

**SOUND TRANSIT  
STAFF REPORT**

**MOTION NO. M2007-50**

**Contract Amendment for  
Geotechnical Support Services During Construction**

<b>Meeting:</b>	<b>Date:</b>	<b>Type of Action:</b>	<b>Staff Contact:</b>	<b>Phone:</b>
Finance Committee	5/3/07	Discussion/Possible Action to Recommend Board Approval Action	Ahmad Fazel, Link Executive Director	(206) 398-5389
Board	5/10/07		Joe Gildner, Link Deputy Executive Director <b>Richard Sage, Link Construction Manager</b>	(206) 689-3350 <b>(206) 398-5226</b>

<b>Contract/Agreement Type:</b>	<input checked="" type="checkbox"/>	<b>Requested Action:</b>	<input checked="" type="checkbox"/>
Competitive Procurement	<input checked="" type="checkbox"/>	Execute New Contract/Agreement	
Sole Source		Amend Existing Contract/Agreement	<input checked="" type="checkbox"/>
Agreement with Other Jurisdiction(s)		Budget Amendment	
Real Estate		Property Acquisition	

**PROJECT NAME**

Central Link Initial Segment

**PROPOSED ACTION**

Authorizes the chief executive officer to execute a contract amendment with Shannon & Wilson, Inc. to provide continuing geotechnical support services during construction for the Beacon Hill Station and Tunnels project in the amount of \$900,000, with a 10% contingency of \$90,000 totaling \$990,000, for a new total authorized contract amount not to exceed \$14,568,581.

**KEY FEATURES**

- As detailed in the project background, Shannon & Wilson was needed to assist in resolving a number of unanticipated issues involving ground conditions during construction. That involvement consumed funds that had been budgeted for the normal scheduled and on-call geotechnical support during construction.
- This amendment will provide additional funds to continue the on-going normal scheduled and on-call geotechnical support during construction for the Beacon Hill Station and Tunnels (Contract C710) in accordance with accepted standards of practice.
- Shannon & Wilson's input and recommendations have been essential during the construction period to date. The requested action would continue the funding of their essential activities through the remaining period of the construction.

## **BUDGET IMPACT SUMMARY**

Current Project Phase: Construction  
Projected Completion Date: 2009

<b>Action Outside of Adopted Budget:</b>	<b>✓</b>	<b>Comments on Checked Items</b>
This Project		
This Phase	✓	Proposed action requires funding from construction services phase unallocated contingency and surplus budget within other phases of the Initial Segment project.
This Task		
Budget Amendment Required		

<b>Key Financial Indicators:</b>	<b>✓</b>	<b>Comments on Checked Items</b>
Contingency Funds Required		
Funding required from other parties (other than what is in financial plan)		

Not checked = action is assumed in current Board-adopted budget. No budget action or adjustment to financial plan required.

## **BUDGET DISCUSSION**

The proposed action would authorize execution of a contract amendment with Shannon & Wilson, Inc. to provide continuing geotechnical construction support services for the Beacon Hill Station and Tunnels project in the amount of \$990,000, for a new total authorized contract amount not to exceed \$14,568,581.

The Adopted 2007 Budget for the Central Link Initial Segment is \$2.07 billion. Within that budget, \$2,500,000 has been set aside for Geotechnical Services for Package 2 (C710 Beacon Hill Segment) within the construction services phase. Since this budget line item is fully committed, the proposed action would result in a budget shortfall of \$990,000, which would be funded from unallocated contingency within the construction services phase. Should the proposed action be approved, the construction services phase unallocated contingency would have a remaining balance of \$10,000. There are currently other board actions pending that, when added to the proposed action, would exhaust the remaining unallocated contingency and result in a budget shortfall of \$1,792,581 for the construction services phase. This would be funded from surplus budget from other phases within the Initial Segment project.

The proposed action, when considered with other pending board actions, would exceed the phase budget, and require a transfer of budget funds from other phases during the next budget update. It is otherwise consistent with the current board-adopted budget, and is affordable within the agency's current long-term financial plan and subarea financial capacity. The action will have no new revenue impact on Sound Transit.

## BUDGET TABLE

**Action Item:** Shannon & Wilson, Inc. (provide geotechnical support services during construction for the C710 Beacon Hill Station and Tunnels within the Central Link Initial Segment)

(Year of Expenditure \$000)

<b>Initial Segment</b>		Adopted 2007 Budget (A)	Committed To Date (B)	This Action (C)	Total Committed & Action (D)	Uncommitted (Shortfall) (E)
1	Agency Administration	214,780	119,850		119,850	94,930
2	Preliminary Engineering	33,357	33,310		33,310	46
3	Final Design	147,167	146,496		146,496	671
4	Right of Way	217,516	200,294		200,294	17,222
5	Construction	1,174,572	1,083,732		1,083,732	90,841
6	Construction Services	90,037	90,840	990	91,830	(1,792)
7	Third Party Agreements	60,264	59,533		59,533	731
8	Vehicles	132,307	131,799		131,799	508
9	<b>Total Current Budget</b>	<b>2,070,000</b>	<b>1,865,853</b>	<b>990</b>	<b>1,866,843</b>	<b>203,157</b>
<b>Construction Services Phase Detail</b>						
10	Geotech Package 2 (C710)	2,500	2,500	990	3,490	(990)
11	Other Construction Services	86,537	88,340		88,340	(1,802)
12	CS Unallocated Contingency	1,000	-		-	1,000
13	<b>Total Phase</b>	<b>90,037</b>	<b>90,840</b>	<b>990</b>	<b>91,830</b>	<b>(1,792)</b>
<b>Contract Amount (All Vendors)</b>						
		Board Approvals to Date (F)	Current Approved Contract Value (G)	Proposed Action (H)	Proposed Total for Board Approval (I)	Proposed Contract Value (J)
14	Contract Amount	12,492	12,856	900	13,392	13,756
15	Contingency	1,086	723	90	1,176	813
16	<b>Total Contract</b>	<b>13,579</b>	<b>13,579</b>	<b>990</b>	<b>14,569</b>	<b>14,569</b>
17	Percent Contingency	9%	6%	10%	9%	6%
<b>Budget Shortfall</b>		\$	Potential Resources		Source	
18	<b>Task Level</b>	(K)	(L)		(M)	
	Geotech Package 2 (C710)	990	1,000		Construction services phase unallocated contingency, and surplus budget from other phases in the Initial Segment	

(B) COMMITTED TO DATE amounts are from Agency WBS Report as of March 2007 + approved and pending board actions not recorded as of 3/31/07, or submitted after that date.

## SMALL BUSINESS PARTICIPATION

### Prime Consultant/Contractor

As the prime consultant for this contract, Shannon & Wilson, Inc. was committed to a 25% small business goal. Shannon & Wilson met or exceeded this goal during the original contract and early amendments to the contract when they completed the geotechnical reports. The contracts current performance was 29.9% through the end of final design.

For the previous amendment and for this amendment, both of which are for geotechnical support during construction, Sound Transit will be working primarily with Shannon & Wilson and there will be little opportunity for subcontracting. For geotechnical support during construction Shannon and Wilson committed to 10% small business participation for the previous amendment and have attained 10.5% to date. Shannon and Wilson has committed to have a 10% small business participation for this amendment. The overall small business participation is projected to be 10.37% at the close of the contract.

### EEO Commitment

Shannon & Wilson's workforce demographics are 33.8% women and 7.1% minorities.

### Apprentice Utilization Commitment

There are no apprentice utilization requirements or agreements on this professional services contract.

### **PROJECT DESCRIPTION and BACKGROUND for PROPOSED ACTION**

A procurement procedure was carried out in 1999 for the geotechnical investigation work for four Link design packages. Four leading geotechnical consultants were selected for the work, but only two were contracted. A contract with Shannon & Wilson, Inc. was originally executed in early 1999 to provide geotechnical services and reports for the design of the Central Link project, including the Beacon Hill station and tunnels.

The contract was subsequently modified to include geotechnical work for the Northgate segment, Beacon Hill exploratory test shaft, and the Pine Street Stub Tunnel.

Shannon & Wilson completed the geotechnical investigation and reports for the Central Link project. The final civil design of the Beacon Hill Tunnel and Station (C710) and the Pine Street Stub Tunnel (C510) segments has been completed.

The geotechnical investigation carried out by Shannon & Wilson indicated difficult geological conditions in much of the Beacon Hill and downtown Seattle areas. Due to the complexity of the geological conditions, the need to respond to unanticipated ground conditions was expected during construction. This requires the interaction of the designer, the geotechnical engineer, and the contractor. The objective is to facilitate changes based on actual ground conditions that may result in more cost effective construction.

Shannon & Wilson's input and recommendations have been essential during the construction period to date. The requested action would continue the funding of their essential activities through the remaining period of the construction.

Several factors have had a significant impact on cost of the work performed to date and the anticipated cost to complete, as follows:

- The presence of a significant quantity of previously unidentified sand at the station level, which necessitated the re-evaluation of the station platform location, resulting in significantly increased effort for review and assessment of geologic data; meetings to assess the situation and determine appropriate courses of action - including a shift in the location of the station platform; a substantial change to the jet grouting program; and significant modifications to the dewatering program.
- Additional borings to "proof" the revised location of the station platform - including review and assessment of geologic data, meetings to assess the situation and determine appropriate courses of action - resulting in further modifications to the station configuration.
- East Portal landslide monitoring, evaluation, remediation design, and support for remediation implementation.
- West Longitudinal Ventilation Adit sand inflow assessment, development of a remedial grouting program, support for remediation implementation, and assessment of appropriate measures for a revised Sequential Excavation Mining (SEM) program.

- Increased duration of the SEM mining of the Beacon Hill Station, resulting in increased cost for monitoring of instruments, review and evaluation of instrumentation data, and daily SEM strategy meetings.
- Increased duration of the tunnel boring machine mining operations, resulting in increased cost for monitoring of instruments, and review and evaluation of instrumentation data.
- West Portal Seattle City Light access road re-evaluation and re-design.
- Significantly increased effort for review and answers of requests for information and submittals.
- Overall increase in the duration of the contract construction, resulting in increased management costs.

### Prior Board/Committee Actions on this Project

Motion/Resolution Number & Date	Summary of Action
M2004-72 7/22/04	Contract amendment with Shannon & Wilson, Inc., for scheduled and on-call geotechnical assistance during construction of the Beacon Hill Tunnel and Station and the Retrofit of the Downtown Seattle Transit Tunnel for the Central Link Light Rail Initial Segment, in the amount of \$2,400,000, with a 4% contingency of \$100,000, for a total of \$2,500,000 for a new total authorized contract amount not to exceed \$13,578,581.
M2003-101 10/9/03	Contract amendment with Shannon & Wilson, Inc., to provide additional geotechnical engineering services for the Beacon Hill Tunnel in the amount of \$251,800, with a 10% contingency of \$25,180, for a total of \$276,980, and for a new total authorized contract amount not to exceed \$11,078,581.
M2002-136 12/12/02	Amendment with Shannon & Wilson, Inc., to provide geotechnical services necessary for final design of the Link Pine Street Stub Tunnel in the amount of \$200,000, with a 10% contingency of \$20,000, for a total of \$220,000, and a new total authorized contract amount not to exceed \$10,801,601.
M2000-107 10/26/00	Amendment with contract RTA/LR 106-98F with Shannon & Wilson, Inc., for geotechnical engineering services of the Central Link light rail project. The action extends the contract period to June 30, 2001 and establishes a contract amendment amount of \$1,093,250 and a 10% contingency of \$109,325, for a total contract amendment amount not to exceed \$1,202,575, and a new total contract amount not to exceed \$10,581,601.
M2000-46 6/22/00	Amendment with Shannon & Wilson, Inc., to proceed with additional professional geotechnical engineering boring, lab work and reports for the north corridor in the amount of \$192,931, with a 10% contingency of \$19,293, for a total amendment not to exceed \$212,224, and a total contract amount not to exceed \$9,379,026.
M2000-40 5/18/00	Contract amendment with Shannon & Wilson, Inc., adding a 10% contingency of \$131,898 to a previously approved contract amendment of \$1,317,898 for a total authorized amount not to exceed \$1,449,688 for geotechnical engineering services on the Central Link Light Rail project
M2000-19 2/24/00	Contract amendment to Contract No. RTA/LR 106-98B for geotechnical engineering services with Shannon & Wilson, Inc., and to proceed with professional geotechnical engineering work on the Northgate segment in an amount of \$1,317,898, with a 20 percent contingency of \$260,000 for a total amount not to exceed \$1,577,898.
M99-17 3/25/99	Contract with Shannon & Wilson, Inc., for geotechnical engineering services for design support on the Central Link Light Rail Project in an amount not to exceed \$7,736,407, which includes a 10% contingency.

## **CONSEQUENCES OF DELAY**

Construction is underway for the Beacon Hill Station and Tunnels. Shannon & Wilson's input is essential to address the actual ground conditions encountered, and to monitor and evaluate the effectiveness of the contractor's means and methods with respect to the excavation of the ground on the C710 Contract. Without the continuing support of Shannon & Wilson, Sound Transit would not be able to effectively evaluate the critical aspects of the contractor's excavation means and methods, nor would it be able to appropriately address the actual ground conditions encountered.

## **PUBLIC INVOLVEMENT**

Sound Transit has worked cooperatively with the City of Seattle, King County Metro, Washington State Department of Transportation, the Department of Ecology, and local businesses and interest groups on the Central Link Light Rail Project. Sound Transit staff continues to keep local and area residents informed about the status of the project and the impact of construction on the affected neighborhoods.

## **ENVIRONMENTAL COMPLIANCE**

Jl, 03/30/07

## **LEGAL REVIEW**

JW 4/26/07

## SOUND TRANSIT

### MOTION NO. M2007-50

A motion of the Board of the Central Puget Sound Regional Transit Authority authorizing the chief executive officer to execute a contract amendment with Shannon & Wilson, Inc. to provide continuing geotechnical support services during construction for the Beacon Hill Station and Tunnels project in the amount of \$900,000, with a 10% contingency of \$90,000 totaling \$990,000, for a new total authorized contract amount not to exceed \$14,568,581.

#### **Background:**

A procurement procedure was carried out in 1999 for the geotechnical investigation work for four Link design packages. Four leading geotechnical consultants were selected for the work, but only two were contracted. A contract with Shannon & Wilson, Inc. was originally executed in early 1999 to provide geotechnical services and reports for the design of the Central Link project, including the Beacon Hill station and tunnels.

The contract was subsequently modified to include geotechnical work for the Northgate segment, Beacon Hill exploratory test shaft, and the Pine Street Stub Tunnel.

Shannon & Wilson completed the geotechnical investigation and reports for the Central Link project. The final civil design of the Beacon Hill Tunnel and Station (C710) and the Pine Street Stub Tunnel (C510) segments has been completed.

The geotechnical investigation carried out by Shannon & Wilson indicated difficult geological conditions in much of the Beacon Hill and downtown Seattle areas. Due to the complexity of the geological conditions, the need to respond to unanticipated ground conditions was expected during construction. This requires the interaction of the designer, the geotechnical engineer, and the contractor. The objective is to facilitate changes based on actual ground conditions that may result in more cost effective construction.

Shannon & Wilson's input and recommendations have been essential during the construction period to date. The requested action would continue the funding of their essential activities through the remaining period of the construction.

Several factors have had a significant impact on cost of the work performed to date and the anticipated cost to complete, as follows:

- The presence of a significant quantity of previously unidentified sand at the station level, which necessitated the re-evaluation of the station platform location, resulting in significantly increased effort for review and assessment of geologic data; meetings to assess the situation and determine appropriate courses of action - including a shift in the location of the station platform; a substantial change to the jet grouting program; and significant modifications to the dewatering program.
- Additional borings to "proof" the revised location of the station platform - including review and assessment of geologic data, meetings to assess the situation and determine appropriate courses of action - resulting in further modifications to the station configuration.

- East Portal landslide monitoring, evaluation, remediation design, and support for remediation implementation.
- West Longitudinal Ventilation Adit sand inflow assessment, development of a remedial grouting program, support for remediation implementation, and assessment of appropriate measures for a revised Sequential Excavation Mining (SEM) program.
- Increased duration of the SEM mining of the Beacon Hill Station, resulting in increased cost for monitoring of instruments, review and evaluation of instrumentation data, and daily SEM strategy meetings.
- Increased duration of the tunnel boring machine mining operations, resulting in increased cost for monitoring of instruments, and review and evaluation of instrumentation data.
- West Portal Seattle City Light access road re-evaluation and re-design.
- Significantly increased effort for review and answers of requests for information and submittals.
- Overall increase in the duration of the contract construction, resulting in increased management costs.

**Motion:**

It is hereby moved by the Board of the Central Puget Sound Regional Transit Authority that the chief executive officer is authorized to execute a contract amendment with Shannon & Wilson, Inc. to provide continuing geotechnical support services during construction for the Beacon Hill Station and Tunnels project in the amount of \$900,000, with a 10% contingency of \$90,000 totaling \$990,000, for a new total authorized contract amount not to exceed \$14,568,581.

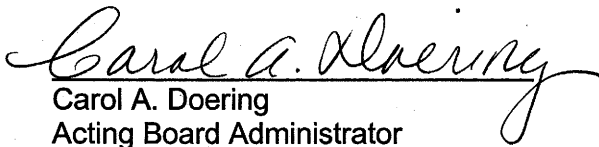
APPROVED by the Board of the Central Puget Sound Regional Transit Authority at a regular meeting thereof held on May 10, 2007.




---

Mark Olson  
Board Vice-Chair

**ATTEST:**



Carol A. Doering  
Acting Board Administrator