SAFETY PROGRAM****PART 1 - GENERAL****1.01 SUMMARY**

This Section includes requirements for the preparation and implementation of health and safety procedures for dealing with known Hazardous or Contaminated Substances and developing plans to manage unknown, unexpectedly encountered Hazardous or Contaminated Substances.

1.02 REFERENCES

- A. This Section incorporates by reference the latest revisions of the following documents.
1. Code of Federal Regulations (CFR)
 - a. 29 CFR 1910 Occupational Safety and Health Standards
 - b. 29 CFR 1926 OSHA Construction Standards
 2. Environmental Protection Agency (EPA)
 - a. SW-846, Test Methods for Evaluating Solid Waste Physical/Chemical Methods
 - b. 5035A, Closed-System Purge-And-Trap And Extraction For Volatile Organics In Soil And Waste Samples
 3. Washington Administrative Code (WAC)
 - a. WAC 173-303 Dangerous Waste Regulations
 - b. WAC 173-340 Model Toxics Control Act - Cleanup
 - c. WAC 296-843 Hazardous Waste Operations
 - d. WAC 173-350 Solid Waste Handling Standards
 4. Washington State Department of Ecology
 - a. Publication 94-49 Guidance on Sampling and Data Analyses Methods
 - b. Publication 97-602 Analytical Methods for Petroleum Hydrocarbons
 - c. Publication 10-09-057 Guidance for Remediation of Petroleum Contaminated Sites
 5. Revised Code of Washington (RCW)
 - a. RCW Chapter 70A.305 Model Toxics Control Act (MTCA)

1.03 DEFINITIONS

- A. Certified Industrial Hygienist (CIH): A trained specialist with at least 5 years of experience in Hazardous or Contaminated Substances handling and working knowledge of selection and use of PPE, air monitoring, regulation, and other health and safety issues, and who is currently certified by the American Board of Industrial Hygiene.
- B. Contaminated Groundwater: Groundwater containing levels of contaminants in excess of applicable WAC 173-340, MTCA Method A Groundwater Cleanup levels if other cleanup levels are not specified in the Contract Documents.
- C. Contamination Reduction Zone: Designated area that provides a physical separation between the Exclusion and Support Zones to decontaminate personnel, equipment and vehicles prior to entering the Support Zone from the Exclusion Zone. This area must be clearly identified and designated as a "Caution" zone and can be entered only by employees with Hazardous Waste Operations and Emergency Response (HAZWOPER) certification and who have signed the HCS-HASP.
- D. Contaminated Soil: Soil, sludge or solid waste containing one or more Hazardous or Contaminated Substances at concentrations greater than applicable cleanup levels based on land use. Examples of Contaminated Soil may include, but are not limited to: street sweeping waste, sediment in utilities, and soil with Hazardous or Contaminated Substances from a past release associated site historical activities or soil contaminated by proximity to contaminated groundwater.
- E. Contaminated Substances: Water, groundwater, air, soil containing one or more Hazardous or Contaminated Substances at concentrations greater than the respective Cleanup Level
- F. Contaminated Water: Water containing levels of contaminants in excess of applicable WAC 173-201A, WAC 173-340, 40 CFR 131.45, and Section 304 of Clean Water Act screening relevant criteria. The relevant criteria must be based on the waterbody where discharge is occurring if other cleanup levels are not specified in the Contract Documents. Water may include surface water, stormwater or groundwater discharged to surface water.
- G. Dangerous Waste: Solid wastes designated in WAC 173-303 as dangerous, or extremely hazardous or mixed waste.
- H. Exclusion Zone: Area of exposed contamination designated for Hazardous or Contaminated Substance storage, excavation or removal. All work performed within the Exclusion Zone must be covered in the HCS-HASP by workers who are appropriately HAZWOPER certified as specified in this Section. The exclusion zone must be clearly marked and designated as a "Danger" zone. Methods must be in place to keep non- designated people out, and to only allow entrance of those employees with HAZWOPER certification and who have signed the HCS-HASP.
- I. Hazardous Air Contaminant: Any air contaminant considered by regulatory agencies to cause or contribute to an identifiable and significant increase in mortality or to an increase in serious irreversible or incapacitating reversible illness and for which no ambient air standard exists.
- J. Hazardous Building Materials (HBM): Materials regulated by law because of potential health and environmental risks. HBM includes asbestos containing material, lead,

mercury and polychlorinated biphenyls (PCBs) that exist in building materials including, but not limited to, walls, floors, ceilings, insulation, caulk, glazing, mastic, paint, light fixtures, fireproofing, and equipment (WAC 296-62; 40 CFR 761.50).

- K. Hazardous or Contaminated Substances Health and Safety Plan (HCS-HASP): A supplemental plan to the Contract requirements which establishes in detail the protocols necessary for protecting workers, on-site personnel, visitors, potential off-site personnel and the public from potential hazards that may be encountered during excavation, stockpiling, handling, sampling, transporting and disposing of Hazardous or Contaminated Substances. This plan must meet the requirements of a Health and Safety Plan as specified in WAC 296-843-120.
- L. Hazardous Material: Another term for Hazardous Substances.
- M. Hazardous Waste: Solid wastes designated by 40 CFR Part 261, and regulated as hazardous and/or mixed waste by the United States EPA.
- N. HAZWOPER: Hazardous Waste Operations and Emergency Response: The Hazardous Waste Operations and Emergency Response Standard (HAZWOPER) applies to five distinct groups of employers and their employees. This includes any employees who are exposed or potentially exposed to hazardous substances -- including hazardous waste -- and who are engaged in operations as specified by 1910.120(a)(1)(i-v) and 1926.65(a)(1)(i-v).
- O. Health and Safety Action Levels: Action levels established to minimizing potential Hazardous or Contaminated Substances exposure to Contractor personnel, Sound Transit personnel, personnel representing third party stakeholders and the public.
- P. Impacted Substances: Solid Waste containing detectable levels of contaminants less than applicable MTCA cleanup levels as specified in the Contract Documents. Substances may be subject to regulatory or location-specific requirements for end use at off-site locations or facilities. Presence of Impacted Substances may also trigger an Administrative Order under the National Pollution Discharge Elimination System permit (NPDES)
- Q. MTCA: Washington State Model Toxics Control Act, Chapter 70A.305, RCW
- R. Permissible Exposure Limits (PEL): Maximum amount or concentration in air for each contaminant that a worker may be exposed to under Washington State Department of Safety & Health (DOSH) and OSHA regulations.
- S. Personal Protective Equipment (PPE): All clothing and other work accessories designed to create a barrier against workplace hazards. Examples include safety goggles, blast shields, hard hats, hearing protectors, gloves, respirators, aprons and work boots.
- T. Cleanup Levels: Cleanup levels established in accordance with MTCA WAC 173-340 based on land use at the location of the substance. Substances with chemicals greater than Cleanup Levels are considered contaminated.
- U. Site Safety and Health Officer (SSHO): A trained specialist in health and safety with a minimum of 3 years of experience and working knowledge of PPE use, regulations and hazard identification.
- V. Solid Waste: as defined in WAC 173-350.
- W. Support Zone: Area designated to provide an entry and exit for personnel, materials

and equipment through the Contamination Reduction Zone to the Exclusion Zone, as an area for support facilities and storage of clean work equipment. Workers may rest, eat and drink in this area.

- X. Unknown Hazardous or Contaminated Substance Screening and Handling Plan (UHCS-SHP): A plan detailing how new discoveries of unknown but suspected Hazardous or Contaminated Substances are to be screened, segregated, sampled, handled and disposed.

1.04 SUBMITTALS

A. General

- 1. Contractor must modify their plans when project information changes and must notify the Resident Engineer when changes or modifications are required. Review and approval of such modifications must require a resubmittal as directed by the Resident Engineer.

B. Submittals

- 1. HCS-HASP: Within 30 days after Notice to Proceed (NTP).
- 2. UHCS-SHP: Within 30 days after NTP.
- 3. Updated HCS-HASP(s): Within 3 days following discovery of new contamination.
- 4. CIH Qualifications and Certifications: Within 30 days after NTP.
- 5. SSHO Qualifications and Certifications: Within 30 days after NTP

C. Air monitoring instrument calibration and data sheets

D. Reports

- 1. Security and training logs and worker compliance agreements
- 2. Safety inspection logs, daily and weekly health and safety reports, and a closeout health and safety report
- 3. Close-out documents or Cleanup Action Report for Unknown Hazardous or Contaminated Substances.
- 4. Emergency and accident report(s) within 24 hours following each occurrence

1.05 QUALITY ASSURANCE

A. Qualifications and Certifications

- 1. CIH:
 - a. Minimum of 5 years of experience in managing employee health and safety when working in Hazardous or Contaminated Substances
 - b. Current certification in first aid and cardiopulmonary

resuscitation (CPR)

- c. Demonstrable experience in Personal Protective Equipment (PPE) selection and use, health hazard analysis of Hazardous or Contaminated Substances, decontamination processes, air monitoring techniques and site control measures
- d. Working knowledge of local, state and federal health and safety regulations
- e. Completion of required OSHA Training in accordance with CFR 1926.120 and WAC 296-843, including completion of 40-hour HAZWOPER training and completion of 3 days on-site training by a fully qualified instructor or mentor, and 8-hour annual update HAZWOPER refresher training.
- f. Current certification with the American Board of Industrial Hygiene

2. SSHO:

- a. Minimum of 3 years of experience supporting employee health and safety protection programs when working with Hazardous or Contaminated Substances
- b. Current certification in first aid and cardiopulmonary resuscitation (CPR)
- c. Working knowledge of local, state and federal health and safety regulations
- d. Completion of required OSHA Training in accordance with CFR 1926.120 and WAC 296-843, including completion of 40-hour supervisory training and completion of 3 days on-site training by a fully qualified instructor or mentor, and 8-hour annual update HAZWOPER refresher training

3. Laboratories: The independent qualified testing for soil, water, air, and vapor samples must be a Washington State Department of Ecology accredited laboratory as applicable (WAC 173-50) with quality assurance and controls sufficient to complete a Level 2a validation. The independent qualified testing laboratory for asbestos air and personal air samples must be a satisfactory participant in the NIOSH Proficiency Analytical Testing (PAT) program and American Industrial Hygiene Association (AIHA) accredited laboratory.

B. Responsibilities

1. CIH:

- a. Responsible for certifying the HCS-HASP, all task-specific HCS-HASPs, selecting PPE, and all additions and modifications thereto.
- b. Required to be accessible to the SSHO as necessary, to assist in the identification and evaluation of potential hazards and the development of appropriate procedures for addressing known or suspected conditions or activities that may pose routine occupational hazards or

immediate danger to life or health of work site personnel, Sound Transit personnel, utility crews working in the construction area, personnel related to third party stakeholders or the public.

- c. Evaluate health and safety hazards when changes in conditions occur or are identified
- d. Review results of environmental sampling of suspected contaminated soils, groundwater, surface water or other substances
- e. Specify personal exposure monitoring protocols and procedures.

2. SSHO:

- a. Required to be on site and present during Hazardous and Contaminated Substance Work to be completed as part of the Contract. Such work includes, but is not limited to: air monitoring, hazardous materials removal, removal of contaminated soil and groundwater, removal of Underground Storage Tanks (UST), and work related to the presence or potential for unknown contaminated materials.
- b. Responsible for the development, implementation, enforcement and monitoring of the HCS-HASP for the project.
- c. Responsible for conducting the pre-construction indoctrination, Pre-Entry Briefings and other periodic training of on-Site personnel with regard to contents of the HCS-HASP and other safety requirements to be observed during construction.
- d. Responsible for performing air monitoring as required by the HCS-HASP.

C. The CIH and the SSHO have the authority to:

- 1. Suspend field activities if health and safety of work site personnel, Sound Transit personnel, other crews working at the Project Site, or the public are endangered.
- 2. Suspend individuals from field activities due to infractions of the HCS-HASP.
- 3. Suspend field activities if Unknown Hazardous or Contaminated Substances are identified during field activities until the Hazardous or Contaminated Substances are characterized, the HCS-HASP is updated and field personnel have been trained on the HCS-HASP updates.

D. Instruments used for air monitoring must be maintained and calibrated as specified in the manufacturer's instructions and user manuals.

PART 2 - PRODUCTS

2.01 PERSONAL PROTECTIVE EQUIPMENT

- A. As identified in the HCS-HASP and/or as selected by the CIH which are appropriate for the hazards likely to be encountered, required tasks, duration, and site requirements and limitations.

2.02 AIR MONITORING EQUIPMENT

- A. Instruments required by the CIH and specified in the UCS-SHP and HCS-HASP. Instruments must be suitable for providing continuous readings and capable of detecting the contaminants of concern.

2.03 FIELD SCREENING EQUIPMENT

Selected by the CIH:

- A. Photoionization detector (PID) able to perform headspace analysis and able to detect contaminants of concern

PART 3 - EXECUTION

3.01 GENERAL REQUIREMENTS

- A. Perform work required by the Contract in a safe and environmentally acceptable manner. Provide for the safety of site personnel, Sound Transit personnel, personnel representing third party stakeholders and the public for the duration of the Contract.
- B. Maintain a current HCS-HASP conforming to applicable federal, state and local statutes, rules, regulations and ordinances, in effect at the time the Work is performed.
- C. Maintain a UHCS-SHP detailing procedures to follow in the event that suspected Unknown Hazardous or Contaminated Substances is identified during the course of work to ensure that all applicable federal, state and local statutes, rules, regulations and ordinances in effect at the time the Work is performed are met for work in areas of Hazardous or Contaminated Substances.
- D. Ensure that personnel working with Hazardous or Contaminated Substances (e.g., soil, groundwater or other environmental media) have current HAZWOPER training and are thoroughly briefed on the anticipated hazards, safety equipment to be employed, safety practices to be followed, and emergency procedures and communications, and have reviewed and signed the HCS-HASP. The signed HCS-HASP must be kept on the job site and be made available for inspection. Do not allow personnel who are not properly trained to enter or to work in areas identified as containing or suspected to contain Hazardous or Contaminated Substances.
- E. Develop and maintain on site industrial hygiene information including right-to-know information, such as Material Safety Data Sheets (MSDS).
- F. If an emergency condition arises during the Contract:
 - 1. Immediately suspend work activities associated with this Contract in the vicinity of the area of the emergency.
 - 2. Notify the Resident Engineer.
 - 3. Secure the area as needed to restrict and protect Work Site personnel and the public from exposure to the emergency condition.
- G. Meetings: The SSHO must conduct daily and weekly health and safety meetings with the workers throughout the duration of all Hazardous or Contaminated Substance work.

The SSHO must discuss each day's activities and associated health and safety issues with the workers and address concerns and issues that the workers may have. Hold the weekly meeting at the beginning of the workweek.

- H. Train all workers on work compliance according to the HCS-HASP and UHCS-SHP.
- I. Distribute the HCS-HASP and UHCS-SHP to personnel on site (contractor, subcontractor, construction management consultants and Sound Transit) who are likely to encounter Hazardous or Contaminated Substances. Require employees to read the plan, sign the plan and abide by its provisions. Display or make the plan available at the Site to employees, Sound Transit representatives and regulatory inspectors.

3.02 HAZARDOUS OR CONTAMINATED SUBSTANCE HEALTH AND SAFETY PLAN (HCS-HASP)

- A. Prepare and implement a HCS-HASP in accordance with the requirements of applicable local, state and federal requirements and this specification section for work in areas of documented Hazardous or Contaminated Substances and for work performed once new discoveries of Hazardous or Contaminated Substances are found. Include, as a minimum, the following Site-specific information:
 - 1. Site Description and Evaluation
 - 2. Comprehensive work plan
 - 3. Site Map including demarcation of zones
 - 4. Names of key personnel and alternates responsible for site safety and health (responsible party) lines of communication and chain of command, including site safety and health officer. Include the responsibilities of each
 - 5. Emergency contact names and telephone numbers
 - 6. Map to nearest emergency medical services
 - 7. Site specific safety and health hazard assessment and risk analysis based on Hazardous or Contaminated Substances known or expected to be present.
 - 8. Training requirements
 - 9. Personnel Protective Equipment
 - 10. Medical Surveillance
 - 11. Air Monitoring Program
 - 12. Site Control Measures (Work Zones, Communications and Security)
 - 13. Personnel Hygiene and Decontamination
 - 14. Equipment Decontamination
 - 15. Sanitation
 - 16. Logs, Reports and Record Keeping
 - 17. Noise, Heat and Cold Stress, and other physical hazard monitoring

18. Emergency Response including evacuation routes and procedures
 19. Include qualified personnel who are fully HAZWOPER trained and certified, as required, for Hazardous or Contaminated Substances site work in accordance with all other applicable federal, state and local statutes, rules, regulations and ordinances.
 20. Spill containment plans
 21. If unexpected Hazardous or Contaminated Substances are found, refer to UHCS-SHP and include requirement to stop work until the HCS-HASP can be updated with a revised hazard assessment.
 22. Drug handling protocols
 23. Site Specific Hazard Communication
 24. Material Safety Data Sheets (MSDS)
 25. Accident Prevention Plan
 26. Specific requirements for Hazardous Building Materials work, if asbestos has been identified on the site. Reference may be made to the Hazardous Building Material Work Plans (asbestos, lead etc.) as required in the Contract Documents.
 27. Reference list of the environmental reports reviewed in the preparation of the HCS-HASP
- B. The HCS-HASP must be regularly reviewed as work progresses and more information becomes known, including discovery of additional Hazardous or Contaminated Substances. Accordingly, the HCS-HASP should be updated as needed.
- 3.03 UNKNOWN HAZARDOUS OR CONTAMINATED SUBSTANCE SCREENING AND HANDLING PLAN (UHCS-SHP)
- A. Prepare and implement a UHCS-SHP that documents how discoveries of suspect Hazardous or Contaminated Substances are to be handled when found in locations not identified in the Contract Documents. Include the following at minimum:
1. Identification of responsible environmental personnel including the Environmental Compliance Manager (ECM), CIH, SSHO, Certified Erosion Sediment and Control Lead (CESCL) and other relevant personnel.
 2. Methods for identification and screening of suspected Hazardous or Contaminated Substances.
 3. Methods for securing and restricting access to the suspected areas of Hazardous or Contaminated Substances including immediate suspension of work activities associated with this Contract in the vicinity of the area of the suspected Hazardous or Contaminated Substances. Securement of the area as needed to restrict and protect work site personnel and the public from exposure. Set up and designate Exclusion Zone and Contamination Reduction Zones using "Danger" tape to identify the Exclusion Zone and "Warning" tape to

designate the Contamination Reduction Zone.

4. Notification protocol for the identification of suspected Hazardous or Contaminated Substances. Notification protocol must include Resident Engineer and Sound Transit Environmental Compliance.
5. Methods for obtaining quantitative data to determine if the Unknown Hazardous or Contaminated Substances are in fact Hazardous or Contaminated Substances and evaluating releases of Hazardous and Contaminated Substances caused by the Contractor during Contractor operations. The methods must include sample collection methods of soil, water, and HBM and appropriate chemical analytical methods to evaluate chemicals of concern based on field screening results, historical use and/or source of Hazardous or Contaminated Substances.
6. Methods and procedures for handling, transportation, disposal, and off-site treatment of Hazardous or Contaminated Substances, including but not limited to soil, groundwater, water and HBM. Methods must be in compliance with this Section, applicable federal, state, and local laws and regulations, including the identification of disposal and treatment facilities, and the use of certified, licensed transporters (also refer to Section 31 23 01 Excavation Spoils Disposal and 02 83 66 Hazardous Building Material Removal and Disposal)
7. Protocol for updating the Hazardous and Contaminated Substances Health and Safety Plan (HCS-HASP) in accordance with the Contract regarding the discovery of previously Unknown Hazardous or Contaminated Substances.

3.04 SITE CONTROL MEASURES

- A. For excavation around suspected underground storage tank locations and for Hazardous or Contaminated Substances, furnish and install Site fencing, warning tapes or other barricades to physically separate the work zones on sites based on the HCS-HASP. Establish the following work zones:
 1. Exclusion Zone: Perform work involving Hazardous or Contaminated Substances inside the Exclusion Zone.
 2. Contamination Reduction Zone
 3. Support Zone
- B. Be responsible for costs associated with cleanup of all Hazardous or Contaminated Substances that may be tracked outside of the Exclusion Zone.

3.05 PERSONAL PROTECTIVE EQUIPMENT

- A. Provide appropriate PPE and ensure that it is kept clean and well maintained. PPE must be selected by the CIH and be appropriate for the hazards likely to be encountered, required tasks, duration, and Site requirements and limitations.
- B. Decontaminate and/or properly dispose of PPE worn on site. Decontaminate and inspect PPE for integrity before being reissued. Unless agreed or required otherwise by Sound Transit, handle used PPE and disposable equipment in accordance with the local, state, and federal requirements for solid waste.

3.06 PERSONAL HYGIENE AND DECONTAMINATION

- A. Define personnel decontamination protocols in the HCS-HASP to be followed by workers performing or supervising work within designated areas or exposed to Hazardous or Contaminated Substances. The HCS-HASP must include a map or diagram of the steps to be followed during decontamination.
- B. Perform decontamination procedures inside the Contamination Reduction Zone.

3.07 EQUIPMENT DECONTAMINATION

- A. Decontaminate vehicles and equipment used during the handling of Hazardous or Contaminated Substances inside the Contamination Reduction Zone before leaving the Site. Collect, treat or dispose of decontamination rinse water at an approved off-site facility.
- B. Keep roads inside the Contamination Reduction Zone free of contamination. Carefully load to avoid contamination of exterior truck surfaces.

3.08 UNKNOWN DISCOVERIES OF HAZARDOUS OR CONTAMINATED SUBSTANCES

- A. Upon discovery of an abnormal condition or indicator of an Unknown Hazardous or Contaminated Substances:
 - 1. Immediately suspend work activities associated with this Contract in the vicinity of the area with Suspect Hazardous or Contaminated Substance.
 - 2. Notify the Resident Engineer immediately after discovery of abnormal condition or Unknown Hazardous or Contaminated Substances.
 - 3. Keep Unknown Hazardous or Contaminated Substances isolated from clean materials. Dispose of material that becomes contaminated as a result of work activities at Contractor's own expense.
 - 4. Secure the area as needed to restrict and protect Contractor personnel, Sound Transit personnel, other project Site workers and the public from exposure to suspected Hazardous or Contaminated Substances.
 - 5. Survey the location of the suspected Hazardous or Contaminated Substances within 24 hours of discovery.
 - 6. Delineate and establish site control measures for:
 - a. Exclusion Zone
 - b. Contamination Reduction Zone
 - c. Support Zone
 - 7. For Unknown Hazardous or Contaminated Substances, place material in a staging unit immediately after removal while awaiting test results. Use and maintain staging units that are in good condition and constructed of materials that are compatible with the substances (solid or liquid) to be staged. Staging units may include stockpiles placed on minimum 6 mils thick plastic sheeting, 55 gallon water-tight barrels, water-tight portable tanks, or water-tight roll-off units lined with 6 mils thick plastic sheeting. Place an impermeable cover over the units to prevent precipitation and stormwater from contacting the

stored Unknown Hazardous and Contaminated Substances. Remove and store liquid that collects inside the units.

8. Staging units with Unknown Hazardous or Contaminated Substances must be clearly labeled with the source, date generated, and type of material. Keep a written log to track the source of Unknown Hazardous and Contaminated Substances in each staging unit.
9. Provide reasonable assistance to the Resident Engineer in the performance of Sound Transit duties. Such assistance may include: documenting site conditions, providing access, collecting samples (at the direction of the Resident Engineer), providing sampling and analysis of the contents of unknown containers, arranging for the disposal of Hazardous or Contaminated Substances, and attending regular project meetings.
- B. Provide Resident Engineer with appropriate documentation required to notify federal, state and local agencies, as part of the removal, cleanup, mitigation, handling, transportation and disposal of Hazardous or Contaminated Substances. Appropriate documentation may include a Cleanup Action Report or close out documents as directed by Resident Engineer.
- C. Secure necessary and applicable permits, certificates, licenses and approvals required for the performance of this Work.
- D. Perform work using only qualified personnel who are fully HAZWOPER trained and certified, as required, for Hazardous or Contaminated Substance site work in accordance with all other applicable federal, state and local statutes, rules, regulations and ordinances. Do not allow personnel who are not properly trained to enter or to work in areas identified as containing or suspected to contain Hazardous or Contaminated Substances.
- E. Comply with record keeping requirements in accordance with the provisions of this Contract and applicable federal, state and local statutes, rules, regulations and ordinances.
- F. Do not resume construction operations in the vicinity of the area where an Unknown Hazardous or Contaminated Substances has been discovered or encountered until so directed by the Resident Engineer.
- G. Coordinate the Work with other Site activities to minimize or avoid delays.
- H. Dispose of excavated material with Hazardous and Contaminated Substances in accordance with Contract Documents and local, state, and federal requirements including but not limited to WAC 173-303 and WAC 173-350.
- I. Submit Resident Engineer documentation of offsite disposal facilities' acceptance criteria and associated chemical analytical data of soil to be disposed that meets acceptance criteria prior to transport of soil to facility.
- J. If landfilling is the chosen disposal option, Sound Transit must sign the waste profile as the generator. The Contractor is responsible for coordinating with Sound Transit and providing sufficient chemical analytical data and information for Sound Transit to verify waste characterization.
- K. For disposal of all Dangerous Waste, with the exception of those wastes resulting from the release of Contaminated Substances negligently disturbed, removed, or handled by Contractor, its employees, agents, officers, or Subcontractors, or any

other persons for whom the Contractor may be contractually or legally responsible, ensure that the Generator's Certification portion of the Uniform Hazardous Waste Manifest is signed only by Sound Transit's Environmental Compliance Manager or by an individual delegated with such authority by Sound Transit.

3.09 LOGS, REPORTS AND RECORDKEEPING

- A. Maintain logs and reports covering the implementation of the HCS-HASP including the Air Monitoring Program. Include daily logs, weekly reports, audits and a close-out report.
- B. Include in Daily Safety Logs when working in areas of Hazardous or Contaminated Substances, at a minimum, the following:
 - 1. Date
 - 2. Area (site specific) checked
 - 3. Employees in particular area
 - 4. Equipment being utilized by employees
 - 5. Protective clothing being worn by employees
 - 6. Protective devices being used by:
 - a. Contractor's personnel
 - b. Visitors
 - c. Designated local, state and federal representatives
 - 7. Air Monitoring Equipment and Data
 - 8. Work activities for the day and associated health and safety issues discussed during the daily Health and Safety meeting.
 - 9. SSHO signature and date
- C. Include pertinent information from the daily logs in the Weekly Safety log. This report must be a summary of the daily reports filed during that workweek.
- D. Conduct health and safety audits of the Work area and procedure monthly. Prepare an audit report/check list and attach to the current weekly report.
- E. Prepare and submit a health and safety close-out report at the completion of the project. The report must summarize the health and safety issues and associated procedures and resolution for the project.
- F. Prepare and submit close-out document or Cleanup Report as directed by Resident Engineer. Closeout document must include:
 - 1. Summary of excavation and backfill activities, sampling (if completed), disposal.
 - 2. Surveys of excavation area including cross-sections of areas of excavation.
 - 3. Analytical laboratory test results and chains-of-custody for samples

collected.

4. Bills of Lading, Weight Tickets and/or Certificates of Disposal or Treatment for soil and groundwater

- G. Comply with federal and state laws that require the retention of chemical exposure records and medical records for 30 years after the termination of the job. MSDSs are considered exposure records under these regulations.

3.11 SCREENING, SAMPLING AND ANALYSIS

- A. Visually screen all soil and water excavated for staining, unusual odors, debris, slag, or sheen to evaluate the presence of contamination. Visually inspect building materials for suspect Hazardous or Contaminated Substances not noted in HBM surveys. Field screening tests may be used to screen for Unknown Hazardous and Contaminated Substances. Field screening tests may include water sheen test for the evidence of petroleum hydrocarbons and headspace measurements with the PID for evidence of volatile organic compounds. Notify Resident Engineer of new discoveries as specified herein.
- B. Perform required sampling and chemical analyses relating to generation, use, release and disposal of Hazardous or Contaminated Substances in the course of Contractor operations, in accordance with the UHCS-SHP and SPCC plan.
- C. Perform required sampling and chemical analyses relating to Unknown Hazardous or Contaminated Substances unless otherwise provided in the Contract Documents or as directed by the Resident Engineer in accordance with the UHCS-SHP. Include characterization sampling and the sampling necessary to determine presence or absence of Hazardous or Contaminated Substances and evaluate disposal methods accordingly. Do not dispose of material until directed to do so by the Resident Engineer.
- D. After Unknown Hazardous or Contaminated Substances is removed, confirmation samples will be collected and analyzed by the Sound Transit or Contractor as directed by Resident Engineer. Based on test results, Contractor to proceed with additional removal that may be required as directed by the Resident Engineer. Mark locations of samples and extent of excavation in the field and document on the surveys and the as-built drawings.

3.12 AIR MONITORING

- A. The CIH must design, develop and implement an Air Monitoring Program to detect and quantify airborne contaminants present during the Work in order to evaluate the inhalation exposure for workers. Submit the details of this program as part of the HCS-HASP.
- B. Monitor air for Hazardous Air Contaminants in breathing zones when work is being conducted in known and suspected hazardous or contaminated areas.
- C. Information gathered during the Air Monitoring Program must be used by the CIH to determine appropriate safety and personnel protective measures and medical monitoring to be implemented during excavation, stockpiling, handling, sampling, transporting and disposing of Hazardous or Contaminated Substances.
- D. Assess off-site migration of air-borne contaminants released during work activities.
- E. Calibrate and maintain air monitoring instruments in accordance with manufacturer's

SOUND TRANSIT

SECTION 01 35 43
HAZARDOUS AND CONTAMINATED
SUBSTANCE HEALTH AND SAFETY
PROGRAM

2023 STANDARD DIV 01 SPECS

recommendations.

F. Monitor air:

1. For potential explosive hazards:
 - a. During excavation and handling of Hazardous or Contaminated Substances
 - b. During handling of materials suspected of containing Hazardous or Contaminated Substances
 - c. In confined spaces.
 - d. Where explosive gases were previously detected.
2. During excavation, use a monitoring instrument to evaluate levels of Hazardous Air Contaminants.
 - a. Air monitoring is intended to provide warning and evaluate appropriate action to be taken to minimize exposure to Hazardous or Contaminated Substances.
 - b. Conduct continuous air monitoring in the areas of known and suspected Hazardous or Contaminated Substance to evaluate the presence of volatile organic compounds.
3. During demolition, quantitatively evaluate levels of particulate lead and asbestos as described in Contract Documents.
 - a. Asbestos and PCB-containing materials may be present in some buildings as indicated on the Contract Drawings.
 - b. Lead-based or lead-containing paint is expected to be present in all buildings.

G. Action Levels

1. If significant staining, sheen, odor, debris, or other evidence of Hazardous or Contaminated Substances is observed in areas where Hazardous or Contaminated Substances were not anticipated, cease all work in the area. Do not continue work in the area until potential risks are evaluated and as directed by the Resident Engineer.
2. The CIH must develop appropriate Health and Safety Action Levels to minimize exposure by Contractor personnel, Sound Transit personnel, personnel representing third party stakeholders and the public. Include action levels in the HCS-HASP. Action Levels must be below the PEL.
3. Ensure that action levels are appropriate for the contaminants of concern.
4. If concentrations of contaminants exceed the Health and Safety Action Levels established by the CIH, cease all work in the area until potential risks can be evaluated further, and immediately notify the Resident Engineer.
5. Site-specific Cleanup Levels have been established for this project as documented in the Contract Documents. If Cleanup levels have not been documented the applicable MTCA Method A cleanup level must be used.

END OF SECTION

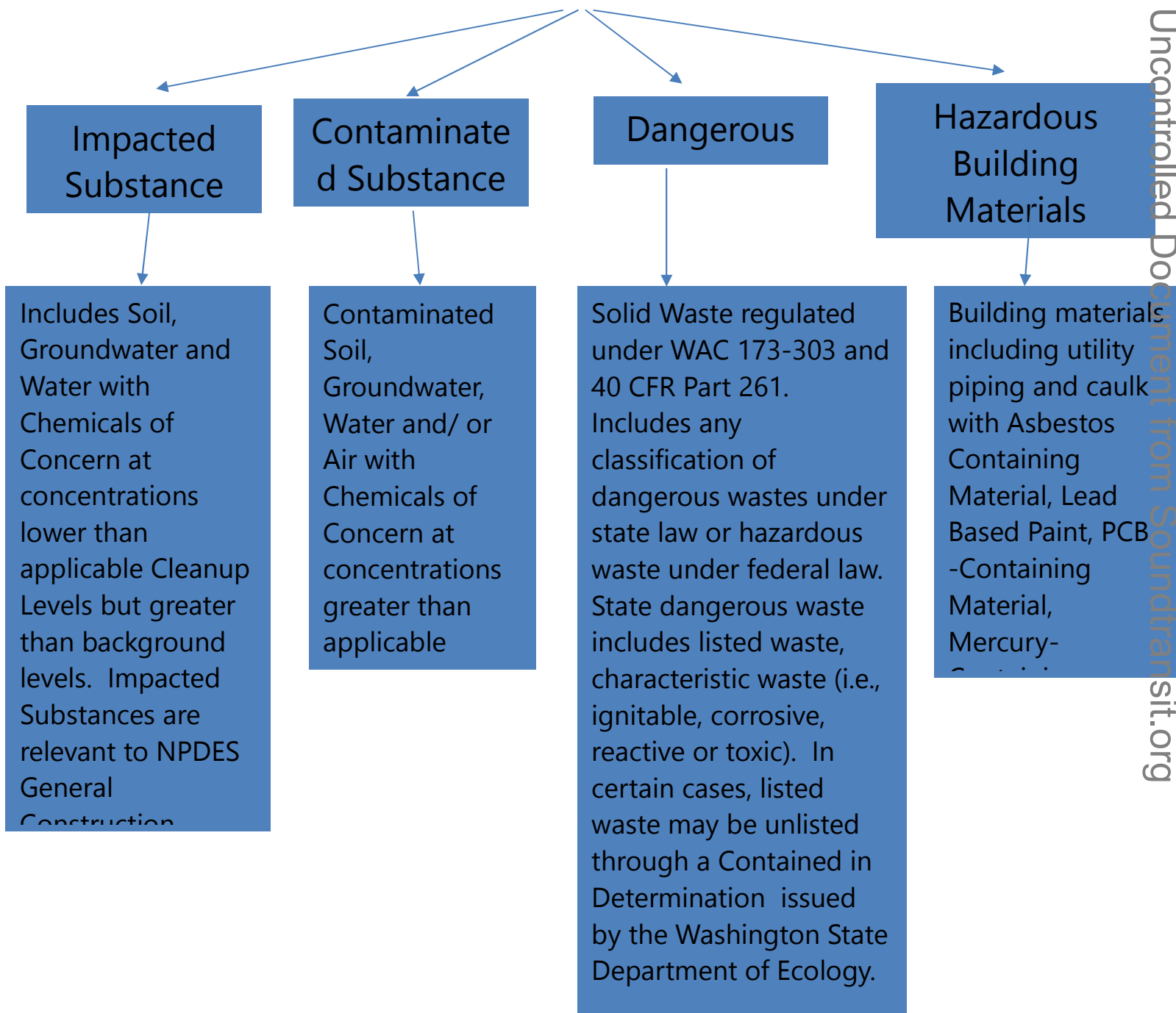
EXHIBITS

Exhibit A: Types of Hazardous or Contaminated Substances

**Exhibit A – Types of
Hazardous or
Contaminated
Substances**

**Hazardous Or Contaminated
Substances**

Include, But Not Limited To



END OF EXHIBIT

SECTION 01 35 43.13**ENVIRONMENTAL MANAGEMENT PLANNING AND PERMITTING****PART 1 - GENERAL****1.01 ENVIRONMENTAL MANAGEMENT PLAN**

- A. Contractor must produce and execute a comprehensive Environmental Management Plan (EMP) to identify, address, and implement all environmental commitments, plans, and permit conditions that are required for design and construction of the Project. The Plan must include, but is not limited to, traffic, noise and vibration, air quality, visual quality, surface water quality, ground water quality, industrial waste discharge, archaeological resources, TESC, sensitive area impact and protection, Migratory Bird Treaty Act (MBTA) compliance, noise during construction, contaminated materials, permit conditions, and environmental documents. The EMP must be submitted to Sound Transit no later than 45 days after NTP. The Environmental Compliance Manager must lead the development and submittal of this Plan.
- B. Sound Transit has prepared a list of environmental commitments, which originate from the environmental documents. Reference Volume 2 for the Environmental Commitments Reporting Table.
- C. The EMP must include the following:
1. Identify the appropriate environmental requirements and guidelines that the Project is required to comply with, including Sound Transit's Environmental Sustainability Management System.
 2. Develop and implement a comprehensive program of environmental monitoring and reporting during construction, including, but not limited to, air, water, soil, and noise and vibration.
 3. Develop and implement a comprehensive environmental training, reporting, and emergency response plan for all personnel working on the Project, including Sound Transit and AHJs assigned to the Project.
 4. Create a culture of environmental stewardship among all construction personnel and subcontractors.
 5. Develop and provide training for all personnel working on the job. Reoccurring training must be provided yearly for all staff, at a minimum. Contractor must also provide a record of training and an easily visible identification of personnel training completed using a yearly color-coded hard hat sticker program.
 6. Stockpile emergency cleanup equipment on site to address hydrocarbon spills. Contractor must provide a protocol for response and cleanup for all spills.
 7. Identify emergency communication protocol. Contractor must prepare a list that establishes priority for parties to be called during an emergency, for both Contractor and Sound Transit.
 8. Demonstrate how all environmental commitments and permit conditions will be met for permits held by Sound Transit and permits held by Contractor. Contractor must submit to Sound Transit a spreadsheet with information on how each

environmental commitment and permit obligation was ultimately met. The spreadsheet must be filled out during the Work and submitted quarterly for acceptance by Sound Transit. Design Builder must submit updates to the EMP on a quarterly basis..

1.02 ENVIRONMENTAL PERSONNEL, COMMUNICATION AND TRAINING

A. Environmental Compliance Manager:

1. Contractor must appoint the Environmental Compliance Manager (ECM). The ECM must be responsible for the overall environmental compliance for the Project and must function as principal technical advisor and coordinator for environmental issues. The EMP must outline all critical roles, responsibilities, and authorities of the ECM. The EMP must also outline the roles and responsibilities of other staff, and their roles in ensuring environmental compliance. The EMP must identify how the ECM will interact with Sound Transit and AHJ inspectors.
2. The ECM position is a critical member of the construction team and must be filled at the time of NTP and start development of the Environmental Management Plan. The ECM must be on site 50 percent of the time for the duration of the Work, any commitment less than 50 percent must be approved by Sound Transit after NTP, based on Project needs. If Contractor replaces the ECM, Contractor must provide an equally or more qualified replacement, contingent upon Sound Transit's approval. During the course of the Contract, if Sound Transit finds that the ECM is not ensuring full environmental compliance with all permits, provisions, policies, and commitments, then Sound Transit will require replacement of the ECM or enforcement of the ECM's roles and responsibilities.
3. The ECM must have at least 5 years of experience managing environmental design and construction compliance issues on projects of similar scope. The ECM must have knowledge of the environmental regulations and permits relevant to the Project. The ECM is required to be a current Certified Erosion and Sediment Control Lead (CESCL), as recognized by Ecology. Contractor must provide a copy of the course certificate or other material verifying completion of the certification course.
4. The ECM must also be responsible for the following:
 - a. Integrating with the design team during plan preparation and advising the design team how to avoid and minimize adverse effects on the natural environment and communities through design and construction means and methods.
 - b. Reviewing engineering plans to ensure the Contractor's design accurately reflects environmental commitments and requirements.
 - c. Ensuring and providing documentation that the work complies with all environmental commitments agreed to in the environmental documents, permits, agreements, and approvals of the Project.
 - d. Coordinating with the Project Archaeologist and Sound Transit for the training.
 - e. Managing hazardous and/or contaminated materials, including known and unanticipated contamination will be conducted in accordance with the Model Toxics Control Act (WAC 173-340). Remedial activities will be completed by the DB as an independent remedial action in accordance with WAC 173-340-515. For known contamination, provide cleanup action plan, appropriate permitting, implement planned remediation and

post-remediation reporting. Manage for unanticipated contamination, including monitoring for potential contamination, working with Sound Transit to develop cleanup action plans if unanticipated contamination is encountered, remediation of contamination in soil and groundwater, and impacted/contaminated soil and groundwater encountered during construction.

- f. Consulting with Sound Transit to determine whether additional environmental review is warranted if there are Project changes.
 - g. Attending and pre-activity meetings.
 - h. Maintaining the authority and means to bring the Project into compliance and/or stop work if the Project is in violation of an environmental regulation or commitment.
 - i. Overseeing preparation and implementation of the TESC, SWPPP, and other relevant plans and submittals.
 - j. Developing or providing direct supervision to individuals assigned to prepare and implement the plans described in this section.
 - k. Identifying non-compliance events and responding to Environmental Correction Action Report (ECAR). Prepares a root-cause analysis and corrective action plan related to the non-compliant event, as necessary.
 - l. Notifying Sound Transit of non-compliance event immediately, but no later than same day of event.
 - m. Attending and facilitating weekly field visits, including those undertaken by regulatory agencies.
 - n. Ensuring daily field inspections are being conducted by Contractor's designated CESCL.
 - o. Preparing and implementing a monitoring plan to ensure erosion/sedimentation and spill control devices and best management practices (BMPs) are effective and maintained. Maintaining a BMP Tracking Log and distributing to internal stakeholders weekly.
 - p. Conducting field inspections on a weekly basis, at a minimum, to ensure that environmental compliance measures and BMPs are meeting environmental requirements.
5. The Contractor has the flexibility to identify one person who meets the qualifications of the ECM and the Construction Site Environmental Management Supervisor (CSEMS), with the approval of the Resident Engineer in consultation with Sound Transit. Or the Contractor would identify two staff members to fill the ECM and CSEMS positions, with approval of the Resident Engineer.

B. Weekly Environmental Coordination Meetings:

- 1. Contractor's ECM must organize and implement weekly meetings during design and construction to ensure that the Project design meets the Project environmental commitments, and to identify which construction elements such as staging locations, work activities, weather conditions, and times of day present the greatest risk to the environment. In addition, the ECM must review BMPs at these meetings, to avoid and minimize risk. Sound Transit must be invited to attend these meetings. The ECM must use the environmental commitments,

permit conditions, and other approvals and review of the construction schedules to identify environmental risks pertaining to upcoming work activities. The ECM must verify that environmental commitments and permit conditions are implemented in daily work activities.

C. Environmental Pre-construction Meeting:

1. Contractor must organize and participate in an environmental pre-construction meeting with the regulatory agencies 30 days prior to the start of construction. During the environmental pre-construction meeting, Contractor must discuss its EMP, including its environmental training program, to demonstrate how Contractor must meet permit conditions and fulfill environmental commitments. Contractor must discuss its construction schedule and identify the early construction elements.

D. Environmental Protection Training:

1. Contractor must develop and implement an environmental protection training program for Contractor's design and construction staff, QA personnel, subcontractors, and vendors. Contractor must be responsible for all work, including subcontracted and supplied work, and associated personnel, ensuring that their work practices avoid causing a negative effect on the environment or a non-compliance event or permit violation. Therefore, Contractor's training program must orient all employees, subcontractors, and all other parties brought onto the Project to complete work in support of the Project to the following activities prior to the start of work:
 - a. Permit conditions, performance standards, environmental commitments, and environmental regulations related to the Project.
 - b. The overall importance of environmental issues.
 - c. The specific environmental sensitivities of the Project.
 - d. Erosion and sediment control procedures and certification.
 - e. Environmental compliance monitoring and reporting procedures.
 - f. Management of known or suspected contamination.
 - g. Unanticipated historic or archaeological discoveries.
 - h. Emergency response procedures.
 - i. Compliance with the MBTA.
2. Contractor must provide training to ensure water quality is monitored in accordance with the permit condition protocols, Project-specific permit conditions, performance standards, regulatory requirements, and environmental commitments. This training must include field visits with Sound Transit staff prior to construction to establish monitoring sites and to review monitoring and reporting procedures. Contractor must coordinate with Sound Transit environmental staff if additional monitoring locations are required.

1.03 ENVIRONMENTAL PLANS AND STRATEGIES

A. Permit Compliance, Modifications, and Additional Approvals:

1. Contractor must follow the requirements of all permits and commitments referenced in this section and elsewhere as applicable to the Project and any

other permits that are obtained by Contractor for the Project. Contractor must provide Sound Transit with timely notice of its intent to propose an alternative construction method or a design change that is inconsistent with a particular permit, environmental requirement, or commitment, or was not covered under existing environmental review documents. Sound Transit will work with the Contractor and will bring final detailed proposals provided by Contractor to the regulatory agencies for permit modifications, to obtain new permits, and to re-initiate consultation as required, but Sound Transit cannot guarantee approval. Contractor must be responsible for preparing any additional environmental documentation needed to secure the additional environmental approvals required for implementation of Contractor's alternative proposals.

2. Contractor must be responsible for preparing any additional environmental documentation or other supporting materials needed to secure a new permit or permit modification. The conditions of the new permit(s) and all costs and/or delays of any kind that result from the inability to complete the Work prior to permit expiration must be borne by Contractor.
3. All costs and/or delays of any kind that result from the discovery of a previously unknown sensitive resource (i.e., streams, jurisdictional ditches, archaeological resources) that is located outside the Project's Area of Potential Effect indicated in the environmental documents, including off-site staging, storage, or assembly areas, must be Contractor's responsibility. To secure permit modifications or additional permits or approvals, Contractor must, upon request, attend environmental coordination meetings between Sound Transit, the regulatory agencies, and other entities that may have an approval role.

B. Environmental Reports:

1. Sound Transit made commitments in the environmental documents. These commitments are included in the Environmental Commitments Reporting Table. Contractor must fulfil and report on the implementation of these commitments.
2. Contractor must update the environmental commitment data base and submit an updated Environmental Commitments Reporting Table to Sound Transit quarterly. The database update and spreadsheet must be submitted on the first business day after March 31, June 30, September 30, and December 31 for the duration of the Contract. The quarterly update of the reporting table must include narratives of how and where each commitment has been incorporated into design and construction. The quarterly update narratives must include citing of specifications, drawings, and reports in which the commitments have been implemented.

C. Integrated Pest Management Plan:

1. Sound Transit has developed an Integrated Pest Management Plan (IPMP). Contractor must follow guidance in the IPMP for control of pests in landscape areas, in and around buildings, and at station areas. The purpose of the IPMP is to minimize use of toxic substances that may contaminate the soil, surface streams, and groundwater. Contractor must follow the considerations and requirements identified in that plan in development of the EMP and design documents, and during the construction phase of the Project. Any noxious weeds identified in the corridor must be surveyed, and a plan must be identified for their removal. Some weeds do not require special handling, but others do. Contractor is required to survey those weeds that when cleared or removed may invade other locations. The IPMP must address aquatic invasive species present or potentially present in the Project footprint or affected by the Project.

1.04 PERMITTING

- A. To perform the permitting work, Contractor must have a member of the team with a minimum of five years of infrastructure permitting.
- B. Permitting Strategy Memo:
 - 1. At the 60 percent design submittal, Contractor must prepare a draft and final memo establishing the list of federal, state, and/or local government permits and approvals required for the work. The list of permits must address all required field exploration, construction, and environmental permits. The memo must include a narrative on the methodology and intended timeframe for obtaining all necessary approvals and permits required for the Project. Contractor must accommodate two weeks for Sound Transit reviews of all permit applications. The memo must present an intended schedule for the permit preparation, Sound Transit reviews, agency review periods, and anticipated approval dates for each required permit or approval. Contractor must include time for Sound Transit and agency reviews during the application and permitting process within the overall Project schedule.
- C. Permits, Schedules, and Status Tracking:
 - 1. During final design and construction, Contractor must maintain and periodically update the list of all required permits, the schedule for permitting activities, and a tracking sheet for monitoring the permitting activities. The purpose of these documents is for coordination of permitting activities between Contractor and Sound Transit staff as well as coordination of permitting activities with engineering and construction activities.
- D. Transmittals:
 - 1. Draft and final updated permitting strategy memo including:
 - a. List of required field exploration, construction permits, and required environmental permits.
 - b. Schedule for permitting activities.
 - 2. Periodic updates to the list of permits, permitting schedule, and permit status.
 - 3. Meeting and conference call notes, memos, transmittal letters, and other correspondence, as requested by Sound Transit.
 - 4. Various permits for field explorations required during final design.
 - 5. Construction permit application packages submitted during final design.
 - 6. Construction permit application packages submitted during construction.
 - 7. List of permit close-out requirements.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 35 93
ARCHAEOLOGICAL FINDS

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section specifies requirements and procedures established to facilitate the investigation and protection of cultural resources and providing archaeological monitoring during construction.

1.02 REFERENCES

- A. This Section incorporates by reference the latest revisions of the following documents.
 - 1. Revised Code of Washington (RCW)
 - a. Chapter 27.44 RCW Indian Graves and Records
 - b. Chapter 27.53 RCW Archaeological Sites and Resources
 - 2. Code of Federal Regulations (CFR)
 - a. 36 CFR Part 800 – Protection of Historic Properties
 - b. 43 CFR Part 10 – Native American Graves Protection and Repatriation Regulations

1.03 DEFINITIONS

- A. Project Archaeologist: Archaeologist who has a separate contract with Sound Transit, monitors Work on Site, and evaluates and documents resources that are inadvertently discovered. They make recommendations to start Work, in the event of “stop work” orders.”

1.04 IMPLEMENTATION

- A. Insert these implementation provisions in Subcontracts for which Work on-Site is likely to disturb land.
- B. Sound Transit has contracted with a Project Archaeologist, who will work with Sound Transit and the Contractor to implement these provisions. The roles and responsibilities are generally as described herein.

1.05 CONTRACTOR’S RESPONSIBILITIES PRIOR TO CONSTRUCTION

- A. Sound Transit will plan and schedule a Pre-Construction Orientation prior to the commencement of land disturbing construction activities. Participants shall include the Construction Management Lead, Resident Engineer, Contractor’s Project Manager, Project Superintendent, and other personnel responsible for overseeing land disturbing field operations. This orientation will serve to:
 - 1. Provide introductions of the Sound Transit representatives, the Project archaeologists and the personnel who will be working together on a daily basis.

2. Describe the role of field archaeologists in the construction process.
 3. Review construction plans, schedules and areas that archaeologists will monitor.
 4. Establish a chain of command for communication and decision-making among Sound Transit, Project Archaeologist and Contractor personnel.
 5. Clarify all questions about schedules, construction locations, construction techniques or notification procedures.
- B. Require all of its personnel who perform Work on-Site that is likely to disturb land, to attend an on-Site orientation briefing (approximately 15 to 60 minutes, depending on the probability of discovering archaeological resources) about procedures established to investigate and protect cultural resources if encountered during construction. Schedule subsequent orientation briefings and training programs, as required, to accommodate new personnel arriving on-Site. Do not allow any employee to participate in land-disturbing construction without first having attended the orientation briefing.
- 1.06 CONTRACTOR'S RESPONSIBILITIES DURING CONSTRUCTION
- A. Undiscovered archaeological materials may exist on the Site. Be watchful for changes in soil color and the presence of ash, shell layers, bones, structures, or artifacts that might indicate the presence of unidentified cultural materials.
 - B. If ground-disturbing activities encounter any archaeological materials, direct the crew to immediately stop Work adjacent to the discovery. Temporarily suspend Work within 20 feet of discovery and protect the discovery, including any spoils in dump trucks or on Site. Work may continue elsewhere.
 - C. Vehicles, equipment and unauthorized personnel will not be permitted to traverse the discover area. Spoils piles or vehicles with the potential to contact cultural resources will not be disturbed or removed from the location of discovery, until authorized by Sound Transit.
 - D. Immediately notify the Resident Engineer, Project Archaeologist and Sound Transit Cultural Resources Manager about the discovery.
 - E. Construction activity shall recommence only at the written direction of the Resident Engineer upon the recommendation from the Project Archaeologist.
- 1.07 RESPONSIBILITIES OF THE PARTIES IF CULTURAL RESOURCES ARE DISCOVERED
- A. The Project Archaeologist may request the use of Contractor's equipment to provide a better vertical exposure or to remove fill or slump that may obscure deposits. The Project Archaeologist may enter the trench and make an assessment of stratigraphy, matrix, characteristics, evidence of previous disturbance, resource type and the spatial extent of the resource. The assessment will determine if the find is classified as significant.
 - B. If cultural resources are discovered, cooperate with the Project Archaeologist to enable the Project Archaeologist to monitor the Work. Examples of cooperation may include moving equipment to provide access for observation, placing excavated material for examination, accessing trench or foundation excavations, excavating in thin lifts or otherwise reasonably modifying construction excavation procedures to provide exposures of subsurface stratigraphy. Generally, the Project Archaeologist will make any requests for such cooperation through the Resident Engineer. However, there may be times when it is necessary for the Project Archaeologist to communicate directly with Contractor's equipment operators. The Contractor shall direct the operators to cooperate with any such requests made by the Project Archaeologist. If doing so would create an

unreasonable safety risk or hazard, refrain from complying with the request and notify the Resident Engineer.

- C. If cultural resources are suspected or discovered, Project Archaeologists will want to observe the equipment working and the soil removal from multiple perspectives around the equipment. . Archaeologists may want to clean trench walls, obtain matrix samples or quickly record the stratigraphy. Archaeologists will observe construction excavation in areas where native soil may be encountered or fill areas with historic artifacts, which may assist in developing a chronology of fill placement and/or filling techniques. At times, close, direct examination of excavation sidewalls may be necessary to identify native soils or possible cultural deposits, requiring an archaeologist to enter an excavation zone. Excavated material may be examined in concert with monitoring of the excavation. These activities may require close communication by the Archaeologist with Contractor's supervisors and equipment operators.
- D. In the event that cultural resources are found during construction, the Project Archaeologist will be responsible for the following:
 - 1. Determining the significance of any such cultural resources
 - 2. Determining whether any such cultural resources require mitigation by archaeological investigation and, if so, what mitigation measures are required
- E. Non-significant finds will be recorded and collected. Provenance information will be recorded, such as the rail segment, construction station, depth below surface, stratum, date and name of person finding the material.
- F. Construction activity shall re-commence only at the written direction of the Resident Engineer with the Sound Transit Cultural Resources Manager consent.
- G. Sound Transit directed written Work stoppages of less than a cumulative duration of 24 work hours shall be considered incidental to the performance of the Contract. The cost of Sound Transit directed Work stoppages in excess of the cumulative 24 work hours will be reimbursed on a Time and Materials Basis in accordance with the General Conditions under the Provisional Sum item in the Contract Price Schedule or by Change Order, should there not be a Provisional Sum item.

1.08 DISCOVERY OF HUMAN REMAINS OR BURIAL SITES

- A. If the Project Archaeologist or the Contractor identifies anything that remotely appears to be human remains, immediately halt construction Work in the area of discovery and secure the area 50 feet in all directions. Notify the Resident Engineer if the Project Archaeologist is not monitoring the excavation at the time of the discovery.
- B. If human graves and associated cultural items are discovered during construction, the applicable federal and state laws require the Contractor and Sound Transit to cease activity in the area of discovery (activities may continue elsewhere in the Project Site. Sound Transit will immediately contact the County Medical Examiner, Federal Transit Administration, affected Indian Tribes and the Washington State Department of Archaeology and Historic Preservation (DAHP).
- C. Do not remove or handle human remains. Prohibit photographs by anyone except Sound Transit's Archaeologist. Flag the area of discovery and prevent construction equipment and personnel from entering the area. Assumptions must not be made concerning the origin of the human remains. Public disclosure of the find shall be avoided. The Resident Engineer or Project Archaeologist will ask the County Medical Examiner to examine the remains in their location of discovery. Under no circumstances shall the remains be removed from the Site before notification of DAHP and the affected Indian Tribes, and approval by Sound Transit.

- D. If Native American burials are encountered during construction-related activity, the Washington Indian Graves Act (Chapter 27.44 RCW) and applicable sections of the Native American Graves Protection and Repatriation Act (NAGPRA, Public Law 101-601, 104 Stat. 3048, USC 3001-13, 43 CFR Part 10) require specific procedures that shall be followed, as appropriate.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 42 23

INTEGRATION WITH [WSDOT] STANDARD SPECIFICATIONS

PART 1 - GENERAL

1.01 SUMMARY

- A. The revisions included in this Section shall modify and shall be used in conjunction with the current version of the [Washington State Department of Transportation (WSDOT) Standard Specifications for Road, Bridge, and Municipal Construction M 41-10 (Standard Specifications)], and the [WSDOT Standard Plans M21-01] at the time bids are received for this Contract.

1.02 STANDARD SPECIFICATION REVISIONS

- A. General:
 - 1. All references to "City" shall mean the local authority having jurisdiction.
 - 2. All references to "Engineer" or "Project Engineer" shall mean "Resident Engineer".
 - 3. All references to "Plans" and "Contract Plans" shall mean "Contract Drawings".
 - 4. All references to "Contracting Agency" shall mean "Sound Transit".
 - 5. All work to be performed and materials to be used shall be in accordance with the Standard Specifications and Amendments as revised by this Section, except for Work specified otherwise.
 - 6. Sections [1-02, 1-03, 1-04, 1-05, 1-06, 1-07, 1-08, 1-09], and all APWA supplements referenced, are deleted in their entirety.
- B. [WSDOT Division 1 - GENERAL REQUIREMENTS:]
 - 1. Section 1-01, DEFINITIONS AND TERMS, is amended to delete any definitions, terms, or other conditions that are not required to properly interpret provisions of Divisions 2 through 9 of the Standard Specifications or the Standard Plans that are included in this Contract.
 - 2. [Section 1-10, TEMPORARY TRAFFIC CONTROL, shall be the basis for planning, managing, supervising, and performing all temporary traffic control activities needed to support the Contract Work.]
- C. WSDOT Divisions 2 through 9 are amended as follows:
 - 1. Except for applicable lump sum payments as noted, delete all Payment references in their entirety. When utilized, revise the words "by force account as provided in Section 1-09.6" or "by force account" to read "on a time and materials basis in accordance with the requirements of the Contract."
 - 2. Revise the words "in accordance with Section 1-04.1" to read "in accordance with the requirements of the Contract."

3. Revise the words "as provided in Section 1-04.4" to read "as provided by the requirements of the Contract."
4. Revise all references to "Section 1-06" to read "in Section 01 45 00[xx], Quality Assurance / Quality Control."

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 45 00.10
QUALITY MANAGEMENT
DESIGN-BID-BUILD & GC/CM

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section defines the requirements for the Contractor to establish, implement and maintain an effective Quality Program to manage, control, document and assure the Work complies with the requirements specified in the Contract Documents. This Section also defines the requirements for the Contractor to prepare, implement and maintain plans, programs, procedures and the organization necessary to assure quality for materials, equipment, execution of work, products, and manufacturing and installation operations covering both on-site and off-site Work by the Contractor, including Subcontractors, Subconsultants, Suppliers and Testing Laboratories.

1.02 REFERENCES

- A. This Section incorporates by reference the latest revisions of the following documents. They are part of this Section as specified and modified.
 - 1. Federal Transit Administration (FTA):
FTA Quality Management System Guidelines December 2012
FTA-PA-27-5194-12.1
 - 2. International Building Code - Structural Tests and Special Inspections (Chapter 17) or Local Authority Having Jurisdiction's (AHJ) Building Code
 - 3. American Society for Testing and Materials (ASTM) Standards
 - 4. Washington Association of Building Officials (WABO) Requirements
- B. Definitions:
 - 1. Project Construction Quality Management Plan (CQMP): A plan that addresses the fifteen quality elements identified in the FTA Quality Management System Guidelines December 2012, FTA-PA-27-5194-12.1. Provides descriptions of and references to Quality procedures and Work instructions, including specified requirements unique to this Contract, which relate to the quality system elements.
 - 2. Construction Work Plan (CWP): Detailed plan for constructing a specific Work activity.
 - 3. Readiness Review Meeting (RRM): A meeting to review and discuss all CWP elements identified below which is conducted by the Resident Engineer with the Contractor, Subcontractors and applicable third party representatives who are involved in executing, supervising, inspecting, testing and monitoring the Work activity.
 - 4. Inspector's Daily Report (IDR): A daily report to be completed by all Inspectors identifying work activities observed, recorded and documented.

5. Quality Audit: A documented activity performed by examination and evaluation of objective evidence, that applicable elements being examined have been developed, documented, and effectively implemented in accordance with Contract requirements.
6. Surveillance: Monitoring or observing to verify whether a test, inspection or process activity conforms to specified requirements.

1.03 CONTRACTOR QUALITY PERSONNEL REQUIREMENTS

- A. Assign a Contractor Quality Manager (CQM) dedicated solely to this Contract responsible for managing and acting on all quality matters and who has the authority to act on all quality matters as a representative of the Contractor. The CQM cannot be subordinate to Contractor's personnel that directly perform, supervise or progress the Work and cannot be responsible for directly performing, supervising or progressing the Work or have responsibilities for this Contract that conflict or appear to conflict with the primary responsibility for quality matters.
- B. Qualification of Contractor Quality Manager (CQM): At least 10 years prior experience as a CQM, Construction Project Engineer, Construction Field Engineer or Quality Supervisor (or combination thereof) on a project of comparable size, scope and complexity to this Contract, which includes a minimum of 5 years of experience as a CQM on projects of comparable size, scope and complexity to this Contract. At the sole discretion of Sound Transit, the Contractor may be required to replace the CQM. Contract Work is not permitted to be performed without an approved CQM on site. Designee approved by Sound Transit and in coordination with the RE will be acceptable during night shifts.
- C. CQM responsibilities include: development and implementation of the ProjectCQMP, planning, performing Quality Audits of construction activities, attending progress and quality meetings, approving IDRs, issuing NCRs, managing the Quality Inspectors, coordinating with the Independent Testing Laboratories, performing and coordinating root cause analysis on nonconformance Work, and monitoring Corrective and Preventive Actions.
- D. Employ qualified Quality Inspectors meeting, at a minimum, the following requirements:
 1. Quality Inspectors shall have a minimum of 5 years construction Quality experience for the Work they are responsible for inspecting or with a minimum of 3 years Quality inspection experience plus a minimum 2 years construction experience in engineering or inspecting within the disciplines for the Work they are responsible for inspecting.
 2. Quality Inspectors must report directly and only to the CQM and cannot be subordinate to Contractor personnel that directly perform, supervise or progress the Work, and cannot be responsible for directly performing, supervising or progressing the Work or have responsibilities for this Contract that conflict or appear to conflict with their primary responsibilities for quality matters.
 3. Only designated Quality Inspectors may perform quality inspections. Other personnel, such as the Contractor Field Engineers or Superintendents, cannot perform as Quality Inspectors.
 4. Field Quality Inspectors cannot perform testing, unless they are employed by the Independent Test Lab that will perform the tests on the samples taken.
 5. QC Inspectors are responsible for monitoring, verifying and documenting in the IDR that the processes and requirements of the approved CWP, drawings, specifications, shop drawings and other applicable Submittals are implemented on each Feature of Work.

6. At the sole discretion of Sound Transit, the Contractor may be required to replace Quality Inspector(s).
- E. For each shift upon which Contract Work is being executed, have sufficient experienced Quality inspectors, who are qualified to inspect the Work being performed. The quantity of Quality inspectors and corresponding inspection coverage shall be in accordance with Inspection and Test Plan approved by Sound Transit. At the sole discretion of the Resident Engineer the Contractor shall provide additional Quality inspectors at no additional cost to Sound Transit if the Resident Engineer determines that additional Quality inspectors are required.

1.04 PROJECT CONSTRUCTION QUALITY MANAGEMENT PLAN (CQMP) REQUIREMENTS

- A. CQMP Development: Part 3 Sections of this specification are intended for use as headings for the CQMP (e.g., Management Responsibility, Quality Management System, Document Control, etc.). Requirements for the CQMP sections are as outlined in the specification sections. A template for the CQMP in MS Word format will be provided by Sound Transit Quality. The Contractor is required to use this template to develop the CQMP submittal. It is the responsibility of the Contractor to ensure all requirements are addressed even if not specifically identified in the template.
- B. CQMP Updating: Review the CQMP every six months at a minimum or on a schedule approved by Sound Transit for the duration of the project; revise and resubmit if any changes to the CQMP are proposed, or if insufficient Quality Process or Procedures are identified during implementation.
- C. Approval: CQMP submittal must be acceptable to Resident Engineer with a No Exceptions Taken (NET) or Exceptions as Noted Resubmission Not Required (EANRNR) disposition, before any construction Work requiring inspection can begin.

1.05 QUALITY MEETINGS

- A. Conduct Quality Meetings every 2 weeks with Sound Transit Quality Assurance along with additional Sound Transit representative(s) as required, the Contractor CQM along with other Contractor representative(s) as required, QC Inspectors and Third Parties (if required) to discuss quality issues. Items discussed will be documented by the Contractor and shall include due dates of assigned action items with agreement from Sound Transit Quality Assurance. Distribute minutes to all attendees and other interested parties. At a minimum, the Quality Meetings shall cover topics of:
 1. Three-week look-ahead schedule update
 2. CWP status with corresponding work activity and RRM's
 3. RFIs status
 4. Submittal approval status of corresponding critical path work activities
 5. Inspection coverage of upcoming work activities
 6. Special Inspections and tests
 7. Test plans, procedures and test results
 8. Quality Audits / Surveillance status
 9. NCRs / implementation of Corrective and Preventive Actions
 10. Materials received and corresponding inspections/documentation

11. Off-site activities including inspections and testing
12. Status of as-built Contract documents
13. Quality training
14. Documentation and status of quality issues, recurring NCR issues, and preventive actions taken

1.06 SUBMITTALS / TRANSMITTALS

A. Submittals include:

1. Name and qualifications of CQM, within 15 days after the effective date of the Notice to Proceed (NTP).
2. CQMP within 30 days after the effective date of the NTP.
3. IDR form, including content and items as identified in Exhibit A. The Contractor may use IDR form provided herein.
4. List of CWPs, within 45 days after the effective date of the NTP. Update the CWP list when new CWPs are added and resubmit within 7 days.
5. Name and qualifications of the Contractor's Independent Testing Laboratory and all subcontracted Testing Laboratories within 45 days after the effective date of the NTP.
6. Inspection and Test Plan within 45 days after the effective date of the NTP. Submittal must be acceptable to Resident Engineer with a No Exceptions Taken (NET) or Exceptions as Noted Resubmission Not Required (EANRNR) disposition before any Construction Work that requires inspection can begin.
7. Inspection and Test Matrix, within 45 days after the effective date of the NTP, includes the following:
 - a. Specification Section number
 - b. Specification Section title
 - c. Section Article
 - d. Test/Inspection Description
 - e. Identify on-site/off-site testing
 - f. Minimum frequency or instance for tests and inspections
 - g. Entity responsible for performing tests and inspections (e.g., Laboratory, Contractor, Subcontractor, or Third Party)
8. Quality Inspectors. Include:
 - a. Name and qualifications
 - b. Discipline of Work to which they will be assigned
9. Name and qualifications of personnel employed to perform special processes to which they are assigned.
10. CWPs required by the CWP List submittal.

11. Contractor IDRs, within 7 days of inspection for the first 4 weeks after the start of inspection. Thereafter, provide IDRs to the Resident Engineer thereafter as a Transmittal. IDR Submittal must be acceptable to ST with a No Exceptions Taken (NET) or Exceptions as Noted Resubmission Not Required (EANRNR) disposition before Transmittal of IDRs can begin.
 12. Contractor Nonconformance Reports (NCRs).
- B. Transmittals include:
1. List of Subcontractors and Subconsultants including Work to which they will perform within 45 days after effective date of NTP. Provide updates at least 10 days prior to each new Subcontractor or Subconsultant beginning Work on Contract.
 2. Quality Audit Schedule within 60 days after the effective date of the NTP.
 3. IDRs subsequent to the first 4 weeks of inspections within 7 days of inspection.
 4. Weekly transmittal of materials received and corresponding inspection documentation.
 5. Independent Testing Laboratory Inspection and Test Reports, unless specified as submittals, within 7 days after completion of the inspection or test.
 6. Completed Utility Strike Log, prior to Substantial Completion. Provide copy of interim Utility Strike Log when requested by Sound Transit.
 7. Completed Nonconformance Log, prior to Substantial Completion. Provide copy of interim NCR Log when requested by Sound Transit.
 8. Contractor Quality Audits Reports within 15 days after the completion of each Quality Audit.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 MANAGEMENT RESPONSIBILITY

- A. Management Statement: As part of the Project CQMP submittal the Contractor is required to provide a management statement, in accordance with FTA Quality Management System Guidelines. The management statement must also include the Contractor's commitment that the Construction Quality Manager (CQM) has the authority to act independent of the Contractor's Project Manager on quality related issues and that the CQM shall be dedicated solely to this Contract with the direction that the CQM cannot have responsibilities that conflict, or appears to conflict with their primary responsibility for quality matters.
- B. Organization Chart: As part of the Project CQMP submittal an organization chart shall be included to demonstrate the level of authority and independence of the CQM and the Quality Management staff. The CQM shall report to a corporate level executive above the level of the Project Manager. The corporate level executive cannot be involved in progressing the project Work or be responsible for administration or implementation of the project contract.

3.02 SUBCONTRACTOR, SUBCONSULTANT AND SUPPLIER CONTROL

- A. Include in the documents provided to Subcontractors the Project CQMP requirements and quality requirements defined herein applicable to the Work they perform.
- B. Assure all products and services procured from Subcontractors, Subconsultants and Suppliers meet Contract Document requirements and comply with Project CQMP or have their QPP approved by the CQM.
- C. Develop and maintain procurement procedures to select and control Suppliers and Subcontractors including:
 - 1. Evaluation and assessment of Suppliers' and Subcontractors' quality systems
 - 2. Methods utilized to monitor quality performance of Suppliers and Subcontractors
 - 3. Flow down of design, reliability and quality requirements to Suppliers and Subcontractors
 - 4. Determination of criteria for performing source inspections

3.03 IDENTIFICATION, TRACEABILITY AND RECEIVING, HANDLING, STORING AND CONTROLLING OF PRODUCTS, MATERIALS AND EQUIPMENT

- A. Establish and maintain procedures and documentation for receiving, handling, storing, identifying and controlling items of production (batch materials, parts, components and subassemblies) to prevent use of incorrect or defective items and to ensure only correct and acceptable items are used or installed.
 - 1. Develop procedures to provide identification, traceability, and documentation during all phases of production from receipt of raw materials, components and subassemblies through the manufacturing process to the delivery of final products and systems on site.
 - 2. Utilize batch number, shipment number, packing slips or invoices along with test data sheets and material certifications for determining traceability of raw materials.
 - 3. Develop procedures and documentation for identification and acceptance of materials delivered on site comply with Contract requirements. Provide physical separation, procedural control or other appropriate means where physical separation is impractical or where record traceability is lost.
 - 4. Employ storeroom or inventory tracking procedures for traceability of items back to a particular order number, batch number, date received, test lot or other pertinent source.
 - 5. Employ routing documentation for traceability of assemblies in production.
 - 6. Mark final assemblies with Contract number, model number, serial number and bar codes.
- B. Control receipt of products, materials and equipment in accordance with Section 01 60 00, Product Requirements.
- C. Inspect and record on the IDR identification, damage and quantity of all products, materials and equipment received. Large lots may be inspected by an industry approved standard sampling method.
- D. Record on the IDR on-site equipment calibration occurrences including the piece of equipment, equipment identification number/label, name(s) and company of personnel

performing the calibration, qualifications (if applicable), brief outline (or document reference) of the procedure including equipment used to perform the calibration and next calibration due date.

- E. All products, materials and equipment are subject to receipt inspection by Sound Transit.

3.04 PROCESS CONTROL

- A. Control on-site and off-site construction through the development of Contractor CWPs, approval of CWPs by the Resident Engineer, execution of the Work in accordance with CWPs and Contract requirements, and timely reporting of the results of the inspections on the IDR and lab test reports of required inspections and tests.
- B. Determine, with the concurrence of the Resident Engineer, which Work activities require submission and approval of a CWP. Prepare and submit a list of CWPs to the Resident Engineer for concurrence and approval. The Resident Engineer and the Contractor may add CWPs to the list. Resubmit the CWP list when CWPs are added, deleted or modified.
- C. CWPs: Prepare and submit a CWP for each of the Work activities identified on the CWP list. Work cannot begin without Sound Transit acceptance of a CWP dispositioned as NET or EANRNR and convening of a RRM. No partial approval of a CWP will be permitted. Changes and revisions to the Work activity require a revised CWP to be submitted and a new RRM to be held prior to resuming Work. As a minimum include, in the order listed, the following in each CWP:
 - 1. Scope of Work
 - 2. List of persons responsible for supervision of the Work
 - 3. List of applicable required submittals status and drawings (with latest revisions)
 - 4. Planned start-work and completion dates, progress rate expected and Work hours
 - 5. Sequence of events and construction methods for performing the Work: Include hold points, inspections and tests
 - 6. Handling and storage of materials and equipment
 - 7. Inspections and tests required by Contractor, Third Parties and Sound Transit
 - 8. Coverage of inspections: List individuals responsible for performing inspections and discipline of Work to which they are assigned
 - 9. Prerequisite activities and related construction safety issues
 - 10. Off-site inspection and test activities and the locations
 - 11. Procedures for controlling hazardous materials, as applicable
 - 12. Erosion and Sediment Control (ESC) Best Management Practices (BMP)
 - 13. Actions defined as "Special Events", which may expose the public to danger or inconvenience, and which may require a third party to be notified
 - 14. Safety-critical installations, inspections and tests
 - 15. Specific Job Hazard Analysis (JHA) for each CWP
- D. CWP and RRM

1. After the CWP has been returned by the Resident Engineer dispositioned as NET or EANRNR and a minimum of 7 and a maximum of 14 days before beginning associated Work activities, attend the RRM conducted by the Resident Engineer. The Resident Engineer documents the meeting with an agenda and minutes of the meeting including an attendance record. Include an activity for each RRM on the Project Schedule.
 2. All Submittals associated with the CWP must be listed in the CWP Submittal.
 3. After the RRM has been held and updates (if any) have been incorporated into the CWP, the Contractor shall distribute the revised CWP and approved associated Submittals to the personnel performing the Work and to the Contractor QC Inspectors. The Contractor and/or its Subcontractor personnel shall keep a copy of the approved CWP and approved associated Submittals within proximity of the Work being done and shall adhere to the approved processes and procedures contained therein. The Contractor or Subcontractor personnel performing the Work shall produce a copy of the approved CWP and approved associated Submittals upon request by QC Inspectors, Resident Engineer team or Sound Transit personnel.
- E. Establish effective configuration control procedures to ensure all field staff including CQM and QC inspectors have the most current contract documents prior to the Work. Include procedures in Project CQMP.
- F. Control of Special Processes
1. Perform special processes (e.g., welding, brazing and soldering) only with personnel certified in accordance with the requirements of the specific processes. Maintain qualification records of personnel performing special processes in the worksite files, submit to the Resident Engineer for approval and reference in the applicable CWPs. Submit qualifications of new personnel and recertifications to the Resident Engineer on an ongoing basis during the Contract.

3.05 INSPECTION AND TESTING

A. Independent Testing Laboratory

1. Employ the services of a WABO certified Independent Testing Laboratory to perform on-site testing and off-site testing to confirm the acceptable quality of materials, parts and equipment required by the Contract Documents. Independent Testing Laboratory must have special inspection capability and certification. Independent Testing Laboratory shall be in compliance with ASTM E329 and currently certified by a nationally or state-recognized regulatory agency or an industrially sponsored organization. The Contractor cannot self-perform as an Independent Testing Laboratory, even if Contractor staff is WABO certified.
2. Obtain Sound Transit approval to use the Independent Testing Laboratory before commencing Work for which testing is required by Contract Documents. Obtain Sound Transit approval before changing or adding Independent Testing Laboratories.

B. Inspection and Test Plan

1. Develop procedures to be implemented covering performance of inspection activities including:
 - a. Receiving inspection: identification and acceptance of materials as required in Contract requirements.

- b. In-process inspection of items or work process will be performed to verify conformance to CWP and Contract requirements. Hold or witness points shall be identified and work will not proceed beyond those designated points until inspection is completed.
 - c. Final Inspection.
 - 2. Include details of inspection coverage in the Plan demonstrating sufficient inspection efforts including number of Inspectors with respect to Work activities to be inspected, locations, and schedules.
 - 3. Update the Inspection and Test Plan whenever an Independent Testing Laboratory is added, or when an inspection or test is added by Change Order or a Change Notice-Work Directive.
 - 4. Perform all Quality inspections including Quality inspections prior to owner conducted Special Inspections. The CQM is responsible for verifying that quality requirements and standards are maintained and documented throughout the Contract to Acceptance. The CQM shall:
 - a. Prepare a schedule of Special Inspections required.
 - b. Notify Resident Engineer in advance of date of performance of Special Inspections.
 - c. Coordinate Work to ensure the next step in the process does not obscure the ability to inspect until the required inspections have been completed.
 - 5. Adjustments to control procedures and CWPs may be required based upon results of inspections and tests. Document inspection and test results of the in-process inspections in the IDRs.
 - 6. Report inspection and test compliance or noncompliance with the Contract requirements specified or indicated in the Contract Documents.
- C. Inspector's Daily Reports (IDRs)
 - 1. Create and maintain daily inspection reports containing factual records with numerical data of the Work and Quality inspection activities performed for each work day.
 - 2. Document all inspection results including material receiving inspection, in-process inspection, and final inspection, and test results in the IDR. Include whether the inspection or test passed or failed.
 - 3. Provide photos of Work.
- D. Special Inspections and Tests
 - 1. Where required by permits and / or building codes of the Authority Having Jurisdiction (AHJ), Sound Transit will contract with a WABO qualified testing laboratory and / or special inspector to conduct Special Inspections and tests.
 - 2. Special Inspection and Test Coordination: Notify Resident Engineer not less than 7 days in advance of Work requiring Special Inspections and tests within the State of Washington; provide not less than 10 days in advance of Work outside of the State of Washington. Do not proceed with the Work until a hold point has been released by the Resident Engineer. Cooperate fully with these special inspectors and provide all assistance necessary to complete their inspections.

- E. Inspection and testing conducted by agencies other than the Contractor's approved Independent Testing Laboratory does not relieve the Contractor of the responsibility of performing QC Inspection of the Work.
- F. Control and Calibration of Inspection, Testing and Monitoring Equipment
 - 1. Calibrate and certify all testing equipment and monitoring devices in accordance with national standards or manufacturer's recommendations. Document calibration records in the calibration report and make available upon ST request. Calibration and certification requirements include the following and apply to the Contractor and all Subcontractors, Suppliers and Independent Testing Laboratories:
 - a. Be able to trace calibration to known national standards and document in calibration report.
 - b. Calibration Report: list inspection, test and monitoring equipment with the name and serial number, intervals of scheduled recalibration, date of current calibration, due date of next calibration and name of person or laboratory conducting the certification or calibration with a brief description of use. Include calibration data/results, acceptance criteria, and pass or fail disposition.
 - c. Store all testing equipment and monitoring devices in a safe and secure location, maintained throughout the Contract and used only for testing or monitoring Work for which they are designed.
 - d. Re-calibrate, re-test and re-inspect materials, parts and equipment, if the inspection or testing equipment is suspected of being out of calibration, broken, dismantled or damaged. Document in calibration log.
 - e. Make all testing and inspection equipment certified calibration records available and display on the equipment calibration sticker showing the last date of calibration, the due date of the next calibration and the name of the calibration laboratory/company.
 - f. All on-site calibrations are to be witnessed by the Resident Engineer or Resident Engineer staff at the option of the Resident Engineer. Provide notification to the Resident Engineer of scheduled on-site calibrations 7 days prior to the calibration.
- G. Inspection and Test Reporting
 - 1. Inspection and test reports are considered Contract Record documents. Require parties performing testing and inspections to verbally transmit information regarding failed inspections and tests on the same day as discovery to the Contractor. Document failed test results on IDRs. Upon receipt of the failed inspections or test information, notify the Resident Engineer by e-mail within 1 day of the failed inspection or test results.
 - 2. Upon discovery of nonconformance Work the Contractor shall issue a Nonconformance Report (NCR), if the nonconformance Work is not immediately corrected. No action shall be taken to cover or obscure the Work that is the subject of a failed inspection or test until it is corrected and re-inspected or otherwise approved by the Resident Engineer
 - 3. Include the following minimum requirements in Inspection and Test Reports:
 - a. Sound Transit Contract number

- b. Reference to Contract Specification Section requirement or test procedure
 - c. Identification of items tested
 - d. Test equipment calibration status
 - e. Test software used
 - f. Location where sample was taken (i.e., stationing and intersection corner)
 - g. Quantity of items inspected or tested
 - h. Date inspection or test was conducted
 - i. Name of technician
 - j. Acceptance criteria
 - k. Pass or Fail disposition
 - l. Results
 - m. Authorized signature
- H. Contractor-performed and Subcontractor-performed inspections and tests are subject to witnessing, verification and approval, including approval of documentation, by the Resident Engineer.

3.06 NONCONFORMANCE

- A. Notify the Resident Engineer in documented form (e.g., email) of nonconformance items within 1 day of discovery.
- B. Document the nonconformance on Sound Transit NCR Form.
- C. Describe the nonconformance, with date of discovery. Investigate and provide the root cause of the nonconformance; provide and implement Preventive Actions to RE for review and acceptance in advance of same or similar work activities to address the root cause and prevent recurrence.
- D. Propose a disposition and provide remedial Corrective Actions for the nonconformance items(s). Submit NCR to the Residential Engineer within 14 days of discovery of the nonconformance Work. Payment will only be made for Work which is in full compliance with the Contract. Complete all REWORK within 30 days from the date that the nonconformance condition was documented. REPAIR work cannot proceed prior to Sound Transit Quality approval of NCR. Complete REPAIR within 30 days after the Sound Transit Quality has approved the NCR, unless additional time is requested in writing by the Contractor and approved by the Resident Engineer. The applicable dispositions are:
 - 1. USE AS IS: allows the use of an item that does not meet specified Contract requirements without the need for Corrective Action, but may require some compensation to Sound Transit as allowed elsewhere in the Contract Documents.
 - 2. REPAIR: item may be repaired if it cannot be reworked to be brought into full compliance with the Contract requirements, but it can be made acceptable to Sound Transit.
 - 3. REWORK: item may be reworked to bring it into full conformance with the Contract requirements. REWORK only applies to conditions where a discrete item can be completely replaced (e.g., bolt). Any changes which are not replacements in part

or in whole are considered a REPAIR. The Resident Engineer has final authority to determine the category to which Work is assigned in a NCR condition. Contractor is required to provide photo documentation of nonconforming Work to the Resident Engineer.

4. REJECT: item is Defective and considered unsuitable for its intended use, is economically or physically incapable of being reworked or repaired, and must be replaced to bring it into conformance with the Contract requirements. These items may be scrapped or returned to the Supplier. Contractor is required to provide photo documentation of Defective Work to the Resident Engineer.
- E. Compile documentation of the NCR for CQM and Resident Engineer verification of Preventive and Corrective Actions implementation. Include IDRs and photos of the Nonconforming Work prior to, during and after Corrective Action clearly labeled with the date, time and description of activities.
- F. Resident Engineer is responsible for submittal of required documentation to the Sound Transit Quality.
- G. Tag or otherwise identify nonconformance items requiring REWORK, REPAIR or USE AS IS. No follow-on Work that integrates with that item can be performed until REWORK or REPAIR is completed and accepted, or a USE AS IS disposition and the NCR is accepted by ST Quality.
- H. Red-tag and remove or isolate all Defective items, identified as REJECT, from the Site within 72 hours of discovery.
- I. Record all NCRs in a NCR Log available upon Sound Transit request.
- J. Provide to the Resident Engineer documentation of utility strikes involving existing utilities within 1 day of the occurrence and within 24 hours record the strike on a Utility Strike Log. Provide the Utility Strike Log to Sound Transit upon request. NCR is not required for Utility Strike.
 1. The Utility Strike Log shall include the following:
 - a. Location
 - b. Date and time of occurrence
 - c. Survey coordinates and elevation
 - d. Utility Type
 - e. Size of Utility
 - f. Name/Description of Utility
 - g. Circumstances leading to the strike
 - h. Date and time of repair after completion
 - i. Contractor performing repair
 - j. Date of acceptance by the Utility owners
 2. The Resident Engineer in conjunction with the affected utility entity will determine the work required to appropriately repair the utility strike.

3. Record all utility strikes and repairs on the as-built drawings within 3 days after strike, or as otherwise approved by the Resident Engineer.

3.07 QUALITY RECORDS

- A. Quality Records are a subset of the Contract Records and that document or reflect the quality of the Work. Quality Records include, but are not limited to, third party reports, off-site inspection reports, IDRs, test reports, Quality Audit and surveillance reports, mill test reports, certificates of compliance, personnel qualifications and certifications, Nonconformance Reports (NCRs), Corrective Action Requests (CARs), failure analysis reports, instrumentation calibration reports, Punch Lists and photographs, As-Built.

3.08 QUALITY AUDITS

- A. CQM shall schedule, perform, document and submit the results of Quality Audits, Assessments and Surveillances along with the Root Cause Analysis and Corrective Actions in conjunction with the Auditee for the Quality Audit and Surveillance Findings.
- B. Audit each scope element of the Project CQMP listed herein of the Prime Contractor organization:
 1. at least once within 180 days after NTP
 2. at least once every 3 months for the duration of the project after the 180 day period
 3. Perform a Substantial Completion Quality Audit to ensure all requirements are met; schedule such audit a maximum of 60 days before the Substantial Completion date
- C. Audit each scope element listed herein of major Subcontractors, Suppliers and Vendors at least once every 6 months after NTP for the duration of the Contract
- D. Include the following scope elements in the Quality Audit:
 1. Project CQMP implementation
 2. Subcontractor, Subconsultant (if applicable), Supplier and Vendor Control
 3. Process and documentation of Identification, Traceability and Receiving, Handling, Storing and Controlling of Products, Materials and Equipment
 4. Process Control (including CWPs and workmanship)
 5. Inspection and Testing
 6. Nonconformance management including effectiveness of implementation of corrective and preventative actions, and verification
 7. Quality Records
 8. Training
 9. Punch Lists (at Substantial Completion)
 10. As-Built Documentation
 11. Warranties
- E. Quality Audit Report shall include an executive summary, scope, process used to perform the Quality Audit, Observations, all Findings and conclusions.

- F. Quality Audit Logs include records of all Quality Audits and results. Report and record Findings and Observations. Auditee to respond to all Quality Audits and Surveillances. Document the root cause of the nonconformance conditions and provide Corrective and Preventive Actions to the Resident Engineer within 14 days of the issuance date of the Quality Audit or Surveillance Report, unless specified otherwise. Document the dates of implementation of the Corrective and Preventive Actions in the response. Failure to provide this information within 14 days or by the specified due date will result in a reduction of the amount approved for payment for the affected Work on the next payment. Provide copies to Sound Transit of record documents as requested during Quality Audits or surveillances.
- G. Sound Transit Quality may conduct Audits or Surveillances to ensure Contractor's conformance to Contract requirements. Respond to all ST Quality Audits and Surveillances as specified herein.

3.09 QUALITY TRAINING

- A. CQM to provide training on the Project CQMP requirements within 21 days after the approval of Project CQMP to all project personnel, including Project Manager, Superintendents, Field/Project Engineers and Quality Inspectors.
- B. Provide and maintain records of the training including schedule, attendance sign-in records and training materials.

3.10 SOUND TRANSIT FORMS AND TEMPLATES

- A. The following list of Sound Transit Forms and Templates are provided by Sound Transit and are required to be used for the duration of the project. Periodic updates maybe be issued by Sound Transit.
 - 1. Nonconformance Report (NCR)
 - 2. Quality Audit Report including Audit/Surveillance Finding Report (ASFR)
 - 3. Inspector's Daily Report (IDR) Form
 - 4. Sound Tansit Quality Project CQMP Template

END OF SECTION

EXHIBITS

Exhibit A: Inspector's Daily Report (IDR) Form

**SECTION 01 45 00.10 - EXHIBIT A
INSPECTOR'S DAILY REPORT (IDR) FORM (2 PAGES)**

Date:		Inspector Name:			
Project Description:		Project Location:			
Contract Unit #:		WEATHER			
Contractor:		Sunny:	<input type="checkbox"/>	Overcast:	<input type="checkbox"/>
QC Team:		Rain:	<input type="checkbox"/>	Snow:	<input type="checkbox"/>
Shift Hours:		Low Temp:		High Temp:	
Contract Work Performed – include time, activity ID #, scope, material, location, documentation verification (drawing, submittal, RFI, etc.), inspections and/or tests performed (include results), and pictures.					
Materials Used Today (Permanent Only)					
Material Description	Manufacturer	Location	Contractor/Sub	Quantity	
Additional Notes:					
Materials Received – Basis Code for Inspection of Mtrl Acceptance: 1. App'd Mtrl Submittal; 2. Mtrl Cert.; 3. Plant Cert.					
Material Description	Basis Code	Buy America	Quantity	Remarks	
		Yes <input type="checkbox"/>	No <input type="checkbox"/>		
		Yes <input type="checkbox"/>	No <input type="checkbox"/>		
		Yes <input type="checkbox"/>	No <input type="checkbox"/>		
Additional Notes:					

Third Party Work- include time, scope, documentation verification, inspection performed (including results), and pictures.			
Non-Conforming Work Observed			
CQM Notified:	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
Attachments – check as appropriate			
Contractor's Special Inspector Daily Report	<input type="checkbox"/>	Surveyor Daily Report	<input type="checkbox"/>
T & M Sheet	<input type="checkbox"/>	Checklists (Pre-Pour, Waterproofing, etc.)	<input type="checkbox"/>
Photos	<input type="checkbox"/>	Other (Describe in Attachment Notes)	<input checked="" type="checkbox"/>
Attachment Notes			
Signatures			
Inspector Signature	Date	CQM Signature	Date
Inspector Name:		CQM Name:	

END OF EXHIBIT

SECTION 01 45 00.15

**QUALITY MANAGEMENT
DESIGN-BUILD**

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section defines the requirements for the DB Contractor to establish, implement and maintain an effective Quality Program to manage, control, document and assure the Work complies with the requirements specified in the Contract Documents. This Section also defines the requirements for the DB Contractor to prepare, implement and maintain plans, programs, procedures and the organization necessary to assure quality for design process and documents, materials, equipment, execution of work, products, and manufacturing and installation operations covering both on-site and off-site Work by the DB Contractor, including Subcontractors, Subconsultants, Suppliers and Testing Laboratories.

1.02 REFERENCES

- A. This Section incorporates by reference the latest revisions of the following documents. They are part of this Section as specified and modified.
1. Federal Transit Administration (FTA):
FTA Quality Management System Guidelines FTA-PA-27-5194-12.1 (current version)
 2. ST Quality Management System Plan (QMSP)
 3. International Building Code - Structural Tests and Special Inspections (Chapter 17) or Local Authority Having Jurisdiction's (AHJ) Building Code
 4. American Society for Testing and Materials (ASTM) Standards
 5. Washington Association of Building Officials (WABO) Requirements
- B. Definitions:
1. Project Design Quality Management Plan (DQMP): A plan that addresses Agency Quality Management System Plan (QMSP) requirements inclusive of the FTA Quality Management System Guidelines quality elements for design. It provides descriptions of and references to quality procedures and work instructions, including specified requirements unique to this Contract.
 2. Project Construction Quality Management Plan (CQMP): A plan that addresses Agency Quality Management System Plan (QMSP) requirements inclusive of the FTA Quality Management System Guidelines quality elements for construction. It provides descriptions of and references to quality procedures and work instructions, including specified requirements unique to this Contract.
 3. Design Submittal Package (DSP): Coherent and complete subsets of design elements that are submitted as separate design packages for review at levels as defined by the Contract.

4. Construction Work Plan (CWP): Detailed plan for constructing a specific Work activity.
5. Readiness Review Meeting (RRM): A meeting to review and discuss all CWP elements identified below which is conducted by the Resident Engineer with the DB Contractor, Subcontractors and applicable third party representatives who are involved in executing, supervising, inspecting, testing and monitoring the Work activity.
6. Inspector's Daily Report (IDR): A daily report to be completed by all Inspectors identifying work activities observed, recorded and documented.
7. Quality Audit: A documented activity performed by examination and evaluation of objective evidence, that applicable elements being examined have been developed, documented and effectively implemented in conformance with ST QMSP and approved Project Design and Construction Quality Management Plans..
8. Surveillance: Monitoring or observing to verify whether a test, inspection or process activity conforms to specified requirements.

1.03 DB CONTRACTOR QUALITY PERSONNEL REQUIREMENTS

- A. Assign a Design Quality Manager (DQM) and a Construction Quality Manager (CQM) each of whom are dedicated solely to this Contract, are responsible for managing and acting on all quality matters and have the authority to act on all quality matters as a representative of the DB Contractor. Assign a Systems Quality Manager solely dedicated to Systems Work in Design and Construction phases if Systems Work is included in Contract. The DQM and the CQM cannot be subordinate to DB Contractor personnel that directly perform, supervise or progress the Work and cannot be responsible for directly performing, supervising or progressing the Work or have responsibilities for this Contract that conflict or appear to conflict with the primary responsibility for quality matters.
- B. Qualification of DQM: At least 10 years prior experience as a Design Quality Manager, Design Project Manager, Design Manager, Lead Design Engineer, or any combination thereof on a project of comparable size, scope and complexity to this Contract, which includes at least 5 years experience as a Design Project Manager or Design Manager and at least 3 years as a Design Quality Manager. At the sole discretion of Sound Transit, the DB Contractor may be required to replace the DQM. Contract design Work is not permitted to be performed without an approved DQM on site.
- C. Qualification of CQM: At least 10 years prior experience as a CQM, Construction Project Engineer, Construction Field Engineer, or QC Supervisor (or combination thereof) on projects of comparable size, scope and complexity to this Contract, which includes a minimum of 5 years of experience as a CQM on projects of comparable size, scope and complexity to this Contract. At the sole discretion of Sound Transit, the DB Contractor may be required to replace the CQM. Contract construction Work is not permitted to be performed without an approved CQM on site. A designee approved by Sound Transit will be acceptable during night shifts.
- D. DQM and CQM responsibilities include:
 1. Development and implementation of the Project DQMP and Project CQMP respectively including PowerPoint (or approved equal) presentation to ST Quality, ST Design Corridor Manager, ST Construction Manager, ST Executives, Design Build Project Management (DBPM) Resident Engineer, and other Agency or project staff as identified in coordination with ST Quality prior to submittal to ST. A separate presentation for each Project QMP is acceptable provided the Project DQMP is presented before the Project CQMP.

2. Planning and performing Quality Audits of design and construction activities
 3. Coordination between design and construction quality elements
 4. Monitoring documentation of design and construction discipline interfaces
 5. Monitoring documentation of interdisciplinary design interface and resolution process
 6. Monitoring documentation of review comment resolution and closure process
 7. Preventing recurring Quality issues
 8. Attending progress and quality meetings
 9. Approving IDRs
 10. Managing the design Quality Auditors and construction Quality Control (QC) Inspectors as applicable
 11. Coordinating with the Independent Testing Laboratories
 12. Issuing Nonconformance Reports (NCRs)
 13. Performing and coordinating root cause analysis on Audit Findings and nonconformance Work and monitoring implementation and effectiveness of Preventive and Corrective Actions
- E. Employ qualified design Quality Auditors with a background in transit facilities design, rail design, systems design, civil/structural design, and other disciplines as applicable to the discipline they are responsible for auditing and with a minimum of 3 years prior experience in auditing design Submittals. Design discipline-specific Quality Auditors shall have a minimum of 10 years experience in their discipline. At the sole discretion of Sound Transit, the DB Contractor may be required to replace design Quality Auditor(s), and/or require additional subject matter (discipline) expert Quality Auditors be provided at no additional cost to Sound Transit. Quality Auditors cannot be subordinate to DB Contractor personnel that directly perform, supervise, or progress the Work, and cannot be responsible for directly performing, supervising, or progressing the Work or have responsibilities for this Contract that conflict or appear to conflict with the primary responsibility for quality matters.
- F. Employ qualified construction QC Inspectors meeting, at a minimum, the following requirements:
1. QC Inspectors shall have a minimum of 5 years construction QC experience for the Work they are responsible for inspecting or have a minimum of 3 years QC inspection experience plus a minimum 2 years experience in constructing or inspecting the Work they are responsible for inspecting.
 2. QC Inspectors must report directly and only to the CQM and cannot be subordinate to DB Contractor personnel that directly perform, supervise or progress the Work and cannot be responsible for directly performing, supervising or progressing the Work or have responsibilities for this Contract that conflict or appear to conflict with their primary responsibilities for quality matters.
 3. Only designated QC Inspectors may perform quality inspections. Other personnel, such as the DB Contractor Field Engineers or Superintendents, cannot perform as QC Inspectors.
 4. Field QC Inspectors cannot perform testing, unless they are employed by the Independent Test Lab that will perform the tests on the samples taken.

5. QC Inspectors are responsible for monitoring, verifying and documenting in the IDR that the processes and requirements of the approved CWP, drawings, specifications, shop drawings and other applicable Submittals are implemented on each Feature of Work.
6. At the sole discretion of Sound Transit, the DB Contractor may be required to replace QC Inspector(s).
- G. For each shift upon which Contract Work is being executed, have sufficient experienced QC inspectors, who are qualified in the Work being performed. The quantity of QC inspectors and corresponding inspection coverage shall be in accordance with Inspection and Test Plan approved by Sound Transit. At the sole discretion of the Resident Engineer the DB Contractor shall provide additional QC Inspectors at no additional cost to Sound Transit if the Resident Engineer determines that additional QC Inspectors are required.

1.04 PROJECT DQMP AND PROJECT CQMP REQUIREMENTS

- A. Project DQMP Development: In accordance with requirements specified in ST Project DQMP template. A template for the DQMP in MS Word format will be provided by Sound Transit Quality.
- B. Project CQMP Development: The titles of the Part 3 Sections of this specification will be used as the headings for the Project CQMP (e.g., Management Responsibility, Quality Management System, Document Control, etc.). Requirements for the Project CQMP sections are as outlined in the Part 3 Sections. A template for the CQMP in MS Word format will be provided by Sound Transit Quality. The Contractor is required to use this template to develop the CQMP submittal. It is the responsibility of the Contractor to ensure all requirements are addressed even if not specifically identified in the template.
- C. Project DQMP and Project CQMP Updating: Review the CQMP and DQMP every six months at a minimum or on a schedule approved by Sound Transit for the duration of the project; revise and resubmit if any changes are proposed, or if insufficient Quality Process or Procedures are identified during implementation.
- D. Project DQMP and Project CQMP Approval: Submittals must be acceptable to Sound Transit with a No Exceptions Taken (NET) or Exceptions as Noted Resubmission Not Required (EANRNR) disposition, before any design document checking or construction work requiring inspection, respectively, can begin.

1.05 QUALITY MEETINGS

- A. Conduct Design Quality Meetings every 2 weeks with Sound Transit Quality along with additional Sound Transit representative(s) as required, the DB Design Quality Manager (DQM) and the DB Construction Quality Manager (CQM) along with other DB Contractor representative(s) including Design Manager, Discipline Leads, and Third Parties (if required) to discuss quality issues. Items discussed will be documented and tracked by the DB Contractor and shall include due dates of assigned action items. Distribute minutes to all attendees and other interested parties. At a minimum, the Design Quality Meetings shall cover topics of:
 1. Three-week look-ahead schedule update
 2. Design interface status
 3. Design Criteria conformance / Request for Deviation (RFD) status
 4. Milestone DSP Scope conformance / Open design issues and status
 5. Milestone DSP schedule, status, and comment resolution

6. Interdisciplinary review schedule, status, and comment resolution
 7. Constructability review schedule, status, and comment resolution
 8. Operations maintainability review schedule, status, and comment resolution
 9. Systems integration review / Interface Control Document (ICD) schedule, status, and comment resolution
 10. Quality training
 11. Quality records
 12. Quality issues and actions taken to prevent recurrence
- B. Conduct Construction Quality Meetings every 2 weeks with Sound Transit Quality, the DB CQM and/or DQM, other DB Contractor representative(s) as required, QC Inspectors and Third Parties (if required) to discuss Contract quality issues. Items discussed will be documented by the DB Contractor and shall include due dates of assigned action items with agreement from Sound Transit. Distribute minutes to all attendees and other interested parties. At a minimum, the Quality Meetings shall cover topics of:
1. Three-week look-ahead schedule update
 2. CWP status with corresponding work activity and RRM's
 3. RFI status
 4. Submittal approval status of corresponding critical path work activities
 5. Inspection coverage of upcoming work activities
 6. Special Inspections and tests
 7. Test plans, procedures and test results
 8. Quality Audits / Surveillance status
 9. NCRs / implementation of Corrective and Preventive Actions
 10. Materials received and corresponding inspections/documentation
 11. Off-site activities including inspections and testing
 12. Status of as-built Contract documents
 13. Quality training
 14. Documentation and status of quality issues, recurring NCR issues, and preventive actions taken
- 1.06 SUBMITTALS / TRANSMITTALS
- A. Design Quality:
1. Submittals include:
 - a. Name and qualifications of proposed DQM within 30 days after the effective date of the Notice to Proceed (NTP). Interview with Sound Transit required prior to appointment of position.

- b. Project DQMP including all forms/exhibits (reports, logs, etc.) within 45 days after the effective date of the Notice to Proceed (NTP). DB Contractor DQM to perform Project DQMP presentation (PowerPoint or approved equal) to ST Quality, Agency and Project staff, and DBPM staff prior to Project DQMP submittal. If Project DQMP presentation does not demonstrate conformance to ST QMSP requirements, additional presentations may be required at the request of ST Quality.
- c. Milestone DSP Scope Deliverable matrix.
- d. Names and qualifications of design Quality Auditors, including technical design discipline-specific Quality Auditors.
- e. Design Quality Training Program including a syllabus, PowerPoint (or approved equal) presentation and schedule for classroom training sessions.

2. Transmittals include:

- a. DSP list with detailed description of deliverables including design subject focus/content and sequence to be submitted within 45 days after the effective date of NTP. Update the DSP list if new DSPs are added, deleted or modified and retransmit within 7 days.
- b. Design Subconsultant List within 45 days after effective date of NTP. Provide updates at least 10 days prior to each new Subcontractor or Subconsultant beginning Work on the Contract.
- c. Design Quality Audit Schedule within 60 days after the effective date of NTP, including Subconsultants and Subcontractors.
- d. DB Contractor Design Quality Audit Report within 15 days after the completion of each Design Quality Audit. Include Observations and Finding(s), if any, from previous design audits and implementation of process improvement for future design Submittals. Include root cause analysis and Corrective and Preventive Actions to Quality Audit Finding(s).
- e. Provide monthly Design Quality status update within 7 days after end of each month. Include the following:
 - 1) Design Quality Audits planned
 - 2) Design Quality Audits completed along with Quality Audit reports
 - 3) Design Quality Audit Finding(s) if any and implementation of associated Preventive and Corrective Actions
 - 4) Design quality-related Submittals submitted to (received by) Resident Engineer
 - 5) Design interface coordinations and issues
 - 6) Other design quality issues

B. Construction Quality:

1. Submittals include:

- a. Name and qualifications of CQM, within 30 days after the effective date of the Notice to Proceed (NTP).
- b. Project CQMP within 90 days after the effective date of the NTP.

- c. IDR form, including content and items as identified in Exhibit A. The DB Contractor may use IDR form provided herein.
- d. Name and qualifications of the DB Contractor's Independent Testing Laboratory and all subcontracted Testing Laboratories at least 90 days prior to the beginning of the Construction Work.
- e. Inspection and Test Plan, at least 90 days prior to the beginning of the Construction Work.
- f. Inspection and Test Matrix, at least 90 days prior to the beginning of the Construction Work. Update the Matrix list if new testing/inspections are added, deleted, or modified and resubmit within 7 days.

Inspection and Test Matrix includes the following:

- 1) Specification Section number
- 2) Specification Section title
- 3) Section Article
- 4) Test/Inspection Description
- 5) Identify on-site/off-site testing
- 6) Minimum frequency or instance for tests and inspections
- 7) Entity responsible for performing tests and inspections (e.g., Laboratory, DB Contractor, Subcontractor or Third Party)
- g. Quality Control (QC) Inspectors at least 30 days prior to the beginning of the Construction Work. Include:
 - 1) Name and qualifications
 - 2) Discipline of Work to which they will be assigned
- h. Name and qualifications of personnel employed to perform special processes. Submit requalifications when appropriate.
- i. List of CWPs, 60 days prior to commencement of Construction Work. Update the CWP list when new CWPs are added and resubmit within 7 days.
- j. CWPs.
- k. DB Contractor Nonconformance Reports (NCRs).
- l. DB Contractor IDRs, within 7 days of inspection for the first 4 weeks subsequent to the start of inspection or as otherwise directed by the Resident Engineer.

2. Transmittals include:

- a. List of Subcontractors and Subconsultants at least 60 days prior to the beginning of the Construction Work. Provide updates at least 10 days prior to each new Subcontractor or Subconsultant beginning Work on Contract.

- b. Quality Audit Schedule at least 60 days prior to the beginning of the Construction Work.
- c. DB Contractor IDRs, subsequent to the first 4 weeks of inspections, transmit within 7 days of inspection.
- d. Weekly transmittal of materials received and corresponding inspection documentation
- e. Independent Testing Laboratory Inspection and Test Reports, unless specified as submittals, within 7 days after completion of the inspection or test.
- f. Completed Utility Strike Log, prior to Substantial Completion. Provide copy of interim Utility Strike Log when requested by Sound Transit.
- g. Completed Nonconformance Log, prior to Substantial Completion. Provide copy of interim NCR Log when requested by Sound Transit.
- h. DB Contractor Quality Audit Reports within 15 days after the completion of each Quality Audit.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 MANAGEMENT RESPONSIBILITY

- A. As part of the Project DQMP and Project CQMP submittals the DB Contractor is required to provide a management statement, in accordance with FTA Quality Management System Guidelines and Agency QMSP requirements, specifically committing to its compliance with the requirements of the Sound Transit Quality Management System Plan (QMSP) as part of their Quality Management Program. The management statement must also include the DB Contractor's commitment that the CQM and DQM have the authority to act independent of the DB Contractor's Project Manager on quality related issues and that the CQM and DQM shall be dedicated solely to this Contract with the direction that the CQM and DQM cannot have responsibilities that conflict or appear to conflict with their primary responsibility for quality matters.
- B. As part of the Project DQMP and Project CQMP submittal, include an organization chart to demonstrate the level of authority and independence of the DQM and CQM and the Quality Management staff. The DQM and CQM shall report to a corporate level executive above the level of the Project Manager. The corporate level executive cannot be involved in administration or implementation of the project contract.
- C. Identify Design Subconsultants and Construction Subcontractors and their respective discipline(s) / areas of responsibility. Include the reporting relationship in the Project Organization Chart.

3.02 DESIGN CONTROL

- A. Design Control processes shall be described and defined in the Project DQMP in conformance with the Agency QMSP. Design Processes to be monitored and documented includes, but not limited to:

1. Integration of Design Quality Work activities and associated schedule requirements into the Master Project Schedule. Include coordination activities with Subconsultants.
2. Design Criteria Conformance.
3. Milestone DSP Scope deliverable conformance.
4. Implementation of Design Quality Checking Procedure for each DSP at every Milestone.
5. Design Process Reviews including Interdisciplinary Review, Systems Integration Review, Constructability Review, Maintainability-Reliability Review, Systems Integration Review, Milestone Design Submittal Agency Review, and corresponding traceability, resolution, and closure of review comments.

3.03 SUBCONTRACTOR, SUBCONSULTANT, AND SUPPLIER CONTROL

- A. Include in the documents provided to Subcontractors the Project CQMP requirements and quality requirements defined herein applicable to the Work they perform.
- B. Assure all products and services procured from Subcontractors, Subconsultants and Suppliers meet Contract requirements and comply with Project CQMP or have their Quality Plan approved by the CQM.
- C. Develop and maintain procurement procedures to select and control Suppliers and Subcontractors including:
 1. Evaluation and assessment of Suppliers' and Subcontractors' quality systems.
 2. Methods utilized to monitor quality performance of Suppliers and Subcontractors.
 3. Flowdown of design, reliability and quality requirements to Suppliers and Subcontractors.
 4. Determination of criteria for performing source inspections.

3.04 IDENTIFICATION, TRACEABILITY AND RECEIVING, HANDLING, STORING AND CONTROLLING OF PRODUCTS, MATERIALS AND EQUIPMENT

- A. Establish and maintain procedures and documentation for receiving, handling, storing, identifying and controlling items of production (batch materials, parts, components and subassemblies) to prevent use of incorrect or defective items and to ensure only correct and acceptable items are used or installed.
 1. Develop procedures to provide identification, traceability, and documentation during all phases of production from receipt of raw materials, components and subassemblies through the manufacturing process to the delivery of final products and systems on site.
 2. Utilize batch number, shipment number, packing slips or invoices along with test data sheets and material certifications for determining traceability of raw materials.
 1. Develop procedures and documentation for identification and acceptance of materials delivered on site comply with Contract requirements.
 3. Provide physical separation, procedural control or other appropriate means where physical separation is impractical or where record traceability is lost.

4. Employ storeroom or inventory tracking procedures for traceability of items back to a particular order number, batch number, date received, test lot or other pertinent source.
 5. Employ routing documentation for traceability of assemblies in production.
 6. Mark final assemblies with Contract number, model number, serial number and bar codes.
- B. Inspect and record on the IDR identification, damage and quantity of all products, materials and equipment received. Large lots may be inspected by an industry approved standard sampling method.
- C. Record on the IDR on-site equipment calibration occurrences including the piece of equipment, equipment identification number/label, name(s) and company of personnel performing the calibration, qualifications (if applicable), brief outline (or document reference) of the procedure including equipment used to perform the calibration and the approximate date of the next scheduled calibration.

3.05 PROCESS CONTROL

- A. Control on-site and off-site construction through the development of DB Contractor CWP's, execution of the Work in accordance with CWP's and Contract requirements, and timely reporting of the results of the inspections on the IDR and lab test reports of required inspections and tests.
- B. Determine, in consultation with the Resident Engineer, which Work activities require submission of a CWP. The Resident Engineer and the DB Contractor may add CWP's to the list. Resubmit the updated CWP list when CWP's are added, deleted or modified.
- C. Prepare and submit a CWP for each of the Work activities identified on the CWP list. No partial approval of a CWP will be permitted. Changes and revisions to the Work activity that require a revised CWP to be submitted and a new RRM to be held prior to resuming Work. As a minimum include, in the order listed, the following in each CWP:
1. Scope of Work
 2. List of persons responsible for supervision of the Work
 3. List of applicable required submittal status, RFIs, Change Orders, and drawings (with latest revisions)
 4. Planned start-work and completion dates, progress rate expected and Work hours
 5. Sequence of events and construction methods for performing the Work: Include hold points, inspections and tests
 6. Handling and storage of materials and equipment
 7. Inspections and tests required by DB Contractor, Third Parties, and Sound Transit
 8. Coverage of inspections: List individuals responsible for performing inspections and discipline of Work to which they are assigned
 9. Prerequisite activities and related construction safety issues
 10. Off-site inspection and test activities and the locations
 11. Procedures for controlling hazardous materials, as applicable

12. Erosion and Sediment Control (ESC) Best Management Practices (BMP)
13. Actions defined as “Special Events”, which may expose the public to danger or inconvenience, and which may require a third party to be notified
14. Safety-critical installations, inspections and tests
15. Specific Job Hazard Analysis (JHA) for each CWP

D. CWP and RRM

1. After the CWP has been returned by the Resident Engineer dispositioned as NET or EANRNR and a minimum of 7 and a maximum of 14 days before beginning associated Work activities, attend the RRM conducted by the Resident Engineer. The Resident Engineer documents the meeting with an agenda and minutes of the meeting including an attendance record. Include an activity for each RRM on the Project Schedule.
2. All Submittals associated with the CWP must be listed in the CWP Submittal.
3. After the RRM has been held and updates (if any) have been incorporated into the CWP, the DB Contractor shall distribute the revised CWP and approved associated Submittals to the personnel performing the Work and to the DB Contractor QC Inspectors. The DB Contractor and/or its Subcontractor personnel shall keep a copy of the approved CWP and approved associated Submittals within proximity of the Work being done and shall adhere to the approved processes and procedures contained therein. The DB Contractor or Subcontractor personnel performing the Work shall produce a copy of the approved CWP and approved associated Submittals upon request by QC Inspectors, Resident Engineer team or Sound Transit personnel.

- E. Establish effective configuration control procedures to ensure all field staff including CQM and QC inspectors have the most current contract documents prior to the Work. Include procedures in Project CQMP.

F. Control of Special Processes

1. Perform special processes (e.g., welding, brazing and soldering) only with personnel certified in accordance with the requirements of the specific processes. Maintain qualification records of personnel performing special processes in the worksite files and reference in the applicable CWPs.

3.06 INSPECTION AND TESTING

A. Independent Testing Laboratory

1. Employ the services of a WABO certified Independent Testing Laboratory to perform on-site testing and off-site testing to confirm the acceptable quality of materials, parts and equipment required by the Contract Documents. Independent Testing Laboratory must have special inspection capability and certification. Independent Testing Laboratory shall be in compliance with ASTM E329 and currently certified by a nationally or state-recognized regulatory agency or an industrially sponsored organization. The DB Contractor cannot self-perform as an Independent Testing Laboratory, even if the DB Contractor is WABO certified.
2. Obtain Sound Transit approval to use the Independent Testing Laboratory before commencing Work for which testing is required by Contract Documents. Obtain Sound Transit approval before changing or adding Independent Testing Laboratories.

B. Inspection and Test Plan

1. Develop procedures to be implemented covering performance of inspection activities including:
 - a. Receiving inspection: identification and acceptance of materials as required in Contract requirements.
 - b. In-process inspection of items or work process will be performed to verify conformance to CWP and Contract requirements. Hold or witness points shall be identified and work will not proceed beyond those designated points until inspection is completed.
 - c. Final Inspection.
2. Include details of inspection coverage in the Plan demonstrating sufficient inspection efforts including number of Inspectors with respect to Work activities to be inspected, locations, and schedules.
3. No construction or fabrication Work may be performed without an approved Inspection and Test Plan.
4. Update and resubmit the Inspection and Test Plan whenever an Independent Testing Laboratory is added or when an inspection or test is added by Change Order or a Change Notice-Work Directive.
5. Perform all QC inspections prior to required Special Inspections. The CQM is responsible for verifying that quality standards are maintained throughout the Contract to Acceptance. The CQM shall:
 - a. Prepare a schedule of Special Inspections required.
 - b. Notify Resident Engineer in advance of date of performance of Special Inspections.
 - c. Coordinate Work to ensure the next step in the process does not obscure the ability to inspect until the required inspections have been completed.
6. Adjustments to control procedures and CWPs may be required based upon results of inspections and tests. Document inspection and test results of the in-process inspections in the IDRs.
7. Report inspection and test compliance or noncompliance with the Contract requirements specified or indicated in the Contract Documents.

C. Inspector's Daily Reports (IDRs)

1. Create and maintain daily quality control reports containing factual records with numerical data of the Work and quality control activities for each work day.
2. Document all inspection results including material receiving inspection, in-process inspection, and final inspection, and test results in the IDR. Include whether the inspection or test passed or failed.
3. Provide photos of Work.
4. Obtain the verification and signature of the CQM on all IDRs.

D. Special Inspections and Tests

1. Where required by permits and / or building codes of the Authority Having Jurisdiction (AHJ), Sound Transit will contract with a WABO qualified testing laboratory and / or special inspector to conduct Special Inspections and tests.
2. Special Inspection and Test Coordination: Notify Resident Engineer not less than 7 days in advance of Work requiring Special Inspections and tests within the State of Washington; provide not less than 10 days in advance of Work outside of the State of Washington. Do not proceed with the Work until a hold point has been released by the Resident Engineer. Cooperate fully with these special inspectors and provide all assistance necessary to complete their inspections.

E. Inspection and testing conducted by agencies other than the DB Contractor's approved Independent Testing Laboratory does not relieve the DB Contractor of the responsibility of performing QC Inspection of the Work.

F. Control and Calibration of Inspection, Testing and Monitoring Equipment

1. Calibrate and certify all testing equipment and monitoring devices in accordance with national standards or manufacturer's recommendations. Document calibration records in calibration report and make available upon ST request. Calibration and certification requirements include the following and apply to the DB Contractor and all Subcontractors, Suppliers and Independent Testing Laboratories:
 - a. Be able to trace calibration to known national standards and document in calibration report.
 - b. Calibration Report: list inspection, test and monitoring equipment with the name and serial number, intervals of scheduled recalibration, date of current calibration, due date of next calibration and name and signature of person or laboratory conducting the certification or calibration with a brief description of use. Include calibration data/results, acceptance criteria, and pass or fail disposition.
 - c. Store all testing equipment and monitoring devices in a safe and secure location, maintained throughout the Contract and used only for testing or monitoring Work for which they are designed.
 - d. Re-calibrate, re-test and re-inspect materials, parts and equipment, if the inspection or testing equipment is suspected of being out of calibration, broken, dismantled or damaged. Document in calibration log.
 - e. Make all testing and inspection equipment certified calibration records available and display on the equipment calibration sticker showing the last date of calibration, the due date of the next calibration and the name of the calibration laboratory/company.
 - f. All on-site calibrations are to be witnessed by the Resident Engineer or Resident Engineer staff at the option of the Resident Engineer. Provide notification to the Resident Engineer of scheduled on-site calibrations 7 days prior to the calibration.

G. Inspection and Test Reporting

1. Inspection and test reports are considered Contract Record documents. Require parties performing testing and inspections to transmit information regarding failed inspections and tests on the same day as discovery to the DB Contractor. Document failed test results on IDRs. Upon receipt of the failed inspections or test

information, notify the Resident Engineer by e-mail within 1 day of the failed inspection or test results.

2. Upon discovery of nonconformance Work the DB Contractor shall issue a Nonconformance Report (NCR), if the nonconformance Work is not immediately corrected. No action shall be taken to cover or obscure the Work that is the subject of a failed inspection or test until it is corrected and re-inspected or otherwise approved by the Resident Engineer
3. Include the following minimum requirements in Inspection and Test Reports:
 - a. Sound Transit Contract number
 - b. Reference to Contract Specification Section requirement or test procedure
 - c. Identification of items tested
 - d. Test equipment calibration status
 - e. Test software used
 - f. Location where sample was taken (i.e., stationing and intersection corner)
 - g. Quantity of items inspected or tested
 - h. Date inspection or test was conducted
 - i. Name of technician
 - j. Acceptance criteria
 - k. Pass or Fail disposition
 - l. Results
 - m. Authorized signature

- H. DB Contractor-performed and Subcontractor-performed inspections and tests are subject to witnessing, verification and approval, including approval of documentation, by the Resident Engineer.

3.07 NONCONFORMANCE

- A. Notify the Resident Engineer in documented form (e.g., email) of nonconformance items within 1 day of discovery.
- B. Document the nonconformance on Sound Transit NCR Form.
- C. Describe the nonconformance with date of discovery. Investigate and provide the root cause of the nonconformance; provide and implement Preventive Actions to RE for review and acceptance in advance of same or similar work activities to address the root cause and prevent recurrence.

Propose a disposition and provide remedial Corrective Actions for the nonconformance item(s). Submit NCR including associated documentation and photos, and Engineer of Record's concurrence memo to the Resident Engineer within 14 days of discovery of the nonconformance Work. Payment will only be made for Work which is in full compliance with the Contract. Complete all REWORK within 30 days from the date that the nonconformance condition was documented. REPAIR work cannot proceed prior to Sound Transit Quality approval of NCR. Complete REPAIR within 30 days after the Sound Transit

Quality has approved the NCR, unless additional time is requested in writing by the DB Contractor and approved by the Resident Engineer. The applicable dispositions for NCRs are:

1. USE AS IS: allows the use of an item that does not meet specified Contract requirements without the need for Corrective Action, but may require compensation to Sound Transit as allowed elsewhere in the Contract Documents.
 2. REPAIR: item may be repaired if it cannot be reworked to be brought into full compliance with the Contract requirements, but it can be made suitable for use.
 3. REWORK: item may be reworked to bring it into full conformance with the Contract requirements. REWORK only applies to conditions where a discrete item can be completely replaced (e.g., bolt). Any changes which are not replacements in part or in whole are considered a REPAIR. The Resident Engineer has final authority to determine the disposition to which Work is assigned in a NCR condition. DB Contractor is required to provide photo documentation of nonconforming Work to the Resident Engineer.
 4. REJECT: item is Defective and considered unsuitable for its intended use, is economically or physically incapable of being reworked or repaired and must be replaced to bring it into conformance with the Contract requirements. These items may be scrapped or returned to the Supplier. DB Contractor is required to provide photo documentation of Defective Work to the Resident Engineer.
- D. Compile documentation of the NCR for CQM and Resident Engineer verification of Preventive and Corrective Actions implementation. Include IDRs and photos of the Nonconforming Work prior to, during and after Corrective Action clearly labeled with the date, time and description of activities.
 - E. Resident Engineer is responsible for submittal of required documentation to the Sound Transit Quality.
 - F. Tag or otherwise identify nonconformance items requiring REWORK, REPAIR or USE AS IS. No follow-on Work that integrates with that item can be performed until REWORK or REPAIR is completed and accepted or a USE AS IS disposition and the NCR is accepted by ST Quality.
 - G. Red-tag and remove or isolate all Defective items, identified as REJECT, from the Site within 72 hours of discovery.
 - H. Record all NCRs in a NCR Log available upon Sound Transit request.
 - I. Provide to the Resident Engineer documentation of utility strikes involving existing utilities within 1 day of the occurrence and within 24 hours record the strike on a Utility Strike Log. Provide the Utility Strike Log to Sound Transit upon request. NCR is not required for Utility Strike.
 1. The Utility Strike Log shall include the following:
 - a. Location
 - b. Date and time of occurrence
 - c. Survey coordinates and elevation
 - d. Utility Type
 - e. Size of Utility

- f. Name/Description of Utility
 - g. Circumstances leading to the strike
 - h. Date and time of repair after completion
 - i. DB Contractor performing repair
 - j. Date of acceptance by the Utility owners
- 2. The Resident Engineer in conjunction with the affected utility entity will determine the work required to appropriately repair the utility strike.
 - 3. Record all utility strikes and repairs on the as-built drawings within 3 days after strike or as otherwise approved by the Resident Engineer.

3.08 QUALITY RECORDS

- A. Quality Records are a subset of the Contract Records and that document or reflect the quality of the Work. Quality Records include, but are not limited to, third party reports, off-site inspection reports, IDRs, test reports, Quality Audit and surveillance reports, mill test reports, certificates of compliance, personnel qualifications and certifications, Nonconformance Reports (NCRs), Corrective Action Requests (CARs), failure analysis reports, instrumentation calibration reports, Punch Lists and photographs, As-builts.

3.09 QUALITY AUDITS

- A. Design Quality Audit: DQM shall schedule, perform, document and submit the results of Quality Audits along with the Root Cause Analysis, Preventive Actions, and Corrective Actions in conjunction with the Auditee for the Quality Audit Findings. Include the following scope elements in the Design Quality Audits:
 - 1. DSP name/number
 - 2. Perform Quality Audits on each DSP at each Milestone. Documentation produced as a result of this process to be submitted for each DSP at every Milestone.
 - 3. Project Quality Management Specification 01 45 00.15 and DQMP Conformance
 - 4. Subconsultant Management
 - 5. Implementation of Design Control Processes (including DSPs)
 - 6. Effectiveness of implementation of corrective and preventive actions and verification
 - 7. Quality Records
 - 8. Quality Training
- B. Construction Quality Audit: CQM shall schedule, perform, document and submit the results of Quality Audits and Surveillances along with the Root Cause Analysis and Corrective Actions in conjunction with the Auditee for the Quality Audit and Surveillance Findings.
 - 1. Audit each scope element of the Project CQMP listed herein of the Prime Contractor organization:
 - a. At least once within 180 days after NTP

- b. At least once every 3 months for the duration of the project after the 180 day period
 - c. Perform a Substantial Completion Quality Audit to ensure all requirements are met; schedule such audit a maximum of 60 days before the Substantial Completion date
 - 2. Audit each scope element listed herein of major Subcontractors and Suppliers at least once every 6 months after NTP for the duration of the Contract
 - 3. Include the following scope elements in the Construction Quality Audit:
 - a. Project CQMP implementation
 - b. Subcontractor, Subconsultant (if applicable) and Supplier Control
 - c. Process and documentation of Identification, Traceability, Receiving, Handling, Storing and Controlling of Products, Materials and Equipment
 - d. Process Control (including CWP's and workmanship)
 - e. Inspection and Testing
 - f. Nonconformance management including effectiveness of implementation of corrective and preventive actions and verification
 - g. Quality Records
 - h. Training
 - i. Punch Lists (at Substantial Completion)
 - j. As-Built Documentation
 - k. Warranties
- C. Quality Audit shall include an executive summary, scope, process used to perform the Quality Audit, Observations, Findings and conclusions.
- D. Quality Audit Logs include records of all Quality Audits and results, including Findings and Observations. Auditee to respond to all Quality Audits and Surveillances. Document the root cause of the nonconformance conditions and provide Corrective and Preventive Actions to the Resident Engineer within 14 days of the issuance date of the Quality Audit or Surveillance Report, unless specified otherwise. Document the dates of implementation of the Corrective and Preventive Actions in the response. Failure to provide this information within 14 days or by the specified due date will result in a reduction of the amount approved for payment for the affected Work on the next payment. Provide copies to Sound Transit of record documents as requested during Quality Audits or surveillances.
- E. Sound Transit Quality may conduct Audits or Surveillances to ensure DB Contractor's conformance to Contract requirements. Respond to all ST Quality Audits and Surveillances as specified herein. Preventive and Corrective Actions for Design Quality Audit Findings shall be accepted by ST Quality and implemented prior to the subsequent DSP Milestone Submittal.

3.10 QUALITY TRAINING

- A. DQM and CQM are to provide training on Project DQMP and Project CQMP requirements within 21 days after the approval of Project DQMP and Project CQMP to the following project personnel: Project Manager, Design Manager, Lead, Design Engineer, CAD

Operator(s), Superintendents, Field Engineers, Project Engineer(s) and QC Inspectors. For the project personnel, who are assigned to the project after the initial training has occurred, the DQM and or the CQM will provide the required training within 14 days of an individual's arrival on site.

- B. Provide and maintain records of the training including schedule, attendance sign-in records and training materials.

3.11 SOUND TRANSIT FORMS AND TEMPLATES

- A. The following list of Sound Transit Forms and Templates are provided by Sound Transit and are required to be used for the duration of the project. Periodic updates may be issued by Sound Transit.
 - 1. Design Request for Deviation (DRFD) Form
 - 2. Nonconformance Report (NCR)
 - 3. Quality Audit Report including Audit/Surveillance Finding Report (ASFR)
 - 4. Inspector's Daily Report (IDR) Form
 - 5. Sound Transit Quality Project DQMP and CQMP Templates

END OF SECTION

EXHIBITS

Exhibit A: Inspector's Daily Report (IDR) Form

**SECTION 01 45 00.15 - EXHIBIT A
INSPECTOR'S DAILY REPORT (IDR) FORM (2 PAGES)**

Date:		Inspector Name:			
Project Description:		Project Location:			
Contract Unit #:		WEATHER			
Contractor:		Sunny:	<input type="checkbox"/>	Overcast:	<input type="checkbox"/>
QC Team:		Rain:	<input type="checkbox"/>	Snow:	<input type="checkbox"/>
Shift Hours:		Low Temp:		High Temp:	
Contract Work Performed – include time, activity ID #, scope, material, location, documentation verification (drawing, submittal, RFI, etc.), inspections and/or tests performed (include results), and pictures.					
Materials Used Today (Permanent Only)					
Material Description	Manufacturer	Location	Contractor/Sub	Quantity	
Additional Notes:					
Materials Received – Basis Code for Inspection of Mtrl Acceptance: 1. App'd Mtrl Submittal; 2. Mtrl Cert.; 3. Plant Cert.					
Material Description	Basis Code	Buy America	Quantity	Remarks	
		Yes <input type="checkbox"/>	No <input type="checkbox"/>		
		Yes <input type="checkbox"/>	No <input type="checkbox"/>		
		Yes <input type="checkbox"/>	No <input type="checkbox"/>		
Additional Notes:					
Third Party Work- include time, scope, documentation verification, inspection performed (including results), and pictures.					

Non-Conforming Work Observed			
CQM Notified:	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
Attachments – check as appropriate			
Contractor's Special Inspector Daily Report	<input type="checkbox"/>	Surveyor Daily Report	<input type="checkbox"/>
T & M Sheet	<input type="checkbox"/>	Checklists (Pre-Pour, Waterproofing, etc.)	<input type="checkbox"/>
Photos	<input type="checkbox"/>	Other (Describe in Attachment Notes)	<input checked="" type="checkbox"/>
Attachment Notes			
Signatures			
Inspector Signature	Date	CQM Signature	Date
Inspector Name:		CQM Name:	

END OF EXHIBIT

SECTION 01 45 00.20
QUALITY MANAGEMENT
DESIGN-BID-BUILD & GC/CM

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section defines the requirements for the Contractor to establish, implement, and maintain an effective Quality Program to manage, control, document, and assure the Work complies with the requirements specified in the Contract Documents. This Section also defines the requirements for the Contractor to prepare, implement, and maintain plans, programs, procedures, and the organization necessary to assure quality for materials, equipment, workmanship, manufacturing, installation operations covering both on-site and off-site Work by the Contractor, including Subcontractors, Subconsultants, Suppliers, and Testing Laboratories.

1.02 REFERENCES

- A. This Section incorporates by reference the latest revisions of the following documents. They are part of this Section as specified and modified.
 - 1. Federal Transit Administration (FTA):
FTA Quality Management System Guidelines December 2012
FTA-PA-27-5194-12.1
 - 2. International Building Code - Structural Tests and Special Inspections (Chapter 17) or Local Authority Having Jurisdiction's (AHJ) Building Code
 - 3. American Society for Testing and Materials (ASTM) Standards
 - 4. Washington Association of Building Officials (WABO) Requirements
- B. Definitions:
 - 1. Construction Quality Management Plan (CQMP): A plan that addresses the fifteen quality elements identified in the FTA Quality Management System Guidelines December 2012 (FTA-PA-27-5194-12.1) for construction. Provides descriptions of, and references to, Quality procedures and Work instructions, including specified requirements unique to this Contract, which relate to the quality system elements.
 - 2. Design Quality Program Plan (DQPP): A plan that addresses the fifteen quality elements identified in the FTA Quality Management System Guidelines December 2012 (FTA-PA-27-5194-12.1) for design. Provides descriptions of and references to Quality procedures and Work instructions, including specified requirements unique to this Contract, which relate to the quality system elements.
 - 3. Design Submittal Package (DSP): Contract is divided into coherent subsets of design elements that are submitted as separate design Submittal packages for review at levels as defined by the Contract.
 - 4. Construction Work Plan (CWP): Detailed plan for constructing a specific Work activity.

5. Readiness Review Meeting (RRM): A meeting to review and discuss all CWP elements identified below which is conducted by the Resident Engineer with the Contractor, Subcontractors and applicable third party representatives who are involved in executing, supervising, inspecting, testing and monitoring the Work activity.
6. Inspector's Daily Report (IDR): A daily report to be completed by all Inspectors identifying work activities observed, recorded and documented.
7. Quality Audit: A documented activity performed in accordance with written procedures or checklist to verify, by examination and evaluation of objective evidence, that applicable elements being examined have been developed, documented, and effectively implemented in accordance with specified requirements.
8. Surveillance: Monitoring or observing to verify whether a test, inspection or process activity conforms to specified requirements.

1.03 CONTRACTOR QUALITY PERSONNEL REQUIREMENTS

- A. Assign a Construction Quality Manager (CQM) to this Contract responsible for managing and acting on all quality matters and have the authority to act on all quality matters as a representative of the Contractor. The CQM cannot be subordinate to Contractor's personnel that directly perform, supervise or progress the Work and cannot be responsible for directly performing, supervising or progressing the Work or have responsibilities for this Contract that conflict or appear to conflict with the primary responsibility for quality matters.
- B. Qualification of CQM: At least 7 years prior experience as a Construction Quality Manager, Construction Project Engineer, Construction Field Engineer or QC Supervisor (or combination thereof) on projects of comparable size, scope and complexity to this Contract, which includes a minimum of 2 years of experience as a CQM on projects of comparable size, scope and complexity to this Contract. At the sole discretion of Sound Transit, the Contractor may be required to replace the CQM. Contract Work is not permitted to be performed without an approved CQM on site. Designee approved by Sound Transit and in coordination with the RE will be acceptable during night shifts.
- C. CQM responsibilities include:
 1. Development and implementation of the CQMP
 2. Planning and performing Quality Audits of design milestone Submittals
 3. Conducting quality meetings
 4. Attending progress meetings
 5. Approving IDRs
 6. Issuing Nonconformance Reports (NCRs)
 7. Managing construction Quality Control (QC) Inspectors
 8. Coordinating with the Independent Testing Laboratories
 9. Performing and coordinating root cause analysis on nonconformance Work and monitoring the subsequent Corrective and Preventive Actions
- D. Employ qualified QC Inspectors meeting, at a minimum, the following requirements:

1. QC Inspectors shall have a minimum of 5 years construction QC experience for the Work they are responsible for inspecting or with a minimum of 3 years QC inspection experience plus a minimum 2 years construction experience in engineering or inspecting within the disciplines for the Work they are responsible for inspecting.
 2. QC Inspectors must report directly and only to the CQM and cannot be subordinate to Contractor personnel that directly perform, supervise or progress the Work, and cannot be responsible for directly performing, supervising or progressing the Work or have responsibilities for this Contract that conflict or appear to conflict with their primary responsibilities for quality matters.
 3. Only designated QC Inspectors may perform quality inspections. Other personnel, such as the Contractor Field Engineers or Superintendents, cannot perform as QC Inspectors.
 4. Field QC Inspectors cannot perform testing, unless they are employed by the Independent Test Lab that will perform the tests on the samples taken.
 5. QC Inspectors are responsible for reviewing, understanding, verifying and documenting in the IDR that the requirements of the approved CWP, drawings, specifications, shop drawings and other applicable Submittals are implemented on each Feature of Work by observing the construction Site Work activities, inspecting the Work activities and documenting the results of the inspections in the IDRs.
 6. At the sole discretion of Sound Transit, the Contractor may be required to replace QC Inspector(s).
- E. Mobilize the number of experienced QC Inspectors, qualified to the type of Work being performed for each Feature of Work that is necessary to perform the QC inspections with at least 1 QC Inspector for each discipline of Work being performed per worksite per shift. The number of QC Inspectors shall be coordinated with the Resident Engineer. At the sole discretion of the Resident Engineer, the Contractor shall provide additional QC Inspectors, if the Resident Engineer determines that additional QC Inspectors are required.

1.04 CQMP REQUIREMENTS

- A. CQMP Development: Part 3 Sections of this specification are intended for use as headings for the CQMP (e.g., Management Responsibility, Quality Management System, Document Control, etc.). Requirements for the CQMP sections are as outlined in the specification sections.
- B. A template for the CQMP in MS Word format will be provided by Sound Transit Quality. The Contractor is required to use this template to develop the CQMP submittal. It is the responsibility of the Contractor to ensure all requirements are addressed even if not specifically identified in the template.
- C. CQMP Updating: Review CQMP every six months at a minimum or on a schedule approved by Sound Transit for the duration of the project; resubmittal required for Sound Transit approval if any changes are proposed, or if insufficient Quality Process or Procedures are identified during implementation.
- D. Approval: CQMP submittals must be acceptable to Sound Transit with a No Exceptions Taken (NET) or Exceptions as Noted Resubmission Not Required (EANRNR) disposition, before any design document checking or construction Work requiring inspection can begin.

1.05 QUALITY MEETINGS

- A. Conduct Construction Quality Meetings biweekly with Sound Transit Quality Assurance along with additional Sound Transit and other Contractor representative(s) as required, QC Inspectors, and Third Parties (if required) to discuss Contract quality issues. Items discussed will be documented by the Contractor and shall include due dates of assigned action items with agreement from Sound Transit Quality Assurance. Distribute minutes to all attendees and other interested parties. At a minimum, the Quality Meetings shall cover topics of:
1. Three-week look-ahead schedule update
 2. CWP status and RRM's
 3. RFIs
 4. Submittal approval status of corresponding critical path work activities
 5. Inspection coverage of upcoming work activities
 6. Special Inspections and tests
 7. Test plans, procedures and test results
 8. IDR status
 9. NCRs / Corrective and Preventive Actions
 10. Materials received and corresponding inspections/documentation
 11. Off-site activities
 12. Updates to as-built Contract documents
 13. Quality training
 14. Documentation and status of quality issues, recurring NCR issues, and preventive actions taken

1.06 SUBMITTALS

- A. Construction Quality Submittals include:
1. Name and qualifications of CQM, within 15 days after the effective date of the Notice to Proceed (NTP).
 2. CQMP within 30 days after the effective date of the NTP.
 3. IDR form, including content and items as identified in Exhibit A. The Contractor may use IDR form provided herein.
 4. List of CWPs, within 45 days after the effective date of the NTP. Update the CWP list when new CWPs are added and resubmit within 7 days.
 5. Name and qualifications of the Contractor's Independent Testing Laboratory and all subcontracted Testing Laboratories within 45 days after the effective date of the NTP.
 6. List of Subcontractors and Subconsultants within 45 days after effective date of NTP. Provide updates at least 10 days prior to each new Subcontractor or Subconsultant beginning Work on Contract.

7. Inspection and Test Plan with Matrix within 45 days after the effective date of the NTP. Submittal must be acceptable to Sound Transit with a No Exceptions Taken (NET) or Exceptions as Noted Resubmission Not Required (EANRNR) disposition before any Construction Work that requires inspection can begin.

Inspection and Test Matrix, include the following:

- a. Specification Section number
 - b. Specification Section title
 - c. Section Article
 - d. Test/Inspection Description
 - e. Standard procedure
 - f. Identify on-site/off-site testing
 - g. Minimum frequency or instance for tests and inspections
 - h. Entity responsible for performing tests and inspections
8. Quality Control (QC) Inspectors. Include:
 - a. Name and qualifications
 - b. Discipline of Work to which they will be assigned
 9. Name and qualifications of personnel employed to perform special processes.
 10. CWP's required by the CWP List submittal.
 11. Contractor IDRs and documentation of material receiving inspection, within 7 days of inspection (as Submittals) for the first 4 weeks after the start of inspection or as otherwise directed by the Resident Engineer. Provide IDRs and documentation of material receiving inspection to the Resident Engineer thereafter as a Transmittal, within 7 days of inspection.
 12. Independent Testing Laboratory Inspection and Test Reports, within 7 days after completion of the inspection or test.
 13. Contractor Nonconformance Reports (NCRs).
 14. Completed Utility Strike Log, within 7 days after Acceptance. Provide copy of interim Utility Strike Log when requested by Sound Transit.
 15. Completed Nonconformance Log, within 7 days after Acceptance. Provide copy of interim NCR Log when requested by Sound Transit.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 MANAGEMENT RESPONSIBILITY

- A. Management Statement: As part of the CQMP submittals the Contractor is required to provide a management statement, in accordance with FTA Quality Management System

Guidelines, specifically committing to its compliance with the requirements of the Sound Transit Quality Assurance Program Plan (QAPP) and Sound Transit Construction Quality Plans as part of their Quality Management Program. The management statement must also include the Contractor's commitment that the CQM has the authority to act independent of the Contractor's Project Manager on quality related issues and that the CQM shall be dedicated to this Contract with the direction that the CQM cannot have responsibilities that conflict, or appears to conflict with their primary responsibility for quality matters.

- B. Organization Chart: As part of the CQMP submittal an organization chart shall be included to demonstrate the level of authority and independence of the CQM and the Quality Management staff. The CQM shall report to a corporate level executive above the level of the Project Manager. The corporate level executive cannot be involved in progressing the project Work or be responsible for administration or implementation of the project contract.

3.02 QUALITY MANAGEMENT SYSTEM

- A. Describe the documentation, plans, procedures, processes, management and organization implemented to achieve compliance with the requirements of the Contract Documents including all of the elements as listed in the CQMP along with their sub-elements in accordance with the requirements as described in herein. Include Contractor-specific and Contract-specific information for the elements and sub-elements, and include both onsite and offsite (e.g. fabrication, manufacturing) activities.
 - 1. Create a clear overview of how these elements and sub-elements work together to produce a Quality Management System that ensures Quality is addressed continuously through every phase of the Contract.
 - 2. Framework for presentation of the information may include Phases including: 1) Preparatory Phase, 2) Initial Phase, 3) Follow-up Phase and 4) Closeout and Final Inspection Phase. Note that different tasks can occur at different phases so that more than one phase can occur concurrently. The categories are intended to assist in presentation of the Quality Management System information.

3.03 SUBCONTRACTOR, SUBCONSULTANT, AND SUPPLIER CONTROL

- A. Submit a list of Subcontractors and Subconsultants including Work to which they will perform, and provide updates prior to each new Subcontractor or Subconsultant beginning Work on Contract.
- B. Include in the documents provided to Subcontractors the CQMP requirements and quality requirements defined herein applicable to the Work they perform.
- C. Assure all products and services procured from Subcontractors, Subconsultants and Suppliers meet Contract Document requirements and comply with CQMP or have their QPP approved by the CQM.
- D. Develop and maintain procurement procedures to select and control Suppliers and Subcontractors including:
 - 1. Evaluate and assess Suppliers' and Subcontractors' quality systems.
 - 2. Methods utilized to monitor quality performance of Suppliers and Subcontractors.
 - 3. Flowdown of design, reliability, and quality requirements to Suppliers and Subcontractors.
 - 4. Determination of criteria for performing source inspections.

3.04 IDENTIFICATION, TRACEABILITY AND RECEIVING, HANDLING, STORING, AND CONTROLLING OF PRODUCTS, MATERIALS, AND EQUIPMENT

- A. Establish and maintain procedures for receiving, handling, storing, identifying, and controlling items of production (batch materials, parts, components and subassemblies) to prevent use of incorrect or defective items and to ensure only correct and acceptable items are used or installed.
 - 1. Provide identification and traceability during all phases of production from receipt of raw materials, components, and subassemblies through manufacturing process to delivery of final products and systems.
 - 2. Utilize batch number, shipment number, packing slips, or invoices along with test data sheets and material certifications for determining traceability of raw materials.
 - 3. Provide physical separation, procedural control, or other appropriate means where physical separation is impractical or where record traceability is lost.
 - 4. Employ storeroom or inventory tracking procedures for traceability of items back to a particular order number, batch number, date received, test lot, or other pertinent source.
 - 5. Employ routing documentation for traceability of assemblies in production.
 - 6. Mark final assemblies with Contract number, model number, serial number, and bar codes.
- B. Control receipt of products, materials, and equipment in accordance with Section 01 60 00, Product Requirements.
- C. Inspect and record on the IDR identification, damage and quantity of all products, materials and equipment received. Large lots may be inspected by an industry approved standard sampling method.
- D. Record on the IDR on-site equipment calibration occurrences including the piece of equipment, equipment identification number/label, name(s) and company of personnel performing the calibration, qualifications (if applicable), brief outline (or document reference) of the procedure including equipment used to perform the calibration, and duration of calibration process.
- E. All products, materials, and equipment are subject to receipt inspection by Sound Transit.

3.05 PROCESS CONTROL

- A. Control on-site and off-site construction through the development of Contractor CWPs, approval of CWPs by the Resident Engineer, execution of the Work in accordance with CWPs and Contract requirements, and timely reporting of the results of the inspections on the IDR and lab test reports of required inspections and tests.
- B. Determine, in consultation with the Resident Engineer, which Work activities require submission and approval of a CWP. Prepare and submit a list of CWPs to the Resident Engineer for concurrence and approval. The Resident Engineer and the Contractor may add CWPs to the list. Resubmit the CWP list when CWPs are added, deleted or modified.
- C. CWPs: Prepare and submit a CWP for each of the Work activities identified on the CWP list. Work cannot begin without Sound Transit acceptance of a CWP dispositioned as NET or EANRNR and convening of a RRM. No partial approval of a CWP will be permitted. Changes and revisions to the Work activity require a revised CWP to be submitted and a

new RRM to be held prior to resuming Work. As a minimum include the following in each CWP:

1. Scope of Work
2. List of persons responsible for supervision of the Work
3. List of required approved submittals (for example; traffic control plans and special processes), drawings (with latest revisions) and the job hazard analysis
4. Planned start-work and completion dates, progress rate expected and Work hours
5. Sequence of events and construction methods for performing the Work: Include Sound Transit hold points and inspection requirements
6. Handling and storage of materials and equipment
7. Inspection and Test hold points required where the next process step or activity will cover up the Work
8. Inspections and tests required by Contractor, Third Parties and Sound Transit
9. Individuals responsible for performing inspections and providing input to as-built drawings
10. Prerequisite activities and related construction safety issues
11. Off-site inspection and test activities and their locations
12. Procedures for controlling hazardous materials, as applicable
13. Erosion and Sediment Control (ESC) Best Management Practices (BMP)
14. Actions defined as "Special Events", which may expose the public to danger or inconvenience, and which may require a third party to be notified
15. Safety-critical installations, inspections and tests
16. Specific Job Hazard Analysis (JHA) for each CWP

D. CWP and RRM

1. After the CWP has been returned by the Resident Engineer dispositioned as NET or EANRNR and a minimum of 7 and a maximum of 14 days before beginning associated Work activities, attend the RRM conducted by the Resident Engineer. The Resident Engineer documents the meeting with an agenda and minutes of the meeting including an attendance record. Include an activity for each RRM on the Project Schedule.
2. All Submittals associated with the CWP must be listed in the CWP Submittal.
3. After the RRM has been held and updates (if any) have been incorporated into the CWP, the Contractor shall distribute the revised CWP and approved associated Submittals to the personnel performing the Work and to the Contractor QC Inspectors. The Contractor and/or its Subcontractor personnel shall keep a copy of the approved CWP and approved associated Submittals within proximity of the Work being done and shall adhere to the approved processes and procedures contained therein. The Contractor or Subcontractor personnel performing the Work shall produce a copy of the approved CWP and approved associated Submittals

upon request by QC Inspectors, Resident Engineer team or Sound Transit personnel.

- E. Establish effective configuration control procedures to ensure all field staff including CQM and QC inspectors have the most current contract documents prior to the Work. Include procedures in CQMP.
- F. Control of Special Processes
 - 1. Perform special processes (e.g., welding, brazing and soldering) only with personnel certified in accordance with the requirements of the specific processes. Maintain qualification records of personnel performing special processes in the worksite files, submit to the Resident Engineer for approval and reference in the applicable CWPs. Submit qualifications of new personnel and recertifications to the Resident Engineer on an ongoing basis during the Contract.
 - 2. Obtain Sound Transit approval of qualifications of personnel performing special processes.

3.06 INSPECTION AND TESTING

- A. Independent Testing Laboratory
 - 1. Employ the services of an Independent Testing Laboratory to perform on-site testing and off-site testing to confirm the acceptable quality of materials, parts and equipment required by the Contract Documents. Independent Testing Laboratory must have special inspection capability and certification. Independent Testing Laboratory shall be in compliance with ASTM E329 and currently certified by a nationally or state-recognized regulatory agency or an industrially sponsored organization. The Contractor cannot self-perform as an Independent Testing Laboratory, even if Contractor staff is WABO certified.
 - 2. Obtain Sound Transit authorization to use the Independent Testing Laboratory before commencing Work for which testing is required by Contract Documents. Obtain Sound Transit authorization before changing or adding Independent Testing Laboratories.
- B. Inspection and Test Plan
 - 1. Prepare and submit Inspection and Test Plan with a Matrix defining the types and frequency of inspections and tests, and the entity responsible for performing each inspection and test (e.g., Laboratory, Contractor, Subcontractor or Third Party).
 - 2. Update the Inspection and Test Plan whenever an Independent Testing Laboratory is added, or when an inspection or test is added by Change Order or a Change Notice-Work Directive.
 - 3. Perform all QC inspections including QC inspections prior to owner conducted Special Inspections. The CQM is responsible for verifying that quality standards are maintained throughout the Contract to Acceptance. The CQM shall:
 - a. Prepare a schedule of Special Inspections required.
 - b. Notify Resident Engineer in advance of date of performance of Special Inspections.
 - c. Coordinate Work to ensure the next step in the process does not obscure the ability to inspect until the required inspections have been completed.

- d. Document all inspections and test results in the IDR. Include whether the test passed or failed.
 - e. Provide photos of Work.
- 4. Adjustments to control procedures and CWP's may be required based upon results of inspections and tests. Document inspection and test results of the in-process inspections in the IDRs.
- 5. Report inspection and test compliance or noncompliance with the Contract requirements specified or indicated in the Contract Documents.
- C. Inspector's Daily Reports (IDRs)
 - 1. Create and maintain daily quality control reports containing factual records with numerical data of the Work and quality control activities for each work day.
 - 2. Provide verification statement on IDRs that states: "All supplies and materials incorporated in to the Work are in compliance with the terms of the Contract except as noted." QC Inspectors sign and date each IDR.
 - 3. Obtain the verification and signature of the CQM on all IDRs.
- D. Special Inspections and Tests
 - 1. Where required by permits and / or building codes of the Authority Having Jurisdiction (AHJ), Sound Transit will contract with a WABO qualified testing laboratory and / or special inspector to conduct Special Inspections and tests.
 - 2. Special Inspection and Test Coordination: Notify Resident Engineer not less than 7 days in advance of Work requiring Special Inspections and tests within the State of Washington; provide not less than 10 days in advance of Work outside of the State of Washington. Do not proceed with the Work until a hold point has been released by the Resident Engineer. Cooperate fully with these special inspectors and provide all assistance necessary to complete their inspections.
- E. Inspection and testing conducted by agencies other than the Contractor's approved Independent Testing Laboratory does not relieve the Contractor of the responsibility of performing QC Inspection of the Work.
- F. Control and Calibration of Inspection, Testing and Monitoring Equipment
 - 1. Calibrate and certify all testing equipment and monitoring devices. Document in calibration log. Calibration and certification requirements include the following and apply to the Contractor and all Subcontractors, Suppliers and Independent Testing Laboratories:
 - a. Be able to trace calibration to known national standards and document in calibration log.
 - b. List inspection, test and monitoring equipment with the name and serial number, date of current calibration, due date of next calibration and name of person or laboratory conducting the certification or calibration with a brief description of use.
 - c. Store all testing equipment and monitoring devices in a safe and secure location, maintained throughout the Contract and used only for testing or monitoring Work for which they are designed.

- d. Re-calibrate, re-test and re-inspect materials, parts and equipment, if the inspection or testing equipment is suspected of being out of calibration, broken, dismantled or damaged. Document in calibration log.
- e. Make all testing and inspection equipment certified calibration records available and display on the equipment calibration sticker showing the last date of calibration, the due date of the next calibration and the name of the calibration laboratory/company.
- f. All on-site calibrations are to be witnessed by the Resident Engineer or Resident Engineer staff at the option of the Resident Engineer. Provide notification to the Resident Engineer of scheduled on-site calibrations 7 days prior to the calibration.

G. Inspection and Test Reporting

- 1. Inspection and test reports are considered Contract Record documents. Require parties performing testing and inspections to verbally transmit information regarding failed inspections and tests on the same day as discovery to the Contractor. Document failed test results on IDRs. Upon receipt of the failed inspections or test information, notify the Resident Engineer by e-mail within 1 day of the failed inspection or test results.
- 2. Upon discovery of nonconformance Work the Contractor shall issue a Nonconformance Report (NCR), if the nonconformance Work is not immediately corrected. See Article 3.07 for the process that must be followed for the correction of nonconformance items. No action shall be taken to cover or obscure the Work that is the subject of a failed inspection or test until it is corrected and re-inspected or otherwise approved by the Resident Engineer
- 3. Include the following minimum requirements in Inspection and Test Reports:
 - a. Sound Transit Contract number
 - b. Reference to Contract Specification Section requirement or test procedure
 - c. Identification of items tested
 - d. Location where sample was taken (i.e., stationing and intersection corner)
 - e. Quantity of items inspected or tested
 - f. Date inspection or test was conducted
 - g. Name of technician
 - h. Acceptance criteria
 - i. Pass or Fail disposition
 - j. Results
 - k. Authorized signature

- H. Contractor-performed and Subcontractor-performed inspections and tests are subject to witnessing, verification and approval, including approval of documentation, by the Resident Engineer.

3.07 NONCONFORMANCE AND CORRECTIVE ACTION

- A. Notify the Resident Engineer in documented form (e.g., email) of nonconformance items within 1 day of discovery.
- B. Document the root cause of the nonconformance and the Corrective and Preventive Actions taken on Sound Transit NCR Form.
- C. Investigate and describe the root cause of the nonconformance, providing remedial Corrective Actions for the nonconformance item(s), providing Preventive Actions to prevent recurrence and recommending a disposition. Submit NCR to the Resident Engineer within 14 days of discovery of the nonconformance Work. Payment will only be made for Work which is in full compliance with the Contract. Complete all REWORK within 30 days from the date that the nonconformance condition was documented. Complete REPAIR within 30 days after the Material Review Board (MRB) has approved the repair procedure, unless additional time is requested in writing by the Contractor and approved by the Resident Engineer. The applicable category designations for NCRs are:
 - 1. USE AS IS: allows the use of an item that does not meet specified Contract requirements without the need for Corrective Action, but may require some compensation to Sound Transit as allowed elsewhere in the Contract Documents. ("USE AS IS" NCR, including photos, will be routed by the Resident Engineer to the Sound Transit Material Review Board (MRB) for review and approval.)
 - 2. REPAIR: item may be repaired if it cannot be reworked to be brought into full compliance with the Contract requirements, but it can be made suitable for use. ("REPAIR" NCR, including photos, will be routed by the Resident Engineer to the Sound Transit Material Review Board (MRB) for review and approval.)
 - 3. REWORK: item may be reworked to bring it into full conformance with the Contract requirements. REWORK only applies to conditions where a discrete item can be completely replaced (e.g., bolt). Any changes which are not replacements in part or in whole are considered a REPAIR. The Resident Engineer has final authority to determine the category to which Work is assigned in a NCR condition. Contractor is required to provide photo documentation of nonconforming Work to the Resident Engineer. ("REWORK" NCR does not require Sound Transit Material Review Board (MRB) review and approval.)
 - 4. REJECT: item is Defective and considered unsuitable for its intended use, is economically or physically incapable of being reworked or repaired, and must be replaced to bring it into conformance with the Contract requirements. These items may be scrapped or returned to the Supplier. Contractor is required to provide photo documentation of Defective Work to the Resident Engineer. ("REJECT" NCR does not require Sound Transit Material Review Board (MRB) review and approval.)
- D. For REPAIR, or REWORK, compile documentation of the NCR for CQM and Resident Engineer verification of Corrective Action implementation. Include IDRs and photos of the Nonconforming Work prior to, during and after Corrective Action clearly labeled with the date, time and description of activities.
- E. Resident Engineer is responsible for submittal of required documentation to the Sound Transit MRB.
- F. Tag or otherwise identify nonconformance items requiring REWORK, REPAIR or USE AS IS. No follow-on Work that integrates with that item can be performed until REWORK or REPAIR is completed and accepted, or a USE AS IS disposition and the NCR is accepted by ST Quality.
- G. Red-tag and remove or isolate all Defective items, identified as REJECT, from the Site within 72 hours of discovery.

- H. Record all NCRs in a NCR Log available in an electronic version
- I. Provide to the Resident Engineer documentation of utility strikes involving existing utilities within 1 day of the occurrence and within 24 hours record the strike on a Utility Strike Log. Provide the Utility Strike Log to Sound Transit upon request.
 - 1. The Utility Strike Log shall include the following:
 - a. Location
 - b. Date and time of occurrence
 - c. Survey coordinates and elevation
 - d. Utility Type
 - e. Size of Utility
 - f. Name/Description of Utility
 - g. Circumstances leading to the strike
 - h. Date and time of repair after completion
 - i. Contractor performing repair
 - j. Date of acceptance by the Utility owners
 - 2. The Resident Engineer in conjunction with the affected utility entity will determine the work required to appropriately repair the utility strike.
 - 3. Record all utility strikes and repairs on the as-built drawings within 3 days after strike, or as otherwise approved by the Resident Engineer.

3.08 QUALITY RECORDS

Quality Records are a subset of the Contract Records and that document or reflect the quality of the Work. Quality Records includes, but are not limited to, third party reports, off-site inspection reports, IDRs, test reports, Quality Audit and surveillance reports, mill test reports, certificates of compliance, personnel qualifications and certifications, Nonconformance Reports (NCRs), Corrective Action Requests (CARs), failure analysis reports, instrumentation calibration reports, Punch Lists and photographs.

3.09 QUALITY TRAINING

- A. CQM to provide training on CQMP requirements within 21 days after the approval of CQMP to all project personnel, including Project Manager, Superintendents, Field/Project Engineers and QC Inspectors.
- B. Provide and maintain records of the training including schedule, attendance sign-in records and training materials.

3.10 SOUND TRANSIT FORMS AND TEMPLATES

- A. The following list of Sound Transit Forms and Templates are provided by Sound Transit and are required to be used for the duration of the project. Periodic updates maybe be issued by Sound Transit.
 - 1. Nonconformance Report (NCR)

2. Inspector's Daily Report (IDR) Form
 3. Construction Quality Management Plan (CQMP) Template
- B. If the Contractor has an equivalent form they wish to use, they must submit the proposed form to Sound Transit for review and approval. Acceptance of the proposed forms is at the sole discretion of Sound Transit.

END OF SECTION

EXHIBITS

Exhibit A: Inspector's Daily Report (IDR) Form

SECTION 01 45 00.25 – EXHIBIT A
INSPECTOR'S DAILY REPORT (IDR) FORM (2 PAGES)

Date:		Report No.:	
Project Description:		Project Location:	
Contract Unit #:		WEATHER	
Contractor:		Sunny: <input type="checkbox"/>	Overcast: <input type="checkbox"/>
CM Team:		Rain	Snow
Inspector:		Low Temp	High Temp
Work Shift:	Day: <input type="checkbox"/>	Swing: <input type="checkbox"/>	Grave: <input type="checkbox"/>
Work Location:			

Job Site Safety / Incident /Accident

Contract Work Performed – include scope, quantity, location, drawing nos., inspections, tests, and activity ID# and calibration records (if available)

Change Order / Work Directive / T&M Work Performed – include scope, quantity, location, and CO or WD Number

Third Party Work- include scope, quantity, inspections

Nonconformance Work – Include defective work notification, if issued

Contractor / Subcontractor Manual Craft Person Count																						
Contractor / Subcontractor or Name (Category)	Crew #	Shift Length	Foreman	Carpenter	Electrician	Laborer	Landscaper	Finisher	Operator/Oiler	Surveyor	Teamster	Iron Worker	Driller	Bricklayer	Plumber	Pile Buck	Flagger	Welder	Lineman	Inspector/Test Tech	Other – Describe in	Total
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Work Force																						0

Work Force Notes				
List Major Equipment Types				
Contractor / Subcontractor Name(s)		Equipment Type(s)	Hours	
			Working	Idle

Materials Delivery / Manifests – Basis Code for Acceptance: 1. App'd Mtrl List; 2. Insp.; 3. Mtrl Cert.; 4. Plant Cert.					
Material	Basis Code	Buy America		Quantity Received	Remarks
		Yes <input type="checkbox"/>	No <input type="checkbox"/>		
		Yes <input type="checkbox"/>	No <input type="checkbox"/>		
		Yes <input type="checkbox"/>	No <input type="checkbox"/>		
		Yes <input type="checkbox"/>	No <input type="checkbox"/>		
		Yes <input type="checkbox"/>	No <input type="checkbox"/>		

Signatures			
Inspector Signature		Contractor Signature	
Date		Date	
Inspector Name		Contractor (Print Signature Name)	

Attachments – check as appropriate

Photographs ☐
 Surveyor Daily Report ☐

T & M Sheet ☐
 Special Inspector Daily Report ☐

END OF EXHIBIT

SECTION 01 45 00.25

**QUALITY MANAGEMENT
DESIGN-BUILD**

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section defines the requirements for the DB Contractor to establish, implement and maintain an effective Quality Program to manage, control, document and assure the Work complies with the requirements specified in the Contract Documents. This Section also defines the requirements for the DB Contractor to prepare, implement and maintain plans, programs, procedures and the organization necessary to ensure quality for design process and documents, materials, equipment, execution of work, products, and manufacturing and installation operations covering both on-site and off-site Work by the DB Contractor, including Subcontractors, Subconsultants, Suppliers and Testing Laboratories.

1.02 REFERENCES

- A. This Section incorporates by reference the latest revisions of the following documents. They are part of this Section as specified and modified.
 - 1. Federal Transit Administration (FTA):
FTA Quality Management System Guidelines FTA-PA-27-5194-12.1 (current version)
 - 2. ST Quality Management System Plan (QMSP)
 - 3. International Building Code - Structural Tests and Special Inspections (Chapter 17) or Local Authority Having Jurisdiction's (AHJ) Building Code
 - 4. American Society for Testing and Materials (ASTM) Standards
 - 5. Washington Association of Building Officials (WABO) Requirements
- B. Definitions:
 - 1. Project Design Quality Management Plan (DQMP): A plan that addresses Agency Quality Management System Plan (QMSP) requirements inclusive of the FTA Quality Management System Guidelines quality elements for design. It provides descriptions of and references to quality procedures and work instructions, including specified requirements unique to this Contract.
 - 2. Project Construction Quality Management Plan (CQMP): A plan that addresses Agency Quality Management System Plan (QMSP) requirements inclusive of the FTA Quality Management System Guidelines quality elements for construction. It provides descriptions of and references to quality procedures and work instructions, including specified requirements unique to this Contract.
 - 3. Design Submittal Package (DSP): Coherent and complete subsets of design elements that are submitted as separate design packages for review at levels as defined by the Contract.

4. Construction Work Plan (CWP): Detailed plan for constructing a specific Work activity.
5. Readiness Review Meeting (RRM): A meeting to review and discuss all CWP elements identified below which is conducted by the Resident Engineer with the DB Contractor, Subcontractors and applicable third party representatives who are involved in executing, supervising, inspecting, testing and monitoring the Work activity.
6. Inspector's Daily Report (IDR): A daily report to be completed by all Inspectors identifying work activities observed, recorded and documented.
7. Quality Audit: A documented activity performed by examination and evaluation of objective evidence, that applicable elements being examined have been developed, documented and effectively implemented in conformance with ST QMSP and approved Project Design and Construction Quality Management Plans..

1.03 DB CONTRACTOR QUALITY PERSONNEL REQUIREMENTS

- A. Assign a Design Quality Manager (DQM) and a Construction Quality Manager (CQM) each of whom are dedicated solely to this Contract, are responsible for managing and acting on all quality matters and have the authority to act on all quality matters as a representative of the DB Contractor. The DQM and the CQM cannot be subordinate to DB Contractor personnel that directly perform, supervise or progress the Work and cannot be responsible for directly performing, supervising or progressing the Work or have responsibilities for this Contract that conflict or appear to conflict with the primary responsibility for quality matters.
- B. Qualification of DQM: At least 10 years prior experience as a Design Project Manager, Design Manager, Lead Design Engineer, or any combination thereof on a project of comparable size, scope and complexity to this Contract, which includes at least 3 years as a Design Quality Manager. At the sole discretion of Sound Transit, the DB Contractor may be required to replace the DQM. Contract design Work is not permitted to be performed without an approved DQM on site.
- C. Qualification of CQM: At least 10 years prior experience as a CQM, Construction Project Engineer, Construction Field Engineer, or QC Supervisor (or combination thereof) on projects of comparable size, scope and complexity to this Contract, which includes a minimum of 3 years of experience as a CQM on projects of comparable size, scope and complexity to this Contract. At the sole discretion of Sound Transit, the DB Contractor may be required to replace the CQM. Contract construction Work is not permitted to be performed without an approved CQM on site.
- D. DQM and CQM responsibilities include:
 1. Development and implementation of the Project DQMP and Project CQMP respectively including PowerPoint (or approved equal) presentation to ST Quality, ST Design Corridor Manager, ST Construction Manager, ST Executives, Design Build Project Management (DBPM) Resident Engineer, and other Agency or project staff as identified in coordination with ST Quality prior to submittal to ST. A separate presentation for each Project QMP is acceptable provided the Project DQMP is presented before the Project CQMP.
 2. Planning and performing Quality Audits of design and construction activities
 3. Coordination between design and construction quality elements
 4. Monitoring documentation of design and construction discipline interfaces

5. Monitoring documentation of interdisciplinary design interface and resolution process
 6. Monitoring documentation of review comment resolution and closure process
 7. Preventing recurring Quality issues
 8. Attending progress and quality meetings
 9. Approving IDRs
 10. Managing the design Quality Auditors and construction Quality Control (QC) Inspectors as applicable
 11. Coordinating with the Independent Testing Laboratories
 12. Issuing Nonconformance Reports (NCRs)
 13. Performing and coordinating root cause analysis on Audit Findings and nonconformance Work and monitoring implementation and effectiveness of Preventive and Corrective Actions
- E. Employ qualified design Quality Auditors with a background in transit facilities design, rail design, systems design, civil/structural design, and other disciplines as applicable to the discipline they are responsible for auditing. Design discipline-specific Quality Auditors shall have a minimum of 10 years experience in their discipline. At the sole discretion of Sound Transit, the DB Contractor may be required to replace design Quality Auditor(s), and/or require additional subject matter (discipline) expert Quality Auditors be provided at no additional cost to Sound Transit. Quality Auditors cannot be subordinate to DB Contractor personnel that directly perform, supervise, or progress the Work, and cannot be responsible for directly performing, supervising, or progressing the Work or have responsibilities for this Contract that conflict or appear to conflict with the primary responsibility for quality matters.
- F. Employ qualified construction QC Inspectors meeting, at a minimum, the following requirements:
1. QC Inspectors shall have a minimum of 5 years construction QC experience for the Work they are responsible for inspecting or have a minimum of 3 years QC inspection experience plus a minimum 2 years experience in constructing or inspecting the Work they are responsible for inspecting.
 2. QC Inspectors must report directly and only to the CQM and cannot be subordinate to DB Contractor personnel that directly perform, supervise or progress the Work and cannot be responsible for directly performing, supervising or progressing the Work or have responsibilities for this Contract that conflict or appear to conflict with their primary responsibilities for quality matters.
 3. Other DB personnel (e.g., the DB Contractor Field Engineers or Superintendents), while implementing Contract Requirements, cannot perform as QC Inspectors.
 4. Field QC Inspectors cannot perform testing, unless they are employed by the Independent Test Lab that will perform the tests on the samples taken.
 5. QC Inspectors are responsible for monitoring, verifying and documenting in the IDR that the processes and requirements of the approved CWP, drawings, specifications, shop drawings and other applicable Submittals are implemented on each Feature of Work.

- 6. At the sole discretion of Sound Transit, the DB Contractor may be required to replace QC Inspector(s).
- G. For each shift upon which Contract Work is being executed, have sufficient experienced QC inspectors, who are qualified in the Work being performed. The quantity of QC inspectors and corresponding inspection coverage shall be in accordance with Inspection and Test Plan approved by Sound Transit. At the sole discretion of the Resident Engineer the DB Contractor shall provide additional QC Inspectors at no additional cost to Sound Transit if the Resident Engineer determines that additional QC Inspectors are required.

1.04 PROJECT DQMP AND PROJECT CQMP REQUIREMENTS

- A. Project DQMP Development: In accordance with requirements specified in ST QMSP and Template.
- B. Project CQMP Development: The titles of the Part 3 Sections of this specification will be used as the headings for the Project CQMP (e.g., Management Responsibility, Quality Management System, Document Control, etc.). Requirements for the Project CQMP sections are as outlined in the Part 3 Sections.
- C. Templates for the DQMP and CQMP in MS Word format will be provided by Sound Transit Quality. The Contractor is required to use the templates to develop the QMP submittals. It is the responsibility of the Contractor to ensure all requirements are addressed even if not specifically identified in the template.
- D. Project DQMP and Project CQMP Updating: Review Project DQMP and Project CQMP at a minimum of every six months or on a schedule approved by Sound Transit, for the duration of the project; resubmittal is required for Sound Transit approval if any changes are proposed, or if insufficient Quality Process or Procedures are identified during implementation.
- E. Project DQMP and Project CQMP Approval: Submittals must be acceptable to Sound Transit with a No Exceptions Taken (NET) or Exceptions as Noted Resubmission Not Required (EANRNR) disposition, before any design document checking or construction work requiring inspection, respectively, can begin.

1.05 QUALITY MEETINGS

- A. Conduct Design Quality Meetings every 2 weeks with Sound Transit Quality along with additional Sound Transit representative(s) as required, the DB Design Quality Manager (DQM) and the DB Construction Quality Manager (CQM) along with other DB Contractor representative(s) including Design Manager, Discipline Leads, and Third Parties (if required) to discuss quality issues. Items discussed will be documented and tracked by the DB Contractor and shall include due dates of assigned action items. Distribute minutes to all attendees and other interested parties. At a minimum, the Design Quality Meetings shall cover topics of:
 - 1. Three-week look-ahead schedule update
 - 2. Design interface status
 - 3. Design Criteria conformance / Request for Deviation (RFD) status
 - 4. Milestone DSP Scope conformance / Open design issues and status
 - 5. Milestone DSP schedule, status, and comment resolution
 - 6. Interdisciplinary review schedule, status, and comment resolution
 - 7. Constructability review schedule, status, and comment resolution

8. Operations maintainability review schedule, status, and comment resolution
 9. Systems integration review / Interface Control Document (ICD) schedule, status, and comment resolution
 10. Quality training
 11. Quality records
 12. Quality issues and actions taken to prevent recurrence
- B. Conduct Construction Quality Meetings every 2 weeks with Sound Transit Quality, the DB CQM and/or DQM, other DB Contractor representative(s) as required, QC Inspectors and Third Parties (if required) to discuss Contract quality issues. Items discussed will be documented by the DB Contractor and shall include due dates of assigned action items with agreement from Sound Transit. Distribute minutes to all attendees and other interested parties. At a minimum, the Quality Meetings shall cover topics of:
1. Three-week look-ahead schedule update
 2. CWP status with corresponding work activity and RRM's
 3. RFI status
 4. Submittal approval status of corresponding critical path work activities
 5. Inspection coverage of upcoming work activities
 6. Special Inspections and tests
 7. Test plans, procedures and test results
 8. NCRs / implementation of Corrective and Preventive Actions
 9. Materials received and corresponding inspections/documentation
 10. Off-site activities including inspections and testing
 11. Updates to as-built Contract documents
 12. Quality training
 13. Quality records
 14. Documentation and status of quality issues, recurring NCR issues, and preventive actions taken
- 1.06 SUBMITTALS / TRANSMITTALS
- A. Design Quality:
1. Submittals include:
 - a. Name and qualifications of proposed DQM within 30 days after the effective date of the Notice to Proceed (NTP). Interview with Sound Transit required prior to appointment of position.
 - b. Project DQMP including all forms/exhibits (reports, logs, etc.) within 45 days after the effective date of the Notice to Proceed (NTP). DB Contractor DQM to perform Project DQMP presentation (PowerPoint or approved equal) to ST Quality, Agency and Project staff, and DBPM staff prior to

Project DQMP submittal. If Project DQMP presentation does not demonstrate conformance to ST QMSP requirements, additional presentations may be required at the request of ST Quality.

- c. Milestone DSP Scope Deliverable matrix.
- d. Names and qualifications of design Quality Auditors, including technical design discipline-specific Quality Auditors.
- e. Design Quality Training Program including a syllabus, PowerPoint (or approved equal) presentation and schedule for classroom training sessions.

2. Transmittals include:

- a. DSP list with detailed description of deliverables including design subject focus/content and sequence to be submitted within 45 days after the effective date of NTP. Update the DSP list if new DSPs are added, deleted or modified and retransmit within 7 days.
- b. Design Subconsultant List within 45 days after effective date of NTP. Provide updates at least 10 days prior to each new Subcontractor or Subconsultant beginning Work on the Contract.
- c. Design Quality Audit Schedule within 60 days after the effective date of NTP, including Subconsultants and Subcontractors.
- d. DB Contractor Design Quality Audit Report within 15 days after the completion of each Design Quality Audit. Include Observations and Finding(s), if any, from previous design audits and implementation of process improvement for future design Submittals. Include root cause analysis and Corrective and Preventive Actions to Quality Audit Finding(s).
- e. Provide monthly Design Quality status update within 7 days after end of each month. Include the following:
 - 1) Design Quality Audits planned
 - 2) Design Quality Audits completed along with Quality Audit reports
 - 3) Design Quality Audit Finding(s) if any and implementation of associated Preventive and Corrective Actions
 - 4) Design quality-related Submittals submitted to (received by) Resident Engineer
 - 5) Design interface coordinations and issues
 - 6) Other design quality issues

B. Construction Quality:

1. Submittals include:

- a. Name and qualifications of CQM, within 30 days after the effective date of the Notice to Proceed (NTP).
- b. Project CQMP within 90 days after the effective date of the NTP.
- c. IDR form, including content and items as identified in Exhibit A. The DB Contractor may use IDR form provided herein.

- d. Name and qualifications of the DB Contractor's Independent Testing Laboratory and all subcontracted Testing Laboratories at least 90 days prior to the beginning of the Construction Work.
- e. Inspection and Test Plan, at least 90 days prior to the beginning of the Construction Work.
- f. Inspection and Test Matrix, at least 90 days prior to the beginning of the Construction Work. Update the Matrix list if new testing/inspections are added, deleted, or modified and resubmit within 7 days.

Inspection and Test Matrix includes the following:

- 1) Specification Section number
- 2) Specification Section title
- 3) Section Article
- 4) Test/Inspection Description
- 5) Identify on-site/off-site testing
- 6) Minimum frequency or instance for tests and inspections
- 7) Entity responsible for performing tests and inspections (e.g., Laboratory, DB Contractor, Subcontractor or Third Party)
- g. Quality Control (QC) Inspectors at least 30 days prior to the beginning of the Construction Work. Include:
 - 1) Name and qualifications
 - 2) Discipline of Work to which they will be assigned
- h. List of CWP's, 60 days prior to commencement of Construction Work. Update the CWP list when new CWP's are added and resubmit within 7 days.
- i. CWP's.
- j. DB Contractor Nonconformance Reports (NCR's).
- k. DB Contractor IDRs, within 7 days of inspection for the first 4 weeks subsequent to the start of inspection or as otherwise directed by the Resident Engineer.

2. Transmittals include:

- a. List of Subcontractors and Subconsultants at least 60 days prior to the beginning of the Construction Work. Provide updates at least 10 days prior to each new Subcontractor or Subconsultant beginning Work on Contract.
- b. Quality Audit Schedule at least 60 days prior to the beginning of the Construction Work.
- c. DB Contractor IDRs, subsequent to the first 4 weeks of inspections, transmit within 7 days of inspection.

- d. Weekly transmittal of materials received and corresponding inspection documentation.
- e. Independent Testing Laboratory Inspection and Test Reports, unless specified as submittals, within 7 days after completion of the inspection or test.
- f. Completed Utility Strike Log, prior to Substantial Completion. Provide copy of interim Utility Strike Log when requested by Sound Transit.
- g. Completed Nonconformance Log, prior to Substantial Completion. Provide copy of interim NCR Log when requested by Sound Transit.
- h. DB Contractor Quality Audit Reports within 15 days after the completion of each Quality Audit.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 MANAGEMENT RESPONSIBILITY

- A. As part of the Project DQMP and Project CQMP submittals the DB Contractor is required to provide a management statement, in accordance with FTA Quality Management System Guidelines and Agency QMSP requirements, specifically committing to its compliance with the requirements of the Sound Transit Quality Management System Plan (QMSP) as part of their Quality Management Program. The management statement must also include the DB Contractor's commitment that the CQM and DQM have the authority to act independent of the DB Contractor's Project Manager on quality related issues and that the CQM and DQM shall be dedicated solely to this Contract with the direction that the CQM and DQM cannot have responsibilities that conflict or appear to conflict with their primary responsibility for quality matters.
- B. As part of the Project DQMP and Project CQMP submittal, include an organization chart to demonstrate the level of authority and independence of the DQM and CQM and the Quality Management staff. The DQM and CQM shall report to a corporate level executive above the level of the Project Manager. The corporate level executive cannot be involved in administration or implementation of the project contract.
- C. Identify Design Subconsultants and Construction Subcontractors and their respective discipline(s) / areas of responsibility. Include the reporting relationship in the Project Organization Chart.

3.02 DESIGN CONTROL

- A. Design Control processes shall be described and defined in the Project DQMP in conformance with the Agency QMSP. Design Processes to be monitored and documented includes, but not limited to:
 - 1. Integration of Design Quality Work activities and associated schedule requirements into the Master Project Schedule. Include coordination activities with Subconsultants.
 - 2. Design Criteria Conformance.
 - 3. Milestone DSP Scope deliverable conformance.

4. Implementation of Design Quality Checking Procedure for each DSP at every Milestone.
5. Design Process Reviews including Interdisciplinary Review, Systems Integration Review, Constructability Review, Maintainability-Reliability Review, Systems Integration Review, Milestone Design Submittal Agency Review, and corresponding traceability, resolution, and closure of review comments.

3.03 SUBCONTRACTOR, SUBCONSULTANT, AND SUPPLIER CONTROL

- A. Include in the documents provided to Subcontractors the Project CQMP requirements and quality requirements defined herein applicable to the Work they perform.
- B. Assure all products and services procured from Subcontractors, Subconsultants and Suppliers meet Contract requirements and comply with Project CQMP or have their Quality Plan approved by the CQM.
- C. Develop and maintain procurement procedures to select and control Suppliers and Subcontractors including:
 1. Evaluation and assessment of Suppliers' and Subcontractors' quality systems.
 2. Methods utilized to monitor quality performance of Suppliers and Subcontractors.
 3. Flowdown of design, reliability and quality requirements to Suppliers and Subcontractors.
 4. Determination of criteria for performing source inspections.

3.04 IDENTIFICATION, TRACEABILITY AND RECEIVING, HANDLING, STORING AND CONTROLLING OF PRODUCTS, MATERIALS AND EQUIPMENT

- A. Establish and maintain procedures and documentation for receiving, handling, storing, identifying and controlling items of production (batch materials, parts, components and subassemblies) to prevent use of incorrect or defective items and to ensure only correct and acceptable items are used or installed.
 1. Develop procedures to provide identification, traceability, and documentation during all phases of production from receipt of raw materials, components and subassemblies through the manufacturing process to the delivery of final products and systems on site.
 2. Utilize batch number, shipment number, packing slips or invoices along with test data sheets and material certifications for determining traceability of raw materials.
 3. Develop procedures and documentation for identification and acceptance of materials delivered on site comply with Contract requirements.
 4. Provide physical separation, procedural control or other appropriate means where physical separation is impractical or where record traceability is lost.
 5. Employ storeroom or inventory tracking procedures for traceability of items back to a particular order number, batch number, date received, test lot or other pertinent source.
 6. Employ routing documentation for traceability of assemblies in production.
 7. Mark final assemblies with Contract number, model number, serial number and bar codes.

- B. Inspect and record on the IDR identification, damage and quantity of all products, materials and equipment received. Large lots may be inspected by an industry approved standard sampling method.
- C. Record on the IDR on-site equipment calibration occurrences including the piece of equipment, equipment identification number/label, name(s) and company of personnel performing the calibration, qualifications (if applicable), brief outline (or document reference) of the procedure including equipment used to perform the calibration and the approximate date of the next scheduled calibration.

3.05 PROCESS CONTROL

- A. Determine, in consultation with the Resident Engineer, which Work activities require submission of a CWP. The Resident Engineer and the DB Contractor may add CWPs to the list. Resubmit the updated CWP list when CWPs are added, deleted or modified.
- B. Prepare and submit a CWP for each of the Work activities identified on the CWP list. No partial approval of a CWP will be permitted. Changes and revisions to the Work activity that require a revised CWP to be submitted and a new RRM to be held prior to resuming Work. As a minimum include, in the order listed, the following in each CWP:
 - 1. Scope of Work
 - 2. List of persons responsible for supervision of the Work
 - 3. List of applicable required submittal status, RFIs, Change Orders, and drawings (with latest revisions)
 - 4. Planned start-work and completion dates, progress rate expected and Work hours
 - 5. Sequence of events and construction methods for performing the Work: Include hold points, inspections and tests
 - 6. Handling and storage of materials and equipment
 - 7. Inspections and tests required by DB Contractor, Third Parties, and Sound Transit
 - 8. Coverage of inspections: List individuals responsible for performing inspections and discipline of Work to which they are assigned
 - 9. Prerequisite activities and related construction safety issues
 - 10. Off-site inspection and test activities and the locations
 - 11. Procedures for controlling hazardous materials, as applicable
 - 12. Erosion and Sediment Control (ESC) Best Management Practices (BMP)
 - 13. Actions defined as "Special Events", which may expose the public to danger or inconvenience, and which may require a third party to be notified
 - 14. Safety-critical installations, inspections and tests
 - 15. Specific Job Hazard Analysis (JHA) for each CWP
- C. Control on-site and off-site construction through the development of DB Contractor CWPs.
- D. CWP and RRM

1. After the CWP has been returned by the Resident Engineer dispositioned as NET or EANRNR and a minimum of 7 and a maximum of 14 days before beginning associated Work activities, attend the RRM conducted by the Resident Engineer. The Resident Engineer documents the meeting with an agenda and minutes of the meeting including an attendance record. Include an activity for each RRM on the Project Schedule.
 2. All Submittals associated with the CWP must be listed in the CWP Submittal.
 3. After the RRM has been held and updates (if any) have been incorporated into the CWP, the DB Contractor shall distribute the revised CWP and approved associated Submittals to the personnel performing the Work and to the DB Contractor QC Inspectors. The DB Contractor and/or its Subcontractor personnel shall keep a copy of the approved CWP and approved associated Submittals within proximity of the Work being done and shall adhere to the approved processes and procedures contained therein. The DB Contractor or Subcontractor personnel performing the Work shall produce a copy of the approved CWP and approved associated Submittals upon request by QC Inspectors, Resident Engineer team or Sound Transit personnel.
- E. Establish effective configuration control procedures to ensure all field staff including CQM and QC inspectors have the most current contract documents prior to the Work. Include procedures in Project CQMP.
- F. Control of Special Processes
1. Perform special processes (e.g., welding, brazing and soldering) only with personnel certified in accordance with the requirements of the specific processes. Maintain qualification records of personnel performing special processes in the worksite files and reference in the applicable CWPs.
- 3.06 INSPECTION AND TESTING
- A. Independent Testing Laboratory
1. Employ the services of a WABO certified Independent Testing Laboratory to perform on-site testing and off-site testing to confirm the acceptable quality of materials, parts and equipment required by the Contract Documents. Independent Testing Laboratory must have special inspection capability and certification. Independent Testing Laboratory shall be in compliance with ASTM E329 and currently certified by a nationally or state-recognized regulatory agency or an industrially sponsored organization. The DB Contractor cannot self-perform as an Independent Testing Laboratory, even if the DB Contractor is WABO certified.
 2. Obtain Sound Transit approval to use the Independent Testing Laboratory before commencing Work for which testing is required by Contract Documents. Obtain Sound Transit approval before changing or adding Independent Testing Laboratories.
- B. Inspection and Test Plan
1. Develop procedures to be implemented covering performance of inspection activities including:
 - a. Receiving inspection: identification and acceptance of materials as required in Contract requirements.
 - b. In-process inspection of items or work process will be performed to verify conformance to CWP and Contract requirements. Hold or witness points

shall be identified and work will not proceed beyond those designated points until inspection is completed.

c. Final Inspection.

2. Include details of inspection coverage in the Plan demonstrating sufficient inspection efforts including number of Inspectors with respect to Work activities to be inspected, locations, and schedules.
3. No construction or fabrication Work may be performed without an approved Inspection and Test Plan.
4. Update and resubmit the Inspection and Test Plan whenever an Independent Testing Laboratory is added or when an inspection or test is added by Change Order or a Change Notice-Work Directive.
5. Perform all QC inspections prior to required Special Inspections. The CQM is responsible for verifying that quality standards are maintained throughout the Contract to Acceptance. The CQM shall:
 - a. Prepare a schedule of Special Inspections required.
 - b. Notify Resident Engineer in advance of date of performance of Special Inspections.
 - c. Coordinate Work to ensure the next step in the process does not obscure the ability to inspect until the required inspections have been completed.
6. Adjustments to control procedures and CWP's may be required based upon results of inspections and tests. Document inspection and test results of the in-process inspections in the IDRs.
7. Report inspection and test compliance or noncompliance with the Contract requirements specified or indicated in the Contract Documents.

C. Inspector's Daily Reports (IDRs)

1. Monitor DB Contractor's execution the Work in accordance with CWP's and Contract requirements.
2. Create and document daily reports containing records with quality control activities performed to monitor implementation of work activities in accordance with Contract requirements and corresponding results for each work day.
3. Document all inspection results including material receiving inspection, in-process inspection, and final inspection, and test results in the IDR. Include whether the inspection or test passed or failed.
4. Provide photos of Work.
5. Obtain the verification and signature of the CQM daily on all IDRs.

D. Special Inspections and Tests

1. Where required by permits and / or building codes of the Authority Having Jurisdiction (AHJ), Sound Transit will contract with a WABO qualified testing laboratory and / or special inspector to conduct Special Inspections and tests.
2. Special Inspection and Test Coordination: Notify Resident Engineer not less than 7 days in advance of Work requiring Special Inspections and tests within the State

of Washington; provide not less than 10 days in advance of Work outside of the State of Washington. Do not proceed with the Work until a hold point has been released by the Resident Engineer. Cooperate fully with these special inspectors and provide all assistance necessary to complete their inspections.

- E. Inspection and testing conducted by agencies other than the DB Contractor's approved Independent Testing Laboratory does not relieve the DB Contractor of the responsibility of performing QC Inspection of the Work.
- F. Control and Calibration of Inspection, Testing and Monitoring Equipment
 - 1. Calibrate and certify all testing equipment and monitoring devices in accordance with national standards or manufacturer's recommendations. Document calibration records in calibration report and make available upon ST request. Calibration and certification requirements include the following and apply to the DB Contractor and all Subcontractors, Suppliers and Independent Testing Laboratories:
 - a. Be able to trace calibration to known national standards and document in calibration report.
 - b. Calibration Report: list inspection, test and monitoring equipment with the name and serial number, intervals of scheduled recalibration, date of current calibration, due date of next calibration and name and signature of person or laboratory conducting the certification or calibration with a brief description of use. Include calibration data/results, acceptance criteria, and pass or fail disposition.
 - c. Store all testing equipment and monitoring devices in a safe and secure location, maintained throughout the Contract and used only for testing or monitoring Work for which they are designed.
 - d. Re-calibrate, re-test and re-inspect materials, parts and equipment, if the inspection or testing equipment is suspected of being out of calibration, broken, dismantled or damaged. Document in calibration log.
 - e. Make all testing and inspection equipment certified calibration records available and display on the equipment calibration sticker showing the last date of calibration, the due date of the next calibration and the name of the calibration laboratory/company.
 - f. All on-site calibrations are to be witnessed by the Resident Engineer or Resident Engineer staff at the option of the Resident Engineer. Provide notification to the Resident Engineer of scheduled on-site calibrations 7 days prior to the calibration.
- G. Inspection and Test Reporting
 - 1. Inspection and test reports are considered Contract Record documents. Require parties performing testing and inspections to transmit information regarding failed inspections and tests on the same day as discovery to the DB Contractor. Document failed test results on IDRs. Upon receipt of the failed inspections or test information, notify the Resident Engineer by e-mail within 1 day of the failed inspection or test results.
 - 2. Upon discovery of nonconformance Work the DB Contractor shall issue a Nonconformance Report (NCR), if the nonconformance Work is not immediately corrected. No action shall be taken to cover or obscure the Work that is the subject of a failed inspection or test until it is corrected and re-inspected or otherwise approved by the Resident Engineer

3. Include the following minimum requirements in Testing Reports:
 - a. Sound Transit Contract number
 - b. Reference to Contract Specification Section requirement or test procedure
 - c. Identification of items tested
 - d. Test equipment calibration status
 - e. Test software used
 - f. Location where sample was taken (i.e., stationing and intersection corner)
 - g. Quantity of items inspected or tested
 - h. Date inspection or test was conducted
 - i. Name of technician
 - j. Acceptance criteria
 - k. Pass or Fail disposition
 - l. Results
 - m. Authorized signature

- H. DB Contractor-performed and Subcontractor-performed inspections and tests are subject to witnessing, verification and approval, including approval of documentation, by the Resident Engineer.

3.07 NONCONFORMANCE

- A. Notify the Resident Engineer in documented form (e.g., email) of nonconformance items within 1 day of discovery.
- B. Document the nonconformance on Sound Transit NCR Form.
- C. Describe the nonconformance with date of discovery. Investigate and provide the root cause of the nonconformance; provide and implement Preventive Actions to RE for review and acceptance in advance of same or similar work activities to address the root cause and prevent recurrence.

Propose a disposition and provide remedial Corrective Actions for the nonconformance item(s). Submit NCR including associated documentation and photos, and Engineer of Record's concurrence memo to the Resident Engineer within 14 days of discovery of the nonconformance Work. Payment will only be made for Work which is in full compliance with the Contract. Complete all REWORK within 30 days from the date that the nonconformance condition was documented. REPAIR work cannot proceed prior to Sound Transit Quality approval of NCR. Complete REPAIR within 30 days after the Sound Transit Quality has approved the NCR, unless additional time is requested in writing by the DB Contractor and approved by the Resident Engineer. The applicable dispositions for NCRs are:

1. USE AS IS: allows the use of an item that does not meet specified Contract requirements without the need for Corrective Action, but may require compensation to Sound Transit as allowed elsewhere in the Contract Documents.

2. REPAIR: item may be repaired if it cannot be reworked to be brought into full compliance with the Contract requirements, but it can be made suitable for use.
 3. REWORK: item to be reworked to bring it into full conformance with the Contract requirements. REWORK only applies to conditions where a discrete item can be completely replaced (e.g., bolt). Any changes which are not replacements in part or in whole are considered a REPAIR. The Resident Engineer has final authority to determine the disposition to which Work is assigned in a NCR condition. DB Contractor is required to provide photo documentation of nonconforming Work to the Resident Engineer.
 4. REJECT: item is Defective and considered unsuitable for its intended use, is economically or physically incapable of being reworked or repaired and must be replaced to bring it into conformance with the Contract requirements. These items may be scrapped or returned to the Supplier. DB Contractor is required to provide photo documentation of Defective Work to the Resident Engineer.
- D. Compile documentation of the NCR for CQM and Resident Engineer verification of Preventive and Corrective Actions implementation. Include IDRs and photos of the Nonconforming Work prior to, during and after Corrective Action clearly labeled with the date, time and description of activities.
 - E. Resident Engineer is responsible for submittal of required documentation to the Sound Transit Quality.
 - F. Tag or otherwise identify nonconformance items requiring REWORK, REPAIR or USE AS IS. No follow-on Work that integrates with that item can be performed until REWORK or REPAIR is completed and accepted or a USE AS IS disposition and the NCR is accepted by ST Quality.
 - G. Red-tag and remove or isolate all Defective items, identified as REJECT, from the Site within 72 hours of discovery.
 - H. Record all NCRs in a NCR Log available upon Sound Transit request.
 - I. NCR is not required for Utility Strike.

Provide to the Resident Engineer documentation of utility strikes involving existing utilities within 1 day of the occurrence and within 24 hours record the strike on a Utility Strike Log. Provide the Utility Strike Log to Sound Transit upon request.

1. The Utility Strike Log shall include the following:
 - a. Location
 - b. Date and time of occurrence
 - c. Survey coordinates and elevation
 - d. Utility Type
 - e. Size of Utility
 - f. Name/Description of Utility
 - g. Circumstances leading to the strike
 - h. Date and time of repair after completion
 - i. DB Contractor performing repair

j. Date of acceptance by the Utility owners

2. The Resident Engineer in conjunction with the affected utility entity will determine the work required to appropriately repair the utility strike.
3. Record all utility strikes and repairs on the as-built drawings within 3 days after strike or as otherwise approved by the Resident Engineer.

3.08 QUALITY RECORDS

- A. Quality Records are a subset of the Contract Records and that document or reflect the quality of the Work. Quality Records include, but are not limited to, third party reports, off-site inspection reports, IDRs, test reports, Quality Audit and surveillance reports, mill test reports, certificates of compliance, personnel qualifications and certifications, Nonconformance Reports (NCRs), Corrective Action Requests (CARs), failure analysis reports, instrumentation calibration reports, Punch Lists and photographs.

3.09 QUALITY AUDITS

- A. Design Quality Audit: DQM shall schedule, perform, document and submit the results of Quality Audits along with the Root Cause Analysis, Preventive Actions, and Corrective Actions in conjunction with the Auditee for the Quality Audit Findings. Include the following scope elements in the Design Quality Audits:
1. DSP name/number
 2. Perform Quality Audits on each DSP at each Milestone. Documentation produced as a result of this process to be submitted for each DSP at every Milestone.
 3. Project Quality Management Specification 01 45 00.15 and DQMP Conformance
 4. Subconsultant Management
 5. Implementation of Design Control Processes (including DSPs)
 6. Effectiveness of implementation of corrective and preventive actions and verification
 7. Quality Records
 8. Quality Training
- B. Quality Audit shall include an executive summary, scope, process used to perform the Quality Audit, Observations, Findings and conclusions.
- C. Quality Audit Logs include records of all Quality Audits and results, including Findings and Observations. Auditee to respond to all Quality Audits and Surveillances. Document the root cause of the nonconformance conditions and provide Corrective and Preventive Actions to the Resident Engineer within 14 days of the issuance date of the Quality Audit, unless specified otherwise. Document the dates of implementation of the Corrective and Preventive Actions in the response. Failure to provide this information within 14 days or by the specified due date will result in a reduction of the amount approved for payment for the affected Work on the next payment. Provide copies to Sound Transit of record documents as requested during Quality Audits.
- D. Sound Transit Quality may conduct Audits or Surveillances to ensure DB Contractor's conformance to Contract requirements. Respond to all ST Quality Audits and Surveillances as specified herein. Preventive and Corrective Actions for Design Quality Audit Findings shall be accepted by ST Quality and implemented prior to the subsequent DSP Milestone Submittal.

3.10 QUALITY TRAINING

- A. DQM and CQM are to provide training on Project DQMP and Project CQMP requirements within 21 days after the approval of Project DQMP and Project CQMP to the following project personnel: Project Manager, Design Manager, Lead, Design Engineer, CAD Operator(s), Superintendents, Field Engineers, Project Engineer(s) and QC Inspectors. For the project personnel, who are assigned to the project after the initial training has occurred, the DQM and or the CQM will provide the required training within 14 days of an individual's arrival on site.
- B. Provide and maintain records of the training including schedule, attendance sign-in records and training materials.

3.11 SOUND TRANSIT FORMS AND TEMPLATES

- A. The following list of Sound Transit Forms and Templates are provided by Sound Transit and are required to be used for the duration of the project. Periodic updates may be issued by Sound Transit.
 - 1. Nonconformance Report (NCR)
 - 2. Quality Audit Report including Audit/Surveillance Finding Report (ASFR)
 - 3. Inspector's Daily Report (IDR) Form
 - 4. QMP Templates

END OF SECTION

EXHIBITS

Exhibit A: Inspector's Daily Report (IDR) Form

SECTION 01 45 00.25 - EXHIBIT A

INSPECTOR'S DAILY REPORT (IDR) FORM (2 PAGES)

Date:		Inspector Name:			
Project Description:		Project Location:			
Contract Unit #:		WEATHER			
Contractor:		Sunny:	<input type="checkbox"/>	Overcast:	<input type="checkbox"/>
QC Team:		Rain:	<input type="checkbox"/>	Snow:	<input type="checkbox"/>
Shift Hours:		Low Temp:		High Temp:	
Contract Work Performed – include time, activity ID #, scope, material, location, documentation verification (drawing, submittal, RFI, etc.), inspections and/or tests performed (include results), and pictures.					
Materials Used Today (Permanent Only)					
Material Description	Manufacturer	Location	Contractor/Sub	Quantity	
Additional Notes:					
Materials Received – Basis Code for Inspection of Mtrl Acceptance: 1. App'd Mtrl Submittal; 2. Mtrl Cert.; 3. Plant Cert.					
Material Description	Basis Code	Buy America	Quantity	Remarks	
		Yes <input type="checkbox"/>	No <input type="checkbox"/>		
		Yes <input type="checkbox"/>	No <input type="checkbox"/>		
		Yes <input type="checkbox"/>	No <input type="checkbox"/>		
Additional Notes:					
Third Party Work- include time, scope, documentation verification, inspection performed (including results), and pictures.					

Non-Conforming Work Observed			
CQM Notified:	Yes <input type="checkbox"/>	No <input type="checkbox"/>	
Attachments – check as appropriate			
Contractor's Special Inspector Daily Report	<input type="checkbox"/>	Surveyor Daily Report	<input type="checkbox"/>
T & M Sheet	<input type="checkbox"/>	Checklists (Pre-Pour, Waterproofing, etc.)	<input type="checkbox"/>
Photos	<input type="checkbox"/>	Other (Describe in Attachment Notes)	<input checked="" type="checkbox"/>
Attachment Notes			
Signatures			
Inspector Signature	Date	CQM Signature	Date
Inspector Name:		CQM Name:	

END OF EXHIBIT

SECTION 01 45 00.30

QUALITY MANAGEMENT

DESIGN-BUILD & GC/CM

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section defines the requirements for the Contractor to establish, implement, and maintain an effective Quality Program to manage, control, document, and assure the Work complies with the requirements specified in the Contract Documents. This Section also defines the requirements for the Contractor to prepare, implement, and maintain plans, programs, procedures, and the organization necessary to assure quality for materials, equipment, workmanship, manufacturing, and installation operations covering both on-site and off-site Work by the Contractor, including Subcontractors, Subconsultants, Suppliers, and Testing Laboratories.

1.02 REFERENCES

- A. This Section incorporates by reference the latest revisions of the following documents. They are part of this Section as specified and modified.
1. Federal Transit Administration (FTA):
FTA Quality Management System Guidelines December 2012
FTA-PA-27-5194-12.1
 2. International Building Code - Structural Tests and Special Inspections (Chapter 17) or Local Authority Having Jurisdiction's (AHJ) Building Code
 3. American Society for Testing and Materials (ASTM) Standards
 4. Washington Association of Building Officials (WABO) Requirements
- B. Definitions:
1. Construction Work Plan (CWP): Detailed plan for constructing a specific Work activity.
 2. Readiness Review Meeting (RRM): A meeting to review and discuss all CWP elements identified below which is conducted by the Resident Engineer with the Contractor, Subcontractors and applicable third party representatives who are involved in executing, supervising, inspecting, testing and monitoring the Work activity.
 3. Inspector's Daily Report (IDR): A daily report to be completed by all Inspectors identifying work activities observed, recorded and documented.

1.03 CONTRACTOR QUALITY PERSONNEL REQUIREMENTS

- A. Employ qualified QC Inspectors meeting, at a minimum, the following requirements:
1. QC Inspectors shall have a minimum of 5 years construction QC experience for the Work they are responsible for inspecting or with a minimum of 3 years QC inspection experience plus a minimum 2 years construction experience in

engineering or inspecting within the disciplines for the Work they are responsible for inspecting.

2. QC Inspectors report directly Project Manager and cannot be responsible for directly performing, supervising or progressing the Work or have responsibilities for this Contract that conflict or appear to conflict with their primary responsibilities for quality matters.
 3. Only designated QC Inspectors may perform quality inspections. Other personnel, such as the Contractor Field Engineers or Superintendents, cannot perform as QC Inspectors.
 4. Field QC Inspectors cannot perform testing, unless they are employed by the Independent Test Lab that will perform the tests on the samples taken.
 5. QC Inspectors are responsible for reviewing, understanding, verifying and documenting in the IDR that the requirements of the approved CWP, drawings, specifications, shop drawings and other applicable Submittals are implemented on each Feature of Work by observing the construction Site Work activities, inspecting the Work activities and documenting the results of the inspections in the IDRs.
 6. At the sole discretion of Sound Transit, the Contractor may be required to replace QC Inspector(s).
- B. Mobilize the number of experienced QC Inspectors, qualified to the type of Work being performed for each Feature of Work that is necessary to perform the QC inspections with at least 1 QC Inspector for each discipline of Work being performed per worksite per shift. The number of QC Inspectors shall be coordinated with the Resident Engineer. At the sole discretion of the Resident Engineer, the Contractor shall provide additional QC Inspectors, if the Resident Engineer determines that additional QC Inspectors are required.

1.04 QUALITY MEETINGS

- A. Conduct Quality Meetings every 2 weeks with Sound Transit Quality Assurance along with additional Sound Transit representative(s) as required, the Contractor Project Manager along with other Contractor representative(s) including QC Inspectors and Third Parties (if required) to discuss quality issues. Items discussed will be documented by the Contractor and shall include due dates of assigned action items with agreement from Sound Transit Quality Assurance. Distribute minutes to all attendees and other interested parties. At a minimum, the Quality Meetings shall cover topics of:
1. Three-week look-ahead schedule update
 2. CWP status and RRM's
 3. RFIs
 4. Submittals
 5. Safety Critical submittals
 6. Inspections
 7. Special Inspections and tests
 8. Test plans, procedures and test results
 9. IDR status
 10. Quality Audits / Surveillance status

11. NCRs / Corrective Action Requests (CARs) / Corrective and Preventive Actions
12. Materials received
13. Off-site activities
14. Updates to as-built Contract documents
15. Quality training
16. Quality issues, recurring issues and actions taken

1.05 SUBMITTALS

- A. Inspection and Test Plan with Matrix within 45 days after the effective date of the NTP. Submittal must be acceptable to Resident Engineer with a No Exceptions Taken (NET) or Exceptions as Noted Resubmission Not Required (EANRNR) disposition before any Construction Work that requires inspection can begin.

Inspection and Test Matrix, include the following:

1. Specification Section number
 2. Specification Section title
 3. Section Article
 4. Test/Inspection Description
 5. Standard procedure
 6. Identify on-site/off-site testing
 7. Minimum frequency or instance for tests and inspections
 8. Entity responsible for performing tests and inspections
- B. Quality Control (QC) Inspectors. Include:
1. Name and qualifications
 2. Discipline of Work to which they will be assigned
- C. Name and qualifications of the Contractor's Independent Testing Laboratory and all subcontracted Testing Laboratories within 45 days after the effective date of the NTP.
- D. List of CWPs, within 45 days after the effective date of the NTP. Update the CWP list when new CWPs are added and resubmit within 7 days .
- E. CWPs required by the CWP List submittal.
- F. Independent Testing Laboratory Inspection and Test Reports, within 7 days after completion of the inspection or test.
- G. List of Subcontractors and Subconsultants within 45 days after effective date of NTP. Provide updates at least 10 days prior to each new Subcontractor or Subconsultant beginning Work on Contract.
- H. IDR form, including content and items as identified in Exhibit A. The Contractor may use IDR form provided herein.

- I. Contractor IDRs, within 7 days of inspection (as Submittals) for the first 4 weeks after the start of inspection or as otherwise directed by the Resident Engineer. Thereafter, provide IDRs to the Resident Engineer thereafter as a Transmittal, within 7 days of inspection.
- J. Completed Utility Strike Log, within 7 days after Acceptance. Provide copy of interim Utility Strike Log when requested by Sound Transit.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 DOCUMENT CONTROL

- A. All documents shall comply with Document Control Requirements in accordance with Section 01 31 25, Document Control and Internet-Based Document Management System.
- B. Provide process procedures in compliance with Section 01 31 25, Document Control and Internet-Based Document Management System for:
 - 1. Meetings: Agenda, Minutes, Distribution, and Filing
 - 2. RFI Management
 - 3. Change Order Management

3.02 SUBCONTRACTOR, SUBCONSULTANT, AND SUPPLIER CONTROL

- A. Submit a list of Subcontractors and Subconsultants including Work to which they will perform, and provide updates prior to each new Subcontractor or Subconsultant beginning Work on Contract.
- B. Assure all products and services procured from Subcontractors, Subconsultants and Suppliers meet Contract Document requirements.
- C. Develop and maintain procurement procedures to select and control Suppliers and Subcontractors including:
 - 1. Evaluation and assessment of Suppliers' and Subcontractors' quality systems
 - 2. Methods utilized to monitor quality performance of Suppliers and Subcontractors
 - 3. Flow down of design, reliability and quality requirements to Suppliers and Subcontractors
 - 4. Determination of criteria for performing source inspections

3.03 IDENTIFICATION, TRACEABILITY AND RECEIVING, HANDLING, STORING AND CONTROLLING OF PRODUCTS, MATERIALS, AND EQUIPMENT

- A. Establish and maintain procedures for receiving, handling, storing, identifying and controlling items of production (batch materials, parts, components and subassemblies) to prevent use of incorrect or defective items and to ensure only correct and acceptable items are used or installed.
 - 1. Provide identification and traceability during all phases of production from receipt of raw materials, components and subassemblies through the manufacturing process to the delivery of final products and systems.

2. Utilize batch number, shipment number, packing slips or invoices along with test data sheets and material certifications for determining traceability of raw materials.
 3. Provide physical separation, procedural control or other appropriate means where physical separation is impractical or where record traceability is lost.
 4. Employ storeroom or inventory tracking procedures for traceability of items back to a particular order number, batch number, date received, test lot or other pertinent source.
 5. Employ routing documentation for traceability of assemblies in production.
 6. Mark final assemblies with Contract number, model number, serial number and bar codes.
- B. Control receipt of products, materials and equipment in accordance with Section 01 60 00, Product Requirements.
- C. Inspect and record on the IDR identification, damage and quantity of all products, materials and equipment received. Large lots may be inspected by an industry approved standard sampling method.
- D. Record on the IDR on-site equipment calibration occurrences including the piece of equipment, equipment identification number/label, name(s) and company of personnel performing the calibration, qualifications (if applicable), brief outline (or document reference) of the procedure including equipment used to perform the calibration and next calibration due date.
- E. All products, materials and equipment are subject to receipt inspection by Sound Transit.

3.04 PROCESS CONTROL

- A. Control on-site and off-site construction through the development of Contractor CWP's, approval of CWP's by the Resident Engineer, execution of the Work in accordance with CWP's and Contract requirements, and timely reporting of the results of the inspections on the IDR and lab test reports of required inspections and tests.
- B. Determine, in consultation with the Resident Engineer, which Work activities require submission and approval of a CWP. Prepare and submit a list of CWP's to the Resident Engineer for concurrence and approval. The Resident Engineer and the Contractor may add CWP's to the list. Resubmit the CWP list when CWP's are added, deleted or modified.
- C. CWP's: Prepare and submit a CWP for each of the Work activities identified on the CWP list. Work cannot begin without Sound Transit acceptance of a CWP dispositioned as NET or EANRNR and convening of a RRM. No partial approval of a CWP will be permitted. Changes and revisions to the Work activity require a revised CWP to be submitted and a new RRM to be held prior to resuming Work. As a minimum include, in the order listed, the following in each CWP:
1. Scope of Work
 2. List of persons responsible for supervision of the Work
 3. List of required approved submittals (for example; traffic control plans and special processes), drawings (with latest revisions) and the job hazard analysis
 4. Planned start-work and completion dates, progress rate expected and Work hours
 5. Sequence of events and construction methods for performing the Work: Include Sound Transit hold points and inspection requirements

6. Handling and storage of materials and equipment
7. Inspection and Test hold points required where the next process step or activity will cover up the Work
8. Inspections and tests required by Contractor, Third Parties and Sound Transit
9. Individuals responsible for performing inspections and providing input to as-built drawings
10. Prerequisite activities and related construction safety issues
11. Off-site inspection and test activities and their locations
12. Procedures for controlling hazardous materials, as applicable
13. Erosion and Sediment Control (ESC) Best Management Practices (BMP)
14. Actions defined as "Special Events", which may expose the public to danger or inconvenience, and which may require a third party to be notified
15. Safety-critical installations, inspections and tests
16. Specific Job Hazard Analysis (JHA) for each CWP

D. CWP and RRM

1. After the CWP has been returned by the Resident Engineer dispositioned as NET or EANRNR and a minimum of 7 and a maximum of 14 days before beginning associated Work activities, attend the RRM conducted by the Resident Engineer. The Resident Engineer documents the meeting with an agenda and minutes of the meeting including an attendance record. Include an activity for each RRM on the Project Schedule.
2. All Submittals associated with the CWP must be listed in the CWP Submittal.
3. After the RRM has been held and updates (if any) have been incorporated into the CWP, the Contractor shall distribute the revised CWP and approved associated Submittals to the personnel performing the Work and to the Contractor QC Inspectors. The Contractor and/or its Subcontractor personnel shall keep a copy of the approved CWP and approved associated Submittals within proximity of the Work being done and shall adhere to the approved processes and procedures contained therein. The Contractor or Subcontractor personnel performing the Work shall produce a copy of the approved CWP and approved associated Submittals upon request by QC Inspectors, Resident Engineer team or Sound Transit personnel.

E. Control of Special Processes

1. Perform special processes (e.g., welding, brazing and soldering) only with personnel certified in accordance with the requirements of the specific processes. Maintain qualification records of personnel performing special processes in the worksite files, submit to the Resident Engineer for approval and reference in the applicable CWPs. Submit qualifications of new personnel and recertifications to the Resident Engineer on an ongoing basis during the Contract.
2. Obtain Sound Transit approval of qualifications of personnel performing special processes.

3.05 INSPECTION AND TESTING

A. Independent Testing Laboratory

1. Employ the services of an Independent Testing Laboratory to perform on-site testing, as well as, off-site testing to confirm the acceptable quality of materials, parts, and equipment required by the Contract Documents. Independent Testing Laboratory must have special inspection capability and certification. Independent Testing Laboratory shall be in compliance with ASTM E329 and be currently certified by a nationally or state-recognized regulatory agency or an industrially sponsored organization. The Contractor cannot self-perform as an Independent Testing Laboratory even if Contractor staff is WABO certified.
2. Obtain Sound Transit authorization to use the Independent Testing Laboratory before commencing Work for which testing is required by Contract Documents. Obtain Sound Transit authorization before changing or adding Independent Testing Laboratories.

B. Inspection and Test Plan

1. Prepare and submit Inspection and Test Plan with a Matrix defining the types and frequency of inspections and tests, and the entity responsible for performing each inspection and test (e.g., Laboratory, Contractor, Subcontractor or Third Party).
2. Update the Inspection and Test Plan whenever an Independent Testing Laboratory is added, or when an inspection or test is added by Change Order or a Change Notice-Work Directive.
3. Perform all QC inspections including QC inspections prior to owner conducted Special Inspections. The Contractor shall:
 - a. Prepare a schedule of Special Inspections required.
 - b. Notify Resident Engineer in advance of date of performance of Special Inspections.
 - c. Coordinate Work to ensure the next step in the process does not obscure the ability to inspect until the required inspections have been completed.
 - d. Document all inspections and test results in the IDR. Include whether the test passed or failed.
 - e. Provide photos of Work.
4. Adjustments to control procedures and CWP's may be required based upon results of inspections and tests. Document inspection and test results of the in-process inspections in the IDRs.
5. Report inspection and test compliance or noncompliance with the Contract requirements specified or indicated in the Contract Documents.

C. Special Inspections and Tests

1. Where required by permits and / or building codes of the Authority Having Jurisdiction (AHJ), Sound Transit will contract with a WABO qualified testing laboratory and / or special inspector to conduct Special Inspections and tests.
2. Special Inspection and Test Coordination: Notify Resident Engineer not less than 7 days in advance of Work requiring Special Inspections and tests within the State of Washington; provide not less than 10 days in advance of Work outside of the State of Washington. Do not proceed with the Work until a hold point has been

released by the Resident Engineer. Cooperate fully with these special inspectors and provide all assistance necessary to complete their inspections.

D. Control and Calibration of Inspection, Testing, and Monitoring Equipment

1. Calibrate and certify all testing equipment and monitoring devices. Document in calibration log. Calibration and certification requirements include the following and apply to the Contractor and all Subcontractors, Suppliers and Independent Testing Laboratories:
 - a. Be able to trace calibration to known national standards and document in calibration log.
 - b. List inspection, test and monitoring equipment with the name and serial number, date of current calibration, due date of next calibration and name of person or laboratory conducting the certification or calibration with a brief description of use.
 - c. Store all testing equipment and monitoring devices in a safe and secure location, maintained throughout the Contract and used only for testing or monitoring Work for which they are designed.
 - d. Re-calibrate, re-test and re-inspect materials, parts and equipment, if the inspection or testing equipment is suspected of being out of calibration, broken, dismantled or damaged. Document in calibration log.
 - e. Make all testing and inspection equipment certified calibration records available and display on the equipment calibration sticker showing the last date of calibration, the due date of the next calibration and the name of the calibration laboratory/company.
 - f. All on-site calibrations are to be witnessed by the Resident Engineer or Resident Engineer staff at the option of the Resident Engineer. Provide notification to the Resident Engineer of scheduled on-site calibrations 7 days prior to the calibration.

E. Inspection and Test Reporting

1. Inspection and test reports are considered Contract Record documents. Require parties performing testing and inspections to verbally transmit information regarding failed inspections and tests on the same day as discovery to the Contractor. Document failed test results on IDRs. Upon receipt of the failed inspections or test information, notify the Resident Engineer by e-mail within 1 day of the failed inspection or test results.
2. Upon discovery of nonconformance Work, no action shall be taken to cover or obscure the Work that is the subject of a failed inspection until it is corrected and re-inspected or otherwise approved by the Resident Engineer. At its discretion, Sound Transit may issue a Nonconformance Report (NCR).
3. Include the following minimum requirements in Inspection and Test Reports:
 - a. Sound Transit Contract number
 - b. Reference to Contract Specification Section requirement or test procedure
 - c. Identification of items tested
 - d. Location where sample was taken (i.e., stationing and intersection corner)

- e. Quantity of items inspected or tested
- f. Date inspection or test was conducted
- g. Name of technician
- h. Acceptance criteria
- i. Pass or Fail disposition
- j. Results
- k. Authorized signature

- F. Contractor-performed and Subcontractor-performed inspections and tests are subject to witnessing, verification, and approval, including approval of documentation, by the Resident Engineer.

3.06 NONCONFORMANCE AND CORRECTIVE ACTION

- A. Upon receipt of a Nonconformance Report (NCR) (or other nonconformance documentation mechanism) from Sound Transit, the Contractor is responsible for: Investigate and describe the root cause of the nonconformance, providing remedial Corrective Actions for the nonconformance item(s), providing Preventive Actions to prevent recurrence and recommending a disposition. Submit NCR to the Resident Engineer within 14 days of discovery of the nonconformance Work. Payment will only be made for Work which is in full compliance with the Contract. Complete all REWORK within 30 days from the date that the nonconformance condition was documented. Complete REPAIR within 30 days after the Material Review Board (MRB) has approved the repair procedure, unless additional time is requested in writing by the Contractor and approved by the Resident Engineer. The applicable category designations for NCRs are:
 - 1. USE AS IS: allows the use of an item that does not meet specified Contract requirements without the need for Corrective Action, but may require some compensation to Sound Transit as allowed elsewhere in the Contract Documents. ("USE AS IS" NCR, including photos, will be routed by the Resident Engineer to the Sound Transit Material Review Board (MRB) for review and approval.)
 - 2. REPAIR: item may be repaired if it cannot be reworked to be brought into full compliance with the Contract requirements, but it can be made suitable for use. ("REPAIR" NCR, including photos, will be routed by the Resident Engineer to the Sound Transit Material Review Board (MRB) for review and approval.)
 - 3. REWORK: item may be reworked to bring it into full conformance with the Contract requirements. REWORK only applies to conditions where a discrete item can be completely replaced (e.g., bolt). Any changes which are not replacements in part or in whole are considered a REPAIR. The Resident Engineer has final authority to determine the category to which Work is assigned in a NCR condition. Contractor is required to provide photo documentation of nonconforming Work to the Resident Engineer. ("REWORK" NCR does not require Sound Transit Material Review Board (MRB) review and approval.)
 - 4. REJECT: item is Defective and considered unsuitable for its intended use, is economically or physically incapable of being reworked or repaired, and must be replaced to bring it into conformance with the Contract requirements. These items may be scrapped or returned to the Supplier. Contractor is required to provide photo documentation of Defective Work to the Resident Engineer. ("REJECT" NCR does not require Sound Transit Material Review Board (MRB) review and approval.)

- B. For REPAIR, or REWORK, compile documentation of the NCR for Resident Engineer verification of Corrective Action implementation. Include IDRs and photos of the Nonconforming Work prior to, during and after Corrective Action clearly labeled with the date, time and description of activities.
- C. Resident Engineer is responsible for submittal of required documentation to the Sound Transit MRB.
- D. Tag or otherwise identify nonconformance items requiring REWORK, REPAIR or USE AS IS. No follow-on Work that integrates with that item can be performed until REWORK or REPAIR is completed and accepted, or a USE AS IS disposition and the NCR is accepted by ST Quality.
- E. Red-tag and remove or isolate all Defective items, identified as REJECT, from the Site within 72 hours of discovery.
- F. Provide to the Resident Engineer documentation of utility strikes involving existing utilities within 1 day of the occurrence and within 24 hours record the strike on a Utility Strike Log. Provide the Utility Strike Log to Sound Transit upon request.
 - 1. The Utility Strike Log shall include the following:
 - a. Location
 - b. Date and time of occurrence
 - c. Survey coordinates and elevation
 - d. Utility Type
 - e. Size of Utility
 - f. Name/Description of Utility
 - g. Circumstances leading to the strike
 - h. Date and time of repair after completion
 - i. Contractor performing repair
 - j. Date of acceptance by the Utility owners
 - 2. The Resident Engineer in conjunction with the affected utility entity will determine the work required to appropriately repair the utility strike.
 - 3. Record all utility strikes and repairs on the as-built drawings within 3 days after strike, or as otherwise approved by the Resident Engineer.

3.07 QUALITY RECORDS

- A. Quality Records are a subset of the Contract Records and that document or reflect the quality of the Work. Quality Records includes, but are not limited to, third party reports, off-site inspection reports, IDRs, test reports, Quality Audit and surveillance reports, mill test reports, certificates of compliance, personnel qualifications and certifications, Nonconformance Reports (NCRs), Corrective Action Requests (CARs), failure analysis reports, instrumentation calibration reports, Punch Lists and photographs.

3.08 QUALITY TRAINING

- A. Provide training to personnel performing Work activities affecting quality of the processes and the product. Maintain records of the training including attendance sign-in records, curriculum, tests, certifications, and training materials as well as qualification and certification documents of personnel who have received training for special processes from outside training organizations.
- B. Provide construction training to Quality Control (QC) Inspectors. Provide a training schedule to the Resident Engineer.

END OF SECTION

EXHIBITS

The following list of Sound Transit Forms and Templates are provided by Sound Transit and are required to be used for the duration of the project. Periodic updates may be issued by Sound Transit.

- 1. Exhibit A - IDR
- 2. Exhibit B - Inspection and Test Matrix Form

If the Contractor has an equivalent form they wish to use, they must submit the proposed form to Sound Transit for review and approval. Acceptance of the proposed forms is at the sole discretion of Sound Transit.

SECTION 01 45 00.30 - EXHIBIT A
INSPECTOR'S DAILY REPORT (IDR) FORM (2 PAGES)

Date:		Report No.:	
Project Description:		Project Location:	
Contract Unit #:		WEATHER	
Contractor:		Sunny: <input type="checkbox"/>	Overcast: <input type="checkbox"/>
CM Team:		Rain	Snow
Inspector:		Low Temp	High Temp
Work Shift:	Day: <input type="checkbox"/>	Swing: <input type="checkbox"/>	Graveyard: <input type="checkbox"/>
Work Location:			

Job Site Safety / Incident /Accident

Contract Work Performed – include scope, quantity, location, drawing nos., inspections, tests, activity ID# and calibration records(if available)

Change Order / Work Directive / T&M Work Performed – include scope, quantity, location, and CO or WD Number

Third Party Work- include scope, quantity, inspections

Nonconformance Work – Include defective work notification, if issued

Contractor / Subcontractor Manual Craft Person Count																						
Contractor / Subcontractor or Name (Category)	Crew #	Shift Length	Foreman	Carpenter	Electrician	Laborer	Landscaper	Finisher	Operator/Oiler	Surveyor	Teamster	Iron Worker	Driller	Bricklayer	Plumber	Pile Buck	Flagger	Welder	Lineman	Inspector/Test Tech	Other – Describe in	Total
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Work Force																						0

Work Force Notes

List Major Equipment Types				
Contractor / Subcontractor Name(s)	Equipment Type(s)	Hours		
		Working	Idle	Down Time

Materials Delivery / Manifests – Basis Code for Acceptance: 1. App'd Mtrl List; 2. Insp.; 3. Mtrl Cert.; 4. Plant Cert.					
Material	Basis Code	Buy America		Quantity Received	Remarks
		Yes <input type="checkbox"/>	No <input type="checkbox"/>		
		Yes <input type="checkbox"/>	No <input type="checkbox"/>		
		Yes <input type="checkbox"/>	No <input type="checkbox"/>		
		Yes <input type="checkbox"/>	No <input type="checkbox"/>		
		Yes <input type="checkbox"/>	No <input type="checkbox"/>		

Signatures			
Inspector Signature		Contractor Signature	
Date		Date	
Inspector Name		Contractor (Print Signature Name)	

Attachments – check as appropriate

Photographs	<input type="checkbox"/>	Surveyor Daily Report	<input type="checkbox"/>
T & M Sheet	<input type="checkbox"/>	Special Inspector Daily Report	<input type="checkbox"/>

SECTION 01 45 00.30 - EXHIBIT B
INSPECTION AND TEST MATRIX FORM

Section	Title	Section Article	Test/Inspection Description	Standard Procedure	On/Off Site	Minimum Frequency or Instance	Test/Inspection By

END OF EXHIBITS

SECTION 01 45 10
CONFIGURATION MANAGEMENT

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section specifies requirements for the Contractor's Configuration Management Program, which includes planning, identification, definition, implementation, control, and accountability.

1.02 REFERENCES

- A. Electronic Industries Alliance (EIA)
 - 1. EIA-649 National Consensus Standard for Configuration Management

1.03 CONFIGURATION MANAGEMENT PROGRAM

- A. Maintain a current internal Configuration Management (CfgM) operating procedure for the tasks specified herein, adequately disseminated and adhered to by Contractor personnel assigned to work. As part of the overall organization, designate a lead Configuration Management Specialist for the purpose of being the primary contact for the Contractor on Configuration Management issues.
- B. Maintain and make available to Resident Engineer accurate and current configuration records throughout the performance of the Contract.
- C. Accountability
 - 1. Maintain records such that the configuration of all items being delivered shall be definable in terms of their component part numbers.
 - 2. Account for differences between the engineering-released and the as-built configuration documentation.
 - 3. Record the status of change approvals and their incorporation at each point in product development, test, production, and operational usage.
 - 4. Maintain a serialization and configuration record.
 - 5. Maintain records tracking for the status of interface specifications, control documents, and plans.
 - 6. Maintain records tracking for the status of software once a baseline has been defined.
- D. Configuration Management Plan
 - 1. Prepare, provide, and maintain a Contractor Configuration Management Plan. This plan shall include management planning, management identification, change management, status accounting, verification audits, management of digital data, and Contractor/vendor configuration management.

2. For unmodified items, provide current internal CfgM operating procedures for the applicable tasks specified herein, adequately disseminated and adhered to by assigned Contractor personnel.
3. Provide CfgM quality records for review at Contractor's facility upon request. These quality records are documentation, which record and verify the results of a controlled process associated with the Contractor's efforts to meet the requirements of this Section.
4. The following are CfgM Quality Records:
 - a. Change records
 - b. Configuration audit reports
 - c. Configuration status accounting records
 - d. Delivery records (Certification of Completion)
 - e. Drawings (drawings, parts lists, models, datasets, circuits, software, geometry)
 - f. Evidence of completion records
 - g. Change incorporation scheduling records, management plans (Configuration management plan)
 - h. Engineering release records (drawings, specifications)
 - i. Variances (deviations)
 - j. Manufacturing, inspection and test records. For unmodified items, only delivery records and variances are required

E. Configuration Identification

1. Deliverable items shall be uniquely marked and be consistent with the Contractor's internal procedures. Deliverable items and their subassemblies shall have permanent item identification applied. Identification shall consist of product identifiers and individual unit identifiers in accordance with EIA-649.
2. Establish baselines for deliverable items, in accordance with the Contractor's internal procedures, as an item proceeds in design from specification to delivered product. Generate configuration documentation for each baseline. This documentation shall include new development, modified, as well as unmodified Commercial Off the Shelf (COTS) items.
3. For unmodified items, deliverable items shall be uniquely marked and be consistent with the Supplier's internal procedures. Deliverable items and their subassemblies shall have permanent item identification applied.

F. Configuration Change Control

1. Conduct a configuration change control process. For unmodified items, the Contractor is not permitted to revise the design or process documentation of the product without prior authorization of Resident Engineer.

2. Prepare and submit Contractor Change Proposals (CCP). Implement changes as Major or Minor in accordance with the subparagraphs below.
 - a. Major Changes: Prior to implementation by the Contractor, the Resident Engineer will authorize Major changes. Approved Major changes will have a mutually-agreed retrofit plan established.
 - b. Major changes are changes that affect one or more of the following:
 - 1) Technical Specification for this Contract (including its appendices)
 - 2) Cost or delivery schedule
 - 3) Interface control documentation
 - 4) Delivered configuration items
 - 5) New or revised requirements for Contractor-identified support equipment or special tools
 - 6) Compatibility with Contractor-identified support equipment or Sound Transit-furnished equipment
 - 7) Interchangeability (as applied to end items and to all subassemblies and parts of repairable end items, excluding the pieces and parts of non-repairable subassemblies) after acceptance of configuration item
 - 8) Configuration to the extent that retrofit action is required
 - 9) All other changes not listed above, which affect form, fit, or function (as defined by EIA-649) of deliverable items after Resident Engineer acceptance of the configuration item
 - c. Minor Changes: Minor changes are changes not classified as Major. Refer Minor changes to Resident Engineer for concurrence with classification of the change. Implementation by the Contractor prior to Resident Engineer concurrence that change is Minor is done at risk of the Contractor. Minor changes shall be submitted commencing with delivery to Sound Transit of the first configuration item.
- G. Deviations: Submit and document requests for deviations from Contract requirements for Resident Engineer approval in accordance with EIA-649. The Contractor shall disposition minor deviations with Resident Engineer concurrence on a case-by-case basis.
- H. Configuration Status Accounting
 1. Establish and maintain a Configuration Status Accounting (CSA) system database for deliverable hardware. The Contractor configuration status accounting system shall:
 - a. Provide the records necessary to verify that the "as designed" configuration is used as the basis for the "as built" configuration.
 - b. Provide status of Major and Minor change processing from initiation through physical incorporation into the design drawings, specifications and hardware.

- c. Provide the incorporation status of Major and Minor changes into the design drawings, specifications and hardware by unit serial number.
- I. Functional Configuration Audits: The Contractor and the Resident Engineer shall jointly conduct Functional Configuration Audits (FCAs) for new development and modified items. FCAs shall be conducted following Resident Engineer approval of applicable acceptance test reports detailing the acceptance test and evaluation results. Enter details of action items raised during a FCA into the Contractor's CSA System. Participate in and support the resolution of discrepancies identified during the conduct of a FCA. Following each FCA, prepare and deliver a Configuration Audit Summary Report.
- J. Physical Configuration Audits: The Contractor and the Resident Engineer shall jointly conduct Physical Configuration Audits (PCAs) for new development and modified items. Enter details of action items raised during a PCA into the Contractor's CSA System. Participate in and support resolution of discrepancies identified during the conduct of a PCA. At the completion of each PCA, the Contractor shall prepare and deliver a Configuration Audit Summary Report.
- K. Delivery
 - 1. Include in each shipment a Certificate of Conformance, signed by the Contractor Quality Manager or designee. Separate certificates will be supplied for each assembly or part number if more than one part number applies.
 - 2. The certificate shall list the following, at a minimum, for the shipment:
 - a. Sound Transit purchase order number
 - b. Part number
 - c. Serial numbers (if applicable)
 - d. Applicable top level specification(s) and drawing(s) with revision levels
 - e. A listing of existing non-conformances by unit (including references to Sound Transit approving paperwork).
 - 3. Contractor format will be acceptable. Sound Transit QA will review each Certificate of Conformance at the Contractor factory and provide concurrence unless Sound Transit inspection is waived.
- L. Nonconforming Units: If, during inspection or test, a unit is determined to be out of compliance to specification or Subcontractor drawing requirements, and the Subcontractor wishes to include the rejected unit as a deliverable unit without fully correcting the defect, Resident Engineer shall be notified within 5 days for concurrence. However, units which do not meet interchangeability requirements will not be considered for acceptance. The notification shall be in the form of a non-compliance notice per Section 01 45 00, and will include, at a minimum, a clear description of the defect, the part number, and serial number of the unit, and the suggested disposition with technical and cost/schedule justification. Unless approved in writing by Resident Engineer, a rejected unit shall not be part of the procurement quantity.
- M. Data Management
 - 1. Maintain a data management program and submit existing Data Management Plan. Include Data Management Plan as a subsection of the Configuration Management Plan.

2. Describe how functional requirements are being met and how interfaces are organized. Use a logical methodology for generating or acquiring, identifying, providing status, planning, and controlling technical and management data and related information.
 3. The methodology shall address on-time delivery of data, identification, marking and control of proprietary data, data quality, updates and corrections to submitted data, automation, and deliveries.
- N. Data Accession List (DAL): The purpose of the DAL is to provide an accession list, which is an index of data that may be available for request. It is a medium for identifying Subcontractor internal data, which have been generated in compliance with the work effort. As a minimum, the DAL shall include the document number, revision, date and title. The DAL provides only a listing of the data and not the data itself. The Data Management organization is authorized to provide copies of the data listed on the DAL only upon receipt of a written Resident Engineer Subcontract management request. It is the responsibility of the Subcontractor to notify the Data Management organization when releasing data defined as a DAL item and to provide information (e.g., location and copies) of such data to Resident Engineer upon request.
- O. Records Retention: Retain Project Records in accordance with the General Conditions. Records.
- P. Hardware Identification
1. All items, beginning with the lowest level of repair or replacement, identified by the same part number shall have the same physical and functional characteristics, shall be equivalent in performance and durability, and shall be interchangeable without alteration to themselves or associated items, other than normal field adjustments.
 2. An item shall not be considered interchangeable if it requires modification for fit or performance other than site-specific programming or jumper configurations identified in the drawings provided to Sound Transit for that site.
 3. Old and new configuration items that require segregation shall be identified either by a new drawing number or a dash number added to the original drawing.
 4. Mark all hardware components to the lowest level of repair and replacement with part number identification.
 5. The hardware identification marking shall coincide with the officially released engineering data.
 6. Nameplates on major equipment items shall provide space for Sound Transit numbers to be added by the Contractor at the direction of Resident Engineer.
 7. Serialization is required on each item of equipment when industry practice or codes require serial numbers.
 8. Assign an individual serial number in a numerical sequence established for the type or model series equipment being supplied. Do not use duplicate serial numbers within a type or model series. Serial numbers shall not exceed ten digits.

1.04 SUBMITTALS

- A. Configuration Management Plan: Submit draft plan within 60 days after the effective date of Notice to Proceed.

- B. Submit final plan 30 days after Resident Engineer comments on the draft plan are received.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

SECTION 01 46 00

**SYSTEM SAFETY AND SECURITY HAZARD MANAGEMENT
DESIGN BUILD**

PART 1 - GENERAL

1.01 SUMMARY

- A. The Design Builder shall develop and implement a Safety and Security Hazard Management program for the project and document and certify compliance. The Design Builder is responsible for safety and security management and certification during all phases of the Work to include design, construction, testing and commissioning, and preparation for revenue operations in accordance with applicable Agency and Governmental Requirements. Sound Transit will document and certify compliance during operation and maintenance of the transit system.
- B. The objective of System Safety and Security Hazard Management is to achieve and document an acceptable level of safety and security risk through a systematic approach to safety hazard and security vulnerability management. This is to be achieved through adherence to the design criteria, development and implementation of mitigation measures, compliance with technical specifications, compliant construction, facility, trackway, and systems verification.

1.02 REFERENCE

- A. The Sound Transit Safety and Security Hazard Management process is conducted in accordance with current versions of the following documents:
 - 1. System Safety – MIL-STD-882E
 - 2. Manual for the Development of System Safety Program Plans for Commuter Railroads – APTA Commuter Rail Safety Management Program
 - 3. Federal Transportation Administration (FTA) Guideline 5800.1, Safety and Security Management Guidance for Major Capital Projects.
 - 4. Federal Transit Administration (FTA) Hazard Analysis Guidelines for Transit Projects, DOT-FTA-MA-26-5005-00-01.
 - 5. Sound Transit Agency Safety and Security Certification Plan (SSCP)
 - 6. Sound Transit Agency Safety and Security Management Plan (SSMP)
 - 7. Project Specific Safety and Security Management Plan (SSMP)
 - 8. Washington State Rail Safety Oversight Program Standard (WSRSOPS)
 - 9. FTA Handbook for Transit Safety & Security Certification
 - 10. FTA Security Design Considerations Manual
 - 11. APTA Safety and Security Guidelines and Best Practices

1.03 DEFINITIONS

- A. **Certifiable Item List (CIL)** – A list typically arranged and according to contract that indicates safety or security related components requiring certification. It is further

broken down into sub-items that appear on the various lists for verification that they have been addressed.

- B. **Fire/Life Safety and Security Committee** – The Fire/Life Safety and Security Committee acts as a review board of the activities, analyses, and reports generated on fire/life safety and security issues.
- C. **Hazard** – Any real or potential condition (as defined in the transit agency's hazard management process) that can cause injury, death, or damage to or loss of equipment or property, or damage to the environment.
- D. **Hazard Analysis** – Any analysis performed to identify hazardous conditions for the purpose of their elimination or control.
- E. **Interface Hazard Analysis (IHA)** – A systematic analysis is designed to complete the system safety program tasks that other techniques are unable to complete for systems of systems, that is, hazard identification and assessment, assessment of residual mishap risk and hazard tracking.
- F. **Operating Hazard Analysis (OHA)** – An analysis performed of the proposed operation to identify operational mitigations that will lower the risk to the lowest practical level.
- G. **Preliminary Hazard Analysis (PHA)** – An analysis performed to obtain an initial risk assessment of a concept or system and identify mitigations that lower the risk to the lowest practical level. This document shall be updated throughout the design and construction of the project.
- H. **Safety** – Freedom from unintentional harm; a reasonable degree of freedom from those conditions that can cause injury or death to personnel, damage to or loss of equipment or property.
- I. **SSIMS – Safety and Security Information Management System** – A business process management tool used to create, track and manage Safety and Security Certifiable Item Lists and their respective Verification Matrices.
- J. **Security** – Freedom from intentional harm
- K. **SQM** – Sound Transit Office of Safety and Quality Management
- L. **System** – A composite of people, procedures, and equipment that are integrated to perform a specific operational task or function within a specific environment. This term is also used to denote the overall rail fixed guideway system; in which case it is capitalized.
- M. **Subsystem** – A major functional subassembly or grouping of items or equipment satisfying a logical group of functions within a particular system.
- N. **System Hazard Analysis (SHA)** – Inductive and deductive procedures in which hazards are identified and analyzed.
- O. **Subsystem Hazard Analysis (SSHA)** – A systematic analysis of subsystem operation to identify, classify, and eliminate hazards.
- P. **Threat** – Deliberate actions intended to cause injury or death to people, or damage or loss to critical assets.
- Q. **Threat and Vulnerability Assessment (TVA)** – An analysis performed to obtain the system security threats, evaluate vulnerabilities to those threats and identify mitigations that lower the risk from the realization of those threats to the lowest practical level.

- R. **Vulnerability** – Any weakness, flaw or condition that allows and/or can be exploited for successful realization of a potential threat against the transit system.
- S. **Verification Matrix (VM)** – A matrix that displays the risk analysis information for each Certifiable item and ensures that the identified mitigations have been implemented in Design, Construction, Testing, and Operations as applicable.

1.04 SUBMITTALS & UPLOADS

- A. Submit the following documents for approval in accordance with Section 01 33 00, SUBMITTAL PROCEDURES:
 - 1. Resume of the Safety and Security Certification Manager (SSCM) within 30 days of Notice to Proceed (NTP).
 - 2. Resume of the Security Design Consultant within 30 days of Notice to Proceed (NTP).
 - 3. Project specific Safety and Security Management Plan (SSMP) within 120 days of NTP. The project specific SSMP shall describe the Design Builder's approach, process, procedures and organization to execute the Sound Transit SSMP and SSCP.
 - 4. Incorporate Safety and Security deliverables and activities into the master project schedule. Example activities include: HA workshops, SSMP, CIL update, Hazard analysis update, Certification conformance documents expected to be submitted by design package disciplines, OHA report, etc. Show safety and security related test and inspection hold points when the project enters construction.
 - 5. System Safety and Security Analyses:
 - a. Facilitate a hazard analysis workshop prior to the 50 percent design milestone and submit updated Preliminary Hazard Analysis (PHA) and provide a report/log within 30 days after PHA workshop.
 - b. Facilitate a Final Design Hazard Analysis (HA) workshop prior to the IFC of the first completed design package and submit updated HA; and workshop report/log within 30 days after HA workshop.
 - c. Facilitate a workshop prior to the 50 percent design submittal to develop the Systems Hazard Analysis / Subsystem Hazard Analysis (SHA/SSHA), Operating & Support Hazard Analysis (O&SHA), and Interface Hazard Analysis (IHA) and submit a report within 30 days after the workshop. Refer to section 3.5 - System Safety Analysis, herein.
 - d. Facilitate a workshop prior to the IFC design submittal for Systems to finalize the System Hazard Analysis / Subsystem Hazard Analysis (SHA/SSHA), Operating & Support Hazard Analysis (O&SHA), and Interface Hazard Analysis (IHA) and Submit a report within 30 days after the workshop. Refer to section 3.5 - System Safety Analysis, herein.
 - e. Submit an Operating Hazard Analysis (OHA) final report to include supporting documentation for operating conformance 30 days before revenue service. Submit draft report to Sound Transit 90 days before revenue service. The report shall detail the systems, equipment, and facilities assessed; potential hazards; operational/procedural

- recommendations for ST Standard Operating Procedures (SOP's), Standard Maintenance Procedures (SMP's), or Facilities Maintenance Procedures (FMP's); training required; and the verification process for such procedures for Operations Conformance Documentation.
- f. All Hazard Analyses shall be developed and tracked in the Safety & Security Information System (SSIMS), including PHA, SHA, SSHA, O&SHA, OHA, and IHA by the Design Builder.
 - g. Participate in TVA workshops conducted by Sound Transit as needed as the design progresses.
6. Certifiable Items List (CIL) for design, construction and testing updates 15 days after each PHA workshop.
 - a. Update List according to the PHA workshop results.
 - b. Update CIL for each submitted design package.
 7. Verification Matrix (VM): prepare and submit a matrix for tracking certification in accordance with Sound Transit Agency SSCP. Update as design and construction is advanced through Contract Acceptance. Include the following:
 - a. CIL and associated hazard analysis
 - b. Identify Critical Items in each planned design and construction package.
 - c. Safety and Security Requirements included in the Design Criteria Manual, and approved Codes and Standards applicable to the project.
 - d. Design Verification includes documents such as drawings, specifications, calculations, etc.
 - e. Construction Verification includes supporting document such as submittals, compliance test reports, daily and special inspection reports, photos, graphics, etc.
 - f. Testing Verification includes all performance testing documentation.
 - g. Operations Verification includes all standard operation and maintenance procedures, training and certification, etc.
 8. The Design Builder shall work with the System Safety and Security Specialists to upload the VM to the Safety and Security Information Management System (SSIMS) at 50 percent design, and update sequentially for each deliverable milestone thereafter.
 9. If changes are proposed by the Design Builder in an approved Alternative Technical Concept (ATC), design or construction which may impact the safety and security certification of any certifiable items in the CIL, the Design Builder shall update and resubmit the CIL, PHA, VM, and System Safety Analyses with the proposed change for the impacted item.
 10. Transmit (by upload to SSIMS) Security Certification Documents including, but not limited to:
 - a. 3D imaging of camera locations and views confirming all required areas

are covered

- b. Riser diagrams of CCTV and Access Control
 - c. Documents confirming that all required restricted spaces are access controlled
 - d. Lighting diagrams indicating lighting requirements were met in accordance with the appropriate Design Criteria Manual (DCM).
 - e. Landscaping design documents confirming the design meets CPTED requirements
 - f. An electronic itemized list of all the cameras that contain the following information:
 - 1) Camera number
 - 2) Camera location
 - 3) Camera serial number
 - 4) Manufacture date
 - 5) Camera type (PTZ, fixed, thermal, IR)
 - 6) Camera make
 - 7) Camera model
 - 8) Drawings
 - g. An electronic itemized list of all access control devices and alarms that contain the following information:
 - 1) Device number
 - 2) Device location
 - 3) Serial number
 - 4) Manufacture date
 - 5) Device type
 - 6) Device make
 - 7) Device model
 - 8) Drawings
11. Transmit Safety and Security Certification Review Monthly Progress Reports: no later than 10 days prior to the project's SSCRS monthly meetings and continuous from NTP through the completion of the contract inclusive of all project stages.
12. Submit Safety and Security Certification Verification Report (SSCVR) 14 days prior to Revenue Operations.

1.05 QUALITY

- A. Design Builder's Safety and Security Certification Manager (SSCM) must have completed a recognized safety certification training course provided by the Federal Transportation Administration (FTA), Transportation Safety Institute (TSI), or other recognized Safety and Security Certification Training Agency within the last 3 years.
- B. The SSCM must have the knowledge of the federal, state, local laws, codes, and regulations; FTA and Federal Rail Administration (FRA) requirements for Safety and Security Certification of Public Transit System, and shall have a minimum of 7 years of experience in conducting Safety and Security Certification of FTA major capital projects.
- C. The SSCM shall have a single point of responsibility for all safety and security tasks other than construction safety and site security during construction including hazard management, certification and verification, and shall interface with Sound Transit Safety and Quality Management (SQM) and Public Safety Divisions on issues related to system safety and security.
- D. The Security Design Consultant shall have a minimum of 3 years of physical security design experience. It is preferred that the consultant holds an ASIS International Certified Protection Professional (CPP) or Physical Security Professional (PSP) certification with demonstrated experience in CPTED principles. Due to the sensitive and confidential nature of the subject matter, the Security Design Consultant for the project will work directly with Sound Transit's Public Safety and Transit Systems Divisions.

1.06 RECORDS MANAGEMENT

- A. The Design Builder shall maintain documentation of all system safety and security related activities throughout the design, construction, testing, and pre-revenue operations.
- B. The Design Builder is responsible for documenting conformance required for the Safety and Security Certification program and uploading the documents in the SSIMS database until all safety and security certification items are deemed closed by Sound Transit. Conformance documents shall be uploaded to SSIMS on a per certifiable item basis with document pages only applicable to conformance provided.

1.07 SSMP AND SSCP GENERAL REQUIREMENTS

- A. The Agency SSMP provides guidance for managing safety and security risk throughout the life of a project in preparation for revenue service, and the SSCP defines the process required to verify that Sound Transit's transit systems and facilities have met requirements and are operationally safe and secure for customers, employees and the general public.
- B. The SSMP emphasizes the reduction of operational risk by identifying and addressing hazards and vulnerabilities in a systematic manner. The Design Builder is responsible to generate and implement the project-specific SSMP consistent with the Agency SSMP.
- C. The Agency SSCP ensures that the design, construction, fabrication, installation, testing and commissioning of all safety and security critical elements (civil, structural and systems) have been evaluated for conformance with the safety and security requirements, and to verify their readiness for operational use.. The Design Builder is responsible to implement the Agency SSCP for the project.
- D. The objective is to achieve acceptable risk through a systematic approach to hazard analysis and management, criteria adherence, design and construction certification and

review, and formal contract acceptance. This is accomplished through design, documentation and verification that:

1. System safety hazards are identified, assessed, and mitigated to acceptable and manageable risk levels through hazard analysis processes such as a PHA and other hazard analyses as described in Section 1.4 A 5c, herein.
2. Security vulnerabilities are identified and assessed, and documented action is taken to resolve identified unacceptable risk using a TVA process.
3. Appropriate codes, guidelines and standards have been reviewed to provide a basis for safety and security considerations in final design documents.
4. Facilities, systems and/or equipment have been designed, constructed, inspected and tested in accordance with applicable codes and standards.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION.

3.01 SAFETY AND SECURITY CERTIFICATION

- A. As described in the tasks above, the Design Builder shall work with Sound Transit to certify the safety and security of the Project, and provide evidence of Safety and Security Certification prior to operations of the new facility, including all inspection and acceptance reports by the Authorities Having Jurisdiction (AHJ) (Fire Department, municipal services, etc.).
- B. The Design Builder shall supply all documentation to support the Safety and Security Certification process. To comply with this certification process, the Design Builder shall follow all the requirements in the Sound Transit Agency SSMP. If there are "Early Work" designated elements, the process must still be followed with "Early Work" design being certified prior to construction, and followed by construction and any required testing for certification.
- C. The Design Builder shall appoint a Safety and Security Certification Manager (SSCM) and additional resources to lead and coordinate the system safety and security efforts to comply with the Agency SSMP, Agency SSCP, and project-specific SSMP.
 1. The SSCM shall ensure the implementation of Agency SSMP, Agency SSCP, and the project-specific SSMP.
 2. The SSCM shall ensure the delivery of all applicable documents listed in Section 1.4 – Submittals herein.
 3. The SSCM shall prepare the agenda and maintain meeting minutes for the monthly SSCRS.
 4. The SSCM shall attend the monthly Safety Security Certification Review Subcommittee (SSCRS) status meeting with Sound Transit and key safety and security personnel, and submit Safety and Security Certification Review Monthly Progress Report.
 5. The SSCM shall provide quarterly reports as stated in Section 1.4.A.12 for status of compliance to fire and life safety performance requirements, design packages review status, and identify current issues to be addressed. The quarterly report will be discussed in the SSCRS monthly meeting, therefore, report shall be provided 10 days prior to SSCRS meeting.

6. The SSCM shall provide all safety and security infrastructure elements consistent with the DCM and contract requirements according to the Agency SSMP and SSCP.
7. The SSCM shall conduct design reviews for all design packages and/or milestone submittals to ensure all safety and security requirements, certifiable items, and hazard mitigations are incorporated into the design. The review shall include safety and security analysis of the design and identification of other potential hazards and threats.
8. The SSCM shall participate in all TVA workshops conducted by Sound Transit Public Safety Division. The SSCM shall coordinate with Sound Transit Public Safety Division regarding all matters related to the review and closeout of Sensitive Security Information (SSI) documents and submittals.
9. The SSCM shall conduct HA workshops and update the project-specific PHA as listed in Section 1.4 A.5.a & b - System Safety and Security Analyses.
10. Through SSIMS, the SSCM shall identify and categorize safety and security Certifiable Items by design package.
11. The SSCM shall ensure that all safety and security conformance supporting documents including, but not limited to, drawings, specifications, calculations, submittals, reports, photos, testing documents, operation and maintenance procedures, and training and/or certifications are uploaded by the Design Builder into SSIMS for each identified CIL item contemporaneous with each design package submittal and as construction progresses.
12. The SSCM shall coordinate with the design team on all design deviations. Any design deviation determined to be safety/security-sensitive shall be presented to the project SSCRS for consideration by the voting members and implementation of appropriate hazard management measures. The committee may deem it necessary to perform a PHA or TVA if the hazard affects safety and security certifiable items. The resulting PHA/TVA report and/or SSCRS meeting minutes shall be included in the design deviation package presented to the MRB.
13. The SSCM shall be responsible for assisting and providing all the safety and security certification documentation to the Sound Transit audit team to ensure compliance with the Agency SSMP and SSCP.

3.02 SAFETY AND SECURITY PROCESS REQUIREMENTS:

- A. The Design Builder shall coordinate with Sound Transit and AHJ's to ensure that systematic, documented, comprehensive, verifiable, and continuous System Safety and Security processes are applied throughout the duration of the Project to implement the intent of the Agency SSMP and SSCP. The Design Builder shall perform the following:
 1. The Design Builder shall comply with the Agency SSMP and SSCP.
 2. The Design Builder shall perform a PHA and participate in the TVA that complies with the processes set forth in the Agency SSMP. The Design Builder in conjunction with SSCM shall evaluate and identify additional potential hazards, threats and vulnerabilities through the progression of the design and provide mitigations to eliminate and/or control such risks in accordance with Agency SSMP. The Design Builder shall develop the Operational Hazard Analysis during the Construction Phase and track items in SSIMS.

3. The Design Builder shall hold a PHA workshop and include, at a minimum, the following stakeholders:
 - a. Sound Transit Operations and Maintenance
 - b. BNSF / Amtrak Operations
 - c. Law Enforcement personnel
 - d. Sound Transit Safety and Quality Assurance
 - e. Sound Transit Public Safety Division
 - f. Sound Transit Design, Engineering and Construction Management
 - g. Design Builder Design Team
 - h. Authorities Having Jurisdiction (Fire Department, City, etc.)
 - i. Others as directed by SQM or Public Safety
4. The Design Builder shall track the completion of the Safety and Security Certification effort and provide monthly reports to Sound Transit on the progress of the certification efforts.
5. The Design Builder shall participate in the project's SSCRS meetings conducted by the Sound Transit System Safety Specialist.
6. The Design Builder shall update the CIL throughout the life of the project from the design through the construction phase until Certification is achieved.
7. The Design Builder shall maintain and update a Verification Matrix (VM) in accordance to the Sound Transit Agency SSCP.
8. The Design Builder shall input and utilize the project's SSIMS database to document completed analyses, approvals of designs, design changes and variances, inspections, tests, and other necessary information required for each certifiable item identified on the CIL.
9. Through the Safety and Security certification process, the Design Builder shall demonstrate, document and certify that the design and construction has been performed in compliance with applicable codes and standards, and ST DCM requirements for each identified CIL and hazard.
10. The Design Builder shall conduct tests and inspections to demonstrate and document compliance with contract requirements, and eliminate and/or control risks identified through the hazard analysis and threat and vulnerability assessment.
11. The Design Builder shall document and provide ST personnel training, maintenance training, and system orientation requirements for installed equipment. This shall include the provision of documentation that verifies that all required personnel training attendance and qualification for operations, maintenance, and emergency response for facilities equipment has been completed by all personnel identified by Sound Transit.
12. The Design Builder shall document that the requirements for operational and system integrated tests have been fulfilled to contract and test plan requirements.

3.03 SAFETY AND SECURITY HAZARDS ANALYSIS

- A. The Design Builder shall perform a PHA in accordance with the Sound Transit Agency SSMP.
- B. The Design Builder shall update CIL in accordance with the Sound Transit Agency SSCP.
- C. The Design Builder shall update a VM in accordance with the Sound Transit Agency SSCP.
- D. The Design Builder shall obtain acceptance of risk management strategies from the appropriate committee for the hazards and threats identified in the PHA/TVA in accordance with the Sound Transit SSMP.
- E. The Design Builder shall upload and manage the CIL and VM using SSIMS as explained in Section 3.9 below.
- F. The Design Builder shall perform OHA in accordance to Sound Transit Agency SSCP.
- G. Systems that will be subject to SHA/SSHA, IHA, and OSHA analyses include, but are not limited to; Communication, Traction Power, Signaling, and Emergency Ventilation System.

3.04 THREAT AND VULNERABILITY ASSESSMENT (TVA)

- A. The Sound Transit Design Criteria Manual (DCM), the TVA, and Project Requirements establish the security design requirements for the project. When requirements listed in the DCM and the TVA conflict, the TVA security requirements will take precedence.
- B. The TVA will be conducted by the Sound Transit Public Safety Division. The Design Builder will be responsible for coordinating with ST Public Safety Division as well as attending and participating in the TVA workshops.
- C. ST Public Safety Division will provide the Security CIL to the Design Builder at the completion of the TVA workshops.
- D. The TVA results will be uploaded to SSIMS and the Design Builder shall provide and update the required documentation for verification.
- E. All submittals that contain security certifiable items are subject to ST Public Safety Division review and approval. Once approved, no changes can be made to a security certifiable item without the written approval of ST Public Safety Division.
- F. The TVA is considered Sensitive Security Information (SSI) and is controlled under 49 CFR parts 15 and 1520. No part of this record may be disclosed to persons without a "need to know", as defined in 49 CFR parts 15 and 1520, except with the written permission of the Sound Transit Director of Public Safety. Unauthorized release may result in civil penalty or other action. For U.S. Government agencies, public disclosure is governed by 5 U.S.C. 552 and 49 CFR parts 15 and 1520. For all others, public disclosure is governed by RCW42.56.420. The SSCM will be required to develop and implement an SSI program to be in compliant with FTA and the Department of Homeland Security requirements.

3.05 SYSTEM SAFETY ANALYSES (see section 3.3.G above for applicable systems)

- A. Identify Hazards – The Design Builder shall perform safety analyses to identify potentially hazardous conditions. Perform and document qualitative analyses as required to ensure that adequate safety consideration has been given. Apply system safety analyses to:
 - 1. Evaluate and verify safety requirements of the System including design and construction.
 - 2. Evaluate the operating procedures and training requirements for operating and

maintenance personnel under normal, abnormal, and emergency conditions

3. Review two aspects of potential hazards in human-induced fault conditions:
 - a. The occupational health and safety hazard to the employee performing the task.
 - b. The safety hazards that can be introduced into the System as a result of employee act of omission or commission.
4. Provide visibility of relative safety and risk within system components.
5. Subsystem Analyses – Perform analyses of subsystems and potential hazard areas of the systems including the following:
 - a. System Assemblies and functions
 - b. Interfaces within the System and subsystems, and the various elements and subsystems which directly interface with them
 - c. Interface between the System and operating and maintenance personnel
- B. Hardware components called for in Final Design, identified critical items, and unresolved potential failures of Unacceptable and Undesirable risk dictate the depth of detail in performing the required analyses (see section 3.3). The following analyses shall be perform and documented:
 1. System Hazard Analysis / Subsystem Hazard Analysis (SHA / SSHA)
 2. Interface Hazard Analysis (IHA)
 3. Operating & Support Hazard Analysis (O&SHA)
- C. Maintain a Hazard and Security Log for capturing and tracking hazards and unresolved safety issues and actions identified during the testing, commissioning, and pre-revenue program activities.
- D. Maintain a compilation of undesirable items identified during the system safety failure mode analyses. Document for approval of any rationale in lieu of corrective action. Conduct a special review of unresolved undesirable items with the Resident Engineer. and ST Safety

3.06 SYSTEM SAFETY AND SECURITY AUDIT.

- A. Sound Transit will conduct audits throughout the safety and security certification process. The audits will serve to validate compliance with established safety and security certification processes and ensure proper verification/submittal of design conformance and construction conformance deliverables. The Design Builder shall cooperate with all audit requests and respond to findings within 30 days of receipt of the audit report.

3.07 SAFETY AND SECURITY CERTIFICATION REVIEW SUBCOMMITTEE (SSCRS)

- A. The purpose of the SSCRS is to discuss, monitor and manage the overall safety and security certification of the project through design, construction, testing, and operation. By establishing this committee, the responsibility of decisions regarding issues/items and risk evaluation and acceptance is shifted to committee collaboration, rather than a single

individual.

- B. The Design Builder shall participate in safety and security certification review subcommittee meetings on a monthly basis for the duration of the Contract.

3.08 FIRE/LIFE SAFETY AND SECURITY COMMITTEE (FLSSC)

- A. Fire safety on the facility is achieved through a composite of facility design, operating equipment, hardware, procedures, and software subsystems that are integrated to provide requirements for the protection of life and property from the effects of fire. The level of fire safety desired for the Project shall be achieved by integrating the required levels for each subsystem. Appropriate representation of AHJ is required in the FLSSC.
- B. The Design Builder shall prepare and transmit quarterly reports on the status of compliance to fire/life safety performance requirements, and identify current issues to be addressed to the Fire/Life Safety and Security Committee or coordination meetings.
- C. The Design Builder shall prepare and submit a draft and final Fire/Life Safety and Security Report. The report shall be issued to the FLSSC with copies to the AHJ upon completion of all required fire/life safety activities at the submission of the Issue for Construction (IFC) packages.

3.09 SAFETY AND SECURITY INFORMATION MANAGEMENT SYSTEM (SSIMS)

- A. The Safety and Security Information Management System is a business process management software used to create, track and manage Safety and Security Certifiable Item Lists and their respective Verification Matrixes. The Design Builder and Sound Transit will use the SSIMS database to manage the CIL and the Verification Matrix (VM).
- B. The Design Builder shall work collaboratively with SQM and Public Safety to register all Design Builder Staff members working on Safety and Security certification activities within the SSIMS software.
- C. SQM and Public Safety will provide SSIMS training to the SSCM and the Design Builder's team working on Safety and Security certification activities.
- D. The Design Builder shall develop and track Design, Construction and Testing conformance documentation along with other required certification documentation through their input and use of the SSIMS application.
- E. The Design Builder shall ensure that the appropriate personnel are uploading the verification documentation for all identified Certifiable Items into the SSIMS.

3.10 SAFETY AND SECURITY CERTIFICATION VERIFICATION REPORT

- A. The Design Builder shall comply with the Agency SSCP requirements and supply all documentation to support the safety and security certification process, as described above, and shall prepare and submit a Safety and Security Certification Verification Report (SSCVR) prior to revenue operations. A report template will be provided by Sound Transit. The SSCVR shall include:
 - 1. The issuance of a Safety and Security Certificate of Conformance for each Certifiable Element, including a record of any restrictions, conditions, and/or approved temporary measures. The Safety and Security Certificate of is signed by the parties listed in the Agency SSCP 3.1.9.
 - 2. Evidence that the requirements for operational and system integrated tests have

been fulfilled to contract and test plan requirements.

3. Evidence that all required emergency response training and exercises for local first responders have been conducted and a certificate of Occupancy has been issued by the Authority Having Jurisdiction (AHJ).
 4. The Design Builder shall provide Notice certifying that the Design Builder has fulfilled all the Safety and Security requirements and the proper documentation has been submitted and inputted into SSIMS.
- B. Final acceptance of the project shall not be issued until the comprehensive Sound Transit System Safety & Security System Readiness Certificate has been signed off by Sound Transit's Executive Management, as per Agency SSCP 3.1.10, and incorporated in the SSCVR.

END OF SECTION

SECTION 01 46 00.10**SYSTEM SAFETY AND SECURITY RISK MANAGEMENT****DESIGN BUILD****PART 1 - GENERAL****1.01 SUMMARY**

- A. The work specified in this Section for the Design Build Contract is to develop and implement a Safety and Security Risk Management program. Safety and Security requirements apply to Contractor and Subcontractor [hereafter, "Contractor(s)"] functions during all phases of work to include design, construction, testing, operational readiness, and subsequent operation of the system.
- B. This Section provides information to the Contractors regarding the Safety and Security Risk Management process, including the Certification process that Sound Transit uses to ensure that the system safety and security requirements comply with the Sound Transit Agency Safety and Security Management Plan (SSMP) and Safety and Security Certification Plan (SSCP), as well as federal and Washington State guidelines. The goal of safety and security risk management and certification is to ensure that all Sound Transit major capital projects, extensions, new and rehabilitated facilities, vehicles and equipment are operationally safe and secure for customers, employees, and the general public.
- C. The objective of System Safety and Security Risk Management is to achieve an acceptable level of safety and security risk through a systematic approach to safety hazard and security vulnerability management. This can be achieved through adherence to the design criteria, development of mitigation measures, compliance with technical specifications, and testing verification.

1.02 REFERENCE DOCUMENTS

- A. The Sound Transit Safety and Security Risk Management process is conducted in accordance with the following documents:
 - 1. System Safety – MIL-STD-882E
 - 2. Manual for the Development of System Safety Program Plans for Commuter Railroads – APTA Commuter Rail Safety Management Program
 - 3. Federal Transportation Administration (FTA) Guideline 5800.1, Safety and Security Management Guidance for Major Capital Projects.
 - 4. Federal Transit Administration (FTA) Hazard Analysis Guidelines for Transit Projects, DOT-FTA-MA-26-5005-00-01.
 - 5. Sound Transit Agency Safety and Security Certification Plan (SSCP)
 - 6. Sound Transit Agency Safety and Security Management Plan (SSMP)
 - 7. Washington State Rail Safety Oversight Program Standard (WSRSOPS)
 - 8. FTA Handbook for Transit Safety & Security Certification
 - 9. Project-specific safety and security risk management and certification documents (PHA, TVA, CIL).

1.03 DEFINITIONS

- A. **Certifiable Item List (CIL)** – A list typically arranged and according to contract that indicates safety or security related components requiring certification. It may be further broken down into sub-items.
- B. **Fail Safe:** A design feature that ensures the system remains safe, or in the event of a failure, causes the system to revert to a safe state that will not cause a mishap.
- C. **Fire/Life Safety and Security Committee:** The Fire/Life Safety and Security Committee acts as a review board of the activities, analyses, and reports generated on fire/life safety and security issues.
- D. **Hazard:** Any real or potential condition (as defined in the transit agency's hazard management process) that can cause injury, death, or damage to or loss of equipment or property, or damage to the environment.
- E. **Hazard Analysis:** Any analysis performed to identify hazardous conditions for the purpose of their elimination or control.
- F. **Operational Hazard Analysis (OHA):** An analysis performed of the proposed operation to identify operation mitigations that will lower the risk to the lowest practical level.
- G. **Preliminary Hazard Analysis (PHA):** An analysis performed to obtain an initial risk assessment of a concept or system and identify mitigations that lower the risk to the lowest practical level. This document shall be updated throughout the design and construction of the project.
- H. **Safety:** Freedom from unintentional harm; a reasonable degree of freedom from those conditions that can cause injury or death to personnel, damage to or loss of equipment or property.
- I. **Safety Data System** – A business process management tool used to create, track and manage Safety and Security Certifiable Item Lists and their respective Verification Matrices.
- J. **Security:** Freedom from intentional harm.
- K. **System:** A composite of people, procedures, and equipment which are integrated to perform a specific operational task or function within a specific environment. This term is also used to denote the overall transit system, in which case it is capitalized.
- L. **Subsystem:** A major functional subassembly or grouping of items or equipment satisfying a logical group of functions within a particular system.
- M. **System Hazard Analysis (SHA):** Inductive and deductive procedures in which hazards are identified and analyzed.
- N. **Subsystem Hazard Analysis (SSHA):** A systematic analysis of subsystem operation to identify, classify, and eliminate hazards.
- O. **Threat:** Deliberate actions intended to cause injury or death to people, or damage or loss to critical assets.
- P. **Threat and Vulnerability Assessment (TVA):** An analysis performed to obtain the system security threats, evaluate vulnerabilities to those threats and identify mitigations that lower the risk from the realization of those threats to the lowest practical level.

- Q. **Vulnerability:** Any weakness, flaw or condition that allows and/or can be exploited for successful realization of a potential threat against the transit system.
- R. **Verification Matrix (VM)** – A matrix that displays the risk analysis information for each Certifiable item and ensures that the identified mitigations have been implemented in Design, Construction, Testing, and Operations as applicable.

1.04 SUBMITTALS

A. Submit for approval:

1. Resume of Safety and Security Certification Manager (SSCM) within 30 days of Notice to Proceed (NTP).
2. Update of project-specific Safety and Security Management Plan (SSMP) at 120 days after NTP and updates as needed during the life of the project.
3. Include System Safety and Security activities in the baseline schedule.
4. System Safety and Security Analyses:
 - a. Facilitate a Final Design Preliminary Hazard Analysis (PHA) workshop around 60 percent Design milestone, update the PHA and provide a report/log within 30 days after PHA workshop.
 - b. Facilitate a Workshop (as needed) around 60 percent Design milestone for System Hazard Analysis/ Subsystem Hazard Analysis (SHA/SSHA), Operating & Support Hazard Analysis (O&SHA), Failure Mode Effects & Criticality Analysis (FMECA), Fault Tree Analysis (FTA) and Interface Hazard Analysis (IHA) and provide a report/log within 30 days after the workshop. Refer to 3.05
 - c. Conduct Operational Hazard Analysis (OHA) workshop 120 days before substantial completion and provide report 30 days after OHA workshop.
 - d. All Safety and Security analysis shall be developed and tracked in the safety data system. The PHA and TVA will be developed by the ST Safety Department and tracked in the safety data system.
 - e. The Contractor shall provide all design and construction conformance documentation through the safety data system.
 - f. The Contractor shall review mitigations compiled in the Certifiable Items List (CIL) as a result of the PHA and TVA Workshops and, in accordance with Agency SSCP, section 9.3, Safety and Security Design Criteria, update project design criteria, construction requirements and required verification documentation as appropriate to ensure mitigations are incorporated into the project design and construction. The Contractor shall provide a memo to Safety Department verifying completion.
5. Verification Matrix (VM): At a minimum, shall include the following to support the certifiable items as per Sound Transit Agency SSCP. Partner with the Senior Transportation Safety and Security Specialist (TSSS) to develop the VM around 60 percent Design milestone and update sequentially in the safety data system to the completion of the project. Verification Matrix will include:
 - a. CIL and associated hazard analyses data

- b. Safety and Security Requirements: Design Criteria Manual, and approved Codes and Standards.
- c. Develop and record suggested Construction Conformance Criteria/Documentation
- d. Design Verification: supporting document references such as drawings, specifications, calculations, etc.
- e. Construction Verification: supporting documents such as Safety and Security Verification Report (Form), submittals, reports, daily inspection reports, graphics, etc.
- f. Testing Verification: all testing documentation.
- g. Operation Verification: standard operation and maintenance procedures, training, and certification.
- h. Security Verification documents include, but are not limited to:
 - 1) Camera information
 - 2) Video Surveillance and Access Control
 - 3) Restricted Access locations
 - 4) Lighting
 - 5) Landscaping
- 6. If changes are proposed by the Contractor during design or construction which may impact the safety and security certification of any certifiable items, the Contractor shall submit the proposed change for the impacted item to the project Safety and Security Certification Review Subcommittee (SSCRS) for review and acceptance.
- 7. Construction Conformance Tracker: The SSCM will be provided a tracking document by the Safety Department to monitor progress of construction conformance verification for each certifiable element. The SSCM will update the Construction Conformance Tracker throughout the construction phase as verification documentation is uploaded to the safety data system.
- 8. Monthly reports of certification activities and updates:
 - a. Safety and Security Certification Review Monthly Progress Reports due within 10 days prior to SSCRS monthly meetings and continuous from NTP through the completion.
 - b. The report will track the planned and actual progress during the design and construction conformance verification phases.
- 9. Acceptance Audit Results for each deliverable milestone due within 30 days after acceptance of each deliverable milestone.
- 10. All Safety and Security certification conformance documentation shall be submitted to Sound Transit Safety Department certifying that all safety and security aspects of the project have been completed and documented by substantial completion.

11. Electronic itemized camera list including network switch and patch panel name and port number. See 3.04 for specific detail requirements.
12. Electronic itemized list of all access control and intrusion detection devices. See 3.04 for specific detail requirements.
13. 3D imaging of camera locations and views confirming all required areas are covered.
14. Camera system and access control / intrusion detection system riser diagrams.

1.05 QUALITY

- A. The Contractor's Safety and Security Certification Manager (SSCM) must have the knowledge of the federal, state, local laws, codes, and regulations; FTA and Federal Rail Administration (FRA) requirements for Safety and Security Risk Management and Certification of Public Transit System, with a minimum of 5 years of System Safety and Security experience, including hazard management and certification, or have 3 years of experience and have completed a recognized system safety training course provided by the Federal Transportation Administration (FTA), Transportation Safety Institute (TSI), or other recognized Safety and Security Training Agency within the last 3 years.
- B. The SSCM shall be the single point of responsibility for all safety and security tasks including risk management, certification and verification and shall interface with Sound Transit Safety Department on issues related to system safety and security.
- C. Refer to section 3.01.D for SSCM responsibilities.

1.06 RECORDS MANAGEMENT

- A. The Contractor shall maintain documentation of system safety and security throughout the design, construction, testing, and make it available for examination by Resident Engineer.
- B. All documentation used to support the Safety and Security Certification program shall be uploaded to the safety data system.

1.07 SSMP AND SSCP GENERAL REQUIREMENTS

- A. The Contractor shall update the project specific SSMP to describe how they will manage and support safety and security certification activities for the project. All updates shall comply with the Sound Transit Agency SSMP and SSCP and be reviewed and accepted by the ST Safety Department.
- B. The Contractor shall follow and perform all the necessary activities stated in the Agency SSMP, Agency SSCP, project specific SSMP, and project specific SSCP (if applicable). These plans describe the processes used to certify the safety and security related elements of the Sound Transit program.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION.

3.01 SAFETY AND SECURITY CERTIFICATION

- A. As described in the tasks above, the Contractor shall work with Sound Transit to certify the safety and security of the Project and provide evidence of certifiable items prior to operations and testing of the rail system for any new system or facility (parking garage, pedestrian bridge, station, etc.), and all inspection and acceptances report by the AHJ (Fire Department, municipal services, etc.).
- B. The Contractor shall supply all documentation to support the Safety and Security Certification process. To comply with this certification process, the Design Build Contractor shall follow all the requirements in the Sound Transit SSCP. If there are "Early Work" designated elements, the process must still be followed with "Early Work" design being certified prior to construction followed by construction and any required testing.
- C. The Contractor will be responsible that all Subcontractors provide necessary submittals and test reports and fulfill all obligations of the "Design Build Contractor" to meet the certification requirements outlined under the Agency SSMP and Agency SSCP.
- D. The Contractor shall appoint a Safety and Security Certification Manager (SSCM) and additional resources to lead and coordinate the system safety and security efforts to comply with the Agency and project-specific Safety and Security Management Plan (SSMP) and the Safety and Security Certification Plan (SSCP). The SSCM must be designated within 60 days of a Notice-To-Proceed (NTP). SSCM's specific duties include:
 - 1. The SSCM shall ensure the implementation of SSMP and SSCP.
 - 2. The SSCM shall ensure the delivery of all applicable documents listed in Section 1.04.
 - 3. The SSCM shall participate and provide a Safety and Security certification status update at the monthly Safety Security Certification Review Subcommittee (SSCRS) meeting with Sound Transit and key safety and security personnel, as well as submit Safety and Security Certification Review Monthly Progress Report.
 - 4. The SSCM shall provide all safety and security infrastructure elements consistent with the DCM and contract requirements according to the Agency SSMP and SSCP.
 - 5. The SSCM shall facilitate workshops where indicated in this specification and the project-specific SSMP.
 - 6. The SSCM shall participate in any additional PHA and TVA analyses and workshops conducted by the Sound Transit Safety Department. The SSCM shall coordinate with Sound Transit Safety Department regarding all matters related to the review and closeout of Sensitive Security Information (SSI) documents and submittals.
 - 7. The SSCM shall conduct design reviews for all design packages and/or milestone submittals to ensure all safety and security requirements and CILs are incorporated into the design. The review will provide safety and security analysis and an opportunity to identify other potential hazards.

8. Through the safety data system, the SSCM shall identify and categorize certifiable items and their corresponding safety and security requirements that are applicable to each design package and provide the Transportation Safety and Security Specialist (TSSS) with a memo indicating which CIL items are part of an IFC package.
9. The SSCM shall ensure that all safety and security conformance supporting documents including, but not limited to, drawings, specifications, calculations, submittals, reports, photos, testing documents, operation and maintenance procedures, and training and/or certifications are uploaded in the safety data system for each identified certifiable item at each major deliverable milestone, IFC, and point of substantial completion of project construction.
10. The SSCM shall independently review and verify conformance documentation prior to submission to the Sound Transit Safety Department for review and approval.
11. The SSCM shall coordinate with the design team on all design deviations. Any design deviation determined to be safety/security-sensitive shall be presented to the respective project SSCRS for consideration by the voting members and implementation of appropriate risk management measures. The committee may deem it necessary to perform updates to the PHA or TVA if the hazard duly affects safety and security certifiable items at the project SSCRS level. The resulting PHA/TVA report and/or SSCRS meeting minutes shall be included in the design deviation package presented to the MRB.
12. The SSCM shall be responsible for assisting and providing all the safety and security certification documentation to the Sound Transit audit team to ensure compliance with the Agency SSMP and SSCP.
13. The SSCM shall remain on Contractor staff until project is approved for revenue operations.

3.02 SAFETY AND SECURITY PROCESS REQUIREMENTS:

- A. The Contractor shall coordinate with Sound Transit Safety Department to ensure that a systematic, documented, comprehensive, verifiable, and continuous System Safety and Security process is applied throughout the duration of the contract to implement the intent of the Agency SSMP and SSCP. The Contractor shall perform the following:
 1. The Contractor shall include Safety and Security Certification activities on the baseline schedule. As well, the Contractor must track the completion of the Safety and Security Certification effort and provide monthly reports to Sound Transit on the progress of the certification efforts.
 2. The Contractor, in conjunction with SSCM, shall evaluate and identify additional potential hazards, threats and vulnerabilities through the progression of the design and provide mitigations to eliminate and/or control such risks.
 3. The Contractor shall participate in the project's SSCRS meetings conducted by the ST Safety Department staff.
 4. The Contractor shall update the Certifiable Items Lists (CIL) throughout the life of the project in accordance with the Sound Transit Agency SSCP, from the design through the construction phase until Certification is achieved.
 5. The Contractor shall update a VM in accordance with the Sound Transit Agency SSCP.

6. The Contractor shall utilize the project's safety data system to document completed analyses, approvals of designs, design changes and variances, inspections, tests, and other necessary information required for each certifiable item identified on the CIL.
7. Through the Safety and Security certification process, the Contractor shall demonstrate, document, and certify that the design and construction has been performed in compliance with applicable codes and standards, and ST DCM requirements for all identified CIL and hazards.
8. The Contractor shall conduct tests and inspections to demonstrate and document compliance with contract safety and security requirements and eliminate and/or control identified risks.
9. The Contractor shall document and provide ST personnel training, maintenance training, and system orientation requirements for installed equipment. This shall include the provision of documentation that verifies that all required personnel training attendance and qualification for operations, maintenance, and emergency response for all systems and facilities equipment has been completed by all personnel identified by Sound Transit.
10. The Contractor shall compile and input approved System Integration Testing Verification documents into the safety data system during the system integration testing phase for review and acceptance by the Sound Transit Safety Department.

3.03 SAFETY AND SECURITY RISK ANALYSES

- A. The Contractor shall support and participate in all system safety and security analyses, including appropriate updates as specified during all the deliverable milestones of the contract.
 1. The Contractor shall facilitate and/or conduct analyses and workshops where indicated in this specification and the project-specific SSMP.
 2. The Contractor shall provide support and participate in any additional PHA, TVA analyses and workshops and OHAs conducted by the Sound Transit Safety Department, by, including but not limited to, providing an overview of project scope, design and identifying any unique project elements that may influence safety hazard or security vulnerability input and corresponding mitigation(s).
 3. Sound Transit will provide the CIL to the Contractor for incorporation into design and construction.
- B. The Contractor is responsible for facilitating a Final Design Preliminary Hazard Analysis (PHA) workshop that complies with the processes set forth in the Agency SSMP. The PHA Workshop shall be organized by system elements to allow maximum use of resources.
- C. The Contractor is responsible for conducting an Operational Hazard Analysis (OHA) workshop during the construction phase and updating the OHA log in accordance with the Agency SSCP. Workshop will include, at a minimum, the following stakeholders:
 - 1) Sound Transit Operations and Maintenance
 - 2) Sound Transit Safety Department

- 3) Sound Transit Design, Engineering and Construction Management (DECM)
- 4) Sound Transit IT Department
- 5) Sound Transit Portfolio Services Office Department
- 6) Authorities Having Jurisdiction (Fire Department, Law Enforcement, City, etc.)
- 7) Others as directed by the Resident Engineer

1. Identified risks shall be reviewed and accepted by the respective Sound Transit Safety and Security Committee Level as indicated in the Agency SSMP prior to finalizing mitigations.

- D. The Contractor is responsible for facilitating a workshop as needed for System Hazard Analysis (SHA), Subsystem Hazard Analysis (SSHA), Operating & Support Hazard Analysis (O&SHA), Failure Mode Effects & Criticality Analysis (FMECA), Fault Tree Analysis (FTA) and Interface Hazard Analysis (IHA) in partnership with the Sound Transit Safety Department.
- E. The TVA is considered Sensitive Security Information (SSI) and is controlled under 49 CFR parts 15 and 1520. No part of this record may be disclosed to persons without a “need to know”, as defined in 49 CFR parts 15 and 1520, except with the written permission of Sound Transit Director of Transportation Safety and Security. Unauthorized release may result in civil penalty or other action. For U.S. Government agencies, public disclosure is governed by 5 U.S.C. 552 and 49 CFR parts 15 and 1520. For all others, public disclosure is governed by RCW42.56.420.

3.04 SECURITY DESIGN REQUIREMENTS

A. General

The Contractor shall work with the Sound Transit Security Division throughout the project and comply with all security requirements outlined in the Sound Transit Design Criteria Manual. Any deviation from the security requirements outlined in the Design Criteria Manual (DCM) must be accepted by the Sound Transit Safety Department. In addition to the DCM requirements, the Design Build Contractor shall design and construct conduit to connect the security equipment listed for each access point in coordination with the Design/Build Systems Consultant. The conduit shall connect from the access control/monitoring equipment to the nearest planned systems (TPSS, signal bungalow or communications bungalow) enclosure that can accommodate these devices. The Design Build Contractor shall design and construct all lighting identified in the Equipment Requirements at Access Points.

B. Video Surveillance System

1. The Contractor shall use current ST standard devices reviewed and approved by ST Transit Systems, Systems Engineer, or approved substitute.
2. The Contractor shall account for onsite video storage that will accommodate Sound Transit's video retention policy for the quantity of cameras in the design and will coordinate with ST, Transit Systems, Systems Engineers to verify this.
3. The Contractor shall provide all infrastructure (separate conduits for communications and power, wiring for power, pull strings in all empty conduits, mounted boxes for video cameras, junction boxes, etc.) necessary for video surveillance components (cameras, media converters, etc.). Contractor will provide and install all video surveillance electronic components and communications wiring. Double conduits (which separate signal and power) are required as part of the security camera infrastructure. Conduit

runs for communications shall originate in a communications room or closet and run to each device, sized to accommodate all devices as necessary.

4. Design requirements and aspects shall be coordinated with Sound Transit's Systems Engineering Consultant so that the level of security camera protection required is achieved. Sound Transit System Engineering Consultant shall coordinate with Sound Transit Security on camera coverage and equipment. Per the DCM, the overall design of infrastructure and video surveillance components shall provide full coverage of all public and service areas, and at all card reader access points.
5. Specific requirements include:
 - a. 3D imaging of camera locations and views confirming all required areas are covered
 - b. The camera system must be documented by riser diagrams
 - c. Electronic itemized camera list including:
 - 1) Camera number
 - 2) Camera location
 - 3) Camera serial number
 - 4) Manufacture date
 - 5) Camera type (PTZ, fixed, thermal, IR)
 - 6) Camera make
 - 7) Camera model
 - 8) Drawings

C. Access Control / Intrusion Detection System

1. The Contractor shall provide for a Lenel OnGuard access control / intrusion detection system. The Design Build Contractor shall provide all infrastructure (separate conduits for communications and power, wiring for power, pull strings in all empty conduits, mounted boxes for access control / intrusion detection devices, junction boxes, etc.) necessary for access control / intrusion detection components (detectors, card readers, door mechanisms, networking equipment, request to exit devices etc.). Double conduits (which separate signal and power) are required as part of the access control / intrusion detection infrastructure. Conduit runs for communications shall originate in a communications room or closet and run to each device and be sized to accommodate required wiring. Conduit runs for electrical power shall originate in a panel box in an electrical room or closet and run to devices as necessary.
2. Separate infrastructure for access control and intrusion detection systems is required as follows: The access control and intrusion detection system for Sound Transit is required at all station security gates, person doors, emergency access stairs, bike storage areas, and overhead rolling grills. Design requirements and proposed layout shall be coordinated with Sound Transit's Systems Engineering Consultant for the arrangement of infrastructure so that the devices and components have been accounted for in the Design Build Contractor's work.

Specific Requirements include:

- a. Access control system must be documented by riser diagrams.
- b. Electronic itemized list of all access control and intrusion detection devices that contains the following information:
 - 1) Device number

- 2) Device location
- 3) Serial number
- 4) Manufacture date
- 5) Device type
- 6) Device make
- 7) Device model
- 8) Drawings

D. Customer Emergency Phone Systems

The Contractor shall provide all infrastructure (separate conduits for communications and power, wiring for power and communications, pull strings in all empty conduits, mounted boxes for customer emergency stations (CESs), junction boxes, etc.) necessary for CES components. The Contractor shall provide and install all CESs. The Contractor shall use current ST standard devices reviewed and approved by ST Transit Systems, Systems Engineer, or approved substitute. All emergency phone enclosures shall be painted red and have the word "EMERGENCY" displayed in white lettering.

E. Other Security Requirements:

1. The Contractor's design and construction of parking garages shall include, but not be limited to, the following:
 - a. Design that maximizes visibility in and out of the structure (Natural Surveillance CPTED Principle.)
 - b. Inclusion of one security room, 80 square feet minimum, located on the bottom floor, as close to the main entry as possible. The room shall accommodate a desk surface for two computers/laptops, two network connections, and phone connection; and shall be provided with heat/ and air conditioning.
 - c. Stairwells that utilize open design with weather protection from above, or that are enclosed with proper glazing and allow visibility of the street.
 - d. Elevator cars and hoist way enclosures provided with proper glazing in accordance with the DCM
2. The Contractor shall work with Sound Transit Safety Department throughout the Project and comply with all security requirements outlined in the DCM and the Project-specific Threat and Vulnerability Assessment (TVA; see Threat Vulnerability Analysis Report, Vol. 3, 4.14). Any deviation from the security requirements outlined in the DCM or the TVA must be accepted by the Sound Transit Safety Department.
3. In addition to the DCM requirements, the Contractor shall design and construct the conduit to connect the equipment listed for each access point in coordination with Sound Transit Systems Engineering. The building shall be connected to the existing Sound Transit fiber network infrastructure. The location for the fiber connection shall be determined based on the location of the building communications room. The Contractor shall coordinate the fiber connection location and other work with the Sound Transit Systems Engineering.
4. The conduit shall connect from the access control/monitoring equipment to the nearest planned systems (TPSS, signal bungalow, or communications bungalow) enclosure that can accommodate these devices. The Contractor shall design and construct all lighting identified in the Equipment Requirements at Access Points, as shown in the Conceptual Design Drawings (Vol. 3, 1.01).

5. The Contractor shall terminate and test all cabling. All wiring installed in conduit shall not exceed 40% of the maximum conduit fill. The Contractor shall use either optical fiber or Cat6 as the method of communication. The Contractor shall make efforts to avoid the use of media converters or extenders by ensuring all wiring to devices is kept to a maximum of 100 meters in length. Any use of media converters or extenders must be approved by Sound Transit. All public facing enclosures shall include a lock to prevent unauthorized access.
6. Contractor shall ensure that all restricted access spaces are controlled. Minimum lighting requirements, specified in the DCM shall be implemented and documented. Landscaping must adhere to CPTED requirements and be confirmed in landscape documentation.

3.05 SYSTEM HAZARD ANALYSES – ONLY APPLY TO SYSTEMS

- A. Perform safety analyses as required to identify potentially hazardous conditions and document qualitative analyses to ensure that adequate safety consideration has been given.
- B. Systems that will be subject to SHA/SSHA, IHA, O&SHA, FMECA and FTA Analyses include, but are not limited to; Communication, Traction Power, Signaling, and Emergency Ventilation System.
- C. The purpose of safety analyses for systems is to:
 1. Evaluate and verify safety requirements of the System including design and construction resolution.
 2. Evaluate the operating procedures and training requirements for operating and maintenance personnel under normal, abnormal, and emergency conditions.
 3. Review two aspects of potential hazards in human-induced fault conditions:
 - a. The occupational health and safety hazard to the employee performing the task.
 - b. The system safety hazard that can be inducted into the System as a result of employee act of omission or commission.
 4. Provide visibility of relative safety and risk within system components
- D. Subsystem Analyses – Perform analyses of subsystems and potential hazard areas of the systems including the following:
 1. System Assemblies and functions.
 2. Interfaces within the System and subsystems, and the various system elements and subsystems which directly interface with them.
 3. Interface between the System and operating and maintenance personnel.
- E. Hardware components called for in Final Design, identified critical items, and unresolved potential failures of Unacceptable and Undesirable risk dictate the depth of detail in performing the required analyses. The following analyses may be performed and documented at the request of Sound Transit:
 1. System Hazard Analysis / Subsystem Hazard Analysis (SHA / SSHA)
 2. Interface Hazard Analysis (IHA)

3. Operating & Support Hazard Analysis (O&SHA)
4. Failure Mode Effects & Criticality Analysis (FMECA)
5. Fault Tree Analysis (FTA)

- F. Maintain a Hazard and Security Log for capturing and tracking hazards and unresolved safety issues and actions identified during the testing, commissioning, and pre-revenue program activities.
- G. Maintain a compilation of undesirable items identified during the system safety failure mode analyses. Document for approval of any rationale in lieu of corrective action. Conduct a special review of unresolved undesirable items with the Resident Engineer.

3.06 SOUND TRANSIT SAFETY AND AUDIT DEPARTMENT AUDIT

- A. Sound Transit Safety Department will conduct audits throughout the safety certification process, particularly from the end of the final design phase through completion of the construction phase. During these phases all safety certification activities will be subject to ST Safety Department audit at any time and coordinated with the project SSCM. The audit will serve to validate compliance with established safety certification processes and ensure proper verification/submittal of design conformance and construction conformance deliverables.
- B. The assigned Transportation Safety and Security Specialist (TSSS) for the project will also audit work performed by the SSCM in accordance with ST Safety Audit requirements and may do so at any time during this phase.
- C. Prior to the issuance of the Final Project Safety & Security Memorandum of Conformance, ST Safety Department will execute an audit to ensure all processes and deliverables have been verified and submitted.
- D. The frequency of the audits during design and construction will be determined by Sound Transit, and notice will be sent out 30 days in advance.

3.07 SAFETY AND SECURITY CERTIFICATION REVIEW SUBCOMMITTEE (SSCRS)

- A. The purpose of the SSCRS is to discuss, monitor and manage the overall safety and security certification of the project through design, construction, testing, and operation. By establishing this committee, the responsibility of decisions regarding issues/items and risk evaluation and acceptance is shifted to committee collaboration, rather than a single individual.
- B. The Contractor shall participate in the monthly safety security certification review subcommittee meeting in accordance with the Agency SSMP.

3.08 FIRE/LIFE SAFETY AND SECURITY COMMITTEE (FLSSC) / DESIGN COORDINATION

- A. Fire safety on a transit system is achieved through a composite of facility design, operating equipment, hardware, procedures, and software subsystems that are integrated to provide requirements for the protection of life and property from the effects of fire. The level of fire safety desired for the Project shall be achieved by integrating the required levels for each subsystem. Appropriate representation of Authorities Having Jurisdiction (AHJ) is required in the FLSSC.
- B. The Contractor shall participate in the Fire/Life Safety and Security Committee or coordination meeting.

3.09 SAFETY DATA SYSTEM

- A. The Safety Data System is a business process management software used to create, track and manage Safety and Security Certifiable Item Lists and their respective Verification Matrices. Sound Transit will use the safety data system to manage the Certifiable items List (CIL) and the Verification Matrix (VM).
- B. The Contractor shall register, through the Resident Engineer, all Contractor staff members working on Safety and Security Certification Activities within the safety data system software.
- C. Sound Transit Safety Department staff will provide the safety data system training to the SSCM and the design build team working on Safety and Security Certification Activities.
- D. The Contractor shall verify upload of the project's CIL, PHA/TVA items, and Safety and Security Requirements into the safety data system as well as provide the Design, Construction, Integrated Testing Conformance and Operational Documentation along with other required certification documentation through the safety data system.
- E. The Design Build Contractor must ensure that the appropriate personnel are uploading the verification documentation for all identified Certifiable Items on the safety data system.

3.10 SAFETY AND SECURITY CERTIFICATION VERIFICATION (SSCVR) REPORT

- A. The Contractor shall comply with the Agency SSCP requirements and supply all documentation to support the safety and security certification process, as listed above in 1.04 A.10. Sound Transit Safety Department staff will develop a Safety and Security Certification Verification Report (SSCVR) prior to revenue operations. The SSCVR will include:
 - 1. A Safety and Security Certificate of Conformance for each CIL element upon completion of the certification effort for that element. The Safety and Security Certificate must be signed by the parties listed on the Agency SSCP 3.1.9.
 - 2. Evidence that the requirements for operational and system integrated tests have been fulfilled to contract and test plan requirements.
 - 3. Evidence that all required emergency response training and exercises for local first responders have been conducted and a Certificate of Occupancy has been issued by the Authority Having Jurisdiction (AHJ).
 - 4. The Contractor shall provide Memo indicating the project has fulfilled all the Safety and Security requirements and the proper documentation has been submitted to the safety data system.
 - 5. Final acceptance of the project shall not be issued until the comprehensive Sound Transit System Safety & Security System Readiness Certificate has been signed off by Sound Transit's Executive Management, as per Agency SSCP 3.1.10, and incorporated in the SSCVR.

END OF SECTION

SECTION 01 50 00
TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section specifies general requirements for furnishing, installing, operating and maintaining temporary facilities and controls.

1.02 REFERENCES

- A. Reference Standards: This Section incorporates by reference the latest revisions of the following documents:
 - 1. ASTM International (ASTM):
 - a. ASTM A392 Zinc-Coated Steel Chain-Link Fence Fabric
 - 2. National Fire Protection Association (NFPA):
 - a. NFPA 13 Installation of Sprinkler Systems
 - b. NFPA 14 Installation of Standpipes and Hose Systems
 - c. NFPA 70 National Electrical Code (NEC)
 - d. NFPA 70E Standard for Electrical Safety in the Workplace
 - e. NFPA 130 Fixed Guideway Transit and Passenger Rail Systems with Seattle Amendments.
 - 3. Manufacturers Standardization Society (MSS):
 - a. MSS SP 58 Pipe Hangers and Supports – Materials, Design and Manufacture
 - b. MSS SP 69 Pipe Hangers and Supports – Selection and Application
 - c. MSS SP 89 Pipe Hangers and Supports – Fabrication and Installation Practices
 - 4. Municipality:
 - a. Applicable municipality Fire Code and amendments
 - b. Applicable municipality standard specifications for road, bridge and municipal Construction
 - c. Applicable municipality standard plans
 - 5. Washington State Department of Transportation (WSDOT):
 - a. WSDOT Standard Specifications for Road, Bridge and Municipal Construction, Division 9-28

b. WSDOT Standard Plans

B. Definitions

1. Authority Having Jurisdiction: Municipality or agencies that have multi-municipality/county jurisdiction
2. Municipality: local political entity(ies) and / or county(ies) in which the Work of this Contract occurs.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. When there is anticipated to be 2 or more contractor's operations overlapping in the construction area, see the Contract Interface requirements specified elsewhere in the Contract Documents for coordination, provision of utilities by one contractor to another and handover requirements.

1.04 SUBMITTALS / Transmittals

A. Submittals

1. Staging Area Management Plan:
 - a. Prepare a Staging Area Management Plan that includes a layout of the construction sites and identifies staging areas including:
 - 1) Buildings, including field offices
 - 2) Parking
 - 3) Hoisting and bridging
 - 4) Material, equipment and designated receiving/storage areas
 - 5) Temporary fencing and access gates
 - 6) Temporary construction walls
 - 7) Temporary walkways
 - 8) Site lighting
 - 9) First aid stations
 - 10) Project identification
 - 11) Temporary utilities
 - 12) Roads and access locations
 - 13) Wash down areas
 - 14) Designated areas for separating materials to be salvaged or recycled.
 - b. Resubmit staging plans prior to changes to Site layout.

- c. Include all temporary facilities to be handed over to the follow-on contractor(s) in the final submission of the Staging Area Management Plan
- 2. Contractor's Parking Plan: Drawings and parking area narrative. Include the following details:
 - a. Location, size (number of stalls) and access requirements, if any, for off-site parking areas
 - b. Sign locations and text to be posted at each work site and at the Site access locations so employees are knowledgeable where parking is allowed and prohibited
 - c. When parking or staging is provided on private property, include copy of lease, easements, or other agreements from the property owner prior to accessing the property.
- 3. Temporary Offices for Sound Transit Construction Management
 - a. Detailed shop drawings of field office including the furniture and equipment layout, and Utility hookup sizes and locations.
 - b. Manufacturer's product data for materials used to construct trailers, heating and cooling systems, and various required amenities as listed on Attachment A.
- 4. Temporary Fencing
 - a. Traffic Gate Operators and Controls: Shop drawings and data sheets.
 - b. Temporary Fencing – Panic Exit Device: Shop drawings and data sheets.
 - c. A sample of the screening material.
- 5. Temporary Construction Wall
 - a. Construction drawings with details of construction wall including structural and wall members, pedestrian gates and traffic gates.
 - b. Plans for viewing windows.
- 6. Temporary Sewer Connections:
 - a. Drawings of proposed temporary sewers connections.
- 7. Temporary Ventilation System - if tunnel and / or underground construction is part of the Work of this Contract
 - a. Design Plan: Submit to Sound Transit for review prior to submittal for approval by the applicable municipal Fire Department .
 - b. Installation and Test Plan:
- 8. Temporary Standpipe System:
 - a. Design Plan. Submit to Sound Transit for review and comments prior to submittal for approval by the applicable municipal Fire Department .

- b. Installation and Test Plan. Submit to Sound Transit for review and comments prior to submittal for approval by the applicable municipal Fire Department.
- c. Shop drawings, component cut sheets, hydraulic calculations and seismic bracing calculations. Submit to Sound Transit for review and comments prior to submittal for approval by the applicable municipal Fire Department.

B. Transmittals (Not Used)

PART 2 - PRODUCTS

2.01 CHAIN LINK FENCE

- A. Chain link fence shall be zinc-coated complying with the requirements of ASTM A392 installed with 88 percent minimum light block-out polyethylene screening in dark navy blue color. Sound Transit will provide print-ready artwork for a Sound Transit logo to be applied to the polyethylene screening on public-facing fence sections with the top of stylized "T" in the logo 4 feet 6 inches above the ground (Exhibit E.1).

2.02 SIGNAGE

A. MDO Plywood Panel Sign:

- 1. MDO ½ inches plywood (may substitute aluminum composite material)
- 2. Square corners and smooth, uniform surface with smooth finished edges
- 3. Pre-drilled mounting holes
- 4. Surface-applied color digital graphics, minimum 300 dpi
- 5. Clear UV coating overcoat to protect images and allow cleaning of graffiti or dirt

B. Mesh Vinyl Banner:

- 1. Minimum 8 ounce weight water-resistant, PVC coated mesh vinyl material
- 2. Minimum 13 mil thickness
- 3. Minimum 1000 by 1000 yarn denier
- 4. Maximum 40 percent air-flow through
- 5. Printed one side with full color UV inks at minimum 300 dpi
- 6. Finished with grommets approximately every 2 feet
- 7. Hemmed edges with reinforced webbing for additional wind resistance

C. Reflective Aluminum Signs:

- 1. Aluminum Sheet and Plate: ASTM B 209 (ASTM B 209M), alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated: 0.080-inch
- 2. 3M Scotchlite Plus "Blue" or approved equal reflective sheeting with electronically cut graphics on one side

3. 3 inch radius corners for 48 by 48 inch signs and 1.5 inch radius corners for 30 by 36 and 30 by 24 inch signs
4. Pre-drilled mounting holes for signs to be wall mounted
5. Construct in accordance with the Contract Specifications

PART 3 - EXECUTION

3.01 STAGING AREAS

- A. The Contract Documents may describe staging areas that are available for use. These staging areas are not exclusive and may be used by Sound Transit and other Sound Transit contractors as indicated in the Contract Documents at no additional cost to Sound Transit.

3.02 PARKING

- A. Parking facilities for Contractor and subcontractor personnel shall be the Contractor's responsibility.
- B. Unless otherwise indicated, the Contractor is responsible for obtaining and maintaining all Contract required parking and staging areas.
- C. Provide parking in accordance with local ordinances and regulations of the local Authority Having Jurisdiction.
- D. All Subcontractors, Suppliers and individuals associated with Contract activities must use approved routes and parking.
- E. Construction parking shall not impair the existing community parking and traffic conditions.
- F. Parking will not be allowed on city streets.
- G. Failure by any employee on this Contract to observe these rules may be grounds for discipline including discharge of the employee in violation.

3.03 TEMPORARY BRIDGING, HOISTING AND HANDLING MATERIAL DISTRIBUTION

- A. Provide temporary bridging, hoisting and material handling required for the execution of the Work.
- B. If required elsewhere in the Contract Documents, provide temporary bridging, hoisting and material handling required in support of a system-wide contractors' performance of the Work.

3.04 MATERIAL, EQUIPEMENT AND DESIGNATED RECEIVING/STORAGE AREAS

- A. Provide all temporary storage and shop rooms that may be required at the Site for safe and proper storage of tools, materials and equipment.
- B. Remove such facilities prior to Acceptance or within 3 days of receipt of Notice from the Resident Engineer that removal is necessary. The Contractor shall assume responsibility for all expenses associated with such removal.
- C. Storage of gasoline or similar fuels shall conform to NFPA regulations and local fire department regulations.

3.05 TEMPORARY OFFICES FOR SOUND TRANSIT CONSTRUCTION MANAGEMENT

- A. Contractor shall be responsible to provide, operate and maintain the temporary offices for Sound Transit Construction Management.
- B. See Attachment A for requirements.

3.06 TEMPORARY FENCING AND ACCESS GATES

- A. Furnish, construct and maintain all temporary fencing around the Site perimeter as necessary, required or as directed.
- B. Install temporary fencing and gates that are a minimum of 6 feet tall and able to secure the Site as indicated or necessary.
- C. Construct pedestrian gates a minimum of 6 feet wide and traffic gates a minimum of 20 feet wide. Provide wireless controlled electric operators for opening and closing traffic gates at a minimum speed of 20 feet per minute.
- D. Used materials may be employed for temporary fencing, provided such used materials are good, sound and suitable for the purpose intended.
- E. Repair or replace, at no additional cost to Sound Transit, temporary fencing that is damaged from any cause during the progress of the Work.
- F. Contractor shall keep perimeter of temporary fencing free of debris and trash buildup caused by installation of fencing. Where the temporary fencing is built against buildings on adjacent properties the Contractor shall be responsible for cleaning area between the fence and the adjacent buildings.
- G. Prior to Acceptance remove all temporary fencing or, if indicated elsewhere in the Contract Documents, handover, in good condition, the temporary fencing to a follow-on Contractor. Temporary fencing materials that have been removed will remain the property of the Contractor

3.07 TEMPORARY CONSTRUCTION WALLS

- A. Furnish, construct and maintain temporary construction walls as indicated in the Contract Documents.
- B. All wood temporary construction walls shall be painted or be provided with a presentable finish to be approved by the Resident Engineer. Refurbish finish of temporary construction walls annually or as directed by the Resident Engineer. Remove/cover graffiti immediately at no additional cost to Sound Transit.
- C. Repair or replace, at no additional cost to Sound Transit, temporary construction walls that become damaged from any cause during the progress of the Work. Protect art work during refurbishing or routine maintenance of temporary construction walls.
- D. Provide 2-foot by 2-foot viewing windows at the locations indicated or designated by the Resident. Cover these viewing windows with 1/4-inch clear transparent polycarbonate and secure in a manner to prevent unauthorized removal. Repair or replace, as necessary or at the direction of the Resident Engineer, damaged polycarbonate to maintain functionality of the viewing window.
- E. Install, protect and maintain art installations provided by Sound Transit Art at locations along the temporary construction wall designated by the Resident Engineer.

- F. Prior to Acceptance remove all temporary construction walls or, if indicated elsewhere in the Contract Documents, handover, in good condition, the temporary construction walls to a follow-on Contractor. Temporary construction wall materials that have been removed will remain the property of the Contractor.

3.08 TEMPORARY WALKWAYS

- A. Furnish, construct and maintain temporary walkway(s) as indicated in the Contract Drawings.
 - 1. Provide security at all times for walkway.
 - a. Walkway shall be open to the public between the hours of 7:00 A.M. and 6:00 P.M. Monday through Friday except on holidays. Walkway shall be closed outside of these hours and shall be secured with locked gates.
 - b. Flaggers stationed at construction wall/fencing access points shall be responsible for the oversight of security for the walkway.
 - 2. Notify law enforcement and Sound Transit security of all incidents on the walkway.
- B. Provide maintenance and servicing of all temporary walkways throughout the life of the Contract:
 - 1. Inspect walkways daily for trash, graffiti, moss, slippery surfaces, hazards and general conditions.
 - 2. Treat walkways with ice melt during freezing weather.
 - 3. Remove trash daily.
 - 4. Remove graffiti within 24 hours.
 - 5. Repair walkway defects immediately.
 - 6. Maintain and service walkway, signage, footpath, lighting and traffic mirrors as needed to ensure safety for pedestrians.
- C. Prior to Acceptance remove all temporary walkways or, if indicated elsewhere in the Contract Documents, handover, in good condition, the temporary walkways to a follow-on Contractor. Temporary walkway materials that have been removed will remain the property of the Contractor.

3.09 TEMPORARY FIRST AID FACILITIES: Furnish, install, maintain and remove temporary first aid facilities and services at each Site of the Work throughout the construction period

3.10 PROJECT IDENTIFICATION, INFORMATION AND ACCESS SIGNAGE

- A. The Contractor shall furnish, install, maintain and update signage and banners required by the Contract
- B. Required Signs/Banners
 - 1. Install Project Identification Signage prior to Work commencing on Site. Install Resident Engineer Office Signage at sites that include a field office for the Resident Engineer or inspectors.

- a. Project Identification Sign (Exhibit A.1) – 96 by 42 inches medium density overlay (MDO) plywood panel with custom, applied digital graphics, which is post mounted or affixed to the site fencing.
 - b. Resident Engineer Office Sign (Exhibit A.2) – 24 by 30 inches MDO plywood panel sign with custom, applied digital graphics, which is wall or post mounted.
- 2. Up to 70 square feet of Project Information Banners may be needed each year.
 - a. 24-Hour Construction Hotline Banner (Exhibit B.1) – 96 by 24 inches mesh vinyl banner, which is fence or wall mounted.
 - b. Project Description Banner (Exhibits B.2.1 and B.2.2) – 96 by 42 inches or 120 by 42 inches mesh vinyl banner, which is fence or wall mounted.
 - c. Light Rail System Map Banner (Exhibit B.3) – 30 by 42 inches mesh vinyl banner, which is fence or wall mounted.
- 3. Provide Business and Pedestrian Access Signage for directing access to impacted businesses and for safe public crossings and accesses. Sound Transit will provide digital graphic artwork for generic pedestrian access signs. For all other signs, Contractor or sign vendor will provide artwork based on content provided by Sound Transit Community Outreach. Up to 80 square feet of signage may be needed each year.
 - a. Large Custom Aluminum Sign (Exhibits C.1) – 48 by 48 inches tripod mounted, reflective aluminum sign with applied vinyl graphics.
 - b. Small Custom Aluminum Sign (Exhibit C.2) – 30 by 24 inches tripod mounted, reflective aluminum sign with applied vinyl graphics.
- 4. Up to 75 square feet of Construction Update Banner may be needed each year. Sound Transit will provide digital graphic artwork.
 - a. Custom Construction Update Banner (Exhibit D.1) – 96 by 36 inches mesh vinyl banner, fence or wall mounted.

C. Installation

- 1. Locations and manner of installation of signs and banners will be as shown on the Contract Documents or as directed by the Resident Engineer.
- 2. Verify that sign components are clean and free of materials or debris that would impair installation. Install level and plumb with sign surfaces free of distortion and other defects in appearance.
- 3. Install signs so they do not protrude or obstruct according to accessibility standard.
- 4. Mounting
 - a. Post mounting:
 - 1) Fabricate posts 3 feet longer than height of sign to permit direct burial or embedment in concrete. Use minimum 4 by 4 inch post width.

- 2) Option 1 - Direct Burial: Set sign posts vertically in position with the bottom of the post 3 feet below ground, level and with top of posts 5 feet 6 inches above the ground. Support posts to prevent movement during backfilling operations. Use satisfactory soil or well-graded aggregate as backfill. Provide adequate compaction of the backfill to prevent sign movement. Install signs horizontal and even with top of posts.
 - 3) Option 2 - Cast-in-Place Concrete: Set posts vertically in position with the bottom of the post 3 feet below ground level and with top of posts 5 feet 6 inches above the ground. Support the posts to prevent movement. Fill postholes with concrete. Install sign horizontal and even with top of posts.
 - 4) Option 3 - Preformed Concrete Foundation: Form or core drill holes in concrete foundation at least 3/4 inch larger than dimension of post. Set posts vertically in position with the bottom of the post 3 feet below the top of the concrete foundation and with top of posts 5 feet 6 inches above the ground. Support the posts to prevent movement. Fill the void around the post with non-shrink, nonmetallic grout or anchoring cement. Install sign horizontal and even with top of posts.
 - 5) Use concealed metal fasteners where possible. Use fasteners at the minimum size needed to adequately secure sign. Use fasteners that match the sign finish. Locate connections to be as inconspicuous as possible.
- b. Wall mounting: Use concealed metal fasteners where possible. Use fasteners at the minimum size needed to adequately secure sign. Use fasteners that match the sign finish. Locate connections to be as inconspicuous as possible.
 - c. Fence mounting:
 - 1) Wrap zip ties through banner grommets and around fencing, using sufficient quantity of zip ties for secure attachment.
 - 2) Install banners with tops of banner 5 feet 6 inches above ground.
 - d. Tripod mounting: Mount sign on metal tripod stand, as manufactured by AABCO Barricade Co. or approved equal. Secure sign assembly so as to remain stationary during high winds.
- D. Maintenance: Review signs every month and repair and clean, or replace signs damaged by vandalism or other causes.
- E. Removal: Prior to Acceptance remove all temporary signs and banners or, if indicated elsewhere in the Contract Documents, handover, in good condition, the temporary signs and banners to a follow-on Contractor. Temporary sign and banner materials that have been removed will remain the property of the Contractor.

3.11 TEMPORARY UTILITIES

A. General

1. Determine the need for temporary utility (e.g., water, electricity, gas, sewer, etc.) services required to execute the Work. Make arrangements with utility companies for such services.

2. Provide utilities for Sound Transit construction offices, as necessary or required.
3. Prior to Acceptance remove all temporary utilities or, if indicated elsewhere in the Contract Documents, handover, in good condition, the temporary utilities to a follow-on Contractor. Temporary utility materials that have been removed will remain the property of the Contractor.

B. Temporary Electrical Facilities:

1. Provide and maintain during the course and progress of the Work all electrical power and temporary wiring, feeders and connections required and / or necessary to facilitate the work of all trades and services associated with the Work. Provide electrical power at Contractor's expense.
2. Coordinate with local electrical power provider for all temporary power supplies needed for construction.
 - a. Fully analyze the temporary electrical construction loads to determine the power needed from the local electrical power provider based upon all electrical loads at the Site, such as but not limited to temporary Site lighting, electrically powered equipment (i.e. pumps, air compressors, ventilation, mining equipment, cranes, etc.), temporary construction facilities (i.e. trailers, shops, etc.) and other.
 - b. Be responsible for preparing necessary documentation as required by the local electrical power provider for service to ensure that there will not be any power quality problems for the power grid.
 - c. Coordinate with the local electrical power provider to determine any specific design and/ or coordination requirements, and approvals are required to be obtained.
 - d. Review the proposed location(s) of underground raceways and vaults for power feeder(s) to ensure it(they) will not interfere with other construction activities and Site improvements, and that it is acceptable to local electrical power provider and Sound Transit.
 - e. Acquire all required approvals from the local electrical power provider for equipment to be used.
3. If primary 13kV or 26kV temporary power is required, provide temporary service equipment with pad-mounted metering cabinets to meter power from the local electrical power provider's feeders.
4. Coordinate with the Resident Engineer for:
 - a. Transfer of low voltage 480Y/277 V power supply needed for follow-on construction work.
 - b. Interfacing with the local electrical power provider for routing / rerouting of electrical power feeders for permanent power.
5. Coordinate with the local electrical power provider for scheduling and termination of services.
6. Provide, operate and maintain backup power sufficient to meet the following requirements:

- a. Necessary to sustain essential power at the construction Site (i.e. pumps, ventilation, Site Lighting, security, communications, etc.).
 - b. Additional power necessary to allow for orderly shutdown and, where needed, to sustain stand-by functions of major equipment including but not limited to pumps and cranes.
- C. Temporary Site Lighting
 - 1. Provide lighting of Sites as required to complete the Work. Different lighting levels may be required for worker safety and pedestrian security.
 - 2. Adjust lighting to avoid shining into residential homes and to prevent public complaints, as necessary or as directed by Resident Engineer.
 - 3. Keep lighting as low as possible (in both height and foot-candles) while providing safe working conditions.
 - 4. Provide additional perimeter lighting to provide for safety and for wayfinding of pedestrians, as necessary or as directed by Sound Transit.
 - 5. Provide cut-off luminaires to direct the light onto the construction Site and eliminate glare skyward, onto surrounding properties or at vehicular traffic.
 - 6. Temporary Lighting for Underground Construction (for Contracts that include tunnels or other underground construction):
 - a. Provide temporary lighting that meets the applicable requirements in the underground work area(s) during construction.
 - b. Remove temporary lighting when permanent lighting in the underground work area(s) is operational.
- D. Temporary Sanitary Facilities
 - 1. Provide the required toilet conveniences and washing facilities in locations that are secluded from public observation.
 - 2. Keep facilities in a clean, sanitary condition. Service temporary toilet and washing facilities regularly and secure them to prevent damage by vandals.
 - 3. The use of sanitary facilities in adjacent commercial buildings, tenant areas or other private facilities will not be permitted.
- E. Temporary Water Service:
 - 1. Provide, operate and maintain all temporary water services necessary to facilitate the work of all trades and services associated with the Work. Provide temporary water at Contractor's expense. Furnish all temporary pipes, valves, fittings, connections and meters, as necessary or required.
 - 2. See Attachment B.
- F. Temporary Sewer Connections:
 - 1. Furnish, install and maintain side sewer piping as necessary for the Sound Transit construction offices and Contractor's convenience.
- G. Temporary Drainage and Discharge

1. Provide temporary pumps, piping and controls sized to adequately control and remove drainage water. Drainage water includes normal drainage from seepage, storm, process water and emergency flows from a temporary standpipe. Select and size pump(s) and discharge piping to remove normal and emergency flows throughout the Contract. Emergency flows include the required discharge flow from the temporary standpipe(s).
 2. Provide temporary and portable backup power for pumps as required to assure operations when necessary.
 3. The temporary pumps shall be operated, when necessary, to maintain the work site in a safe and workwise condition. If necessary, operate the pump(s) and discharge system 24 hours a day, 7 days per week until Acceptance. Maintain an inventory of spare pump(s), of quantity and capacity equal to the installed pumps, at the project Site at all times. Provide hoisting or other means to remove and replace pumps.
 4. Treat drainage discharge water as required by the Contract.
 5. The location of the temporary pumps and discharge piping shall not create any hazard to construction or interfere with other temporary facilities.
 6. Temporary pumps at cross-passages (for Contracts that include tunnels or other underground construction):
 - a. Once the sump is constructed at a cross-passage and receiving drainage water, utilize the sump with temporary pumps. Once the permanent tunnel power and control equipment is installed, the Contractor may utilize this equipment for tunnel drainage. Coordinate use of the sump for temporary tunnel drainage with the work shown on the Contract Drawings and in these Specifications.
 - b. When the motor control center (MCC), as required elsewhere in the Contract, is energized, the Contractor may utilize the pump power supply circuits and motor starters provided and installed as a part of this Contract. Determine the correct settings of the protective devices in the permanent power supply and motor control center equipment, and reset and / or resize said devices to the correct settings, as necessary.
 - c. If the temporary sump pump power requirements exceed the ratings of the permanent sump pump power supply or starters, provide another means of supplying power to the temporary sump pumps.
 - d. Determine a sequence of operation for the pumps provided. When the pump controller, installed inside the MCC, is energized, coordinate the sequence of this operation. The sequence is specified elsewhere in the Contract and includes the level transducer for pump ON/OFF operation and float switches for high and low level alarm.
- H. Temporary Ventilation (for Contracts that include tunnels or other underground construction):
1. Provide, install, operate and maintain temporary ventilation in the tunnels and underground areas to meet applicable requirements during and subsequent to excavation activities. As a minimum, provide a ventilation system capable of delivering fresh air to meet the minimum requirements indicated below.

- a. Maintain minimum of 60-feet per minute velocity throughout the tunnel, via mechanical ventilation system at all times work is being carried out in the tunnel. During periods when the tunnel is unoccupied, this requirement may be reduced to 50 percent with the approval of the Resident Engineer.
- b. Deliver a minimum of 100 cfm per horsepower for all diesel-operated equipment and 50 cfm air per person in the tunnel.
- c. Install fans with screens, motors and controls. Provide noise suppressors to maintain noise level within the required limits. The system shall be anchored with seismic vibration isolators.
- d. Provide, install and maintain ductwork, isolation damper, electrical power and all system-associated accessories.
- e. The location and installation of the temporary ventilation shall not create any hazard to construction or interfere with other temporary facilities.

I. Temporary Standpipe

- 1. Provide and maintain a wet temporary standpipe system which meets the minimum requirements described below and as required in accordance with the following:
 - a. National Fire Protection Association (NFPA) 130, Standard for Fixed Guideway Transit and Passenger Rail Systems including AHJ amendments, as applicable
 - b. National Fire Protection Association (NFPA) 14, Standard for the Installation of Standpipes and Hose Systems
 - c. Local AHJ Fire Code
- 2. For tunnel construction utilizing a Tunnel Boring Machine (TBM), the piping system used to supply cooling water for the TBM shall not be used as a temporary standpipe, unless otherwise agreed to by local municipal fire department.
- 3. Size standpipe for the pressure required to provide a minimum of 500 gpm, with a 130 psi residual pressure at the hydraulically most remote hose connection, together with a simultaneous flow of 500 gpm at the next most remote hose connection on the same standpipe and for the test pressure requirements.
 - a. Water Supply: Verify current water supply information with local water utility for this Contract. Information regarding hydrant flow tests can be seen in the Hydrant Flow Profiles Calculation in the Mechanical calculation package.
- 4. Provide fire hose valves spaced not greater than 200 feet apart.
- 5. Provide a 4-way, 2.5-inch fire department connection manifold, minimum 6-inch inlet size and connected to the temporary standpipe, and riser to the ground surface level, terminating in an approved fire department Siamese connection located not more than 100 feet from a fire hydrant.
- 6. Hydro test the entire length of pipe after every 200 feet of new standpipe is added. Test the entire standpipe system at a pressure 50 psi greater than the maximum piping system pressure during the flow conditions stated above. Repair all leaks and retest before system is put back in use.

7. Installation, testing and maintenance of the standpipe shall be performed by individuals who have obtained specific certification in accordance with the local municipal fire department.
8. Maintain an air release valve at the high point of the system.
9. Employ means to prevent freezing of the standpipe during cold weather.
10. The location the temporary standpipe shall not create any hazard to construction or interfere with other temporary facilities.
11. Remove the temporary standpipe after the permanent standpipe system installation is complete and successfully tested. Arrange for temporary connection of the 6-inch fire department connection to the end of the permanent standpipe.

END OF SECTION

EXHIBITS

Exhibits A to E: Examples of Identification Signage, Banners and Logos

ATTACHMENTS

Attachment A: Temporary Offices for Sound Transit Construction Management

Attachment B: Temporary Water Service

SECTION 01 50 00 – EXHIBITS

A.1 – Example of Project Identification/Contractor Sign – 96 x 42 inches



A.2 – Example of Resident Engineer Office Sign – 24 x 30 inches



B.1 – 24-Hour Construction Hotline Banner – 96 x 24 inches



B.2.1 – Example of Project Information Banner 1 – 96 x 42 inches



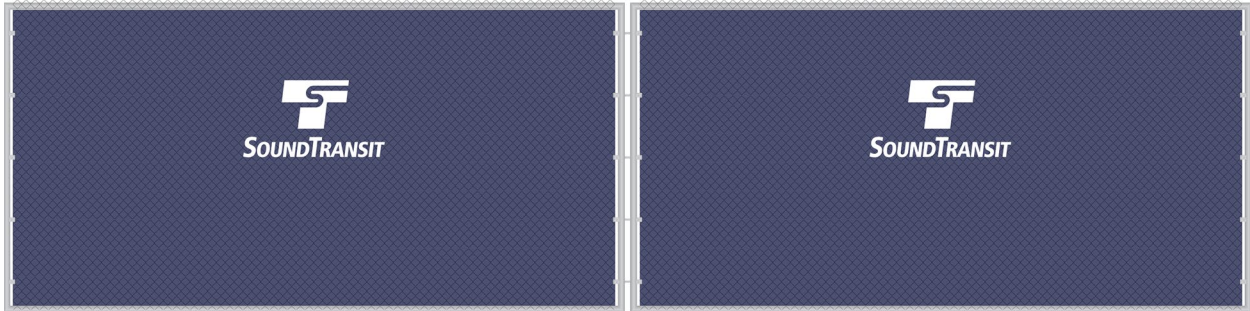
B.2.2 – Example of Project Information Banner 2 –120 x 42 inches



B.3 – Light Rail System Map Banner – 30 x 42 inches



E.1 – Sound Transit logo applied to navy blue polyethylene screening – Logo is 33 by 18 inches



END OF EXHIBITS

SECTION 01 50 00 – ATTACHMENT A

TEMPORARY OFFICES FOR SOUND TRANSIT CONSTRUCTION MANAGEMENT

Contractor shall be responsible to provide, operate and maintain the temporary offices for Sound Transit Construction Management.

Temporary office locations shall be established at the following locations:

[]

Field office shall be completely furnished and ready for occupancy within 60 days of NTP.

Provide a []-story []-foot by []-foot field office trailer unit consisting of the following rooms/areas:

- a. [] offices with interior doors (approx. [] sq ft each)
- b. [] conference rooms (approx. [] sq ft each in rectangular shape). Include [] on 1st floor and [] on 2nd floor.
- c. Reception area
- d. [] partitioned cubicles (approx. [] sq ft each)
- e. [] meeting room (approx. [] sq ft)
- f. [] storage closet with shelves (approx. [] sq ft)
- g. Kitchen facilities (approx. [] sq ft) including double stainless steel sink, []-foot counter with storage above and below, with hot water and cold water supply, refrigerator, microwave, and trash bin.
- h. Copy machine room/area sized to accommodate floor standing copier/scanner, [qty] []-ft long side tables for sorting/collating.
- i. ADA-compliant access
- j. [] restrooms facilities ([] men's and [] women's or [] unisex) sized to accommodate one flush toilet each, toilet paper dispensers, toilet seat dispensers, and coat hook. The restrooms shall be integrated within the office facility, outfitted with sink, base cabinet, hot and cold water supply, mirrored medicine cabinet, paper towel dispenser, door hooks, and exhaust fans.
- k. [] ADA compliant shower facilities for men and women with hot and cold water supplies, non-slip flooring, soap dish, shower curtain or door and an adjustable shower head. Shower facilities shall have an abutting dressing area with privacy curtain, bench, clothes hook, towel hooks, and overhead cupboard for temporary storage.
- l. [] mud rooms (men's/women's) with locker facilities for [] people (men's) and [] people (women's).
- m. []-foot by []-foot lighted supply room with lockable door and floor-to-ceiling independently framed metal shelving with a minimum depth of [] inches along the perimeter, Shelving units to be secured to the walls.

- n. File area adequate to contain [] lateral file cabinets, each having [qty] []-inch high drawers on rails and one lift-up door with fixed shelf. Room shall have center table adequately sized for sorting and binding of plans and Submittal drawings. Overall cabinet dimensions for each cabinet shall be approximately [] inches deep, [] inches wide and [] inches high. Each cabinet shall be lockable using a 9250 Ember Chrome Lock or approved equal.
- o. A separately acclimatized Computer Server/Network closet (approx. [] sq ft)
- p. ADA-compliant access to first floor
- q. [] entrance and at least one separate emergency exit: Contractor shall comply with local code requirements for all additional emergency exiting requirements.
- r. Exterior stairway to second floor entrances

Furnish the field office trailer unit with the following:

- a. Each office shall include one desk with side return (30 inches by 60 inches), ergonomic swivel chair with armrests, 6-foot tall bookcase, two-drawer lateral file cabinet, round table with two side chairs, one 3-foot by 4-foot whiteboard, waste basket, and coat hook.
- b. Each cubicle shall include one desk (each 30 inches by 60 inches) and one ergonomic swivel chair with armrests, one 2-drawer lateral file cabinet, one 3-foot by 4-foot whiteboard, one waste basket, and one coat hook.
- c. Open bullpen area shall include four desks (each 30 inches by 60 inches), four ergonomic swivel chairs with armrests, four 2-drawer file cabinets, two 3-foot by 4-foot whiteboards, four waste baskets, and four coat hooks.
- d. The meeting room shall have a []-foot by []-foot meeting table, [] [stacking] [swivel] chairs, one side table, ceiling-mounted electrically operated projection screen, a 4-foot by []-foot whiteboard and a [large] waste basket. Conference table shall have electrical outlets and internet connections built into either end of table top w/cover.
- e. Reception/entry area shall have reception desk, ergonomic swivel chair with armrests, two stack chairs, 3-foot by 4-foot whiteboard, one two-drawer lateral file cabinet, a tack board (approximately 3 feet by 4 feet), and a coat rack.
- f. Kitchen shall include one round table and four stacking chairs.
- g. File room must have centrally located plan/file sorting table approximately 36 inches by 60 inches and one small side table to store a standard stapler, heavy duty stapler, and electric three-hole punch.
- h. Storage room shall include four shelves, 24 inches by 36 inches in dimension.
- i. Two-drawer lateral file cabinets shall each have two 12-inch high drawers on rails. Overall cabinet dimensions for each cabinet shall be approximately 18 inches deep, 42 inches wide, and 28 inches high. Each cabinet shall be lockable using a 9250 Ember Chrome Lock or approved equal.
- j. One each, 4-drawer lateral file cabinets will each have four 12-inch high drawers on rails. Overall cabinet dimensions for each cabinet shall be approximately 18 inches deep, 42 inches wide, and 52 inches high. Each cabinet shall be lockable using a 9250 Ember Chrome Lock or approved equal.

- k. Entry area shall have a 3-foot by 4-foot whiteboard, a tack board (approximately 3 feet by 4 feet), and a coat rack.
- l. Keypad locks on all doors to the field office.
- m. First aid kit for 20 people, replenished by the Contractor as needed.
- n. Fire extinguishers, tested and re-pressurized by the Contractor as required.

Provide utilities, power, telephone, and parking facilities to the field offices for the exclusive use of Sound Transit. The field offices shall be situated in the work area at locations shown on the Contract Drawings. They shall be maintained and serviced by the Contractor as hereinafter specified until the Acceptance of the Contract or as otherwise permitted by Sound Transit, whichever occurs sooner.

Construction Requirements, Systems, and Materials: Obtain and pay all costs for hauling, building, and connection permits. The field offices shall be substantially constructed and satisfactory to Sound Transit. All materials shall be good commercial quality. Provide field offices having at a minimum the following features and facilities specified or as agreed with the Resident Engineer:

Exterior and interior surfaces, other than factory finished, painted with two coats of an approved paint of a color or colors approved by Sound Transit. No painting will be required on aluminum or stainless steel surfaces.

Interior walls and ceilings paneled with finished plywood or gypsum wallboard of not less than 1/2-inch thickness, or other suitable material.

Floors covered with resilient flooring material such as vinyl composition tile or sheet vinyl flooring. Floors shall be constructed to withstand a live load of 150 psf.

Lighting shall furnish a minimum of 100 foot-candles at desk height uniformly in all areas.

Duplex electrical receptacles around interior walls at approximately 10-foot spacing

Specific electrical requirements to enable Sound Transit to provide copy machines and scanners: Provide one 20 amp dedicated circuit with 20 amp plug for [] Sound Transit-provided copy machines.

A multiple-zoned and automatically controlled heating/cooling system as needed to allow for climate control of separate offices and common areas

Electrical utility connections

Metal stairs at all doorways to the mobile unit and pedestrian access ramps: Meeting the requirements of "Persons with Disabilities (Equal Opportunities, Protection of Rights & Full Participation) Act"

Adequate access from public streets shall be provided to the field offices, together with space for parking [10] cars. The access roadway and parking area shall be graded for drainage and surfaced with gravel, concrete, or pavement in an approved manner. Surfaces shall be maintained until the Acceptance of the Contract or as otherwise permitted by Sound Transit, whichever occurs sooner.

Utility service connection sizes and locations shown on the Contract Drawings are approximate. Final locations and sizes of all required utility service connections shall be the Contractor's responsibility.

Flush-toilets, washing facilities, and hook-ups to sewer and water utilities: Bathrooms shall comply with ADA Accessibility requirements.

Tie down field offices to meet state and local wind and seismic construction criteria.

Exterior hose bib with boot scrape

Telecommunication connections for telephones and computers: Consisting of two 2-inch underground conduits extending from street services to the server closet.

Internet and telecom receptacles pre-wired from the computer server/network closet around interior walls and floors that correspond to the desk requirements outlined herein

Intrusion alarm, security bars at windows as needed, and call-up security system.

[] standing hanging plan/shop drawing rack

Windows furnished with [vinyl blinds, insect screens, other requirements, as needed]

Recycling and garbage receptacles and pickup service

Provide maintenance and service throughout the specified period as follows:

Repairing and daily cleaning of the field offices, parking and access areas. Cleaning service shall include providing paper towels and hand soap in kitchen(s) and toilet tissue, paper towels and hand soap in restrooms.

The furnishing of all utilities excluding telephone and network service

Provide security measures and area protection in accordance with with Contract requirements.

Bottled water and water dispenser with hot and cold water

Assume operations and maintenance of the temporary offices for Sound Transit Construction Management from the [] Contractor at Substantial Completion of the [] Contract. Maintain and service as specified herein until the Substantial Completion of this Contract or as otherwise permitted by Sound Transit, whichever occurs sooner..

Be responsible for operations and maintenance of the temporary offices for Sound Transit Construction Management. Maintain and service as specified herein until Substantial Completion of this Contract or as otherwise permitted by Sound Transit, whichever occurs sooner.

Sound Transit will provide the following:

Installation of the telephone and computer network

Telephone and internet service

Printers, copiers, scanners, and fax machines

Office/desktop consumable supplies for Sound Transit and Construction Management Consultant staff.

Additional requirements as indicated on Contract Drawings

Field offices shall become the property of Sound Transit upon Acceptance.

Field offices shall remain the property of the Contractor upon Acceptance.

SECTION 01 50 00 – ATTACHMENT B

TEMPORARY WATER SERVICE

Contractor shall be responsible for installation, operations and maintenance of the temporary water service(s).

[] will only allow [] domestic meter and [] fire service connection(s) to serve the Sound Transit project Site. Obtain temporary service connections from [] for their work.

For the duration that the [] Contractor and [] Contractor both occupy the Site, the [] Contractor may purchase water from and connect to the [] Contractor's construction water system. The [] Contractor will provide sub-meters for the [] Contractor's connections and bill the [] Contractor for water used in accordance with the local public utility's current water use billing rates.

Once the [] Contractor completes construction, the [] Contractor will retire its service meters with [] and then the [] Contractor shall coordinate directly with [] to obtain service from the existing meters.

SECTION 01 51 15

TEMPORARY ELECTRICAL POWER

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section includes requirements for providing temporary electrical power for construction.

1.02 COORDINATION

- A. During the time period when [] and [] operations overlap in the construction area, grant the [] contractor access to the [Seattle City Light (SCL)] construction power. The [] contractor will likewise be obliged to grant the [] Contractor access to the [SCL] construction power.

1.03 COORDINATION WITH [SEATTLE CITY LIGHT (SCL)]

- A. Coordinate Work affecting [Seattle City Light (SCL)] source power throughout the duration of the Contract with [SCL] through the Resident Engineer.
- B. Coordinate with [Seattle City Light (SCL)] for the [26 kV] and 480 V temporary power supplies needed for construction. Review the indicated location of conceptual underground raceways and vaults for [26 kV] [and 480 V SCL] power feeders' to ensure it will not interfere with other construction activities and Site improvements and is acceptable to [SCL].
- C. Completely analyze the temporary construction loads and power needs based upon the temporary power needed for all electrical loads at the Site such as but not limited to temporary Site lighting, power to construction trailers, tunnel lighting, and sump pumps.
- D. Be responsible for preparing necessary documentation as required by [SCL] for service to ensure that there will not be any power quality problems for the power grid.
- E. Acquire all approvals from [SCL] for equipment to be used.
- F. Coordinate with the [SCL] for scheduling and termination of the [26 kV] cables.
 - 1. Coordinate through the Resident Engineer for the low voltage 480Y/227 V power supply needs for station construction work and later interfacing with [SCL] to reroute [26 kV] feeders for permanent power. Attend meetings called by the Resident Engineer to schedule and plan coordination activities with [Seattle City Light].

1.04 REFERENCES

- A. This Section incorporates by reference the latest revisions of the following documents:
 - 1. National Fire Protection Association (NFPA)
 - a. NFPA 70 – National Electrical Code (NEC)
 - b. NFPA 70E - Standard for Electrical Safety in the Workplace

PART 2 - PRODUCTS (NOT USED)**PART 3 - EXECUTION****3.01 ELECTRICAL DEMAND**

- A. Coordinate with the [] contractor for construction power as required.
- B. Coordinate with the [] contractor for metered power for the [] construction power required.

3.02 CONTRACTOR INSTALLED AND MAINTAINED TEMPORARY POWER

- A. Perform electrical work in compliance with NFPA 70F.
- B. Comply with applicable provisions of the NEC, especially Article 230-Services, and Article 590-Temporary Installations.
- C. Temporary power will be installed as shown in the Contract Drawings to the construction Site.
- D. Provide temporary power as required for construction activities.

Insert specific design coordination requirements and approval with the appropriate local power jurisdiction/company.

1. []

- E. If primary 13kV or 26kV temporary power is required, provide temporary service equipment with pad-mounted metering cabinets to meter power from the [SCL] construction power feeders for the following items:

1. []

3.03 BACKUP POWER

- A. Provide backup power sufficient to meet the following requirements.
 - 1. Anticipated for additional essential power at the construction Site
 - 2. Additional power anticipated at the construction Site to sustain essential Site functions such as security, communication, and Site lighting.
 - 3. Additional power anticipated at the construction Site to allow for orderly shutdown and where needed to sustain stand-by functions of major equipment including but not limited to pumps and cranes.

3.04 CLOSEOUT ACTIVITIES

- A. Permanent connections to the [SCL] power source will be provided in the [] contract.
- B. [Contractor shall coordinate with follow-on contractor to verify if these power sources may be a continuation of entire temporary service or only a part of SCL temporary power.]
- C. [Temporary power service shall be kept energized throughout the handover process.]

END OF SECTION

SECTION 01 53 13
CONTRACTOR-DESIGNED TEMPORARY
BRIDGES

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section includes requirements for design, fabrication, and erection of Contractor- designed Temporary Bridge.

1.02 REFERENCES

- A. This Section incorporates by reference the latest revisions of the following documents.
1. American Association of State Highway and Transportation Officials (AASHTO)
 - a. AASHTO Guide Specifications for LRFD Seismic Bridge Design, with revisions
 - b. AASHTO M251, Plain and Laminated Elastomeric Bridge Bearings
 - c. AASHTO Guide Design Specifications for Bridge Temporary Works
 - d. AASHTO Construction Handbook for Bridge Temporary Works
 - e. AASHTO LRFD Bridge Design Specifications
 2. Washington State Department of Transportation (WSDOT)
 - a. WSDOT Bridge Design Manual (BDM) with current design memorandums.
 3. ASTM International (ASTM)
 - a. ASTM D4014, Plain and Steel-Laminated Elastomeric Bearings for Bridges.
 4. American Welding Society (AWS)
 - a. ANSI/AWS D1.1, Section 5
 - b. ANSI/AWS A5 Series Standards
 - c. ANSI/AWS D1.1, Table 4.1.1
 - d. ANSI/AWS A2.4

1.03 DEFINITIONS

- A. Working Drawings: Contractor-developed general and detailed plans/drawings, shop drawings used for purposes of fabrication, erection, construction of temporary works, falsework, and the temporary bridges identified in this Contract Specification.

- B. Temporary Bridge: A Contractor-designed temporary structure, including superstructure, substructure, and foundation, to carry utilities or vehicles over an excavation or obstacle within the limits of construction.

1.04 SUBMITTALS

- A. Resident Engineer will review and comment on Submittals. The Contractor shall not rely on the Resident Engineer's review and comment to determine the adequacy of the Temporary Bridge for its intended use.
- B. Design Engineer Qualifications Documentation.
- C. Design Criteria including:
 - 1. Governing codes, standards, and specifications.
 - 2. The method of design used and associated factors of safety and load factors.
 - 3. Design loads including dead load, construction live load, impact load, wind load, thermal loads, and lateral earth loads
 - 4. Loads superimposed by temporary excavation support structures.
 - 5. Foundation bearing and skin friction stresses.
 - 6. Load Combinations.
 - 7. Material properties.
 - 8. Allowable stresses / Load Factors / Resistance Factors.
- D. Design Calculations and Shop Drawings:
 - 1. The design, design calculations, and shop drawings must be stamped by the design engineer having the qualifications required under Article 1.05C herein.
 - 2. Provide design calculations and shop drawings to the Resident Engineer 25 days prior to the start of fabrication of the Temporary Bridges. Work shall not begin until the design has been approved.
 - 3. Include Working Drawings showing member identity, welding technique, cuts, copes, gussets, connections, holes, fasteners, camber, fabrication and erection tolerances, type of finish, weights of members, and critical clearances.
 - 4. Indicate welds using standard welding symbols of ANSI/AWS A2.4. Show the size, length, and type of each weld on drawings.
 - 5. Show sizes, details of fabrication, methods of assembly, locations of hardware and erection sequence, and procedures for heavy lifts and rigging.
- E. Work Plan:
 - 1. Provide a work plan to the Resident Engineer. Include in the work plan a schedule identifying the dates and durations of the design, fabrication, and installation. Include a site plan indicating the location and

orientation of the Temporary Bridges.

F. Installation Requirements

1. Methods required by the field personnel to install and uninstall the Temporary Bridges to conform to the design requirements and assumptions.

1.05 QUALITY ASSURANCE

- A. Prior to fabrication of the Temporary Bridge(s) verify actual Site conditions and dimensions to ensure they conform to the Temporary Bridge Working Drawings.
- B. Each page of design calculations shall bear the handwritten annotation of the initials of the designer and the checker and dates of origin, checking, and backchecking activities.
- C. Qualifications for Design Engineer: Licensed in the State of Washington as a Professional Civil Engineer and shall have a minimum of 4 years of verifiable experience in design of short span bridges.

PART 2 - PRODUCTS

2.01 DESIGN CRITERIA

A. General

1. The design, certification, Working Drawings, and specifications shall be prepared by the Contractor's design engineer, thoroughly checked, backchecked, and reconciled for completeness and accuracy.
2. Design the Temporary Bridge in accordance with the AASHTO LRFD Bridge Design Specifications.
3. The design and construction shall comply with all applicable environmental procedures and AHJ permitting requirements.

B. Performance Requirements

1. Include required barriers and safety features in the design of the Temporary Bridge.
2. Design the Temporary Bridge to be "redundant" as defined by AASHTO LRFD Bridge Design Specifications.
3. Take into consideration the superposition of surcharge due to a loaded bridge and equipment placed at the back of the bridge abutment.
4. Design the Temporary Bridge for a minimum service life of 8 years.

C. Structural Design Criteria

1. Determine loads and loading conditions to be used for the design of the Temporary Bridge that is consistent with the design specifications and the Contractor's means and methods of the construction. Give due

consideration to the dynamic loads associated with heavy equipment, soil excavation, and hauling of excavated soils.

2. Use a minimum vehicular design load for the Temporary Bridge equivalent to an HL-93 truck load (AASHTO LRFD loading) with 33 percent live load impact for LRFD design.

2.02 MATERIALS

- A. Structural Steel, post-tensioning, and concrete for the Temporary Bridge: As determined by the Contractor, provided material properties can be verified.
- B. Welding Rod/Electrodes
 1. Ensure electrodes for structural plate, shapes, pipe, tubes, and bars conform to ANSI/AWS A5 Series Standards and are coated rods or wire of size and classification number as recommended by their manufactures for the positions and other conditions of actual use. Match filler metal in conformance with ANSI/AWS D1.1, Table 4.1.1.

2.03 FABRICATION

- A. Fabricate elastomeric bearing pads of the material specified by the Contractor's design engineer and in accordance with the applicable requirements of AASHTO M251 and ASTM D4014.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Inspect all components of the Temporary Bridges after fabrication and after installation to ensure they conform to the intent of the design and requirements of the Working Drawings and specifications.

3.02 INSTALLATION

- A. Install the Temporary Bridge in accordance with the Working Drawings, erection sequencing, and Contractor's design engineer's instructions.

3.03 REMOVAL

- A. Contractor is responsible for removal of the Temporary Bridge(s).

END OF SECTION

SECTION 01 55 00
VEHICULAR ACCESS AND HAUL ROUTES

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section includes requirements for construction Site access and haul routes.

1.02 REFERENCES

- A. This Section incorporates by reference the latest revisions of the following documents:
 - 1. U.S. Department of Transportation, Federal Highway Administration (FHWA)
 - a. Manual on Uniform Traffic Control Devices (MUTCD)
 - 2. United States Access Board
 - a. Public Right of Way Accessibility Guidelines (PROWAG)

1.03 SUBMITTALS

- A. Access and Haul Plans, Locations, and Certifications:
 - 1. Initial plan, submitted per Contractor's approved Submittal Log so as to allow review and approval prior to commencement of hauling activities
 - 2. Updates to reflect modifications and alternative plans
- B. Haul Summary Reports: Submit weekly or as directed by the Resident Engineer.

1.04 ACCESS AND HAUL PLANS

- A. Written plan with drawings, which include the following:
 - 1. Detailed narrative describing access and haul plan for the Work, including:
 - a. Truck routes, number, frequency of trucks, and times of operation
 - b. Load areas and access into and out of the construction staging areas
 - c. An alternate location necessary to stage trucks during times of Site congestion
 - d. On-Site roads required to transport materials
 - e. Identify locations where on-street parking should be removed or traffic lanes closed to allow adequate truck access and turning movements

- f. Schedule for parking and removal and/or traffic lane closures required to provide safe construction activities, including truck turning movements
- 2. A copy of all necessary street use permits in connection with operations and activities.
- 3. Survey and documentation of pre-existing roadway conditions along proposed haul routes
- 4. Copies of truck drivers' driver licenses and certifications kept on record or file and made available upon request.
- 5. Submit updates to reflect modifications and alternative plans
- B. Truck Haul Route Plan: Reflect all constraints and requirements of the Contract Documents and this Section.
- C. Disposal Locations:
 - 1. List all disposal sites for all types and classification of material to be removed from the Site.
 - a. If disposal sites are to be added or location of material haul is changed, submit new disposal sites and types and classification of material.
 - 2. Certifications that all disposal sites are legally permitted for the type and content of the material to be disposed.
 - a. Submit new certifications if the disposal sites are changed or if the type or content of the materials being disposed varies from that previously approved.

1.05 HAUL SUMMARY REPORTS

- A. Weekly reports to include the following daily information for each Site:
 - 1. Material type
 - 2. Material weight
 - 3. Identity of each truck by hauler and truck number
 - 4. Total number of trucks per day entering the Site
 - 5. Origin of material brought on Site
 - 6. Location of material removed from the Site
 - 7. Disposal location
- B. Format as approved by the Resident Engineer.

PART 2 - PRODUCTS (NOT USED)**PART 3 - EXECUTION****3.01 ACCESS AND HAULING**

- A. For activities that require continuous work and hauling for which the interruption or halting of truck traffic would compromise the quality of the finished work, such as continuous concrete pours, obtain the written approval of the Resident Engineer for hauling outside the hours specified herein a minimum of 3 weeks prior to the scheduled start of the activity.
- B. Trim and cover loads when hauling is done over highways or city streets. Clean vehicle shelf areas after each loading and comply with local ordinances and traffic regulations.
- C. Station flaggers at vehicle access points into and out of construction staging areas or work zones to ensure safety of vehicles and pedestrians while vehicle access gates are open.

3.02 MAINTENANCE, REPAIR, RESTORATION

- A. Maintain all haul route roadways related to construction activities in safe, good condition and repair as necessary or as directed by the Resident Engineer, at no additional cost to Sound Transit. Share haul routes with businesses, residential, pedestrian and bicycle traffic, and maintain in good condition.
- B. Provide required oversight for approved truck route requirements to ensure compliance with traffic routing requirements. Trucks are prohibited on local/neighborhood streets and must avoid all cut-through routes. Provide lighted or reflective truck route identification and truck prohibition signs as directed by the Resident Engineer. If Contractor fails to abide to the approved haul routes, Resident Engineer will, if deemed to be in the public's interest, direct the Contractor to assign off-duty police officers for enforcement of haul route restrictions at the expense of the Contractor, and at no additional cost to Sound Transit.
- C. Maintain haul routes in a condition that is smooth, level, clean, and free of debris. Route condition must be suitable for the public to drive passenger cars on without damage to vehicles and allow for the safe travel for pedestrians and cyclists at all haul route crossings. Maintain all crosswalks and sidewalks along the haul route for pedestrians to cross safely. Maintain signs, lights, and pavement markings along haul routes.
- D. Maintain full access to all businesses, alleyways, driveways, walkways, and delivery/loading zones. If access agreement(s) are required, secure the agreements at no additional cost to Sound Transit and provide executed access agreements signed by property owner(s).
- E. If pavement, curb, sidewalk, or landscaping damage results, including but not limited to potholes or loose chunks of pavement due to Contractor's work, remove damaged asphalt/concrete/curb/sidewalk and repair as directed by the Resident Engineer within 48 hours, in accordance with standard plans and specifications of the local authority having jurisdiction.
- F. Restore signs, pavement markings, and all other traffic control or calming devices removed or modified for the truck haul route to their pre-existing configuration or as directed by the Resident Engineer.

END OF SECTION

SECTION 01 55 26

TRAFFIC CONTROL

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section specifies temporary traffic control.

1.02 REFERENCES

- A. This Section incorporates by reference the latest revisions of the following documents:

- 1. [Authority Having Jurisdiction]
 - a. City of Seattle Traffic Control Manual for In-Street Work
 - b. City of Seattle Standard Specifications for Road, Bridge and Municipal Construction
 - c. City of Seattle Standard Plans for Municipal Construction
- 2. Washington State Department of Transportation (WSDOT)
 - a. WSDOT Standard Specifications for Road, Bridge and Municipal Construction
 - b. WSDOT Standard Plans, M21-01
 - c. WSDOT Design Manual, M22-01
 - d. WSDOT Work Zone Traffic Control Guidelines, M55-44
- 3. U. S. Department of Transportation, Federal Highway Administration (FHWA)
 - a. Manual on Uniform Traffic Control Devices (MUTCD)
 - b. FHWA Final Rule on 23 CFR 630 Subpart J, 2004
- 4. United States Access Board
 - a. Public Right of Way Accessibility Guidelines (PROWAG)
 - b. ADA Accessibility Guideline (ADAAG)
- 5. American Traffic Safety Services Association (ATSSA)
 - a. ATSSA Quality Guidelines for Work Zone Traffic Control Devices
 - b.

1.03 SUBMITTALS

- A. Traffic Control Plan: In accordance with these documents, WSDOT Standard Specifications, or the authorities having jurisdictions (AHJ)'s Standard Specifications

1. The Traffic Control Plan shall provide description of all devices and management to be used during working and non-working periods. Include durations (days and times) of control plans. Plans shall be submitted for approval per Contractor's approved Submittal Log, so as to allow review and approval by Sound Transit and the Authorities Having Jurisdiction prior to the implementation of the plans.

- B. Qualifications for Traffic Control Manager (TCM) and Traffic Control Supervisor (TCS)

1.04 QUALITY ASSURANCE

- A. Qualifications for the Traffic Control Manager: As specified in WSDOT Standard Specifications Section 1-10.2(1)A.
- B. Qualifications for the Traffic Control Supervisor: As specified in WSDOT Standard Specifications Section 1-10.2(1)B.
- C. The TCS and the TCM shall have valid certificates as "Traffic Control Supervisors" as issued by the Evergreen Safety Council, The Northwest Laborers-Employers Training Trust, The American Traffic Safety Services Association, or approved equal.

PART 2 - PRODUCTS

2.01 TRAFFIC CONTROL DEVICES

- A. Provide or construct all traffic control devices, including temporary concrete barriers and temporary construction fencing, in conformance with applicable jurisdiction specifications and requirements. Include descriptions of traffic control devices in the Traffic Control Plan. The condition of signs and traffic control devices shall be new or "acceptable" as defined in the ATSSA Quality Guidelines for Work Zone Traffic Control Devices, and will be accepted based on a visual inspection by the Traffic Control Supervisor.

PART 3 - EXECUTION

3.01 GENERAL CONSTRUCTION

- A. For temporary traffic control of streets, roadways, and pedestrian and bicycle facilities that are to be owned or maintained by the AHJ, perform work described in this Section in conformance with the applicable requirements of that jurisdiction.
- B. Work with the Resident Engineer and the responsible jurisdiction to coordinate all necessary signal changes if required by the traffic control plan. Traffic signals shall only be countermanded by a uniformed police officer.
- C. Identify the use of flaggers and Police staff for traffic control in the Traffic Control Plan and obtain prior approval from the Resident Engineer. Employ flaggers whenever trucks enter onto a city street, including at all vehicle access gates to the construction work Site, to prevent conflicts with vehicles, cyclists, and pedestrians. Minimize roadway, lane, and sidewalk closures. Limit lane and roadway closures to non-peak traffic flow hours or other hours as determined by the AHJ. Travel lanes, parking lanes, and sidewalks outside of the construction wall shall be reopened when no construction activities are occurring.
- D. When sidewalks or bike paths are closed temporarily, provide alternate detour paths complying with ADA accessibility. In the case of temporarily closed bike lanes or paths, provide signing next to the lane or path and ahead of the work alerting bicyclists to the change. Parking lanes may be used for this purpose if a transition between the existing top of curb and the roadway is accessible. Include proposed design, including pedestrian

and bicycle detour and wayfinding signage, and business access signs and devices with the Traffic Control Plan. If the temporary walkway is to remain in place during non-working hours, clearly describe, in a separate section/chapter of the Traffic Control Plan, the traffic control devices to be in place during this period. Obtain all applicable permits for parking lane use and sidewalk closures.

- E. Maintain open access for all businesses at all times during construction, including large delivery vehicles. Sound Transit will work with property owners and businesses to understand access requirements.
- F. Do not close sidewalks on opposite sides of the roadway at the same time.
- G. Coordinate work activities with affected transit agencies, including temporary relocation or closure of bus stops and posting of informative signs (by others). See Special Conditions.
- H. Coordinate street closures, lane closures, and other in-street work activities including haul routes with Fire Departments and other emergency responders, post offices, major private delivery services, school districts, and solid waste collection operators.
- I. Obtain prior approval from local jurisdictions, [or WSDOT, and transit agencies] for closing or partial closing of all streets, sidewalks, or bike routes, as applicable. Give the required advance notice of all full and partial street closures after approval of the traffic control plan to all agencies providing emergency services, including without limitation, police, fire, and ambulance services. Include, at the least, the dates and times of commencement and completion of work, names of streets or location of sidewalks and alleys to be closed or partially closed, and schedule of operations and routes of detours where applicable.
- J. Ensure that reliable emergency access is maintained to avoid delays in response times.
- K. When the Work involves use of public ways, follow standard construction safety measures, which include but are not limited to, installing advance warning signs and high visibility construction barriers, providing necessary flaggers as required by the local authorities, and installing and maintaining means of reasonable access to all fire hydrants, parking garages, and other property.
- L. During nighttime work hours, use lighted or reflective signage to direct drivers, pedestrians, and bicyclists through work zones, and direct truck drivers to truck haul routes. Cover all conflicting signage.
- M. Obtain approvals from all jurisdictions if detours pass through multiple jurisdictions.
- N. Obtain all permits required for short-term and long-term, on-street parking displacements.

3.02 TRAFFIC CONTROL MANAGEMENT

- A. Before beginning work on the project, designate individual(s) to perform the duties of TCM and TCS, as described in Article 1.04 herein.
- B. Identify an alternate TCM and TCS that can assume the duties of the assigned or primary TCM and TCS in case of that person's inability to perform. Alternates will be adequately trained and certified to the same degree as the primary TCM and TCS.
- C. Maintain 24-hour telephone numbers at which the TCM and TCS can be contacted and be available at the Resident Engineer's request at other than normal working hours. Supply the TCM and TCS with appropriate personnel, equipment, and materials to correct any deficiency in the traffic control system at any time.

- D. Patrol the traffic control area daily and reset all disturbed signs and traffic control devices.
- E. Remove or cover signs and other traffic control devices during periods when they are not necessary.

END OF SECTION

SECTION 01 56 39
TEMPORARY TREE AND PLANT PROTECTION

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section includes requirements for:
1. Developing a Landscape Protection Plan approved by the Resident Engineer for all Trees and Landscape Requiring Protection, and all associated tree and plant protection elements that are in place at the beginning of the Contract prior to commencement of construction activity.
 2. Furnishing all labor, materials, equipment, supplies, and operations as required to install and maintain tree and plant protection as indicated and as required by the approved Landscape Protection Plan.
 3. Maintaining newly installed tree and landscape protection elements, including, but not limited to, fencing, woodchip mulch, landscape fabric, cabling, and signage.
 4. Areas for Tree and Plant Protection, as shown on the Drawings, include properties under the jurisdiction of the City of [Seattle], and Washington State Department of Transportation. Standards of each authority having jurisdiction must be met or exceeded.

1.02 REFERENCES

- A. This Section incorporates by reference the following documents:
1. [City of Seattle]
 - a. Standard Plans for Road, Bridge and Municipal Construction.
 - b. Standard Plans 132a, 132b, and 133.
 2. Council of Tree and Landscape Appraisers:
 - a. *Guide for Establishing Values of Trees and Other Plants*, issued by the Council of Tree and Landscape Appraisers.
 3. Washington State Department of Transportation
 - a. Standard Specifications for Road, Bridge and Municipal Construction 2012.

1.03 DEFINITIONS

- A. [COS: City of Seattle]

- B. Critical Root Zone (CRZ): An area surrounding the tree trunk which is equal to 1 foot radius for every 1 inch diameter of diameter of tree at breast height (DBH), measured from the center of the tree.
- C. DBH: Diameter of a tree at breast height, as measured 4-1/2 feet above the root flare.
- D. Dripline: The area on the ground beneath the outer edge of the tree's canopy.
- E. Exceptional Tree: A tree or group of trees that because of its unique historical, ecological, or aesthetic value constitutes an important community resource, and is determined as such by the Director of the City of [Seattle Department of Planning and Development (DPD) according to standards and procedures promulgated by DPD].
- F. Inner Critical Root Zone: An area surrounding the tree trunk which is equal to 6-inch radius for every 1 inch diameter of diameter of tree at breast height (DBH), measured from the center of the tree.
- G. ISA: International Society of Arboriculture.
- H. Landscape Requiring Protection: All existing vegetation with the soil that supports its growth as identified in the Contract Documents to remain and be protected.
- I. Project Arborist: An International Society of Arboriculture (ISA) certified arborist on the Contractor or Subcontractor's team, and approved by Sound Transit.
- J. Root Flare: The area at the base of the plant's stem or trunk where the stem or trunk broadens to form roots; the area of transition between the root system and the stem or trunk.
- K. Trees Requiring Protection: All existing trees to remain and be protected as identified in the Contract Documents and the Tree Protection Plan, including areas of tree critical root zones of trees within the vicinity of the Project Site which may be affected by construction.
- L. WSDOT: Washington State Department of Transportation.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Coordination: Coordinate with property owners having jurisdiction over Work Sites.

1.05 SUBMITTALS

- A. Tree and Landscape Protection Plan: Submit to the Resident Engineer 30 days prior to commencement of any construction activity. Include the following:
 - 1. Table of Contents
 - 2. A survey plan drawing with tree locations provided by a professional surveyor
 - 3. Final landscape protection locations and phasing plan drawing. Include fence locations and a schedule, if fence locations must change to accommodate other Site Work
 - 4. List and schedule of all intended landscape maintenance practices to be provided
 - 5. Tree labels including identification number as assigned

6. Each tree's number, botanical and common name, DBH, CRZ, and minimum tree value
 7. List of Exceptional Trees, if any
 8. The watering schedule for temporary watering. Indicate source of water, a reliable method of slow application, and duration for watering
 9. All Work activities within 50 feet of Trees and Landscape Requiring Protection
 10. Anticipated work methods for work within CRZ of all landscape to be protected
 11. Proposed tree and root avoidance techniques
 12. Documentation of Project Arborist's on-site confirmation or re-designation of the CRZ for each tree
- B. Photo Documentation, Tagging, and Inventory Reports: To be performed by Project Arborist prior to construction activities:
1. Photograph Trees and Landscape Requiring Protection immediately following Notice to Proceed and again after plants produce a full canopy of leaves if initial photographs are taken when plants are bare of leaves.
 2. Photo Document all Landscape Requiring Protection: Photograph trees from the cardinal directions (north, south, east, west). Label all photographs with:
 - a. Location of photograph
 - b. Tree tag number, unique for each tree
 - c. Direction from which the photograph was taken
 - d. Date photograph was taken
 3. Written inventory of Landscape Requiring Protection, confirming location, type, and size.
 4. Provide two (2) hard copies of photographic documentation and inventory and two (2) electronic copies to the Resident Engineer 30 Days prior to Work commencing on Site.
- C. If not listed herein, provide an appraisal by the Project Arborist for all Trees and Landscape Requiring Protection identified by the Contract Documents. The Project Arborist shall provide supplemental appraisal values for additional landscape or trees whose critical root zones may be affected by construction and therefore need to be protected. Base the appraisals upon the current *Guide for Establishing Value of Trees and Other Plants*.
- D. Qualifications of Project Arborist.
1. International Society for Arboriculture Certified Arborist in good standing.
 2. Minimum 5 years of experience in the field.
- E. Product Data:
1. Mycorrhizae fungal inoculant

2. Slow release fertilizer
3. Landscape protection fencing
4. Wood chip laboratory report

F. Samples:

1. Landscape protection signage: One (1).
2. Tree appraisal value signage: One (1).
3. Cabling material: One foot length.
4. Wood chips: One pound bag.
5. Coir mat: One square foot.

G. Compliance Reports: Submit observations and recommendations for each Site visit conducted by the Project Arborist.

1.06 PROJECT CONDITIONS

- A. The Resident Engineer may order the Work stopped if tree and landscape protection is not complete prior to Site Work, if unauthorized use of protected area is occurring, or if protection fencing is not restored within 24 hours of notice to do so.
- B. Tree Identification: In all correspondence regarding Trees and Landscape Requiring Protection and protection systems, refer to the location and specific tree number on the Contract Documents or as listed herein.
- C. Trees Requiring Protection: Use list of trees and data provided in the Landscape Protection Plan, not the Contract Drawings, as the information in the Landscape Protection Plan may be more current than the Contract Drawings.
- D. Exceptional Trees: Some surface impact locations include Exceptional Trees. Coordination and scheduling of tree protection measures is required with [City of Seattle Urban Forestry representatives]. Protection measures at these locations include, but are not limited to, fencing, special containment and handling of construction materials, selective pruning and tying-back of tree limbs, scheduling of work in seasons amenable to manipulation of tree limbs, avoidance of inner critical root zones, and special excavation and drilling practices.

1.07 WARRANTY

- A. Warranty for replacement plants as follows:
 1. Replace plants which, in the opinion of the Resident Engineer, are in unhealthy or unsightly condition, or that have lost their natural shape due to dead branches, excessive pruning, or excessive defoliation.
 2. Be responsible for maintenance of all replacement plants during the Warranty Period. Inspect the plant materials to ensure that the areas are receiving proper care. Sound Transit will provide periodic reviews and notify of areas needing attention.
 3. Replace unacceptable plants no later than the next succeeding planting season.

4. Replace unacceptable plants in accordance with original specification. Cost is considered to be included in the Contract.
5. Any plant that is 25 percent or more dead or disfigured is considered dead and must be replaced at no charge. Plants are considered disfigured when excessive dead wood has been removed or when the symmetry, typical habit of growth, or sculptural form has been impaired by the removal of dead wood.
6. The above warranty is applicable to any growing conditions through which plants of like kind could be expected to survive and any deformity or cause of death which could be attributed to, or affected by, the physiological conditions of the plant. The warranty would not apply to plant losses due to abnormal weather conditions such as floods, excessive wind damage, drought, severe freezing, or abnormal rain, as determined by the National Weather Service.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Protection Fencing

1. In accordance with the jurisdictional standards of the property owner for each Site.
2. If no standards exist, use chain-link fencing only.
 - a. Chain link fence materials including footings, posts, braces, and mesh to be used to form a 6 foot high enclosure.
 - b. Footings:
 - 1) Type 2: above ground precast concrete block type footings, 100 pounds minimum.
 - c. Posts: 1-1/2 inch steel pipe, minimum. Use with approval by Resident Engineer in areas where fence must cross existing paved surfaces or where indicated by Contract Drawings or Landscape Protection Plan.
 - d. Mesh: 2 inch by 2 inch 11 gauge chain link fabric, minimum.

B. Protection Signage:

1. Provide weather resistant, fluorescent green or yellow signs 48 inch by 48 inch with minimum of 3 inch high letters indicating the following:
 - a. Protection Warning: No Trespassing on the landscape or critical root zone of tree/trees without direct approval of Resident Engineer. Unauthorized activities or Work within the critical root zone of trees will result in a fine of \$1,500, or the appraised landscape value, whichever is greater.
 - b. Botanical/common names
 - c. Appraised value of tree and landscape

C. Cabling: Meet landscape industry standards for permanent cabling of trees.

- D. Tree tags: Race-track shaped aluminum tags engraved with individual tree numbers as indicated on Contract Documents.
- E. Water: Potable water supplied by the Contractor.
- F. Mycorrhizae Fungal Inoculant: Mycogrow Gel, manufactured by Fungi Perfecti (Olympia, WA) or Mycorrhizal Landscape Inoculant, manufactured by BioOrganics (Santa Monica, CA), or approved equal to meet jurisdictional requirements.
- G. Slow Release Fertilizer: Osmocote 14-14-14 slow release pellets, Osmocote Controlled Release Fertilizer 13-13-13, Sierra Controlled Release Fertilizer Plus Minors 17-6-12, or approved equal to meet jurisdictional requirements.
- H. Wood Chips: Chipped wood mulch or hog fuel, which has composted for a minimum of 1 year, or approved equal to meet jurisdictional requirements. Submit mulch to laboratory to be checked for undesirable pathogens. Submit laboratory report.
- I. Coir Mat: Geocoir@DeKoWe 400 by Belton Industries, Koir Mat 400 by Nedia Enterprises, or approved equal to meet jurisdictional requirements.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Prior to construction activity:
 - 1. Submit a Landscape Protection Plan for review and acceptance which meets or exceeds the standards of the jurisdiction of the property owner.
 - 2. Verify adequacy of the extent of Landscape Requiring Protection as defined in the Contract Documents.
 - a. Project Arborist to review Contract Documents and periphery of Site for any additional landscape or trees whose critical root zones may be affected by construction and therefore need to be protected.
 - 3. Tag trees with designated numbers.
 - 4. Post Protection Signage for all Trees and Landscape Requiring Protection as specified herein.
 - 5. Protect Landscape in accordance with approved Landscape Protection Plan.
 - 6. Protect soil and roots within the CRZ of all Trees and Landscape Requiring Protection with coir mat under wood chips.
 - 7. If required, root prune within the CRZ three (3) months prior to commencement of construction activity under the guidance of the Project Arborist..
 - 8. Install landscape protection fencing.
 - 9. Protection begins prior to commencement of construction activities and continues to Acceptance.

3.02 INSTALLATION

A. Landscape protection fencing:

1. Fencing in accordance with jurisdictional requirements specified herein: Install fence on above ground precast concrete block type footings in locations as indicated in approved Landscape Protection Plan.
2. Install fencing and wood chips to protect Trees or Landscape Requiring Protection from construction activities unless otherwise approved by Resident Engineer.
3. If construction activities are expected adjacent or near Trees or Landscape Requiring Protection, install chain-link fencing in accordance with jurisdictional standards for the duration of construction activities.
4. Do not compact soil or use heavy equipment in the CRZ when installing protective fencing installation.
5. Provide diagonal bracing to vertical posts at corners of enclosures and wherever needed to ensure rigidity of the fencing.
6. Install chain link fabric tight to grade at the bottom edge, and stretched uniformly between posts. Install top of fabric 6 feet above grade, minimum.
7. Install fabric to form continuous fencing. Attach fabric to posts 12 inches on center with 11 gauge wire ties securely fastened, or with bolted ring clips, and to top rail not over 3 feet on center.
8. Attach orange flag strips 12 inches long at 3 feet on center along the fence, 5 feet above grade.
9. Provide one (1) locked gate at each fenced area.

B. Protection signage:

1. Affix one (1) protection sign to each Tree Requiring Protection using a method accepted by the Project Arborist.
2. Affix one (1) protection sign to the Protection Fence around each area of Landscape Requiring Protection.

C. Coir Mat and Wood Chips:

1. Protect soil and roots within the CRZ of all Trees Requiring Protection with a coir mat under a layer of 4 inches of wood chips. Provide a 12 inch radius clear zone at the base of each tree.
2. When understory plants such as lawn or shrubs are within the CRZ of Trees Requiring Protection, or in areas of Landscape Requiring Protection, provide coir mat and wood chips when directed to do so by the Resident Engineer as needed to protect soils and roots from any work taking place within the fencing.
3. In areas of Tree or Landscape Requiring Protection with understory landscape, provide additional wood chips when directed to do so by the Resident Engineer as needed to protect soils and roots from any work taking place within the fencing.

3.03 PROTECTION

A. Project Arborist to:

1. Monitor Work within CRZ of all Trees Requiring Protection including all excavation, demolition, and all resurfacing of sidewalks and road beds. See Section 31 11 00, Clearing and Grubbing, for excavation requirements for trees.
2. Monitor and be on Site at time of removal of existing hardscape within CRZs to avoid root damage. As hardscape is removed, identify existing subgrade and assist in establishing final grade or new pavement subgrade by providing direction for root protection. Where new pavement is planned, direct the cutting of roots 6 inches clear of planned paving edge.
3. Monitor maintenance of all Landscape Requiring Protection to ensure it is in a healthy condition. Report deficiencies or concerns to the Resident Engineer immediately. Implement adjustments to the protection plan as directed by the Resident Engineer as needed during the course of the Work.
4. Immediately report deficiencies or concerns to the Resident Engineer.
5. Implement adjustments to Landscape Protection Plan and list of Landscape Requiring Protection as needed and as accepted by the Resident Engineer.
6. Perform on-Site review as needed during construction for activities that are adjacent to or affecting all Trees and Landscape Requiring Protection.
7. Provide Compliance Reports of maintenance Site visits and field inspections to review and respond to Site conditions and health status of all Trees and Landscape Requiring Protection including:
 - a. Construction activities affecting protected areas.
 - b. Status of protection elements.
 - c. Maintenance and watering conditions.

B. Tree and Landscape Protection:

1. Refer to Section 31 11 00, Clearing and Grubbing. Protect landscape in accordance with Tree and Landscape Protection Plan.
2. Coordinate with Project Arborist regarding areas requiring special attention as identified and specified on the Contract Documents.
3. Locate tree protection in accordance with the Contract Documents and approved Tree and Landscape Protection Plan unless otherwise directed by Project Arborist.
4. Within the CRZ, hand-excavate to prevent tears and breaks in root surfaces. Leave roots larger than 2 inches in diameter intact and undamaged. If roots greater than 2 inches in diameter must be removed, consult with Project Arborist prior to removal.
5. Use air spade to excavate within CRZs, as identified on Tree and Landscape Protection Plan. Cut roots cleanly with a diamond blade when roots are exposed or disturbed by Work activities.

6. At all times when roots are exposed, keep roots moist with moist soil, wet mulch, and burlap, or approved equal.
 7. In utility trenches, place utility conduit either under roots by tunneling, or over roots using adequate sand bedding. Verify with the Resident Engineer that the bedding is adequate.
 8. Carefully plan and execute operations to avoid damaging plants and soils. Coordinate with Project Arborist and Resident Engineer on requirements specified herein.
 9. Protect against cutting, breaking or skinning of roots, skinning or bruising of bark, compaction of soils in root zones, and breaking of branches.
 10. Perform heavy equipment work from locations, angles, and directions that minimize compaction to tree or shrub roots and soils.
 11. Under the supervision of the Project Arborist and Resident Engineer, tie back flexible limbs and overhead branches which may, in the opinion of the Project Arborist and Resident Engineer, be damaged by the passage or activity of equipment. Anticipate limbs that may be in the way of necessary equipment to avoid limb damage and provide a remedy before Work occurs. Do not remove tree limbs without the prior written acceptance of the Resident Engineer.
- C. Use of area within protective fences and within the CRZ of all Trees and Landscape Requiring Protection:
1. Do not store materials potentially harmful to plants within 20 feet of outside limit of protected areas. Potentially harmful materials include, but are not limited to: petroleum products, cement and concrete materials, cement additives, lime, paint coatings, waterproofing agents, form coatings, detergents, acids, and cleaning agents.
 2. Do not alter grades within the required protective fence area.
 3. Control soil moisture within the protected area. Prevent flooding of the soil, and protect root areas from leachate, cement, oil, fuel and lubricating oil, and all contaminants.
 4. Notify the Resident Engineer and Project Arborist 48 hours in advance of the need to move protection fence.
 5. Upon relocation of fence, continue all other protection efforts and maintenance of Trees and Landscape Requiring Protection in accordance with the Trees and Landscape Protection Plan.

3.04 MAINTENANCE

- A. Tree and Landscape Maintenance:
1. Perform all pruning, thinning, and other maintenance under the direction of the Project Arborist.
 2. Prune as necessary for safety, to promote the health of the tree, and to allow clearance for construction within the tree dripline or CRZ (whichever is greater) of all Trees Requiring Protection. Do not move protection fences prior to consultation with the Project Arborist and acceptance by the Resident Engineer.

3. Fertilize and inoculate all Trees and Landscape Requiring Protection throughout the life of the Contract. Under direction of Project Arborist, aerate and inject mycorrhizae and slow release fertilizer into the root zone surrounding all Trees and Landscape Requiring Protection. Perform injection with a soil injection needle attached to an applicator or other means per direction of Project Arborist.
4. Water Trees and Landscape Requiring Protection at least once per week from June 21 to September 21 or as directed by the Project Arborist. Ensure continuous uninterrupted water supply to each area of protection throughout the duration of the Contract. Do not allow water to run off or cause erosion at any time during watering.
5. Maintain woodchips at the specified depth. Should the depth of wood chips measure less than the specified depth at any time; replenish to attain the specified depth. Do not allow the depth of wood chips in the CRZ to measure less than the specified depth for more than 48 hours.
6. Notify the Resident Engineer and Project Arborist 48 hours prior to all Work to be performed within the CRZ of any Tree Requiring Protection.
7. Maintain all Trees and Landscape Requiring Protection in a healthy and flourishing condition until Acceptance of the Contract, as directed by the Project Arborist. Prevent damage to roots, trunks, and crown protected plants, and provide maintenance required to guarantee their health. Protection and maintenance responsibilities include, but are not limited to:
 - a. Replacing damaged protection fencing regardless of cause, including acts of vandalism.
 - b. Aerating compacted soils.
 - c. Controlling surface runoff.
 - d. Expertly pruning and treating damaged roots.
 - e. Replacing wood chips within protection areas to maintain the specified depth of chips.
 - f. Keeping all exposed roots moist in accordance with Article 3.03.B.6 herein.
 - g. Keeping mulch away from base of trunk as specified herein.
 - h. Performing work under the direction of the Project Arborist.
 - i. Remove weeds in planting areas throughout the duration of the Contract.

B. Fence Maintenance

1. Maintain fences in good condition at the specified location until Acceptance of Site operations, except where directed otherwise in writing by the Resident Engineer. Immediately repair fencing when damaged, regardless of cause of damage.
2. Protection fencing may be removed temporarily for specific construction operations only under review and acceptance of the Project Arborist and the Resident Engineer.

3.05 REPAIR/RESTORATION OF DAMAGED LANDSCAPING

- A. Repair and restore landscaping damage inflicted by construction outside the construction areas and designated access routes, which include damaged landscape removal, complete soil preparation, approved planting, and adequate irrigation to establish the replaced landscape.
- B. Damages for loss or injury to Tree or Landscape Requiring Protection including loss or injury as a result of vandalism or construction activities:
 - 1. In the event of damage or loss to Trees or Landscape Requiring Protection due to failure to protect and maintain said tree, pay Sound Transit as liquidated damages a sum equal to:
 - a. The value of each lost tree or plant, as determined by the Project Arborist's confirmed and accepted appraisal values as noted in Article 1.05C herein.
 - b. The cost to remove and dispose of said tree or plant, and
 - c. An additional \$1,500 per damaged or lost tree or plant in compensation for the efforts of Sound Transit in administering and overseeing the replacement.
 - 2. In the event of injuries to the crown, trunk, branches or root system of Trees Requiring Protection that are the result of the Contract's failure to protect and maintain such tree, the Resident Engineer may elect to retain the tree and hold the Contractor liable for compensation.
 - 3. Completely remove and dispose of plants requiring protection that are killed or irreparably damaged due to vandalism, natural acts, diseases, or failure to protect or maintain plant. Remove and dispose of the plant, including the entire stump and roots to a depth of 2 feet below finish grade.
 - 4. Replace at Resident Engineer's direction trees or plants lost or, in the opinion of the Resident Engineer, irreparably damaged as a result of failure to protect or to adequately maintain. Replacement conditions will not apply to plant losses due to abnormal weather conditions such as floods, excessive wind damage, drought, severe freezing, or abnormal rain, as determined by the National Weather Service. Trees, which fail to fully foliate in the spring following completion of construction operations, may be presumed to have been lost due to construction operations.
- C. Locate and install replacement trees and plants in accordance with jurisdictional standards and by direction of the Resident Engineer. The Resident Engineer may require lost trees be replaced in areas other than in their original location.
- D. Pruning of Damaged Trees
 - 1. Sterilize equipment with alcohol prior and during trimming and pruning operation.
 - 2. Under the direction of the Project Arborist, cleanly cut off broken limbs and branches to the nearest crotch in accordance with good horticultural practice. Cut limbs and branches greater than 1/2 inch in diameter. Carry out all pruning of damaged trees to the approval of the Resident Engineer.
 - 3. Maintain Trees and Landscape Requiring Protection in as good of a condition at the completion of the Work as at the commencement of the Work. If such a

condition does not exist at the completion of the Work, provide corrective measures at the direction of the Project Arborist.

4. Pay for all costs for the repair of damage to trunks or major limbs 3 inches in diameter or over requiring, in the opinion of the Resident Engineer, the attention of a professional tree surgeon. Consider all costs incurred in the protection of Trees Requiring Protection incidental to the Contract.

3.06 Fence Removal

- A. Remove protection fencing and wood chips only at Resident Engineer's direction. Fence removal is subject to all protection measures for Trees and Landscape Requiring Protection being satisfied as stated in this Section and stated in the Tree and Landscape Protection Plan prepared by the Project Arborist.

3.07 Schedule

TREES TO BE PROTECTED

NUMBER	Botanical Name	Common Name	SIZE (DBH)	CRZ Dia	VALUE

END OF SECTION

SECTION 01 57 00**TEMPORARY ENVIRONMENTAL PROTECTIONS AND CONTROLS****PART 1 - GENERAL****1.01 SUMMARY**

- A. Section includes the requirements and performance specifications for mitigating construction impacts to the environment including air, land and Waters of the United States or Waters of the State, through best management practices (BMP) and environmental controls
- B. Section applies to projects with an anticipated total impacted/disturbed development or project scope size of 1 acre or greater. For early site development work, if the impacted or disturbed area is 1 acre or greater, an NPDES permit will be required. If conditions or requirements change, the Contractor shall not disturb any further area without Sound Transit approval, with the exception of necessary TESC-related activities to maintain site compliance, Contractor shall cease all work until the appropriate permit is acquired.
- C. The Contractor is responsible for control of water, including groundwater, entering onto, flowing through, originating, and exiting the construction site or staging areas.
- D. The Contractor is responsible for coordination with Authorities Having Jurisdiction (AHJ) associated with this Contract. This includes defining, confirming, verifying, and complying with current requirements for construction stormwater permitting, operations, and mitigation.

1.02 REFERENCES

- A. This Section incorporates by reference the latest revisions of the following documents:
 - 1. Code of Federal Regulations (CFR)
 - a. 40 CFR Part 136, Guidelines Establishing Test Procedures for the Analysis of Pollutants
 - b. 40 CFR 261.21, Identification and Listing of Hazardous Waste, Characteristic of Ignitability
 - c. 40 CFR Part 112, Spill Prevention Control and Countermeasure (SPCC) regulation
 - d. 40 CFR 230.3(s) Waters of the United States
 - 2. Revised Code of Washington (RCW)
 - a. RCW 77.08.010: Definitions
 - b. RCW 77.135: Invasive Species
 - 3. Environmental Protection Agency
 - a. Clean Water Act, Section 404 Permit Program

4. Washington Administrative Code (WAC)
 - a. Chapter 16-750 WAC—State Noxious Weed List and Schedule of Monetary Penalties
 - b. Chapter 173-200 WAC—Water Quality Standards for Ground Waters of the State of Washington
 - c. Chapter 173-201A WAC—Water Quality Standards for Surface Waters of the State of Washington
 - d. Chapter 173-226-030 – Water Discharge General Permit Program
5. Washington Department of Ecology (Ecology)
 - a. Stormwater Management Manual for Western Washington (SMMWW) Current Version
 - b. Construction Stormwater General Permit (CSWGP)
6. Washington State Recreation and Conservation Office
 - a. Washington Invasive Species Council: 50 Priority Species
7. Municipality
 - a. Applicable municipality Noxious Weed List
 - b. Applicable municipality Environmentally Sensitive Areas Ordinance
 - c. Applicable municipality Fire Code and amendments
 - d. Applicable municipality standard specifications for road, bridge and municipal construction
 - e. Applicable municipality standard plans

1.03 DEFINITIONS

- A. Administrative Order (AO): Issued by Ecology to implement more stringent sampling and discharge requirements that may take precedence over the CSWGP
- B. AHJ: Agency(ies) that have multi-municipality or multi-county jurisdiction or a single municipality
- C. BMPs: The activities, practices, maintenance procedures, and other physical, structural, or managerial actions used during construction to prevent or reduce the pollution of Groundwater and Surface Waters of the State. BMP types are specified by number in the current version of the Ecology Western Washington Stormwater Manual
- D. Bulk Fuels: Fuels in quantities greater than 250 gallons, including, but not limited to, motor oil, gasoline, kerosene, diesel fuel, hydraulic oil, and other products derived from the refining of crude oil that are contained in drums or tanks (above ground or buried)
- E. CESCL: Certified erosion and sediment control lead
- F. CESF System Operator: Chitosan Enhanced Sand Filtration (CESF) system operator
- G. CSEMS: Construction site environmental management supervisor

- H. Dewatering Water: Groundwater encountered, captured, extracted, and collected during construction excavation activities; dewatering water may also include trench seepage and/or infiltration which could come in contact with saturated zone groundwater.
- I. Dry season: May 1 through September 30
- J. ECAR (Environmental Corrective Action Required): An ECAR is a ST formal process for responding to and tracking environmental incidents and issues that occur, identifying the root cause of the environmental issue, and implementing corrective actions in a timely manner. An ECAR has the goal of promoting continual improvement, identifying opportunities for preventative management, and ensuring compliance with environmental regulations and contract requirements.
- K. Groundwater: Water that exists underground in saturated zones beneath the land surface
- L. Leachate: Any liquid that, in the course of passing through matter, extracts soluble or suspended solids, or any other component of the material through which it has passed
- M. Monitoring Results of Discharges to Sanitary Sewer or Combined Sewer: Daily quantity and quality reports for each discharge to the sanitary sewer or combined sewer
- N. Monitoring Results of Discharges to Surface Water: Daily quantity and quality reports for each permitted surface water discharge location or any identified non-point source discharge
- O. Municipality: local political entity(ies) or county(ies) in which the Work of this Contract occurs
- P. Notice of Intent: The application for coverage under Ecology's CSWGP
- Q. Non-Compliance Event(s): Occurrence(s) where discharge to surface water, groundwater or sanitary sewer exceeds allowable discharge limits
- R. NPDES (National Pollutant Discharge Elimination System): The national program for issuing, modifying, revoking, reissuing, terminating, monitoring, and enforcing treatment requirements under Sections 307, 318, 402, and 405 of the Clean Water Act for discharge of pollutants to surface waters
- S. POD: Point of Discharge
- T. Process Water: Discharge includes, but is not limited to:
 - 1. Truck and wheel wash water, equipment wash water, petroleum or chemically contaminated water, non-contact cooling water, and chlorinated water
 - 2. All water which, during manufacturing or construction process, comes into direct contact with, or results from the process or use of, a raw material, intermediate product, finished product, byproduct, or waste product
 - 3. Water used for sawcutting
 - 4. Decant water, originating as either groundwater or added potable water, from excavated spoils that contain additives, conditioners including bentonite, cementitious materials, pollutants, or Hazardous or Contaminated Substances
 - 5. Water in bottom of tunnels or underground excavations
 - 6. Water entering the excavation from or through excavation support system walls or invert, including any working slab areas

- 7. Water discharge from slurry mixing and treatment plant, jet grouting operation, or other similar operations.
- 8. Site water in contact with, and chemically affected by, site conditions which may or may not be treated on site to meet surface water discharge criteria
- U. Qualified Wetland/Stream Biologist: A biologist who has a minimum of 5 years' experience, is a Professional Wetland Biologist, or has similar qualifications
- V. Rolled Erosion Control Products: Prefabricated blankets or netting which are formed from both natural and synthetic materials
- W. Sensitive Areas: Areas including wetlands, streams, buffers or other areas designated as sensitive or protected by local ordinances, applicable State or Federal law, or which are shown on the Contract Drawings
- X. Site Water: All water on the work site that requires discharge from the Site: classified as Stormwater (including water in open trench), Dewatering Water, Sanitary Sewage, or Process Water
- Y. SMMWW: The current version of the technical manual published by Ecology for use by local governments, that contains the description of, and design criteria for, BMPs to prevent, control, or treat pollutants in stormwater
- Z. Soil Erosion: The action of surface processes (such as water flow or wind) that removes soil, rock, or dissolved material from one surface location and then transports it to another location
- AA. Stormwater: Water originating as precipitation that does not infiltrate into the ground or evaporate, as more specifically defined in the CSWGP
- BB. Surface Water:
 - 1. Waters of the U.S. and Surface Waters of the State
 - 2. Wetlands, jurisdictional ditches, and open drainage channels
 - 3. Municipalities' stormwater systems
- CC. Surface Waters of the State: Lakes, rivers, ponds, streams, inland waters, salt waters and all other surface waters and water courses within the jurisdiction of the state of Washington.
- DD. Waters of the U.S.: All waters of the United States, including the territorial seas which are traditionally navigable waters
- EE. SWPPP (Stormwater Pollution Prevention Plan): A documented plan to implement measures to identify, prevent, and control the contamination of point source discharges of stormwater
- FF. TESC (Temporary Erosion and Sedimentation Control): Planning, managing, controlling, mitigating, recording, and reporting discharge of stormwater from construction sites
- GG. Turbidity: The clarity of water expressed as nephelometric turbidity units (NTU) and measured with a calibrated turbidimeter
- HH. Wet season: October 1 through April 30

1.04 ADMINISTRATION

- A. Within 21 days of the effective date of the Notice to Proceed, hold a meeting with the CSEMS and the Resident Engineer to review and discuss in detail the environmental requirements of the Contract and how to meet them and to prepare a draft schedule for related submittals.
- B. Coordinate with property owners having jurisdiction over work sites.
- C. A TESC preconstruction meeting, including a Site inspection with the AHJs and Sound Transit, is required before ground disturbance begins.
- D. Contractor shall not clear, grub, grade, demolish, or perform any earthwork after Notice to Proceed until the requirements of the appropriate permits and submittals (i.e., NPDES, TESC, Surface and Sanitary Discharge Plans, and SWPPP) are accepted and the following have been installed: perimeter controls, construction entrances and wheel washes, clearing and sensitive area limits marked, stormwater ponds or tanks in place, off-site water bypassed, stormwater system protections in place, BMP materials on hand, any required protection of trees, sensitive areas, or other areas as directed by the Resident Engineer.
- E. The provisions of the section shall apply to the Contractor, subcontractors at all tiers, suppliers, and all others who may have access to the work site including third-party contractors.

1.05 SUBMITTALS AND TRANSMITTALS

A. General

- 1. Unless otherwise approved by Resident Engineer, Contractor shall provide submittals related to the stormwater permitting, SWPPP, Surface Water Discharge Plan, Sanitary Sewer Discharge Plan, and other applicable discharge permitting requirements as a complete package for Sound Transit prior to starting construction. Plans may be submitted as a separate submittal for early work activities. Sound Transit will coordinate with Contractor on necessary lead time for submittal.
- 2. Contractor shall modify plans included in this specification when project information changes throughout the duration of the project. Contractor shall notify Resident Engineer when changes or modifications are made. Additional review and approval of such modifications will require transmittal or resubmittal as directed by the Resident Engineer or specified below.

B. Submittals

- 1. Environmental Compliance Strategy Plan
- 2. Air Pollution Control Plan
- 3. SWPPP
- 4. Quarterly SWPPP updates
- 5. TESC Plan
- 6. Quarterly TESC Plan updates
- 7. Discharge to Surface Water Plan

8. Discharge to Surface Water Plan updates: submit when proposing modification to the approved plan
9. Dewatering Plan
10. Dewatering Plan updates: submit when proposing modification to the approved plan
11. Discharge to Sanitary Sewer/Combined Sewer Plan
12. Discharge to Sanitary Sewer/Combined Sewer Plan update: submit when proposing modifications to the approved plan
13. Trucking Plan
14. Invasive Species Management Protocols
15. Qualifications of the CSEMS
16. Environmental Corrective Action Required(s) (ECARs)

C. Transmittals

1. Industrial Waste Discharge Permit Application
2. Permits obtained by the Contractor
3. Chemical Usage Documentation: Transmit the daily chemical usage logs on a monthly basis, no later than the third day of each month
4. Spill Report Form: Within 24 hours of a reported spill, including any follow-up reports
5. Reports to Ecology's Environmental Reports Tracking System (ERTS) within 24 hours and associated 5-day follow-up reports
6. Citations issued in conjunction with this Contract: Within 24 hours of issuance
7. Monitoring Results of Discharges to sanitary sewer/combined sewer: Monthly
8. Monitoring Results of Discharges to Surface Water
 - a. Provide monthly reports to Sound Transit and Ecology whether or not discharge of stormwater has occurred, including any follow-up reports.
 - b. Submit report electronically to Ecology's WebDMR database: <https://secureaccess.wa.gov/ecy/wqwebportal/>.
9. TESC BMP Inspection Reports and BMP Tracking Log: Transmit copies weekly for the previous week's inspections.
10. Manufacturer data and test results for all erosion control products
11. Qualifications of Accredited Independent Testing Laboratory: Only if chemical analysis is required by an AO to the CSWGP
12. Qualifications of the CESCL(s)

13. Qualifications of the BMP/Site Inspection Lead(s)
14. Qualifications for CESF system operator(s)
15. Environmental Compliance Manual (ECM): Transmit to Resident Engineer at Acceptance

1.06 QUALITY ASSURANCE

- A. Use a professional engineer (PE), licensed in the state of Washington, to prepare the Discharge to Surface water Plan and the Discharge to Sanitary Sewer/Combined Sewer Plan, and a person who meets the qualifications of a CSEMS to prepare the SWPPP and TESC Plan. A qualified CESCL may develop the draft plans only; final review and approval of plans will be completed by a CSEMS. The SWPPP may be prepared by the CSEMS, but the final submittal shall have been reviewed and stamped by a licensed PE.
- B. Certifications of Qualified Personnel
 1. CSEMS
 - a. Current CESCL
 - b. Minimum of 7 years of direct and applicable experience, with 3 years of proven experience managing TESC on large civil projects of similar scope and scale located in the Pacific Northwest
 - c. Knowledge and understanding of the SMMWW, CSWGP, SWPPP, TESC, and Discharge to Surface Water and Sanitary and Combined Sewer Plans, and their intent
 - d. Reside locally and available on-call 24 hours per day through acceptance
 2. CESCL
 - a. A person who has a current certificate proving attendance in an approved erosion and sediment control training course that meets the minimum training and certification requirements established by Ecology (see BMP C160 in the SMMWW)
 3. CESF System Operator
 - a. Trained by an Ecology-approved trainer and is on Ecology's list of Certified Operators

PART 2 - PRODUCTS

2.01 GENERAL

- A. Materials used for erosion and sediment control BMPs shall be in accordance with the materials specified in the most current SMMWW.

PART 3 - EXECUTION

3.01 GENERAL

- A. Conduct operations in a manner to minimize pollution of the environment surrounding the area of work by every means practicable.

- B. Maintain the site in a neat and orderly manner to avoid environmental degradation.
- C. Manage site water including infiltration and runoff to minimize the spread of Hazardous or Contaminated Substances.
- D. Initial site construction activities include:
 - 1. Establish stabilized construction access points
 - 2. Mobilization of equipment and materials
 - 3. Stabilized equipment, material, and construction personnel parking/staging area
 - 4. Temporary security fence installation
 - 5. Sediment Control BMPs (including but not limited to sediment ponds, storage tanks, traps, filters, perimeter controls, wheel wash) constructed as one of the first steps in grading, as per section 1.03.E
 - 6. Start-up of treatment systems
 - 7. Minor grading as needed for BMP construction
- E. CSEMS
 - 1. Responsible for construction site erosion and sediment control regulatory requirements, BMPs, TESC Plan development, and stormwater monitoring
 - 2. Assigned to the project until Acceptance.
 - 3. More than one person may be necessary to provide services required for the CSEMS; however, only one person will be responsible for all activities

3.02 CONSTRUCTION STORMWATER PERMITS

- A. A CSWGP has been obtained by Sound Transit. Contractor is responsible to file a transfer of coverage with Ecology under the CSWGP and for obtaining coverage prior to any disturbance of soils or demolition activities at the Site. The Contractor will assume responsibility, as sole permittee under the Washington State CSWGP, for the entire Site of Work. Upon transfer of the CSWGP, Contractor is responsible for paying all permit fees, for complying with and paying for all requirements of the permit, and for filing for termination of the permit at the appropriate time.
- B. Ecology may issue an AO if known Hazardous or Contaminated Substances are present within the project site. If issued, the Contractor and the current permittee shall comply with the requirements of the AO which may require treatment and chemical analytical testing. The Contractor is responsible for informing Ecology and updating the AO as necessary if Unknown Hazardous and Contaminated Substances are encountered during construction as required by Ecology.
- C. With the exception of the NPDES permit, which Sound Transit will obtain and transfer to the Contractor, the following will apply: The Contractor shall furnish all information, applications, and supporting documentation to obtain the appropriate permit(s) required for any discharges off site to the stormwater, sanitary sewer, or receiving water bodies. Contractor shall be responsible to maintain and comply with all elements, aspects, and requirements of any permit(s) required for the duration of the project and through shutdown and decommissioning of any on-site operations where a discharge may occur.

- D. Contractor is responsible to install, operate, and maintain all controls specified in any approved site stormwater management plan (e.g., NPDES, SWPPP, TESC) and other AHJ permit required during construction activities. Any action to deviate, violate, and become noncompliant must result in a stop work order initiated by the Resident Engineer or Sound Transit. Failure to comply may result in fines and penalties in addition to those that may be imposed by Ecology or another AHJ.
- E. Contractor shall make proper assurance that any on-site, active, and operational stormwater treatment system required to maintain compliance with all discharge permitting be monitored during periods when the site is not occupied by the Contractor or Contractor's assigned responsible representative. Contractor is responsible for monitoring weather conditions (e.g., rain events) necessary to plan and schedule personnel trained in the operations and BMPs of the stormwater system and monitoring. Noncompliance resulting in treatment system failure, disruption, or violations in a discharge permitting requirement may result in additional fines or penalties by Sound Transit.

3.03 PLAN REQUIREMENTS

A. Environmental Compliance Strategy Plan

1. Environmental Compliance Plan is an overarching document related to environmental issues and should include references to all the other complementary plans.
2. Environmental staffing strategy and contact information
3. Communications protocol
4. Environmental protection training program
5. Environmental violation avoidance strategy
6. Environmental monitoring strategy
7. BMP installation/ maintenance strategy

B. Air Pollution Control Plan

1. Describe the approach the project will take for air pollution control
2. Describe the BMPs that will be used so that no emissions are visible beyond the Site boundaries
3. Include the requirement for the prevention of odors that interfere with the public, including limiting use of chemical products and keeping construction equipment in good mechanical condition to minimize exhaust emissions
4. Include requirement that the application of any chemical dust suppressants must be approved by the Resident Engineer prior to use
5. Provide Point of Contact for Non-Compliance

C. SWPPP

1. Include a copy of the qualifications of the individual preparing the SWPPP with the SWPPP

2. The SWPPP shall comply with all requirements of the SMMWW, Volume II, Chapter 3: required 13 elements of an SWPPP can be found in the most current CSWGP, SMMWW, and Ecology SWPPP template

D. TESC Plan

1. TESC Plans are required for the successful preparation and implementation of the SWPPP. The drainage report prepared as part of the Project development is available as a design resource.
2. Include a copy of the qualifications of the individual preparing the TESC Plan with the TESC Plan.
3. Generally, the TESC Plan shall:
 - a. Describe in narrative form all construction activities with the potential for producing construction stormwater discharge
 - b. Provide sufficient detail and clarity to allow field personnel to adequately implement TESC
 - c. Be updated and documented throughout the project as construction activities, conditions and BMPs are adjusted
 - d. Be prepared by CSEMS or PE
4. Format: Follow Sound Transit CAD standards, as referenced in the current version of the Sound Transit CAD/Drafting Standards Manual (the Design Technology Manual).
 - a. The initial TESC Plans shall be prepared using the version of AutoCAD currently being used by Sound Transit.
 - 1) Sound Transit will provide AutoCAD base files for Contractor use.
 - b. Plan sheet size shall be as required by the permitting AHJ.
 - c. Roll plots shall be provided for each plan.
 - d. Details of the BMPs proposed for use in TESC design can be placed on plan sheets or the TESC plans shall reference standard details.
 - 1) If standard details are referenced, a copy of each detail shall be included in the TESC Project Binder and provided to the field personnel installing and maintaining the TESC elements.
 - e. Notes and Legend
 - 1) TESC Plans shall include:
 - a) General or standard notes as required by the permitting AHJ
 - b) 24-hour contact information for the CSEMS
 - c) Vicinity map, with Project location and key map showing work areas
 - f. Each TESC Plan sheet shall include a legend that depicts information on that sheet related to clearing, grading and TESC. Examples include:

- 1) Delineated elements
 - 2) Existing and proposed contours
 - 3) Existing, temporary, and proposed storm catch basins and piping
 - 4) Walls
 - 5) Stabilization
 - 6) Blocks indicating BMP elements
 - a) TESC Plan updates occurring during the construction process may be handwritten by the CSEMS or others under CSEMS's supervision. Updates must be clear and legible and in blue, black, or red ink.
2. The TESC plans must include, at a minimum, the following specific information on the narrative and map:
- a. Construction details of all:
 - 1) chemical handling and storage areas
 - 2) vehicle and equipment storage areas
 - 3) wheel washes
 - 4) stabilized construction entrances
 - 5) perimeter control BMPs
 - 6) collection sump pumps
 - 7) conveyance pipes
 - 8) ditches
 - 9) berms
 - 10) culvert pipes
 - 11) storage ponds
 - 12) storage tanks
 - 13) filters and basin outfalls
 - b. Locations, types, and quantities of all seeding, slope coverings (Rolled Erosion Control Products or other approved methods) and ditch liners
 - c. Proposed reroutes of existing surface water and underground drainage within the Site to erosion control facilities prior to release to approved discharge location(s) into drainage systems or sanitary sewer systems
 - d. Location of all facilities that are designed to treat construction-impacted stormwater runoff prior to the runoff being discharged to the existing drainage system; in lieu of providing on-site treatment of the runoff, the runoff may be collected and hauled off site for treatment using an approved method

- e. Location of all dewatering well extractions points, with reference elevation and completion depths
- f. Location of subsurface drainage system outlets
- g. Approximate slopes and contours and the direction of stormwater flow before and after major grading activities
- h. Locations where water (stormwater and non-stormwater) discharges off-site or to a surface water body, including wetlands
- i. Map showing all potential discharge points within the project area (including catch basins and ditches) to receiving water (including wetlands)
- j. Location of water quality sampling station(s), if sampling is required by state or permitting AHJs: include latitude and longitude of POD and name of receiving water
- k. Contract limits
- l. Staging areas
- m. Clearing and grading limits
- n. Work area and limits of Work
- o. Initial BMPs, chosen for specific risks, to be installed at the start of construction
- p. Top and toe line for slopes and walls
- q. Excavation cut and fill
- r. Permanent drainage, both existing and proposed
- s. Sensitive areas
- t. High-visibility fence
- u. Perimeter sediment controls
- v. Stockpile, laydown, and staging areas
- w. Construction personnel parking areas
- x. Construction access
- y. Low-impact development facilities, including bioretention areas and infiltration areas
- z. Waters of the State
- aa. Wetlands
- bb. Buffer areas
- cc. Tributaries
- dd. Other sensitive areas

E. Spill Prevention, Control, and Countermeasures Plan

1. Developed in accordance with 40 CFR 112 with supplemental requirements as indicated below.
2. Provide a table quantifying the volume of all SPCC-regulated oil and other Hazardous or Contaminated Substances that will be in storage tanks, fuel cans, and any non-motive equipment. The Contractor shall include all products greater than or equal to 55 gallons. Sound Transit requires that the plan be a certified SPCC Plan.
3. Include the following:
 - a. Person(s) responsible for implementing the plan if a spill of a Hazardous or Contaminated Substance should occur
 - b. Training protocol that is to be conducted and documented on a monthly basis and that includes a discussion of the requirements of the SPCC Plan and the current locations of the on-site spill kits
 - c. Drawing(s) for each area showing the locations of all spill kits and the locations of staging, storage for oil and other Hazardous and Contaminated Substances, maintenance and refueling, and their relationship to drainage pathways, waterways, and other sensitive areas
 - d. Spill prevention and containment methods to be used at each Site
 - e. Site security measures, inspection procedures, and personnel training procedures related to spill prevention, containment, response, cleanup, and management
 - f. Routine equipment maintenance, refueling, and cleaning activities
 - g. Frequency of inspections of spill kits to ensure that adequate spill response, containment, and cleanup materials are available, and the method to be used to document the inspection results
 - h. Frequency of inspection of fuel hoses, lubrication equipment, hydraulically operated equipment, oil drums, and other equipment and facilities for drips, leaks, or signs of damage, and for their proper maintenance and storage in order to prevent spills, and the method to be used to document the inspection results
 - i. Security to be implemented to discourage vandalism
 - j. Spill reporting
 - k. Provide details of the spill kits—locations, contents, quantities, volumes, products vendors, and any special SPCC measures or materials that may be a non-typical component of the spill kit specific to the project site and planned activities
4. Contractor will adhere to the approved SPCC Plan and updates for the duration of the project. This applies to subcontractors and any other third-party contractors working under contract on Sound Transit projects. Maintain on-site spill, release, and reporting forms, documentation, activity logs, complete spill cleanup actions for any incident.

5. Contractor shall include a weather protected copy of the Contact list and basic instructions from the approved SPCC Plan in each spill kit maintained on site.

F. Discharge to Surface Water Plan must include:

1. A narrative describing the approach to collecting, conveying, storing, treating, discharging, and monitoring any project site water being discharged to any surface water.
2. Contractor is responsible for the design, engineering, approval, construction, operation, and maintenance of all stormwater management and treatment systems required for the duration of construction. Any engineering assessment, calculations, design, and approach will be reviewed and approved by the agency four weeks in advance of ground-breaking and construction.
3. Experience and expertise in an engineering discipline is required where major equipment (such as pumps, advanced treatment BMPs), hydraulic calculations, treatment removal efficiencies, or advanced technologies are necessary to meet permit discharge criteria. Design of any stormwater treatment facility, dewatering system, or treatment BMPs (e.g., ponds, detention basins, swales) shall be prepared and stamped by a qualified PE registered in the State of Washington.
4. Evaluation and design of each proposed treatment system, including the following:
 - a. Determination of the location of the POD for treatment system(s), AHJ catch basin identification information, the name for the POD in accordance with the established naming convention that will be used on DMRs, the latitude and longitude of the POD, and the receiving water body
 - b. Delineation of sub basins and a determination of the area draining to each POD
 - c. The location of sumps, pumps, conveyance lines, water storage facilities (tanks or ponds), and filter systems
 - d. Determination of the volume of water storage necessary, based on treatment system design, treatment rate, and detention time requirements
 - e. For the runoff generated by design storm, determination of the storage volume necessary for batch treatment, and the testing that may be required by an AO to the project's CSWGP permittee
5. Drawings at a legible scale that include all the elements of the Discharge to Surface Water Plan. The Contractor may use the TESC drawing as the base drawing, if the drawing is legible after inclusion of each of the elements of the plan
6. Solids management procedures, including an operations and maintenance procedure explaining how solids and sludge accumulation in wastewater ponds and tanks as the result of wastewater and stormwater collection and treatment will be managed during construction including the storage, characterization, transportation, and final disposal of the solids
7. Contingency procedures describing the actions to be taken for site water management in case of treatment system failure, a spill of Hazardous or Contaminated Substances or a directive from the AHJ to discontinue discharge

- G. The Dewatering Plan applies to saturated zone groundwater, but shall include construction trench seepage or infiltration. The Dewatering Plan maybe combined with the Dewatering Plan required in the Contract Documents and must include:

1. A narrative describing the location(s) where groundwater will be collected: describe the approach to collecting, conveying, storing, treating, and discharging
 2. Dewatering systems should be designed in a way that prevents the spread of Hazardous or Contaminated Substances whether in the subsurface or in the collected water. If treatment is necessary, provide the treatment system design information as required for each of the proposed treatment systems:
 - a. Provide a list of the Hazardous or Contaminated Substances being treated
 - b. Provide the process of how treatment will be accomplished
 - c. Provide method(s) for sampling, analysis, and treatment for each Hazardous or Contaminated Substance
 3. The estimated volume of water being collected and the amount of water being discharged
 4. Methods for discharging water collected
 5. A map of the approved locations where discharges will occur
 6. Contingency procedures describing the actions to be taken for site water management in case of treatment system failure, a spill of Hazardous or Contaminated Substances, or a directive from the AHJ to discontinue discharge
- H. Discharge to Sanitary Sewer/Combined Sewer Plan must include:
1. A narrative describing the approach to collecting, conveying, storing, treating, discharging, and monitoring any discharges to the sanitary sewer/combined sewer for the project
 2. Treatment system design information required for each of the proposed treatment systems
 3. Solids management procedures, including an operations and maintenance plan explaining how solids and sludge accumulation in wastewater ponds and tanks as the result of wastewater and stormwater collection and treatment will be managed during construction including the storage, characterization, transportation, and final disposal of the solids
 4. Contingency procedures describing the actions to be taken for site water management in case of treatment system failure, a spill of hazardous substances, or a directive from the AHJ to discontinue discharge.
- I. Trucking Plan
1. Required for all trucking of water not disposed of in the sanitary/combined sewer or discharged to surface waters
 2. Provide:
 - a. Name, address, and telephone number of firm responsible for trucking
 - b. Receiving facility permit profiles for treating, handling, recycling, or disposing of waste materials
 3. Provide an approval or acknowledgement from the Specific AHJ confirming the proposed route identified

4. Describe training provided to truck operators in discharge procedures and spill response

J. Environmental Compliance Manual

1. The purpose of the ECM is to have all of the information regarding the environmental management of the project in one easily accessible document.
2. CSEMS shall be solely responsible for developing the ECM and maintaining a hard copy on the Site.
3. The ECM will be prepared by the Contractor and consist of a tabbed compendium of the environmental permits and Contractor plans received and prepared for the project. Include the following in the ECM:
 - a. Environmental Compliance Strategy Plan
 - b. Air Pollution Control Plan
 - c. SWPPP
 - d. TESC Plans
 - e. SPCC Plan
 - f. Discharge to Surface Water Plan
 - g. Dewatering Plan per Section 3.03G
 - h. Discharge to Sanitary Sewer/Combined Sewer Plan
 - i. Trucking Plan (for water)
 - j. Site-Specific Waste Management Plan
 - k. Hazardous or Contaminated Substance Screening and Handling Plan
 - l. Unknown Hazardous or Contaminated Substance Screening and Handling Plan
 - m. Permits: including, but not limited to:
 - 1) CSWGP with:
 - a) NOI
 - b) Letter of Coverage
 - c) Related documents and correspondence
 - d) Termination Form
 - 2) Grading
 - 3) Noise variance
 - 4) Industrial Waste Discharge (for sanitary sewer/combined sewer)
 - 5) Wetland and stream permit (USACE 404 Permit or state and local AHJs)

- n. Copies of certification documents for required personnel
- o. Environmental coordination meeting minutes
- p. TESC BMP inspection logs
- q. Stormwater Discharge Monitoring Reports
- r. ERTS Five-Day Reports

3.04 SITE WATER DISCHARGE

A. The Contractor must:

1. Prior to start of initial construction activities, obtain written approvals from AHJs for all Discharge to Surface Water and Discharge to Sanitary Sewer/Combined Sewer submittals
2. Install sediment control BMPs and water treatment systems (sediment ponds, storage tanks, traps, filters, silt fences, stabilized construction entrances, wheel wash) as one of the first steps in grading; these BMPs shall be functional before other land-disturbing activities take place
3. Provide treatment methods, as necessary to meet the discharge requirements
4. Meet the discharge requirements
5. Refer to the Site Water Discharge flowchart (Exhibit A)

B. Discharge of stormwater

1. All stormwater that can be adequately treated for discharge to surface waters under the CSWGP permit using water treatment techniques from the current version of the SMMWW, shall be discharged to surface waters unless expressly allowed to be discharge to the sanitary and combined Sewer by the AHJ under the applicable Industrial Waste Permit for discharge to the Sanitary and Combined Sewers.
2. All stormwater treatment systems shall be designed per the requirements for storm event volume and intensity in the SMMWW, to ensure that pumps, conveyance piping, and other hydraulically sized components can manage larger storm events. Treatment systems shall utilize high-flow bypass (weir, orifice), control vaults, and other means to ensure peak maximum design storm discharge volumes are properly managed. Stormwater modeling software (e.g., HydroCAD) shall be used as necessary to properly design the stormwater conveyance, structures, piping, and other required components.
3. Discharge of stormwater to the sanitary or combined sewer for relief purposes will not be allowable unless in compliance with the written conditions of the Industrial Waste Permit from the AHJ.

C. Field Quality Control

1. Site Tests
 - a. CSWGP monitoring:

- 1) Collect water samples for all POD locations at the minimum frequencies indicated and in accordance with applicable discharge permit requirements, CSWGP, these Specifications, and the AO, as issued by Ecology
 - 2) All testing requirements shall be in accordance with the CSWGP and the AO, if issued by Ecology
- b. Noncompliance event:
- 1) When not in compliance with discharge limits specified herein, take immediate action to stop the violation and notify the Resident Engineer
 - 2) Collect a discharge sample and submit new data within one day of becoming aware of non-compliance
 - 3) When discharge pH is in noncompliance, take immediate actions to bring the discharge into compliance—if it is not possible to be in compliance, stop the discharge
 - 4) In the event of a Hazardous or Contaminated Substance spill, notify the Resident Engineer immediately, take immediate actions stop the discharge, and implement the SPCC procedures
 - 5) Conduct monitoring daily, or more as necessary, after a violation is documented until three consecutive days of samples show the discharge(s) is (are) in compliance or discharge is stopped
- c. Quantity Limitations:
- 1) Implement the contingency procedures if:
 - a) Discharge rates require a reduction from the maximum allowable or
 - b) Discharges must be discontinued immediately upon notification by Resident Engineer
- d. Solids Management
- 1) Solids accumulation in the treatment pond and tank used for solids settling shall not exceed 25 percent of the tank's hydraulic capacity. For the wastewater treatment ponds and tanks, the 25 percent criterion shall apply at all discrete locations throughout the ponds and tanks and shall be based on the height of solids in relation to the depth of the lowest static water level in the wastewater pond.
 - 2) On each day that discharge to the sewer occurs, the Contractor shall use an instrument capable of displaying the water column to conduct inspections of solids accumulation at the following locations:
 - a) Wastewater pond or tank pumping chamber
 - b) Within the pond or tanks at a minimum of four probing locations, strategically located to gauge overall solids accumulation within the pond

- c) Each chamber of the final wastewater settling tank
- d) Observations and measurements made during these inspections must be recorded. These records must be maintained on site and available for Resident Engineer and regulators' review at all times.

2. Inspection

- a. Resident Engineer, AHJs, and representatives from Ecology have the rights of access to:
 - 1) Enter the Site where a discharge is located or where all submittals and monitoring logs are kept
 - 2) View and copy submittals and monitoring logs
 - 3) Inspect all facilities, equipment (including monitoring and control equipment), practices, methods, or operations regulated or required
 - 4) Collect monitoring samples in addition to those required and test for constituents both listed and additional constituents
- b. The Contractor shall provide access for these purposes. If results from the sampling taken by the Resident Engineer, or AHJs indicate a noncompliance event, the Resident Engineer will notify the Contractor and Ecology.

3.05 SPILL PREVENTION, CONTROL AND COUNTERMEASURES

A. Chemical storage and containment:

- 1. Store solid chemicals, chemical solutions, paints, petroleum products, solvents, acids, caustic solutions, and waste materials, including used batteries, in a manner that prevents the inadvertent entry of these materials into surface waters or groundwater.
- 2. Store materials in a manner that prevents spills due to tipping or rupture.
- 3. Store all chemical products on or in a durable impervious surface.
- 4. Store liquid chemical products within bermed containment areas or containment facilities capable of retaining 110 percent of the volume of all the containers in the storage area.
- 5. Store liquid chemical products under cover, such as tarpaulins or roofed structures. All labels must be visible.
- 6. Do not store caustic and acidic materials together.
- 7. Maintain a complete inventory of chemicals and their associated safety data sheets within the immediate storage area.
- 8. Provide fire extinguishing equipment that is appropriate for the materials being stored at all storage areas.
- 9. Clearly designate all Hazardous or Contaminated Substance storage areas (i.e., waste oil, hazardous waste or other waste) using clearly visible signage. Keep waste storage areas segregated from new product storage areas.

10. Segregate noncompatible chemicals and securely store in separate containment areas to prevent mixing of incompatible or reactive materials.
 11. Plug barrel openings and store all empty barrels that have not been cleaned in an upright position.
 12. Identify and implement reasonable steps to prevent releases of liquid products as a result of malicious tampering or vandalism.
- B. Fuel Storage: Portable fuel storage tanks, over 6-gallon capacity:
1. Must be:
 - a. Specifically engineered to meet or exceed all national environmental and hazardous waste regulations
 - b. Underwriters Laboratory (UL)-certified and National Fire Code compliant
 - c. Durable, all steel.
 - d. Coated with a weather- and corrosion-resistant exterior
 - e. Provided with an interstitial space check port to help identify any possible fluid release
 - f. Accompanied by a spill kit and fire extinguisher staged within 15 feet
 2. Must have either:
 - a. A secondary shell providing containment of at least 110 percent of the primary (internal) tank volume, or
 - b. A secondary containment of at least 110 percent of the volume of all the containers, without secondary shells, that are in the storage area
 3. Capacity:
 - a. Up to 250 gallons does not need Sound Transit approval
 - b. Over 250 gallons and up to a maximum capacity of 500 gallons requires Sound Transit approval
 - c. Over 500 gallons will not be permitted on Site
- C. Fuel Storage: Portable fuel storage less than 6-gallon capacity
1. Must be specifically designed to be petroleum storage containers
 2. Shall be placed and stored, unless being actively used to fill equipment, in secondary containment area with a minimum capacity equivalent to 110 percent of all containers within the containment
 3. Shall be refilled in a secondary containment area
- D. Conduct fueling in designated controlled locations or in other locations with the appropriate use of BMPs to contain and absorb potential spills.
1. Comply with the requirements of BMP S419-BMPs for Mobile Fueling of Vehicles and Heavy Equipment from the SWMWW.

2. Ensure the presence and the constant observation/monitoring of the driver/operator at the fuel transfer location at all times during fuel transfer and ensure implementation of the proper procedures at the fuel transfer locations.
3. Locate the point of fueling at least 25 feet from the nearest storm sewer or cover the storm sewer to ensure no inflow of spilled or leaked fuel.
4. Place a drip pan, or an absorbent pad under each fueling location prior to and during all dispensing operations. The pan (must be liquid tight) and the absorbent pad must have a capacity of at least 5 gallons.

E. Spill Response Procedures

1. Stop the spill at the source and install protective covers over storm drain grates.
2. If the spill is flammable, call 911 and dispose of the materials as directed by the local Fire Marshal.
3. Ensure employees who respond to spills are trained to a level of competence defined in the SPCC Plan.
4. Promptly clean up and properly dispose of Hazardous or Contaminated Substance by spillage or leakage of products. Handle all spills of material and dispose of them in a manner that does not cause contamination of soil, surface water or groundwater. Collect at least one soil sample following removal of Hazardous or Contaminated Substances and complete appropriate chemical analysis based on Hazardous or Contaminated Substance spilled to confirm removal is sufficient in accordance with Model Toxics Control Act.
5. If unidentified materials are encountered, control and contain the material until appropriate measures can be taken.
6. Material impacted by the spill shall be stored at a location approved or directed by the Resident Engineer and treated as if it is a Contaminated Substance until determined otherwise.
7. Report all spills, regardless of size, to the Resident Engineer.
 - a. Use the Spill Report Form (Exhibit B) provided herein
 - b. Modifications to the form must be approved by the Resident Engineer
 - c. Retain a copy of the Spill Report Form on site and available for review upon request of the Resident Engineer and AHJs
8. If the spill of a Hazardous or Contaminated Substance could reach surface waters or groundwater, the following agencies must be notified: National Response Center at 1-800-424-8802 or WWW.NRC.USG.MIL/INDEX.HTM, the regional Ecology office, and the AHJ's spill reporting hotline.
9. Maintain a log of all spills using the Spill Report Log (Exhibit C).

F. Provide and maintain adequately stocked spill kits within 15 feet of any fueling activities or chemical storage facility.

G. Concrete Disposal and Cleanup

1. Wash out concrete truck chutes, pumps, and barrels into sealed Eco-pans

2. Wash off hand tools into sealed Eco-pans
3. Recycle unused concrete offsite
4. Only if no Eco-pans are available and approved by Resident Engineer, contain wash water and waste concrete within a liquid-tight container lined with 30 mil plastic liner or with six inches of concrete or asphalt: contain and dispose of concrete waste and wash water in a manner which does not violate water quality standards or solid waste regulations

H. Leachate

Do not allow leachate from any material to enter surface water or groundwater without providing all known, available, and reasonable methods of treatment, nor allow such leachate to cause violations of surface water quality standards (Chapter 173-201A WAC) or groundwater quality standards (Chapter 173-200 WAC).

3.06 TEMPORARY EROSION AND SEDIMENTATION CONTROL

A. Required Personnel

1. CSEMS

- a. The Contractor shall designate a CSEMS who shall have the authority to act on behalf of the Contractor and shall have the following responsibilities and authority related to TESC and SWPPP:
 - b. Accompany the Resident Engineer and Ecology during weekly inspections of all BMPs at a time designated by the Resident Engineer
 - c. Review and approve TESC drawings and TESC updates
 - d. Prepare SWPPP drawings and SWPPP updates for licensed PE approval
 - e. Identify and correct potential stormwater discharge risks
 - f. Direct field personnel to correct issues or stop work
 - g. Perform or oversee sampling, monitoring, and reporting of stormwater discharge, including contacting Ecology within 24 hours after a high-turbidity discharge
 - h. Maintain the ECM

2. Site BMP Inspection Lead

- a. The Contractor shall designate one or more individuals to be site BMP inspection leads responsible for supervising installation, inspection, and maintenance of BMPs. These individuals shall report to the CSEMS. Alternatively, this role can be filled by the CSEMS.
- b. The BMP inspection lead must be a CESCL.
- c. A BMP Inspection Lead or CSEMS must be onsite during any work activity.

3. CESF systems operator

B. Responsibilities

1. The Contractor is fully responsible for:

- a. TESC and SWPPP performance and compliance with Ecology's CSWGP and AHJ requirements
 - b. Training. Ensuring that site crews are properly trained on the importance of not removing stormwater BMPs and made aware of the locations where BMPs have been installed; the training must be incorporated into a mandatory preconstruction training program for all employees and subcontractors working on the project; documentation of completed training records shall be kept and maintained on site for the duration of the project
 - c. All damages, fines, levies, or judgments incurred as a result of Contractor, subcontractor, consultant, or supplier failure to comply with the requirements of the Contract and all state and local permits required for TESC and SWPPP.
 - d. Preventing waste or eroded materials from entering natural or man-made waters or sewage removal systems
- 2. The Contractor must comply with the conditions of the CSWGP, including implementing and maintaining the SWPPP, TESC Plans, and any local TESC requirements, until acceptance.
 - 3. The ECM must be available at all times for review by permitting agencies, Sound Transit representatives, and Contractor's field personnel.
 - 4. TESC Plans and SWPPPs are living documents. The Contractor is responsible for maintaining current versions of the documents to include locations of newly discovered or implemented TESC features, BMPs, and areas of potential TESC risks.
 - 5. The CSEMS must, at a minimum, conduct environmental coordination meetings on a weekly basis until Acceptance.
 - a. Attendance at these meetings is mandatory for the individual or individuals responsible for implementation of TESC on behalf of the Contractor.
 - b. These meetings will:
 - 1) Be at a consistent location and on a consistent day and time
 - 2) Be open to representatives of Sound Transit, Ecology, and AHJ
 - 3) Discuss the details of the work to be performed during the upcoming week, the TESC features to be implemented, any required discharge monitoring and other specific work with potential TESC risks
 - 4) Discuss the issues and lessons learned from the previous week
 - 5) Include a site inspection of areas of active work or environmental concern
 - c. The CSEMS must keep accurate minutes to be included in ST's project documents.
 - 6. At a minimum, the Contractor must train its staff, during regularly scheduled meetings, on environmental protection measures related to the execution of this Contract. This training may be added to existing weekly meetings (such as safety

meetings). Emphasize issues such as sensitive receptors, spill prevention, chemical handling and storage, emergency response, stormwater control facilities inspections, proper dewatering techniques, and concrete handling.

C. Sequencing and Scheduling

1. Obtain CSWGP coverage as sole permittee.
2. Prior to land-disturbing activities, obtain applicable permits and approval of stormwater discharge treatment methods and BMPs and have necessary materials and equipment in place.
3. Include on the 3-week look-ahead schedule activities related to TESC design, permitting, implementation, operation, maintenance, monitoring, and reporting requirements.
4. When phasing work activities, Contractor must schedule a preconstruction meeting with Resident Engineer, local AHJs, and Sound Transit personnel to discuss procedures of the TESC and other plans for implementation on the specific work area(s) during each proposed phase.
5. Sequence the work to reduce erosion and sediment risk.
 - a. Install applicable TESC BMPs prior to commencing work within associated work area(s).
 - b. Limit exposed or unstabilized areas to locations being actively worked.
 - c. Provide permanent stabilization following completion of work in each area.
6. The following sequence must be followed prior to any work occurring adjacent to or within a designated sensitive area:
 - a. All sensitive areas must be resurveyed by a professional surveyor. The sensitive area boundaries shall be verified and updated by Sound Transit.
 - b. Prior to installing the BMPs for perimeter controls (such as silt fence or other acceptable controls), the construction limits must be delineated by the Contractor and verified by Sound Transit to ensure that they are consistent with the permitted impact areas according to the permits.
 - c. If the impact areas are not consistent with the permitted impact areas, the Resident Engineer shall provide guidance to the Contractor.
 - d. Once the perimeter controls have been approved and are in place, Work may commence.
7. Seasonal Requirements
 - a. Wet Season: October 1 through April 30—No soils shall remain exposed and unworked for more than two days or as required by AHJ's, the lesser of the two, without adequate protection from the environment (i.e., precipitation, wind). Provide secured and anchored plastic sheeting cover, or other acceptable and approved erosion control BMP methods. In addition to soil piles, other materials, such as asphalt, rock, debris, and exposed materials that could impact stormwater and air quality, shall be effectively managed. Stockpiles that are expected to remain in place for extended periods may be managed and protected with seeding, mulching, and plastic covering with Sound Transit approval.

- b. Dry Season: May 1 through September 30—No soils shall remain exposed and unworked for more than seven days without adequate protection from the environment (i.e., precipitation, wind). Provide secured and anchored plastic sheeting cover, or other acceptable and approved erosion control BMP methods. In addition to soil piles, other materials, such as asphalt, rock, debris, and exposed materials that could impact stormwater and air quality (windblow dust), shall be effectively managed. Stockpiles that are expected to remain in place for extended periods may be managed and protected with seeding, mulching, and plastic covering with Sound Transit approval.
- c. Holidays and weekends—Soils and other exposed materials must be protected and stabilized per CSEMS direction.

D. Preparation

- 1. Post signs at all Sites with name and phone number of the CSEMS.
- 2. Clearly delineate the boundaries of the clearing and construction as indicated on the Plan or as designated by the Resident Engineer, by using a continuous length of fencing or screening wall prior to construction.
 - a. During the construction period of each site, no disturbance beyond the clearing and construction limits is permitted without prior authorization from the Resident Engineer.
 - b. Maintain the clearing and construction limits delineation materials for the duration of construction.
- 3. Temporary stockpiles:
 - a. Cover piles after two days of inactivity during the wet period and seven days of inactivity during the dry period, or as required by AHJ's, the lesser of the two.
 - b. Place all excavated material not hauled directly from the construction site in a temporary stockpile surrounded by ecology blocks or equivalent.
 - c. Control water seepage and runoff, and direct to water treatment system. Treatment of seepage and runoff from temporary spoil piles is required prior to discharge from site.
 - d. Provide BMPs to mitigate dust generation from stockpiles.
- 4. Stockpile on site sufficient BMP materials and supplies as may be necessary to protect the site.
- 5. Protect catch basin inlets to the permanent storm drainage system from sediment influx by use of catch basin insert or similar filtering materials and methods per SMMWW.
 - a. Do not block or plug catch basins without written authorization from drainage systems' local AHJs.
 - b. When sealing catch basin inlets, covers must be 30-millimeter PVC liner material or equivalent. In cases where an adequate seal cannot be made with plastic alone, a mechanical or pneumatic plug is required to provide an adequate seal.

6. Clean and remove silt from any permanent storm drainage system elements that were used to convey or hold construction stormwater before introducing clean stormwater to those elements.
7. Clearly mark locations of water quality sampling stations.

E. Installation

1. Installation practices for TESC BMPs shall be in accordance with the current SMMWW, Volume II, and manufacturer's specifications.
2. Provide necessary conveyance to direct all potentially sediment-laden water towards approved treatment BMPs.
3. Grass seeding:
 - a. Revisit all disturbed areas prior to the beginning of the wet season to identify which areas need to be seeded or reseeded in preparation for the wet season.
 - b. Install surface runoff control measures, such as gradient terraces, interceptor dikes or swales, level spreaders, and sediment traps and basins prior to seeding.
 - c. Cultivate all areas to be seeded to meet Ecology requirements. Cultivation may be accomplished by disking, raking, harrowing, or other acceptable means. Perform all cultivating at right angles to the slope.
 - d. Hydroseed all disturbed areas following completion of construction or sooner, if directed by the CSEMS.
 - e. Hydroseed shall be applied with Bonded Fiber Matrix on slopes exceeding 3:1.
 - f. Seeding may be accomplished by approved hand methods when it is impractical to do by hydroseeding.
 - g. Seed disturbed areas within one week of the beginning of the wet season.
 - h. Optimum seeding windows are April 1 to June 30 and September 1 to September 30.
 - i. Fertilize all areas that are seeded. Use only approved fertilizers.
 - j. Mulch in accordance with BMP C121.

F. Maintenance

1. Maintain TESC items until areas are permanently stabilized.
2. General maintenance activities
 - a. Repair or replace damaged or missing items immediately in order to meet requirements of the SMMWW and CSWGP
 - b. Repair all TESC items as needed to ensure continued performance of their intended function
 - c. Maintain seeded surfaces throughout construction

- 1) Avoid tracking of equipment and vehicles on newly seeded area
 - 2) Provide temporary irrigation or provide some means and method to establish grass in seeded areas. Operate and maintain BMPs in accordance with SMMWW Volume II, manufacturer's specifications, and the following:
 - d. Prevent sediments from being flushed to the downstream system during cleaning.
 - e. Remove sediment, trash, and debris from catch basin grate surfaces when blocking more than 20 percent of the grate surface.
 - f. Perform inspection of systems using catch basin inserts. Clear or replace clogged fabric. Clean or replace inlet and catch basin filter socks when sediment fills one-third of the available storage or the fill limits recommended by the manufacturer have been met.
 - g. Immediately remove all sediment accidentally introduced into a catch basin.
 - h. Clean interceptor ditches of sediment and vegetation when accumulation exceeds 3 inches in depth or when free movement of water through ditch is restricted.
3. If erosion is occurring, the CSEMS and CESCL shall determine the appropriate BMP items to use and immediately make modifications to the erosion control system to mitigate the erosion and its effects.
4. Address all areas needing BMP measures that do not require immediate attention within seven days of Contractor's awareness of such need or notification from the Resident Engineer or CSEMS.
5. Handle and dispose of cleaning waste material and demolition debris in a manner that does not cause contamination of water. If the area is swept with a pick-up sweeper, the material shall be hauled out of the area to an appropriate disposal site.
6. Maintaining flow of sewers and drains
 - a. The Contractor must provide for and maintain, the existing flow of all sewers, drains, building or inlet connections, and all watercourses that may be encountered during progress of the Work.
 - b. Do not allow the contents of sewer, drain, or inlet connections to flow into trenches.
 - c. Maintenance of sewers and drains may require, at the Contractor's expense, the use of temporary pump stations with backup generators.
7. Mud control
 - a. Take proper measures to prevent equipment and vehicle tracking of soil, aggregate, mud, or other debris onto public and private streets, drives, parking lots, and sidewalks. Measures include, but are not limited to, covering on-site haul roads and muddy areas with clean, dry sand, gravel, or trap rock, or a combination of these. Maintain clean haul routes on paved surfaces.

b. Street Sweeping

- 1) Provide street sweeping on streets, sidewalks, driveways, and parking areas within one block of the construction sites using the following schedule:
 - a) A minimum of once per day during construction work.
 - b) More frequently if, in the Resident Engineer's opinion, excessive mud or other debris is present.
- 2) Promptly clean up spills of transported material on public and private roads and parking lots by sweeping.
- 3) Immediately remove mud or other debris tracked onto streets, sidewalks, or driveways, and clean the affected area.
- 4) Mechanical street sweeper must:
 - a) Have available a combination of mechanical brushes, water spray, and vacuum system capable of trapping and preventing fugitive dust emissions and remove sediment present on the roadway as a result of Contractor activities.
 - b) Be licensed for use on public streets.

c. Wheel and Truck Wash

- 1) Where construction vehicles leave a site and enter paved public streets, maintaining a stabilized construction entrance, BMP C105, and a suitable truck wheel-washing facility are required.
- 2) Before any trucks or other vehicles leave the Site, clean mud and dirt from the wheels and exterior of the vehicle.
- 3) Construct the approach to the wheel wash of clean quarry spalls or pavement. Keep the approach free of any accumulated sediments by sweeping, washing, or refreshing of quarry spalls.
- 4) The exit shall be graded to allow overspray and any water falling off washed vehicles to return to a collection sump, typically near the spray deck, where it can be returned to the reservoir by low-volume sump pump.
- 5) Inspect the wheel wash system at the start of each workday for any damage and maintain as necessary.
- 6) Inspect and top off the level of wash water in reservoir as required.
- 7) Include water spray nozzles aimed at tires and undercarriage. Inspect the jets to see that they are properly aimed and free of any blockage.
- 8) Ensure water pressure and volume rates are sufficient to clean the vehicles.
- 9) Periodically inspect the wheel wash during operations to see that the system is continuing to function properly, the vehicles are

attaining a satisfactory level of cleaning, and the water level is at a satisfactory level.

- 10) Include other methods, such as laborers with hoses, when needed to meet requirements to prevent mud and debris being transported off Site.
 - 11) Use a closed-loop recirculating design that is separate from a wastewater treatment facility.
 - 12) Do not discharge wheel wash water to storm drain system.
 - 13) Wheel wash water is considered process water and is prohibited by permit and law from being combined or comingled with stormwater or infiltrated. Contractor will take all measures possible to minimize the possibility of wheel wash water entering or contacting stormwater (treated or untreated). Contractor must implement and maintain appropriate BMP(s) to ensure comingling of process water and stormwater does not occur. Sound Transit will review and approve Contractor's BMP, which must be included in the SWPPP.
 - 14) Change wheel wash water as part of routine maintenance, to ensure the process remains effective to clean, rinse, and properly minimize trackout.
 - 15) Include BMPs for the wheel wash discharge water to meet applicable city, state and federal permits and requirements for containment, treatment, and disposal.
 - 16) The Resident Engineer may impose additional wheel wash requirements, if it is determined that the wheel wash is not functioning or being maintained properly.
- d. Equipment Wash
- 1) Do not discharge thinners or solvents into the sanitary or storm sewer systems when used to clean machinery or parts.
 - 2) Use alternative methods for cleaning equipment or parts, such as high pressure, high temperature water washes or steam cleaning.
 - 3) Do not discharge process water from equipment cleaning to the storm drainage system.
8. Sawcutting: Collect, treat, and dispose of water, slurry, and cuttings used for, or produced by, the sawcutting operation.
- a. Continually vacuum slurry and cuttings during cutting and surfacing operations.
 - b. Do not leave slurry and cuttings on permanent concrete or asphalt pavement overnight.
 - c. Do not allow slurry and cuttings to drain to any natural or constructed conveyance system.
 - d. Dispose of collected slurry and cuttings in a manner that does not violate groundwater or surface water quality standards.

- e. Continually monitor operations to determine whether slurry, cuttings, or process water could enter surface waters or groundwater. If inspections show that a violation of water quality standards could occur, stop operations and immediately implement preventive measures such as berms, barriers, secondary containment, and vacuum trucks.

G. INSPECTION, DISCHARGE SAMPLING, and COMPLIANCE REQUIREMENTS

1. Site Inspections

- a. CSEMS or designated CESCL shall conduct inspections of all BMPs and stormwater discharge locations within all construction areas, including at inactive sites:
 - 1) On a daily basis when work is occurring on site, including weekends and holidays, the time of inspection should be representative of normal work activity occurring during the day and/or night.
 - 2) After any significant rain event (0.25 inch or greater), including weekends and holidays.
 - 3) Use Ecology template or approved format and keep a copy on Site.

2. Compliance with an Administrative Order (AO)

- a. An AO may be issued for the CSWGP for this project. This order may provide a list of Hazardous or Contaminated Substances ("contaminants") that may be present in the site water discharge, based on previous environmental investigations. Sampling and analysis of the site water discharge for these contaminants is typically required by the AO. Follow all additional requirements for sampling and analysis identified in the AO for the CSWGP for this project.
- b. Additional sampling and analysis may be required if Unknown Hazardous and Contaminated Substances are encountered during construction.
- c. Contractor shall comply and demonstrate material quality and conformance for the use of import, on-site material and recycled, reclaimed materials prior to commencement of construction. Materials including, but not limited to, soil, aggregate, recycled concrete, and asphalt blends or mixes shall be sampled, tested by a certified laboratory, reviewed, and approved by Resident Engineer prior to use for any purpose on site. Laboratory analysis shall include, at a minimum, the following constituents: Arsenic, cadmium, lead, mercury, chromium metals as total and Toxicity Characteristic Leachate Procedure metals (EPA 6000/7000 series and 1311); volatile organic compounds (EPA 8260D); total petroleum hydrocarbons— gasoline-, diesel- and oil-range (NWTPH-Gx and NWTPH-Dx); polynuclear aromatic hydrocarbons (8270SIM); pH by EPA method 9045D and other known or suspected contaminants that could be present based on the source of the materials. Material shall meet Cleanup Levels and Reuse Criteria specified in Contract Documents. Contractor shall be aware that material that meets the Cleanup Levels and Reuse Criteria specified in the Contract Documents may still require sampling and treatment requirements under the AO. Contractor will work with Sound Transit, Ecology, and any other AHJ to review, consider, and or confirm any additional and appropriate regulatory criteria to ensure

proper testing, concentration screening, and compliance. Contractor is responsible for informing Ecology, amending the AO as required, and additional sampling and treatment requirements based on the presence of Hazardous or Contaminated Substances on-site material, import material, and recycled, reclaimed materials.

3. Flow Rates

- a. Flow control must be provided when construction activities within a given work area disturb one acre or more through the life of the project.
- b. Construction sites that must implement flow control for the developed site condition must also control release rates during construction.
 - 1) The construction site discharge must not exceed the discharge rates of the pre-developed condition, as defined in the SMMWW.
 - 2) The pre-developed condition must be the land cover immediately prior to start of construction.

H. USE OF EXPERIMENTAL BMPs

- 1. Prior to implementation, obtain approval for all experimental BMPs for treatment of water that is to be discharged to surface water from the Department of Ecology.
 - a. Approval request is to include a description of:
 - 1) The experimental BMP
 - 2) Why the experimental BMP is being requested
 - 3) Why the BMPs in the SMMWW are not adequate
 - 4) Applicable construction techniques
 - 5) The characteristics of the site or sites where the experimental BMP is proposed
 - 6) Design criteria for the experimental BMP and the expected results
 - 7) Maintenance procedures
 - 8) Cost estimates
 - 9) Monitoring procedures and duration
 - 10) For proposals for chemical treatment:
 - 11) Bench test data using soils and water from the site which cite the optimum polymer dosage rate to achieve colloidal capture at a range of anticipated turbidities and the aquatic toxicity of treated stormwater on Daphnia and on salmonid fishes, using Standard Methods for the Examination of Water and Wastewater, Methods 8-10B and 8-04B, except temperature is ambient
 - 12) Engineering description of the chemical feed systems
 - a) An Ecology approved BMP that could be used if the experimental BMP fails

I. Environmental System Compliance (ESC)

1. The Resident Engineer, CSEMS, and regulatory agencies will determine the effectiveness of the ESC system. If the Contractor's ESC system is found to be not conforming to environmental specifications, laws, permit conditions or BMPs, the Resident Engineer will issue an Environmental Corrective Action Required (ECAR). See Exhibit D.
2. Upon issuance of an ECAR, the Contractor will:
 - Investigate and describe the root cause of the noncompliance
 - Provide remedial correction for the nonconforming item(s)
 - Immediately correct damaged, inadequate, or ineffective TESC BMPs
 - Record all ECARs in an ECAR log (See Exhibit E).
3. Within 72 hours of an ECAR issuance the CSEMS will organize and implement an after incident ECAR meeting including: the pertinent Environmental Discipline Lead(s); Contractor's staff that provided notification of the incident; Contractor's staff that led the response of the incident; and the Supervisor of the work or activity that triggered or was responsible for the incident and/or the work zone where the incident occurred. The contractor will also invite the Resident Engineer and Sound Transit SME and/or designated Sound Transit contact associated with the incident and accommodate their participation to the extent practicable
4. The goal of the meeting will be to identify and analyze root causes of the incident, review of the initial response to determine adequacy, identification of appropriate corrective actions to prevent recurrence, and to establish a schedule for corrective action implementation. The Contractor must participate in good faith and provide necessary information and documentation requested by the Resident Engineer.
5. The Contractor will be responsible for submitting a completed ECAR response within ten (10) working days of issuance that includes a description of the incident, immediate response action taken, a detailed analysis of the root cause, proposed corrective actions to prevent a recurrence, and a schedule for corrective action implementation.
6. If the ESC system is determined to be ineffective by the Resident Engineer or regulatory agencies, the Contractor must upgrade and/or modify the system until it is effective, as determined by the Resident Engineer and regulatory agencies.
7. Refusal to immediately modify or upgrade the ESC system as required by the Resident Engineer, will result in the issuance of a Stop Work Order until the required modifications or upgrades have been completed either by the Contractor or by a third party, if it is determined necessary by Sound Transit. If completed by a third party, the cost of the work shall be deducted from the Contractor's progress payment.
8. If Ecology or other AHJs issues a Notice of Violation, Notice of Noncompliance, Corrections Required, or other enforcement action, the Resident Engineer must issue a Stop Work Order for construction activities until it has been determined to the satisfaction of the Resident Engineer and Ecology or the other AHJs that the Project is in compliance. The Resident Engineer may require the Contractor to send additional staff to stormwater construction BMPs field training, as provided by the Associated General Contractors, or other Sound-Transit-approved training.

J. COMPLETION OF CONSTRUCTION

1. Remove all TESC measures within 30 days after final site stabilization is achieved or after the temporary BMPs are no longer needed.
2. Remove and dispose of trapped sediment in an approved site or stabilize the trapped sediment on site.
3. Permanently stabilize disturbed soil areas resulting from such removals.
4. Terminate the GSWGP with Ecology, once the Contractor, with acceptance from Sound Transit, has completed the following:
 - a. Final stabilization of all soils, with permanent vegetative cover or final surfacing
 - b. Elimination of construction-related stormwater discharges
 - c. Removal of all temporary BMPs
 - 1) Contractor shall provide Sound Transit with verification that all temporary BMPs (including but not limited to catch basin inserts, silt fence, check dams) have been removed.

3.07 INVASIVE SPECIES MANAGEMENT PROTOCOLS

- A. The following requirements are applicable to work around lakes, streams, streambanks, or wetlands. Management protocols herein refer to invasive species as defined under RCW 77.135, RCW 77.08.010(14), and WAC 16-750.
 1. To prevent the spread of terrestrial or aquatic invasive species, noxious weeds, and weeds of concern, thoroughly clean all gear and equipment that is to be used on site (including equipment, hand tools, boots, waders) before arriving at and again before leaving the site. Properly dispose of water and chemicals used to clean gear and equipment in sanitary sewage drains (not storm drains).
 2. Invasive species, noxious weeds, and weeds of concern, including, but not limited to, New Zealand mud snails, Asian clams, Red swamp crayfish, reed canary grass, non-native knotweed, and other species listed under RCW 77.135, the current local County Noxious Weed List, and the current list of priorities on the Washington Invasive Species Council's website, shall be identified, listed, and provided to the Resident Engineer for review. Based on the findings, the Resident Engineer may request an Integrated Pest Management Plan.
 3. If invasive species, noxious weeds, or weeds of concern are identified, the species that are removed as part of clearing and grubbing activities and the habitat or topsoil containing the roots and seeds of these species shall be hauled from the site and disposed of at an approved location.
 4. Follow procedures in RCW 77.135 and the Washington Department of Fish and Wildlife's current version of the Invasive Species Management Protocols.

3.08 AIR POLLUTION CONTROLS

- A. Take precautions to minimize fugitive dust emissions from operations involving demolition, excavation, grading, clearing of land, and off-site transport and disposal of solid waste.
- B. Do not cause or allow emissions of fugitive dust from transport, handling, construction, or storage activities to remain visible in the atmosphere beyond the boundary of the Site.

1. Use water sprinkling on construction sites, temporary enclosures, and other methods, as necessary, to minimize dust and dirt migration.
 2. Use water to suppress dust during handling of soil or debris, or during demolition of brick or concrete buildings.
 3. Provide sufficient equipment for dust control to effectively prevent dust nuisance on and about the job site.
 4. When weather conditions warrant, have water sprinkler equipment (for example, a water truck) on hand at all times, including weekends and holidays, for immediate use for dust control. Contractor shall ensure proper coordination and arrangements are made, as needed, to provide personnel on site to operate equipment for dust control measures during off-work hours, holidays, and weekends. Contractor shall inform Sound Transit in advance if provisions cannot be arranged.
 5. Apply the water sprinkling so that water does not accumulate or run across the Site.
 6. Do not allow runoff of water that is used for dust control to enter surface water or groundwater.
 7. The application of any chemical dust suppressants must be approved by the Resident Engineer prior to use.
 8. If portions of the Site are temporarily inactive or abandoned for any reason, provide dust control and abatement, as necessary, during periods of inactivity.
- C. Take precautions to prevent visible particulate matter from being deposited upon public roadways, sidewalks, or adjacent building facades as a direct result of transportation and Work operations. Precautions and remediation include:
1. Load all trucks, coming to the job site or leaving the job site, in a manner that prevents dropping of materials or debris on streets.
 2. Remove particulate matter from equipment before movement to paved streets.
 3. Cover and secure all loads of materials, debris, and soil transported to and from construction sites.
 4. As appropriate, wet materials in trucks to reduce fugitive dust and prevent deposition of particulates during transportation.
 5. Immediately remove from public roadways, sidewalks, or adjacent buildings facades spillage or other materials deposited as a direct result of transportation operations.
 6. Establish regular cycles and locations for cleaning trucks that haul soil from the Site.
- D. Cover loads of hot asphalt to minimize odors.
- E. Use construction equipment designed and equipped to prevent or control air pollution.
1. Maintain evidence of such equipment and make available for inspection by the Resident Engineer.

2. Establish and maintain records for routine maintenance program for all hauling trucks used for the Work. Keep records available for inspection by the Resident Engineer.
 3. Do not allow internal combustion engines to idle on city streets or state or federal highways.
 4. Use electrically powered equipment where needed to meet requirements.
- F. Report all complaints from the public to the Resident Engineer.
- G. Use appropriate environmental sampling techniques, as determined by a Certified Industrial Hygienist, for airborne emissions, if necessary to verify compliance with fugitive dust control measures.

END OF SECTION

EXHIBITS

Exhibit A: Temporary Site Water Discharge Flow Chart

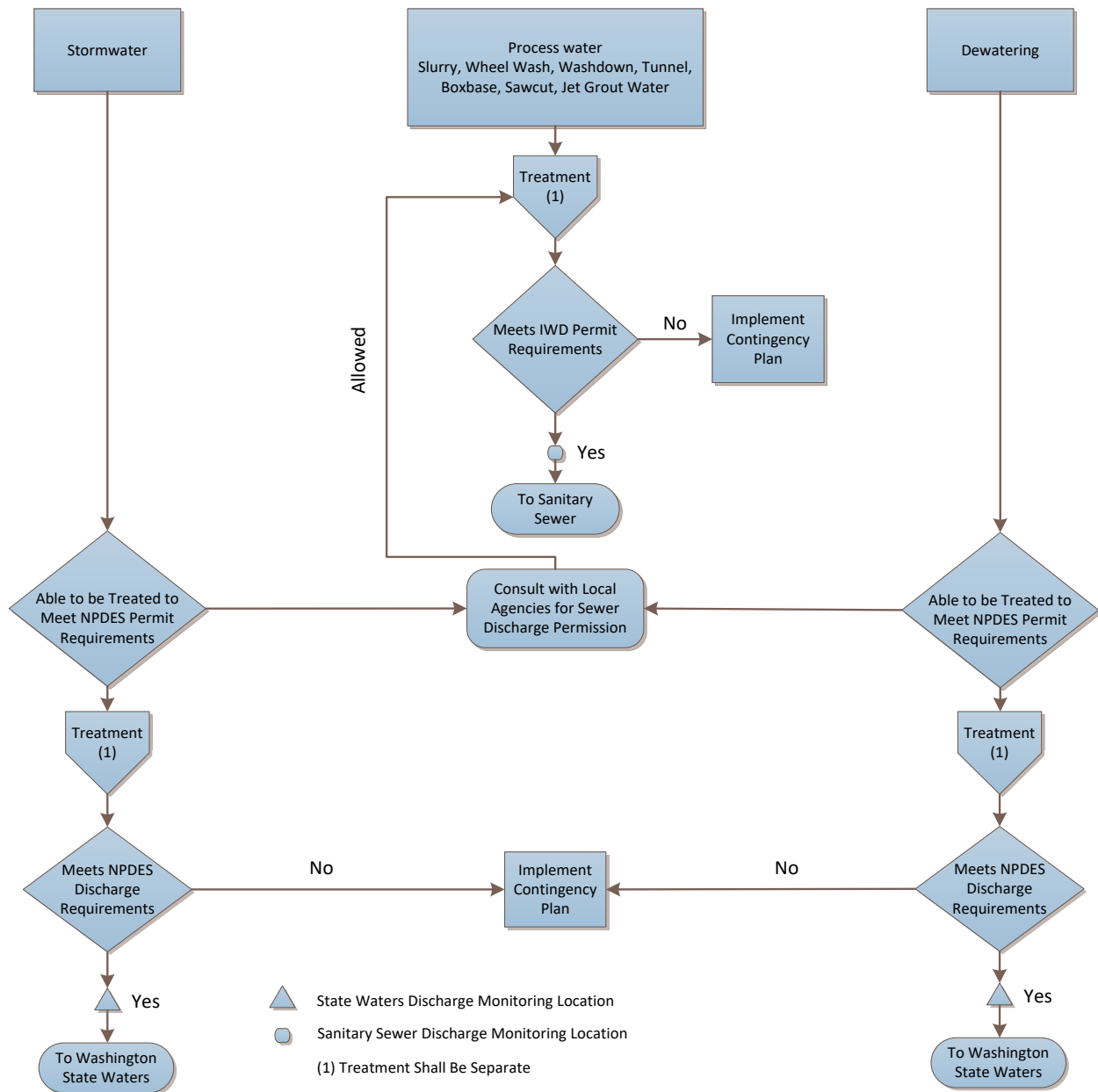
Exhibit B: Spill Report Log

Exhibit C: Spill Report Form

Exhibit D: Environmental Corrective Action Required Form (ECAR)

Exhibit E: Environmental Corrective Action Required Log (Sample Template)

SECTION 01 57 00 – EXHIBIT A
TEMPORARY SITE WATER DISCHARGE FLOW CHART



SECTION 01 57 00 – EXHIBIT B

SPILL REPORT LOG

SPILL REPORT LOG

PLEASE COMPLETE THIS FORM AND RETAIN ON FILE.

DATE	LOCATION	TYPE OF MATERIAL & QUANTITY	SOURCE	CAUSE	CORRECTIVE AND/OR PREVENTIVE ACTION(S) TAKEN	RECORDER'S INITIALS

Uncontrolled Document from Soundtransit.org

SECTION 01 57 00 – EXHIBIT C

SPILL REPORT FORM

Please complete this form and retain on file. Page ____ of ____

Person reporting spill:	Telephone number:
Date of spill:	Time of spill:
Time / Date spill was cleaned up:	
Source of Spill – Equipment:	
Material type:	
Material quantity:	
Weather conditions:	
Spill reported to: <input type="checkbox"/> Police/Fire Dept. (911) <input type="checkbox"/> Ecology – (425) 649-7000 <input type="checkbox"/> Sound Transit – Resident Engineer	
<input type="checkbox"/> National Response Center 800-424-8802 <input type="checkbox"/> Spill Response Subcontractor <input type="checkbox"/> Other: _____	
Cause(s) and effect(s) of spill:	
Spill containment and clean up procedures initiated:	
Description of spill location and surroundings:	
Corrective actions taken to prevent future incident:	
Agency(s) on the scene:	
Report completed by:	
Printed Name: _____	
Signature: _____	
Title:	Date:

SECTION 01 57 00 – EXHIBIT D

ENVIRONMENTAL CORRECTIVE ACTION REQUIRED

**ENVIRONMENTAL CORRECTIVE ACTION REQUIRED (ECAR)****Environmental Non-Conformance*****THIS SECTION WILL BE COMPLETED BY THE ORIGINATOR ISSUING THE ECAR***

1. Project Name:	2. ECAR Number:	3. Date ECAR Issued:	4. Originator/Organization:
5. ECAR Issued to:	6. Date of Environmental Non-Conformance:	7. ECAR Response Due Date: [within ten (10) working days after issue date]	

8. Location of Environmental Non-Conformance:

9. Contract Requirement(s):

☐ Specification Section(s):☐ Permit and Condition Number:☐ Other (e.g., Submittal, Drawing(s), etc.):

10. Description of Non-Conformance [include photographs as appropriate, see below]:

Is this a Recurring Non-Conformance [check one]: ☐ Yes ☐ No

11. ECAR Originator's RE/Supervisor Signature:

Printed Name:

Signature:

Date:

THIS SECTION WILL BE COMPLETED BY THE INDIVIDUAL/ORGANIZATION RESPONSIBLE FOR RESPONDING TO THE ECAR

12. Immediate Actions Taken to Correct Non-Conformance

13. Root Cause(s): [Describe why the Non-Conformance happened using the "five whys" methodology]:

14. Corrective Action Taken to Prevent Recurrence [Describe the corrective action(s) that will be established to prevent recurrence of non-conformance project wide. Include where incorporated/documented – e.g., checklist, drawing, inspection, SWPPP, etc.]:		15. Corrective Action Implementation/ Effective Date:
16. Environmental Manager's concurrence that information above accurate and correct: Printed Name: _____ Signature: _____ Date: _____		
<i>This section will be completed by Originator issuing the ECAR</i>		
17. Originator's signature indicating ECAR response has been satisfactorily addressed and closed, or rejected: <input type="checkbox"/> Accept <input type="checkbox"/> Reject, brief description of why: _____ Printed Name: _____ Signature: _____ Date: _____		
<i>This section will be completed by Sound Transit Environmental Compliance Staff Reviewer</i>		
18. This ECAR response satisfactorily addresses the non-conformance. Printed Name: _____ Signature: _____ Date: _____		

Environmental Non-Conformance

1.01 ORIGINATOR PHOTOS: [ADD PHOTOS BELOW WITH DESCRIPTIONS TO SUPPORT THE DESCRIPTION AND LOCATION OF NON-COMPLIANCE]

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Photo 1:

Photo 2:

1.02 RESPONSE PHOTOS: [ADD PHOTOS BELOW WITH DESCRIPTIONS TO SUPPORT THE ROOT CAUSE AND CORRECTIVE ACTION TAKEN]


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Photo A:

Photo B:

Provide additional responses/ photos below, as needed:

SECTION 01 57 00 – EXHIBIT E
ENVIRONMENTAL CORRECTIVE ACTION REQUIRED LOG (EXAMPLE)

 <div style="display: inline-block; vertical-align: middle;">ENVIRONMENTAL COMPLIANCE</div>							
Page ____ of ____							
Department:							
Contract Name:				Contract Number:			
E-CAR No:	Description:	Originator	Resp. Org.	Issue Date	REC Date	Verified by Date	Close Date

END OF EXHIBITS

SECTION 01 57 00.10

SMALL PROJECT ENVIRONMENTAL PROTECTIONS AND CONTROLS

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section includes the requirements and performance specifications for mitigating construction impacts to the environment, including air, land, and waters of the United States or Waters of the State, through best management practices and controls for project typically less than 1 acre and where Hazardous or Contaminated Substances are not present.
- B. The Contractor is wholly responsible for control of all water, including groundwater, stormwater, process water, entering onto, originating, and exiting the construction site or staging areas.
- C. The Contractor is responsible for coordination with Authorities Having Jurisdiction (AHJ) associated with this Contract. This includes defining, confirming, verifying, and complying with current requirements for construction stormwater permitting, operations, and wetland mitigation.
- D. This work must apply to all areas associated with contract work including, but not limited to the following work areas:
 - 1. Job site
 - 2. Equipment and material storage areas
 - 3. Staging and laydown areas
 - 4. Stockpiles

1.02 STANDARDS

- A. This Section incorporates by reference the latest revisions of the following documents:
 - 1. Washington State
 - a. Department of Ecology (Ecology) Stormwater Management Manual for Western Washington (SMMWW)
 - b. Washington State Department of Transportation (WSDOT) Standard Specifications for Road, Bridge, and Municipal Construction
 - 2. Municipality:
 - a. Applicable municipality noxious weed list
 - b. Applicable municipality environmentally sensitive areas ordinance
 - c. Applicable municipality fire code and amendments
 - d. Applicable municipality standard specifications for road, bridge, and municipal construction

- e. Applicable municipality standard plans
- f. Applicable municipality stormwater manual
- g. Applicable municipality stormwater code
- 3. Industrial Waste Rules and Regulations
 - a. King County Code (KCC)-KCC 28.84.060
 - b. Applicable municipality industrial waste rules and regulations

1.03 DEFINITIONS

- A. BMPs (Best Management Practices): The activities, practices, maintenance procedures, and other physical, structural, or managerial actions used during construction to prevent or reduce the pollution of groundwater and surface waters of the State: BMP types are specified by number in the current version of the Ecology Western Washington Stormwater Manual
- B. Bulk Fuels: Fuels in quantities greater than 250 gallons including, but not limited to, motor oil, gasoline, kerosene, diesel fuel, hydraulic oil, and other products that are derived from the refining of crude oil and are contained in drums or tanks (above ground or buried)
- C. CESCL: Certified Erosion and Sediment Control Leads for Western Washington, Ecology: BMP C160
- D. CSEMS: Construction Site Environmental Management Supervisor
- E. Critical Area: Any wetland, stream, buffer, steep slope, wildlife area or zone, or other designated area: these areas or zones are defined by the local, state, or federal laws and requirements
- F. ECAR: Environmental Corrective Action Request
- G. Fugitive Dust: As defined by the Puget Sound Clean Air Agency
- H. Noncompliance Event (or Events): Noncompliance exists where surface water, groundwater, or sanitary sewer water discharged to groundwater exceeds allowable discharge limits
- I. Process Water: Discharges including, but not limited to:
 - 1. Truck and wheel wash water, equipment wash water, petroleum or chemically contaminated water, non-contact cooling water, and chlorinated water
 - 2. Water used for sawcutting, grinding, and coring of asphalt and concrete
 - 3. Site water in contact with and chemically affected by site conditions which cannot be treated on site to meet surface water discharge criteria.
- J. Surface Water:
 - 1. Federal waters and surface waters of the State
 - 2. Wetlands, jurisdictional ditches, and open drainage channels
 - 3. Municipality's stormwater system
- K. Surface Waters of the State: Lakes, rivers, ponds, streams, inland waters, salt waters, and all other surface waters and water courses within the jurisdiction of the state of Washington

- L. SMMWW (Stormwater Management Manual for Western Washington): The technical manual published by Ecology for use by local governments, that contains the description of and design criteria for BMPs to prevent, control, or treat pollutants in stormwater
- M. SPCC: Spill Prevention, Control, and Countermeasures Plan
- N. TESC (Temporary Erosion and Sedimentation Control): Planning, managing, controlling, mitigating, recording, and reporting discharge of stormwater from construction sites
- O. Turbidity: The clarity of water, expressed as nephelometric turbidity units (NTU) and measured with a calibrated turbidimeter
- P. Vegetation Management Plan: A plan describing how trees, vegetation, or landscaping will be protected throughout the duration of the project: this must include invasive species management within the project area following Sound Transit's Integrated Pest Management Plan and pesticide use request forms (Exhibit A), which can be downloaded at N:\Environmental Affairs & Sustainability\EAS OPERATIONS\IPM_Sustainable Landscaping\Herbicide Requests\Pesticide Use Request Form\ST Pesticide Use Request Form_6-2020.docx
- Q. Wet Season: October 1 through April 30
- R. Dry Season: May 1 through September 30

1.04 ADMINISTRATION

- A. Coordinate with property owners having jurisdiction over work sites.
- B. A TESC preconstruction meeting, including a site inspection with the AHJs and Sound Transit, is required before ground disturbance including, staging, grubbing, clearing, or grading begins.

1.05 SUBMITTALS & TRANSMITTALS

- A. Submittals
 - 1. Air Pollution Control Plan: Submit 21 days prior to disturbing soil, staging, land clearing, grubbing, grading, or any demolition activities
 - 2. Critical Area Protection Plan: Submit 30 days prior to disturbing soil, staging, land clearing, grubbing, grading, or any demolition activities
 - 3. Discharge to Sanitary Sewer/Combined Sewer Plan
 - 4. Qualifications for Construction Site Environmental Management Supervisor
 - 5. Spill Prevention, Control, and Countermeasures Plan: Submit 21 days prior to disturbing soil, land clearing, grubbing, grading, or any demolition activities
 - 6. Spill Report Form (Exhibit B) Submit within 24 hours of a reported spill
 - 7. TESC Plan: Submit 21 days prior to disturbing soil, including staging, clearing, grubbing, grading, or any related demolition activities
 - 8. Trucking Plan: For any construction-impacted stormwater or wastewater being transported off site for disposal at an Ecology permitted facility
 - 9. Vegetation Management Plan: Submit 21 days prior to disturbing soil, staging, land clearing, grubbing, grading, or any demolition activities

B. Transmittals

1. Citations issued in conjunction with this Contract: Within 24 hours of issuance
2. Manufacturer data and test results for all erosion control products
3. Qualifications of the CESCL
4. Spill Report Form (Exhibit B) Within 24 hours of a reported spill.
5. Spill Report Log (Exhibit C) Update within 7 days of a reported spill
6. TESC BMP Inspection Log: Transmit copies to the Resident Engineer weekly for the previous week's inspections

1.06 QUALITY ASSURANCE

- A. Implement the Construction TESC Plan, Spill Control Plan, and Air Pollution Control Plan, including design of and all revisions to, and the construction, maintenance, replacement, and modification of the erosion and sedimentation control facilities, until Acceptance of current work.
- B. Employ Construction Site Environmental Management Supervisor (CSEMS with the following responsibilities:
 1. Be currently certified as a CESCL in accordance with BMP C160 requirements
 2. Have a minimum five years of experience being responsible for construction, site erosion and sediment control regulatory requirements, BMPs, TESC Plan development, and stormwater monitoring: at least three years of the experience must be on projects in the Pacific Northwest
 3. Approved by the Resident Engineer to implement, manage and enforce compliance with the requirements
 4. Be solely responsible for developing, maintaining, and modifying the TESC Plan, SPCC Plan, and Pollution Control Plan for the life of the Contract and ensuring compliance with all requirements
 5. Have the authority to act on behalf of the Contractor and be available on call 24 hours per day for the duration of the Contract Must arrive on-site within 12 hours of being called.
 6. Be available to accompany Sound Transit's representative or Ecology personnel during weekly inspections of all BMPs, at a time designated by the Resident Engineer.
 7. Ensure that all TESC BMPs are installed, inspected, maintained, and modified as conditions change for the duration of the Contract
- C. TESC BMP daily logs and inspection reports must be updated by the CESCL on a daily basis and must include the following:
 1. Inspection date/time
 2. Weather information; general conditions during inspection and amount of precipitation since the last inspection
 3. A summary or list of all BMPs implemented, including observations of all erosion and sediment control structures or practices. Note locations of BMPs inspected,

needing maintenance, or failing to operate as designed and locations where additional or different BMPs are required

4. General comments and notes, including a brief description of BMP repairs, maintenance, or installations made as a result of the inspection
5. Visually Inspect all stormwater discharges for turbidity and oily sheen

1.07 SEQUENCING AND SCHEDULING

- A. CSEMS will review construction sequencing and staging to identify BMPs that will be implemented.
- B. Prior to installing the BMPs for perimeter controls (such as silt fence), the construction limits must be surveyed by the Contractor and verified by Sound Transit to ensure they are consistent with the permitted impact areas according to the permits.
 1. Work must not begin until the perimeter controls have been approved and are installed.
 2. Sequence the Work per the BMP tables defined in the current SMMWW. Construction sequencing that limits staging, land clearing, provides timely installation of erosion and sedimentation controls, and restores protective cover quickly can significantly reduce the erosion potential of a site. Consider scheduling the project to disturb only small portions of the site at any one time. Complete grading as soon as possible. Immediately stabilize the disturbed portion before grading the next portion. Practice staged seeding to revegetate cut and fill slopes as the work progresses.
 3. Provide permanent stabilization following completion of Work in an area.

PART 2 - PRODUCTS

2.01 SUMMARY

- A. The materials, BMPs, and methods listed below are some of the materials, BMPs, and methods that the Contractor may choose to use in meeting the requirements of this Section. A complete list of approved BMPs can be found in Volume II of the current SMMWW. Unless otherwise noted, the materials, BMPs, and methods listed are not required and the list of materials, BMPs, and methods is not intended to be all-inclusive. The Contractor may choose other materials, BMPs, and methods, provided they meet the applicable city, state, and federal permits and requirements.
- B. Materials
 1. General: Materials used for erosion and sediment control BMPs must be in accordance with the materials specified in the SMMWW Volume II, Chapter 4
 2. Stabilized Construction Entrance: In accordance with SMMWW Volume II, BMP C105
 3. Inlet Protection (required): Specifically designed for catch basins and inlets, made of a filter fabric insert with a 48- by 36-inch adapter skirt, retrieval strap, overflow bypass, and sediment accumulator: inlet protection by Silt Sack, Streamguard, or approved equal
 4. Take proper measures to prevent tracking of soil, aggregate, mud, or other debris onto public and private streets, drives, parking lots, and sidewalks: measures may

include, but are not limited to, closed loop wheel wash, washing tires, covering on-site haul roads and muddy areas with clean, dry sand, gravel, or trap rock, and maintaining clean haul routes on paved surfaces

PART 3 - EXECUTION

3.01 GENERAL

- A. Conduct operations in a manner to minimize pollution of the environment surrounding the area of work by every means practicable.
- B. Maintain the site in a neat and orderly manner to avoid environmental degradation.
- C. Initial site construction activities include:
 - 1. Mobilization and staging of equipment and materials
 - 2. Temporary security fence installation
 - 3. Sediment control BMPs (such as sediment ponds, storage tanks, traps, filters, silt fences, stabilized construction entrances, wheel wash) constructed as one of the first steps for staging and grading
 - 4. Marking and managing critical areas and vegetation to be protected
- D. Major staging and grading is allowed except as needed for BMP installation and construction
- E. Maintain proper security at all times to discourage and avoid vandalism

3.02 PLAN REQUIREMENTS

- A. TESC PLAN
 - 1. Include a copy of the qualifications of the individual preparing the TESC Plan with the TESC Plan.
 - 2. The TESC Plan consists of two parts: a narrative and drawings. Both parts must contain information specific to the construction site.
 - 3. The TESC Plan must show how construction stormwater and erosion control BMPs will be installed, maintained, and removed, and be updated throughout the project as construction activities, conditions and BMPs are adjusted, and will include, at a minimum, the following specific information:
 - a. Construction details of all chemical handling and storage areas, vehicle and equipment storage areas, wheel washes, stabilized construction entrances, perimeter control BMPs, collection sump-pumps, conveyance pipes, ditches, berms, culvert pipes, storage ponds, storage tanks, filters, and basin outfalls
 - b. Location of all facilities that are designed to treat sediment-laden runoff prior to discharge to the existing drainage system: in lieu of providing on-site treatment of the runoff, the runoff may be collected and hauled off site for treatment using an approved method
 - c. A conceptual TESC Plan may be included in the Contract Drawings "for information only": revise the TESC Plan to reflect the actual means and methods proposed, including alternative BMPs

- d. A description of the inspection and monitoring plan for TESC BMPs over the life of the Contract pertaining to the inspection of all BMPs daily. The log of TESC all inspection reports must be transmitted to the Resident Engineer weekly, for the previous week
- e. A narrative describing the training program for educating all personnel, including subcontractors, on environmental protection: this training may be added to existing weekly meetings (such as safety meetings): emphasize issues such as sensitive receptors, spill prevention, chemical handling and storage, emergency response, stormwater control facilities inspections, proper dewatering techniques, and concrete handling
- f. The name, telephone number, cell phone number(s), email address, and business address of the designated CSEMS and all Contractor personnel responsible for erosion and sediment control, updated as needed

B. AIR POLLUTION CONTROL PLAN

- 1. Describe the approach the project will take for air pollution control
- 2. Describe the BMPs that will be used so that no emissions are visible beyond the site boundaries.
- 3. Include the requirement for the prevention of odors that interfere with the public, including limiting use of chemical products and keeping construction equipment in good mechanical condition to minimize exhaust emissions.
- 4. The application of any chemical dust suppressants must be approved by the Resident Engineer prior to use.
- 5. Notify the Resident Engineer of any complaints.

C. SPILL PREVENTION PLAN

- 1. Developed in accordance with 40 CFR 112 with supplemental requirements as indicated below.
- 2. Include the following:
 - a. CSEMS is responsible for implementing the plan if a spill occurs
 - b. Training protocol to be conducted and documented monthly to discuss the status and requirements of the spill prevention plan and the current locations of the spill kits on site
 - c. On a drawing for each site: staging, storage areas, maintenance, spill kits, and refueling locations and their relationship to drainage pathways, waterways, and other sensitive areas
 - d. Daily inspection of spill kits to ensure that adequate spill response, containment, and cleanup materials are available: document inspection results on daily TESC inspection reports
 - e. Daily Inspection of fuel hoses, lubrication equipment, hydraulically operated equipment, oil drums, and other equipment and facilities. Inspect for drips, leaks, or signs of damage, and maintain and store properly to prevent spills.
 - f. Fuel Storage:

- 1) All portable fuel storage tanks between 6 and 250 gallons, except for vehicle and equipment petroleum fluid tanks, must:
 - a) Be specifically engineered to meet or exceed all national environmental and hazardous waste regulations
 - b) Have a secondary shell providing up to 110 percent containment
 - c) Be accompanied by a spill kit and fire extinguisher staged within 15 feet
- 2) Portable fuel storage containers less than 6 gallons
 - a) Must be stored within secondary containment equivalent to 110 percent of the container's capacity
 - b) Must be placed and stored in secondary containment at all times, unless being actively used to fill equipment
 - c) Must be refilled in secondary containment
- g. Spill Response Procedures: Report all spills that occur regardless of the size or type of the spill to the Resident Engineer on a Spill Report Form.
- h. Collect at least one soil sample following removal of spilled Hazardous Substance and complete appropriate chemical analysis based on Hazardous Substance spilled to confirm removal of Contaminated Substances is sufficient in accordance with Model Toxics Control Act.
- i. The provided Spill Report Form (Exhibit B) must be used, and modifications to the form must be approved by the Resident Engineer.
- j. Maintain a Spill Report Log (Exhibit C) for all spills.
- k. If the spill of a hazardous substance could reach surface waters, the following agencies must be notified: National Response Center (1-800-424-8802) or WWW.NRC.USG.MIL/INDEX.HTM. Notify the regional WA Department of Ecology office. Timely notification is required.
- l. The SPCC Plan must include provisions, requirements, and details to stop any spills at the source and install protective covers over storm drain grates. If spill is flammable, call 911 and dispose of as directed by the local Fire Marshal.
- m. Ensure employees who respond to spills are trained to a level of competence as defined in the SPCC Plan.

3.03 IMPLEMENTATION

A. Preparation

1. Clearly flag the boundaries of the staging/clearing and construction limits as indicated on the Contract Drawings or as designated by the Resident Engineer by a continuous length of fencing or screening wall prior to construction.
2. During the construction period at each site, no disturbance beyond the staging/clearing and construction limits is permitted without prior authorization from the Resident Engineer.

3. Maintain the staging/clearing and construction limits for the duration of construction.
- B. Temporary spoil piles:
1. Cover the piles after 2 days of inactivity during the wet period and 7 days of inactivity during the dry period.
 2. Place all excavated material not hauled directly from the construction site in a temporary spoil pile surrounded and contained using ecology blocks or equivalent.
 3. Control water seepage and runoff and direct to water treatment system. Treatment of seepage and runoff from piles is required prior to discharge from site.
 - a. Stockpile on Site sufficient BMP materials and supplies to protect the entire site.
 - b. Protect catch basin inlets to the permanent storm drainage system from sediment influx by use of filter fabric, catch basin insert, or similar filtering materials and methods in accordance with the SMMWW.
- C. BMP Installation
1. Installation practices for erosion and sediment control BMPs must be in accordance with the most recent SMMWW, Volume II and manufacturer's specifications.
 2. Inlet Protection: Protect catch basin inlets to the permanent storm drainage system from sediment influx by use of catch basin insert or similar filtering materials and methods per SMMWW.
- D. Maintenance
1. Before and while erosion is occurring, make modifications to the erosion control system to mitigate the erosion and its effects.
 2. General maintenance activities:
 - a. Repair or replace damaged or missing items immediately.
 - b. Use water sprinkling, temporary enclosures, and other methods to minimize dust and dirt migration. Prevent runoff from all water used for dust control from entering the storm sewer system.
 - c. Immediately stabilize, with the approved BMP methods (such as seeding, mulching, and plastic covering), all areas of exposed soils that will not be disturbed for 2 days during the wet season or 7 days during the dry season.
 - d. Address all areas needing BMP measures that do not require immediate attention within 7 days of notification from the Resident Engineer or CSEMS.
 - e. At a minimum, inspect all TESC BMPs daily and after significant rain events (0.5 inch or greater). Repair as necessary to meet requirements of the SMMWW
 - f. Maintain and repair all TESC practices as needed to ensure continued performance of their intended function.

- g. Operate and maintain BMPs in accordance with the SMMWW Volume II and following operational and maintenance requirements:
- h. Prevent sediments from being flushed to the downstream system during cleaning.
- i. Remove sediment, trash, and debris from catch basin grate surfaces when blocking more than 20 percent of the grate surface.
- j. Clean or replace inlet and catch basin filter socks when sediment fills one-third of the available storage or the fill limits recommended by the manufacturer have been met. Immediately clear or replace clogged fabric.
- k. Immediately remove and properly dispose of all sediment introduced into a catch basin.
- l. Handle and dispose of cleaning waste material and demolition debris in a manner that does not cause contamination of water. If the area is swept with a pick-up sweeper, the material must be hauled out of the area to an appropriate disposal site.
- m. Update the TESC with site-specific construction work plans as necessary to reflect construction work area limit changes, the construction activities accompanying these changes, and all changes to BMPs or stormwater handling and treatment systems.

E. Completion of Construction

Remove all TESC measures within 30 days after final site stabilization is achieved or after the temporary BMPs are no longer needed. Remove and dispose of trapped sediment in an approved site or stabilize trapped sediment on site. Permanently stabilize disturbed soil areas resulting from removal.

F. System Compliance

- 1. The Resident Engineer, CSEMS, and regulatory agencies will determine the effectiveness of the TESC system. If the Contractor's ESC system is found to be not conforming to specifications, laws, permit conditions or BMPs, the Contractor or the Resident Engineer, or both, will issue an ECAR. See Exhibit D.
- 2. If the erosion control system is determined to be ineffective by the Resident Engineer or regulatory agencies, the Resident Engineer may issue an ECAR. (See Exhibit D.)
- 3. Upon issuance of an ECAR, the Contractor must investigate and describe the root cause of the noncompliance and provide remedial correction for the nonconforming item(s). Immediately correct damaged, inadequate, or ineffective TESC BMPs.
- 4. Refusal to modify and upgrade the erosion control system as required within 5 days of notice from the Resident Engineer may result in the work being completed by a third party and the cost of the work being withheld from payments due.
- 5. Continued noncompliance with the erosion control requirements and water quality requirements may result in stoppage of work and monetary fines.
- 6. In the event that the Washington State Department of Ecology or other AHJs issues a Notice of Violation, Notice of Noncompliance, Corrections Required, or other enforcement action, the Resident Engineer may issue a stop work order for

all construction activities until it has been determined to the satisfaction of the Resident Engineer and Ecology or the other AHJs that the project is in compliance. The Resident Engineer may require the Contractor to send additional staff to stormwater construction BMPs field training, as provided by the Associated General Contractors, or other Sound-Transit-approved training before construction activities can resume. The Contractor must not be entitled to additional time or compensation arising from any measures required or taken under this clause. The Contractor must be responsible for, and pay all costs associated with, work stoppages, mitigation of the triggering event(s), and training.

7. The contractor must be solely responsible for all damages, fines, levies, judgments, stop work orders, and related schedule impacts incurred as a result of Contractor, subcontractor, or supplier failure to comply with the requirements of this Section. Said damages, fines, levies, or judgments will be deducted from payments due. The Contractor will not be entitled to additional contract time arising from any measures required or taken under this clause.

END OF SECTION

EXHIBITS

Exhibit A: Pesticide Use Request Form

Exhibit B: Spill Report Form

Exhibit C: Spill Report Log

Exhibit D: Environmental Corrective Action Request (ECAR)

SECTION 01 57 00.10 – EXHIBIT A

PESTICIDE USE REQUEST FORM



Date of Request:		Date of Revised Request:	
Sound Transit Pesticide Use Request Form			
Requestors Information			
Full Name:			
Last		First	M.I.
Phone:	()	E-mail Address:	
Company Name:			
Street Address:			
City		State	ZIP Code
Pesticide License No:	Expiration Date:	List Endorsements	
Are non-licensed applicators proposed?		YES* <input type="checkbox"/>	NO <input type="checkbox"/>
*If yes, direct supervision by the licensed applicator is required. The applicator must follow all current regulations. The licensed applicator must be physically present at the application site. The person making the application is always in voice and visual contact with the licensed applicator during the application.			
Describe why pesticide control is needed. List methods already used (e.g., grubbing, mowing, mulching, etc.) and why those methods are not appropriate or did not work.			
Date of Proposed Use:		End Date of Proposed Use:	
(Attach map and provide approximate area to be treated (i.e., square feet or acres))			
Targeted Species: (i.e., noxious weed species, insect name, fungi name, other)			
Targeted Species:			
Targeted Species:			
Targeted Species:			
Targeted Species:			
When is the best time for control? (month, season, time of day)			

Does this request coincide with the best control time?		YES <input type="checkbox"/>	NO <input type="checkbox"/>
If no, describe why not:			
Provide methods and/or criteria for application (e.g. mow, spray, air temperature thresholds, precipitation criteria, etc.):			
<p align="center">Proposed Pesticide Product(s) Information (Attach additional sheets as needed)</p>			
Trade Name:		EPA Registration No:	
Active Ingredients:		Inert Ingredients (if listed) include surfactants:	
Pesticide Label (attach):	YES <input type="checkbox"/> NO <input type="checkbox"/>	Material Type: (e.g., gas, liquid, powder, solid, etc.)	
Will pesticide be applied in a critical area or buffer?	YES <input type="checkbox"/> NO <input type="checkbox"/>	If yes, what kind? (e.g., wetland, stream, buffer)	
Will pesticide be applied in or over water	YES <input type="checkbox"/> NO <input type="checkbox"/>	If yes, is an NPDES Permit required?	YES <input type="checkbox"/> NO <input type="checkbox"/>
Is the site located in a Pesticide Use Limitation Area (PULA)	YES <input type="checkbox"/> NO <input type="checkbox"/>	Is a Bulletin required?	YES <input type="checkbox"/> NO <input type="checkbox"/>

SECTION 01 57 00.10 – EXHIBIT B

SPILL REPORT FORM

Please complete this form and retain on file. Page ____ of ____

Person reporting spill:	Telephone number:
Date of spill:	Time of spill:
Time / Date spill was cleaned up:	
Source of Spill – Equipment:	
Material type:	
Material quantity:	
Weather conditions:	
<div>Spill reported to:</div> <div> <input type="checkbox"/> Police/Fire Dept. (911) <input type="checkbox"/> National Response Center 800-424-8802 </div> <div> <input type="checkbox"/> Ecology – (425) 649-7000 <input type="checkbox"/> Spill Response Subcontractor </div> <div> <input type="checkbox"/> Sound Transit – Resident Engineer <input type="checkbox"/> Other: _____ </div>	
Cause(s) and effect(s) of spill:	
Spill containment and clean up procedures initiated:	
Description of spill location and surroundings:	
Corrective actions taken to prevent future incident:	
Agency(s) on the scene:	
Report completed by:	
Printed Name: _____	
Signature: _____	
Title:	Date:

**SECTION 01 57 00.10 – EXHIBIT C
SPILL REPORT LOG**

SPILL REPORT LOG

PLEASE COMPLETE THIS FORM AND RETAIN ON FILE.

DATE	LOCATION	TYPE OF MATERIAL & QUANTITY	SOURCE	CAUSE	CORRECTIVE AND/OR PREVENTIVE ACTION(S) TAKEN	RECORDER'S INITIALS

Uncontrolled Document from Soundtransit.org

SECTION 01 57 00.10 – EXHIBIT D

ENVIRONMENTAL CORRECTIVE ACTION REQUEST (ECAR)



ENVIRONMENTAL CORRECTIVE ACTION REQUEST (ECAR)

Environmental Non-Conformance

1.01 THIS SECTION WILL BE COMPLETED BY THE ORIGINATOR ISSUING THE ECAR

1. Project Name:	2. ECAR Number:	3. Date ECAR Issued:	4. Originator/Organization:
5. ECAR Issued to:	6. Date of Environmental Non-Conformance:	7. ECAR Response Due Date: [within ten (10) working days after issue date]	
8. Location of Environmental Nonconformance:			
9. Contract Requirement(s):			
<input type="checkbox"/> Specification Section(s):			
<input type="checkbox"/> Permit and Condition Number:			
<input type="checkbox"/> Other (e.g. – Submittal, Drawing(s), etc.):			
10. Description of Non-Conformance [include photographs as appropriate, see below]:			
Is this a Recurring Non-Conformance [check one]: <input type="checkbox"/> Yes <input type="checkbox"/> No			
11. ECAR Originator's RE/Supervisor Signature:			
<hr/>			
Printed Name: Signature: Date:			

1.02 THIS SECTION WILL BE COMPLETED BY THE INDIVIDUAL/ORGANIZATION RESPONSIBLE FOR RESPONDING TO THE ECAR	
12. Root Cause(s): [Describe why the Non-Conformance happened using the "five whys" methodology]:	
13. Corrective Action Taken to Prevent Recurrence [include where incorporated/documented – e.g., checklist, drawing, inspection, etc.]:	14. Corrective Action Implementation/ Effective Date:
15. Environmental Manager's concurrence that information above accurate and correct:	
<p>_____</p> <p>Printed Name: Signature: Date:</p>	
This section will be completed by Originator issuing the ECAR	
16. Originator's signature indicating ECAR response has been satisfactorily addressed and closed, or rejected:	
<p><input type="checkbox"/> Accept <input type="checkbox"/> Reject, brief description of why:</p> <p>_____</p> <p>Printed Name: Signature: Date:</p>	
<i>This section will be completed by Sound Transit Environmental Compliance Staff Reviewer</i>	
17. This ECAR response satisfactorily addresses the non-conformance.	
<p>_____</p> <p>Printed Name: Signature: Date:</p>	

END OF EXHIBITS

SECTION 01 57 13**TEMPORARY EROSION AND SEDIMENT CONTROL****PART 1 - GENERAL****1.01 SUMMARY**

- A. This Section contains performance specifications for controlling and mitigating impacts from construction stormwater discharge through temporary erosion and sediment control, pollution control, and maintaining the surface drainage system. The Contractor is wholly responsible for control of water, including ground water, onto and exiting the construction site or staging areas.
- B. As a part of the requirements of this Section, the Contractor is responsible for coordination with jurisdictions associated with a particular Contract. This includes: defining, confirming, verifying and complying with current requirements for construction stormwater permitting, operations and mitigation.

1.02 DEFINITIONS

- A. Best Management Practices (BMPs) – The activities, practices, maintenance procedures, and other physical, structural and/or managerial actions used during construction to prevent or reduce the pollution of waters of the State of Washington. BMP types are specified in the DOE 2012 Western Washington Stormwater Manual by number. The BMPs listed include details for treatment systems, operating procedures, and other means to control stormwater that minimizes erosion and other potential pollution sources including spillage, leaks, waste disposal, and/or runoff from raw material storage. Contractors are required to reference these BMP's in all on-site stormwater pollution prevention plans.
- B. Bulk Fuels: Fuels in quantities greater than 250 gallons. Includes, but is not limited to motor oil, gasoline, kerosene, diesel fuel, hydraulic oil, and other products derived from the refining of crude oil contained in drums or tanks, above ground or buried.
- C. CESCL: Certified Erosion and Sediment Control Lead. A person who has current certification through an approved erosion and sediment control training program that meets the minimum training standards established by Ecology. See BMP C160 in the SMMWW.
- D. CPESC: Certified Professional in Erosion and Sediment Control. A qualification indicating that the holder has educational training and experience in controlling erosion and sedimentation, and has met certification standards. See CPESC website at <http://www.cpesc.org>.
- E. CSEMS: Construction Site Environmental Management Supervisor. The individual responsible for implementation of the SWPPP and TESC Plans, monitoring installation and maintenance of BMPs, sampling and recording discharges, and maintaining records. See Section 01 57 19, Temporary Environmental Control, for requirements.
- F. CSWGP: Construction Stormwater General Permit.
- G. Dry season: May 1 through September 30.

- H. NOI: The Notice of Intent to Discharge is the application for coverage under Ecology's Construction Stormwater General Permit.
- I. NPDES: National Pollution Discharge Elimination System: The national program for issuing, modifying, revoking, reissuing, terminating, monitoring, and enforcing pretreatment requirements under Sections 307, 318, 402, and 405 of the Clean Water Act for discharge of pollutants to surface waters.
- J. Surface Waters of the State: Lakes, rivers, ponds, streams, inland waters, salt waters, and all other surface waters and water courses within the jurisdiction of the State of Washington.
- K. SMMWW: Stormwater Management Manual for Western Washington. The technical manual published by Ecology, for use by local governments, that contains description of and design criteria for BMPs to prevent, control, or treat pollutants in stormwater.
- L. SWPPP: Stormwater Pollution Prevention Plan. A documented plan to implement measures to identify, prevent, and control the contamination of point sources discharges of stormwater.
- M. TESC: Temporary Erosion and Sedimentation Control. Planning, managing, controlling, mitigating, recording and reporting discharge of stormwater from construction sites.
- N. Turbidity: The clarity of water expressed as nephelometric turbidity units (NTU) and measured with a calibrated turbidimeter.
- O. Wet season: October 1 through April 30.

1.03 REQUIRED PERSONNEL, RESPONSIBILITIES, AND CERTIFICATIONS

- A. Preparation of TESC Plans
 - 1. CPESC
- B. Preparation of SWPPP
 - 1. Washington State Professional Engineer (Civil)
 - 2. CPESC
- C. Construction Site Environmental Management Supervisor (CSEMS)
 - 1. Contractor shall designate a CSEMS as defined in Section 01 57 19, Temporary Environmental Controls. The CSEMS shall have the authority to act on behalf of the Contractor and shall have the following responsibilities and authority related to TESC:
 - a. Knowledge and understanding of the SWPPP and TESC Plans and their intent
 - b. Review, approve, and stamp revised drawings and updates
 - c. Identifying and correcting potential stormwater discharge risks and corrective action, including the authority to direct field personnel and stop work
 - d. Be stationed locally and available on-call 24 hours per day through the duration of the Contract

- e. Performing or overseeing sampling, monitoring and reporting of stormwater discharge including contacting Ecology within 24 hours after a high turbidity discharge
- f. Be available to accompany the Resident Engineer and Ecology during weekly inspections of all BMPs at a time designated by the Resident Engineer
- g. Maintaining the TESC binder for the Contract
- 2. The CSEMS shall have the following credentials for TESC:
 - a. CPESC

D. BMP/Site Inspection Lead

- 1. Contractor shall designate one or more individuals responsible for supervising installation, inspection, and maintenance of BMPs. These individuals shall report to the CSEMS. Alternatively, this role can be filled by the CSEMS. The following credentials are required for each individual:
 - a. CESCL or CPESC

E. Operating Chitosan Enhanced Sand Filtration systems (CESF)

- 1. Training required by Ecology-approved trainer.

1.04 SUBMITTALS

A. Certifications of Qualified Personnel

- 1. Contractor shall provide a list of qualified personnel and license or certification number to the Resident Engineer per Contractor's approved Submittal Log so as to allow review and approval of qualifications prior to the submission of TESC Plans and installation of TESC measures. At a minimum, the following personnel shall be included:
 - a. Professional Engineer responsible for preparation of TESC Plans
 - b. CSEMS
 - c. CESCL
 - d. CESF Operator
- 2. Substitutions of qualified personnel shall be provided in writing for review and approval by Resident Engineer.

B. Manufacturer Data and Test Results for all products

C. SWPPP

- 1. See Article 1.11 herein for the 13 elements contained in a SWPPP.
- 2. SWPPP: List Professional Engineer or CPESC responsible for preparation.
- 3. Provide adequate copies as required by permitting agencies and two (2) copies to the Resident Engineer.
- 4. Update and submit quarterly.

D. TESC Plans

1. See Article 1.10 herein for content and format of TESC plans
2. Provide adequate copies as required by permitting agencies and two (2) copies to the Resident Engineer.
3. Update and submit quarterly.

E. Discharge Monitoring Reports

1. Contractor shall provide monthly reports to Ecology whether or not discharge of stormwater has occurred.
2. Submit report electronically to Ecology's WebDMR database: <https://secureaccess.wa.gov/ecy/wqwebportal/>.

F. TESC BMP Inspection Log

1. Prepare daily BMP inspection logs.
2. Use Ecology template or approved format.
3. Maintain daily and keep copy on Site.
4. Transmit copies weekly for the previous week's inspections.

G. Project Binder for TESC

1. CSEMS shall be solely responsible to develop and maintain a tabbed Project Binder for TESC containing the following:
 - a. Construction Stormwater General Permit
 - 1) NOI
 - 2) Letter of Coverage
 - 3) Related documents and correspondence
 - b. All supporting permits or approvals
 - c. 3-week look ahead construction schedule with TESC elements for current work week and all previous weeks.
 - d. Environmental coordination meeting minutes, per Article 1.07D, herein
 - e. Copies of certification documents for required personnel
 - f. SWPPP current with all modifications
 - g. TESC plans, original and for each modification
 - h. BMP inspection logs
 - i. Discharge Monitoring Reports
 - j. Termination Form

2. Binder shall be updated, complete and available for review by Resident Engineer, Ecology Inspectors, and City or County staff at all times during the project. Provide the binder to Resident Engineer upon Acceptance.
3. Copies of current SWPPP and TESC plans with field markups shall be submitted monthly at the Resident Engineer's request.

1.05 QUALITY ASSURANCE

- A. Be fully responsible for TESC performance and compliance with Ecology NPDES, Pierce County, and City of Puyallup requirements. Be solely responsible for all damages, fines, levies, or judgments incurred as a result of Contractor, Subcontractor, Consultant, or Supplier failure to comply with the requirements of this Section or any and all State and local permits required for TESC. Any damages, fines, levies or judgments will be deducted from payments due. Schedule impacts resulting from Contractor, Subcontractor, Consultant, or Supplier failure to comply with this Section or any and all State and local TESC/NPDES permits shall be corrected by the Contractor at the Contractor's expense. This includes the time necessary to achieve approval of TESC Plans, SWPPPs, and other permit application requirements, as well as stop work orders.
- B. Meet the conditions of the Construction Stormwater General Permit for the Contract, including implementing and maintaining the SWPPP, TESC Plans and any local TESC requirements, until Acceptance of the Contract work.
 1. TESC Plans and SWPPPs are living documents. Be responsible for maintaining current versions of the documents showing locations of TESC features, BMPs, and areas of potential TESC risks.
- C. Maintain a project binder containing all permit information, meeting minutes, TESC design plans and updated plans, the SWPPP, monitoring records and modifications to TESC. The binder will be maintained under the direction of CSEMS and available for review by permitting agencies, Sound Transit representatives and Contractor's field personnel.
- D. The CSEMS shall conduct environmental coordination meetings on a minimum weekly basis until Acceptance of the work.
 1. Attendance is mandatory for individual or individuals responsible for implementation of TESC on behalf of the Contractor.
 2. These meetings will be at a consistent location, day and time and open to representatives of Sound Transit and permitting agencies.
 3. The meetings shall detail the work to be performed during that week, the TESC features to be implemented, any required discharge monitoring, and specific work with potential TESC risks.
 4. Issues and lessons learned from the previous week shall be discussed.
 5. The CSEMS shall keep accurate minutes to be included in the project binder.
- E. Monitor and report stormwater discharges in accordance with Section 01 57 24, Temporary Site Water Discharge.
- F. Meet the discharge requirements of Section 01 57 24, Temporary Site Water Discharge. Provide treatment methods, such as sedimentation systems, sand filtration, or other means, as necessary, to meet the discharge requirements.

1.06 SEQUENCING AND SCHEDULING

- A. Obtain CSWGP coverage as Sole Permittee per Article 1.03A, herein.
- B. Within 30 days of the effective date of the Notice to Proceed, hold a meeting with the CSEMS and the Resident Engineer to review and discuss in detail all requirements of this Section, how to meet them, and prepare a draft schedule for Submittals.
- C. Obtain applicable permits, approval of stormwater discharge treatment methods, BMPs, and necessary equipment in place prior to land disturbing activities.
- D. Contractor shall maintain an accurate 3-week look-ahead construction schedule through Acceptance of the work. The schedule shall include TESC design, permitting, implementation, operation, maintenance, monitoring, and reporting requirements.
- E. Contractor shall sequence the work to reduce TESC risk.
 - 1. Install TESC BMPs prior to commencing work within Contract limits or work area.
 - 2. Limit exposed or unstabilized areas to locations being worked.
 - 3. Provide permanent stabilization following completion of work in a given area.
- F. Seasonal Requirements
 - 1. Wet Season: October 1st through April 30th
 - a. No soils shall remain exposed and unworked for more than two (2) days.
 - 2. Dry Season: May 1st through September 30th
 - a. No soils shall remain exposed and unworked for more than seven (7) days.
 - 3. Holidays and Weekends
 - a. Soils shall be stabilized per CSEMS direction.
- G. Terminating CSWGP
 - 1. Be responsible for terminating the permit with Ecology once the following items have been completed by the Contractor:
 - a. Final stabilization of all soils with permanent vegetative cover final surfacing
 - b. Elimination of construction-related stormwater discharges
 - c. Removal of all temporary BMPs
 - 1) Note: Contractor shall verify to Sound Transit that all temporary BMPs have been removed, including but not limited to, catch basin inserts, silt fence, check dams, etc. Leaving these items in place may cause impacts to the functionality of permanent stormwater systems.

1.07 START-UP

- A. Pre-Construction Meeting including a Site inspection by the City of Puyallup is required before ground disturbance begins.
 - 1. See Section 01 31 19 Project Meetings

1.08 TESC PLANS

- A. TESC Plans are required for the successful preparation and implementation of the SWPPP. The stamped drainage report is available as a design resource. Generally, the TESC Plans shall:
1. Visually present and describe in narrative form all construction activities with the potential for producing construction stormwater discharge.
 2. Provide sufficient detail and clarity to allow field personnel to adequately implement TESC.
 3. Be updated throughout the project as construction activities, conditions and BMPs are adjusted.
 4. TESC Plan updates occurring during the construction process may be handwritten by the CSEMS or others under CSEMS supervision.
 - a. Updates must be clear and legible and in blue, black, or red ink.
- B. At a minimum, the TESC plans should include the following specific information:
1. Depict construction details of all chemical handling and storage areas, vehicle/equipment storage areas, wheel washes, stabilized construction entrances, perimeter control BMP's, silt fences, collection sumps-pumps, ditches, berms, culvert pipes, filters, and basin outfalls.
 2. Locations, types and quantities of all seeding, slope coverings, and ditch liners.
 3. Proposed reroutes of existing surface water and underground drainage within site to erosion control facilities prior to release to the offsite storm drain or sanitary sewer system. Refer to Section 01 57 24, Temporary Site Water Discharge.
 4. Location of all facilities that are designed to treat sediment-laden runoff prior to the runoff being discharged to the existing drainage system: In lieu of providing onsite treatment of the runoff, the runoff may be collected and hauled off site for treatment using an approved method.
 5. Location of outlets of subsurface drainage systems.
 6. Approximate slopes, contours, and direction of stormwater flow before and after major grading activities.
 7. Locations where stormwater or non-stormwater discharges off-site and/or to a surface water body, including wetlands.
 8. Location of water quality sampling station(s), if sampling is required by state or local permitting authority.
 9. Contract or Project limits (ST).
 10. Clearing and Grading Limits (ST).
 11. Work Area/Limits of Work.
 12. Initial BMP's, chosen for specific risks, to be installed at the start of construction.
 13. Top and Toe line for slopes and walls.

14. Excavation Cut and Fill.
15. Permanent Drainage, Existing and Proposed (ST).
16. Sensitive Areas (ST)
17. High-Visibility Fence
18. Silt Fence
19. Stockpile/Laydown Areas
20. Construction Personnel Parking Areas
21. Construction Access
22. Low Impact Development Facilities including Bioretention Areas and Infiltration Areas (ST)

1.09 SWPPP

- A. Ecology provides a template for preparation of the SWPPP. A link is provided in this Section under Article 1.04.A.3.c.
- B. The CSWPPP shall be in accordance with all requirements of the SMMWW, Volume II, Chapter 3.
- C. The SWPPP shall contain a narrative, supporting information, calculations, and drawings.
- D. SWPPP Drawings:
 1. Typically 11 inches x 17 inches.
 2. TESC Plans may be used as SWPPP drawings.
 3. Show by a series of time sequence shop drawings, how construction stormwater and erosion control BMPs will be installed, maintained, and removed.
 4. Prepare a separate Temporary Erosion and Sediment Control Plan for each location and its major construction activities, and as required by the Resident Engineer. Not all major activities will occur at the same time at each location and the plans for more than one major activity can be combined on a single Plan if the BMPs shown are appropriate to all major activities shown.
- E. SWPPP Narrative shall describe:
 1. Information on site topography.
 2. Potential erosion problem areas.
 3. Types and locations of BMPs used to address SWPPP requirements, selected and used in accordance with SMMWW.
 4. Construction phasing and sequence.
 5. Action plan(s) in the event that BMPs do not meet performance criteria.
 6. Engineering calculations for designed structures such as storage tanks and ponds.

7. Site log book
 8. Include a description of the inspection and monitoring plan for TESC BMPs over the life of the Contract. Inspect all BMPs daily, and ensure that the log of TESC Daily inspection reports is submitted to the Resident Engineer weekly, for the previous week.
 9. Provide a narrative describing the training program for educating all personnel including Subcontractors on environmental protection. At a minimum, train staff through regularly scheduled meetings to discuss environmental protection subjects as related to this Contract. This training may be added to existing weekly meetings (such as safety meetings). Emphasize issues such as sensitive receptors, spill prevention, chemical handling, and storage, emergency response, stormwater control facilities inspections, proper dewatering techniques, and concrete handling.
 10. Include the name, telephone number, fax number, cell phone number(s), email address, and business address of the designated CSEMS and all Contractor personnel responsible for erosion and sediment control. Be responsible for updating this information as required.
- F. Required Elements of a SWPPP can be found in the CSWGP, SMMWW, and Ecology SWPPP template.
- G. The CSWPPP shall show how compliance with the specific requirements of the CSWGP will be achieved.
- H. Coordinate CSWPPP development and implementation with the requirements of Section 01 57 19, Temporary Environmental Controls, and Section 01 57 24, Temporary Site Water Discharge.
- 1.10 INSPECTION, SAMPLING REQUIREMENTS AND DISCHARGE LIMITS
- A. Site Inspections
1. CSEMS or designated CESCL shall conduct daily inspections of all areas disturbed by construction activities, all BMPs and stormwater discharge locations.
 2. See Special Conditions of the CSWGP for additional inspection requirements.
 3. Inspections shall be recorded on the inspection checklist and included in the project binder.
- B. Turbidity. See Section 01 57 24, Temporary Site Water Discharge
1. Discharges from areas of soil disturbance greater than one (1) acre must be sampled for turbidity prior to leaving the construction site and entering conveyance systems.
 2. See Special Condition S4 of the CSWGP for sampling requirements, discharge limits and notification requirements.

- C. pH. See Section 01 57 24, Temporary Site Water Discharge
 - 1. pH sampling of stormwater discharge is required for construction activities that disturb one (1) acre or more and involve significant concrete work.
 - a. Significant concrete work is defined as 1,000 cubic yards of poured or recycled concrete over the life of the project.
 - 2. See Special Condition S4 of the CSWGP for additional information.

D. Flow Rates

- 1. Construction sites that must implement flow control for the developed site condition must also control release rates during construction
 - a. The construction site discharge shall not exceed the discharge durations of the pre-developed condition as defined in the SMMWW Section 2.5.7.
 - b. The pre-developed condition shall be the land cover immediately prior to start of construction
- 2. Flow control shall be provided when construction activities within a given work area disturb one (1) acre or more through the life of the project.

1.11 BMPS TO ADDRESS THE ELEMENTS OF A SWPPP

- A. BMPs for each SWPPP element can be found in the SMMWW.
- B. Sound Transit requires modification or addition to SMMWW BMPs as follows:
 - 1. Wheelwash (Required): Resident Engineer may require additional wheel wash requirements if it is determined that the wheel wash is not functioning or being maintained properly.

1.12 USE OF EXPERIMENTAL BMP'S

- A. Obtain approval for all experimental BMP's from Resident Engineer for water treatment of water discharged to surface water prior to implementation.
 - 1. With approval requests, include a description of:
 - a. The experimental BMP.
 - b. Why the experimental BMP is being requested.
 - c. Why the BMPs in the SMMWW are not adequate.
 - 2. Applicable construction techniques
 - 3. The characteristics of the site or sites where the experimental BMP is proposed
 - 4. If chemical treatment is proposed, include bench test data which cites the optimum polymer dosage rate to achieve colloidal capture at a range of anticipated turbidities and the aquatic toxicity of treated stormwater on Daphnia and on Salmonid fishes. Determine effectiveness by bench testing using soils and water from the Site. Determine effluent toxicity using Standard Methods for the Examination of Water and Wastewater, Methods 8-10B and 8-04B, except temperature is ambient.
 - 5. Engineering description of the chemical feed systems

6. Design criteria for the experimental BMP and the expected results
7. Maintenance procedures
8. Cost estimates
9. Monitoring procedures and duration
10. An Ecology approved BMP that could be used if the experimental BMP fails

PART 2 - PRODUCTS

2.01 SUMMARY

- A. The materials, BMPs, and methods listed below are some of the materials, BMPs, and methods that the Contractor may choose to use in meeting the requirements of this Section. A complete list of approved BMPs can be found in Volume II of the SMMWW. Unless otherwise noted, the materials, BMPs, and methods listed are not required and the list of materials, BMPs, and methods is not intended to be all-inclusive. The Contractor may choose other materials, BMPs, and methods, provided they meet the CSWGP and applicable local permits or requirements.

2.02 GENERAL

- A. Materials used for Erosion and Sediment Control BMPs shall be in accordance with the materials specified in the SMMWW Volume II, Chapter 4, supplemented with the following.
 1. Wheelwash (Required): In accordance with Section 01 57 19, Temporary Environmental Controls. Resident Engineer may require additional wheel wash requirements if it is determined that the wheel wash is not functioning or being maintained properly.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Clearly flag the boundaries of the clearing/construction limits as indicated on the Plan or as designated by the Resident Engineer by a continuous length of fencing or screening wall prior to construction.
 1. During the construction period of each site, no disturbance beyond the clear/construction limits is permitted without prior authorization from the Resident Engineer.
 2. Maintain the clearing/construction limits for the duration of construction.
- B. Temporary spoil piles:
 1. Cover the piles after two (2) days of inactivity during the wet period and seven (7) days of inactivity during the dry period.
 2. Place all excavated material not hauled directly from the construction site in a temporary spoil pile surrounded by ecology blocks or equivalent.

3. Control water seepage and runoff and direct to water treatment system. Treatment of seepage and runoff from piles is required prior to discharge from site.
- C. Stockpile on-site sufficient BMP materials and supplies to protect the site.
- D. Protect catch basin inlets to the permanent storm drainage system from sediment influx by use of filter fabric, catch basin insert, or similar filtering materials and methods per SMMWW.
- E. Clean and remove silt from any permanent storm drainage system elements that were used to convey or hold construction stormwater before introducing clean stormwater to those elements.
- F. Clearly mark locations of water quality sampling stations.

3.02 INSTALLATION

- A. Installation practices for Erosion and Sediment Control BMPs shall be in accordance with the SMMWW, Volume II and manufacturer's instructions.
- B. Grass seeding:
 1. Revisit all disturbed areas prior to the beginning of the wet season to identify which ones can be seeded in preparation for the wet season.
 2. Install surface runoff control measures such as gradient terraces, interceptor dikes or swales, level spreaders and sediment traps/basins prior to seeding.
 3. Cultivate all areas to be seeded to meet the Ecology requirements.
 - a. Cultivation may be accomplished by disking, raking, harrowing, or other acceptable means. Perform all cultivating at right angles to the slope.
 4. Hydroseed all disturbed areas following completion of construction or as otherwise indicated herein.
 5. Hydroseed shall be applied with Bonded Fiber Matrix on slopes exceeding 3:1.
 6. Seeding may be accomplished by approved hand methods when impracticable to do by hydroseeding.
 7. Seed disturbed areas within one (1) week of the beginning of the wet season.
 - a. Optimum Seed Windows: April 1 to June 30 and September 1 to September 30
 8. Fertilize all areas which are seeded.
 9. Mulch in accordance with BMP C121.
 10. Inlet Protection:
 - a. Install in accordance with SMMWW BMP C220.

3.03 STORMWATER POLLUTION CONTROLS

- A. Control use of all chemicals, lubricating oils, hydraulic fluids, greases and other such products, and prevent migration from the Work Site. Promptly clean up and properly dispose of materials contaminated by spillage or leakage of products. Comply with

storage and containment requirements of these materials in accordance with Washington Stormwater Permit Regulations.

- B. Cover, containment, and protection from vandalism shall be provided for all chemicals, liquid products, petroleum products, and other materials that have the potential to pose a threat to human health or the environment. On-site fueling tanks shall include secondary containment.
- C. Conduct fueling only in designated controlled locations with appropriate BMPs installed to contain and absorb potential spills.
- D. Temporary Erosion and Sediment Control:
 - 1. Do not allow waste or eroded materials to enter natural or man-made waters or sewage removal systems.
- E. Maintaining Flow of Sewers and Drains:
 - 1. Provide for and maintain, at Contractor's expense, the flow of all sewers, drains, building or inlet connections, and all watercourses that may be encountered during progress of the Work.
 - 2. Do not allow the contents of sewer, drain, or inlet connection to flow into trenches.
 - 3. Maintenance of sewers and drains may require, at the Contractor's expense, the use of temporary pump stations with backup generators.
- F. Mud Control
 - 1. Take proper measures to prevent tracking of soil, aggregate, mud or other debris onto public and private streets, drives, parking lots, and sidewalks. Measures include, but are not limited to, covering on-Site haul roads and muddy areas on the Site with clean, dry sand, gravel, and trap rock and maintaining clean haul routes on paved surfaces.
 - 2. Immediately remove mud or other debris tracked onto streets, sidewalks, or driveways, and clean the affected area. Sweep all areas on adjacent streets within one block of the construction Site using the following schedule:
 - a. A minimum of once per day during construction work
 - b. The Resident Engineer may require additional cleaning if in his/her opinion excessive mud or other debris is present.
 - 3. Street Sweeping
 - a. Provide street sweeping on streets, sidewalks, driveways, and parking areas surrounding construction sites. Promptly clean up spills of transported material on public and private roads and parking lots by sweeping. Coordinate with traffic control requirements, Section 01 5526, Traffic Control.
 - b. Mechanical Street Sweeper shall have a combination of mechanical brushes, water spray, and vacuum system capable of trapping and preventing fugitive dust emissions and removal of sediment present on the roadway as a result of Contractor activities.
 - c. Ensure mechanical street sweeper is licensed for use on public streets.

4. Wheel/Truck Wash

- a. Where construction vehicles leave a site and enter paved public streets, maintain a stabilized construction entrance, BMP C105, and a suitable truck wheel-washing facility. Clean all trucks, or other vehicles leaving the Site, of mud and dirt, including the exterior body surfaces of vehicles.
- b. Construct the approach to the wheel wash of clean quarry spalls or pavement. Keep the approach free of any accumulated sediments by sweeping, washing, or refreshing of quarry spalls.
- c. The exit shall be graded to allow overspray and any water falling off washed vehicles to return to a collection sump, typically near the spray deck, where it can be returned to the reservoir by low volume sump pump.
- d. Inspect the wheel wash system at the start of each workday for any damage and maintenance: Inspect and top off the level of wash water in reservoir as required.
- e. Include water spray nozzles aimed at tires and undercarriage. Inspect the spray to see that you have properly aimed all jets and free of any blockage.
- f. Ensure water pressure and volume rates are sufficient to clean.
- g. Periodically inspect the wheel wash during operations to see that the system is continuing to function properly, vehicles are attaining a satisfactory level of cleaning, and water level is at a satisfactory level.
- h. Ensure water pressure and volume rates are sufficient to clean.
- i. Include other methods, such as laborers with hoses, when needed to meet requirements to prevent mud and debris being transported off Site.
- j. Use a closed-loop recirculating design that is separate from a wastewater treatment facility.
- k. Do not discharge wash water to storm drain system.
- l. Include BMPs for the wheel wash discharge water to meet applicable city, state, and federal permits and requirements for containment, treatment and disposal.

5. Equipment Wash

- a. Do not discharge thinners or solvents into the sanitary or storm sewer systems when cleaning large machine parts where discharge of water is required. Use alternative methods for cleaning larger equipment parts such as high pressure, high temperature water washes, or steam cleaning.
- b. Equipment washing detergents can be used and wash water discharged into the sanitary sewer system if grit is removed from the solution first. Do not exceed the discharge limits set by the sewer authority with the water discharged into the sewer.

- c. Small parts can be cleaned with degreasing solvents, which are reused or recycled. Do not discharge solvents into storm sewer in accordance with the SMMWW, nor into sanitary or combined sewer system.
 - d. Do not discharge process water from equipment washing to the storm drainage system.
 - G. Sawcutting: Collect, treat, and disposal of water used for and slurry and cuttings produced by the sawcutting operation:
 - 1. Vacuum slurry and cuttings during cutting and surfacing operations continually.
 - 2. Do not leave slurry and cuttings on permanent concrete or asphalt pavement overnight.
 - 3. Do not allow slurry and cuttings to drain to all natural or constructed conveyance system.
 - 4. Dispose of collected slurry and cuttings in a manner that does not violate groundwater or surface water quality standards.
 - 5. For disposal and treatment methods, Refer to Section 01 57 24, Temporary Site Water Discharge.
 - H. Continually monitor operations to determine whether slurry, cuttings, or process water could enter waters of the State. If inspections show that a violation of water quality standards could occur, stop operations and immediately implement preventive measures such as berms, barriers, secondary containment, and vacuum trucks.
- 3.04 MAINTENANCE
- A. If erosion is occurring, the CSEMS/CESCL shall determine the appropriate BMP and immediately make modifications to the erosion control system to mitigate the erosion and its effects.
 - B. General maintenance activities:
 - 1. Repair or replace damaged or missing items immediately.
 - 2. Maintain seeded surfaces throughout construction.
 - a. Avoid tracking on newly seeded area.
 - b. Provide irrigation until grass is established.
 - C. Maintain erosion and sediment control plans after excavation and grading. Maintain erosion and sediment control until areas are permanently stabilized.
 - D. Provide necessary ditches, swales, and dikes to direct all potentially sediment-laden water towards and into sediment traps/basins or other approved treatment BMPs or devices.
 - E. Dust Control:
 - 1. Use water sprinkling, temporary enclosures, and other methods to minimize dust and dirt migration in accordance with Section 01 57 19, Temporary Environmental Controls. Prevent runoff from all water used for dust control from entering into the storm sewer system. See Section 01 57 24, Temporary Site

Water Discharge, for containment options and treatment measures. Do the water sprinkling so that water does not accumulate or run across grade.

2. The application of any chemical dust suppressants must be approved by the Resident Engineer prior to use.
 3. See Section 01 57 19, Temporary Environmental Controls for requirements.
- F. Immediately stabilize with the approved BMP methods (such as seeding, mulching, and plastic covering) all areas of exposed soils that will not be disturbed for two (2) days during the wet season or seven (7) days during the dry season.
- G. Address all areas needing BMP measures that do not require immediate attention within seven (7) days of Contractor's attention or notification from the Resident Engineer or CSEMS.
- H. At a minimum, inspect all TESC BMPs daily and after any significant rain event (0.5 inch or greater). Repair as necessary to meet requirements of the SMMWW and/or NPDES permit.
- I. Maintain and repair all TESC practices as needed to ensure continued performance of their intended function.
- J. Inspect and maintain the TESC facilities on inactive sites daily or 24 hours following a storm event.
- K. Operate and maintain BMPs in accordance with SMMWW Volume II and following:
1. Prevent sediments from being flushed to the downstream system during cleaning.
 2. Remove sediment, trash, and debris from catch basin grate surfaces when blocking more than 20 percent of the grate surface.
 3. Clean or replace inlet and catch basin filter socks when sediment fills one third of the available storage or the fill limits recommended by the manufacturer have been met. Immediately clear or replace clogged fabric. Perform inspection for systems using catch basin inserts. Clear or replace clogged fabric.
 4. Immediately remove all sediment accidentally introduced into a catch basin.
 5. Clean interceptor ditches of sediment and vegetation when accumulation exceeds 3 inches in depth or when free movement of water through ditch is restricted.
- L. Handle and dispose of cleaning waste material and demolition debris in a manner that does not cause contamination of water. If the area is swept with a pick-up sweeper, the material shall be hauled out of the area to an appropriate disposal site.

3.05 COMPLETION OF CONSTRUCTION

- A. Remove all TESC measures within 30 days after final site stabilization is achieved or after the temporary BMPs are no longer needed. Remove and dispose of in an approved site or stabilize trapped sediment on site. Permanently stabilize disturbed soil areas resulting from removal.

3.06 SYSTEM COMPLIANCE

- A. The Resident Engineer, CSEMS and regulatory agencies will determine the effectiveness of the erosion control system. Immediately correct damaged and/or inadequate or ineffective TESC BMPs.
- B. If the erosion control system is determined to be ineffective by the Resident Engineer or regulatory agencies, upgrade and modify erosion control system until effective, as determined by the Resident Engineer and regulatory agencies.
- C. Refusal to modify and upgrade the erosion control system as required within five (5) days of notice from the Resident Engineer, may result in the work being completed by a third party and the cost of the work being withheld from the Application for Payment.
- D. Continued non-compliance with the erosion control requirements and water quality requirements may result in the stoppage of work and monetary fines.
- E. In the event that Ecology issues a Notice of Violation, Notice of Non-Compliance, Corrections Required, or other Enforcement Action, the Resident Engineer may stop all construction activities until it has been determined to the satisfaction of the Resident Engineer that the project is in compliance. The Resident Engineer may require the Contractor to send additional staff to successfully complete the Stormwater Construction BMPs field training as provided by the Associated General Contractors (AGC) before construction activities can resume. The Contractor shall not be entitled to additional Contract time arising from any measures required or taken under this clause. Pay all costs associated with work stoppages, mitigation of the triggering event(s), and/or training.

END OF SECTION

SECTION 01 57 15

TEMPORARY CONSTRUCTION NOISE AND VIBRATION CONTROL

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section specifies requirements for complying with applicable noise regulations, and noise and vibration limits.

1.02 REFERENCES

- A. This Section incorporates by reference the latest revisions of the following documents.

1. American National Standards Institute (ANSI) / Acoustical Society of America (ASA)
 - a. ANSI/ASA S1.4 American National Standard Specification for Sound Level Meters
 - b. ANSI/ASA S2.4 American National Standard Method for Specifying the Characteristics of Auxiliary Analog Equipment for Shock and Vibration Measurements

1.03 DEFINITIONS

- A. Construction Site: For purpose of noise and vibration control requirements, the Construction Work Area limits. This includes Right-of-Way, property, and construction easements, used expressly for construction.
- B. Noise Level Measurements: A-weighted and "slow" response readings from instruments complying with TYPE 1 or TYPE 2 requirements of the ANSI/ASA S1.4.
- C. A-Weighted Noise Levels: Decibels (referenced to 20 micro-Pascal) as measured with A-weighting network of standard sound level meter, abbreviated dBA.
- D. Vibration Measurements: The use of a vibration transducer, amplifier, peak detector, and frequency band filters complying with ANSI/ASA S2.4.
- E. Vibration: Velocity in microinches per second. Vibration levels are expressed as velocity levels in Decibels referenced to one microinch per second, abbreviated VdB.
- F. Noise Sensitive Locations: Residential areas, institutions, hospitals, parks, and other locations so named herein.
- G. Maximum Sound Level L_{max} : The maximum recorded root mean square (RMS) A-weighted sound level for a given time interval or event.
- H. Equivalent Sound Level L_{eq} : The A-weighted level of a constant sound having the same energy content as the actual time-varying level during a specified interval. The L_{eq} is used to characterize complex, fluctuating sound levels with a single number. Typical intervals for L_{eq} are hourly, daily and annually.

- I. Vibration Monitoring: Monitoring used to determine if the equipment and methods used to complete the work cause vibrations that equal or exceed threshold values. The data gathered provide onsite feedback of the effects of specific operations and procedures.

1.04 SUBMITTALS

- A. Noise and Vibration Control Plan:
 - 1. Within 45 days of Notice to Proceed (NTP), prior to commencing work on the site, or as specified herein.
 - 2. Update and re-submit upon all major change in work schedule, construction methods, or equipment operations not included in the most recent Plan.
 - 3. Monitoring Plan:
 - a. Prepare and submit a scaled plan indicating noise and vibration measurement monitoring locations on a scaled plan.
 - b. Certificates of calibration for monitoring instruments, including updated certificates after repairs to instruments.
- B. Noise and Vibration Measurement Reports: Submit weekly. Include measurements taken during the previous week.
- C. Shop and Working Drawings, computations, material data and other criteria, for all noise abatement measures identified in the Noise and Vibration Control Plan.
- D. Qualifications of the Acoustic Specialist:
 - 1. Membership in at least one of the following recognized acoustical organizations:
 - a. Institute of Noise Control Engineering (INCE): INCE Member. INCE Associate Membership is insufficient.
 - b. Acoustical Society of America (ASA): Member. Student and Associate Memberships are insufficient.
 - c. National Council of Acoustical Consultants (NCAC): Employee of a NCAC Member Firm.
 - 2. Minimum 10 years of experience performing similar work.

1.05 RESPONSIBILITIES OF CONTRACTOR

- A. Perform Work within the permissible noise and vibration levels, work schedule limitations, and procedures provided for in this Section; the approved Noise Variance listed in Contract Documents; and applicable federal, state, county and local codes, regulations, and standards.
- B. Use equipment with effective noise-suppression devices and employ other noise control measures such as barriers and curtains necessary to protect the public.
- C. Schedule and conduct operations in a manner minimizes, to the greatest extent feasible, the disturbance to the public in areas adjacent to the construction activities and to occupants of buildings in the vicinity of the construction activities.
- D. Compliance with the requirements of this Section may require the use of equipment with special exhaust silencers or enclosures, and construction of temporary enclosures or

noise barriers around activities. Use haul routes and staging areas as shown on the Contract Drawings or if not shown as approved by the Resident Engineer, to minimize noise at residential and other sensitive receptor sites. Noise produced by elevated equipment, including crane pulleys and hoses, must be minimized.

1.06 NOISE AND VIBRATION CONTROL PLAN

- A. Prepared and certified by the Acoustic Specialist.
- B. Include the following requirements for construction activities that may occur at the construction site:
 - 1. Site Drawing - Prepare a scaled drawing of the construction site indicating the following:
 - a. Contract name and number
 - b. Contractor's name
 - c. Date and hours of work operation
 - d. Scale
 - e. Direction of North
 - f. Identify noise and vibration sensitive locations near the construction site
 - g. Construction equipment locations used, designated by the code letter used in Column (a) in Part A of the Noise Control Plan Form, Exhibit A.
 - h. Locations of the noise levels calculated for the nearest residential, commercial, and industrial areas as specified herein.
 - i. Locations and types of noise abatement measures that may be required to meet codes and regulations as indicated by the calculations.
 - 2. Equipment Inventory - Prepare an inventory of equipment used by providing the following information in the indicated columns of Noise Control Plan Form, Exhibit A.
 - a. Column (a) - Code letter in sketch to indicate position of equipment on site
 - b. Column (b) - Category or type of equipment
 - c. Column (c) - Equipment manufacturer and model, if known at the time of the Plan's preparation
 - d. Column (d) - Unique identifier (ID), such as registration number, if known at the time of the Plans preparation.
 - e. Column (e) - Equipment horsepower
 - f. Column (f) - Estimated noise level at 50 feet, obtained from either the manufacturer or from approved field noise measurements of same equipment
 - g. Column (g) - Estimated date of first use on site
 - h. Column (h) - Estimated date of last use on site

- i. Noise Calculations - Prepare calculations of L_{max} noise levels expected at the nearest residential and commercial property lines and identified noise-sensitive locations near the construction site, based on the equipment noise levels given in Part A of the Noise Control Plan Form. Determine the nearest property lines from the noise-sensitive locations. Make the calculations for locations where noise emitted by applicable equipment causes the greatest noise level for each type of land use, if necessary. Provide the results on Part B of the Noise Control Plan Form, Exhibit B, with calculations included below the results, and with the locations for the calculations indicated on the site sketch.
 - 3. Summary of Required Abatement Measures, as necessary.
 - a. Noise Abatement Measures - If the results of the noise calculations indicate that noise level limits are exceeded, identify proposed noise abatement measures, their anticipated effects (dBA reductions), and a schedule for their implementation. Re-calculate the noise levels at the nearest sensitive receptor location property lines that include the anticipated noise reduction effects and submit the results on Part B of the Noise Control Plan Form. Include, as backup documentation to Part B of the Noise Control Plan, drawings, sketches, and suitable calculations that demonstrate anticipated noise reduction benefits and that proposed structures or facilities comply with applicable building code requirements.
 - b. Noise Reduction Methods - To the extent required to meet the noise limits specified, indicate noise reduction measures to minimize construction noise emission levels.
 - c. Vibration Control – Provide measures that can be used to reduce vibrations in the event that level limits are exceeded. The measures include changes in construction techniques.
- C. Monitoring Plan
 - 1. Requirements
 - a. In the event that the measured noise levels exceed the allowable limits as specified by the local jurisdiction, immediately notify the Resident Engineer and immediately implement additional specified Noise Abatement Measures. Where necessary terminate the construction activity responsible for the noise limits exceedance until the specified Abatement Measures can be implemented and compliance with the approved noise variance is achieved.
 - b. In the event that the measured vibration levels exceed the allowable limits as specified by the local jurisdiction, immediately notify the Resident Engineer and immediately implement changes in construction techniques as specified in the Noise and Vibration Control Plan.
 - 2. Monitoring Locations
 - a. The noise and vibration monitoring locations are shown on the Contract Documents. The measurement sites shown represent the closest points to noise and vibration sensitive land uses to the construction equipment being operated. These locations may change during the Contract and the Resident Engineer will provide updates as required.

- b. Noise measurement to be taken at construction site boundaries and at nearby residential and commercial property lines as defined above.

PART 2 - PRODUCTS

2.01 NOISE CONTROL MATERIALS

- A. Noise control materials may be new or used. Used materials must be sound and free of damage and defects and are of a quality and condition to perform their designed function for the duration of construction of this Contract.

2.02 NOISE MEASUREMENT EQUIPMENT

- A. Perform noise measurements using installed sound monitoring stations approved by the local jurisdiction which are equipped with the following measurement and documentation devices:

- 1. Sound level analyzer with the following capabilities:
 - a. Capable of measuring on both the A-Weighted and C-Weighted scales required by regulatory criteria and Noise Level Limits.
 - b. Complies with the criteria for a TYPE 1 (Precision) or TYPE 2 (General Purpose) Sound Level Meter as defined in the ANSI/ASA S1.4.
 - c. Continuous broadband logging on 1-second LAeq, LAmix and LAmix.
 - d. Continuous spectral logging of 1-second LAeq, LAmix and LAmix.
 - e. Sound recording and external equipment trigger capabilities in the event of a variance exceedance.
 - f. Sufficient internal memory for one (1) week of logged data and sound recordings.
- 2. Free-field microphone housed in an environmental shroud providing protection from rain and wind conditions. The environmental shroud is capable of outdoor measurements for at least one (1) year without service or replacement.

- B. Calibrate sound level analyzer, microphones, and calibrators for certified laboratory conformance at least once during the Contract. Submit a current certificate of conformance to the Resident Engineer before using the sound level meter and submit updated certificates following subsequent calibrations upon the completion of repairs to the instrument.

2.03 VIBRATION MONITORING EQUIPMENT

- A. Provide portable seismographs for monitoring the velocities of ground vibrations resulting from construction activities. The seismograph has the following minimum features:
 - 1. Seismic Velocity range: 0.005 to 10 inches per second with an accuracy of within 3 percent of the measured peak particle velocity or better at frequencies between 1 Hertz and 250 Hertz, and with a resolution of 0.005 inch per second or less.
 - 2. Frequency response (within 3 dBA points): 1 to 250 Hertz.
 - 3. Multi channel for vibration monitoring.

4. Two power sources: internal rechargeable battery and charger and 115 volts AC. Battery must be capable of supplying power to monitor vibration continuously for up to 30 days.
 5. Capable of internal dynamic calibration.
 6. Direct writing to printer and capability to transfer data from memory to a laptop computer or compact disc (CD). Instruments must be capable of producing strip chart recordings of readings on site within one (1) hour of obtaining the readings. Provide computer software to perform analysis, produce reports of continuous monitoring, and to perform zero-crossing frequency analyses of waveform data. Ensure that all reports and analyses are capable of output to a laptop computer or CD.
 7. Self-triggering wave form capture mode that provides the following information: plot of wave forms, peak particle velocities, frequencies of peaks.
 8. Continuous monitoring mode must be capable of recording single-component peak particle velocities, and frequency of peaks with an interval of 1 minute or less.
- B. Provide all recommended ancillary equipment as recommended by the manufacturer for a complete and functional system.

PART 3 - EXECUTION

3.01 NOISE LEVEL LIMITS

- A. Do not operate noise generating construction equipment at the construction site prior to final approval of the Noise and Vibration Control Plan or formal noise variance activation by the local jurisdiction..
- B. Do not exceed the maximum permissible sound levels as authorized by the local jurisdiction's noise code for nighttime construction hours.
- C. Sound created by impact types of construction equipment, including but not limited to pavement breakers, jackhammers, sandblasting tools, or other types of equipment or devices that create impulse noise or impact noise or are used as impact equipment, as measured at the nearest property line or monitoring point, may exceed the maximum permissible sound levels as approved by the local jurisdiction.
- D. For operation of construction equipment that could exceed allowable noise limits during nighttime hours established by the local jurisdiction, the Contractor must obtain the appropriate noise variance from the local jurisdiction having authority. During these hours, meet the performance criteria as approved by Sound Transit and the local jurisdiction.
- E. The noise limits in 3.01A through 3.01C are for equipment on construction sites, including but not limited to crawlers, tractors, dozers, rotary drills, loaders, power shovels, cranes, derricks, graders, off-highway trucks, ditchers, trenchers, compactors, compressors, and pneumatic-powered equipment
- F. The noise levels should be measured at the nearest reasonable sensitive noise receptor.

3.02 VIBRATION LEVEL LIMITS

- A. Measures applied to limit noise levels may in some cases limit vibration levels also. Measures specified above for noise levels are applicable.
- B. For all areas, conduct construction activities so that vibration levels at the nearest affected building monitoring points do not exceed root-mean-square (rms) unweighted vibration velocity levels in vertical direction over a frequency range of one to 100 Hertz as listed in Table 3.
- C. Vibration levels at buildings affected by construction operations refer to vertical direction vibration on ground surface or building floor.
- D. Installation of Vibration Monitors:
 - 1. For monitoring in the vicinity of nearby structures or utilities, locate vibration sensors on the ground surface near the structures or utilities. Install geophones level and firmly mount on the surface slab of concrete or asphalt, or firmly anchor in undisturbed soil. Orient geophones towards the construction activity.
 - 2. For monitoring on structures, install wall mount kit to attach geophones to structure face or columns. Mount geophones level and orient towards the construction activity.
 - 3. See Section 31 09 00, Geotechnical Instrumentation and Monitoring of Earthwork, for other installation, monitoring, and reporting requirements.
- E. Conduct daily measurements of vibration during peak vibration generating construction activities. Any activities that may produce vibration levels above values shown in Table 3 whenever a structure is located near the construction activity are subject to vibration monitoring. Peak vibration generating construction activities are limited in the design.

3.03 CONSTRUCTION METHODS - EQUIPMENT

- A. Where possible, use concrete crushers or pavement saws rather than hoe rams for tasks such as concrete deck removal and retaining wall demolition.
- B. Ensure that pneumatic impact tools and equipment used at the construction site have intake and exhaust mufflers recommended by the manufacturers thereof, to meet relevant noise ordinance limitations.
- C. Construction equipment, both stationary and mobile, should be of recent manufacture and incorporate effective noise-suppression design, including features such as shrouds, baffles, and mufflers or as recommended by the manufacturer. Locate stationary equipment that generates noise away from sensitive receptors and shield with a noise-attenuating barrier or shroud.
- D. Line or cover storage bins and chutes with sound-deadening material. Ensure all vehicles engaged in loading on-site have lined truck beds.
- E. Provide mufflers or shield paneling for equipment, including internal combustion engines, recommended by manufacturers thereof.
- F. Blasting, impact pile driving, vibratory hammers for pile casing installation, vibratory sheet installation and vibratory rollers are prohibited from use during those hours established by the local jurisdiction.

- G. As required to meet the noise limits specified in this Section, use alternative procedures of construction and selection of proper combination of techniques that generate least overall noise and vibration. Such alternative procedures include the following:
 - 1. Use electric welders powered from utility main lines instead of internal combustion powered generators/welders.
 - 2. Mix concrete off-site instead of on-site.
 - 3. Employ prefabricated structures instead of assembling on-site.
 - 4. Drilled pile installation methods.
- H. Use construction equipment manufactured or modified to dampen noise and vibration emissions, such as:
 - 1. Electric instead of diesel-powered equipment
 - 2. Hydraulic tools instead of pneumatic impact tools
 - 3. Electric instead of air- or gasoline-driven saws

3.04 CONSTRUCTION METHODS - OPERATIONS

- A. Operate equipment and in particular slurry wall installation equipment and cranes so as to minimize banging, clattering, buzzing, and other annoying types of noises, especially near residential areas.
- B. To the extent feasible, configure the construction site in a manner that keeps noisier equipment and activities as far as possible from noise sensitive locations and nearby buildings.
- C. In no case are above restrictions limiting the responsibility for compliance with applicable federal, state and local safety ordinances and regulations and other Sections of these Contract Specifications.
- D. Maximize physical separation, as far as practicable, between noise generators and noise receptors. Separation includes following measures:
 - 1. Provide enclosures for stationary items of equipment and barriers around particularly noisy areas on site.
 - 2. Locate stationary equipment to minimize noise and vibration impact on community, subject to verification by the Resident Engineer.
- E. Minimize noise-intrusive impacts during most noise sensitive hours.
 - 1. Plan noisier operations during times of highest ambient noise levels.
 - 2. Keep noise levels relatively uniform; avoid excessive and impulse noises.
 - 3. Turn off idling equipment and vehicles.
 - 4. Phase in start-up and shut-down of site equipment.
 - 5. Avoid simultaneous activities that both generate high noise levels.
 - 6. Conduct truck loading, unloading and hauling operations so noise and vibration are kept to a minimum.

- 7. Whenever feasible, do not operate trucks on streets that pass by schools during school hours.
- 8. Limit the time that steel decking or plates for street decking or covering excavated areas are in use.
- 9. Grade surface irregularities on construction sites to minimize the generation of impact noise and ground vibrations by passing vehicles.
- F. Use warning broadband backup alarms on all equipment in operation at the site, at all times.
- G. Limit the use of annunciators or public address systems, except for emergency notifications.

3.05 CONSTRUCTION METHODS – NOISE ABATEMENT MEASURES

- A. Install noise abatement measures in locations specified in the Noise Control Plan adjacent to equipment as required to meet the noise limits specified.

3.06 NOISE AND VIBRATION MEASUREMENT PROCEDURES

- A. Noise Measurement Procedure
 - 1. Field calibrate the sound level analyzer using an acoustic calibrator, according to the manufacturer's specifications, before each measurement.
 - 2. Except as otherwise indicated, perform measurements using the A-weighting network and the SLOW response of the sound level meter.
 - 3. Measure impulsive or impact noises using the C-Weighting network and the FAST response of the sound level meter.
 - 4. Fit the measurement microphone with an appropriate windscreen at the location of the sensitive receptor at least four to six feet away from the nearest reflective surface.
 - 5. Take noise measurements at the nearest property line and agreed noise sensitive locations at least once each week and after a change in construction activity or construction location. Determine the duration of noise measurements based on the type of construction activity, the length of the activity, and whether it is continuous or intermittent. Measurement periods: a minimum of 20 minutes.
 - 6. Ensure that construction noise measurements coincide with periods of maximum noise-generating construction activity, and take measurements during the construction phase or activity that has the greatest potential to create annoyance or to exceed applicable noise regulations and restrictions.
 - 7. If, in the estimation of the person performing the measurements, outside noise sources contribute significantly to the measured noise level, repeat the measurements with the same outside source contributions when construction is inactive to determine the background noise level.
 - 8. Submit noise data to the Resident Engineer on a weekly basis using the Noise Measurements Report Form provided in Exhibit C. Note the type of measurement (for example, baseline, on-going construction) on the form.
 - 9. Clearly identify proposed monitoring locations that must be approved by the local jurisdiction and sketch on the back of the Noise Measurements Report Form,

Exhibit C, along with the locations of and distances from any agreed sensitive noise receptor or location.

10. Identify construction equipment operating and characterize the sound being generated during the monitoring period and the locations sketched on the back of the Noise Measurements Report Form, along with the locations and distances to any agreed noise sensitive location.

B. Vibration Measurement Procedures

1. Field calibrate the vibration monitoring equipment, according to the manufacturer's specifications, before each measurement.
2. Take vibration measurements at sensitive locations as indicated herein and on the Contract Drawings at least once each week and after a change in construction activity or construction location. Measurement periods: a minimum of 20 minutes.
3. Submit vibration data to the Resident Engineer on a weekly basis using a Contractor-generated form. Note the type of measurement (for example baseline, on-going construction) on the form.
4. Clearly identify monitoring locations and sketch on the back of the vibration report form.
5. Identify construction equipment operating during the monitoring period and the locations sketched on the back of the vibration report form.

TABLE 1 - CONSTRUCTION VIBRATION LIMITS

Vibration Type (Permissible Duration)	Peak Particle Velocity (in/sec)
Sustained (≥ 1 hr/day)	0.04
Transient (< 1 hr/day)	0.12
Transient (< 10 min/day)	0.4

END OF SECTION

EXHIBITS

Exhibit A: Quarterly Noise Control Plan – Part A

Exhibit B: Quarterly Noise Control Plan – Part B

Exhibit C: Noise Measurements Report Form

APPENDICES

Appendix A: Other Noise Sensitive Locations

SECTION 01 57 15 – EXHIBIT A
QUARTERLY NOISE CONTROL PLAN – PART A

CONSTRUCTION ACTIVITIES AT EACH CONSTRUCTION SITE
(DUPLICATE AS NEEDED)

Contract No.: _____ Contract Name:

Contractor: _____

Site: _____ Date:

Resubmit every three months

(ATTACH SITE SKETCH)

PART A: EQUIPMENT INVENTORY

	Equipment				Noise Level	Date	Date
Code	Categor y	Model	ID No.	HP	At 50 Feet	Begin	End
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)

SECTION 01 57 15 – EXHIBIT B
QUARTERLY NOISE CONTROL PLAN FORM - PART B

(DUPLICATE AS NEEDED)

Contract No.: _____ Contract Name:

Contractor: _____ Site:

Date: _____ Land Use:

Resubmit every three months.

PART B: CALCULATED CONSTRUCTION NOISE LEVELS AT NEAREST RESIDENTIAL AND COMMERCIAL RECEIVERS FOR EACH CONSTRUCTION ACTIVITY

Nearest Noise Sensitive Receivers	Calculated Sound Pressure Level (dBA)*

*** EQUIPMENT USED FOR EACH CONSTRUCTION ACTIVITY IS TAKEN FROM PART A OF THE NOISE CONTROL PLAN**

NOISE ABATEMENT MEASURES

ANTICIPATED EFFECTS

CALCULATIONS - attach additional sheet(s) as needed.

SECTION 01 57 15 – EXHIBIT C
NOISE MEASUREMENTS REPORT FORM

Contract No(s): _____

Date: _____

Time: _____

Measured By: _____ Of: _____ (Company)

Monitoring Address: _____ (Provide Sketch on Back)

Location No: _____ Wind Speed: _____ Km/Hr Direction: _____
(MPH x 1.6)

Location of Sound Level Meter: (No closer than 15 meters from equipment and 3 meters from building)

Monitoring was Conducted: _____ Meters from Equipment (_____) (Type(s): Leave Blank for Baseline)

Land Use: ☐ Residential/Institutional ☐ Business/Recreational ☐ Industrial

Sound Level Meter: Make and Model: _____ ☐ A - Weighted Sound Level (Slow)

Duration of Measurement: _____ (20 minutes to 1 hour)

Calibration Level	
Leq	
L25	
L08	
L02	
Lmax	
Allowable Noise Limit	

Field Notes;

Check one of the following:

☐ Ongoing Construction ☐ Post-Construction: _____ ☐ Baseline Conditions
(Contract)

(Complete all that apply below)

Active Contract(s): _____
(List all contracts that contribute to measured noise)

Complaint Response: _____
(Describe: Include Log-In Number)

Abatement Follow-Up: _____
(Describe)

END OF EXHIBIT

SECTION 01 57 15 – APPENDIX A
OTHER NOISE SENSITIVE LOCATIONS

In addition to residential areas, hospitals and parks, the following locations are considered
Noise Sensitive Locations

Description	Address or Location

END OF APPENDICES

SECTION 01 57 19

TEMPORARY ENVIRONMENTAL CONTROLS

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section includes requirements for constructing and maintaining the Temporary Erosion and Sediment Control system and specifies elimination or minimization of air and water pollution generated by construction activities. Contractor is wholly responsible for preventing erosion from occurring and sediments from exiting the construction Site or staging areas.

1.02 REFERENCES

- A. This Section incorporates by reference the latest revisions of the following documents.
 - 1. Washington State Department of Ecology (Ecology)
 - a. Stormwater Management Manual for Western Washington (SMMWW)
 - 2. City of [INSERT]
 - a. [INSERT STANDARDS, CODES & REGULATIONS]
 - 3. [INSERT] County CODE
 - a. [INSERT STANDARDS, CODES & REGULATIONS]
 - 4. Other Agency Requirements
 - a. EPA 40 CFR Part 112

1.03 DEFINITIONS

- A. CESCL: Certified Erosion and Sediment Control Leads for Western Washington, Washington State Department of Ecology. BMP C160
- B. SMMWW: Stormwater Management Manual for Western Washington, Washington State Department of Ecology.
- C. Fugitive Dust: As defined by the Puget Sound Clean Air Agency

1.04 SUBMITTALS

- A. Temporary Erosion and Sediment Control Plan(s): Submit prior to disturbing soil or demolition activities.
- B. Manufacturer Data and Test Results for all products
- C. TESC BMPs (Best Management Practices) inspection log as defined in Article 1.05C herein:
 - 1. Maintained on a weekly basis
 - 2. Kept on Site
 - 3. Submit copies to the Resident Engineer weekly for the previous week
- D. Designee's qualifications for Construction Site Environmental Management Supervisor (CSEMS)
- E. Spill Prevention, Control and Countermeasure Plan
- F. Spill Report Forms (Exhibit A): Within 24 hours of reported spill
- G. Spill Report Logs (Exhibit B)

1.05 QUALITY ASSURANCE

- A. Implement the Construction TESC Plan, SPCC Plan, including design of and all revisions to, and the construction, maintenance, replacement, and modification of the erosion and sedimentation control facilities, until Acceptance of current work.
- B. Employ Construction Site Environmental Management Supervisor (CSEMS), with the following responsibilities:
 - 1. Be currently certified as a Certified Erosion and Sediment Control Lead BMP C160 – SWMMWW 2016
 - 2. Have a minimum five (5) years of experience being responsible for construction Site erosion and sediment control regulatory requirements, BMPs, TESC Plan development, and stormwater monitoring. At least three years of the experience must be on projects in the Pacific Northwest.
 - 3. Approved by the Resident Engineer, to implement, manage and enforce compliance with the requirements herein.
 - 4. Be solely responsible for developing, maintaining, and modifying TESC PLANs, and SPCC Plan for the life of the Contract and ensuring compliance with all requirements of this Section.
 - 5. Have the authority to act on behalf of the Contractor and be available on call 24 hours per day for the duration of the Contract.
 - 6. Be available to accompany the Resident Engineer and ST Environmental staff during weekly inspections of all BMPs at a time designated by the Resident Engineer.
 - 7. Ensure that all TESC BMPs are installed, inspected, maintained, and modified as conditions change for the duration of the Contract.
 - 8. Keep weekly logs and inspection reports as defined in Article 1.05C herein.

9. Visually Inspect stormwater discharges for turbidity and oily sheen.
- C. TESC BMP Weekly Logs and inspection reports shall be updated by the CESCL on a weekly basis and shall include the following:
1. Inspection date/time.
 2. Weather information; general conditions during inspection and amount of precipitation since the last inspection.
 3. A summary or list of all BMPs implemented, including observations of all erosion and sediment control structures or practices. Note locations of BMPs inspected, needing maintenance, failing to operate as designed, and where additional or different BMPs are required.
 4. General comments and notes, including a brief description of BMP repairs, maintenance, or installations made as a result of the inspection.

1.06 SEQUENCING AND SCHEDULING

- A. Obtain applicable permits, approval of stormwater discharge treatment methods, BMPs, and necessary equipment in place prior to land disturbing activities.
- B. Within 21 Days of the effective date of the Notice to Proceed, hold a meeting with the Construction Site Environmental Management Supervisor and drawings the Resident Engineer to review and discuss in detail all requirements of this Section, how to meet them, and prepare a draft schedule for Submittals, in accordance with Section 01 33 00, Submittal Procedures.

1.07 CONSTRUCTION TESC PLAN

- A. Prepare a site specific TESC Plan describing best management practices (BMPs) to prevent erosion and sedimentation, and to identify, reduce, eliminate, or prevent stormwater contamination and water pollution from construction activities.
- B. The TESC PLAN consists of two parts: a narrative and. Both parts must contain information specific to the construction Site.
- C. TESC Drawings:
 1. Show by a series of time sequence shop drawings, how construction stormwater and erosion control BMPs will be installed, maintained, and removed.
 2. A conceptual Temporary Erosion and Sediment Control Plan is included in the Contract Drawings "for information only." Revise the TESC Plan to reflect the actual means and methods proposed including alternative BMPs.
 3. Prepare a separate Temporary Erosion and Sediment Control Plan for each location and its major construction activities, and as required by the Resident Engineer. Not all major activities will occur at the same time at each location and the plans for more than one major activity can be combined on a single Plan if the BMPs shown are appropriate to all major activities shown.
- D. TESC Plan Narrative:
 1. Include a description of the inspection and monitoring plan for TESC BMPs over the life of the Contract. Inspect all BMPs weekly, and ensure that the log of TESC inspection reports is submitted to the Resident Engineer weekly, for the previous week.

2. Provide a narrative describing the training program for educating all personnel including Subcontractors on environmental protection. At a minimum, train staff through regularly scheduled meetings to discuss environmental protection subjects as related to this Contract. This training may be added to existing weekly meetings (such as safety meetings) or during new hire orientation. Emphasize issues such as sensitive receptors, spill prevention, chemical handling, and storage, emergency response, stormwater control facilities inspections, proper dewatering techniques, and concrete handling.
3. Include the name, telephone number, fax number, cell phone number(s), email address, and business address of the designated CSEMS and all Contractor personnel responsible for erosion and sediment control. Be responsible for updating this information as required.

1.08 SPILL PREVENTION, CONTROL AND COUNTERMEASURES PLAN (SPCC)

- A. Fuel Storage: All portable fuel storage tanks between 6 and 250 gallons except for vehicle and equipment petroleum fluid tanks shall:
 1. Be specifically engineered to meet or exceed all national environmental and hazardous waste regulations.
 2. Have a secondary shell providing up to 110 percent containment.
 3. Be accompanied by a spill kit and fire extinguisher staged within 15 feet.
- B. Fuel Storage: Portable fuel storage less than 6 gallons:
 1. Must be stored within secondary containment equivalent to 110 percent of the container's capacity.
 2. Shall be placed and stored in secondary containment at all times unless being actively used to fill equipment.
 3. Shall be refilled in secondary containment.
- C. Spill Response Procedures:
 1. Report all spills that occur regardless of the size or type of the spill to the Resident Engineer.
 2. The provided Spill Report Form (Exhibit A) shall be used, and modifications to the form must be approved by the Resident Engineer. Submit a Spill Report Form to the Resident Engineer for all spills.
 3. Maintain a Spill Report Log (Exhibit B) for all spills.
 4. If the spills of a hazardous substance could reach surface waters, the following agencies must be notified: National Response Center 1-800-424-8802 or WWW.NRC.USG.MIL/INDEX.HTM and notify the regional Department of Ecology Office. Note: There are fines for failing to provide the required notification.
 5. Some important components of a spill control plan are to stop the spill at the source and install protective covers over storm drain grates. If spill is flammable, call 911 and dispose of as directed by the local Fire Marshal.
 6. Ensure employees who respond to spills are trained to a level of competence as defined in the SPCC Plan.

1.09 WATER MANAGEMENT

- A. All water pumped from existing facilities shall be inspected for a visible sheen and/or turbidity. If present water must be disposed offsite, where not present the water may be dispersed to a permeable area within construction boundary.
- B. Water shall be pumped in a manner that will not cause erosion.

PART 2 - PRODUCTS

2.01 SUMMARY

- A. The materials, BMPs, and methods listed below are some of the materials, BMPs, and methods that the Contractor may choose to use in meeting the requirements of this Section. A complete list of approved BMPs can be found in Volume II of the SMMWW. Unless otherwise noted, the materials, BMPs, and methods listed are not required and the list of materials, BMPs, and methods is not intended to be all-inclusive. The Contractor may choose other materials, BMPs, and methods provided they meet the applicable city, state, and federal permits and requirements.

2.02 MATERIALS

- A. General: Materials used for Erosion and Sediment Control BMPs shall be in accordance with the materials specified in the SMMWW Volume II, Chapter 4.
- B. Stabilized Construction Entrance: In accordance with SMMWW Volume II, BMP C105
- C. Inlet Protection (Required): Specifically designed for catch basins and inlets, made of a filter fabric insert with 48 inches by 36 inches adapter skirt, retrieval strap, overflow bypass, and sediment accumulator. Inlet protection by Silt Sack, Streamguard or approved equal.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Protect catch basin inlets to the permanent storm drainage system from sediment influx by use of filter fabric, catch basin insert, or similar filtering materials and methods in accordance with the SMMWW.

3.02 INSTALLATION

- A. Installation practices for Erosion and Sediment Control BMPs shall be in accordance with the SMMWW, Volume II and manufacturer's instructions.
- B. Inlet Protection:
 - 1. Install in accordance with COS Standard Specification, Section 8-01.3(12).

3.03 MAINTENANCE

- A. If erosion is occurring, make modifications to the erosion control system to mitigate the erosion and its affects.
- B. General maintenance activities:
 - 1. Repair or replace damaged or missing items immediately.

- C.
 - 1. Use water sprinkling, temporary enclosures, and other methods to minimize dust and dirt migration. Prevent runoff from all water used for dust control from entering into the storm sewer system.
 - 2. The application of any chemical dust suppressants must be approved by the Resident Engineer prior to use.
 - D. Address all areas needing BMP measures that do not require immediate attention within 7 days of notification from the Resident Engineer or CSEMS.
 - E. At a minimum, inspect all TESC BMPs weekly and after significant rain events (0.5 inch or greater). Repair as necessary to meet requirements of the SMMWW and NPDES permit.
 - F. Maintain and repair all TESC practices as needed to ensure continued performance of their intended function.
 - G. Operate and maintain BMPs in accordance with the SMMWW Volume II and the following:
 - 1. Prevent sediments from being flushed to the downstream system during cleaning.
 - 2. Remove sediment, trash, and debris from catch basin grate surfaces when blocking more than 20 percent of the grate surface.
 - 3. Clean or replace inlet and catch basin filter socks when sediment fills one-third of the available storage or the fill limits recommended by the manufacturer have been met. Immediately clear or replace clogged fabric.
 - 4. Immediately remove all sediment accidentally introduced into a catch basin.
 - H. Handle and dispose of cleaning waste material and demolition debris in a manner that does not cause contamination of water. If the area is swept with a pick-up sweeper, the material shall be hauled out of the area to an appropriate disposal site.
 - I. Update the TESC with site-specific construction work plans as necessary to reflect construction work area limit changes, the construction activities accompanying these changes, and all changes to BMPs.
- 3.04 COMPLETION OF CONSTRUCTION
- A. Remove all TESC measures within 30 days after final Site stabilization is achieved or after the temporary BMPs are no longer needed. Remove and dispose of in an approved Site or stabilize trapped sediment on Site. Permanently stabilize disturbed soil areas resulting from removal.
- 3.05 SYSTEM COMPLIANCE
- A. The Resident Engineer, CSEMS, and regulatory agencies will determine the effectiveness of the erosion control system. Immediately correct damaged, inadequate, and ineffective TESC BMPs.
 - B. If the erosion control system is determined to be ineffective by the Resident Engineer or regulatory agencies, upgrade and modify erosion control system until effective, as determined by the Resident Engineer and regulatory agencies.
 - C. Refusal to modify and upgrade the erosion control system as required within 5 days of notice from the Resident Engineer, may result in the work being completed by a third party and the cost of the work being withheld from the Application for Payment.

- D. Continued non-compliance with the erosion control requirements and water quality requirements may result in stoppage of work and monetary fines.
- E. In the event that the Washington State Department of Ecology issues a Notice of Violation, Notice of Non-Compliance, or other Enforcement Action, the Resident Engineer may stop all construction activities until it has been determined to the satisfaction of the Resident Engineer that the Contract is in compliance. The Resident Engineer may require the Contractor to send additional staff to successfully complete the Stormwater Construction Best Management Practices (BMPs) field training as provided by the Associated General Contractors (AGC) before construction activities can resume. The Contractor will not be entitled to additional Contract Time arising from any measures required or taken under this clause. Pay all costs associated with work stoppages, mitigation of the triggering event(s), and training.
- F. Be solely responsible for all damages, fines, levies, judgments, stop work orders, and related schedule impacts incurred as a result of Contractor, Subcontractor, or Supplier failure to comply with the requirements of this Section. Said damages, fines, levies, or judgments will be deducted from payments due. The Contractor will not be entitled to additional Contract Time arising from any measures required or taken under this clause.

END OF SECTION

EXHIBITS

Exhibit A: Spill Report Forms

Exhibit B: Spill Report Logs

SECTION 01 57 19 – EXHIBIT A

SPILL REPORT FORM

Please complete this form and retain on file.

Page ____ of ____

Person reporting spill:		Telephone number:	
Date of spill:		Time of spill:	
Time / Date spill was cleaned up:			
Source of Spill – Equipment:			
Material type:			
Material quantity:			
Weather conditions:			
Spill reported to: <input type="checkbox"/> Police/Fire Dept. (911) <input type="checkbox"/> National Response Center 800-424-8802 <input type="checkbox"/> Ecology – (425) 649-7000 <input type="checkbox"/> Spill Response Subcontractor <input type="checkbox"/> Sound Transit – Resident Engineer <input type="checkbox"/> Other: _____			
Cause(s) and effect(s) of spill:			
Spill containment and clean up procedures initiated:			
Description of spill location and surroundings:			
Corrective actions taken to prevent future incident:			
Agency(s) on the scene:			
Report completed by:			
Printed Name: _____			
Signature: _____			
Title:		Date:	

SECTION 01 57 19 – EXHIBIT B

SPILL REPORT LOG

SPILL REPORT LOG

Please complete this form and retain on file.

Date	Location	Type of Material & Quantity	Source	Cause	Corrective and/or Preventive Action(s) Taken	Recorder's Initials

END OF EXHIBITS

SECTION 01 57 24
TEMPORARY SITE WATER DISCHARGE

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section specifies permit compliance requirements, controls, treatment, monitoring, reporting, and inspection required during construction related to water discharged from construction sites.
- B. The Construction Site Environmental Management Supervisor (CSEMS) shall be responsible for all work specified herein. Refer to Section 01 57 19, Temporary Environmental Controls for the CSEMS qualifications.
- C. Site Water discharge flow according to Exhibit A.

1.02 REFERENCES

- A. Referenced Standards: This Section incorporates, by reference, the latest revisions of the following documents.
 - 1. Code of Federal Regulations (CFR):
 - a. 40 CFR Part 136, Guidelines Establishing Test Procedures for the Analysis of Pollutants
 - b. 40 CFR 261.21, Identification and Listing of Hazardous Waste, Characteristic of Ignitability
 - c. 40 CFR Part 112 Spill Prevention Control and Countermeasure (SPCC) regulation
 - 2. Washington Administrative Code (WAC):
 - a. Chapter 173-50 WAC, Accreditation of Environmental Laboratories
 - b. Chapter 173-200 WAC, Water Quality Standards for Ground Waters of the State of Washington
 - c. Chapter 173-201A WAC, Water Quality Standards for Surface Waters of the State of Washington
 - d. Chapter 173-204 WAC, Sediment Management Standards
 - e. Chapter 173-216 WAC State Waste Discharge Permit Program
 - 3. Federal Register
 - a. Vol. 57, No. 246, National Toxics Rule
 - 4. City of [INSERT]
 - a. [INSERT STANDARDS, CODES & REGULATIONS]

5. Washington Department of Ecology (Ecology)
 - a. Stormwater Management Manual for Western Washington (SMMWW)
 - b. NPDES Permit – Construction Stormwater General Permit (CSWGP)

1.03 DEFINITIONS

- A. Best Management Practices (BMPs): See Section 01 57 13, Temporary Erosion and Sediment Control.
- B. Construction Site Environmental Management Supervisor: Section 01 57 19, Temporary Environmental Controls.
- C. Dewatering Water: Groundwater extracted and pumped away from an active construction site by the dewatering system as defined in Section 31 23 19, Dewatering.
- D. Ecology: Washington State Department of Ecology.
- E. FOG: Fats, oils and grease.
- F. Groundwater: Water in a saturated zone or stratum beneath the land surface or a surface of water. See Section 31 23 19 Dewatering.
- G. Initial Site Construction Activities:
 1. Mobilization of equipment and materials
 2. Temporary security fence installation
 3. Sediment Control BMP's (sediment ponds, storage tanks, traps, filters, silt fences, stabilized construction entrances, wheel wash, etc.) shall be constructed as one of the first steps in grading. These BMP's shall be functional before other land disturbing activities take place.
 4. Start-up of treatment systems
 5. Major grading not allowed except as needed for BMP construction.
- H. Leachate: Water that has become contaminated by contact with material within the soil profile.
- I. Non-Compliance Event (or Events): Occurrence where Surface Water, Groundwater, or sanitary sewer water discharge or discharge to Groundwater exceeds allowable discharge limits.
- J. Process Water:
 1. Process Water discharges include, but are not limited to: Truck and wheel wash water, equipment wash water, petroleum, chemically contaminated water, non-contact cooling water, and chlorinated water.
 2. All water which, during manufacturing or construction process comes into direct contact with or results from the process or use of all raw material, intermediate product, finished product, byproduct, or waste product.

3. Water used for sawcutting
4. Decant water, originating as either Groundwater or added potable water, from excavated spoils that contain additives, conditioners including bentonite, cementitious materials, or pollutants.
5. Water discharge from slurry mixing
6. Site Water in contact with and chemically affected by site conditions which cannot be treated on site to meet Surface Water discharge criteria.

K. Site Water:

1. All water on the Work Site that requires discharge from the Site.
 - a. Classified as either: Stormwater, Dewatering Water, Sanitary Sewage, or Process Water

L. Stormwater: Water originating as precipitation that does not infiltrate into the ground or evaporate or come into contact with process generating activities

M. Surface Water:

1. Lakes, Rivers, Federal Waters and Waters of the State
2. Wetlands, streams, and open drainage channels
3. City of Puyallup Stormwater system

N. Wet Weather Discharge: Any measurable precipitation during previous 72 hours at time of discharge

1.04 SUBMITTALS

A. Surface Water Discharge:

1. Treatment System design info, monitoring procedures. (If needed to comply with Surface Water Discharge Requirements):
 - a. Separate submittals for each of the proposed treatment systems.
 - b. Proposed modifications to the Treatment System
2. Monitoring Results: Quantity and Quality, daily for each discharge location
3. Trucking Plan
4. Contingency Plan
5. Obtain Surface Water Discharge submittal approvals prior to start of Initial Construction Activities in conjunction with authority and approval of local jurisdictions.

B. Sanitary Sewer/Combined Sewer Discharge:

1. Treatment Systems design information and monitoring procedures.
 - a. Separate submittals for each of the proposed treatment systems.
 - b. Proposed modifications to the Treatment Systems

2. Industrial Waste Discharge Permit Application
 3. Monitoring Results: Quantity and Quality, daily for each discharge location
 4. Trucking Plan
 5. Contingency Plan
 6. Obtain Sanitary Sewer Discharge submittal approvals prior to start of Initial Construction Activities in conjunction with authority and approval of local jurisdictions.
 7. Sludge Disposal and Control Plan
 - a. Management of the sludge generated as the result of wastewater/Stormwater collection and treatment.
 - b. This includes, but is not limited to, storage, characterization, transportation and final disposal including all associated documentation
 8. Solids Management Plan: Solids accumulation in wastewater ponds and tanks used for solids settling shall not exceed 25 percent of the facility's hydraulic capacity. Submit an operations and maintenance plan explaining how solid accumulation in wastewater ponds and tanks will be managed during construction.
- C. Chemical Usage Documentation: Submit daily logs monthly, no later than the third day of each month.
- D. Qualifications of Accredited Independent Testing Laboratory
- E. Permits obtained by the Contractor
- 1.05 QUALITY ASSURANCE
- A. Qualifications:
1. Accredited Independent Testing Laboratory for testing water samples for pH, turbidity, TPH, and parameters with discharge limits in accordance with permit requirements
 2. Independent Testing Laboratory registered or accredited under the provisions of Chapter 173-50 WAC.
- B. Fines
1. Be responsible for all fines from governing authorities incurred from non-compliance with regulations.
- 1.06 SEQUENCING AND COORDINATION
- A. Within 60 days of the effective date of the Notice to Proceed, hold a meeting with the Construction Site Environmental Management Supervisor and the Resident Engineer to review and discuss in detail all requirements of this Section, and how the Contractor will implement methods/procedures to meet them.
- 1.07 SITE WATER DISCHARGE RELATED DOCUMENTATION
- A. Provide engineered Stormwater Management Plan for treatment and disposal of discharges to Surface Water, and Wastewater Pre-Treatment Plan for treatment and

disposal of discharges to the Public Combined or Sanitary Sewer system, and Trucking Plan for Site Water to be hauled offsite.

1. Ensure plan is prepared by a licensed Professional Engineer registered in the State of Washington.
 2. Discharges to Surface Water must meet all state water quality requirements in accordance with the site's NPDES Construction Stormwater Permit described in the SWPPP.
 3. Discharges to combined or sanitary sewer must be permissible in accordance with AHJ, and adhere to all requirements of the Construction Stormwater General Permit
- B. Stormwater and Groundwater shall be collected, treated, and discharged to Surface Water in accordance with the Construction Stormwater General Permit.

1.08 SURFACE WATER DISCHARGE RELATED DOCUMENTATION

- A. Provide Treatment Systems for the treatment of all discharges to Surface Water prior to discharge from the Site:
1. Evaluate and design each proposed treatment system, including the following:
 - a. The evaluation of potential pollutant loading from construction activities
 - b. Treatment process evaluation
 - c. Description of process used in treatment:
 - 1) Design criteria
 - 2) Design flow rates
 - a) Expected water volumes to be discharged to Surface Water
 - b) Treatment plant capacity
 - 3) Design loading, type of pollutant material, and quantity
 - 4) Chemical usage
 - 5) Design parameters associated with each unit process
 - 6) Method for removal of solids off site and treatment and removal of backwash water
 - 7) Description of emergency power generator to operate treatment plant during power failure
 - d. Pressure filter system required except as indicated herein.
 - e. Capability of automatic flow and turbidity passed chemical addition.
 - f. Use BMPs as a treatment system during Initial Site Construction.
 2. Obtain approval of Surface Water Discharge Submittals prior to start of Initial Construction Activities in conjunction with authority and approval of local jurisdictions, including City of Puyallup and Ecology.

- B. Monitoring and Reporting Results:
1. Submit and certify daily as specified herein.
 2. Include any pollutant monitored more frequently than required herein.
- C. Non-compliance Event Notification:
1. Immediate notification of the Resident Engineer of the Non-compliance or becoming aware of a Non-compliance Event
 2. Submit a written report of the violation describing the Non-compliance.
 3. In the report, include the following:
 - a. Exact dates and times of the Non-compliance Event
 - b. Steps taken or planned to prevent reoccurrence of the Non-compliance
 - c. Water quality data in accordance with the requirements of the NPDES Waste Discharge Permit
 4. Submit the report within 2 days after the initial Event occurrence or 1 day after receiving Independent Testing Laboratory results, whichever time is shorter.
- D. Operations and Maintenance Manual:
1. Design criteria including pertinent calculations used in designing, selecting, or verifying the suitability of the installed equipment
 2. Pump curves: Manufacturer's catalog curve
 3. Installation and startup procedures: Manufacturer's recommendations for installation, adjustment, calibration, and troubleshooting
 4. Operating procedures: Manufacturer's recommended step-by-step procedures for starting, operating, and stopping the equipment under specified modes of operation
 5. Preventive maintenance procedures: Manufacturer's recommended steps and schedules for maintaining the equipment
- E. Contingency plan for the following:
1. Non-compliance Event
 2. For Site Water management in case of treatment system failure, a spill of hazardous substances, or other incident which introduces excess volume or unanticipated contaminants into the system.
 3. For treatment system improvements necessary to meet discharge requirements if existing treatment system fails to meet discharge requirements.
 4. Discharge rates require reduction from the maximum
 5. Discontinued discharge
 6. Treatment system improvements necessary to meet discharge requirements if existing treatment system fails to meet discharge requirements
 7. Additional BMP's to bring discharge into compliance

1.09 SANITARY AND COMBINED SEWER DISCHARGE AND OFFSITE DISPOSAL DOCUMENTATION

A. Treatment and Disposal:

1. Submit a report outlining how Process Water discharges to the sanitary and combined sewer will be treated and/or disposed of:
 - a. Ensure the report is prepared by a licensed Professional Engineer registered in the State of Washington in accordance with Chapter 173-240 WAC.
 - b. Include design criteria and calculations for all major equipment, including but not limited to pumps, tanks, dosing pumps, and mixers.
 - c. Submit all modifications with the approval of the Professional Engineer to the Resident Engineer, prior to any pretreatment system modifications or upgrades.
 - d. Method to convey or truck Site Water from the Site
 - e. Water discharge to sanitary sewer is acceptable under the conditions of the authority and approval of the local jurisdiction.
 - f. Discharge of Site sanitary sewage from Contractor sanitary facilities to the Sanitary Sewer System is acceptable with approval of the local permitting authority.
 - g. Trucking Plan:
 - 1) Required for all trucking of Process Water and Site Water not disposed of in the sanitary sewer
 - 2) Provide name, address, and telephone number of firm responsible for trucking
 - 3) Provide all receiving facility permit profiles for treating, handling, recycling or disposing of waste materials
 - 4) Truck capacity or capacities
 - 5) Training provided to truck operators in discharge procedures and spill response
 - 6) In the event of a spill:
 - a) Emergency contact person to handle the spill
 - b) Steps taken by truck operator
 - h. Local jurisdiction's approval of the pretreatment facility plan and site inspection are required prior to commencing of any discharges to the sewer system.

B. Non-compliance Event Notification:

1. Immediately notify the Resident Engineer upon becoming aware of a Non-compliance Event.

2. Submit a written report of the violation to the Resident Engineer describing the Non-compliance. Report shall include the following:
 - a. Exact dates and times of the Non-compliance Event
 - b. List of permits with parameters in non-compliance
 - c. List of parameters not in compliance with permit conditions
 - d. Steps taken or planned to prevent reoccurrence of the Non-compliance
 - e. Water quality data in accordance with the requirements of the NPDES Discharge Permit
3. Submit the report within 2 days after the initial event occurrence or 1 day after receiving Independent Testing Laboratory results, whichever time is shorter
- C. Contingency plan shall include provisions for the following:
 1. Waste discharge limits exceeded
 2. For Site Water management in case of treatment system failure, a spill of hazardous substances, or other incident which introduces excess volume or unanticipated contaminants into the system.
 3. Non-compliance Event
 4. Discharge maximum rates require reduction from the maximum
 5. Discontinue discharge immediately upon notification by Resident Engineer
 6. For treatment system improvements necessary to meet discharge requirements if existing treatment system fails to meet discharge requirements

1.10 CHEMICAL USAGE DOCUMENTATION

- A. Document and submit chemicals used to treat water discharged to Surface Water and Sanitary and Combined sewers.
- B. Document the following:
 1. Identification of chemical used
 2. Commercial source
 3. Material Safety Data Sheet (MSDS)
 4. Quantities used
 5. Quantities of water treated
 6. Dosage rate
- C. Provide Certification as described in Article 1.13 below.
- D. Maintain a daily log for all use.

1.11 CERTIFICATION

- A. Include in monitoring reports, non-compliance notifications, and chemical usage documentation the following certification:
 - 1. "I certify under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

PART 2 - PRODUCTS

2.01 SYSTEM DESCRIPTION

- A. Design Requirements
 - 1. Process Water Treatment
 - a. Provide treatment for Process Water when necessary to meet discharge requirements.
 - b. Provide provisions for maintenance and operations of treatment systems.
 - c. Provide provisions for contingencies.
 - d. Design of treatment system shall be stamped by a Professional Engineer who is licensed to practice in the State of Washington.
 - e. Design and implementation of a pretreatment system shall be approved by the local jurisdiction prior to commencement of discharges to the sanitary sewer.
 - 2. Surface Water Treatment
 - 3. Solid Waste
 - a. Handle and dispose of all solid waste material in such a manner as to prevent its entry into ground or surface waters of the State.
 - b. Handle and dispose of solid and liquid wastes generated by construction activity (such as demolition debris, construction materials, contaminated materials, and waste materials from maintenance activities, including liquids and solids from street sweeping operations, cleaning catch basins and other Stormwater and wastewater pretreatment facilities), in accordance with:
 - 1) NPDES Permit Special Conditions S3, Compliance with Standards.
 - 2) WAC 173-216-110, and other applicable regulations.
 - c. Collected screenings, grit, solids, sludges, filter backwash, or other pollutants removed in the course of treatment or control of wastewaters so it is not re-suspended or reintroduced to the final effluent stream for discharge to state waters.

4. Concrete Truck Washout Disposal:
 - a. Washout concrete truck chutes, pumps and barrel only into Eco-pans.
 - b. Return unused concrete remaining in the truck and pump to the originating batch plant for recycling.
 - c. Wash off hand tools only into Eco-pans.
 - d. Do not drain runoff from paved areas into the natural or constructed storm water conveyance until the measured pH of the discharge water is within the discharge criteria parameters.
 - e. Contain wash water and waste concrete within a lined container, lined with 30 mils plastic liner or six (6) inches of concrete or asphalt, when no formed areas or eco-pans are available. Contain and dispose of concrete waste in a manner which does not violate water quality standards or solid waste regulations.
5. Leachate
 - a. Do not allow leachate from solid waste material to enter State waters without providing "all known, available, and reasonable methods of treatment" (AKART), nor allow such leachate to cause violations of surface water quality standards (Chapter 173-201A WAC), or ground water quality standards (Chapter 173-200 WAC).
6. Chemical Usage:
 - a. Use chemicals according to the manufacturer's instructions.
 - b. Do not use chemical if its toxicity to aquatic organisms is not known.
 - c. Any chemical usage for Stormwater treatment requires prior approval from the Washington State Department of Ecology. Submit the request for chemical treatment usage 30 days prior to the anticipated usage date.

B. Performance Requirements

1. Surface Water Discharges
 - a. Discharge Quantity Restrictions:
 - 1) As determined by the AHJ.
 - b. Comply with the water quality standards and requirements of the following:
 - 1) Chapter 173-201A WAC
 - 2) Chapter 173-204 WAC
 - 3) Washington State Department of Ecology NPDES Construction General Stormwater Permit
 - 4) Human health-based criteria in the National Toxics Rule (Federal Register, Vol. 57, No. 246, December 22, 1992, pages 60848-60923)
 - 5) For facilities that discharge either directly or indirectly via a Stormwater conveyance system to waters listed as impaired by

the State under Section 303(d) of the Clean Water Act, comply with the State's water quality standards of the named pollutants

- 6) The benchmark value for turbidity is 25 NTU or less. Refer to the Project's Construction General NPDES permit on how to use the benchmark.
- 7) Do not discharge Process Water or domestic wastewater to Surface Water or Groundwater.
- 8) Comply with the Effluent Limitations of the NPDES Permit

SURFACE WATER DISCHARGE EFFLUENT LIMITATIONS:

<u>PARAMETER</u>	<u>MAXIMUM DAILY¹</u>
Turbidity ^{2,6}	When the background turbidity is less than or equal to 50 nephelometric turbidity units (NTU), the turbidity in the receiving water must not exceed 5 NTUs over background turbidity.
Benchmark Turbidity ^{2,7}	25 NTU
Turbidity ^{2,7} (chemical treatment)	10 NTU
Total Petroleum Hydrocarbons ^{2,7} (TPH)	10 mg/l
Oily Sheen	No visible oily sheen
pH ^{4,5}	In the range of 6.5 to 8.5 standard units
¹ The maximum daily effluent limitation is defined as the highest allowable daily discharge ² The method detection level (MDL) for turbidity is 1 NTU using a turbidimeter and Method Number 180.1 from 40 CFR Part 136. ³ TPH must be measured by Ecology Method NWTPH-DX ⁴ <i>Standard Methods for the Examination of Water and Wastewater, 20TH Edition, 4500-H+ or EPA</i> ⁵ Indicates the range of permitted values ⁶ Measured in the receiving water ⁷ Measured at the point of discharge ⁷ Measured at the point of discharge Note: Refer to monitoring requirement in Section S3 for details	

GROUND WATER EFFLUENT LIMITATIONS

<u>PARAMETER</u>	<u>MAXIMUM DAILY¹</u>
Total Petroleum Hydrocarbons ²	10 mg/l
Oily Sheen	No visible oily sheen
pH ³	In the range of 6.5 to 8.5 standard units.
¹ The maximum daily effluent limitation is defined as the highest allowable daily discharge ² TPH must be measured by Ecology Method NWTPH-DX ³ Indicates the range of permitted values Note: <ol style="list-style-type: none"> 1) The point of compliance with the ground water quality standards is any point within an unlined impoundment pond or other point of discharge to groundwater. 2) Refer to monitoring requirement in Section S3 for monitoring details. 	

2. Combined or Sanitary Sewer Discharge
 - a. Comply with the water quality standards and requirements of the local permitting authority:
 - b. Discharge Quantity Restrictions:
 - 1) As determined by AHJ
 - c. Discharge Quality
 - 1) Monitor discharge for odor of solvent, gasoline, or hydrogen sulfide (rotten egg odor), oil sheen, or unusual color in discharge water.
 - 2) If waste discharge limits identified in Table 1 are exceeded, stop discharging, notify the Resident Engineer, and implement the Contingency Plan.

2.02 MONITORING INSTRUMENT

- A. Use field equipment in-situ:
 1. Calibrated turbidity meter
 2. Calibrated pH meter
 3. Rugged, small, portable and waterproof
 4. Meet the requirements of the EPA Guidance Manual
 5. Maintain calibration records
 6. Acceptable manufacturer:
 - a. Hydrolab
 - b. YSI MS5
 - c. LaMotte 2020 can be used for turbidity
 - d. HACH 2100P
 - e. Approved equal

PART 3 - EXECUTION

3.01 PREPARATION

- A. Post sign at all Sites with name and phone number of the Construction Site Environmental Management Supervisor.

3.02 FIELD QUALITY CONTROL

- A. Site Tests
 1. NPDES Permit Monitoring:
 - a. General:
 - 1) Collect water samples for all point of discharge locations and receiving water upstream and downstream monitoring locations

at the minimum frequencies indicated and in accordance with the Project's NPDES Permit.

- 2) Increase monitoring frequency whenever required.
 - 3) All testing requirements shall be in accordance with the Project's NPDES permit.
2. Collect water samples at all discharge locations in accordance with the Project's NPDES permit.
 3. NPDES permit parameters other than those listed above may be monitored by the Resident Engineer. Provide access to allow such sampling to occur.
 4. The Resident Engineer may collect monitoring samples in addition to those required in this Section and test for constituents both listed in this Section and additional constituents. If results from the sampling indicate a Non-compliance Event, the Resident Engineer will notify Ecology.
 5. Non-compliance Event:
 - a. When not in compliance with discharge limits specified herein, take immediate action to stop the violation and notify the Resident Engineer.
 - b. Collect a discharge sample and submit new data within 1 day of becoming aware of non-compliance.
 - c. When discharge pH is in non-compliance, take immediate steps to bring the discharge into compliance. If it is not possible to be in compliance, stop discharge.
 - d. In the event of a concentrated solution spill, notify the Resident Engineer immediately and stop the discharge.
 - e. Implement the Contingency Plan.
 - f. Conduct monitoring twice daily after a violation is documented until 3 consecutive daily samples show the discharge(s) is in compliance.
 6. Quantity Limitations:
 - a. Implement the Contingency Plan if discharge maximum rates indicated above require reduction from the maximum or discontinue discharge immediately upon notification by Resident Engineer.
 7. Solids Management
 - a. Solids accumulation in the Stormwater treatment pond and tank used for solids settling shall not exceed 25 percent of the tank's hydraulic capacity. For the Stormwater treatment pond and tanks, the 25 percent criterion shall apply at all discrete locations throughout the pond and tanks shall be based on the height of solids in relation to the height of the lowest static water level in the wastewater pond.
 - b. The permittee shall use an instrument capable of displaying the water column to conduct daily (each day discharge to the sewer occurs) inspections of solids accumulation at the following locations:
 - 1) Stormwater pond pumping chamber

- 2) Minimum off our probing locations within the pond, strategically located to gauge overall solids accumulation within the pond. These probing locations must be described in the facility's Stormwater Treatment System Operation, Maintenance, and Supervision Manual.
- 3) Each chamber of the final wastewater settling tank
- c. Observations and measurements made during these daily inspections must be recorded. These records must be maintained on site and must be available for Resident Engineer review.

B. Inspection

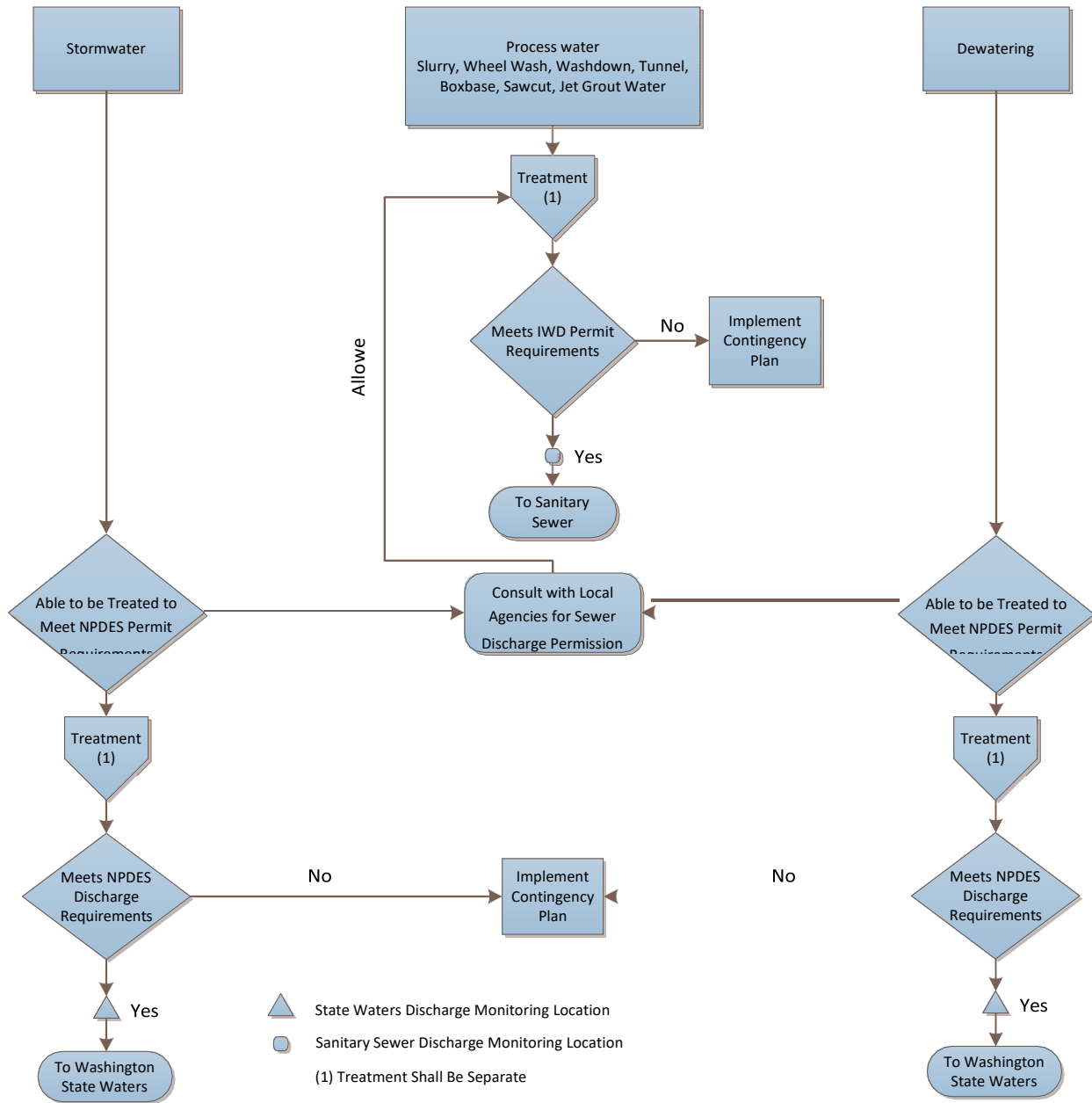
- 1. Grant the Resident Engineer, jurisdictional agencies, and representatives from Ecology the rights of access to:
 - a. Enter the Site where a discharge is located or where all submittals and monitoring logs are kept.
 - b. View and copy submittals and monitoring logs
 - c. Inspect all facilities, equipment (including monitoring and control equipment), practices, methods, or operations regulated or required.
 - d. Sample or monitor all substances or parameters at all locations to ensure Contract compliance.

END OF SECTION

EXHIBITS

Exhibit A: Temporary Site Water Discharge Flow Chart

SECTION 01 57 24 – EXHIBIT A
TEMPORARY SITE WATER DISCHARGE FLOW CHART



END OF EXHIBIT

SECTION 01 60 00
PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section includes specifications for:
 - 1. Existing and new product requirements
 - 2. Procedures for selecting products
 - 3. Sound Transit furnished materials
 - 4. Manufacturers' instructions
 - 5. Nameplates
 - 6. Delivery, storage and handling requirements

1.02 DEFINITIONS

- A. Reused Products or Materials: Products or materials recovered during demolition or construction for subsequent use in its same or similar form.
- B. Renewable Products or Materials: Products or materials made from plants harvested on a less than 10 year cycle.
- C. Recycled Products or Materials: Products or materials generated by households, commercial, industrial or institutional facilities which have served their intended use.
- D. Regional Products or Materials: Products or materials that have been extracted, harvested, recovered or manufactured within 500 miles of the project site.

PART 2 - PRODUCTS

2.01 EXISTING PRODUCTS

- A. Do not use materials and equipment removed from existing premises unless specifically required or permitted by the Contract Documents.
- B. Unanticipated historic items encountered during the Work will remain the property of Sound Transit. Notify Sound Transit promptly upon discovery. Protect, remove, handle and store as directed by Sound Transit.
- C. Existing materials and equipment indicated to be removed, but not to be re-used, relocated, reinstalled, delivered to Sound Transit or otherwise indicated to remain the property of Sound Transit, become the property of the Contractor. The Contractor is responsible to remove them from site and dispose of lawfully.

2.02 NEW PRODUCTS

- A. Do not use products having the following characteristics:

1. Made using or containing CFCs or HCFCs
 2. Made of wood from newly cut old growth timber
- B. Where all other criteria are met, give preference to products that:
1. Are extracted, harvested and/or manufactured closer to the location of the project
 2. Have longer documented life span under normal use
 3. Result in less construction waste

2.03 PROCEDURES FOR SELECTING PRODUCTS

- A. General: The specified requirements for individual products indicated in the Contract are multiple in nature and may include generic, descriptive, proprietary, performance, prescriptive, proscriptive, compliance with standards, compliance with codes, conformance with graphic details and other similar forms of requirements.
1. Noncompliance of a named product: If it is known that a named product or product source does not comply with requirements or is no longer available, advise the Resident Engineer before proceeding.
 2. Equivalent materials and equipment: Whenever a material or article is specified or described by using the name of a proprietary product or the name of a particular manufacturer or vendor, the specific item mentioned is understood as establishing type, function, dimension, appearance and quality desired. Another manufacturer's product may be acceptable provided the specification does not require a designated matching product or is a "no substitution" product, and provided that sufficient information is submitted as required by Contract in order to allow the Sound Transit to determine that the products proposed are equal to or better than those named.
 3. Sustainable requirements: Select products with a goal of incorporating 25% (by cost) of materials made from reused, renewable, recycled and/or regional materials within the project.
- B. Procedures: The options for selecting products are limited by the specified requirements and governing regulations. The following are some of the various selection procedures for specified requirements:
1. Characteristics or Performance Requirements: Provide products that comply with the specific qualities indicated and which are recommended or certified in writing by manufacturer for the specific use indicated. General performance of a product is implied where product is specified for specific performances.
 2. Prescriptive Requirements: Provide products produced in accordance with the prescriptive requirements, using the specified ingredients and components, and complying with the specified requirements for mixing, fabricating, curing, finishing, testing and similar operations.
 3. Or Approved Equal: Where named products or sources are accompanied by the term "or approved equal" or other language of similar effect, provide one of the specified products or submit a request for substitution for a product not named, which the Contractor judges to be of equal or better quality.
 4. Product names: Unless otherwise indicated, products identified by name mean a manufacturer's product as recorded in published literature, of latest issue

preceding the date of Contract Documents. Submit request for substitution in order to use products of a later or earlier model.

5. **Basis-of-Design Product:** A single product identified by name, which cannot be generically represented in the Contract. This product will be identified and detailed in the Contract Documents to indicate sizes, profiles, dimensions and other characteristics based on that product. If another manufacturer's product is proposed by the Contractor, the Contractor is responsible for necessary modifications to the structure and adjacent work and assuring coordination of any substituted product/system. The Contractor assumes all risk of necessary re-design and / or re-construction.
 6. **Comparable Product:** A product deemed acceptable if demonstrated and approved through the submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance and other characteristics that equal or exceed those of the specified product. Other products that meet the specified requirements and are sufficiently equivalent to the Basis-of-Design product in quality (design, configuration, color, pattern, texture, sheen, etc.) to satisfy the design intent of the Designer of Record, may be submitted for consideration. Sound Transit will be the sole judge of aesthetic equivalence.
 7. **Visual Matching:** Where matching an established sample is required, Sound Transit will make final judgment of whether a product proposed by Contractor matches the sample satisfactorily.
 8. **Visual Selection:** Where product requirements include "... as selected from manufacturer's standard colors, patterns, textures..." or words of similar effect, the selection of manufacturing source and basic product, which complies with the requirements, is the Contractor's option, but the selection of color, pattern and texture is Sound Transit's responsibility.
- C. **NonConforming Products:** Use of a product not conforming to specified requirements may only be approved by means of a request for substitution as specified elsewhere.
- D. **Precedence of Specification by Characteristics, Reference Standard and Source:** If it occurs that a product cannot be supplied to meet all requirements, the following order of precedence will be followed:
1. **Characteristics:** For product specified by characteristics or description, and also by reference standard or by source and name, the specified characteristics or description shall take precedence.
 2. **Reference standards:** For product specified by reference to a published standard and by source or name, the reference standard shall take precedence over the source.

2.04 MANUFACTURERS' INSTRUCTIONS

- A. Maintain one (1) set at the site until installation is complete.
- B. Should job conditions or specified requirements conflict with the manufacturers' instructions, notify the Resident Engineer.

2.05 NAMEPLATES

- A. Except as otherwise indicated for required labels and operating data, attach or imprint manufacturer's or producer's nameplates or trademarks on exposed surfaces of the products either in occupied spaces or on the exterior of the work.

- B. Labels:
 - 1. Locate required product labels and stamps on a concealed surface.
 - 2. Attach labels where required for observation after installation, on inconspicuous accessible surfaces in occupied spaces.
- C. Equipment Nameplates:
 - 1. Provide a permanent nameplate on each item of service-connected or power-operated equipment. Indicate the manufacturer, product name, model number, serial number, capacity, speed, ratings and similar essential operating data. Equipment nameplates shall be stainless steel.
 - 2. Locate nameplate on an accessible surface, which, in occupied spaces, is not conspicuous.

PART 3 - EXECUTION

3.01 TRANSPORTATION

- A. Transport products in accordance with manufacturer's instructions.
- B. Pack and brace items while transporting to the site from the plant of manufacture in order to prevent damage. Protect all items from conditions that might have a detrimental effect.

3.02 DELIVERY

- A. Deliver materials in original, sealed containers or packages in an undamaged condition complete with labels and instructions for handling, storing, unpacking, protecting and installing.
 - 1. Promptly inspect shipments to ensure that products comply with requirements, the quantities are correct and the products are undamaged.
 - 2. Do not remove from containers or destroy labels until ready for installation unless otherwise approved by the Resident Engineer.
 - 3. Arrange for the return of packing materials, such as wood pallets, where economically feasible.
- B. Designate receiving/storage areas for incoming materials so that they are delivered according to installation schedule. Minimize long-term storage at Project site and overcrowding of construction spaces.
 - 1. Place materials convenient to work area in order to minimize waste due to excessive handling and misapplication.
 - 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, sensitive to deterioration, subject to theft or other losses.
- C. Verify that equipment supplied and installed under other contracts, but required for the work in this Contract, is compatible.

3.03 STORAGE

- A. All equipment and materials shall be stored in accordance with the manufacturer's recommendations or as specified in the Contract Documents in order to preserve their quality and fitness for the Work. Provide weatherproof, secure storage for materials and equipment at Project site.
 - 1. Stored equipment and materials, although determined acceptable for the Work upon delivery or during storage, must again be inspected by the Contractor for acceptability before their incorporation into the Work.
 - 2. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.
- B. Coordinate location with Resident Engineer. Organize and arrange storage to allow accessibility for inspection, measurement of quantity, and for efficient and timely installation.
 - 1. Comply with product manufacturer's written instructions for temperature, humidity, ventilation and weather-protection requirements for storage.
 - 2. Store products, that are subject to damage by the elements, , above ground, in a weathertight enclosure with ventilation adequate to prevent condensation.
 - 3. Protect stored material from damage and from sunlight. Do not mark in a manner that will remain visible after installation or which will affect performance or appearance.
 - 4. Protect stored products from damage and liquids from freezing.
 - 5. For exterior storage of fabricated products, place on level supports above ground.
 - 6. Store loose, granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.
- C. Store materials in a manner that will not endanger the Project structure.
- D. Sound Transit-furnished materials or materials paid for before incorporation shall be stored in secure locations approved in writing by Sound Transit in a manner that will preserve their full value. Such materials shall be prominently labeled as property of Sound Transit and shall not be commingled with non-Sound Transit owned materials. If necessary, storage shall be in controlled environment buildings.
- E. Off-Site Storage:
 - 1. Provide bonded off-site storage and protection when site does not permit on-site storage or protection.
 - 2. Label with project name, project address and Contractor's name. Insure for full replacement value.
 - 3. If requested by the Contractor and approved in writing by Sound Transit, Sound Transit may make payment to the Contractor for products stored off-site prior to their installation. Such payment will be approved by Sound Transit, only when Contractor has furnished evidence, satisfactory to Sound Transit, of compliance with the requirements of the Contract and, in addition, documentation outlining type and location of storage facilities and a method of inventory, suitable to account for all such materials and products, until installed in the Work.

3.04 HANDLING

- A. Handle products in accordance with manufacturer's instructions when off-loading equipment and materials at jobsite.
- B. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement or damage.

END OF SECTION

SECTION 01 64 00

OWNER-FURNISHED MATERIALS AND EQUIPMENT

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section describes the material to be furnished by Sound Transit, the approximate quantities and schedule delivery of materials furnished, and the delivery, receiving, handling, and storage requirements for Sound Transit-furnished items.

1.02 ABBREVIATIONS:

- A. Sound Transit-furnished materials and equipment may be referred to herein and in other Sections where applicable by the abbreviations OFM (Owner-Furnished Materials) and OFE (Owner-Furnished Equipment) respectively.

1.03 OWNER-FURNISHED/CONTRACTOR INSTALLED ITEMS

- A. The following materials will be Owner-furnished by Sound Transit. Provide pick-up, hauling, and delivery of materials to the project site from *[location]*.

1.

2.

1.04 CONTRACTOR'S RESPONSIBILITIES

- A. Notify the Resident Engineer when the materials will be required for transportation of the materials to the Site and for the installation of the materials in accordance with these Specifications.
- B. Include all costs associated with transporting the Owner-furnished items to the Site as well as all costs associated with installing the Owner-furnished items as required by the Contract Documents.
- C. Assume custody of and provide protection for OFM and OFE from the time of acceptance until the return of excess materials.
- D. Inspect OFM and OFE at time of acceptance and submit certification to the Resident Engineer showing the quantity of accepted materials and equipment. A Sound Transit representative will verify the quantity and condition of materials delivered. Set aside damaged materials and equipment, and immediately notify the Resident Engineer and, if applicable, the delivery carrier in writing of the damage and circumstances of discovery.
- E. Prepare and maintain perpetual inventory records of Sound Transit-furnished materials and equipment. Notify the Resident Engineer of anticipated shortages and assign stock numbers and dates of receipt from Sound Transit. Ensure that all transfers of materials and equipment between the Contractor and Sound Transit are accompanied by an inventory record forms.
- F. Upon Substantial Completion, transport and unload excess OFM and OFE to *[location]* or *[within 50 miles of the Site]*, to be determined by the Resident Engineer.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 71 23
FIELD ENGINEERING

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section includes requirements for construction surveying of the Work and if required, for field measurement of Work quantities.

1.02 SUBMITTALS / TRANSMITTALS

- A. Submittals
 - 1. Qualifications of Surveyor-in-Charge
- B. Transmittals
 - 1. Instrument calibration reports, upon request
 - 2. Cut sheets for all open cut pipeline and pavement restoration work.
 - 3. Survey field notes, survey calculations and electronic files
 - 4. Approved permit and completion report

1.03 QUALITY ASSURANCE

- A. Perform all survey work under the direction and supervision of a Licensed Professional Land Surveyor registered in the State of Washington.
- B. The surveyor-in-charge of the field work shall have a minimum of 5 years of experience as surveyor-in-charge on Work of comparable scope, magnitude and complexity.
- C. Perform all survey work in conformance with the Contract and survey requirements imposed by State of Washington and / or the local jurisdiction(s) through a permit, development condition, law or regulation.

1.04 PROJECT CONDITIONS

- A. Construction Control monuments and benchmarks, generally referred to as Construction Control Points (CCPs), will be provided by Sound Transit. CCPs for vertical and horizontal control are indicated on the Contract Drawings.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 CONSTRUCTION

- A. General:

1. Prior to the start of Work, verify the coordinates and elevations of the CCPs as shown on the Contract Drawings. Inform the Resident Engineer of any discrepancies which may be identified. The Resident Engineer will work with the designer and the Contractor to resolve such discrepancies.
2. Maintain all CCPs and replace those that become damaged or destroyed, at no additional cost to Sound Transit.
3. Use provided CCPs to control establishment of the lines and grades required for completion of the Work.
4. From the CCPs establish and maintain all secondary or additional survey control and control points, stakes, hubs or marks as needed for the construction of the Work. As necessary re-establish such secondary or additional survey control and control points, stakes, hubs or marks that become damaged or destroyed, at no additional cost to Sound Transit
5. Develop and maintain detailed survey records that allow the survey work to be retraced.
6. Maintain and preserve all monuments, stakes and markers outside the construction limits. In the event that monuments, stakes or markers are destroyed or damaged, replace them at no cost to Sound Transit. Provide new replacement monuments and boxes when removed or damaged during construction.
7. Identify survey control monuments within the construction limits that have the potential to be disturbed or removed during construction. Prepare and file a Washington State Department of Natural Resources (DNR) Permit to Destroy or Remove Survey Monument for each monument that falls into this category. Prepare and file the Completion Report for Monument Removal or Destruction with the DNR once the monuments have been replaced.
8. Perform all surveys for layout and performance of the Work, reduce the field notes and make all necessary calculations and drawings to carry out such work. Check the relative positions of all monuments and benchmarks each time monuments or benchmarks are used.
9. Use instruments and other survey equipment that are accurate, suitable for the surveys required in accordance with recognized professional standards and in proper condition and adjustment at all times. Carry out instrument calibrations prior to the start of survey work and every 12 months thereafter. Furnish calibration reports upon request.
10. Record all surveys manually in field notebooks or automatically by electronic means. Furnish a certified copy of the original pages of field books or printed copies of the electronic records to the Resident Engineer upon request. Furnish each field notebook and an electronic copy of the electronically recorded data to the Resident Engineer at the completion of the project or sooner if requested.
11. The Resident Engineer may check the Contractor's surveys at any time as those surveys are a part of the Work required by the Contract. The Contractor is responsible for lines, grades or measurements, which do not comply with specified or proper tolerances or which are otherwise defective, and for the resultant defects in the Work. Conduct resurveys or check surveys to correct errors indicated by review of the field notebooks or electronic data.

12. The Resident Engineer may require that work be suspended at any time when the location and limit marks established by the Contractor are not reasonably adequate to permit inspection of the Work.
 13. In advance of any restoration paving, produce survey information to check the line and grade used for paving elevations and slopes.
- B. Surveys for Underground Structures
1. Establish and maintain control for line and grade within the underground construction.
 2. Complete an optical survey and immediately provide survey results for the actual tunnel alignment, grade and temporary and permanent lining configuration on, at least, a weekly basis or at 300-foot intervals for the tunneling progress, whichever comes first, or sooner if required by the Resident Engineer. Immediately verify apparent changes in location or deviations from allowable tolerances and notify the Resident Engineer.
 3. Adjust the published coordinates (horizontal and vertical) of these survey points as necessary and provide the revised coordinates to the Resident Engineer as soon as possible after verification of the location information.
 4. Follow up the surveys with an As-Built Drawing, indicating the results of the survey and any deviation from the tolerances as indicated in the Contract Documents.
- C. Surveys for Measurement and Payment
1. Perform surveys for all unit priced Contract Price Schedule items that are necessary to be measured by surveying methods.
 2. Reduce the field notes and calculate quantities for payment purposes. Provide a duplicate copy of the note reductions and calculations to the Resident Engineer.
- D. Surveys for Record Drawings (As-Built Drawings)
1. Perform surveys as required to accurately indicate the record (as-built) information for all components of the Work.
- E. Surveying Accuracy and Tolerances in Setting Survey Stakes or Markers
1. Perform all control traverse field surveys and computations, including surveys of main control lines to determine alignment of major structure components, to a precision of at least 1:20,000 after azimuth closure and adjustment.
 2. Set survey stakes or markers within the tolerances in Table A, herein, unless more stringent tolerances are specified elsewhere in the Contract Documents. Table A does not otherwise relieve the Contractor of responsibility for measurements in compliance with the Contract requirements.
 3. Do not exceed the following tolerances in setting survey stakes or markers:

TABLE A - SURVEYING ACCURACY AND TOLERANCES

	Tolerance in Staked Point	
Setting Survey Stakes or Markers:	Horizontal	Vertical
Markers on hubs and monuments on centerlines and offset centerlines.	0.02 foot	0.01 foot
Intermediate Stakes or Markers on Centerlines and Offset Centerlines for:	Horizontal	Vertical
Rough excavation and embankment for roads and for other work not otherwise provided	0.12 foot	0.10 foot
Trimming of excavation and embankment, unless otherwise provided	0.12 foot	0.10 foot
Structures (including at-grade, aerial and underground), building construction,	0.02 foot	0.01 foot
Equipment installation	As required by manufacturer	
Trimming or preparation of earth subgrade for roadways, trackway, concrete pipe and other concrete structures	0.12 foot	0.10 foot
Trackway sub-ballast, roadway sub-base and base, steel pipe and for other work not otherwise provided	0.12 foot	0.05 foot
Roadway surfacing, steel reinforcement, concrete pipe and other formed concrete	0.05 foot	0.02 foot

END OF SECTION

SECTION 01 71 30

PROTECTION AND MAINTENANCE OF PROPERTY AND WORK

PART 1 - GENERAL

1.01 SUMMARY

This Section specifies protection and maintenance of underground and aboveground utilities, structures, fences, parking strips, sidewalks, driveways, streets and other improvements, which may be affected by the Work.

1.02 DEFINITIONS

A. Conflict: An existing Major Underground Utility is considered to be in Conflict if:

1. It crosses or projects into the specified excavation at an elevation between the top and bottom of the proposed Facility
2. When parallel to a proposed Facility within the zone-of-influence (1:1)

If the proposed Facility does not meet the above listed requirements, then no Conflict exists.

B. Facility: A real property entity consisting of one or more of the following: an underground or aboveground utility system or structure, pavement or other improvement.

C. Major Utility: A transmission, collection or distribution line that is not considered a Minor Utility.

D. Minor Utility: Any Service Line regardless of size or type, water lines of 4-inch diameter and less, sanitary sewer lines of 6-inch diameter and less, natural gas lines of 2-inch diameter and less, and any irrigation line, including all appurtenances.

E. Service Line:

1. Utility line, the function of which is to directly connect the improvements on an individual property (e.g., residential, industrial or commercial) to a larger utility system line, located off said property or in an easement / right of way on said property, to which other utility lines also connect.
2. Any cable or conduit that supplies an active feed from a utility Owner's facilities to activate or energize any federal, state or local governmental entity's local lighting and electrical systems, traffic control systems, street lights, communication systems or irrigation systems.

Service lines which are encountered and which may need relocation or other changes to achieve the Work shall not be considered as the basis of any Claim or Change Order, or for payment under the Provisional Sum Item for Unidentified Utility Conflicts

1.03 SUBMITTALS / TRANSMITTALS

A. Listing and schedule of all potholing

B. Listing of utilities/facilities to be physically protected and relocated

- C. Listing of utilities/facilities to be physically protected and supported in place
- D. Qualifications for independent third party pre- and post-construction inspectors
- E. Pre- and post-construction inspections and surveys of utilities and buildings
- F. WSDOT Pavement Survey Work Plan

1.04 QUALITY ASSURANCE

Independent, third-party inspectors shall have a minimum of 5 years performing work of similar nature.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 LOCATION OF EXISTING FACILITIES

- A. Coordinate efforts to locate existing underground utilities. A minimum of 30 days prior to work in the location of a utility, review with the Resident Engineer the locations of existing utilities in relation to the Work and evaluate areas of conflict and potential conflict.
- B. Excavate (pothole) and expose existing Major and Minor Underground Utilities prior to the work to determine utility dimensions and elevations.
- C. Sound Transit will not be liable for utility protection, modification and relocation that is not indicated on the Contract Drawings but is required by the Contractor due to its means and methods. Determine the requirements of the Work specified in the Contract Documents and make necessary provisions for the protection, modification, support and/or relocation of utilities or other facilities as necessary to perform the Work.
- D. Remove, plug or fill abandoned pipelines in accordance with the local jurisdiction's requirements.
- E. Storm and sanitary sewers:
 - 1. Existing live sewers shall remain in service, unless otherwise indicated.
 - 2. If interruption of sewers is required, provision shall be made for disposal of existing flows.
 - 3. Immediately repair, to a condition equal to or better than that existing prior to the damage, construction damage caused to the existing sewer system and manholes.
 - 4. With prior approval from the local authority having jurisdiction, flush existing pipes that were affected by the Work, from the point of the next upstream connection. Clean and repair all pipelines or manholes affected by gravel, rocks or other debris that has entered the existing system during construction.
 - 5. Connection of new Work to an existing manhole or sewer line shall not be made until approved by the Resident Engineer.
- F. Aboveground electrical cable and communication facilities:
 - 1. Support poles that are at risk of being undermined by the Work.

2. Comply with all applicable requirements and regulations for work in the vicinity of energized primary conductors.
- G. Underground electrical cable, communication and fiber optic facilities:
1. Protect these underground facilities and accomplish with the Work of the Contract.
 2. Fiber optics:
 - a. When not indicated on the Contract Drawings and if in conflict with the new facility, meet and agree with the Resident Engineer and the utility owner on how to proceed.
 - b. When not indicated on the Contract Drawings and not in conflict with the new facility, no additional payment will be considered.
- H. Gas:
1. As required by the appropriate utility owner, protect, maintain, support in place or relocate all gas mains crossing pipeline trenches and other elements of the Work.
 2. Provide a minimum of 12 inches of clearance, measured from edge to edge, between gas mains or gas service lines and new facilities.
 3. If relocating either utility to obtain the 12 inches of clearance is not practical, provide a protective wrap for the entire distance where there is less than 12 inches of clearance.
 4. Provide a split polyvinyl chloride (PVC) pipe or PVC wrapping of at least 0.04 inch in thickness, applied to gas mains and lines.
 5. Protect and maintain all temporary gas service slack lines during pipeline installation.
 6. Notify the gas utility owner through the Resident Engineer at least 30 days in advance of excavation in the vicinity of high-pressure gas mains.
- I. Water:
1. Maintain water service along the alignment of Work at all times, unless otherwise permitted by the Resident Engineer for utility service cutovers.
 2. Existing thrust blocks are not indicated on the Contract Drawings. Assume that thrust blocks are present at all water line deflections of 11.25 degrees or greater.
- J. Roadways:
1. Take adequate precautions to protect existing sidewalks, driveways, parking strips, curbs, pavements, fences, utilities, adjoining property structures and other improvements to avoid damage thereto.
 2. Protect and replace traffic signage, paint striping and channelization, if damaged by the Contractor's operation.
 3. Unless otherwise indicated, maintain the existing illumination pattern for signs and roads at all times.

4. Install temporary roadway lighting, as necessary.

3.02 SHORING AND BRACING

Shore up, brace, underpin and protect, as necessary, the foundations and other parts of existing structures adjoining the Site of the Work that may be affected by the Work.

3.03 PRE- AND POST-CONSTRUCTION VIDEO INSPECTION UTILITY SURVEYS

For those utilities listed in Appendix A to this Specification Section, have an independent third party perform closed circuit television (CCTV) inspection surveys at least 30 days prior to the start of construction in the vicinity of the utility lines to be surveyed. Have the inspecting party perform a post-construction CCTV inspection surveys within 60 days following the completion of construction in the vicinity of the utility lines to be surveyed. Transmit a copy of the pre- and post- construction CCTV inspection survey records to Sound Transit with 30 days after performing each inspection survey. The inspecting party shall maintain the original CCTV inspection survey records until Acceptance of the Work. Transmit the original pre- and post-construction CCTV inspection survey records to Sound Transit within 60 days after Acceptance of the Work, or within a time period specifically authorized by the Resident Engineer. Notify local utility owners of the planned inspections a minimum of 7 days in advance. Coordinate inspections with the local utility owners.

3.04 PRE- AND POST-CONSTRUCTION LEAK DETECTION UTILITY SURVEYS

For those utilities listed in Appendix A to this Specification Section have an independent third party perform pre-construction leak detection surveys at least 30 days prior to the start of construction in the vicinity of the utility. Have the independent third party perform a post- construction leak detection survey within 60 days following the completion of construction in the vicinity of the utility lines to be surveyed. Transmit a copy of the pre- and post-construction leak detection survey records to Sound Transit with 30 days after performing the leak detection survey. The inspecting party shall maintain the original leak detection survey records until Acceptance of the Work. Transmit the original pre- and post-construction leak detection survey records to Sound Transit within 60 days after Acceptance of the Work, or within a time period specifically authorized by the Resident Engineer. Notify local utility owners of the planned inspections a minimum of 7 days in advance. Coordinate inspections with the local utility owners.

3.05 PRE- AND POST-CONSTRUCTION BUILDING, BRIDGE, UTILITY TUNNEL, PARKING GARAGE, SURFACE FEATURE SURVEYS

- A. Have an independent third party conduct pre- and post-construction inspections of the facilities listed in Appendix A to this Specification Section.
- B. Pre-construction surveys shall document interior and exterior inspections of conditions prior to commencement of construction activities in the vicinity of the facilities to be surveyed. Post-construction surveys shall document interior and exterior inspections of conditions subsequent to Acceptance of the Work.
 1. Survey documents including but not limited to the following:
 - a. Handwritten notes
 - b. Audio notes on tape
 - c. Color photographs and videos:
 - 1) Requirements for photographs and videos are specified elsewhere in the Contract

- 2) Include time stamp and narrative giving location of the items being shown.
 - 3) Identify houses and buildings visually by house number, when visible.
 - d. Inspection forms approved by the Resident Engineer
 - e. Document all visible cracks, defects or unusual conditions. Document and record all comments made by property owners during inspections.
 - 2. Coordinate all pre- and post-construction surveys with the Resident Engineer. Do not perform pre- or post-construction surveys unless accompanied by the Resident Engineer or its designee.
 - 3. Transmit a copy of each inspection to Sound Transit within 30 days after completion of that survey. Have the independent third party perform a post-construction inspection within 60 days following the completion of construction in the vicinity of the facility to be inspected. Have the independent third party maintain the original inspection reports until Acceptance. Transmit the original pre- and post-construction inspection reports to Sound Transit within 60 days after Acceptance of the Work or within a time period specifically authorized by the Resident Engineer.
 - 4. Do not access private property unless a right-of-entry permit has been obtained through Sound Transit or a temporary construction easement is granted to the Contractor through the terms of the Contract. Maintain a log of the rights of entry and permitted access for each property and the dates of entry on which the surveys of the current conditions were performed.
- C. For those WSDOT facilities listed in Appendix A to this Specification Section, have an independent third party perform pre- and post-construction survey inspections.
- 1. Perform all pre-construction surveys of WSDOT bridges, overpasses, retaining walls and pavements prior to commencement of the Work on or in the vicinity of the structures.
 - 2. Perform all post-construction surveys of WSDOT bridges, overpasses, retaining walls and pavements within 60 days after the Work is complete
 - 3. WSDOT Pavement Survey Work Plan:
 - a. Describe in detail proposed methods and equipment to be used to survey WSDOT pavement elevations and grades to an accuracy of 0.01 foot.
 - b. Photograph pavement surfaces.
- D. For those haul routes listed in Appendix A to this Specification Section, videotape the haul routes before the start of construction and then once every year thereafter until Acceptance of the Work. Requirements for video recording are specified elsewhere in the Contract.

END OF SECTION

APPENDIX

Appendix A: Protection and Maintenance of Property and Work

SECTION 01 71 30 - APPENDIX A

PROTECTION AND MAINTENANCE OF PROPERTY AND WORK

- A. Pre- and Post-Construction Video Inspection Utility Surveys
 - 1. Perform pre- and post-construction closed circuit television (CCTV) inspection of the following utilities.
 - a. Sanitary Sewer
 - 2. Perform post-construction closed circuit television (CCTV) inspection of the following utilities.
 - a. Sanitary Sewer
 - b. Storm drainage
- B. Pre- and Post-Construction Leak Detection Utility Surveys
 - 1. Perform pre- and post-construction leak detection inspection of the following utilities.
 - a. Not Applicable
 - 2. Perform post-construction leak detection surveys of the following utilities:
 - a. Water mains
 - 3. In addition to pre- and post-construction leak detection surveys, perform additional surveys on the following utilities:
 - a. Not Applicable
- C. Pre- and Post-Construction Building, Bridge, Utility Tunnel, Parking Garage and Surface Feature Surveys: Perform pre- and post-construction survey inspections of the following:
 - 1. Buildings
 - a. Interior and exterior of north side of Vancouver Door factory
 - 2. Bridges / Overpasses
 - a. Not Applicable
 - 3. Retaining Walls
 - a. Not Applicable
 - 4. Parking Garages
 - a. Not Applicable
 - 5. Pavements
 - a. Not Applicable

- 6. Surface Features
 - a. Not Applicable
- 7. Utility Tunnels
 - a. Not Applicable
- D. Post-construction survey inspections of WSDOT facilities
 - 1. Bridges / Overpasses
 - a. Not Applicable
 - 2. Retaining Walls
 - a. Not Applicable
 - 3. Pavements
 - a. Not Applicable
- E. Videotape the following haul routes:
 - 1. Not Applicable

END OF APPENDIX

SECTION 01 73 29**CUTTING, FITTING AND PATCHING****PART 1 - GENERAL****1.01 SUMMARY**

This Section includes requirements for cutting, fitting and patching required to accomplish the Work. This Section is to be used in conjunction with other specification sections which may stipulate additional requirements or place limitations on the cutting, fitting and patching activities.

1.02 SUBMITTALS

- A. Written Request for Approval: For all cutting, fitting or patching which affect the following:
 - 1. Work by Sound Transit or another contractor
 - 2. Structural value or integrity of any element of the Project
 - 3. Integrity or effectiveness of weather exposed or moisture resistant elements or systems
 - 4. Building aesthetic qualities for exterior areas or in occupied spaces
 - 5. Efficiency, operational life, maintenance or safety of operational systems,
- B. Cutting, Fitting, and Patching Proposal: The Contractor is to submit a written request to and receive approval from the Resident Engineer prior to proceeding with the cutting, fitting or patching Work. The written request shall include the following:
 - 1. A description of the extent of cutting, fitting and patching required, including a description of how it will be performed and why it is required, if it cannot be avoided.
 - 2. A description of anticipated results in terms of changes to existing construction, including changes to structural elements and operating components as well as changes in the building's appearance and other significant visual elements.
 - 3. A list of utilities that will be disturbed or affected, including those that will be relocated and those that will be temporally out of service, including how long service will be disrupted.
- C. Structural Details and Engineering Calculations: Where cutting, fitting and patching involves addition of reinforcement to structural elements, submit details and engineering calculations to show how reinforcement is integrated with the original structure to satisfy requirements.
- D. Proposed Change of Materials or Methods: Should conditions of work or schedule dictate a change of materials or methods, submit written recommendations to Resident Engineer, including:
 - 1. Conditions necessitating the change

2. Recommendations for alternative materials or methods
3. Submittal as required for substitution

1.03 QUALITY ASSURANCE

- A. Do not cut and patch structural elements in a manner that would change their load carrying capacity or load deflection ratio.
- B. Do not cut and patch operating elements or related components in a manner that would result in:
 1. Reducing their capacity to perform as intended.
 2. Increased maintenance or decreased operational life or safety.
- C. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in the Sound Transit's opinion, reduce the building's aesthetic qualities.
- D. Do not cut and patch construction in a manner that would result in visual evidence of cutting, fitting and patching.
 1. If possible retain the original installer or fabricator to cut and patch exposed Work. If it is impossible to engage the original installer or fabricator, engage another recognized experienced and specialized firm.
 2. Remove and replace construction that has been performed in a visually unsatisfactory manner, as determined by Sound Transit.

PART 2 - PRODUCTS

2.01 MATERIALS

Use materials that are:

- A. Identical to the existing materials, whenever possible, or
- B. For exposed surfaces, visually match the existing adjacent surfaces to the fullest extent possible, if identical materials are unavailable or cannot be used, and
- C. Use materials whose installed performance will equal or surpass that of existing materials.

PART 3 - EXECUTION

3.01 INSPECTION

- A. Before commencing the cutting, fitting or patching, examine surfaces to be cut and patched, and the conditions under which the Work is to be performed. If unsafe or unsatisfactory conditions are encountered, take corrective action before proceeding.
- B. After uncovering Work, inspect conditions affecting installation of new products.
- C. Report unsatisfactory or questionable conditions to the Resident Engineer in writing and do not proceed with the Work until the Resident Engineer has provided further instruction.

3.02 PREPARATION PRIOR TO CUTTING AND FITTING

- A. Provide shoring, bracing and support as required to maintain structural integrity of the affected portion of the Work.
- B. Protect existing Work, furnishings and equipment during cutting, fitting and patching to prevent damage.
- C. Provide protection from adverse weather conditions for portions of the Project that might be exposed during cutting, fitting and patching operations.
- D. Avoid interference with the use of adjoining areas or interruption of free passage to adjoining areas.

3.03 PERFORMANCE

- A. Employ skilled workmen to perform cutting, fitting and patching.
- B. Proceed with cutting, fitting and patching at the earliest feasible time and complete without delay.
- C. Cut existing construction using methods least likely to damage elements to be retained or adjoining construction. Where possible, review proposed procedures with the original installer. Comply with the original installer's recommendations.
 - 1. In general, where cutting and fitting is required, use hand or small power tools designed for sawing or grinding, not hammering and chopping.
 - 2. Cut holes and slots neatly to the size required with minimum disturbance of adjacent surfaces.
 - 3. Temporarily cover openings when not in use.
 - 4. To avoid marring existing finished surfaces, cut or drill from the exposed or finished side into concealed surfaces.
 - 5. Cut through concrete and masonry using a cutting machine such as a carborundum saw or diamond core drill.
 - 6. Where utility services, such as pipe or conduit, are shown or required to be removed, relocated or abandoned, bypass the utility services before cutting. Cut pipe or conduit in walls or partitions to be removed. Install cap or valve, or plug and seal the remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after bypassing and cutting.
- D. Patch so that the seams are durable and as invisible as possible. Comply with specified tolerances.
 - 1. Where feasible, inspect and test patched areas to demonstrate integrity of the installation.
 - 2. Restore the exposed finishes of patched areas and extend the finish restoration into the undisturbed adjoining construction in a manner that will eliminate evidence of patching and refinishing.
 - 3. Where removal of walls or partitions extends from one finished area into another, patch and repair floor and wall surfaces in the new space to provide an even surface of uniform color and appearance. If necessary, remove the remaining existing floor and wall coverings from areas outside of the patch and replace with new materials to achieve uniform color and appearance.

4. Where patching occurs in a smooth painted surface, extend final paint coat over entire undisturbed adjoining area containing the patch, after the patched area has received primer and second coat.
 5. Patch, repair or rehang existing ceilings as necessary to provide an even plane surface of uniform appearance.
- E. Approval by the Resident Engineer to proceed with cutting, fitting and patching work does not waive the Resident Engineer's right to later require complete removal and replacement of Work found to be unsatisfactory.

3.04 CLEANING

Thoroughly clean areas and spaces where cutting and patching has been performed or which has been used as access. Completely remove paint, mortar, oils, putty and items of similar nature. Thoroughly clean piping, conduit and similar features before painting or other finishes are applied. Restore damaged pipe covering to its original condition.

END OF SECTION

SECTION 01 74 00

CLEANING AND WASTE MANAGEMENT

PART 1 - GENERAL

1.01 SUMMARY

- A. In all cases, follow the specific permits for this project. If permits do not address the following provisions, these provisions apply:
- B. Section includes requirements for the following:
 - 1. Cleanup activities
 - 2. Salvaging nonhazardous construction and demolition (C&D) debris as required
 - 3. Recycling nonhazardous construction and demolition debris
 - 4. Disposing of nonhazardous construction and demolition debris
 - 5. Special project procedures for transients – homeless and illegal encampments

1.02 DEFINITIONS

- A. Bio-sweep: A process of inspecting the Site to identify and remove transients, removal, storage, and return of personal property, Site cleanup, which addresses all biological and associated physical hazards present, evictions, and periodic Site maintenance.
- B. Commingled C&D Recycling: A method of recovery where recyclable construction and demolition debris are mixed together at the Work Site and brought to a recycling facility for sorting.
- C. Construction and Demolition Debris: Construction, Demolition and Land Clearing Debris (CDL). All non-hazardous solid waste and building materials resulting from construction, remodeling, renovation, repair, demolition, selective demolition, and land-clearing operations. Consists of, but is not limited to, wood waste, concrete, brick, asphalt, other aggregates, gypsum wallboard, glass, scrap metal, roofing, siding, wire, insulation, packaging materials, intact building materials and fixtures, and land-clearing debris such as, brush, shrubs, plants, limbs and trees.
- D. Deconstruction: The systematic disassembly of a structure in order to maximize the salvage of reusable building materials first and to recycle materials second.
- E. Disposal: Off-site removal of construction and demolition debris and subsequent final deposit in landfill or incinerator.
- F. Recycling: Recovery of Construction and Demolition Debris for subsequent processing (sorting, cleaning, treating, reconstituting) in preparation for use in the manufacture of a new product.
- G. Reuse: Recovery of Construction and Demolition Debris and subsequent use of the material in its same or similar form. Materials can be reused on Site or in other Work. Examples include, but are not limited to, grinding concrete for use as subbase material; chipping land-clearing debris for use as mulch.

- H. Salvage: Recovery of Construction and Demolition Debris for subsequent sale. Reuse in another facility, or donation to a third party.
- I. Source-Separated C&D Recycling: The process of separating recyclable Construction and Demolition Debris in separate containers as they are generated at the Work Site. The separated materials are hauled directly to a Recycling facility.

1.03 SUBMITTALS

- A. Site-specific Waste Management Plan
- B. Waste Management Progress Reports: Concurrent with each Application for Payment and no less frequently than monthly, submit report (Exhibit A for construction Work and for demolition Work). Include the following information and any additional requirements (not listed below):
 - 1. Generation point of waste (including project address)
 - 2. Total quantity of waste generated in tons
 - 3. Quantity and type of waste reused
 - 4. Quantity and type of waste salvaged
 - 5. Quantity and type of waste recycled
 - a. Specify collection method (source-separated or commingled). For commingled materials, include verification of the recycling rate for commingled loads at the facility (or provide King County certified facility diversion rates).
 - 6. Total quantity and types of waste recovered (reused plus salvaged plus recycled) in tons
 - 7. Total quantity of waste recovered (reused plus salvaged plus recycled) as a percentage of total waste generated
 - 8. Statement of discovery of Hazardous or Contaminated Substances. Report abatement, remediation, disposal methods and provide final report from certified hazardous material vendor
 - 9. Statement of current regulatory compliance for all facilities receiving waste
 - 10. If directed by Sound Transit, the Contractor shall use King County waste reporting requirements in lieu of the form in Exhibit A.
 - 11. Final Progress Report, summarizing all efforts and totaling waste recovered, to be submitted upon Substantial Completion.
- C. Qualification Data: For waste management coordinator and recycling facility (certification)
- D. Waste Management Calculations: Prior to Substantial Completion, submit calculated end-of-Contract rates for Reuse, Salvage, Recycling, and Disposal as a percentage of total waste generated by the Work.
- E. Records of Donations: Indicate receipt and acceptance of reusable or salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.
- F. Records of Sales: Indicate receipt and acceptance of reusable or salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.

- G. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities permitted or certified to accept them. Include manifests, weight tickets, receipts, and invoices.
- H. Landfill, Incinerator, and Intermodal Facility Disposal Records: Indicate receipt and acceptance of waste by landfills, incinerator, and intermodal facilities permitted to accept them. Include facility diversion reports, manifests, weight tickets, receipts, and invoices.
- I. Prepare a written plan for Work Site cleanup or bio-sweep in accordance with requirements specified in Article 1.06 herein. The plan can be incorporated into or follow the requirements of the Hazardous or Contaminated Substance Health and Safety Plan Hazardous or Contaminated Substance Health and Safety Program. Submit the plan to the Resident Engineer prior to commencing cleanup Work.

1.04 QUALITY ASSURANCE

- A. Regulatory Requirements: Construction and demolition waste management activities in compliance with all applicable regulations of authorities having jurisdiction for the Work.
- B. Waste Management Coordinator: Engage a waste management coordinator to be responsible for implementing, monitoring, and reporting status of Waste Management Work Plan.
- C. Refrigerant Recovery Technician Qualifications: Certified by EPA-approved certification program if applicable.
- D. Waste Management Pre-Construction Meeting: Review methods and procedures related to waste management including, but not limited to, the following:
 - 1. Review and discuss waste management plan including responsibilities of waste management coordinator.
 - 2. Review requirements for documenting quantities of each material type and their disposition.
 - 3. Review and finalize procedures for materials separation and verify adequate availability of containers and bins.
 - 4. Review procedures for periodic material collection and transportation to Recycling and Disposal facilities.
- E. Training: Provide mandatory on-site instruction on appropriate separating, handling, recycling, recovering, and compost methods to be used by all parties at the appropriate stages of the Work at the Site. Distribute waste management plan to entities when they first begin work on Site and review at regular job and safety meetings.
- F. Signage: Provide consistent recycling and composting signage throughout the jobsite offices and jobsite at points of creation/collection (lunchrooms, kitchens). Graphics shall be consistent in color, image, and message, while be located on every collection container and areas where waste is generated.
- G. Include discussion of waste management and Recycling in regular quarterly job meeting and job safety meetings conducted during the course of work at the Site. Include report out of landfill diversion rates, items recently salvaged or reused, and discuss improvement opportunities (recyclables spoiled through mis-sorting).

1.05 WASTE MANAGEMENT PLAN

- A. Develop a waste management plan consisting of methods for waste identification. Include separate sections in Plan for Demolition and construction waste. Indicate types and quantities by weight.
- B. Waste Identification: Indicate anticipated types and quantities of demolition, land clearing and construction waste generated by the Work, as listed in Exhibit A. Include estimated quantities and assumptions for estimates.
- C. Confirm through an Asbestos Hazard Emergency Response Act (AHERA) Inspection Report and other investigation reports for Hazardous or Contaminated Substances that the Project Site does not contain Hazardous or Contaminated Substances. A report or the Hazardous Building Material Clearance form indicating the Project Site has been remediated or does not contain Hazardous or Contaminated Substances is required to be provided to the Waste Management Coordinator and distributed to all haulers and receiving Salvage and Recycling facilities, in accordance with regulations of authorities having jurisdiction, such as the Puget Sound Clean Air Agency and Washington Department of Labor and Industries.
- D. List each type of waste and whether it will be reused, salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.
 - 1. Salvaged Materials for Reuse: For materials that will be salvaged and reused in this Project or other Work, describe methods for preparing salvaged materials before incorporation into the Work.
 - 2. Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers. List individuals or organizations responsible for removing materials from Project Site (names, addresses, telephone numbers, and current insurance certificates).
 - 3. Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers. List individuals or organizations responsible for removing materials from Project Site (names, addresses, telephone numbers, and current insurance certificates).
 - 4. Recycled Materials: Include list of anticipated certified C&D receivers and processors and type of recycled materials each will accept. Include names, addresses, certification, and telephone numbers.
 - 5. Disposed Materials: Indicate how and where materials will be disposed. Include name, address, and telephone number of each facility, transfer station, landfill and incinerator facility.
 - 6. Handling and Transportation Procedures: Include methods that will be used for separating recyclable waste, including sizes of containers, container labeling, and designated location(s) where materials separation will be performed, and source-separated or commingled collection.
 - 7. Provide names, addresses, and telephone numbers of hauling contractor(s), as applicable.
- E. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.

- F. Training: Indicate the procedures for mandatory on-site instruction on appropriate separation, handling, recycling, recovery, and compost methods to be used by all parties at the appropriate stages of the work at the Site. Distribute waste management plan to subcontractors when they first begin work on-site and review at regular job and safety meetings.
- G. Signage: Indicate the program for consistent signage at all collection containers and areas waste is generated.
- H. Reporting: Indicate reporting procedures for this project.

1.06 BIO-SWEEP HEALTH AND SAFETY PLAN

- A. Plan Requirements
 - 1. Prepare under the supervision of a certified industrial hygienist and incorporate all required County, State, and Federal health and safety provisions.
 - 2. Include requirements of the Federal Occupational Safety and Health Act of 1970 (OSHA), all amendments, and all other applicable health regulations.
 - 3. Include an initial Site assessment by the industrial hygienist prior to preparation of the plan.
 - 4. Break the initial cleanup into identifiable construction areas.
- B. At least one copy of the plan shall be posted at the Work Site while cleanup Work is in progress.
- C. The industrial hygienist shall perform one or more follow-up Site assessments as needed to approve the Site following completion of the initial Site cleanup.

PART 2 - PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

- A. General: Achieve end-of-Contract rates for Reuse/Salvage/Recycling of 80 percent minimum by weight of total non-hazardous solid waste generated by the Work. Practice efficient waste management in the use of materials during the Work. Use all reasonable means to divert deconstruction, construction and demolition debris from landfills and incinerators by one or a combination of the following activities in order of priority.
 - 1. Reuse
 - 2. Salvage
 - 3. Source-Separated C&D Recycling
 - 4. Commingled C&D Recycling
- B. Materials for which Reuse, Salvage, or Recycling is Required: In conformance with requirements promulgated by authorities having jurisdictions, and industry best practices, 100 percent of the following materials must be separated for Reuse, Salvage, or Recycling, regardless of Reuse/Salvage/Recycling goal indicated in Article 2.01A herein:
 - 1. Asphalt paving
 - 2. Asphalt roofing shingles

3. Brick
 4. Cardboard
 5. Carpet
 6. Concrete
 7. Gypsum Scrap (new construction only)
 8. Metals
 9. Plastic sheet and film
 10. Wood (readily recyclable – unpainted and untreated)
- C. Materials for which Reuse, Salvage, or Recycling are Practicable: material shall be Reused, Salvaged, or Recycled whenever practicable. Construction and Demolition Debris that can be Reused, Salvaged, or Recycled include, but are not limited to, the following:
1. Uncontaminated Packaging materials:
 - a. Paper
 - b. Polystyrene packaging
 - c. Wood crates
 2. Division 03 – Concrete
 - a. Concrete reinforcing steel
 - b. Concrete masonry units
 3. Division 06 - Wood, Plastics, and Composites
 - a. Vertical timbers
 - b. Glu-lam beams
 - c. Wood studs/joists
 - d. Plywood and oriented strand board (OSB)
 - e. Wood paneling
 - f. Wood trim
 - g. Wood decking
 - h. Casework
 4. Division 07 – Thermal and Moisture Protection
 - a. Insulation
 5. Division 08 - Openings
 - a. Doors and frames
 - b. Exterior wood windows

- c. Stained glass windows
 - d. Vinyl windows
 - e. Door hardware
 - f. Glazing
- 6. Division 09 – Finishes
 - a. Metal studs
 - b. Acoustical tile and panels
 - c. Carpet pad
- 7. Division 10 – Specialties
 - a. Demountable partitions
- 8. Division 11 - Equipment
 - a. Elevator equipment
- 9. Division 12 – Furnishings
 - a. Cabinets
- 10. Division 21 – Fire Suppression
 - a. Sprinklers
- 11. Division 22 – Plumbing
 - a. Plumbing fixtures
 - b. Piping – (see Division 5 Metals)
 - c. Supports and hangers - (see Division 5 Metals)
 - d. Valves
- 12. Division 23 – Heating, Ventilating, and Air-Conditioning (HVAC)
 - a. Mechanical equipment – (see Division 5 Metals)
 - b. Refrigerants
- 13. Division 26 – Electrical
 - a. Electrical conduit
 - 1) Copper – (see Division 5 Metals)
 - b. Copper wiring – (see Division 5 Metals)
 - c. Lighting fixtures
 - d. Lamps
 - e. Ballasts
 - f. Electrical devices
 - g. Switchgear and panelboards

- h. Transformers
- i. Uninterrupted Power Source and Generators
- j. Conduit – (see Division 5 Metals)
- 14. Division 32 – Exterior Improvements
 - a. Landscape/hardscape materials – plants, pavers, rockeries, etc.

PART 3 - EXECUTION

3.01 GENERAL

- A. Take precautions and perform any necessary Work required to provide and maintain a safe and healthful jobsite for all workers and the public for the duration of the project in accordance with all applicable laws and contract requirements.
- B. Ensure that the public, including persons who may be non-English speaking or those who may not be able to recognize potential safety and health hazards within the project area, are not harmed by the Contractors activities.

3.02 CLEANUP DURING CONSTRUCTION

- A. Keep the entire Site in a neat and orderly condition at all times during construction.
 - 1. Conduct a general cleanup of the Site daily as a part of the Work.
 - 2. Provide general daily cleanup and disposal service for removal of waste and rubbish from the jobsite.
- B. Provide daily litter pickup and general cleanup within designated work limits. Clean up both construction and non-construction material, and perform bio-sweep. Provide trash receptacles for workers' lunches, cigarette butts, and other miscellaneous garbage.
 - 1. Dispose or recycle waste, compost, trash, and debris in a safe, acceptable manner in accordance with applicable laws and ordinances.
 - 2. Bury no waste material and debris on the Site.
 - 3. Burning of trash and debris on the Site is prohibited.
- C. Remove graffiti from walls, fences, trailers, and equipment within 24 hours.
- D. Remove materials and equipment from the Site when no longer necessary.
- E. Maintain planted landscape areas on the construction Site and as specified. Mow and weed areas as needed.

3.03 SPECIAL PROJECT PROCEDURES FOR TRANSIENTS – HOMELESS AND ILLEGAL ENCAMPMENTS

- A. The Work Site may include materials and waste that pose physical or biological safety and health hazards. These may include, but not be limited to, food, garbage, contaminated clothing and bedding, broken glass, human, bird, and animal excrement, drug paraphernalia including hypodermic needles, birds, bats, rodents, and other hazards. Personal property items, which are not considered a safety or a health hazard, shall not be disposed of without appropriate owner notification, as indicated in Article 3.03.C herein.

- B. The Work Site may be occupied by homeless and otherwise transient persons who may attempt to seek shelter in or near construction zones or services in the area during the day and at night. Transients may seek shelter in or under dumpsters, equipment, blankets, construction materials, or other spaces hidden from plain view. Transients may be under the influence of alcohol or drugs and it should not be assumed that loud construction noise would wake them. Prior to the removal of transient's personal property within the Project limits, the Contractor shall provide a minimum 72 hour public notification in accordance with Article 3.03.C. The Contractor's Health and Safety Plan shall include requirements for thorough daily Work area checks for unauthorized people prior to the start of Work.
- C. Public Notification
1. Furnish and install "No Trespassing" signage as part of initial Site posting and fencing activities.
 2. Provide written notification of the following to the Resident Engineer and to the chief law enforcement officer of the local governmental entity where the Work will occur at the same time the "No Trespassing" signs are posted:
 - a. The precise location of each area that is posted "No Trespassing"
 - b. The date and time that each Site was posted "No Trespassing"
 - c. The date, time, description and duration of the Work to be performed at each Site
 3. Post a notification at each encampment area at least 72 hours prior to performing Work in areas containing encampments (such as tents, makeshift dwellings, sleeping sites, or accumulations of personal property that are not refuse). Each notice shall:
 - a. Be weather resistant, and written in both English and Spanish
 - b. Be affixed to each dwelling or post mounted within 10 feet of each encampment
 - c. State the Prime Contractor's business name as the entity performing the work as required by the Sound Transit
 - d. Provide the date that the notice is posted
 - e. Provide the date(s) and time(s) that cleanup will occur
 - f. Provide the telephone number, business hours and physical address of the location where stored personal property may be claimed.
 - g. State that personal property will be stored for 70-days from the date of removal, and if unclaimed within that time, will be disposed of.
 4. At the same time that notifications are posted at encampment areas, provide written notification of the schedule to perform Site cleanup to the Resident Engineer and to the affected homeless advocacy groups as identified by Sound Transit.
 5. Acceptance of signs and notifications will be based on visual inspection that the sign and notifications meet their requirements.
 6. Maintain no-trespassing signs near the construction Site or locations of the construction activity for the duration of construction.
- D. Site Cleanup of Biological and Physical Hazards

1. Provide necessary training of personnel, on and offsite preparations, and safety equipment to complete initial cleanup and disposal of the biological and associated physical hazards. Perform the Work using trained personnel.
 2. Proceed with initial Site cleanup and clearing of the Site, once the 72-hour public notification period has passed. If aggressive or violent individuals are encountered, notify the local law enforcement agency to assist in clearing people from the area when necessary. Responsible for all enumerated activities therein in relation to this Project, unless otherwise directed by the Resident Engineer.
 3. Perform an initial cleanup of the Project area, which includes all preparatory work required to make the Project area sanitary and safe in accordance with applicable laws, and to address all biological and physical hazards present
 4. Refuse generated by the Site cleanup shall become the property of the Contactor and removed from the project. Personal property shall be handled as required by this Specification and applicable laws.
- E. Removal, Storage, and Return of Personal Property
1. Personal Property:
 - a. May include radios, audio and video equipment, sleeping bags, tents, stoves and cooking utensils, lanterns, flashlights, bed rolls, tarps, foam, canvas, mats, blankets, pillows, medication, personal papers, photographs, books and other reading materials, luggage, backpacks or other storage containers, clothing, towels, shoes, toiletries and cosmetics, clocks and watches, and eye glasses.
 - b. Does not include building materials such as wood products, metal, or rigid plastic.
 2. Personal property items that are not refuse, contaminated, illegal or hazardous shall be removed from the Work area and stored at a location near the Project Site for return to the property owner.
 - a. Items shall be placed in large transparent plastic bags and stored in a manner that protects them from adverse weather and theft.
 - b. Reasonable efforts shall be made to place all items from each encampment into a separate bag. Each bag shall be labeled with an inventory to include a brief description of the contents, a description of the location that it was removed from, and the date that it was removed from the Work area.
 - c. The Contractor shall not open closed items of personal property unless, in its determination, it is necessary to do so to protect public safety.
 3. The Contractor shall retain the property for 70 days.
 4. If the name and contact information of the owner of a personal property item is identified on that item, then for a period of not less than 10-days after removing the property from the Work area, the Contractor shall attempt to notify the apparent owner of the property and make arrangements for the owner to claim the property.
 5. The Contractor shall release the property to any individual who claims ownership provided they are able to establish ownership by identifying the property and its approximate location. The Contractor shall maintain a record of all property that is claimed. The record shall include a description of the property, the date claimed, and the name of the claimant.

6. If personal property is not claimed within 70-days of removal from the encampment, then the property shall become the property of the Contractor and shall be removed from the project.

F. Site Preservation

1. On a daily basis and prior to performing any Work in areas where pedestrians or encampments may be present, the Contractor shall verify that the Work area is cleared of all persons not associated with the project.
2. If the Work Site becomes unsanitary or unsafe due to new encampments or new biological and associated physical hazards after initial cleanup is completed, then the Contractor shall perform additional Site assessment, additional notification and additional cleanup.
3. The Resident Engineer may authorize additional Site preservation measures. The nature and frequency of these measures will be as agreed to by the Resident Engineer. Additional Site preservation measures may include the use of fencing, lighting, or security, provided it is approved in advance by the Resident Engineer. Work performed without Resident Engineer authorization will not be eligible for payment.

3.04 FINAL SITE CLEANUP

- A. Prior to final inspection, clean the entire Site. Remove from the entire Site all construction equipment and facilities, construction waste and unused materials, loose rock and stones, excess earth, and debris of all description resulting from the Work.
- B. Wash, scrub clean, and use a street sweeper where necessary for all pavement and paved walks.
- C. Remove mortar droppings from concrete work and pavement where they occur. Wash and scrub clean all exposed vertical surfaces of concrete.
- D. Clear and clean all manholes and drainage systems.

3.05 WASTE MANAGEMENT - PLAN IMPLEMENTATION

- A. General: Identify materials and provide methods for material separation, handling, containers, storage, signage, transportation, and other items as required to implement waste management.
- B. Designate and label specific areas on Project Site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.

3.06 RECYCLING DEMOLITION AND CONSTRUCTION WASTE

- A. Recycling and Salvaging Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall accrue to Contractor.
- B. Preparation of Waste: Prepare and maintain reusable, salvage, or recyclable materials according to recycling or reuse facility requirements. Maintain materials free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to the recycling process.
- C. Procedures: Separate reusable, salvageable, and recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project Site to the maximum extent practicable according to approved waste management plan.

1. Provide appropriately marked containers or bins for controlling recyclable materials until removed from Project Site. Include list of acceptable and unacceptable materials at each container and bin. Inspect and remove contaminated materials if found.
2. Provide separate containers for non-recyclable materials (debris destined for disposal), clearly labeled as "Garbage."
3. Stockpile processed materials on Site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water.
4. Do not store materials within drip line or critical root zone of remaining trees.
5. Remove recyclable materials from Sound Transit's property and transport to certified recycling receiver or processor within 30 days unless otherwise approved by the Resident Engineer.

3.07 RECYCLING DEMOLITION MATERIALS

- A. Concrete: Transport concrete to concrete recycling facility.
- B. Concrete Masonry: Transport masonry to masonry recycling facility.
- C. Brick Masonry: Transport masonry to masonry recycling facility.
- D. Metals: Separate metals into "metal only" containers if sufficient space exists.
- E. Wood Materials: Separate unpainted lumber, engineered wood products and panel products into "wood only" container if sufficient space exists. Transport to wood recycling facility. Dispose of painted and treated wood materials.
- F. Asphalt Shingle Roofing: Separate asphalt shingles into separate container for recycling at appropriate recycling facility.
- G. Mixed Materials: Collect remaining materials after separation of the above materials in commingled recycling containers for processing by a certified / permitted C&D recycling facility.
- H. Asphalt Paving: Transport paving to asphalt-recycling facility.

3.08 RECYCLING CONSTRUCTION MATERIALS

- A. Packaging:
 1. Cardboard and Boxes: Separate and recycle per local regulations.
 2. Polystyrene Packaging: Separate and recycle per local regulations.
 3. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project Site. For pallets that remain on Site, reuse as appropriate or break down pallets into component wood pieces and comply with requirements for recycling wood.
 4. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.
- B. Wood Materials:
 1. Clean Cut-Offs of Lumber: Separate into "wood only" container if sufficient space exists.

- C. Separate the materials below into material specific container, if space at Project Site allows, or sort into commingled container for mixed C&D debris:
1. Metals
 2. Concrete
 3. Masonry
 4. Carpet
 5. Acoustical Ceiling Tile
 6. Glazing
 7. Styrofoam (white EPS)

3.09 DISPOSAL OF WASTE

- A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project Site and legally dispose of them in a landfill or incinerator. Do not allow waste materials that are to be disposed of accumulate on Site.
- B. Burning: Do not burn waste materials on Site.

END OF SECTION

EXHIBITS

Exhibit A: Example Waste Management Progress Report

SECTION 01 74 00 - EXHIBIT A

EXAMPLE WASTE MANAGEMENT PROGRESS REPORT

Generation Point: (project address)		
Time Period: (dates)		

Material Description	Unit	Total Qty of Waste to date (A)	Qty Reused to date(B)	Qty Salvaged to date (C)	Qty Recycled to date (D)	Total Qty Waste Recovered to date (E=B+C+D)	Total Qty Waste Recovered % to date (E/A x100)	Total Waste Disposed to Landfill to date	Actual Handling and Collection Method Used (See Codes)	Disposal Facility
Required Recovery:										
Asphalt paving										
Asphalt roofing shingles										
Brick										
Cardboard (uncontaminated)										
Carpet										
Concrete										
Metals										
Scrap gypsum (new construction only)										
Uncontaminated plastic sheet and film										
Wood (readily recyclable - unpainted and untreated)										
Recommended Recovery:										
Uncontaminated paper packaging										
Uncontaminated boxes										
Uncontaminated polystyrene packaging										
Uncontaminated wood crates										
Concrete reinforcing steel										
Concrete masonry units										
Structural beams and columns										
Structural and miscellaneous steel										
Vertical timbers										
Glu-lam beams										
Wood studs/joists										
Plywood and oriented strand board (OSB)										
Wood paneling										
Wood trim										
Wood decking										
Rough hardware										
Insulation										
Interior doors and frames										
Exterior doors and frames										
Exterior wood windows										
Stained glass windows										
Vinyl windows										
Door hardware										
Glazing										

SECTION 01 74 00 - EXHIBIT A
EXAMPLE WASTE MANAGEMENT PROGRESS REPORT (CONTINUED)

Material Description	Unit	Total Qty of Waste to date (A)	Qty Reused to date(B)	Qty Salvaged to date (C)	Qty Recycled to date (D)	Total Qty Waste Recovered to date (E=B+C+D)	Total Qty Waste Recovered % to date (E/A x100)	Total Waste Disposed to Landfill to date	Actual Handling and Collection Method Used (See Codes)	Disposal Facility
Gypsum board										
Metal studs										
Acoustical tile and panels										
Carpet pad										
Demountable partitions										
Equipment										
Elevator equipment										
Cabinets										
Sprinklers										
Plumbing fixtures										
Plumbing piping										
Plumbing supports and hangers										
Plumbing valves										
Mechanical equipment										
Refrigerants										
Electrical conduit										
Copper										
Copper wiring										
Lighting fixtures										
Lamps										
Electrical ballasts										
Electrical devices										
Switchgear and panelboards										
Transformers										
(Insert other materials as necessary)										
TOTAL:										

Codes:
1 - Reuse of building or other materials on site (i.e., crushing asphalt/concrete for subbase or grinding for mulch)
2 - Salvaging building materials or fixtures at an off-site salvage or re-use center (i.e., lighting, fixtures)
3 - Recycling source-separated materials at an off-site recycling center (i.e., scrap metal or landscaping)
4 - Recycling commingled loads of C&D materials at an off-site mixed debris recycling center or transfer station
5 - Disposal at a landfill or transfer station
6 - Other (please describe)

END OF EXHIBIT

SECTION 01 78 23
OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section specifies requirements for providing the following:
 - 1. O&M Manual Log
 - 2. Preliminary O&M Materials
 - 3. Posted Operating and Maintenance Instructions
 - 4. Final Operation and Maintenance Manuals
 - 5. Manual Revisions
 - 6. Renewal Parts Catalog
 - 7. Illustrated Parts Catalog

1.02 SUBMITTALS

- A. O&M Manual Log
- B. Preliminary Operation and Maintenance materials must be submitted within 60 days of individual acceptance of Product Data Submittals.
 - 1. Submittals for:
 - a. Facilities
 - b. Systems
- C. Posted Operating and Maintenance Instructions
- D. Renewal Parts Catalog
- E. Illustrated Parts Catalog
- F. Startup and Testing Plan
- G. Final Operation and Maintenance Manuals

1.03 O&M MANUAL LOG

- A. The Log must be submitted to the RE and approved by Sound Transit prior to the 4th scheduled Transition to Operations meeting after 100% Design.
- B. The Log shall be updated at least 5 days prior to the scheduled Transition to Operations Meeting.
- C. The Log shall always be accessible for review by Sound Transit and the Resident Engineer.

1.04 PRELIMINARY O&M MATERIALS

- A. Preliminary O&M Materials will follow the content and formatting requirements detailed in Section 1.06.C.
- B. Electronic versions of the Preliminary O&M Materials will be submitted to Sound Transit for review, comment, and approval.

1.05 POSTED OPERATING AND MAINTENANCE INSTRUCTIONS

- A. Provide and mount at each location with equipment that needs to be operated or maintained, a printed sheet under framed clear acrylic plastic, giving brief, concise operating and maintenance instructions for items of mechanical, optical, and electrical equipment at that location.
- B. Provide color-coded lubrication charts and lubrication diagrams. Assign different colors to each, when two or more types of lubrication are required on one piece of equipment.

1.06 OPERATION AND MAINTENANCE MANUALS

- A. Include instructions of each equipment and its component parts, including but not limited to the following:
 - 1. Manufacturers' certificates
 - 2. Warranties
 - 3. Parts lists
 - a. Critical Parts
 - b. General Parts
 - c. Parts List in Electronic Format must be in an .xml formatted data sheet
 - 4. Descriptive brochures
 - 5. Maintenance and operating instructions for all equipment and systems installed
 - 6. Installation and start-up instructions
 - 7. Installation verification checklist
 - 8. All Commissioning Reports and tests related to the applicable equipment
 - 9. Start-up instructions and checklist
- B. Format and Publication
 - 1. One Paper Hardcopy O&M Manual shall be provided, one electronic file shall be provided, and one exact replica of all software programs shall be provided.
 - 2. Standard sized manuals shall be reproduced on pages that are 8-1/2 by 11 inches. The binder cover shall be 10-inch to 10-1/2-inch wide (depending on ring size) and 11-1/2 inches to 12 inches high. The binders shall not exceed 3-inch overall thickness. Punched holes shall be on 3/4-inch centers. Folded pages will be permitted (11 inches by 17 inches, "Z" - folded) where the information to be conveyed cannot be presented clearly on single pages. Manuals for 8-1/2-inch by 11-inch pages shall be divided into multiple volumes if the required material cannot be accommodated within the maximum binder thickness, natural breakpoints in

the manuals need to be maintained when multiple volumes of the manuals are provided. Approval by Sound Transit of the final versions is required prior to printing and publication.

3. All covers shall be approximately 1/16 inch thick, resistant to oil, moisture, and wear, to a high degree commensurate with their intended uses. Final sets of manuals shall be serialized with numbers to be supplied by Sound Transit. The numbers shall be permanently marked on the spine of the cover.
4. Loose-leaf metal binder rings with locks shall be used to prevent undesired opening and to provide positive engagement when closed. Diagrams and illustrations shall not be loose or in pockets.
5. Electronic Files
 - a. Electronic file shall be a duplicate of the hard copy publication, provided in .PDF format as one (1) file, with bookmarks used in lieu of tabs, for easy identification and reference. Electronic file will be labeled to identify Project Name, name and function of equipment, manufacturer's identification number, and Contract Specifications number and title, as shown on the title page of the hard copy publication. PDF must be searchable, and have the applicable markers and identical documentation that is provided above in Section 1.06.B
6. Publication
 - a. Printed material shall be clearly reproducible by dry copying machines. This precludes the use of halftone illustrations. Line drawings are required. Printed material shall be double-sided where practical.
 - b. Supply master reproducible copies of all documents. The quality of the master shall be such that duplicates may be made of the same quality as the original, approved submittals.
 - c. All documents or drawings shall be in English language only. All dimensions given in metric units shall also state the English unit equivalents in parenthesis next to the metric dimensions.
 - d. Paper on 20-pound bond white paper, 8-1/2 by 11-inch pages in size or folded to that size and placed in a three-ring binder filled to no more than 2/3 of its capacity. Tab for easy identification and reference.
7. Software
 - a. An exact replica of the installed equipment software for the applicable equipment (i.e., BMS, VMS, etc....) shall be provided.
 - b. Integrated Automation - Software and Documentation (for Design-Build and Systems Contracts)
 - 1) Compile a complete and current set of application software necessary to operate or maintain the system in accordance with the Contract Documents.
 - 2) Build System Databases from compiled documentation and on-Site verification:
 - a) Hardware Component Database: Computers and field controllers.

- b) Software Component Database: Off-the-shelf and application-specific software installed on hardware components.
 - c) Monitored/Controlled Equipment Database: Equipment and devices monitored and controlled.
 - d) Points List Database: Comprehensive list of data points exchanged including real I/O and logical I/O from field controllers.
 - c. All Sound Transit IT protocols for Information Security must be followed.
- C. Contents of Manual(s)
- 1. Include a title page, table of contents page with cross-reference between volumes, frontispiece, a list of Subcontractors and Suppliers and their respective contact information, and information covering description, installation, operation, preventive maintenance, corrective maintenance, overhaul, parts list, a list of recommended spare parts, an .xml file must be provided for spare parts in electronic format, and as well as an appendix as described in 1.06 C. 11.
 - a. Include on the title page, the name and function of the equipment, manufacturer's identification number, and the Contract Specifications number and title.
 - b. The Table of Contents shall list all sections and subsection titles of the Manuals with reference to the page on which each starts and a list of included drawings.
 - c. Frontispiece shall be a recognizable illustration of the equipment described in the Manuals.
 - 2. Manufacturer
 - a. Provide a clear and legible copy of manufacturers' certificates, as accepted by Sound Transit.
 - 3. Warranty table of contents with an index, listing equipment/materials, term and expiration date.
 - a. In reference to Project Requirements.
 - b. Expiration date shall be 1 year from project acceptance or last repair, whichever is most recent.
 - c. Preliminary expiration date at time of Submittal
 - d. Product Data, approximate quantities installed of typical maintenance items (e.g., Lights)
 - e. Shop drawings
 - 4. Descriptive information including drawings and diagrams, and a physical and functional description of the equipment, and major assemblies and subassemblies
 - 5. Installation information and pre-installation inspection, installation, calibration, and preparation for operation: Both for initial installation and for re-installation after overhaul.

6. Operation information including, but not limited to: Step-by-step procedures for starting, restarting, operating, shutdown, and emergency requirements. Include the information on performance specifications and operating limitations.
7. Modification of manual contents to the appropriate environment: For example, if a product that is typically installed in a building is installed in an underground tunnel, customize the standard manual and describe the operation and maintenance for that particular environment.
8. Maintenance information, including, but not limited to, step-by-step procedures for inspection, testing, operation checks, cleaning, lubrication, adjustments, repair, overhaul, disassembly, and reassembly of the equipment for proper operation of the equipment. Include a list of special tools that are required for maintenance with the maintenance information.
9. Provide the complete parts list, exploded diagrams containing lowest level replaceable parts, and a list of recommended spare parts with all necessary information, including part numbers and catalog item numbers if applicable, for identifying parts. Identify parts or assemblies obtained from another manufacturer by the name of that manufacturer and its identifying part number. Supply the size, capacity, or other characteristics of the part. The material in the maintenance manuals and parts catalogs shall be organized and indexed, with a standard numbering system.
10. Provide the manufacturer's recommendations for a preventive maintenance schedule and procedures. This should include any daily, weekly, monthly, quarterly, semi-annual, annual to meet the expected life for each piece of the equipment.
11. Include in the appendix safety precautions, a troubleshooting tree, a glossary, and, if available at time of Submittal, copies of test reports, final set points, and other relevant material not specified to be submitted.
12. Delete all information from O&M Manuals on material or equipment not used in the Work from the O&M Manuals.

1.07 MANUAL REVISIONS

- A. Up until Acceptance, if subsequent modifications to the equipment require revised operation and maintenance procedures:
 1. Revise the O&M Manuals to show the equipment as installed.
 2. Revise by issuance of replacement pages to the final O&M Manuals, or by reissue of the O&M Manuals, at Contractor's option.
 3. Following the issue of each publication, provide revised table of contents and pages covering all changes, whether required by change of design, or procedures, or due to error. Submittals of revised pages shall be accompanied by an updated revision record for each manual documenting date revised, page number, effective date of the revision, a description of the change, and the reason for the change. Manual and catalog revisions shall be supplied to Sound Transit before, within 30 days of the arrival of the altered parts or components.
 4. Submit the revisions to the O&M Manual not later than 30 days following revision of the equipment. Submittal of revisions will be subject to Standard Submittal review process, submitted as a subsequent revision to the previously approved revision.

5. These revisions shall be kept current (revised every 6 months or less) during the warranty period. After the warranty period, revisions shall be supplied to Sound Transit every 6, 9, or 12 months for a period of 2 additional years. Changes affecting safety, safe maintenance, or operation shall be supplied as soon as they are discovered.
- B. Provide a revised manufacturers recommended maintenance schedule in both graphic and list form. Provide separate schedules for: Guideway/Track/Systems, Stations/Transit Centers, and Parking Garages. Cross reference the Maintenance Manual. Provide both an editable electronic source file and a hard copy. The maintenance schedules are to include:
 1. Consolidated manufacturer recommended service, maintenance procedures, inspections, equipment sub-component replacement etc., to the expected end of product or equipment service life date or 10 years, whichever is shorter. Address, mechanical, electrical, plumbing, fire protection, architectural, structural, civil, landscape, systems, etc., elements of the project.
 2. Identify if any changes in equipment requires additional or revised jurisdictional inspections, operating permits, licenses etc. Notify Sound Transit if needed and ensure such additional or revised inspections, permits, licenses, etc., are received as of the date of substantial completion.

1.08 RENEWAL PARTS CATALOG

- A. Enumerate and describe every component with its related parts, including Supplier's number, Contractor's number, Drawings Apparatus Reference number, and provision for entry of Sound Transit part number.
- B. Use cut-away and exploded drawings to aid identification of parts not readily identified by description.
- C. Parts common to different components, for instance, bolts and nuts, must bear the same Contractor's number with a reference to other components in which they are found.
- D. Identify each part or component as being part of the next assembly.
- E. Commercially available items such as common standard fastenings, fuses, lamps, and fittings, must be identified by standard hardware nomenclature besides Contractor's number. Provide a separate list of these items in the catalog with adequate information to order these items through commercial channels.
- F. Provide a complete itemization of servicing materials (such as oils, paints, special compounds, and greases) required and component requiring its use.
- G. Provide ordering and procurement information required for components and subassemblies to the lowest level replaceable component.
- H. Submit lists in the form of reproducible Bills of Materials suitable for loose-leaf binding adequately cross-referenced to related drawings and Bills of Material.

1.09 ILLUSTRATED PARTS CATALOG (IPC)

- A. The Illustrated Parts Catalog (IPC) describes and illustrates all the replaceable assemblies following a general "*Top-Down Breakdown*" concept, starting with the top assembly, and proceeding downward through its various sub-assemblies, components, and detail parts to the lowest replaceable unit. This arrangement enables the user to start with the completely assembled (top) major groups and follow each down to the unit, or to reverse the procedure.

- B. Each part illustrated shall include a corresponding number on a related part listing in general disassembly sequence down to the lowest replaceable part. The listing will provide complete identifying information on each item. This format is designed to aid the user in readily identifying and ordering replacement parts to support proper maintenance of the equipment. The IPC submittal will be in PDF format.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 SPECIAL SUBMITTAL PROCEDURES

- A. In a meeting convened by Sound Transit, the Contractor and affected Subcontractor and equipment Supplier shall review and identify corrections, which are necessary to the O&M Manuals.
- B. Revise manuals in accordance with directions and comments from both meeting inputs and formal mark-ups (by reviewers).
- C. Resubmit as required

3.02 SOUND TRANSIT RESPONSIBILITY

- A. Upon completion of all Contractual training and receipt of all Contractual spare parts, and the project is issued acceptance, Sound Transit will determine an operational care and custody date in which Sound Transit will be responsible for operation, adjustment, and maintenance of all permanent equipment and systems.
- B. Sound Transit will convene an instructional meeting before Substantial Completion, with the Contractor, affected Subcontractor and equipment or material manufacturer, and the O&M personnel before final inspection or Acceptance, to review the contents of the O&M manuals with Contractor's personnel.
- C. After Acceptance, Sound Transit will designate operating and maintenance personnel who will be responsible for operation, adjustment, and maintenance of all equipment and systems.

END OF SECTION

SECTION 01 78 24

FACILITY AND LINEAR DATA

PART 1 - GENERAL

1.01 SUMMARY

- A. This section defines the requirements for preparation, maintenance, organization, and submission of electronic Facility Data and Linear Data documents for specific assets installed and/or constructed as part of the Contract.

1.02 REFERENCES

- A. Not Used.

1.03 DEFINITIONS AND ABBREVIATIONS

- A. Attributes: Attributes are individual pieces of Data forming a description of an asset.
- B. Facility Assets: Assets located at a specific site or a portion of a specific site. There may be multiple facilities located at a site. There may be multiple facilities within a contract.
- C. Facility Data: Information defined and collected in the Facility Asset Data Collection Spreadsheet.
- D. Facility Asset Data Collection Spreadsheet (FADCS): A pre-formatted spreadsheet template used to compile Facility, Asset, Attribute, and Space Data Sound Transit wishes to manage via electronic means. The FADCS also contains all requirements associated with proper collection, and organization of the Facility Data.
- E. Linear Assets: Elements of infrastructure and systems necessary for the operation of the Light Rail System and Tacoma Light Rail System. Assets are generally associated with a length of track by contract.
- F. Linear Data: Information defined and collected in the Linear Asset Data Collection Spreadsheet.
- G. Linear Asset Data Collection Spreadsheet (LADCS): A pre-formatted spreadsheet template used to compile Asset, Attribute, Linear Systems, and Space Data Sound Transit wishes to manage via electronic means. The LADCS also contains all requirements associated with proper collection, and organization, of the Linear Data.
- H. Facility and Linear Data Project Execution Plan (FLDPxP): A document describing the clear and organized plan for the collection, organization, and turnover of the Facility and Linear Data deliverables required by this specification.

1.04 UNITS OF MEASURE

- A. Provide Asset Data deliverables utilizing the units of measure identified in the Contract Documents or as listed within the Facility Asset Data and Linear Asset Data Spreadsheets. In the event of conflict, the Spreadsheets shall govern.

1.05 QUALITY ASSURANCE

A. General

1. Contractor must provide a dedicated asset data preparer to gather, collect, prepare, assemble, coordinate, and deliver the required documents and supporting information as well as coordinate with the RE to resolve deficiencies.
2. Contractor must have the Construction Quality Manager, or a licensed Professional Engineer or Architect supervise the asset data collection individual/s.
3. Submit a resume for review and approval by the RE 3 weeks prior to beginning of Work.

B. Qualifications

1. Minimum 2 years prior experience in engineering and construction, including:
 - a. Familiarity with working on asset management systems (or asset data collection) for projects of comparable size, scope, and complexity or as approved by SoundTransit.
 - b. Familiarity with architectural and engineering terminology with a focus on transit facilities and light rail civil and systems infrastructure construction.
 - c. Competency in reading and interpreting construction documents and changes to such documents.

C. Roles and Responsibilities:

1. Contractor must maintain and coordinate the maintenance of all required documents until final submission.
2. Review, or coordinate the reviews, of all required documents.
3. Deliver facility and linear data submittals in an organized and legible manner.
4. Provide submittals as live MS Excel documents following Sound Transit Document Control requirements.
5. Compile FADCS(s) and LADCS(s) using provided or developed spreadsheet templates. Do not alter the formatting or organizational layout of the templates in any way.
6. Setup and lead meetings with the RE team and Sound Transit personnel as defined in project FLDPxP.
7. Make all required documents available to the RE for review and coordinate any needed corrections monthly.

8. Compile and submit all required documents to the RE for incremental submissions and the final submission.

1.06 SUBMITTALS

A. Facility and Linear Data Project Execution Plan (FLDPxP)

1. Provide Sound Transit with a plan for the collection, organization, and turnover of the Facility Data and Linear Data deliverables to Sound Transit utilizing the template provided.
2. At a minimum, include all the items required by the template provided.
3. The Contractor, RE and ST Operations shall develop a timeline for the incremental and final submissions that will be recorded in the FLDPxP.
4. Submit the plan not later than 120 days after the project Notice to Proceed.

B. Incremental Submission

1. General
 - a. Incremental submissions do not constitute the final submission.
2. Recording
 - a. Contractor must continue recording all subsequent changes to the required documents until the completion of construction and submit as part of the final submission.
3. Submissions
 - a. Submit within 14 days of request by the Resident Engineer
 - b. Allow for up to 5 submittals of the following documents in per 12-month period preceding project Substantial Completion.
 - 1) Facility Asset Data Collection Spreadsheet (one per facility as defined).
 - 2) Linear Asset Data Collection Spreadsheet (containing one LADCS per contract).
 - c. Submit all documents and supporting electronic data as requested by the RE.
 - d. The first submission shall be per the timeline agreed between Contractor, RE and Sound Transit Operations as part of the accepted FLDPxP.

C. Final Submission

1. General
 - a. The final submission is the delivery of all required documents and supporting electronic data that accurately reflects the final site condition.

2. Recording
 - a. Record all changes up to Acceptance.
3. Submittal
 - a. Submit the FADCS and LADCS final submittals when completed, but no later than 180 calendar days prior to Substantial Completion or the timeline agreed between Contractor, RE and Sound Transit Operations as part of the accepted FLDPxP.
 - b. Submit any additional changes, from conditions which may arise after Final Submittal, for Sound Transit review and approval.
 - c. Submit the following documents and their supporting electronic data,
 - 1) Facility Asset Data Collection Spreadsheet (one per facility as defined).
 - 2) Linear Asset Data collection Spreadsheet (containing one LADCS per contract).

1.07 MEETINGS

- A. To assure that Facility and Linear Data requirements are being met through the duration of the project, organize the following meetings, and discuss the subsequent topics:
 1. Kick Off Meeting
 - a. At a minimum, discuss the following:
 - 1) The requirement for Facility and Linear Systems Data deliverables under this contract.
 - 2) Primary roles and responsibilities associated with the development and delivery of the Facility and Linear Systems Data deliverables, and,
 - 3) Identify and agree upon a date and attendance list for the meetings described below:
 2. FLDPxP Coordination Meeting
 - a. Facilitate a meeting following submission and Sound Transit review of the FLDPxP. Include the following individuals:
 - 1) Contractor's Facility Data Preparer(s).
 - 2) Contractor's Linear Data Preparer(s).
 - 3) Contractor's Quality Control (QC) Manager.
 - 4) Commissioning Authority (CA).
 - 5) Sound Transit Asset Planning representative(s)

- 6) Resident Engineer.
- 7) Construction Management Representative(s).
- b. The purpose of this meeting is to coordinate the efforts necessary by the Contractor to ensure an accurate collection, preparation, quality control, and submittal of the FLDPxP.
- c. The FLDPxP serves as the primary agenda for this meeting. At a minimum, discuss the following:
 - 1) Processes and methods of gathering facility data during construction. Discuss and obtain special permissions and/or waivers as necessary (photo waivers, data encryption, etc.).
 - 2) Contractor Quality Control practices and procedures.
 - 3) Corrective actions.
 - 4) Necessity for additional or recurring Facility Data Coordination Meetings as requested by the Contractor and Sound Transit. Intent of these meetings would be to maintain regular contact between the Contractor and Sound Transit with regard to development of the facility data deliverables. Conduct status meetings with a frequency agreed upon at this meeting.
- 3. Comment Resolution Meeting
 - a. Facilitate a meeting following Sound Transit review of each design or progress submittal of the Facility and Linear Data. Include the following individuals:
 - 1) Contractor's Facility Data Preparer(s).
 - 2) Contractor's Linear Data Preparer(s).
 - 3) Contractor's Quality Control (QC) Manager.
 - 4) Commissioning Authority (CA).
 - 5) Sound Transit Asset Planning representative(s).
 - 6) Sound Transit Operations Readiness and Transition representative(s).
 - 7) Sound Transit Facilities Manager(s).
 - 8) Sound Transit Linear Systems Manager(s).
 - 9) Conveyance, HVAC, Electrical, Plumbing, Fire Protection, Track, Traction Electrification, Signal, and SCADA subcontractors as applicable.

- b. The applicable deliverables, along with Sound Transit comments associated with review of these submittals serve as the primary guide and agenda for this meeting. At a minimum, discuss the following during this meeting:
 - 1) Review assets, applicable attributes, facility, and space data in FADCS and LADCS at time of submittal.
 - 2) Demonstrate Quality Control and site verification procedures, as applicable, by Contractor QC.
 - 3) Discuss Sound Transit review comments and/or unresolved items preventing completion and Sound Transit approval of the FADCS, and LADCS.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 GENERAL

- A. Contractor to receive the initial Facility Asset Data Collection Spreadsheet/s and Linear Asset Data Collection Spreadsheet/s from Sound Transit at Notice-to Proceed.
- B. Contractor must update the Facility Asset Data Collection Spreadsheet/s and Linear Asset Data Collection Spreadsheet/s with specific assets installed and constructed during the Work.
- C. Contractor must record all Work prior to concealing or covering.
- D. Contractor must make the 'in progress' FADCS and LADCS available to the Resident Engineer for review and acceptance every 30 days as part of the pay application review per the Contract Documents.

3.02 FACILITY ASSET DATA COLLECTION SPREADSHEET(S)

- A. Provide a completed FADCS as identified above. Complete all assigned portions of each FADCS including facility, space, asset, and attribute data in compliance with the FADCS Requirements.
- B. Assets
 - 1. The completed FADCS is to contain all maintainable and warrantable equipment (assets) associated with each facility. This includes all assets in contract scope and within the project extents. Assets shall include but are not limited to those types listed within the FADCS template and any additional assets defined in the FLDPxP. FADCS asset entries shall be individually itemized (instance-based) or multiple assets (type-based or system-based) as required within the FADCS. Assets applicable to the scope of this project shall be documented in the

FLDPxP.

2. Definitions, descriptions, and formatting requirements are found in the FADCS Instructions contained within the FADCS template.
3. If an asset type is not included in the scope of the Project, no Facility Data (assets or attributes) are to be included in the FADCS (even as a placeholder) for that asset type.

C. Attributes

1. Populate each individual asset with all required attributes defined in the FADCS template.
2. Definitions, descriptions, and formatting requirements for these attributes can be found within the FADCS template.
3. If an attribute is not applicable, populate that field with "[N/A]." Do not leave cells blank.

D. Spaces

1. Provide data for all applicable spaces in the facility. Minimum space definitions are as follows:
 - a. Provide all spaces and rooms as defined in the design documents. Include plenums, chases, and shafts as applicable.
 - b. Provide all spaces not otherwise described, but necessary to accurately indicate the locations of all FADCS assets required by this specification.

E. Photographs

1. Provide photographs of the following:
 - a. All Facility asset equipment labels showing manufacturer name, model name or number, and serial number. Label photographs with equipment identification number as shown within the drawings.

3.03 LINEAR ASSET DATA COLLECTION SPREADSHEET(S)

- A. Provide one compiled LADCS for each Linear System per contract. Complete all portions of each LADCS including location ID, space, asset, and attribute data in compliance with the LADCS Requirements.

B. Spaces

1. Provide data for all applicable spaces in the facility where Linear Systems are installed. Minimum space definitions are as follows:
 - a. Provide all rooms as defined in the design documents as applicable.
 - b. Provide stationing and/or milepost of a stationary structure along linear

segments / alignments.

- c. Provide all spaces not otherwise described, but necessary to accurately indicate the location of all LADCS assets required by this specification.

C. Assets & Parts

1. Compile an LADCS containing the maintainable and warrantable equipment (assets) associated with each linear segment. This includes assets in contract scope and within the project extents. Assets shall include but are not limited to those types described in the "Required Assets" portion of the LADCS template, those assets listed in the table below, and any additional assets defined in the FLDPxP. LADCS asset entries shall be individually itemized (instance-based). Entries indicative of multiple assets (type-based) are not allowed. Assets applicable to the scope of this project shall be in the FLDPxP. Assets may have "parts," components, or sub-components considered warrantable. Refer to the LADCS for examples.
2. Definitions, descriptions, and formatting requirements for these assets can be found in the LADCS Requirements contained within the LADCS template.
3. If an asset type is not included in the scope of the Project, no Linear Data (assets or attributes) are to be included in the LADCS (even as a placeholder) for that asset type.
4. Portions of the Linear Assets may be located within a Facility such as a Station or Parking Garage.

D. Attributes

1. Populate each individual asset with all required attributes defined in the "Required Attributes" portion of the LADCS template.
2. Definitions, descriptions, and formatting requirements for these attributes can be found in the LADCS Requirements contained within the LADCS template.
3. If an attribute is not applicable, populate that field with "[N/A]". Do not leave it blank.

E. Photographs

1. Provide photographs of the following:
 - a. All assets at TPSS, SCADA, and Signal equipment labels showing manufacturer name, model name or number, and serial number. Label photographs with equipment identification number as shown within the drawings.

3.04 FIELD VERIFICATION

- A. Verify the FADCS and LADCS through the quality control personnel and procedures as defined in the FLDPxP. Coordinate and conduct verification

with commissioning procedures. FADCS and LADCS information needs to be accurate and reflective of field conditions for Sound Transit acceptance of the final submittals of Facility Asset Data Collection Spreadsheet and Linear Asset Data Collection Spreadsheet.

END OF SECTION

EXHIBITS

Exhibit A: Example Facility Asset Data Collection Spreadsheet

Exhibit B: Example Linear Asset Data Collection Spreadsheet

Exhibit C: Facility and Linear Data Project Execution Plan template

SECTION 01 78 24 – EXHIBIT A

EXAMPLE FACILITY ASSET DATA COLLECTION SPREADSHEET

Organization & Structure

The Sound Transit Facility Asset Data Collection Spreadsheet (FADCS) is structured and categorized in accordance with Federal Transit Administration guidelines which in turn are based upon UniFormat, A Uniform Classification of Construction Systems and Assemblies (Construction Specifications Institute, 2010).

To provide the requested data the FADCS utilizes both DropDowns and Free Text methodologies, DropDowns when attributes can be predefined, and Free Text when attributes are unknown at the time a FADCS is issued. In order to designate which attributes are to be provided for a given component cells within the various tabs are colored yellow, blue, and green in accordance with who is to provide the data. When data is preestablished or not requested cells have been colored grey.

Sound Transit	
A/E Team	
Contractor	
Preestablished or Not Requested	

For pieces of equipment, materials, or assemblies for which a classification is not readily found the "Unknown" tab is provided at the end of the workbook. Instances are anticipated to be few. It is Sound Transit's preference additional items not listed to not be added to the existing A through J tabs.

All data to be entered in ALL CAPITALS.

All data to be entered using full words, not abbreviations.

When an ADCS is submitted all rows and columns are to be visible and unlocked for use by Asset Planning personnel. ADCS which contain locked rows and columns when submitted may be returned without review at Asset Planning's discretion.

Definitions:

Assets: Specific items of property or equipment. Assets are further defined as:

- * Necessary to enable scheduling of work, capture of costs, and maintenance recorded and analyzed to develop strategies and determine achievement of performance goals.
- * There is a defined Preventative Maintenance (PM) plan.
- * To perform Property Condition Assessments (PCA's) and develop Property Condition Reports (PCR's) in accordance with Industry Standards.
- * To develop Lifecycle Plans (LCP's) in accordance with Industry Standards.
- * Rotatable (removed and replaced with like kind, repaired, and reused) as individually serialized component parts and for which installation, service life, and maintenance history is required.
- * Statutory purposes.
- * The recording of statistical and measurement details for operational and maintenance purposes including root cause (failure) analysis.
- * The recording and management of warranties.
- * Necessary for configuration control including the management of new asset approval.
- * Identify the Total Cost of Ownership (TCO) for facilities.

Abbreviations:

A/E: Architect / Engineers
CONTR: Contractor
ST: Sound Transit

Set-up Instructions:

Convert the following letter codes utilizing the 'Replace' command under 'Find & Select' on the Excel "Home" tab.

XXX: Convert to established location code.

YYY: Convert to facility name.

ZZZ: Convert to facility type (Station, Parking Garage, Pedestrian Bridge, etc.)

Additional Instructions:

Notes(s) Notes, represented by the red triangle, are present throughout the FADCS. These notes provide definitions, additional instructions, and/or commentary to assist with the proper completion of the FADCS.

Buttons to tabs:			
UniFormat Code	FTA Code	FTA Categories	Comment:
Z		Facility	Facility, high-level, data regarding the structures to be constructed at a facility.
A B C	A B C	Substructure Shell Interiors	<p>A - The underlying/below-ground supporting structure to a building's superstructure.</p> <p>B - Outer structure or make-up of a building. The building enclosure and related elements.</p> <p>C - The space or area of a building or structure enclosed and protected from outside elements.</p> <p>A separate A-B-C tab is required for each distinct structure. Examples include Stations, Parking Garages, Pedestrian Bridges and all ancillary structures.</p>
		A-B-C - Platforms	<p>This tab is specifically formatted for Tunnel Platforms, At-Grade Platforms, and Elevated Platforms and formatted utilizing the limited data set necessary to describe them.</p> <p>Site Furnishings and Site Specialties are to be entered on Tab-J.</p>
		A-B-C - Shelters	<p>This tab is specifically formatted for Platform Shelters, Windscreens, and similar structures and formatted utilizing the limited data set necessary to describe them.</p> <p>Site Furnishings and Site Specialties are to be entered on Tab-J.</p>
		A-B-C - Misc.	<p>This tab is specifically formatted for miscellaneous at grade, generally open, free standing structures including Dumpster and/or Equipment Enclosures and formatted utilizing the limited data set necessary to describe them.</p>
D10	D	Conveying	Elevators, lifts, escalators, material handling equipment such as cranes, and operable access equipment.
D20	E	Plumbing	<p>The system of pipes, tanks, fittings, and other apparatus required for the water supply, heating, and sanitation in a building.</p> <p>Per industry standard Plumbing assets are interior to a structure and extend five-feet beyond the structure perimeter. Assets beyond five-feet are to be listed under Category J - Site.</p>
D30	F	HVAC	Heating, Ventilation and Air Conditioning, system used to control temperature within a facility.
D40	G	Fire Protection	Refers to any apparatus, machinery or appliance intended for use by a fire service unit in fire prevention or suppression activities.
D50 D70	H	Electrical	System providing electric power to the facility. Also included are Lighting, and Fire Detection and Alarm.

D60 D70	H.1	Communication	<p>System providing Communications, Electronic Safety & Security, and Integrated Automation Facility Controls (Building Management Systems)</p> <p>Note: This tab is not to be used for Light Rail projects. The data collected herein is collected for Light Rail projects through the Linear Asset Data Spreadsheet.</p> <p>The use of this tab is limited to Sounder and BRT projects only.</p>
E10	I	Equipment	Various equipment to service a facility and/or vehicle
G	J	Sitework	The space of ground located at and around a facility that includes roads, parking lots, plazas & walkways, landscaping, and other features/structures.
			Enter unlisted assets or assets without a easily recognizable category herein for Asset Planning to sort later.
Data Requested			
Responsible Party		Who is responsible for providing the data requested. Who refers to the Agency, Construction Manager, Contractor, or other group. Names of individuals are not to be entered.	
Yes/No		Utilze the Yes/No dropdown to indicate whether the asset exists at the facility.	
AP Asset ID Number:		<p>Unique Identification Number based on UniFormat utilized by Sound Transit's Assets Planning group to develop asset inventories, structure and perform property condition assessments, write property condition reports, report state-of-good repair scores to the FTA, and develop lifecycle plans to maintain Sound Transits assets.</p> <p>AP Asset ID Numbers are pre-established and entered through the use of a DropDown.</p>	
Asset Level		<p>The Asset Level identifies whether the piece of equipment, material, or assembly is deemed a System, Individual item, or an assembly by Sound Transit.</p> <p>The Asset Level is pre-established and is shown on entry tabs.</p>	
EAMS Level		<p>The EAMS Level is a secondary means to identify where an asset falls within a heirarchical structure.</p> <p>The EAMS Level is pre-established and is shown on entry tabs.</p>	
Drawing Asset ID (As Shown on Dwgs)		<p>The Identification Code used within the drawings and specifications to identify a piece of equipment, material, or assembly.</p> <p>For equipment the code is shown as N05-EL-01 with N05 the location, EL the equipment type, and 01 an instance number.</p> <p>The Drawing Asset ID is to be entered as Free Text.</p>	
Operational Drawing / EAMS Asset ID		<p>The Identification Code used within Sound Transit's Enterprise Asset Management System and to identify equipment within Sound Transit's Operational Drawing set.</p> <p>The Operational Drawing / EAMS Asset ID codes are pre-established and entered through the use of a DropDown.</p>	

Asset Name:	<p>The name assigned to a piece of equipment, material, or assembly. The Asset Name generally aligns with UniFormat conventions.</p> <p>The Asset Names are pre-established and entered through the use of a DropDown.</p>
Size / Mark / Capacity:	<p>Enter the Size, Mark, or Capacity where requested. Data requested ranges from the dimensions of a slab-on-grade to the capacity of a fan in cubic feet per minute.</p> <p>Entered as Free Text.</p>
Description:	<p>The Asset Name is typically maintained and additional information provided to enhance the understanding of a piece of equipment or material. In a few instances the Description is complete. In most instances the DropDown is a placeholder for Sound Transits use.</p> <p>The Descriptions are pre-established and entered through the use of a DropDown.</p>
Material:	<p>Enter the material where requested.</p> <p>Entered as both Free Text and DropDown where provided.</p>
Manufacturer:	<p>Enter the manufacturer of a specific piece or type of equipment or material.</p> <p>Entered as Free Text.</p>
Product Name / Model #:	<p>Enter Product Name and/or Model number of a specific piece or type of equipment.</p> <p>Entered as Free Text.</p>
Serial #:	<p>Enter the Serial number of a specific piece of equipment.</p> <p>Entered as Free Text.</p>
Quantity:	<p>Enter the appropriate quantity as defined by Unit of Measure.</p> <p>Entered as Free Text.</p>
Unit of Measure:	<p>The Unit of Measure is closely aligned with the Asset Level. The Unit of Measure may be "Each," "Total," or "System." The appropriate quantity is to be entered.</p> <p>The Unit of Measure is pre-established and is shown on the entry tabs.</p>
Station Level	<p>The level a piece of equipment or other item is located on. The Station Level ranges from Platform to Roof and includes, basement levels, floors, and surface.</p> <p>Entered by DropDown.</p>
Room / Area In:	<p>Enter the Room or Area a piece of equipment, material, or assembly is located. Locations vary from specific rooms, elevations, or general areas within the site.</p> <p>Entered as Free Text.</p> <p>Note: A potential means to assist with consistency is to create, and utilize, the Interior Finish Schedule room names and room numbers to create a DropDown methodology.</p>

Room / Area / Equipment Served:	Enter the Room, Area, or Equipment served. This may range from a single piece of equipment, a single room, to a zone, or to multiple pieces of equipment or range of rooms. Entered as Free Text.
Room Number:	Enter the Room Number associated with the Room / Area / Equipment Served. Entered as Free Text
Asset Value (In US Dollars):	The value of individual piece of equipment or system as appropriate in U.S. Dollars without associated labor costs. The value of equipment or material assemblies is necessary for projecting lifecycle costs. Entered as Free Text.
Manufacture Date (Year):	The year a piece of equipment was manufactured. Currently this data is not requested for any items. Entered by DropDown.
Estimated Useful Life (In Years)	Note: Asset Planning has developed and utilizes a proprietary list of Estimated Useful Life data. The column for EUL entry is therefore hidden and data entry regarding EUL is not the A/E's or Construction Teams responsibility. The useful life of a piece of equipment or material as judged by the manufacturer of the equipment or material. Entered as Free Text.
In-Service Date (Year):	The year the facility goes in to service. Entered by DropDown.
O & M Manuals (PDF's):	The number or other coding of the Operation & Maintenance data for a given piece of equipment or material. Entered as Free Text.
As- Built Drawing Reference:	The sheet number on which a piece of equipment or material can best be found. This may be a single sheet or a range of sheets. Entered as Free Text.
Notes(s)	Notes are present throughout the FADCS These notes provide definitions, additional instructions, and/or commentary to assist with the proper completion of the FADCS.

SECTION 01 78 24 – EXHIBIT B
EXAMPLE LINEAR ASSET DATA COLLECTION SPREADSHEET

Instructions:

Please fill out the columns under each tab as it relates to installed assets. For ease of use, buttons have been provided to the right to take you directly to the desired tab. For pieces of equipment, materials, or assemblies for which a classification is not readily found the "Other" tab is provided at the end of the workbook. Instances are anticipated to be few. Green cells are generally required, while gray cells do not need to be filled in, or house a formula.

Please Note:

- 1
- Track includes the track itself, bridges, tunnels, and associated structures. Track is broken up by interlocking and further split into 1/10th of a mile sections (0.1 Mile). Within each 1/10th of a mile, track should be split into Tangent (straight), Curves, and Spirals to provide an accurate representation. Additionally, we request track segments be broken out by Northbound, Southbound, Eastbound, Westbound.
- 2
- Signal and OCS should also be broken into 1/10th of a mile segments within the interlocking. The interlocking should match the naming convention from track exactly. For OCS, each pole will have a pole ID/number under the "Name" column. The beginning point for wiring will start at the pole and run to the following pole. Any specialty items along the wiring will be nested under the preceding pole.
- 3
- TPSS and SCADA will not be tied to interlockings and will be entered at the system level. If the assets do have a specific location, it should still be entered in the location column.
- 4
- If the asset exists, please enter "Yes" from the dropdown in column I. Each asset present should have "Yes" selected. If an item on the list is not present, please select "No." Any assets with no selection in column I are assumed to be non-existing or excluded.
- 5
- For additional assets, please insert new lines and fill out the information as you would. Please drag the formulas down, or ask Sound Transit to assist in correcting these once the document is sent for review.

Contractor Data Requested:

Yes/No:	Please select "Yes" for anything you are providing information for. Select "No" for any asset that should not be included and explain why in "Description" if necessary. You will need to drag the formula down as you add lines.
Name / Title:	The name assigned to a piece of equipment, material, or assembly. This field is automatic from the hierarchy as it is created. You will need to drag the formula down as you add lines.
Asset Description	Provide any additional descriptions, comments, or notes as needed for each asset.
Unique Asset ID:	Provide any label or ID as referenced in As-Built, documents, or on site.
Location: Stationing:	Enter stationing position of the asset. This field is especially important when entering information for Track, Signal, and OCS.
Location: Milepost:	Enter milepost position of the asset to the tenth of a mile. Tenth of a mile segments and interlockings will already be accounted for within the asset structure if entered correctly. This field is especially important when entering information for Track, Signal, and OCS. Where possible, try to provide both Stationing and Milepost.
Location: Name / Number / ID:	Enter the general name for the location. I.E. the station name or ID, the interlocking name, or other given name.
Location: Room / Sub-Location:	An additional level of detail for naming. Use this field to provide room names or numbers or additional description to the location as needed.
Location: Server / Rack Placement / Additional:	A final level of location information, typically used to provide rack locations of equipment.
Latitude and Longitude Coordinates:	Provide the lat/long coordinates for the asset if applicable and able. This applies to assets along the right of way. (Enter in separate columns)
Manufacturer:	Enter the manufacturer of a specific piece or type of equipment or material.
Manufacturer Website:	Enter the manufacturer website.
Manufacturer Contact / Representative:	Enter the name and contact information for the manufacturer contact or representative.
Manufacture Date:	Enter the date the asset was originally produced from the manufacturer.
Install Date:	Enter the date when the asset was installed or accepted.
Model #:	Enter Product Name and/or Model number of a specific piece or type of equipment.
Serial #:	Enter the Serial number of a specific piece of equipment.
Shop Drawing / As-Built / File Referenced:	Provide the file name where the initial piece of information was pulled from. I.E. As-Built drawings, etc. This will allow us to track down the original data reference if there are questions on the data.
Size / Mark/ Capacity:	Enter the Size, Mark, or Capacity where requested. Data requested ranges from the dimensions of a slab-on-grade to the capacity of a fan in cubic feet per minute.
Value in US Dollars	Enter the cost the asset. This should be your replacement value.

Buttons to specific tabs:

Signal/COMMs

SCADA

Track	
RH	Right Hand
LH	Left Hand

OCS	
SI	Section Insulator

Signals	
VHLC	Vital Harman Logic Controller
NVIO	Non Vital Input-Output
VIO	Vital Input-Output
CPS	VHLC Card Model
VPM	VHLC Card Model
CIO	VHLC Card Model
CDU	VHLC Card Model
LCP	Local Control Panel
GND	Ground
TWC	Train-to-Wayside Communication
LDP	Local Distribution Point
IPITC	Intelligent Processor Island Track Circuit
PSO	Phase Shift Overlay
T-Line	Transmit Line
R-Line	Receive Line
NNWR	North Normal Switch Relay
NRWR	North Reverse Switch Relay
OR	Overload Relay
SMN	Snow Melter North
SMZ	Snow Melter Control
PLC	Programmable Logic Controller
Xmit	Transmit
REC	Receive
SM	Snow Melter
NV Relay	Non-Vital Relay

TPSS	
TPSS	Traction Power Substation
AC	Alternating Current
DC	Direct Current
PSE	Puget Sound Energy
MVAC	Medium Voltage Alternating Current
CPT	Control Power Transformer
TRU	Transformer Rectifier Unit
CS	Control Switch
ACM	AC Control Module
HMI	Human Machine Interface
DCM	DC Control Module
VM	Voltmeter
AM	Ammeter
SEL	Schweitzer Engineering Laboratories
GVM	Ground Voltage Monitor
LCMS	Local Control and Monitoring System
WINPAC	Type of Program Development System
SSS	Substation Shutdown Station
ETS	Emergency Transfer Switch
HVAC	Heating Ventilation and Air Conditioning

SCADA	
DAS	Distributed Antenna System
BBL	Battery Backup Model
BBS	Battery Backup Model
UPS	Uninterruptable Power Supply
PCM	Pulse Core Modulation
PCM TIM	Pulse Core Modulation Telephone Interface Module
PCM ZPM	Pulse Core Modulation Zone Paging Module
CPU	Central Processing Unit
PoE	Power over Ethernet
CP	Cabinet - Pole Mounted

Contractor Enter the name of the contractor responsible for installing / constructing a specific piece or type of equipment or material.

Installing Contractor Contact / Representative Enter the name and contact information for the installing contractor contact or representative.

CB	Circuit Breaker
CS	Current Sensor
CR-BR	Control Relay - Bungalow Relay
CR-R	Control Relay
CR-GF	Control Relay Ground Fault
CR-SS	Control Relay Short Circuit
CR-TS	Control Relay Temperature Sensor
S-LR	3 position selector lever
Z-LR	Switch mounting bracket

CW	Cabinet - Wall Mounted
PDU	Power Distribution Unit
Comms	
CDC	Communication Distribution Cabinet
NVR	Non-Vital Relay

Definitions:	
Track Naming	Sound Transit will be moving forward with a new, universal naming scheme for track. Double track sections, most of the ROW, will be identified as Track 1 and Track 2. Previously, tracks were identified as North and South, but this will not work as more lines are added to the system.
Mileposts	Previously, Sound Transit has not been able to collect data along the alignment. With this new data collection sheet, the intent is to break out interlockings into tenth of a mile sections to allow work orders to be completed with a much more pinpointed location. This capability will also add GPS coordinates for an additional layer of tracking. Over time, Sound Transit will be able to utilize location based work order data to help with maintenance planning and identify areas of reoccurring need.
Interlocking	Interlockings are the named sections of track as identified by Sound Transit. We will break up the linear assets (Track, Signal, and OCS) by interlockings and identify them in accordance with Sound Transit's naming plans. Each interlocking is further broken down by milepost sections, down to the tenth of a mile.
Bridges - Aerial Structures	All bridges and aerial guideways fall under this category. Each bridge should be named as it is referenced to in drawings.
Floating Bridge Specifics	Specific assets associated with the floating bridge should be tracked under this bucket on the "Track" tab. The track sections and ST owned specific equipment should fall within this group rather than treated as a standard track segment within an interlocking.
Non-Facility Assets vs. Facility Assets	Assets entered here are specific to the alignment (Track, Signal, OCS, TPSS, and SCADA). For example, lighting in tunnel stations and would not be included with this document, but lighting in the tunnel itself, if not already collected, would be captured here. If you aren't sure if an item shouldn't be collected, it is always safer to enter the information here and it can be vetted at a later time.



Sound Transit

[Project Name]

FLD Project Execution Plan (PxP)

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1: FLD Project Execution Plan (PxP) Overview

The purpose of this FLD PxP is to provide a document framework, with which, consultants and construction teams can outline the information, procedures, and responsibilities relevant to Facility and Linear Data collection for Sound Transit projects. The goal of the FLD PxP framework is to assure accurate and consistent work within, and across Sound Transit projects. This document works in concert with the project scope and the ST Design Technology Manual.

The FLD PxP for a project is a living document that will be revised and updated as necessary by the construction teams to reflect changes that may occur during the project lifecycle. Any changes made to this document during the course of project shall be approved by Asset Planning, Sound Transit.

Please note: Instructions (italicized) to assist with the completion of this guide are shown in grey. The instructions should be deleted and the example text should be modified to suit the needs of the organization filling out the template.

2: Document Revision History

At a minimum, updates are required at the beginning of the project, design milestones, final design, and award of contract for pre-construction and construction services.

Revision	Date	Section	Description of Updates

3: Contract Package Information

3.01 : Basic Information

Confirm official project name and project number

Project Name	
Contract Number	
Contract Name	
Project Location and Address	Location of Facilities/Their Names/Addresses
Contract Type / Delivery Method	
Brief Contract Description	Number of stations or facilities, size, etc.

3.02 : Project Schedule

Include project milestones, design activities, and any other major activities during the project that directly impact schedule submission

Project Phase / Milestone	Estimated Start Date	Estimated Completion Date	QC Lock Date	REVISE FLD PLAN
60% Design	Date TBD	Date TBD		YES/NO
90% Design	Date TBD	Date TBD		YES/NO
Final Design	Date TBD	Date TBD		YES/NO
Issue for Construction	Date TBD	Date TBD		YES/NO
FLD Pre-Construction Meeting	Date TBD	Date TBD		YES/NO
Start of Construction	Date TBD	Date TBD		YES/NO
FLD Coordination Meeting	Date TBD	Date TBD		YES/NO
FLD Submittal Coordination Meeting	Date TBD	Date TBD		N/A

3.03 : Key Project and FLD Contacts

List of lead FLD contacts and key FLD Staff for each organization on the project.

Role	Organization	Contact Name	Location	E-Mail	Phone
Project Manager(s)					
Quality Control Manager					
FADCS Data Preparer(s)					
LADCS Data Preparer(s)					
Asset Planning: FADCS	Sound Transit				
Asset Planning: LADCS	Sound Transit				
Transition to Operations	Sound Transit				

3.04 : FLD Roles and Responsibilities

Describe FLD roles and responsibilities such as Project Managers, Quality Control Manager, Data Preparer(s) etc. Responsibilities may include quality assurance and quality control, data collection and verification, maintaining project folders and files, etc.

Role	Responsibilities
Project Manager(s)	
Quality Control Manager(s)	
FADCS Data Collector(s)	
LADCS Data Collector(s)	

4: Software and Document Management

4.01 : Software Requirements

This table will detail the software applications and the versions employed on the projects.

FLD	Discipline	Software	Version
FADCS	Asset Data Collection	MS Excel	
LADCS	Asset Data Collection	MS Excel	

4.02 : FADCS and LADCS

This table will detail the FADCS and LADCS versions employed on the projects.

FLD	Version	Collected Asset Groups	Not-collected Asset Groups
FADCS			
LADCS			

4.03 : Electronic File Storage

An electronic storage location, such as a SharePoint site, will be identified for the regular exchange of files from the owner, project consultants, and other project participants.

File Location	File Path /Directory	Password Protect	Folder Maintainer
SharePoint Site	Root Project Folder	Yes/No	Name(s) and Responsibilities

5: Collaboration and Coordination Procedures

5.01 : FLD Kick-off and Coordination Meetings

In the table below, define the type and frequency of meetings related to FLD Coordination. Indicate the required attendees and scope of the meetings.

Meeting Type	Phase	Frequency	Participants	Location

5.02 : Project Meetings

In the table below, define the type of meetings held during the project, including interface management, design review, coordination meetings, progress meetings, etc. Indicate the required attendees and scope of the meeting.

Meeting Type	Phase	Frequency	Participants	Location

6: FLD Review/Quality Assurance/Quality Checks

The following checks should be performed in the FLP spreadsheets to assure quality:

Checks	Definition	Responsible Party	Software Program(s)	Frequency
Visual Check	Ensure all requested data is entered.	All Data Providers	MS Excel	
Asset Verification	Verify all requested data is accurate		MS Excel	

7: Exceptions

7.01: Exceptions to FLD PxP

List items approved as exceptions to FLD PxP.

8: Attachments and Appendixes

List the supporting attachments supplementary to this FLD PxP.

END OF EXHIBITS

SECTION 01 78 36
WARRANTY MANAGEMENT

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section specifies general requirements for Warranty Management.

1.02 SUBMITTALS

A. WARRANTIES

1. A draft of all required warranties shall be submitted to Sound Transit for approval prior to Substantial Completion.
2. When Operating and Maintenance Manuals are required for warrantied construction, a draft copy of each required warranty shall be provided, as necessary, with each Operating and Maintenance Manual.

B. WARRANTY PLAN

1. The Contractor shall prepare and submit a Warranty Plan no less than 90 days prior to Substantial Completion which outlines the responsibilities and procedures to address warranty issues arising from the Contract and the Work. The Resident Engineer has the right to shorten this time period based on project duration.
2. Prior to Substantial Completion, the Contractor shall meet with Sound Transit to develop a mutual understanding with respect to the requirements of the Warranty Plan. Communication procedures for notification of construction warranty defects, priorities with respect to the type of defect, reasonable time required for Contractor response, and other details deemed necessary by Sound Transit for the execution of the warranty shall be established and reviewed at this meeting. Based on the information provided at the meeting, the Contractor shall submit to Sound Transit a written Warranty Plan.
3. The Warranty Plan shall include the following information.
 - a. The Warranty Plan shall include all the warranty information required to assure that Sound Transit receives all warranties to which it is entitled including:
 - 1) Key personnel associated with the warranty management process, to include their specific roles and responsibilities, and their telephone numbers and other means of contact.
 - 2) Key personnel should be from within the organizations of the Contractor, subcontractors, manufacturers, and suppliers involved.
 - b. The Contractor may choose to furnish the name, telephone number and address of a licensed and bonded company, other than itself, authorized to directly initiate and pursue warranty work on its behalf.
 - c. The Plan shall include the draft Warranty Log.

C. WARRANTY LOG AND DOCUMENT SET

1. The Contractor shall populate the Warranty Log included in Appendix A. The log shall contain the following information in an organized fashion for all warranted products, assets, and materials:
 - a. Warrantied Product
 - b. Manufacturer of Product
 - c. Specification Division of Warranty
 - d. Warranty General Description of what is covered. The warranty requirements shall match the requirements in the technical specifications.
 - e. Warranty Length of Time of product covered.
 - f. Date Warranty Commences.
 - g. Date of Warranty final inspection walk
 - h. Contact Information for Warranty Manufacturer.
2. Preliminary Warranty Document Set shall contain the following information in an electronic file format organized in the following manner:
 - a. Warranty Log shall be presented in preliminary condition.
 - b. Product, Asset and Material Warranties shall be listed in digital file listing Division and Description in the File Name.
3. Final Warranty Document Set shall be submitted in final condition upon Acceptance of the Project in prescribed electronic format and in a hard copy format.

1.03 WARRANTY WORK INSPECTION

- A. Sound Transit and Contractor shall jointly inspect work performed under the warranty provisions within two-weeks of repair.
- B. Two (2) months prior to the date warranty expiration, Sound Transit will conduct an inspection of the facility, linear system and/or warranted product. The Contractor shall participate in this inspection.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01 78 39.10

AS-BUILT DOCUMENTS

DESIGN-BUILD

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section specifies requirements for the preparation, maintenance, completion, and submission of as-built documents, including drawing/model change logs, field survey point data tables, record shop drawings, record drawings, and all supporting electronic data.

1.02 DEFINITIONS

- A. Refer to Chapter 2 in the Sound Transit Design Technology Manual for definitions related to the required documents, drawings, and supporting electronic data.

1.03 STANDARDS

- A. Sound Transit Design Technology Manual (DTM): Standards and requirements for all drawings, models, and their supporting electronic data.

1.04 ELECTRONIC FILE FORMATS AND SOFTWARE

A. General

- 1. Contractor must provide all software, access to software, technical and administration support, and training to the Resident Engineer (RE) and their designated personnel to conduct reviews and coordinate the competition of the required documents and supporting electronic data.
- 2. Contractor to submit all electronic files in the latest software version unless otherwise approved by the Sound Transit Design Technology Manager.

B. Portable Document Format (PDF)

1. General

- a. Contractor to submit in multi-sheet PDF files with the drawings/pages in the same order as provided in the Contract Documents.

2. File Naming

- a. Include in all PDF file names:

- 1) An underscore (_) between each word with no spaces.
- 2) The Contract Unit Description (CUD) number, for example, E340.
- 3) The Contract Unit Description Name, for example, Bel-Red.
- 4) The type of document, for example, Contract Specifications.

5) Date of submittal, for example, 05-01-2022.

6) Example: E340_Bel-Red_Contract _Specifications_05-01-2022

C. Civil3D and REVIT

1. Files and their internal elements must be fully readable and modifiable in the approved software, and conform to the standards and requirements in the DTM.
2. File naming must follow the requirements of the Design Technology Manual.

D. Excel

1. Contain all data in a Table within Excel.
2. Name each table to represent the content.

1.05 SUBMITTALS

A. Incremental Submissions

1. General
 - a. Incremental Submissions do not constitute the Final Submission.
2. Recording
 - a. Contractor must continue recording all subsequent changes to the required documents and supporting electronic data until the completion of construction and submit as part of the Final Submission.
3. Submittal
 - a. Submit within 14 days of request by the Resident Engineer.
 - b. Must provide 3 submittals of the following documents and their supporting electronic data per 12-month period.
 - c. Submit all documents and supporting electronic data as requested by the RE.

B. Authority Having Jurisdiction (AHJ) Permit Submission

1. General
 - a. AHJ Permit Submissions do not constitute the Final Submission.
2. Recording
 - a. Contractor must continue recording all subsequent changes to the required documents and supporting electronic data until the completion of construction and submit as part of the Final Submission.
3. Submittal
 - a. Submit within 14 days of request by the Resident Engineer.
 - b. Allow for 1 submittal for each permit.
 - c. Allow for 1 submittal for each AHJ utility relocation work on the project.

- d. Submit all documents and supporting electronic data as requested by the AHJ and the RE.

C. Final Submission

1. General

- a. The Final Submission is the delivery of all required documents, drawings, and supporting electronic data that accurately reflect the final site condition.

2. Recording

- a. Record all changes up to Acceptance.

3. Submittal

- a. Submit within the time frame specified in the Contract Documents.
- b. Submit any additional changes from NCR corrective actions for approval 14 days before Acceptance.
- c. Submit the following documents and their supporting electronic data.
 - 1) Contract Specifications
 - 2) Drawing/Model Change Log
 - 3) Record Drawings
 - 4) Record Shop Drawings
 - 5) Field Survey Point Data Tables

1.06 QUALITY ASSURANCE

A. General

1. Contractor must provide a full-time As-Built Documents individual to lead the maintenance and delivery of the required documents and supporting electronic data as well as coordinate with the Resident Engineer.
2. Contractor must have the Construction Quality Manager or a licensed Professional Engineer supervise the As-Built Documents individual.
3. Submit a resume for review and approval by the RE 3 weeks prior to beginning of Work.

B. Qualifications

1. 5 years prior experience in As-Built document management, including:
 - a. Managing As-Built documents for a project of comparable size, scope, and complexity.
 - b. Familiarity working with the required documents and data.

- c. Competency in reading, interpreting and markups, sketches, and drafting/modeling changes to design and construction documents.
- C. Roles and responsibilities
 - 1. Contractor must maintain, and coordinate the maintenance, of all required documents and logs until Final Submission
 - 2. Review, or coordinate the reviews, of all required documents and their supporting electronic data.
 - 3. Verify completed changes to all documents with field staff monthly.
 - 4. Setup and lead meetings with the RE and Sound Transit personnel:
 - a. Coordinate and changes to the required documents and their status.
 - b. Review the required documents for completeness and accuracy.
 - 5. Train field engineers to update the required documents.
 - 6. Make all required documents available to the RE for review and coordinate any needed corrections monthly.
 - 7. Compile and submit all required documents to the RE for Incremental Submissions and the Final Submission.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 GENERAL

- A. Contractor must update the contract specifications, record shop drawings, and record drawings to reflect all changes made to the IFC specifications, IFC drawings, and shop drawings, as well as any site conditions encountered during the Work.
 - 1. Collect and compile any required survey data.
 - 2. Collect and compile all Drawing/Model Change Logs
- B. Contractor must record all Work prior to concealing or covering.
- C. Maintenance and Verification
 - 1. As-built documents must be reviewed and accepted by the Resident Engineer on a monthly basis as part of the pay application review per the Contract Documents.

3.02 AS-BUILT DOCUMENTS FORMAT AND CONTENT

- A. Contract Specifications:
 - 1. General
 - a. Obtain from the RE and utilize the ST contract specifications and/or any modified contract specifications and provide in PDF format.

- b. Stamp the front cover of each specification with "As-Built" in red.
 - c. Annotate all changes using red markings.
 - d. Red markings must be clear and legible.
 - 2. Recording
 - a. Record all changes within 30 days.
- B. Drawing/Model Change Logs:
 - 1. General
 - a. Obtain from the RE and utilize the ST drawing/model change log template Excel file and provide in the Excel file.
 - 2. Record and include the following information about each change:
 - a. Issue date
 - b. Document number
 - c. Drawing, specification, and/or model impacted
 - d. Description
 - e. Date change was incorporated into the drawings, specifications, and/or models
 - f. Record all changes to IFC drawings and the supporting models within 30 days of change
- C. Field Survey Point Data Tables:
 - 1. General
 - a. Consolidate all field survey point data into an Excel table documenting the final site conditions and provide in Excel.
 - b. Include the Point number, Northing, Easting, Elevation, and Description for each surveyed item.
- D. Record Shop Drawings:
 - 1. Update all shop drawings to reflect the final installed Work.
 - 2. Submit in Portable Document Format (PDF).
 - 3. Consolidate drawings into packages per each trade or sub-contractor.
 - 4. Include in all packages:
 - a. Cover sheet with the project title and Contract Number Included
 - b. All installed work and impacts to the site
 - c. Index
 - d. Legends

- e. Schedules
 - f. Color codes
- 5. Locate and orient all information in the required coordinate system.
- 6. When the Issued For Construction (IFC) Drawings and shop drawings have the same information:
 - a. Update all drawings to reflect an accurate and complete representation of the final condition and correct any conflicts between them.
- 7. Submit all Contractor and Sub-contractor Model(s) and Federated Model used to create Record Shop Drawings:
 - a. In their native format
 - b. In the project coordinates and grid layout established in the models that support the IFC Drawings.
- 8. Submit a Federated Model of all models used to support the Record Shop Drawings in .nwd format.
- E. Record Drawings:
 - 1. Update and consolidate all IFC drawing packages into a single set of drawings along with their supporting electronic data to represent the final site conditions without duplicate or unrelated information.
 - 2. Submit the drawings in PDF.
 - 3. Submit all supporting electronic data, including Civil3D and REVIT files and populated asset data.
 - 4. Include the following information as a minimum:
 - a. All Work to the original site, including but not limited to:
 - 1) Visible and concealed
 - 2) Permanent
 - 3) Temporary - only if remaining on site
 - 4) Abandoned - only if remaining on site
 - 5) Found, built, installed, or relocated
 - b. All design and survey location data
 - c. A list of all related record shop drawings on the cover sheets of all record drawing books.
 - 5. Do not include phased conditions (to bridge from one construction package to a later set).

END OF SECTION

SECTION 01 78 39.20
AS-BUILT DOCUMENTS
DESIGN-BID-BUILD & GC/CM

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section specifies requirements for the preparation, maintenance, completion and submission of the as-built documents, including any Contract specification changes, as-built drawings, field sketches, record shop drawings, field survey point data tables, and all supporting electronic data.

1.02 DEFINITIONS

- A. Refer to Chapter 2 in the Design Technology Manual for definitions related to the required documents, drawings, and supporting electronic data.

1.03 STANDARDS

- A. Sound Transit Design Technology Manual (DTM): Standards and requirements for all drawings, models, and their supporting electronic data.

1.04 ELECTRONIC FILE FORMATS AND SOFTWARE

A. General

- 1. Contractor must provide all software, access to software, technical and administration support, and training to the Resident Engineer and their designated personnel to conduct reviews and coordinate the competition of the required documents and electronic data.
- 2. Contractor must submit all electronic files in the latest software version unless otherwise approved by the Sound Transit Design Technology Manager.

B. Portable Document Format (PDF)

1. General

- a. Submit in multi-sheet PDF files with the drawings/pages in the same order as provided in the Contract Documents.

2. File Naming

- a. Include in all PDF file names:
 - 1) An underscore (_) between each word with no spaces.
 - 2) The Contract Unit Description (CUD) number, for example, E340.
 - 3) The Contract Unit Description Name, for example, Bel-Red.
 - 4) The type of document, for example, As-Built Specifications.

5) Date of submittal, for example, 05-01-2022.

6) Example: E340_Bel-Red_As-Built_Specifications_05-01-2022

C. REVIT & Civil3D

1. Include all source files and supporting data used to reproduce the drawings.
2. Files and their internal elements must be fully readable and modifiable in the approved software and conform to the standards and requirements in the DTM.
3. File Naming must follow the requirements of the DTM.

D. Excel

1. Contain all data in a Table within Excel.
2. Name each table to represent the content.

1.05 SUBMITTALS

A. Incremental Submission

1. General
 - a. Incremental submissions do not constitute the final submission.
2. Recording
 - a. Contractor must continue recording all subsequent changes to the required documents and supporting electronic data until the completion of construction and submit as part of the final submission.
3. Submissions
 - a. Submit within 14 days of request by the Resident Engineer.
 - b. Must provide 3 submittals of the following documents and their supporting electronic data per 12-month period.
 - c. Submit all documents and supporting electronic data as requested by the RE.

B. Authority Having Jurisdiction (AHJ) Permit Submission

1. General
 - a. AHJ Permit Submissions do not constitute the final submission.
2. Recording
 - a. Contractor must continue recording all subsequent changes to the required documents and supporting electronic data until the completion of construction and submit as part of the final submission.
3. Submission
 - a. Submit within [14] days of request by the Resident Engineer.
 - b. Allow for [1] submittal for each permit.

- c. Allow for [1] submittal for each AHJ utility relocation work on the project.
- d. Submit all documents and supporting electronic data as requested by the AHJ and the RE.

C. Final Submission

1. General

- a. The final submission is the delivery of all required documents, drawings, and supporting electronic data that accurately reflect the final site condition.

2. Recording

- a. Record all changes up to Acceptance.

3. Submittal

- a. Submit within the time frame specified in the Contract Documents.
- b. Submit any additional changes from NCR corrective actions for approval 14 days before Acceptance.
- c. Submit the following documents and their supporting electronic data.
 - 1) Contract Specifications
 - 2) As-Built Drawings
 - 3) Field Survey Point Data Tables
 - 4) Record Shop Drawings

1.06 QUALITY ASSURANCE

A. General

- 1. Contractor must provide a full-time as-built documents individual to lead the maintenance and delivery of the required documents and supporting electronic as well as coordinate with the RE to resolve errors and omissions.
- 2. Contractor must have the Construction Quality Manager, or a licensed Professional Engineer supervise the as-built documents individual.
- 3. Submit a resume for review and approval by the RE 3 weeks prior to beginning of Work.

B. Qualifications

- 1. 5 years prior experience in as-built document management, including:
 - a. Managing as-built documents for a project of comparable size, scope, and complexity.
 - b. Familiarity working with the required documents and data.
 - c. Competency in reading and interpreting markups, sketches, and drafting/modeling changes to design and construction documents.

C. Roles and Responsibilities:

1. Contractor must maintain and coordinate the maintenance, of all required documents and logs until final submission.
2. Maintain a log of all change documents that contribute to a change in the as-built drawings.
3. Review, or coordinate the reviews, of all required documents and their supporting electronic data.
4. Verify completed changes to all documents with field staff monthly.
5. Setup and lead meetings with the RE team and Sound Transit personnel:
 - a. Coordinate any changes to the required documents and their status.
 - b. Review the required documents for completeness and accuracy.
6. Train field engineers to properly update the required documents.
7. Make all required documents available to the RE for review and coordinate any needed corrections monthly.
8. Compile and submit all required documents to the RE for incremental submissions and the final submission.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 GENERAL

- A. Contractor must update the as-built drawings, Contract specifications, and record shop drawings with all changes made to the IFC drawings, IFC specifications, and shop drawings, as well as any site conditions encountered during the Work.
- B. Contractor must collect and compile any required survey data.
- C. Contractor must record all Work prior to concealing or covering.
- D. Contractor must make available to the Resident Engineer for review and acceptance every 30 days as part of the pay application review per the Contract Documents.

3.02 CONTRACT SPECIFICATIONS

- A. General
 1. Utilize the ST provided Contract Specifications and maintain them in PDF.
 2. Stamp the front cover of each specification with "As-Built" in red.
 3. Annotate all changes using red markings.
 4. Red markings must be clear and legible.

5. Submit in Portable Document Format (PDF).

B. Recording

1. Record all changes within 30 days.

3.03 AS-BUILT DRAWINGS

A. General

1. Utilize the provided Contract drawings and maintain them in PDF with unflattened markups and annotations. No inserted images or documents.
2. Stamp the front cover of each specification with "As-Built" in red.

B. Recording

1. Mark with color, using the following conventions:
 - a. Red: Information to add.
 - b. Green: Information to delete.
 - c. Blue: Communications, instructions or reference information used to clarify changes (blue annotations will not be transcribed). This may include dimensions and references to other documents.
 - d. Record all changes within 30 days of executed change.

C. Incorporate Revised Contract Drawings

1. Update the as-built drawings with new versions of the contract drawings:
 - a. Add the new version of the drawing to the set.
 - b. Move all previous markups, sketch references, and other annotations to the new version of the drawing.
 - c. Remove the previous version of the drawing.
2. Add only drawings with the project title block and all information included.

3.04 FIELD SKETCHES

A. General

1. Provide field sketches when there is not sufficient space on the as-built drawing, or if the level of change is too complex to provide clearly.
2. Provide change information in either the drawing or referenced sketch without duplication.
3. Submit in PDF
 - a. Include:
 - 1) Labeled cross referenced sketch number in blue.
 - 2) Reference numbering format for a PDF with a single page:
 - a) Sound Transit/ DSDC/ CMC; FSKST-XXXX.

- b) Contractor; FSKGC-XXXX.
 - b. Reference numbering format for PDF with multiple pages:
Sound Transit/ DSDC/ CMC; FSKST-XXXX-1.
 - c. Contractor; FSKGC-XXXX-1.
 - B. Recording
 - 1. Add dimensions to accurately locate and orient the objects in the sketch to objects already in the as-built drawings.
 - 2. Create a unique identification number for each field sketch and place the number on the sketch and related as-built drawing.
 - 3. Store all field sketches separately from the as-built drawings.
- 3.05 RECORD SHOP DRAWINGS
- A. General
 - 1. Update all Shop Drawings and models to reflect the final installed Work.
 - 2. Submit in Portable Document Format (PDF).
 - 3. Consolidate drawings into packages per each trade or sub-contractor.
 - 4. Include in all packages:
 - a. Cover sheet with the project title and Contract Number Included
 - b. All installed Work and impacts to the site
 - c. Index
 - d. Legends
 - e. Schedules
 - f. Color codes
 - 5. Locate and orient all information in the required coordinate system.
 - 6. When the Issued For Construction (IFC) Drawings and shop drawings have the same information:
 - a. Update all drawings to reflect an accurate, and complete representation of the final condition and correct any conflicts between them.
 - 7. Submit all Contractor and Sub-contractor models and Federated Model used to create the record shop drawings:
 - a. In their native format
 - b. In the project coordinates and grid layout established in the models that support the IFC drawings.
 - 8. Submit a Federated Model of all models used to support the record shop drawings in .nwd format.

3.06 FIELD SURVEY POINT DATA TABLES

A. General

1. Consolidate all field survey point data into an Excel table documenting the final site conditions and provide in Excel.
2. Include the point number, Northing, Easting, Elevation, and Description for each surveyed item.

END OF SECTION

SECTION 01 78 39.30
AS-BUILT DOCUMENTS
JOC AND SMALL WORKS

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section specifies requirements for the preparation, maintenance, completion and submission of the as-built documents, including any Contract specification changes, as-built drawings, and field sketches.

1.02 DEFINITIONS

- A. Refer to Chapter 2 in the Design Technology Manual for definitions related to the as-built Drawings and field sketches.

1.03 STANDARDS

- A. Sound Transit Design Technology Manual (DTM): Standards and requirements for all drawings, models, and their supporting electronic data.

1.04 ELECTRONIC FILE FORMATS AND SOFTWARE

A. General

- 1. Contractor must submit all electronic files in the latest software version unless otherwise approved by the Sound Transit Design Technology Manager.

B. Portable Document Format (PDF)

1. General

- a. Submit in multi-sheet PDF files with the drawings/pages in the same order as provided in the Contract Documents.

2. File Naming

- a. Include in all PDF file names:
 - 1) An underscore (_) between each word with no spaces.
 - 2) The Facility ID(s) of the impacted site, for example, "N03" or "N03-N07".
 - 3) The type of document, for example, As-Built Specifications.
 - 4) Date of submittal, for example, 05-01-2022.
 - 5) Example: N03_As-Built_Specifications_05-01-2022

1.05 SUBMITTALS

- A. Authority Having Jurisdiction (AHJ) Permit Submittals

1. General
 - a. AHJ Permit Submittals do not constitute the final submission.
 2. Recording
 - a. Contractor must continue recording all subsequent changes to the required documents and supporting electronic data until the completion of construction and submit as part of the final submission.
 3. Submissions
 - a. Submit within [14] days of request by Sound Transit.
 - b. Allow for [1] submittal for each permit.
 - c. Allow for [1] submittal for each AHJ utility relocation work on the project.

Submit all documents and supporting electronic data as requested by the AHJ and Sound Transit.
- B. Final Submission
1. General
 - a. The Final Submission is the delivery of all required documents, drawings, and sketches that accurately reflect the final site condition.
 2. Recording
 - a. Record all changes up to Acceptance.
 3. Submission
 - a. Submit within the time frame specified in the Contract Documents.
 - b. Submit the following documents.
 - 1) Contract Specifications
 - 2) As-Built Drawings
 - 3) Field Sketches

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 GENERAL

- A. Contractor must update the as-built drawings, sketches, and Contract specifications with all changes made to the Contract drawings, Contract specifications, and field sketches as well as any site conditions encountered during the Work.
- B. Contractor must record all Work prior to concealing or covering.
- C. Make available to Sound Transit for review and acceptance every 30 days or sooner as part of the pay application review per the Contract Documents.

3.02 CONTRACT SPECIFICATIONS

A. General

1. Utilize the ST provided Contract Specifications and maintain them in PDF.
2. Stamp the front cover of each specification with "As-Built" in red.
3. Annotate all changes using red markings.
4. Red markings must be clear and legible.
5. Submit in Portable Document Format (PDF).

B. Recording

1. Record all changes within 30 days or less.

3.03 AS-BUILT DRAWINGS

A. General

1. Utilize the provided Contract Drawings and maintain them in PDF with unflattened markups and annotations. No inserted images or documents.
2. Stamp the front cover of each drawing set with "As-Built" in red.
3. Submit in Portable Document Format (PDF).

B. Recording

1. Mark with color, using the following conventions:
 - a. Red: Information to add.
 - b. Green: Information to delete.
 - c. Blue: Communications, instructions or reference information used to clarify changes (blue annotations will not be transcribed). This may include dimensions and references to other documents.
 - d. Record all changes within 30 days of executed change.

C. Incorporate Revised Contract Drawings

1. Update the As-Built drawings with new versions of the contract drawings:
 - a. Add the new version of the drawing to the set.
 - b. Move all previous markups, sketch references, and other annotations to the new version of the drawing.
 - c. Remove the previous version of the drawing.
2. Add only drawings with the project title block and all information included.

3.04 FIELD SKETCHES

A. General

1. Provide field sketches when there is not sufficient space on the As-Built Drawing, or if the level of change is too complex to provide clearly.
 2. Provide change information in either the drawing or referenced sketch without duplication.
 3. Submit in PDF
 - a. Include:
 - 1) Labeled cross referenced sketch number in blue.
 - 2) Reference numbering format for a PDF with a single page:
 - a) Sound Transit/ DSDC/ CMC; FSKST-XXXX.
 - b) Contractor; FSKGC-XXXX.
 - b. Reference numbering format for PDF with multiple pages:
Sound Transit/ DSDC/ CMC; FSKST-XXXX-1.
 - c. Contractor; FSKGC-XXXX-1.
- B. Recording
1. Add dimensions to accurately locate and orient the objects in the sketch to objects already in the as-built drawings.
 2. Create a unique identification number for each Field Sketch and place the number on the sketch and related as-built drawing.
 3. Store all field sketches separately from the as-built drawings.

END OF SECTION

SECTION 01 78 43.20
SPARE PARTS AND MAINTENANCE MATERIALS
DESIGN-BID-BUILD & GC/CM

PART 1 - GENERAL

1.01 SUMMARY

- A. This section includes furnishing, packaging, shipping, delivering, and unloading spare parts, replacement materials, keys, special tools, and test equipment.
- B. Operations and Maintenance Data: Lists of spare parts.

1.02 SUBMITTALS

- A. Spare Parts Logs:
 - 1. Contractor to receive the initial Spare Parts log from Sound Transit at Notice-to-Proceed.
 - 2. Submit spare parts and replacement materials log for approval for total quantities and material by Sound Transit
 - 3. The Contractor, in collaboration with the ST RE, shall confirm that Spare Parts list is complete and update as necessary.
 - 4. The Contractor is also responsible for updating the spare parts list as necessary to reflect Contract changes.
 - 5. The Spare Parts Log shall be organized in accordance with the Technical Specifications, by Section number and title.
 - a. The Spare Parts Log shall include the part's name or description, its trade name, Contractor's part number, manufacturer's name, manufacturer's part number, quantity, and correlation with the pertinent Contract Specifications, Contract Drawings, and Operations and Maintenance Manuals.
 - b. Spare parts shall be sub-grouped by equipment category. Replacement parts common to more than one category shall be cross-referenced and indexed. Common parts shall have only one part number.
 - c. The spare parts/shipping list shall include the following. (Sound Transit to provide Excel shipping template with each list separated by affected system)
 - 1) Item by item listing
 - 2) Affected System (Track TPS, TC, Communications, OCS, Electrical, Mechanical, Corrosion Control, and like items.) or Station (station furniture, tiles, and like items.)
 - 3) Quantity provided

- 4) Product Name / Description (starting with the appropriate keyword, followed by keyword modifiers)
- 5) Manufacturer's Name, Address and Telephone number
- 6) Manufacturer's Part Number
- 7) Manufacturer's Model Number
- 8) Unit of Measure (each, feet, and like items.)
- 9) Unit cost
- 10) Local Distributor (Name, Address, Federal ID, and Phone Number)
- 11) Distributor's Part Number
- 12) Authorized OEM Rebuild Facility (Name, Address, and Phone Number)
- 13) Confirmation of whether part is hazardous or not. (Include MSDS sheet if hazardous)
- 14) Recommended stocking quantities
- 15) Alternate vendor sources

6. Furnish spare parts and replacement materials as indicated in the table, on an approved log.

B. Shipping List and Delivery Form:

1. Coordinate with Resident Engineer to complete the appropriate delivery form(s).
2. Submit complete shipping list and delivery form (hard copy and spreadsheet file) to Sound Transit for review prior to requesting delivery appointment. Contractor will coordinate with Sound Transit to check the shipping list against the contract requirements and list of approved spare parts prior to scheduling delivery.
3. Submit MSDS for all hazardous materials (solvents, paints, and like items along with shipping list for Sound Transit review/acceptance for storage. Delivery will not be scheduled until discrepancies between the shipping lists and the contract and/or approved Spare Parts Log are resolved.
4. Following acceptance of the shipping list contractor may request a delivery date/time after information has been input in Sound Transits delivery receipt system.

C. Maintenance Materials Log (additional log inside of Spare Parts Log):

1. Prepare and submit a complete list of maintenance materials as specified in this Specifications and Contract Technical Specifications.
2. The Maintenance Materials Log shall be organized in accordance with the Technical and Construction Specifications by Section number and title. Include the quantities to be furnished.

3. Where maintenance materials are specified as a percentage of the materials installed, such percentages shall be translated to actual quantities of materials in the Maintenance Materials Log. List quantities to nearest boxed quantity as applicable.

D. Keys, Special Tools, and Test Equipment List:

1. Prepare and submit a complete list of keys, special tools, and test equipment as specified in this Specifications and in the Contract Technical Specifications.
2. The Keys, Special Tools, and Test Equipment List shall be organized in accordance with the Contract Technical Specifications by Section number and title.

1.03 SPARE PARTS

A. Requirements:

1. Provide spare parts as specified in Contract Technical Specifications.
2. Spare parts shall be identical to the parts installed in the Work.

1.04 MAINTENANCE MATERIALS

A. Requirements:

1. Provide maintenance materials as specified in the individual Sections of the Contract Specifications.
2. Maintenance materials shall be identical to the materials installed in the Work.

- B. Quantities: Provide quantities of materials as specified in the Contract Technical Specifications.

1.05 KEYS, SPECIAL TOOLS, AND TEST EQUIPMENT

- A. Requirements: Provide sufficient keys, special tools and wrenches, and special test equipment and gages as required to access, start, maintain, and repair all the installed equipment, appliances, systems, and assemblies as specified in the Contract Technical Specifications.

- B. Quantities: Provide quantities of keys, special tools, and test equipment as specified in the Contract Technical Specifications.

1.06 PACKAGING

- A. All spare parts, maintenance materials, keys, special tools, and test equipment shall be securely packaged in boxes, with the boxes clearly labeled as to the contents. Such labeling shall include location and description of the equipment and the item, complete listing of all items in the box, and the quantity of each item included in the box.
- B. Package and label spare parts and replacement materials in moisture proof containers suitable for shipment and storage. Attach copies of shipping list in package and to exterior of package. Submit procedures for packaging of spare parts for review and accepted by Sound Transit or its designee prior to any delivery of spare parts.
- C. Packaging shall consider the reliability of the parts and the normal requirements for inspecting and inventorying (e.g., the packaging selected for highly reliable parts shall be such that the parts can be identified, inspected, stored for 6-12 month periods, and endure multiple inventories).

- D. On scheduled delivery date(s) representative(s) from Sound Transit will be contacted to witness inspection of the contents of each item and verify the manufacturer numbers on the delivered material, match the manufacturer part numbers on the submitted and approved Spare Parts Delivery Form. The Spare Parts Delivery Form will be provided by Sound Transit at Notice to Proceed.
- E. To allow adequate inspection time deliveries may be scheduled over a period of one or more days.
- F. Spares shall be grouped together by like item, and not by station.

1.07 DELIVERY

- A. Deliver spare parts, maintenance materials, keys, special tools, and test equipment to the warehouse location or locations specified in the Contract Technical Specifications. The warehouse location will be designated by Sound Transit or its designee and within a maximum distance of 50 miles. Provide unloading service at the designated storage location for all delivered products.
- B. Prepare formal receipts for all such delivered products and have them signed by Sound Transit or its designee at the location. A copy of all such receipts shall be submitted to Sound Transit for information and record.
- C. Spare parts shall be new and unused components. During the construction phase any factory repaired components will not be acceptable as being equal to newly manufactured unit and delivered to Sound Transit for placement into inventory as a spare part.
- D. All Deliveries need to be compliant with required submittals prior to scheduling and executing deliveries of spare parts, maintenance materials and specials tools. All material shall be unloaded by contractor unless approved by Sound Transit. Any material noted as damaged by Sound Transit upon delivery shall be replaced by the contractor at no cost to Sound Transit.

1.08 STORAGE AND HANDLING REQUIREMENTS

- A. Spare parts, maintenance materials, keys, special tools, and test equipment may be stored temporarily at the site of the Work in suitable storage facilities until time to deliver these products to the locations designated in the Contract Technical Specifications.
- B. Unload spare parts and materials in a manner that will prevent damage to packages and contents. The Contractor will open packages and inspect spare parts and material for damage as required by Sound Transit. Damaged parts and materials will be returned to contractor for replacement with undamaged parts and materials at no additional cost to Sound Transit.
- C. All Spare Parts, Materials and Special Tools shall be stored in a temperature-controlled and weather protected location unless otherwise authorized in writing by Sound Transit

1.09 PRESERVATIVE COATINGS

- A. Apply to all materials subject to corrosion as required by supplier or manufacturer requirements.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 79 00

TRAINING

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section includes specifications for training of Operations and Maintenance personnel, Sound Transit, or other agencies in the operation and maintenance of all furnished equipment and systems.
- B. The training program shall train personnel to operate and maintain the furnished equipment and systems to perform in accordance with the requirements of this Contract.

1.02 SUBMITTALS

- A. Training Program Plan: Three hard copies and two electronic copies (one Microsoft Office document and one pdf) of the draft and final versions
 - 1. Draft Version: Submit 6 months before the start of training.
 - 2. Final Version: Submit 1 month prior to the start of training.
- B. Instruction Material: Instructor Guides and Student Handout Packages.
 - 1. Draft Version: Three hard copies and one electronic copy (Microsoft Office document) of the draft version. Submit 1 month prior to the start of training.
 - 2. Final Version: One hard copy and one electronic copy (Microsoft Office document). Submit by Substantial Completion.
- C. Training reports shall be submitted not later than 1 week after completion of training in accordance with the training schedule.

1.03 TRAINING PROGRAM DEVELOPMENT PLAN

- A. Prepare a Training Program Plan describing the training program. Provide complete documentation to substantiate employee certification and course program guides. Include, as a minimum, the following:
 - 1. A flow diagram indicating the logical progression of the training courses
 - 2. A training matrix for each course, including course title, type of instruction, lesson objectives, method of evaluating achievement of each objective, material and equipment requirements, and class duration of each lesson
 - 3. Résumés showing the qualifications of all proposed instructors: The principal instructors shall have previous formal classroom instruction training and relevant experience with the provided systems equipment in an operating environment.
 - 4. A list of all Subcontractors or other equipment manufacturers to be used in the training program and a description of their responsibilities
 - 5. A list of each course's prerequisites (e.g., knowledge of basic electronics)

6. Training Schedule: Develop a complete, detailed training schedule, in consultation with Sound Transit, after Sound Transit's receipt and review.

7. Instructor Guides

1.04 TRAINING PROGRAM: GENERAL

- A. Develop a training program consisting of a logically related sequence of separate courses covering equipment, system, and overall system maintenance of operations.
- B. Develop training that meets requirements Hazardous Waste Operations specified in WAC 296-843.
- C. Include classroom, hands-on or field instruction, as appropriate. Instruct Operations and Maintenance personnel first in the classroom, then with hands-on experience for putting the theoretical classroom training to practical use.
- D. Present classes and instructions in person by a qualified instructor. When prerecorded lectures are part of a training course, have the instructor or a qualified substitute supplement the recorded material. Ensure instructors demonstrate a complete and thorough technical knowledge of the material in the course – that they be thoroughly familiar with handbooks, guides, tools, test equipment, and other aids used in troubleshooting and repairing the equipment.
- E. Schedule training to fully train personnel prior to Substantial Completion, but after acceptance of Operations and Maintenance Manuals and completion of commissioning.
- F. Provide training for up to 30 participants in each training courses.
- G. Training facilities will be provided by Sound Transit.
- H. Schedule training to not interfere with the pre-revenue tests and commissioning of the system.
- I. Schedule training a minimum of two weeks in advance of desired training dates. Schedule training to not exceed 8 hours per day.
- J. Prepare training material appropriate for personnel with only basic skills pertinent to their agency job descriptions. Anticipate personnel who may not have knowledge of features of the subject equipment or systems.

1.05 TRAINING COURSES

- A. System Operations Training: Address the operating procedures of the integrated system. Include an understanding of the overall system operation and provide hands-on experience in operating the systems.
- B. Overall System Maintenance Training: Provide participants with a working knowledge of the system equipment, its operation, interfaces, and use of test equipment. Cover sufficient theoretical background and hands-on experience in troubleshooting and repair procedures to permit participants to locate and repair system faults in a timely manner. Cover all available troubleshooting and debugging techniques.
- C. Equipment Operations and Maintenance Training:
 - 1. For all equipment provided under the Contract, offer training in its operation and maintenance. Provide a thorough knowledge of the equipment, its operation, interfaces with other equipment, its capabilities, and use of related test equipment.

- 2. Provide participants with theoretical background and hands-on experience in troubleshooting, repair procedures, and preventive maintenance procedures. Include board level troubleshooting, repair and replacement. Have course participants operate equipment and learn how to use test equipment and fixtures to troubleshoot problems and repair failures.
- 3. Enable Operations and Maintenance personnel to develop a self-sufficient hardware maintenance team for all the equipment.
- D. Provide additional training, as deemed necessary by the Resident Engineer, due to modification to the systems and equipment made after completion of the training.
- E. Document training sessions with a sign-in sheet to confirm the training sessions were performed as required.

1.06 MATERIALS

- A. Use reference manuals, operating and maintenance manuals, system documentation, diagnostic manuals and user's manuals as training materials.
- B. Tailor principal documents used for training to reflect all Sound Transit equipment and specific user requirements.
- C. Reference the Operations and Maintenance Manual general version during training.
- D. Provide each course participant copies of training manuals and other pertinent material prior to the commencement of all courses.
- E. Upon completion of each course, instructor's manuals, training manuals, and training aids shall become the property of Sound Transit unless such items are specifically exempted by the Resident Engineer. Sound Transit reserves the right to copy all training materials and aids for Sound Transit use in Sound Transit-conducted training courses.
- F. Throughout the Contract and warranty periods, supply Sound Transit with all changes and revisions to the training manuals and other documentation.
- G. Provide all special tools, equipment, training aids, and all other materials required to train course participants. Provide an adequate number of special tools and other training equipment for the number of participants attending the course.
- H. Use actual hardware and photographs taken during the manufacturing process wherever possible. Ensure actual hardware used for training passes re-inspection and acceptance testing prior to being placed in service.
- I. Sound Transit shall have the right to video any and all training courses presented and to use these videotapes to train personnel in the future.

1.07 INSTRUCTION MATERIAL

- A. Instructor Guides and Student Handout Packages
 - 1. Include: Course title, agenda, schedule, document list (such as manuals), training aids (such as handouts), and the presentation.
- B. The presentation portion of the Instructor Guide shall be detailed enough to:
 - 1. Serve as a written record of the specific facts and information.
 - 2. Allow another instructor with knowledge of the area to teach the class.

3. Allow replication of all evaluations, tests, and quizzes given in conjunction with this lesson.

- C. The student handout package shall include all material referenced in the lesson.

1.08 TRAINING REPORTS

- A. Establish a grading system for approval by Sound Transit to report the progress of each trainee during a course. Grading shall be kept strictly confidential and furnished only to personnel in Sound Transit that are designated by the Resident Engineer. The grading system shall identify all requirements for further training for each participant.

1. Include graded tests (without names) with raw scores.
2. Include a summary of the results of monitoring and evaluating as well as records of student attendance and performance.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01 91 13**GENERAL SYSTEMS TESTING AND COMMISSIONING REQUIREMENTS****PART 1 - GENERAL****1.01 SUMMARY****A. Purpose:**

The purpose of the Testing and Commissioning Requirements is to establish the process for verifying that the systems have been installed in the prescribed manner and will perform in accordance with Sound Transit's project requirements. Adherence to the testing and commissioning process is a contractual obligation which will verify and document the quality of the system during testing and start-up and aid in the orderly transfer of equipment and systems into operational service to be used by Sound Transit.

B. Scope:

This Section includes general requirements for:

1. The Testing and Commissioning process including defined testing levels.
2. The Testing and Commissioning Plan, which includes the procedures, management, coordination, scheduling, execution and documentation of testing and commissioning work.
3. Performance of testing and commissioning testing and troubleshooting of equipment and systems.
4. Qualifications of the technical staff to perform and oversee the testing and commissioning activities.
5. Technician services requiring the use of tools or test equipment to perform the testing and commissioning work and to test adjust or otherwise bring equipment into a full operational state.

C. Testing and Commissioning work includes, but is not limited to:

1. Scheduling and coordination of testing and commissioning work.
2. Preparation of submittals.
3. Installation verification and documentation of components, and equipment to be commissioned.
4. Providing all necessary tools, instruments, equipment and personnel for Commissioning Tests.
5. Performing testing and commissioning activities including Systems integration testing to verify readiness for service.

6. Correcting issues and repeating testing and commissioning activities when results do not meet acceptance criteria.

1.02 SUBMITTALS

- A. Submittals shall be in accordance with Section 01 33 00, Submittal Procedures.
- B. Testing and commissioning.
 1. Testing and Commissioning Manager: Contractor must submit a resume documenting the following qualifications of the proposed candidate to Sound Transit for approval. Sound Transit, prior to approval, may elect to interview the candidate.
 - a. Employment History
 - 1) Present position, title, job description and employer details
 - 2) History of employment (include companies, dates and positions held), description of work on projects which qualifies the individual for the position
 - 3) Education and technical training
 - b. Employment History/Qualifications:
 - 1) Minimum ten (10) years of experience in Start-up and troubleshooting complex mechanical and electrical systems of similar complexity to those contained in these documents and their interface with other building equipment and Systems.
 - 2) Good working knowledge of complex environmental and electric power control and facility management Systems: Capability of understanding control vendor's operating System and control code; Capability of troubleshooting control code and recommending necessary modifications.
 - 3) Experience writing Testing and Commissioning Activity Procedures similar in complexity and level of detail required by this Contract.
 - 4) Excellent communication and writing skills, meeting facilitation skills, organizational skills, and ability to work well with management and trades contractors
 - 5) Experience with managing, scheduling and coordinating complex acceptance and verification work of multiple Subcontractors: Demonstrated ability to coordinate and schedule work of multiple contractors, integrated with other construction activities. Provide samples of work products that demonstrate day-by-day coordination and scheduling skills.
 2. Testing and Commissioning Plan
 3. Testing and Commissioning Schedule - Contractor may choose to submit this as part of CPM Schedule. Refer to 01 31 13.10.

4. Level 1 Testing and Commissioning Activity procedures and test forms for the following:
 - a. Factory Acceptance Testing
 - b. Installation Verification checklists
 - c. Static Test procedures and test forms
 - d. Start-up requirements, procedures, and test forms
 - e. Component Testing and Commissioning tests
 - f. Equipment Testing and Commissioning tests
 - g. System Testing and Commissioning tests
 5. Level 2 Testing and Commissioning Activity procedures and test forms for Intra-Facilities System Interface Testing (Field System Tests) and Commissioning Tests.
 6. Level 3 Testing and Commissioning Activity procedures and test forms for the following:
 7. Inter-Facilities Interface Tests (Systems Integration Testing)
 8. Testing and Commissioning Certificate of Conformance (for Level 3 to start): Submit within 14 days after the completion of Testing and Commissioning work is completed prior to Level 3 testing
 9. Final Testing and Commissioning Report: Submit within 14 days after the completion of all Level 1, 2 and 3 activities.
- C. Systems Integration
1. Systems Integration Test Manager/Integrated Test Lead: Contractor must submit a resume documenting the following qualifications of the proposed candidate to Sound Transit for approval. Sound Transit, prior to approval, may elect to interview the candidate. Resident Engineer reserves the right to interview the Systems Integration Test Manager/Integrated Test Lead candidate in person prior to accepting placement in the position. Final approval of the Systems Integration Test Manager/Integrated Test Lead will be by Resident Engineer.
 - a. Employment History
 - 1) Present position, title, job description and employer details
 - 2) History of employment (include companies, dates and positions held), description of work on projects which qualifies the individual for the position
 - 3) Education and technical training
 - b. Employment History/Qualifications:
 - 1) Minimum ten (10) years urban transit environment experience in testing, start-up and troubleshooting systems

of similar complexity to those contained in these documents.
Knowledge of testing procedures.

- 2) Demonstrated ability to coordinate and schedule work of multiple contractors, integrated with other construction activities. Provide samples of work products that demonstrate day-by-day coordination and scheduling skills.
- 3) Experience demonstrates a proven ability to collaborate with Civil contractors, subcontractors, suppliers, engineering leads and the owner to create testing plans for the verification, and validation activities, such as determining verification methods or simulation test cases.
- 4) Knowledge of selection, application, and use of field calibration grade equipment and instrumentation for measuring equipment and system performance.
- 5) Have ten years of experience as a System Test Manager and Systems Integration Test Manager, or comparable role, performing testing and commissioning of systems of similar complexity to those contained in these documents.
- 6) Have extensive knowledge of System Integrated Test Procedures.

c. Experience with managing, scheduling and coordinating complex acceptance and verification work of multiple Subcontractors.

2. System Integration Test Plan (SITP); Submit at least 12 months before the start of SIT Testing.
3. System Integration Test Procedures; Submit at least 6 months before the start of the SIT Testing.
4. System Integration Test Reports; Submit within 7 days after the completion of system integration tests.

1.03 TRANSMITTALS

- A. Testing and Commissioning Manager Letter of Authority: Within 10 days after approval of the Testing and Commissioning Manager resume and qualifications.
- B. Testing and Commissioning Activity weekly/monthly reports.
 1. Installation Verification report: Prior to Start-up of a System, transmit Installation Verification report.
 2. Monthly Testing Summary: Transmit monthly beginning with first factory test submittal.
 3. Monthly Issues Log update: Transmit monthly beginning with first factory test submittal.
 4. Three-week look ahead Testing and Commissioning Schedule; Transmit weekly

5. Weekly Testing and Commissioning Progress Report: Transmit on the first day of the week following the week in which Testing and Commissioning Activities are conducted. Include information for Testing and Commissioning Activities conducted since the preceding report:
 - a. Testing and Commissioning Activity number including identification of components, assemblies, equipment or Systems
 - b. Activity date
 - c. Submittal date
 - d. Apparent activity status: Acceptable or not acceptable results, in the opinion of the Testing and Commissioning Manager.
 - e. Testing and Commissioning Activity data: Within 3 days after completion of each test
 - f. Testing and Commissioning Activity test forms, signed and dated.
 - g. Provide data trend logs when specified for individual Testing and Commissioning Activities.

PART 2 - SYSTEMS TESTING AND COMMISSIONING AND SYSTEMS INTEGRATION TESTING PROCESS

2.01 OVERVIEW OF THE TESTING AND COMMISSIONING PROCESS

- A. Requirements Based Process: To demonstrate meeting the contract requirements, and those required by Authorities Having Jurisdiction and Sound Transit, the testing and commissioning process shall be structured as requirements-based to demonstrate that criteria and functionality is achieved at each level of testing.
 1. The Contractor is responsible to test and commission all installed equipment and it's remote monitoring and control as applicable. At a minimum, equipment and Systems shall be subject to the testing levels defined in section 2.02 below.
 2. The Testing and Commissioning Plan shall be multi-leveled, structured from factory to field, and progressed through increasing levels of complexity from component to subsystem to system-level testing as defined below.
 3. The Testing and Commissioning Plan shall define the interfaces between the system elements to be commissioned under this contract and those in operational service on Sound Transit facilities. Specific procedures to manage these interfaces without impact to operations shall be included in the Plan.
 4. The Testing and Commissioning Plan shall define the interfaces between the system elements to be commissioned under this contract and those being installed and commissioned by other contractors or Agency personnel and develop procedures for testing these interfaces.
- B. The Contractor assumes sole responsibility for the planning and safe execution of all testing and commissioning activities.

The Contractor shall:

1. Ensure that all tests are carried out in a manner such that adverse impacts on Sound Transit assets or operations do not result.
2. Ensure that the testing is performed in a safe and effective manner and shall be responsible for the progressive levels of testing and final acceptance into operational service of all new or modified equipment installed under this contract.
3. Be responsible for testing the equipment installed under this Contract in order to demonstrate that the equipment will operate as specified and can be monitored or controlled remotely as required by Sound Transit's Link Control Center (LCC) and back-up LCC.
4. Be responsible for coordinating and providing all procedures, equipment, instruments and personnel required to complete the required testing.

2.02 TESTING AND COMMISSIONING ORGANIZATION OF LEVELS

- A. The Testing and Commissioning Plan shall be organized in a progressive fashion to clearly define the testing process in the following categories. Each component, subsystem and system to be tested shall be associated with one of the Levels defined below. A full definition of these levels can be found in the latest Systems Integration Test Program (SITP).
 1. Level 1 Testing and Commissioning activities:
 - a. Factory Acceptance Testing: Activities numbered xxxx-FAT-xx. The Factory Acceptance Testing (FAT) shall demonstrate that each System as a whole and each of its subsystems and components meets all requirements, including functional and non-functional requirements.
 - b. Installation Verification: Activities numbered xxxx-IV-xx. Procedures to confirm material and equipment is installed in accordance with Contract requirements. (see additional information in 3.08.1)
 - c. Static Test: Activities numbered xxxx-ST-xx. Procedures to test the integrity of installed elements.
 - d. Start-up: Level 1 Testing and Commissioning: Activities numbered xxxx-SU-xx. Procedures used to bring equipment or systems from a state of complete installation to powered operation. Verify capacity, control, and coordinated response of materials, components and equipment that comprise a system to a variety of conditions and loads in accordance with specified sequences of control.
 - e. Component Tests: Activities numbered xxxx-C-xx. Tests of the controllability, functionality and calibration of individual instrumentation, components, monitoring and control devices. Verify installation, calibration, adjustment and response under a variety of conditions important to the required performance of associated equipment and systems.
 - f. Equipment Tests: Activities numbered xxxx-E-xx. Tests of the controllability, functionality and capacity of individual assemblies or items of equipment including, but not limited to, items identified in equipment schedules.

- g. System Tests: Activities numbered xxxx-S-xx. Tests of the controllability, functionality and coordination of individual systems.
2. Level 2 Testing and Commissioning Activities:
- a. Facilities System Interface Tests (Field System Tests): Activities numbered xxxx-IS-xx. Tests of the controllability, functionality and coordination of multiple systems, within a facility, provided within this Contract.
 - 1) Includes tests to demonstrate that the systems elements perform satisfactorily when connected to interfacing systems elements or subsystems, within a facility or single location. Facilities as intended here would include stations, office or maintenance facilities, garages, buildings and any wayside structures. Identification of facilities is to be included in the Testing and Commissioning Plan for approval.
 - 2) Includes verifying capacity, control and coordinated response of systems within the facilities, including communication signals and responses between the various Systems under a variety of conditions and loads.
 - 3) Verify functional performance of the completed system as a standalone system independent of interfacing systems such as remote SCADA monitoring and control.
 - b. Site Acceptance Tests: Activities numbered xxxx-SAT-xx are systems tests performed at a given facility/site, as provided by the Contract. These systems tests are performed to test the controllability, functionality, and integration of provided systems at a single location/site.
3. Level 3 Testing and Commissioning Activities:
- a. Inter-Facilities System Interface Tests (Systems Integration Testing): Testing and Commissioning Activities numbered xxxx-IIS-xx or xxxx-SIT-xx. Tests of remote monitoring and control and interface beyond a single location or Facility. This includes testing of monitoring and control by existing systems located at control centers, including SOC, the LCC and Backup LCC. It shall also include any other control external to the Work of this Contract of the systems provided within this Contract.
 - 1) Tests that are performed to ensure that operating system elements function properly together.
 - 2) These tests are performed to assure that all elements and personnel on the rail system can function together properly as an integrated system.
 - 3) The Contractor's testing shall verify functionality between all related System elements such as Communications, Supervisory Control and Data Acquisition (SCADA), Building Management Systems, Fire Detection and the Emergency Ventilation System (EVS), Signaling and Traction Electrification. An example would be to perform Integrated

Factory Acceptance Tests for SCADA prior to field deployment. Testing shall include functionality at both the Link Control Center (LCC) and the back-up control center.

- 4) Level 3 includes the testing to support the Sound Transit System Integration Test Plan (SITP). Further information for the SITP is shown in Section 3.04 below.

4. Level 4 Testing and Commissioning Activities

- a. Pre-Revenue Operations/Simulated Service Tests: Testing and Commissioning Activities that are conducted to simulate revenue service operations
 - 1) Pre-Revenue Operations simulate normal and abnormal conditions, including emergencies, and progressively stress test the functionality of the installed systems.
 - 2) Simulated service tests will be conducted by Sound Transit prior to opening of the service. The simulated service conducted during the pre-revenue service phase provides additional System validation. The Contractor shall support the simulated service tests per milestone and contract dates.
 - 3) Sound Transit will verify proper training of operations staff during this level.
 - 4) Sound Transit will perform operations during Pre-Revenue Service that are intended to stress test the system including service at peak headways for extended periods of time. The Contractor shall provide technical personnel for; monitoring the system performance during Pre-Revenue Service; troubleshooting; and repairing issues as required. The Contractor shall be responsible for all access permits, coordination with Operations, and performance of required work.
 - 5) Sound Transit will perform emergency drills with the Authorities Having Jurisdiction (AHJ) which support Rail Activation and Final Safety Certification Requirements. The Contractor shall provide technical support to this effort.
 - 6) Contractor must request and gain approval from Sound Transit for track time or any other access through the Sound Transit Track Access Permit procedure during pre-revenue operations.
 - 7) Maintenance: Contractor must provide maintenance of systems elements for the duration of the pre-revenue operations phase. In the event of a component failure or general maintenance, coordinate with Sound Transit Operations prior to entering Pre-Revenue areas.

2.03 SYSTEMS INTEGRATION TESTING

A. SIT Overview

1. System Integration Testing (SIT) is the culmination of all subsidiary system testing to validate final operation of the integrated system completely (as a whole). Table A is a minimum set of required tests. In creation of the DIP and other integration information coming to light, the system integrator is responsible for defining any tests to de-risk SIT and add any SIT testing per project requirements to validate systems.
 2. The Contractor's integrated testing shall verify all elements on the rail system can function together properly as an integrated system. Details of the tests from previous Sound Transit projects are available upon request.
- B. SIT tests versus tests called out in Technical Specifications.
1. Testing
 - a. While several system integration tests are defined in individual system tech specs (e.g. 34 23 69) as shown in column "Test Definition" in Table A, this alignment is in terms of scope and criteria. Tests in lower-level technical specifications may be iterated until the integrator has a high level of confidence that the test passes. At this time, the owner will be requested to witness the SIT as a final validation of successful system integration. An example of this would be iterative live wire testing per 34 23 69 3.05 C until confidence in passing test results is gained. At this time, SIT 301 may be conducted.
 2. Submittal Clarification
 - a. Where scope of test is aligned between the subsidiary system testing technical specifications and a SIT per 01 91 13, the same document (test procedure, results and/or reports) may be used to satisfy both requirements if they meet all requirements of both specifications. In this case, the document must be submitted to both the tech spec and 01 91 13.
 3. Technical Specification Specific Plans vs System Integration Plan
 - a. Any test plans that are required by technical specifications for system integration are to follow the detail required per each specification. The System integration plan, provided by the contractor, that is an overview which covers all the requirements in section 3.04. Utilization of the SITP is intended for development of discipline specific tests that are required by technical specifications.
- C. Prerequisite testing guidance. This is a min set of requirements that will be discussed during subcommittee and tiger team meetings to get approval of test acceptance from ST. Prerequisites shall identify all steps, including those from lower level tests, must be completed successfully prior to any integrated tests.
1. Refer to Attachment 2 below.
- 2.04 ALIGNMENT OF T&C (TESTING AND COMMISSIONING) AND SIT (SYSTEMS INTEGRATION TESTING):
- A. Testing and Commissioning and System Integration Testing are two separate requirements. Both requirements are to be completed prior to handoff to Sound Transit.

- B. Tests that are performed during the Level 3 SIT may also require prerequisites in Level 1 or 2 commissioning which if so, will cause additional coordination between the two groups (e.g. operations and subject matter experts). Any identified issues during SIT may require re-commissioning of any lower-level elements.
- C. Tests that cover both a commissioning test as well as an integration test should be submitted in both sections.

2.05 ROLES AND RESPONSIBILITIES: CONTRACTOR AND AGENCY

A. Contractor Responsibilities:

1. The Contractor shall perform all the tests defined in the Testing and Commissioning Plan.
2. The Contractor shall ensure that a fully traceable and auditable record of all testing completed is maintained for the duration of this Contract. The Contractor shall utilize the Sound Transit provided Commissioning Database for maintaining current versions of all Test Procedures, Test Reports and Issues Log on Sound Transit's SharePoint Site. The Commissioning Database will reflect the current status of all Test Procedures, Test Reports and Issues in accordance with the requirements of this specification.
3. The Contractor is responsible for correcting any non-compliant items or defects found during testing including those found by Sound Transit personnel or other AHJs.
4. The Contractor is responsible for safely executing all testing and test support activities. The Agency reserves the right to order the cessation of any test or activity due to any safety concern, including personal injury and property damage, until the safety concern is resolved and eliminated.
5. The Contractor shall schedule and attend regular testing and commissioning meetings with Sound Transit to discuss Testing and Commissioning. Items discussed shall be documented by the Testing and Commissioning Manager and agreed upon by Sound Transit's Resident Engineer or delegate with due dates for assigned action items. Minutes shall be distributed to all attendees and other interested parties.
 - a. Testing and Commissioning Meetings shall include at a minimum the topics of:
 - 1) Testing and Commissioning schedule and progress, including a three-week look ahead schedule.
 - 2) Testing and Commissioning Issue Report Database open items.
 - 3) Test Plans, Procedures, and Test Results.
 - 4) Alignment with Sound Transit Systems Integration Test Plan
 - 5) Work Permit and Sound Transit EIC and resource requirements.
 - 6) LRV and LRV Operator needs.

- 7) Upcoming Test Readiness Reviews and Test Briefings
- 8) Any information, testing parameters, equipment set points that changed as a result of testing and shall be updated in the O&M Manuals.

b. Meeting frequency:

- 1) Prior to the beginning of Testing and Commissioning Test activities, conduct testing and commissioning meetings at least monthly, to review the Commissioning Database, plan, schedule, coordinate, and set test procedures. After the Testing and Commissioning Manager is approved, the first meeting shall be held 90 days prior to submission of the Testing and Commissioning Plan.
- 2) Following the approval of Testing and Commissioning Plan the Contractor should have monthly meetings. At three weeks prior to the beginning of Component or Equipment Testing the contractor shall transition into weekly meetings. On occasion, more frequent meetings may be required.
- 3) The Resident Engineer may require additional testing and commissioning meetings if the testing and commissioning process is behind schedule or if there are coordination problems. The Testing and Commissioning Manager may also request in writing additional meetings. Attendance at additional testing and commissioning meetings shall be at no cost to Sound Transit.

6. Contractor to provide expectations on ST staffing support (signal, train operators, safety oversight) so that ST can reasonably accommodate personnel as listed in section 2.03 c.1. At a minimum, contractor shall provide hours of staffing support required and what work activities are being scheduled.

B. Sound Transit Responsibilities

1. All personnel, facilities, rolling stock, equipment, and other resources, if agreed by Sound Transit to be supplied for use by the Contractor, shall be in accordance with Sound Transit's-accepted Testing and Commissioning Plan. The quantities, schedule, and other logistical aspects of Sound Transit making such resources available shall be in accordance with Sound Transit's-accepted Testing and Commissioning Plan, Cutover Plan, Site-Specific Work Plan (SSWP), System Access/Track Allocation Request, and Master Project Schedule (MPS). Access procedures to these resources shall be as pre-arranged with Sound Transit. The Contractor shall return all Sound Transit-provided items to Sound Transit in a revenue ready condition to the satisfaction of Sound Transit (which includes punch list completions and acceptance of deviations by Sound Transit).
2. Sound Transit reserves the right to deny access to any Sound Transit operational infrastructure or resources if the Contractor cannot demonstrate readiness of hardware, software, and Contractor resources or if preceding build, integration, and testing steps are not sufficiently complete and passed, at the sole discretion of Sound Transit.

3. Sound Transit will provide a Commissioning Database. Commissioning Database will be hosted on Sound Transit's SharePoint Site.
4. Sound Transit will provide the project System Integration Test Project Plan (SITPP) which shall be supported by the Contractor's System Integration Test Plan (SITP), as well as test procedures (see Attachment 1).
5. Sound Transit has the right to cease any testing/commissioning activities that may jeopardize revenue service or safety. Any confirmed or potential delays to revenue service due to systems commissioning must be reported to ST Operations / Link Control Center immediately.

C. Sound Transit Personnel

1. Sound Transit will provide signal maintainers, train operators, safety monitors, rail car maintainers and supervisors, LCC personnel, on-rail vehicle drivers, SCADA technicians, and access to Sound Transit system, as agreed in the accepted Testing and Commissioning Plan and Master Project Schedule. This is dependent on the contractor following the KCM track access process for coordination.
2. Sound Transit will provide Operations Representatives and Test Engineers to Witness all testing at its discretion as indicated in section 3.03 below.

2.06 MANAGEMENT OF TESTING AND COMMISSIONING

A. Testing and Commissioning Manager

1. The Testing and Commissioning Manager is responsible for the development and execution of all Testing and Commissioning activities and shall execute the testing and commissioning program in accordance with the approved Testing and Commissioning Plan and Testing and Commissioning Master Schedule. The Testing and Commissioning Manager shall manage and coordinate the Testing and Commissioning work and shall be supported by the System Integration Test Manager and specific System Test Engineers. The Testing and Commissioning Manager shall:
 - a. Coordinate with Subcontractors with respect to their responsibilities and contractual obligations for Testing and Commissioning.
 - b. Coordinate with System discipline testing managers to ensure timely development of System Test Procedures, Execution of Systems Integrated Tests and delivery of in-process and final Test Reports as outlined in the requirements of this specification
 - c. Obtain, assemble, and submit Testing and Commissioning documentation.
 - d. Conduct on-site Testing and Commissioning meeting, with remote participation capabilities.
 - e. Develop and maintain the Testing and Commissioning schedule. Integrate Testing and Commissioning schedule into the construction schedule. Update schedule and submit monthly along with the monthly Baseline Project Schedule update.
 - f. Populate and maintain the Testing and Commissioning Database per section 2.05.

- g. Prepare, with assistance from Subcontractors as needed, and submit the Testing and Commissioning Activity Procedures and test forms.
- h. Verify that Testing and Commissioning Activities have been completed with passing results.
- i. Ensure that necessary test instrumentation is available during Testing and Commissioning Activities and that those instruments meet quality and calibration requirements and are in good working order.
- j. Track and report Testing and Commissioning issues until resolution and retesting is successfully completed.
- k. Retain original records of all Testing and Commissioning Activities, organized as required for the Testing and Commissioning report. Provide Sound Transit's Representative access to these records upon request throughout the Contract period.
- l. Assemble and submit the Testing and Commissioning Report to Sound Transit for acceptance.
- m. Provide 24/7 contact and coverage information to ST for use by the Link Control Center in case of unplanned system failures

B. Systems Integration Test Manager/Integrated Test Lead

- 1. The Systems Integration Test Manager/Integrated Test Lead shall be responsible for directing the performance of all Systems Integrated Testing that involves a Passenger Vehicle and a related System element such as Communications, Supervisory Control and Data Acquisition (SCADA), Building Management Systems, Fire Detection and the Emergency Ventilation System (EVS), Signaling and Traction Electrification as defined in the Testing and Commissioning Plan. The System Integration Test Manager/Integrated Test Lead shall be responsible for all aspects of the System Integrated Test effort, including coordinating access to test locations, arranging support personnel from other Contractor functional areas and from areas not under the Contractor's authority, coordinating test efforts with other functional area construction and test activity, and providing overall monitoring of the System Integrated Test Performance. The System Integration Test Manager/Integrated Test Lead shall:
 - a. Manage the development of the Systems Integration Testing procedures.
 - b. Report to the Testing and Commissioning Manager and provide support with the timely scheduling and execution of all System Integrated Tests as identified in the Testing and Commissioning Plan.
 - c. Plan, schedule and execute each System Integration Test.
 - d. Ensure that all pre-requisite tests have been performed prior to the performance of each Systems Integration Test.

C. System Test Engineer

- 1. The System Test Engineer is the lead engineer responsible for performance of the system testing and integrated tests for an individual system;

Communications, Supervisory Control and Data Acquisition (SCADA), Building Management Systems, Fire Detection, Fare Collection, Signaling, Traction Electrification, Passenger Vehicles or any other specialty system that requires a technical expert to perform the integrated testing and commissioning. The System Test Engineer shall provide support to the System Integration Test Manager and the Testing and Commissioning Manager as required. The System Test Engineer shall:

- a. Lead the development of the individual system test procedures and test reports.
- b. Be responsible for the execution of individual System testing and commissioning.
- c. Support the Testing and Commissioning Manager and the Systems Integrated Test Manager in development of the Testing and Commissioning Program Plan and Testing and Commissioning Master Schedule.

2.07 TESTING AND COMMISSIONING MASTER SCHEDULE

A. The Testing and Commissioning Master Schedule: Develop CPM schedule with tests to identify how the Systems Integration Testing process will meet overall Contract schedule durations. Identify critical path tests. Activities shall be linked to the Baseline Project Schedule such that changes in predecessor activities are reflected in the Testing and Commissioning Master Schedule.

1. Schedule shall include a line item for each Commissioning Test or activity specific to the equipment or Systems involved.
2. Identify CPM schedule predecessor activities and dependent activities for Testing and Commissioning work.
3. Identify Testing and Commissioning work predecessor activities, prerequisites and dependencies in monthly statused CPM schedule Submittals.
4. Identify Testing and Commissioning work activities in monthly CPM schedule update Submittals.
5. Identify track access permit application activity.
6. Identify Testing and Commissioning work predecessor activities, prerequisites and dependencies in three- week look-ahead schedule Submittals.
7. Integrate Testing and Commissioning work into the Contractor's construction schedule and updates, and the Three-Week Look-ahead Schedules.

B. Three Week Look Ahead Schedules:

Three-week look-ahead schedules shall identify the following for each Testing and Commissioning Activity for the following 3 weeks:

1. Activity date
2. Activity start time and anticipated duration

Three-week look-ahead schedules will be used to notify and coordinate participation of Sound Transit's Witnesses, support equipment, and EIC. The Contractor shall

provide the following information for each Testing and Commissioning Activity to the Resident Engineer at the Weekly Construction Meeting:

3. Staging location for participants and witnesses to meet
4. Contractor and Sound Transit personnel that will be required
5. Sequencing
 - a. For any particular assembly, system or area of work, Testing and Commissioning Activities shall proceed in the following order:
 - 1) Complete testing at the lower number level prior to starting the next higher number level, except that Level 1 component tests shall be performed prior to Level 1 Start-up if the proper function of the component impacts the performance of the Start-up.
 - 2) Verify the functional readiness of equipment and system.
 - 3) Notify the Resident Engineer if acceptable results cannot be achieved due to conditions beyond the Contractor's control or responsibility.
 - 4) Tests shall not be performed and test reports and results will not be considered valid until procedures are approved by Resident Engineer.
 - 5) Tests results showing prerequisite test passed must be submitted before subsequent tests can be performed as outlined in accepted Testing and Commissioning Plan.

PART 3 - EXECUTION

3.01 TESTING AND COMMISSIONING PLAN

- A. The Contractor shall develop and submit a complete overall Testing and Commissioning Plan to Sound Transit for review and acceptance. Contractor shall utilize the Sound Transit General Testing and Commissioning Plan as the basis for the development of the Contractor's Testing and Commissioning Plan. Submit the Testing and Commissioning Plan no later than 180 days prior to the start of the first scheduled Testing and Commissioning Test.
- B. The Contractor shall implement the testing, commissioning and reporting process in accordance with the Testing and Commissioning Plan. In addition, the Contractor shall develop and submit a Cutover Plan for each cutover phase of the project, to provide further elaboration and updates based on the overall Testing and Commissioning Plan. Each Cutover Phase-specific Testing and Commissioning Plan shall include all details specific to the cutover area needed to plan and execute the cutover phase, including but not limited to over-and-back procedures and the final cutover methods in support of revenue service.
- C. The Testing and Commissioning program shall be requirements-based to demonstrate that all requirements are met by the System at each level of testing. The Contractor shall define and provide at minimum the testing levels defined in section 2.02. The Testing and Commissioning program shall be multi-leveled, structured from factory to

field, and progressed through increasing levels of complexity from component/subsystem to system-level testing. The Testing and Commissioning plan shall describe the approach to the component/subsystem and system-level testing and how it relates to the deployment and migration of each System.

- D. The Testing and Commissioning Plan shall provide details, for each major system and subsystem (the detailed list of which shall be developed by the Contractor), how the requirements of the Technical Specifications will be achieved, including, at a minimum, the following:
1. Introductory overview and scope of the Testing and Commissioning work, developed specifically for the Contract.
 2. A clear and logical testing and commissioning sequence for the entire program, including dependencies between predecessor and successor tests and other activities. This shall be incorporated into and maintained in the Master Project Schedule.
 3. Preliminary Testing and Commissioning schedule that summarizes execution of activities by specification section, testing and commissioning level and its relationship within the contract.
 4. Descriptions and listings of what testing and commissioning activities will be done.
 5. Responsibility, accountability and authority of the Contractor and the Sound Transit personnel
 6. Review and utilization of the Final Design Verification Report.
 7. Methods of compliance to Sound Transit KCM Track Access Permitting.
 8. Record-keeping assignments, procedures, and forms
 9. Methodology for tracking and correcting failures and unexpected observations including the use of the Issues Log as defined in section 3.09.
 10. Specific information on means and methods for testing each cutover phase and each distinct cutover area.
 11. An outline of the organization of Testing and Commissioning team members, their defined roles, their company and its relation to the project, their names, contact information and position or title.
 - a. Descriptions of the roles and responsibilities for testing and commissioning team members to differentiate portions of the Testing and Commissioning work with which the team members are involved. Define in detail the responsibilities and specific tasks to be completed by the individual members including, but not limited to, test procedure development, approval and execution; database management; coordination of meetings, communication and notifications.
 - b. Describe intended methods for Communication within the team, including meeting organization, routine status updates, three-week look ahead schedules and management of the database.

12. Matrix of Testing and Commissioning Activities, organized by specification section to identify Testing and Commissioning Activities by subject area, equipment or system, the estimated execution dates, pre-requisites, predecessors, and the primary party responsible for performing activities and providing necessary instrumentation.
13. Achieve a mutual understanding between Contractor and Resident Engineer on range, scope, and other aspects of tests to be conducted.

3.02 SYSTEMS INTEGRATION TEST PLAN (SITP)

- A. The Contractor shall develop and submit an overall Systems Integration Test Plan (SITP) to Sound Transit for review and acceptance.
- B. System Integration tests are functional tests performed when all systems that need to talk to each other come together. These System Integration Tests provide verification of the integrated systems required to operate a railroad and provide a key element of validation of the System as a whole. Separate subcontractors may provide individual systems, but Contractor has the responsibility to test functionality of Systems when they are interconnected. These tests also include integration testing between Sound Transit equipment and new equipment provided by the Contractor.
- C. Tests involving other contractors such as fare collection equipment, radio and civil contractors must be coordinated with other contractors.
- D. Review and utilization of Final Design Verification Report along with Testing and Commissioning Plan.
- E. At a minimum, the System Integration Test Plan shall provide the following, including:
 1. Organizational Structure.
 2. Criteria and plan to meet safety certification testing requirements.
 3. Plan for integration test procedures, System Tests list scheduling, support, conduction and documenting the integration tests.
 4. Describe Contractor responsibilities for testing from factory testing through Integrated Testing and up to pre-revenue testing.
 5. Plan for coordination between, all interfacing contracts and Sound Transit Operations.
 6. Access control to Project area and plan to manage the access regulations between contractors, testing, and rail operations. For access to revenue service areas of mainline track adhere to track access procedure outlined in the Contract Documents.
 7. Integrated Testing Elements:
 - a. List test personnel, their responsibilities, and resources necessary for integration.
 - b. Interface with Sound Transit: List tests required to integrate Systems elements with existing Sound Transit systems.
 - c. Integrated Test Sequence: List tests that must be performed first to obtain data for interface with subsequent designs.

- d. Integrated Test Schedule: Develop CPM schedule with tests to identify how design integration process will meet overall Contract schedule durations. Identify critical path tests.
 - e. List and describe tests.
 - f. For each test provide a test procedure and test results.
- 8. Support and Coordination:
 - a. Notify Resident Engineer, at least 2 weeks in advance, of any scheduled integrated test.
 - b. Resident Engineer or designated representative may witness each test.
 - c. Sound Transit will be responsible for LRV operations functions during integrated testing. Sound Transit will arrange operations support for integrated testing as requested by Contractor.
- 9. Meetings:
 - a. Hold weekly integrated test status meetings with Resident Engineer during integrated testing period.
 - b. Meeting Attendees: Project Manager, Integration Test Lead, Test Directors involved in that week's testing activities, and Resident Engineer.
 - c. Agenda: Progress, status issues, and future activities. Review monthly testing summary.
 - d. Document these meetings with meeting minutes and provide an initial distribution to attendees within 1 week for comment.
 - e. Incorporate any Sound Transit and Resident Engineer comments on meeting minutes and provide final copies of minutes at next meeting.
- 10. Integrated Test Responsibilities:
 - a. Identify Integrated Test Lead position who is responsible for managing day-to-day activities for the SITP and each System Test Director. Test Lead and Directors must be present on-site during testing activities.
 - b. Integrated Test Lead is responsible for coordinating with Resident Engineer and Sound Transit, provides advance notice for testing dates, issues requests for Sound Transit support and track access for revenue operation sections of Sound Transit LRV System.
 - c. System Test Director: Manages execution of each test procedure, arranges, in conjunction Integrated Test Lead, support personnel for each test.
- 11. Staffing:
 - a. Coordinate staffing provided by others that may be required for integrated testing effort.

- b. Sound Transit Operations, Maintenance, Engineering, and Construction Management staff may witness actual execution of tests.
 - c. This process is intended to maximize involvement of Sound Transit employees to familiarize them with the Project Work to the greatest extent possible.
- 12. Cutover plans
- 13. Resource needs
- 14. Test schedules
- 15. Test sequencing
- 16. Safety measures – e.g. protected crossings, job hazard analysis, site specific safety info, communications (Irv before radio commissioned), etc.
- 17. Prerequisite definition & tracking
- 18. Configuration control - changes happen post test
- 19. Iterate / revisit plan periodically
- 20. Integration of individual test plans

3.03 TESTING PROCEDURES

- A. For each individual test to be performed throughout the Contract period, including all Proof of Concept, Factory, and Field testing specified herein, the Contractor shall submit Test Procedures for Sound Transit's acceptance.
 - 1. The Contractor test procedures shall list clear unambiguous criteria for each step indicating what would be a result in a PASS, FAIL or INCOMPLETE result.
 - 2. A test fails if the expected results for it are not achieved as described in the criteria.
 - 3. Only if all test steps of the procedure have passed, shall the test be recorded as passed.
 - 4. If any test step is not performed, the procedure shall be marked as incomplete. Any problem, failure or procedure mark-up arising from the tests shall be reported and recorded.
- B. The test procedures shall contain, at a minimum, the following:
 - 1. Test ID as identified in the Testing and Commissioning Plan and approved by Sound Transit;
 - 2. Test objective with the name of the feature and/or function to be tested;
 - 3. Revision level and reference number of the test procedure;
 - 4. References to the functional, design, user, and any other documents describing the function;

5. List and detailed configuration descriptions of all subsystems and components under test
 6. Test location
 7. Estimated time
 8. Expected results for each test step with success/failure criteria in quantitative terms
 9. Safety flags to identify and verify key items to ensure safe system behavior in the scope of the test
 10. Safety issues and concerns to be addressed/mitigated
 11. Clearly identify required outages, schedule impacts, and recovery methods
 12. Sequence of testing including prerequisite tests
 13. Equipment and instrumentation required
 14. Weather and other ambient conditions during the test
 15. Test setup and initial conditions
 16. Testing pre-requisites
 17. Descriptions of the techniques and scenarios to be used to simulate system field inputs and controlled equipment
 18. Sound Transit support requirements, including personnel, equipment and trains/work vehicles, Link Control Center accommodations
 19. Step-by-step descriptions of each test step, including train movements and the inputs and user actions for each test step
 20. Data to be recorded and evaluation procedure
 21. Space to be provided in the test procedure and filled in during the performance of the test for the software to be used, with revision numbers identified
 22. Reference to Testing and Commissioning Issues Report generated as necessary
 23. Type of report or data to be issued
 24. Test personnel performing the test, Attendees and witnesses who shall sign test procedure witness sheets
 25. A test data sheet form to capture the items to be recorded at during the test
 26. Test Procedures shall be inclusive and thoroughly test each subsystem and component, both independently and collectively as an integrated system, for Sound Transit's acceptance.
- C. Test Procedures shall consist of pre-printed step-by-step procedure sheets for each test, with any salient data or reference material incorporated, attached or referenced.

When completed by the test personnel and checked for accuracy and completeness, the sheet shall be submitted as the test report.

1. The test sheets shall contain a check-off system for each test, and a blank space adjacent to the expected range of values in which to record the test readings.
 2. When tests require specific meter or test instrument readings, the pre-printed data sheet shall show the allowable range of values for each step of the test. Data sheets shall also include test equipment information, including manufacturer, model number, serial number and calibration information.
- D. During field testing, if any temporary changes in software or hardware are made for any reason, it shall be identified and captured in the Contractor's configuration management system. All changes shall be removed after the completion of the test, with the software and hardware under test returned to original configuration, pending formal build, acceptance, and release of any desired changes resulting from the test.
- E. During testing, simulated conditions may need to be imposed using an artificial load when it is not practical to test under design conditions. Provide equipment to simulate loads. Set simulated conditions in accordance with approved Commissioning Test Procedures, as directed by the Commissioning Coordinator. Document simulated conditions and methods of simulation. After tests, remove external loads and return settings to normal operating conditions.
- F. Test Procedures shall be submitted 60 Days prior to commencement of each test and shall be approved prior to 30 days prior to the start of any testing. The contractor shall provide any necessary revisions prior to approval from ST.

3.04 MONTHLY TEST SUMMARY

- A. Show consolidated test data including tables, curves, photographs, and any additional test data required to support test results. List summary and conclusions based on test data for each system.
- B. List tests performed, when and where the test is performed, and the test results (passed or failed). List tests scheduled for the upcoming month including personnel, equipment, and other resources required to complete the tests. List any issues impacting scheduling of tests. Provide update to the testing CPM schedule and list critical path tests.
- C. Provide an update of the Test Issue Log to show new issues found and issues with resolutions determined and retests passed.

3.05 TEST READINESS REVIEWS AND TEST BRIEFINGS

- A. The Contractor shall conduct a Test Readiness Review (TRR) at least five days prior to any type of test. The Test Readiness Review will be attended in person or via web meeting by Sound Transit and any third parties required for the test. The Contractor shall demonstrate through the Test Readiness Review that the system safety, logistical, and other necessary elements for test are ready. The Contractor shall ensure that all safety issues and hazards are identified, reviewed, and completely mitigated. The Contractor shall also be responsible to obtain all applicable work and track access permits from Sound Transit. As a prerequisite to the TRR, the Contractor shall demonstrate approval of the procedure for the subject test and closure of all design review action items for the subject under test and its subassemblies. At the TRR, the contractor shall review open nonconformance and issue reports generated during previous testing of the test subject and its subassemblies (i.e. lower level testing).

- B. At the time of every test, upon the start of every work shift and whenever there are changing conditions, personnel, or activities, the Contractor shall conduct a safety briefing with all test personnel involved. The safety briefing shall review and establish the work to be performed, physical and other limits of the work, emergency procedures, potential hazards and mitigation, address any safety concerns of any personnel, and other topics needed to ensure safe conduct of the test. In the safety briefing, the methods and protocols for communication among personnel shall be established, to ensure safe train movements and otherwise ensure safety during the testing activities.

3.06 WITNESSING OF TESTS

- A. Sound Transit will provide operations representative and test engineers or inspectors to witness and verify testing performed by the Contractor. Sound Transit will advise the Contractor if Sound Transit will be witnessing the test(s) within five days of receipt of the Test Notification. The Contractor shall accommodate such test witnessing.
- B. If Sound Transit does not confirm the witnessing, Sound Transit shall still have the right to witness any and all tests. In this circumstance the Contractor shall not be required to make any arrangements to enable such witnessing.
- C. As part of test witnessing by Sound Transit representatives, the Contractor shall provide informal training opportunities for system familiarization, with the test articles and test environments of any witnessed test. Witnessing of tests shall not be considered as acceptance of test results or test reports.

3.07 TEST REPORTS

- A. The Contractor shall ensure that test results compiled in a test report provide an accurate record of the event detailing version(s) of software, subsystem(s) and test tools. Any supporting evidence such as drawings, tools, data and log files must be included as part of the test report.
- B. The Contractor shall ensure that the original test results and supporting evidence will be archived and available for audit by Sound Transit.
- C. Upon completion of each type of test described in this section, the Contractor shall submit to Sound Transit for review and acceptance a Test Report. Test Reports shall include the completed test procedure form plus all the following information if not already included:
 - 1. Pass or Fail results overall and for each test step
 - 2. Reference to the appropriate section of the test procedures
 - 3. Description of the test performed
 - 4. Date of the test
 - 5. Description of all problems encountered and applicable defect identification numbers
 - 6. Any deviations to the test procedure along with descriptions and rationale for any observations or deviations from the test procedure
 - 7. Test results
 - 8. Identification by signature of the Contractor's test engineer, and of Sound Transit's personnel or representatives present (if any)

9. Provision for comments by Sound Transit representatives
10. Names of any log files used to verify results
11. Retest procedures, if required
12. Software/Hardware version numbers
13. Final configuration of all tested equipment including set-points developed or modified during testing and commissioning.
14. Upon completion of each test, the Contractor shall update and submit the following:
 - a. Configuration item list
 - b. Technical Change Reports.

3.08 TESTING AND COMMISSIONING ISSUES

- A. Testing and Commissioning activity results that are not within the range of acceptable results are Testing and Commissioning Issues.
- B. Resolve Testing and Commissioning Issues promptly. Testing and Commissioning Issues where the issue is obvious and resolution can be completed in a time agreed to by Sound Transit shall be noted on the Testing and Commissioning test data form and a Testing and Commissioning issue report shall be issued. A new Testing and Commissioning test data form, marked "retest," shall be initiated after the resolution has been completed.
- C. Test Issue Log: Contractor to maintain this document, on ST database, to track test and commissioning issues and their corresponding resolution. Provide a summary sheet tracking systematic test issues to aid in identification of quality and procedural problems.
 1. For each test issue, provide the following information on the Test Issue Log:
 - a. Test number and description.
 - b. Equipment identification and location.
 - c. Briefly describe observations about the performance which was associated with failure to achieve acceptable results. Identify the cause of failure if such is apparent.
 - d. Diagnostic procedure or plan to determine the cause if the cause is not readily apparent.
 - e. Diagnosis of fundamental cause of issues as specified below if the cause is not readily apparent.
 2. For each test issue resolution provide the following information on the Test Issue Log:
 - a. Identify the fundamental cause of unacceptable performance as determined by diagnostic tests and activities.
 - b. Identify corrective action taken to resolve the issue.

- c. List date of retest and result. Final entry shall be of test that passed.
- D. Track and report test issues until resolution and retesting are successfully completed. Maintain a current record of testing issues on a Test Issues Log to be submitted with the Monthly Testing Summary.
- E. Complete a Testing and Commissioning Issue Report for Level 3 & 4 Testing and Commissioning Activities for which acceptable results were not achieved. All Issues Reports shall be logged into the Commissioning Database Issues Log.
- F. Contractor shall record the following when Testing and Commissioning Issues are identified:
 - 1. A unique, sequential number for tracking purposes for individual Testing and Commissioning issue reports when they are created.
 - 2. Action distribution list
 - 3. Report date
 - 4. Amended test number and description
 - 5. Equipment identification and location
 - 6. A brief description of observations concerning the performance, which was associated with failure to achieve acceptable results. Identify the cause of failure if such is apparent.
 - 7. Diagnostic procedure or plan to determine the cause if the cause is not readily apparent
 - 8. Diagnosis of fundamental cause of issues as specified below if the cause is not readily apparent
- G. A Testing and Commissioning Issue Report shall be logged in the Issues log of the Commissioning Database within 24 hours of the time the issue is identified.
- H. Complete the closure of the logged Issue when the issue has been resolved. Include:
 - 1. The fundamental cause of unacceptable performance as determined by diagnostic tests and activities
 - 2. The corrective action taken to resolve the issue, and the dates and initials of the persons making the entries
 - 3. The schedule for retesting
 - 4. Signature and date of the person(s) who performed actions
- I. The Testing and Commissioning Issue Report shall be updated and logged into the Issues Log of the Commissioning Database within 24 hours of the time the issue is reported resolved.
- J. Track and report Testing and Commissioning issues until resolution and retesting are successfully completed. Maintain a current record of Testing and Commissioning issues on Testing and Commissioning Issues Log on the shared Commissioning Database.

- K. Do not report multiple issues on the same Commissioning issue report, except if an entire class of devices is determined to exhibit the identical issue. In that case the identical issue for the entire class may be reported on a single Commissioning issue report. If a single Commissioning issue report is used for multiple devices, each device shall be identified in the report and the total number of devices at issue shall be identified.
- L. The Quality Manager plays a key role in the testing and commissioning process. Per 01 45 00 Quality Management Specification, the quality manager should ensure all procedures and reports are being submitted correctly per standards. The quality manager shall coordinate issues from the construction issue's log that require any further testing/retesting are making its way to the SIT and commissioning issues log and that they are being completed per schedule. The quality manager shall ensure any hold point checklists that are completed have the relevant forms and signatures for signoff from commissioning or SIT. They shall not conduct any commissioning or SIT tests and IDR's that falls under the responsibility of the System Test Engineer.

3.09 CATEGORIES OF TEST FAILURES

- A. Test failures and defects shall be categorized by the Contractor based on standardized severity levels; the categorization is subject to Sound Transit acceptance and in case of disagreement, revision at the sole discretion of Sound Transit. Categories shall be numbered 1 through 4 as defined below:
 - 1. Critical: Safety or operationally catastrophic or critical
 - 2. Severe: Prevents or severely limits proper operation of the system, subsystems and components under test
 - 3. Significant: Requirement(s) in the accepted test plan have not been met
 - 4. Minor: Test failure due to a relatively minor behavior or appearance, which can be reasonably worked around temporarily until the defect is corrected.
- B. Category 1 and 2 failure actions: Further deployment, migration, and testing shall not be allowed of items with open Category 1 and 2 failures against the hardware or software item allocated the failure, except that informal site engineering testing is allowed provided that the testing can be done safely and productively.
 - 1. If a Category 1 or 2 Failure is identified during field testing, no equipment related to the specific problem may be placed into service without a resolution.
 - 2. Depending on the severity of the problem either testing will immediately stop and the Contractor shall evaluate and correct the problem before testing is resumed, or other testing will continue and the problem will be evaluated and corrected at a mutually agreed upon time.
- C. Category 3 and 4 failure actions: Further deployment, migration, and testing may be allowed of items with open Category 3 and 4 failures, at Sound Transit's sole discretion, provided that the Contractor presents and implements a reasonable work-around plan to allow the productive continuation of deployment, migration, and testing activities.
- D. Category 1 or 2 Factory Tests: If a Category 1 or 2 failure is identified during the factory testing, no equipment related to the specific problem can be shipped to the field.
- E. Category 3 or 4 Factory Tests: If a Category 3 or 4 failure is identified during the factory testing, a plan of action for resolution of the failure must be agreed between the

Contractor and Sound Transit officials before the equipment is installed. Shipping documentation shall reflect test failure and requirements for additional work.

- F. No equipment shall be energized or placed in operating mode until completion of the Field Installation testing and permission of the Resident Engineer.

3.10 REPAIR / RESTORATION

- A. Diagnosis of Cause: Where the fundamental cause of a Testing and Commissioning issue is not readily apparent, the Contractor shall perform, diagnostic tests and activities required to determine the fundamental cause of the issues being observed.
 - 1. If it is determined that the issue results from design errors or omissions or other conditions beyond the Contractor's responsibility the Contractor is to document the issue and notify Sound Transit of the probable cause of the issue.
- B. Records shall be kept for each step of the diagnostic procedure prior to performing the procedure. The written procedure shall be updated as changes become necessary.
- C. The results of each step of the diagnostic procedure shall be recorded in the testing log.
 - 1. Record the conclusion of the diagnostic procedure with regard to the fundamental cause of the issue.
 - 2. Determine and record corrective measures including repair and restoration.
- D. Include diagnosis of fundamental cause of issues and the repair or restoration activities in Testing and Commissioning Issue Report Log Part 2 and include in the Testing and Commissioning Issues Report.

3.11 TOOLS AND TEST EQUIPMENT

- A. The Contractor shall develop and use software, laptops, and other test tools and devices to ensure that the requirements of the testing and commissioning phase are met. Test tools are subject to validation tests before use in their intended environment and prior to the formal testing.
- B. The Contractor shall ensure that all industry standard test equipment and instrumentation has been validated and/or calibrated against known and traceable requirements and that valid calibration certificates are available for inspection.
- C. Provide a list of instruments and test equipment that will be used in the Testing and Commissioning Tests. Sort instruments and test equipment according to intended use. Obtain acceptance of the test equipment identification list prior to executing Testing and Commissioning Tests. Instruments and test equipment not included in the accepted test equipment identification list shall not be used. The test equipment identification list shall include:
 - 1. Test equipment identification number: Identify equipment by a unique alphanumeric identifier to be referenced in submitted procedures.
 - 2. Range
 - 3. Accuracy
 - 4. Resolution

5. Intended use

D. Proprietary test instruments and tools:

Test instruments and tools are proprietary if they are required by the equipment manufacturer for testing, calibrating, servicing or maintaining equipment provided under this Contract, and if the test instruments or tools are available exclusively through said manufacturer or their authorized representative.

1. The Contractor shall provide proprietary test instruments or tools required by the equipment manufacturer and shall operate the proprietary test instruments or tools as required for Testing and Commissioning work.
2. Identify proprietary test instruments or tools required in the test equipment identification list. Include a separate list of proprietary test instruments in the Operations and Maintenance manuals.
3. Proprietary test instruments or tools become the property of Sound Transit upon completion of Testing and Commissioning the Work.

END OF SECTION

ATTACHMENTS

Attachment 1: Sample Integrated Text Matrix

Attachment 2: Sample SIT Prerequisites

ATTACHMENT 1 – SAMPLE INTEGRATED TEST MATRIX

Test ID	Test Description	Test Objective	Test Definition (Verify tech spec references per project)
101	Radio Communications Device	Verify personnel are able to communicate by radio throughout the extension, stations and any wayside buildings.	27 60 07-009 1.04 D 3 Radio System Testing
102	Cart Clearance	Verify that there is adequate clearance between the LRV (including pantograph) and all equipment and facilities along the segment (including underbody clearances) as demonstrated by a clearance cart.	OCS clearance per 34 23 69 3.01 E.2 Overhead Contact System Testing; Car body clearance per DCM Chapter 4, 4.2.6.
103	LRV Car Mover Clearance	Verify that there is adequate clearance between the car mover and equipment and facilities along the segment.	Low speed sweep with car mover to be used for SIT 201.
201	LRV Dead Tow Clearance	Verify that there is adequate clearance between the LRV and the equipment and facilities along the extension.	Dead wire per 34 23 69 3.05 B Overhead Contact System Testing; Car body clearance per DCM Chapter 4, 4.2.6.
202	Track Switch / LRV Interface	To verify proper operation, orientation and wheel to rail interface of the switches using a light rail vehicle.	Operate a two car (minimum) LRV at walking, then operating speed over track switches in each direction inspecting track pre and post run, and noting interface during operation focusing on switch points and frogs.
203	Bumping Post / LRV Interface	To verify proper interface between LRV and bumping posts.	Bring LRV near to post to check alignment of bumping pads and anti-climbers. Verify pantograph stays on OCS up to post.
204	Ride Quality	Evaluate riding comfort of an “as-finished” train operating under anticipated revenue service conditions on “as-built” trackwork.	Evaluate using one or multiple cars at weight conditions defined by SME. Qualitative test could be followed by quantitative assessment if required.
301/302	Live Wire OCS (Including Camera)	Verify the LRV pantograph and OCS perform as designed with the system energized.	34 23 69 3.05 C Overhead Contact System Testing
303	TPSS Emergency Trip	Verify proper Transfer Trip, ETS, including all FCC ETS, and SSS operation.	34 21 16.11 3.02 D Traction Power Substation Testing

304	Overcurrent Relay / Pull-Away	Verify that the Traction Power with OCS system will allow multiple train starts under full load in the same power grid throughout the extension. i.e. verify "worst case" operating scenario from load flow analysis.	34 21 16.11 3.03 E Traction Power Substation Testing
305a	Rail / Earth / Isolation / Detection	To verify the Rail to Earth Voltage is within allowable limits and that the rail is properly isolated.	26 42 55 (Civil spec) Track Resistance Testing
305b	Rail to Ground Monitoring	To verify the Stray Current Monitoring System monitors voltage as designed and that the values are within limits. DURING PRE-REVENUE	34 21 16.11 3.03 D Traction Power Substation Testing
401	Train Control / Track Circuit Shunting	To verify that a single axle of one LRV provides sufficient shunting at ends of track circuits to permit detecting the vehicle and that the train signals and control operates as intended.	34 42 98 3.01 D 4 Signal System Testing - (SIT requires LRV for test)
402	Train to Wayside Comms (TWC)	Verify the proper operation of TWC equipment. Verify that the train is communicating with the system, all valid TWC codes are requested and decoded.	34 42 98 3.01 D 6 Signal System Testing - (SIT requires LRV for test)
403	Control Line / In Cab Signalling	Verify that a under all circumstances, the correct cab signal is received by the train as shown on the control lines.	34 42 98 3.01 D 2,3,5 Signal System Testing - (SIT requires LRV for test)
404	Train Tracking	Verify train control/signal system identifies multiple train movements on same and intersecting tracks throughout the Extension and that signal aspects in the field match the LCC screens.	Traverse alignment with LRV while monitoring TCS screens in LCC (or laptop proxy). Ensure multiple trains are accurately tracked and ensure that the signal aspects in the field match those on the screen.
405	Signal Aspect Sighting	Verify visibility of all signal aspects in the Extension.	34 42 98 3.01 D 2; Any signal sighting distance under 600' must be accepted by EOR.
406	Control Line Braking Distance	To verify that the designed braking distances provide adequate stopping distance for operational vehicles.	Identify and agree (w EOR) control lines for test, use degraded brake configuration for LRV ATP, travel at Control Line speed and go into safety braking at extreme of control line and measure stopping distance.
407	Wayside Sign / Marker Visibility	Verify visibility and ensure that all wayside signs and markers on the Link	34 42 98 3.01 D 2 Signal System Testing; evaluate sighting visibility of

		ROW are outside of the dynamic envelope of the LRV.	all signs and markers. E.g. speed signs, stopping markers, etc...
408	Traffic Signal Interface	To ensure the signal system properly spaces trains and traffic. Verification of all systems for traffic and pedestrian grade crossings including deployment and audio, visual and gates and all associated timings. Tests must be coordinated with AHJs as required.	34 42 98 3.01 D 7 Signal System Testing
501a	EFN Test (Emerg Fire Network)	Verify that the installed EFN operates in a normal, and failover configuration as intended. Testing includes transmission tests, link speed and ping tests, and traffic failover tests.	N/A
501b	TCN Test (Train Control Network)	Verify that the installed TCN operates in a normal, and failover configuration as intended. Testing includes transmission tests, link speed and ping tests, and traffic failover tests.	N/A
502	EVS Tunnel Airflow Test	Verify air flow and velocity within tunnel align to design and meet requirements for fire, life safety.	Interstation Tech Spec (Civil)
503	SCADA EVS Sequence	Verify proper integration between SCADA, field control programmable logic controllers, fan damper control panels, emergency ventilation control panels, fire alarm control panels and building management systems. End to end test verifying alarms picked up by EVS at the station are registered at LCC and vice-versa. Conduct sequence testing verifying the Emergency Response Matrix (tunnel stations).	Interstation Tech Spec (Civil)
504a	SCADA TCS Test (Signals); SCADA TCS Test (Traction Power)	Verify the monitor and control functionality of all signals and traction power operation on the TCS network operate as designed.	34 42 98 3.01 E 1; 34 21 16.11 3.03 C; 25.00.001.07F.3.a-f
504b	SCADA TCS Train Tracking with LRV Test	Verify train tracking, routing and monitoring are demonstrated using LRVs operating on the extension.	25.00.00.1.07F.3.g-l
504c	SCADA TCS Train Tracking Accuracy Test	Verification of the PACIS integration aligning platform announcements with train arrival information. (PIMS may replace this scope going forward)	25.00.00.1.07F.3.n

504d	TCS Performance Testing	Robustness measure of database used for TCS information DURING PRE-REVENUE	25.00.00.1.07F.3.o-p
505	SCADA BMS Test	Conducted from the SCADA BMS user interface at LCC and verifies proper control and indications of all BMS devices in the field.	Verify the monitor and control function of all BMS points from the LCC.
506	PA/VMS/VES & ERM Verification	Verify the integration of all audio and visual station messaging elements from standard operation through emergency scenarios. the Voice Evacuation System and the Station Control Unit and Station PA subsystems.	Verify the operation of the PA, VMS and VES through integration of the EVCP, FACP and SCU in all modes from normal operating to alarm, including modes in the ERM. Verify message priority for different messaging systems.

ATTACHMENT 2 – SAMPLE SIT Prerequisites

Test ID	Test Description	Civil Prerequisite	System Prerequisite
S1-101	Radio Communications Device	<ul style="list-style-type: none"> Complete building enclosures 	<ul style="list-style-type: none"> Complete Installation of Radio Network
S1-102	Cart Clearance	<ul style="list-style-type: none"> Final Track Survey Approved Track weld reports received All wayside equipment with chance to affect Dynamic envelope installed. 	<ul style="list-style-type: none"> All wayside equipment installed
S1-103	LRV Car Mover Clearance	<ul style="list-style-type: none"> Final Track Survey Approved w/ Track Gage measurements Fire Department training of lifting plan 	<ul style="list-style-type: none"> SIT 102 Clearance Cart Test report Approved
S1-201	LRV Dead Tow Clearance	<ul style="list-style-type: none"> Final Track Survey Approved w/ Track Gage measurements Fire Department training of lifting plan 	<ul style="list-style-type: none"> SIT 102 Clearance Cart Test report Approved
S1-202	Track Switch / LRV Interface	<ul style="list-style-type: none"> Level 1&2 track switch commissioning tests Approved 	<ul style="list-style-type: none"> Signals / interlocking Level 2 testing Approved
S1-203	Bumping Post / LRV Interface	<ul style="list-style-type: none"> Bumping posts installed 	<ul style="list-style-type: none"> OCS installed over bumping post
S1-204	Ride Quality	<ul style="list-style-type: none"> Rail grinding/polishing complete 	<ul style="list-style-type: none"> SIT 201 LRV Dead Tow Clearance Approved
S1-301/302	Live Wire OCS (Including Camera)	<ul style="list-style-type: none"> Demonstrate that TPSS have completed and passed FIT Civil R2G testing approved Working limits and speed limits for train (overall work plan) Communication plan (if SIT 101 is not completed) TCP approved. Fire Department Authorized and Trained Any vegetation overgrown considered that could impact testing 	<ul style="list-style-type: none"> SIT 201 LRV Dead Tow Clearance Approved TPSS L2 testing Systems Certificate of Conformance 4 car consist available
S1-303	TPSS Emergency Trip	<ul style="list-style-type: none"> Demonstrate that TPSS have completed and passed FIT 	<ul style="list-style-type: none"> TPSS L2 testing fiber between TPSSs

S1-304	Overcurrent Relay / Pull-Away	<ul style="list-style-type: none"> Demonstrate that TPSS have completed and passed FIT 	<ul style="list-style-type: none"> SIT TPSS L2 testing SIT 301 Live Wire OCS Approved
S1-305	Rail / Earth / Isolation / Detection	<ul style="list-style-type: none"> Civil R2G testing approved 	<ul style="list-style-type: none"> All rail interfacing equipment installed
S1-401	Train Control / Track Circuit Shunting		<ul style="list-style-type: none"> Signals L2 testing SIT 301 Live Wire OCS Approved
S1-402	Train to Wayside Comms (TWC)		<ul style="list-style-type: none"> Signals L2 testing SIT 301 Live Wire OCS Approved
S1-403	Control Line / In Cab Signaling		<ul style="list-style-type: none"> Signals L2 testing SIT 301 Live Wire OCS Approved
S1-404	Train Tracking		<ul style="list-style-type: none"> Signals L2 testing SIT 301 Live Wire OCS Approved
S1-405	Signal Aspect Sighting		<ul style="list-style-type: none"> Signals L2 testing SIT 301 Live Wire OCS Approved
S1-406	Control Line Braking Distance		<ul style="list-style-type: none"> Signals L2 testing SIT 301 Live Wire OCS Approved
S1-407	Wayside Sign / Marker Visibility		<ul style="list-style-type: none"> Signals L2 testing SIT 301 Live Wire OCS Approved
S1-408	Traffic Signal Interface	<ul style="list-style-type: none"> Traffic signal's installed 	<ul style="list-style-type: none"> Signals L2 testing SIT 301 SIT 301 Live Wire OCS Approved City traffic signal interfaces commissioned
S1-501a	EFN Test (Emerg Fire Network)	<ul style="list-style-type: none"> Permanent power energized to rooms or cabinets housing network switches. 	<ul style="list-style-type: none"> Fiber network and switches fully run, terminated and continuity confirmed.

S1-501b	TCN Test (Train Control Network)		<ul style="list-style-type: none"> Fiber network and switches fully run & terminated
S1-502	EVS Tunnel Airflow Test	<ul style="list-style-type: none"> Level 1 and 2 testing for all components associated with tunnel ventilation. Ventilation shafts and elevators complete. Station and cross passage doors installed and tested. 	<ul style="list-style-type: none"> EFN fiber network complete
S1-503	EVS Sequence Testing	<ul style="list-style-type: none"> Level 1 and 2 testing for all components associated with tunnel ventilation. Level 1 and 2 testing complete for all building systems and fire alarm systems that respond to emergency events. 	<ul style="list-style-type: none"> PIMS Commissioned SCADA installed on server (or laptop) Factory Integrated Acceptance Test
S1-504	SCADA TCS Test		<ul style="list-style-type: none"> TCN fiber network complete SCADA installed on server (or laptop)
S1-505	SCADA BMS Test	<ul style="list-style-type: none"> Level 1 and 2 testing for all components associated with BMS complete. 	<ul style="list-style-type: none"> TCN fiber network complete SCADA installed on server (or laptop)
S1-506	PA/VMS/VES & ERM Verification	<ul style="list-style-type: none"> Level 1 and 2 testing for all components associated with EVS, BMS and Fire Alarm. 	<ul style="list-style-type: none"> PA, VMS, VES, EVS, BMS fully commissioned PIMS Commissioned

Notes:

- Switches shall be clamped and blocked and only hand thrown until SIT 202 is complete
- SIT 303 should be completed prior to new substations used for train testing
- SIT 305a should be completed before live train testing
- Temp train speed signs posted until SIT 403
- Crossings should be protected (flaggers) until all SIT 400 level's are completed.

END OF ATTACHMENTS

SECTION 01 95 00

SYSTEM INTEGRATION REQUIREMENTS

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes requirements necessary for proper system development, design and execution required for completion of this Contract.
- B. This document provides the framework for the Systems integration activities including establishing and tracking all interfacing elements within the project, with other interfacing projects and with the Sound Transit Operating system.

1.02 DEFINITIONS

- A. Integrated Design Lead/Systems Design Integration Manager: Individual responsible for:
 - 1. Detailed Systems integration (including train control, traction electrification, SCADA, communication systems, security systems, facility control systems, etc.) both internal to the project and with the Sound Transit existing system.
 - 2. Development and authorization of formal technical documents, procedures and reports.
 - 3. Understanding and verifying system requirements to ensure components are designed to criteria and codes and are integrated into the overall transit systems.
 - 4. Working in conjunction with the Project Systems Integration Manager (see Sound Transit Interface Coordination and Integration Plan (ICIP) requirements).
- B. System Design Leads: Designers responsible for:
 - 1. Detailed system designs.
 - 2. Developing designs in conjunction with the Systems Design Integration Manager.
 - 3. Serving as support personnel for each design integration task.
- C. Design Verification Forms:
 - 1. Used for documenting the interface design information.
 - 2. Shall include a brief description of interface, related drawings and/or sections by number to be verified, and a date and signature block for each responsible designer to sign.

1.03 SUBMITTALS

A. Integrated Design

1. Integrated Design Lead/Systems Design Integration Manager: Contractor must submit a resume documenting the following qualifications of the proposed candidate to Sound Transit for approval. Sound Transit, prior to approval, may elect to interview the candidate. Resident Engineer reserves the right to interview the Integrated Design Lead/Systems Design Integration Manager candidate in person prior to accepting placement in the position. Final approval of the Integrated Design Lead/Systems Design Integration Manager will be by Resident Engineer.
 - a. Present position, title, job description and employer details
 - b. History of employment (include companies, dates and positions held), description of work on projects which qualifies the individual for the position.
 - c. Education and technical training.
 - d. Personnel Qualifications:
 - 1) Minimum ten (10) years of experience in transit system design integration tasks across all disciplines/systems.
 - 2) Expert competency in transit system design and intent. Should have good experience in transit system design integration tasks across all disciplines/systems included in this contract.
 - 3) Excellent communication and writing skills, organizational skills and ability to work well with management and contractors.
 - 4) Minimum five (5) years of experience with management responsibility for scheduling and coordinating complex integrated systems design, acceptance, and verification work of multiple subcontractors.
 - 5) Availability to perform the work in accordance with the project schedule. Sound Transit reserves the right to interview the Systems Design Integration Manager candidate in person prior to accepting placement in the position.

B. Design Integration Plan (DIP)

C. Final Design Verification Report

1. A copy of The Final Systems Interface List (SIL)
2. A copy of final Interface Control Documents (ICD)
3. All signed Design Verification Forms.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 DESIGN INTEGRATION PLAN (DIP)

- A. The Contractor shall develop and submit an overall Design Integration Plan (DIP) to Sound Transit for review and acceptance. The DIP should cover both system design and verification including required design meetings, list Integration and System Design leads and list of documents required for exchange of design information.
- B. At a minimum, the Design Integration Plan shall provide the following, including:
 - 1. Provide a plan for both system design and verification. List integration and Systems Design Leads, design meetings required and documents necessary for exchange of information.
 - 2. Uniform process to identify interfaces and coordination between individual Systems elements at design level.
 - 3. Describe process and procedures for identifying, verifying, and documenting interfaces including appendices with lists of interfaces to be verified, verification schedules, verification procedures, and verification forms.
 - 4. Integrated Design Elements:
 - a. List design personnel, including their responsibilities, and resources necessary for integration.
 - b. Integrated Design Sequence: List designs that must be performed first to obtain data for interface with subsequent designs.
 - c. Integrated Design Schedule: Develop CPM schedule with design tasks to identify how design integration process will meet overall Contract schedule durations. Identify critical path design issues.
 - d. Develop a summary and procedure for each design integration element.
 - 5. Systems Interface List (SIL):
 - a. List identified interfaces between each individual System.
 - b. Incorporate assistance of personnel listed for each individual System design to aid in identification of pertinent interfaces.
 - c. Include System elements (e.g. TES, Signals, Corrosion and Communications) and their interfaces with civil elements (e.g. clearances, conduits, manholes, ROW).
 - d. List systems and equipment that interface with items provided under civil contracts (e.g. lighting, building management system (BMS), ventilation, fire alarm and suppression, and HVAC).
 - e. Instructions and formatted template for integrating the design specifics between the systems (i.e. Inputs/Outputs/Protocols) provided under

this contract (Interface Control Documents (ICDs)/Systems Interface Data Tables (SIDT)).

- f. List information or requirements required from civil contractors for design of systems provided under this Contract (e.g. BMS points list).
- g. Include a column preliminary IS and IIS connections based off created 08 specifications.
- h. Interface with Sound Transit: List data and process to integrate System elements with existing Sound Transit systems.

6. Integrated Design Responsibilities:

- a. Identify Integrated Design Lead/Systems Design Integration Manager position responsible for managing day-to-day activities for the DIP. This person shall ensure that the system design elements are compatible, integrated and will not result in any conflict during project construction, integration, and revenue service.
- b. Integrated Design Lead/Systems Design Integration Manager will be responsible for coordinating with Resident Engineer and Sound Transit, provides advance notice for design meetings, issues requests for Sound Transit support, data, and field survey. Develops and authors; formal technical documents; integration test plans, procedures, and reports. Understands and verifies system requirements to ensure components are built to specification and are integrated into the overall transit systems. The Integrated Design Lead/Systems Design Integration Manager will develop the Design Integration Plan (DIP).
- c. System Design Lead: Designer in responsible charge of system design. Provide one design lead for each system. System Design lead develops procedures, and arranges, in conjunction with Integrated Design Lead/Systems Design Integration Manager, support personnel for each design integration task.

7. Design Verification:

- a. Develop procedures and forms to be used for verification process and a process for documenting and verifying that design interfaces have been completed.
- b. Verification Forms: List information about which interfaces are to be verified, a brief description of interface, related drawings and/or sections by number to be verified, and a date and signature block for each responsible designer to sign.
- c. Verification Process: Include assurances responsible design engineers have reviewed and approved interfaces, must be completed prior to installation of any Systems elements.
- d. Design Verification Report: Include, at a minimum, an outline describing verification process, a copy of final SIL, and signed verification forms.

3.02 MEETINGS

- A. Hold monthly integrated-design status meetings with the Resident Engineer during integrated design period.
 - 1. Meeting Attendees: Project Manager, Systems Design Integration Manager, System Design Leads involved in that month's integration activities, Resident Engineer, Sound Transit and interfacing contractor leads as required.
 - 2. Agenda: Progress, status issues and future activities (3-month look ahead).
 - 3. Document these meetings with meeting minutes and provide an initial distribution to attendees within one week for comment.
 - 4. Incorporate any Sound Transit and Resident Engineer comments on meeting minutes and provide final copies of minutes at next meeting.

END OF SECTION