**SOIL/ROCK DESCRIPTION**

Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines indicated below represent the approximate boundaries between material types, and the transition may be gradual.

<table>
<thead>
<tr>
<th>Depth, ft.</th>
<th>Symbol</th>
<th>Samples</th>
<th>Ground Water</th>
<th>Depth, ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Loose, brown, sandy, organic SILT; moist; (Topsoil) OL.

Very dense, brown and gray, silty, sandy GRAVEL; moist; primarily boulders and cobbles; (Qc) GM.

**NOTE:** Blow counts are artificially high due to the presence of boulders, cobbles, and gravel.

- Non-granodiorite boulder from 5.8 to 7.0 feet.
- Cobble from 7.0 to 7.3 feet.
- Fractured cobble/boulder from 7.8 to 8.2 feet.
- Iron-oxide-stained silty sand from 8.2 to 8.4 feet.
- Cobble/boulder from 8.4 to 8.7 feet.
- Boulder from 8.7 to 10.5 feet.
- Fractured non-granodiorite boulder from 12.4 to 13.4 feet with sand infilling.
- Non-granodiorite cobble from 14.3 to 14.8 feet.
- Non-granodiorite cobble/boulder from 15.7 to 16.1 feet.
- Silty, gravelly sand layer from 16.7 to 17.5 feet.
- Non-granodiorite cobble/boulder from 17.5 to 18.2 feet.
- Wood fragments at 18.2 feet.
- Void at 18.5 to 18.8 feet.
- Boulder from 18.8 to 20.2 feet.
- Brown, silty, gravelly sand from 20.2 to 20.4 feet.
- Cobble/boulder from 20.4 to 20.9 feet.
- Sandy silt, trace of clay and gravel from 21.1 to 22.1 feet.
- Cobble/boulder from 22.1 to 22.8 feet.
- Slightly clayey, silty sand, trace of charcoal from 22.8 to 23.2 feet.

---

**LEGEND**

- * Sample Not Recovered
- † Standard Penetration Test
- ‡ Rock Core

---

**NOTES**

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.
SOIL/ROCK DESCRIPTION

- Slightly clayey, silty sand layer with a trace of charcoal from 22.8 to 23.2 feet.
- Fractured cobble/boulder from 25.3 to 26.2 feet.

GRANODIORITE: Moderate strength, light and dark gray, medium- to coarse-grained, igneous; smooth, moderate to closely spaced low- to high-angle joints, fresh to locally faintly iron-oxide-stained and slightly weathered at joints (Tig).

-Slightly weathered zone with very close fracture spacing from 44.9 to 45.8 feet.

BOTTOM OF BORING
COMPLETED 8/31/2009

NOTES
1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.
SOIL DESCRIPTION

Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines indicated below represent the approximate boundaries between material types, and the transition may be gradual.

Loose, brown, slightly sandy, slightly clayey SILT; moist; scattered roots; (Topsoil) ML.

Medium stiff to hard, brown and gray, slightly gravelly, sandy, clayey SILT to silty CLAY; moist; scattered cobbles and gravel, locally blocky and sheared texture; (Qvrl) MH/CH.
- Cobble/boulder from 3.1 to 3.4 feet.

NOTE: Blow counts are artificially high due to the presence of cobbles.

Light gray and dark gray, sandy GRAVEL; moist; primarily boulders and cobbles; (Qc) GP.
- Boulder from 5.6 to 7.2 feet.
- Boulder from 7.6 to 9.6 feet.
- Weathered zone, lost drilling fluid circulation at 9.0 feet.
- Cobble/boulder from 9.8 to 10.3 feet.
- Cobble/boulder from 10.8 to 11.1 feet.
- Boulder from 11.3 to 13.1 feet.

Gray, slightly silty, sandy GRAVEL; moist; slightly to moderately weathered granodiorite, faint to moderate iron-oxide staining, trace of wood fragments; (Qc) GP-GM.

Gray, silty SAND and silty SAND; wet; scattered cobbles, rounded gravel clasts, weathered appearance; (Qc) SM.
- Cobble/boulder from 16.6 to 17.0 feet.

GRANODIORITE: Medium to high strength, gray and dark gray, medium- to coarse-grained, igneous; smooth and rough, closely spaced, low- to high-angle joints, joints are locally iron-oxide-stained, slightly weathered with moderately weathered zones (Tig).
- Silt-filled fracture at 19.4 feet.
- Moderately weathered from 19.8 to 22.0 feet

CONTINUED NEXT SHEET

LEGEND

* Sample Not Recovered
\[ Standard Penetration Test
\[ Rock Core

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.

Index Galena Flood Repairs Project
Milepost 6.4 to 6.9
Snohomish County, Washington

LOG OF BORING B-2

December 2012
21-1-21116-031
SOIL DESCRIPTION

Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines indicated below represent the approximate boundaries between material types, and the transition may be gradual.

and mineralized joints from 20 to 22 feet.
- Mineralized joints from 20.0 to 22.0 feet.
- Thin fracture infilling at about 24.4 feet.
- Weathered zone from about 29.1 to 29.8 feet, strong iron-oxide staining.
- Very closely spaced high- and low-angle, moderately weathered joints from 34.5 to 35.2 feet.

- Moderately weathered joints from 39.3 to 41.8 feet.

- 1/8-inch fracture infilling at 43.5 feet.

BOTTOM OF BORING
COMPLETED 9/3/2009

NOTES
1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.
SOIL DESCRIPTION

Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines indicated below represent the approximate boundaries between material types, and the transition may be gradual.

Topsoil.
Loose, brown, fine sandy SILT; moist; scattered organics; (Qc) ML.

Medium still to stiff, brown, trace to slightly fine sandy, slightly gravelly, clayey SILT to silty CLAY; moist; laminated, locally sandy, scattered iron-oxide-stained layers, locally gravelly with scattered cobbles in increasing concentration with depth; (Qvrl) MH/CL.

Note: Blow counts may be artificially high due to the presence of gravel and cobbles.
- Inclined bedding at 5.1 feet.
- Scattered cobbles inferred from drill action at 6.5 feet.

Gray, sandy GRAVEL; moist; primarily granodiorite boulders and cobbles, locally silty; (Qc) GP.
- Fractured boulder from 9.7 to 11.7 feet with iron-oxide staining on joints.
- Cobble/boulder from 13.0 to 13.5 feet.
- Fractured cobble/boulder from 14.9 to 15.6 feet. Moderately weathered joints with thin silt infilling.
- Fractured boulder from 16.0 to 17.1 feet.
- Silty, gravelly sand layer from 17.1 to 17.3 feet.
- Boulder from 17.3 to 18.8 feet.
- Cobble/boulder from 19.2 to 19.8 feet.
- Boulder from 20.5 to 21.6 feet.

GRANODIORITE: Moderate strength, dark gray, light gray and white, medium- to coarse-grained, igneous; smooth, medium to widely spaced low-angle joints, fresh to slightly weathered on joints (Tig).
- No joints from 26.3 to 31.3 feet.

CONTINUED NEXT SHEET

LEGEND

- Sample Not Recovered
- Standard Penetration Test
- Rock Core
- Piezometer Screen and Sand Filter
- Bentonite-Cement Grout
- Bentonite Chips/Pellets
- Bentonite Grout
- Ground Water Level in WWP

NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.
SOIL DESCRIPTION
Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines indicated below represent the approximate boundaries between material types, and the transition may be gradual.

BOTTOM OF BORING
COMPLETED 9/4/2009

LEGEND
* Sample Not Recovered
I Standard Penetration Test
I Rock Core

PENETRATION RESISTANCE (blows/foot)
A Hammer Wt. & Drop: 140 lbs / 30 inches

PENETRATION RESISTANCE (blows/foot)

NOTES
1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.

Index Galena Flood Repairs Project
Milepost 6.4 to 6.9
Snohomish County, Washington

LOG OF BORING B-3

December 2012

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants
SOIL DESCRIPTION

Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines indicated below represent the approximate boundaries between material types, and the transition may be gradual.

<table>
<thead>
<tr>
<th>Depth, ft.</th>
<th>Symbol</th>
<th>Samples</th>
<th>Ground Water</th>
<th>Penetration Resistance (blows/foot)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Very dense, brown and gray, silty SAND and dark brown WOOD; moist to wet; wood is partially decomposed; (Qc) SM/PT.

Brown and gray, silty, sandy GRAVEL; moist; locally clayey, local slightly clayey, gravelly, sandy silt layers, abundant granodiorite cobbles and boulders, trace of wood fragments; (Qc) GM.
- Boulder from 1.2 to 3.5 feet.
- Cobble/boulder from 5.3 to 6.0 feet.
- Cobble/boulder from 7.6 to 8.3 feet.
- Cobble/boulder from 10.5 to 10.8 feet.
- Fractured cobble/boulder from 11.9 to 12.8 feet.
- Fractured cobble/boulder from 13.5 to 14.2 feet.

Gray, clean to slightly silty, sandy GRAVEL; moist; abundant granodiorite cobbles and boulders; (Qc) GP/GP-GM.
- Fractured cobble/boulder from 16.9 to 17.6 feet.
- Fractured cobble/boulder from 18.3 to 18.7 feet.
- Fractured cobble/boulder from 19.6 to 20.4 feet.
- Fractured boulder from 21.2 to 23.2 feet.

Dark gray, light gray, and white GRAVEL; moist; scattered granodiorite and diorite cobbles; (Qc) GP.
- Granodiorite cobble/boulder from 23.5 to 24.0 feet.
- Diorite cobble/boulder from 26.9 to 27.8 feet.

NOTES
1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.

Index Galena Flood Repairs Project
Milepost 6.4 to 6.9
Snohomish County, Washington

LOG OF BORING B-4

December 2012

21-1-21116-031

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants
FIG. A-15
Sheet 1 of 2
SOIL DESCRIPTION

Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines indicated below represent the approximate boundaries between material types, and the transition may be gradual.

DIORITE: Moderate strength, dark green-gray and light gray, medium- to coarse-grained, igneous; smooth, closely spaced low- to high-angle joints with minor infilling and iron-oxide staining; slightly weathered (Tig).

GRANODIORITE: Medium to high strength, dark gray and light gray, medium- to coarse-grained, igneous; smooth, closely spaced low- to high-angle joints; fresh (Tig).

GRANODIORITE: High strength, dark gray, light gray and white, medium- to coarse-grained, igneous; smooth, moderately spaced, low- to high-angle joints; fresh (Tig).

BOTTOM OF BORING
COMPLETED 9/5/2009

INDEX

LEGEND
+ Sample Not Recovered
Standard Penetration Test
Rock Core

NOTES
1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.

PE N E T R AT I O N R ES ISTANC E (b lows/foot)

PENETRATION RESISTANCE (blows/foot)

Hammer Wt. & Drop: 140 lbs / 30 inches
SOIL DESCRIPTION
Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines indicated below represent the approximate boundaries between material types, and the transition may be gradual.

Very loose, dark brown, sandy, organic SILT, trace of gravel; moist; (Topsoil) OL.

Gray GRAVEL; moist; scattered cobbles and roots; (Qc) GP.

Soft to medium stiff, brown and gray, silty CLAY; moist; locally laminated, scattered sandy seams, scattered zones with slightly blocky texture, locally clayey silt seams, iron-oxide-stained partings below 5.2 feet; (Qvr) CH.

Light gray and dark gray, sandy GRAVEL, trace of silt; moist; primarily granodiorite boulders and cobbles, local clayey layers above 19.0 feet, locally highly weathered, local gravelly, silty sand layers; (Qc) GP/GW.

Fractured boulder from 6.5 to 9.6 feet.

NOTE: Blow counts are artificially high due to the presence of cobbles and boulders.

-Silty clay seams from 9.6 to 10.3 feet.
- Fractured cobble/boulder from 10.4 to 10.9 feet.
- Fractured cobble from 11.3 to 12.0 feet.
- Boulder from 14.0 to 15.9 feet.
- Silty clay layer from 15.9 to 16.0 feet.
- Non-granodiorite cobble/boulder from 16.0 to 16.6 feet.
- Silty, gravelly, clayey sand layer from 16.6 to 16.9 feet.
- Boulder from 17.4 to 18.3 feet.
- Slightly clayey, silty, sandy gravel layer at 18.5 to 18.7 feet.
- Cobble/boulder from 21.5 to 22.1 feet.
- Cobble/boulder from 22.4 to 22.8 feet.
- Sandy gravel, trace of silt; completely weathered granodiorite from 22.8 to 24.2 feet.
- Fractured boulder from 26.5 to 29.3 feet.

CONTINUED NEXT SHEET

LEGEND

Sample Not Recovered
Standard Penetration Test
Rock Core
Piezometer Screen and Sand Filter
Bentonite-Cement Grout
Bentonite Chips/Pellets
Bentonite Grout
Ground Water Level in WWP

NOTES
1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.

LOG OF BORING B-5

Index Galena Flood Repairs Project
Milepost 6.4 to 6.9
Snohomish County, Washington

December 2012
21-1-21116-031
SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants
FIG. A-16
Sheet 1 of 4

REV 3
### SOIL DESCRIPTION

Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines indicated below represent the approximate boundaries between material types, and the transition may be gradual.

- Cobble/boulder from 30.4 to 30.7 feet.
- Fractured boulder from 32.1 to 33.1 feet.
- Cobble/boulder from 33.5 to 34.0 feet.
- Cobble/boulder from 37.4 to 37.6 feet.
- Cobble/boulder from 38.0 to 39.0 feet.
- Cobble/boulder from 40.0 to 40.7 feet.
- Cobble/boulder from 42.9 to 43.2 feet.
- Slightly gravelly, silty sand, trace of clay; completely weathered granodiorite from 43.4 to 44.5 feet.
- Cobble/boulder from 44.5 to 45.7 and from 45.7 to 46.1 feet.
- Gravely, silty sand, trace of clay; completely weathered granodiorite from 46.1 to 47.0 feet.
- Cobble/boulder from 47.0 to 47.8 feet.
- Cobble/boulder from 49.5 to 49.8 feet.
- Silty sand layer from 49.8 to 50.3 feet.
- Cobble from 50.3 to 50.6 feet.
- Silty, gravelly sand layer from 50.6 to 52.0 feet.
- Boulder from 52.3 to 55.1 feet.
- Cobble/boulder from about 56.5 to 57.0 feet.
- Fractured cobble/boulder from 57.1 to 57.7 feet.
- Void from 59.0 to 59.4 feet.

CONTINUED NEXT SHEET

### PENETRATION RESISTANCE (blows/foot)

- Hammer Wt. & Drop: 140 lbs / 30 inches

### LEGEND

- Sample Not Recovered
- Standard Penetration Test
- Rock Core
- Piezometer Screen and Sand Filter
- Bentonite-Cement Grout
- Bentonite Chips/Pellets
- Bentonite Grout
- Ground Water Level in VWP

### NOTES

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.

---

Index Galena Flood Repairs Project
Milepost 6.4 to 6.9
Snohomish County, Washington

LOG OF BORING B-5

December 2012
21-1-21116-031

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants
FIG. A-16
Sheet 2 of 4
SOIL DESCRIPTION

Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines indicated below represent the approximate boundaries between material types, and the transition may be gradual.

- Fractured and highly weathered cobble/boulder from 60.2 to 60.8 feet, strong iron-oxide staining.
- Fractured and moderate to highly weathered boulder from 62.0 to 63.2 feet, strong iron-oxide staining.
- Fractured boulder from 64.5 to 65.5 feet.
- Cobble/boulder from 65.7 to 66.0 feet.
- Fractured cobble/boulder from 66.5 to 67.0 feet.
- White weathering product on fracture at approximately 68.0 feet.
- Fractured cobble/boulder from 68.4 to 69.3 feet.
- Boulder from 69.9 to 73.4 feet.
- Slightly clayey silt seam at 73.4 feet.
- Boulder from 73.5 to 75.8 feet.

- Cobble/boulder from 77.5 to 77.8 feet.
- Void from 78.5 to 79.0 feet.

- Fractured cobble/boulder from 81.3 to 82.2 feet with strong iron-oxide staining and approximately 1/8-inch of silt infilling.
- Fractured cobble/boulder from 83.8 to 84.2 feet.

- Fractured boulder from 87.3 to 90.3 feet.

CONTINUED NEXT SHEET
-Fractured boulder from 91.8 to 93.5 feet.

-Highly weathered granodiorite gravel and sand zone from about 93.5 to 96.3 feet.

-Rounded gravel at 96.8 feet.

-Highly weathered granodiorite gravel and sand from 99.5 feet to the bottom of the boring.

BOTTOM OF BORING COMPLETED 9/8/2009
### SOIL/ROCK DESCRIPTION

Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines indicated below represent the approximate boundaries between material types, and the transition may be gradual.

<table>
<thead>
<tr>
<th>Depth, ft.</th>
<th>Symbol</th>
<th>Samples</th>
<th>Ground Water</th>
<th>Depth, ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td>8</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td>12</td>
</tr>
<tr>
<td>14</td>
<td></td>
<td></td>
<td></td>
<td>14</td>
</tr>
<tr>
<td>16</td>
<td></td>
<td></td>
<td></td>
<td>16</td>
</tr>
<tr>
<td>18</td>
<td></td>
<td></td>
<td></td>
<td>18</td>
</tr>
<tr>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td>20</td>
</tr>
<tr>
<td>22</td>
<td></td>
<td></td>
<td></td>
<td>22</td>
</tr>
<tr>
<td>24</td>
<td></td>
<td></td>
<td></td>
<td>24</td>
</tr>
<tr>
<td>26</td>
<td></td>
<td></td>
<td></td>
<td>26</td>
</tr>
<tr>
<td>28</td>
<td></td>
<td></td>
<td></td>
<td>28</td>
</tr>
</tbody>
</table>

**Gray, sandy GRAVEL; moist; primarily granodiorite cobbles and boulders; (Qc) GP.**
- Cobble/boulder from 0.0 to 0.8 foot.
- Boulder from 3.6 to 5.1 feet.

**Stiff, brown, silty CLAY, trace of gravel and sand; moist; trace of roots, locally blocky texture; (Qvrl) CL.**

**Gray, sandy GRAVEL; moist; scattered voids, primarily cobbles and boulders; (Qc) GP.**
- Fractured cobble/boulder from 7.6 to 8.1 feet.
- Cobble/boulder from 10.1 to 10.6 feet.
- Silty, gravelly sand layer and silty clay seam from 10.6 to 11.4 feet.
- Fractured boulder from 11.7 to 15.0 feet.
- Slightly gravelly, clayey, silty sand layer from 15.0 to 16.4 feet.
- Fractured, moderately weathered boulder from 16.4 to 18.1 feet.
- Laminated, silty clay from 18.1 to 18.3 feet with slightly silty sand partings.
- Fractured boulder from 18.4 to 19.4 feet.
- Void from 19.4 to 19.7 feet.
- Void from 20.2 to 21.2 feet.
- Fractured boulder from 21.7 to 23.1 feet with a highly weathered zone at 22.6 feet.
- Boulder from 23.5 to 24.6 feet.
- Boulder from 24.8 to 27.0 feet.

- Cobble from 29.9 to 30.2 feet.

CONTINUED NEXT SHEET

### PENETRATION RESISTANCE (blows/foot)

- Hammer Wt & Drop: 140 lbs / 30 inches

### Index Galena Flood Repairs Project
Milepost 6.4 to 6.9
Snohomish County, Washington

### LOG OF BORING B-6

December 2012
21-1-21116-031

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants
FIG. A-17
Sheet 1 of 2

---

**NOTES**

1. Refer to KEY for explanation of symbols, codes, abbreviations and definitions.
2. Groundwater level, if indicated above, is for the date specified and may vary.
3. USCS designation is based on visual-manual classification and selected lab testing.
SOIL/ROCK DESCRIPTION

Refer to the report text for a proper understanding of the subsurface materials and drilling methods. The stratification lines indicated below represent the approximate boundaries between material types, and the transition may be gradual.

Brown and gray, slightly silty to silty, sandy GRAVEL; moist; locally trace of clay, angular to locally rounded clasts, scattered clayey silt pockets, weathered appearance, scattered to numerous granodiorite cobbles; (Qc) GP-GM/GM.

- Fractured, weathered cobbles/boulder from 33.6 to 34.1 feet.
- Void from 36.2 to 36.4 feet.
- Cobble/boulder from 36.4 to 36.7 feet.
- Fractured cobbles/boulder from 37.0 to 37.6 feet.
- Cobble/boulder from 38.4 to 38.8 feet.

GRANODIORITE: Moderate strength, light gray and black, medium- to coarse-grained, igneous; moderate to closely spaced, rough to smooth joints with faint iron-oxide staining, fresh to slightly weathered along joints (Tig).

- No recovery from 55.5 to 57.1 feet.

BOTTOM OF BORING COMPLETED 9/11/2009

PENETRATION RESISTANCE (blows/foot)

▲ Hammer Wt. & Drop: 140 lbs / 30 inches