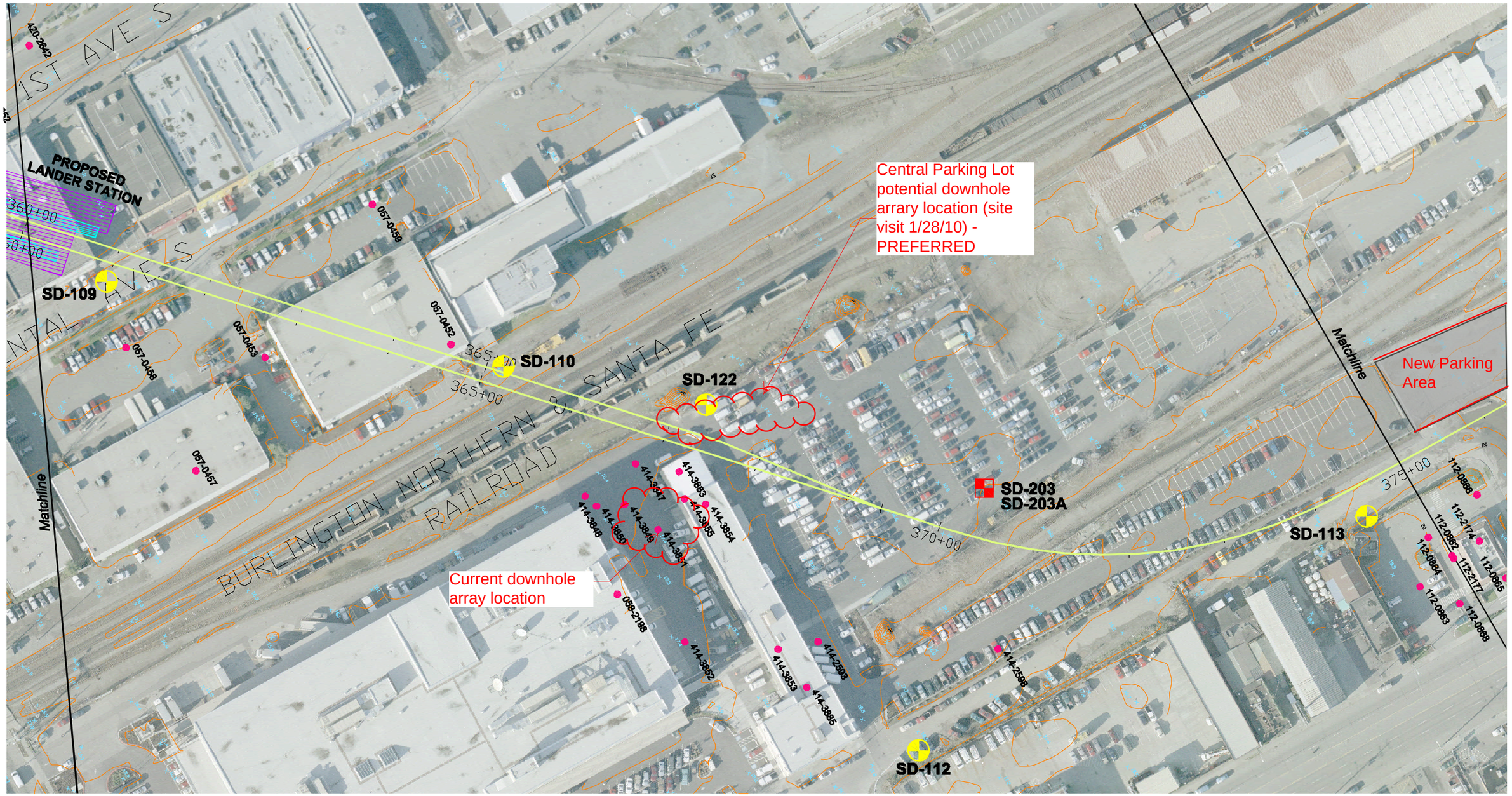


LEGEND

- **SD-100** — Project Boring Designation and Surveyed Location
- **SD-200** — Cone Penetration Test (CPT) Designation and Approximate Location
- 187-1260 — Research Boring Designation and Approximate Location
- Preliminary Staff Recommended Alignment for Green Line
- 230 — Topographic Contours With Elevation in Feet

NOTES

1. This figure is based on drawings and aerial photographs provided by Bechtel/Jacobs and the City of Seattle. The alignment and stations were compiled from the following files received 12-1-03: gl01-00-H.dwg, gl02-00-plan-H.dwg, gl03-00-H.dwg, gl04-00-H.dwg, gl05-00-plan-H.dwg, gl06-00-plan-H.dwg and the following files received 12-4-03: Station Locations_North-031202.dwg, Station Locations_South-031202.dwg.
2. Vertical datum: NAVD88.

0 100 200

Scale in Feet

STATIONING BETWEEN MATCHLINES

360+00 to 375+00

N

Seattle Monorail Project
Seattle, Washington

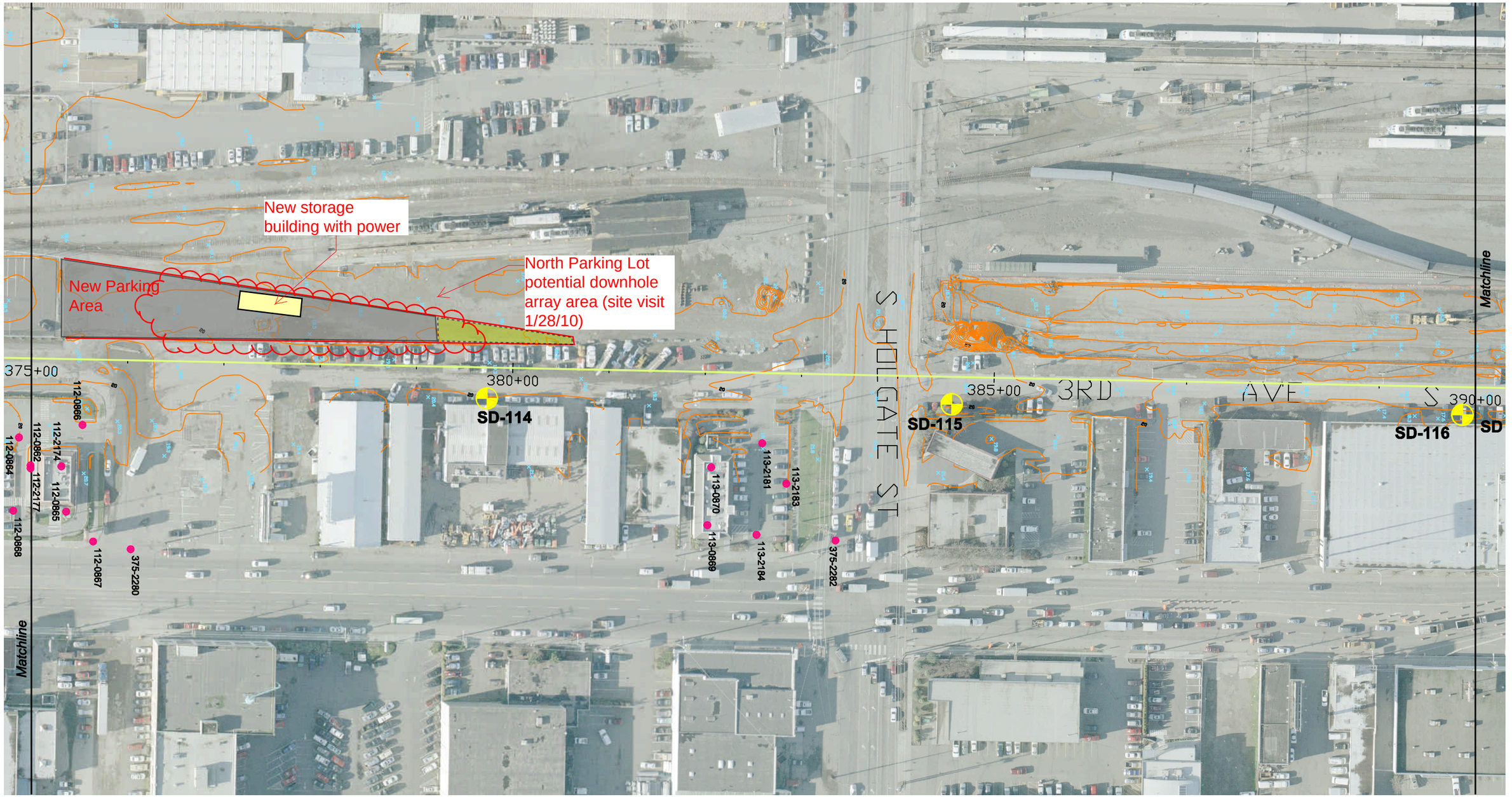
SITE AND EXPLORATION PLAN
SODO SEGMENT

February 2004 21-1-09910-101

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. 3
Sheet 4 of 9

File: I:\Drafting\21\09910-001 \plans \21-1-09910 Plans.dwg Date: 02-05-2004 Author: LR



LEGEND

- **SD-100** — Project Boring Designation and Surveyed Location
- 187-1260 — Research Boring Designation and Approximate Location
- Preliminary Staff Recommended Alignment for Green Line
- 230 — Topographic Contours With Elevation in Feet

NOTES

1. This figure is based on drawings and aerial photographs provided by Bechtel/Jacobs and the City of Seattle. The alignment and stations were compiled from the following files received 12-1-03: gl01-00-H.dwg, gl02-00-plan-H.dwg, gl03-00-H.dwg, gl04-00-H.dwg, gl05-00-plan-H.dwg, gl06-00-plan-H.dwg and the following files received 12-4-03: Station Locations_North-031202.dwg, Station Locations_South-031202.dwg.
2. Vertical datum: NAVD88.

0 100 200

Scale in Feet

STATIONING BETWEEN MATCHLINES

375+00 to 390+00

N

Seattle Monorail Project
Seattle, Washington

SITE AND EXPLORATION PLAN
SODO SEGMENT

February 2004 21-1-09910-101

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FIG. 3
Sheet 5 of 9

File: I:\Drafting\21\09910-001\plans\21-1-09910 Plans.dwg Date: 02-05-2004 Author: LR

GEOLOGIC UNIT EXPLANATION

NON OVERRIDDEN

HOLOCENE DEPOSITS

Hf — FILL: Fill placed by humans, both engineered and nonengineered.
Various materials, including debris; cobbles and boulders may be common; commonly dense or stiff if engineered, but very loose to dense or very soft to stiff if nonengineered.

Hls — LANDSLIDE DEPOSITS: Deposits of landslides, normally at and adjacent to the toe of slopes.
Disturbed, heterogeneous mixture of one or more soil types; may contain wood and other organics; loose or soft, with random dense or hard pockets.

Ha — ALLUVIUM: River or creek deposits, normally associated with historical streams, including deltaic and overbank deposits.
Sand, silty Sand, gravelly Sand; very loose to very dense.

Hp — PEAT DEPOSITS: Depression fillings of organic materials.
Peat, peaty Silt, organic Silt; very soft to medium stiff.

He — ESTUARINE DEPOSITS: Fine-grained sediments deposited in brackish water associated with rivers and streams located along the present and former Puget Sound shoreline.
Clayey Silt, silty Clay, Silt, and fine Sand; organics and shell fragments common; very soft to very stiff or very loose to medium dense.

Hl — LAKE DEPOSITS: Depression fillings of fine-grained soils.
Sandy Silt, Silt, clayey Silt, silty Clay; commonly with scattered organics; very soft to stiff or very loose to medium dense.

Hb — BEACH DEPOSITS: Deposits along present and former shorelines of Puget Sound and tributary river mouths.
Silty Sand, sandy Gravel, gravelly Sand, wood and shell debris common; loose to dense.

Hrw — REWORKED GLACIAL DEPOSITS: Glacially deposited soils that have been reworked by fluvial or wave action.
Sand, silty Sand, gravelly Sand; lies on top of glacially overridden soils; loose to dense.

QUATERNARY VASHON DEPOSITS

Qvro — RECESSIONAL OUTWASH DEPOSITS: Glaciofluvial sediment deposited as glacial ice retreated.
Clean to silty Sand, gravelly Sand, sandy Gravel; cobbles and boulders common; loose to very dense.

Qvrl — RECESSIONAL LACUSTRINE DEPOSITS: Glaciolacustrine sediment deposited as glacial ice retreated.
Fine Sand, Silt, and Clay; dense to very dense, soft to hard.

Qvri — ICE-CONTACT DEPOSITS: Heterogeneous soils deposited against or adjacent to ice during the wasting of glacial ice; commonly reworked.
Stratified to irregular bodies of Gravel, Sand, Silt, and Clay; loose to dense.

Qvat — ABLATION TILL: Heterogeneous soils deposited during the wasting of glacial ice; generally not reworked.
Gravelly silty Sand, silty gravelly Sand, with some clay; cobbles and boulders common; loose to very dense or soft to hard.

GLACIALLY OVERRIDDEN

QUATERNARY VASHON DEPOSITS

Qvt — TILL: Lodgment till laid down along the base of glacial ice.
Gravelly silty Sand, silty gravelly Sand ("hardpan"); cobbles and boulders common; very dense.

Qvd — TILL-LIKE DEPOSITS (DIAMICT): Glacial deposit intermediate between till and outwash; subglacially reworked.
Silty gravelly Sand, silty Sand, sandy Gravel; highly variable over short distances; cobbles and boulders common; dense to very dense.

Qva — ADVANCE OUTWASH: Glaciofluvial sediment deposited as the glacial ice advanced through the Puget Lowland.
Clean to silty Sand, gravelly Sand, sandy Gravel; dense to very dense.

Qvgl — GLACIOLACUSTRINE DEPOSITS: Fine-grained glacial flour deposited in proglacial lake in Puget Lowland.
Silty clay, Clayey Silt, with interbeds of Silt and fine Sand; locally laminated; scattered organic fragments locally; hard or dense to very dense.

QUATERNARY PRE-VASHON DEPOSITS

Qpnf — FLUVIAL DEPOSITS: Alluvial deposits of rivers and creeks.
Clean to silty Sand, gravelly Sand, sandy Gravel; very dense.

Qpnl — LACUSTRINE DEPOSITS: Fine-grained lake deposits in depressions, large and small.
Fine sandy Silt, silty fine Sand, clayey Silt; scattered to abundant fine organics; dense to very dense or very stiff to hard.

Qpnp — PEAT DEPOSITS: Depression fillings of organic materials.
Peat, peaty Silt, organic Silt; hard.

Qpls — LANDSLIDE DEPOSITS: Heterogeneous deposits of landslide debris.
Chaotic mixture of silt, sand, clay, and gravel; may contain wood and other organics; hard or very dense.

Qpgo — OUTWASH: Glaciofluvial sediment deposited as the glacial ice advanced or retreated through the Puget Lowland.
Clean to silty Sand, gravelly Sand, sandy Gravel; very dense.

Qpgl — GLACIOLACUSTRINE DEPOSITS: Fine-grained glacial flour deposited in proglacial lake in Puget Lowland.
Silty Clay, clayey Silt, with interbeds of Silt and fine Sand; very stiff to hard or very dense.

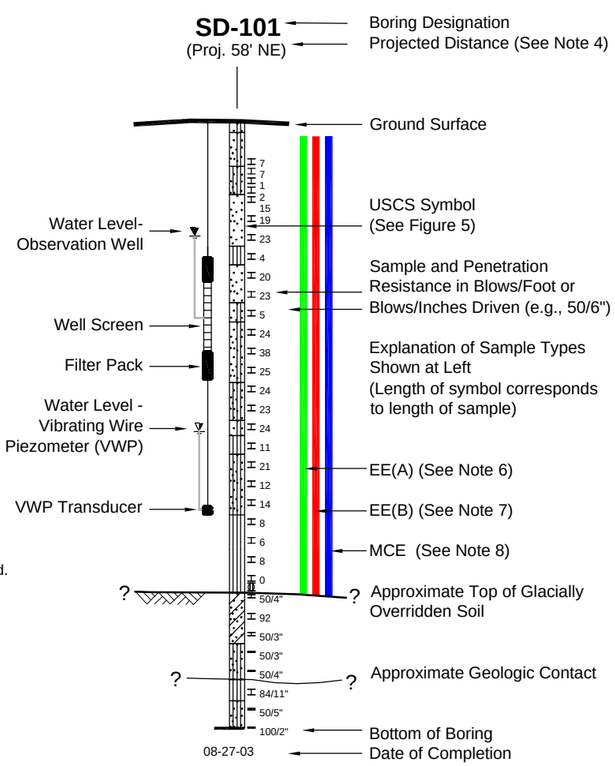
Qpgt — TILL: Lodgment till laid down along the base of glacial ice.
Gravelly silty Sand, silty gravelly Sand ("hardpan"); cobbles and boulders common; very dense.

Qpgd — TILL-LIKE DEPOSITS (DIAMICT): Glacial deposit intermediate between till and outwash; subglacially reworked.
Silty gravelly Sand, silty Sand, sandy Gravel; highly variable over short distance; cobbles and boulders common; very dense.

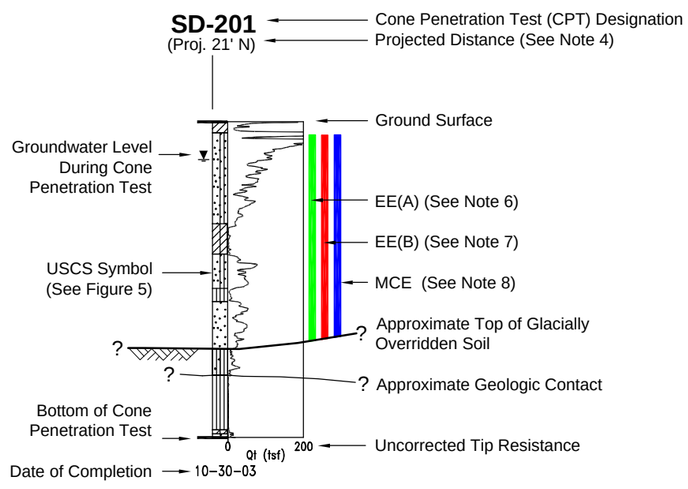
Qpgm — GLACIOMARINE DEPOSITS: Till-like deposit with clayey matrix deposited in proglacial lake by icebergs, floating ice, or gravity currents.
Variable mixture of Clay, Silt, Sand, and Gravel; scattered shells locally; cobbles and boulders common; very dense or hard.

PROFILE LEGEND

PROJECT BORING

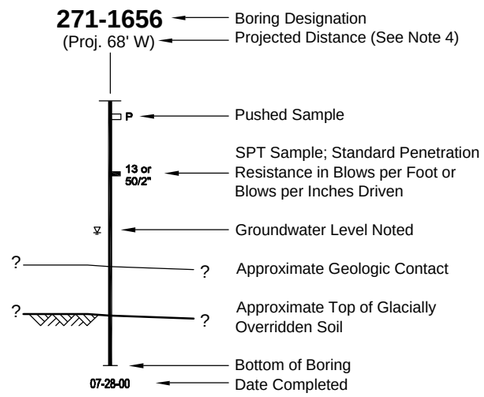


PROJECT CONE PENETRATION TEST



PREVIOUS BORING

(By Shannon & Wilson or others)



NOTES

1. Ground surface shown was constructed from digital elevation data provided by Bechtel/Jacobs and the City of Seattle.
2. Elevation Datum: North American Vertical Datum of 1988 (NAVD88).
3. Subsurface conditions shown are generalized from soils encountered in project borings and from logs of borings previously completed for other projects along the alignment. Variations between the profile and actual conditions may exist.
4. Projections are taken from the southbound track alignment in areas where two tracks are present.
5. Potentially liquefiable zones were identified using the following criteria:
   a. the factor-of-safety against liquefaction for the soil sample at the corresponding depth was found to be less than 1.0 (FS_{liq}<1.0) using the procedures described by Youd et al., 2001, **or**
   b. the adjacent soil samples above and below a given soil sample were both found to have FS_{liq},1.0 using the procedures described by Youd et at., 2001, regardless of the FS_{liq} calculated for the given sample.
6. Soil in the EE(A) zone is potentially liquefiable during an earthquake of magnitude (M_w) 6.75 and having a peak ground acceleration (PGA) of 0.15g.
7. Soil in the EE(B) zone is potentially liquefiable during an earthquake of magnitude (M_w) 7.5 and having a peak ground acceleration (PGA) of 0.20g.
8. Soil in the MCE zone is potentially liquefiable during an earthquake of magnitude (M_w) 7.5 and having a peak ground acceleration (PGA) of 0.30g.
9. See Data Report for groundwater fluctuations.
10. The description of each geologic unit includes only general information regarding the environment of deposition and basic soil characteristics. See text of report for additional discussion of geologic units.

Seattle Monorail Project
Seattle, Washington

PROFILE LEGEND AND GEOLOGIC UNIT EXPLANATION

February 2004 — 21-1-09910-101

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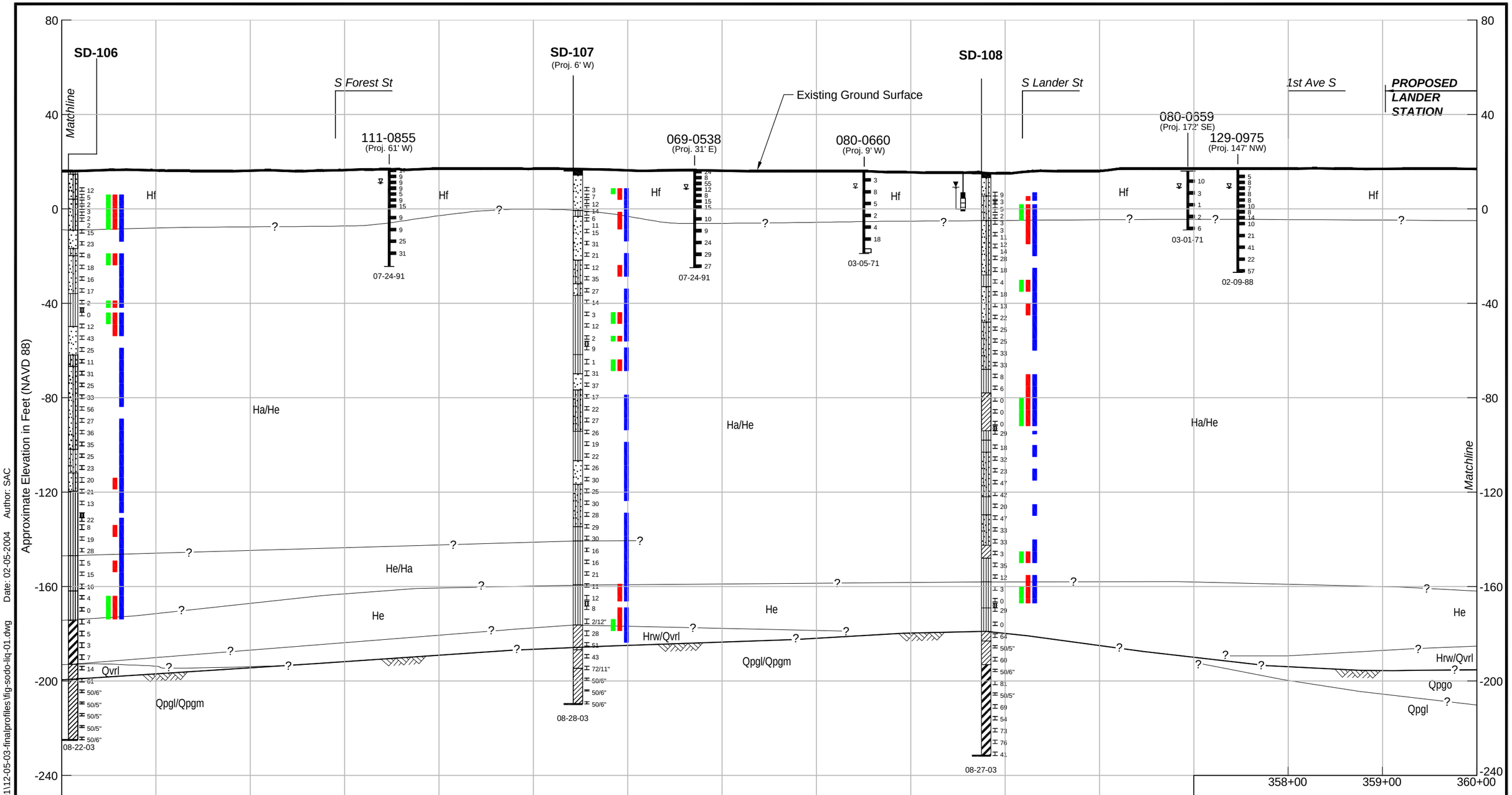
Geotechnical and Environmental Consultants

FIG. 4



NOTE

See Figure 4 for Legend and Geological Unit Explanation

0 100 200

Horizontal Scale in Feet

0 40 80

Vertical Scale in Feet

Vertical Exaggeration 2.5x

Seattle Monorail Project
Seattle, Washington

GENERALIZED SUBSURFACE PROFILE SODO SEGMENT

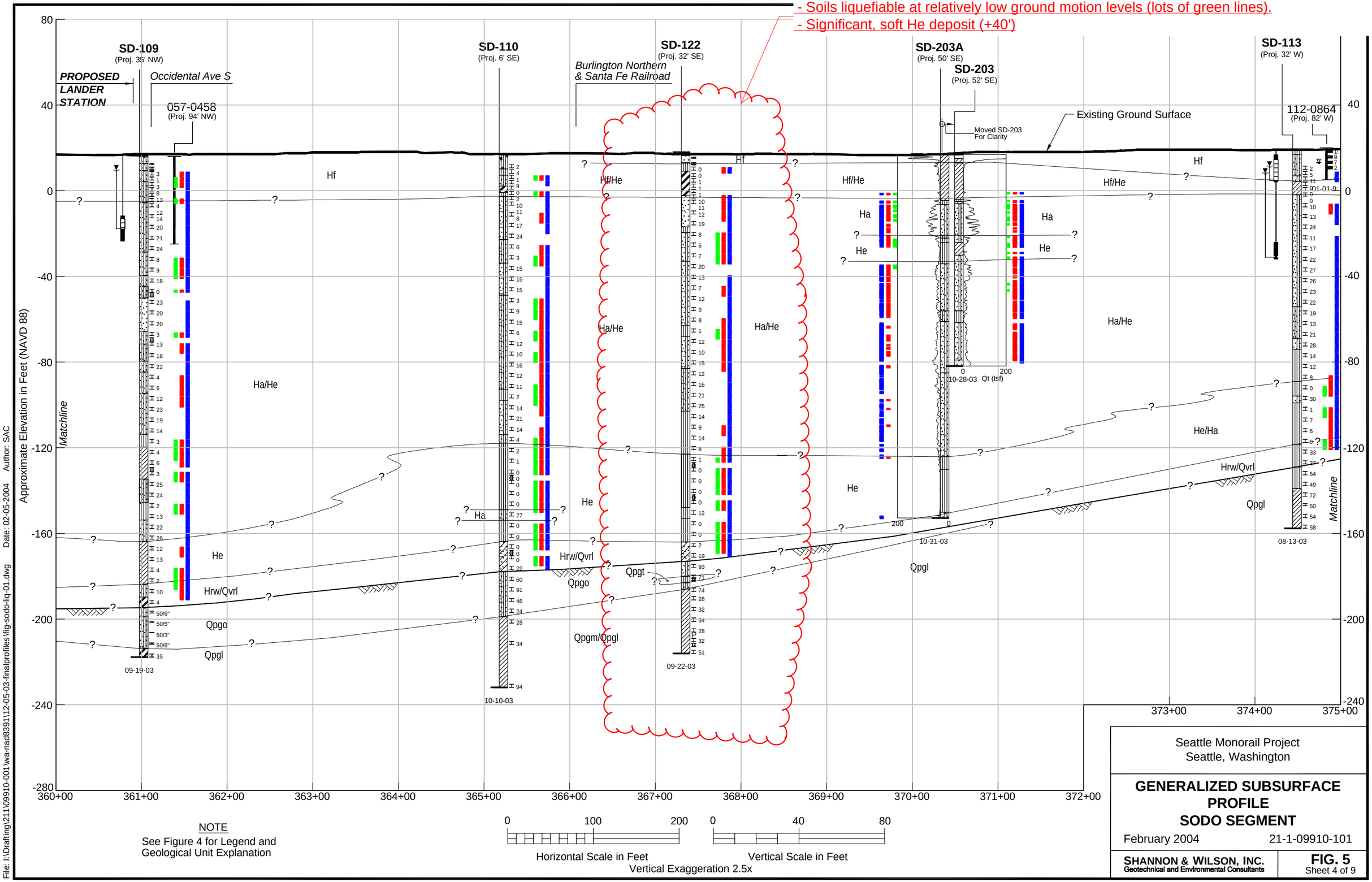
February 2004 21-1-09910-101

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. 5
Sheet 3 of 9

File: I:\Drafting\21\09910-001\wa-nad8391\12-05-03-finalprofiles\fig-sodo-liq-01.dwg Date: 02-05-2004 Author: SAC

Approximate location of existing downhole and preferred Central Parking Lot array.
- Soils liquefiable at relatively low ground motion levels (lots of green lines).
- Significant, soft He deposit (+40')



NOTE
See Figure 4 for Legend and Geological Unit Explanation

Horizontal Scale in Feet: 0, 100, 200
Vertical Scale in Feet: 0, 40, 80
Vertical Exaggeration 2.5x

Seattle Monorail Project
Seattle, Washington

GENERALIZED SUBSURFACE PROFILE
SODO SEGMENT

February 2004 21-1-09910-101

SHANNON & WILSON, INC.
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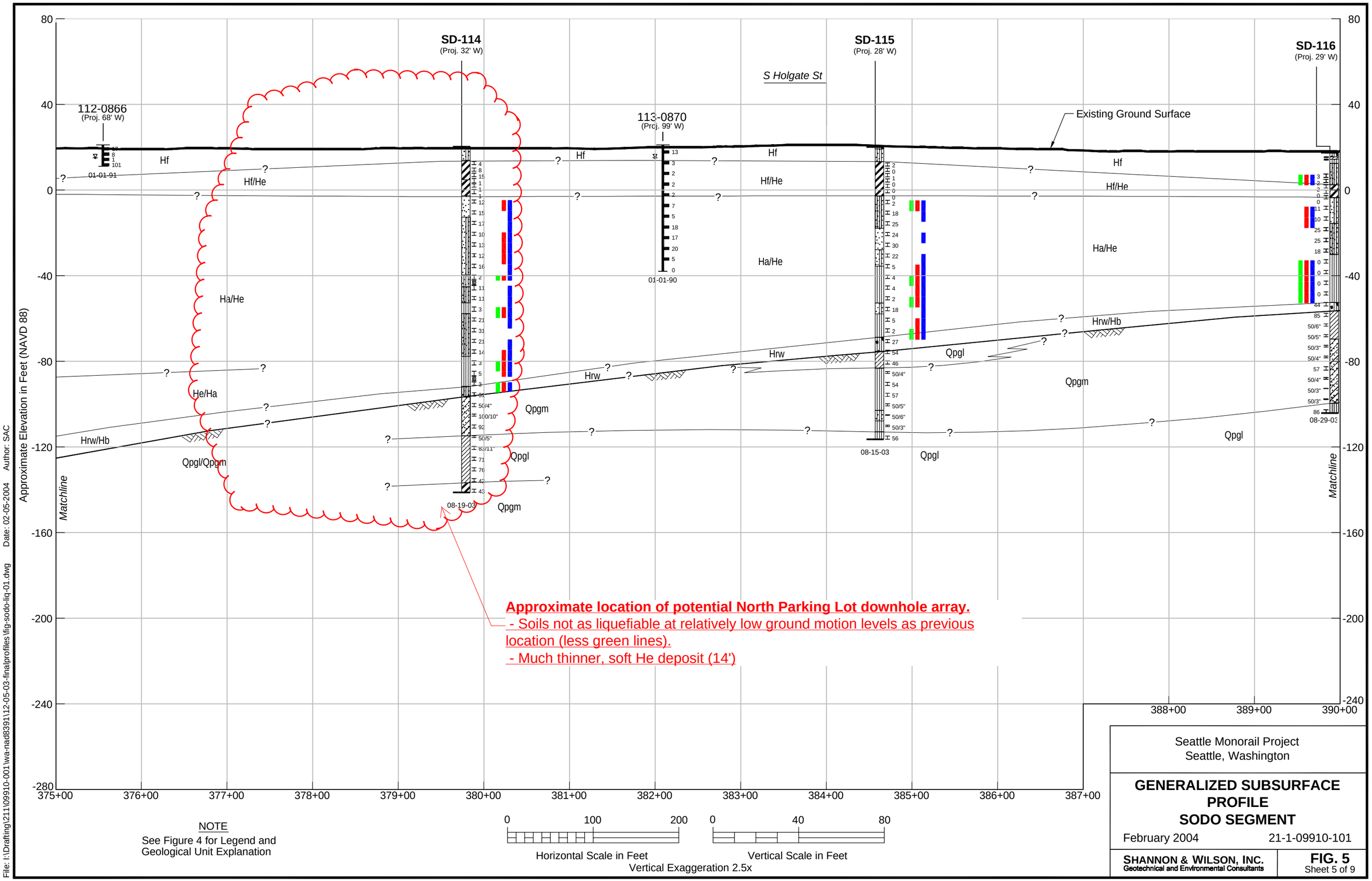
FIG. 5
Sheet 4 of 9

File: I:\Drafting\21\09910-001\wa-nad8391\12-05-03-finalprofiles\fig-sodo-liq-01.dwg Date: 02-05-2004 Author: SAC



Seattle Monorail Project
Seattle, Washington

GENERALIZED SUBSURFACE PROFILE
SODO SEGMENT

February 2004 21-1-09910-101

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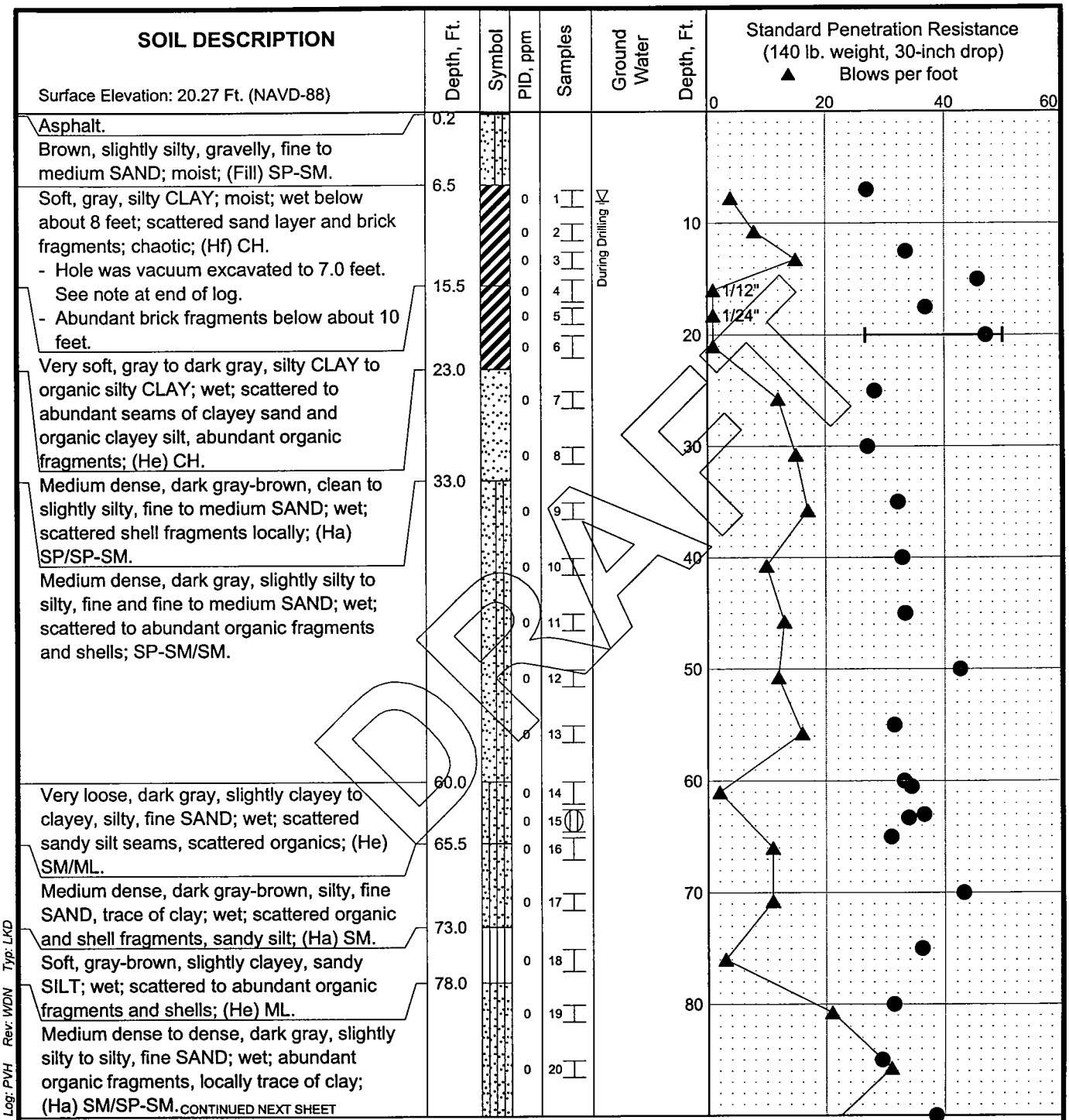
FIG. 5
Sheet 5 of 9

File: I:\Drafting\211\09910-001\wa-nad8391\12-05-03-finalprofiles\fig-sodo-liq-01.dwg Date: 02-05-2004 Author: SAC



LEGEND

* Sample Not Recovered
Standard Penetration Test
3.0" O.D. Osterberg Sample
Ground Water Level ATD

NOTES

1. The boring was performed using Mud Rotary drilling methods.
2. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
3. The discussion in the text of this report is necessary for a proper understanding of the nature of the subsurface materials.
4. Groundwater level, if indicated above, is for the date specified and may vary.
5. Refer to KEY for explanation of symbols, codes and definitions.
6. USCS designation is based on visual-manual classification and selected lab testing.

Seattle Monorail Project
Seattle, Washington

LOG OF BORING SD-114

November 2003 21-1-09910-154

SHANNON & WILSON, INC.
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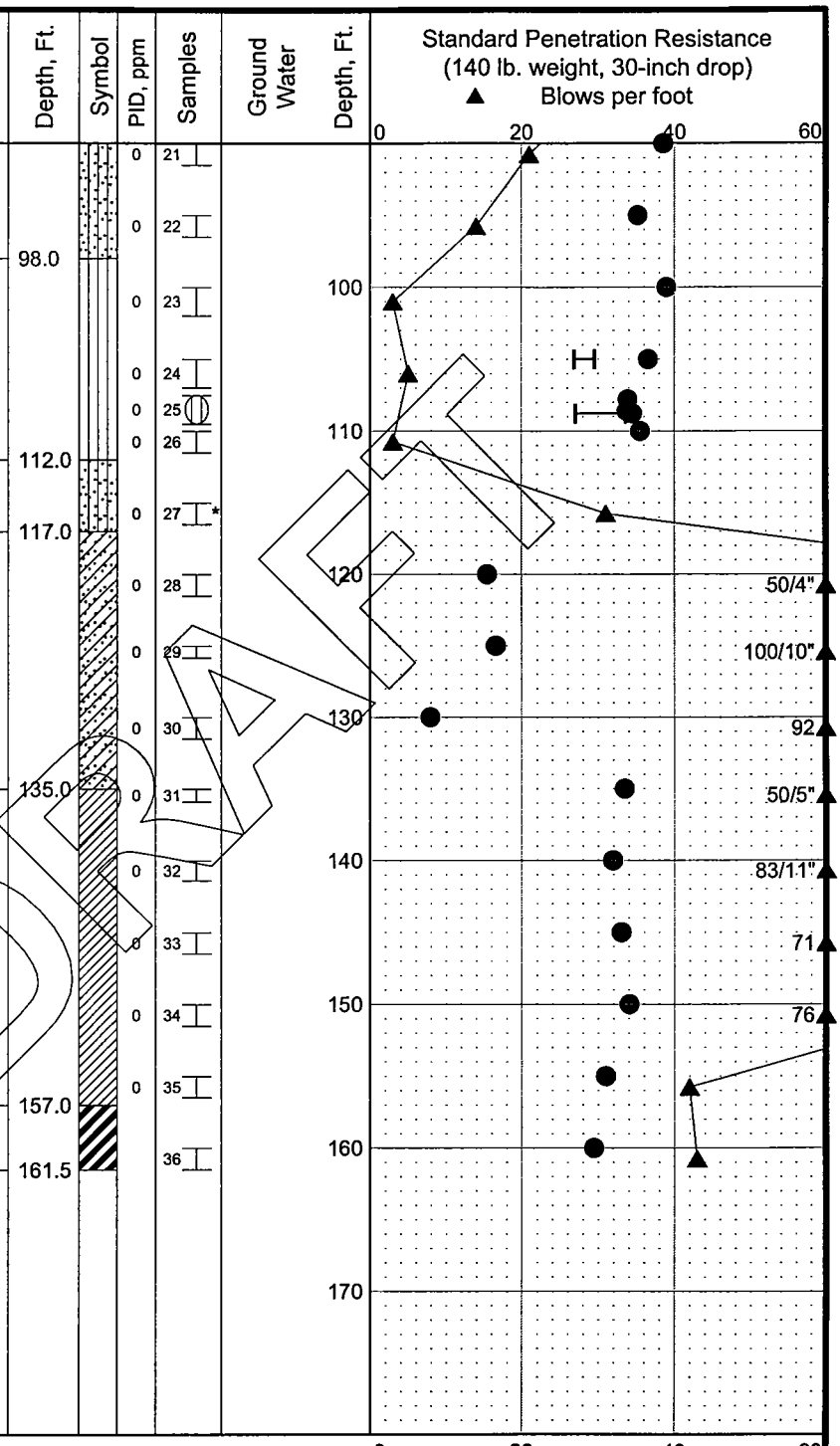
FIG. A.2-16
Sheet 1 of 2

REV 1.5

MASTER LOG2 21-09910.GPJ SHAN WIL.GDT 11/18/03 Log: PVH Rev: WDN Typ: LKD

SOIL DESCRIPTION Surface Elevation: 20.27 Ft. (NAVD-88)	Depth, Ft.
Soft to medium stiff, dark gray, clayey SILT to silty CLAY, trace of sand; wet; abundant organics, scattered shell fragments and sandy layers; (He) ML/CL.	98.0
Gravelly SAND to sandy GRAVEL inferred from drill action; (Hrw) SM/GM.	112.0
Hard, gray, slightly gravelly, silty, clayey SAND to silty, clayey SAND; moist; massive, scattered layers of silty clay; (Qpgm) SC/CL.	117.0
- gravelly below 131 feet	
Hard, gray, interbedded, silty CLAY and clayey SILT; moist to wet; massive, commonly dilatant; (Qpgl) CL/ML.	135.0
- trace gravel below about 150 feet	
Hard, gray, silty CLAY, trace of sand; moist; locally slightly sandy; (Qpgm) CH.	157.0
BOTTOM OF BORING COMPLETED 8/19/2003	161.5

Note: Soils descriptions above 7.0 feet are based on observations made during vacuum excavation.



LEGEND

* Sample Not Recovered
Standard Penetration Test
3.0" O.D. Osterberg Sample
Ground Water Level ATD
● % Water Content
Plastic Limit ⊢●⊣ Liquid Limit
Natural Water Content

NOTES

1. The boring was performed using Mud Rotary drilling methods.
2. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
3. The discussion in the text of this report is necessary for a proper understanding of the nature of the subsurface materials.
4. Groundwater level, if indicated above, is for the date specified and may vary.
5. Refer to KEY for explanation of symbols, codes and definitions.
6. USCS designation is based on visual-manual classification and selected lab testing.

Seattle Monorail Project
Seattle, Washington

LOG OF BORING SD-114

November 2003 21-1-09910-154

SHANNON & WILSON, INC.
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FIG. A.2-16
Sheet 2 of 2

REV 1.5

MASTER LOG2 21-09910.GPJ SHAN WIL.GDT 11/18/03 Log: PVH Rev: WDN Typ: LKD

SOIL DESCRIPTION

Surface Elevation: 18.02 Ft. (NAVD-88)

Depth, Ft.	Soil Description
0.2	ASPHALT CONCRETE
1.6	Dense, tan, sandy GRAVEL, trace of silt; moist; 5/8-inch crushed rock; (Hf) GP.
4.8	Medium dense to loose, dark gray, fine to medium SAND, trace of silt to silty, fine SAND; moist; scattered organics; (Hf) SP/SM.
9.0	Very soft, dark gray, slightly fine sandy, slightly clayey SILT; wet; massive, abundant organics; (He) ML.
20.5	Note: Soil descriptions above 7.0 feet are based on observations made during vacuum excavation.
	Very soft, dark gray, silty CLAY, trace of fine sand; wet; bedded, abundant organics, scattered silt and peat seams at top; (He) CH/CL.
35.0	
37.7	Loose to medium dense, dark gray, fine to medium SAND, trace of silt; wet; massive, scattered organic and shell fragments; (Ha) SP.
	Medium stiff, olive-gray, slightly fine sandy, clayey SILT; moist; bedded, scattered organic and shell fragments; (He) ML.
51.0	Loose, dark gray, slightly silty, fine to medium SAND; wet; massive to bedded, abundant wood and shell fragments; (Ha) SP-SM.
	Medium dense and loose, dark gray, silty, fine SAND and fine sandy SILT, trace of clay; wet; interbedded, scattered seams of clean sand, scattered shell fragments, abundant organics; (Ha) SM/ML.
81.0	Very loose, dark gray, fine sandy SILT, trace of clay; wet; massive to bedded, abundant organics, scattered shell fragments; (Ha) ML
86.0	CONTINUED NEXT SHEET

Sample	PID, ppm	Blows per Foot (SPT)	Blows per Foot (non-standard)
1	0		
2	0		
3	0		
4	0.1		
5	0.2		
6	0.3		
7	0.1		
8	0.4		
9	0.2		
10	0.1	84	
11	0		
12	0		
13 *	0		
14	0		
15	0.2		
16	0.1		
17	0		
18	0.1		
19	0		
20	0	71	

Ground Water Depth, Ft.

PENETRATION RESISTANCE
▲ Blows per Foot (SPT)
▼ Blows per Foot (non-standard)

0 20 40 60

10 20 30 40 50 60 70 80

0 20 40 60

● % Water Content

Plastic Limit ⊢●⊣ Liquid Limit
Natural Water Content

LEGEND

- * Sample Not Recovered
- Grab Sample
- Standard Penetration Test
- Thin Wall Sample
- 3.0" O.D. Osterberg Sample
- Pressuremeter Test (f=failed)

NOTES

1. The boring was performed using Mud Rotary drilling methods.
2. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
3. The discussion in the text of this report is necessary for a proper understanding of the nature of the subsurface materials.
4. Groundwater level, if indicated above, is for the date specified and may vary.
5. Refer to KEY for explanation of symbols, codes and definitions.
6. USCS designation is based on visual-manual classification and selected lab testing.

Seattle Monorail Project
Seattle, Washington

LOG OF BORING SD-122

November 2003 21-1-09910-154

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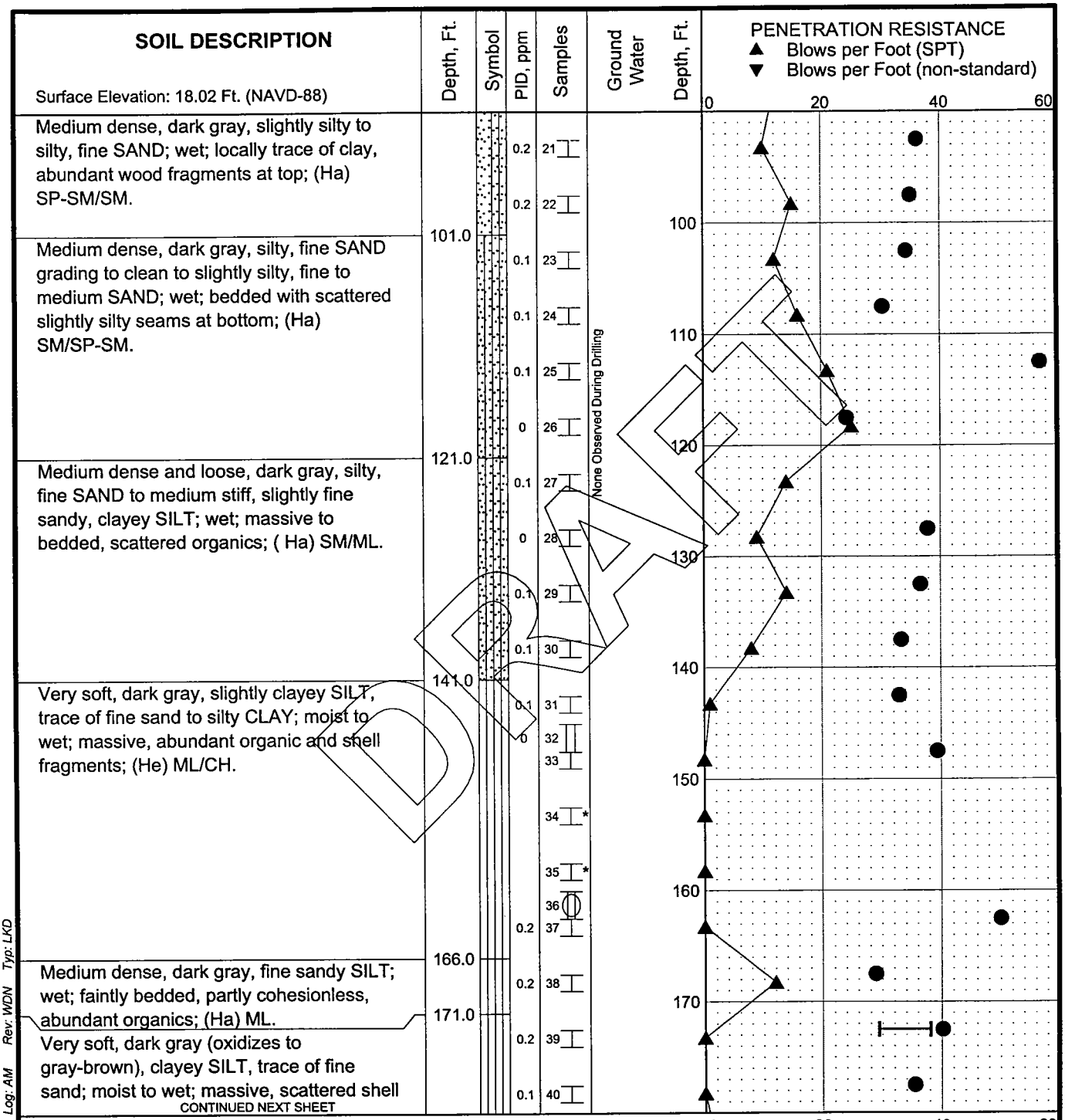
FIG. A.2-24
Sheet 1 of 3

REV 1.6

MASTER_LOG2 21-09910.GPJ SHAN WIL.GDT 11/18/03 Log: AM Rev: WDN Typ: LKD



NOTES

1. The boring was performed using Mud Rotary drilling methods.
2. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
3. The discussion in the text of this report is necessary for a proper understanding of the nature of the subsurface materials.
4. Groundwater level, if indicated above, is for the date specified and may vary.
5. Refer to KEY for explanation of symbols, codes and definitions.
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Seattle Monorail Project
Seattle, Washington

LOG OF BORING SD-122

November 2003 21-1-09910-154

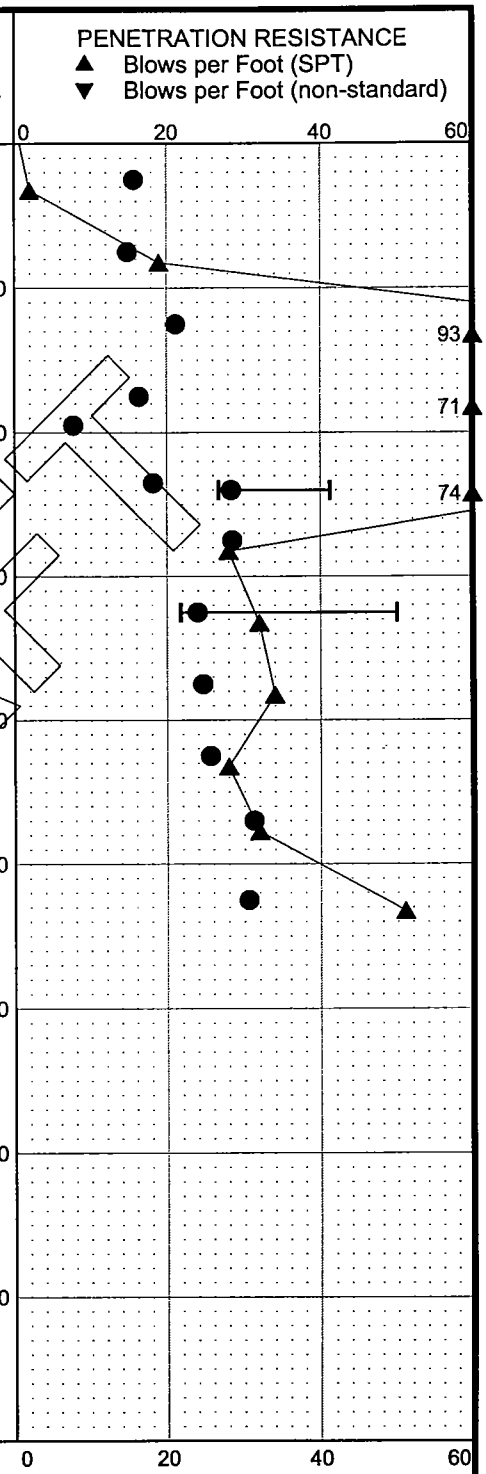
SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants

FIG. A.2-24
Sheet 2 of 3

REV 1.6

MASTER LOG2 21-09910.GPJ SHAN WIL.GDT 11/18/03 Log: AM Rev: WDN Typ: LKD

SOIL DESCRIPTION Surface Elevation: 18.02 Ft. (NAVD-88)	Depth, Ft.	Symbol	PID, ppm	Samples	Ground Water
fragments; (He) ML/CL.	182.0		0.2	41	
Very loose, green-gray, slightly silty, gravelly, clayey SAND to very soft, green-gray, sandy, silty CLAY, trace of gravel; moist; massive to bedded, scattered organic fragments, scattered sheared seams at bottom; (Hrw) SC/CL.	191.0			42 43	
Very dense, brown, slightly silty SAND; moist; massive; (Qva) SP-SM.	198.0			44 M101	
Very dense, gray-brown, sandy, gravelly SILT; moist; massive; (Qvt) ML/GM.	201.0				
Very dense, dark gray, silty, fine to medium SAND; moist; bedded with scattered sandy silt seams, scattered organics; (Qpnf) SM.	204.0			45 46	
Very stiff and hard, gray, silty CLAY, trace of sand; moist; massive, scattered gravel dropstones; (Qpgl) CL/CH. - Seam of light gray, clayey silt (Ash?) at 204.0 feet.				47 48	
				49 50 51 M15	
BOTTOM OF BORING COMPLETED 9/22/2003	234.0			52	



LEGEND

- * Sample Not Recovered
- Grab Sample
- Standard Penetration Test
- Thin Wall Sample
- 3.0" O.D. Osterberg Sample
- Pressuremeter Test (f=failed)

NOTES

1. The boring was performed using Mud Rotary drilling methods.
2. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
3. The discussion in the text of this report is necessary for a proper understanding of the nature of the subsurface materials.
4. Groundwater level, if indicated above, is for the date specified and may vary.
5. Refer to KEY for explanation of symbols, codes and definitions.
6. USCS designation is based on visual-manual classification and selected lab testing.

Seattle Monorail Project
Seattle, Washington

LOG OF BORING SD-122

November 2003 21-1-09910-154

SHANNON & WILSON, INC.
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FIG. A.2-24
Sheet 3 of 3

REV 1.6

MASTER LOG2 21-09910.GPJ SHAN_WIL.GDT 11/18/03 Log: AM Rev: WDN Typ: LKD