



**Date:** October 19, 2006

**TO:** Mohammad Hasan MS 117

**FROM:** Chris Johnson/Nabil Dbaibo/Maher Shebl MS 29

**SUBJECT:** SR-520 XL-2028  
Flyover Ramp  
MP ± 12.55  
Luminaires Foundations Report (Supplement 1)

As requested, the NW Region Materials Lab has completed the soils investigation for the design and construction of four (4) luminaires located at the north side of SR 520 between MP ±12.55 and MP ±12.70. We understand that two of the luminaires will be installed on the north side of the flyover ramp (BL line) at Sta. 14+63 and Sta. 18+28, and two luminaires on the north side of AL line at Sta.21+06 and Sta.23+21. The luminaire foundations will be located in embankment fill as indicated by the cross sections provided by your office, and by previous geotechnical report prepared by CH2M Hill for this section of SR 520. A copy of the cross sections and a boring log that was drilled within the project limits are included in this report.

The conclusions and design recommendations contained in this memorandum are based on the project description and information contained in the boring log and cross sections. It is further assumed that the subsurface conditions, as interpreted from the boring log, are representative of the subsurface conditions throughout the project area. If during construction, subsurface conditions are different from those encountered in the exploratory borings, we should be advised so that we can assist you and re-evaluate our recommendations.

### **Subsurface Conditions**

Soil conditions were interpreted from the exploratory boring previously drilled within the project limits by CH2M Hill for the SR 520, W. Lake Sammamish Parkway Interchange to SR 202 project. The boring location is shown on the Site and Exploration Plan attached to this report. This plan sheet shows that fill was used to establish the road embankment. The provided cross sections also show that additional fill will be used to establish the new ramp embankment. The boring log indicates the site is underlain by medium dense to dense sand and gravel with silt. Detailed description of the soil conditions are described in more detail in the attached boring log.

### Foundation Recommendations

Considering that the embankment fill will be constructed with gravel or select borrow as Road Embankment in accordance with the WSDOT Standard Specifications and compacted using method B or method C, the average allowable lateral bearing pressure will meet the minimum required 1,500 psf required for a standard foundation. Therefore a WSDOT Standard foundation (3-foot diameter shaft with 8-foot embedment) as shown on Light Standard Luminaire Foundation Plan Sheet included in HQ Design Standards Team Memo dated February 1, 2006 can be used (copy attached).

### Construction Considerations

The boring log shows that water seepage was not encountered during the site investigation. Given that shaft foundation will be in compacted gravel/select borrow, we do not anticipate groundwater problem. However, the base of the shaft borings should be cleaned from any loose soil before concrete placement. Excessive loose material left in the bottom of the shaft borings will increase the amount of settlement that occurs, affecting the performance of the luminaires. After placement of the reinforcing steel and concrete, temporary casing if used, must be removed so that the shaft can develop its friction resistance from the concrete/soil interface.

### Closure

We trust the information contained in this report meets the current needs for your project at this time. If you have any questions regarding this memorandum, please call Nabil Dbaibo at (206)768-5905 or Maher Shebl at (206) 768-5915.

NTD/MAS:mas

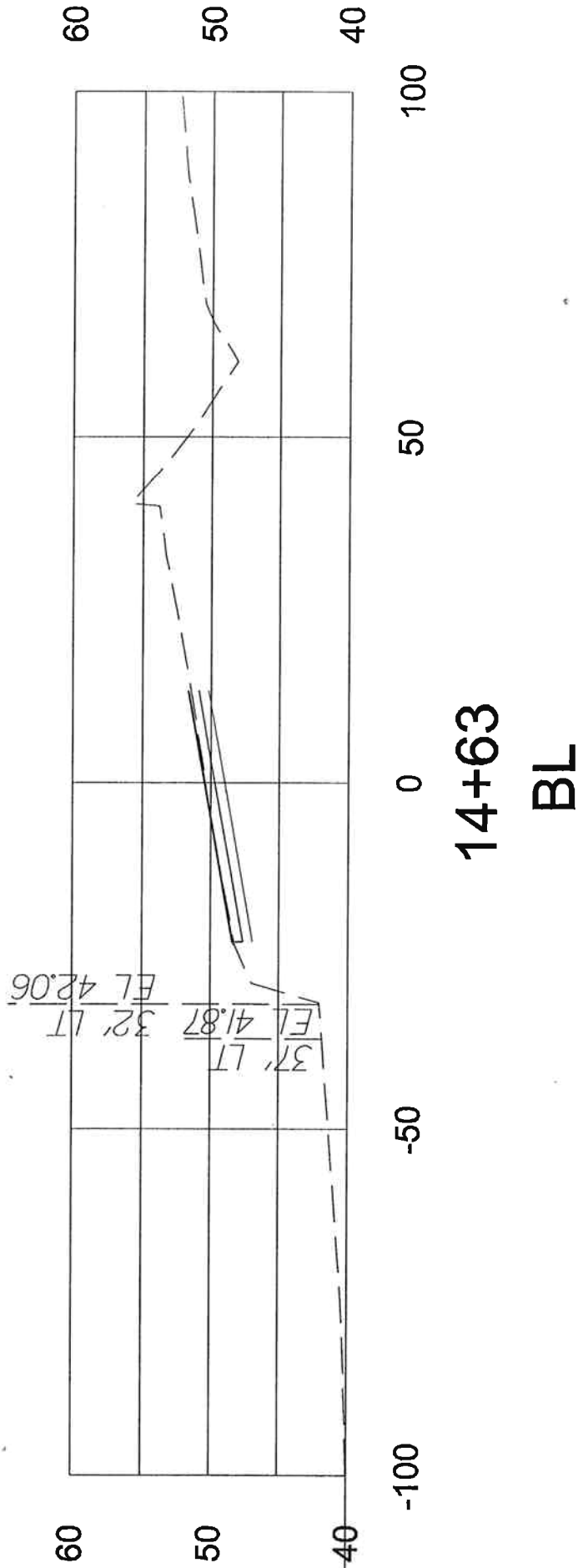
Attachments: Site and Exploration Plan  
Boring Log  
Light Standard Foundation Plan Sheet

File: SR-520, XL-2028  
Serial No: 06-186

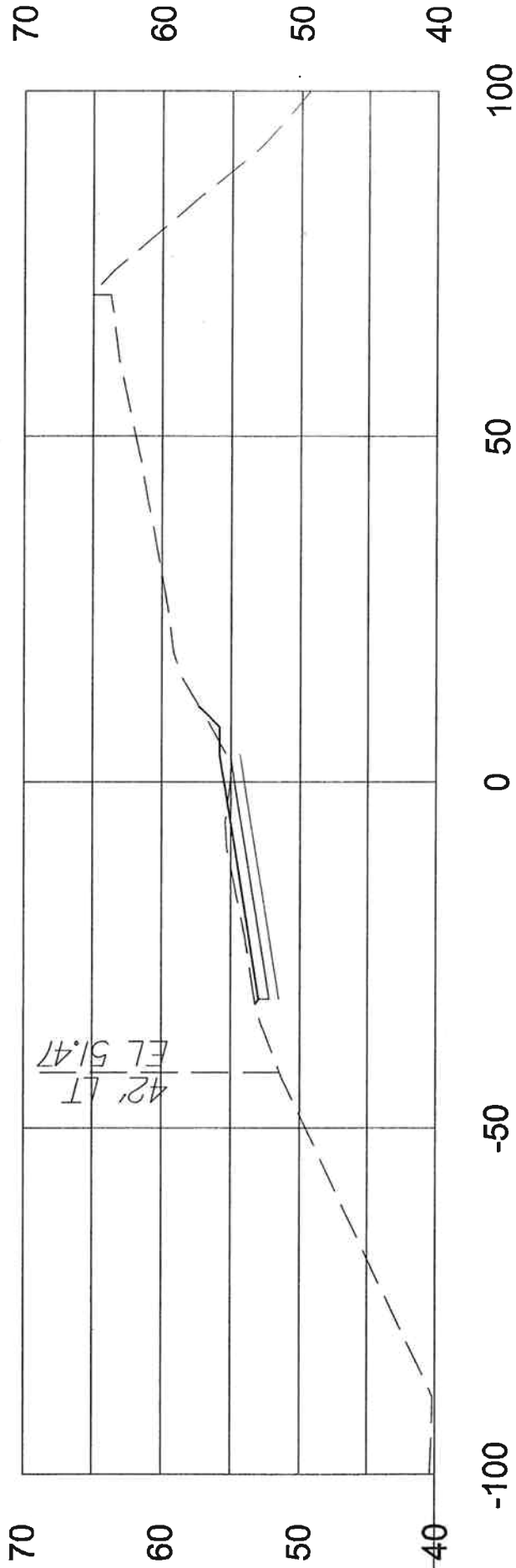
cc: Jim Cuthbertson/HQ Mats Lab/MS-47365  
Gary Bedi/HQ Bridge/MS-47340



10/09/06



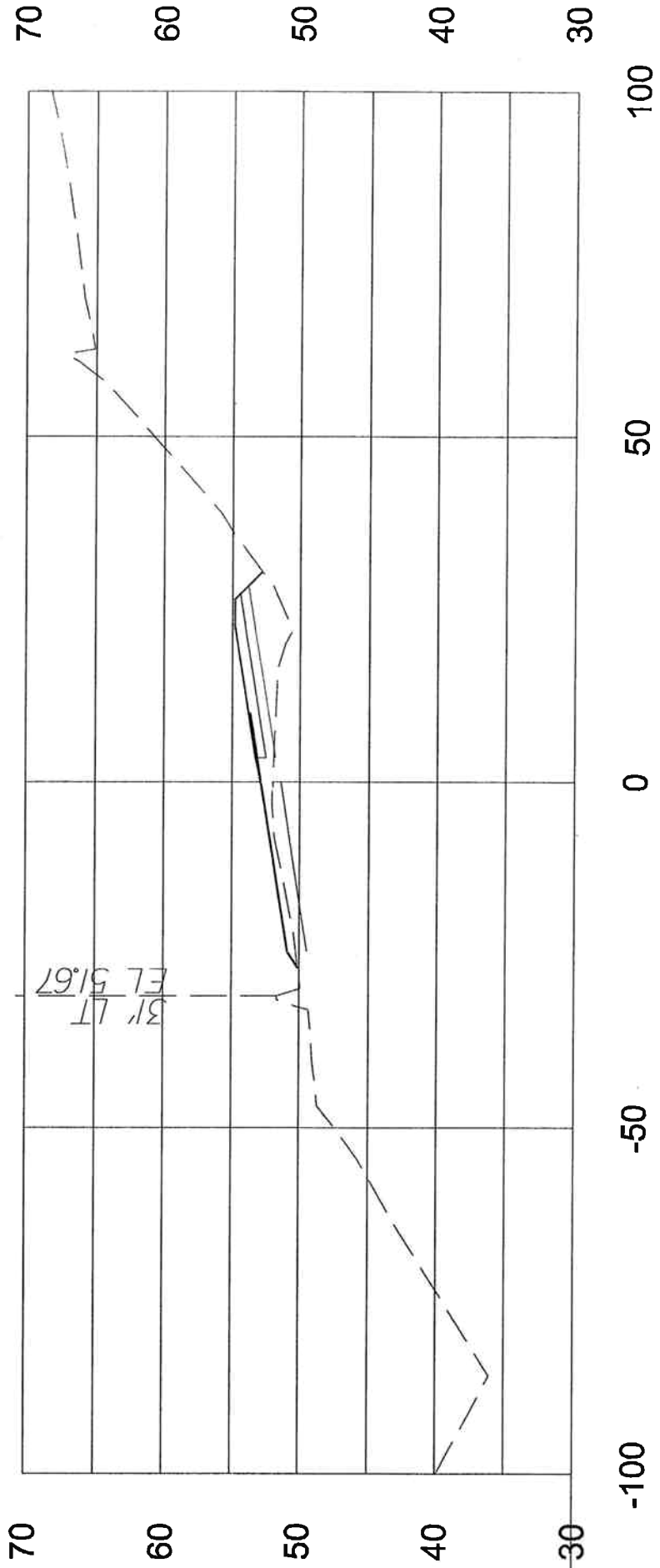
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18+28

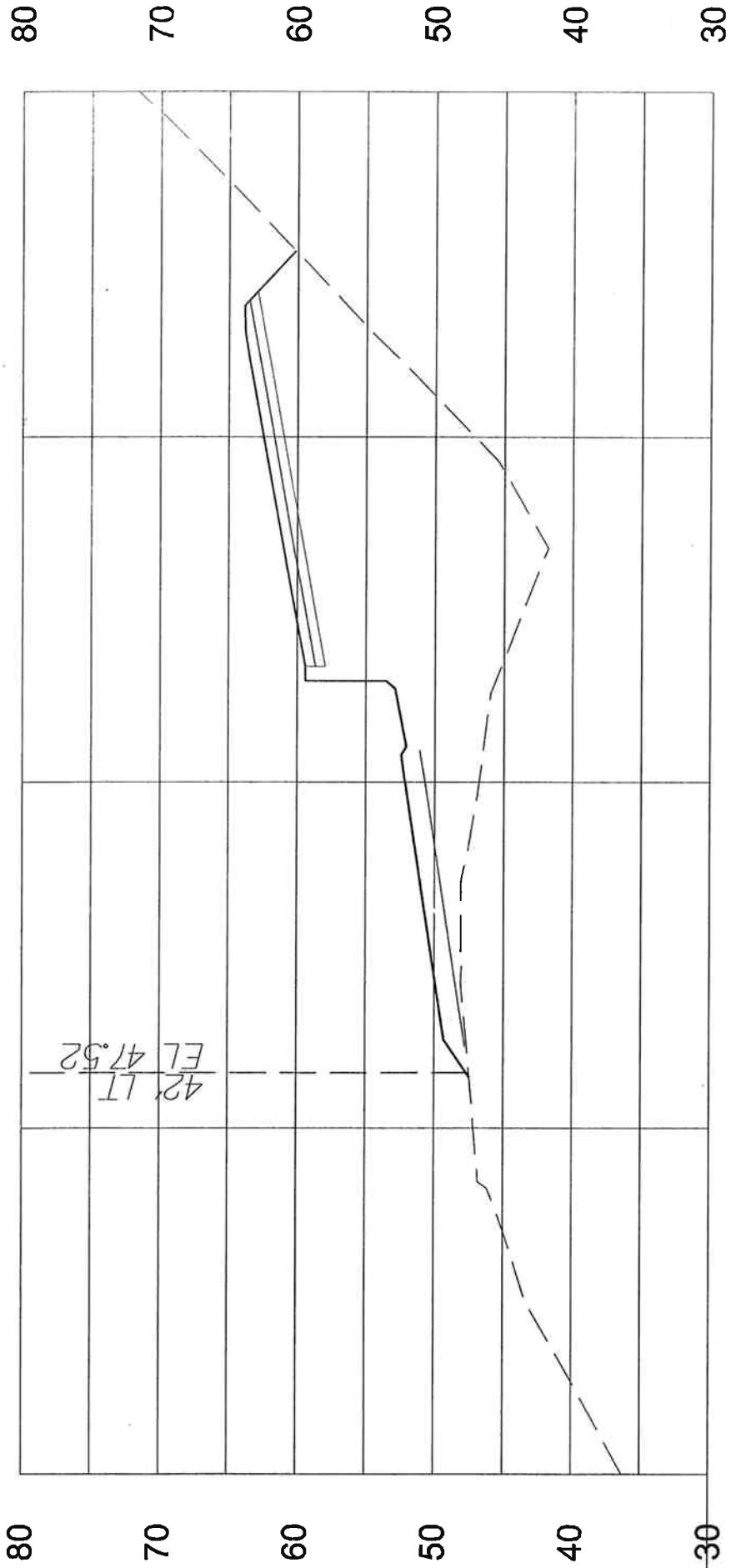
BL

10/09/06



21+06  
AL

10/09/06



23+21  
AL



PROJECT NUMBER SEA32579.G2	BORING NUMBER C-17B	SHEET 1 OF 1
<b>SOIL BORING LOG</b>		

PROJECT SR 520 LOCATION F-LINE STA 857+45, 76' RIGHT  
 ELEVATION -44 FT DRILLING CONTRACTOR GEO-TECH EXPLORATIONS  
 DRILLING METHOD AND EQUIPMENT MUD ROTARY CME 75  
 WATER LEVELS NOT AVAILABLE START 8-5-92 FINISH 8-5-92 LOGGER C.J. Behrens

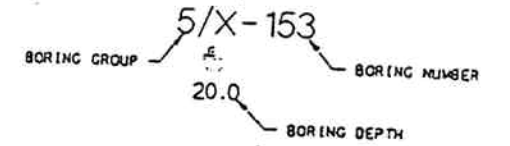
DEPTH BELOW SURFACE (FT)	SAMPLE			STANDARD PENETRATION TEST RESULTS 6" -6" -6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS TESTS AND INSTRUMENTATION
	INTERVAL	TYPE AND NUMBER	RECOVERY			
5.0	5.0				APPROXIMATELY 9" ASPHALTIC CONCRETE.	
	6.5	S-1	0.2	13-11-7 (18)	WELL GRADED GRAVEL WITH SAND. (GW), brown, damp, dense, subangular 1.50" minus gravel, with approximately 40% fine to coarse grained sand.	
	7.5					
10.0	9.0	S-2	0.4	17-20-20 (40)	POORLY GRADED SAND WITH SILT. (SP-SM), brown, damp, dense, fine grained sand with approximately 5% silt.	
	10.0				NO RECOVERY.	
	11.5	S-3	0	2-6-11 (17)		
15.0	12.5					
	14.0	S-4	0.3	13-17-20 (37)	WELL GRADED SAND WITH SILT AND GRAVEL. (SW-SM), olive, moist, dense, fine to coarse grained sand, with approximately 5% silt, and 25% subrounded 0.75" minus gravel.	
	15.0					
20.0	16.5	S-5	0.5	14-16-18 (34)	WELL GRADED SAND WITH GRAVEL. (SW), olive, wet, dense, fine to medium grained sand, with approximately 20% subrounded 1" minus gravel.	
	17.5					
	19.0	S-6	0.3	18-24-25 (49)	WELL GRADED SAND WITH GRAVEL. (SW), olive, wet, dense, fine to coarse grained sand, with approximately 20% subangular 0.5" minus gravel.	
25.0	20.0					
	21.5	S-7	0.5	11-12-11 (23)	WELL GRADED SAND. (SW), gray, wet, medium dense, fine to coarse grained sand.	
	22.5					
25.0	24.0	S-8	0.5	11-11-11 (22)	WELL GRADED SAND. (SW), as above, coarser grained.	
	25.0					
	26.5	S-9	0.6	20-15-12 (17)	WELL GRADED SAND WITH GRAVEL. (SW), as above, with approximately 40% subrounded 1" minus gravel.	
					END OF BORING AT 26.5 FEET.	

T.25N. R.5E. W.M.

**LEGEND**

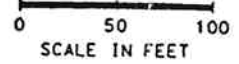
- WSDOT BORING LOCATIONS
- BORING 0' TO 25'
  - BORING 25' TO 50'
  - BORING 50' TO 75'
  - BORING 75' TO 100'
  - BORING DEPTH GREATER THAN 100.1'

- CH2M HILL BORING LOCATION
- CH2M HILL TEST PIT LOCATION



F 855+00 MATCH TO DRAWING CH-14

F 865+00 MATCH TO DRAWING CH-16



HONG WEST & ASSOCIATES	
SR 520 W. LAKE SAMMAMISH PARKWAY I/C TO SR 202	
SITE AND EXPLORATION PLAN	
PROJECT NO. 92089	FIGURE NO. 5

