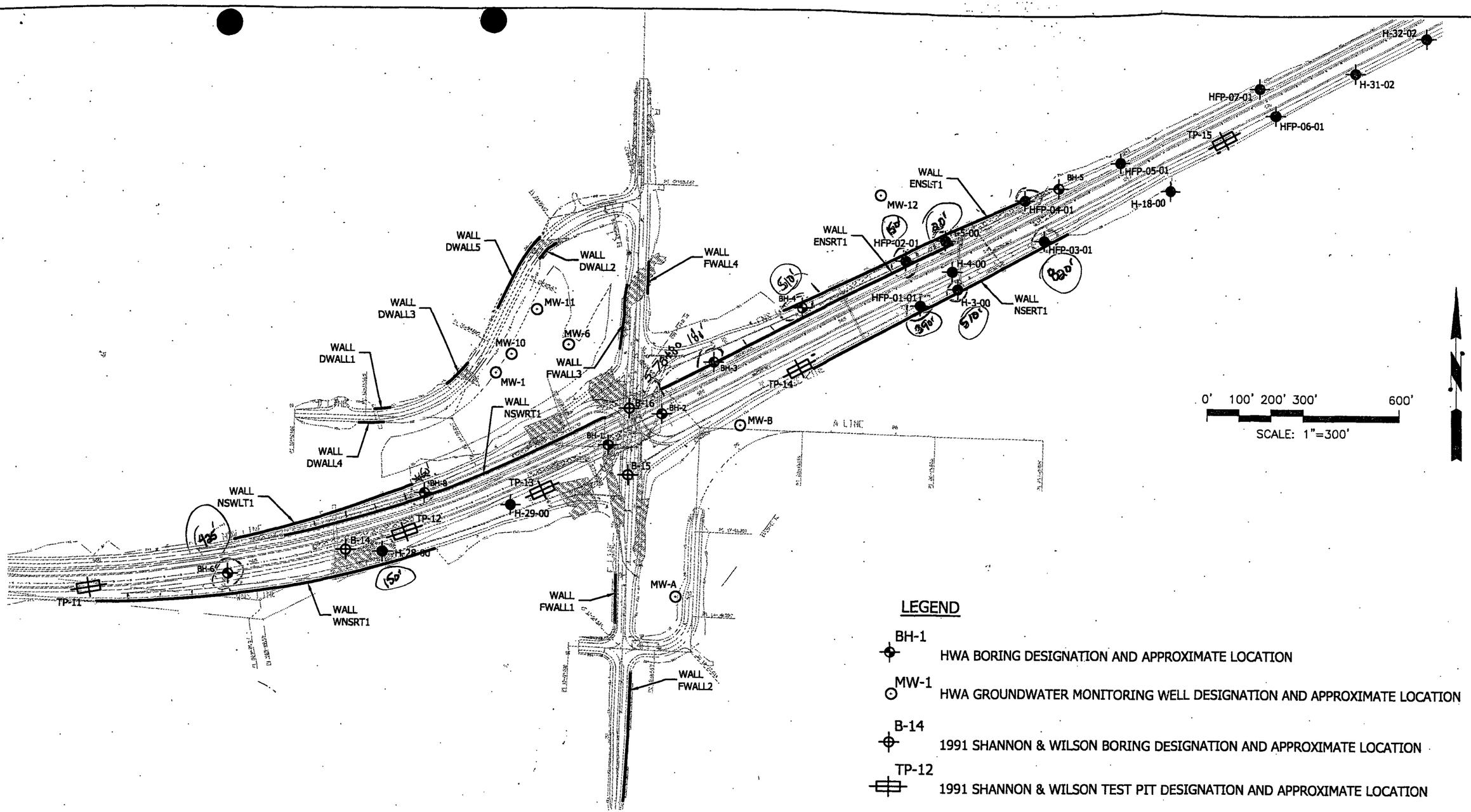


LEGEND

BH-1
HWA BORING DESIGNATION AND APPROXIMATE LOCATION

MW-1
HWA GROUNDWATER MONITORING WELL DESIGNATION AND APPROXIMATE LOCATION

B-14
1991 SHANNON & WILSON BORING DESIGNATION AND APPROXIMATE LOCATION

TP-12
1991 SHANNON & WILSON TEST PIT DESIGNATION AND APPROXIMATE LOCATION

H-3-00
HFP-01-01
WSDOT BORING DESIGNATION AND APPROXIMATE LOCATION

HWA GEOSCIENCES INC.

SR 522, FALES / ECHO LAKE ROAD INTERCHANGE
SNOHOMISH COUNTY, WASHINGTON

INTERCHANGE SITE AND EXPLORATION PLAN

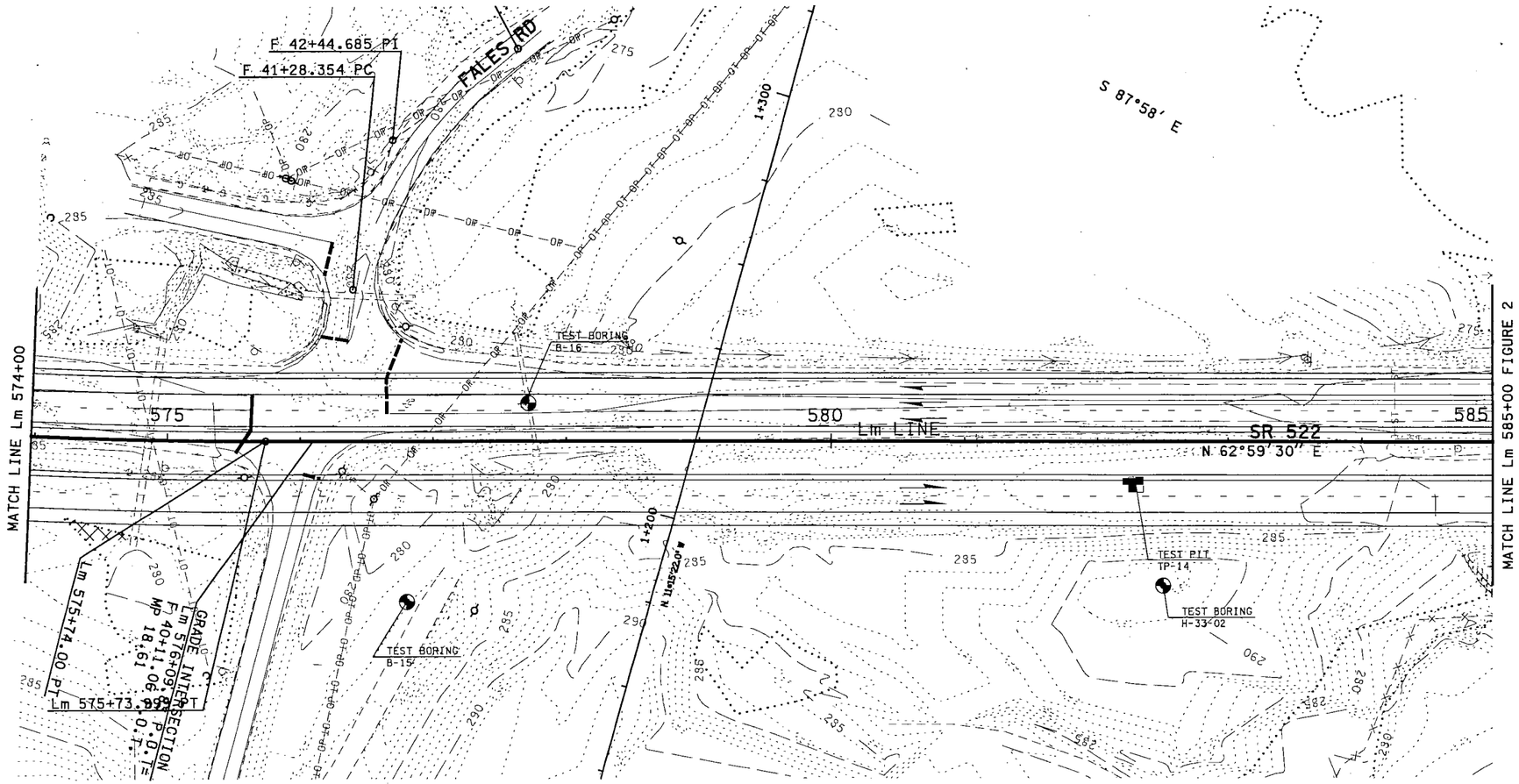
DRAWN BY KS
CHECKED BY LCB
DATE 10.08.02

FIGURE NO. 3
PROJECT NO. 2001-070

REV 04 KLS 6/26/03

BASE MAP PROVIDED BY: PARAMETRIX, INC.
H:\1Projects\2001 Projects\2001070 Sr 522 Fales Road\cad\2001070-02A.DWG

T. 27 N. R. 6E., W.M.



0 50 100
SCALE IN FEET

Figure 1: Boring and Test Pit Location Plan, STA 574 to 585

JOB OL-3491 S.R. 522 C.S. _____ LAYOUT _____

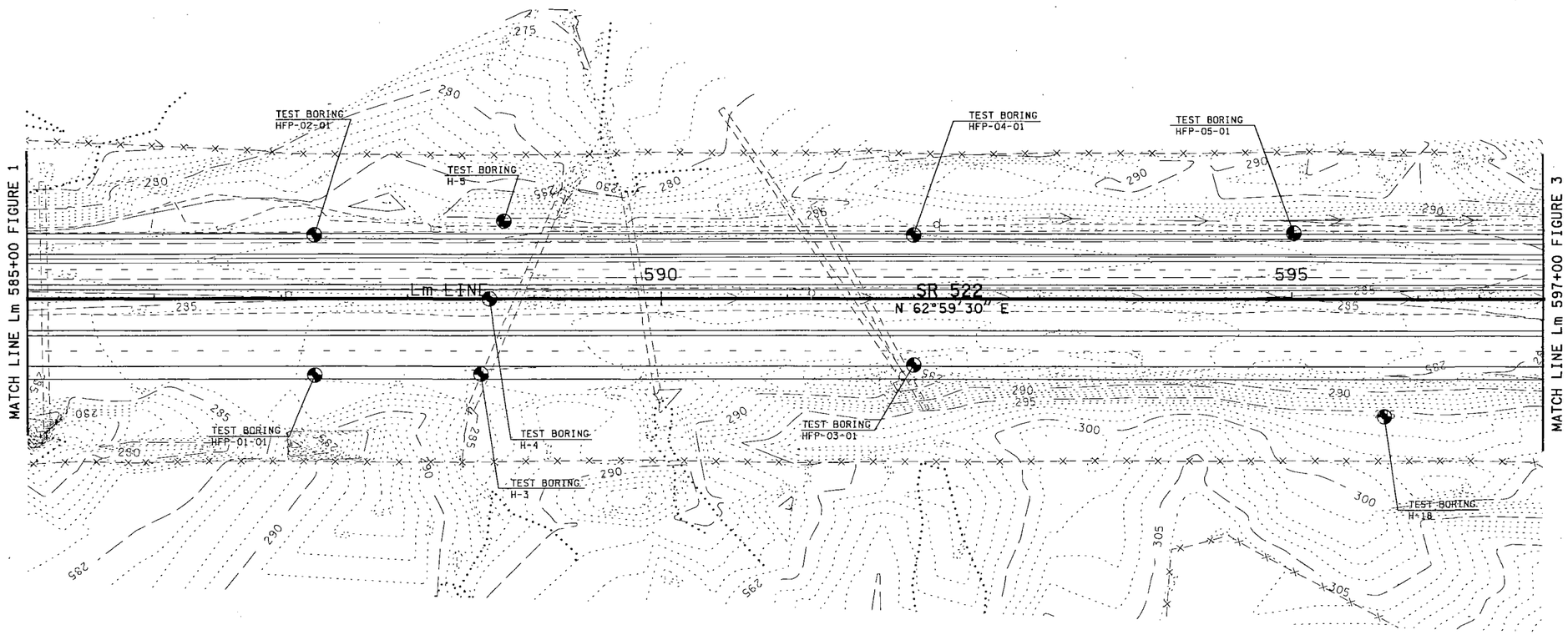
Paradise Lake Road to Snohomish River Bridge Stage 2

WASHINGTON STATE
TRANSPORTATION COMMISSION
DEPARTMENT OF TRANSPORTATION
MATERIALS BRANCH
T. E. BAKER MATERIALS ENGINEER

DATE July 02
SCALE 1"=100' VERT.
1"=100' HORIZ.
SHEET ____ OF ____
DRAWN BY DWG

...\New Folder\S-contour.dgn 01/30/2003 06:40:07 AM

T. 27 N. R. 6E., W.M.



0 50 100
SCALE IN FEET

Figure 2: Boring and Test Pit Location Plan, STA 585 to 597

JOB OL-3491 S.R. 522 C.S. _____ LAYOUT _____

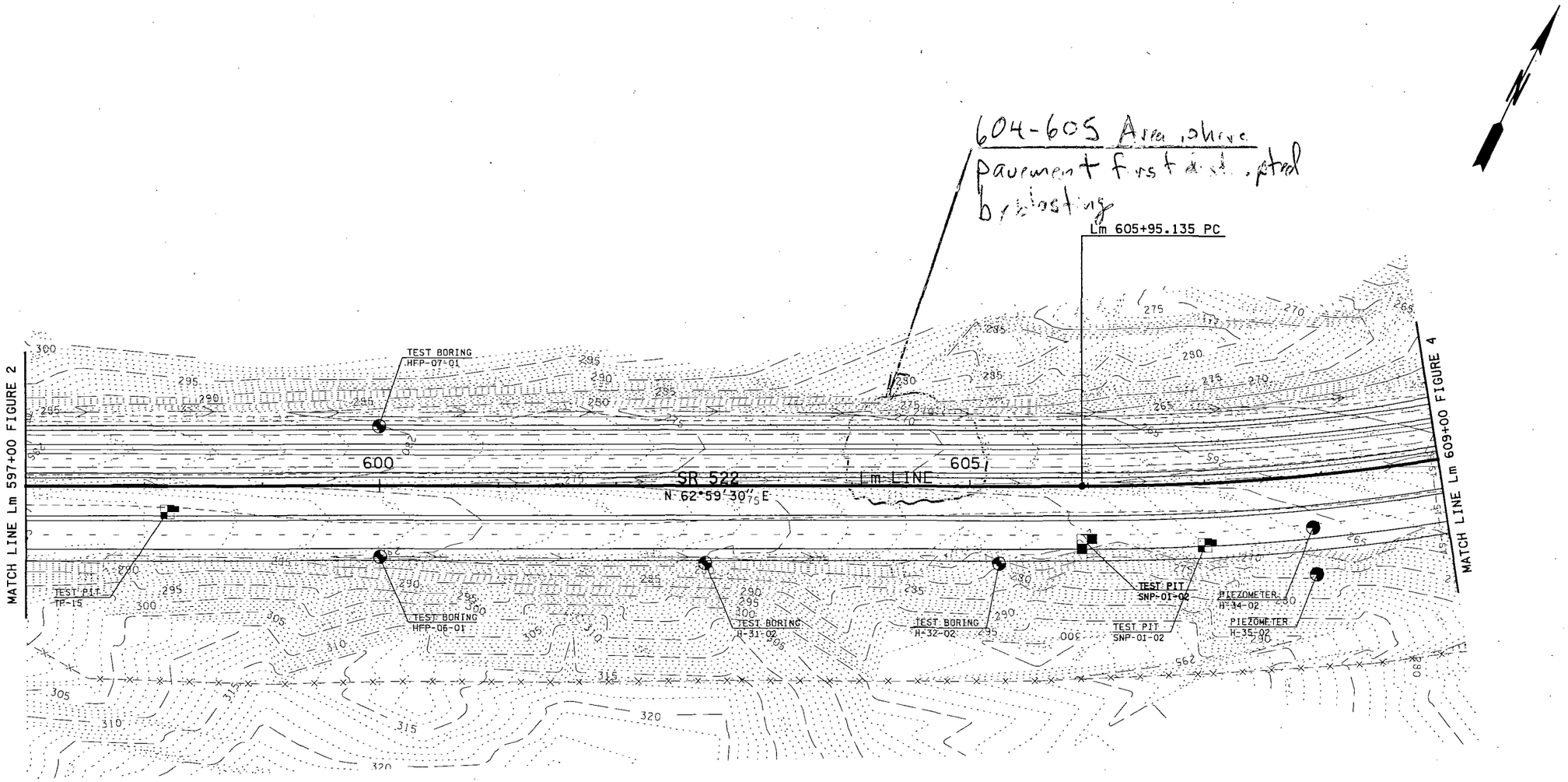
Paradise Lake Road to Snohomish River Bridge Stage 2

WASHINGTON STATE TRANSPORTATION COMMISSION
DEPARTMENT OF TRANSPORTATION
MATERIALS BRANCH
T. E. BAKER MATERIALS ENGINEER

DATE July 02
SCALE 1"=100' VERT. 1"=100' HORIZ.
SHEET ___ OF ___
DRAWN BY DWG

...\New Folder\S-contour.dgn 01/30/2003 06:41:11 AM

T. 27 N. R. 6E., W.M.



0 50 100
SCALE IN FEET

Figure 3: Boring and Test Pit Location Plan, STA 597 to 609

JOB OL-3491 S.R. 522 C.S. _____ LAYOUT _____

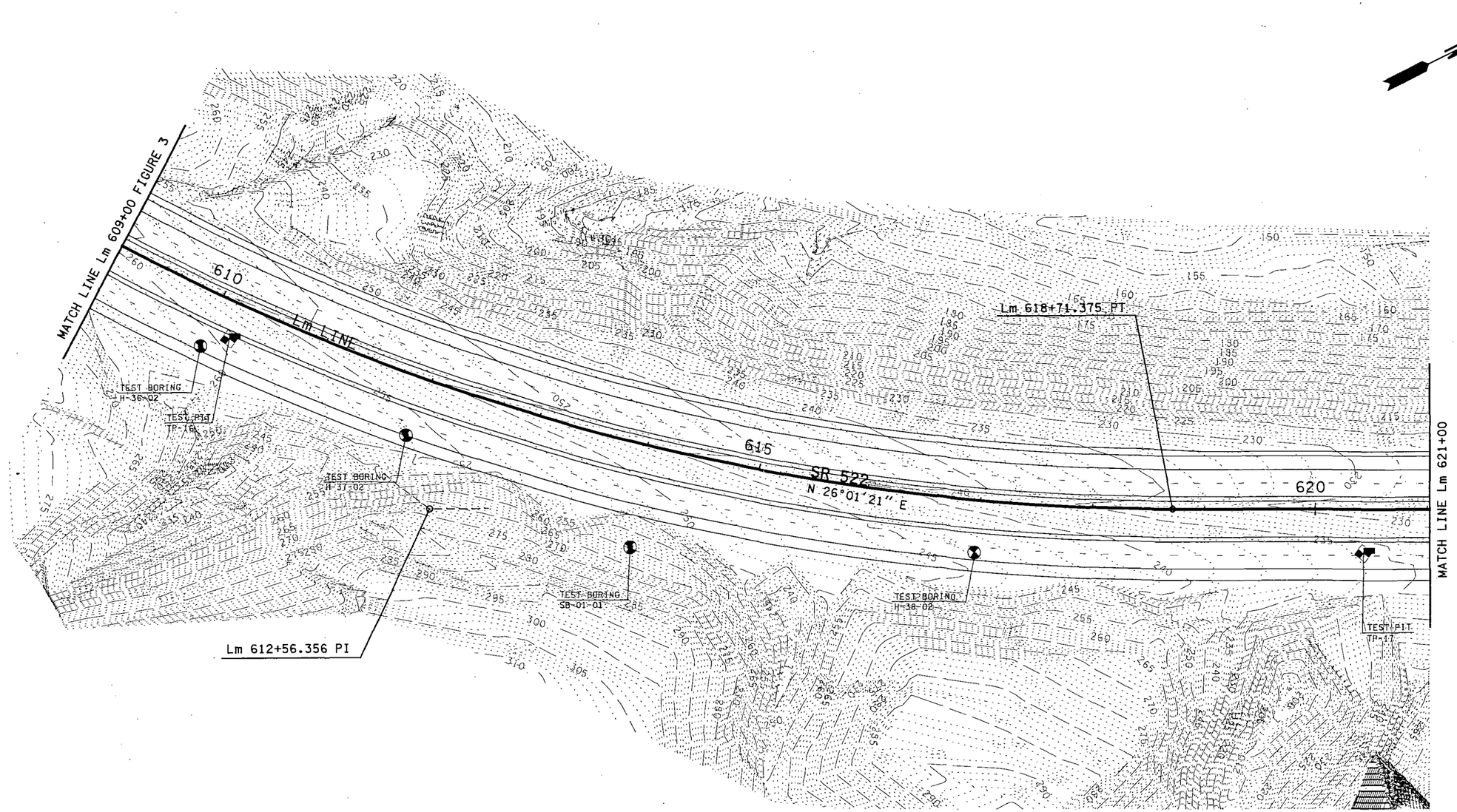
Paradise Lake Road to Snohomish River Bridge Stage 2

WASHINGTON STATE TRANSPORTATION COMMISSION
DEPARTMENT OF TRANSPORTATION
MATERIALS BRANCH
T. E. BAKER MATERIALS ENGINEER

DATE July 02
SCALE 1"=100'VERT. 1"=100'HORIZ.
SHEET ___ OF ___
DRAWN BY DWG

...\New Folder\S-contour.dgn 01/30/2003 06:41:59 AM

T. 27 N. R. 6E., W.M.



0 50 100
SCALE IN FEET

JOB OL-3491 S.R. 522 C.S. _____ LAYOUT _____

Paradise Lake Road to Snohomish River Bridge Stage 2

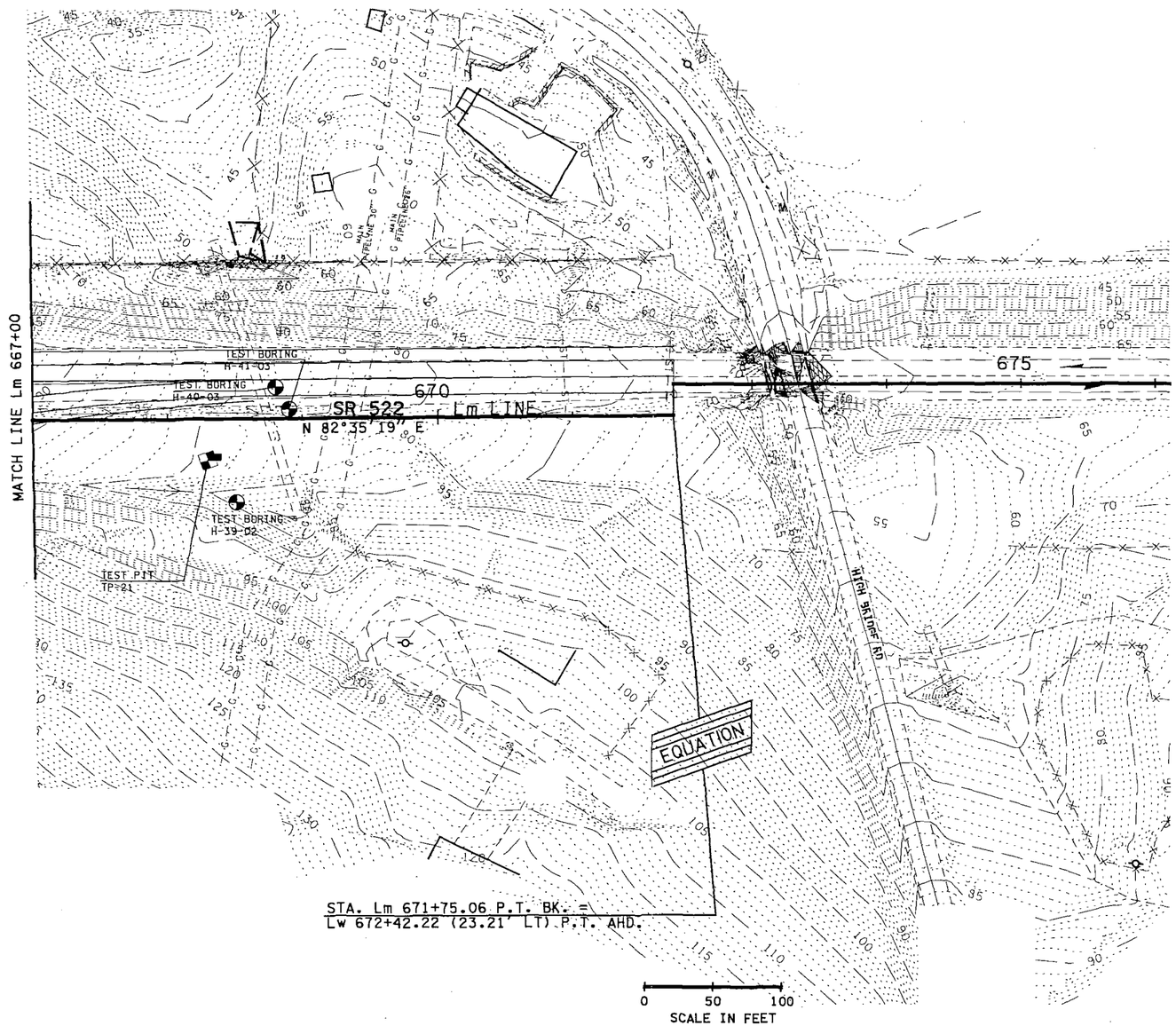
WASHINGTON STATE TRANSPORTATION COMMISSION
DEPARTMENT OF TRANSPORTATION
MATERIALS BRANCH
T. E. BAKER MATERIALS ENGINEER

DATE July 02
SCALE 1"=100'VERT.
1"=100'HORIZ.
SHEET ____ OF ____
DRAWN BY DWG

Figure 4: Boring and Test Pit Location Plan, STA 609 to 621

...\New Folder\S-contour.dgn 01/30/2003 06:43:15 AM

T. 27 N. R. 6E., W.M.



JOB OL-3491 S.R. 522 C.S. _____ LAYOUT _____

Paradise Lake Road to Snohomish River Bridge Stage 2

WASHINGTON STATE
TRANSPORTATION COMMISSION
DEPARTMENT OF TRANSPORTATION

MATERIALS BRANCH

T. E. BAKER MATERIALS ENGINEER

DATE July 02
SCALE 1"=100'VERT.
1"=100'HORIZ.
SHEET ___ OF ___
DRAWN BY DWG

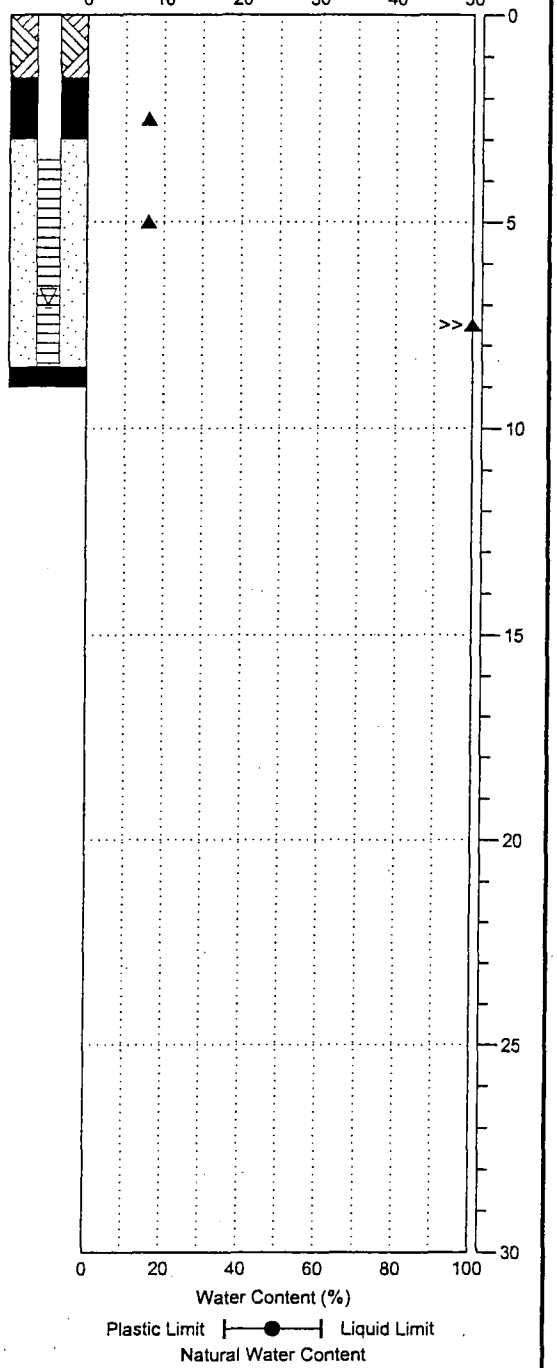
Figure 9: Boring and Test Pit Location Plan, STA 667 to 671+75

...\New Folder\S-contour.dgn 01/30/2003 07:28:25 AM

DRILLING COMPANY: Boretec, Inc.
DRILLING METHOD: 4" Hollow Stem Auger, 8 HP Engine
SAMPLING METHOD: SPT w/rope and cathead
SURFACE ELEVATION: ± feet

LOCATION: See Figure 2
DATE STARTED: 6/21/2001
DATE COMPLETED: 6/21/2001
LOGGED BY: B. Hawkins

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS
0		ML	Soft, brown, slightly fine to coarse gravelly SILT, moist. Abundant organics/roots. [TOPSOIL/ALLUVIUM]				
		ML SM	Medium stiff, mottled brown and gray, sandy SILT, moist to wet.		S-1	3-4-4	
5		GW	Loose, red brown, fine to coarse sandy, fine to coarse GRAVEL, moist.		S-2	5-4-4	
		SW	[OUTWASH]				
		SM	Loose, red brown, slightly fine to coarse gravelly, fine to coarse SAND, moist.				
			Very dense, olive gray, silty, fine to coarse gravelly, fine to coarse SAND, wet. Oxidation stains noted. [GLACIAL DRIFT]		S-3	6-16-48	
10			Total depth = 9 feet.				



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

HWA GEOSCIENCES INC.

SR 522, Fales/Echo Lake Road Interchange
Snohomish County, Washington

BORING:
MW- 1

PAGE: 1 of 1

PROJECT NO.: 2001070 FIGURE: A-15

PZO 2001070.GPJ 4/21/03

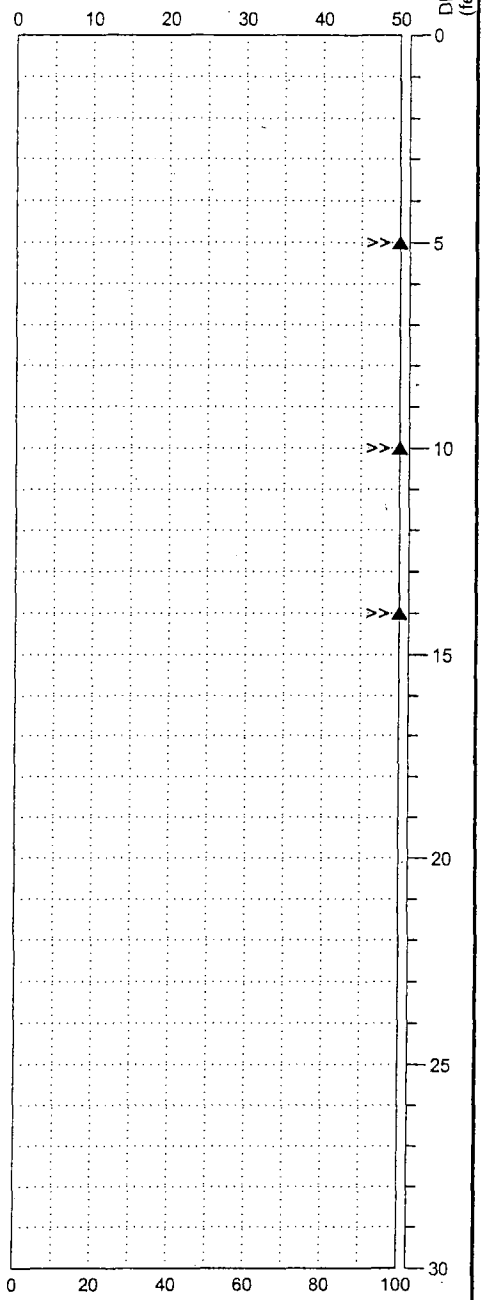
DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: 3" Hollow Stem Auger, Simco truck mounted drill
SAMPLING METHOD: SPT w/rope and cathead
LOCATION: See Figure 2

SURFACE ELEVATION: ± feet

DATE STARTED: 4/25/2002
DATE COMPLETED: 4/25/2002
LOGGED BY: B. Hawkins

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS	GROUNDWATER
0		ML SM	Loose, brown, sandy SILT to silty SAND, moist. Organics noted.					
5		SM	Very dense, gray, fine to coarse gravelly, silty, fine to medium SAND, moist. [TILL]	☒	S-1	50/6"		
10				☒	S-2	50/6"		
				☒	S-3	50/2"		
15			Refusal on cobble at 14.2 feet. No ground water seepage observed.					
20								
25								
30								

Standard Penetration Test
(140 lb. weight, 30" drop)
▲ Blows per foot



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

HWA GEOSCIENCES INC.

SR 522, Fales/Echo Lake Road Interchange
Snohomish County, Washington

BORING:
MW-10

PAGE: 1 of 1

PROJECT NO.: 2001070 FIGURE: A-17

BORING 2001070.GPJ 7/3/03

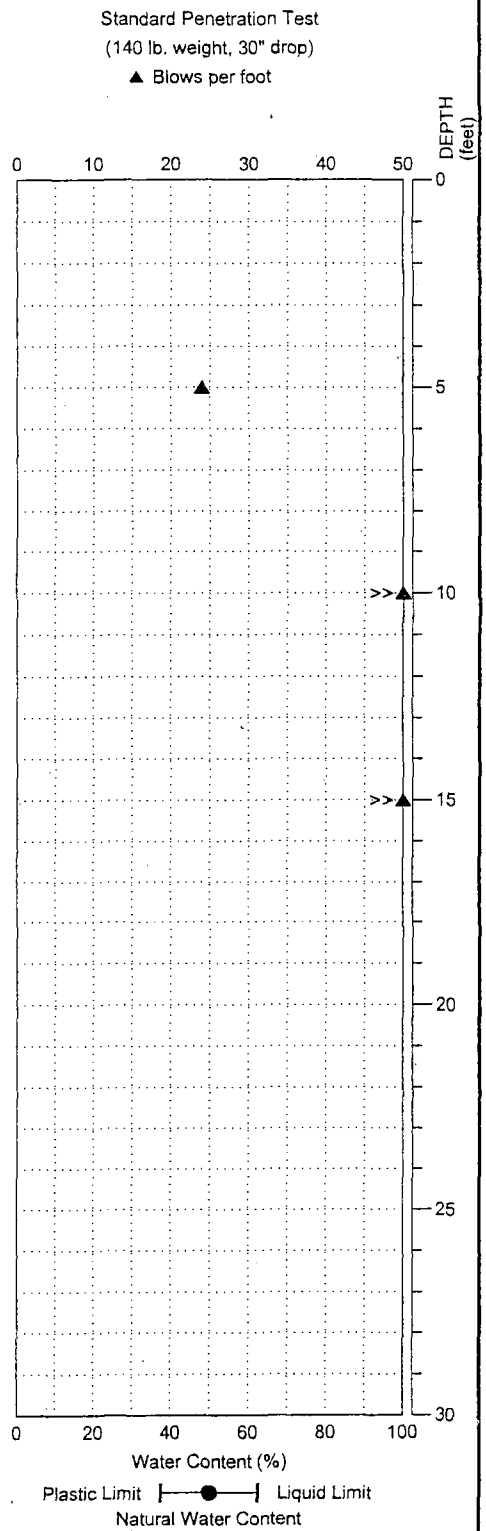
DRILLING COMPANY: Holocene Drilling
DRILLING METHOD: 3" Hollow Stem Auger, Simco trac[illegible]nted drill
SAMPLING METHOD: SPT w/rope and cathead
LOCATION: See Figure 2

SURFACE ELEVATION: ± feet

DATE STARTED: 4/25/2002
DATE [illegible]LETED: 4/25/2002
LOGGED BY: B. Hawkins

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS	GROUNDWATER
0		GM	Medium dense, brown, silty, sandy, fine to coarse GRAVEL, moist. *Organics noted.*					
5		SM	Medium dense, brown, silty, gravelly, fine to medium SAND, moist.		S-1	5-10-14		
		SM	Very dense, brown to gray, gravelly, silty, fine to medium SAND, moist. [TILL]					
10					S-2	36-50/3"		
15					S-3	50/5"		
20								
25								
30								

Refusal at 17.5 feet.
No ground water seepage observed.



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

HWA GEOSCIENCES INC.

SR 522, Fales/Echo Lake Road Interchange
Snohomish County, Washington

BORING:
MW-11

PAGE: 1 of 1

PROJECT NO.: 2001070 FIGURE: A-18

BORING 2001070.GPJ 7/3/03

Appendix A: Boring Logs

GrfcText\BORLEGSOIL 1/29/2003 8:02:04 AM

Washington State
Department of Transportation

Test Boring Legend

Sampler Symbols

	Standard Penetration Test
	Oversized Penetration Test (Dames & Moore, California)
	Shelby Tube
P	Piston Sample
	Washington Undisturbed
	Vane Shear Test
	Core
	Becker Hammer
B	Bag Sample

Well Symbols

	Cement Surface Seal
	Piezometer Pipe in Granular Bentonite Seal
	Piezometer Pipe in Sand
	Well Screen in Sand
	Granular Bentonite Bottom Seal
	Inclinometer Casing in Concrete Bentonite Grout

Laboratory Testing Codes

UU	Unconsolidated Undrained Triaxial
CU	Consolidated Undrained Triaxial
CD	Consolidated Drained Triaxial
UC	Unconfined Compression Test
DS	Direct Shear Test
CN	Consolidation Test
GS	Grain Size Distribution
MC	Moisture Content
SG	Specific Gravity
OR	Organic Content
DN	Density
AL	Atterberg Limits
PT	Point Load Compressive Test
SL	Slake Test
DG	Degradation
LA	LA Abrasion

Soil Density Modifiers

Gravel, Sand & Non-plastic Silt		Elastic Silts and Clay	
SPT Blows/ft	Density	SPT Blows/ft	Consistency
0-4	Very Loose	0-1	Very Soft
5-10	Loose	2-4	Soft
11-24	Medium Dense	5-8	Medium Stiff
25-50	Dense	9-15	Stiff
>50	Very Dense	16-30	Very Stiff
		31-60	Hard
		>60	Very Hard

Angularity of Gravel & Cobbles

Angular	Coarse particles have sharp edges and relatively plane sides with unpolished surfaces.
Subangular	Coarse grained particles are similar to angular but have rounded edges.
Subrounded	Coarse grained particles have nearly plane sides but have well rounded corners and edges.
Rounded	Coarse grained particles have smoothly curved sides and no edges.

Soil Moisture Modifiers

Dry	Absence of moisture; dusty, dry to touch
Moist	Damp but no visible water
Wet	Visible free water

Soil Structure

Stratified	Alternating layers of varying material or color at least 6mm thick; note thickness and inclination.
Laminated	Alternating layers of varying material or color less than 6mm thick; note thickness and inclination.
Fissured	Breaks along definite planes of fracture with little resistance to fracturing.
Slickensided	Fracture planes appear polished or glossy, somtimes striated.
Blocky	Cohesive soil that can be broken down into smaller angular lumps which resist further breakdown.
Disrupted	Soil structure is broken and mixed. Infers that material has moved substantially - landslide debris.
Homogeneous	Same color and appearance throughout.

HCL Reaction

No HCL Reaction	No visible reaction.
Weak HCL Reaction	Some reaction with bubbles forming slowly.
Strong HCL Reaction	Violent reaction with bubbles forming imediately.

Degree of Vesicularity of Pyroclastic Rocks

Slightly Vesicular	5 to 10 percent of total
Moderately Vesicular	10 to 25 percent of total
Highly Vesicular	25 to 50 percent of total
Scoriaceous	Greater than 50 percent of total

GrfcText!BORLEGROCK 1/29/2003 8:01:40 AM

Washington State
Department of Transportation

Test Boring Legend

Grain Size

Fine Grained	< 1mm	Few crystal boundaries/grains are distinguishable in the field or with hand lens.
Medium Grained	1mm to 5mm	Most crystal boundaries/grains are distinguishable with the aid of a hand lens.
Coarse Grained	> 5mm	Most crystal boundaries/grains are distinguishable with the naked eye.

Weathered State

Term	Description	Grade
Fresh	No visible sign of rock material weathering; perhaps slight discoloration in major discontinuity surfaces.	I
Slightly Weathered	Discoloration indicates weathering of rock material and discontinuity surfaces. All the rock material may be discolored by weathering and may be somewhat weaker externally than its fresh condition.	II
Moderately Weathered	Less than half of the rock material is decomposed and/or disintegrated to soil. Fresh or discolored rock is present either as a continuous framework or as core stones.	III
Highly Weathered	More than half of the rock material is decomposed and/or disintegrated to soil. Fresh or discolored rock is present either as discontinuous framework or as core stone.	IV
Completely Weathered	All rock material is decomposed and/or disintegrated to soil. The original mass structure is still largely intact.	V
Residual Soil	All rock material is converted to soil. The mass structure and material fabric is destroyed. There is a large change in volume, but the soil has not been significantly transported.	VI

Relative Rock Strength

Grade	Description	Field Identification	Uniaxial Compressive Strength approx
R1	Very Weak	Specimen crumbles under sharp blow from point of geological hammer, and can be cut with a pocket knife.	1 to 25 MPa
R2	Moderately Weak	Shallow cuts or scrapes can be made in a specimen with a pocket knife. Geological hammer point indents deeply with firm blow.	25 to 50 MPa
R3	Moderately Strong	Specimen cannot be scraped or cut with a pocket knife, shallow indentation can be made under firm blows from a hammer.	50 to 100 MPa
R4	Strong	Specimen breaks with one firm blow from the hammer end of a geological hammer.	100 to 200 MPa
R5	Very Strong	Specimen requires many blows of a geological hammer to break intact sample.	Greater than 200 MPa

Discontinuities

Spacing	
Very Widely	Greater than 3 m
Widely	1 m to 3 m
Moderately	0.3 m to 1 m
Closely	50 mm to 300 mm
Very Closely	Less than 50 mm

RQD (%)

$$\frac{100(\text{length of core in pieces} > 100\text{mm})}{\text{Length of core run}}$$

Condition	
Excellent	Very rough surfaces, no separation, hard discontinuity wall
Good	Slightly rough surfaces, separation less than 1 mm, hard discontinuity wall.
Fair	Slightly rough surfaces, separation greater than 1 mm, soft discontinuity wall.
Poor	Slickensided surfaces, or soft gouge less than 5 mm thick, or open discontinuities 1 to 5 mm.
Very Poor	Soft gouge greater than 5 mm thick, or open discontinuities greater than 5 mm.

Fracture Frequency (FF) is the average number of fractures per 300 mm of core.
Does not include mechanical breaks caused by drilling or handling.

Washington State
Department of Transportation

LOG OF TEST BORING

Job No. XL-1142_0L-3491 SR 522 HOLE No. H-33-02

PROJECT Paradise Lake Road to Snohomish River, Stage 2 Sheet 1 of 2

SR - 522 MP.17.09 to MP. 20.42 Inspector Dave Nelson

Station 582+50 Offset 108' Rt. Equipment CME 850 w/ auto hammer

Latitude Longitude Method Wet Rotary

Northing Easting Casing HWTx20.0 & HQx40.0

Ground Elevation 290.0 (88.4 m) Start Date December 4, 2002 Completion Date December 4, 2002

Depth (ft)	Meters (m)	Profile	Standard Penetration Blows/ft (10 20 30 40)	SPT Blows/6" (N)	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
	1									
5				6 10 13 (29)		D-1		Sandy SILT with gravel and some organics, mottled, dense, reddish brown, moist, Laminated, no HCl reaction Length Recovered 1.0 ft		
	2									
10	3			10 50 (50)		D-2		Silty SAND with gravel, mottled, very dense, reddish brown, moist, Laminated, no HCl reaction Length Recovered 0.6 ft		
						C-3		Well graded GRAVEL with boulders, sub rounded, very dense, bluish grey, wet, Homogeneous, no HCl reaction Length Recovered 0.9 ft		
	4									
15			>>	13 32 38 (70)		D-4		Silty SAND with gravel, very dense, grey, wet, Homogeneous, no HCl reaction Length Recovered 1.0 ft	12/04/2002	
	5					C-5		Silty SAND with gravel, very dense, grey, wet, Homogeneous, no HCl reaction Length Recovered 0.9 ft		
20	6		>>							

Washington State
Department of Transportation

LOG OF TEST BORING

Job No. XL-1142_0L-3491 SR 522 HOLE No. H-33-02

PROJECT Paradise Lake Road to Snohomish River, Stage 2 Sheet 2 of 2

Depth (ft)	Meters (m)	Profile	Standard Penetration Blows/ft (10 20 30 40)	SPT Blows/6" (N)	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
				69 (69) RQD 98 FF 0		D-6 C-7		Silty SAND with gravel, very dense, grey, wet, Homogeneous, no HCl reaction Length Recovered 0.3 ft Sandstone, fine grained, black, fresh, moderately weak rock, no HCl reaction. Discontinuities are moderately spaced and in good condition, Percent Recovered 100.0%		
	7									
25				RQD 76 FF 1		C-8		Sandstone, fine grained, black, fresh, moderately weak rock, no HCl reaction. Discontinuities are moderately spaced and in good condition, Percent Recovered 100.0%		
	8									
	9									
30				RQD 86 FF 1		C-9		Sandstone, fine grained, black, fresh, moderately weak rock, no HCl reaction. Discontinuities are moderately spaced and in good condition, Percent Recovered 100.0%		
	10									
35				RQD 100 FF 0		C-10		Sandstone, fine grained, black, fresh, moderately weak rock, no HCl reaction. Discontinuities are very widely spaced and in excellent condition, Percent Recovered 100.0%		
	11									
	12									
40								End of test hole boring at 40 ft below ground elevation.		
	13									
45								This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data.		

Washington State
Department of Transportation

LOG OF TEST BORING

Job No. XL-1142_0L-3491 SR 522 HOLE No. H-34-02

PROJECT Paradise Lake Road to Snohomish River, Stage 2 Sheet 1 of 1

SR - 522 MP.17.09 to MP. 20.42 Inspector Dave Nelson

Station 608+00 Offset 62' Rt. Equipment CME 850 w/ auto hammer

Latitude Longitude Method Wet Rotary

Northing Easting Casing HWTx5.0 & HQx20.0

Ground Elevation 265.0 (80.8 m) Start Date December 5, 2002 Completion Date December 5, 2002

Depth (ft)	Meters (m)	Profile	Rock Quality Designation (%) 20 40 60 80	% Rec. / FPF	Rock Strength	Sample Type	Sample No.	Blows/6" SPT (N)	Description of Material	Groundwater	Instrument
				100 / 1			C-1	RQD 80 FF 1	Siltstone, fine grained, black, slightly weathered, moderately weak rock, no HCl reaction. Discontinuities are closely spaced and contain a very thin clay film. Percent Recovered 100.0% 1/29/03		
5	1			100 / 2			C-2	RQD 70 FF 2	Siltstone, fine grained, slightly weathered, moderately weak rock, no HCl reaction. Discontinuities are closely spaced and in good condition, Percent Recovered 100.0% ↳ No clay film?		
10	2			100 / 1			C-3	RQD 84 FF <1	Siltstone, fine grained, slightly weathered, moderately weak rock, no HCl reaction. Discontinuities are closely spaced and in good condition, Percent Recovered 100.0%		
15	3			80 / 3			C-4	RQD 24 FF 3	Siltstone, fine grained, moderately weathered, very weak rock, no HCl reaction. Discontinuities are closely spaced and in fair condition, Percent Recovered 80.0%		
20	4								End of test hole boring at 20 ft below ground elevation.		
	5								This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data.		
	6										

Washington State
Department of Transportation

LOG OF TEST BORING

Job No. XL-1142_0L-3491 SR 522 HOLE No. H-35-02

PROJECT Paradise Lake Road to Snohomish River, Stage 2 Sheet 1 of 2

SR - 522 MP.17.09 to MP. 20.42 Inspector Hanning

Station 607+90 Offset 90 Rt Equipment CME 45 w/ autohammer

Latitude Longitude Method Wet Rotary

Northing Easting Casing HQ

Ground Elevation 278.0 (84.7 m) Start Date December 3, 2002 Completion Date December 4, 2002

Depth (ft)	Meters (m)	Profile	Rock Quality Designation (%) 20 40 60 80	% Rec. / FPF	Rock Strength	Sample Type	Sample No.	Blows/6" SPT (N)	Description of Material	Groundwater	Instrument
	1						D-1	42 60/6 (60/6")	SILT with sand, very dense, dark greenish black, moist, Homogeneous, no HCl reaction, contact with completely weathered material at 0.8' below surface.		
5				95 / 7			C-2	RQD 0 FF 7	Length Recovered 1.0 ft, Length Retained 1.0 ft Siltstone, fine grained, moderately weathered, moderately weak rock, no HCl reaction. Discontinuities are very closely spaced and in poor condition, Potential for slaking. Percent Recovered 95.0%		
	2									1/29/03	
10	3			96 / 10			D-3 C-4	50/4" (50/4") RQD 11 FF 10	No Recovery Siltstone, fine grained, moderately weathered, moderately weak rock, no HCl reaction. Discontinuities are very closely spaced and in poor condition, Percent Recovered 96.0%		
	4										
15				100 / 1.2			C-5	RQD 70 FF 1.2	Siltstone, fine grained, moderately weathered, moderately weak rock, no HCl reaction. Discontinuities are very closely spaced and in poor condition, Percent Recovered 100.0%		
	5										
20	6			99			C-6	RQD	Siltstone, fine grained, moderately weathered,		

Washington State
Department of Transportation

LOG OF TEST BORING

Job No. XL-1142_0L-3491 SR 522 HOLE No. H-35-02

PROJECT Paradise Lake Road to Snohomish River, Stage 2 Sheet 2 of 2

Depth (ft)	Meters (m)	Profile	Rock Quality Designation (%) 20 40 60 80	% Rec. / FPF	Rock Strength	Sample Type	Sample No.	Blows/6" SPT (N)	Description of Material	Groundwater	Instrument
				.8				82 FF .8	moderately weak rock, no HCl reaction. Discontinuities are very closely spaced and in fair condition, Percent Recovered 99.0%		
	7										
25				100 / 1.2			C-7	RQD 91 FF 1.2	Siltstone, fine grained, moderately weathered, moderately weak rock, no HCl reaction. Discontinuities are very closely spaced and in fair condition, Percent Recovered 100.0%		
	8										
	9			100 / .2			C-8	RQD 100 FF .2	Siltstone, fine grained, moderately weathered, moderately weak rock, no HCl reaction. Discontinuities are closely spaced and in good condition. Percent Recovered 100.0% Gravel size inclusions at 30.5 ft. Bailed hole. No recharge prior to installing piezometer.		
30											
	10										
35									End of test hole boring at 34.5 ft below ground elevation.		
	11										
									This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data.		
	12										
40											
	13										
45											

Washington State
Department of Transportation

LOG OF TEST BORING

Job No. XL-1142_0L-3491 SR 522 HOLE No. H-36-02

PROJECT Paradise Lake Road to Snohomish River, Stage 2 Sheet 1 of 2

SR - 522 MP.17.09 to MP. 20.42 Inspector Dave Nelson

Station 610+00 Offset 62' Rt. Equipment CME 850 w/ auto hammer

Latitude Longitude Method Wet Rotary

Northing Easting Casing HWTx6.0 & HQx20.5

Ground Elevation 261.0 (79.6 m) Start Date December 3, 2002 Completion Date December 3, 2002

Depth (ft)	Meters (m)	Profile	Standard Penetration Blows/ft (10 20 30 40)	SPT Blows/6" (N)	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
5	1			6 10 12 (22)		D-1		Silty SAND with gravel, mottled, medium dense, reddish brown, moist, Homogeneous, no HCl reaction Length Recovered 1.0 ft		
	2					C-2		Silty SAND with gravel, mottled, dense, grey/reddish brown, moist, Homogeneous, no HCl reaction Length Recovered 4.5 ft		
10	3			9 14 11 (25)		D-3		Silty SAND, dense, reddish brown, moist, Homogeneous, no HCl reaction Length Recovered 1.0 ft		
	4					C-4		Silty SAND, dense, reddish brown, wet, Homogeneous, no HCl reaction Length Recovered 3.0 ft	12/03/2002	
15	5			16 50 (50)		D-5 C-6		Silty SAND, very dense, grey, wet, Homogeneous, no HCl reaction Length Recovered 0.8 ft SANDSTONE, gray, fine grained, fresh, moderately weak rock. Discontinuities are moderately space and in good condition. Length Recovered 3.3 ft		
20	6									

SOIL XL-1142_0L3491 PARADISE LAKE TO SNOHOMISH RIVER BRIDGE.GPJ SOIL.GDT 1/29/03 8:36:32 A1

Washington State
Department of Transportation

LOG OF TEST BORING

Job No. XL-1142 0L-3491 SR 522 HOLE No. H-36-02

PROJECT Paradise Lake Road to Snohomish River, Stage 2 Sheet 2 of 2

Depth (ft)	Meters (m)	Profile	Standard Penetration Blows/ft (10 20 30 40)	SPT Blows/6" (N)	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
			>>	66 (66)		D-7		Silty SAND, very dense, grey, wet, Homogeneous, no HCl reaction Length Recovered 0.5 ft		
								End of test hole boring at 21 ft below ground elevation.		
	7									
25								This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data.		
	8									
	9									
30										
	10									
35										
	11									
	12									
40										
	13									
45										

Washington State
Department of Transportation

LOG OF TEST BORING

Job No. XL-1142_0L-3491 SR 522 HOLE No. H-37-02

PROJECT Paradise Lake Road to Snohomish River, Stage 2 Sheet 1 of 2

SR - 522 MP.17.09 to MP. 20.42 Inspector Dave Nelson

Station 612+00 Offset 62' Rt. Equipment CME 850 w/ auto hammer

Latitude Longitude Method Wet Rotary

Northing Easting Casing HWTx15.0 & HQx20.5

Ground Elevation 255.0 (77.7 m) Start Date December 3, 2002 Completion Date December 3, 2002

Depth (ft)	Meters (m)	Profile	Standard Penetration Blows/ft (10 20 30 40)	SPT Blows/6" (N)	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
	1									
5				3 5 3 (8)		D-1		Silty SAND with gravel, loose, reddish brown, wet, Homogeneous, no HCl reaction Length Recovered 0.8 ft		
						C-2		Silty SAND with gravel, loose, grey, wet, Homogeneous, no HCl reaction Length Recovered 2.0 ft		
	2									
10	3			3 4 5 (8)		D-3		Silty SAND with gravel, mottled, loose, grey/brown, wet, Homogeneous, no HCl reaction Length Recovered 1.0 ft		
						C-4		Silty SAND, mottled, loose, bluish grey, wet, Homogeneous, no HCl reaction Length Recovered 1.5 ft		
	4									
15				2 3 4 (7)		D-5		Silty SAND with gravel, mottled, loose, bluish grey, wet, Homogeneous, no HCl reaction Length Recovered 1.0 ft		
	5					C-6		Silty SAND with gravel and cobbles, loose, bluish grey, wet, Disrupted, no HCl reaction Length Recovered 1.3 ft	▽ 12/03/2002	
20	6									

Washington State
Department of Transportation

LOG OF TEST BORING

Job No. XL-1142_0L-3491 SR 522 HOLE No. H-37-02

PROJECT Paradise Lake Road to Snohomish River, Stage 2 Sheet 2 of 2

Depth (ft)	Meters (m)	Profile	Standard Penetration Blows/ft (10 20 30 40)	SPT Blows/6" (N)	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
			◆	3 6 8 (14)		D-7		Sandy SILT with gravel, medium dense, bluish grey, wet, Disrupted, no HCl reaction Length Recovered 0.5 ft		
	7							End of test hole boring at 22 ft below ground elevation.		
25								This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data.		
	8									
	9									
30										
	10									
35										
	11									
	12									
40										
	13									
45										

Washington State
Department of Transportation

LOG OF TEST BORING

Job No. XL-1142_0L-3491 SR 522 HOLE No. H-38-02

PROJECT Paradise Lake Road to Snohomish River, Stage 2 Sheet 1 of 2

SR - 522 MP.17.09 to MP. 20.42 Inspector Dave Nelson

Station 617+50 Offset 62' Rt. Equipment CME 850 w/ auto hammer

Latitude Longitude Method Wet Rotary

Northing Easting Casing HWTx5.0 & HQx20.5

Ground Elevation 243.0 (74.1 m) Start Date December 3, 2002 Completion Date December 3, 2002

Depth (ft)	Meters (m)	Profile	Standard Penetration Blows/ft (10 20 30 40)	SPT Blows/6" (N)	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
	1		>>	10 23 28 (51)		D-1		Poorly graded SAND with gravel, mottled, very dense, grayish brown, moist, Stratified, no HCl reaction, silt stratified Length Recovered 1.0 ft		
5						C-2		Silty SAND with gravel, dense, grey, moist, Homogeneous, no HCl reaction Length Recovered 1.0 ft		
	2									
10	3			7 20 25 (45)		D-3		Silty SAND with gravel, dense, grey, moist, Homogeneous, no HCl reaction Length Recovered 1.0 ft		
						C-4			12/03/2002	
	4									
15				15 19 22 (41)		D-5		Silty SAND with gravel, dense, grey, wet, Homogeneous, no HCl reaction Length Recovered 1.0 ft		
	5					C-6		Sandy SILT with gravel, dense, grey, wet, Homogeneous, no HCl reaction Length Recovered 3.0 ft		
	6									
20										

SOIL XL-1142_0L3491 PARADISE LAKE TO SNOHOMISH RIVER BRIDGE.GPJ SOIL.GDT 1/29/03,8:41:04 A1

Washington State
Department of Transportation

LOG OF TEST BORING

Job No. XL-1142_0L-3491 SR 522 HOLE No. H-38-02

PROJECT Paradise Lake Road to Snohomish River, Stage 2 Sheet 2 of 2

Depth (ft)	Meters (m)	Profile	Standard Penetration Blows/ft (10 20 30 40)	SPT Blows/6" (N)	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
			>>	20 28 35 (63)		D-7		Sandy SILT with gravel, very dense, grey, wet, Homogeneous, no HCl reaction Length Recovered 1.0 ft		
	7							End of test hole boring at 22 ft below ground elevation.		
25	8							This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data.		
	9									
30										
	10									
35	11									
	12									
40										
	13									
45										

Washington State Department of Transportation

LOG OF TEST BORING

Job No. XL-1142_0L-3491 SR 522 HOLE No. H-39-02

PROJECT Paradise Lake Road to Snohomish River, Stage 2 Sheet 1 of 2

SR - 522 MP.17.09 to MP. 20.42 Inspector Dan Reed

Station 668+50 Offset 62' Rt Equipment CME 850 w/ autohammer

Latitude Longitude Method Wet Rotary

Northing Easting Casing HW/HQ

Ground Elevation (m) Start Date December 19, 2002 Completion Date December 19, 2002

Depth (ft)	Meters (m)	Profile	Standard Penetration Blows/ft (10 20 30 40)	SPT Blows/6" (N)	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
	1			2 1 2 (3)		D-1		Silty SAND with gravel, very loose, light brown, wet, Homogeneous, no HCl reaction Length Recovered 1.5 ft, Length Retained 1.5 ft		
5	2			18 17 23 (40)		D-2		Silty SAND with gravel, dense, light brown, wet, Homogeneous, no HCl reaction Length Recovered 1.5 ft, Length Retained 1.5 ft	12/19/2002	
10	3		>>	100/2 (100)		D-3		Silty SAND with gravel, very dense, gray, wet, Homogeneous, no HCl reaction, contact with very dense material at 8.0' Length Recovered 0.2 ft, Length Retained 0.2 ft		
			>>	60 (60) RQD 40% FF 4		D-4 C-5		Well graded GRAVEL with sand, angular, very dense, gray, wet, Homogeneous, no HCl reaction, started core drilling at 11.0' Length Recovered 0.4 ft, Length Retained 0.4 ft CONGLOMERATE, gray, coarse grained, highly weathered, moderately strong, no HCl reaction. Discontinuities are very closely spaced and in poor condition. Core recovery = 76%		
15	4									
	5		>>	63/4" (63/4") RQD 32% FF 3.6		D-6 C-7		Well graded GRAVEL with sand, angular, very dense, gray, wet, Homogeneous, no HCl reaction Length Recovered 0.2 ft, Length Retained 0.2 ft CONGLOMERATE, gray, coarse grained, highly weathered, moderately strong, no HCl reaction. Discontinuities are very closely spaced and in poor condition. Core recovery = 80%		
20	6									

Washington State
Department of Transportation

LOG OF TEST BORING

Job No. XL-1142_0L-3491 SR 522 HOLE No. H-39-02

PROJECT Paradise Lake Road to Snohomish River, Stage 2 Sheet 2 of 2

Depth (ft)	Meters (m)	Profile	Standard Penetration Blows/ft (10 20 30 40)	SPT Blows/6" (N)	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
				50/4" (50/4") RQD 40% FF 3		D-8 C-9		Well graded GRAVEL, angular, very dense, gray, wet, Homogeneous, no HCl reaction Length Recovered 0.2 ft, Length Retained 0.2 ft CONGLOMERATE, gray, coarse grained, highly weathered, moderately strong, no HCl reaction. Discontinuities are very closely spaced and in poor condition. Core recovery = 75%		
7										
25										
	8		>>	60 (60) RQD 65% FF 2.3		D-10 C-11		Well graded GRAVEL, angular, very dense, gray, wet, Homogeneous, no HCl reaction Length Recovered 0.2 ft, Length Retained 0.2 ft CONGLOMERATE, gray, coarse grained, highly weathered, moderately strong, no HCl reaction. Discontinuities are very closely spaced and in poor condition. Core recovery = 82%		
	9									
30			>>	60 (60)		D-12		Well graded GRAVEL, angular, very dense, gray, wet, Homogeneous, no HCl reaction Length Recovered 0.3 ft, Length Retained 0.3 ft		
								End of test hole boring at 30.4 ft below ground elevation.		
	10							This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data.		
35										
	11									
	12									
40										
	13									
45										

Washington State
Department of Transportation

LOG OF TEST BORING

Job No. XL-1142_0L-3491 SR 522 HOLE No. H-40-03

PROJECT Paradise Lake Road to Snohomish River, Stage 2 Sheet 1 of 2

SR - 522 MP.17.09 to MP. 20.42 Inspector Dan Reed

Station 668+80 Offset 48' L Equipment CME 850 w/ autohammer

Latitude Longitude Method Wet Rotary

Northing Easting Casing HW/HQ

Ground Elevation (m) Start Date January 7, 2003 Completion Date January 7, 2003

Depth (ft)	Meters (m)	Profile	Standard Penetration Blows/ft (10 20 30 40)	SPT Blows/6" (N)	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
	1									
5				7 9 7 (16)		D-1		Silty SAND with gravel, medium dense, gray, wet, Disrupted, no HCl reaction, light brown silt lenses Length Recovered 1.2 ft, Length Retained 1.2 ft		
	2									
10	3			5 5 6 (11)		D-2		Silty SAND with gravel, medium dense, light brown, wet, homogeneous, no HCl reaction. Length recovered 1.3 ft. Length retained 1.3 ft. Sand lenses at 10.5 ft.	01/07/2003	
	4									
15				5 6 7 (13)		D-3		Silty SAND with gravel, medium dense, light brown, wet, Disrupted, no HCl reaction, trace of organics, wood, roots, etc. Length Recovered 1.1 ft, Length Retained 1.1 ft		
	5									
20	6			7 9		D-4		Silty SAND with gravel, medium dense, light brown, wet, Disrupted, no HCl reaction.		

SOIL XL-1142_0L3491 PARADISE LAKE TO SNOHOMISH RIVER BRIDGE.GPJ SOIL.GDT 1/29/03 1:31:26 P1

Washington State
Department of Transportation

LOG OF TEST BORING

Job No. XL-1142_0L-3491 SR 522 HOLE No. H-40-03

PROJECT Paradise Lake Road to Snohomish River, Stage 2 Sheet 2 of 2

Depth (ft)	Meters (m)	Profile	Standard Penetration Blows/ft (10 20 30 40)	SPT Blows/6" (N)	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
				8 (17)				Length Recovered 1.5 ft, Length Retained 1.5 ft		
	7									
25				9 9 11 (20)		D-5		Silty SAND with gravel, medium dense, dark brown, wet, Disrupted, no HCl reaction, trace of organics. Length Recovered 1.5 ft, Length Retained 1.5 ft		
	8									
30	9			7 9 11 (20)		D-6		Sandy SILT with gravel, medium dense, light brown, wet, Stratified, no HCl reaction. Length Recovered 1.5 ft, Length Retained 1.5 ft		
	10									
35			>>	65 (65)		D-7		Well graded GRAVEL with sand, silt, angular, very dense, light brown, wet, Homogeneous, no HCl reaction Length Recovered 0.5 ft, Length Retained 0.5 ft		
	11									
40	12		>>	78 (78)		D-8		Well graded GRAVEL with sand, silt, angular, very dense, gray, wet, Homogeneous, no HCl reaction Length Recovered 0.4 ft, Length Retained 0.4 ft		
	13							Silty SAND with gravel, very dense, gray, wet, Homogeneous, no HCl reaction Length Recovered 0.4 ft, Length Retained 0.4 ft		
45			>>	70 (70)		D-9		End of test hole boring at 43.4 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data.		

Washington State
Department of Transportation

LOG OF TEST BORING

Job No. XL-1142_0L-3491 SR 522 HOLE No. H-41-03

PROJECT Paradise Lake Road to Snohomish River, Stage 2 Sheet 1 of 2

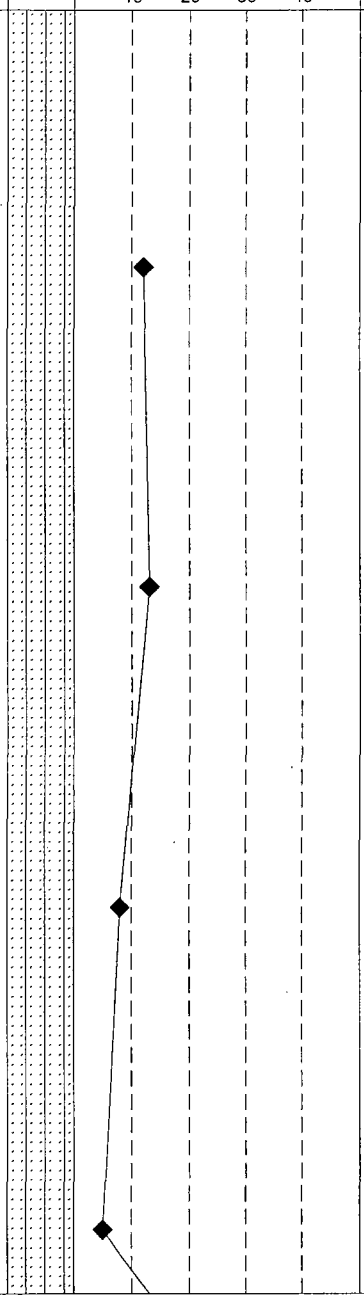
SR - 522 MP.17.09 to MP. 20.42 Inspector Reed

Station 668+85 Offset 10 lt. Equipment CME 850 w/ autohammer

Latitude Longitude Method Wet Rotary

Northing Easting Casing HQ

Ground Elevation (m) Start Date December 24, 2002 Completion Date January 6, 2003



Depth (ft)	Meters (m)	SPT Blows/6" (N)	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
5	1	5 5 7 (12)		D-1		Silty SAND with gravel, medium dense, greenish gray, moist, Homogeneous, no HCl reaction, Drilling indicates large gravels 0-3'. Length Recovered 1.3 ft, Length Retained 1.3 ft		
10	2, 3	8 7 6 (13)		D-2		Poorly graded GRAVEL with sand, angular, medium dense, olive brown, moist, Homogeneous, no HCl reaction; trace of silt. Length Recovered 0.2 ft, Length Retained 0.2 ft		
15	4, 5	2 3 5 (8)		D-3		Silty GRAVEL with sand, subrounded, loose, grayish brown, wet, Homogeneous, no HCl reaction, Organics throughout sample. Length Recovered 1.0 ft, Length Retained 1.0 ft		
20	6	2 2		D-4		Gravelly SILT with sand, organics, loose, dark grayish brown, moist, Stratified, no HCl reaction		

Washington State
Department of Transportation

LOG OF TEST BORING

Job No. XL-1142_0L-3491 SR 522 HOLE No. H-41-03

PROJECT Paradise Lake Road to Snohomish River, Stage 2 Sheet 2 of 2

Depth (ft)	Meters (m)	Profile	Standard Penetration Blows/ft (10 20 30 40)	SPT Blows/6" (N)	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
				3 (5)				Length Recovered 1.0 ft, Length Retained 1.0 ft		
	7			15 19 26 (45)		D-5		Silty SAND with gravel, dense, light brown, wet, Stratified, no HCl reaction, Fine, medium, and coarse sand lenses. Length Recovered 1.5 ft, Length Retained 1.5 ft		
25	8									
	9		>>	50 65 (65)		D-6		Silty SAND with gravel, very dense, light brown, wet, Disrupted, no HCl reaction, Mixed colors, and soil types. Length Recovered 1.0 ft, Length Retained 1.0 ft		
30	10		>>	85 (85)		D-7		Silty SAND with gravel, very dense, gray, wet, Homogeneous, no HCl reaction. Length Recovered 0.5 ft, Length Retained 0.5 ft		
35	11							End of test hole boring at 34.5 ft below ground elevation.		
	12							This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data.		
40	13									
45										

LOG OF TEST BORING

Washington State Department of Transportation

HOLE No. **H-3-00**

PROJECT **Paridise Lake Road to Snohomish River ,Stage 2** Job No. **0L-3491**

SR - 522 MP.17.09 to MP. 20.42 S.R. **522**

Station **17+940 (588+60)** Offset **40ft Right** C.S.

Equipment **CME 850 w/ autohammer** Casing **HW x 12 HQ x 22** Ground El **286.1 (87.20 m)**

Method of Boring **Wet Rotary**

Start Date **May 3, 2000** Completion Date **May 4, 2000** Sheet **1** of **2**

Depth (ft)	Meters (m)	Profile	Rock Quality Designation (%) 20 40 60 80	% Rec. / FPF	Rock Strength	Sample Type	Sample No.	Blows/6" SPT (N)	Description of Material	Groundwater	Instrument
									1 ft.=0.3048 m.		
							D - 1	4 4 7 (11)	Silty SAND with gravel, medium dense, brown, wet, Homogeneous, no HCl reaction Length Recovered 0.4 ft, Length Retained 0.4 ft 05/04/2000	▽	
	1						D - 2	2 5 4 (9)	SM, MC=23% Silty SAND, loose, brown and gray, moist, Laminated, Fissured, no HCl reaction Length Recovered 1.2 ft, Length Retained 1.2 ft		
5											
	2								Note - Contacted Sandstone at - 7.0'.		
							D - 3	22 34 28 (62)	SANDSTONE, medium grained, fresh, moderately weak rock, no HCl reaction. Discontinuities are moderately spaced and in good condition Length Recovered 1.0 ft, Length Retained 1.0 ft		
10	3			100 / 6			C - 4	RQD 83 FF 6	SANDSTONE, medium grained, fresh, moderately strong rock, no HCl reaction. Discontinuities are widely spaced and in good condition Percent Recovered 100.0%		
	4										
15	5			100 / 1			C - 5	RQD 100 FF 1	SANDSTONE, medium grained, fresh, strong rock, no HCl reaction. Discontinuities are widely spaced and in good condition Percent Recovered 100.0%		
20	6										

ROCKN 0L3491-1.GPJ 5/29/01 8:12:35 A5

LOG OF TEST BORING

Washington State Department of Transportation

HOLE No. **H-3-00**

Sheet **2** of **2**

PROJECT **Paridise Lake Road to Snohomish River ,Stage 2**

Job No. **0L-3491**

Depth (ft)	Meters (m)	Profile	Rock Quality Designation (%) 20 40 60 80	% Rec. / FPF	Rock Strength	Sample Type	Sample No.	Blows/6" SPT (N)	Description of Material	Groundwater	Instrument
				100 / 0			C - 6	RQD 100 FF 0	SANDSTONE, medium grained, fresh, strong rock, no HCl reaction. Discontinuities are very widely spaced and in good condition Percent Recovered 100.0%		
	7								End of test hole boring at 22 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data.		
25											
	8										
	9										
30											
	10										
35											
	11										
	12										
40											
	13										
45											

ROCKN 0L3491-1.GPJ 5/29/01 8:12:35 A5

LOG OF TEST BORING

Washington State Department of Transportation

HOLE No. **H-4-00**

PROJECT **Paridise Lake Road to Snohomish River ,Stage 2** Job No. **0L-3491**

SR - 522 MP.17.09 to MP. 20.42 S.R. **522**

Station **17+942 (588+64)** Offset **36ft Right** C.S.

Equipment **CME 850 w/ autohammer** Casing **HW X 12 HQ X 28.5** Ground El **283.5 (86.41 m)**

Method of Boring **Wet Rotary**

Start Date **May 16, 2000** Completion Date **May 16, 2000** Sheet **1** of **2**

Depth (ft)	Meters (m)	Profile	Rock Quality Designation (%) 20 40 60 80	% Rec. / FPF	Rock Strength	Sample Type	Sample No.	Blows/6" SPT (N)	Description of Material	Groundwater	Instrument
									1 ft.=0.3048 m.		
	1						D - 1	2 3 4 (7)	ML, MC=34% Sandy SILT, loose, brown and gray, wet, Stratified, no HCl reaction Length Recovered 1.2 ft, Length Retained 1.2 ft		
5							D - 2	1 1 2 (4)	Sandy SILT, very loose, brown, wet, Homogeneous, no HCl reaction Length Recovered 1.5 ft, Length Retained 1.5 ft		
	2										
							D - 3	3 6 6 (12)	SM, MC=18% Silty SAND, medium dense, brown and gray, wet, Laminated, no HCl reaction Length Recovered 1.2 ft, Length Retained 1.2 ft 05/16/2000	▽	
10	3						D - 4	4 7 12 (19)	Silty SAND, medium dense, brown, wet, Homogeneous, no HCl reaction Length Recovered 1.5 ft, Length Retained 1.5 ft		
									Contacted SANDSTONE at - 10.5'.		
	4			100 / 8			C - 5	RQD 50 FF 8	SANDSTONE, *medium grained, slightly weathered,* moderately weak rock, no HCl reaction. Discontinuities are closely spaced and in good condition Percent Recovered 100.0%		
15	5			100 / 3			C - 6	RQD 86 FF 3	SANDSTONE, medium grained, slightly weathered, moderately strong rock, no HCl reaction. Discontinuities are widely spaced and in good condition Percent Recovered 100.0%		
20	6										

ROCKN 0L3491~1.GPJ 5/29/01 8:12:40 A5

LOG OF TEST BORING

Washington State Department of Transportation

HOLE No. **H-4-00**

Sheet **2** of **2**

PROJECT **Paridise Lake Road to Snohomish River ,Stage 2**

Job No. **0L-3491**

Depth (ft)	Meters (m)	Profile	Rock Quality Designation (%) 20 40 60 80	% Rec. / FPF	Rock Strength	Sample Type	Sample No.	Blows/6" SPT (N)	Description of Material	Groundwater	Instrument
				70 / 3			C - 7	RQD 63 FF 3	SANDSTONE to a CONGLOMERATE, coarse grained, fresh, moderately weak rock, no HCl reaction. Discontinuities are widely spaced and in good condition. Percent Recovered 70.0%		
25	7										
	8								End of test hole boring at 26 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data.		
30	9										
	10										
35	11										
40	12										
	13										
45											

ROCKN 0L3491-1.GPJ 5/29/01 8:12:40 A5

LOG OF TEST BORING

Washington State Department of Transportation

HOLE No. **H-5-00**

PROJECT **Paridise Lake Road to Snohomish River ,Stage 2** Job No. **0L-3491**

SR - 522 MP.17.09 to MP. 20.42 S.R. **522**

Station **17+945 (588+74)** Offset **26ft Left** C.S.

Equipment **CME 850 w/ autohammer** Casing **HW X 12 HQ X 28.5** Ground El **283.8 (86.50 m)**

Method of Boring **Wet Rotary**

Start Date **May 17, 2000** Completion Date **May 18, 2000** Sheet **1** of **2**

Depth (ft)	Meters (m)	Profile	Rock Quality Designation (%) 20 40 60 80	% Rec. / FPF	Rock Strength	Sample Type	Sample No.	Blows/6" SPT (N)	Description of Material	Groundwater	Instrument
									1 ft.=0.3048 m.		
	1						D - 1	0 1 2 (3)	Silty SAND, very loose, brown, wet, Homogeneous, no HCl reaction Length Recovered 0.6 ft, Length Retained 0.6 ft		
5	2						D - 2	1 2 3 (5)	SM, MC=32% Silty SAND, loose, brown, wet, Homogeneous, no HCl reaction Length Recovered 1.3 ft, Length Retained 1.3 ft 05/18/2000	▽	
							D - 3	3 3 4 (7)	Silty SAND with some organics (wood), loose, brown, wet, Homogeneous, no HCl reaction Length Recovered 0.7 ft, Length Retained 0.7 ft		
10	3						D - 4	7 6 9 (15)	Silty SAND with gravel, medium dense, brown and gray, wet, Laminated, no HCl reaction Length Recovered 1.1 ft, Length Retained 1.1 ft		
15	4			100 / 8			C - 5	RQD 50 FF 8	SANDSTONE, medium grained, slightly weathered, moderately weak rock, no HCl reaction. Discontinuities are closely spaced and in good condition Percent Recovered 100.0%		
	5			100 / 9			C - 6	RQD 73 FF 9	SANDSTONE, medium grained, fresh, moderately strong rock, no HCl reaction. Discontinuities are widely spaced and in good condition Percent Recovered 100.0%		
20	6										

ROCKN 0L3491-1.GPJ 5/29/01 8:12:44 A5

LOG OF TEST BORING

Washington State Department of Transportation

HOLE No. H-5-00

Sheet 2 of 2

PROJECT Paridise Lake Road to Snohomish River ,Stage 2

Job No. 0L-3491

Depth (ft)	Meters (m)	Profile	Rock Quality Designation (%) 20 40 60 80	% Rec. / FPF	Rock Strength	Sample Type	Sample No.	Blows/6" SPT (N)	Description of Material	Groundwater	Instrument
									Changing to CONGLOMERATE - 20.5'.		
				95 / 4			C - 7	RQD 96 FF 4	CONGLOMERATE back to SANDSTONE, medium grained, fresh, moderately strong rock, no HCl reaction. Discontinuities are widely spaced and in good condition Percent Recovered 95.0%		
25	7										
	8								End of test hole boring at *26 ft below* ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data.		
30	9										
	10										
35	11										
40	12										
	13										
45											

ROCKN 0L3491-1.GPJ 5/29/01 8:12:45 A5

Washington State Department of Transportation

LOG OF TEST BORING

Start Card R 048650

HOLE No. SF-01-01

Sheet 1 of 3

Job No. XL-1142 SR 522 Elevation 73.0 ft (22.3 m)

Project Paradise Lake Road to Snohomish River, Stage 2

Driller Fetterly Lic# 2507

Site Address

Inspector Hanning

Start July 11, 2001 Completion July 11, 2001 Well ID# AMF 879 Equipment CME 850 w/ autohammer

Station 655+53 Offset 182.6 ft Lt. Casing HQ Method Wet Rotary

Northing Easting Latitude Longitude

County Snohomish Subsection NW/NW Section 16 Range 6 EWM Township 27N

Depth (ft)	Meters (m)	Profile	Standard Penetration Blows/ft (10 20 30 40)	SPT Blows/6" (N)	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
								3/12/2002		
	1									
5				2 4 6 (10)		D-1		Silty SAND with gravel, loose, brown, moist, Homogeneous, no HCl reaction Length Recovered 0.8 ft, Length Retained 0.8 ft		
	2									
			>>	9 25 50 (75)		D-2	GS MC	SM, MC=15% Silty SAND with gravel, very dense, greenish gray, moist, Stratified, no HCl reaction Length Recovered 0.9 ft, Length Retained 0.9 ft		
10	3			50/6 (50/6")		D-3	GS MC	SM, MC=17% Silty SAND with gravel, very dense, greenish gray, moist, Stratified, no HCl reaction Length Recovered 0.5 ft, Length Retained 0.5 ft		
				RQD 25 FF 4		C-4		CONGLOMERATE, medium grained, moderately weathered, very weak rock, no HCl reaction. Discontinuities are closely spaced and in poor condition. Percent Recovered 80.0%		
	4									
15										
	5			RQD 70 FF 1.3		C-5		CONGLOMERATE, moderately weathered, very weak rock, no HCl reaction. Discontinuities are closely spaced and in poor condition. Percent Recovered 100.0%		
	6									
20										

Washington State Department of Transportation

LOG OF TEST BORING

Start Card R 048650

HOLE No. SF-01-01

Job No. XL-1142 SR 522 Elevation 73.0 ft (22.3 m)

Sheet 2 of 3

Project Paradise Lake Road to Snohomish River, Stage 2 Driller Fetterly Lic# 2507

Depth (ft)	Meters (m)	Profile	Standard Penetration Blows/ft (10 20 30 40)	SPT Blows/6" (N)	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
						C-6		CONGLOMERATE, coarse grained, highly weathered, very weak (matrix largely absent in recovered sample) Percent Recovered 20%. No HCl reaction Length Recovered 0.5 ft, Length Retained 0.5 ft		
	7									
25										
	8			RQD 0 FF 20		C-7		CONGLOMERATE dark green gray, coarse grained, highly weathered, very weak rock, no HCl reaction. Discontinuities are closely spaced and in poor condition. Percent Recovered 35.0%		
	9									
30										
				RQD 50 FF 5		C-8		CONGLOMERATE dark green gray, coarse grained, moderately weathered, very weak rock, no HCl reaction. Discontinuities are closely spaced and in poor condition. Percent Recovered 100.0%		
	10									
35										
	11			RQD 0 FF 20		C-9		CONGLOMERATE dark green gray, coarse grained, highly weathered, very weak rock, no HCl reaction. Discontinuities are closely spaced and in poor condition. Percent Recovered 40.0%		
	12									
40										
				RQD 0 FF 20		C-10		CONGLOMERATE dark green gray, coarse grained, highly weathered, very weak rock, no HCl reaction. Discontinuities are closely spaced and in poor condition. Percent Recovered 40.0%		
	13									
45										

Washington State Department of Transportation

LOG OF TEST BORING

Start Card R 048650

HOLE No. SF-01-01

Job No. XL-1142 SR 522 Elevation 73.0 ft (22.3 m)

Sheet 3 of 3

Project Paradise Lake Road to Snohomish River, Stage 2

Driller Fetterly Lic# 2507

Depth (ft)	Meters (m)	Profile	Standard Penetration Blows/ft (10 20 30 40)	SPT Blows/6" (N)	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
	14			RQD 0 FF 20		C-11		CONGLOMERATE, coarse grained, highly weathered, very weak rock, no HCl reaction. Discontinuities are closely spaced and in poor condition. Percent Recovered 40.0%		
	15									
50								07/11/2001		
	16							End of test hole boring at 51 ft below ground elevation.		
								This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data.		
55	17									
	18									
60										
	19									
65										
	20									
	21									
70										

Washington State Department of Transportation

LOG OF TEST BORING

Start Card R 048650

HOLE No. SF-02-01

Sheet 1 of 2

Job No. XL-1142 SR 522 Elevation 63.0 ft (19.2 m)

Project Paradise Lake Road to Snohomish River, Stage 2

Driller Fetterly Lic# 2507

Site Address

Inspector Hanning

Start July 12, 2001 Completion July 12, 2001 Well ID# NA

Equipment CME 850 w/ autohammer

Station 666+08 Offset 214.5 ft Lt. Casing HQ

Method Wet Rotary

Northing Easting Latitude Longitude

County Snohomish Subsection NW/NW Section 16 Range 6 EWM Township 27N

Depth (ft)	Meters (m)	Profile	Standard Penetration Blows/ft (10 20 30 40)	SPT Blows/6" (N)	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
5	1			2 3 4 (7)		D-1	GS MC	SM, MC=19% Silty SAND, loose, brown, wet, Homogeneous, no HCl reaction Length Recovered 1.3 ft, Length Retained 1.3 ft Encountered Bedrock at 10.5'.		
10	2 3		>>	11 19 50/3" (69/9")		D-2		Silty SAND with gravel, very dense, brown, moist, Homogeneous, no HCl reaction. Length Recovered 1.0 ft, Length Retained 1.0 ft		
				RQD 0 FF 20		C-3		CONGLOMERATE bluish gray, coarse grained, highly weathered, very weak rock, no HCl reaction. Discontinuities are closely spaced and in poor condition. Percent Recovered 40.0%		
15	4 5			RQD 0 FF 20		C-4		CONGLOMERATE bluish gray, coarse grained, highly weathered, very weak rock, no HCl reaction. Discontinuities are closely spaced and in poor condition. Percent Recovered 20.0%		
20	6									

Washington State Department of Transportation

LOG OF TEST BORING

Start Card R 048650

HOLE No. SF-02-01

Job No. XL-1142 SR 522 Elevation 63.0 ft (19.2 m)

Sheet 2 of 2

Project Paradise Lake Road to Snohomish River, Stage 2

Driller Fetterly Lic# 2507

Depth (ft)	Meters (m)	Profile	Standard Penetration Blows/ft (10 20 30 40)	SPT Blows/6" (N)	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
	7			RQD 0 FF 20		C-5		CONGLOMERATE bluish gray, coarse grained, moderately weathered, very weak rock, no HCl reaction. Discontinuities are closely spaced and in poor condition. Percent Recovered 100.0%		
25	8							End of test hole boring at 26 ft below ground elevation. This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data.		
30	9									
	10									
35	11									
40	12									
	13									
45										

Washington State Department of Transportation

LOG OF TEST BORING

Start Card R 048650

HOLE No. SF-03-01

Sheet 1 of 2

Job No. XL-1142 SR 522 Elevation 57.0 ft (17.4 m)

Project Paradise Lake Road to Snohomish River, Stage 2

Driller Fetterly Lic# 2507

Site Address

Inspector Hanning

Start July 12, 2001 Completion July 12, 2001 Well ID# NA

Equipment CME 850 w/ autohammer

Station 666+52 Offset 249.9 ft Lt. Casing HQ

Method Wet Rotary

Northing Easting Latitude Longitude

County Snohomish Subsection NW/NW Section 16 Range 6 EWM Township 27N

Depth (ft)	Meters (m)	Profile	Standard Penetration Blows/ft (10 20 30 40)	SPT Blows/6" (N)	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
5	1, 2		>>	10 20 50/4" (70/10")		D-1	GS MC	SM, MC=13% Silty SAND with gravel, very dense, brown, moist, Stratified, no HCl reaction Length Recovered 1.3 ft, Length Retained 1.3 ft		
10	3			50/6" (50/6")		D-2		No Recovery		
				RQD 48 FF 2.4		C-3		CONGLOMERATE bluish gray, coarse grained, moderately weathered, very weak rock, no HCl reaction. Discontinuities are closely spaced and in poor condition. Note color change at 11', from brown to gray. Percent Recovered 100.0%		
15	4, 5			RQD 0 FF 20		C-4		CONGLOMERATE bluish gray, coarse grained, moderately weathered, very weak rock, no HCl reaction. Discontinuities are very closely spaced and in poor condition. Percent Recovered 100.0%		
20	6							Water reading after bail. Dry hole.		

Washington State Department of Transportation

LOG OF TEST BORING

Start Card R 048650

HOLE No. SF-03-01

Job No. XL-1142 SR 522 Elevation 57.0 ft (17.4 m)

Sheet 2 of 2

Project Paradise Lake Road to Snohomish River, Stage 2

Driller Fetterly Lic# 2507

Depth (ft)	Meters (m)	Profile	Standard Penetration Blows/ft (10 20 30 40)	SPT Blows/6" (N)	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
								End of test hole boring at 20 ft below ground elevation.		
								This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data.		
	7									
25										
	8									
	9									
30										
	10									
35										
	11									
	12									
40										
	13									
45										

Washington State Department of Transportation

LOG OF TEST BORING

Start Card R62080

HOLE No. SF-04-03

Job No. XL-1142 SR 522 Elevation ft (m)

Sheet 1 of 2

Project Paradise Lake Road to Snohomish River, Stage 2

Driller Joe Judd Lic# 2454

Site Address

Inspector Dan Reed

Start April 3, 2003 Completion April 3, 2003 Well ID# AHP-909 Equipment CME 850 w/ autohammer

Station LM 666+24 Offset 163 ft Lt. Casing HW/HQ Method Wet Rotary

Northing Easting Latitude Longitude

County Snohomish Subsection NW 1/4 of the NW 1/4 Section 16 Range 6 EWM Township 27

Depth (ft)	Meters (m)	Profile	Standard Penetration Blows/ft (10 20 30 40)	SPT Blows/6" (N)	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
								04/03/2003	▽	
5	1, 2			4 5 5 (10)		D-1		Silty SAND with gravel, loose, light brown, wet, Homogeneous, no HCl reaction Length Recovered 1.5 ft, Length Retained 1.5 ft		
10	3, 4		>>	23 35 50 (85)		D-2		Silty SAND with gravel, very dense, gray, wet, Stratified, no HCl reaction, well graded sand lens 11.0 - 11.5' Length Recovered 1.5 ft, Length Retained 1.5 ft		
15	5			35 50/6 (50/6")		D-3		Silty SAND with gravel, very dense, gray, wet, Homogeneous, no HCl reaction Length Recovered 1.0 ft, Length Retained 1.0 ft		
20	6									

Washington State Department of Transportation

LOG OF TEST BORING

Start Card R62080

HOLE No. SF-04-03

Job No. XL-1142 SR 522 Elevation ft (m)

Sheet 2 of 2

Project Paradise Lake Road to Snohomish River, Stage 2

Driller Joe Judd Lic# 2454

Depth (ft)	Meters (m)	Profile	Standard Penetration Blows/ft (10 20 30 40)	SPT Blows/6" (N)	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
				38 50/6 (50/6")		D-4		Silty SAND with gravel, very dense, gray, wet, Homogeneous, no HCl reaction Length Recovered 1.0 ft, Length Retained 1.0 ft		
	7									
25			>>	33 43 55 (55)		D-5		Silty SAND with gravel, very dense, gray, wet, Homogeneous, no HCl reaction Length Recovered 1.0 ft, Length Retained 1.0 ft		
	8									
	9									
30			>>	52/6 (52/6")		D-6		Silty SAND with gravel, very dense, gray, wet, Homogeneous, no HCl reaction, water table 0.5 ft in casing run 15 ft HW to seal surface water run 30 ft HQ for test boring bailed bore hole to 20.0 ft recharged to 18.5 ft in 5 minutes at depth 30.0 ft Length Recovered 0.5 ft, Length Retained 0.5 ft		
	10									
								End of test hole boring at 30.5 ft below ground elevation.		
35										
	11							This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data.		
	12									
40										
	13									
45										

Washington State Department of Transportation

LOG OF TEST BORING

Start Card _____

HOLE No. P-1-05

Sheet 1 of 1

Job No. C-6726 SR 522 Elevation ~305.9 ft (m)

Project SR 522 Paradise Lake Road to Snohomish River, Interchange and Drainage

Driller _____ Lic# _____

Site Address _____

Inspector Todd Mooney

Start August 30, 2005 Completion August 30, 2005 Well ID# _____ Equipment Hand Tools

Station ~560+00 Offset ~70.6' Lt. Casing _____ Method _____

Northing _____ Easting _____ Latitude _____ Longitude _____

County _____ Subsection _____ Section _____ Range _____ Township _____

Depth (ft)	Meters (m)	Profile	Standard Penetration Blows/ft (10 20 30 40)	SPT Blows/6" (N)	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
									▽ 8/30/2005	
	1			1 2 5 (4)				Poorly graded SAND with occasional gravel, gray		
5				2 1 9 (5)				Organics at 5ft		
	2			32 50/4 (25)				Gravel at 6ft		
								End of Test Hole Boring at 6 feet below ground elevation.		
								Station, offset and elevation are approximate.		
								*The portable penetrometer blows per foot have been converted to approximate Standard Penetrometer blows based on WSDOT experience.		
10	3									
	4									
15	5									
20	6									

Washington State Department of Transportation

LOG OF TEST BORING

Job No. 0L-3491 SR 522 HOLE No. H-28-00

PROJECT Paradise Lake Road to Snohomish River, Stage 2 Sheet 1 of 2

SR - 522 MP.17.09 to MP. 20.42 Inspector Mike Brun

Station 569+22 Offset 52ft Rt. Equipment CME 850 w/ autohammer

Latitude Longitude Method Auger

Northing Easting Casing Hollow Stem

Ground Elevation 279.0 (85.0 m) Start Date September 29, 2000 Completion Date September 29, 2000

Depth (ft)	Meters (m)	Profile	Standard Penetration Blows/ft (10 20 30 40)	SPT Blows/6" (N)	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
				7 17 26 (43)		D-1	GS MC	SM, MC=9% Silty SAND, dense, brown, dry, Homogeneous, no HCl reaction Length Recovered 1.2 ft, Length Retained 1.2 ft		
5	1		>>	7 29 24 (53)		D-2	GS MC	SP-SM, MC=5% Poorly graded SAND with silt and gravel, very dense, gray, dry, Homogeneous, no HCl reaction Length Recovered 1.0 ft, Length Retained 1.0 ft		
10	2			3 7 7 (14)		D-3	GS MC	ML, MC=17% Sandy SILT, medium dense, gray, moist, Homogeneous, no HCl reaction Length Recovered 1.0 ft, Length Retained 1.0 ft		
15	3			4 6 9 (15)		D-5		Silty SAND, medium dense, brown, wet, Homogeneous, no HCl reaction Length Recovered 0.5 ft, Length Retained 0.5 ft 09/29/2000	▽	
20	4									
	5									
	6									

SOIL 0L3491 PARADISE LAKE TO SNOHOMISH RIVER BRIDGE.GPJ SOIL.GDT 6/28/02,12:52:34 PS

Washington State
Department of Transportation

LOG OF TEST BORING

Job No. 0L-3491 SR 522 HOLE No. H-28-00

PROJECT Paradise Lake Road to Snohomish River, Stage 2 Sheet 2 of 2

Depth (ft)	Meters (m)	Profile	Standard Penetration Blows/ft (10 20 30 40)	SPT Blows/6" (N)	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
				9 16 20 (36)		D-5		Silty SAND, dense, brown, wet, Homogeneous, no HCl reaction Length Recovered 1.0 ft, Length Retained 1.0 ft		
	7									
25				17 20 28 (48)		D-6	GS MC	SM, MC=22% Silty SAND, dense, gray, wet, Homogeneous, no HCl reaction Length Recovered 1.0 ft, Length Retained 1.0 ft		
	8							End of test hole boring at 26.5 ft below ground elevation.		
								This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data.		
	9									
30										
	10									
35										
	11									
	12									
40										
	13									
45										

SOIL C ARAD E TO I MISH F IDGE JIL.GC 2,12:5

COMPANY: Holocene Drilling
G METHOD: 3" Hollow Stem Auger, Simco track-mounted drill
PLING METHOD: SPT w/rope and cathead
URFACE ELEVATION: 311 ± feet

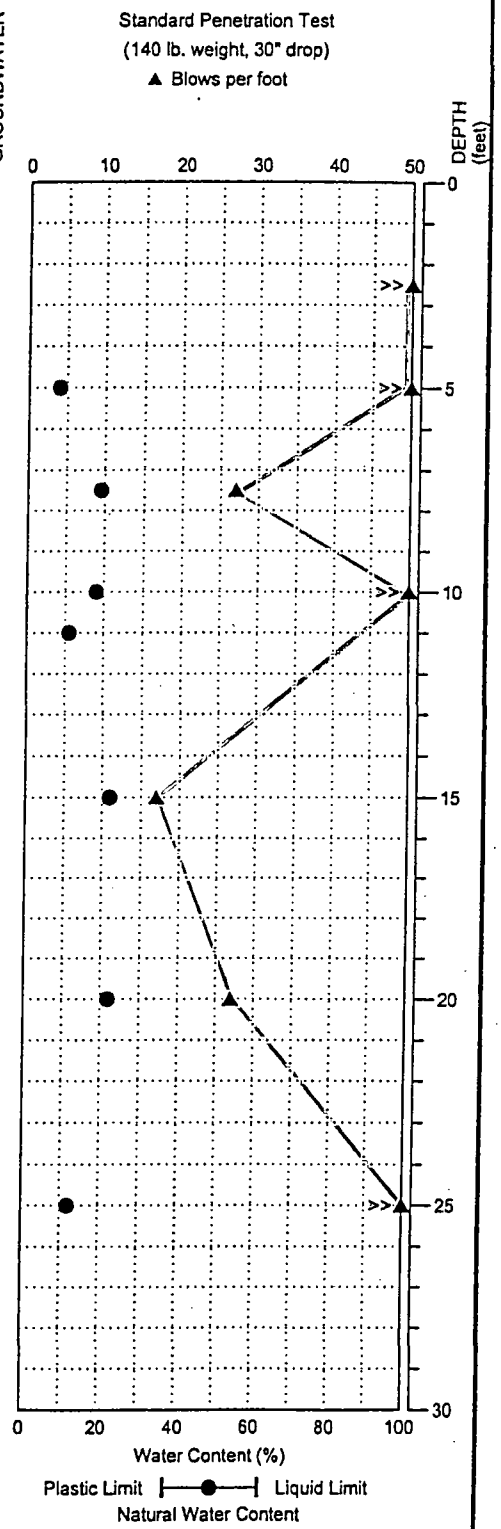
LOCATION: See Figure 2
DATE STARTED: 4/29/2002
DATE COMPLETED: 4/29/2002
LOGGED BY: B. Hawkins

~~10~~ 17

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE / SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS	GROUNDWATER
0		SM	Loose, dark brown, silty, gravelly, SAND, moist. Organics noted. [TOPSOIL]				
		SM	Very dense, olive gray, fine to coarse gravelly, silty, fine to medium SAND, moist. [FILL]	S-1	41-50/3"		
5				S-2	25-32-50		
				S-3	13-15-12		
		SM	Medium dense, black, fine to coarse gravelly, silty, fine to medium SAND, moist. Abundant organics/wood noted. [ORGANIC SOIL] Drilling through log?	S-4A	10-25-34		
10				S-4B			
		SW	Very dense, red brown to brown, slightly silty, fine to coarse gravelly, fine to coarse SAND, moist. [RECESSIONAL OUTWASH]				
		SW	Medium dense, red brown, slightly silty, fine to coarse gravelly, fine to coarse SAND, wet.				▽
15				S-5	8-8-9		
20				S-6	7-8-19		
		SM	Very dense, dark gray to brown, gravelly, very silty, fine to medium SAND, moist. [GLACIAL DRIFT]				
25				S-7	50/6"		
30							

306
301
296
291
286
281

Total depth = 25.5 feet.
Ground water at approximately 13 feet.



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

HWA GEOSCIENCES INC.

SR 522, Fales/Echo Lake Road Interchange
Snohomish County, Washington

BORING: BH- 6

PAGE: 1 of 1

PROJECT NO.: 2001070 FIGURE: A-7

BORING 2001070.GPJ 4/21/03

Appendix B: Laboratory Test Results

Job No. **XL-1142** Date **October 10, 2005**

Hole No. **SF-01-01** Sheet **1** of **1**

Project **Paradise Lake Road to Snohomish River, Stage 2**

Laboratory Summary

Washington State Department of Transportation

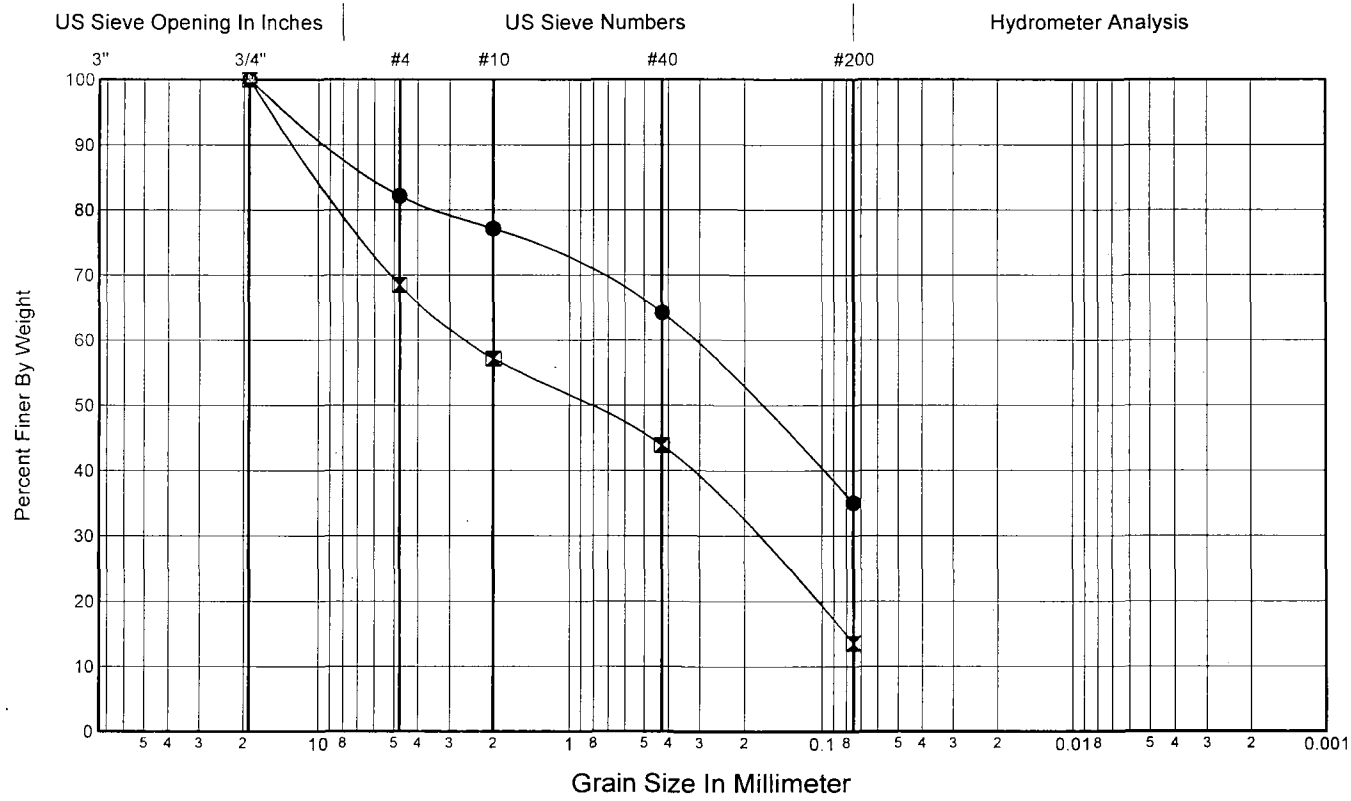
	Depth (ft)	Depth (m)	Sample No.	USCS	Color	Description	MC%	LL	PL	PI
●	**9.0**	**2.74**	**D-2**	**SM**	**See Boring Log**	**SILTY SAND with GRAVEL**	**15**			
⊠	**10.5**	**3.20**	**D-3**	**SM**	**See Boring Log**	**SILTY SAND with GRAVEL**	**17**			

GRADATION FRACTIONS

	%Gravel	%Sand	%Fines	Cc	Cu
●	**17.8**	**47.1**	**35.0**		
⊠	**31.5**	**55.0**	**13.5**		

GRADATION VALUES

	D60	D50	D30	D20	D10
●	0.330	0.18			
⊠	**2.482**	**0.87**	**0.19**	**0.11**	



Job No. **XL-1142** Date **October 10, 2005**

Hole No. **SF-02-01** Sheet **1** of **1**

Project **Paradise Lake Road to Snohomish River, Stage 2**

Laboratory Summary

Washington State Department of Transportation

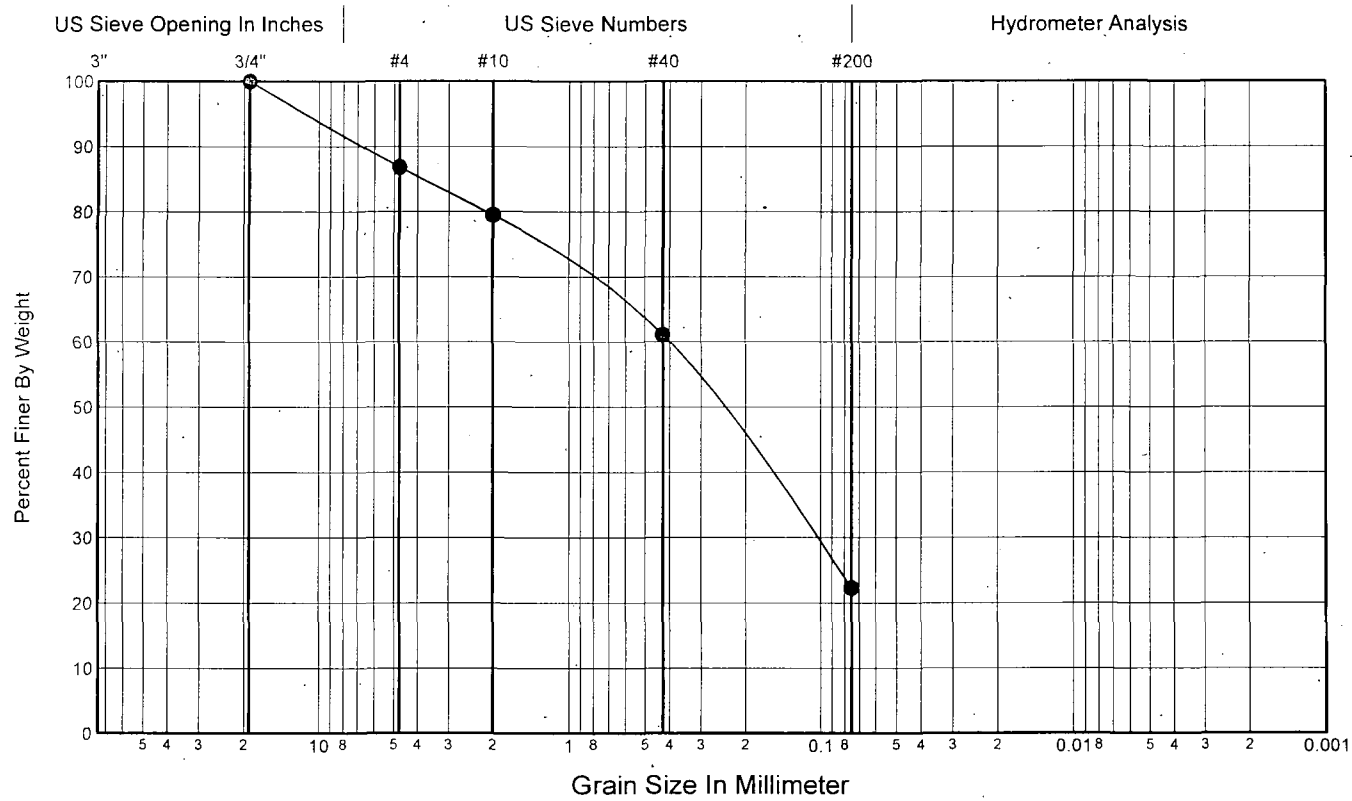
	Depth (ft)	Depth (m)	Sample No.	USCS	Color	Description	MC%	LL	PL	PI
●	**4.5**	**1.37**	**D-1**	**SM**	**See Boring Log**	**SILTY SAND**	**19**			
⧗										
▲										
★										
⊙										

GRADATION FRACTIONS

	%Gravel	%Sand	%Fines	Cc	Cu
●	**13.1**	**64.6**	**22.3**		
⧗					
▲					
★					
⊙					

GRADATION VALUES

	D60	D50	D30	D20	D10
●	0.405	0.26	0.11		
⧗					
▲					
★					
⊙					



Job No. **XL-1142** Date **October 10, 2005**

Hole No. **SF-03-01** Sheet **1** of **1**

Project **Paradise Lake Road to Snohomish River, Stage 2**

Laboratory Summary

Washington State Department of Transportation

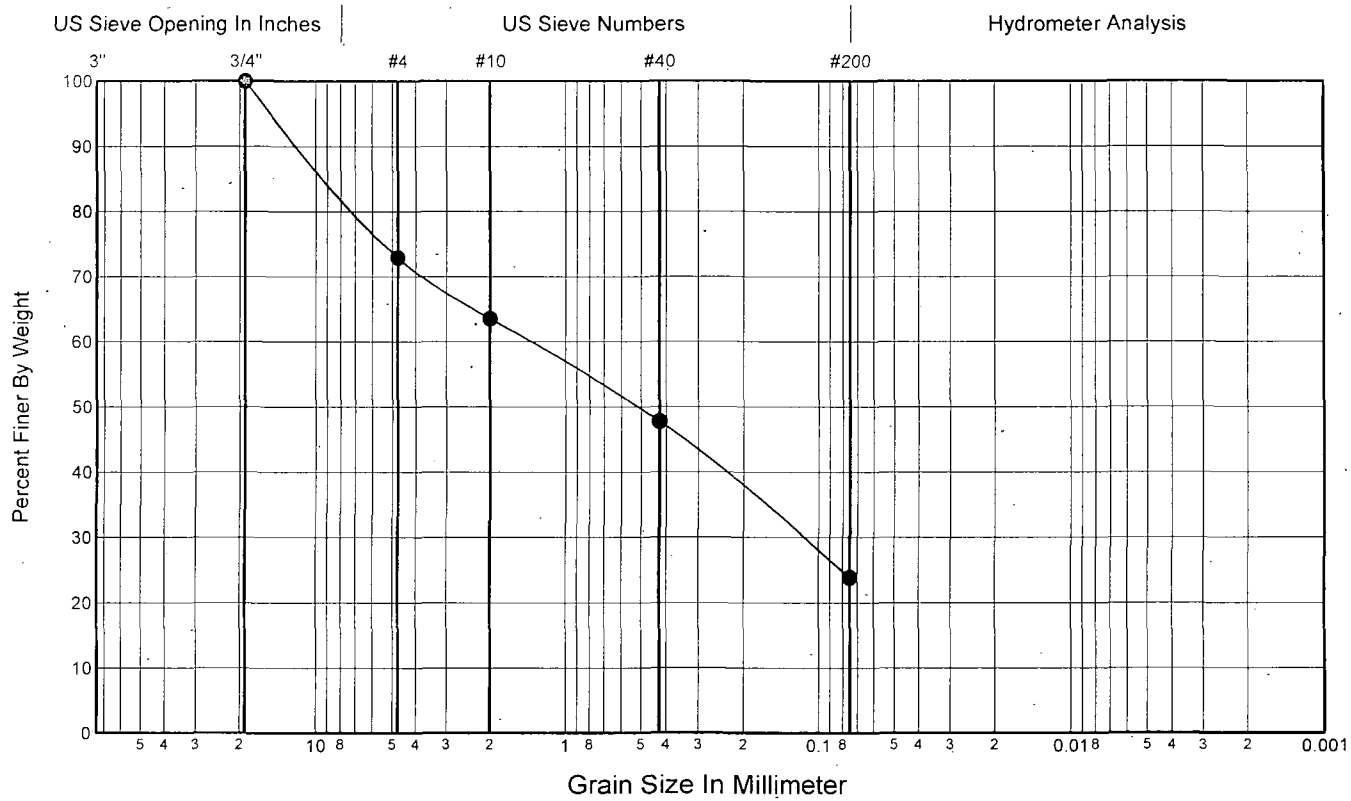
	Depth (ft)	Depth (m)	Sample No.	USCS	Color	Description	MC%	LL	PL	PI
●	**5.0**	**1.52**	**D-1**	**SM**	**See Boring Log**	**SILTY SAND with GRAVEL**	**13**			
⊠										
▲										
★										
⊙										

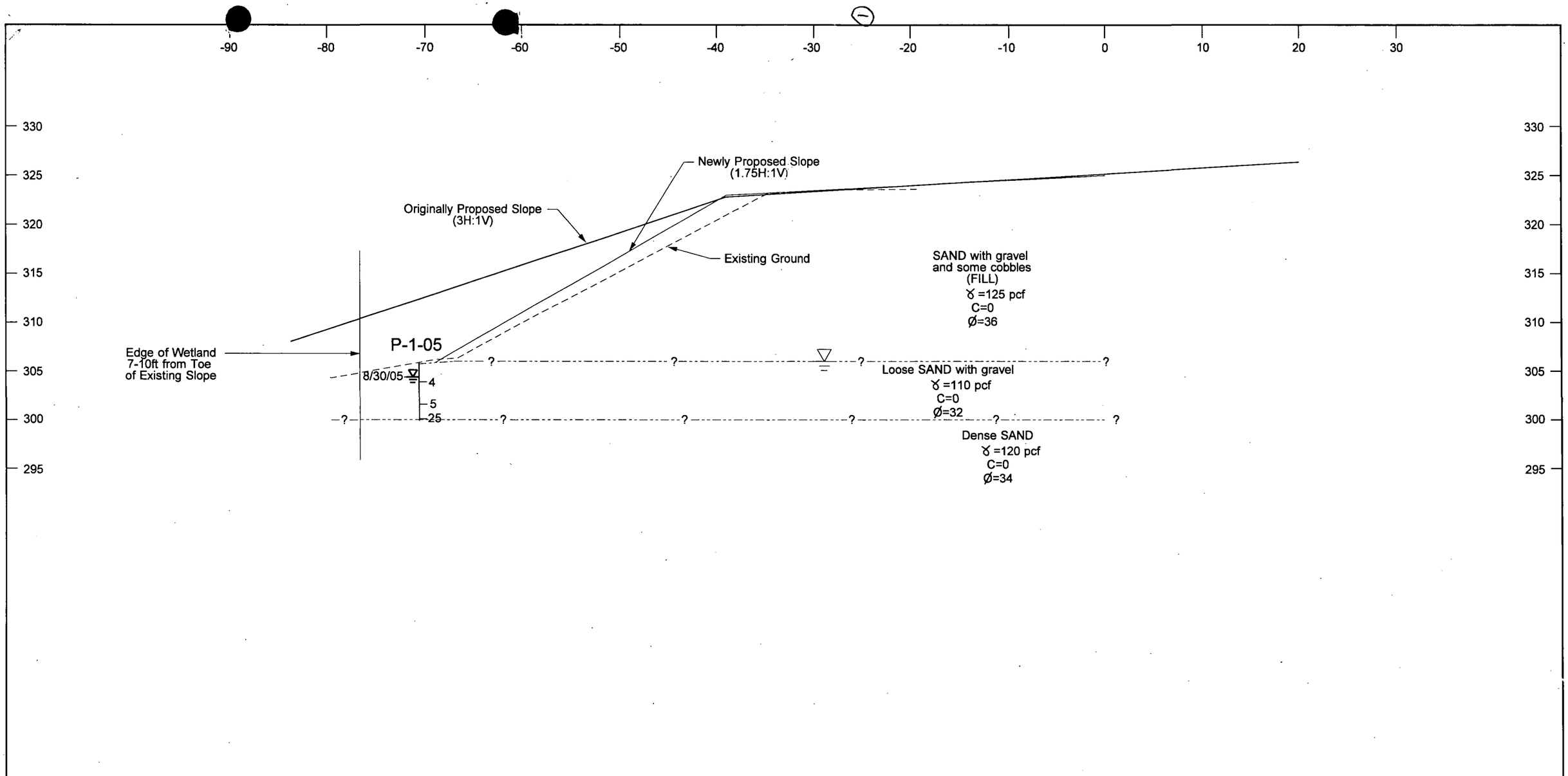
GRADATION FRACTIONS

	%Gravel	%Sand	%Fines	Cc	Cu
●	**27.1**	**49.1**	**23.9**		
⊠					
▲					
★					
⊙					

GRADATION VALUES

	D60	D50	D30	D20	D10
●	1.412	0.53	0.12		
⊠					
▲					
★					
⊙					





TEST HOLE LEGEND

H-1-98	TEST HOLE NUMBER
110+55	TEST HOLE STATION
26 ft.Rt.	TEST HOLE OFFSET
23	STANDARD PENETROMETER TEST (BLOWS PER FOOT)
	UNDISTURBED SAMPLE
8-6-86	WATER LEVEL & DATE
?	? INDICATES SOIL/ROCK STRATA BETWEEN TEST HOLES MAY NOT BE CONTINUOUS
	INDICATES INTACT ROCK
86%	INDICATES CORE SAMPLE TAKEN
	ROCK QUALITY DESIGNATION

Figure: Cross-Sections at 560+00

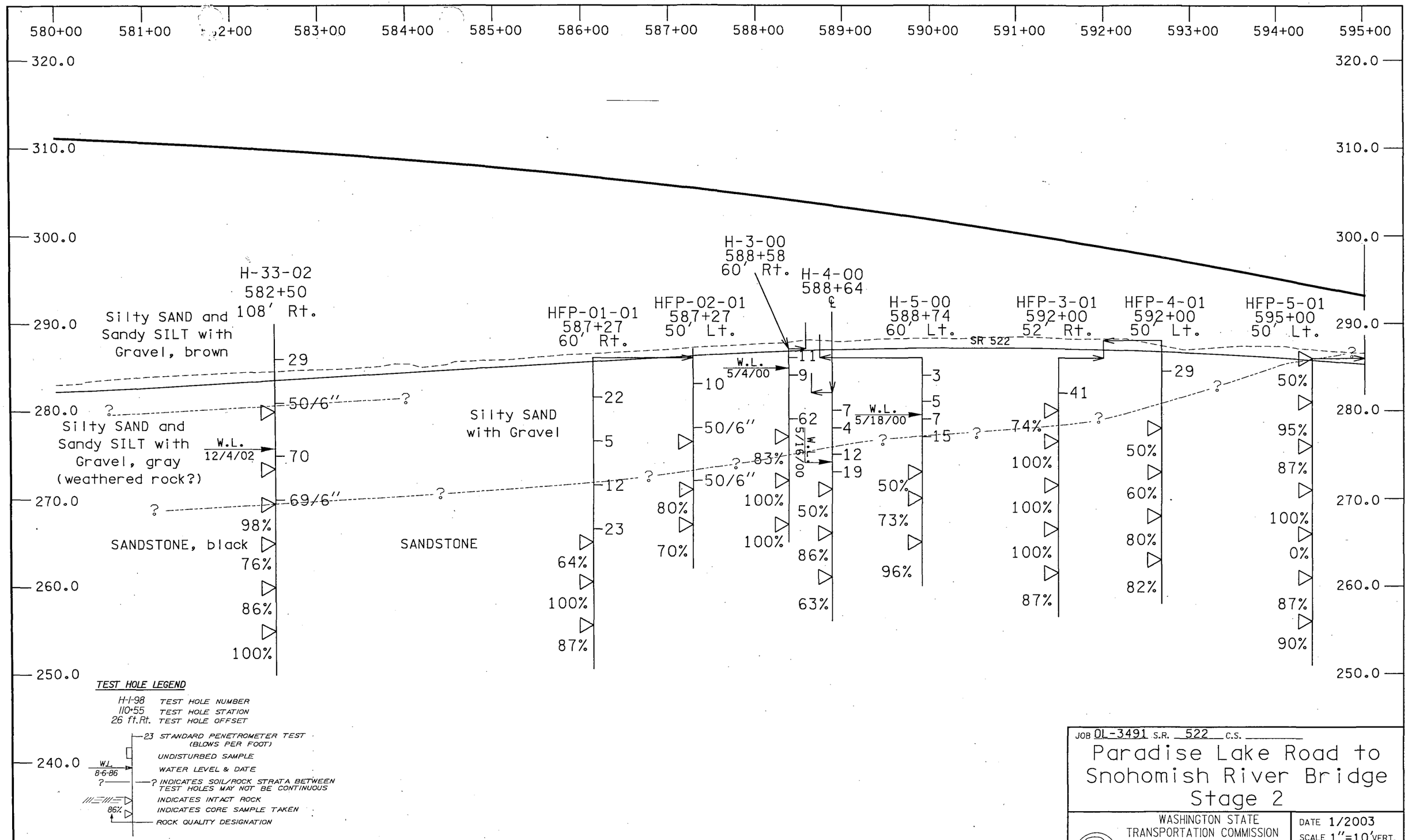
JOB C-6726 S.R. 522 C.S.

SR 522 Interchange and Drainage

WASHINGTON STATE
DEPARTMENT OF TRANSPORTATION
MATERIALS LABORATORY
T. E. BAKER, STATE MATERIALS ENGINEER

DATE 10/2005
SCALE 1=10' VERT.
1=10' HORIZ.
SHEET ___ OF ___
DRAWN BY WM

...\NSW Wetland ear.dgn 10/06/2005 01:44:29 PM



TEST HOLE LEGEND

H-1-98	TEST HOLE NUMBER
110+55	TEST HOLE STATION
26 ft.Rt.	TEST HOLE OFFSET
23	STANDARD PENETROMETER TEST (BLOWS PER FOOT)
	UNDISTURBED SAMPLE
W.L. 8-6-86	WATER LEVEL & DATE
?	INDICATES SOIL/ROCK STRATA BETWEEN TEST HOLES MAY NOT BE CONTINUOUS
	INDICATES INTACT ROCK
86%	INDICATES CORE SAMPLE TAKEN
	ROCK QUALITY DESIGNATION

FIGURE 5: Generalized Soil Profile, STA 580.00 to 595.00

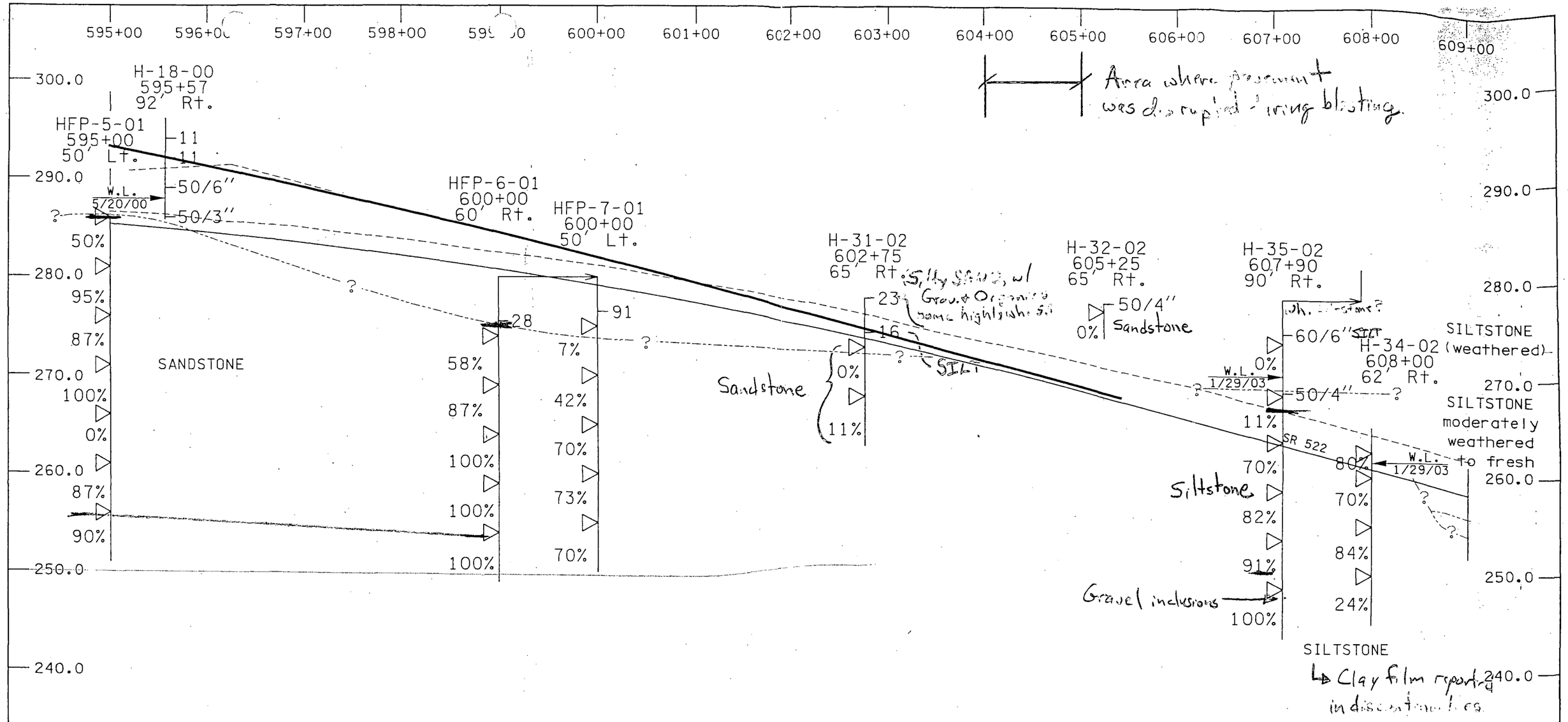
JOB OL-3491 S.R. 522 C.S. _____

Paradise Lake Road to Snohomish River Bridge Stage 2

WASHINGTON STATE TRANSPORTATION COMMISSION
DEPARTMENT OF TRANSPORTATION
MATERIALS BRANCH
T. E. BAKER MATERIALS ENGINEER

DATE 1/2003
SCALE 1"=10' VERT. 1"=100' HORIZ.
SHEET ___ OF ___
DRAWN BY W.M.

...\abPROFIL.dgn 01/30/2003 11:09:54 AM



TEST HOLE LEGEND

H-1-98 TEST HOLE NUMBER
110+55 TEST HOLE STATION
26 ft.Rt. TEST HOLE OFFSET

23 STANDARD PENETROMETER TEST (BLOWS PER FOOT)

UNDISTURBED SAMPLE

W.L. 8-6-86 WATER LEVEL & DATE

? INDICATES SOIL/ROCK STRATA BETWEEN TEST HOLES MAY NOT BE CONTINUOUS

INDICATES INTACT ROCK

86% INDICATES CORE SAMPLE TAKEN

ROCK QUALITY DESIGNATION

FIGURE 6: Generalized Soil Profile, STA 595.00 to 609.00

JOB OL-3491 S.R. 522 C.S.

Paradise Lake Road to Snohomish River Bridge Stage 2

WASHINGTON STATE TRANSPORTATION COMMISSION
DEPARTMENT OF TRANSPORTATION
MATERIALS BRANCH
T. E. BAKER MATERIALS ENGINEER

DATE 1/2003
SCALE 1"=10' VERT. 1"=100' HORIZ.
SHEET ___ OF ___
DRAWN BY: W.M.

...\abPROFIL.dgn 01/30/2003 11:09:47 AM

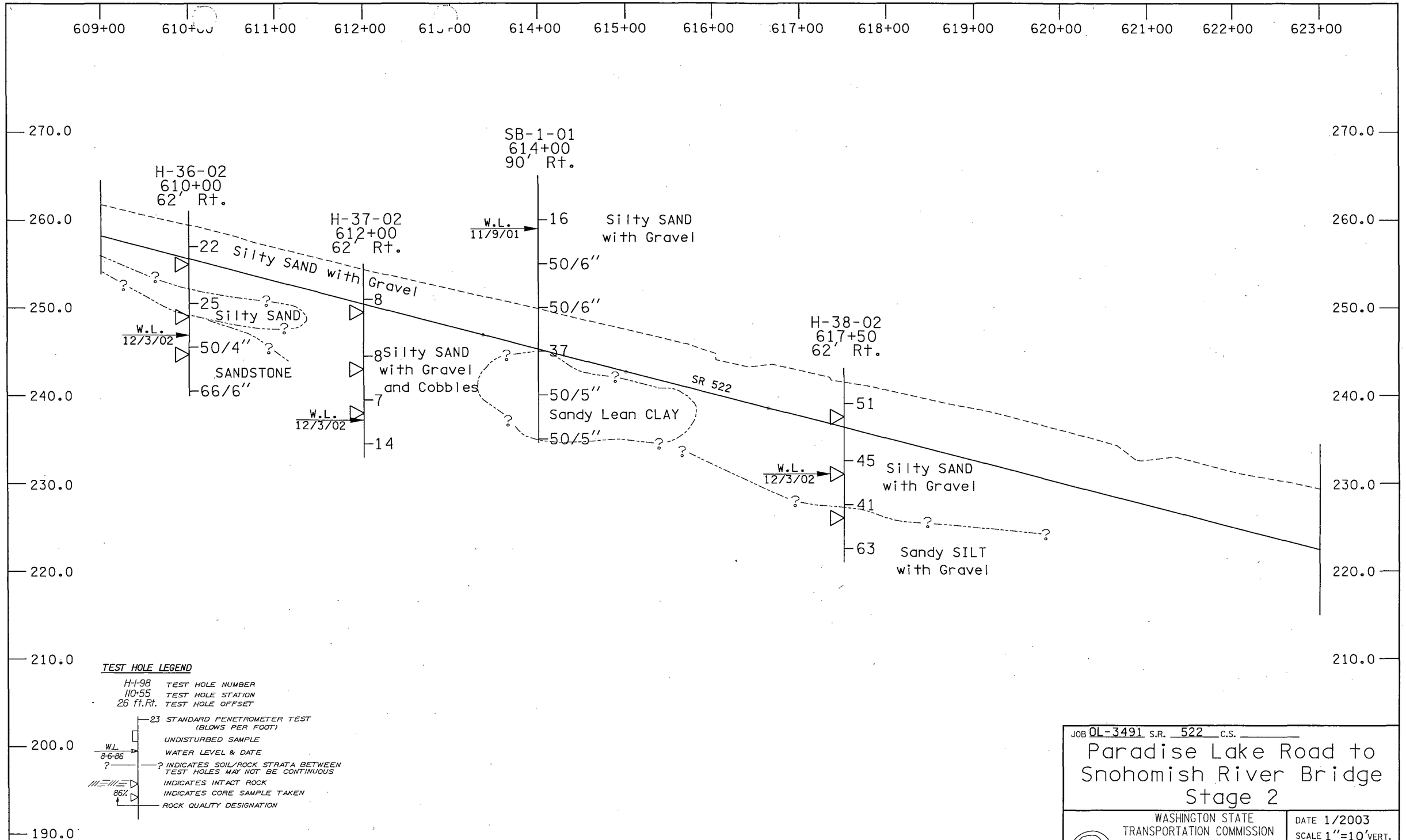


FIGURE 7: Generalized Soil Profile, STA 609.00 to 623.00

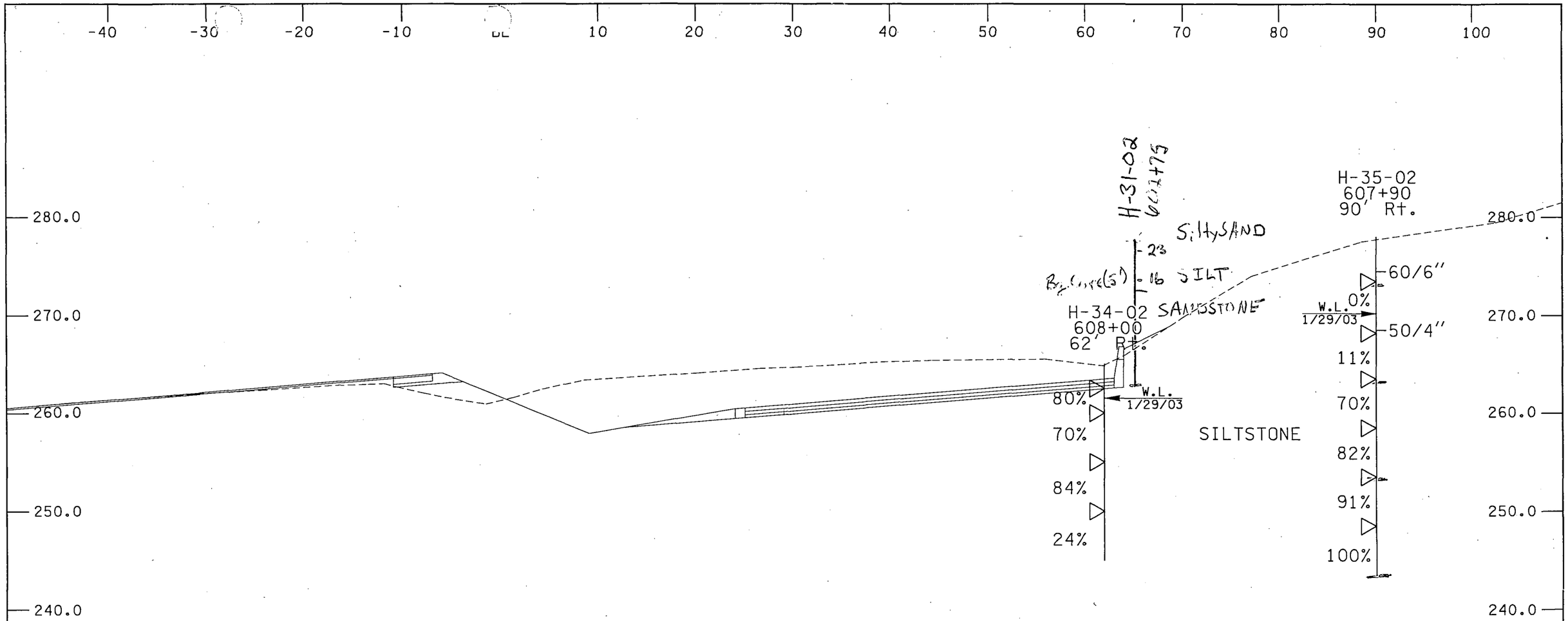
JOB OL-3491 S.R. 522 C.S. _____

Paradise Lake Road to Snohomish River Bridge Stage 2

WASHINGTON STATE TRANSPORTATION COMMISSION
DEPARTMENT OF TRANSPORTATION
MATERIALS BRANCH
T. E. BAKER MATERIALS ENGINEER

DATE 1/2003
SCALE 1"=10' VERT. 1"=100' HORIZ.
SHEET ___ OF ___
DRAWN BY W.M.

...\abPROFIL.dgn 01/29/2003 04:35:22 PM



TEST HOLE LEGEND

H-1-98 TEST HOLE NUMBER
110+55 TEST HOLE STATION
26 ft.Rt. TEST HOLE OFFSET

23 STANDARD PENETROMETER TEST (BLOWS PER FOOT)
UNDISTURBED SAMPLE
W.L. 8-6-86 WATER LEVEL & DATE
? INDICATES SOIL/ROCK STRATA BETWEEN TEST HOLES MAY NOT BE CONTINUOUS
INDICATES INTACT ROCK
86% INDICATES CORE SAMPLE TAKEN
ROCK QUALITY DESIGNATION

FIGURE 8: Generalized Soil Cross-Section at STA 608+00

JOB OL-3491 S.R. 522 C.S.

Paradise Lake Road to Snohomish River Bridge Stage 4

WASHINGTON STATE TRANSPORTATION COMMISSION
DEPARTMENT OF TRANSPORTATION
MATERIALS BRANCH
T. E. BAKER MATERIALS ENGINEER

DATE 1/2003
SCALE 1"=10' VERT. 1"=10' HORIZ.
SHEET ___ OF ___
DRAWN BY W.M.

...\SR522FinXsection_Stg2.dgn 01/30/2003 11:14:54 AM

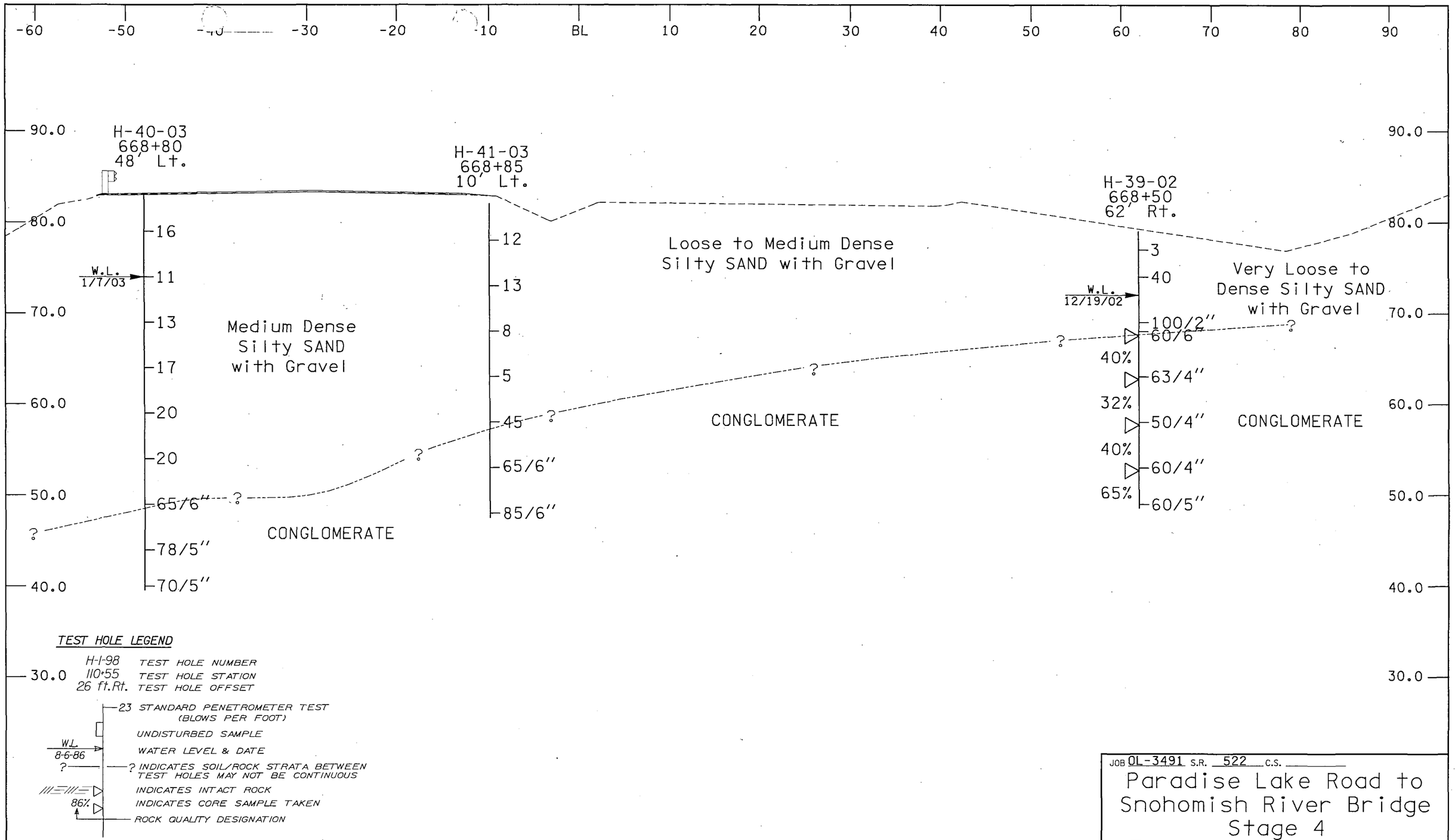


FIGURE 10: Generalized Soil Cross-Section at STA 669+00

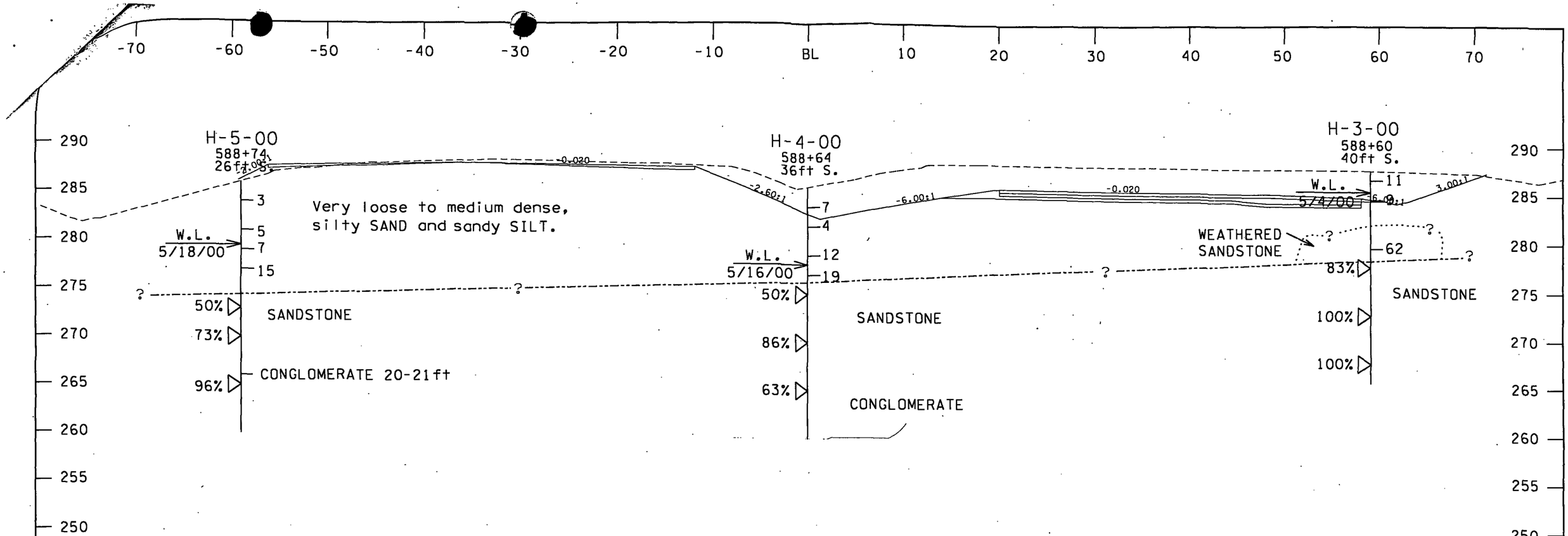
JOB OL-3491 S.R. 522 C.S.

Paradise Lake Road to Snohomish River Bridge Stage 4

WASHINGTON STATE TRANSPORTATION COMMISSION
DEPARTMENT OF TRANSPORTATION
MATERIALS BRANCH
T. E. BAKER MATERIALS ENGINEER

DATE 1/2003
SCALE 1"=10' VERT. 1"=10' HORIZ.
SHEET ___ OF ___
DRAWN BY W.M.

...\SR522FinXsection_Stg2.dgn 01/30/2003 11:14:47 AM



TEST HOLE LEGEND

H-1-98 TEST HOLE NUMBER
110+55 TEST HOLE STATION
26 ft.Rt. TEST HOLE OFFSET

23 STANDARD PENETROMETER TEST (BLOWS PER FOOT)

UNDISTURBED SAMPLE

W.L. 8-6-86 WATER LEVEL & DATE

? INDICATES SOIL/ROCK STRATA BETWEEN TEST HOLES MAY NOT BE CONTINUOUS

INDICATES INTACT ROCK

86% INDICATES CORE SAMPLE TAKEN

ROCK QUALITY DESIGNATION

SOIL PROFILE AT STA 589+00

JOB OL-3491 S.R. 522 C.S. _____

PARADISE LAKE ROAD TO SNOHOMISH RIVER, STAGE 2

WASHINGTON STATE TRANSPORTATION COMMISSION
DEPARTMENT OF TRANSPORTATION
MATERIALS BRANCH
T. E. BAKER MATERIALS ENGINEER

DATE 5/2001
SCALE 1'-10' VERT.
1'-10' HORIZ.
SHEET ___ OF ___
DRAWN BY W.M.

...\FINALXSECT2scale1to10.dgn 05/29/2001 07:46:51 AM

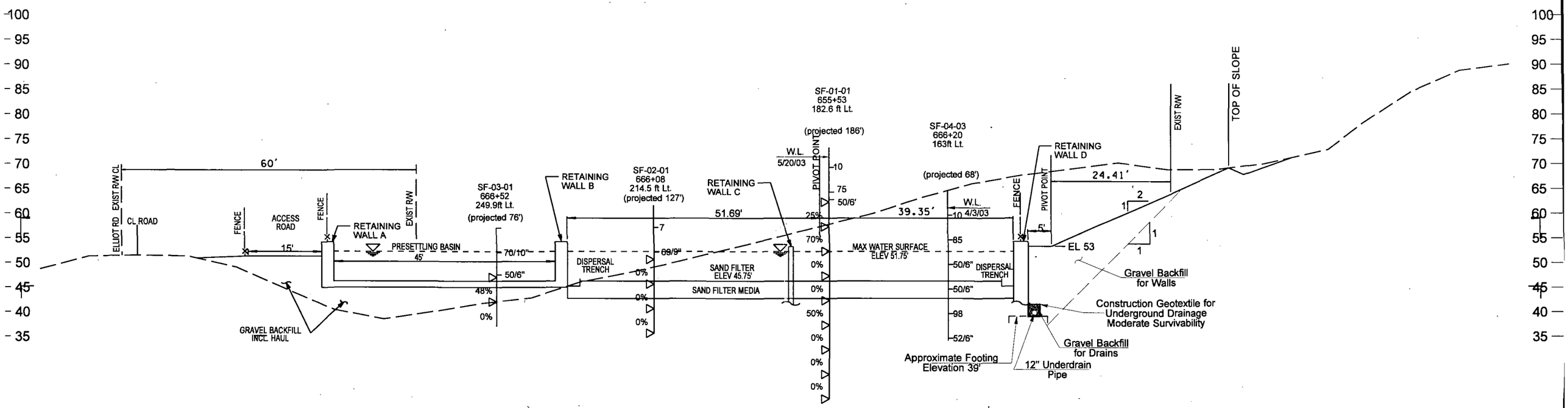


Figure 1

JOB C-6726 S.R. 522 C.S. _____ LAYOUT _____

Paradise Lake Road to Snohomish River Bridge Interchange and Drainage

WASHINGTON STATE
TRANSPORTATION COMMISSION
DEPARTMENT OF TRANSPORTATION

MATERIALS BRANCH

T. E. BAKER MATERIALS ENGINEER

DATE June 03
SCALE 1"=20' VERT.
1"=20' HORIZ.
SHEET ___ OF ___
DRAWN BY DWG

..\abkj-S-01-DD3.dgn 10/11/2005 3:01:16 PM