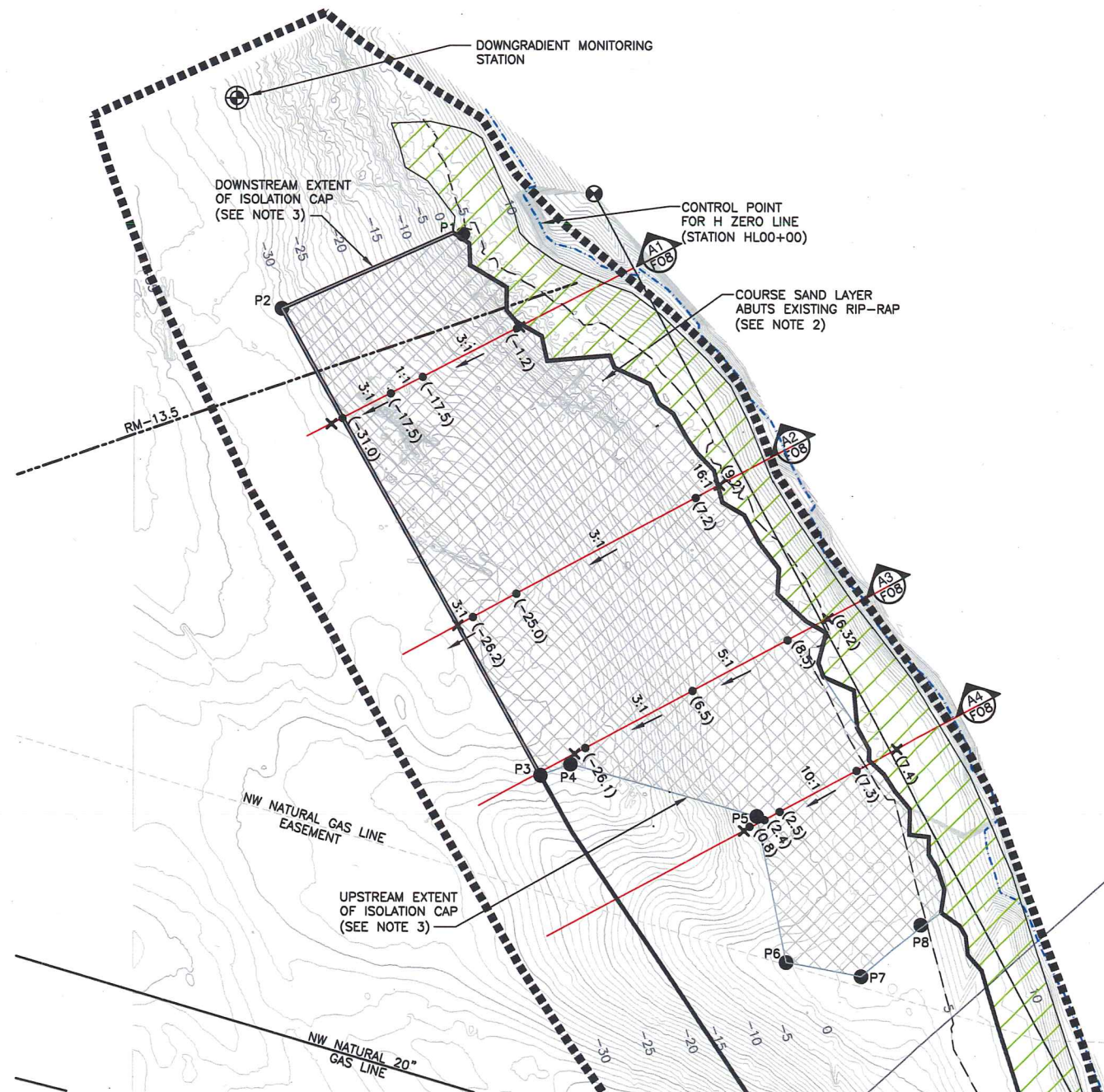


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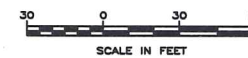
**NOTES:**

1. ISOLATION CAP BOUNDARY SHOWN IS APPROXIMATE; ACTUAL EXTENT MAY VARY DEPENDING ON CONDITIONS ENCOUNTERED AT THE TIME OF THE INSTALLATION.
2. ISOLATION CAP WILL EXTEND TO THE EXISTING RIP-RAP. SEE SHEET F08 AND F09 FOR ADDITIONAL DETAILS.
3. COURSE SAND ISOLATION LAYER WILL EXTEND APPROXIMATELY TO THE EXTENT SHOWN. THE GRAVEL ARMOR LAYER WILL BE EXTENDED AT THE UPSTREAM AND DOWNSTREAM EXTENTS OF THE CAP TO MEET THE EXISTING SURROUNDING SEDIMENT ELEVATION (SEE DETAIL CV-4, SHEET F09).
4. ALL MATERIALS SHALL BE VERIFIED BEFORE THEY ARE MOBLIZED TO THE SITE. SEE SHEET F10 FOR VERIFICATION REQUIREMENTS.
5. THE MATERIAL WILL BE PLACED SLOWLY AND WITH CARE TO MINIMIZE THE AMOUNT OF SEDIMENT THAT MAY BECOME RESUSPENDED AND RE-DEPOSITED DURING THE CAP INSTALLATION.
6. SEE SHEET F07 AND DETAIL CV-4 ON SHEET F09 FOR GRAVEL ARMOR AT THE UPSTREAM AND DOWNSTREAM EXTENTS OF THE CAP.

BOUNDARY POINT	NORTHING	EASTING
P1	678494.6	7646850.4
P2	678459.1	7646764.2
P3	678238.3	7646888.2
P4	678243.6	7646902.4
P5	678219.1	7646991.0
P6	678156.0	7647005.0
P7	678143.4	7647040.6
P8	678167.8	7647065.4

**LEGEND:**

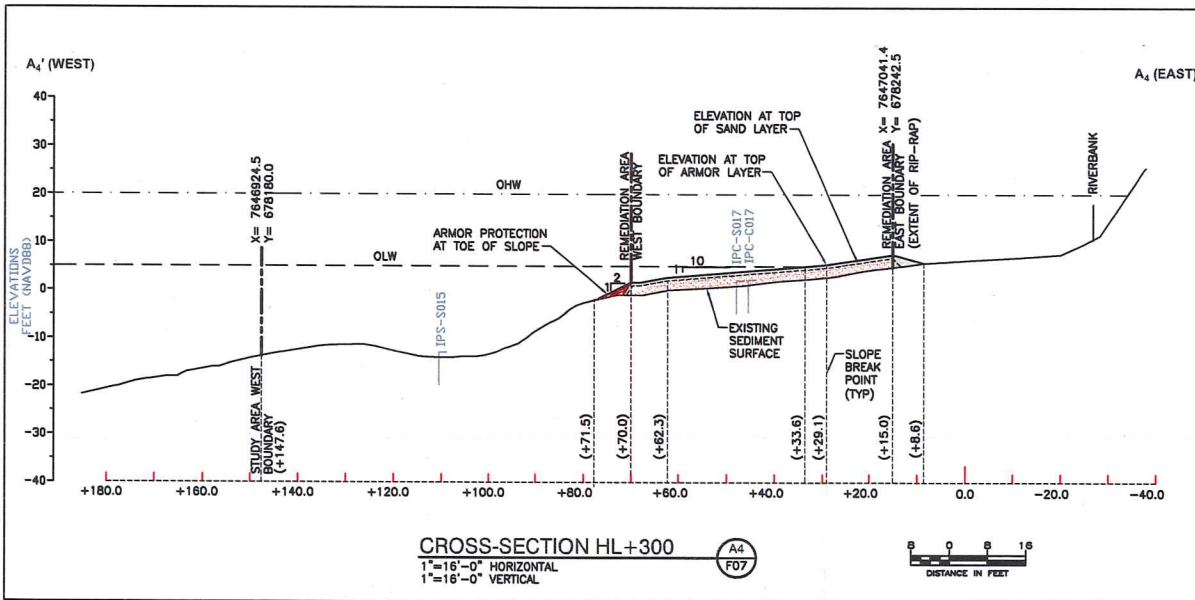
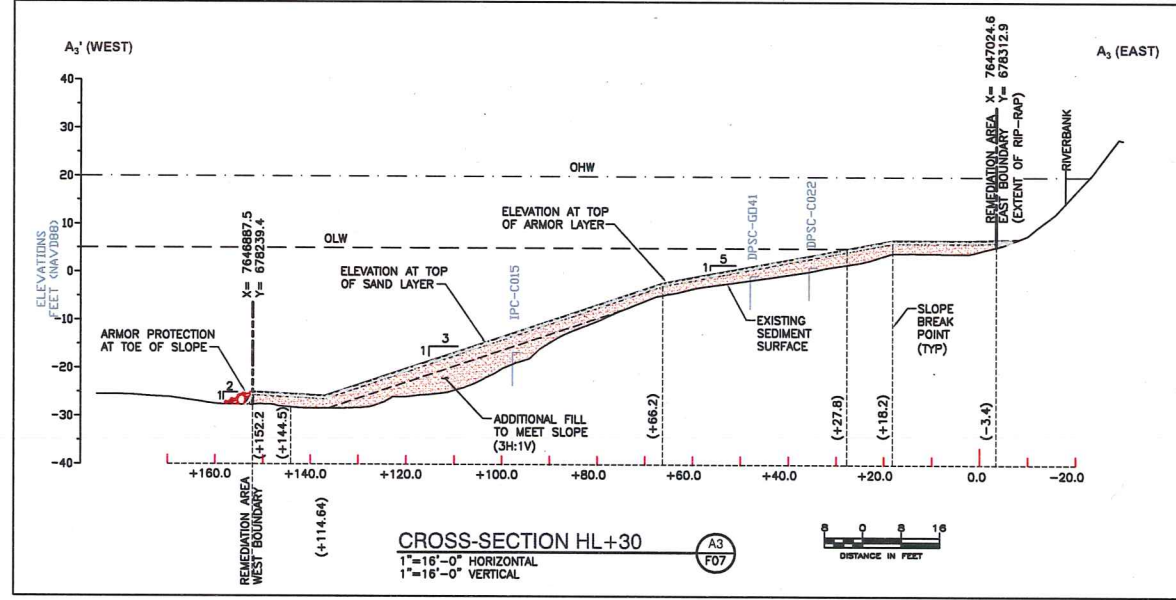
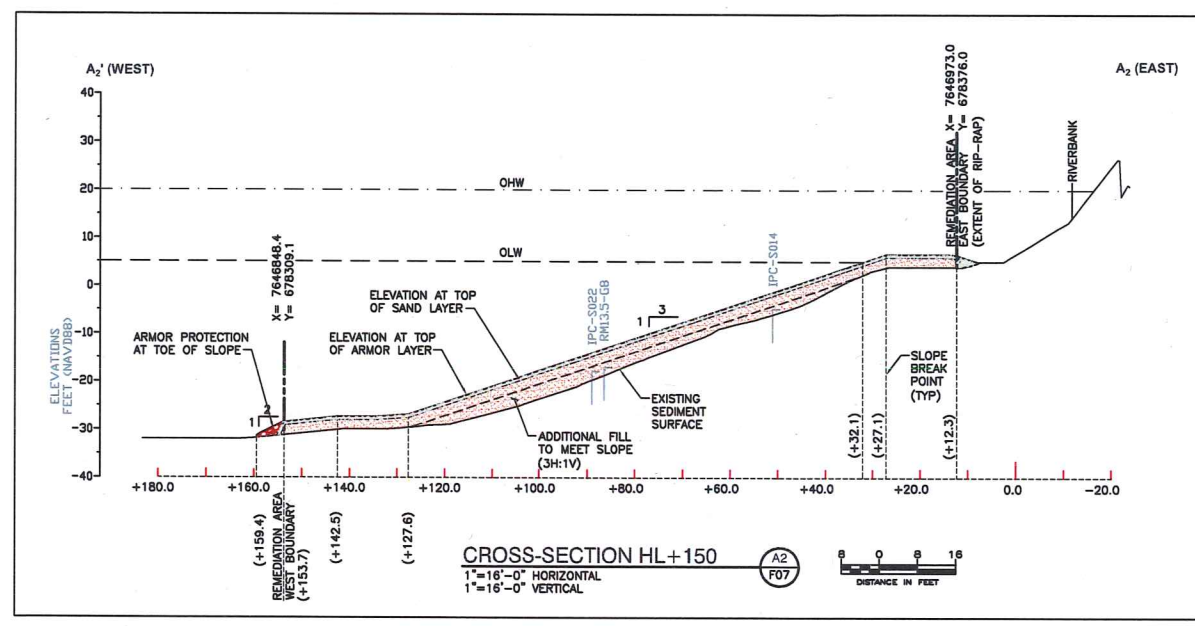
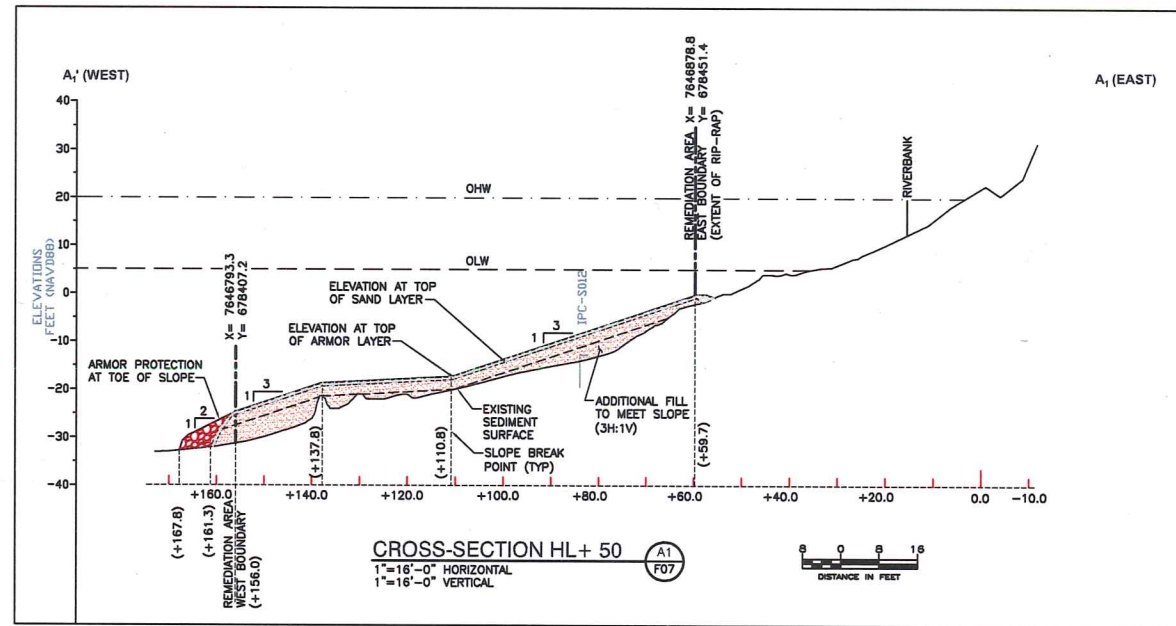
- CONTROL POINT
- ⊙ GROUND SHOT
- NORTHING, 678514, EASTING, 7646913, NAVD83 14
- RIVER MILE (RM)
- ⊠ DISCHARGE POINT
- ⊠ CAP TRANSECTS
- STORM DRAIN
- ORDINARY LOW WATER
- ORDINARY HIGH WATER
- TILKUM CROSSING BRIDGE ALIGNMENT
- ▨ RIP-RAP (EXISTING)
- STUDY AREA
- ▩ PROJECT WORK LIMITS
- ▨ ISOLATION CAP AREA (SEE NOTE 1 ABOVE AND DETAIL CV-5, SHEET F09)
- (-17.5) ELEVATION IN NAVD83
- TARGET AREA (ISOLATION CAP)
- P1 TARGET AREA BOUNDARY POINT
- x MATCH EXISTING SURFACE ELEVATION
- SLOPE BREAK



<b>PRELIMINARY NOT FOR CONSTRUCTION</b>			JOB No. 25698205	DESIGNED: HWN	PROJ. ENGINEER: HWN		<b>Portland General Electric</b>	<b>RIVER MILE 13.5, 90% SEDIMENT CAP DESIGN</b>	DRAWING NUMBER: <b>F06</b>								
			SCALE: AS NOTED	DRAWN BY: BJR	APPROVED BY: HWN				CAD FILE NUMBER:								
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>No.</th> <th>DATE</th> <th>BY</th> <th>REVISION</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>			No.	DATE	BY	REVISION					CHECKED BY: GB	DATE: MAY 29, 2015		<b>Portland, Oregon</b>	<b>PROPOSED DEVELOPMENT SITE PLAN ISOLATION CAP BOUNDARY</b>	SHEET: 6 OF 11	REV.
			No.	DATE	BY	REVISION											
111 SW Columbia, Suite 1500 Portland, Oregon 97201-5814 (tel) 503-222-7200 (fax) 503-222-4292 www.aecom.com		<b>6 OF 11</b>															



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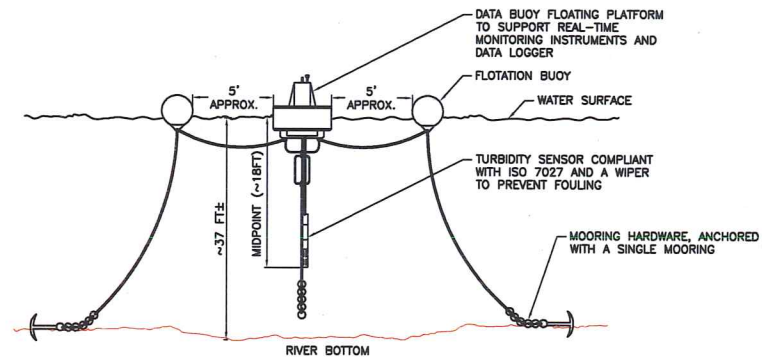


**LEGEND**

- SAND
- ARMOR
- ARMOR PROTECTION
- HL H-ZERO LINE CONTROL POINT @ GROUND SHORE (X, Y, Z)
- OHW ORDINARY HIGH WATER
- OLW ORDINARY LOW WATER
- DPSC-C022 HISTORICAL SAMPLING LOCATION

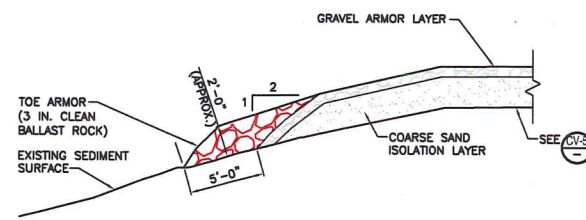
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No.	DATE	BY	CHECKED BY: BG		DATE: MAY 29, 2015	<p><b>Portland, Oregon</b></p>		<p><b>PROPOSED DEVELOPMENT SITE PLAN CROSS SECTIONS</b></p>		SHEET: 8 OF 11
REVISION										REV.

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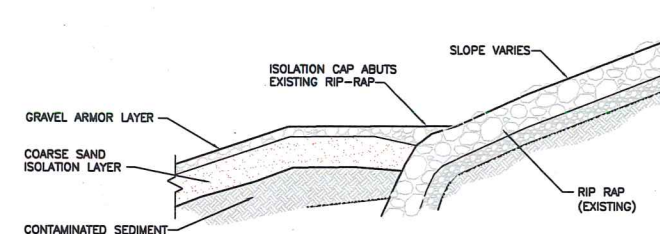


NOTE:  
WATER QUALITY MONITORING STATION SHALL BE INSTALLED ACCORDING TO MANUFACTURE'S INSTRUCTIONS.

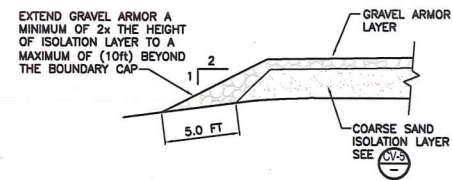
**WATER QUALITY MONITORING STATION** (CV-1)  
N.T.S.



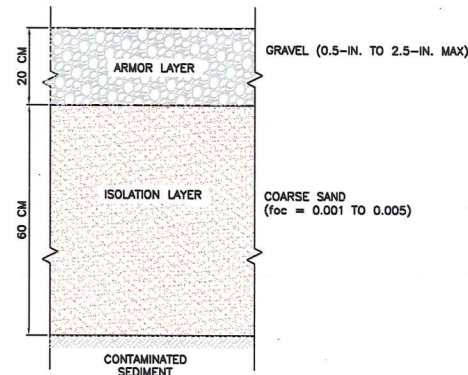
**ARMOR PROTECTION AT TOE OF SLOPE** (CV-2)  
N.T.S.



**ARMOR PROTECTION AT EXISTING RIP-RAP** (CV-3)  
N.T.S.



**ARMOR PROTECTION AT UPSTREAM AND DOWNSTREAM EXTENT OF ISOLATION CAP** (CV-4)  
N.T.S.



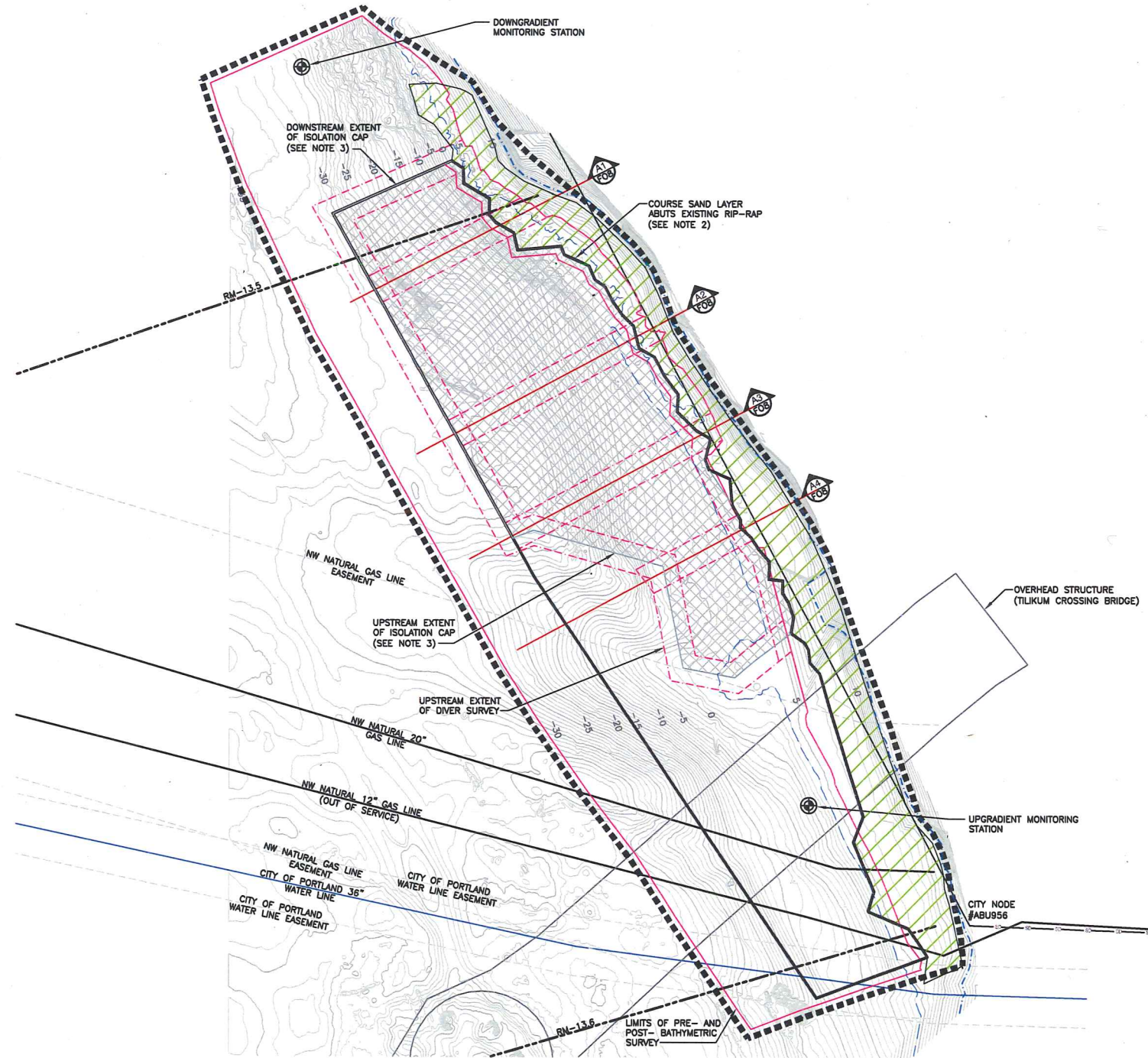
**ISOLATION CAP** (CV-5)  
N.T.S.

**GENERAL NOTES:**

- CAP SAND ISOLATION LAYER WILL BE PLACED AT A FINAL SLOPE OF 3:1 OR LESS WITHIN THE DESIGNATED CAP BOUNDARIES. CAP PLACEMENT TO BE FIELD VERIFIED USING BATHYMETRY SURVEY AND DIVER VISUAL SURVEY.
- foc = FRACTION OF ORGANIC CARBON

<p style="text-align: center;"><b>PRELIMINARY NOT FOR CONSTRUCTION</b></p>		JOB No. 25698205	DESIGNED: HWN	PROJ. ENGINEER: HWN		<p style="text-align: center;"><b>Portland General Electric</b></p>	<p style="text-align: center;"><b>RIVER MILE 13.5, 90% SEDIMENT CAP DESIGN</b></p>	DRAWING NUMBER: <b>F09</b>	
		SCALE: AS NOTED	DRAWN BY: BJR	APPROVED BY: HWN				CAD FILE NUMBER:	
No.	DATE	BY	CHECKED BY: BG	DATE: MAY 29, 2015	<p style="text-align: center;">Portland, Oregon</p>	<p style="text-align: center;">PROPOSED DEVELOPMENT SITE PLAN DETAILS</p>	SHEET: 9 OF 11		
REVISION				REV.					

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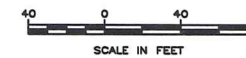


**NOTES:**

1. THE FINAL SURFACE ELEVATIONS FROM THE TOPOGRAPHICAL SURVEY SHALL BE COLLECTED DURING LOW TIDE TO AN ACCURACY OF 0.2 FEET VERTICALLY ACROSS A GRID WITH A MAXIMUM SPACING OF 10 FEET.
2. THE TOPOGRAPHICAL SURVEY DATA SHALL BE TIED TO THE NAD83 SPCS AND NAVD88 DATUM.
3. A HIGH RESOLUTION MULTI-BEAM BATHYMETRIC SURVEY OF THE STUDY AREA SHALL BE CONDUCTED DURING A PERIOD OF HIGH TIDE IN TO A HORIZONTAL AND A VERTICAL ACCURACY OF 0.1 FEET. THE BATHYMETRIC SURVEY DATA WILL BE TIED TO THE NAD83/91 SPCS AND NAVD 88 DATUM.
4. A DIVER SURVEY SHALL INCLUDE VIDEO FOOTAGE, AND GPS COORDINATES, TIED TO THE NAD83 SPCS AND NAVD88 DATUM.

**LEGEND:**

- CAP TRANSECTS
- 100 YEAR FLOOD
- ORDINARY LOW WATER
- ORDINARY HIGH WATER
- TILIKUM CROSSING BRIDGE ALIGNMENT
- STUDY AREA
- PROJECT WORK LIMITS
- ISOLATION CAP AREA (SEE NOTE 1 ABOVE AND DETAIL CV-5, SHEET F09)
- ELEVATION IN NAVD88 (-17.5)
- TARGET AREA (ISOLATION CAP)
- LIMIT OF BATHYMETRIC SURVEY
- DIVER SURVEY TRANSECT AREA
- RIP RAP (EXISTING)



<b>PRELIMINARY NOT FOR CONSTRUCTION</b>			JOB No. 25698205		DESIGNED: HWN		PROJ. ENGINEER: HWN			<b>Portland General Electric</b>	<b>RIVER MILE 13.5, 90% SEDIMENT CAP DESIGN</b>		DRAWING NUMBER: F10		
			SCALE: AS NOTED		DRAWN BY: BJR		APPROVED BY: HWN				111 SW Columbia, Suite 1500 Portland, Oregon 97201-5814 (tel) 503-222-7200 (fax) 503-222-4292 www.aecom.com		Portland, Oregon		CONSTRUCTION MANAGEMENT SITE PLAN CONFIRMATION SURVEY AREAS
			CHECKED BY: GB		DATE: MAY 29, 2015										SHEET: 10 OF 11
No.	DATE	BY	REVISION												

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**GENERAL:**

- DESIGN AND CONSTRUCTION INFORMATION, IN ADDITION TO THE DESIGN DRAWINGS, MAY BE PRESENTED IN THE SPECIFICATIONS AND FINAL REMEDIAL DESIGN REPORT. THE CONTRACTOR SHALL COMPLETE THE REMEDIAL ACTION CONSTRUCTION TO MEET ALL THE REQUIREMENTS IDENTIFIED IN THE PROJECT DOCUMENTS. CONTRACTOR SHALL IDENTIFY ANY DISCREPANCIES BETWEEN THE CONTRACT DOCUMENTS IN WRITING IN THE FORM OF A RFI SUBMITTAL TO THE OWNER.
- THE OWNER WILL BE RESPONSIBLE FOR OBTAINING ALL FEDERAL, STATE, AND LOCAL PERMITS. THE OWNER WILL PROVIDE COPIES OF THE NECESSARY APPROVED PERMITS TO THE CONTRACTOR. THE REQUIREMENTS OF THE FEDERAL, STATE, AND LOCAL PERMITS SHALL BE MET BY THE CONTRACTOR THROUGHOUT THE DURATION OF THE CONSTRUCTION.
- ANY DIFFERENCES BETWEEN THE PLANS AND SPECIFICATIONS AND THE ACTUAL SITE CONDITIONS ENCOUNTERED AT THE TIME OF THE REMEDIAL ACTION CONSTRUCTION SHALL BE IDENTIFIED BY THE CONTRACTOR IN WRITING IN THE FORM OF A RFI SUBMITTAL TO THE OWNER.
- ALL PROJECT WORK SHALL BE PERFORMED WITHIN THE PROJECT WORK LIMITS, IDENTIFIED ON THE DRAWINGS AND IN THE PERMITS. NO WORK SHALL BE PERFORMED OUTSIDE THE PROJECT LIMITS WITHOUT PRIOR, WRITTEN APPROVAL BY THE OWNER.
- NO DEVIATIONS FROM THE PLANS OR SPECIFICATIONS SHALL BE COMPLETED BY THE CONTRACTOR WITHOUT PRIOR, WRITTEN APPROVAL BY THE OWNER.
- THE CONTRACTOR SHALL PERFORM THE CONSTRUCTION ACTIVITIES IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL CODES FOR CONSTRUCTION.
- THE CONTRACTOR SHALL NOT ADDRESS PUBLIC REQUESTS FOR INFORMATION. ALL PUBLIC REQUESTS FOR INFORMATION SHALL BE DIRECTED TO THE OWNER.

**SAFETY:**

- THE CONTRACTOR SHALL DEVELOP AND IMPLEMENT HEALTH AND SAFETY MEASURES FOR ITS EMPLOYEES, ALL SUBCONTRACTORS, SITE VISITORS, AND FOR THE SURROUNDING ENVIRONMENT IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL REQUIREMENTS.
- THE CONTRACTOR SHALL INITIATE, MAINTAIN, AND SUPERVISE ALL SAFETY REQUIREMENTS IDENTIFIED FOR THE PROJECT AND SHALL PROVIDE ALL PRECAUTIONS TO ENSURE THE SAFETY OF THE SITE WORKERS, THE CONSTRUCTION OVERSIGHT PERSONNEL, AND THE SITE VISITORS.
- THE CONTRACTOR SHALL PROVIDE ALL NECESSARY PERSONAL PROTECTIVE EQUIPMENT AND ENGINEERING CONTROLS NECESSARY TO PREVENT ACCIDENTS.
- THE CONTRACTOR IS RESPONSIBLE FOR SITE SECURITY THROUGHOUT THE CONSTRUCTION PROJECT.

**UTILITIES:**

- A PRE-CONSTRUCTION SURVEY OF ALL IN-WATER UTILITIES SHALL BE CONDUCTED THROUGH THE OREGON UTILITY NOTIFICATION CENTER.
- THE CONTRACTOR SHALL PROTECT ALL UTILITIES IDENTIFIED WITHIN THE WORK AREA, AND ANY POTENTIALLY IMPACTED THROUGHOUT THE CONSTRUCTION ACTIVITIES.
- THERE ARE TWO KNOWN ACTIVE UTILITIES INCLUDING A 20-INCH NW NATURAL GAS LINE AND A 36 INCH CITY OF PORTLAND PRESSURIZED WATER MAIN WITHIN THE PROJECT AREA.
- ANY NECESSARY COORDINATION WITH THE KNOWN UTILITIES WILL BE IDENTIFIED AS PART OF THE FINAL DESIGN.

**CONSTRUCTION:**

- THE CONTRACTOR SHALL ESTABLISH A SECURE PROJECT STAGING AREA AT THE BEGINNING OF THE CONSTRUCTION.
- THE CONTRACTOR SHALL ESTABLISH AND MAINTAIN THE SITE-SPECIFIC CONTROL POINTS AND PROJECT WORK LIMITS.
- THE CONTRACTOR SHALL DECON ANY EQUIPMENT THAT COMES IN CONTACT WITH THE IMPACTED SEDIMENT IN ACCORDANCE WITH THE SPECIFICATIONS.
- THE CONTRACTOR SHALL CONTROL DUST AND ODOR THROUGHOUT CONSTRUCTION.
- THE CONTRACTOR SHALL TAKE CARE TO PREVENT THE MIGRATION OF CONSTRUCTION-RELATED DEBRIS, FUELS, LUBRICANTS, OR OTHER POLLUTANTS INTO THE WATERWAY AND BEYOND THE WORK AREA.
- THE CONTRACTOR SHALL INSPECT ALL EQUIPMENT DAILY TO ENSURE THE EQUIPMENT IS IN WORKING ORDER AND IS FREE OF LEAKS AND IS OPERATIONAL IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS.
- THE CONTRACTOR SHALL SUBMIT A LETTER VERIFYING THAT ALL MATERIALS TO BE USED IN THE ISOLATION CAP MEET THE REQUIREMENTS LISTED IN THE CONTRACT DOCUMENTS. THE VERIFICATION LETTER SHALL BE SENT TO THE OWNER FOR REVIEW AND APPROVAL PRIOR TO MOBILIZING OR PLACING ANY MATERIAL IN THE WORK AREA.
- THE CONTRACTOR SHALL SUBMIT PROOF, IN THE FORM OF ANALYTICAL TESTING RESULTS THAT ALL SAND SOURCES TO BE USED AT THE SITE COMPLY WITH THE CHEMICAL SCREENING CRITERIA IDENTIFIED IN THE CONTRACT DOCUMENTS. GRAVEL FILL SOURCE SHALL BE SUBMITTED FOR PARTICLE SIZE.
- THE CONTRACTOR SHALL DETERMINE THE MOST APPROPRIATE MEANS AND METHODS TO PLACE THE MATERIALS TO MEET THE REQUIREMENTS SET FORTH IN THE CONTRACT DOCUMENTS.

**SURVEYING:**

- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING AND MAINTAINING SURVEY CONTROL POINTS AND VERIFYING THE GRADES THROUGHOUT THE CONSTRUCTION ACTIVITIES.
- THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE MAY VARY FROM THOSE SHOWN ON THE DRAWINGS AND IDENTIFIED IN THE SPECIFICATIONS. ANY DIFFERENCES BETWEEN THE ACTUAL CONDITIONS ENCOUNTERED SHALL BE IDENTIFIED BY THE CONTRACTOR IN WRITING IN THE FORM OF A RFI SUBMITTAL TO THE OWNER. TOPOGRAPHICAL SURVEY PERFORMED BY WH PACIFIC ON 7/22/2013. MULTIBEAM BATHYMETRIC SURVEY PERFORMED BY HYDROSOLMAR ON 6/23/2013.
- THE CONTRACTOR SHALL ESTABLISH A PLACEMENT GRID FOR THE MATERIAL, USING ELEVATIONS FROM A DIGITAL TERRAIN MODEL PROVIDED BY THE OWNER.
- THE CONTRACTOR SHALL CONDUCT A PRE-CONSTRUCTION BATHYMETRIC SURVEY TO DOCUMENT MATERIAL PLACEMENT ELEVATIONS. INTERMEDIATE BATHYMETRIC SURVEYS SHALL ALSO BE CONDUCTED AFTER PLACEMENT OF THE SAND ISOLATION LAYER AND FOLLOWING PLACEMENT OF THE GRAVEL. THE CONTRACTOR SHALL ALSO PROVIDE THE RESULTS OF A POST-CONSTRUCTION BATHYMETRIC SURVEY TO DOCUMENT THE FINAL (AS-BUILT) ELEVATIONS OF THE CAP.

**WASTE MANAGEMENT:**

- THE CONTRACTOR SHALL CONTAIN ALL WASTE, INCLUDING, BUT NOT LIMITED TO, DECON WATER, PPE, AND DEBRIS.
- THE CONTRACTOR SHALL PROFILE THE WASTE PRIOR TO DISPOSAL AT A LICENSED DISPOSAL FACILITY APPROVED BY THE OWNER.

**COARSE SAND ISOLATION LAYER:**


- THE CONTRACTOR SHALL PLACE THE CLEAN SAND ISOLATION CAP SO THE UPPER ELEVATION OF THE ISOLATION CAP WILL MAINTAIN A MAXIMUM 3H:1V SURFACE SLOPE ACROSS THE ISOLATION CAP BOUNDARY AREA.
- THE SOURCE OF THE CLEAN SAND FILL SHALL BE SUBMITTED TO THE OWNER FOR APPROVAL BEFORE MOBILIZING THE MATERIAL TO THE WORK AREA. THE SAND MATERIAL MUST HAVE A MINIMUM ORGANIC CONTENT OF 0.1% WITH NOT GREATER THAN 10% OF THE MATERIAL PASSING THE #200 SIEVE.
- THE CLEAN SAND FILL SHALL BE PLACED IN A MAXIMUM OF 12 INCH LIFTS, TO AN AVERAGE CAP THICKNESS OF 1.97 FEET (60 CM) WITH AN ALLOWABLE MARGIN OF ERROR OF -10 PERCENT. THE CLEAN SAND FILL SHALL NOT BE BELOW THE MINIMUM ALLOWABLE THICKNESS OVER MORE THAN 10 PERCENT OF THE PLACEMENT GRIDS.
- THE CONTRACTOR SHALL COMPLETE INSTALLATION OF THE ISOLATION CAP SAND LAYER ACROSS THE ENTIRE BOUNDARY AREA BEFORE PLACING THE GRAVEL ARMOR.
- FOLLOWING PLACEMENT OF THE SAND ISOLATION CAP, INTERIM MONITORING WILL BE PERFORMED BY THE CONTRACTOR TO CONFIRM THE DESIGNED ELEVATIONS AND SLOPES HAVE BEEN ACHIEVED, USING BATHYMETRIC SURVEYING AND A DIVER INSPECTION, AT A MINIMUM.

**GRAVEL ARMOR LAYER:**

- THE CONTRACTOR SHALL PLACE THE GRAVEL ARMOR LAYER SO THE UPPER ELEVATION OF THE ISOLATION CAP WILL MAINTAIN A MAXIMUM 3H:1V SURFACE SLOPE ACROSS THE CAP BOUNDARY AREA.
- THE SOURCE OF THE GRAVEL ARMOR SHALL BE SUBMITTED TO THE OWNER FOR APPROVAL BEFORE MOBILIZING THE MATERIAL TO THE WORK AREA. THE GRAVEL MATERIAL SHALL CONSIST OF CLEAN POORLY GRADED ANGULAR GRAVEL WITH A D50 OF 1-INCH, AND A DMAX AND DMIN OF 2.5-INCHES AND 0.5-INCHES, RESPECTIVELY.
- THE GRAVEL ARMOR LAYER SHALL BE PLACED IN ONE LIFT, WITH THE THICKNESS AVERAGING 8-INCHES WITH A MAXIMUM ALLOWABLE ERROR OF -10 PERCENT OVER THE FOOTPRINT OF THE CAP WITH NO MORE THAN 10 PERCENT OF THE PLACEMENT GRIDS BELOW THE MINIMUM ALLOWABLE THICKNESS.
- FOLLOWING PLACEMENT OF THE GRAVEL ARMOR LAYER, MONITORING WILL BE PERFORMED BY THE CONTRACTOR TO CONFIRM THE REQUIRED THICKNESS AND SLOPES HAVE BEEN ACHIEVED. ADDITIONAL GRAVEL MAY BE PLACED IN AREAS IF ANY DEFICIENCY IN THE THICKNESS IS IDENTIFIED.
- TOE ARMOR SHALL BE PLACED ALONG THE TOE OF THE CAP TO PROVIDE PROTECTION, AS SHOWN IN DETAIL CV-2, FIGURE F09.
- THE CONTRACTOR SHALL BE REQUIRED TO SUBMIT A POST-CONSTRUCTION BATHYMETRIC SURVEY TO DOCUMENT THE FINAL SLOPES AND CAP THICKNESS.

**STAGING AREA:**

- ALL VESSEL AND MATERIAL STAGING WILL OCCUR AT HICKEY MARINE ENTERPRISES DOCK AND FACILITIES, 6801 NW OLD LOWER RIVER ROAD, VANCOUVER, WASHINGTON 98660.
- MATERIAL AND EQUIPMENT STAGING IN THE CONSTRUCTION AREA WILL BE CONDUCTED FROM RIVER VESSELS AND BARGES. NO EQUIPMENT OR ACTIVITIES WILL BE STAGED FROM THE SHORE.

<p style="text-align: center;"><b>PRELIMINARY NOT FOR CONSTRUCTION</b></p>			JOB No. 25698205	DESIGNED: NWH	PROJ. ENGINEER: NWH		<b>Portland General Electric</b>	<b>RIVER MILE 13.5, 90% SEDIMENT CAP DESIGN</b>	DRAWING NUMBER: F11								
			SCALE: AS NOTED	DRAWN BY: BJR	APPROVED BY: NWH				CAD FILE NUMBER:								
<table border="1"> <tr> <td>No.</td> <td>DATE</td> <td>BY</td> <td>REVISION</td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table>			No.	DATE	BY	REVISION					CHECKED BY: BG	DATE: MAY 29, 2015	111 SW Columbia, Suite 1500 Portland, Oregon 97201-5814 (tel) 503-222-7200 (fax) 503-222-4292 www.aecom.com	Portland, Oregon	NOTES	SHEET: 11 OF 11	REV.
			No.	DATE	BY	REVISION											