

# Soil Classification System

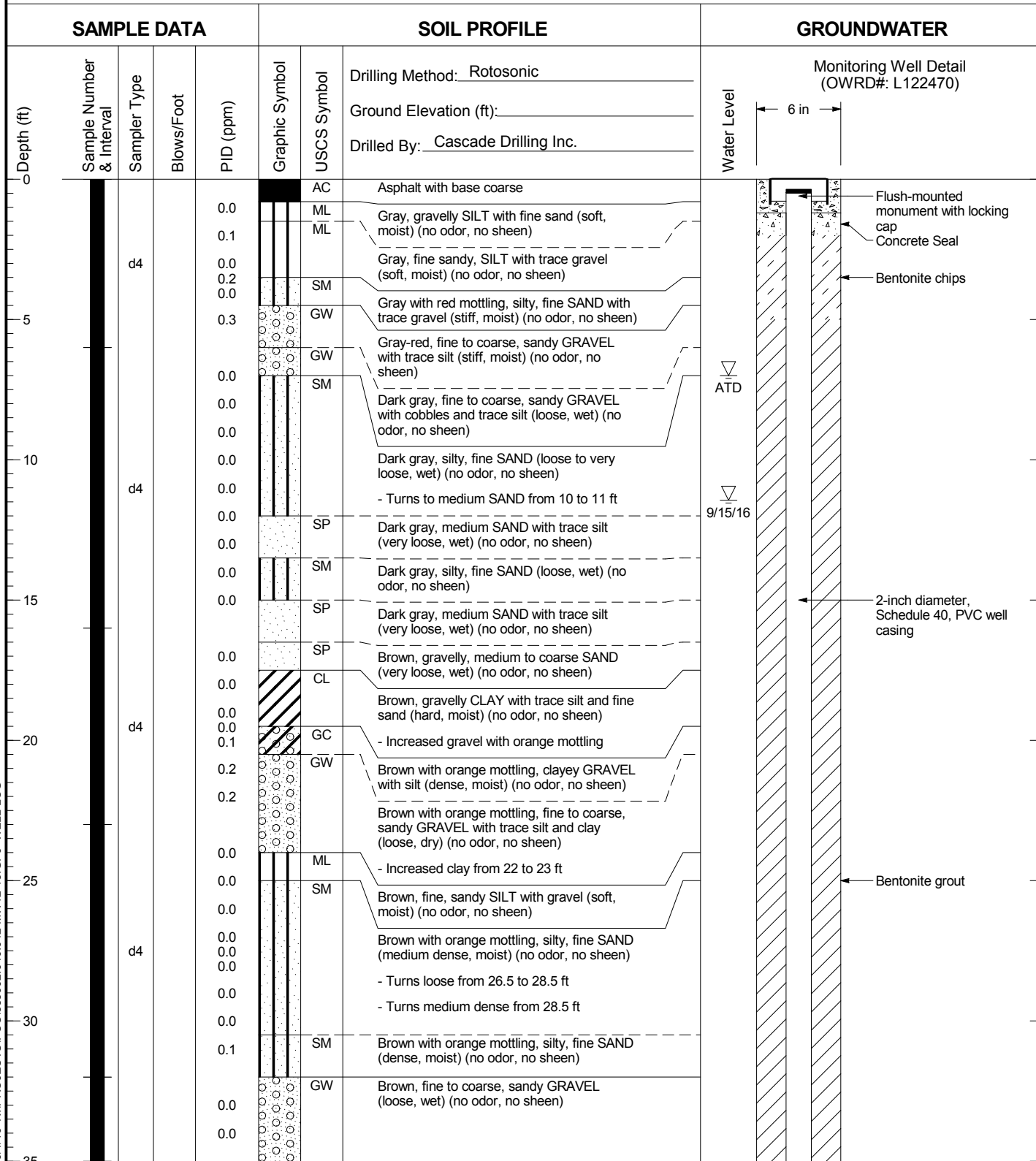
	MAJOR DIVISIONS	CLEAN GRAVEL (Little or no fines)	GRAPHIC SYMBOL	LETTER SYMBOL <sup>(1)</sup>	TYPICAL DESCRIPTIONS <sup>(2)(3)</sup>
COARSE-GRAINED SOIL (More than 50% of material is larger than No. 200 sieve size)	GRAVEL AND GRAVELLY SOIL  (More than 50% of coarse fraction retained on No. 4 sieve)	CLEAN GRAVEL (Little or no fines)		<b>GW</b>	Well-graded gravel; gravel/sand mixture(s); little or no fines
		GRAVEL WITH FINES (Appreciable amount of fines)		<b>GP</b>	Poorly graded gravel; gravel/sand mixture(s); little or no fines
		GRAVEL WITH FINES (Appreciable amount of fines)		<b>GM</b>	Silty gravel; gravel/sand/silt mixture(s)
	SAND AND SANDY SOIL  (More than 50% of coarse fraction passed through No. 4 sieve)	CLEAN SAND (Little or no fines)		<b>SW</b>	Well-graded sand; gravelly sand; little or no fines
		CLEAN SAND (Little or no fines)		<b>SP</b>	Poorly graded sand; gravelly sand; little or no fines
		SAND WITH FINES (Appreciable amount of fines)		<b>SM</b>	Silty sand; sand/silt mixture(s)
FINE-GRAINED SOIL (More than 50% of material is smaller than No. 200 sieve size)	SILT AND CLAY  (Liquid limit less than 50)	CLEAN SAND (Little or no fines)		<b>SC</b>	Clayey sand; sand/clay mixture(s)
		SILT AND CLAY (Liquid limit less than 50)		<b>ML</b>	Inorganic silt and very fine sand; rock flour; silty or clayey fine sand or clayey silt with slight plasticity
		SILT AND CLAY (Liquid limit less than 50)		<b>CL</b>	Inorganic clay of low to medium plasticity; gravelly clay; sandy clay; silty clay; lean clay
		SILT AND CLAY (Liquid limit less than 50)		<b>OL</b>	Organic silt; organic, silty clay of low plasticity
	SILT AND CLAY  (Liquid limit greater than 50)	SILT AND CLAY (Liquid limit greater than 50)		<b>MH</b>	Inorganic silt; micaceous or diatomaceous fine sand
		SILT AND CLAY (Liquid limit greater than 50)		<b>CH</b>	Inorganic clay of high plasticity; fat clay
		SILT AND CLAY (Liquid limit greater than 50)		<b>OH</b>	Organic clay of medium to high plasticity; organic silt
		HIGHLY ORGANIC SOIL		<b>PT</b>	Peat; humus; swamp soil with high organic content

OTHER MATERIALS	GRAPHIC SYMBOL	LETTER SYMBOL	TYPICAL DESCRIPTIONS
PAVEMENT		<b>AC or PC</b>	Asphalt concrete pavement or Portland cement pavement
ROCK		<b>RK</b>	Rock (See Rock Classification)
WOOD		<b>WD</b>	Wood, lumber, wood chips
DEBRIS		<b>DB</b>	Construction debris, garbage

- Notes:
- USCS letter symbols correspond to symbols used by the Unified Soil Classification System and ASTM classification methods. Dual letter symbols (e.g., SP-SM for sand or gravel) indicate soil with an estimated 5-15% fines. Multiple letter symbols (e.g., ML/CL) indicate borderline or multiple soil classifications.
  - Soil descriptions are based on the general approach presented in the Standard Practice for Description and Identification of Soils (Visual-Manual Procedure), outlined in ASTM D 2488. Where laboratory index testing has been conducted, soil classifications are based on the Standard Test Method for Classification of Soils for Engineering Purposes, as outlined in ASTM D 2487.
  - Soil description terminology is based on visual estimates (in the absence of laboratory test data) of the percentages of each soil type and is defined as follows:
    - Primary Constituent: > 50% - "GRAVEL," "SAND," "SILT," "CLAY," etc.
    - Secondary Constituents: > 30% and ≤ 50% - "very gravelly," "very sandy," "very silty," etc.
    - > 15% and ≤ 30% - "gravelly," "sandy," "silty," etc.
    - Additional Constituents: > 5% and ≤ 15% - "with gravel," "with sand," "with silt," etc.
    - ≤ 5% - "with trace gravel," "with trace sand," "with trace silt," etc., or not noted.
  - Soil density or consistency descriptions are based on judgement using a combination of sampler penetration blow counts, drilling or excavating conditions, field tests, and laboratory tests, as appropriate.

Drilling and Sampling Key		Field and Lab Test Data																																																				
SAMPLER TYPE	SAMPLE NUMBER & INTERVAL																																																					
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# MW-12



- Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
  2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
  3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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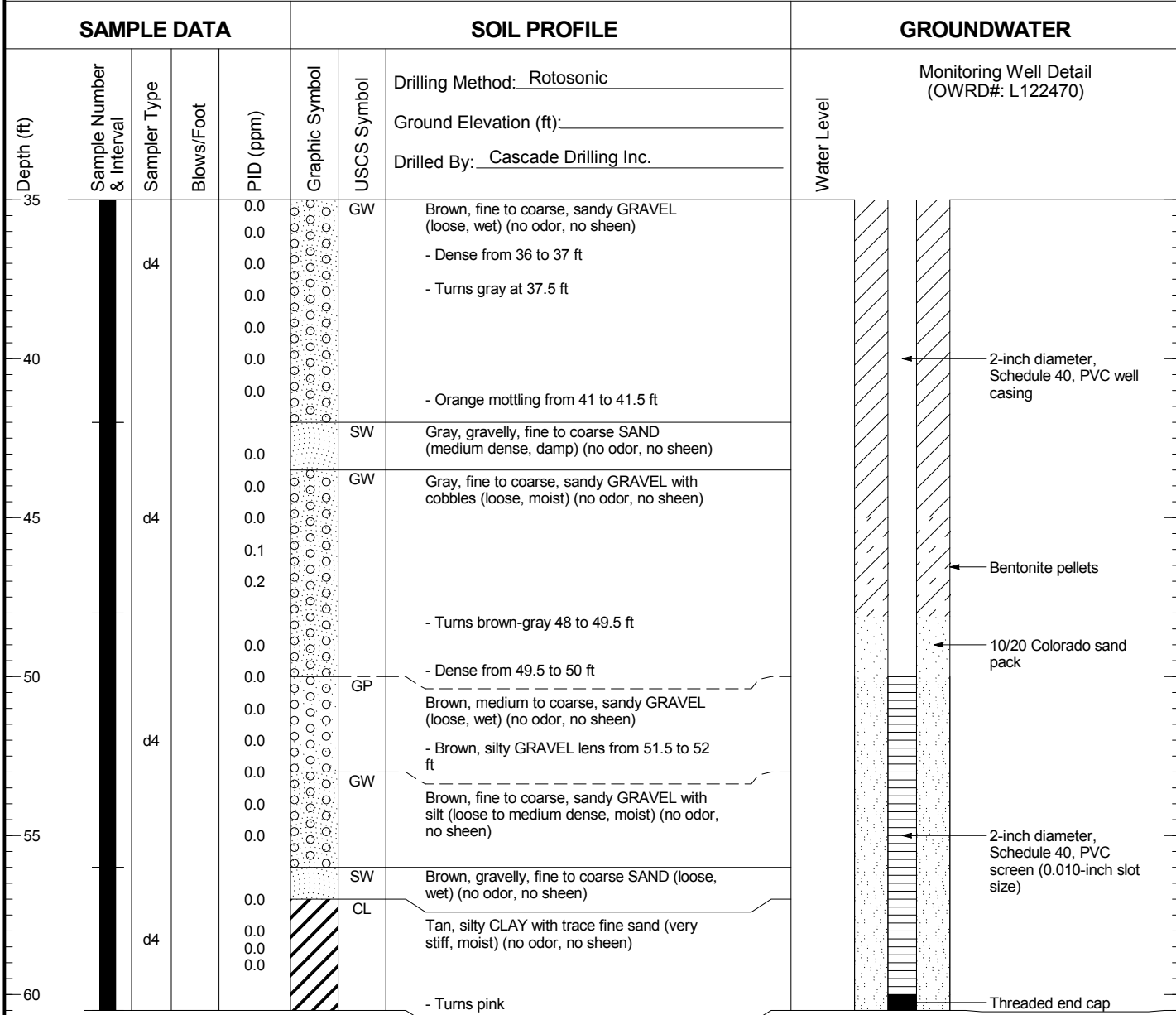


PCC Structurals Inc.  
Portland, OR

Log of Monitoring Well MW-12

Figure  
A-2  
(1 of 2)

# MW-12



Boring Completed 09/13/16  
Total Depth of Boring = 60.5 ft.

Monitoring Well Completed 09/14/16

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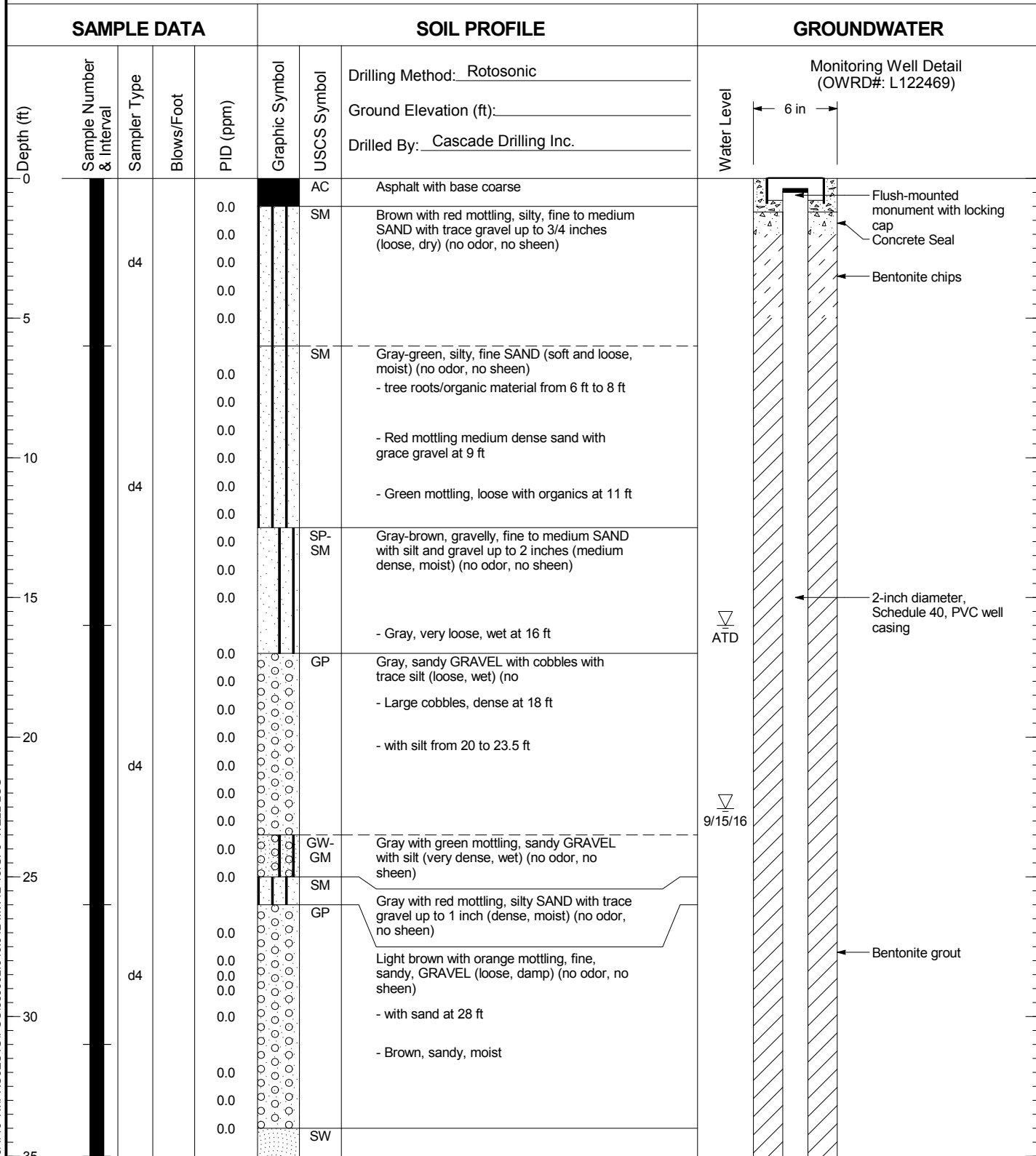


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Portland, OR

Log of Monitoring Well MW-12

Figure  
A-2  
(2 of 2)

# MW-13



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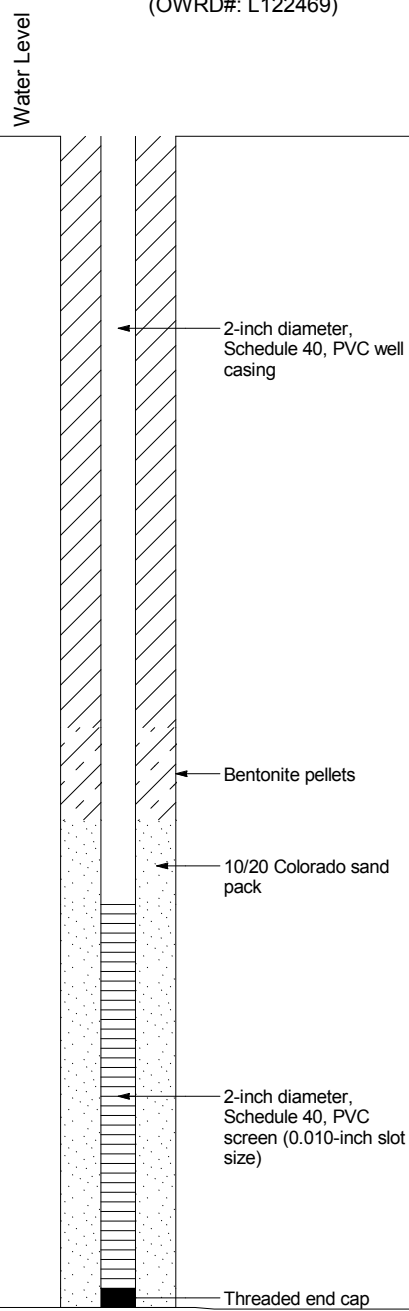
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Log of Monitoring Well MW-13

Figure  
A-3  
(1 of 2)

# MW-13

SAMPLE DATA				SOIL PROFILE			GROUNDWATER		
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	Graphic Symbol	USCS Symbol	Drilling Method: <u>Rotosonic</u>	Monitoring Well Detail (OWRD#: L122469)	
									Ground Elevation (ft): _____
									Drilled By: <u>Cascade Drilling Inc.</u>
	35		d4		0.0 0.0 0.0 0.0	[Stippled Pattern]	SW		Brown, gravelly, fine to coarse SAND with trace silt (dense, moist) (no odor, no sheen)  - Increased gravel with orange mottling
	40				0.0 0.0	[Circular Pattern]	GP		Gray-brown, sandy GRAVEL with cobbles (medium dense, moist) (no odor, no sheen)  - Turns dry, loose at 40 ft
	45		d4		1.8 0.6 0.4 0.0 0.3 0.2 0.2	[Circular Pattern]			- No cobbles at 47 ft
50		d4		0.6 0.0 2.4 0.0	[Circular Pattern]	GW	Dark brown, fine to coarse, SAND/GRAVEL (medium stiff, dry) (no odor, no sheen)  - Turns damp, grades to sand at 51 ft  - Turns brown-gray with cobbles, wet at 52.5 ft		
55		d4		0.0 0.0 0.0	[Circular Pattern]	GW-GM	Brown-gray mottled, fine to coarse, sandy, GRAVEL with silt (loose, wet) (no odor, no sheen)  - Turns brownish orange at 57.5 ft  - Turns dense at 59 ft		
60		d4		0.0 0.0 0.0 0.0 0.0	[Circular Pattern]	GP	Brown with some orange mottling, sandy GRAVEL trace silt (medium dense, wet) (no odor, no sheen)  - Turns gray, loose at 64 ft		
65				0.0	[Circular Pattern]				



Boring Completed 09/12/16  
Total Depth of Boring = 65.5 ft.

Monitoring Well Completed 09/13/16

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