GRANDE RONDE SUBBASIN FISH HABITAT RESTORATION

CATHERINE CREEK CC-44 PHASE III HABITAT ENHANCEMENT PLANS - PARCEL 3

CONSTRUCTION DRAWINGS

PREPARED FOR:

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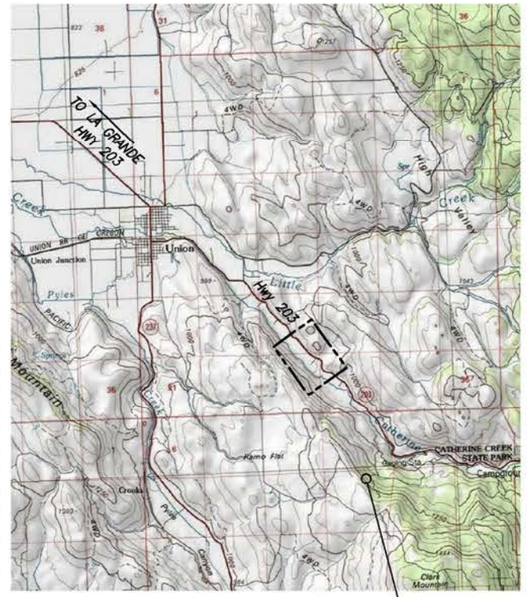
PARTNERS:

OREGON DEPARTMENT OF FISH AND WILDLIFE
UNION SOIL AND WATER CONSERVATION DISTRICT
BONNEVILLE POWER ADMINISTRATION

SITE SUMMARY

T4S, R40E, SEC.34
UNION COUNTY, WA.
45°10'10.22"N 117°47'58.49"W



VICINTIY MAP

PROJECT LOCATION

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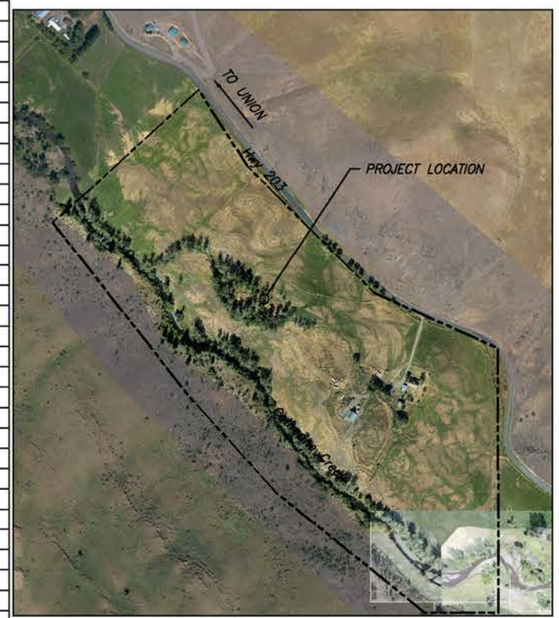
SCALE OF FEET



LOCATION MAP

500 0 500 1000 1500
SCALE OF FEET

SHEET	SHEET NUMBER	SHEET TITLE
1	1678-100-2011	COVER SHEET
2	1678-100-2012	GENERAL NOTES & ABBREVIATIONS
3	1678-100-2013	SURVEY CONTROL
4	1678-100-2014	EXISTING CONDITIONS - PARCEL 3
5	1678-100-2015	PROPOSED CONDITIONS - PARCEL 3
6	1678-100-2016	ACCESS & STAGING - YEAR 1 5+00 TO 33+00
7	1678-100-2017	ACCESS & STAGING - YEAR 1 33+00 TO 55+00
8	1678-100-2018	ACCESS & STAGING - YEAR 2 5+00 TO 33+00
9	1678-100-2019	ACCESS & STAGING - YEAR 2 33+00 TO 55+00
10	1678-100-2020	ACCESS & STAGING - STOCKPILE & TEMPORARY BRIDGE DETAILS
11	1678-100-2021	DEWATERING PLAN - YEAR 1 0+00 TO 32+00
12	1678-100-2022	DEWATERING PLAN - YEAR 1 32+00 TO 48+50
13	1678-100-2023	DEWATERING PLAN - UPSTREAM CONNECTION
14	1678-100-2024	DEWATERING PLAN - MIDDLE CONNECTION
15	1678-100-2025	DEWATERING PLAN - DOWNSTREAM CONNECTION
16	1678-100-2026	DEWATERING PLAN - DEWATERING DETAILS
17	1678-100-2027	DEWATERING PLAN - CHANNEL DIVERSION PROCEDURE
18	1678-100-2028	EARTHWORK CUT & FILL AREAS
19	1678-100-2029	GRADING PLAN OVERVIEW - PARCEL 3
20	1678-100-2030	GRADING PLAN - STA 6+00 TO 21+00
21	1678-100-2031	GRADING PLAN - STA 21+00 TO 34+00
22	1678-100-2032	GRADING PLAN - STA 34+00 TO 50+00
23	1678-100-2033	GRADING PLAN - STA 50+00 TO 60+00
24	1678-100-2034	GRADING PLAN - IRRIGATION DITCH FILL
25	1678-100-2035	GRADING PLAN - IRRIGATION DITCH FILL
26	1678-100-2036	GRADING PLAN - IRRIGATION DITCH FILL
27	1678-100-2037	MAIN CHANNEL PLAN & PROFILE-STA 5+00-10+00
28	1678-100-2038	MAIN CHANNEL PLAN & PROFILE-STA 10+00-15+00
29	1678-100-2039	MAIN CHANNEL PLAN & PROFILE-STA 15+00-19+50
30	1678-100-2040	MAIN CHANNEL PLAN & PROFILE-STA 19+50-25+00
31	1678-100-2041	MAIN CHANNEL PLAN & PROFILE-STA 25+00-30+00
32	1678-100-2042	MAIN CHANNEL PLAN & PROFILE-STA 30+00-35+00
33	1678-100-2043	MAIN CHANNEL PLAN & PROFILE-STA 35+00-40+00
34	1678-100-2044	MAIN CHANNEL PLAN & PROFILE-STA 40+00-45+00
35	1678-100-2045	MAIN CHANNEL PLAN & PROFILE-STA 45+00-49+85
36	1678-100-2046	MAIN CHANNEL PLAN & PROFILE-STA 49+85-51+50
37	1678-100-2047	MAIN CHANNEL CROSS SECTIONS-STA 6+50-9+25
38	1678-100-2048	MAIN CHANNEL CROSS SECTIONS-STA 9+55-12+00
39	1678-100-2049	MAIN CHANNEL CROSS SECTIONS-STA 12+45-15+30
40	1678-100-2050	MAIN CHANNEL CROSS SECTIONS-STA 15+90-20+80
41	1678-100-2051	MAIN CHANNEL CROSS SECTIONS-STA 21+13-24+90
42	1678-100-2052	MAIN CHANNEL CROSS SECTIONS-STA 26+05-29+25
43	1678-100-2053	MAIN CHANNEL CROSS SECTIONS-STA 30+02-33+20
44	1678-100-2054	MAIN CHANNEL CROSS SECTIONS-STA 33+50-35+94
45	1678-100-2055	MAIN CHANNEL CROSS SECTIONS-STA 36+30-38+92
46	1678-100-2056	MAIN CHANNEL CROSS SECTIONS-STA 39+40-41+45
47	1678-100-2057	MAIN CHANNEL CROSS SECTIONS-STA 42+25-45+70
48	1678-100-2058	MAIN CHANNEL CROSS SECTIONS-STA 46+05-49+45
49	1678-100-2059	MAIN CHANNEL - CROSS SECTIONS - STA 49+97

SHEET	SHEET NUMBER	SHEET TITLE
50	1678-100-2060	SOD SALVAGE AREAS - PLAN
51	1678-100-2061	TOPSOIL PLACEMENT AREAS - PLAN
52	1678-100-2062	TYPICAL POINT BAR POOL DETAIL - SECTION
53	1678-100-2063	RIFFLE AND GLIDE CONSTRUCTION - DETAILS
54	1678-100-2064	EXISTING CHANNEL FILL - PLAN & SECTIONS
55	1678-100-2065	EXISTING CHANNEL FILL - PLAN & SECTIONS
56	1678-100-2066	EXISTING CHANNEL FILL - PLAN & SECTIONS
57	1678-100-2067	EXCESS FILL AREA - DETAILS
58	1678-100-2068	SIDE CHANNEL 1 - PLAN, PROFILE, & SECTIONS
59	1678-100-2069	SIDE CHANNEL 1 - PLAN, & PROFILE
60	1678-100-2070	SIDE CHANNEL 1 - PLAN, & PROFILE
61	1678-100-2071	SIDE CHANNEL 1 - CROSS SECTIONS
62	1678-100-2072	SIDE CHANNEL 2 - PLAN & PROFILE
63	1678-100-2073	SIDE CHANNEL 2 - SECTIONS
64	1678-100-2074	FLOOD SWALE COMPLEX 1 - PLAN
65	1678-100-2075	FLOOD SWALE COMPLEX 1 - SWALE A & CHANNEL A PLAN & PROFILE
66	1678-100-2076	FLOOD SWALE COMPLEX 1 - SWALE A & CHANNEL A PLAN & PROFILE
67	1678-100-2077	FLOOD SWALE COMPLEX 1 - SWALE B & CHANNEL B PLAN & PROFILE
68	1678-100-2078	FLOOD SWALE COMPLEX 1 - CHANNEL C & CHANNEL D PLAN & PROFILE
69	1678-100-2079	FLOOD SWALE COMPLEX 1 - SECTION VIEW
70	1678-100-2080	FLOOD SWALE COMPLEX 1 - SECTION VIEW
71	1678-100-2081	FLOOD SWALE COMPLEX 1 - SECTION VIEW
72	1678-100-2082	FLOOD SWALE COMPLEX 2 - PLAN
73	1678-100-2083	FLOOD SWALE COMPLEX 2 - SWALE A & CHANNEL A PLAN & PROFILE
74	1678-100-2084	FLOOD SWALE COMPLEX 2 - SWALE B & CHANNEL B PLAN & PROFILE
75	1678-100-2085	FLOOD SWALE COMPLEX 2 - SWALE C & CHANNEL C PLAN & PROFILE
76	1678-100-2086	FLOOD SWALE COMPLEX 2 - SWALE D, SWALE E, & CHANNEL D PLAN & PROFILE
77	1678-100-2087	FLOOD SWALE COMPLEX 2-SWALE A-SECTION VIEW
78	1678-100-2088	FLOOD SWALE COMPLEX 2-SWALE B & C-SECTION VIEW
79	1678-100-2089	FLOOD SWALE COMPLEX 2-SWALE D & E - SECTION VIEW
80	1678-100-2090	FLOOD SWALE COMPLEX 3 - PLAN
81	1678-100-2091	FLOOD SWALE COMPLEX 3 - SWALE A & CHANNEL A PLAN & PROFILE
82	1678-100-2092	FLOOD SWALE COMPLEX 3 - SWALES B & C, CHANNEL B - PLAN & PROFILE
83	1678-100-2093	FLOOD SWALE COMPLEX 3 - SWALES A, B, & C - SECTION VIEW
84	1678-100-2094	FLOOD SWALE 4 - PLAN
85	1678-100-2095	FLOOD SWALE 4 - SWALE A & CHANNEL A PLAN & PROFILE
86	1678-100-2096	FLOOD SWALE 4 - SWALE B, CHANNEL B, & ALCOVE 2 PLAN & PROFILE
87	1678-100-2097	FLOOD SWALE 4 - SWALE C & CHANNEL C PLAN & PROFILE
88	1678-100-2098	FLOOD SWALE 4 - SWALE D & E PLAN & PROFILE
89	1678-100-2099	FLOOD SWALE 4 SWALE A SECTIONS
90	1678-100-2100	FLOOD SWALE 4 SWALE B SECTIONS
91	1678-100-2101	FLOOD SWALE 4 SWALE C SECTIONS
92	1678-100-2102	FLOOD SWALE 4 SWALE D & E SECTIONS

SHEET	SHEET NUMBER	SHEET TITLE
93	1678-100-2103	FLOOD SWALE 5 - PLAN
94	1678-100-2104	FLOOD SWALE 5 - CHANNEL A PLAN & PROFILE
95	1678-100-2105	FLOOD SWALE 5 - CHANNEL A PLAN & PROFILE
96	1678-100-2106	FLOOD SWALE 5 - CHANNEL B & C PLAN & PROFILE
97	1678-100-2107	FLOOD SWALE 5 - CHANNEL A SECTIONS
98	1678-100-2108	FLOOD SWALE 5 - CHANNEL B & C SECTIONS
99	1678-100-2109	FLOOD SWALE COMPLEX 6 - PLAN
100	1678-100-2110	FLOOD SWALE COMPLEX 6 - SWALE A & CHANNEL A PLAN & PROFILE
101	1678-100-2111	FLOOD SWALE COMPLEX 6 - SWALE B & CHANNEL B - PLAN & PROFILE
102	1678-100-2112	FLOOD SWALE COMPLEX 6 - SWALE A & SWALE B SECTIONS
103	1678-100-2113	ALCOVE 1 DETAILS - PLAN, PROFILE, & SECTIONS
104	1678-100-2114	ALCOVE 3 DETAILS - PLAN, PROFILE, & SECTIONS
105	1678-100-2115	EXISTING CHANNEL FILL PLUGS & BLIND CHANNEL DETAILS
106	1678-100-2116	LWM PLAN - YEAR 1 2+50 TO 13+00
107	1678-100-2117	LWM PLAN - YEAR 1 13+00 TO 23+00
108	1678-100-2118	LWM PLAN - YEAR 1 23+00 TO 33+00
109	1678-100-2119	LWM PLAN - YEAR 1 33+00 TO 44+50
110	1678-100-2120	LWM PLAN - YEAR 1 44+50 TO 51+00
111	1678-100-2121	LWM PLAN - YEAR 1 SIDE CHANNEL 1
112	1678-100-2122	LWM PLAN - YEAR 1 SIDE CHANNEL 1
113	1678-100-2123	LWM PLAN - YEAR 2 3+00 TO 14+25
114	1678-100-2124	LWM PLAN - YEAR 2 14+25 TO 25+00
115	1678-100-2125	LWM PLAN - YEAR 2 25+00 TO 35+50
116	1678-100-2126	LWM PLAN - YEAR 2 35+50 TO 44+00
117	1678-100-2127	LWM PLAN - YEAR 2 46+25 TO 57+00
118	1678-100-2128	LWM DETAILS - UPSTREAM BEND COMPONENT
119	1678-100-2129	LWM DETAILS - UPSTREAM BEND COMPONENT
120	1678-100-2130	LWM DETAILS - MIDDLE BEND COMPONENT
121	1678-100-2131	LWM DETAILS - MIDDLE BEND COMPONENT
122	1678-100-2132	LWM DETAILS - MIDDLE BEND COMPONENT
123	1678-100-2133	LWM DETAILS - DOWNSTREAM BEND COMPONENT
124	1678-100-2134	LWM DETAILS - DOWNSTREAM BEND COMPONENT
125	1678-100-2135	LWM DETAILS - DOWNSTREAM BEND COMPONENT
126	1678-100-2136	LWM DETAILS - SMALL APEX JAM
127	1678-100-2137	LWM DETAILS - SIDE CHANNEL 1 INLET STRUCTURE
128	1678-100-2138	LWM DETAILS - SIDE CHANNEL 1 INLET STRUCTURE
129	1678-100-2139	LWM DETAILS - STREAMBANK HABITAT STRUCTURE
130	1678-100-2140	LWM DETAILS - STREAMBANK HABITAT STRUCTURE
131	1678-100-2141	LWM DETAILS - SWEEPER LOG STRUCTURE
132	1678-100-2142	LWM DETAILS - SWEEPER LOG STRUCTURE
133	1678-100-2143	LWM DETAILS - HIGH ENERGY BANK STRUCTURE
134	1678-100-2144	LWM DETAILS - HIGH ENERGY BANK STRUCTURE
135	1678-100-2145	LWM DETAILS - HIGH ENERGY BANK STRUCTURE
136	1678-100-2146	LWM DETAILS - LARGE APEX JAM
137	1678-100-2147	LWM DETAILS - ON SITE WALNUT TREE & BANK LOG WITH BOULDERS
138	1678-100-2148	LWM DETAILS -LARGE GRAVEL BAR TREE
139	1678-100-2149	LWM DETAILS - BANK ROUGHNESS ELEMENTS
140	1678-100-2150	LWM DETAILS - FLOODPLAIN ROUGHNESS ELEMENTS
141	1678-100-2151	LWM DETAILS - BRUSH MATTRESS & EDGE ROUGHNESS

RECLAMATION
Managing Water in the West

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FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN

CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

Joy B. Hovde
DESIGNED
JH/KK
DRAWN
Mike Knutson P.E.
CHECKED
Joy B. Hovde P.E.
TECH. APPR.
Steve Montague - Acting
APPROVED
ADMIN APPROVAL - PROGRAM MANAGER
BOISE, IDAHO 2015-09-14

COVER SHEET

1678-100-2011

SHEET 1 OF 2

DATE AND TIME PLOTTED
AUGUST 14, 2015 11:38
PLOTTED BY
KKORTHALS

CAD SYSTEM
AutoCAD Rel. 20.0s
CAD FILENAME
01_1678-100-T1.DWG

GENERAL NOTES:

1. Work shown on these plans will be performed for the Confederated Tribes of the Umatilla Indian Reservation (CTUIR), herein referred to as "Contracting Agency." Contact information for Contracting Agency's representative is included on Sheet 1678-100-2011. Contracting Agency's representative (or other persons assigned by Contracting Agency to act as Contracting Agency's representative) are herein referred to as the "Contracting Officer."
2. The drawings contained within should not be applied to any project except the one specified; specifically the habitat enhancements on Catherine Creek within the project boundary for CC-44 PHASE III – Parcel 3 as seen on the cover sheet.
3. The Contractor shall construct the stream enhancement in accordance with the plans stamped "Approved for Construction." These plans will be provided to the Contractor by the Contracting Agency prior to construction. Work shall not be done without the current set of approved construction plans.
4. The enhancement designs depicted herein are approximate and are intended to express the overall design intent of the project. These designs may need to be adjusted in the field during construction in order to meet the specific site conditions and intended function. Adjustments are to be authorized by the Contracting Officer after consensus with the "Engineer".
5. Elevations and distances shown are in feet and decimals.
6. Horizontal datum is US State Plane Coordinate System, Oregon North Zone, NAD 83, International Feet. The vertical datum is NAVD 88, feet.
7. Topographic mapping within stream banks of the project area is based on surveys performed with ground survey equipment. Topographic mapping outside of the stream banks is based on LiDAR imaging. Due to continued evolution of the channel, the geometry of the stream at the time of construction could be different than shown on these plans.
8. Existing underground utility locations have not been completely identified and may not be shown on these plans. The Contractor is responsible to locate utilities prior to construction and protect utilities during construction. The telephone number for the one call center for utility locates is 1-800-424-5555.
9. The Contractor shall pursue work in a continuous and diligent manner to ensure a timely completion of the project.
10. The Contractor shall be responsible for the general safety during construction, and all work shall conform to pertinent safety regulations and codes. The Contractor shall be solely and completely responsible for compliance with all applicable provisions of OSHA and OAR Chapter 437, in the construction practices for all employees directly engaged in the construction of this project.
11. All material and workmanship furnished on or for the project must meet the minimum requirements of project permits, approving agencies, specifications as set forth herein, or whichever is more restrictive.
12. Contractor shall be responsible for obtaining, at Contractor's expense, all construction permits as required by local, state and federal agencies. Contractor shall provide all material, labor, and equipment required to comply with all applicable permit conditions and requirements.
13. Contractor shall confirm the access point, route(s), and locations of temporary staging and storage areas with the Contracting Officer prior to transporting materials and equipment to the project site.
14. Prior to commencement of work, Contractor shall provide the Contracting Agency with a detailed construction schedule and work plan for approval. The Contractor shall not begin any construction work until the project schedule and work plan is approved by the Contracting Officer.
15. All construction shall be closely coordinated with the Contracting Officer so that the quality of work can be checked for approval.
16. All work within the actively flowing channel or side channels of Catherine Creek shall occur only within the allowable fish window (July 1 – August 15).
17. Anytime work occurs within the actively flowing channel, the Contractor shall monitor turbidity in the creek once per hour at a location 100 feet downstream of the construction activity using turbidity monitoring equipment provided by the Contracting Officer. Turbidity in the creek shall be limited to the levels listed in the permits and specifications, and the Contractor shall modify work procedures if necessary as listed in the specifications. The Contracting Officer will assist the Contractor during initial measurements to ensure the Contractor is using the testing equipment correctly, however, the Contractor will be responsible to perform all measurements and maintain a log that documents the dates, times, and turbidity levels of all measurements taken.
18. The Contractor shall notify the Contracting Officer a minimum of 5 working days in advance of in-channel work and work area isolation to coordinate fish removal. The Contracting Agency will be responsible for all fish removal and handling.
19. Fish exclusion shall be conducted in this project area prior to any dewatering activities or construction within or directly connected to the existing channel of Catherine Creek. Fish exclusion shall be conducted by the Contracting Agency.
20. The Contractor shall install and maintain appropriate sediment control devices throughout the project site, including the construction staging area and stockpile area throughout the projects' construction. Temporary construction and permanent erosion control measures shall be designed, constructed and maintained in accordance with all applicable local, state and federal regulations.
21. Dewatering of work areas shall be performed to the extent that at LWM structures standing water is no deeper than the diameter of the log(s) on the lowest layer of the structure, and at constructed channel areas the depth of water in the work zone is shallow enough so that the Contracting Officer can easily verify the finished channel bed elevation. Discharge from dewatering within the work area shall be routed to floodplain areas to allow the removal of fine sediments or other contaminant prior to reentering Catherine Creek. All pumps used in the active channel by the Contractor for dewatering of areas in or directly connected to the actively flowing creek channel shall have screened intakes that meet Oregon Department of Fish and Wildlife specifications and National Oceanic and Atmospheric Administration (NOAA) juvenile fish screening criteria. All dewatering during Year 1 will not require screened intakes.
22. Discharges entering active streams on site shall satisfy all state and federal standards and project permit requirements for contaminants and turbidity.
23. Construction shall minimize disturbance to and maximize reuse of existing riparian vegetation per the sod salvage areas shown on the plans.
24. All excavated soil not used as part of channel or floodplain construction shall be disposed of on-site at locations shown on these drawings or as directed by the Contracting Officer.
25. The Engineers responsible for the preparation of these drawings and specifications will not be responsible for, or liable for, unauthorized changes to, or use of, these drawings. All changes to constructed features that varies from the drawings and specifications must be in writing and approved by the Engineer responsible for the preparations of the drawings and specifications.
26. Record Drawings (as-built drawings) shall be accurately recorded by the Contractor for future use, reference and monitoring. The Contractor shall be responsible to accurately record any alterations from the Construction Documents with red pen on a set of hand marked record drawings. Submittal of Record Drawings is a condition of final acceptance.

ABBREVIATIONS

T	Township
R	Range
Sec.	Section
ID	Idaho
OR	Oregon
U.S.	United States
NAD	North American Datum
NAVD	North American Vertical Datum
FCRPS	Federal Columbia River Power System
CSRO	Columbia-Snake Salmon Recovery Office
OSHA	Occupational Safety and Health Administration
OAR	Oregon Administrative Rules
CP	Control Point
STA, Sta.	Station
O.G.	Original Grade
F.G.	Finished Grade
OHW	Ordinary High Water
WSE	Water Surface Elevation
CY	Cubic Yard
SY	Square Yard
LF	Linear Feet

SUMMARY OF QUANTITIES (Year 1 and Year 2)

BID ITEM	YEAR 1 QTY	YEAR 2 QTY	TOTAL QTY	UNIT	DESCRIPTION
1	1	1	2	Lump Sum	Mobilization and Demobilization
2	1	1	2	Lump Sum	Environmental Controls (SWPPP, ESC, Etc.)
3	1	1	2	Lump Sum	Temporary Haul Roads
4	1000	1000	2000	SY	Temporary Access Road Stabilization
5	–	2	2	Each	Temporary Bridge Crossing
6	–	1	1	Lump Sum	Cofferdams and Temporary Diversion Dams
7	1	1	2	Lump Sum	Dewatering
8	3	10	13	Acre	Site Clearing
9	22473	8671	31144	CY	Floodplain Excavation (includes SC1, SC2, ALC1, ALC3, SWC1 to SWC6)
10	21027	2667	23694	CY	Main Channel Excavation
11	5445	–	5445	CY	Riffle Overexcavation
12	5445	–	5445	CY	Riffle Material Screening
13	5445	–	5445	CY	Riffle Construction
14	615	49314	49929	CY	Excavated Material Placed and Compacted as Fill
15	525	–	525	Each	Riffle In-Channel Habitat Boulders (316 small, 209 large)
16	38	5	43	Each	Three log Bank Roughness Element
17	9	–	9	Each	Tree Top Bank Roughness Element
18	12	4	16	Each	Upstream Bend Component
19	17	2	19	Each	Middle Bend Component
20	10	2	12	Each	Downstream Bend Component
21	5	1	6	Each	Small Apex Jam
22	10	7	17	Each	Large Gravel Bar Tree
23	1	–	1	Each	Side Channel 1 Inlet Structure
24	2	4	6	Each	Streambank Habitat Structure
25	3	2	5	Each	Sweeper Log Structure
26	3	1	4	Each	High Energy Bank Structure
27	–	4	4	Each	Onsite Walnut Tree Placement
28	–	1	1	Each	Large Apex Jam
29	–	2	2	Each	Bank Log with Boulders
30	465	105	570	LF	Edge Roughness
31	885	695	1580	LF	Brush Mattress
32	100	100	200	Each	Two log Floodplain Roughness Element
33	18	24	42	Each	Single Log With Rootwad on Floodplain
34	100	100	200	Each	Tree Top With Branches on Floodplain
35	28	78	106	Each	Tree Top Floodplain Roughness Element
36	150	50	200	Each	Large Racking Member (12"-8")
37	150	50	200	Each	Small Racking Member (8"-4")
38	2000	1000	3000	CY	Slash Material
39	20	20	40	Acre	Straw Mulch
40	1	1	2	Lump Sum	Site Cleanup
41	8611	2264	10875	CY	Sod Salvage, Maintain, and Transplant
42	20	20	40	Hours	Track Hoe (300 Series)
43	80	80	160	Hours	Track Hoe (200 Series)
44	60	60	120	Hours	Dozer (D5 or D6)
45	40	40	80	Hours	Dump Truck (Off-road)
46	20	20	40	Hours	End Dump (30-Foot)

RECLAMATION
Managing Water in the West

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COLUMBIA/SNAKE RIVER SALMON RECOVERY PROGRAM
FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN

CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

SCALE	DATE	DESIGN MODIFICATIONS
NO	2015-10-09	100 Corrected font size of abbreviations and added footer quantity
1	Jeffrey J. Fedko P.E.	

Jay B. Hovde
DESIGNED
JH/KK
DRAWN
Mike Knutson P.E.
CHECKED
Jay B. Hovde P.E.
TECH. APPR.
Steve Montague – Acting
APPROVED
ADMIN APPROVAL – PROGRAM MANAGER
BOISE, IDAHO 2015-09-14

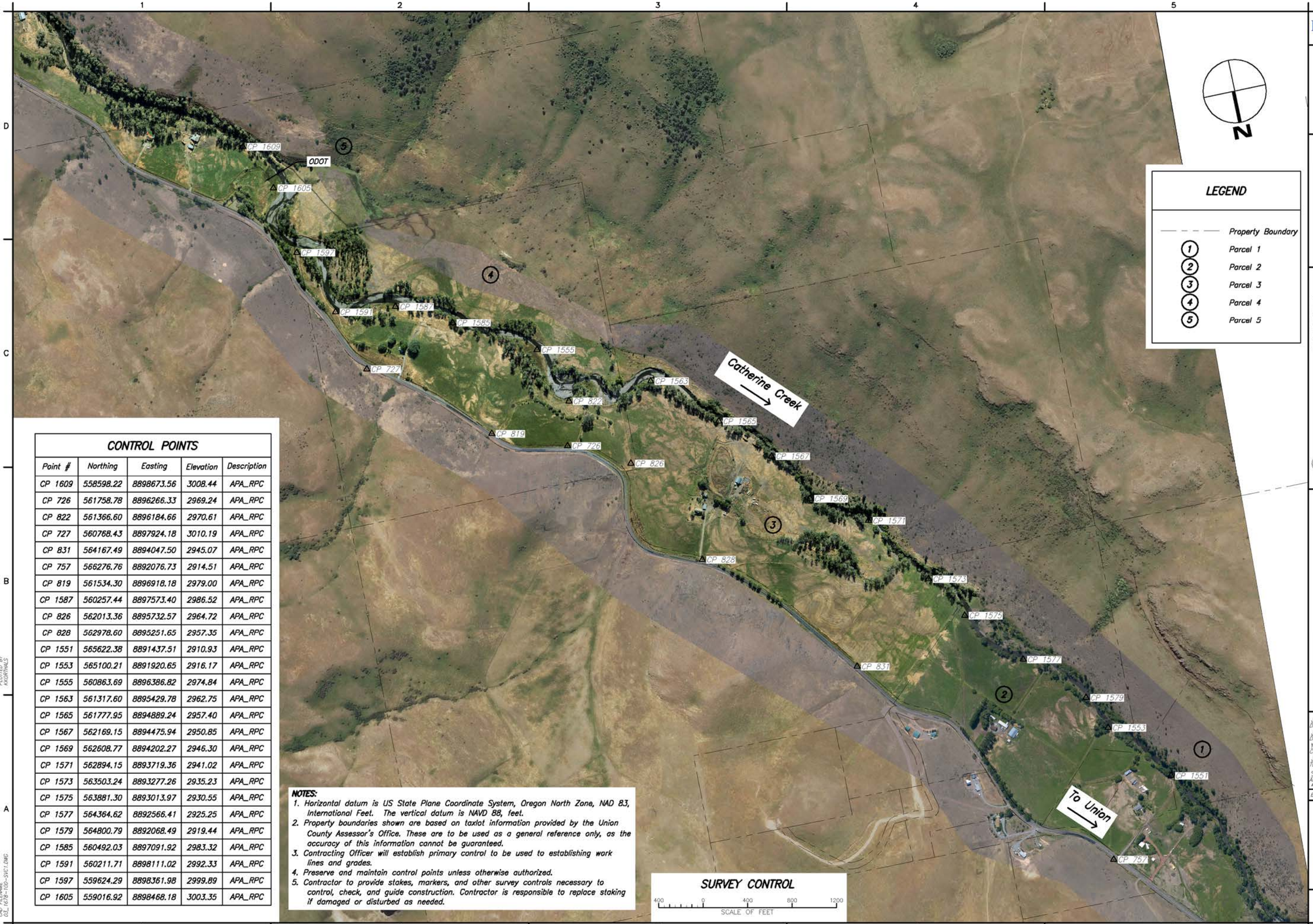
GENERAL NOTES AND ABBREVIATIONS

1678-100-2012

SHEET 2 OF 2

DATE AND TIME PLOTTED
OCTOBER 30, 2015 8:45
PLOTTED BY
AHATCH

CAD SYSTEM
AutoCAD Rel. 20.0s
CAD FILENAME
1678-100-2012_REV1



CONTROL POINTS

Point #	Northing	Easting	Elevation	Description
CP 1609	558598.22	8898673.56	3008.44	APA_RPC
CP 726	561758.78	8896266.33	2969.24	APA_RPC
CP 822	561366.60	8896184.66	2970.61	APA_RPC
CP 727	560768.43	8897924.18	3010.19	APA_RPC
CP 831	564167.49	8894047.50	2945.07	APA_RPC
CP 757	566276.76	8892076.73	2914.51	APA_RPC
CP 819	561534.30	8896918.18	2979.00	APA_RPC
CP 1587	560257.44	8897573.40	2986.52	APA_RPC
CP 826	562013.36	8895732.57	2964.72	APA_RPC
CP 828	562978.60	8895251.65	2957.35	APA_RPC
CP 1551	565622.38	8891437.51	2910.93	APA_RPC
CP 1553	565100.21	8891920.65	2916.17	APA_RPC
CP 1555	560863.69	8896386.82	2974.84	APA_RPC
CP 1563	561317.60	8895429.78	2962.75	APA_RPC
CP 1565	561777.95	8894889.24	2957.40	APA_RPC
CP 1567	562169.15	8894475.94	2950.85	APA_RPC
CP 1569	562608.77	8894202.27	2946.30	APA_RPC
CP 1571	562894.15	8893719.36	2941.02	APA_RPC
CP 1573	563503.24	8893277.26	2935.23	APA_RPC
CP 1575	563881.30	8893013.97	2930.55	APA_RPC
CP 1577	564364.62	8892566.41	2925.25	APA_RPC
CP 1579	564800.79	8892068.49	2919.44	APA_RPC
CP 1585	560492.03	8897091.92	2983.32	APA_RPC
CP 1591	560211.71	8898111.02	2992.33	APA_RPC
CP 1597	559624.29	8898361.98	2999.89	APA_RPC
CP 1605	559016.92	8898468.18	3003.35	APA_RPC

NOTES:

1. Horizontal datum is US State Plane Coordinate System, Oregon North Zone, NAD 83, International Feet. The vertical datum is NAVD 88, feet.
2. Property boundaries shown are based on taxlot information provided by the Union County Assessor's Office. These are to be used as a general reference only, as the accuracy of this information cannot be guaranteed.
3. Contracting Officer will establish primary control to be used to establishing work lines and grades.
4. Preserve and maintain control points unless otherwise authorized.
5. Contractor to provide stakes, markers, and other survey controls necessary to control, check, and guide construction. Contractor is responsible to replace staking if damaged or disturbed as needed.

LEGEND

- Property Boundary
- (1) Parcel 1
- (2) Parcel 2
- (3) Parcel 3
- (4) Parcel 4
- (5) Parcel 5

SURVEY CONTROL

400 0 400 800 1200
SCALE OF FEET

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BUREAU OF RECLAMATION
COLUMBIA/SNAKE RIVER SALMON RECOVERY PROGRAM
FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN

CC-44 PHASE III HABITAT ENHANCEMENT PARCEL 3

Jay B. Hovde
DESIGNED
JH/JET/KK
DRAWN
Mike Knutson P.E.
CHECKED
Jay B. Hovde P.E.
TECH. APPR.
Steve Montague – Acting
APPROVED
ADMIN. APPROVAL – PROGRAM MANAGER
BOISE, IDAHO 2015-09-14

SURVEY CONTROL

1678-100-2013

SHEET 1 OF 1

DATE AND TIME PLOTTED
AUGUST 14, 2015 11:53
PLOTTED BY
KKORTHALS

CAD SYSTEM
AutoCAD Rel. 20.0s
CAD FILENAME
01_1678-100-SVC1.DWG

Catherine Creek Flow

Downstream limits of project

Maintain and protect existing infrastructure

Upstream limits of project

Phase II pipeline alignment

Phase II 6" farm delivery

Maintain and protect existing infrastructure

Phase II 6" farm delivery

HWY 203

Existing driveway access

LEGEND

- Existing Wetland
- OHW — Existing OHW
- Parcel Boundary
- POWER — Overhead Power Lines (locations approx.)

EXISTING CONDITIONS PARCEL 3

150 0 150 300 450

SCALE OF FEET

RECLAMATION
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COLUMBIA/SNAKE RIVER SALMON RECOVERY PROGRAM
FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN

CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

Jay B. Hovde
DESIGNED
JH / JET/KK
DRAWN
Mike Knutson P.E.
CHECKED
Jay B. Hovde P.E.
TECH. APPR.
Steve Montague – Acting
APPROVED
ADMIN APPROVAL – PROGRAM MANAGER

BOISE, IDAHO 2015-09-14

EXISTING CONDITIONS

PLAN

1678-100-2014

SHEET 1 OF 1

DATE AND TIME PLOTTED
AUGUST 14, 2015 15:33
PLOTTED BY
KKOKRTHALS

CAD SYSTEM
AutoCAD Rel. 20.0s
CAD FILENAME
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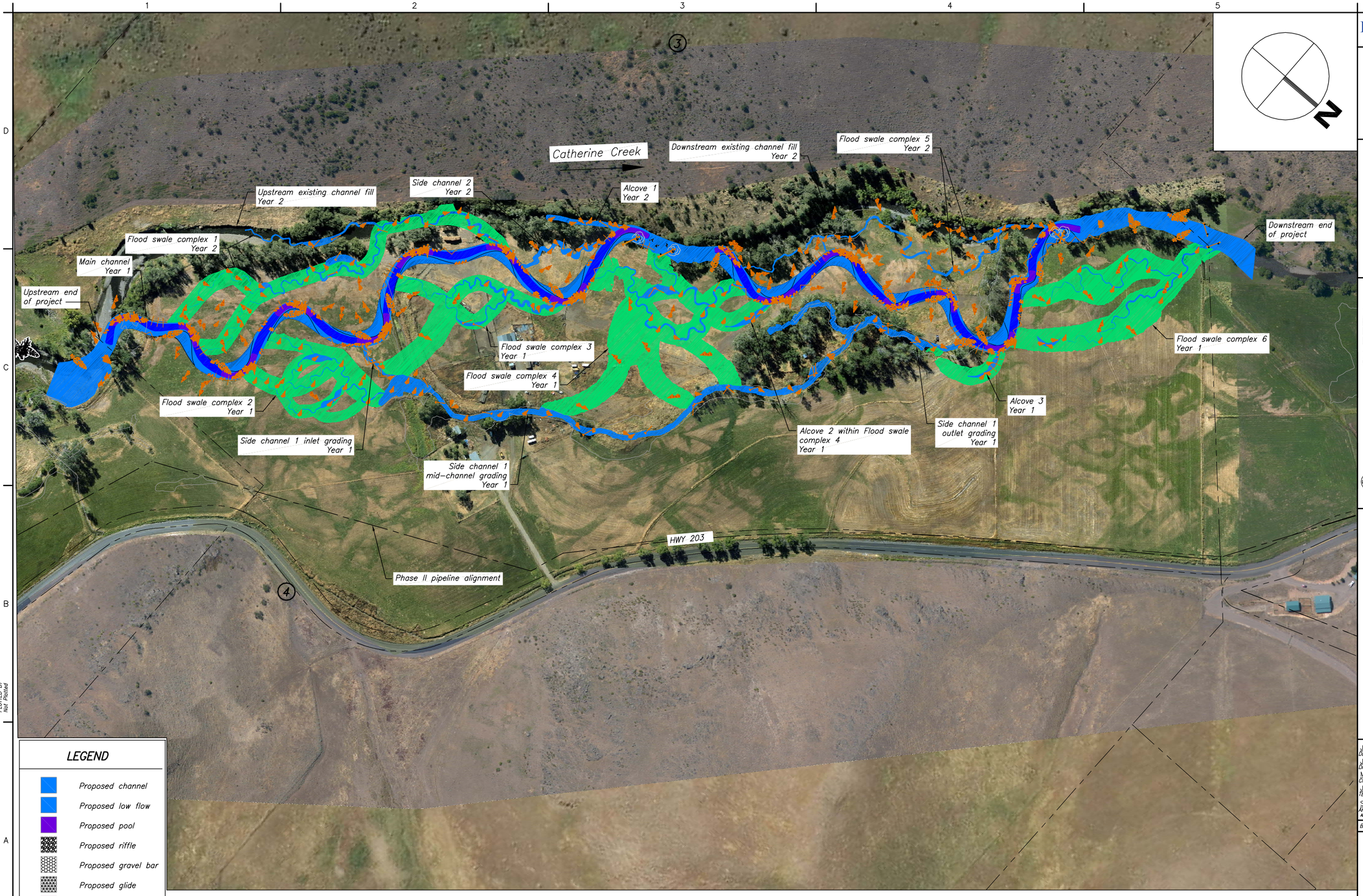

LEGEND

- Proposed channel
- Proposed low flow
- Proposed pool
- Proposed riffle
- Proposed gravel bar
- Proposed glide
- Proposed swale
- Large Woody Material
- Parcel Boundary

PROPOSED CONDITIONS
PARCEL 3

150 0 150 300 450
SCALE OF FEET

RECLAMATION
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COLUMBIA/SNAKE RIVER SALMON RECOVERY PROGRAM
FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN

CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

Jeffrey J Fealko P.E.
DESIGNED
JJF
DRAWN
Mike Knutson P.E.
CHECKED
Jay B Hovde P.E.
TECH. APPR.
Steve Montague-Acting
APPROVED
ADMIN. APPROVAL - PROGRAM MANAGER

BOISE, IDAHO 2015-09-14

PROPOSED CONDITIONS

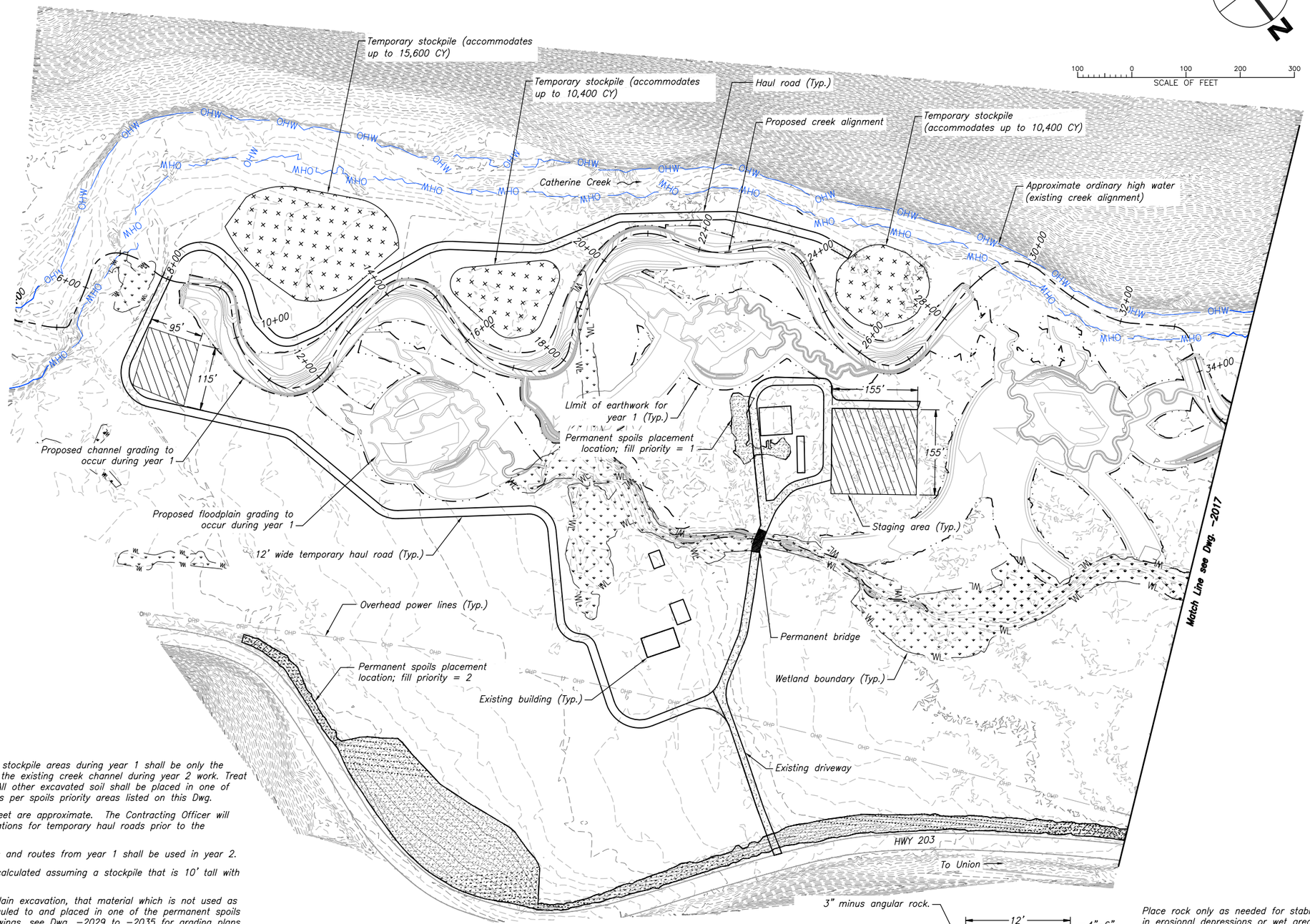
PLAN

1678-100-2015
SHEET 1 OF 1

DATE AND TIME PLOTTED
Not Plotted
PLOTTED BY
Not Plotted

CAD SYSTEM
AUTOCAD
CAD FILENAME
UNKNOWN

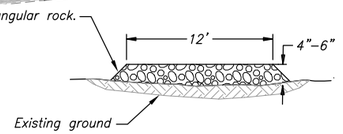
REGISTERED PROFESSIONAL ENGINEER
83129PE
OREGON
JULY 14, 2006
MARTIN K. FISHER
9/1/15
RENEWAL DATE: 12/31/2015



NOTES:

1. Material placed in designated temporary stockpile areas during year 1 shall be only the material necessary for fill placement in the existing creek channel during year 2 work. Treat stockpiles as shown on Dwg. -2020. All other excavated soil shall be placed in one of the permanent spoils placement locations per spoils priority areas listed on this Dwg.
2. Temporary haul roads shown on this sheet are approximate. The Contracting Officer will stake or similarly identify the exact locations for temporary haul roads prior to the beginning of construction.
3. Whenever possible, temporary haul roads and routes from year 1 shall be used in year 2.
4. Volumes for temporary stockpiles were calculated assuming a stockpile that is 10' tall with 2:1 side slopes.
5. All excess soil from channel and floodplain excavation, that material which is not used as fill to construct the project, shall be hauled to and placed in one of the permanent spoils placement location shown on these Drawings, see Dwg. -2029 to -2035 for grading plans. Permanent spoils placement locations are listed on these Drawings with labels that identify the order of preference for use. Priority 1 area shall be completely filled before any fill is placed in priority 2 area, etc.
6. Dust control shall be implemented during the entire length of the project. Spray haul roads with water as needed to prevent dust generation. Dewatering water from isolated work areas that has passed through fish screens may be used for dust control as approved by the Contracting Officer.

YEAR 1 STA. 5+00 TO 35+00



STABILIZED HAUL ROAD DETAIL
NTS

Place rock only as needed for stabilization in erosional depressions or wet areas along haul roads.

RECLAMATION
Managing Water in the West

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FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN

CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

A. NELSON
DRAWN

X Jay Hovde
ACCEPTED
NAME
TITLE

BOISE, ID 2015-09-11

ACCESS & STAGING

YEAR 1
5+00 TO 35+00

1678-100-2016

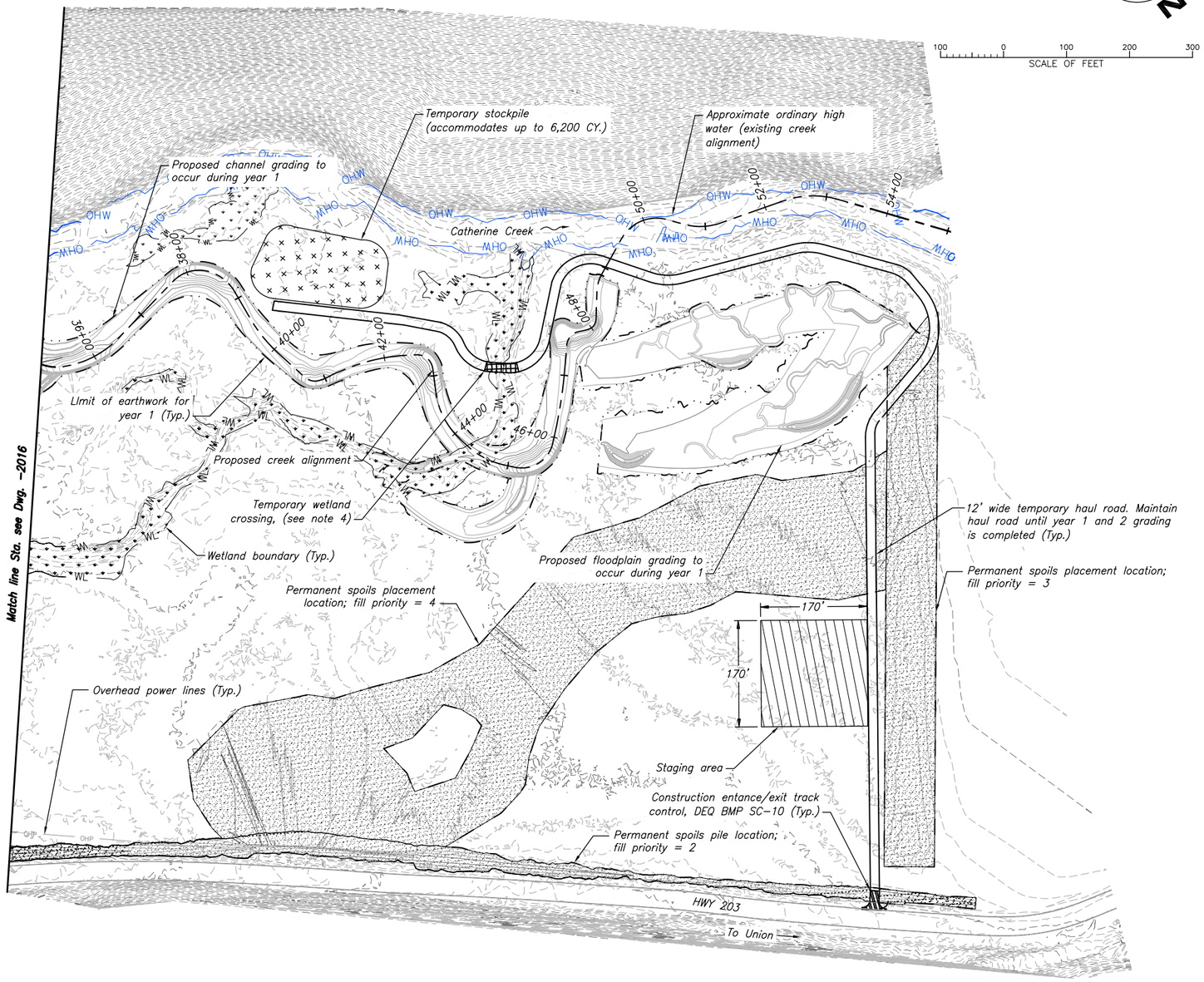
SHEET 1 OF 5

DATE AND TIME PLOTTED
August 24, 2015 08:38
PLOTTED BY
FISHER, MARTIN

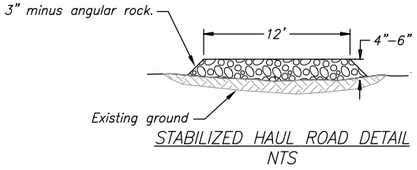
CAD SYSTEM
AutoCAD Civil 3D 2014
CAD FILENAME
CC44_Phase_3-4_Parcel3_Access_Staging.dwg

REGISTERED PROFESSIONAL ENGINEER
83129PE
OREGON
JULY 14, 2009
MARTIN K. FISHER
9/1/15

RENEWAL DATE: 12/31/2015



YEAR 1 STA. 35+00 TO 55+00



STABILIZED HAUL ROAD DETAIL
NTS

Place rock only as needed for stabilization in erosional depressions or wet areas along haul roads.

NOTES:

1. Material placed in designated temporary stockpile areas during year 1 shall be only the material necessary for fill placement in the existing creek channel during year 2 work. Treat stockpiles as shown on Dwg. -2020. All other excavated soil shall be placed in one of the permanent spoils placement locations per spoils priority areas listed on this Dwg.
2. Temporary haul roads shown on this sheet are approximate. The Contracting Officer will stake or similarly identify the exact locations for temporary haul roads prior to the beginning of construction.
3. Whenever possible, temporary haul roads and routes from year 1 shall be used in year 2.
4. Volumes for temporary stockpiles were calculated assuming a stockpile that is 10' tall with 2:1 side slopes.
5. All excess soil from channel and floodplain excavation, that material which is not used as fill to construct the project, shall be hauled to and placed in one of the permanent spoils placement location shown on these Drawings, see Dwg. -2029 to -2035 for grading plans. Permanent spoils placement locations are listed on these Drawings with labels that identify the order of preference for use. Priority 1 area shall be completely filled before any fill is placed in priority 2 area, etc.
6. Dust control shall be implemented during the entire length of the project. Spray haul roads with water as needed to prevent dust generation. Dewatering water from isolated work areas that has passed through fish screens may be used for dust control as approved by the Contracting Officer.

DATE AND TIME PLOTTED
August 24, 2015 08:38
PLOTTED BY
FISHER, MARTIN

CAD SYSTEM
AutoCAD Civil 3D 2014
CAD FILENAME
CC44_Phase_3-4_Parcel3_Access_Staging2.dwg

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FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN

CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

A. NELSON
DRAWN

X Jay Hovde
ACCEPTED
NAME
TITLE

BOISE, ID 2015-09-11

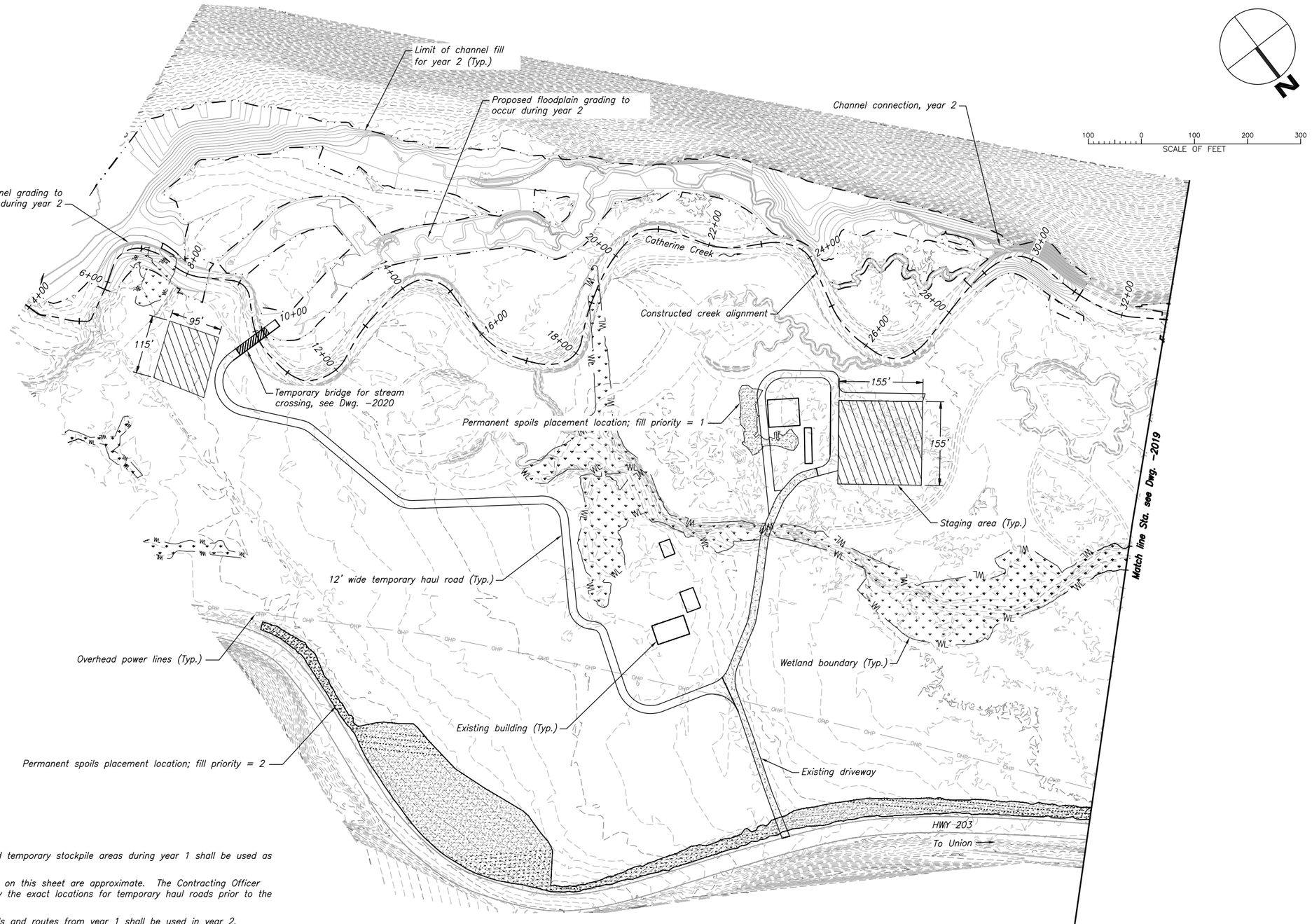
ACCESS & STAGING

Year 1
35+00 to 55+00

1678-100-2017

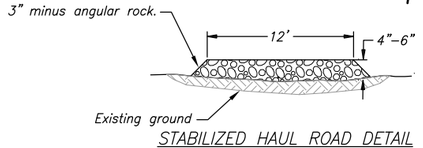
SHEET 2 OF 5

REGISTERED PROFESSIONAL ENGINEER
83129PE
OREGON
JULY 14, 2006
MARTIN K. FISHER
9/1/15
RENEWAL DATE: 12/31/2015



NOTES:
1. Material placed in designated temporary stockpile areas during year 1 shall be used as channel fill during year 2.
2. Temporary haul roads shown on this sheet are approximate. The Contracting Officer will stake or similarly identify the exact locations for temporary haul roads prior to the beginning of construction.
3. Whenever possible, haul roads and routes from year 1 shall be used in year 2.
4. All excess soil from channel and floodplain excavation, that material which is not used as fill to construct the project, shall be hauled to and placed in one of the permanent spoils placement location shown on these Drawings, see Dwg. –2029 to –2035 for grading plans. Permanent spoils placement locations are listed on these Drawings with labels that identify the order of preference for use. Fill priority 1 area shall be completely filled before any fill is placed in fill priority 2 area, etc.
5. Dust control shall be implemented during the entire length of the project. Spray haul roads with water as needed to prevent dust generation. Dewatering water from isolated work areas that has passed through fish screens may be used for dust control as approved by the Contracting Officer.

YEAR 2 STA. 5+00 TO 33+00



STABILIZED HAUL ROAD DETAIL
NTS

Place rock only as needed for stabilization in erosional depressions or wet areas along haul roads.

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GRANDE RONDE SUBBASIN

CC–44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

A. NELSON
DRAWN

x Jay Hovde
ACCEPTED
NAME
TITLE

BOISE, ID 2015–09–11

ACCESS & STAGING

Year 2
5+00 to 33+00

1678–100–2018

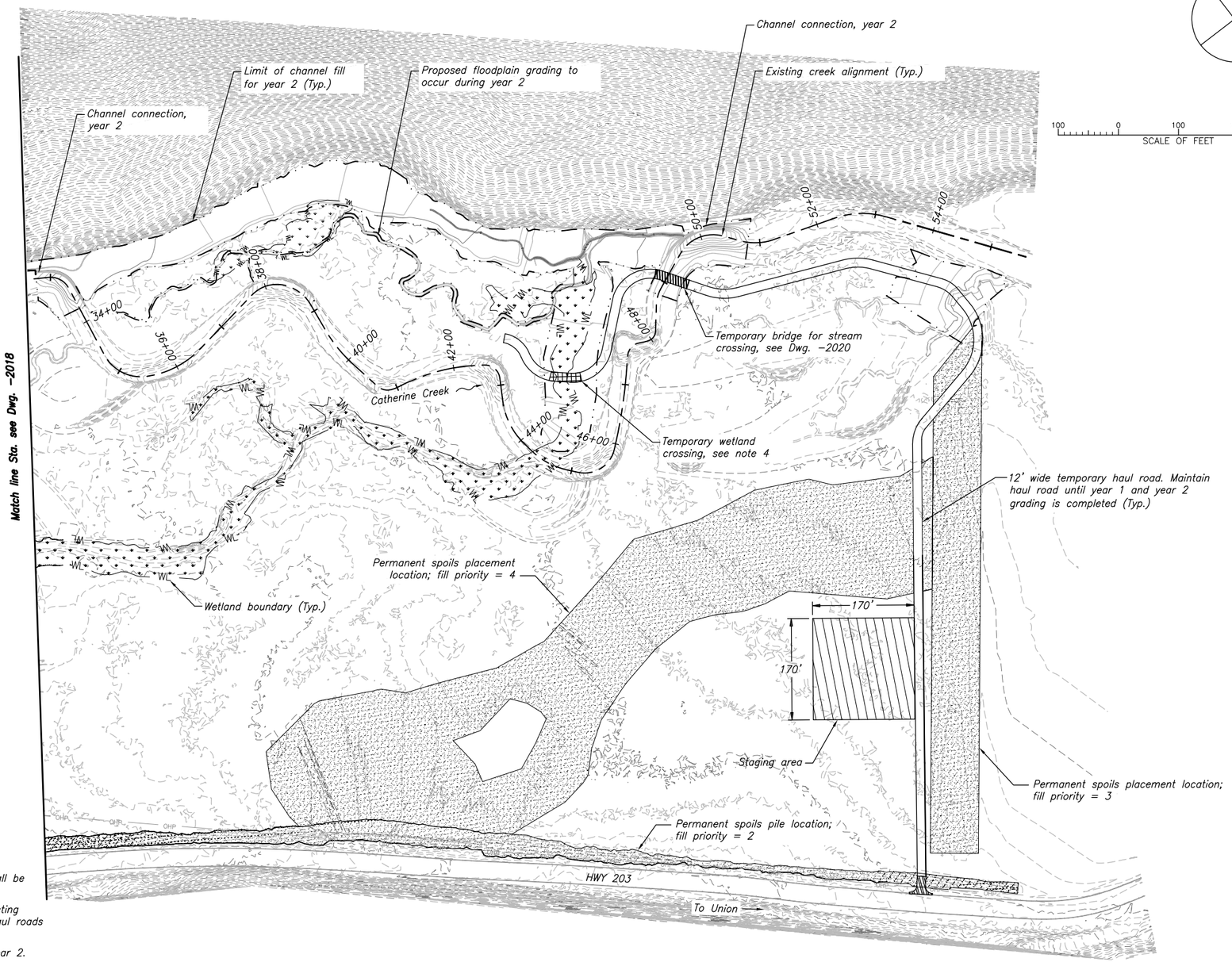
SHEET 3 OF 5

DATE AND TIME PLOTTED
TRUSCOTT, NIC
PLOTTED BY
FISHER, MARTIN

CAD SYSTEM
AutoCAD Civil 3D 2014
CAD FILENAME
CC44_Phase_3-4_Parcel3_Access_Staging.dwg

REGISTERED PROFESSIONAL ENGINEER
83129PE
OREGON
JULY 14, 2006
MARTIN K. FISHER
9/1/15

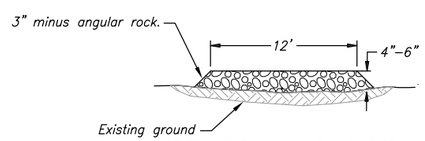
RENEWAL DATE: 12/31/2015



NOTES:

1. Material placed in designated temporary stockpile areas during year 1 shall be used as channel fill during year 2.
2. Temporary haul roads shown on this sheet are approximate. The Contracting Officer will stake or similarly identify the exact locations for temporary haul roads prior to the beginning of construction.
3. Whenever possible, temporary haul roads from year 1 shall be used in year 2.
4. The wetland crossing shown on this Dwg. may require installation of a short temporary bridge or culvert depending on hydrologic and site conditions.
5. All excess soil from channel and floodplain excavation, that material which is not used as fill to construct the project, shall be hauled to and placed in one of the permanent spoils placement location shown on these Drawings, see Dwg. -2029 to -2035 for grading plans. Permanent spoils placement locations are listed on these Drawings with labels that identify the order of spoils fill preference for use. Fill priority 1 area shall be completely filled before any fill is placed in fill priority 2 area, etc.
6. Dust control shall be implemented during the entire length of the project. Spray haul roads with water as needed to prevent dust generation. Dewatering water from isolated work areas that has passed through fish screens may be used for dust control as approved by the Contracting Officer.

YEAR 2 STA. 33+00 TO 55+00



STABILIZED HAUL ROAD DETAIL
NTS

Place rock only as needed for stabilization in erosional depressions or wet areas along haul roads.

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FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN

CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

A. NELSON
DRAWN

X Jay Hovde
ACCEPTED
NAME
TITLE

BOISE, ID 2015-09-11

ACCESS & STAGING

Year 2
33+00 to 55+00

1678-100-2019

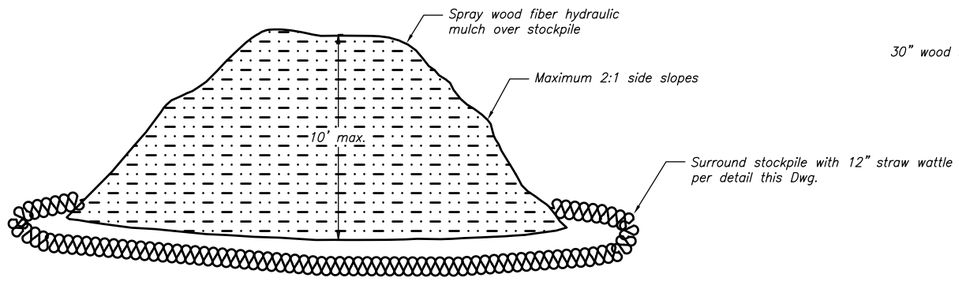
SHEET 4 OF 5

DATE AND TIME PLOTTED
September 11, 2015 15:49
PLOTTED BY
FISHER, MARTIN

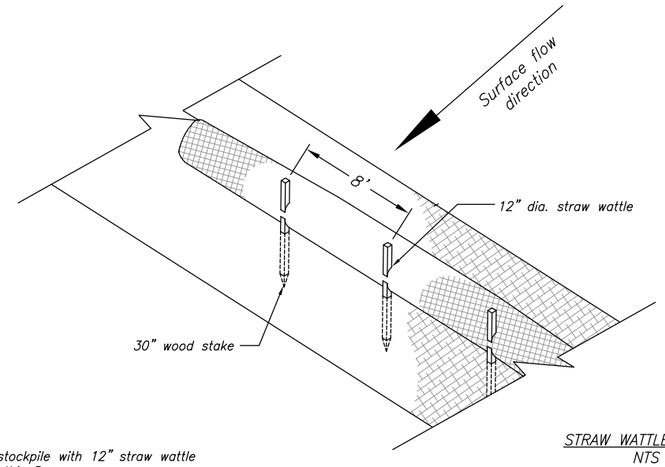
CAD SYSTEM
AutoCAD Civil 3D 2014
CAD FILENAME
CC44_Phase_3-4_Parcel3_Access_Staging.dwg

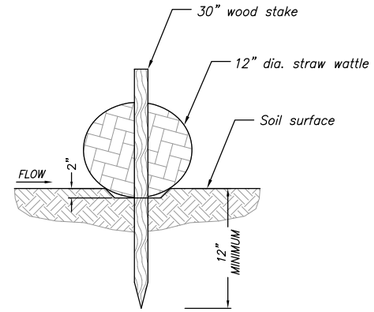
NOTES:

1. Stockpiles shall be temporarily stabilized with a wood fiber hydraulic mulch while the site is inactive between construction seasons. Stockpiles shall be treated prior to completing year 1 work or earlier as directed by the Contracting Officer.
2. Wood fiber hydraulic mulch shall consist of a mix of wood mulch (from wood, wood waste or other sources) and a tackifier.
3. The Contractor shall submit a hydraulic mulch mix for review and approval by the Contracting Officer prior to application.
4. Apply mulch at a rate of 3,000 lbs per acre unless otherwise directed by Contracting Officer.
5. Wood fiber hydraulic mulch shall be applied as a slurry with equipment that is capable of mixing and spraying components of mulch. Equipment shall be capable of producing a homogeneous mix and uniform application rate. Apply mulch in successive passes until specified application rate is achieved.
6. Stock piles shall be inspected by the Contractor a minimum of twice per month or within 48 hours following a major storm event when the site is inactive between construction seasons. Wattles shall be repaired or replaced as needed by the contractor to provide filtration of stormwater runoff from stockpile. The Contractor shall reapply wood fiber hydraulic mulch as needed when it is observed that mulch is not providing cover over stockpile.

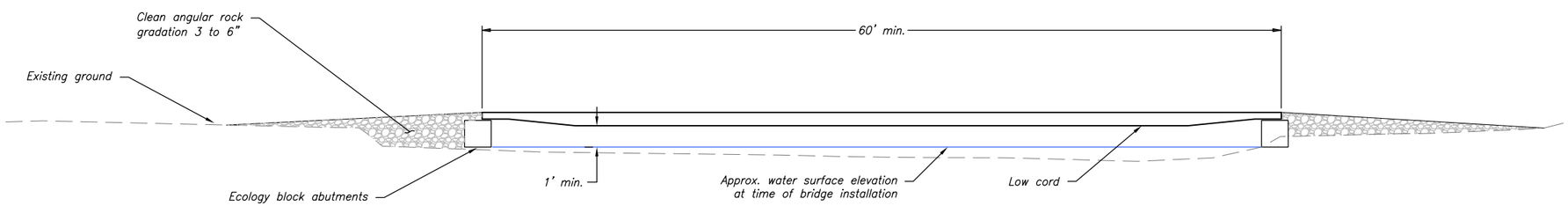


STOCKPILE DETAIL
NTS





STRAW WATTLE DETAIL
NTS



NOTES:

1. Contractor shall notify Contracting Officer 10 days prior to installation of temporary bridge crossing. Contracting Officer will instruct Contractor on acceptable location for temporary bridge. Contracting Officer will review area for presence of active spawning sites and adults of listed fish prior to bridge removal.
2. The Contractor shall furnish and maintain all equipment and materials required to install temporary bridge as shown on this sheet.
3. Fill for approach ramps to the temporary bridge shall be clean angular rock with a gradation of 3" to 6".
4. The Contractor is solely responsible for ensuring the structural integrity of the temporary bridge and maintaining the bridge throughout the duration of the project.
5. The low chord of the bridge shall be a minimum of 1' above the water surface elevation at the time of bridge installation. In the event of an unanticipated rise in water surface elevation due to unanticipated hydrologic conditions the Contractor shall remove the temporary bridge.
6. The exact location, elevation of bridge deck, and configuration of approach ramps will be determined in the field with the aid of the Contracting Officer. The work shown on this sheet is an example of an acceptable method of placing abutments, constructing approach ramps and placing the bridge deck. The Contractor shall submit a temporary bridge plan for review and approval at least 10 working days prior to installing the bridge.

TEMPORARY BRIDGE DETAIL
NTS

REGISTERED PROFESSIONAL ENGINEER
83129PE
OREGON
JULY 14, 2006
MARTIN K. FISHER
9/11/15
RENEWAL DATE: 12/31/2015

RECLAMATION
Managing Water in the West

ICF INTERNATIONAL

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BUREAU OF RECLAMATION
COLUMBIA/SNAKE RIVER SALMON RECOVERY GROUP
FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN

CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

A. NELSON
DRAWN

x Jay Hovde
ACCEPTED
NAME
TITLE

BOISE, ID 2015-09-11

ACCESS & STAGING

STOCKPILE & TEMPORARY BRIDGE DETAILS

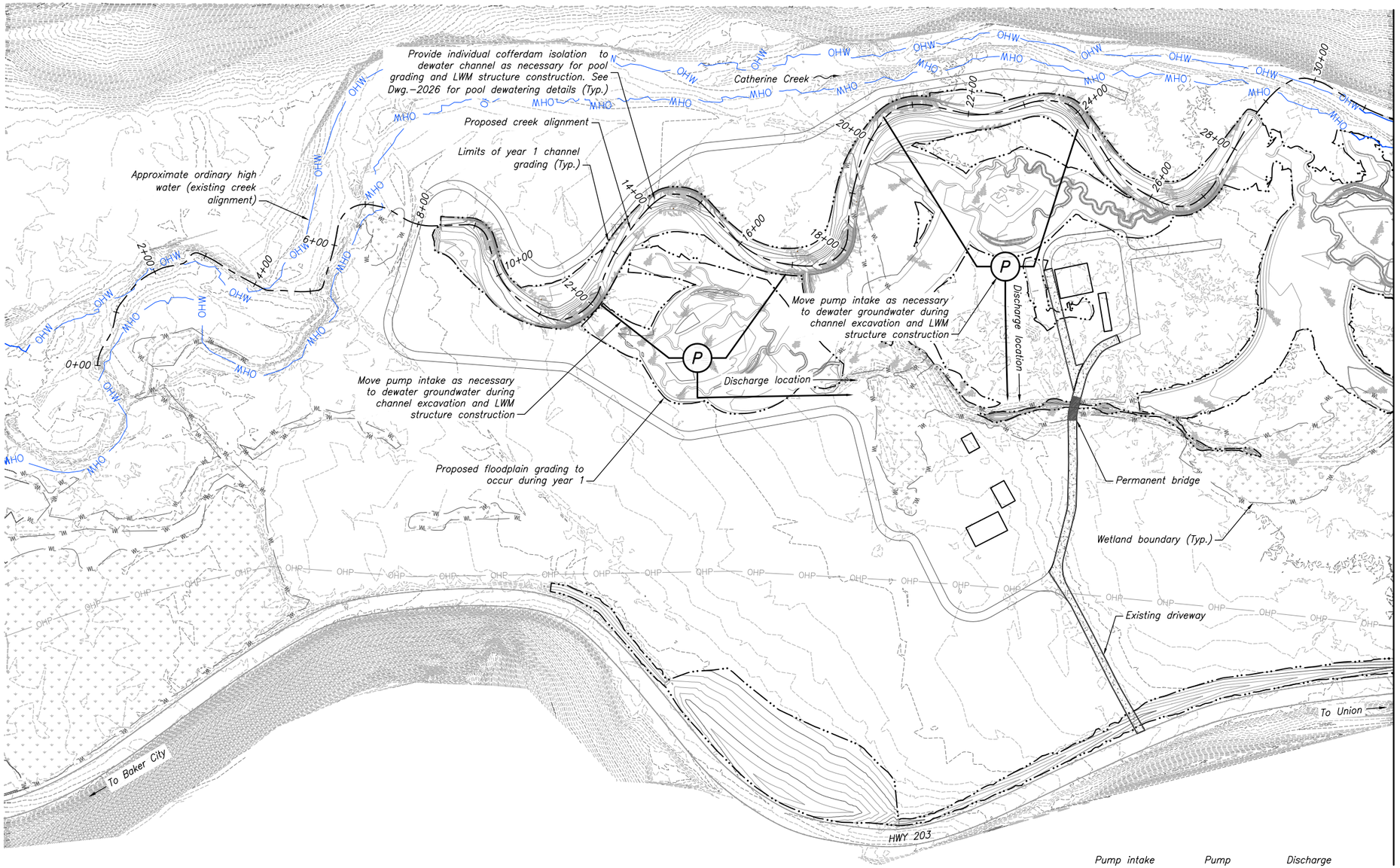
1678-100-2020

SHEET 5 OF 5

DATE AND TIME PLOTTED
September 11, 2015 15:49
PLOTTED BY
FISHER, MARTIN

CAD SYSTEM
AutoCAD Civil 3D 2014
CAD FILENAME
CC44_Phase_3-4_Parcel3_TESC.dwg

REGISTERED PROFESSIONAL ENGINEER
83129PE
OREGON
JULY 14, 2006
MARTIN K. FISHER
9/11/15
RENEWAL DATE: 12/31/2015



YEAR 1 0+00 TO 32+00

Pump intake Pump Discharge

P

Dewatering pump detail
NTS

NOTES:
1. Move pumps as necessary to dewater groundwater during channel excavation and construction of LWM structures. Surface flows from Catherine Creek will not be connected to Year 1 excavation but a significant amount of groundwater is expected to be present in areas of excavation.
3. At the location of each LWM structure the area shall be dewatered to the extent that standing water is present in the excavation no greater than the diameter of the lowest log in the LWM structure.

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FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN

CC–44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

M. FISHER
DRAWN

x Jay Hovde
ACCEPTED

BOISE, ID 2015–09–11

DEWATERING PLAN

YEAR 1
0+00 TO 32+00

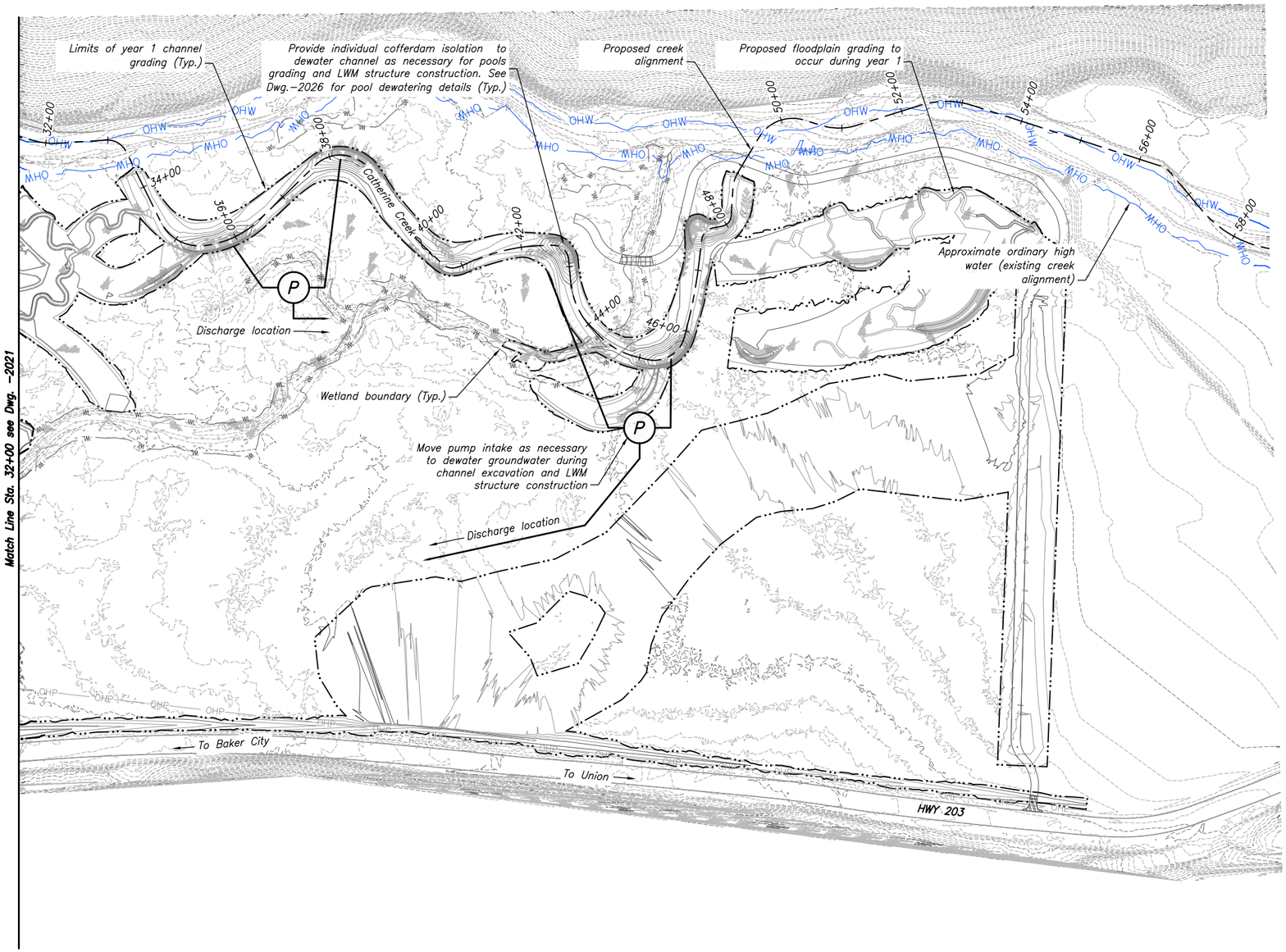
1678–100–2021

SHEET 1 OF 7

DATE AND TIME PLOTTED
September 11, 2015 15:59
PLOTTED BY
M. FISHER

CAD SYSTEM
AutoCAD Civil 3D 2014
CAD FILENAME
CC44_Phase_3-4_Parcel3_Dewatering.dwg

REGISTERED PROFESSIONAL ENGINEER
83129PE
OREGON
JULY 14, 2009
MARTIN K. FISHER
9/11/15
RENEWAL DATE: 12/31/2015



N

NOTES:
1. Move pumps as necessary to dewater groundwater during channel excavation and construction of LWM structures. Surface flows from Catherine Creek will not be connected to Year 1 excavation but a significant amount of groundwater is expected to be present in areas of excavation.
2. At the location of each LWM structure the area shall be dewatered to the extent that standing water is present in the excavation no greater than the diameter of the lowest log in the LWM structure.

YEAR 1 32+00 TO 58+50

Pump intake — Pump — Discharge

P

Dewatering pump detail
NTS

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GRANDE RONDE SUBBASIN
CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

M. FISHER
DRAWN

X Jay Hovde
ACCEPTED

BOISE, ID 2015-09-11

DEWATERING PLAN

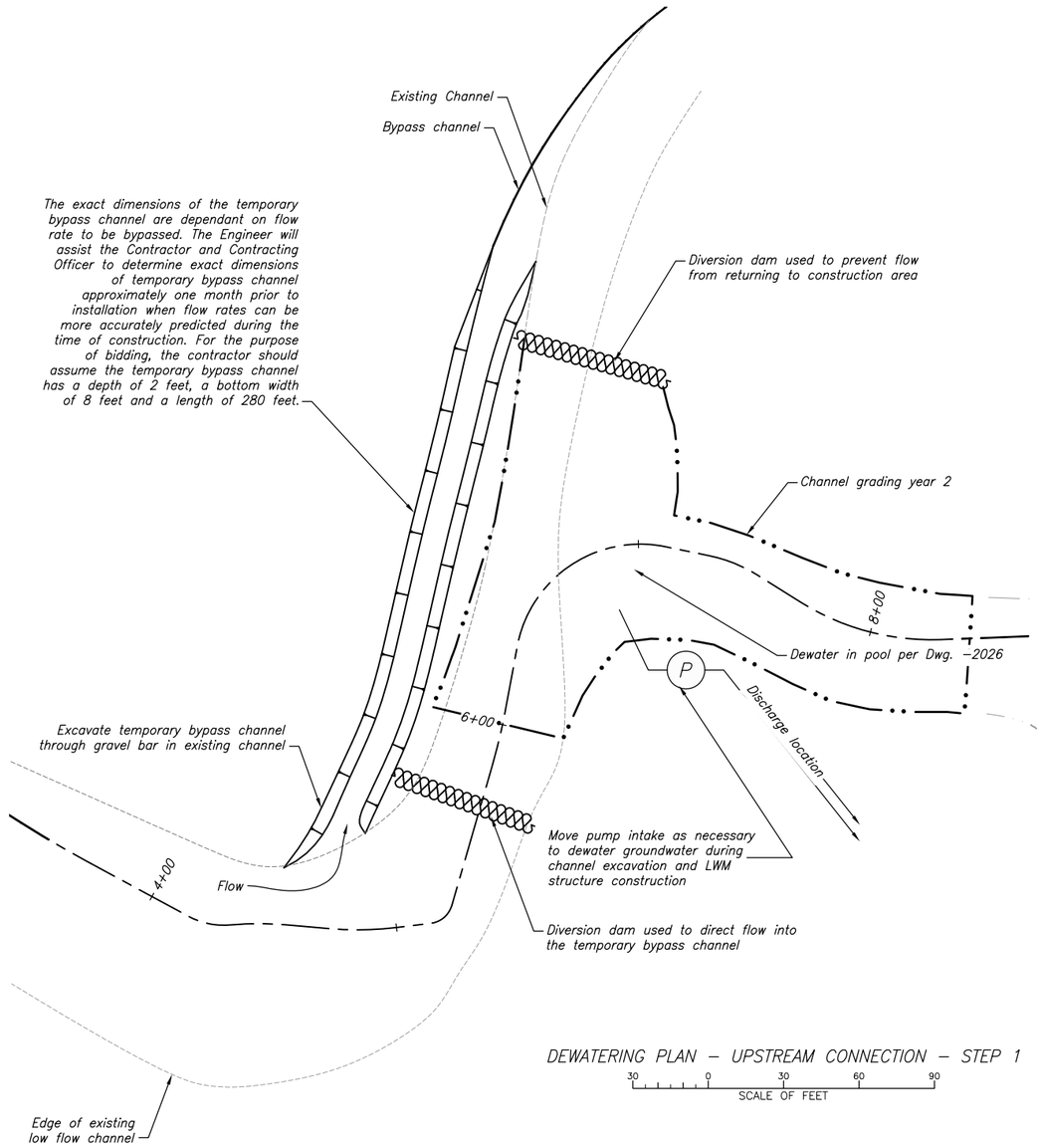
YEAR 1
32+00 TO 58+50

1678-100-2022

SHEET 2 OF 7

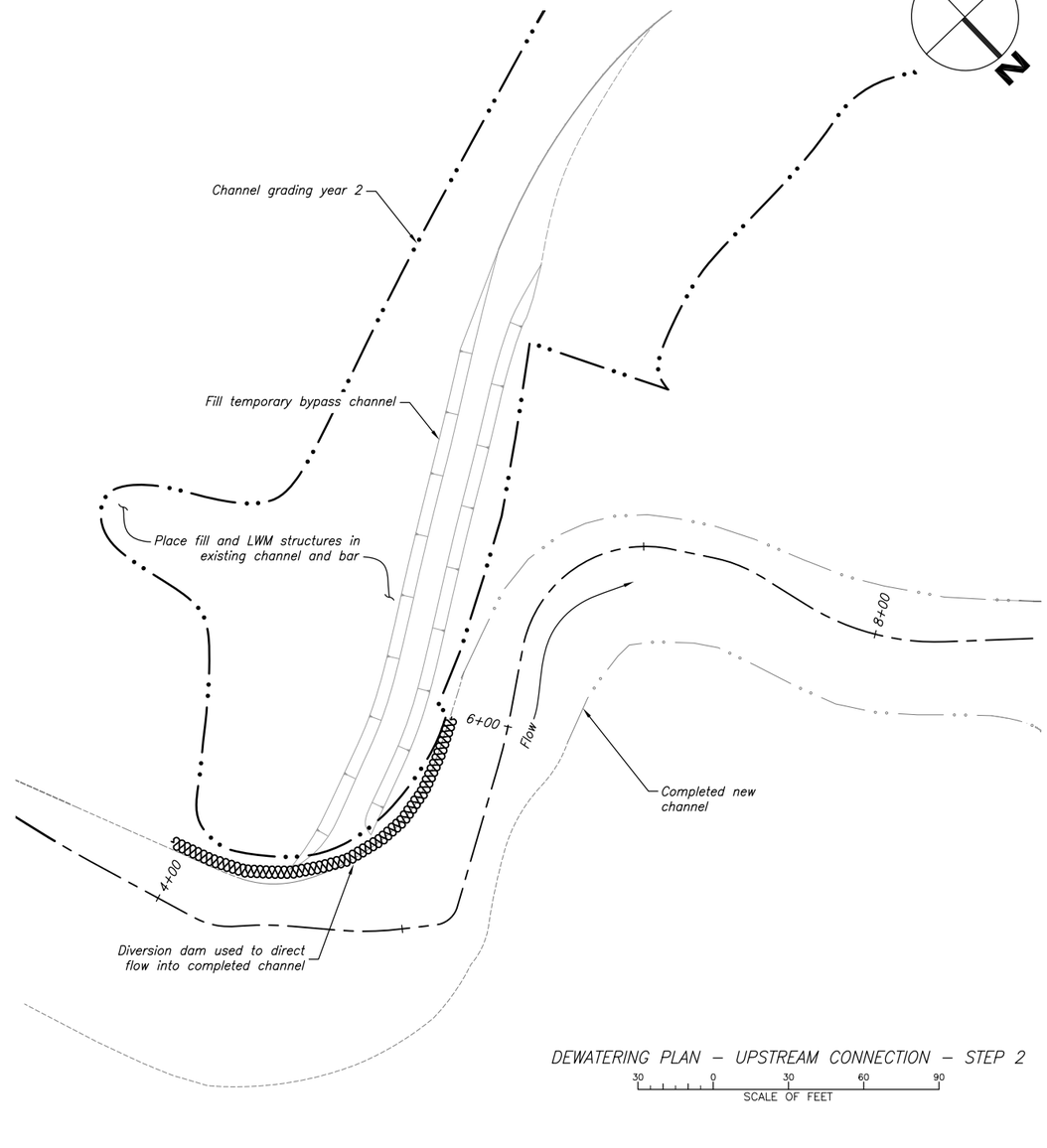
DATE AND TIME PLOTTED
September 11, 2015 16:00
PLOTTED BY
M. FISHER

CAD SYSTEM
AutoCAD Civil 3D 2014
CAD FILENAME
CC44_Phase_3-4_Parcel3_Dewatering.dwg



DEWATERING PLAN – UPSTREAM CONNECTION – STEP 1

30 0 30 60 90
SCALE OF FEET



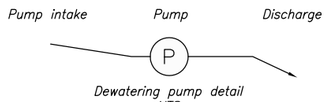
DEWATERING PLAN – UPSTREAM CONNECTION – STEP 2

30 0 30 60 90
SCALE OF FEET

NOTES:

1. Mainstem channel grading will occur in two steps between Sta. 4+00 and Sta. 8+40. The first step will include excavating a temporary bypass channel through a gravel bar on the left bank of the existing channel, and installing a diversion dam to force all flow into the temporary bypass channel, allowing channel grading to occur in the area of the existing creek channel, installation of LWM structures, and filling of the approximately 75 feet of the channel to be abandoned. The second step includes removing the main channel diversion dam and placing a diversion dam at the inlet of the temporary bypass channel to divert all flow into the newly constructed creek channel and allow placement of fill in the existing channel and the temporary bypass channel that will be abandoned.
3. At the location of each LWM structure the area shall be dewatered to the extent that standing water is present in the excavation no greater than the diameter of the lowest log in the LWM structure.
4. All dewatering pumps shall be screened for fish protection per ODFW requirements.
5. Water pumped from inside cofferdams shall not be discharged directly to flowing surface waters or wetlands.

DEWATERING PLAN – YEAR 2 UPSTREAM CONNECTION



Dewatering pump detail
NTS

REGISTERED PROFESSIONAL ENGINEER
83129PE
OREGON
JULY 14, 2006
MARTIN K. FISHER
9/14/15

RENEWAL DATE: 12/31/2015

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M. FISHER
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ACCEPTED

BOISE, ID 2015–09–11

DEWATERING PLAN

YEAR 2
UPSTREAM CONNECTION

1678–100–2023

SHEET 3 OF 7

DATE AND TIME PLOTTED
September 11, 2015 16:00
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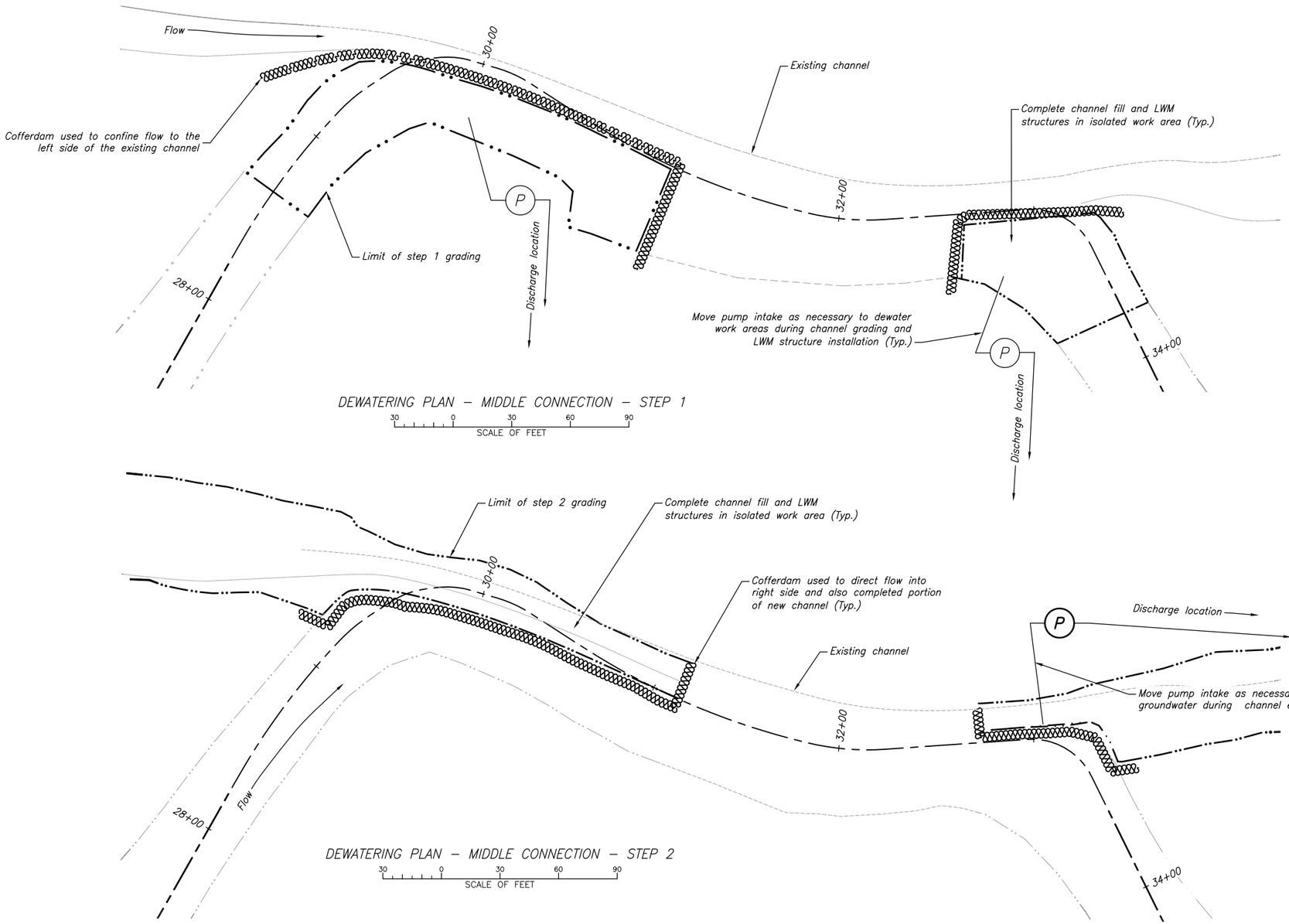
CAD SYSTEM
AutoCAD Civil 3D 2014
CAD FILENAME
CC44_Phase_3-4_Parcel3_Dewatering.dwg



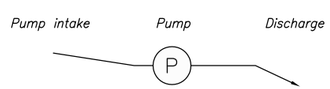
DEWATERING PLAN – MIDDLE CONNECTION – STEP 1

30 0 30 60 90
SCALE OF FEET

DEWATERING PLAN – MIDDLE CONNECTION – STEP 2

30 0 30 60 90
SCALE OF FEET

DEWATERING PLAN – YEAR 2 MIDDLE CONNECTION



Dewatering pump detail
NTS

NOTES:

1. Mainstem channel grading will occur in two steps.
2. The first step will include installing a cofferdam that will isolate the right side of the stream channel from surface water flow so that channel grading and LWM structure construction can occur. Channel isolation will occur between Sta. 28+50 and Sta. 31+15 and between 32+70 and 33+75. Flows diverted around the cofferdam will remain in left (southwest) side of the existing channel. After channel grading and LWM structure work is completed in the isolated portion of the channel, flow can be diverted from the existing channel into the new channel.
3. The second step of dewatering will be to isolate the left side of the channel so that channel grading and LWM structure construction can occur in the left portion. All flow in the creek will be in the newly constructed channel.
3. At the location of each LWM structure the area shall be dewatered to the extent that standing water is present in the excavation no greater than the diameter of the lowest log in the LWM structure.
4. Dewatering pumps shall be screened for fish protection per ODFW requirements.
5. Water pumped from inside cofferdams shall not be discharged directly to flowing surface waters or wetlands.

REGISTERED PROFESSIONAL ENGINEER
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JULY 14, 2006
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RENEWAL DATE: 12/31/2015

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CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

M. FISHER
DRAWN

x Jay Hovde
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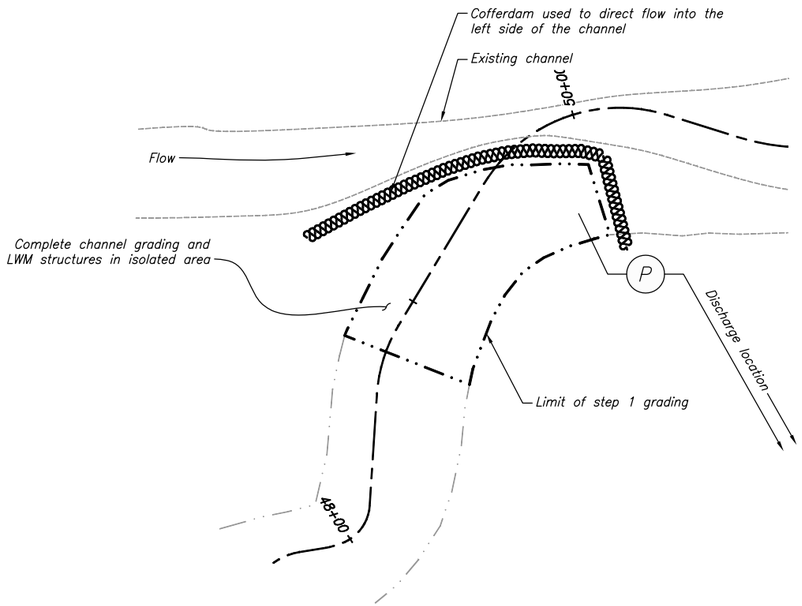
BOISE, ID 2015-09-11

DEWATERING PLAN

YEAR 2 MIDDLE CONNECTION

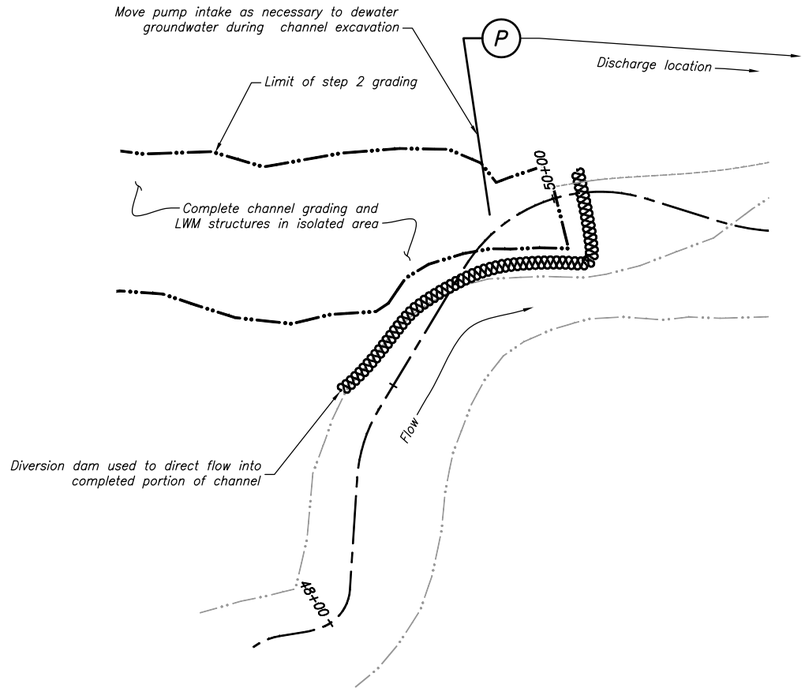
1678-100-2024

SHEET 4 OF 7



DEWATERING PLAN – DOWNSTREAM CONNECTION – STEP 1

30 0 30 60 90
SCALE OF FEET



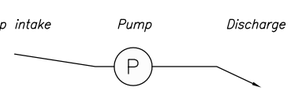
DEWATERING PLAN – DOWNSTREAM CONNECTION – STEP 2

30 0 30 60 90
SCALE OF FEET

NOTES:

1. Mainstem channel grading will occur in two steps between Sta. 48+50 and Sta. 50+00. The first step will include installing a cofferdam that will isolate the right side of the stream channel from surface water flow. Flows diverted around the cofferdam will remain in left (southwest) side of the existing channel so that channel grading and LWM structure placement can occur. After channel grading and LWM structure work is completed in the isolated portion of the channel, flow can be diverted from the existing channel into the new channel.
2. The second step of dewatering will be to isolate the left side of the channel so that channel grading and LWM structure construction can occur in the left portion. All flow in the creek will be in the newly constructed channel.
3. At the location of each LWM structure the area shall be dewatered to the extent that standing water is present in the excavation no greater than the diameter of the lowest log in the LWM structure.
4. Dewatering pumps shall be screened for fish protection per ODFW requirements.
5. Water pumped from inside cofferdams shall not be discharged directly to flowing surface waters or wetlands.

DEWATERING PLAN – YEAR 2 DOWNSTREAM CONNECTION



Dewatering pump detail
NTS

REGISTERED PROFESSIONAL ENGINEER
83129PE
OREGON
JULY 14, 2009
MARTIN K. FISHER
9/4/15

RENEWAL DATE: 12/31/2015

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CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

M. FISHER
DRAWN

X Jay Hovde
ACCEPTED

BOISE, ID 2015-09-11

DEWATERING PLAN

YEAR 2
DOWNSTREAM CONNECTION

1678-100-2025

SHEET 5 OF 7

DATE AND TIME PLOTTED
September 11, 2015 16:00
PLOTTED BY
M. FISHER

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CAD FILENAME
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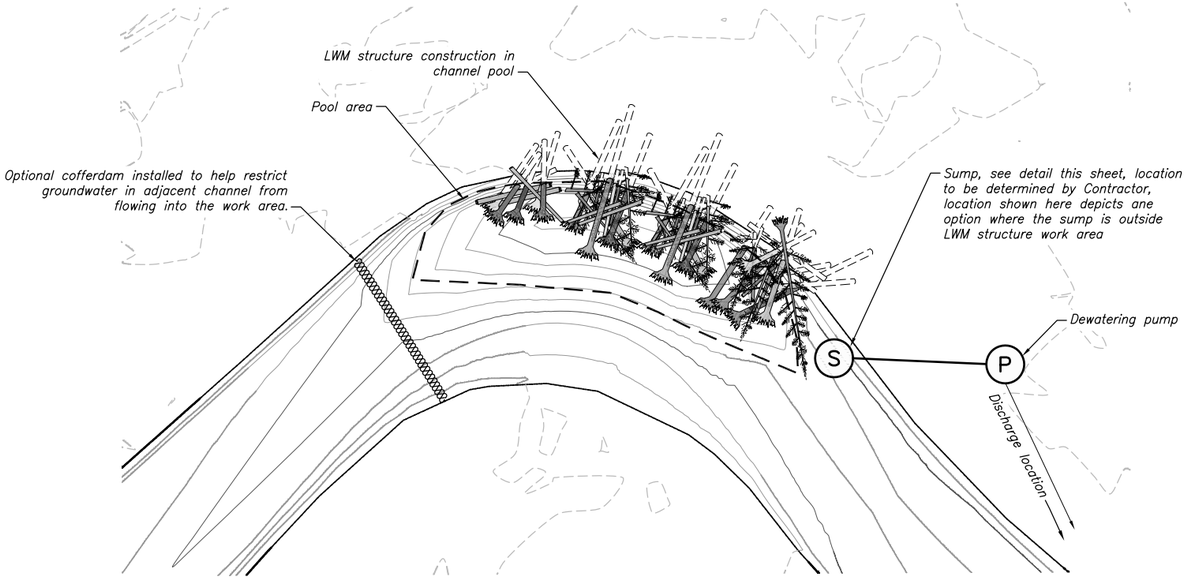
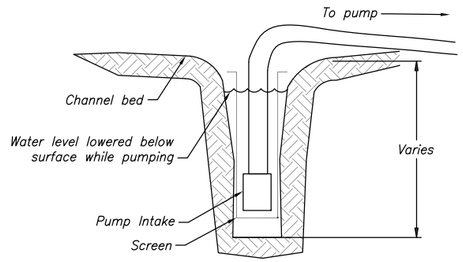
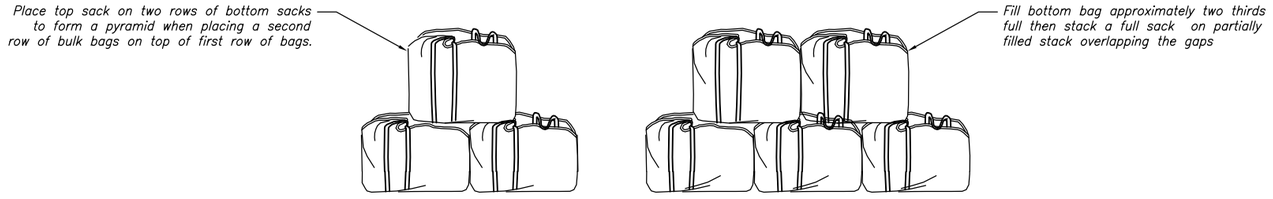


NOTES:

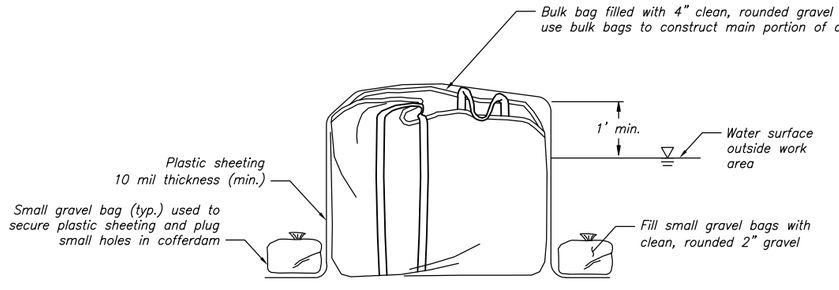
1. The Contractor is responsible for providing pump capacity and associated equipment sufficient to dewater the work site. At no time shall final channel grading or construction of LWM structures occur if the work area is not dewatered to the extent of the minimum requirements listed in Note 2.
2. During construction of LWM structures and during final channel grading, the work area shall be dewatered to a depth no greater than the diameter of the lowest log in the LWM structure.
3. All water pumped from work areas shall be discharged to upland areas at locations shown on these drawings or as directed by the Contracting Officer.
4. Turbid groundwater pumped during dewatering activities shall not be directly discharged to Catherine Creek.
5. Cofferdams shown in this detail are optional at the Contractor's selection. These cofferdams limit the amount of groundwater that would flow into the work area from adjacent constructed stream channel. If the Contractor has sufficient pump capacity to meet the minimum water depth requirements in the work area then the cofferdams may not be needed.
6. The sump and pump intake configuration shown on this drawing is one option for dewatering the work area. The Contractor shall be responsible for selecting a sump and intake configuration that allows dewatering to meet the minimum requirements listed in Note 2.



Sump Pump Detail



SIDE VIEW FRONT VIEW



NOTES:

1. Cofferdams shall be used to isolate work areas from the actively flowing channel and for dewatering groundwater in work areas.
2. The Contractor shall submit a Dewatering Plan for review and approval by the Contracting Officer a minimum of 10 working days prior to beginning work.
3. All pump intakes at locations connected to surface flow in Catherine Creek shall be screened for fish protection as required by ODFW.
4. Cofferdams may be constructed as shown on these drawings. Alternative methods of cofferdam construction are allowable if they provide similar or better performance than the method shown here, and if approved by the Contracting Officer.

DEWATERING DETAILS

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CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

M. FISHER/ N. TRUSCOTT
DRAWN

X Jay Hovde
ACCEPTED

BOISE, ID 2015-09-11

DEWATERING PLAN

DEWATERING DETAILS

1678-100-2026

SHEET 6 OF 7

REGISTERED PROFESSIONAL ENGINEER
83129PE
OREGON
JULY 14, 2009
MARTIN K. FISHER
9/14/15

RENEWAL DATE: 12/31/2015

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September 11, 2015 16:01
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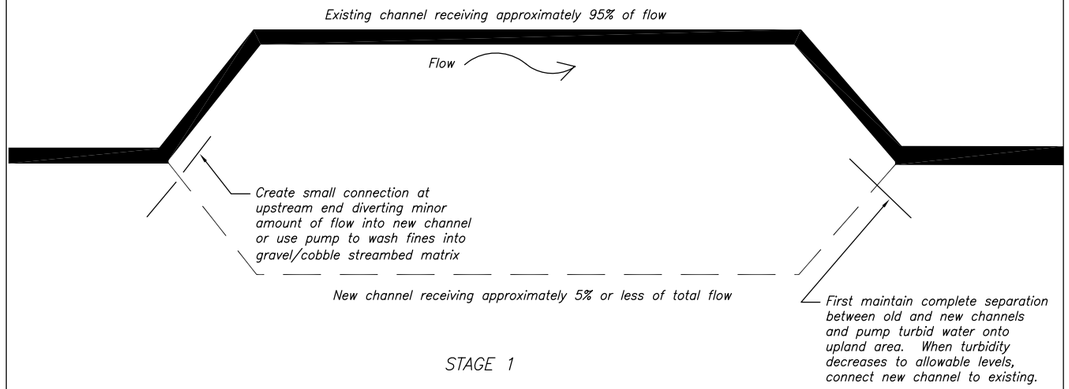
M. FISHER

CAD SYSTEM
AutoCAD Civil 3D 2014
CAD FILENAME
CC44_Phase_3-4_Parcel3_Sump_Pump_Detail.dwg

NOTES:
1. Use pumped water applied to new channel to wash the fines into the gravel/cobble bed material. Alternatively, a small opening can be made in the upstream diversion to allow a minor amount of flow from the creek to enter the new channel. During either process, place a pump at the downstream end of the new channel that will pump turbid water onto an upland area. The capacity of the downstream pump shall exceed the amount of flow applied upstream.

2. When water pumped from the downstream end is no longer significantly turbid the pump can be removed and the downstream end of the new channel can be opened up to the existing channel. Amount of allowable turbidity of the flow in the new channel varies depending on the flow rate in the new channel vs. flow rate in the existing channel. After mixing at the downstream connection, flow in the creek channel shall meet water quality standards for maximum turbidity as required by multiple state and federal permits.

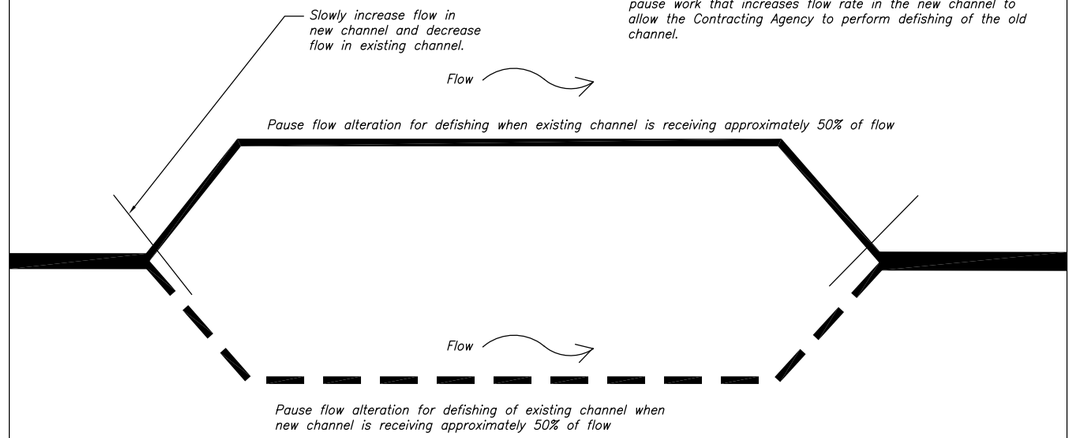
3. Following open connection, monitor turbidity of water in the creek 300 feet downstream of where new channel and existing channel meet. Incrementally increase upstream connection to fifty percent of total flow as turbidity of water at monitoring station decreases to allowable levels.



STAGE 1

NOTES:
1. Slowly increase the amount of flow entering the new channel. The Contracting Officer will determine the rate to increase flow into the new channel. It is critical that the flow increase is done slowly to minimize turbidity generated in the new channel, and to prevent stranding of fish in the existing channel where flow rate is decreasing.

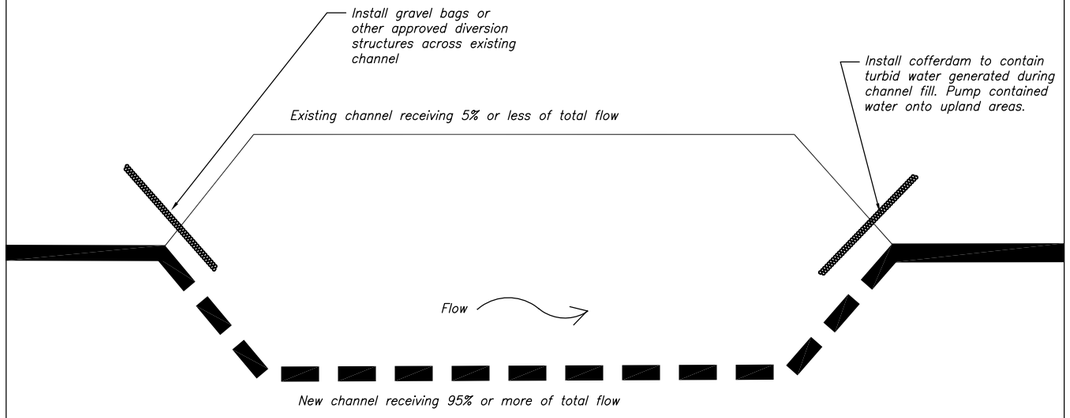
2. When approximately half of the flow is in the new channel, pause work that increases flow rate in the new channel to allow the Contracting Agency to perform defishing of the old channel.



STAGE 2

NOTES:
1. After defishing of existing channel is complete as determined by the Contracting Officer, resume work to slowly increase amount of total flow entering the new channel.

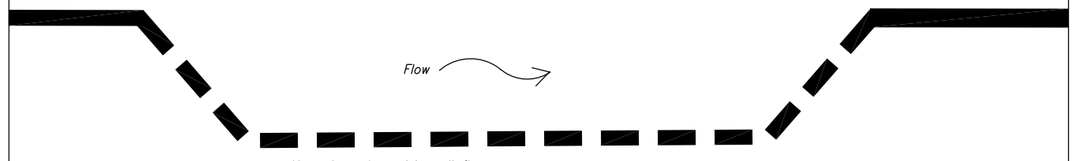
2. Install temporary diversion dam across upstream end of Existing channel to complete diversion. Install temporary cofferdam at downstream end of existing channel to contain turbid water generated during fill placement in existing channel.



STAGE 3

NOTES:
1. Fill existing channel as shown in Grading Plan sheets in these Drawings.

2. Remove temporary diversion dam and cofferdam from abandoned channel.



STAGE 4

REGISTERED PROFESSIONAL ENGINEER
93129PE
OREGON
JULY 14, 2009
MARTIN K. FISHER
9/4/15
RENEWAL DATE: 12/31/2015

CHANNEL DIVERSION PROCEDURE

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GRANDE RONDE SUBBASIN

CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

M. FISHER
DRAWN

X Jay Hovde
ACCEPTED

BOISE, ID 2015-09-11

DEWATERING PLAN

CHANNEL DIVERSION PROCEDURE

1678-100-2027

SHEET 7 OF 7

DATE AND TIME PLOTTED
September 11, 2015 16:02
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M. FISHER

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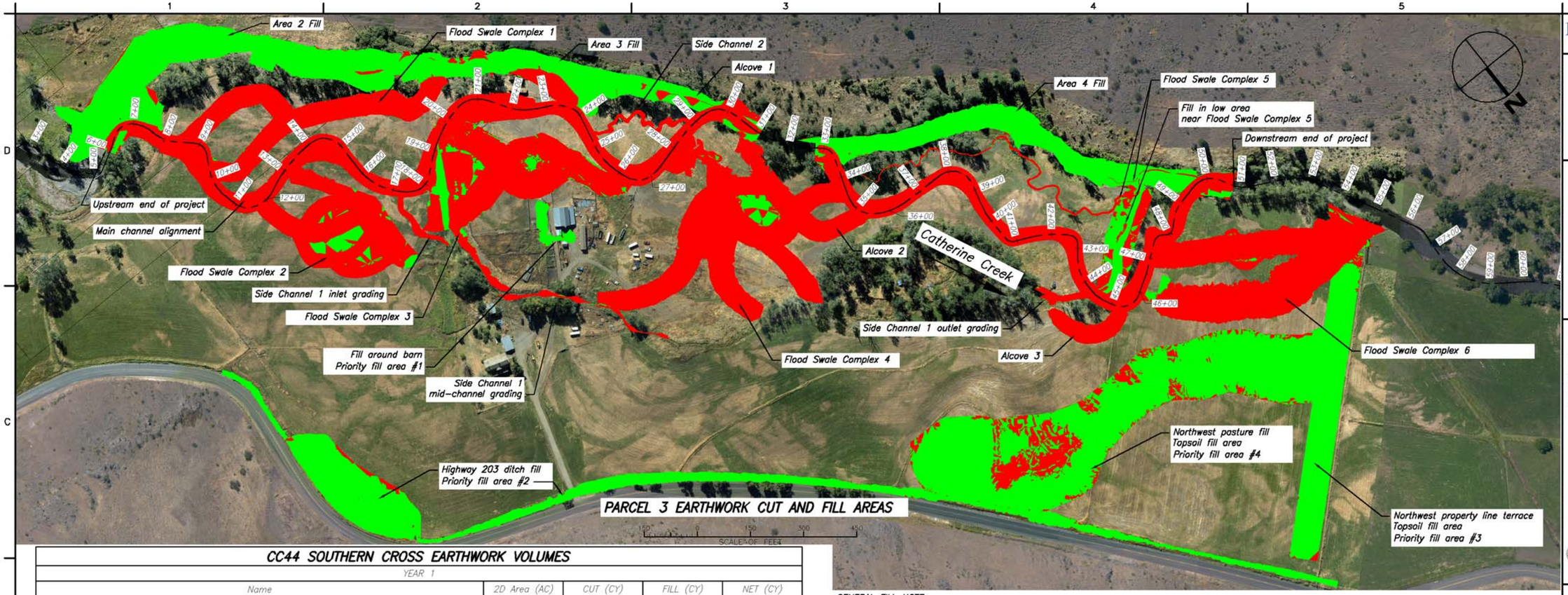
CAD FILENAME
CC44_Phase_3-4_Schematic_Diversion.dwg



CC44 SOUTHERN CROSS EARTHWORK VOLUMES

YEAR 1				
Name	2D Area (AC)	CUT (CY)	FILL (CY)	NET (CY)
MAIN CHANNEL	3.9	21027	9	21018<Cut>
FLOOD SWALE COMPLEX 2	1.7	2336	47	2289<Cut>
FLOOD SWALE COMPLEX 3	1.7	3577	47	3530<Cut>
FLOOD SWALE COMPLEX 4 (PARTIAL)	2.9	9113	0	9113<Cut>
FLOOD SWALE COMPLEX 6 (PARTIAL)	2.2	4857	97	4760<Cut>
SIDE CHANNEL 1	0.9	1763	415	1348<Cut>
ALCOVE 3	0.3	827	0	827<Cut>
YEAR 1 SUBTOTAL*	13.5	43500	615	42885<Cut>
YEAR 2				
Name	2D Area (AC)	Cut (CY)	FILL (CY)	NET (CY)
MAIN CHANNEL CONNECTION	0.8	2667	243	2424<Cut>
FLOOD SWALE COMPLEX 1 (EXCAVATED FROM O.G.)	2.1	3893	1377	2516<Cut>
FLOOD SWALE COMPLEX 1 (AMOUNT REDUCED FROM AREA 3 FILL TO SHAPE CHANNEL D)	0.5	888	27	861<Cut from Area 3 fill>
FLOOD SWALE COMPLEX 4 (CONNECT SWALES UPSTREAM TO MAIN CHANNEL)	0.4	264	0	264<Cut>
FLOOD SWALE COMPLEX 6 (CONNECT SWALES DOWNSTREAM TO MAIN CHANNEL)	0.3	700	6	693<Cut>
FLOOD SWALE COMPLEX 5 (EXCAVATED FROM O.G.)	0.2	246	92	154<Cut>
FLOOD SWALE COMPLEX 5 (AMOUNT REDUCED FROM AREA 4 FILL TO SHAPE CHANNEL)	0.1	162	1	161<Cut from Area 4 fill>
SIDE CHANNEL 2	0.1	329	0	329<Cut>
FILL LOW AREA NEAR FLOOD SWALE COMPLEX 5	0.6	113	435	325<Fill>
AREA 2 FILL	1.7	19	15338	15319<Fill>
AREA 3 FILL	2.3	31	11693	11661<Fill>
AREA 4 FILL	1.6	4	7382	7378<Fill>
FILL AROUND BARN	0.1	0	90	90<Fill>
HIGHWAY 203 DITCH FILL	2.9	15	7919	7904<Fill>
NORTHWEST PROPERTY LINE TERRACE FILL	1.6	6	3410	3404<Fill>
NORTHWEST PASTURE FILL	5.4	137	5525	5388<Fill>
YEAR 2 SUBTOTAL*	20.8	10301	53538	43237<Fill>
OVERALL COMPOSITE SURFACE*	32.6	52171	49929	2243<Cut>

GENERAL FILL NOTE:
Unless otherwise noted on other drawings, at locations where the grading requires fill to create the shape and topography shown on the Drawings, the Contractor shall place fill in one (1) foot maximum lifts and compact using mechanical compaction equipment such as a vibratory compactor head or roller compactor. No testing of compacted density will be performed, but the intent is to achieve an 85% relative density; acceptance will be by the Contracting Officer observing fill placement and compaction effort.

GENERAL EXCAVATION NOTES:
1. *Provide excavation as required for construction of the Work shown on the Drawings.*
2. *Excavation shall be done to the lines and grades shown on the Drawings and as indicated by construction staking provided by the Contractor.*
3. *The quantity of material to be excavated has been measured by surface subtraction in AutoCAD and is therefore in-place and not factored for expansion.*
4. *Shape, trim, and finish cut slopes to conform with lines, grades, and cross-sections shown on the Drawings.*
5. *Stockpile excavated material that is suitable for use as fill until material is needed.*
6. *Dry excavated material may be stockpiled near each work site. Wet excavated material shall be hauled to a stockpile area where turbid water draining from the material cannot enter the waterway.*
7. *As boulders larger than 18 inches in diameter are discovered during excavation, remove and stock pile at locations to be used in the riffle construction.*

FINISH GRADING NOTES:
1. *Finish grading shall be within ±0.50 feet Horizontal and ±0.10 feet Vertical of the locations and elevations shown on the Drawings and construction stakes.*
2. *Where 6 to 12 inches of topsoil is applied, the topsoil shall be compacted by a single pass with an excavator tracks or similar equipment to provide a uniform firm compaction, prior to measurement of finish grade.*
3. *Shall be flush with adjacent surfaces unless otherwise indicated.*
4. *Shall be inspected and approved by the Contracting Officer prior to seeding or other activity that would hinder adjustments to the finish grading.*
5. *Compaction of finished surface is not required where the finished surface is achieved through only excavation, except in main channel excavation areas through riffles and point bars.*

TABLE NOTE:
* *The cut and fill volumes of each feature were calculated using a comparison of the proposed surface of each feature surface to the original ground surface. The proposed surface of one feature may overlap the surface of one or more proposed features, particularly in the Year 2 work areas. Therefore, the sum of the cut and fill volumes of the features for each year will not correspond with the earthwork cut and fill volumes of the overall composite surface of the entire project shown at the bottom of the table.*

LEGEND

Fill

Cut

**Cut areas are shown in red and fill areas are shown in green.*

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GRANDE RONDE SUBBASIN
CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV NO	DATE	DESCRIPTION
1	2015-10-09	Revised notes and corrected table units and updated grading details
		Jeffrey J Fealko P.E.

Jeffrey J. Fealko P.E.
DESIGNED
DR
DRAWN
Mike Knutson P.E.
CHECKED
Jeffrey J. Fealko P.E.
TECH. APPR.
Steve Montague – Acting
APPROVED
ADMIN APPROVAL – PROGRAM MANAGER
BOISE, ID 2015-09-14

EARTHWORK CUT AND FILL AREAS

PLAN

1678-100-2028

SHEET 1 OF 1

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1678-100-2030
1678-100-2031
1678-100-2032
1678-100-2033
1678-100-2034
1678-100-2035
1678-100-2036

Upstream existing channel fill
Flood swale complex 1
Side channel 2
Alcove 1
Downstream Plug
Downstream existing channel fill
Large Woody Material (typ.)
Catherine Creek
Plug 3
Flood swale complex 5
Downstream end of project
N 561462.9427
E 8895111.9688
FLOW
Upstream Plug
Flood swale complex 3
Flood swale complex 4
Main channel
Upstream end of project
Flood swale complex 2
Side channel 1 inlet grading
Alcove 2 within Flood swale complex 4
Alcove 3
Flood swale complex 6
Limits of excavation, typ.
Fill around barn
Priority fill area #1
Side channel 1 mid-channel grading
Proposed bridge
See Culvert Replacement on Side Channel drawings.
Existing house
Existing driveway
HWY 203
Northwest pasture fill
Topsoil fill area
Priority fill area #4
Northwest property line terrace
Topsoil fill area
Priority fill area #3
This fill could be completed in Year 1, as desired by the Contractor.
Highway 203 ditch fill
Priority fill area #2
This fill could be completed in Year 1, as desired by the Contractor
Lot line, typ.

LEGEND
Year 1 Construction
Year 2 Construction
Existing wetland areas

GRADING PLAN OVERVIEW
150 0 150 300 450
SCALE OF FEET

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GRANDE RONDE SUBBASIN
CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV NO		
1	2015-10-09	Deleted note, added bridge drawing reference, removed section arrows, and updated limits of disturbance
	Jeffrey J Fealko P.E.	

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BOISE, IDAHO 2015-09-14

GRADING PLAN OVERVIEW

PLAN

1678-100-2029
SHEET 1 OF 8

Existing channel fill
see Dwg. –2064

Plug 1 to concentrate subsurface flow to Channel D of Flood Swale Complex 1
see section detail Dwg. –2115

N: 561462.9427
E: 8895111.9688

Spring channel (Channel D) shaped in the fill of the existing main channel (see Dwg. –2078)

Channel C
see Dwg. –2078

Match Line
see Sheet –2031

Flood swale complex 1
Swale B and Channel B
see Dwg. –2077

Upstream Plug
see section detail
Dwg. –2115

Flood swale complex 1
see Dwgs. –2074 to 2081

Swale A/Channel A
see Dwgs. –2075 to –2076

Flood swale complex 1
Begin flood swale grading
at Main Channel Sta. 8+74

Begin channel fill to shape
left bank of proposed main channel
See Dwg. –2064

Main channel

Limit of excavation, typ.

Begin main channel
shaping Main Channel Sta. 5+84
N 561383.7
E 8895673.4
Surface at beginning of alignment may not be accurate. Grade transition
from the existing channel to the proposed channel as directed by the C.O.

Upstream end of project
~Main Channel Sta. 4+70

Flood swale complex 1
Begin flood swale grading
at Main Channel Sta. 9+84

Flood swale complex 2
Begin flood swale grading
at Main Channel Sta. 11+91

Flood swale complex 2
Begin flood swale grading
at Main Channel Sta. 12+92

Flood swale complex 2
Dwgs. –2082 to –2089

Grading limits

Flood swale complex 3
Begin flood swale grading
at Main Channel Sta. 19+66

Fill existing ditch
to match adjacent floodplain
as directed by C.O.

Start Side channel 1 inlet excavation
Main Channel Sta. 17+25

Flood swale complex 3
see Dwgs. –2090 to –2093
for details

Flood swale complex 3
Begin Flood swale grading at
N 562145.1
E 8895060.5

Side channel 1 inlet shaping
see. Dwgs. –2068 to –2071

Connect Flood swale complex 2
to Side channel 1 at Side Channel 1 Sta. 2+24

Existing wetland

B (–2067)

LEGEND

Year 1 Construction

Year 2 Construction

Existing wetland areas

GRADING PLAN

Main Channel Sta. 6+00 TO Main Channel Sta. 21+00

40 0 40 80 120
SCALE OF FEET

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CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV NO	DATE	DESCRIPTION	BY
1	2015-10-09	Shrawed extents of upstream plug and updated limits of disturbance	Jeffrey J Fealko P.E.

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BOISE, IDAHO 2015-09-14

GRADING PLAN
Main Channel Sta. 6+00
TO
Main Channel Sta.
21+00

PLAN

1678–100–2030

SHEET 2 OF 8

Flood swale complex 1
see Dwg. −2074 to −2081

Existing channel fill
(Dwg. −2065)

Plug 2 to concentrate
sursurface flow to Alcove 1
see Dwg. −2115)

Begin Alcove 1 shaping in
existing channel fill
N 562156.2
E 8894421.5

Alcove 1 (−Dwg. 2113)
shaped into existing
channel fill −Dwg. −2065)

End Alcove 1 shaping
at Main Channel Sta. 29+73

Begin flood swale complex 4
Flood swale grading at
Main Channel Sta. 30+51

Match Line
see Sheet −2030

Match Line
see Sheet −2032

End Flood swale complex 1
Flood swale grading at
Main Channel Sta. 23+86

Side channel 2
see Dwg. −2072 to −2073

Downstream plug
see section detail
Dwg. −2115

End Side channel 2
grading at Main Channel
Sta. 28+93

Main channel

Begin Side channel 2
grading at
Main Channel Sta. 24+53

Begin Flood swale complex 5
grading at Main Channel Sta. 33+92

FLOW

End Flood swale complex 4
grading at Main Channel Sta. 34+57

Begin flood swale complex 4
Flood swale grading at
Main Channel Sta. 27+64

Flood swale complex 3
see Dwgs. −2090 to 2093

Flood swale complex 4
see Dwgs. −2094 to −2102

End Flood swale complex 3
grading at Main Channel Sta. 26+35

FLOW

Grading limits

Existing structures, typ.

Alcove 2

Fill around barn
Priority fill area #1
Place material as
directed by C.O.

Grading limits

Flood swale complex 3
Begin flood swale grading
N 562145.1
E 8895060.5

Begin flood swale complex 4
Flood swale grading at
Side channel 1 Main Channel Sta. 7+16
N 562590.8
E 8894884.5

End flood swale complex 4
Flood swale grading at
Side channel 1 Main Channel Sta. 14+03
N 562978.1
E 8894404.3

Proposed bridge

Side channel 1
mid−channel grading
see Dwgs. −2068 to 2071

End Side channel 1
mid−channel grading
Main Channel Sta. 9+48
N 562791.2
E 8894787.6

End flood swale complex 4
Flood swale grading at
Side channel 1 Main Channel Sta. 12+44
N 5625912.6
E 8894544.8

Begin Side channel 1
mid−channel grading
Main Channel Sta. 4+30
N 562391.1
E 8895084.5

Match Line
see Sheet −2035

Existing Side channel 1
No grading from Main Channel Sta. 9+48 to Main Channel Sta. 21+28

LEGEND

Year 1 Construction

Year 2 Construction

Existing wetland areas

GRADING PLAN
STA 21+00 TO STA 34+00

40 0 40 80 120
SCALE OF FEET

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CC−44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV NO	DATE	DESCRIPTION
1	2015-10-09	Removed extra leader
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GRADING PLAN
Main Channel Sta.
21+00 TO
Main Channel Sta.
34+00

PLAN

1678−100−2031

SHEET 3 OF 8

Match Line see Sheet −2031

Match Line see Sheet −2033

Existing channel fill see Dwg. −2066

Downstream Plug see section detail Dwg. −2115

Begin channel grading of Flood swale complex 5 channel in existing channel fill at N 563029.7 E 8893594.3

End Flood swale complex 5 channel at Main Channel Sta. 49+78

Flood swale complex 5 see Dwgs. −2103 to −2107

Plug 3 in existing channel fill see Dwg. −2115

FLOW

Begin flood swale complex 5 channel grading at Main Channel Sta. 33+82

End Flood swale complex 4 grading at Main Channel Sta. 34+57

Main channel

(−2067) B

Fill existing ditch

Flood swale complex 4 see Dwgs. −2094 to 2102

End Flood swale complex 4 grading at Main Channel Sta. 35+27

Begin flood swale channel 6 Flood swale grading at Main Channel Sta. 47+17

Alcove 2

Begin Side channel 1 downstream grading at Main Channel Sta. 21+28 N 563327.7 E 8893886.9

Begin flood swale channel 6 Flood swale grading at Main Channel Sta. 45+92

Flood swale complex 6 see Dwgs. −2108 to −2112

Blind channel see section detail Dwg. −2115

Side channel 1 see Dwgs. −2068 to −2071

Begin Alcove 3 grading at Side channel 1 Main Channel Sta. 21+52 N 563349.0 E 8893876.6

End Side channel 1 downstream grading Main Channel Sta. 44+59

Fill low point area as directed by the C.O.

End Alcove 3 grading Main Channel Sta. 45+29

Existing Side channel 1 No grading until Main Channel Sta. 21+28

Alcove 3 see Dwg. −2114

Northwest pasture fill Topsoil fill area Priority #4

Begin flood swale complex 4 Flood swale grading at Side channel 1 Main Channel Sta. 14+03 N 562978.1 E 8894404.3

Match Line see Sheet −2036

LEGEND

Year 1 Construction

Year 2 Construction

Existing wetland areas

GENERAL FILL NOTE:
Unless otherwise noted on other drawings, at locations where the grading requires fill to create the shape and topography shown on the Drawings, the Contractor shall place fill in one (1) foot maximum lifts and compact using mechanical compaction equipment such as a vibratory compactor head or roller compactor. No testing of compacted density will be performed, but the intent is to achieve an 85% relative density; acceptance will be by the Contracting Officer observing fill placement and compaction effort.

GRADING PLAN

Main Channel Sta. 34+00 TO Main Channel Sta. 50+00

40 0 40 80 120
SCALE OF FEET

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GRANDE RONDE SUBBASIN
CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV. NO. 1 | 2015-10-09 | Jeffrey J Fealko P.E. | 100 Updated limits of disturbance

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GRADING PLAN
Main Channel Sta. 34+00 TO Main Channel Sta. 50+00
PLAN

1678-100-2032
SHEET 4 OF 8

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Utilize boulders for LWM structures and channel roughness

End Flood swale complex 5 channel grading at Main Channel Sta. 49+78

Remove existing diversion dam as directed by C.O. Location is approximate. Contractor to field verify location.

End Flood swale complex 6 grading at Main Channel Sta. 55+39

Main channel

Downstream end of project Main Channel Sta. 55+60

FLOW

Flood swale complex 6 see Dwgs. −2108 to −2112

Blind channel See Dwgs. −2109, −2110, and −2115

Deep pool

Northwest pasture fill
Topsoil fill area
Priority fill area #4

Match Line see Sheet −2032

Match Line see Sheet −2036

Lot line, typ.

Northwest property line terrace
Topsoil fill area
Priority fill area #3

LEGEND

Year 1 Construction

Year 2 Construction

Existing wetland areas

GRADING PLAN

Main Channel Sta. 50+00 TO Main Channel Sta. 60+00

40 0 40 80 120
SCALE OF FEET

GENERAL FILL NOTE:
Unless otherwise noted on other drawings, at locations where the grading requires fill to create the shape and topography shown on the Drawings, the Contractor shall place fill in one (1) foot maximum lifts and compact using mechanical compaction equipment such as a vibratory compactor head or roller compactor. No testing of compacted density will be performed, but the intent is to achieve an 85% relative density; acceptance will be by the Contracting Officer observing fill placement and compaction effort.

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CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV NO	DATE	DESCRIPTION
1	2015-10-09	Jeffrey J Fealko P.E. 100 Updated limits of disturbance

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GRADING PLAN
Main Channel Sta. 50+00 TO Main Channel Sta. 60+00

PLAN

1678-100-2033

SHEET 5 OF 8

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Lot line, typ.

Begin Highway 203 ditch fill
N 562075.7
E 8895829.3

B' (–2067)

Highway 203 ditch fill
Priority fill area #2
This fill could be
completed in Year 1, as
desired by the Contractor

B'

2960

2970

2955

Existing house

Existing driveway

HWY 203

Match Line
see Sheet –2035

N

LEGEND

Year 1 Construction

Year 2 Construction

Existing wetland areas

GENERAL FILL NOTE:
Unless otherwise noted on other drawings, at locations where the grading requires fill to create the shape and topography shown on the Drawings, the Contractor shall place fill in one (1) foot maximum lifts and compact using mechanical compaction equipment such as a vibratory compactor head or roller compactor.
No testing of compacted density will be performed, but the intent is to achieve an 85% relative density; acceptance will be by the Contracting Officer observing fill placement and compaction effort.

GRADING PLAN
IRRIGATION DITCH FILL

40 0 40 80 120
SCALE OF FEET

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CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV NO	DATE	DESCRIPTION
1	2015-10-09	100 Updated limits of disturbance
		Jeffrey J Fealko P.E.

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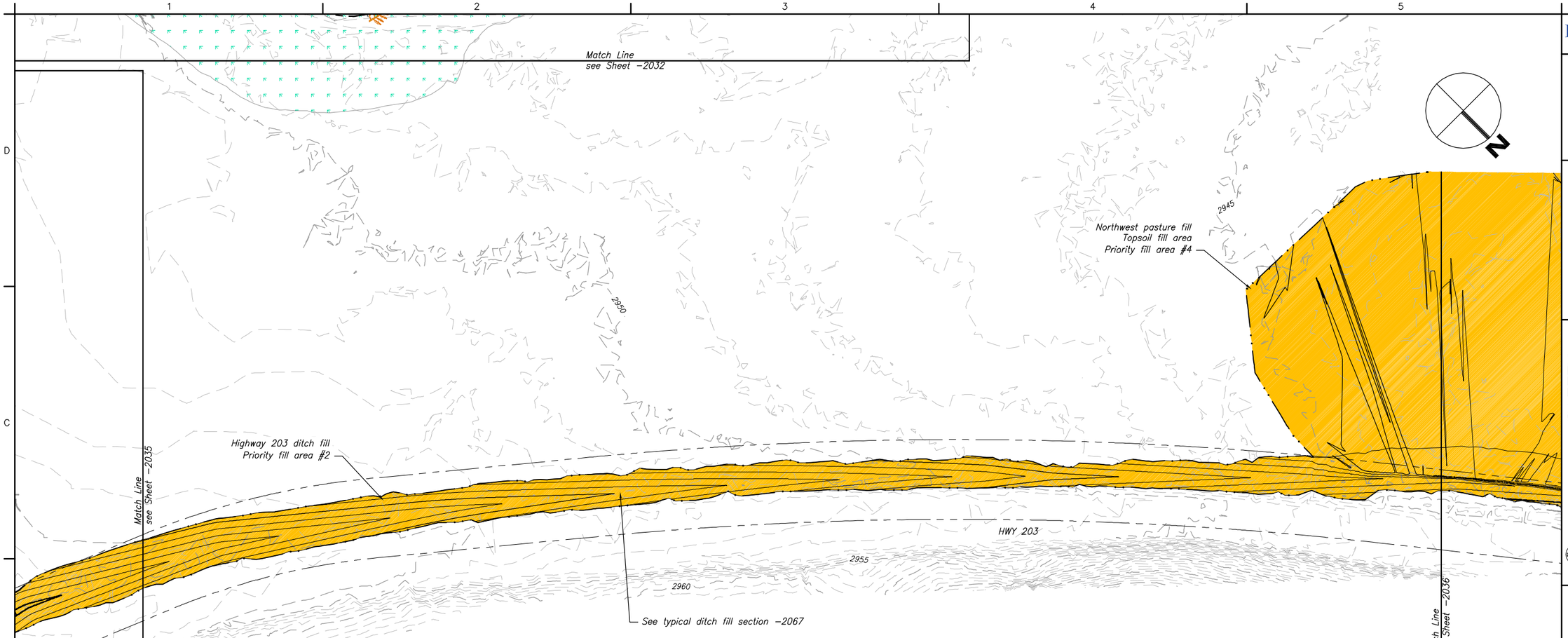
GRADING PLAN
IRRIGATION DITCH FILL

PLAN

1678-100-2034

SHEET 6 OF 8



LEGEND

- Year 1 Construction
- Year 2 Construction
- Existing wetland areas

GENERAL FILL NOTE:

Unless otherwise noted on other drawings, at locations where the grading requires fill to create the shape and topography shown on the Drawings, the Contractor shall place fill in one (1) foot maximum lifts and compact using mechanical compaction equipment such as a vibratory compactor head or roller compactor. No testing of compacted density will be performed, but the intent is to achieve an 85%% relative density; acceptance will be by the Contracting Officer observing fill placement and compaction effort.

GRADING PLAN

IRRIGATION DITCH FILL

40 0 40 80 120

SCALE OF FEET

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CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV NO		
1	2015-10-09	Updated limits of disturbance
	Jeffrey J Fealko P.E.	

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GRADING PLAN
IRRIGATION DITCH FILL

PLAN

1678-100-2035

SHEET 7 OF 8

Match Line
see Sheet –2032

Match Line
see Sheet –2033

Match Line
see Sheet –2035

D

D (–2067)

2940

Northwest pasture fill
topsoil fill area
Priority #4

Do not place excess
material this area, as
directed by the C.O.

Northwest property line terrace
Topsoil fill area
Priority fill area #3
This fill could be completed in Year 1,
as desired by the Contractor.

Lot line, typ.

2935

C

C (–2067)

Highway 203 ditch fill
Priority area #2

B

2945

End Highway 203 ditch fill
N 564515.1
E 8893749.5

HWY 203

LEGEND

Year 1 Construction

Year 2 Construction

Existing wetland areas

GENERAL FILL NOTE:

Unless otherwise noted on other drawings, at locations where the grading requires fill to create the shape and topography shown on the Drawings, the Contractor shall place fill in one (1) foot maximum lifts and compact using mechanical compaction equipment such as a vibratory compactor head or roller compactor. No testing of compacted density will be performed, but the intent is to achieve an 85%%% relative density; acceptance will be by the Contracting Officer observing fill placement and compaction effort.

GRADING PLAN
IRRIGATION DITCH FILL

40 0 40 80 120
SCALE OF FEET

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PARCEL 3

REV NO 1 — 2015-10-09 — Jeffrey J Fealko P.E. — 100 Updated limits of disturbance

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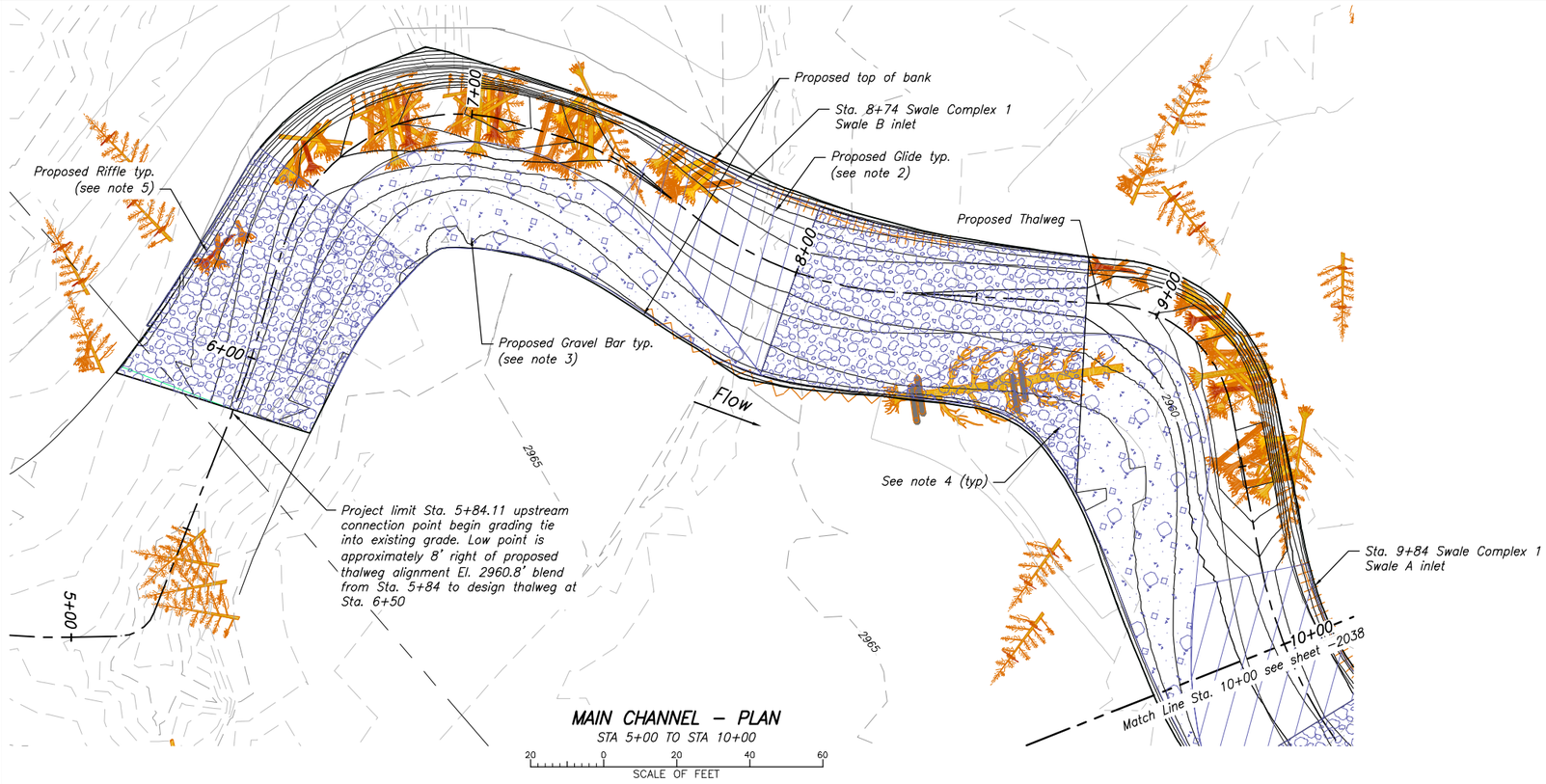
GRADING PLAN
IRRIGATION DITCH FILL

PLAN

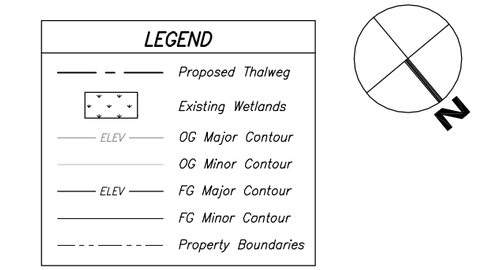
1678-100-2036

SHEET 8 OF 8



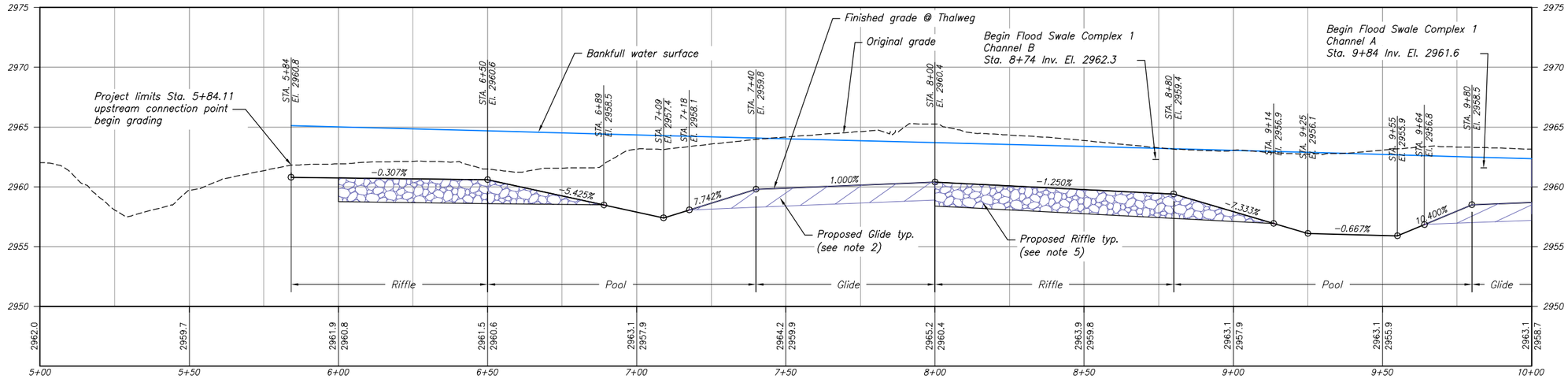
MAIN CHANNEL – PLAN
STA 5+00 TO STA 10+00

20 0 20 40 60
SCALE OF FEET



NOTES:

1. Cross sections are shown at all major vertical grade breaks shown in profile view. Sections can be found on sheets –2047 and –2059.
2. Glides shall be mechanically lifted and uncompacted for a minimum depth of 18 inches. Contracting Officer shall accept or reject uncompacted glide material based on the gradation shown on sheet –2062. If rejected, material shall be over excavated and rebuilt with acceptable material as shown on sheet –2062. Contractor shall take care to not overly compact glide material.
3. Gravel bar shall be graded to design elevations as shown on plans. Contracting Officer shall accept or reject gravel bar material based on the gradation shown on sheet –2062. If rejected, material shall be over excavated and rebuilt with acceptable material as shown on sheet –2062.
4. No boulders grater than 12 inches in diameter shall be placed in areas where riffle and gravel bars overlap. Riffle material shall be placed in these overlap areas.
5. Riffles shall be graded to design elevations as shown on plans. Contracting Officer shall accept or reject riffle bed material based on the gradation shown on sheet –2063. If rejected, material shall be over excavated and rebuilt with acceptable material as shown on sheet –2063.
6. For large woody material structures see sheets –2116 to –2127.



MAIN CHANNEL – THALWEG PROFILE
STA 5+00 TO STA 10+00

HORIZONTAL SCALE
20 0 20 40 60
SCALE OF FEET

VERTICAL SCALE
5 0 5 10 15
SCALE OF FEET

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GRANDE RONDE SUBBASIN
CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV NO		
1	2015-10-09	100 Corrected Plan and Profile call out
	Jeffrey J Fealko P.E.	

DESIGNED	Jeffrey J Fealko P.E.
DRAWN	JH
CHECKED	Mike Knutson P.E.
TECH. APPR.	Jeffrey J Fealko P.E.
APPROVED	Steve Montague–Acting
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MAIN CHANNEL STA. 5+00 TO STA. 10+00

PLAN AND PROFILE

1678-100-2037

SHEET 1 OF 10

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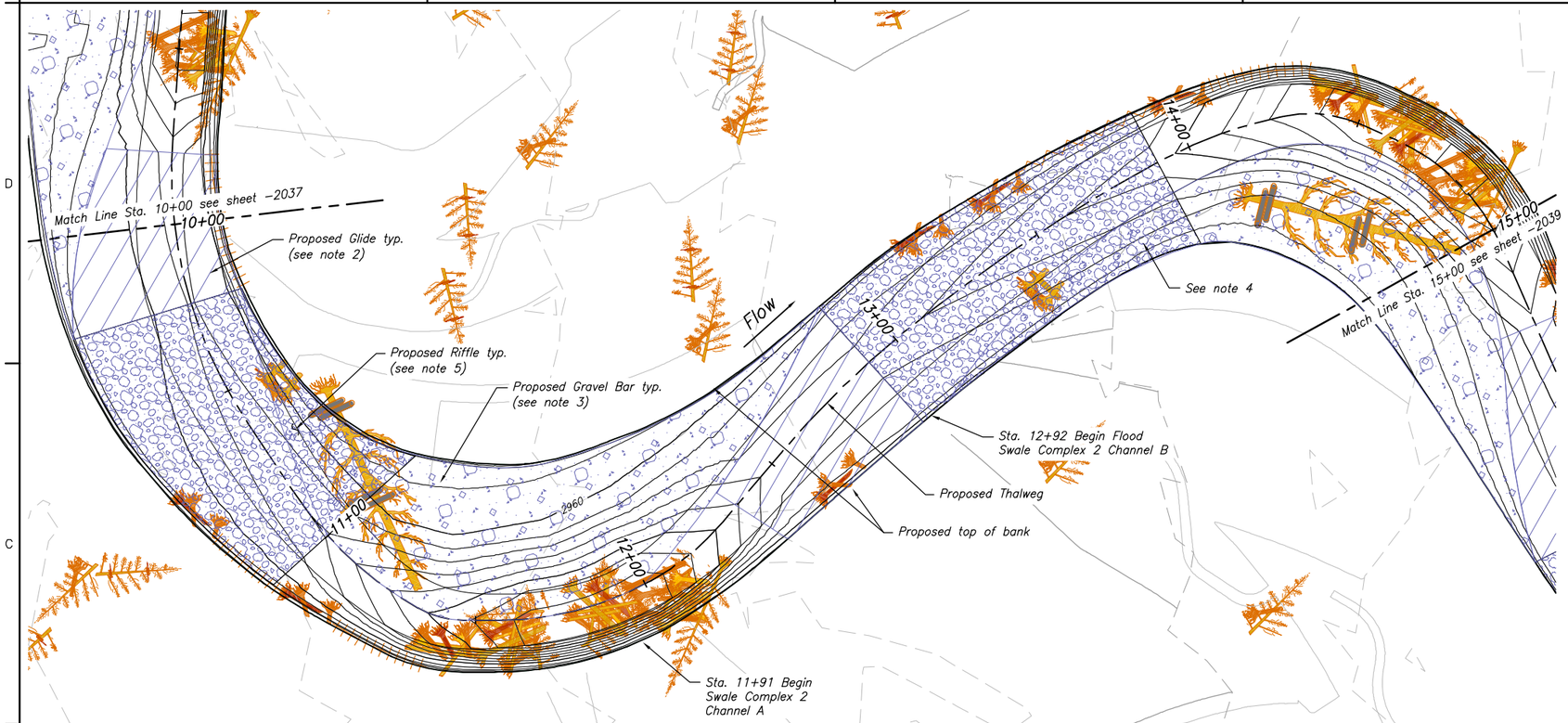
CAD FILENAME
PLAN AND PROFILE SHEETS - MAIN CHANNEL.DWG

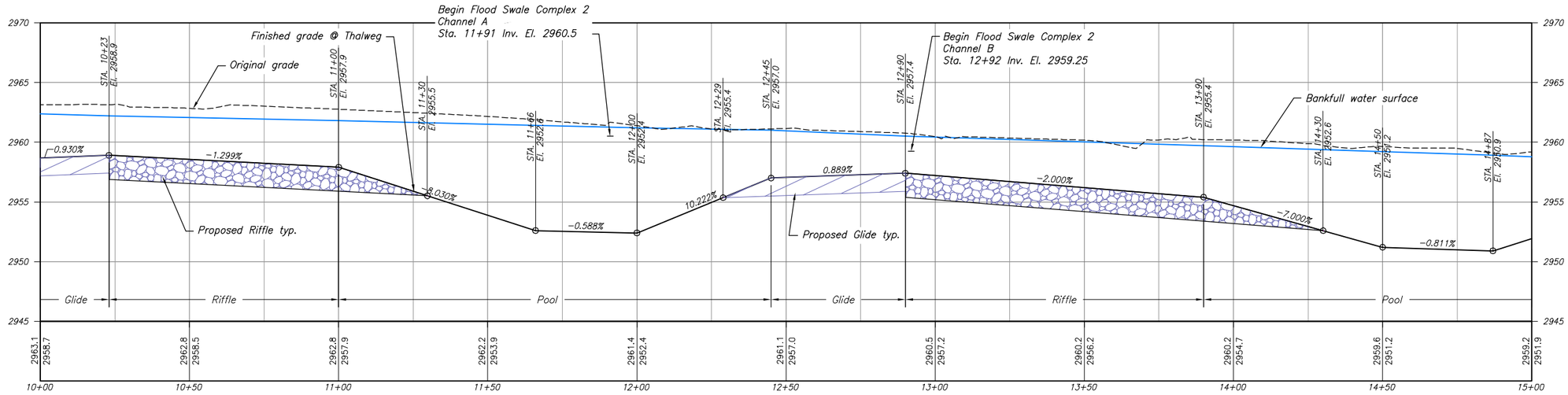


MAIN CHANNEL – PLAN

STA 10+00 TO STA 15+00

20 0 20 40 60

SCALE OF FEET



MAIN CHANNEL – THALWEG PROFILE

STA 10+00 TO STA 15+00

HORIZONTAL SCALE

20 0 20 40 60

SCALE OF FEET

VERTICAL SCALE

5 0 5 10 15

SCALE OF FEET

LEGEND

- Proposed Thalweg
- Existing Wetlands
- ELEV — OG Major Contour
- OG Minor Contour
- ELEV — FG Major Contour
- FG Minor Contour
- Property Boundaries

N

NOTES:

1. Cross sections are shown at all major vertical grade breaks shown in profile view. Sections can be found on sheets –2047 and –2059.
2. Glides shall be mechanically lifted and uncompacted for a minimum depth of 18 inches. Contracting Officer shall accept or reject uncompacted glide material based on the gradation shown on sheet –2062. If rejected, material shall be over excavated and rebuilt with acceptable material as shown on sheet –2062. Contractor shall take care to not overly compact glide material.
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6. For large woody material structures see sheets –2116 to –2127.

RECLAMATION
Managing Water in the West

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U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
COLUMBIA/SNAKE RIVER SALMON RECOVERY PROGRAM
FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN
CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV NO	DATE	DESCRIPTION
1	2015-10-09	100 Corrected Plan call out and station label Jeffrey J Fealko P.E.

Jeffrey J Fealko P.E.
DESIGNED
JH
DRAWN
Mike Knutson P.E.
CHECKED
Jeffrey J Fealko P.E.
TECH. APPR.
Steve Montague–Acting
APPROVED
ADMIN APPROVAL – PROGRAM MANAGER
BOISE, IDAHO 2015-09-14

MAIN CHANNEL
STA. 10+00 TO
STA. 15+00

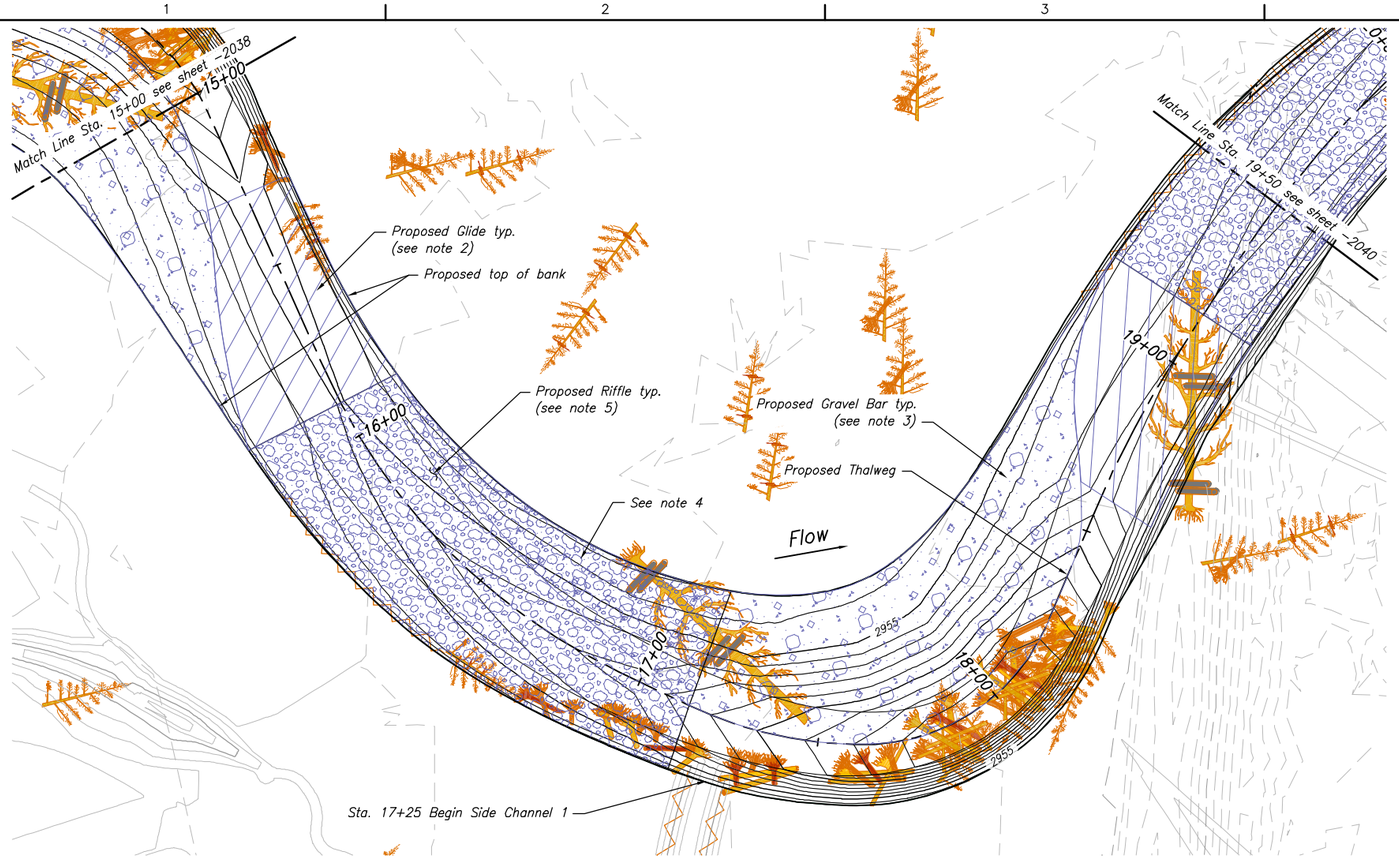
PLAN AND PROFILE

1678–100–2038

SHEET 2 OF 10

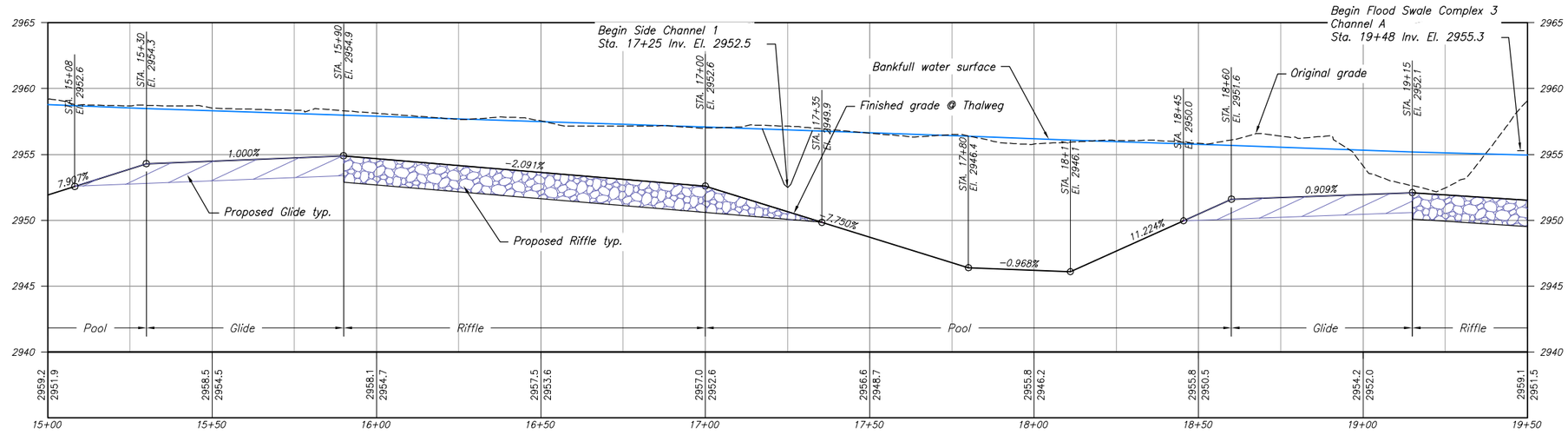
DATE AND TIME PLOTTED
MAY 26, 2015 17:07
PLOTTED BY
MBERGSTROM

CAD SYSTEM
AutoCAD Rel. 19.1s
CAD FILENAME
PLAN AND PROFILE SHEETS – MAIN CHANNEL.DWG



MAIN CHANNEL – PLAN
STA 15+00 TO STA 19+50

20 0 20 40 60
SCALE OF FEET



MAIN CHANNEL – THALWEG PROFILE
STA 15+00 TO STA 19+50

HORIZONTAL SCALE
20 0 20 40 60
SCALE OF FEET

VERTICAL SCALE
5 0 5 10 15
SCALE OF FEET

LEGEND
- Proposed Thalweg
- Existing Wetlands
- ELEV — OG Major Contour
- OG Minor Contour
- ELEV — FG Major Contour
- FG Minor Contour
- Property Boundaries

N

NOTES:
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BUREAU OF RECLAMATION
COLUMBIA/SNAKE RIVER SALMON RECOVERY PROGRAM
FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN
CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REVISED	DATE	DESCRIPTION
1	2015-10-09	Jeffrey J Fealko P.E. corrected Plan call out and station label

Jeffrey J Fealko P.E.
DESIGNED
JH
DRAWN
Mike Knutson P.E.
CHECKED
Jeffrey J Fealko P.E.
TECH. APPR.
Steve Montague – Acting
APPROVED
ADMIN. APPROVAL – PROGRAM MANAGER
BOISE, IDAHO 2015-09-14

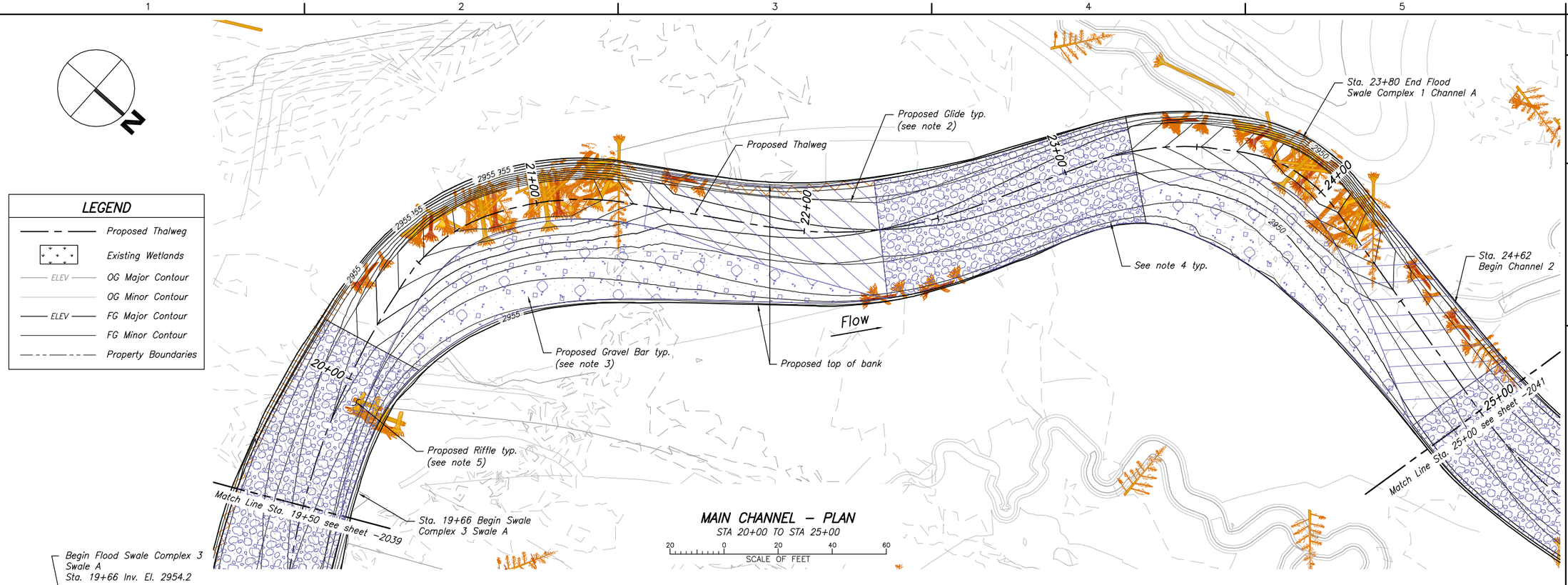
MAIN CHANNEL STA. 15+00 TO STA. 19+50

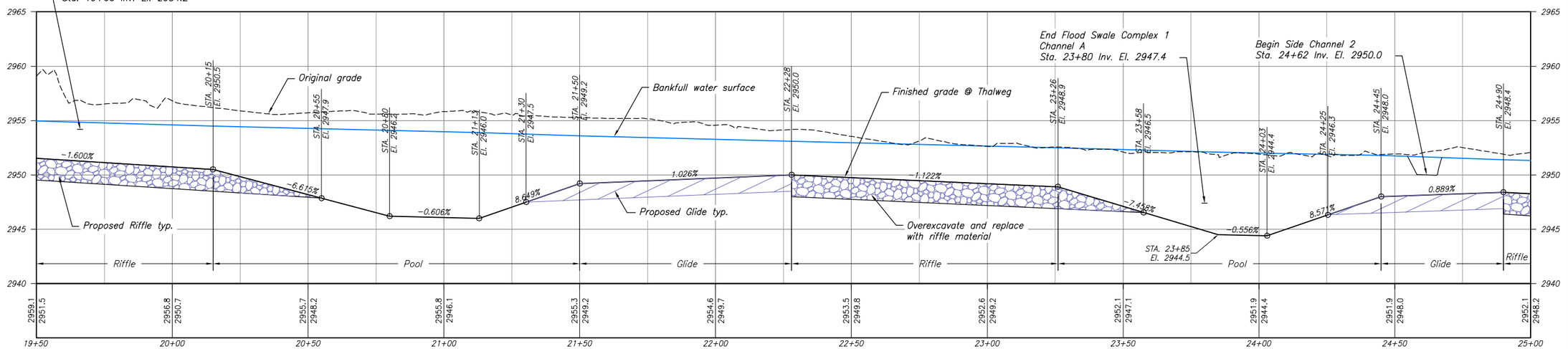
PLAN AND PROFILE

1678-100-2039
SHEET 3 OF 10

DATE AND TIME PLOTTED
MAY 26, 2015 17:07
PLOTTED BY
MBERGSTROM

CAD SYSTEM
AutoCAD Rel. 19.1s
CAD FILENAME
PLAN AND PROFILE SHEETS - MAIN CHANNEL.DWG





MAIN CHANNEL – THALWEG PROFILE
STA 20+00 TO STA 25+00

HORIZONTAL SCALE
20 0 20 40 60
SCALE OF FEET

VERTICAL SCALE
5 0 5 10 15
SCALE OF FEET

NOTES:

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FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN
CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV NO	DATE	DESCRIPTION
1	2015-10-09	100 Corrected station label

Jeffrey J Fealko P.E.
DESIGNED
JH
DRAWN
Mike Knutson P.E.
CHECKED
Jeffrey J Fealko P.E.
TECH. APPR.
Steve Montague–Acting
APPROVED
ADMIN. APPROVAL – PROGM MANAGER
BOISE, IDAHO 2015-09-14

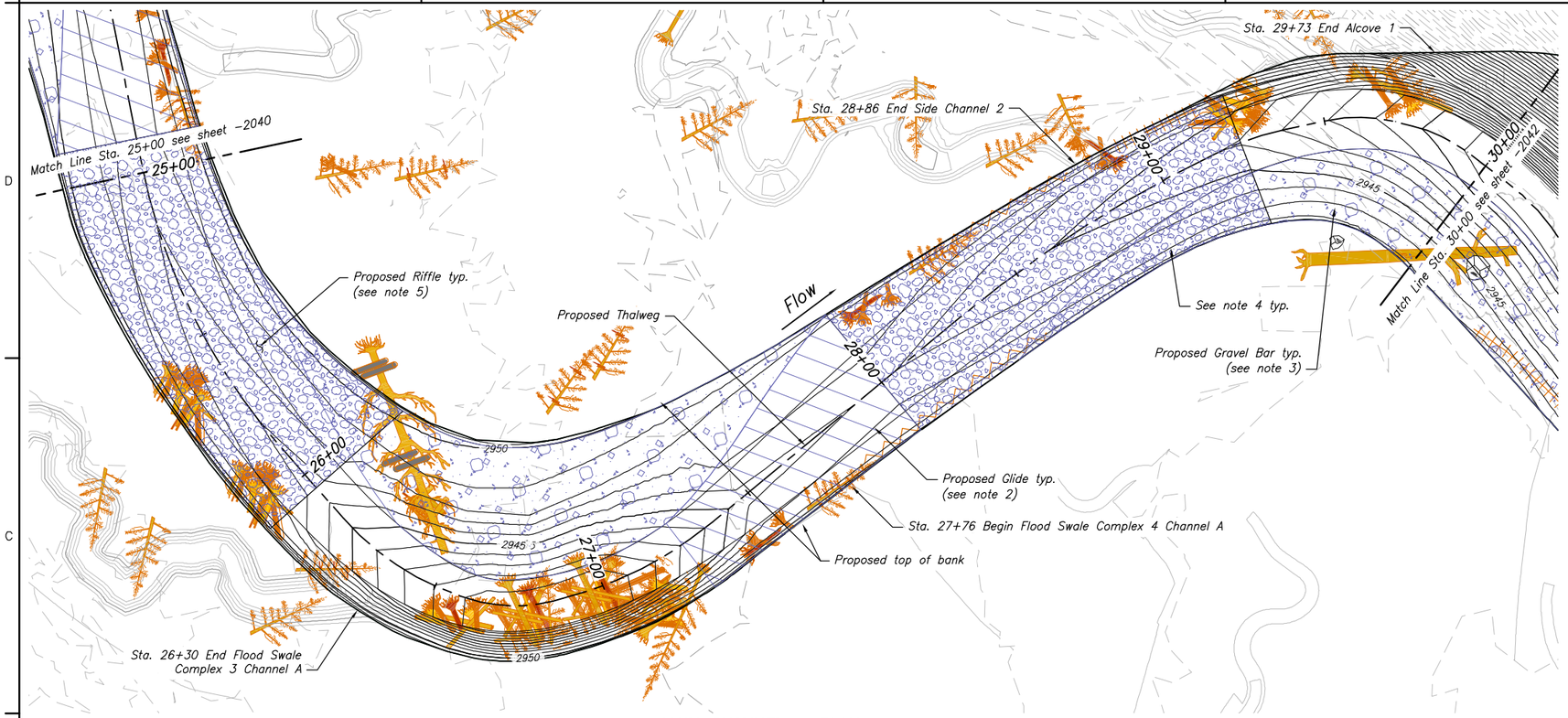
MAIN CHANNEL
STA. 19+50 TO
STA. 25+00

PLAN AND PROFILE

1678–100–2040
SHEET 4 OF 10

DATE AND TIME PLOTTED
MAY 26, 2015 17:07
PLOTTED BY
MBERGSTROM

CAD SYSTEM
AutoCAD Rel. 19.1s
CAD FILENAME
PLAN AND PROFILE SHEETS – MAIN CHANNEL.DWG



MAIN CHANNEL – PLAN

STA 25+00 TO STA 30+00

20 0 20 40 60
SCALE OF FEET

LEGEND

- Proposed Thalweg
- Existing Wetlands
- ELEV — OG Major Contour
- OG Minor Contour
- ELEV — FG Major Contour
- FG Minor Contour
- Property Boundaries

NOTES:

1. Cross sections are shown at all major vertical grade breaks shown in profile view. Sections can be found on sheets –2047 and –2059.
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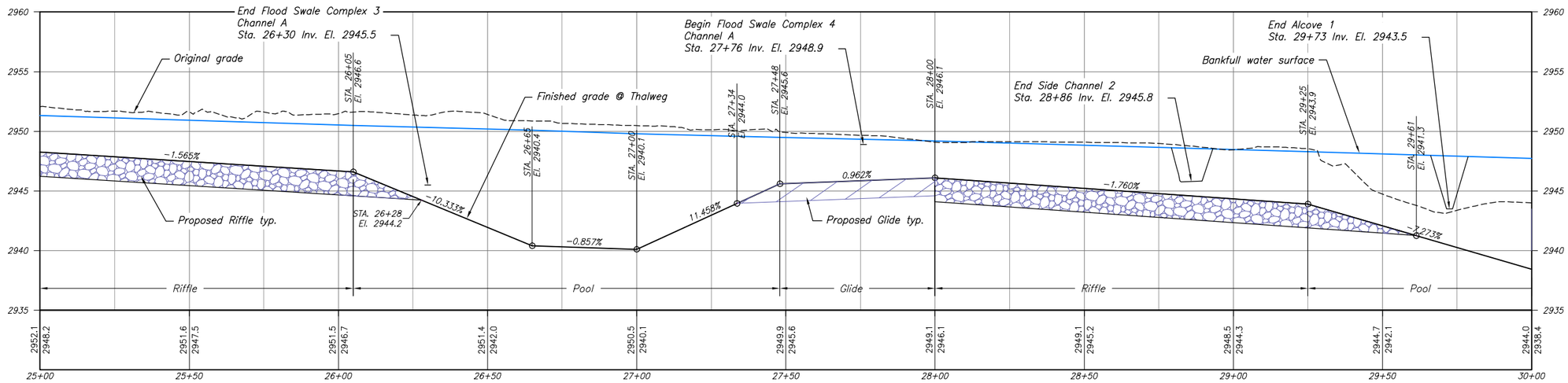

MAIN CHANNEL – THALWEG PROFILE

STA 25+00 TO STA 30+00

HORIZONTAL SCALE
20 0 20 40 60
SCALE OF FEET

VERTICAL SCALE
5 0 5 10 15
SCALE OF FEET

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COLUMBIA/SNAKE RIVER SALMON RECOVERY PROGRAM
FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN
CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV NO	DATE	DESCRIPTION
1	2015-10-09	100 Corrected Plan call out and station label Jeffrey J Fealko P.E.

Jeffrey J Fealko P.E.	DESIGNED
JH	DRAWN
Mike Knutson P.E.	CHECKED
Jeffrey J Fealko P.E.	TECH. APPR.
Steve Montague–Acting	APPROVED ADMIN APPROVAL – PROGRAM MANAGER
BOISE, IDAHO	2015-09-14

MAIN CHANNEL
STA. 25+00 TO
STA. 30+00

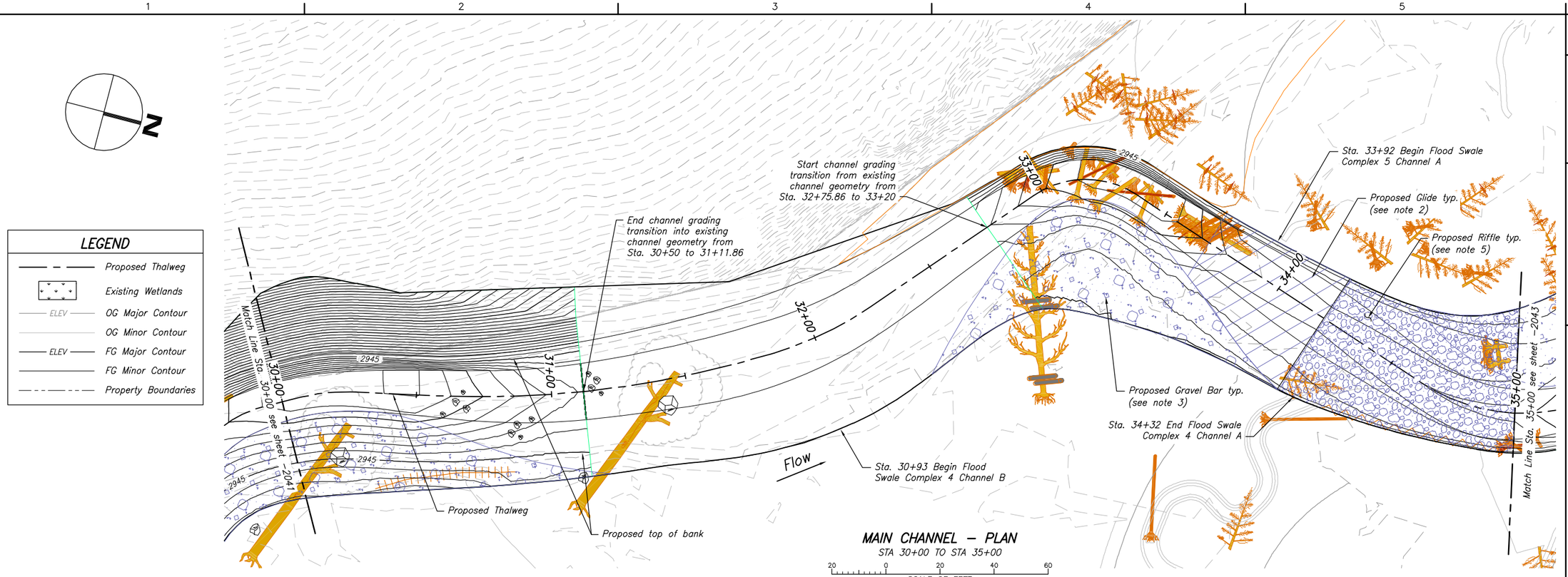
PLAN AND PROFILE

1678–100–2041

SHEET 5 OF 10

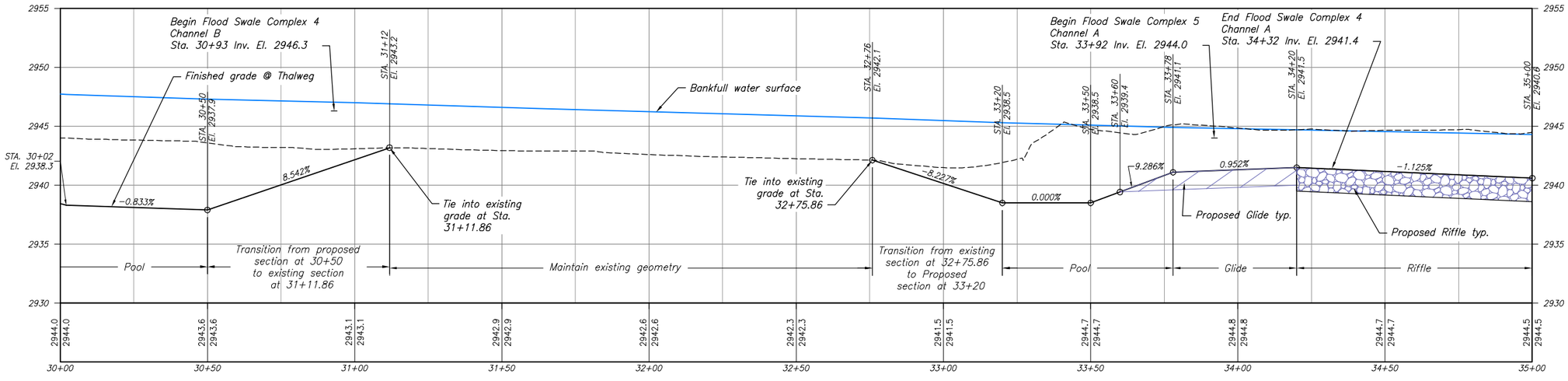
DATE AND TIME PLOTTED
MAY 26, 2015 17:07
PLOTTED BY
MBERGSTROM

CAD SYSTEM
AutoCAD Rel. 19.1s
CAD FILENAME
PLAN AND PROFILE SHEETS – MAIN CHANNEL.DWG



MAIN CHANNEL – PLAN
STA 30+00 TO STA 35+00

SCALE OF FEET: 20 0 20 40 60



MAIN CHANNEL – THALWEG PROFILE
STA 30+00 TO STA 35+00

HORIZONTAL SCALE: 20 0 20 40 60 SCALE OF FEET

VERTICAL SCALE: 5 0 5 10 15 SCALE OF FEET

NOTES:

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RECLAMATION
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COLUMBIA/SNAKE RIVER SALMON RECOVERY PROGRAM
FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN
CC-44 PHASE III HABITAT ENHANCEMENT PARCEL 3

REV NO	DATE	
1	2015-10-09	100 Changed position of profile label

Jeffrey J Fealko P.E.
DESIGNED
JH
DRAWN
Mike Knutson P.E.
CHECKED
Jeffrey J Fealko P.E.
TECH. APPR.
Steve Montague–Acting
APPROVED
ADMIN APPROVAL – PROGRAM MANAGER – ACTING
BOISE, IDAHO 2015–09–14

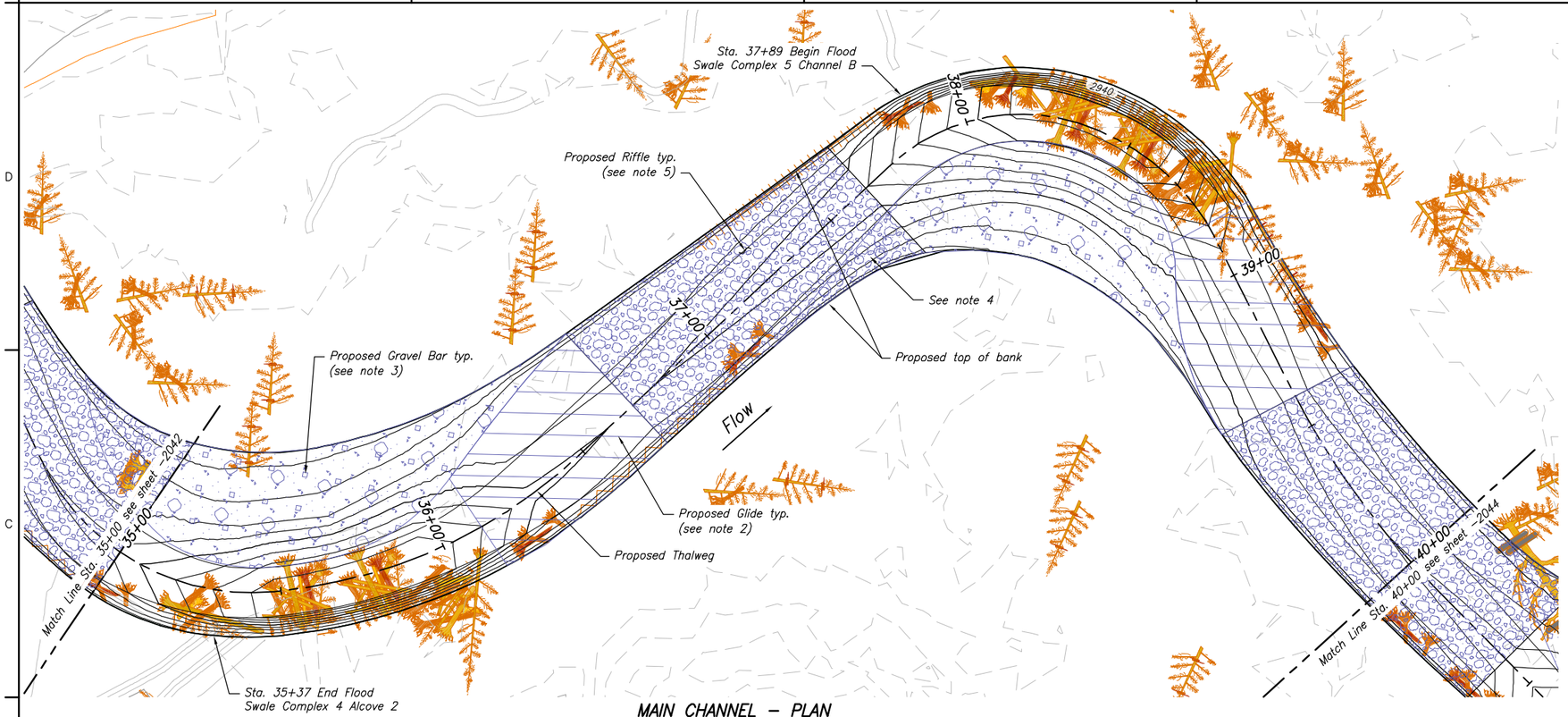
MAIN CHANNEL STA. 30+00 TO STA. 35+00

PLAN AND PROFILE

1678–100–2042
SHEET 6 OF 10

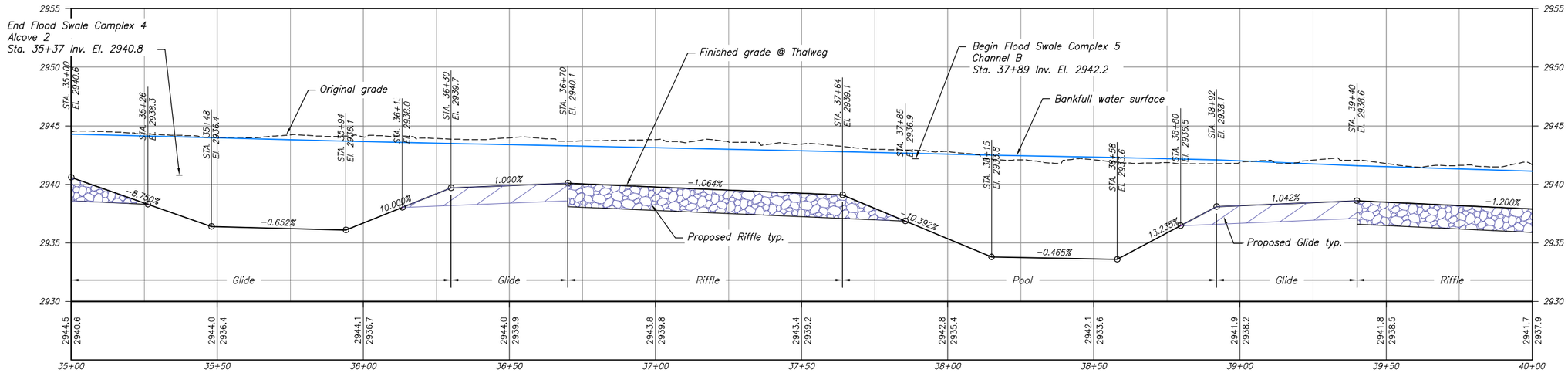
DATE AND TIME PLOTTED
MAY 26, 2015 17:07
PLOTTED BY
MBERGSTROM

CAD SYSTEM
AutoCAD Rel. 19.1s
CAD FILENAME
PLAN AND PROFILE SHEETS – MAIN CHANNEL.DWG



MAIN CHANNEL – PLAN
STA 35+00 TO STA 40+00

SCALE OF FEET: 20 0 20 40 60



MAIN CHANNEL – THALWEG PROFILE
STA 35+00 TO STA 40+00

HORIZONTAL SCALE: 20 0 20 40 60 SCALE OF FEET

VERTICAL SCALE: 5 0 5 10 15 SCALE OF FEET

LEGEND
- Proposed Thalweg
- Existing Wetlands
- ELEV — OG Major Contour
- OG Minor Contour
- ELEV — FG Major Contour
- FG Minor Contour
- Property Boundaries

N

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RECLAMATION
Managing Water in the West

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U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
COLUMBIA/SNAKE RIVER SALMON RECOVERY PROGRAM
FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN
CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV NO	DATE	DESCRIPTION
1	2015-10-09	100 Corrected Plan cell out and station label
		Jeffrey J Fealko P.E.

Jeffrey J Fealko P.E.	DESIGNED
JH	DRAWN
Mike Knutson P.E.	CHECKED
Jeffrey J Fealko P.E.	TECH. APPR.
Steve Montague – Acting	APPROVED
	ADMIN. APPROVAL – PROGRAM MANAGER
BOISE, IDAHO	2015-09-14

MAIN CHANNEL
STA. 35+00 TO
STA. 40+00

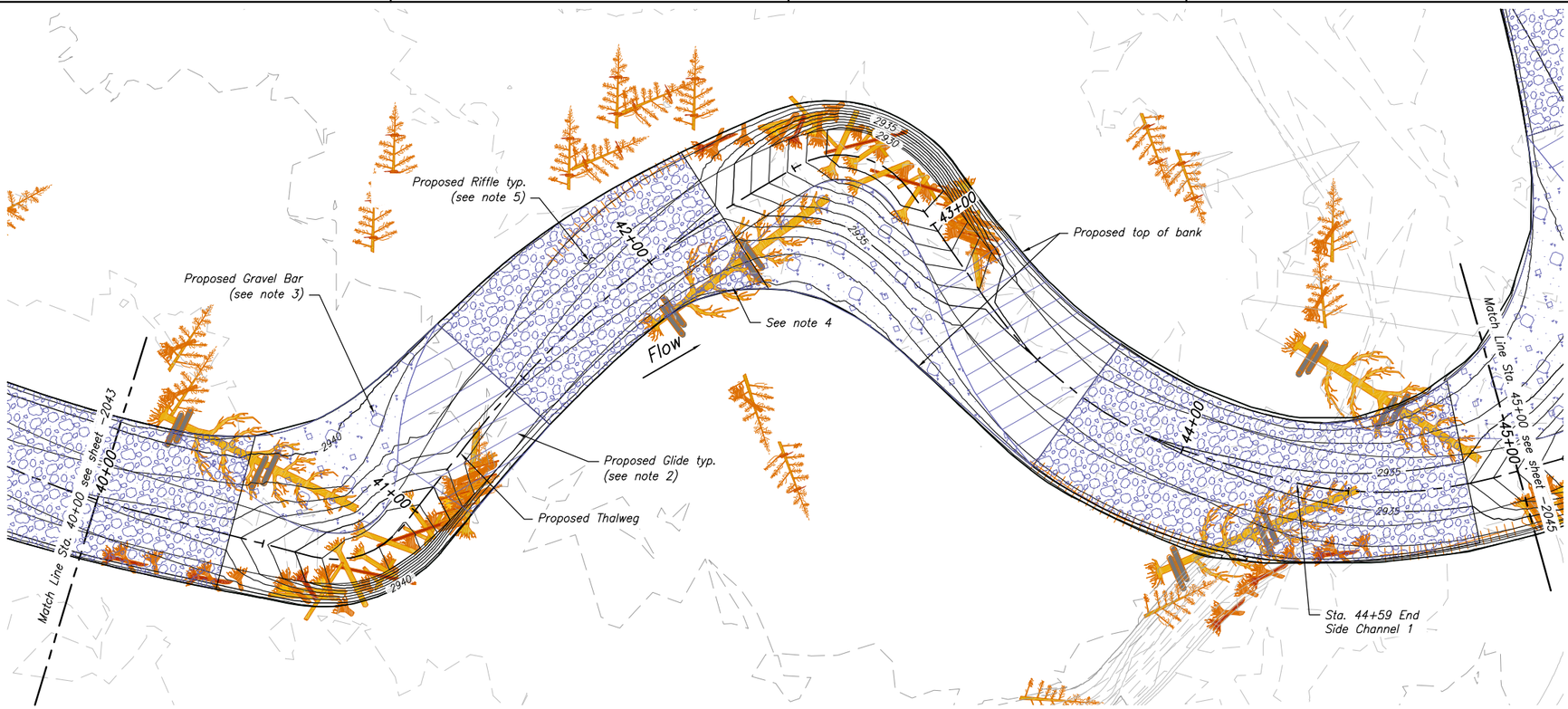
PLAN AND PROFILE

1678-100-2043

SHEET 7 OF 10

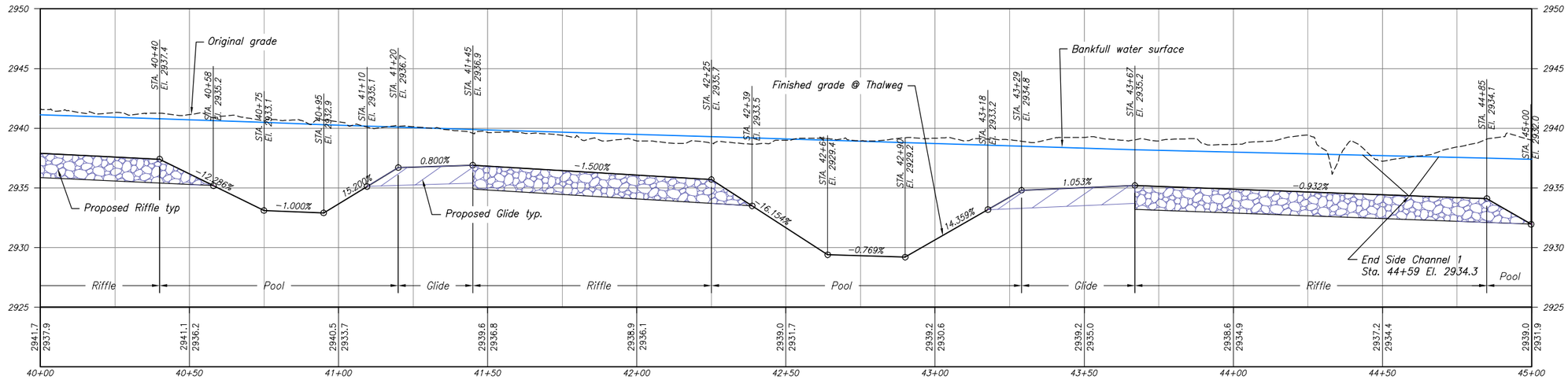
DATE AND TIME PLOTTED
MAY 26, 2015 17:07
PLOTTED BY
MBERGSTROM

CAD SYSTEM
AutoCAD Rel. 19.1s
CAD FILENAME
PLAN AND PROFILE SHEETS - MAIN CHANNEL.DWG



MAIN CHANNEL – PLAN
STA 40+00 TO STA 45+00

SCALE OF FEET: 20 0 20 40 60



MAIN CHANNEL – THALWEG PROFILE
STA 40+00 TO STA 45+00

HORIZONTAL SCALE: 20 0 20 40 60 SCALE OF FEET

VERTICAL SCALE: 5 0 5 10 15 SCALE OF FEET

LEGEND
- Proposed Thalweg
- Existing Wetlands
- ELEV — OG Major Contour
- OG Minor Contour
- ELEV — FG Major Contour
- FG Minor Contour
- Property Boundaries

N

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RECLAMATION
Managing Water in the West

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U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
COLUMBIA/SNAKE RIVER SALMON RECOVERY PROGRAM
FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN
CC–44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV NO	DATE	DESCRIPTION
1	2015–10–09	100 Corrected Plan cut out and station label
		Jeffrey J Fealko P.E.

Jeffrey J Fealko P.E. — DESIGNED
JH — DRAWN
Mike Knutson P.E. — CHECKED
Jeffrey J Fealko P.E. — TECH. APPR.
Steve Montague–Acting — APPROVED
ADMIN. APPROVAL – PROGM MANAGER
BOISE, IDAHO 2015–09–14

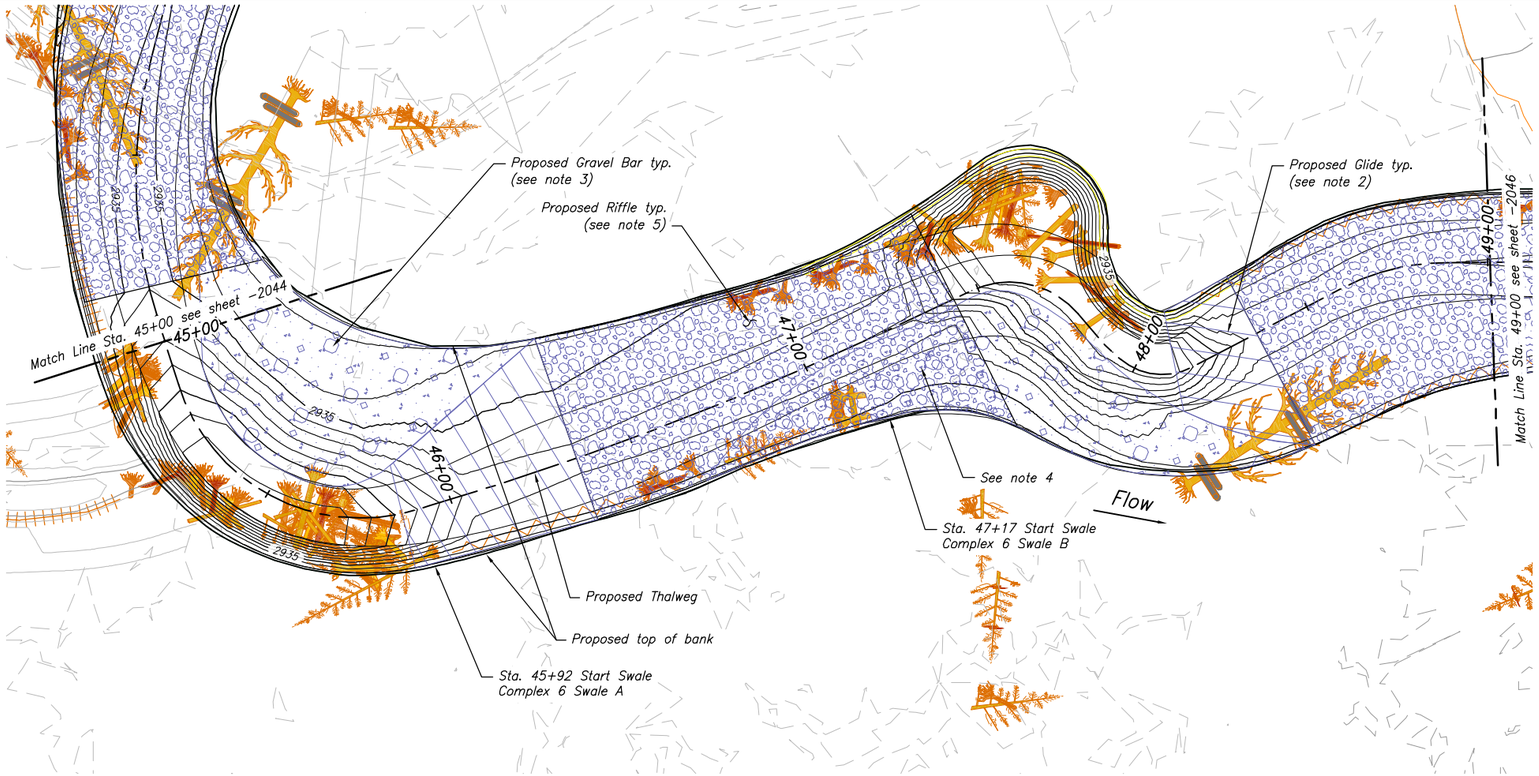
MAIN CHANNEL STA. 40+00 TO STA. 45+00

PLAN AND PROFILE

1678–100–2044

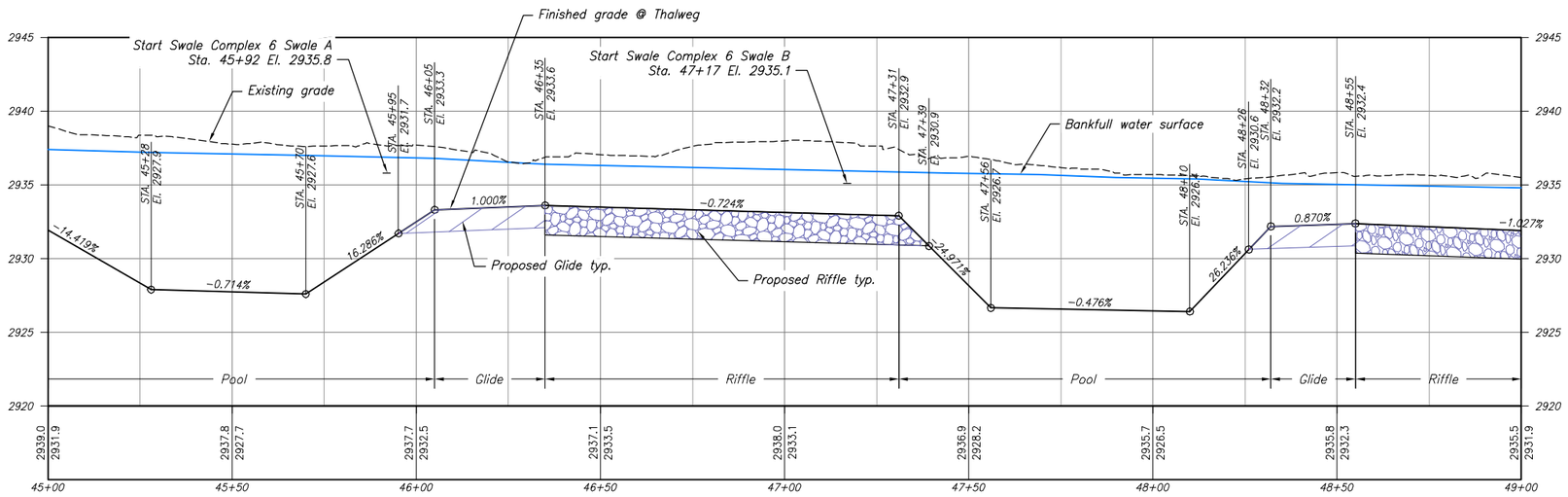
SHEET 8 OF 10

DATE AND TIME PLOTTED: MAY 26, 2015 17:07
PLOTTED BY: MBERGSTROM
CAD SYSTEM: AutoCAD Rel. 19.1s
CAD FILENAME: PLAN AND PROFILE SHEETS – MAIN CHANNEL.DWG



MAIN CHANNEL – PLAN
STA 45+00 TO STA 49+00

SCALE OF FEET: 20 0 20 40 60



MAIN CHANNEL – THALWEG PROFILE
STA 45+00 TO STA 49+00

HORIZONTAL SCALE: 20 0 20 40 60 SCALE OF FEET

VERTICAL SCALE: 5 0 5 10 15 SCALE OF FEET

LEGEND
- Proposed Thalweg
- Existing Wetlands
- ELEV — OG Major Contour
- OG Minor Contour
- ELEV — FG Major Contour
- FG Minor Contour
- Property Boundaries

N

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1. Cross sections are shown at all major vertical grade breaks shown in profile view. Sections can be found on sheets −2047 and −2059.
2. Glides shall be mechanically lifted and uncompacted for a minimum depth of 18 inches. Contracting Officer shall accept or reject uncompacted glide material based on the gradation shown on sheet −2062. If rejected, material shall be over excavated and rebuilt with acceptable material as shown on sheet −2062. Contractor shall take care to not overly compact glide material.
3. Gravel bar shall be graded to design elevations as shown on plans. Contracting Officer shall accept or reject gravel bar material based on the gradation shown on sheet −2062. If rejected, material shall be over excavated and rebuilt with acceptable material as shown on sheet −2062.
4. No boulders grater than 12 inches in diameter shall be placed in areas where riffle and gravel bars overlap. Riffle material shall be placed in these overlap areas.
5. Riffles shall be graded to design elevations as shown on plans. Contracting Officer shall accept or reject riffle bed material based on the gradation shown on sheet −2063. If rejected, material shall be over excavated and rebuilt with acceptable material as shown on sheet −2063.
6. For large woody material structures see sheets −2116 to −2127.

RECLAMATION
Managing Water in the West

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U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
COLUMBIA/SNAKE RIVER SALMON RECOVERY PROGRAM
FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN

CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV NO	DATE	DESCRIPTION
1	2015-10-09	100 Corrected Plan cut and station label

Jeffrey J Fealko P.E.
DESIGNED
JH
DRAWN
Mike Knutson P.E.
CHECKED
Jeffrey J Fealko P.E.
TECH. APPR.
Steve Montague – Acting
APPROVED
ADMIN APPROVAL – PROGRAM MANAGER
BOISE, IDAHO 2015-09-14

MAIN CHANNEL STA. 45+00 TO STA. 49+00

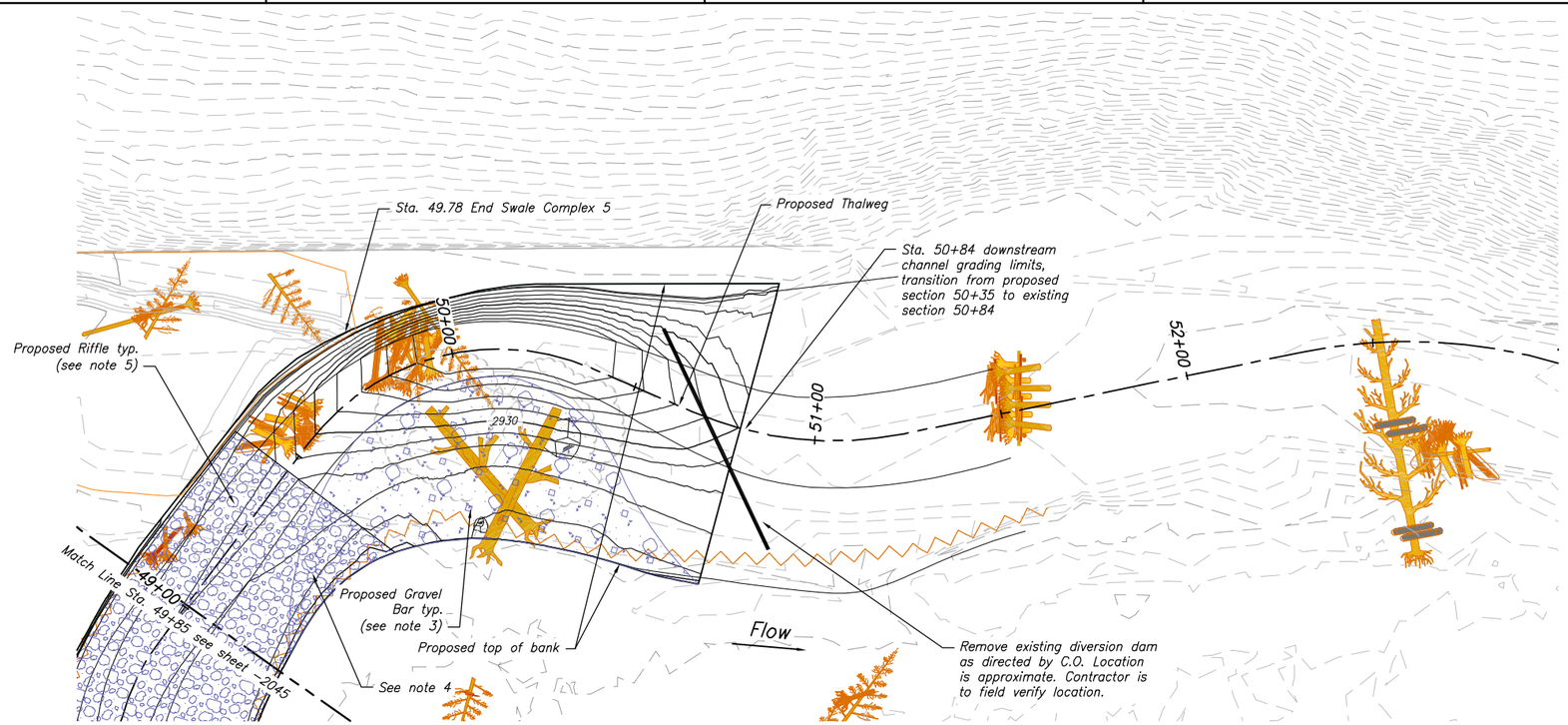
PLAN AND PROFILE

1678-100-2045

SHEET 9 OF 10

DATE AND TIME PLOTTED
MAY 26, 2015 17:07
PLOTTED BY
MBERGSTROM

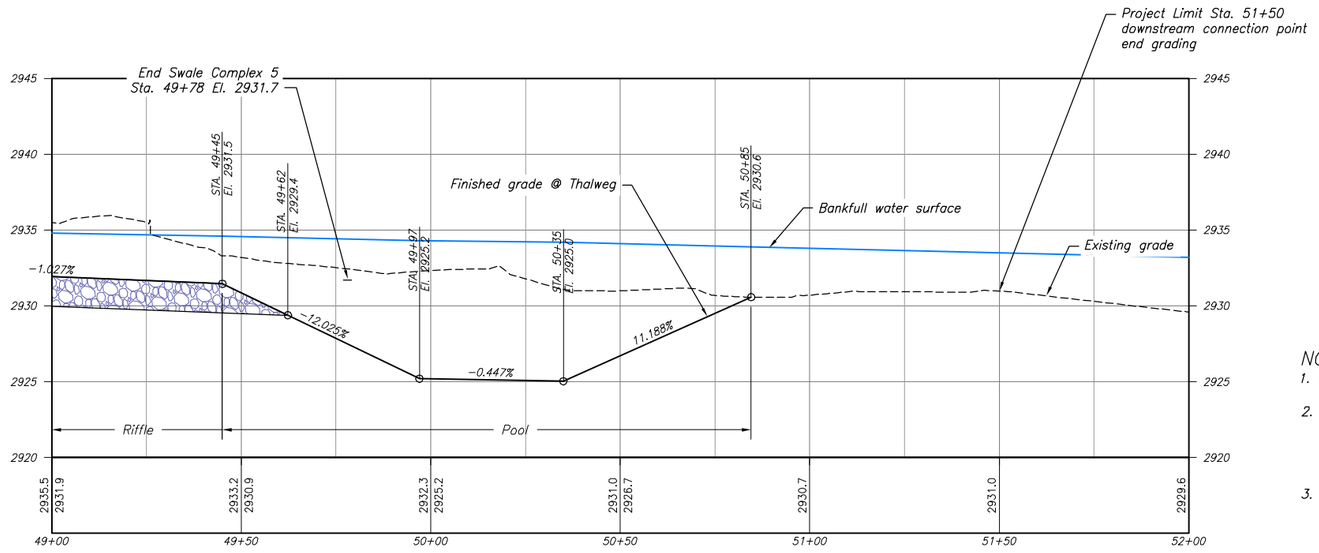
CAD SYSTEM
AutoCAD Rel. 19.1s
CAD FILENAME
PLAN AND PROFILE SHEETS - MAIN CHANNEL.DWG



MAIN CHANNEL – PLAN

STA 49+00 TO STA 51+50

SCALE OF FEET: 20 0 20 40 60



MAIN CHANNEL – THALWEG PROFILE

STA 49+00 TO STA 51+50

HORIZONTAL SCALE: 20 0 20 40 60 SCALE OF FEET

VERTICAL SCALE: 5 0 5 10 15 SCALE OF FEET

LEGEND

- Proposed Thalweg
- Existing Wetlands
- ELEV — OG Major Contour
- OG Minor Contour
- ELEV — FG Major Contour
- FG Minor Contour
- Property Boundaries

NOTES:

1. Cross sections are shown at all major vertical grade breaks shown in profile view. Sections can be found on sheets –2047 and –2059.
2. Glides shall be mechanically lifted and uncompacted for a minimum depth of 18 inches. Contracting Officer shall accept or reject uncompacted glide material based on the gradation shown on sheet –2062. If rejected, material shall be over excavated and rebuilt with acceptable material as shown on sheet –2062. Contractor shall take care to not overly compact glide material.
3. Gravel bar shall be graded to design elevations as shown on plans. Contracting Officer shall accept or reject gravel bar material based on the gradation shown on sheet –2062. If rejected, material shall be over excavated and rebuilt with acceptable material as shown on sheet –2062.
4. No boulders grater than 12 inches in diameter shall be placed in areas where riffle and gravel bars overlap. Riffle material shall be placed in these overlap areas.
5. Riffles shall be graded to design elevations as shown on plans. Contracting Officer shall accept or reject riffle bed material based on the gradation shown on sheet –2063. If rejected, material shall be over excavated and rebuilt with acceptable material as shown on sheet –2063.
6. For large woody material structures see sheets –2116 to –2127.

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COLUMBIA/SNAKE RIVER SALMON RECOVERY PROGRAM
FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN

CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV NO		
1	2015-10-09	100 Added diversion dam and call out
	Jeffrey J Fealko P.E.	

DESIGNED	Jeffrey J Fealko P.E.
DRAWN	JH
CHECKED	Mike Knutson P.E.
TECH. APPR.	Jeffrey J Fealko P.E.
APPROVED	Steve Montague–Acting
ADMIN. APPROVAL	-
BOISE, IDAHO	2015-09-14

MAIN CHANNEL
STA. 49+00 TO
STA. 51+50

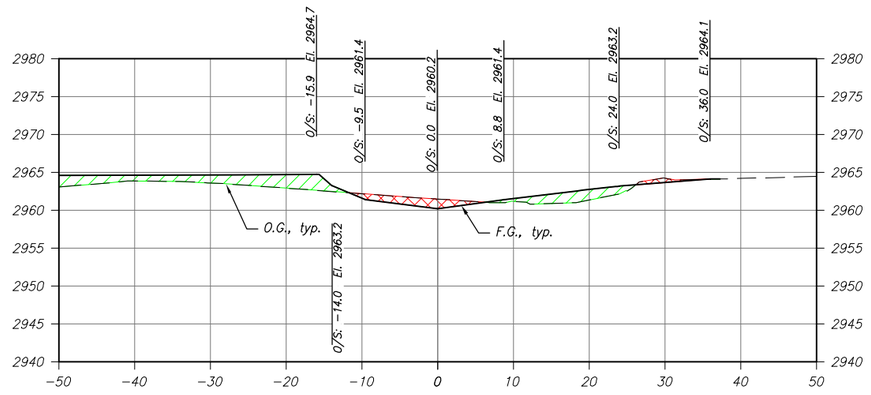
PLAN AND PROFILE

1678–100–2046

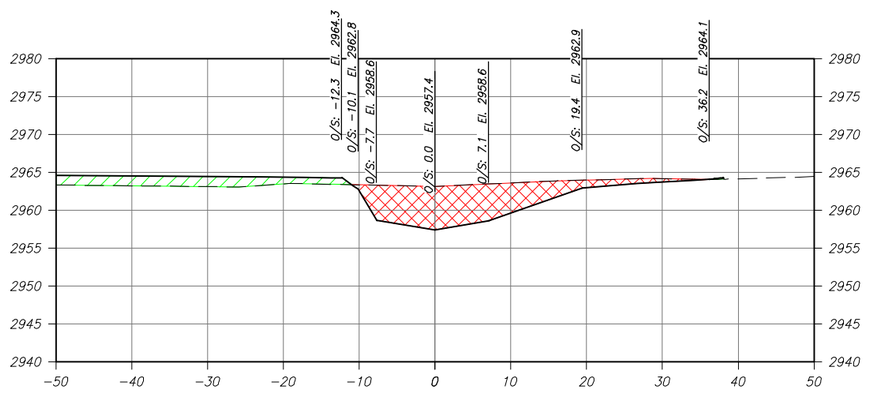
SHEET 10 OF 10

DATE AND TIME PLOTTED
MAY 26, 2015 17:07
PLOTTED BY
MBERGSTROM

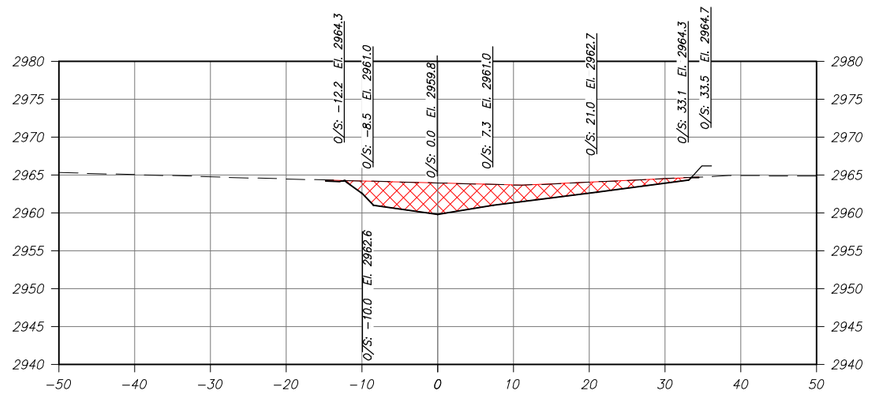
CAD SYSTEM
AutoCAD Rel. 19.1s
CAD FILENAME
PLAN AND PROFILE SHEETS - MAIN CHANNEL.DWG



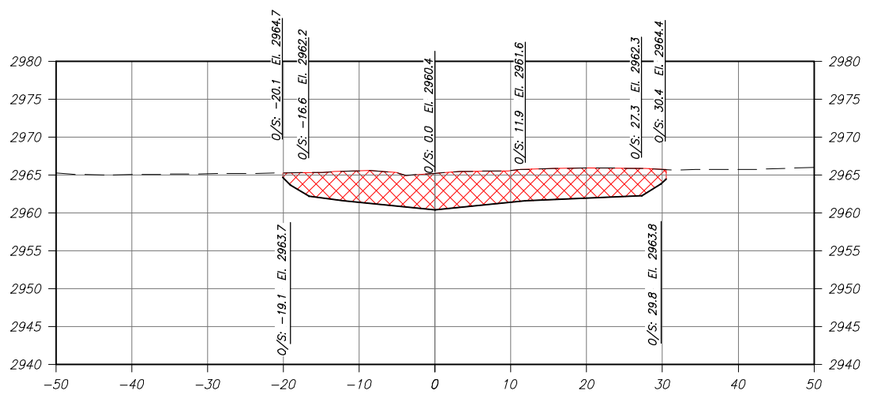
STA. 6+50



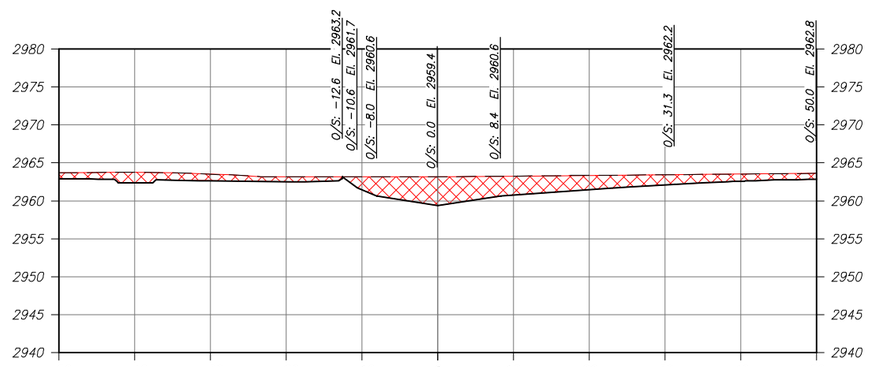
STA. 7+09



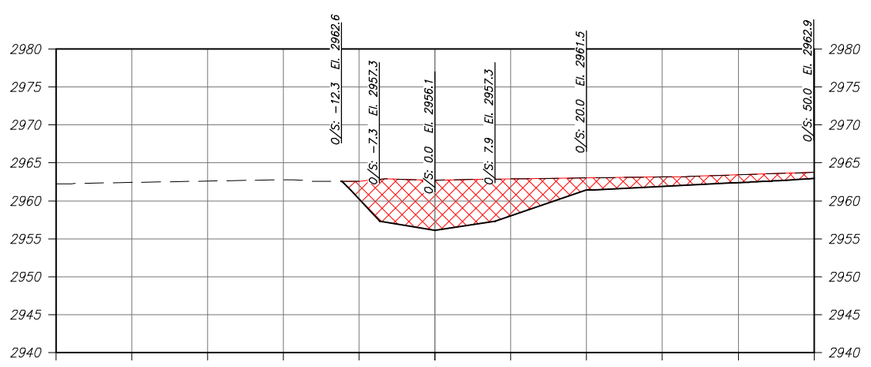
STA. 7+40



STA. 8+00



STA. 8+80



STA. 9+25

Cut

Fill

MAIN CHANNEL CROSS SECTION STA. 6+50 TO 9+25

SCALE OF FEET

NOTES:

1. Cross sections face downstream. Cross section centerline station is located along the thalweg alignment.
2. Y–axis is elevation, X–axis is distance in feet along a chord perpendicular to the thalweg. The zero station shown on these cross sections represents the thalweg alignment.
3. Constructed channel shall transition smoothly between cross sectional geometries shown within these cross sections. Cross section geometry shown represents one point in a smooth transition.
4. Cross–sections are to be used to stake out the channel offsets at the vertical grade breaks of the channel profile.

DATE AND TIME PLOTTED
JUNE 15, 2015 10:11
PLOTTED BY
JHOADE

CAD SYSTEM
AutoCAD Rel. 20.0s
CAD FILENAME
CROSS SECTIONS.DWG

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Managing Water in the West

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BUREAU OF RECLAMATION
COLUMBIA/SNAKE RIVER SALMON RECOVERY PROGRAM
FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN
CC–44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

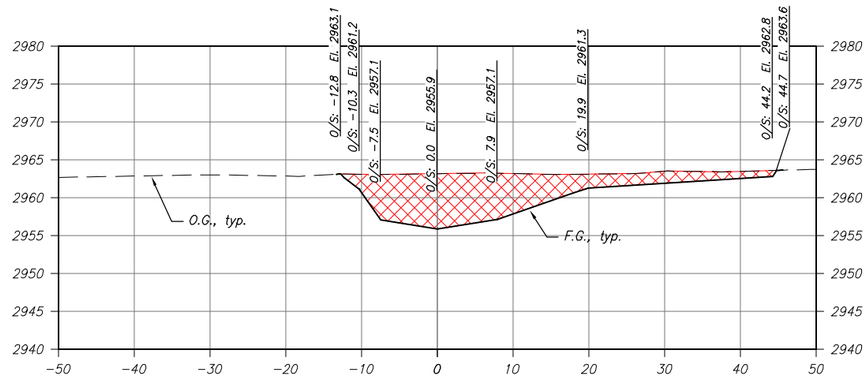
Jeffrey J Fealko P.E.
DESIGNED
JH
DRAWN
Mike Knutson P.E.
CHECKED
Jeffrey J Fealko P.E.
TECH. APPR.
Steve Montague–Acting
APPROVED
ADMIN. APPROVAL – PROGRAM MANAGER
BOISE, ID 2015–09–14

MAIN CHANNEL
STA. 6+50 TO 9+25

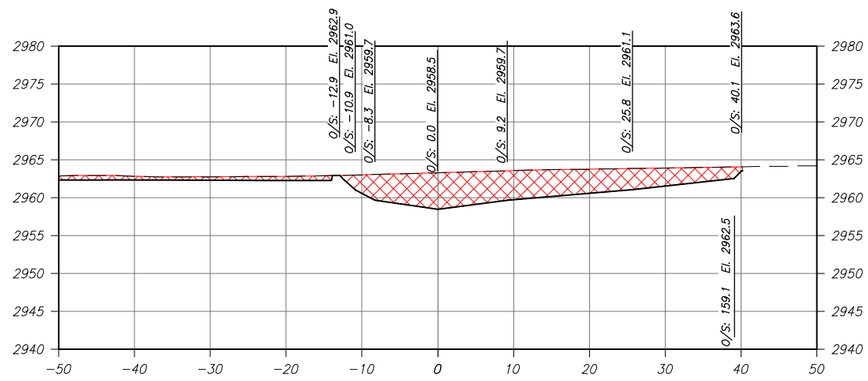
CROSS SECTIONS

1678–100–2047

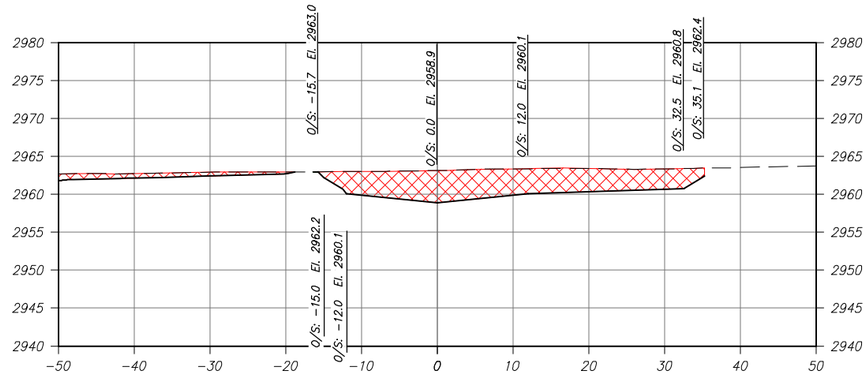
SHEET 1 OF 13



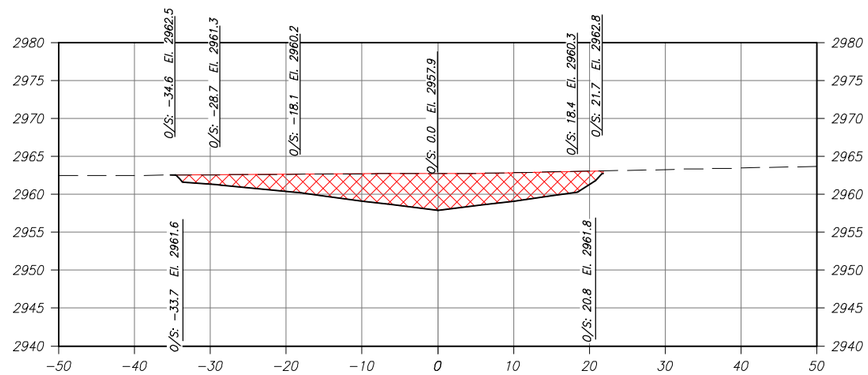
STA. 9+55



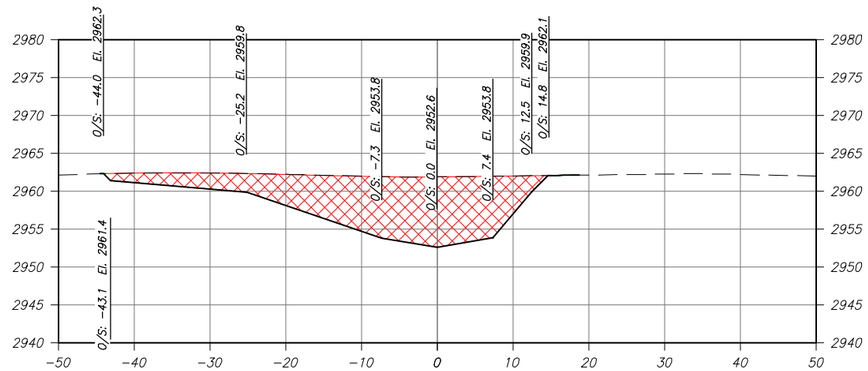
STA. 9+80



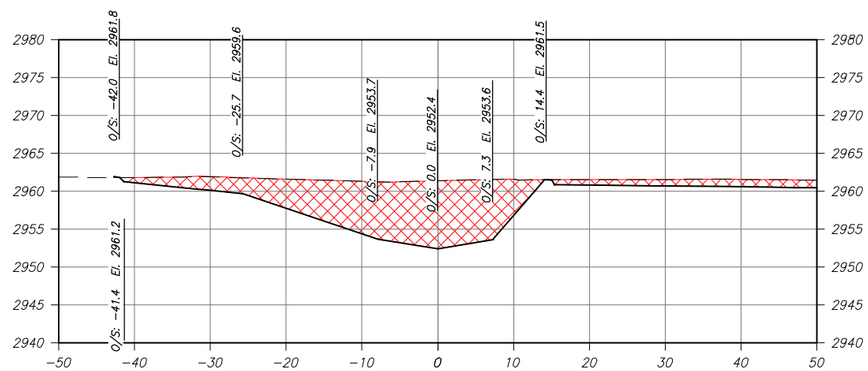
STA. 10+23



STA. 11+00



STA. 11+66



STA. 12+00

Cut

Fill

MAIN CHANNEL CROSS SECTION STA. 9+55 TO 12+00

10 0 10 20 30
SCALE OF FEET

NOTES:

1. Cross sections face downstream. Cross section centerline station is located along the thalweg alignment.
2. Y-axis is elevation, X-axis is distance in feet along a chord perpendicular to the thalweg. The zero station shown on these cross sections represents the thalweg alignment.
3. Constructed channel shall transition smoothly between cross sectional geometries shown within these cross sections. Cross section geometry shown represents one point in a smooth transition.
4. Cross-sections are to be used to stake out the channel offsets at the vertical grade breaks of the channel profile.

DATE AND TIME PLOTTED
AUGUST 13, 2015 15:38
PLOTTED BY
JHOVDE

CAD SYSTEM
AutoCAD Rel. 20.0s
CAD FILENAME:
1678-100-MCXS.DWG

RECLAMATION
Managing Water in the West

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U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
COLUMBIA/SNAKE RIVER SALMON RECOVERY PROGRAM
FCRPS HABITAT IMPROVEMENT PROGRAM

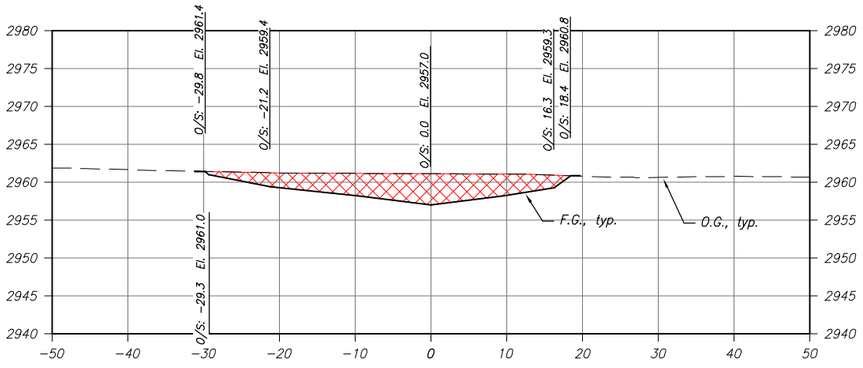
GRANDE RONDE SUBBASIN
CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

Jeffrey J Fealko P.E.
DESIGNED
JH
DRAWN
Mike Knutson P.E.
CHECKED
Jeffrey J Fealko P.E.
TECH. APPR.
Steve Montague-Acting
APPROVED
ADMIN. APPROVAL - PROGRAM MANAGER
BOISE, ID 2015-09-14

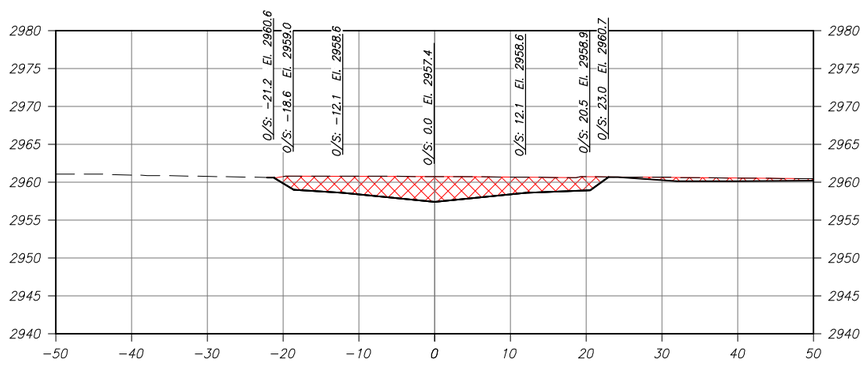
MAIN CHANNEL
STA. 9+55 TO 12+00

CROSS SECTIONS

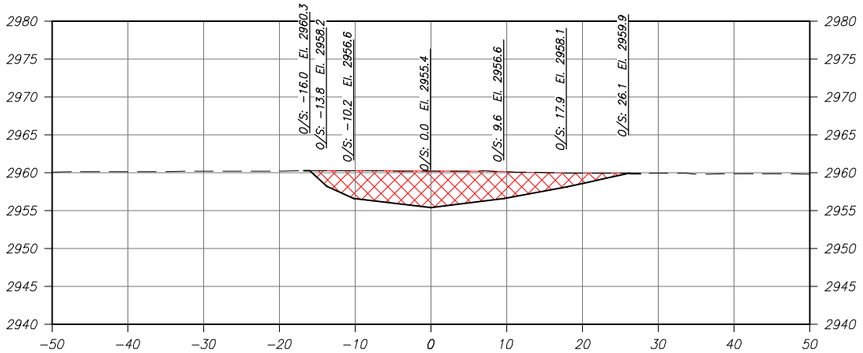
1678-100-2048
SHEET 2 OF 13



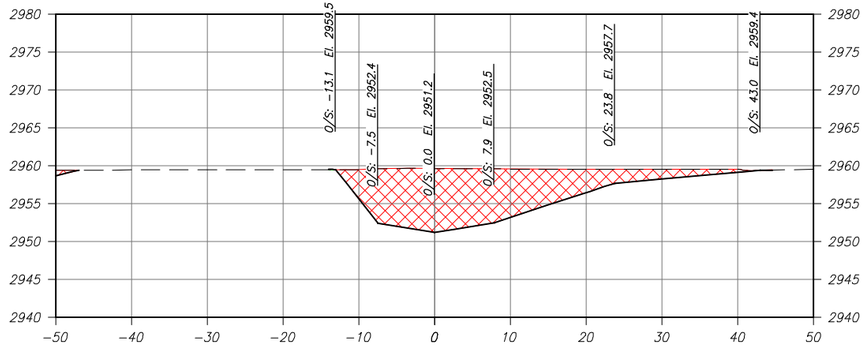
STA. 12+45



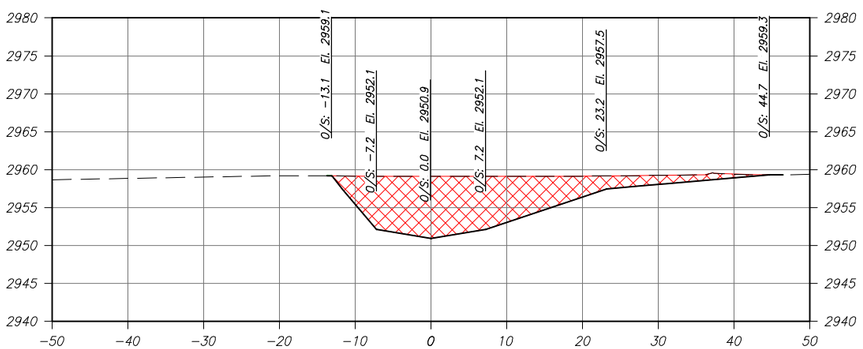
STA. 12+90



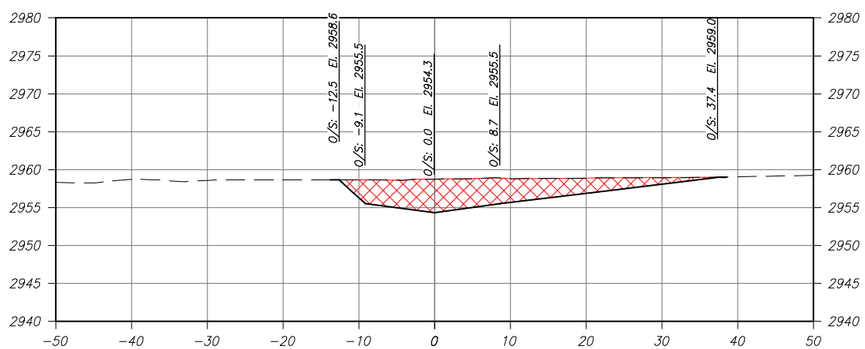
STA. 13+90



STA. 14+50



STA. 14+87



STA. 15+30

Cut

Fill

MAIN CHANNEL CROSS SECTION STA. 12+45 TO 15+30

10 0 10 20 30
SCALE OF FEET

Notes

1. Cross sections face downstream. Cross section centerline station is located along the thalweg alignment.
2. Y-axis is elevation, X-axis is distance in feet along a chord perpendicular to the thalweg. The zero station shown on these cross sections represents the thalweg alignment.
3. Constructed channel shall transition smoothly between cross sectional geometries shown within these cross sections. Cross section geometry shown represents one point in a smooth transition.
4. Cross-sections are to be used to stake out the channel offsets at the vertical grade breaks of the channel profile.

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Managing Water in the West

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U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
COLUMBIA/SNAKE RIVER SALMON RECOVERY PROGRAM
FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN
CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

Jeffrey J Fealko P.E.
DESIGNED
JH
DRAWN
Mike Knutson P.E.
CHECKED
Jeffrey J Fealko P.E.
TECH. APPR.
Steve Montague-Acting
APPROVED
ADMIN. APPROVAL - PROGRAM MANAGER
BOISE, ID 2015-09-14

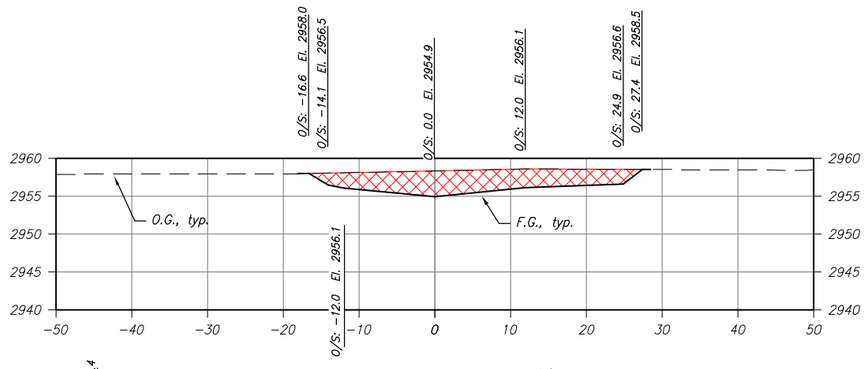
MAIN CHANNEL
STA. 12+45 TO 15+30

CROSS SECTIONS

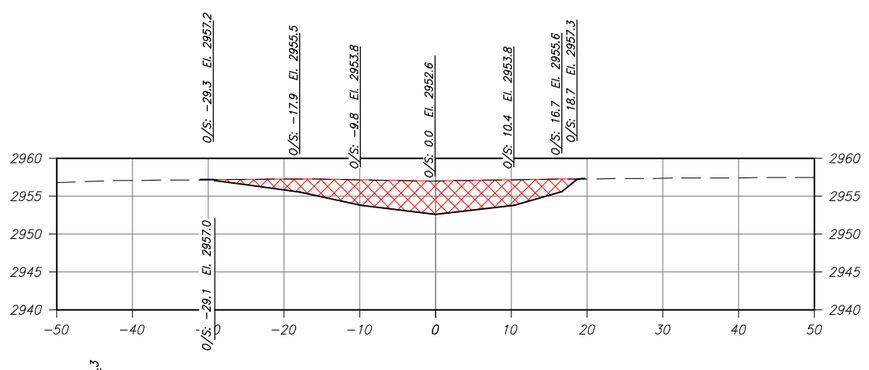
1678-100-2049
SHEET 3 OF 13

DATE AND TIME PLOTTED
AUGUST 13, 2015 15:40
PLOTTED BY
JHOVDE

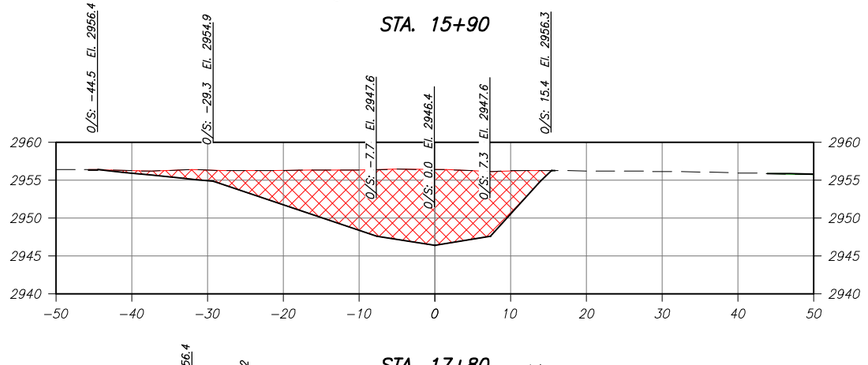
CAD SYSTEM
AutoCAD Rel. 20.0s
CAD FILENAME
1678-100-MCXS.DWG



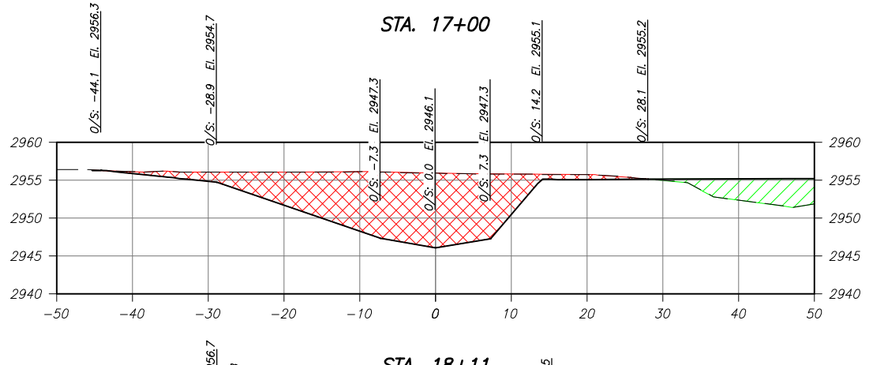
STA. 15+90



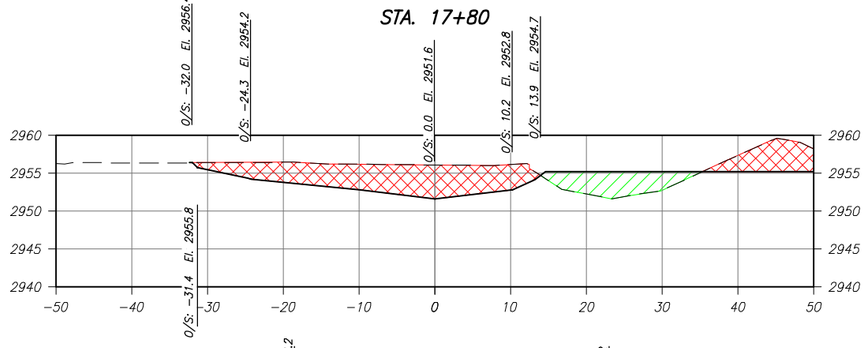
STA. 17+00



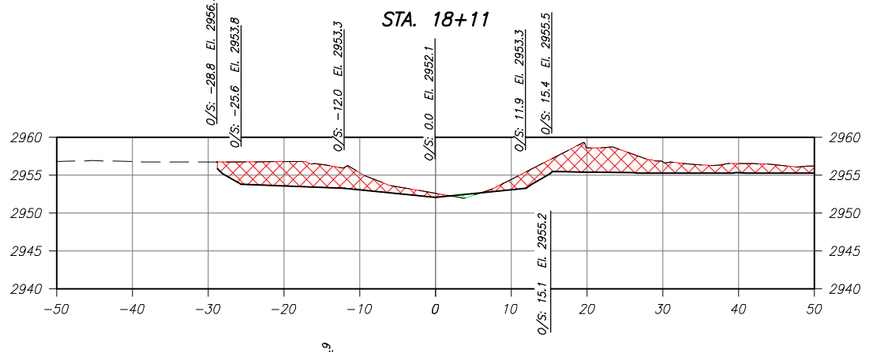
STA. 17+80



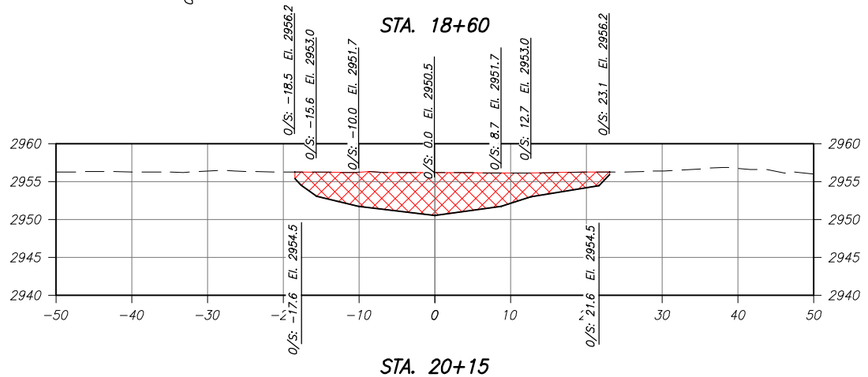
STA. 18+11



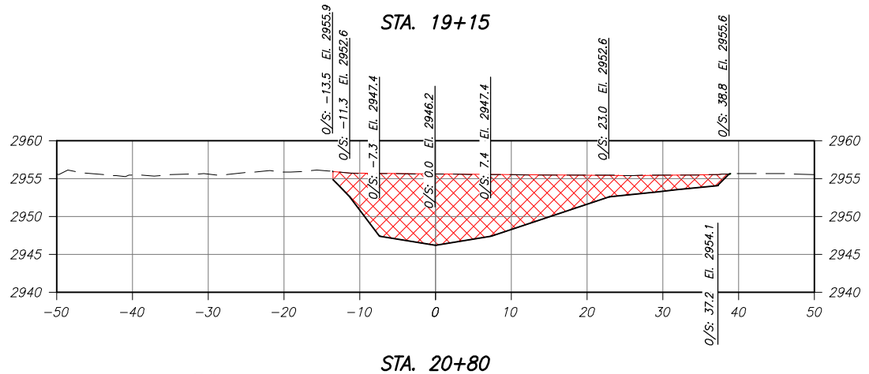
STA. 18+60



STA. 19+15



STA. 20+15



STA. 20+80

Cut

Fill

MAIN CHANNEL CROSS SECTION STA. 15+90 TO 20+80

10 0 10 20 30
SCALE OF FEET

Notes

1. Cross sections face downstream. Cross section centerline station is located along the thalweg alignment.
2. Y-axis is elevation, X-axis is distance in feet along a chord perpendicular to the thalweg. The zero station shown on these cross sections represents the thalweg alignment.
3. Constructed channel shall transition smoothly between cross sectional geometries shown within these cross sections. Cross section geometry shown represents one point in a smooth transition.
4. Cross-sections are to be used to stake out the channel offsets at the vertical grade breaks of the channel profile.

DATE AND TIME PLOTTED
AUGUST 13, 2015 15:48
PLOTTED BY
JHOVDE

CAD SYSTEM
AutoCAD Rel. 20.0s
CAD FILENAME
1678-100-MCXS.DWG

RECLAMATION
Managing Water in the West

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U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
COLUMBIA/SNAKE RIVER SALMON RECOVERY PROGRAM
FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN
CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV NO		
1	2015-10-09	100 Corrected Sta 18+11 and Sta. 19+15 offset and elevation labels
	Jeffrey J Fealko P.E.	

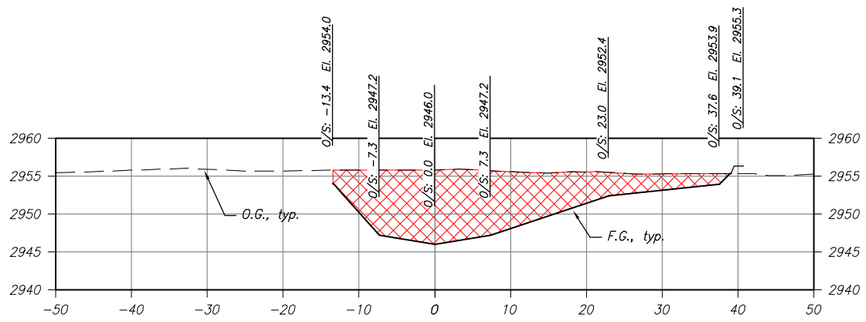
Jeffrey J Fealko P.E.
DESIGNED
JH
DRAWN
Mike Knutson P.E.
CHECKED
Jeffrey J Fealko P.E.
TECH. APPR.
Steve Montague-Acting
APPROVED
ADMIN APPROVAL - PROGRAM MANAGER
BOISE, ID 2015-09-14

MAIN CHANNEL
STA. 15+90 TO 20+80

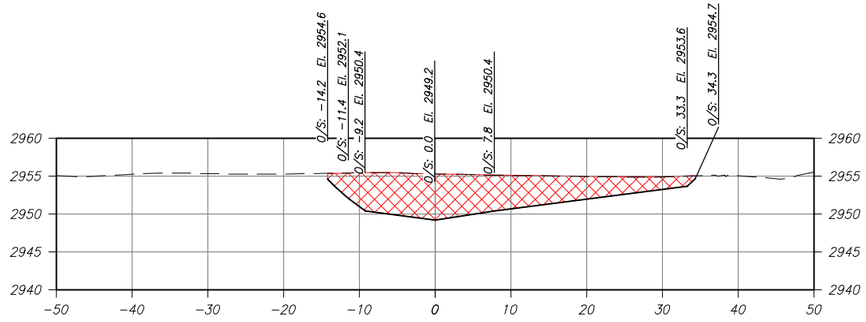
CROSS SECTIONS

1678-100-2050

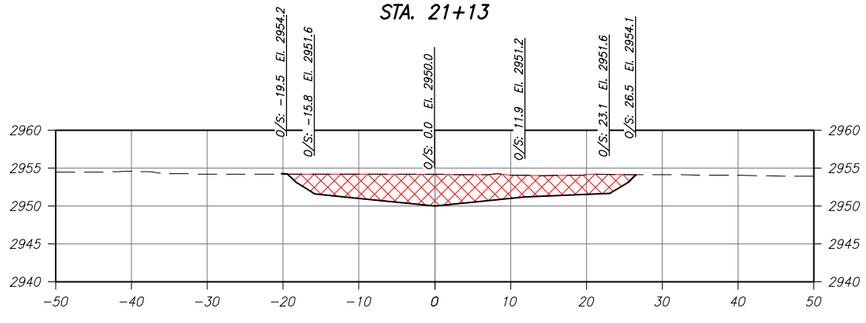
SHEET 4 OF 13



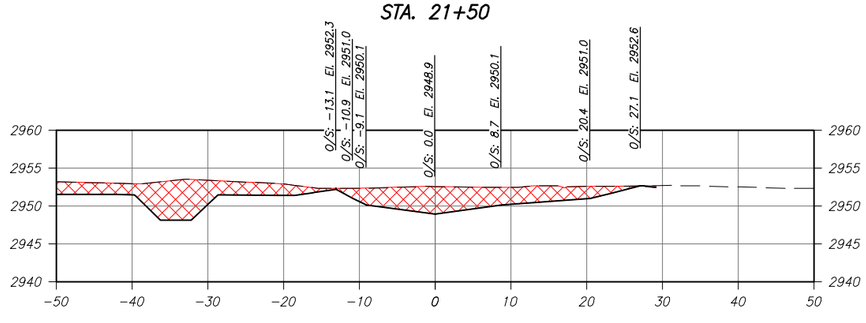
STA. 21+13



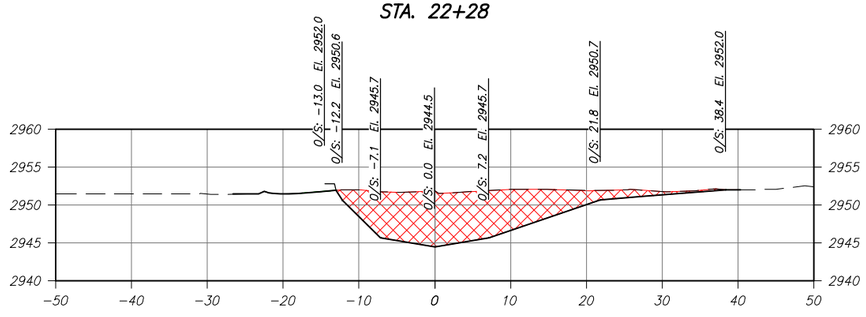
STA. 21+50



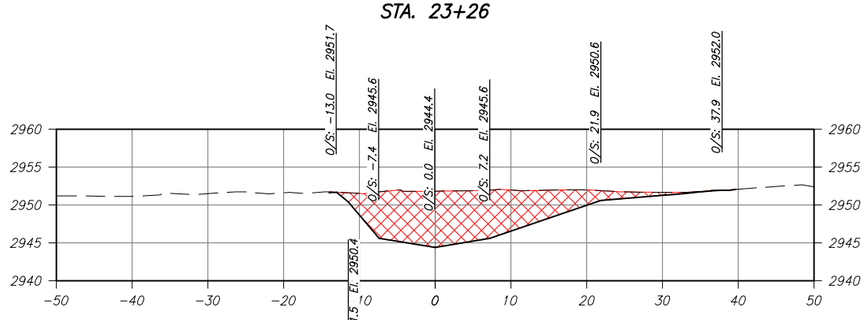
STA. 22+28



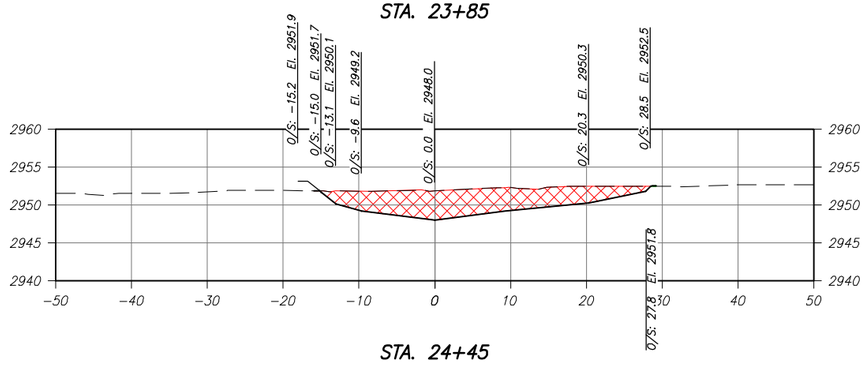
STA. 23+26



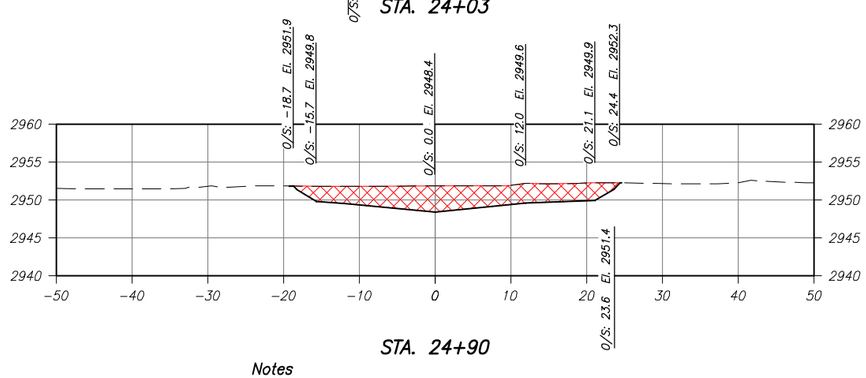
STA. 23+85



STA. 24+03



STA. 24+45



STA. 24+90

Cut

Fill

MAIN CHANNEL CROSS SECTION STA. 21+13 TO 24+90

10 0 10 20 30
SCALE OF FEET

Notes

1. Cross sections face downstream. Cross section centerline station is located along the thalweg alignment.
2. Y-axis is elevation, X-axis is distance in feet along a chord perpendicular to the thalweg. The zero station shown on these cross sections represents the thalweg alignment.
3. Constructed channel shall transition smoothly between cross sectional geometries shown within these cross sections. Cross section geometry shown represents one point in a smooth transition.
4. Cross-sections are to be used to stake out the channel offsets at the vertical grade breaks of the channel profile.

DATE AND TIME PLOTTED
AUGUST 13, 2015 15:50
PLOTTED BY
JHOVDE

CAD SYSTEM
AutoCAD Rel. 20.0s
CAD FILENAME
1678-100-MCXS.DWG

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Managing Water in the West

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BUREAU OF RECLAMATION
COLUMBIA/SNAKE RIVER SALMON RECOVERY PROGRAM
FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN
CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

Jeffrey J Fealko P.E.
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Jeffrey J Fealko P.E.
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Steve Montague-Acting
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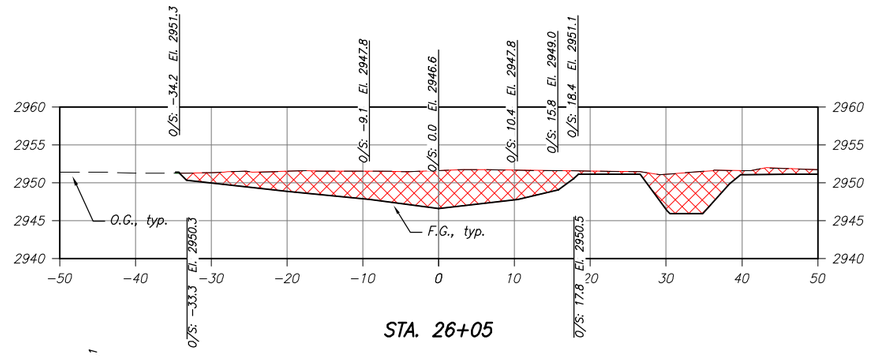
BOISE, ID 2015-09-14

MAIN CHANNEL
STA. 21+13 TO 24+90

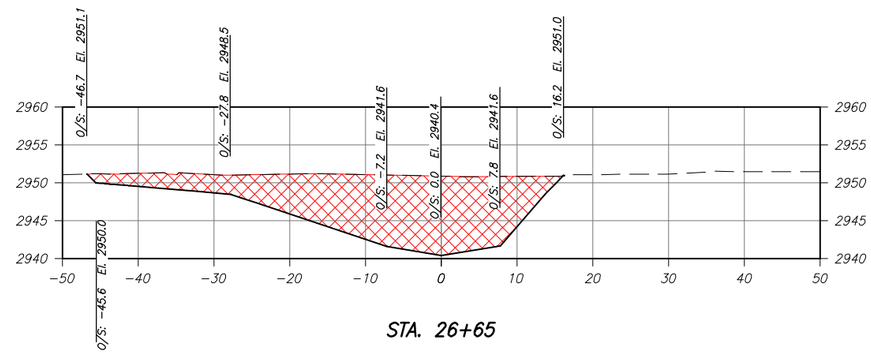
CROSS SECTIONS

1678-100-2051

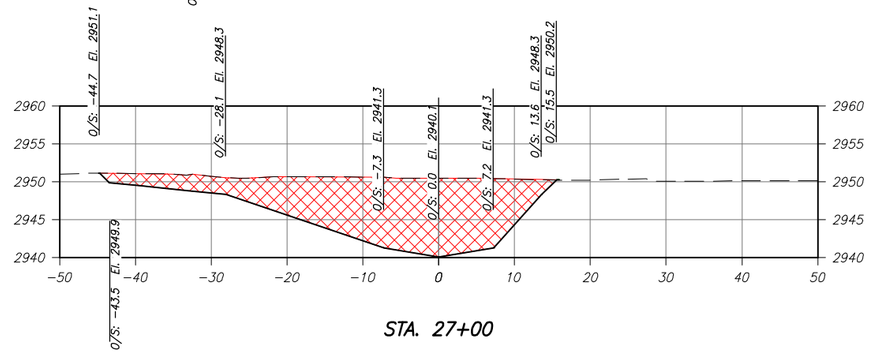
SHEET 5 OF 13



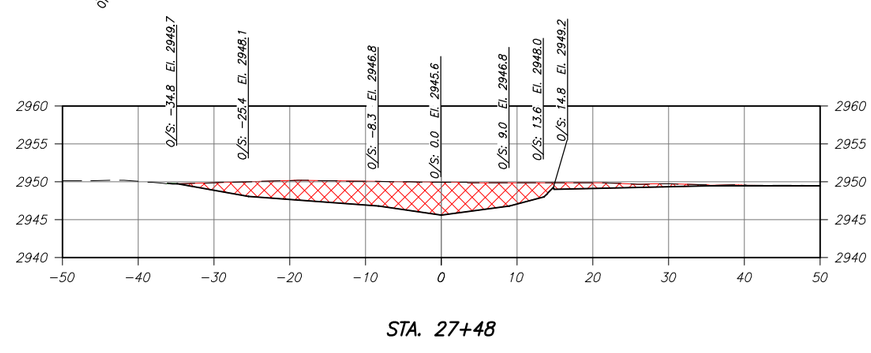
STA. 26+05



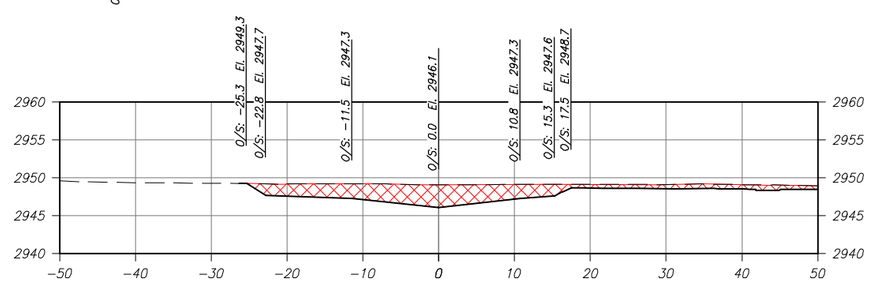
STA. 26+65



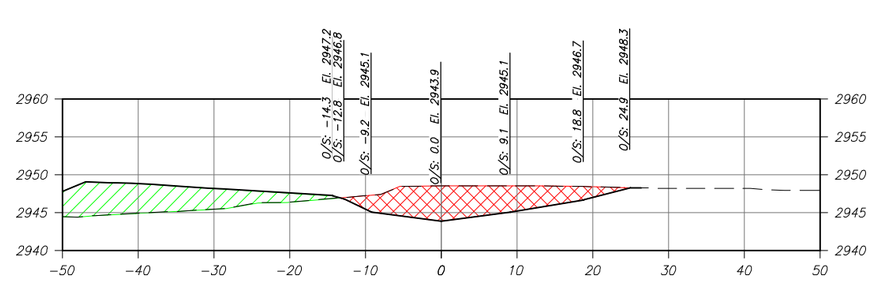
STA. 27+00



STA. 27+48



STA. 28+00



STA. 29+25

Cut

Fill

MAIN CHANNEL CROSS SECTION
STA. 26+05 TO 29+25

10 0 10 20 30
SCALE OF FEET

Notes

1. *Cross sections face downstream. Cross section centerline station is located along the thalweg alignment.*
2. *Y–axis is elevation, X–axis is distance in feet along a chord perpendicular to the thalweg. The zero station shown on these cross sections represents the thalweg alignment.*
3. *Constructed channel shall transition smoothly between cross sectional geometries shown within these cross sections. Cross section geometry shown represents one point in a smooth transition.*
4. *Cross–sections are to be used to stake out the channel offsets at the vertical grade breaks of the channel profile.*

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AUGUST 13, 2015 16:07
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JHOVDE

CAD SYSTEM
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CAD FILENAME
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COLUMBIA/SNAKE RIVER SALMON RECOVERY PROGRAM
FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN

CC–44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV. NO.	DATE	DESCRIPTION
1	2015–10–09	100 Corrected Sta. 26+65 offset and elevation labels

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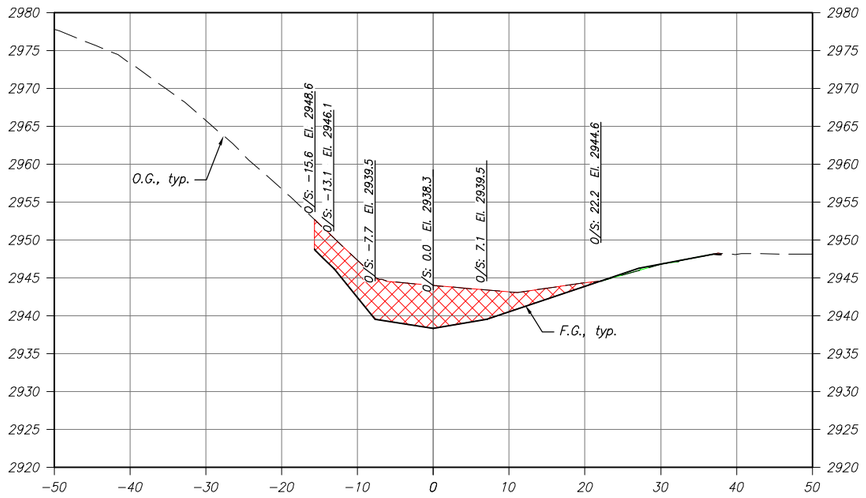
BOISE, ID 2015–09–14

MAIN CHANNEL
STA. 26+05 TO 29+25

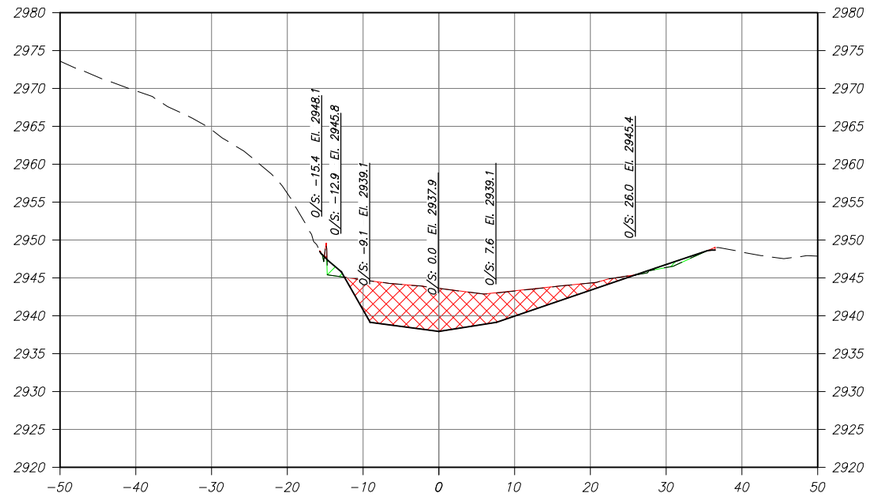
CROSS SECTIONS

1678–100–2052

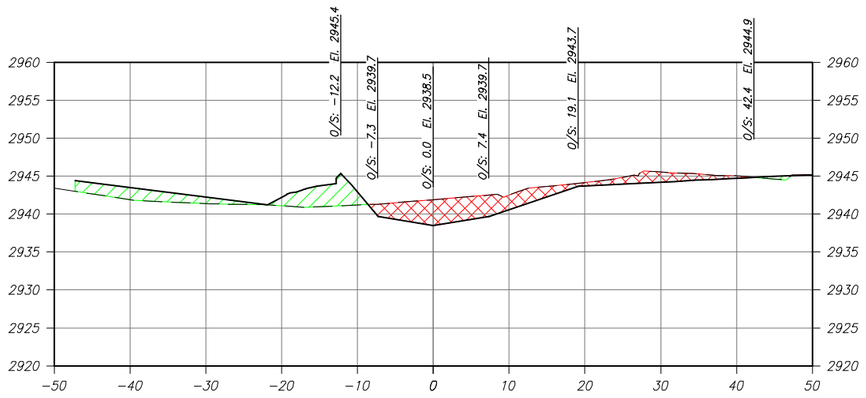
SHEET 6 OF 13



STA. 30+02



STA. 30+50



STA. 33+20

Cut

Fill

MAIN CHANNEL CROSS SECTION STA. 30+02 TO 33+20

SCALE OF FEET

Notes

1. Cross sections face downstream. Cross section centerline station is located along the thalweg alignment.
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FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN

CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

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BOISE, ID 2015-09-14

MAIN CHANNEL
STA. 30+02 TO 33+20

CROSS SECTIONS

1678-100-2053
SHEET 7 OF 13

DATE AND TIME PLOTTED
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AutoCAD Rel. 20.0s
CAD FILENAME
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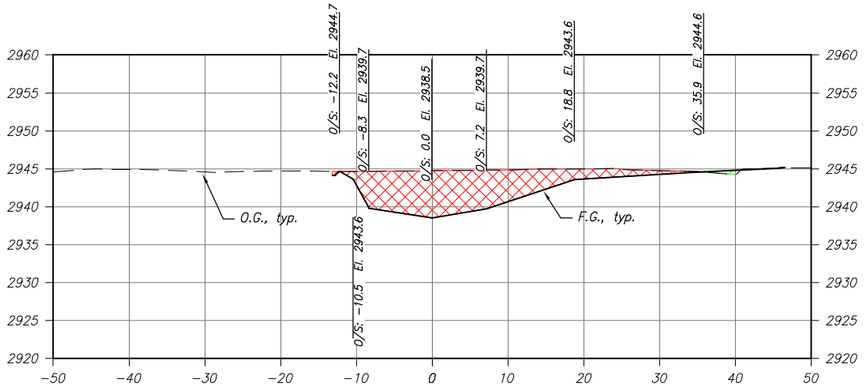
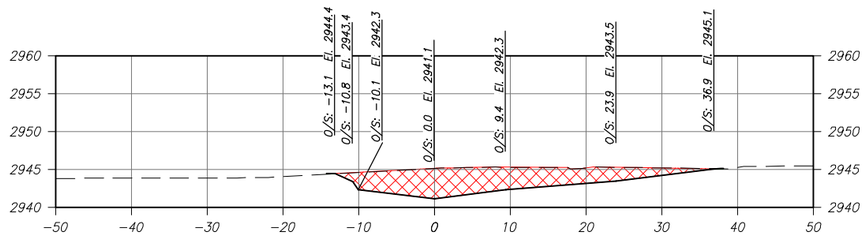
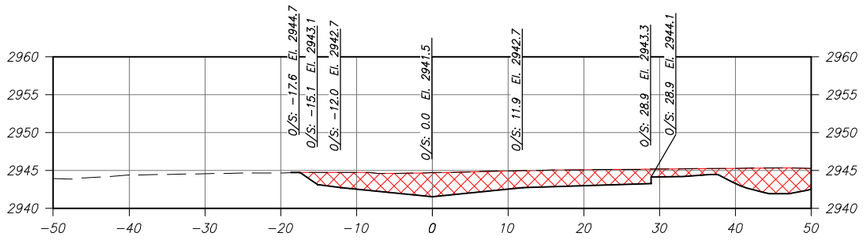


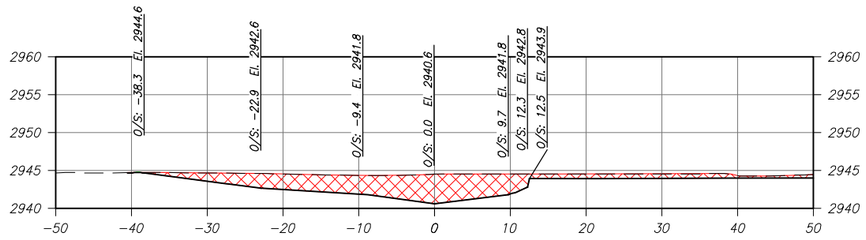
STA. 33+50



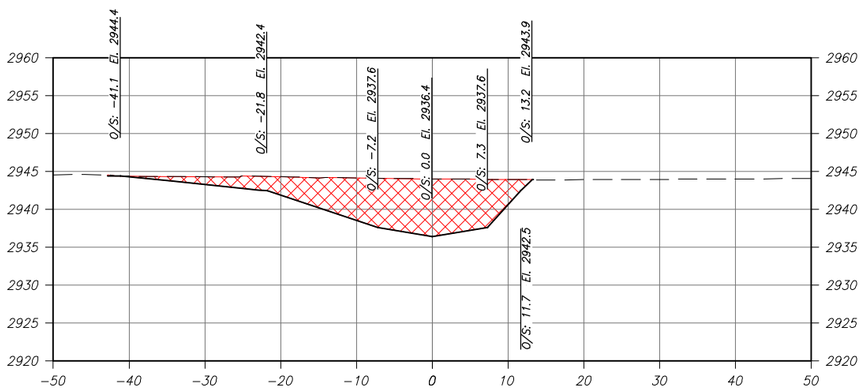
STA. 33+78



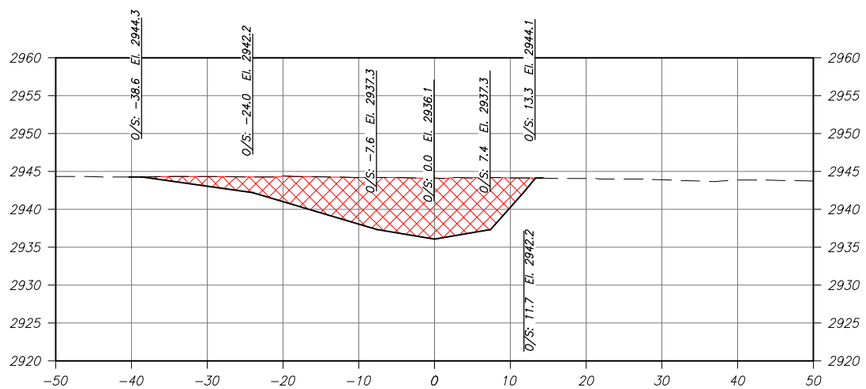
STA. 34+20



STA. 35+00



STA. 35+48



STA. 35+94

Cut

Fill

MAIN CHANNEL CROSS SECTION
STA. 33+50 TO 35+94

10 0 10 20 30
SCALE OF FEET

Notes

1. Cross sections face downstream. Cross section centerline station is located along the thalweg alignment.
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COLUMBIA/SNAKE RIVER SALMON RECOVERY PROGRAM
FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN

CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

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Steve Montague-Acting
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BOISE, ID 2015-09-14

MAIN CHANNEL
STA. 33+50 TO 35+94

CROSS SECTIONS

1678-100-2054
SHEET 8 OF 13

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CAD SYSTEM
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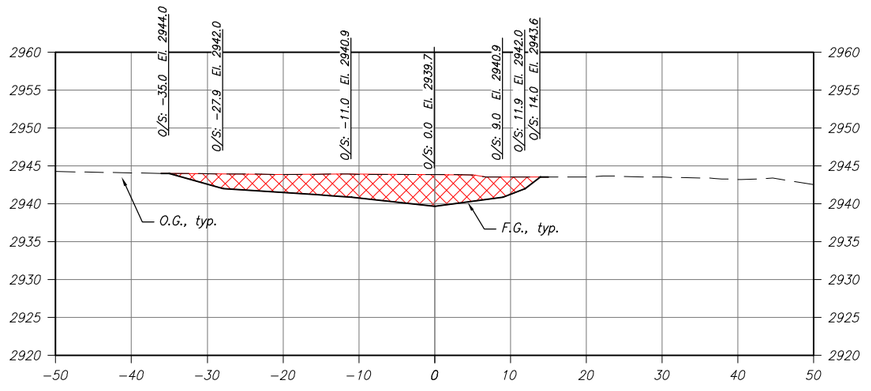
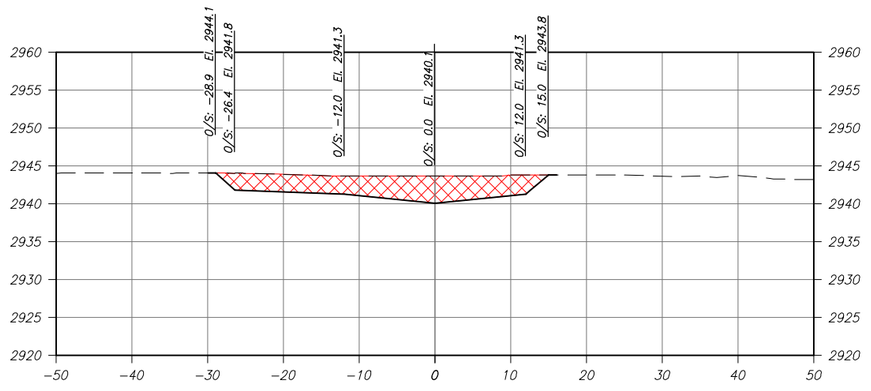
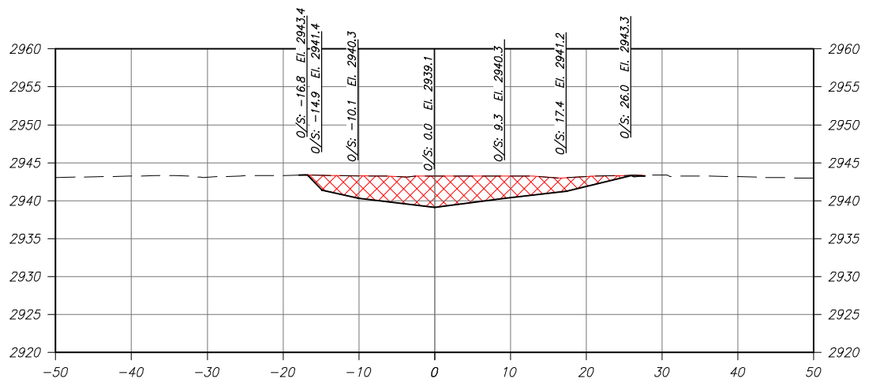


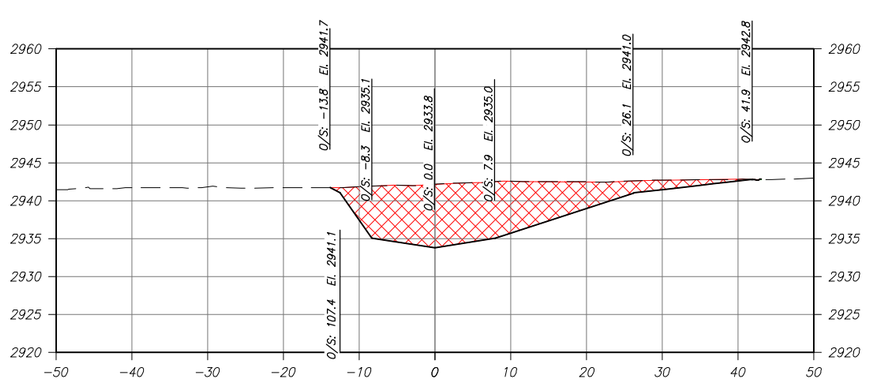
STA. 36+30



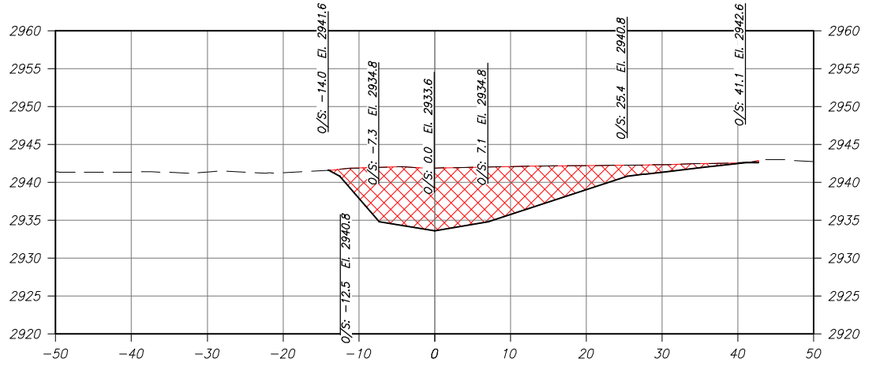
STA. 36+70



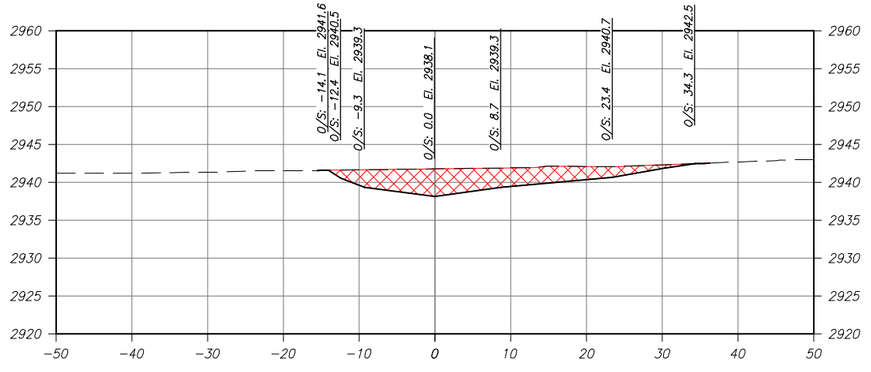
STA. 37+64



STA. 38+15



STA. 38+58



STA. 38+92

Cut

Fill

MAIN CHANNEL CROSS SECTION STA. 36+30 TO 38+92

10 0 10 20 30
SCALE OF FEET

Notes

1. Cross sections face downstream. Cross section centerline station is located along the thalweg alignment.
2. Y-axis is elevation, X-axis is distance in feet along a chord perpendicular to the thalweg. The zero station shown on these cross sections represents the thalweg alignment.
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COLUMBIA/SNAKE RIVER SALMON RECOVERY PROGRAM
FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN
CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

Jeffrey J Fealko P.E.
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Jeffrey J Fealko P.E.
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Steve Montague-Acting
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BOISE, ID 2015-09-14

MAIN CHANNEL
STA. 36+30 TO 38+92

CROSS SECTIONS

1678-100-2055
SHEET 9 OF 13

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AUGUST 13, 2015 16:15
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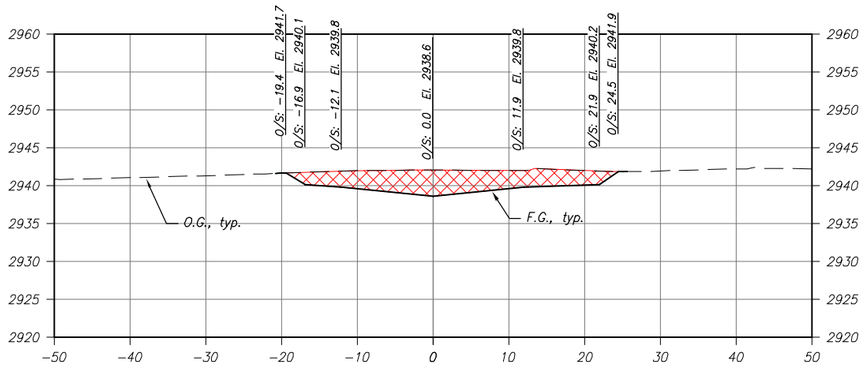
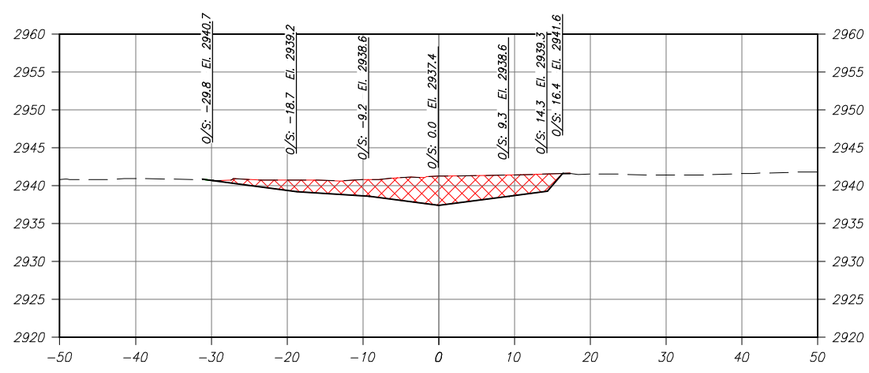
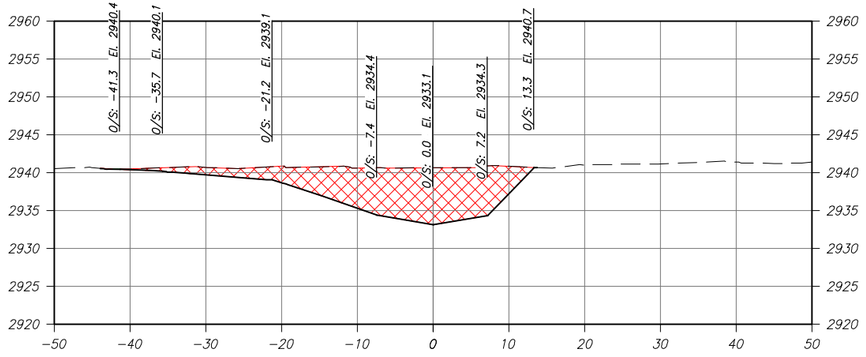


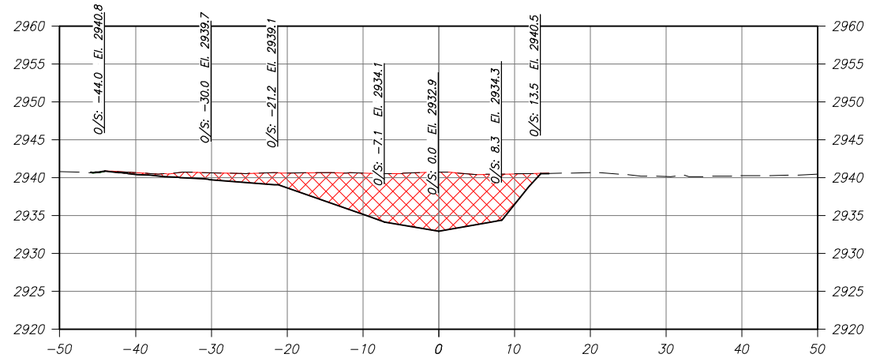
STA. 39+40



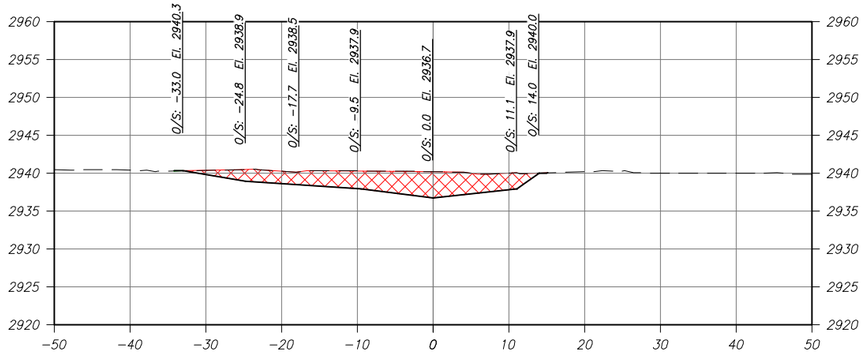
STA. 40+40



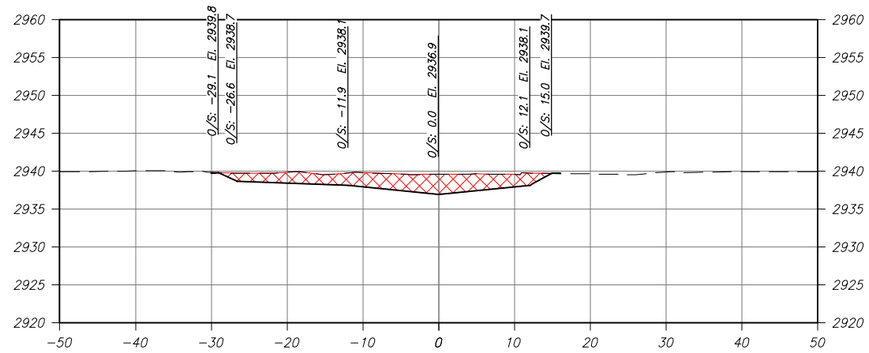
STA. 40+75



STA. 40+95



STA. 41+20



STA. 41+45

Cut

Fill

MAIN CHANNEL CROSS SECTION STA. 39+40 TO 41+45

10 0 10 20 30
SCALE OF FEET

Notes

1. Cross sections face downstream. Cross section centerline station is located along the thalweg alignment.
2. Y-axis is elevation, X-axis is distance in feet along a chord perpendicular to the thalweg. The zero station shown on these cross sections represents the thalweg alignment.
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JHOVDE

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CAD FILENAME
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FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN
CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

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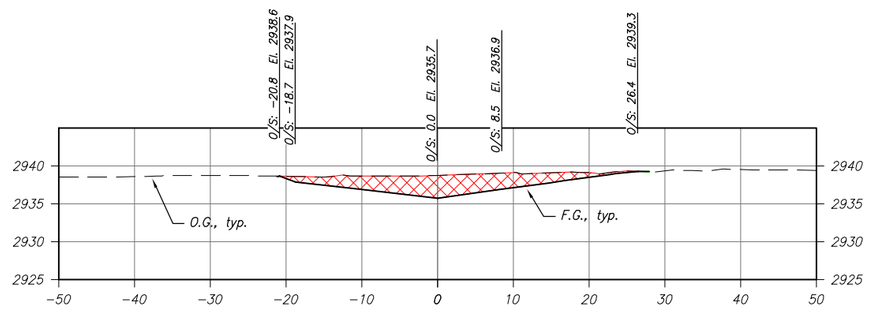
BOISE, ID 2015-09-14

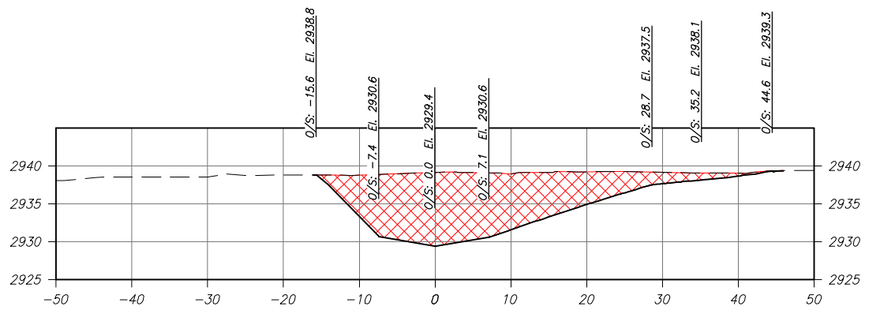
MAIN CHANNEL
STA. 39+40 TO 41+45

CROSS SECTIONS

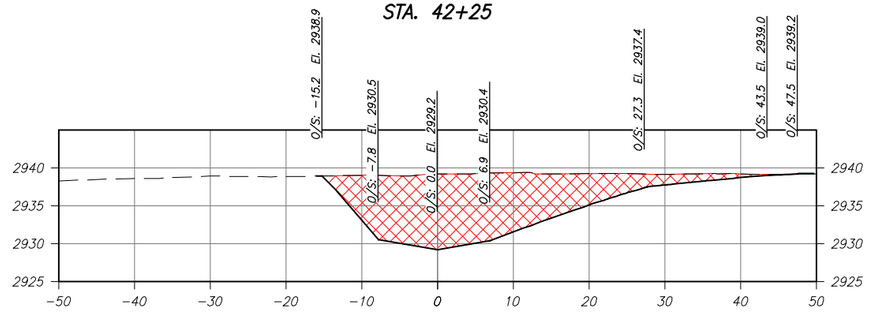
1678-100-2056
SHEET 10 OF 13



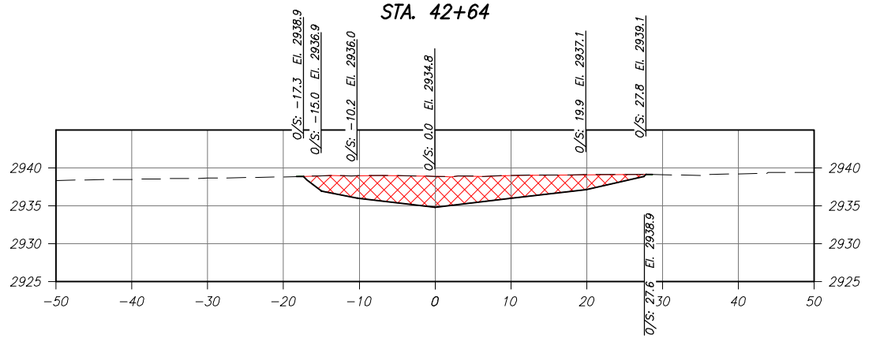
STA. 42+25



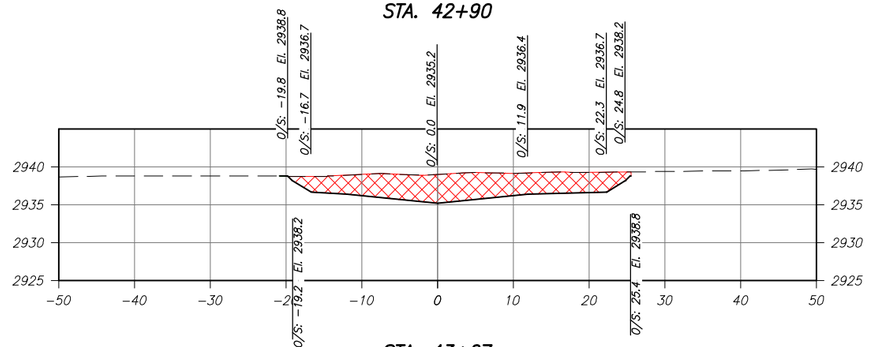
STA. 42+64



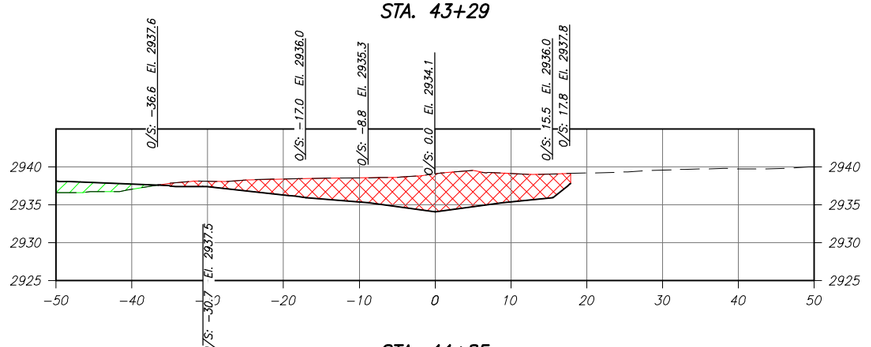
STA. 42+90



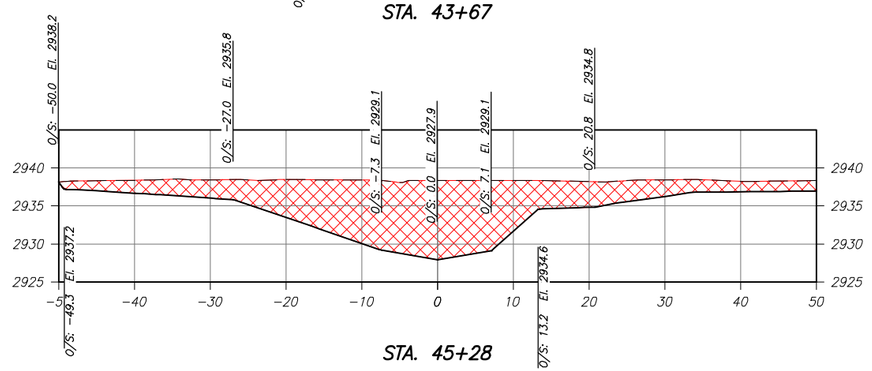
STA. 43+29



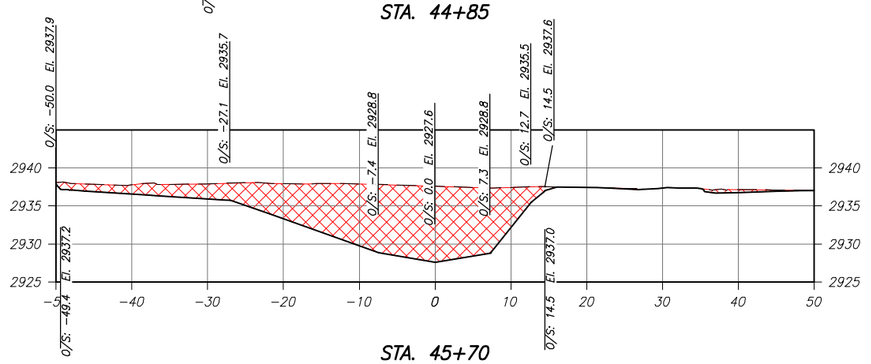
STA. 43+67



STA. 44+85



STA. 45+28



STA. 45+70

Cut

Fill

MAIN CHANNEL CROSS SECTION STA. 42+25 TO 45+70

10 0 10 20 30
SCALE OF FEET

Notes

1. *Cross sections face downstream. Cross section centerline station is located along the thalweg alignment.*
2. *Y–axis is elevation, X–axis is distance in feet along a chord perpendicular to the thalweg. The zero station shown on these cross sections represents the thalweg alignment.*
3. *Constructed channel shall transition smoothly between cross sectional geometries shown within these cross sections. Cross section geometry shown represents one point in a smooth transition.*
4. *Cross–sections are to be used to stake out the channel offsets at the vertical grade breaks of the channel profile.*

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FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN
CC–44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

Jeffrey J Fealko P.E.
DESIGNED
JH
DRAWN
Mike Knutson P.E.
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Jeffrey J Fealko P.E.
TECH. APPR.
Steve Montague–Acting
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BOISE, ID 2015–09–14

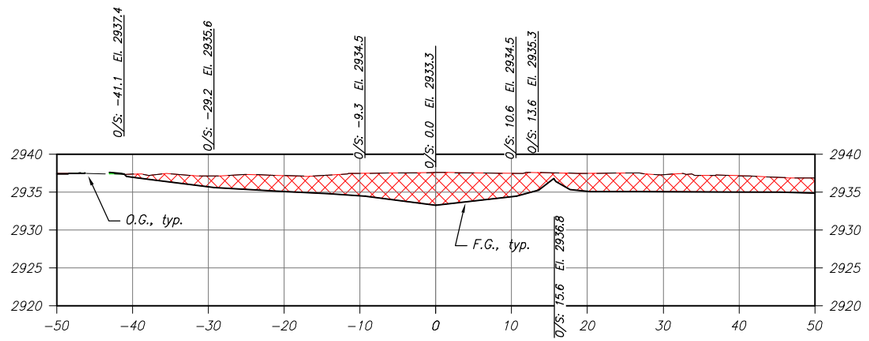
MAIN CHANNEL
STA. 42+25 TO 45+70

CROSS SECTIONS

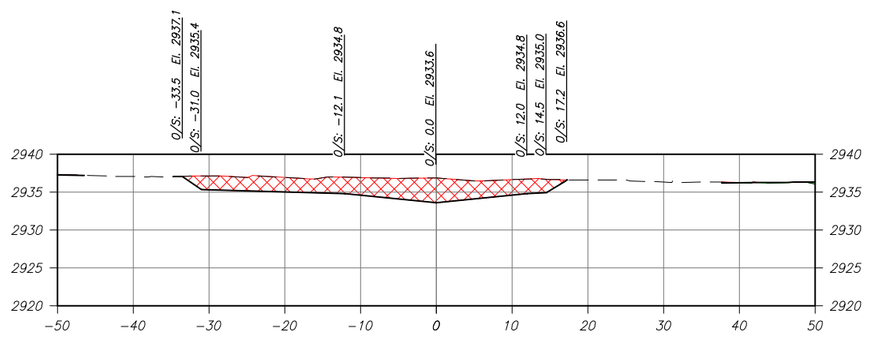
1678–100–2057
SHEET 11 OF 13

DATE AND TIME PLOTTED
AUGUST 13, 2015 16:18
PLOTTED BY
JHOGE

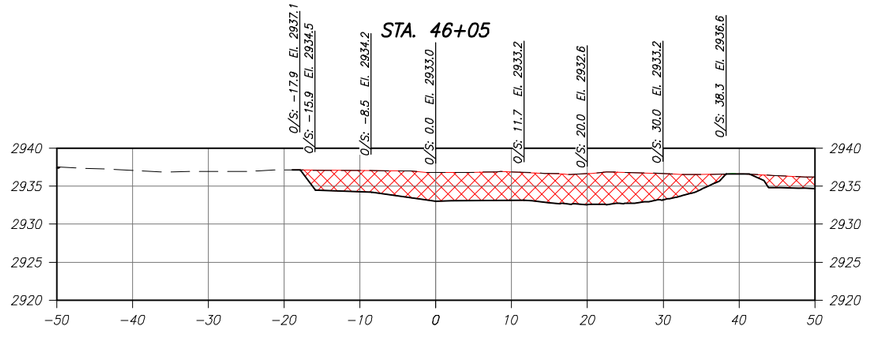
CAD SYSTEM
AutoCAD Rel. 20.0s
CAD FILENAME
1678–100–MCXS.DWG



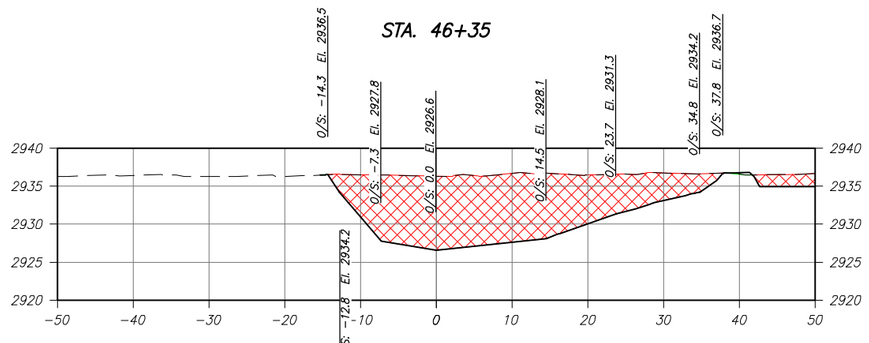
STA. 46+05



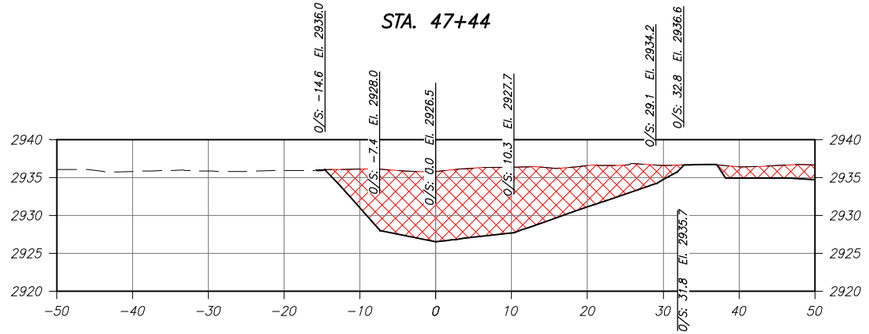
STA. 46+35



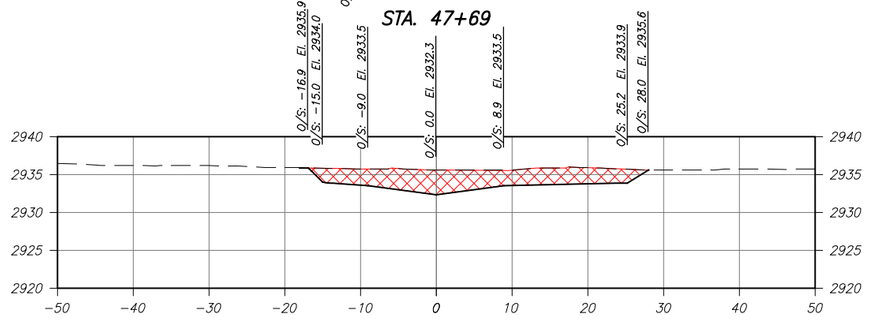
STA. 47+44



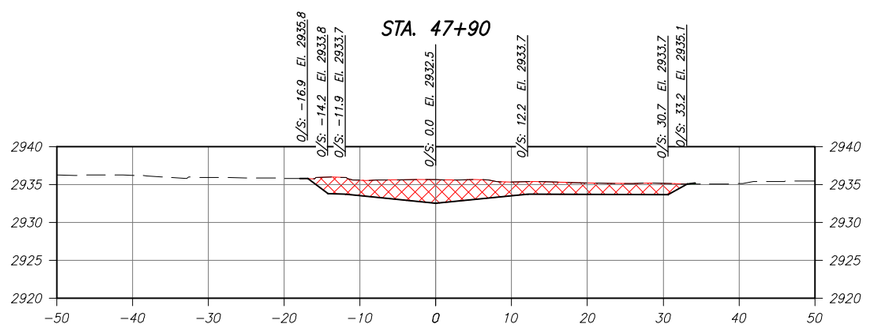
STA. 47+69



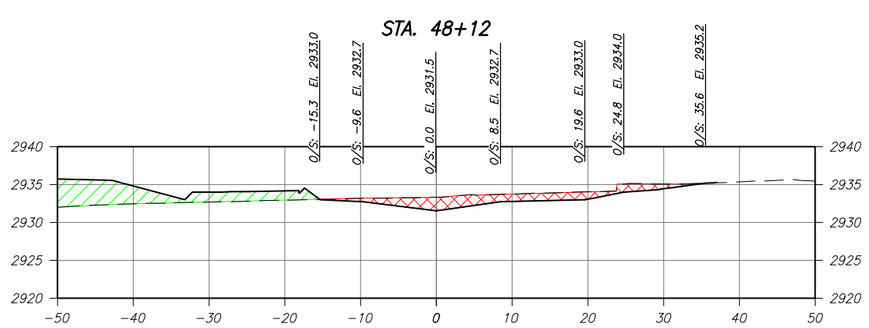
STA. 47+90



STA. 48+12



STA. 48+35



STA. 49+45

Cut

Fill

MAIN CHANNEL CROSS SECTION STA. 46+05 TO 49+45

10 0 10 20 30
SCALE OF FEET

Notes

1. Cross sections face downstream. Cross section centerline station is located along the thalweg alignment.
2. Y–axis is elevation, X–axis is distance in feet along a chord perpendicular to the thalweg. The zero station shown on these cross sections represents the thalweg alignment.
3. Constructed channel shall transition smoothly between cross sectional geometries shown within these cross sections. Cross section geometry shown represents one point in a smooth transition.
4. Cross–sections are to be used to stake out the channel offsets at the vertical grade breaks of the channel profile.

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AUGUST 13, 2015 16:19
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JHOVDE

CAD SYSTEM
AutoCAD Rel. 20.0s
CAD FILENAME
1678-100-MCXS.DWG

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FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN

CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

Jeffrey J Fealko P.E.
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Jeffrey J Fealko P.E.
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Steve Montague–Acting
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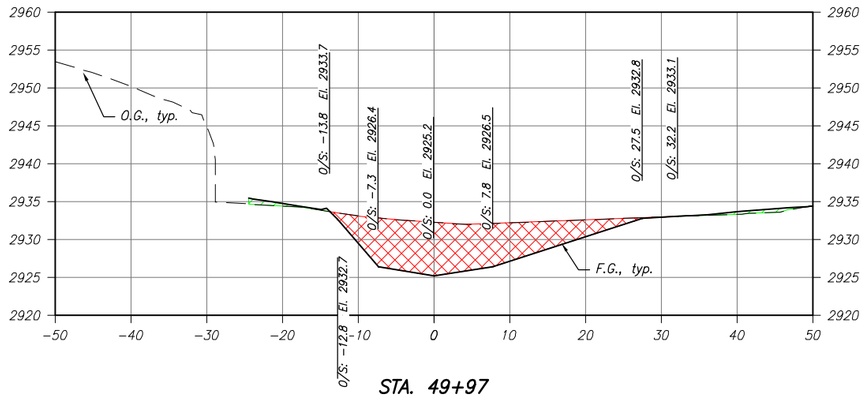
ADMIN. APPROVAL – PROGRAM MANAGER
BOISE, ID 2015-09-14

MAIN CHANNEL
STA. 46+05 TO 49+45

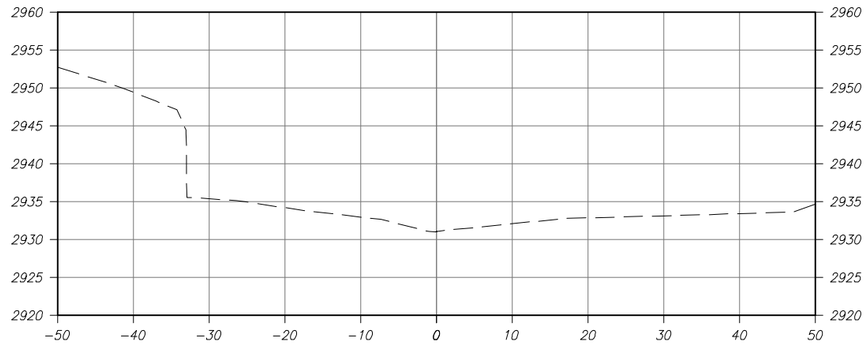
CROSS SECTIONS

1678–100–2058

SHEET 12 OF 13



STA. 49+97



STA. 50+35

Cut

Fill

MAIN CHANNEL CROSS SECTION
STA. 49+97

10 0 10 20 30
SCALE OF FEET

NOTES:

1. Cross sections face downstream. Cross section centerline station is located along the thalweg alignment.
2. Y-axis is elevation, X-axis is distance in feet along a chord perpendicular to the thalweg. The zero station shown on these cross sections represents the thalweg alignment.
3. Constructed channel shall transition smoothly between cross sectional geometries shown within these cross sections. Cross section geometry shown represents one point in a smooth transition.
4. Cross-sections are to be used to stake out the channel offsets at the vertical grade breaks of the channel profile.

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GRANDE RONDE SUBBASIN

CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

Jeffrey J Fealko P.E.
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Jeffrey J Fealko P.E.
TECH. APPR.
Steve Montague-Acting
APPROVED
ADMIN APPROVAL - PROGRAM MANAGER

BOISE, ID 2015-09-14

MAIN CHANNEL
STA. 49+97 TO 50+35

CROSS SECTIONS

1678-100-2059

SHEET 13 OF 13

DATE AND TIME PLOTTED
AUGUST 13, 2015 16:20
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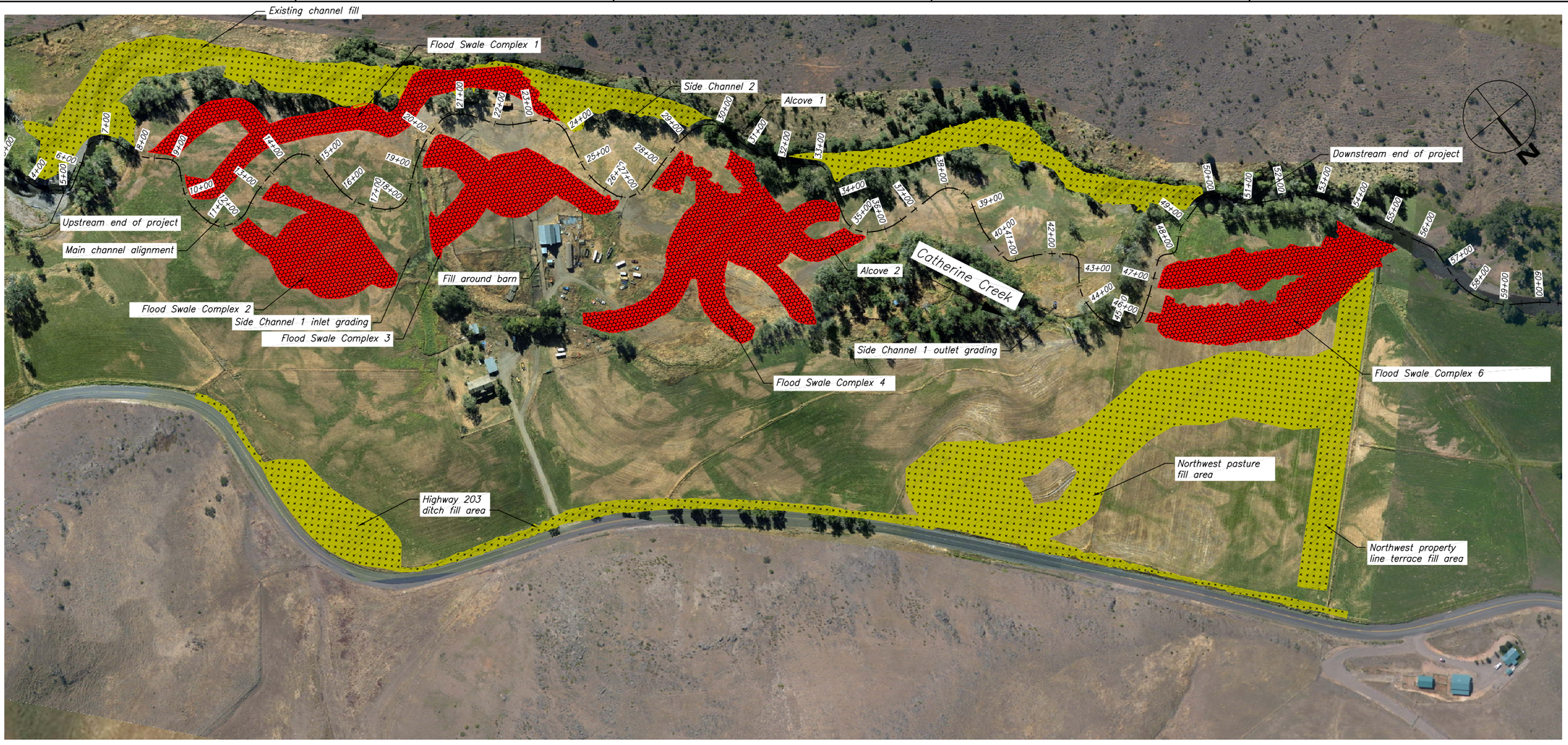
JHOVDE

CAD SYSTEM
AutoCAD Rel. 20.0s
CAD FILENAME
1678-100-MCXS.DWG

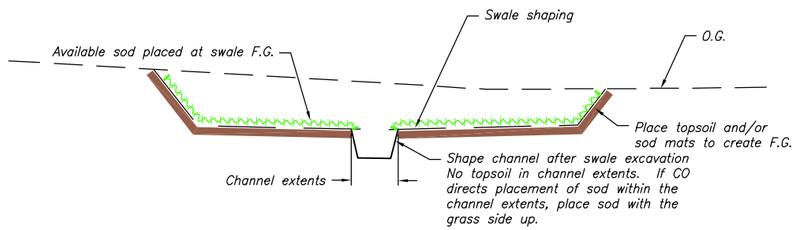


PARCEL 3 TOPSOIL PLACEMENT AREAS

150 0 150 300 450
SCALE OF FEET

TOPSOIL NOTES:

1. Strip topsoil from excavated areas shown on the drawings, as approved by the COR.
2. Remove topsoil to depths directed by COR. Soil may contain grass vegetation and roots where sod mats cannot be effectively removed. Avoid visible noxious weed plants and roots.
4. Transport and stockpile topsoil as necessary prior to final hauling and placing.
5. Transport and place topsoil for the upper 6 to 12 inches of topsoil areas shown on this drawing. The measurement of 6 to 12 inches of placement shall be after compaction by a single pass over the soil with excavator tracks or similar equipment to produce a firm layer of top soil.
6. Do not compact topsoil in stockpile.
7. Protect stockpile from contamination and erosion.



TYPICAL TOPSOIL PLACEMENT IN SWALE COMPLEXES

N.T.S.

LEGEND

12" Topsoil Placement Areas (24,095 cubic yards)

6" Topsoil Placement Areas (9,025 cubic yards)

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CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV NO	DATE	BY	DESCRIPTION
1	2015-10-09	Jeffrey J. Fealko, P.E.	100 Removed a topsoil hatch area and added topsoil placement detail for swales

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BOISE, ID 2015-09-14

TOPSOIL PLACEMENT AREAS

PLAN

1678-100-2060
SHEET 1

DATE AND TIME PLOTTED
OCTOBER 30, 2015 10:02
PLOTTED BY
JBACKOUS

CAD SYSTEM
AutoCAD Rel. 20.0s
CAD FILENAME
1678-100-2060_REV1.DWG

SOD SALVAGE AND TRANSPLANT NOTES:

1. Salvage all sod mats and woody vegetation within any of the areas shown on this drawing and reuse in the project as direct by the Contracting Officer.
2. Separate the soil layer below the sod mats from gravel layers and separately stock pile in a location agreed upon by the landowner and contractor. This soil will be spread on the re-contoured flood plain or other locations on site as depicted.
3. Moisten harvest sites for sod mats throughout the top eight (8) inches prior to harvest.
4. Harvest sod mats by skimming a six- to ten-inch deep mat from the ground surface. Depth of cut will be determined by soil depth and rooting depth as directed by Contracting officer. Length and width of mats shall be determined by the bucket width such that a section of mat can be handled and transported to storage and final placement as one intact unit.
5. Harvest equipment shall approach vegetation at right angle to the flowing river channel such that the scooping action is towards the bank and away from the water to prevent turbidity. At no time should the bucket with loose material be suspended over flowing water to prevent dropping material into water and causing turbidity.
6. Sod mats can be stored up to two weeks provided they are watered daily to keep the roots moist. Depending on the storage site and weather, mats may require more frequent watering to ensure roots do not dry out.
7. Store on disturbed ground where the sod mat can be kept moist as directed by the C.O.
8. Mats stored no more than two or three days can be stacked on top of each other, while mats stored longer should be laid out flat with the edges close together. Both must be watered daily.
9. Stockpile salvaged riparian vegetation out of the way of construction traffic in such a manner that it can be picked up and transported to its final placement.
10. Topsoil will be obtained from the excavated areas shown on this drawing.
11. Apply 6 inches of topsoil up to finish grade of the flood swale complex excavation areas.
12. Apply 12 inches of topsoil up to finish grade of the existing channel fill areas, the ditch fill area, and the excess fill material areas.
13. Place sod mats in locations as directed by the Contracting Officer. Sod mats with majority of upland grass species will be laid over smoothed and lightly scarified soil layer at the top of banks as directed by the Contracting Officer.

PARCEL 3 SOD SALVAGE AREAS

150 0 150 300 450
SCALE OF FEET

LEGEND

Sod Salvage Areas

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CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV NO	DATE	DESCRIPTION
1	2015-10-09 Jeffrey J. Fealko, P.E.	100 Corrected notes 11 and 12 and hatch color.

Jeffrey J Fealko P.E.
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DB
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Jeffrey J Fealko P.E.
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BOISE, ID 2015-09-14

SOD SALVAGE AREAS

PLAN

1678-100-2061

SHEET 1 OF 1

DATE AND TIME PLOTTED
AUGUST 26, 2015 14:38
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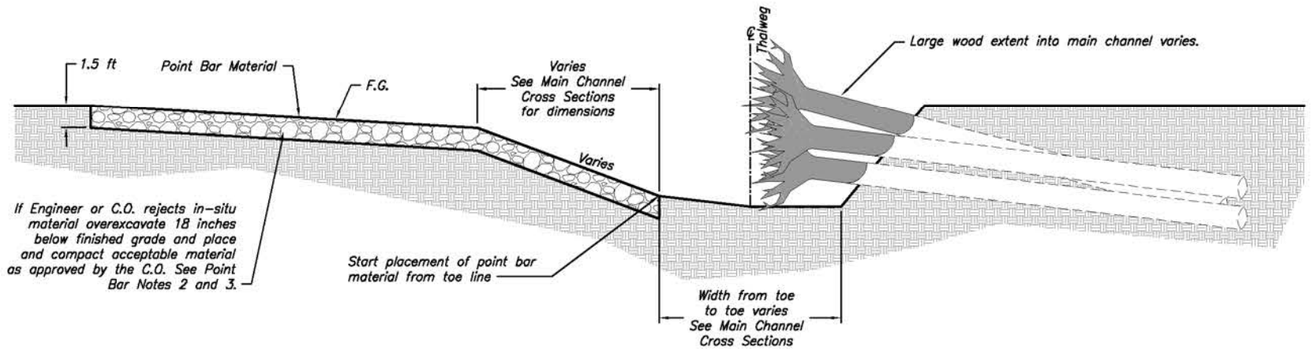
JBACKOUS

CAD SYSTEM
AutoCAD Rel. 20.0s
CAD FILENAME
1678-100-EW_RECOVER.DWG

TYPICAL POINT BAR MATERIAL AND PLACEMENT DETAILS

POINT BAR OVERVIEW:
Point bars are located at inside of meander bends and consist of mobile alluvium that is stored by the stream and mobilized in large storm events. This material replenishes glide and riffle material.



TYPICAL POINT BAR POOL SECTION – FOR AREAS WITH UNSUITABLE IN-SITU MATERIAL

NOT TO SCALE

VOLUMES OF PLACED POINT BAR MATERIAL (IF REQUIRED)				VOLUMES OF PLACED POINT BAR MATERIAL (IF REQUIRED)				VOLUMES OF PLACED POINT BAR MATERIAL (IF REQUIRED)			
Point Bar Number	Approximate Main Channel Thalweg Alignment Station	Bar Location (Left or Right)	Placed Point Bar Material (CY)	Point Bar Number	Approximate Main Channel Thalweg Alignment Station	Bar Location (Left or Right)	Placed Point Bar Material (CY)	Point Bar Number	Approximate Main Channel Thalweg Alignment Station	Bar Location (Left or Right)	Placed Point Bar Material (CY)
1	6+90	Right	114	7	24+00	Right	128	13	40+90	Left	83
2	9+25	Right	149	8	26+80	Left	206	14	42+75	Right	104
3	11+75	Left	173	9	30+00	Right	105	15	45+50	Left	155
4	14+50	Right	184	10	33+25	Right	125	16	48+00	Right	92
5	18+00	Left	206	11	35+75	Left	180	17	50+00	Right	188
6	20+90	Right	171	12	38+40	Right	143				

POINT BAR NOTES:
1. *Refer to Main Channel Cross Section sheets for design elevations and offsets of pool sections.*
2. *Engineer or C.O. shall inspect suitability of in-situ material and accept or reject in-situ material based on the acceptable in-situ point bar material gradation shown on this sheet.*
3. *If in-situ material does not meet the specified gradation Contractor shall overexcavate unsuitable material as shown in the typical point bar pool section and replace with specified point bar material (See placed point bar material gradation this sheet) to design finish grade.*
4. *Point Bar material shall meet the gradations (in-situ or placed) on this sheet and shall be well-mixed.*
5. *Point Bars to be machine compacted with specification as directed by C.O.*

ACCEPTABLE IN-SITU POINT BAR MATERIAL	
Percent Passing	Size Class
100%	12 inches
84%	2 inches – 6 inches
50%	0.5 inch – 3 inches
16%	0.08 inch – 1 inch

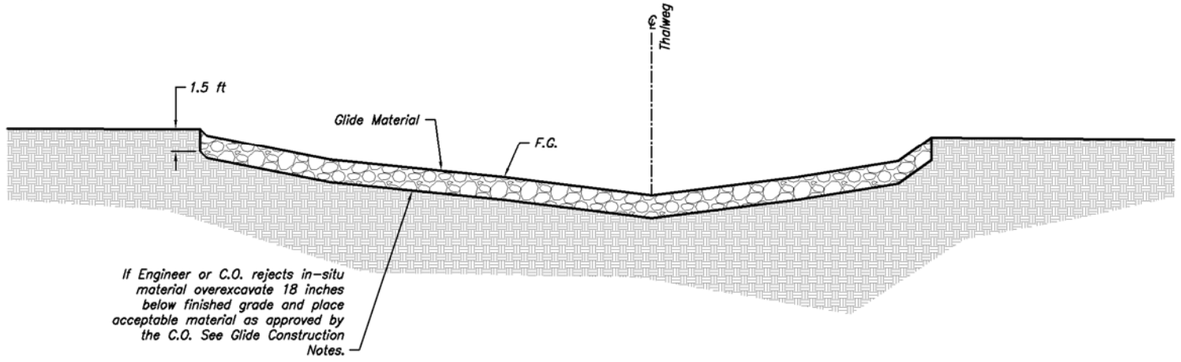
PLACED POINT BAR MATERIAL	
Percent Passing	Size Class
100%	12 inches
84%	3 inches – 6 inches
50%	1 inches – 3 inches
16%	0.25 inches – 1 inches
10%	< 0.5 inches

GRADATION NOTES:
1. *Percent passing size class is based on the nominal diameter of rock.*
2. *Nominal diameter shall be measured as the intermediate axis where the small and large axis shall not be more than 3 times less than or greater than the nominal diameter.*
2. *Acceptable placed point bar material may be created from stockpiles of various sized screened materials. One example that creates an acceptable placed point bar material is shown below. The C.O. and Engineer shall work with the Contractor to develop an acceptable mixture to meet the requirements above.*
3. *All stockpiles shall be well graded containing equal amounts of material within the range of each size class.*

EXAMPLE STOCKPILE MIX RATIOS FOR PLACED POINT BAR MATERIAL		
Stock Pile Size Class	Mix Percentage (By Volume)	Mix Ratios (By Parts)
6 – 12 inches	10%	1
3 – 6 inches	20%	2
1 – 3 inches	40%	4
0 – 1 inches	30%	3

TYPICAL GLIDE MATERIAL AND PLACEMENT DETAILS

GLIDE OVERVIEW:
Glide features are located between pools and riffles and are formed by mobile bed material. Glide features are used for spawning by salmon and steelhead, which require clean, sub-rounded alluvium of specific size. Glide features will not be overly compacted and will contain minimum fines.



TYPICAL GLIDE MATERIAL SECTION – FOR AREAS WITH UNSUITABLE IN-SITU MATERIAL

NOT TO SCALE

VOLUMES OF PLACED GLIDE MATERIAL (IF REQUIRED)			VOLUMES OF PLACED GLIDE MATERIAL (IF REQUIRED)			VOLUMES OF PLACED GLIDE MATERIAL (IF REQUIRED)		
Glide Number	Approximate Main Channel Thalweg Alignment Station	Placed Point Bar Material (CY)	Glide Number	Approximate Main Channel Thalweg Alignment Station	Placed Point Bar Material (CY)	Glide Number	Approximate Main Channel Thalweg Alignment Station	Placed Point Bar Material (CY)
1	7+40	115	6	21+50	146	11	38+92	93
2	9+80	94	7	24+45	85	12	41+20	45
3	12+45	93	8	27+48	100	13	43+29	76
4	15+30	111	9	33+78	90	14	46+05	65
5	18+60	111	10	36+30	76	15	48+32	53

GLIDE CONSTRUCTION NOTES:
1. *Excavate native material to design grade. Rip and uncompact in-situ material so it is unconsolidated for a depth of 18 inches below the finished grade.*
2. *C.O. or Engineer shall accept or reject glide material after it has been uncompacted.*
3. *If in-situ material is accepted by C.O. or Engineer leave material in its unconsolidated condition.*
4. *Replace unsuitable glide material with material that meets placed glide gradation as shown on this sheet*
5. *For unsuitable material overexcavate glide areas shown on Drawings to 1.5-feet below finish grade.*
6. *Place glide material meeting the specifications below for placed material directly upstream of riffles and feather into pool for a natural appearance, as shown in plans and as directed by the C.O.*
7. *Glide material will be clean and sub-rounded to rounded native gravel and cobble with minimal fines as approved by C.O.*
8. *Spread glide material with minimal compaction.*

ACCEPTABLE IN-SITU GLIDE MATERIAL	
Percent Passing	Size Class
100%	12 inches
84%	3 inches – 6 inches
50%	1 inch – 4 inches
16%	0.08 inch – 1 inch

PLACED GLIDE MATERIAL	
Percent Passing	Size Class
100%	12 inches
84%	3 inches – 6 inches
50%	1 inches – 3 inches
16%	0.25 inches – 1 inches
10%	< 0.5 inches

GRADATION NOTES:
1. *Percent passing size class is based on the nominal diameter of rock.*
2. *Nominal diameter shall be measured as the intermediate axis where the small and large axis shall not be more than 3 times less than or greater than the nominal diameter.*
2. *Acceptable placed glide material may be created from stockpiles of various sized screened materials. One example that creates an acceptable placed glide material is shown below. The C.O. and Engineer shall work with the Contractor to develop an acceptable mixture to meet the requirements above.*
3. *All stockpiles shall be well graded containing equal amounts of material within the range of each size class.*

EXAMPLE STOCKPILE MIX RATIOS FOR PLACED GLIDE MATERIAL		
Stock Pile Size Class	Mix Percentage (By Volume)	Mix Ratios (By Parts)
6 – 12 inches	10%	1
3 – 6 inches	20%	2
1 – 3 inches	40%	4
0 – 1 inches	30%	3

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CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3 – TYPICAL POOL AND GLIDE MATERIAL SECTIONS

SCALE	DATE	DESIGNED	DRAWN	CHECKED	TECH. APPR.	APPROVED
NO SCALE	2015-10-09	Jeffrey J. Fealko, P.E.	DB	Mike Knutson P.E.	Jeffrey J Fealko P.E.	Steve Montague–Acting

100 Corrected side slope label of point bar detail, added detail for glide, added gradation size on point bar and glide tables.

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Mike Knutson P.E.
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Jeffrey J Fealko P.E.
TECH. APPR.
Steve Montague–Acting
APPROVED
ADMIN APPROVAL – PROGRAM MANAGER

BOISE, IDAHO 2015-09-14

TYPICAL POINT BAR AND GLIDE MATERIAL SECTIONS

DETAILS

1678–100–2062

SHEET 1 OF 2

DATE AND TIME PLOTTED
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CAD FILENAME
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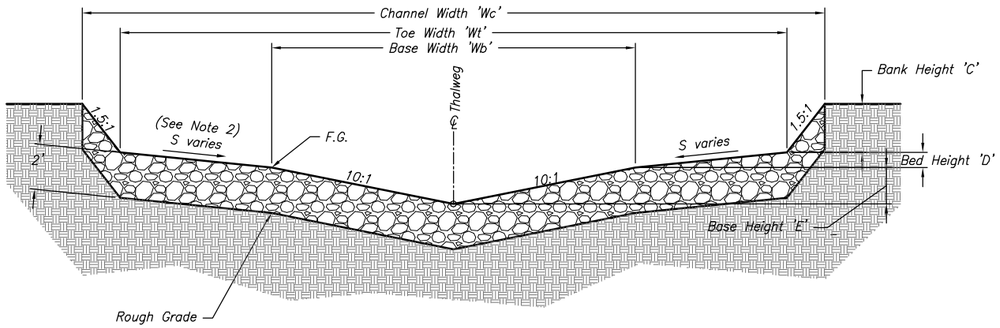
RIFFLE OVERVIEW

Riffle features are intended to mimic a natural stream channel. Riffles are to be constructed to be stable and to provide hydraulic roughness and fish resting areas through small pocket pool development. Riffles are to be constructed such that low flows remain on the surface.



TYPICAL RIFFLE CREST CROSS SECTION

NOT TO SCALE

MAIN CHANNEL – RIFFLE CREST CROSS SECTIONS

Station	Channel Width 'Wc' (ft)	Toe Width 'Wt' (ft)	Base Width 'Wb' (ft)	Bank Height 'C' (ft)	Bed Height 'D' (ft)	Base Height 'E' (ft)	Riffle Crest Elevation (ft NAVD 88)	Riffle Matrix Mix Volume (CY)	Small Boulders (Each)	Large Boulders (Each)
5+85	Match Existing							239	14	10
8+00	49	44	24	1.6	0.5	1.2	2960.40	293	16	11
10+23	50	45	24	1.6	0.5	1.2	2958.90	315	18	13
12+90	44	39	24	1.5	0.4	1.2	2957.40	335	19	13
15+90	44	39	24	1.5	0.4	1.2	2954.90	400	22	15
19+15	43	38	24	1.5	0.4	1.2	2952.10	320	18	13
22+28	44	39	24	1.5	0.4	1.2	2950.00	315	18	13
24+90	43	38	24	1.5	0.3	1.2	2948.40	403	22	15
28+00	43	38	24	1.5	0.4	1.2	2946.10	392	22	15
31+63	Match Existing									
34+20	49	44	24	1.5	0.5	1.2	2941.50	298	17	12
36+70	48	43	24	1.5	0.5	1.2	2940.10	299	17	12
39+40	42	38	24	1.4	0.4	1.2	2938.60	345	19	13
41+45	42	38	24	1.4	0.4	1.2	2936.90	273	15	11
43+67	42	38	24	1.4	0.4	1.2	2935.20	407	23	16
46+35	54	50	24	1.4	0.7	1.2	2933.60	354	20	14
48+35	54	50	24	1.4	0.7	1.2	2932.50	336	19	13

NOTES:

1. *Overexcavate by 2–feet and replace with riffle material and specification as shown on Dwg. –2063.*
2. *Side slopes vary per guidance in table and location of channel thalweg as shown on grading sheets. A low flow channel is created by side slopes and finish grading – See Typical Riffle Construction Dwg. –2063 and grading plans.*
3. *Typical section shown at Riffle Crest locations, (where the thalweg is in the center of the channel). Riffle crest location is typically the widest location on the riffle length and should transition to next section as shown on the grading plans*
4. *Refer to Main Channel Cross Section sheets for design elevations and offsets at riffle crest locations.*

RIFFLE MATRIX MIX

Percent Passing	Size Class
D100	10 inches – 12 inches
D84	7 inches – 10 inches
D50	3 inches – 5 inches
D16	0.5 inch – 2 inches
D10	<0.08 inch

RIFFLE BOULDER CLASSIFICATIONS

Boulder Size	Size Class
Small	12 inches – 24 inches
Large	24 inches – 48 inches

GRADATION NOTES:

1. *Percent passing size class is based on the nominal diameter of rock.*
2. *Nominal diameter shall be measured as the intermediate axis where the small and large axis shall not be more than 3 times less than or greater than the nominal diameter.*
2. *Acceptable riffle material may be created from stockpiles of various sized screened materials. One example that creates an acceptable riffle matrix material is shown to the right. The C.O. and Engineer shall work with the Contractor to develop an acceptable mixture to meet the requirements above.*
3. *All stockpiles shall be well graded containing equal amounts of material within the range of each size class.*

EXAMPLE STOCKPILE MIX RATIOS FOR RIFFLE MATRIX MATERIAL

Stock Pile Size Class	Mix Percentage (By Volume)	Mix Ratios (By Parts)
9 – 12 inches	10%	2
6 – 9 inches	15%	3
3 – 6 inches	30%	6
1 – 3 inches	30%	6
0.08 – 1 inches	5%	1
< 0.08 inches	10%	2

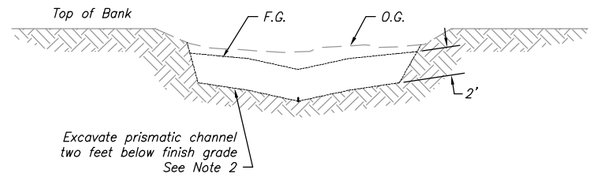
RIFFLE CONSTRUCTION NOTES:

1. *Stockpile engineered fill material per design specifications. Materials are to be stockpiled in the immediate project area or transported from the sorting area as needed.*
2. *Treat existing channel bed by removing organics and creating a prismatic working surface following thalweg and design contours on grading sheets.*
3. *Import well–mixed engineered riffle matrix material. Compact matrix material in 12–inch lifts using 300 Series Excavator, or similar equipment. Track on matrix material sufficiently to compact material. Add a layer of additional fines on the surface. Wash fines into matrix material using a trash pump and 2–inch fire hose with a nozzle until water ponds on the surface and approved by the C.O.*
4. *Repeat riffle matrix construction in another 12–inch lift to design channel thalweg elevation and shape.*
5. *Place boulders in the riffles by embedding a minimum of 50% of boulder diameter into the riffle, compact per specifications, and top dress as directed by the C.O.*

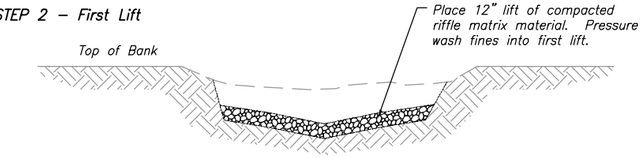
RIFFLE CONSTRUCTION STEPS

NOT TO SCALE

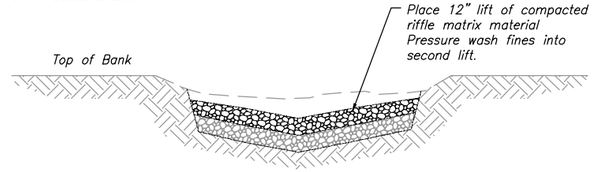
STEP 1 – Rough Grade



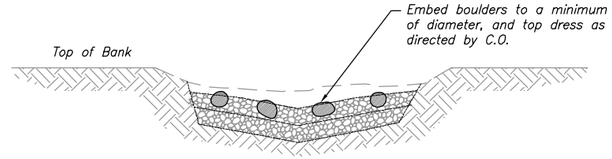
STEP 2 – First Lift



STEP 3 – Second Lift



STEP 4 – Boulder Placement and Top Dressing



EXAMPLE CONSTRUCTED RIFFLE

Note boulder features, thalweg transition, and bank roughness
(Photo – Shitike Creek Restoration Project – Courtesy of S. Welch)

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FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN

CC–44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV NO	DATE	DESCRIPTION
1	2015–10–09	Corrected note reference of Step 1 Riffle Construction Steps.

Jeffrey J. Fealko P.E.

Jeffrey J. Fealko, P.E.
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JJF/DB/KK
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Mike Knutson, P.E.
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Steve Montague–Acting
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ADMIN. APPROVAL – PROGRAM MANAGER
BOISE, IDAHO 2015–08–14

RIFFLE AND GLIDE CONSTRUCTION

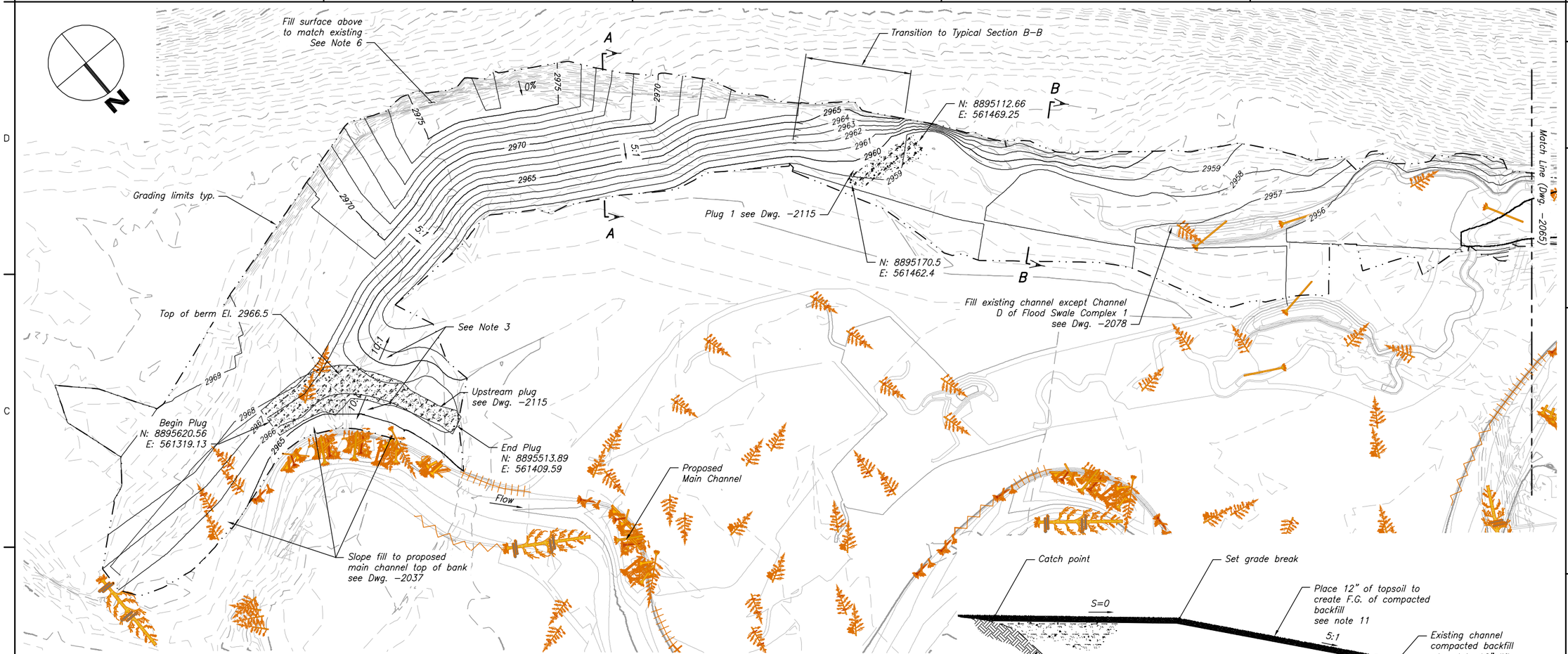
DETAILS

1678–100–2063

SHEET 2 OF 2

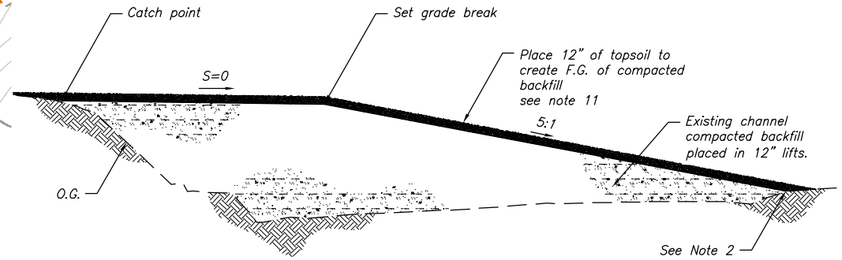
DATE AND TIME PLOTTED
Not Plotted
PLOTTED BY
Not Plotted

CAD SYSTEM
AUTOCAD
CAD FILENAME
UNKNOWN



EXISTING CHANNEL FILL PLAN

40 0 40 80 120
SCALE OF FEET



TYPICAL SECTION A–A

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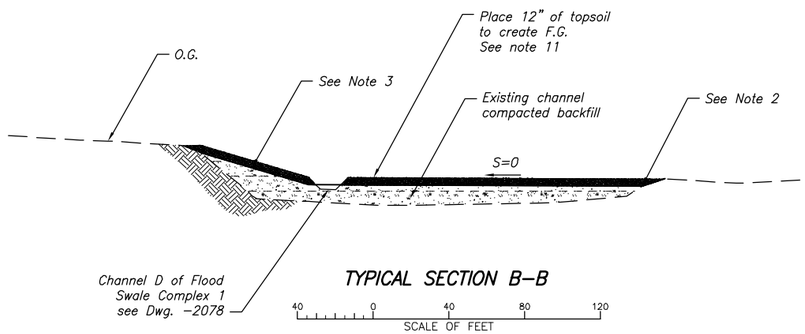

TYPICAL SECTION B–B

40 0 40 80 120
SCALE OF FEET

NOTES:

1. All work shown on this sheet shall be completed in construction year 2 during the in water work period.
2. Fill boundary is intended to match the right top of bank of the existing channel. Stake out shall be field verified by C.O. prior to installation of compacted channel backfill.
3. Slope of existing channel fill material varies. Slope compacted channel fill material from left edge of Flood Swale Complex 1, channel D, to top of left bank of existing channel.
4. Remove organic debris in existing channel and stockpile as directed by the C.O. prior to placement of compacted backfill.
5. Collect boulders in existing channel and stockpile as directed by C.O. prior to placement of compacted backfill.
6. All sloped material shall be graded to meet the natural existing topography unless indicated otherwise.
7. Flood Swale Complex 1 Drawings supersede this drawing if elevations are contrary to the elevations shown on this drawing.
8. Fill placed in the existing channel to create a flow plug shall be material as specified on sheet –2115.
9. Fill material shall be a well graded mix and be near optimum moisture content for compaction. Fill material shall be approved by the C.O.
10. Place fill material in 12–inch maximum lifts, and compact thoroughly. No testing of compacted density will be performed; acceptance will be by the Contracting Officer observing fill placement and compaction effort. The intent of compaction will be to achieve approximately 85% relative density.
11. Grading contours are for the additional 12" of topsoil creating the final finished grade.

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CC–44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV NO	DATE	DESCRIPTION
1	2015–10–09	Corrected topsoil placement notes on typical sections and Note 11

Jeffery J. Fealko, P.E.
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BOISE, ID 2015–09–14

EXISTING CHANNEL FILL

PLAN AND SECTIONS

1678–100–2064

SHEET 1 OF 3

DATE AND TIME PLOTTED
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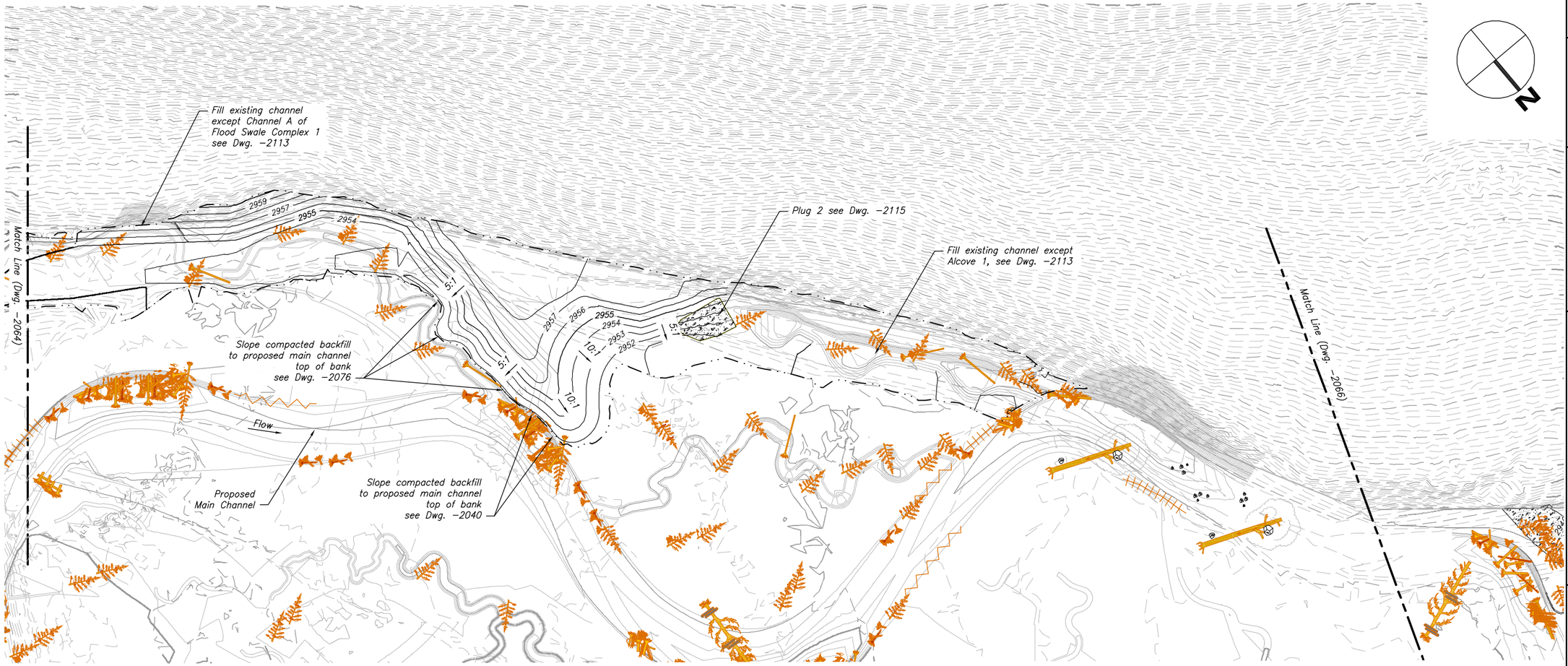

EXISTING CHANNEL FILL PLAN

40 0 40 80 120
SCALE OF FEET

NOTES:

1. All work shown on this sheet shall be completed in construction year 2 during the in water work period.
2. Fill Boundary is intended to match the right top of bank of the existing channel. Stake out shall be field verified by C.O. prior to installation of channel fill material.
3. Slope of existing channel fill material varies. Slope channel fill material from left edge of Flood Swale Complex 1, channel A, to existing ground at 5:1 or as indicated on this drawing.
4. All sloped material shall be graded to meet the natural existing topography unless indicated otherwise.
5. Channel shaping drawings; Plan and Profile, cross sections, typical sections or any related design, supersede this drawing if elevations are contrary to the elevations shown on this drawing.
6. Fill placed in the existing channel to create a flow plug shall be material as specified on sheet –2115.
7. Fill material shall be a well graded mix and be near optimum moisture content for compaction. Fill material shall be approved by the C.O. before placement.
8. Place material in 12–inch maximum lifts, and compacted thoroughly. No testing of compacted density will be performed; acceptance will be by the Contracting Officer observing fill placement and compaction effort. The intent of compaction will be to achieve approximately 85% relative density.
9. Grading contours are for the additional 12" of topsoil creating the final finished grade.

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CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV NO. 1 | 2015-10-09 | 100 Corrected Note 9 | Jeffrey J. Fealko, P.E.

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Jeffery J. Fealko, P.E.	TECH. APPR.
Steve Montague, P.E.	APPROVED ADMIN. APPROVAL – PROGRAM MANAGER – ACTING
BOISE, ID	2015-09-14

EXISTING CHANNEL FILL

PLAN

1678–100–2065

SHEET 2 OF 3

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Not Plotted

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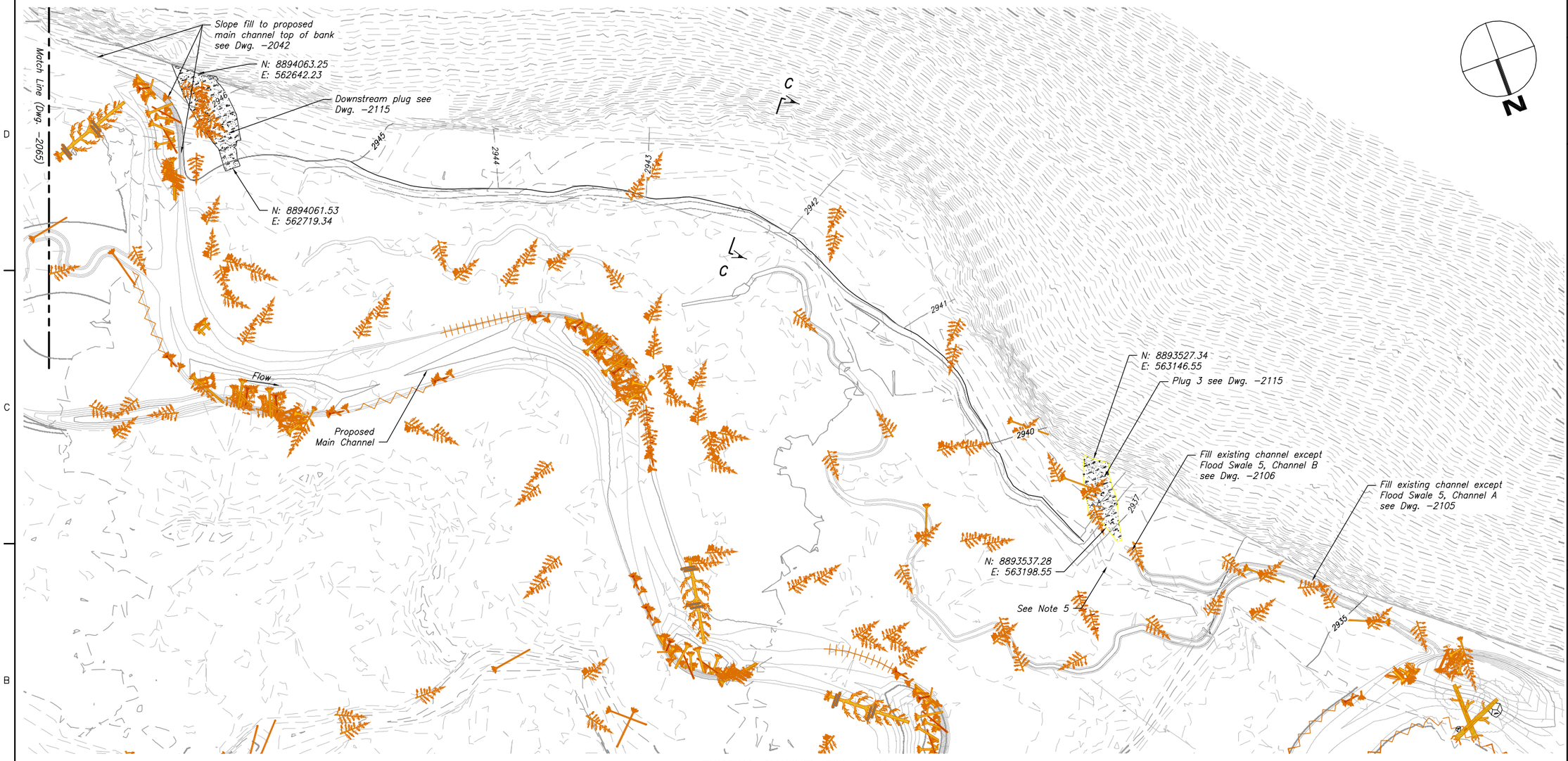

EXISTING CHANNEL FILL PLAN

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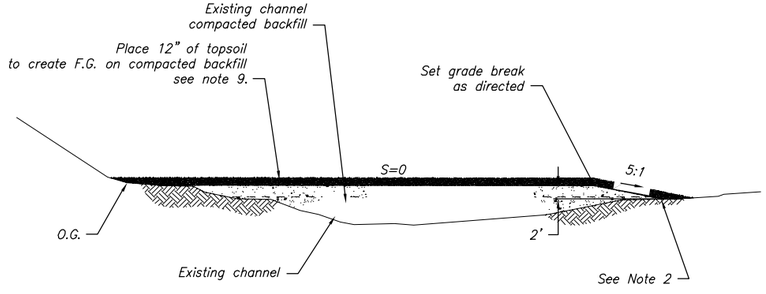
SCALE OF FEET



TYPICAL SECTION C–C

Points 166 through 189

10 0 10 20 30
SCALE OF FEET

NOTES:

1. All work shown on this sheet shall be completed in construction year 2 during the in water work period.
2. Fill boundary is intended to match the right top of bank of the existing channel. Stake out shall be field verified by C.O. prior to installation of compacted channel backfill.
3. Fill to existing grade with a cross sectional slope of zero. Fill surface to match elevation at catch point of existing grade, see TYPICAL SECTION C–C, this sheet.
4. All sloped material shall be graded to meet the natural existing topography unless indicated otherwise.
5. Flood Swale Complex 5 Drawings supersede this drawing if elevations are contrary to the elevations shown on this drawing.
6. Fill placed in the existing channel to create a flow plug shall be material as specified on sheet –2115.
7. Fill material shall be a well graded mix and be near optimum moisture content for compaction. Fill material shall be approved by the C.O. before placement at each plug.
8. Place fill material in 12–inch maximum lifts, and compact thoroughly. No testing of compacted density will be performed; acceptance will be by the C.O. observing fill placement and compaction effort. The intent of compaction will be to achieve approximately 85% relative density.
9. Grading contours are for the additional 12" of topsoil creating the final finished grade.

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GRANDE RONDE SUBBASIN

CC–44 PHASE III HABITAT ENHANCEMENT PARCEL 3

REV NO.	DATE	DESCRIPTION
1	2015–10–09	100 Corrected section detail topsoil note and Note 9
		Jeffery J. Fealko, P.E.

DESIGNED	Jeffery J. Fealko, P.E.
DRAWN	JET/DB/KK
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TECH. APPR.	Jeffery J. Fealko, P.E.
APPROVED	Steve Montague, P.E.
	ADMIN. APPROVAL – PROGRAM MANAGER – ACTING
BOISE, ID	2015–09–14

EXISTING CHANNEL FILL

PLAN AND SECTION

1678–100–2066

SHEET 3 OF 3

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Not Plotted

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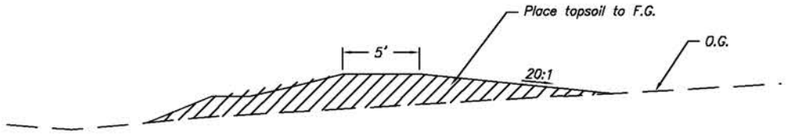
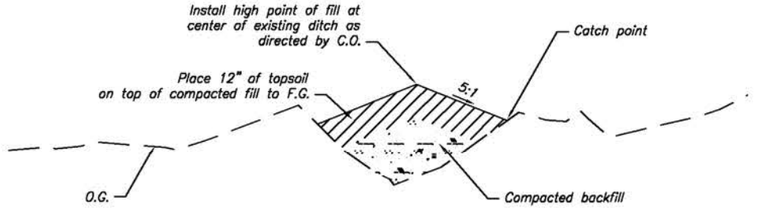


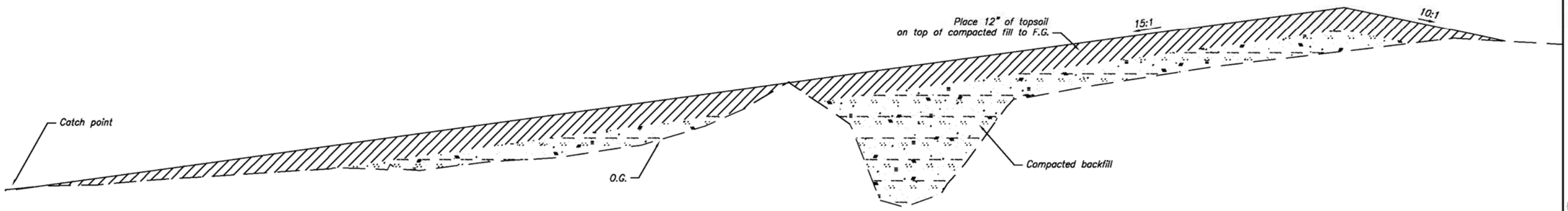
TYPICAL FILL AROUND BARN A–A

SCALE OF FEET



TYPICAL HIGHWAY 203 DITCH FILL B–B

SCALE OF FEET

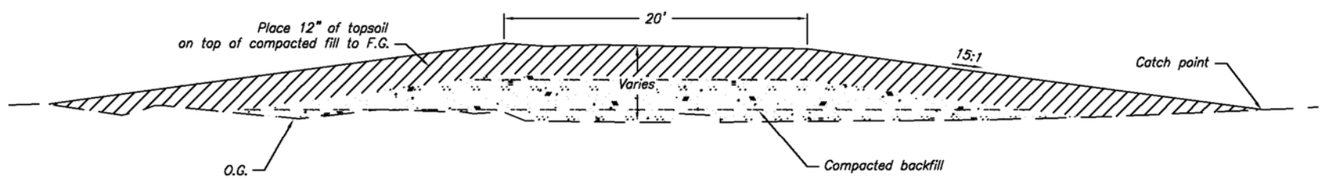


TYPICAL HIGHWAY 203 NE CORNER DITCH FILL B'–B'

SCALE OF FEET

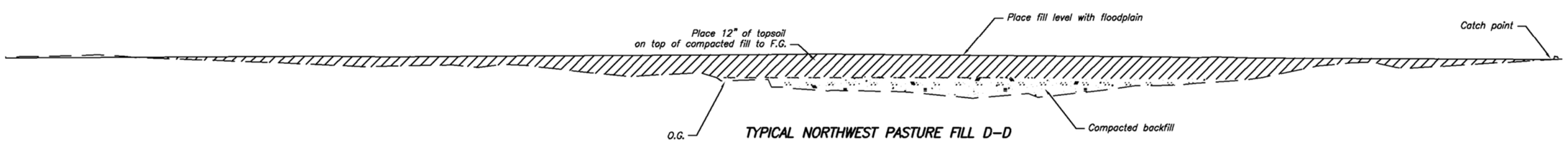
NOTES:

1. Clear and grub extents of where excess material/spoils areas are shown on Dwgs. –2060 and –2033 through 2036.
2. Salvage sod and transplant over fill material. See Dwg. –2060 for Sod Salvage and Transplant Notes.
3. Place fill material in 12–inch maximum lifts, and compacted thoroughly. No testing of compacted density will be performed; acceptance will be by the Contracting Officer observing fill placement and compaction effort. The intent of compaction will be to achieve approximately 85% relative density. See Dwg. –2028 for General Fill Note.
3. Place 12 inches of topsoil on compacted fill material as approved by the C.O. See Dwg. –2061 for Topsoil Notes.



TYPICAL NORTHWEST PROPERTY LINE FILL C–C

SCALE OF FEET



TYPICAL NORTHWEST PASTURE FILL D–D

SCALE OF FEET

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GRANDE RONDE SUBBASIN

CC–44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV NO	DATE	DESCRIPTION
1	2015–10–09	Corrected topsoil placement note all sections

Jeffrey J. Fealko, P.E.
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Jeffrey J. Fealko, P.E.
TECH. APPR.
Steve Montague – Acting
APPROVED
ADMIN APPROVAL – PROGRAM MANAGER
BOISE, IDAHO 2015–09–14

UPLAND FILL

SECTIONS

1678–100–2067

SHEET 1 OF 1

DATE AND TIME PLOTTED
AUGUST 12, 2015 14:37
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JBACONGUIS

CAD SYSTEM
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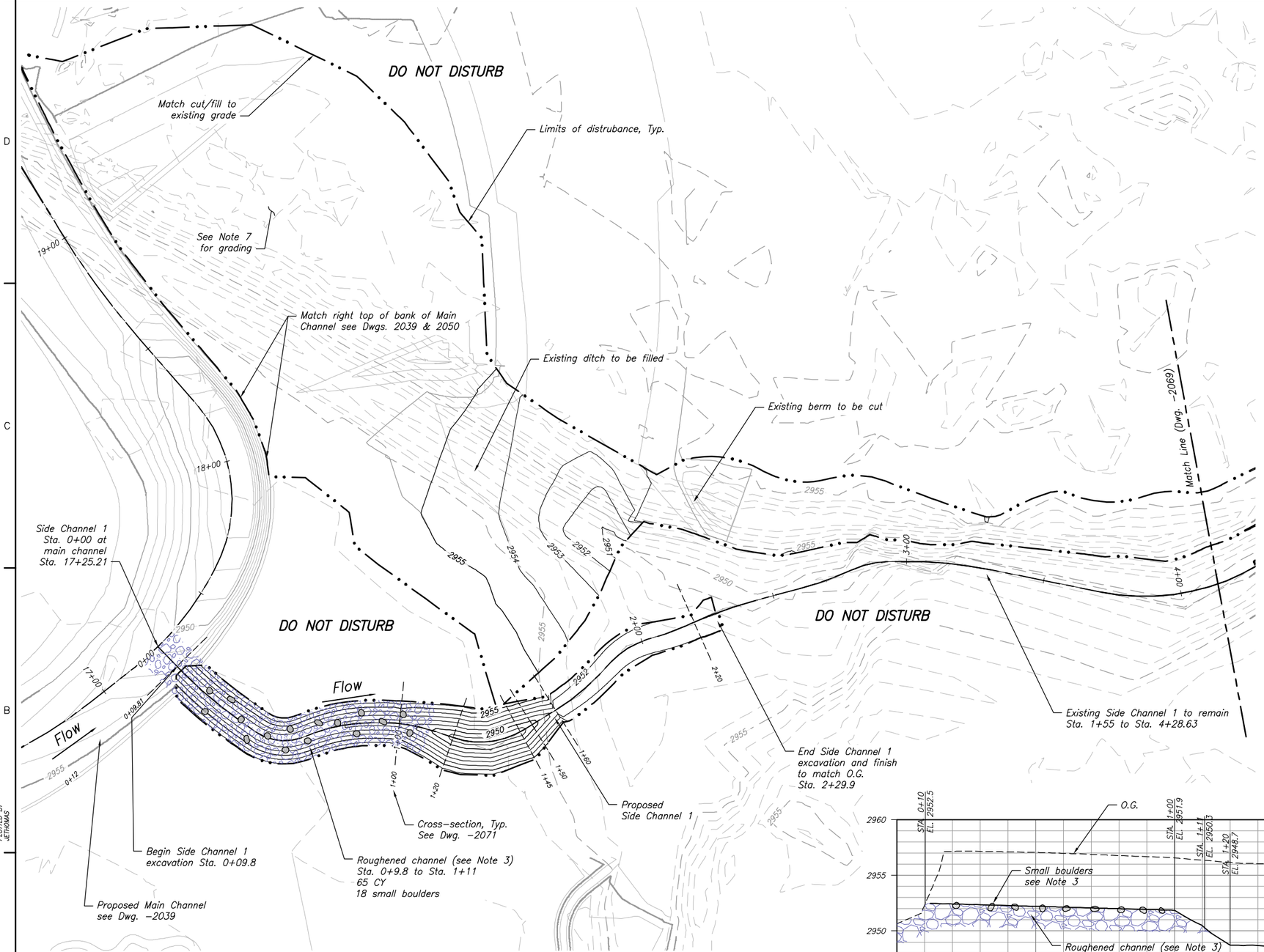
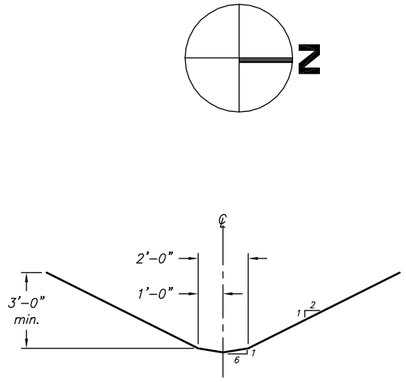


SIDE CHANNEL 1 – PLAN

STA 0+00 TO STA 2+50

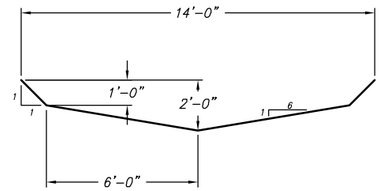
SCALE OF FEET: 20 0 20 40 60



TYPICAL SECTION

STA 0+09 TO STA 1+50

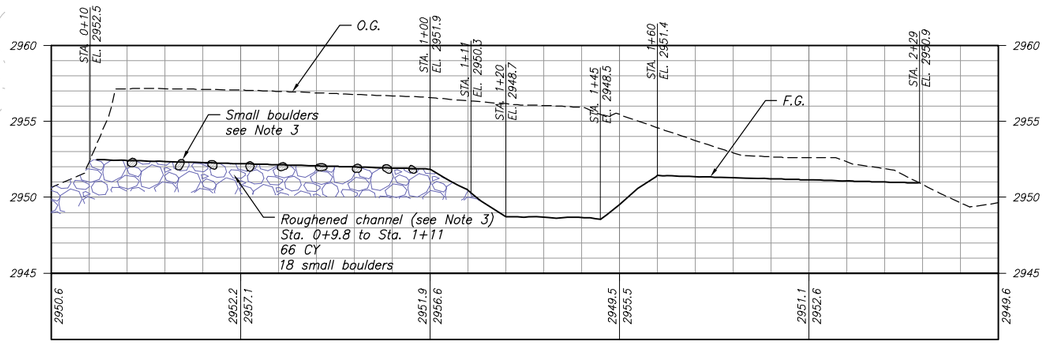
SCALE OF FEET: 3 0 3 6 9



TYPICAL SECTION

STA 1+60 TO END

SCALE OF FEET: 3 0 3 6 9



SIDE CHANNEL 1 – PROFILE

STA 0+00 TO STA 2+50

HORIZONTAL SCALE: 20 0 20 40 60 SCALE OF FEET

VERTICAL SCALE: 5 0 5 10 15 SCALE OF FEET

NOTES:

1. Salvage and transplant sod along the excavation extents of Side Channel 1. See Dwg. -2028 for Sod Salvage and Transplant notes.
2. Place salvaged sod on channel side slopes.
3. The roughened channel shall be constructed utilizing the same methods and materials as a riffle (see Dwg. 2063) except boulder sizes. Boulders shall be all small boulders. Additional boulders placed as directed by C.O.R.
4. See Dwg. -2028 for General Fill note for compaction requirements.
5. Cross sections are shown at all major vertical grade breaks shown in profile view. Sections can be found on sheets -2071.
6. For large woody material structures see sheets -2116 to -2127.
7. Grade ditch fill using a constant slope from top of right bank of Main Channel to limits of disturbance as shown on drawing above.

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GRANDE RONDE SUBBASIN
CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV NO	DATE	DESCRIPTION
1	2015-10-09	Jeffrey J. Fealko, P.E. 100 Corrected roughened channel material to 2" DIA.

DESIGNED	Jeffrey J Fealko P.E.
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CHECKED	Mike Knutson P.E.
TECH. APPR.	Jeffrey J Fealko P.E.
APPROVED ADMIN. APPROVAL – PROGRAM MANAGER	Steve Montague–Acting
BOISE, ID	2015-09-14

SIDE CHANNEL 1

PLAN, PROFILE, & SECTIONS
STA 0+00 TO STA 2+50

1678-100-2068

SHEET 1 OF 4

DATE AND TIME PLOTTED JULY 25, 2015 16:51
PLOTTED BY JETHOMAS

CAD SYSTEM AutoCAD Rel. 20.0s
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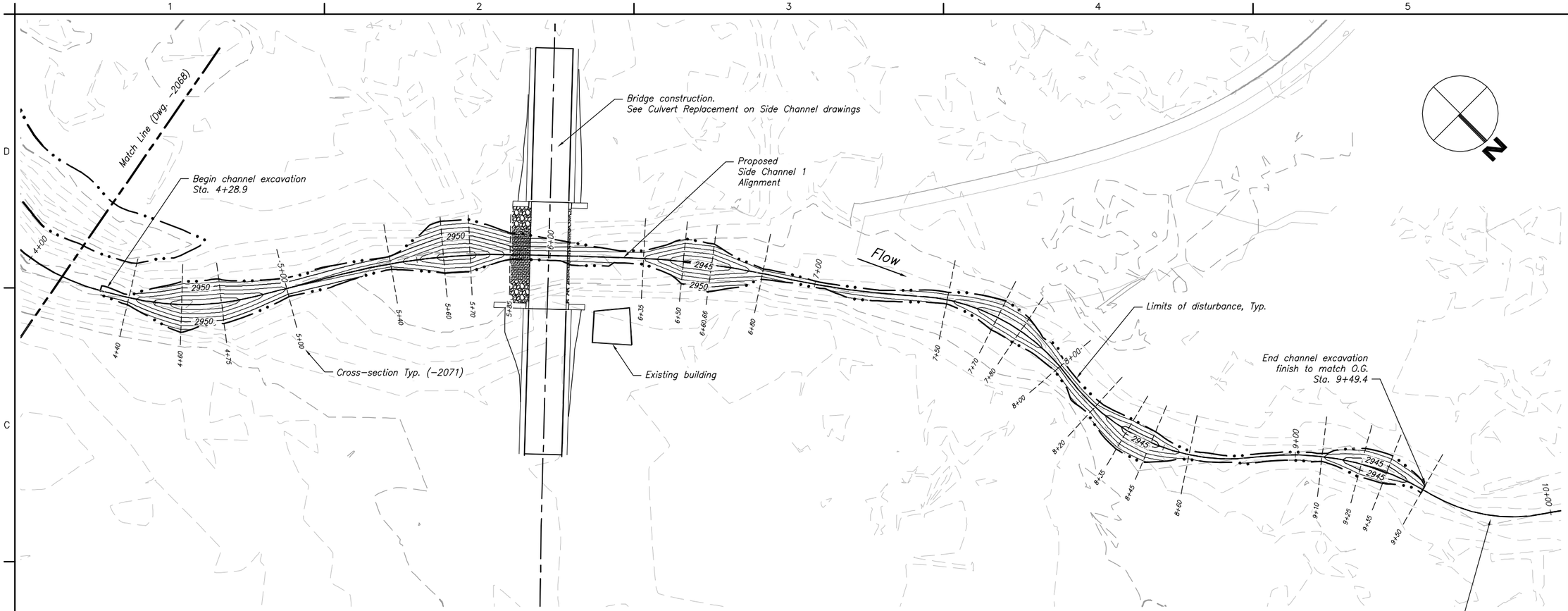


SIDE CHANNEL 1 – PLAN

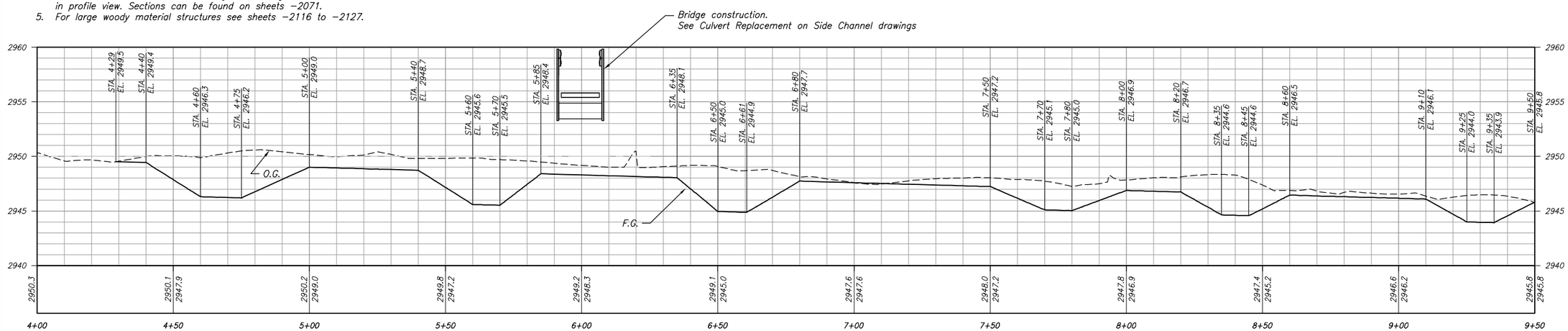
STA 4+00 TO STA 9+50

20 0 20 40 60

SCALE OF FEET

NOTES:

1. Salvage and transplant sod along the excavation extents of Side Channel 1. See Dwg. -2028 for Sod Salvage and Transplant notes.
2. Place salvaged sod on channel side slopes.
3. See Dwg. -2028 for General Excavation and Finish Grading Notes.
4. Cross sections are shown at all major vertical grade breaks shown in profile view. Sections can be found on sheets -2071.
5. For large woody material structures see sheets -2116 to -2127.



SIDE CHANNEL 1 – PROFILE

STA 4+00 TO STA 9+50

HORIZONTAL SCALE

20 0 20 40 60

SCALE OF FEET

VERTICAL SCALE

5 0 5 10 15

SCALE OF FEET

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FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN

CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV NO		
1	2015-10-09	100 Corrected bridge construction drawing reference
	Jeffrey J. Fealko, P.E.	

Jeffrey J Fealko P.E.
DESIGNED
JET
DRAWN
Mike Knutson P.E.
CHECKED
Jeffrey J Fealko P.E.
TECH. APPR.
Steve Montague-Acting
APPROVED
ADMIN APPROVAL - PROGRAM MANAGER
BOISE, ID 2015-09-14

SIDE CHANNEL 1

PLAN & PROFILE
STA 4+00 TO STA 9+50

1678-100-2069

SHEET 2 OF 4

DATE AND TIME PLOTED
AUGUST 14, 2015 13:24
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JETHOMAS

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CAD FILENAME
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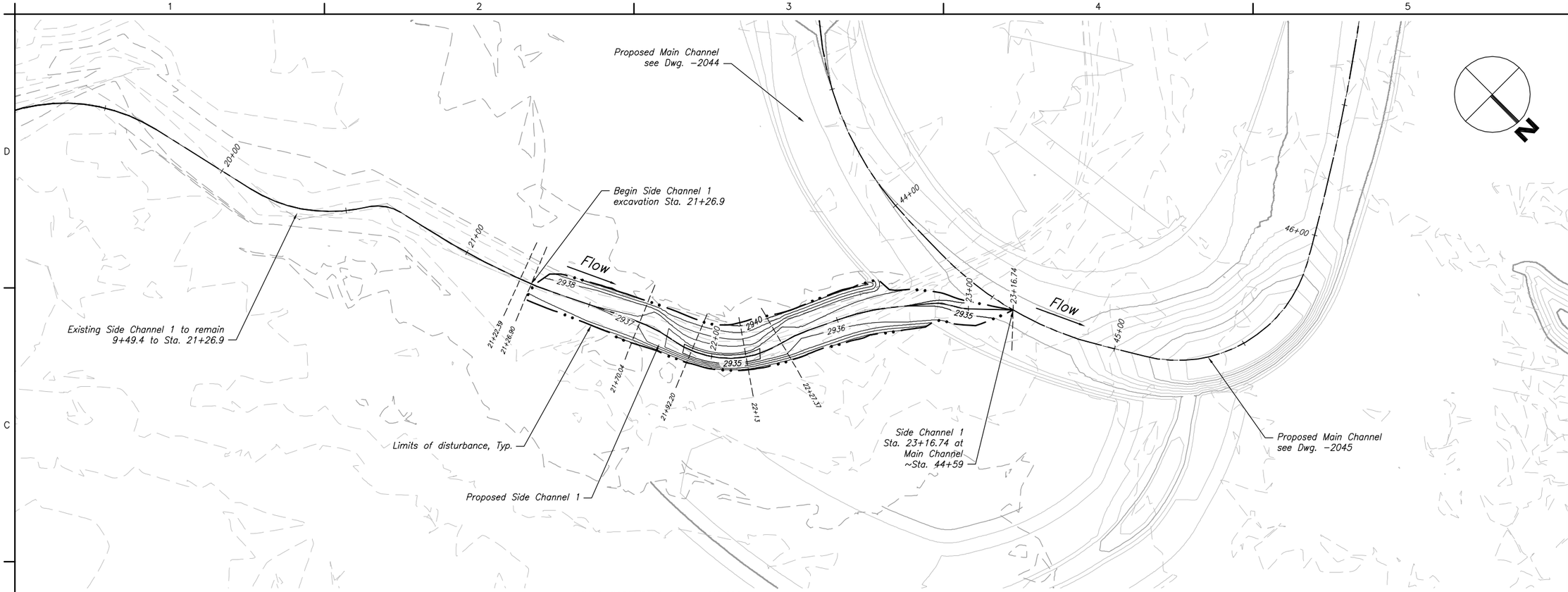
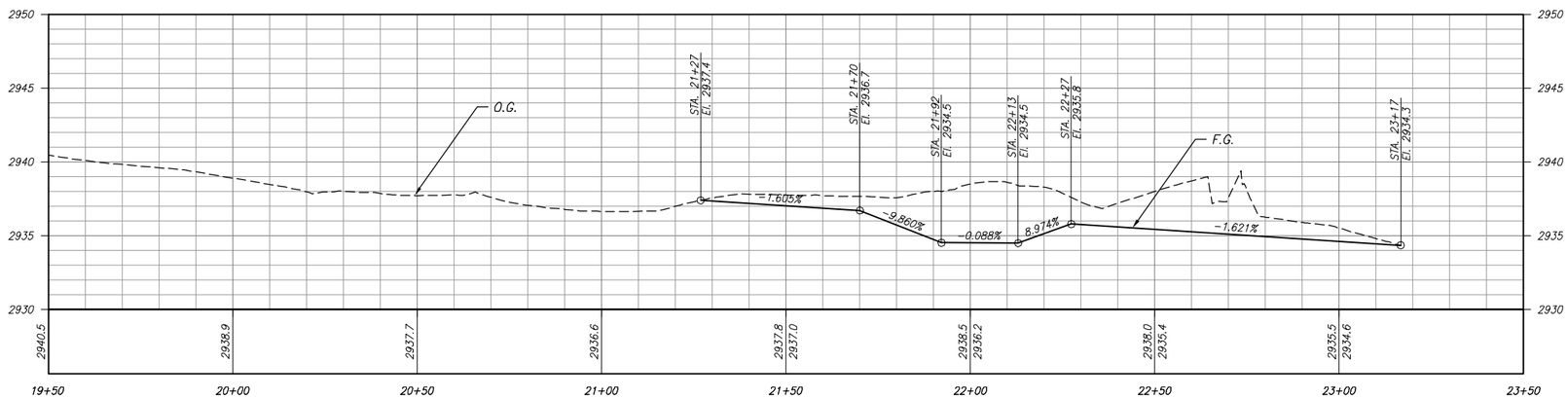


SIDE CHANNEL 1 – PLAN

STA 19+50 TO STA 23+50

20 0 20 40 60
SCALE OF FEET

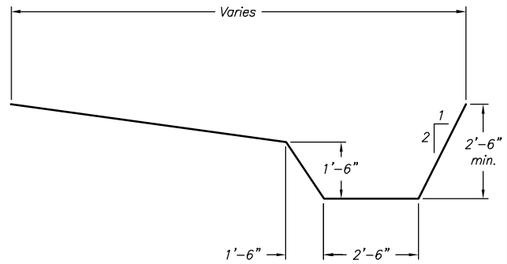


SIDE CHANNEL 1 – PROFILE

STA 19+50 TO STA 23+50

HORIZONTAL SCALE
20 0 20 40 60
SCALE OF FEET

VERTICAL SCALE
5 0 5 10 15
SCALE OF FEET



SIDE CHANNEL 1 POOL SECTION

STA 21+92.2 TO 22+13

2 0 2 4 6
SCALE OF FEET

NOTES:

1. Salvage and transplant sod along the excavation extents of Side Channel 1. See Dwg. –2028 for Sod Salvage and Transplant notes.
2. Place salvaged sod on channel side slopes.
3. See Dwg. –2028 for General Excavation and Finish Grading Notes.
4. Cross sections are shown at all major vertical grade breaks shown in profile view. Sections can be found on sheets –2071.
5. For large woody material structures see sheets –2116 to –2127.

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FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN

CC–44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

DESIGNED	Jeffrey J Fealko P.E.
DRAWN	JET
CHECKED	Mike Knutson P.E.
TECH. APPR.	Jeffrey J Fealko P.E.
APPROVED	Steve Montague–Acting
ADMIN. APPROVAL – PROGRAM MANAGER	
BOISE, ID	2015–09–14

SIDE CHANNEL 1

PLAN, PROFILE & SECTION
STA 21+92.2 TO STA 22+13

1678–100–2070

SHEET 3 OF 4

DATE AND TIME PLOTTED
AUGUST 14, 2015 13:43
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JETHOMAS

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CAD FILENAME
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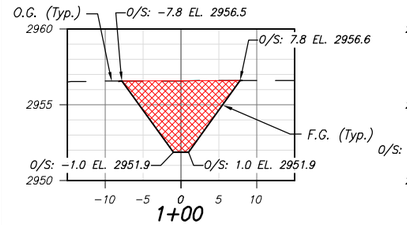

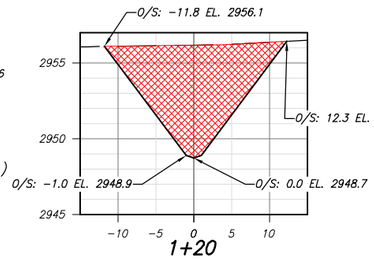

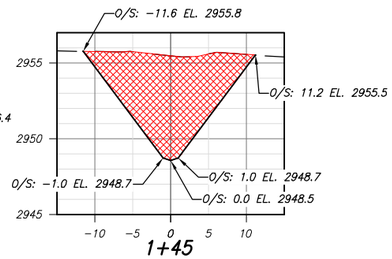

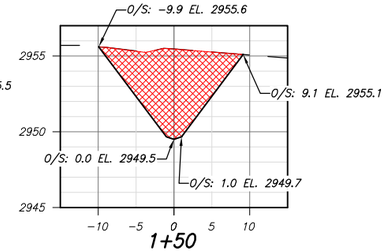

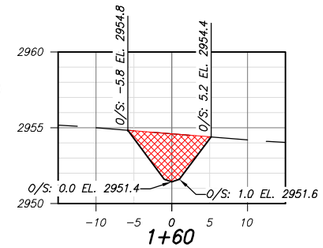

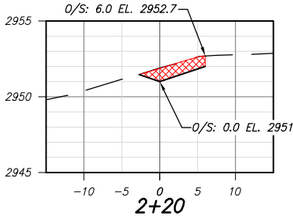

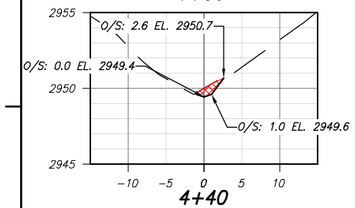

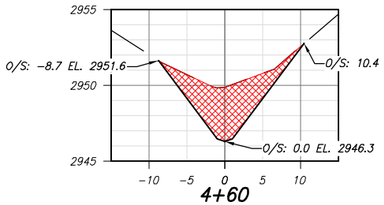

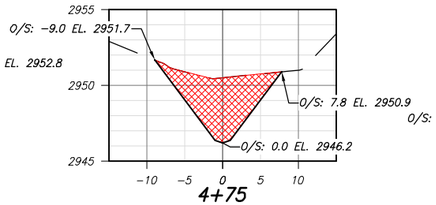

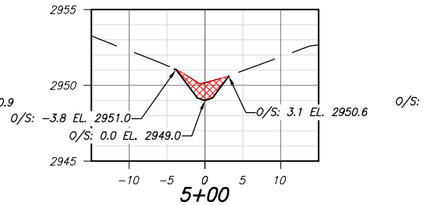

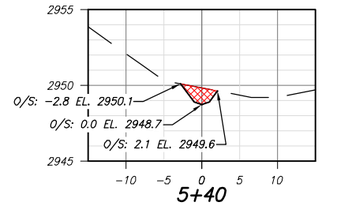

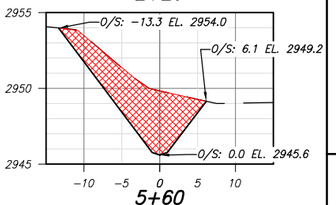

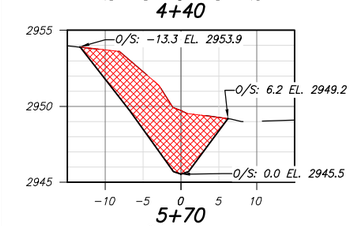

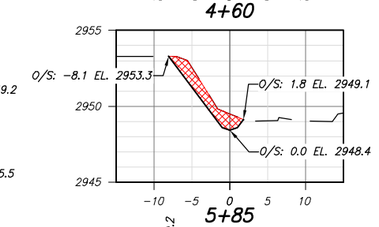

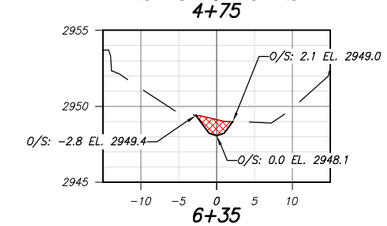

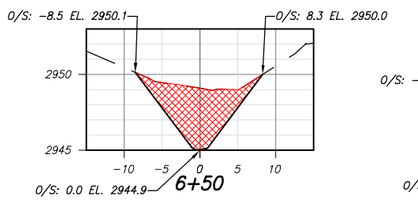

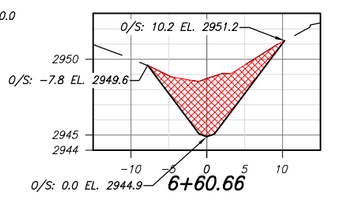

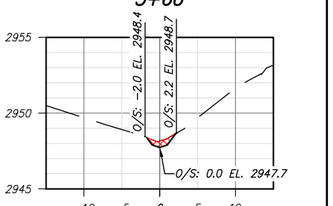

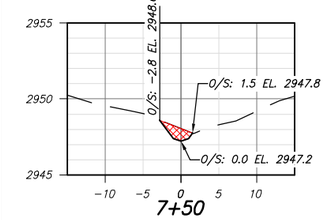

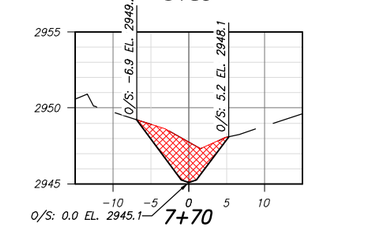

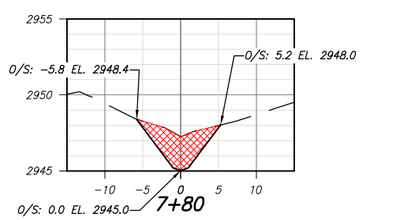

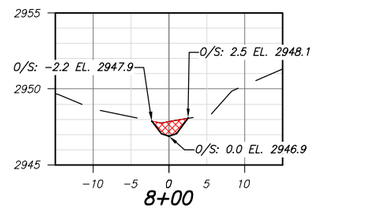

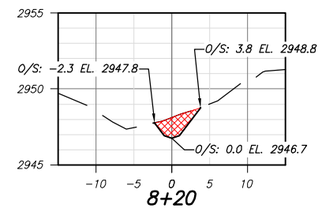

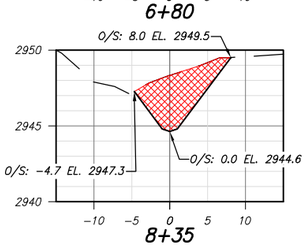

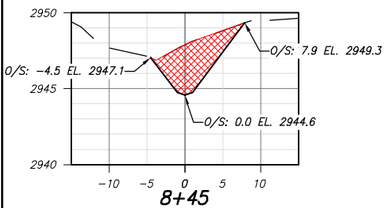

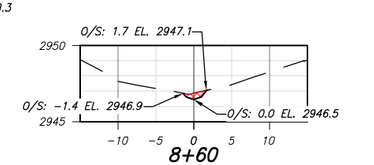

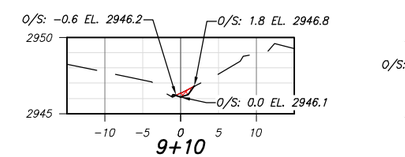

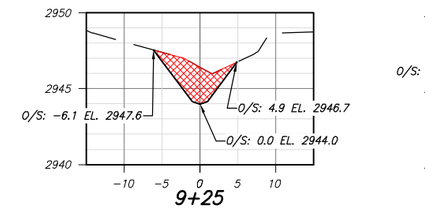

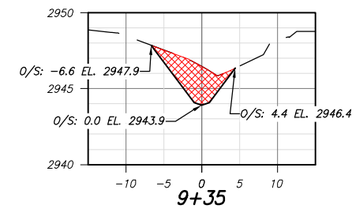

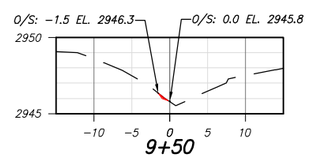

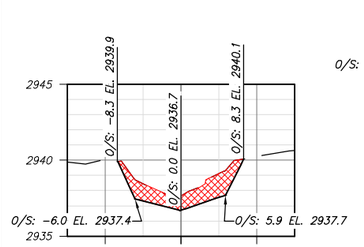

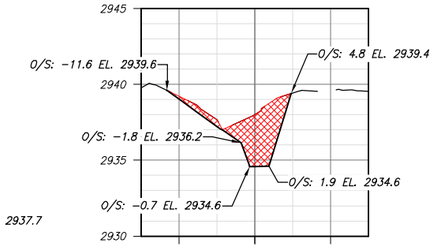

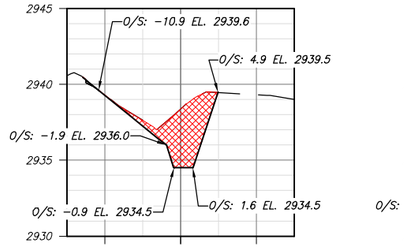

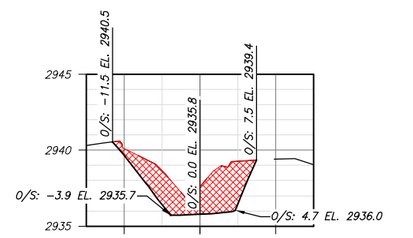

CUT

NOTES:

1. Cross sections face downstream. Cross section centerline station is located along the thalweg alignment.
2. Y-axis is elevation, X-axis is distance in feet along a chord perpendicular to the thalweg. The zero station shown on these cross sections represents the thalweg alignment.
3. Constructed channel shall transition smoothly between cross sectional geometries shown within these cross sections. Cross section geometry shown represents one point in a smooth transition.
4. Cross-sections are to be used to stake out the channel offsets at the vertical grade breaks of the channel profile.

SIDE CHANNEL 1 CROSS SECTIONS

SCALE OF FEET

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COLUMBIA/SNAKE RIVER SALMON RECOVERY PROGRAM
FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN
CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV NO	DATE	
1	2015-10-09	100 Changed O.G. linetype
		Jeffrey J. Fealko, P.E.

Jeffrey J Fealko P.E.
DESIGNED
JET
DRAWN
Mike Knutson P.E.
CHECKED
Jeffrey J Fealko P.E.
TECH. APPR.
Steve Montague-Acting
APPROVED
ADMIN. APPROVAL - PROGRAM MANAGER
BOISE, ID 2015-09-14

SIDE CHANNEL 1

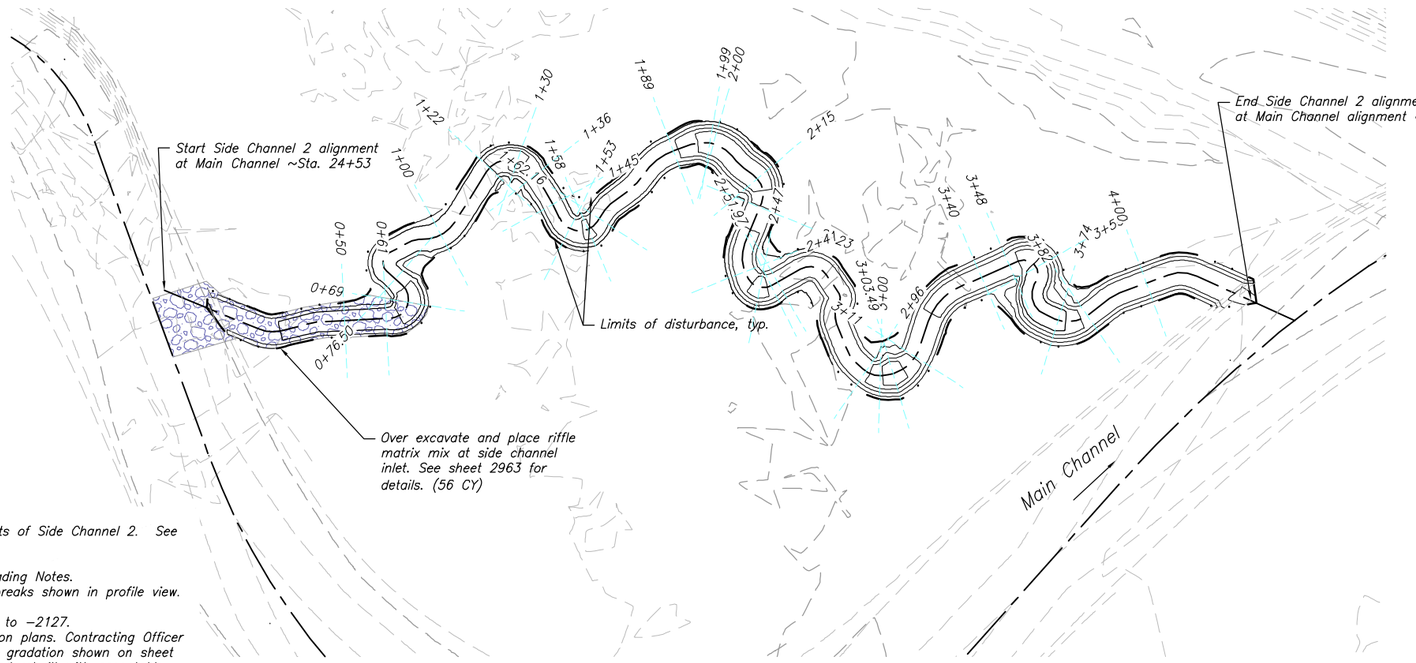
CROSS SECTIONS

1678-100-2071

SHEET 4 OF 4

DATE AND TIME PLOTTED
AUGUST 14, 2015 13:49
PLOTTED BY
JETHOMAS

CAD SYSTEM
AutoCAD Rel. 20.0s
CAD FILENAME
28_1678-100-SC1.DWG

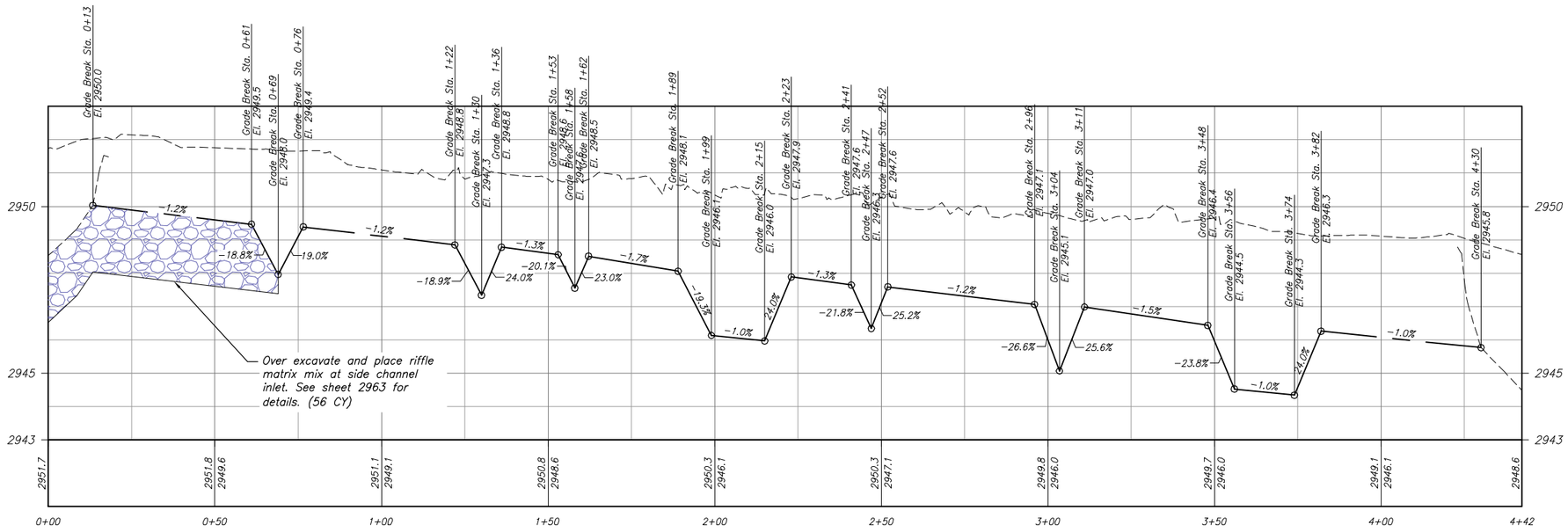


SIDE CHANNEL 2 PLAN

SCALE OF FEET 20 0 20 40 60

NOTES::

1. Salvage and transplant sod along the excavation extents of Side Channel 2. See Dwg. –2028 for Sod Salvage and Transplant notes.
2. Place salvaged sod on channel side slopes.
3. See Dwg. –2028 for General Excavation and Finish Grading Notes.
4. Cross sections are shown at all major vertical grade breaks shown in profile view. Sections can be found on sheets –2073.
5. For large woody material structures see sheets –2116 to –2127.
6. Riffles shall be graded to design elevations as shown on plans. Contracting Officer shall accept or reject riffle bed material based on the gradation shown on sheet –2063. If rejected, material shall be over excavated and rebuilt with acceptable material as shown on sheet –2063.
7. The roughened channel shall be constructed using the same methods and materials as a riffle (see Dwg. –2063).



SIDE CHANNEL 2 PROFILE

SCALE OF FEET 20 0 20 40 60

DATE AND TIME PLOTTED
AUGUST 14, 2015 12:07
PLOTTED BY
KKORTHALS

CAD SYSTEM
AutoCAD Rel. 20.0s
CAD FILENAME
1678-100-SC2.DWG

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FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN

CC–44 PHASE III HABITAT ENHANCEMENT PARCEL 3

REV NO	DATE	DESCRIPTION
1	2015-10-09	100 Added Note 7. Jeffrey J Fealko P.E.

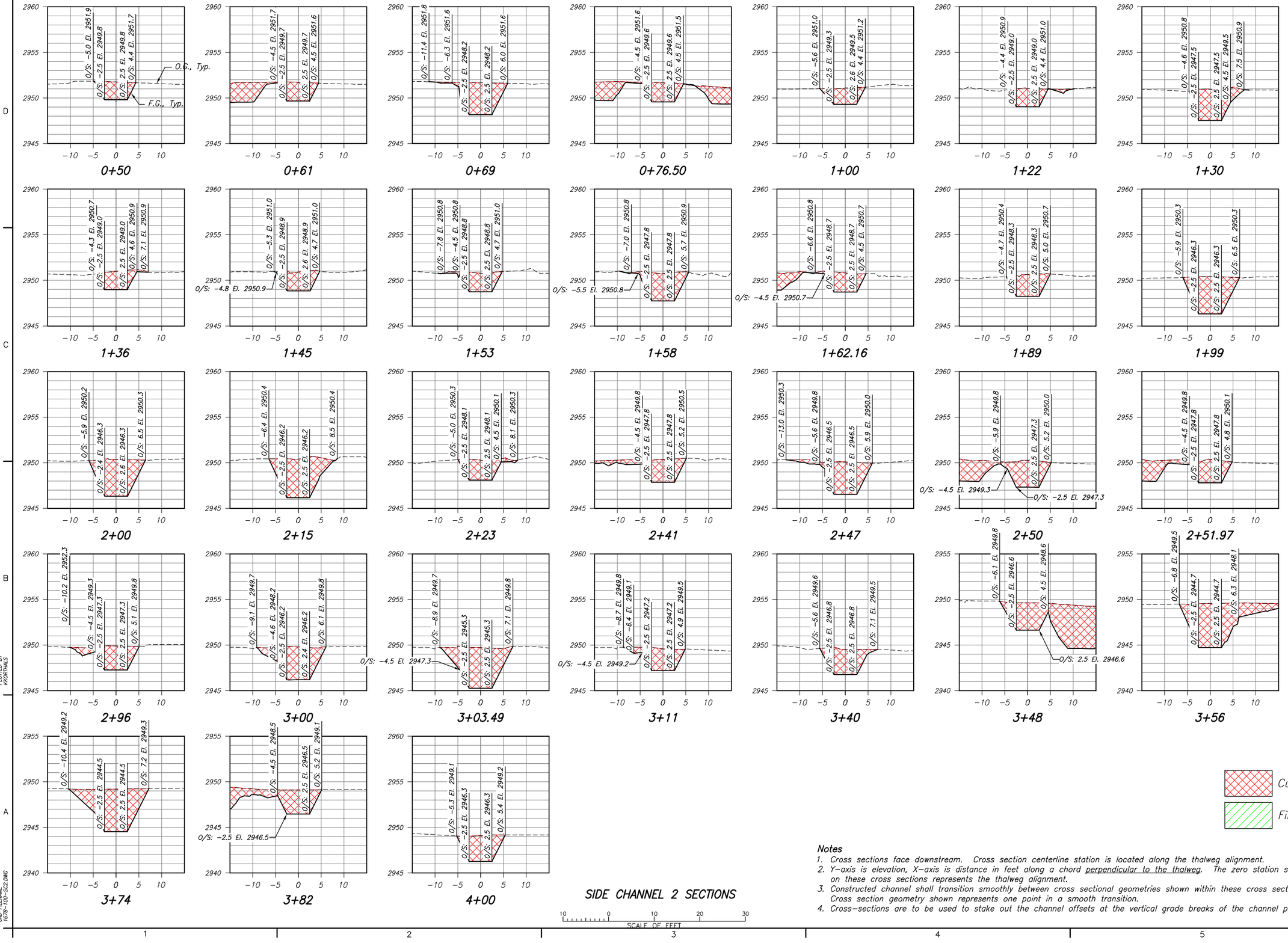
DESIGNED	Jeffrey J. Fealko, P.E.
DRAWN	JF/DB/KK
CHECKED	Mike Knutson, P.E.
TECH. APPR.	Jeffrey J. Fealko, P.E.
APPROVED	Steve Montague – Acting
ADMIN. APPROVAL – PROGRAM MANAGER	
BOISE, ID	2015-09-14

SIDE CHANNEL 2

PLAN AND PROFILE VIEW

1678–100–2072

SHEET 1 OF 2



SIDE CHANNEL 2 SECTIONS

SCALE OF FEET: 10 0 10 20 30

Notes

1. Cross sections face downstream. Cross section centerline station is located along the thalweg alignment.
2. Y-axis is elevation, X-axis is distance in feet along a chord perpendicular to the thalweg. The zero station shown on these cross sections represents the thalweg alignment.
3. Constructed channel shall transition smoothly between cross sectional geometries shown within these cross sections. Cross section geometry shown represents one point in a smooth transition.
4. Cross-sections are to be used to stake out the channel offsets at the vertical grade breaks of the channel profile.

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FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN
CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV NO	DATE	DESCRIPTION
1	2015-10-09	Revised hatch for section cut

Jeffrey J Fealko P.E.
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DB
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Mike Knutson P.E.
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Jeffrey J Fealko P.E.
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BOISE, ID
2015-09-14

SIDE CHANNEL 2

SECTION VIEW

1678-100-2073

SHEET 2 OF 2

DATE AND TIME PLOTTED
AUGUST 14, 2015 12:08
PLOTTED BY
KKORTHALS

CAD SYSTEM
AutoCAD Rel. 20.0s
CAD FILENAME
1678-100-SC2.DWG

Start Channel D spring channel

Start Swale B and Channel B at Main Channel ~Sta. 8+74

Start Swale A and Channel A at Main Channel ~Sta. 9+84

End Channel B at Channel A ~Sta. 4+19

End Swale B at Swale A ~Sta. 2+75

Start Channel C with Pool at Channel A ~Sta. 7+30

End Channel C with pool at Channel A ~Sta. 9+56

End Channel D spring channel at Channel A ~Sta. 11+38

End Channel A and Swale A at Main Channel ~Sta. 23+81

See channel fill grading (–2065)

Flow

Pool

N

NOTES:

1. Salvage sod within the excavation extents of swale alignments. See Dwg. –2028 for Sod Salvage and Transplant Notes.
2. Place 6 inches of topsoil on finish grade of swale side slopes.
3. Place sod mats on swale side slopes.
4. See Dwg. –2028 for General Excavation and Finish Grade Notes.
5. Alignment station labels removed for clarity, see Dwgs. –2075 through –2078 for channel stationing.
6. Two alignments are shown, one for the swale grading feature, and one for the channel feature.
7. "Swales" are the excavated floodplain areas.
8. "Channels" are excavated into the "swale" features.
9. Salvaged sod mats shall be placed throughout the swale complexes as directed by the Contracting Officer to provide immediate vegetation and floodplain roughness. The top of sod mats shall be placed at the final design elevations.
10. Swale complex channels shown in profile are average gradient and shall have pools excavated at the outside of meander bends as directed by the Contracting Officer. Pools shall vary from 1 to 3 feet deep.
11. Swale complex ponds shall be excavated to a minimum depth of 3 feet below encountered groundwater or as directed by the Contracting Officer.

FLOOD SWALE COMPLEX 1 – PLAN

40 0 40 80 120
SCALE OF FEET

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GRANDE RONDE SUBBASIN

CC–44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV NO.		
1	2015–10–09	100 Extended swale tie to main channel
	Jeffrey J Fealko P.E.	

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FLOOD SWALE COMPLEX 1

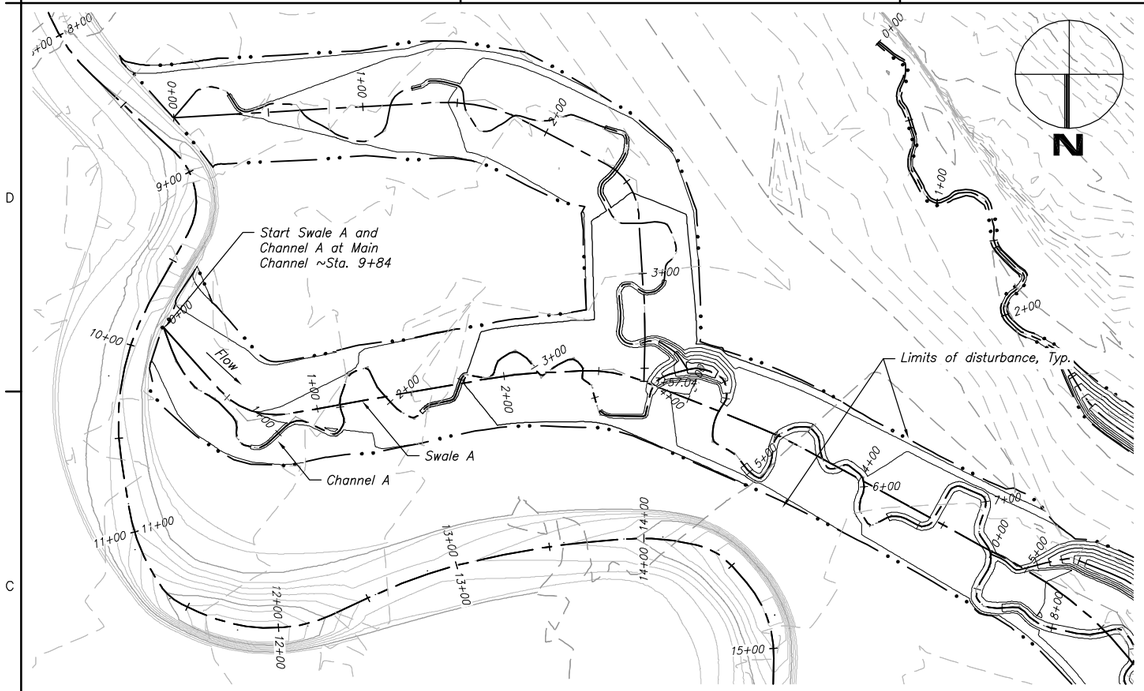
PLAN

1678–100–2074

SHEET 1 OF 8

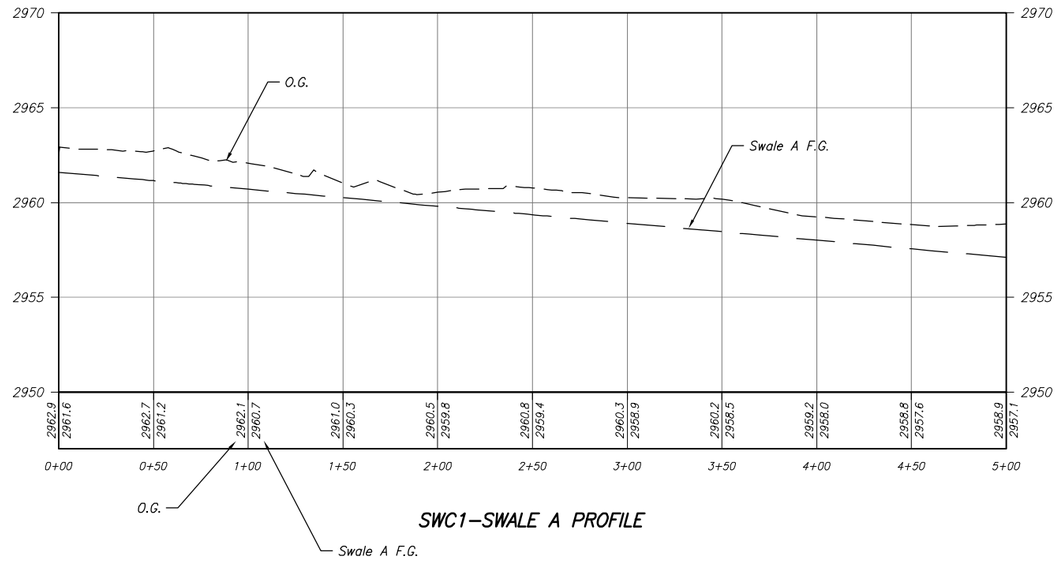
DATE AND TIME PLOTTED
AUGUST 11, 2015 09:18
PLOTTED BY
AHATCH

CAD SYSTEM
AutoCAD Rel. 20.0s
CAD FILENAME
1678–100–SNC1.DWG

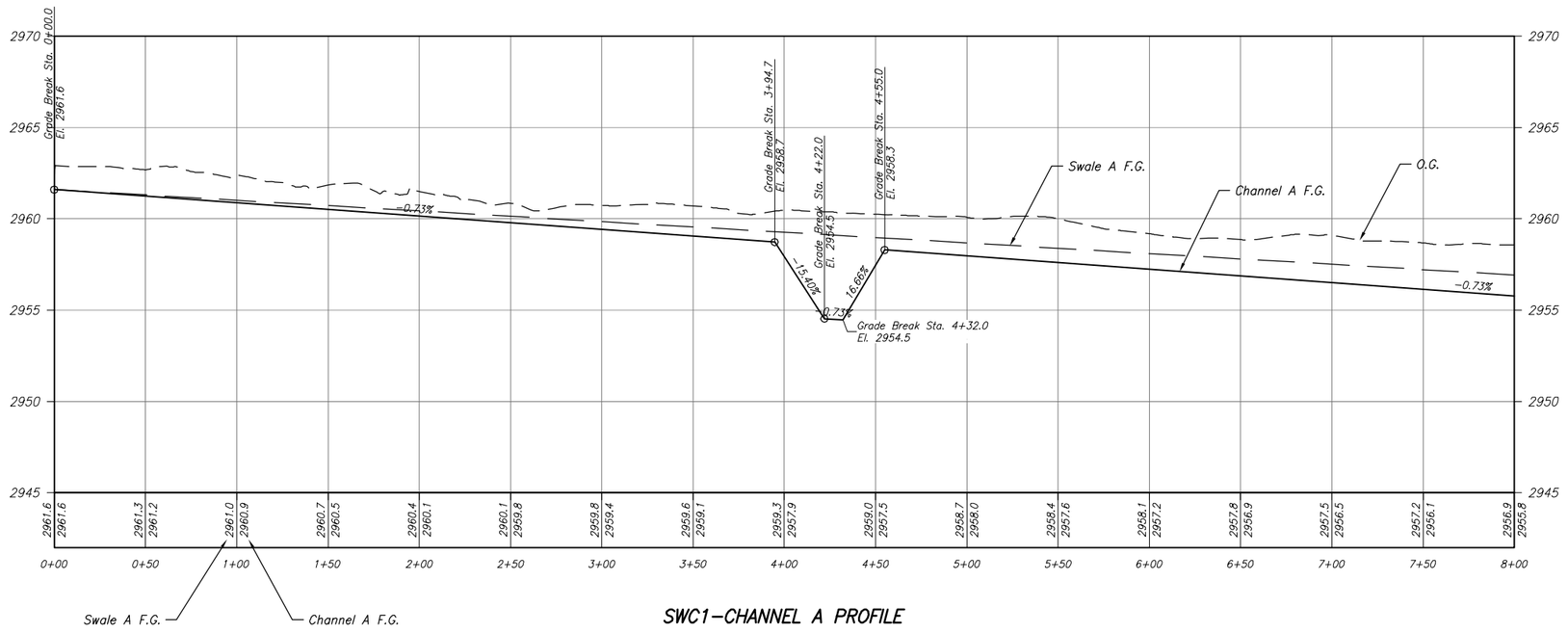


FLOOD SWALE COMPLEX 1
SWALE A
CHANNEL A

SCALE OF FEET: 40 0 40 80 120



SWC1–SWALE A PROFILE



SWC1–CHANNEL A PROFILE

NOTES:

1. Two alignments are shown, one for the swale grading feature, and one for the channel feature.
2. "Swales" are the excavated floodplain areas.
3. "Channels" are excavated into the "swale" features.
4. Swale complex channels shown in profile are average gradient and shall have pools excavated at the outside of meander bends as directed by the Contracting Officer. Pools shall vary from 1 to 3 feet deep.
5. Swale complex ponds shall be excavated to a minimum depth of 3 feet below encountered groundwater or as directed by the Contracting Officer.
6. Where O.G. is lower than proposed channel finish grade, no fill should be placed in the channel.

SCALE OF FEET: 1 0 5 10 15
VERTICAL SCALE

SCALE OF FEET: 40 0 40 80 120
HORIZONTAL SCALE

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GRANDE RONDE SUBBASIN
CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV. NO.		
1	2015-10-09	100 Added profile labels and notes
	Jeffrey J. Fealko, P.E.	

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BOISE, ID 2015-09-14

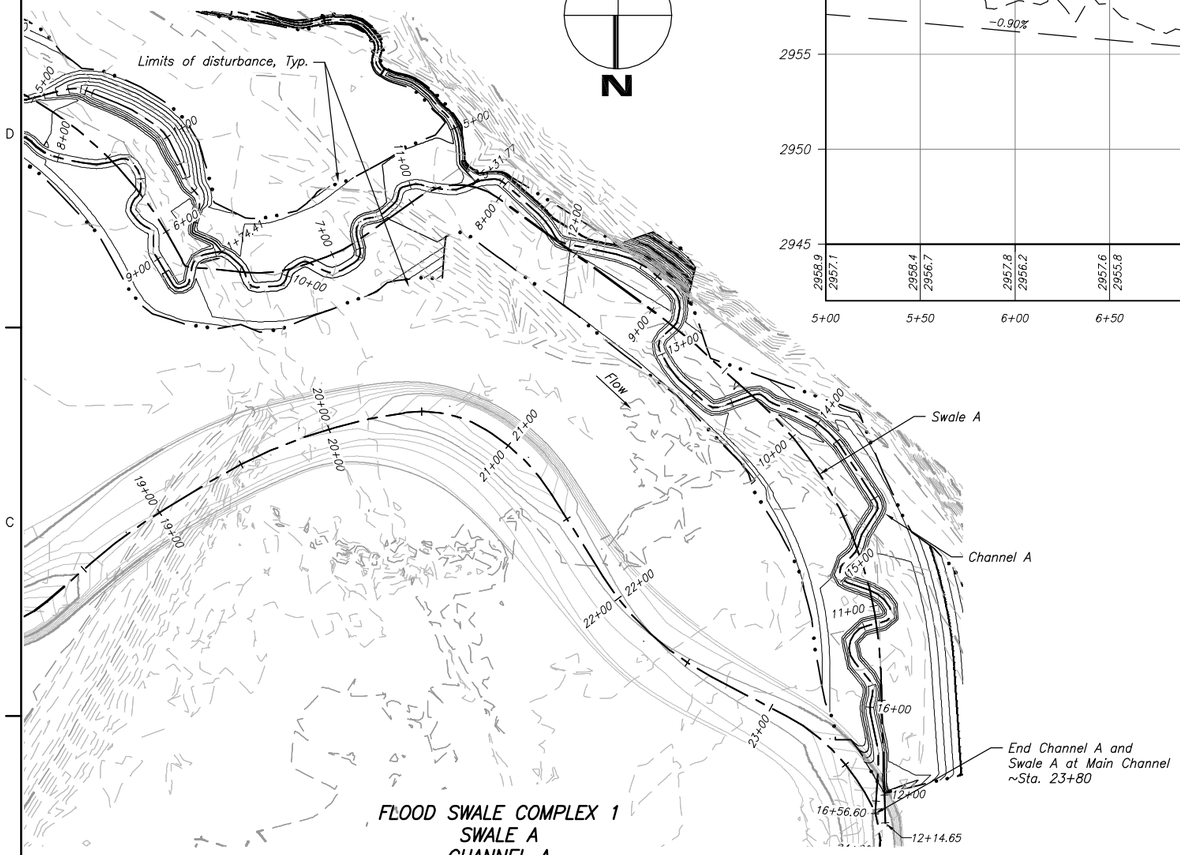
FLOOD SWALE COMPLEX 1
SWALE A
CHANNEL A

PLAN AND PROFILES

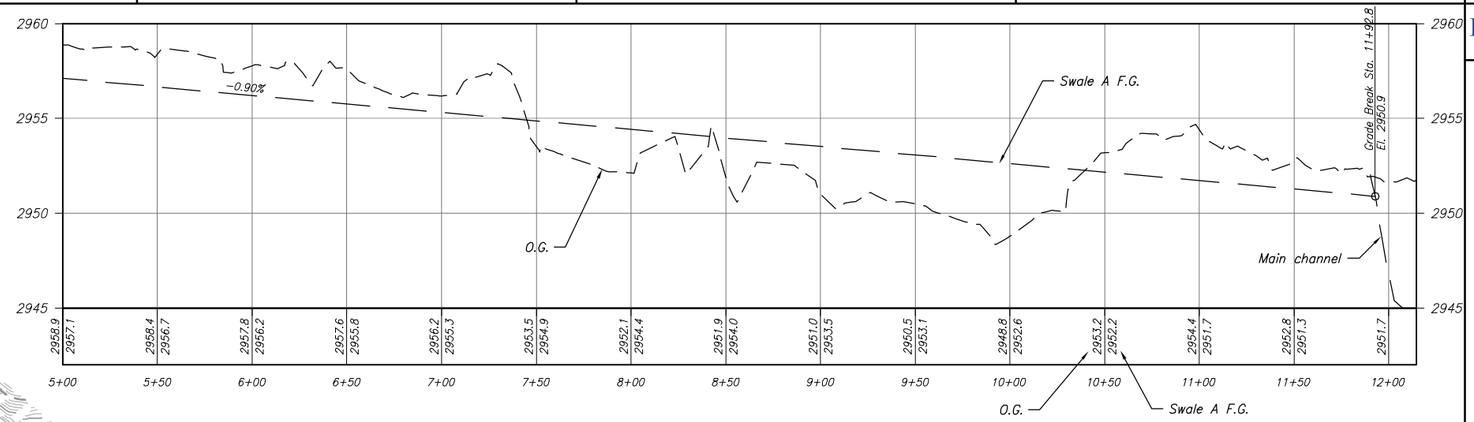
1678-100-2075
SHEET 2 OF 8

DATE AND TIME PLOTTED
AUGUST 13, 2015 10:21
PLOTTED BY
AHATCH

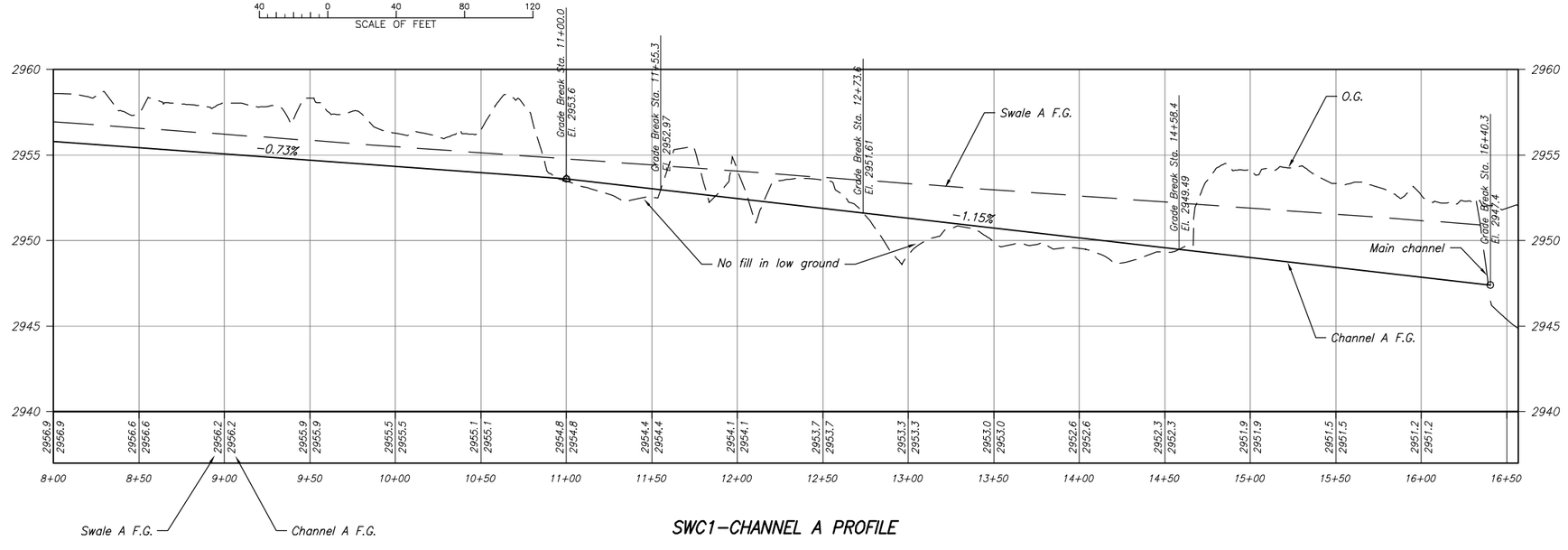
CAD SYSTEM
AutoCAD Rel. 20.0s
CAD FILENAME
1678-100-SWC1.DWG



FLOOD SWALE COMPLEX 1
SWALE A
CHANNEL A



SWC1–SWALE A PROFILE



SWC1–CHANNEL A PROFILE

SCALE OF FEET
VERTICAL SCALE

SCALE OF FEET
HORIZONTAL SCALE

NOTES:

1. Two alignments are shown, one for the swale grading feature, and one for the channel feature.
2. "Swales" are the excavated floodplain areas.
3. "Channels" are excavated into the "swale" features.
4. Swale complex channels shown in profile are average gradient and shall have pools excavated at the outside of meander bends as directed by the Contracting Officer. Pools shall vary from 1 to 3 feet deep.
5. Swale complex ponds shall be excavated to a minimum depth of 3 feet below encountered groundwater or as directed by the Contracting Officer.
6. Where O.G. is lower than proposed channel finish grade, no fill should be placed in the channel.

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GRANDE RONDE SUBBASIN
CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV NO		
1	2015-10-09	Added profile labels and notes
		Jeffrey J. Fealko, P.E.

Jeffrey J Fealko P.E.
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Steve Montague–Acting
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FLOOD SWALE COMPLEX 1
SWALE A
CHANNEL A

PLAN AND PROFILES

1678–100–2076
SHEET 3 OF 8

DATE AND TIME PLOTTED
AUGUST 13, 2015 - 10:27
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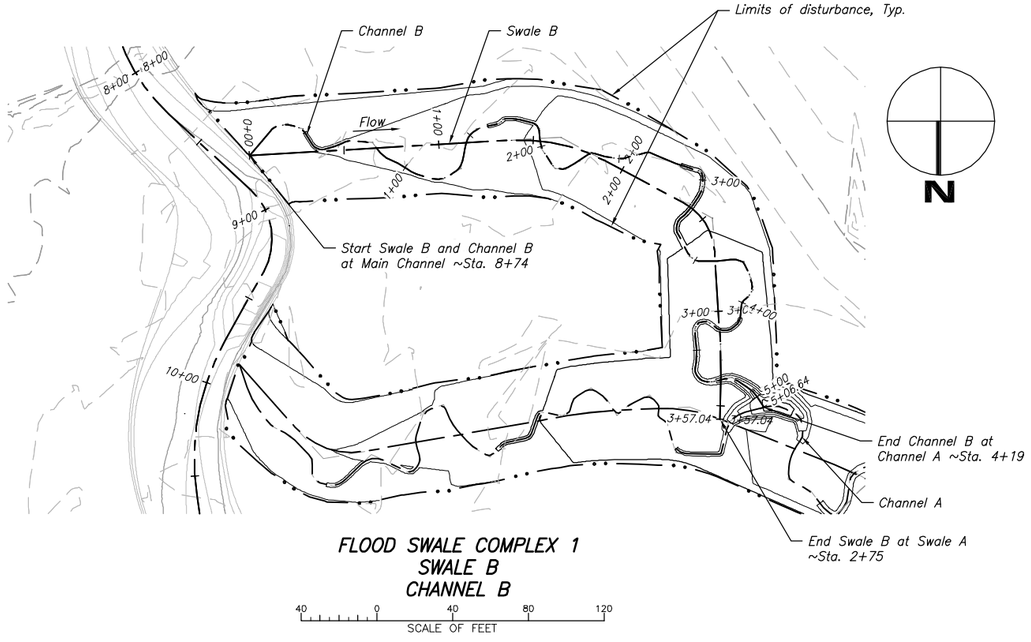
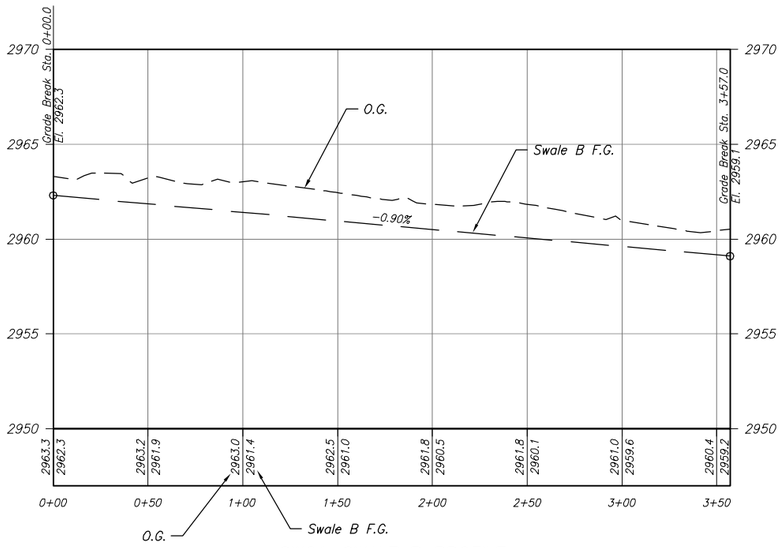
AHATCH

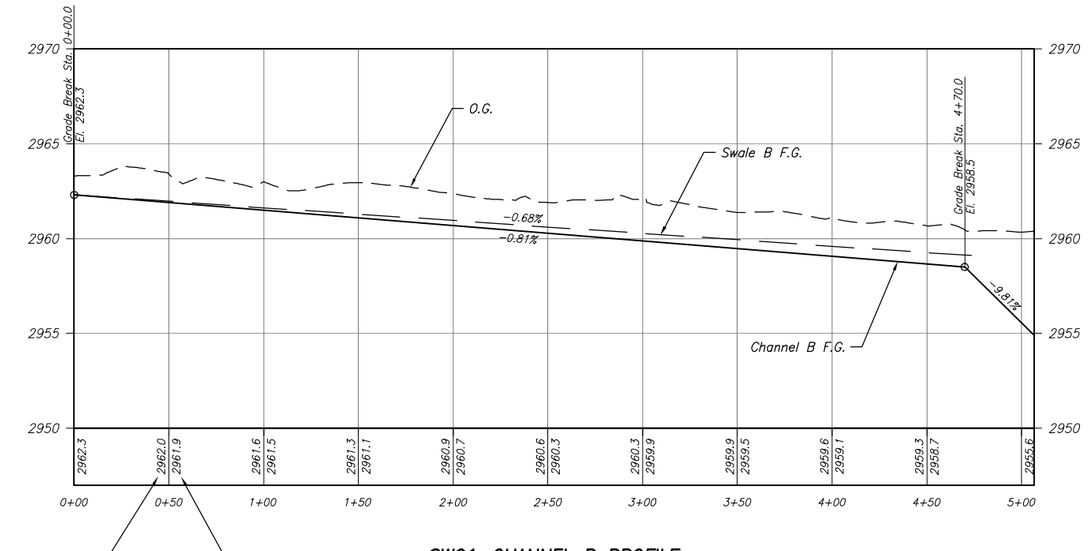
CAD SYSTEM
AutoCAD Rel. 20.0s
CAD FILENAME
1678-100-SWC1.DWG



FLOOD SWALE COMPLEX 1
SWALE B
CHANNEL B



SWC1–SWALE B PROFILE



SWC1–CHANNEL B PROFILE

1 0 5 10 15
SCALE OF FEET
VERTICAL SCALE

40 0 40 80 120
SCALE OF FEET
HORIZONTAL SCALE

NOTES:

1. Two alignments are shown, one for the swale grading feature, and one for the channel feature.
2. "Swales" are the excavated floodplain areas.
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GRANDE RONDE SUBBASIN

CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV NO	DATE	DESCRIPTION
1	2015-10-09	100 Added profile labels and notes
		Jeffrey J. Fealko, P.E.

Jeffrey J Fealko P.E.
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Steve Montague–Acting
APPROVED
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BOISE, ID 2015-09-14

FLOOD SWALE COMPLEX 1
SWALE B
CHANNEL B

PLAN AND PROFILES

1678–100–2077
SHEET 4 OF 8

DATE AND TIME PLOTTED
AUGUST 13, 2015 10:56
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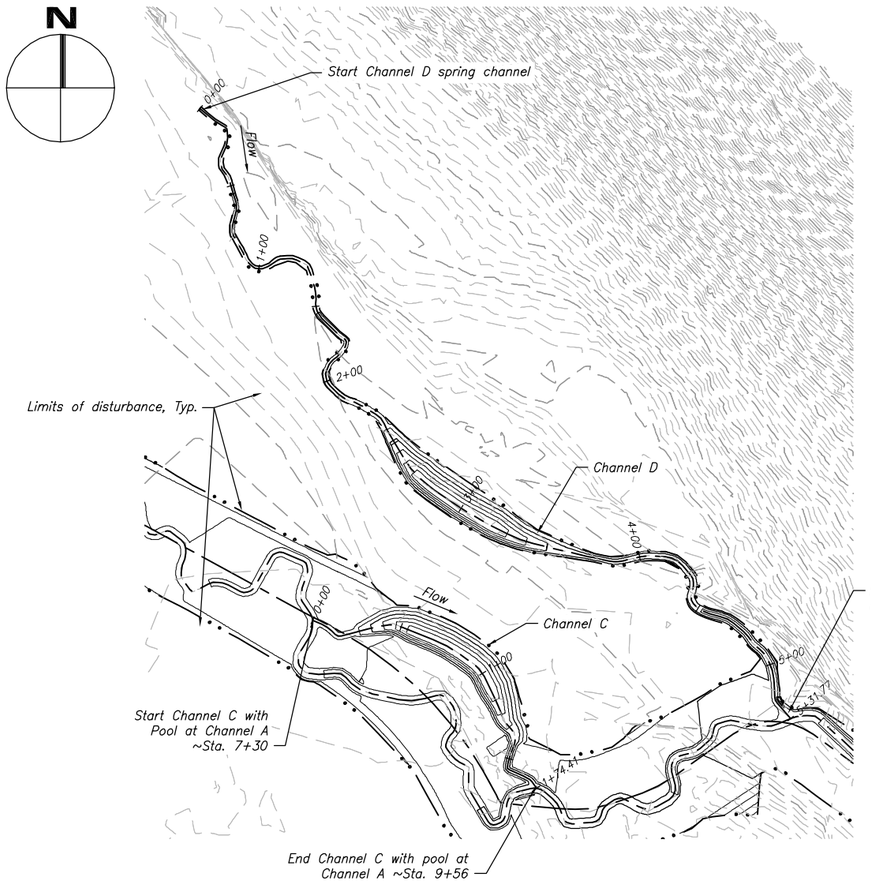
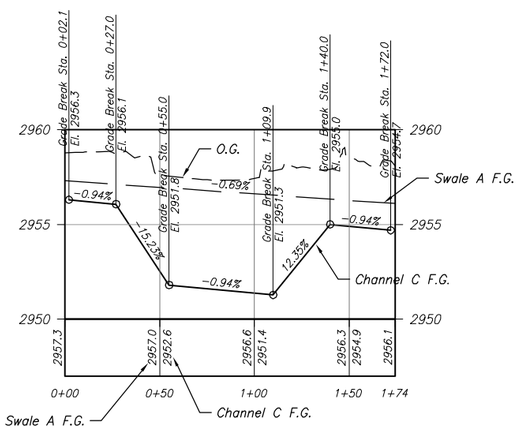
AHATCH

CAD SYSTEM
AutoCAD Rel. 20.0s
CAD FILENAME
1678-100-SWC1.DWG



SWALE COMPLEX 1
CHANNEL C
CHANNEL D

40 0 40 80 120
SCALE OF FEET



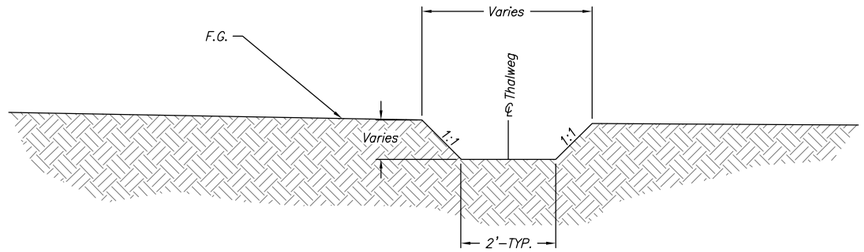
SWC1–CHANNEL C WITH POOL PROFILE

1 0 5 10 15
SCALE OF FEET
VERTICAL SCALE

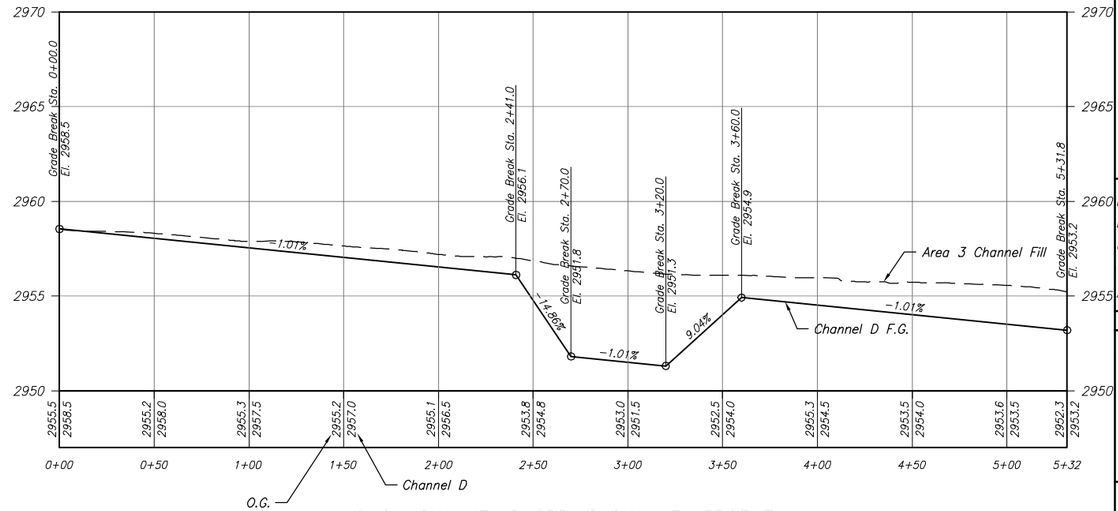
40 0 40 80 120
SCALE OF FEET
HORIZONTAL SCALE

NOTES:

1. Two alignments are shown, one for the swale grading feature, and one for the channel feature.
2. "Swales" are the excavated floodplain areas.
3. "Channels" are excavated into the "swale" features.
4. Swale complex channels shown in profile are average gradient and shall have pools excavated at the outside of meander bends as directed by the Contracting Officer. Pools shall vary from 1 to 3 feet deep.
5. Swale complex ponds shall be excavated to a minimum depth of 3 feet below encountered groundwater or as directed by the Contracting Officer.
6. Where O.G. is lower than proposed channel finish grade, no fill should be placed in the channel.



SWALE COMPLEX CHANNEL TYPICAL SECTION
NOT TO SCALE



SWC1–CHANNEL D SPRING CHANNEL PROFILE

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GRANDE RONDE SUBBASIN
CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV. NO	DATE	DESCRIPTION
1	2015-10-09	100 Added profile labels and notes; corrected title of typical section

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Steve Montague-Acting
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BOISE, ID 2015-09-14

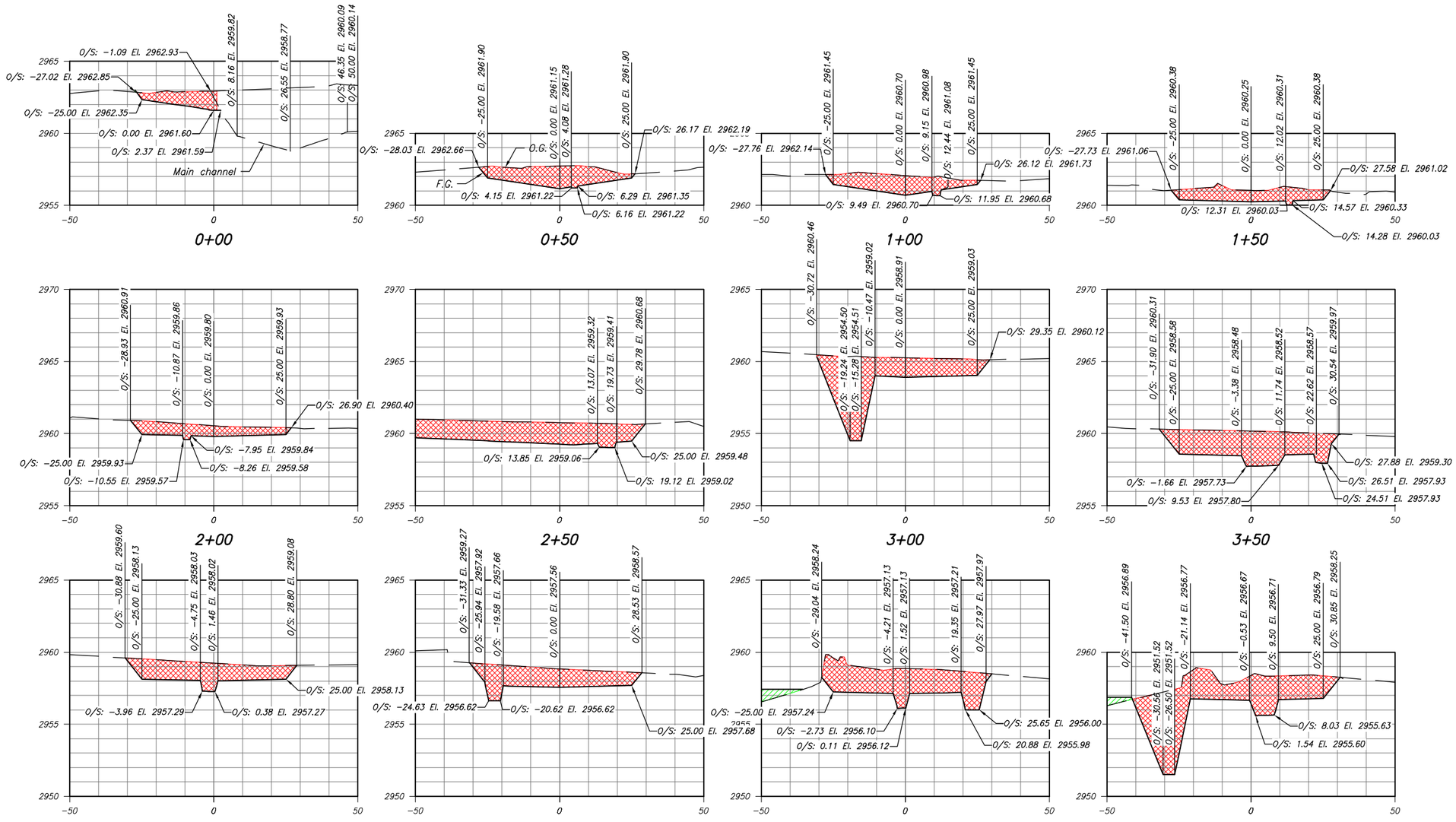
FLOOD SWALE COMPLEX 1
CHANNEL C
CHANNEL D

PLAN AND PROFILES

1678-100-2078
SHEET 5 OF 8

DATE AND TIME PLOTTED
AUGUST 13, 2015 10:43
PLOTTED BY
AHATCH

CAD SYSTEM
AutoCAD Rel. 20.0s
CAD FILENAME
1678-100-SWC1.DWG



SWALE A CROSS SECTIONS

SCALE OF FEET

NOTES:

1. Cross sections face downstream. Cross section centerline station is located along the thalweg alignment.
2. Y-axis is elevation, X-axis is distance in feet along a chord perpendicular to the thalweg. The zero station shown on these cross sections represents the thalweg alignment.
3. Constructed channel shall transition smoothly between cross sectional geometries shown within these cross sections. Cross section geometry shown represents one point in a smooth transition.
4. Cross-sections are to be used to stake out the channel offsets at the vertical grade breaks of the channel profile.
5. Cross-sections that do not daylight to original ground connect to other swale features.

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GRANDE RONDE SUBBASIN

CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV NO	DATE	DESCRIPTION
1	2015-10-09	Corrected draw order of sections and added labels

Jeffrey J Fealko P.E.

Jeffrey J Fealko P.E.
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Jeffrey J Fealko P.E.
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Steve Montague-Acting
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BOISE, ID
2015-09-14

FLOOD SWALE COMPLEX 1
SWALE A

CROSS SECTIONS

1678-100-2079

SHEET 6 OF 8

DATE AND TIME PLOTTED
AUGUST 13, 2015 10:44
PLOTTED BY
AHATCH

CAD SYSTEM
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CAD FILENAME
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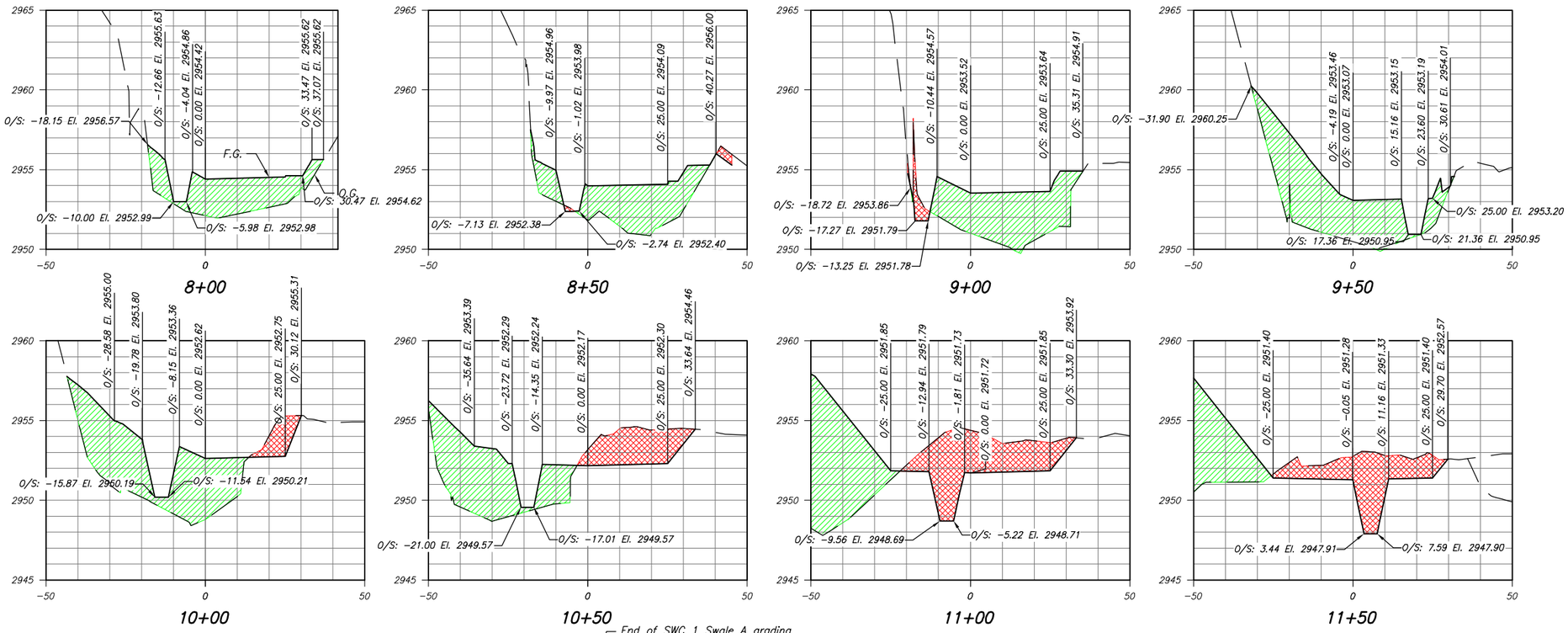

NOTES:

1. Cross sections face downstream. Cross section centerline station is located along the thalweg alignment.
2. Y–axis is elevation, X–axis is distance in feet along a chord perpendicular to the thalweg. The zero station shown on these cross sections represents the thalweg alignment.
3. Constructed channel shall transition smoothly between cross sectional geometries shown within these cross sections. Cross section geometry shown represents one point in a smooth transition.
4. Cross–sections are to be used to stake out the channel offsets at the vertical grade breaks of the channel profile.
5. Cross–sections that do not daylight to original ground connect to other swale features.

SWALE A CROSS SECTIONS

20 0 20 40 60
SCALE OF FEET

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GRANDE RONDE SUBBASIN
CC–44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV NO	DATE	DESCRIPTION
1	2015–10–09	100 Corrected draw order of sections and added labels

Jeffery J Fealko P.E.
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Mike Knutson P.E.
CHECKED
Jeffery J Fealko P.E.
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Steve Montague–Acting
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BOISE, ID 2015–09–14

FLOOD SWALE COMPLEX 1
SWALE A

CROSS SECTIONS

1678–100–2080

SHEET 7 OF 8

DATE AND TIME PLOTTED
AUGUST 13, 2015 11:21
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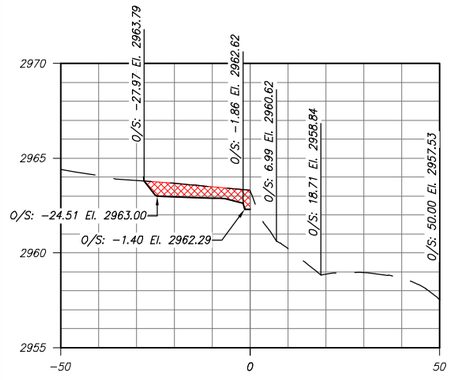
AHATCH

CAD SYSTEM
AutoCAD Rel. 20.0s
CAD FILENAME
1678–100–SWC1.DWG



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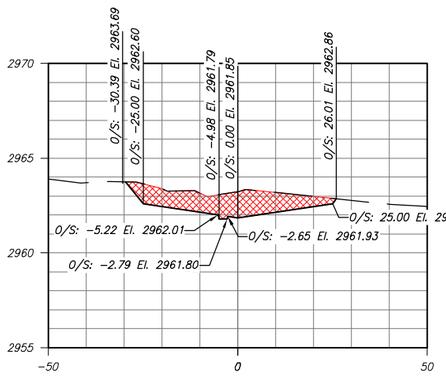

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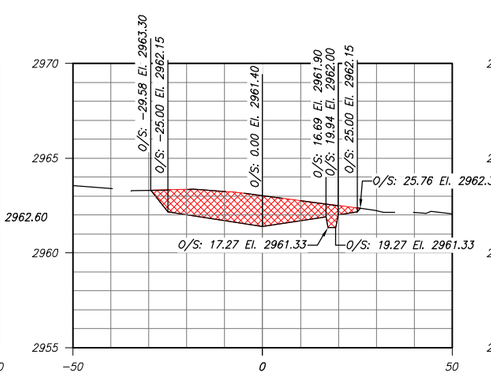

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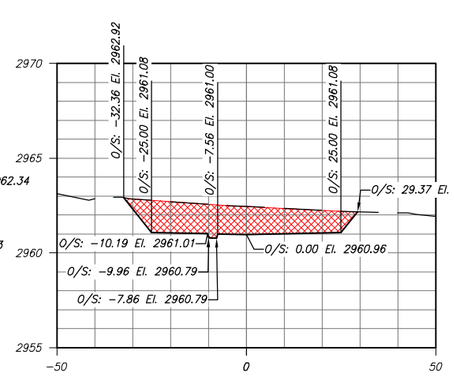

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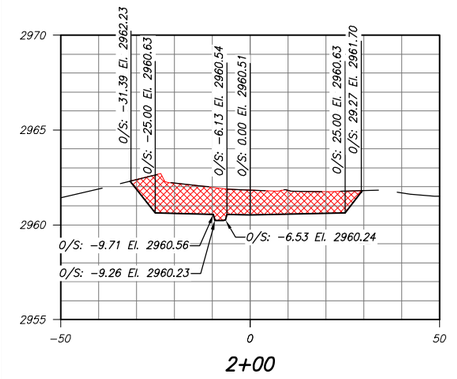

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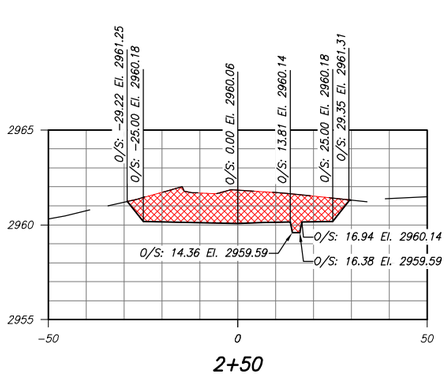

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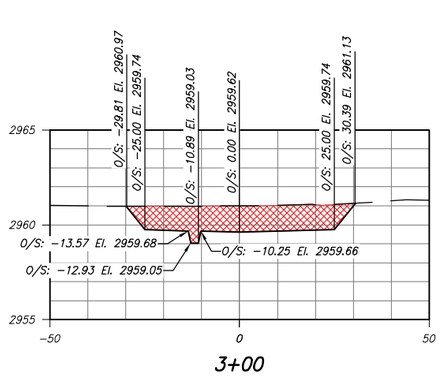

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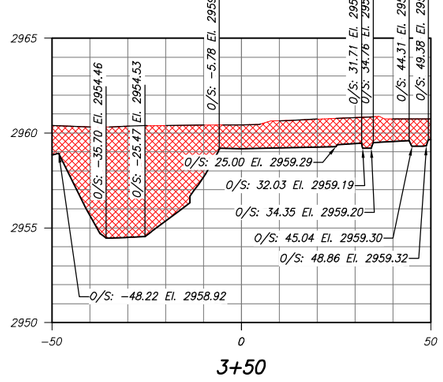

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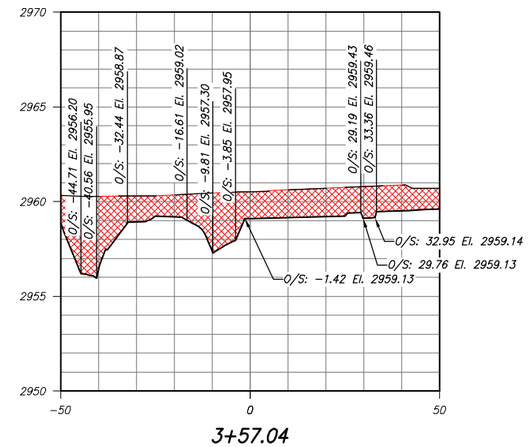

3+57.04

CUT

Fill

NOTES:

1. Cross sections face downstream. Cross section centerline station is located along the thalweg alignment.
2. Y−axis is elevation, X−axis is distance in feet along a chord perpendicular to the thalweg. The zero station shown on these cross sections represents the thalweg alignment.
3. Constructed channel shall transition smoothly between cross sectional geometries shown within these cross sections. Cross section geometry shown represents one point in a smooth transition.
4. Cross−sections are to be used to stake out the channel offsets at the vertical grade breaks of the channel profile.
5. Cross−sections that do not daylight to original ground connect to other swale features.

SWALE B CROSS SECTIONS

20 0 20 40 60
SCALE OF FEET

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FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN
CC−44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV NO		
1	2015−10−09	100 Corrected draw order of sections and added labels
		Jeffery J. Fealko, P.E.

Jeffery J Fealko P.E.
DESIGNED
DB/AH/KK/JET
DRAWN
Mike Knutson P.E.
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Jeffery J Fealko P.E.
TECH. APPR.
Steve Montague−Acting
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ADMIN APPROVAL − PROGRAM MANAGER
BOISE, ID 2015−09−14

FLOOD SWALE COMPLEX 1
SWALE B

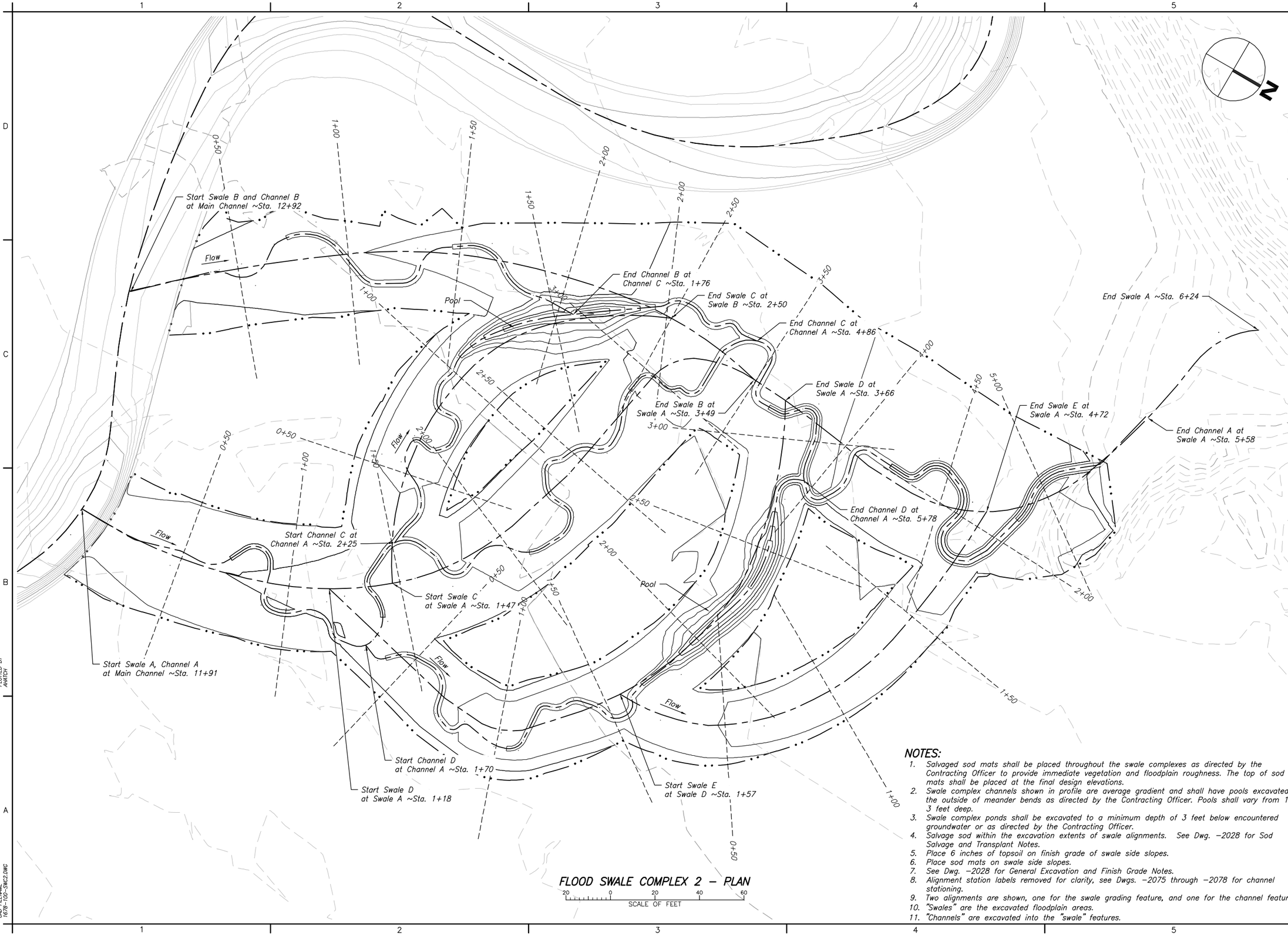
CROSS SECTIONS

1678−100−2081

SHEET 8 OF 8

DATE AND TIME PLOTTED
AUGUST 13, 2015 11:19
PLOTTED BY
AHATCH

CAD SYSTEM
AutoCAD Rel. 20.0s
CAD FILENAME
1678−100−SWC1.DWG



FLOOD SWALE COMPLEX 2 – PLAN

20 0 20 40 60
SCALE OF FEET

NOTES:

1. Salvaged sod mats shall be placed throughout the swale complexes as directed by the Contracting Officer to provide immediate vegetation and floodplain roughness. The top of sod mats shall be placed at the final design elevations.
2. Swale complex channels shown in profile are average gradient and shall have pools excavated at the outside of meander bends as directed by the Contracting Officer. Pools shall vary from 1 to 3 feet deep.
3. Swale complex ponds shall be excavated to a minimum depth of 3 feet below encountered groundwater or as directed by the Contracting Officer.
4. Salvage sod within the excavation extents of swale alignments. See Dwg. –2028 for Sod Salvage and Transplant Notes.
5. Place 6 inches of topsoil on finish grade of swale side slopes.
6. Place sod mats on swale side slopes.
7. See Dwg. –2028 for General Excavation and Finish Grade Notes.
8. Alignment station labels removed for clarity, see Dwgs. –2075 through –2078 for channel stationing.
9. Two alignments are shown, one for the swale grading feature, and one for the channel feature.
10. "Swales" are the excavated floodplain areas.
11. "Channels" are excavated into the "swale" features.

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FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN
CC–44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV NO	DATE	DESCRIPTION	BY
1	2015–10–09	Added station labels	Jeffrey J. Fealko, P.E.

Jeffrey J Fealko, P.E.
DESIGNED
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DRAWN
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Jeffrey J Fealko, P.E.
TECH. APPR.
Steve Montague, P.E. – Acting
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BOISE, ID 2015–09–14

FLOOD SWALE COMPLEX 2

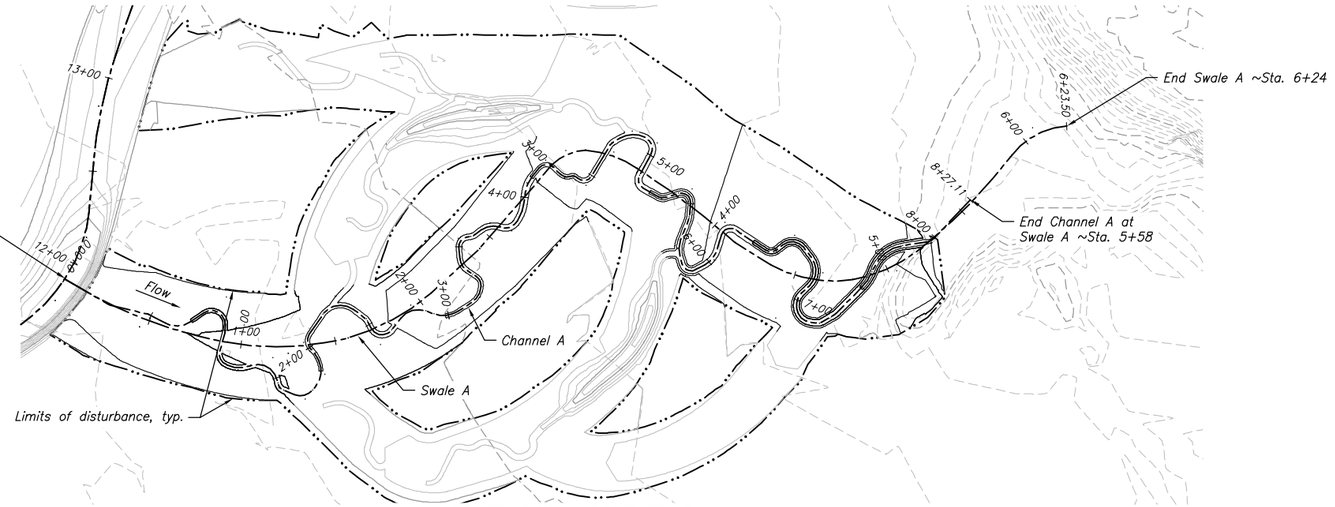
PLAN

1678–100–2082

SHEET 1 OF 8

DATE AND TIME PLOTTED
AUGUST 11, 2015 15:01
PLOTTED BY
AHATCH

CAD SYSTEM
AutoCAD Rel. 20.0s
CAD FILENAME
1678–100–SWC2.DWG

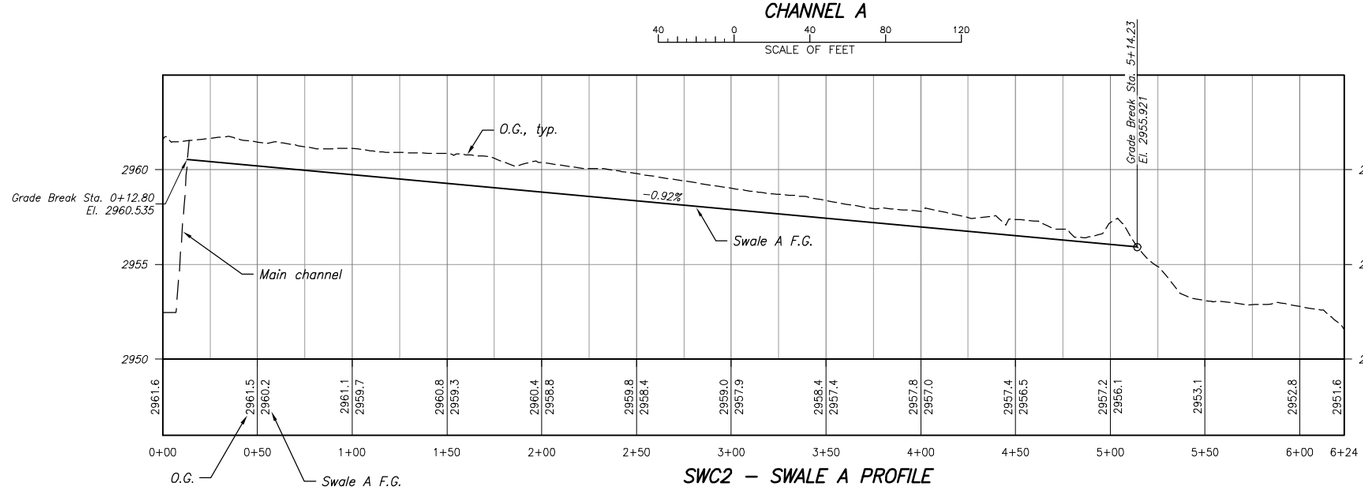


NOTES:

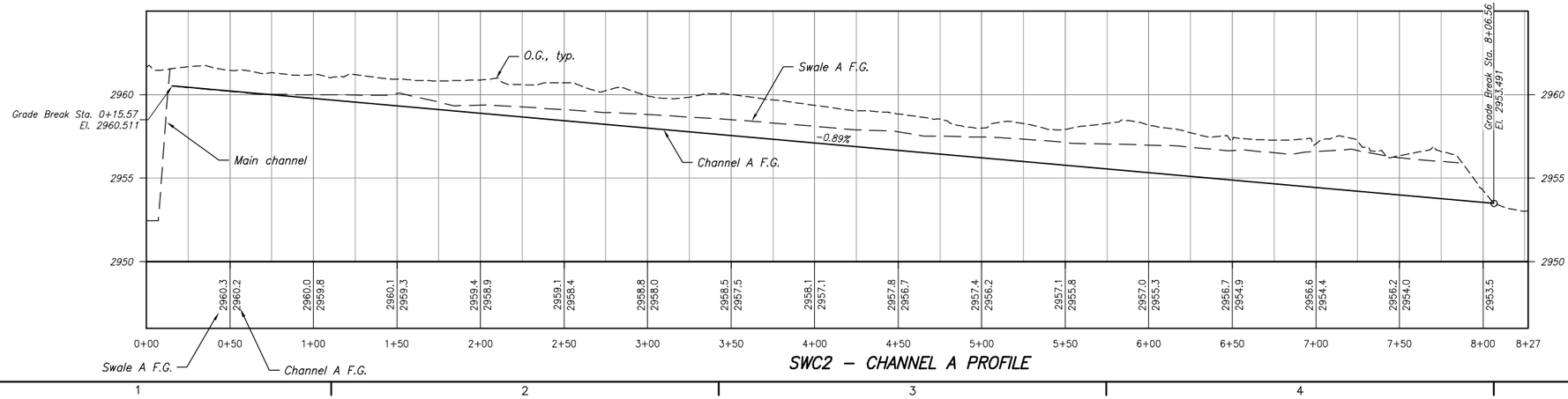
1. Two alignments are shown, one for the swale grading feature, and one for the channel feature.
2. "Swales" are the excavated floodplain areas.
3. "Channels" are excavated into the "swale" features.
4. Swale complex channels shown in profile are average gradient and shall have pools excavated at the outside of meander bends as directed by the Contracting Officer. Pools shall vary from 1 to 3 feet deep.
5. Swale complex ponds shall be excavated to a minimum depth of 3 feet below encountered groundwater or as directed by the Contracting Officer.
6. Where O.G. is lower than proposed channel F.G. no fill should be placed in channel.

FLOOD SWALE COMPLEX 2
SWALE A
CHANNEL A

SCALE OF FEET: 40 0 40 80 120



SWC2 – SWALE A PROFILE



SWC2 – CHANNEL A PROFILE

SCALE OF FEET: 1 0 5 10 15
VERTICAL SCALE

SCALE OF FEET: 40 0 40 80 120
HORIZONTAL SCALE

DATE AND TIME PLOTTED
AUGUST 13, 2015 - 13:24
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AHATCH

CAD SYSTEM
AutoCAD Rel. 20.0s
CAD FILENAME
1678-100-SWC2.DWG

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GRANDE RONDE SUBBASIN
CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV. NO.		
1	2015-10-09	100 Added profile labels and notes
	Jeffrey J Fealko P.E.	

Jeffrey J Fealko, P.E.
DESIGNED
DB/AH/KK
DRAWN
Mike Knutson, P.E.
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Jeffrey J Fealko, P.E.
TECH. APPR.
Steve Montague, P.E. – Acting
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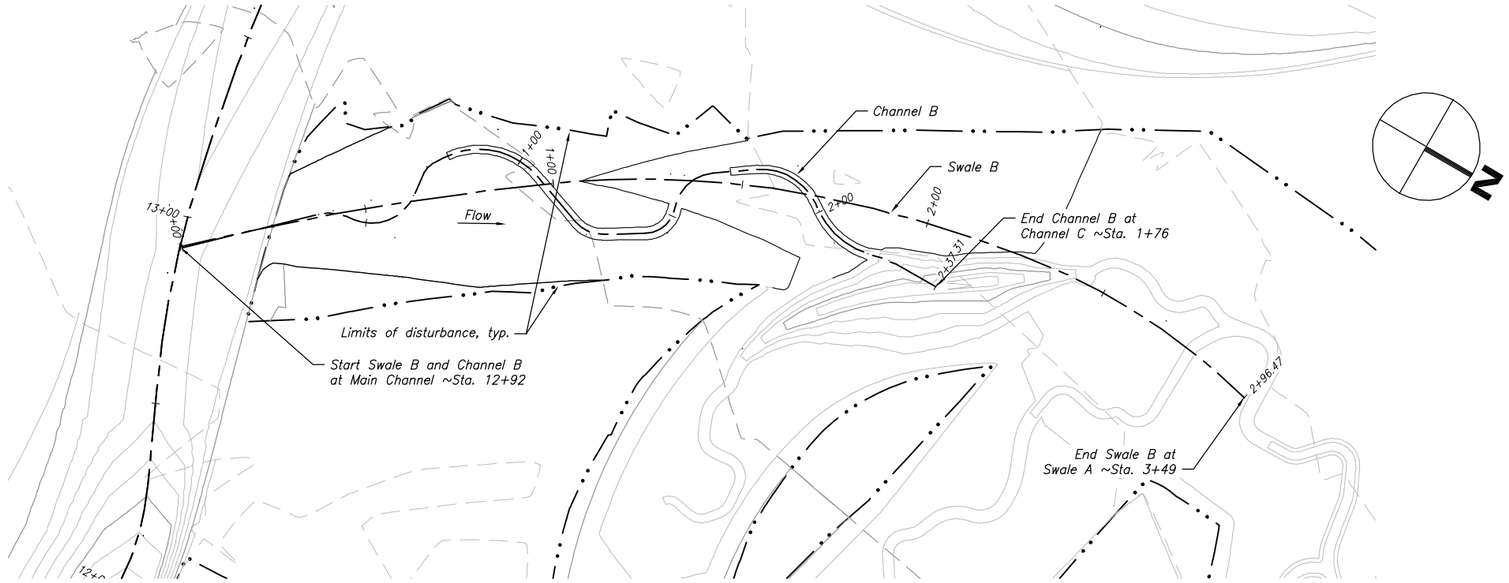
ADMIN. APPROVAL – PROGRAM MANAGER
BOISE, ID 2015-09-14

FLOOD SWALE COMPLEX 2
SWALE A
CHANNEL A

PLAN AND PROFILES

1678-100-2083

SHEET 2 OF 8



NOTES:

1. Two alignments are shown, one for the swale grading feature, and one for the channel feature.
2. "Swales" are the excavated floodplain areas.
3. "Channels" are excavated into the "swale" features.
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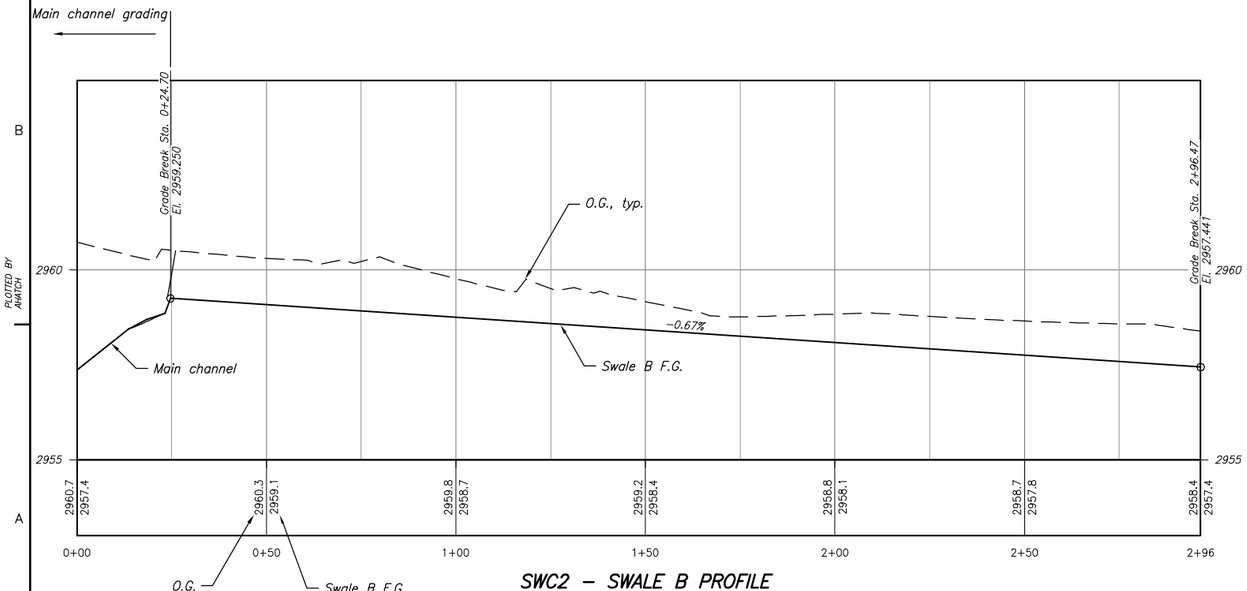
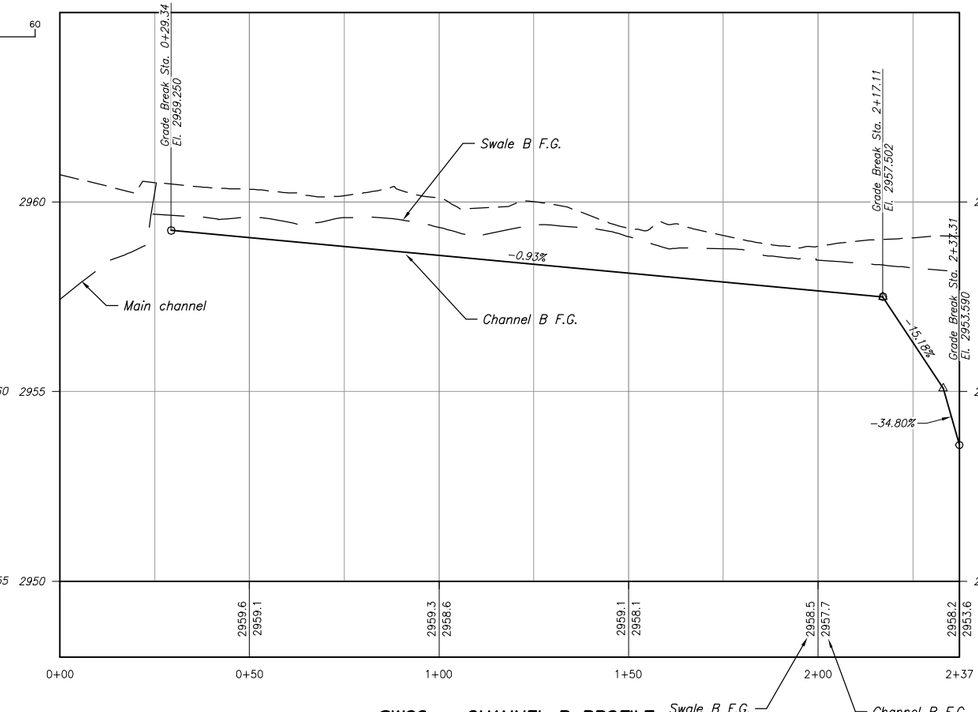
5. Swale complex ponds shall be excavated to a minimum depth of 3 feet below encountered groundwater or as directed by the Contracting Officer.
6. Where O.G. is lower than proposed channel F.G. no fill should be placed in channel.

SWALE COMPLEX 2
SWALE B
CHANNEL B

20 0 20 40 60
SCALE OF FEET



SWC2 – SWALE B PROFILE



SWC2 – CHANNEL B PROFILE

1 0 1 2 3 4 5
SCALE OF FEET
VERTICAL SCALE

20 0 20 40 60
SCALE OF FEET
HORIZONTAL SCALE

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GRANDE RONDE SUBBASIN
CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV NO		
1	2015-10-09	100 Added profile labels and notes Jeffrey J Fealko P.E.

Jeffrey J Fealko, P.E.
DESIGNED
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Mike Knutson, P.E.
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Jeffrey J Fealko, P.E.
TECH. APPR.
Steve Montague, P.E. – Acting
APPROVED
ADMIN. APPROVAL – PROGRAM MANAGER
BOISE, ID 2015-09-14

FLOOD SWALE COMPLEX 2
SWALE B
CHANNEL B

PLAN AND PROFILES

1678-100-2084
SHEET 3 OF 8

DATE AND TIME PLOTTED
AUGUST 13, 2015 13:34
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AHATCH

CAD SYSTEM
AutoCAD Rel. 20.0s
CAD FILENAME
1678-100-SWC2.DWG

NOTES:

1. Two alignments are shown, one for the swale grading feature, and one for the channel feature.
2. "Swales" are the excavated floodplain areas.
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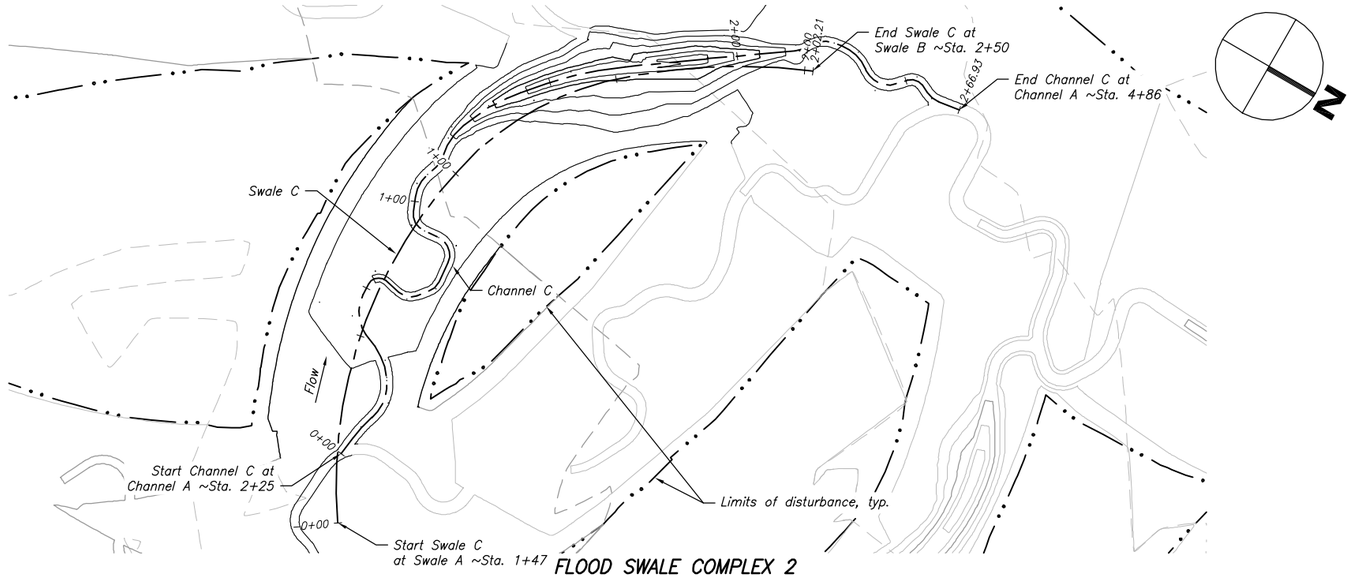
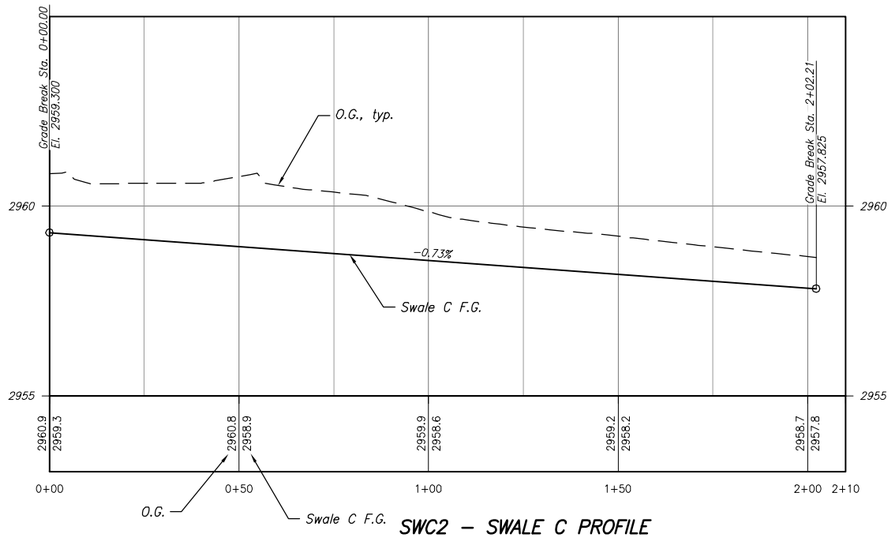
6. Where O.G. is lower than proposed channel F.G. no fill should be placed in channel.

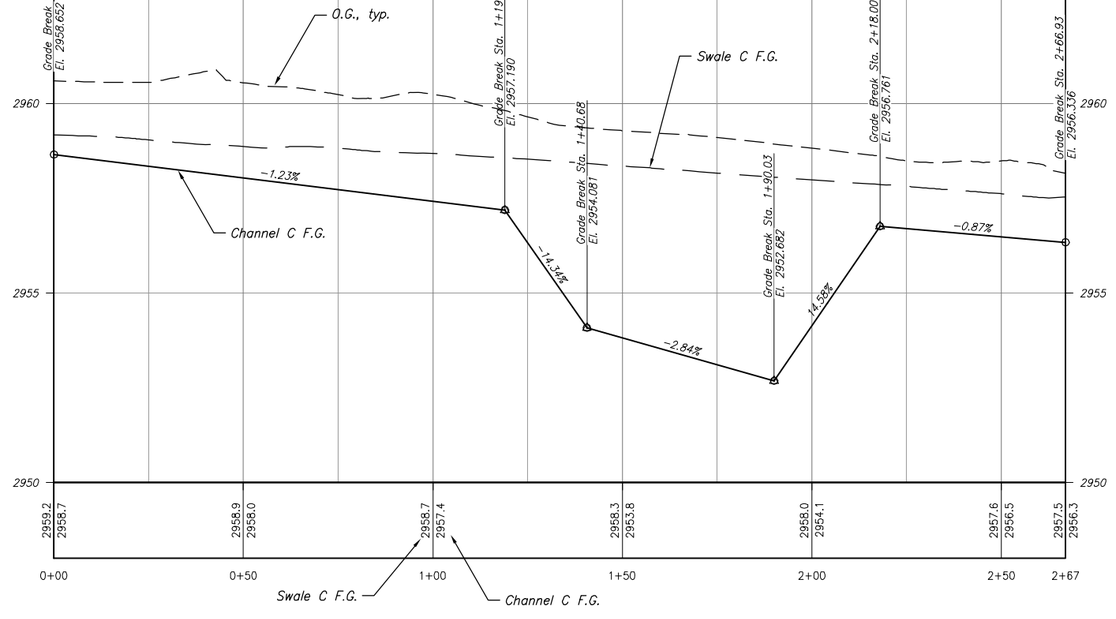


FLOOD SWALE COMPLEX 2
SWALE C
CHANNEL C

SCALE OF FEET: 20 0 20 40 60



SWC2 – SWALE C PROFILE



SWC2 – CHANNEL C PROFILE

SCALE OF FEET: 1 0 1 2 3 4 5
VERTICAL SCALE

SCALE OF FEET: 20 0 20 40 60
HORIZONTAL SCALE

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COLUMBIA/SNAKE RIVER SALMON RECOVERY PROGRAM
FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN
CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV NO	DATE	DESCRIPTION
1	2015-10-09	100 Added profile labels and notes
		Jeffrey J Fealko P.E.

Jeffrey J Fealko, P.E.
DESIGNED
DB/AH/KK
DRAWN
Mike Knutson, P.E.
CHECKED
Jeffrey J Fealko, P.E.
TECH. APPR.
Steve Montague, P.E. – Acting
APPROVED
ADMIN APPROVAL – PROGRAM MANAGER
BOISE, ID 2015-09-14

FLOOD SWALE COMPLEX 2
SWALE C
CHANNEL C

PLAN AND PROFILES

1678-100-2085
SHEET 4 OF 8

DATE AND TIME PLOTTED
AUGUST 13, 2015 13:56
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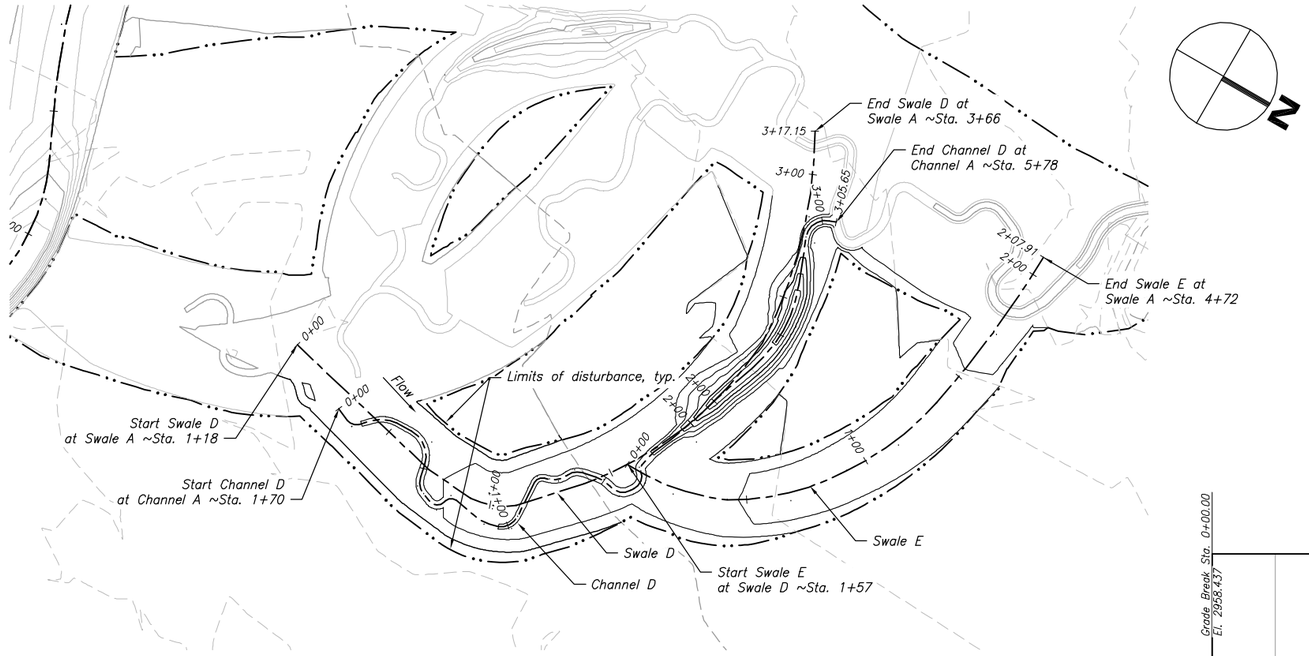
AHATCH

CAD SYSTEM
AutoCAD Rel. 20.0s
CAD FILENAME
1678-100-SWC2.DWG



N

FLOOD SWALE COMPLEX 2
SWALE D
SWALE E
CHANNEL D

30 0 30 60 90
SCALE OF FEET

NOTES:

1. Two alignments are shown, one for the swale grading feature, and one for the channel feature.
2. "Swales" are the excavated floodplain areas.
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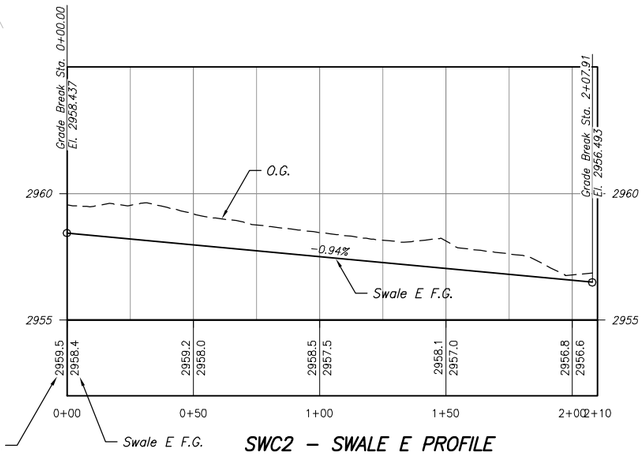
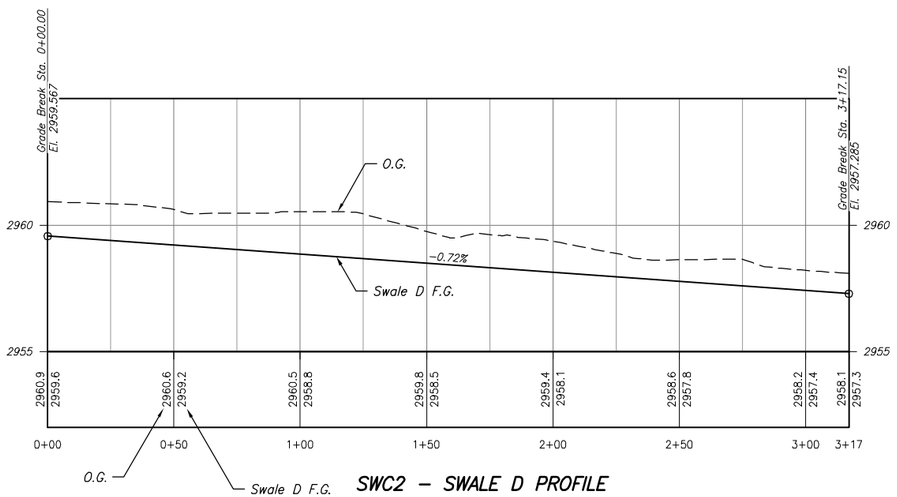
6. Where O.G. is lower than proposed channel F.G. no fill should be placed in channel.



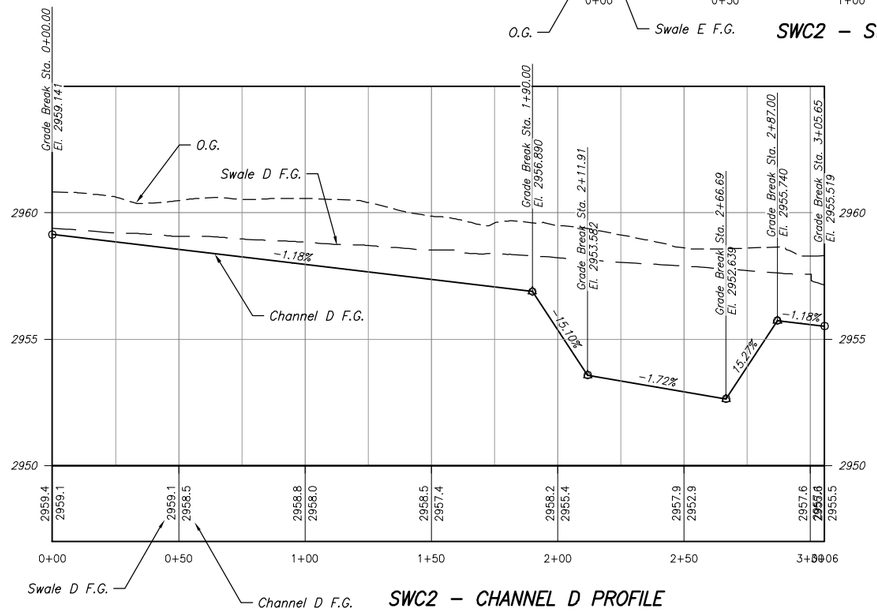
O.G.
Swale E F.G.

SWC2 – SWALE E PROFILE



O.G.
Swale D F.G.

SWC2 – SWALE D PROFILE



Swale D F.G.
Channel D F.G.

SWC2 – CHANNEL D PROFILE

3 0 3 6 9
SCALE OF FEET
VERTICAL SCALE

30 0 30 60 90
SCALE OF FEET
HORIZONTAL SCALE

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FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN
CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV NO.	DATE	DESCRIPTION
1	2015-10-09	100 Added profile labels and notes

Jeffrey J Fealko P.E.

DESIGNED	Jeffrey J Fealko, P.E.
DRAWN	DB/AH/KK
CHECKED	Mike Knutson, P.E.
TECH. APPR.	Jeffrey J Fealko, P.E.
APPROVED	Steve Montague, P.E. – Acting
ADMIN APPROVAL – PROGRAM MANAGER	
BOISE, ID	2015-09-14

FLOOD SWALE COMPLEX 2
SWALE D
SWALE E
CHANNEL D

PLAN AND PROFILES

1678-100-2086

SHEET 5 OF 8

DATE AND TIME PLOTTED
AUGUST 13, 2015 13:34
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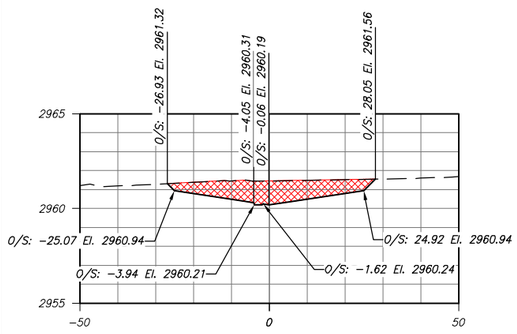
AHATCH

CAD SYSTEM
AutoCAD Rel. 20.0s
CAD FILENAME
1678-100-SWC2.DWG



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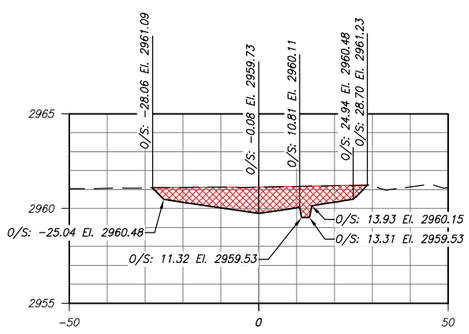

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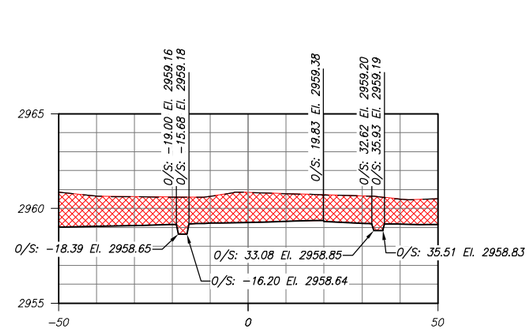

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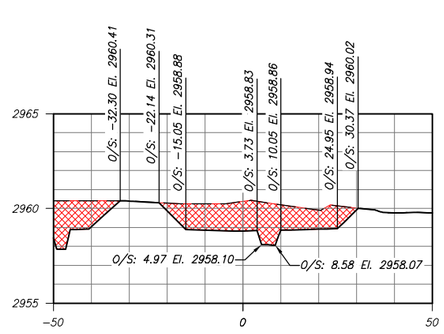

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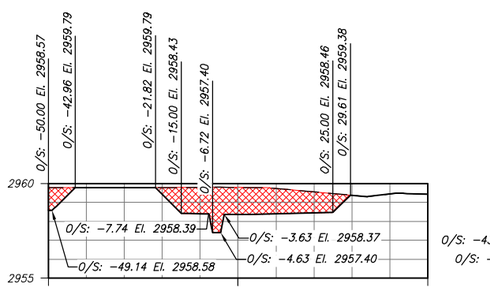

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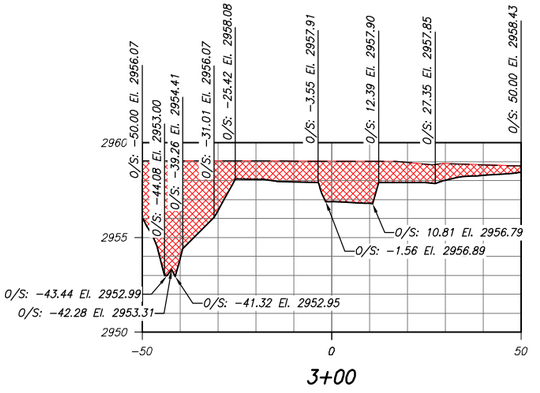

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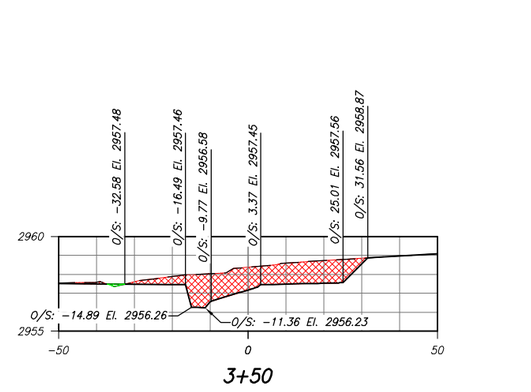

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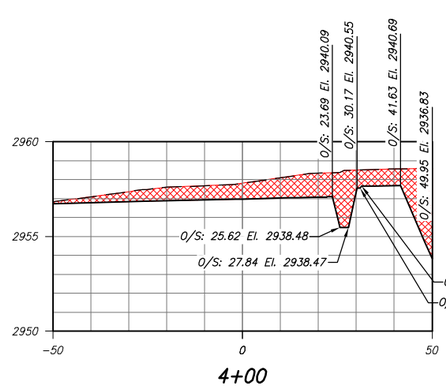

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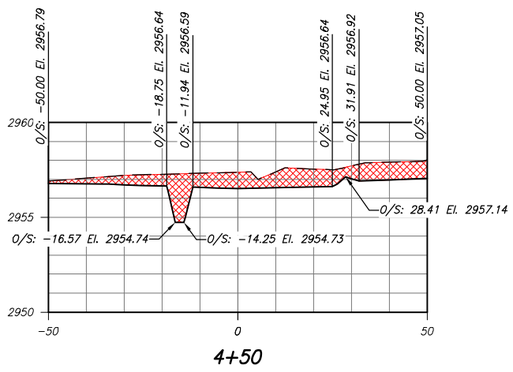

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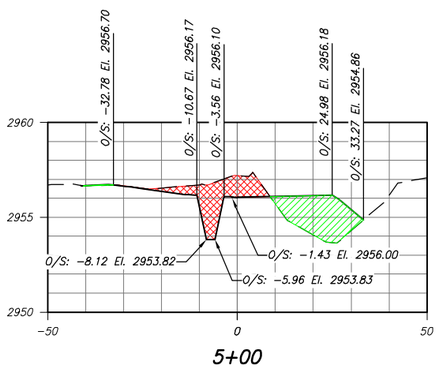

5+00

Cut

Fill

SWALE A CROSS SECTIONS

20 0 20 40 60
SCALE OF FEET

NOTES:

1. Cross sections face downstream. Cross section centerline station is located along the thalweg alignment.
2. Y–axis is elevation, X–axis is distance in feet along a chord perpendicular to the thalweg. The zero station shown on these cross sections represents the thalweg alignment.
3. Constructed channel shall transition smoothly between cross sectional geometries shown within these cross sections. Cross section geometry shown represents one point in a smooth transition.
4. Cross–sections are to be used to stake out the channel offsets at the vertical grade breaks of the channel profile.
5. Cross–sections that do not daylight to original ground connect to other swale features.

DATE AND TIME PLOTTED
AUGUST 14, 2015 08:50
PLOTTED BY
AHATCH

CAD SYSTEM
AutoCAD Rel. 20.0s
CAD FILENAME
1678-100-SWC2.DWG

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Managing Water in the West

CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION
CAYUSE · WALLA WALLA · UMATILLA
Treaty of 1855

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U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
COLUMBIA/SNAKE RIVER SALMON RECOVERY PROGRAM
FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN

CC–44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV NO	DATE	DESCRIPTION
1	2015–10–09	100 Corrected draw order of sections and added labels

Jeffrey J Fealko P.E.

Jeffrey J Fealko, P.E.
DESIGNED
DB/AH/KK
DRAWN
Mike Knutson, P.E.
CHECKED
Jeffrey J Fealko, P.E.
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Steve Montague, P.E. – Acting
APPROVED
ADMIN. APPROVAL – PROGRAM MANAGER

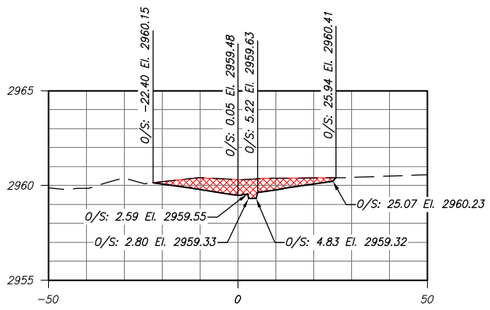
BOISE, ID 2015–09–14

FLOOD SWALE COMPLEX 2
SWALE A

CROSS SECTIONS

1678–100–2087

SHEET 6 OF 8



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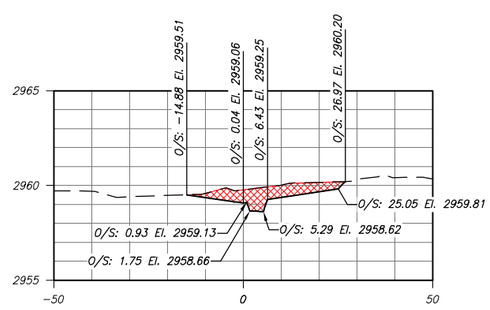

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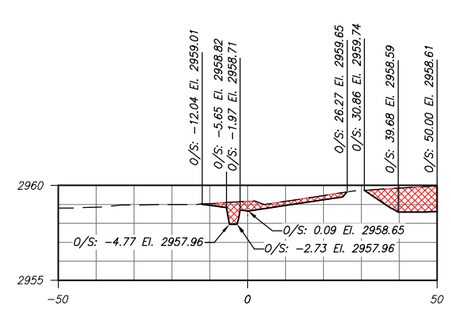

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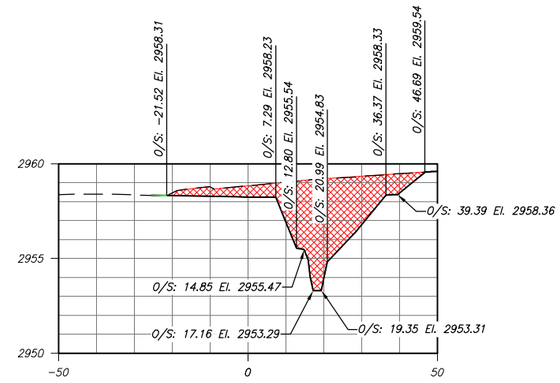

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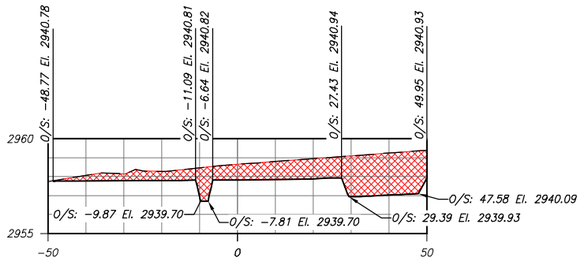
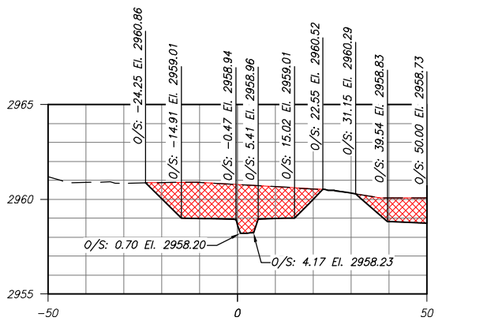


2+50

SWALE B CROSS SECTIONS

20 0 20 40 60
SCALE OF FEET



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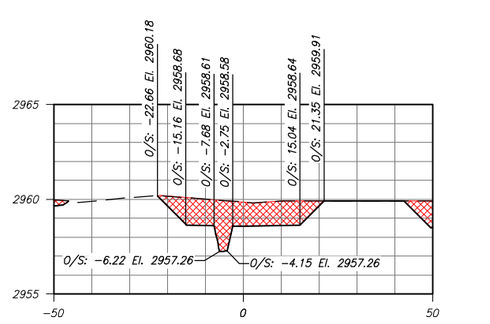

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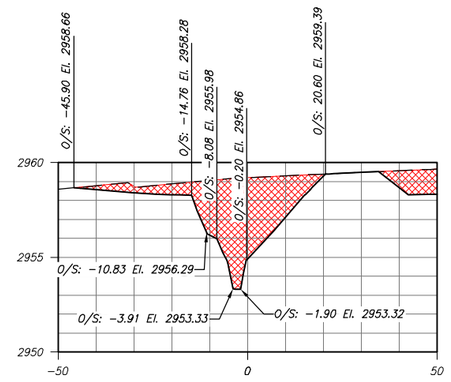

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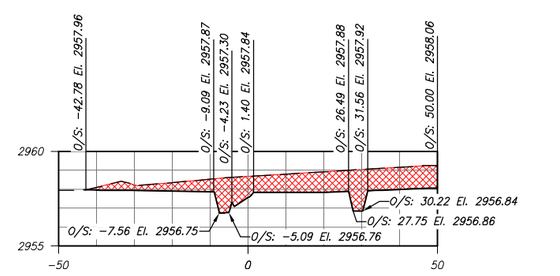

2+00

SWALE C CROSS SECTIONS

20 0 20 40 60
SCALE OF FEET

Cut

Fill

NOTES:

1. Cross sections face downstream. Cross section centerline station is located along the thalweg alignment.
2. Y–axis is elevation, X–axis is distance in feet along a chord perpendicular to the thalweg. The zero station shown on these cross sections represents the thalweg alignment.
3. Constructed channel shall transition smoothly between cross sectional geometries shown within these cross sections. Cross section geometry shown represents one point in a smooth transition.
4. Cross–sections are to be used to stake out the channel offsets at the vertical grade breaks of the channel profile.
5. Cross–sections that do not daylight to original ground connect to other swale features.

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BUREAU OF RECLAMATION
COLUMBIA/SNAKE RIVER SALMON RECOVERY PROGRAM
FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN
CC–44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV NO		
1	2015–10–09	100 Corrected draw order of sections and added labels
	Jeffrey J Fealko P.E.	

Jeffrey J Fealko, P.E.
DESIGNED
DB/AH/KK
DRAWN
Mike Knutson, P.E.
CHECKED
Jeffrey J Fealko, P.E.
TECH. APPR.
Steve Montague, P.E. – Acting
APPROVED
ADMIN. APPROVAL – PROGRAM MANAGER
BOISE, ID 2015–09–14

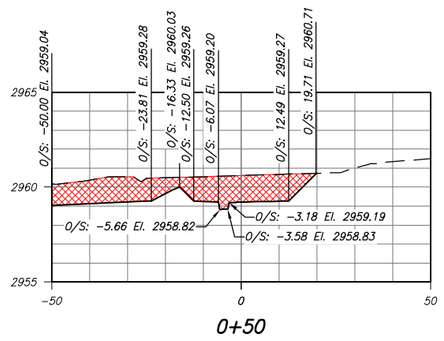
FLOOD SWALE COMPLEX 2
SWALE B
SWALE C

CROSS SECTIONS

1678–100–2088
SHEET 7 OF 8

DATE AND TIME PLOTTED
AUGUST 14, 2015 08:52
PLOTTED BY
AHATCH

CAD SYSTEM
AutoCAD Rel. 20.0s
CAD FILENAME
1678–100–SWC2.DWG



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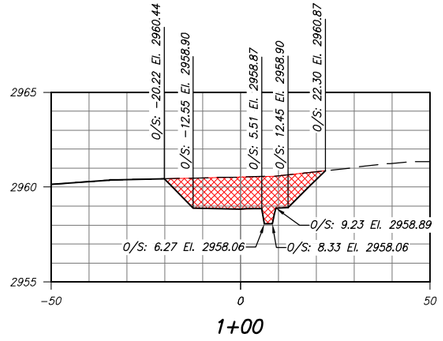

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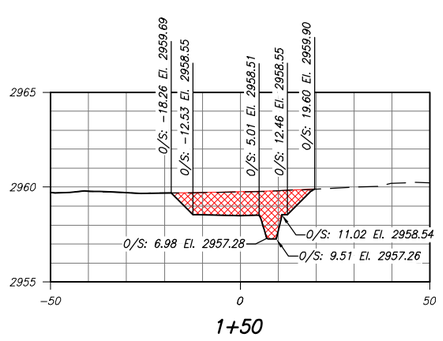

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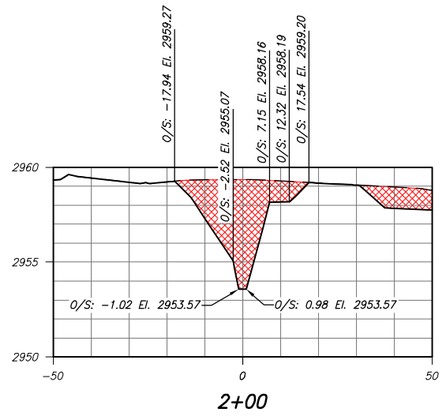

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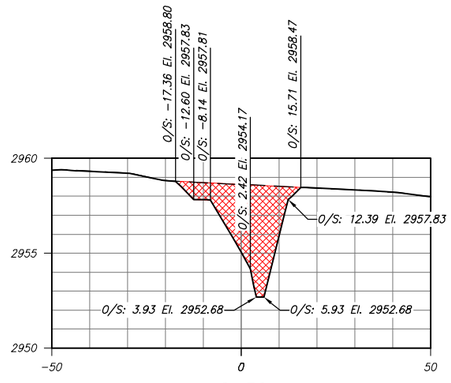

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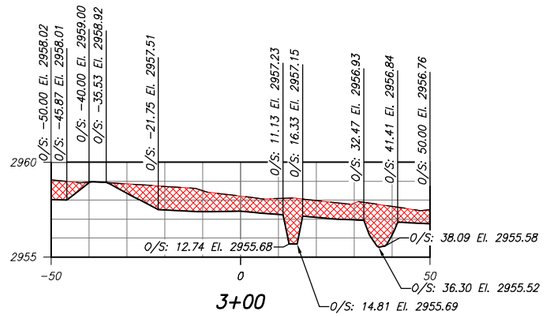
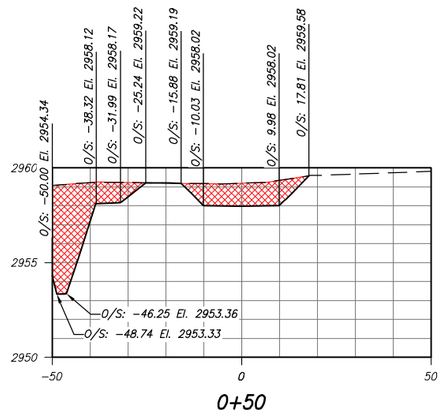


3+00

SWALE D CROSS SECTIONS

SCALE OF FEET



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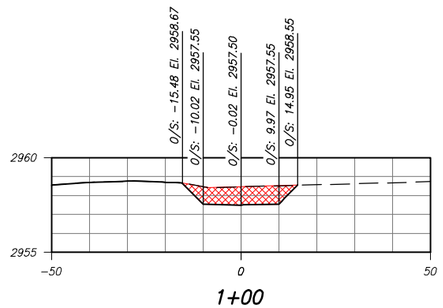

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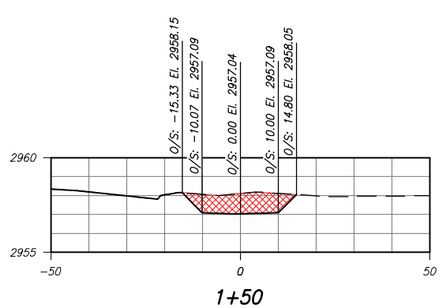

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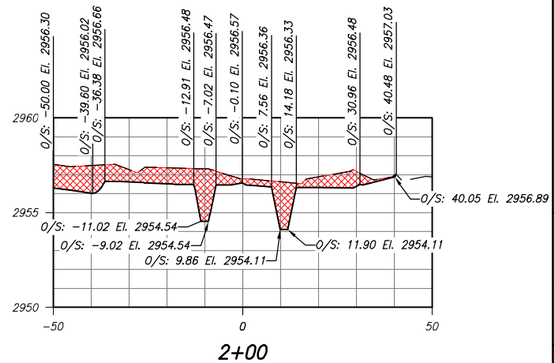

2+00

Cut

Fill

SWALE E CROSS SECTIONS

SCALE OF FEET

NOTES:

1. Cross sections face downstream. Cross section centerline station is located along the thalweg alignment.
2. Y-axis is elevation, X-axis is distance in feet along a chord perpendicular to the thalweg. The zero station shown on these cross sections represents the thalweg alignment.
3. Constructed channel shall transition smoothly between cross sectional geometries shown within these cross sections. Cross section geometry shown represents one point in a smooth transition.
4. Cross-sections are to be used to stake out the channel offsets at the vertical grade breaks of the channel profile.
5. Cross-sections that do not daylight to original ground connect to other swale features.

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COLUMBIA/SNAKE RIVER SALMON RECOVERY PROGRAM
FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN
CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV NO	DATE	DESCRIPTION
1	2015-10-09	Corrected draw order of sections and added labels

Jeffrey J Fealko, P.E.
DESIGNED
DB/AH/KK
DRAWN
Mike Knutson, P.E.
CHECKED
Jeffrey J Fealko, P.E.
TECH. APPR.
Steve Montague, P.E. - Acting
APPROVED
ADMIN. APPROVAL - PROGRAM MANAGER
BOISE, ID 2015-09-14

FLOOD SWALE COMPLEX 2
SWALE D
SWALE E

CROSS SECTIONS

1678-100-2089
SHEET 8 OF 8

DATE AND TIME PLOTTED
AUGUST 14, 2015 09:31
PLOTTED BY
AHATCH

CAD SYSTEM
AutoCAD Rel. 20.0s
CAD FILENAME
1678-100-SWC2.DWG

Start Swale A Alignment at Main Channel ~Sta. 19+66

Start Channel B Alignment at Channel A ~Sta. 2+29

Start Channel A Alignment at Main Channel ~Sta. 19+48

End Swale B Alignment
Start Swale C Alignment
at Swale A ~Sta. 1+96

Start Swale B Alignment at Side Channel 1 Sta. 2+24

End Channel B Alignment Sta 3+42 at Channel A ~Sta. 6+04

End Swale C Alignment at Swale A ~Sta. 4+34

End Swale A Alignment at Main Channel Alignment ~Sta. 26+36 and Swale A Sta. 6+32

End Channel A Alignment Sta. 8+58

Tie–in to main channel bank grading

Channel A

Channel B

Swale A

Swale B

Swale C

Swale A Flow

Swale B Flow

Swale C Flow

DO NOT DISTURB

Limits of disturbance, typ.

Pool

2+34.48

6+32.47

2+19.17

2952

2953

2954

2955

NOTES:

1. Two alignments are shown: one for the swale grading feature and one for the channel feature.
2. "Swales" are the excavated floodplain areas.
3. "Channels" are excavated into the swale feature.
4. Place 6 inches of topsoil on finish grade of swale side slopes.
5. Place sod mats from other parts of the project on swale side slopes.
6. See Dwg. –2028 for General Excavation and Finish Grade Notes.
9. Salvaged sod mats shall be placed throughout the swale complexes as directed by the Contracting Officer to provide immediate vegetation and floodplain roughness. The top of sod mats shall be placed at the final design elevations.
10. Swale complex channels shown in profile are average gradient and shall have pools excavated at the outside of meander bends as directed by the Contracting Officer. Pools shall vary from 1 to 3 feet deep.
11. Swale complex ponds shall be excavated to a minimum depth of 3 feet below encountered groundwater or as directed by the Contracting Officer.

FLOOD SWALE COMPLEX 3 – PLAN

20 0 20 40 60
SCALE OF FEET

DATE AND TIME PLOTTED
JULY 31, 2015 08:06
PLOTTED BY
KKORTHALS

CAD SYSTEM
AutoCAD Rel. 20.0s
CAD FILENAME
1678-100-SWC3.DWG

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FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN
CC–44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV. NO		
1	2015–10–09	100 Added station labels and notes
	Jeffrey J Fealko P.E.	

Jeffrey J Fealko P.E.
DESIGNED
DB/AH/JH
DRAWN
Mike Knutson P.E.
CHECKED
Jeffrey J Fealko P.E.
TECH. APPR.
Steve Montague – Acting
APPROVED
ADMIN APPROVAL – PROGRAM MANAGER
BOISE, ID 2015–09–14

FLOOD SWALE COMPLEX 3

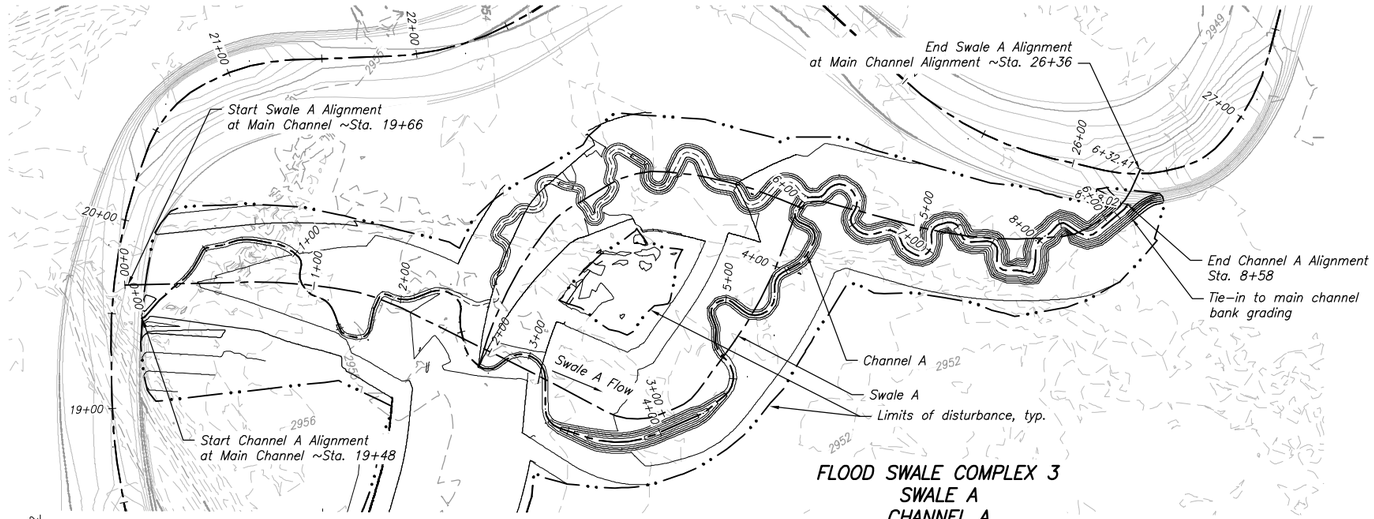
PLAN

1678–100–2090

SHEET 1 OF 4

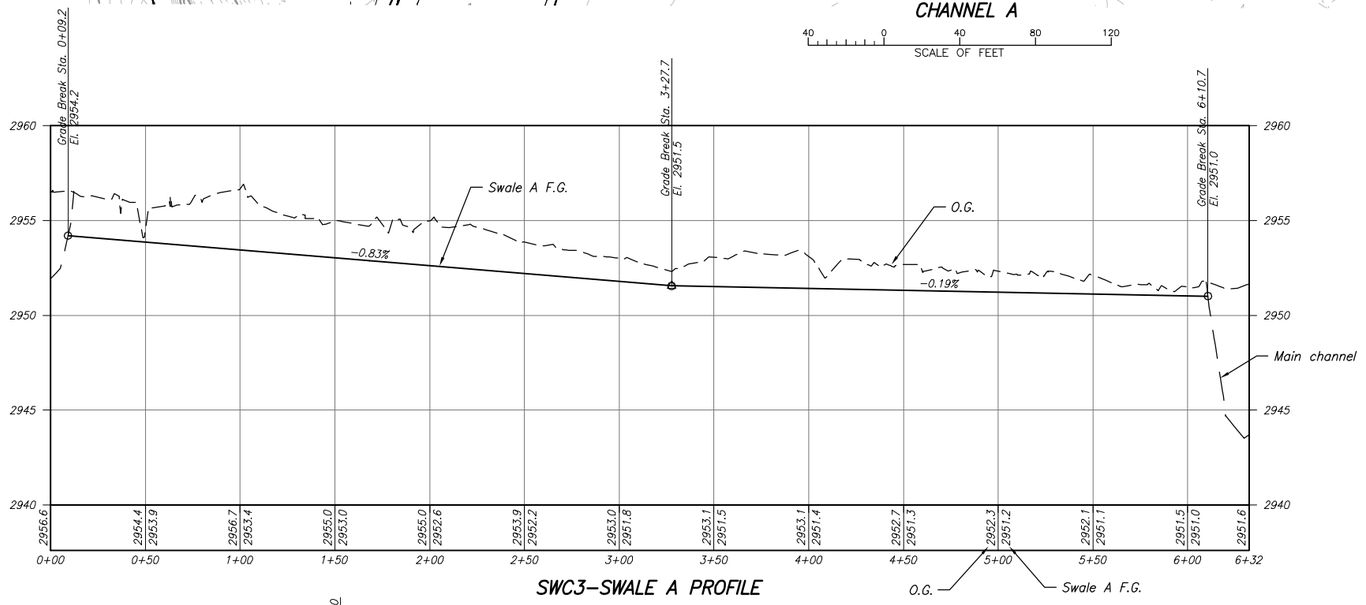
NOTES:

1. Two alignments are shown, one for the swale grading feature, and one for the channel feature.
2. "Swales" are the excavated floodplain areas.
3. "Channels" are excavated into the "swale" features.
4. Swale complex channels shown in profile are average gradient and shall have pools excavated at the outside of meander bends as directed by the Contracting Officer. Pools shall vary from 1 to 3 feet deep.
5. Swale complex ponds shall be excavated to a minimum depth of 3 feet below encountered groundwater or as directed by the Contracting Officer.
6. Where O.G. is lower than proposed channel F.G. no fill should be placed in channel.

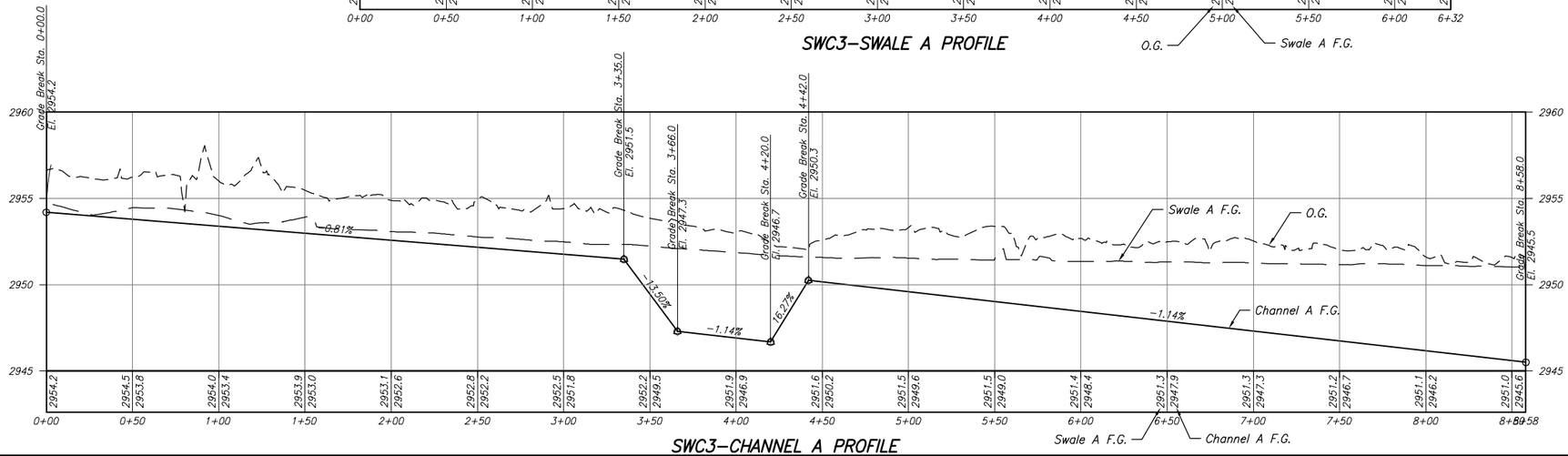


FLOOD SWALE COMPLEX 3
SWALE A
CHANNEL A

SCALE OF FEET: 40 0 40 80 120



SWC3–SWALE A PROFILE



SWC3–CHANNEL A PROFILE

SCALE OF FEET: 1 0 5 10 15
VERTICAL SCALE

SCALE OF FEET: 40 0 40 80 120
HORIZONTAL SCALE

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FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN
CC–44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV NO	DATE	DESCRIPTION
1	2015–10–09	Jeffrey J Fealko P.E. 100 Added profile labels and notes

Jeffrey J Fealko P.E. — DESIGNED
DB/AH/JH — DRAWN
Mike Knutson P.E. — CHECKED
Jeffrey J Fealko P.E. — TECH. APPR.
Steve Montague – Acting — APPROVED
ADMIN APPROVAL – PROGRAM MANAGER
BOISE, ID 2015–09–14

FLOOD SWALE COMPLEX 3
SWALE A
CHANNEL A

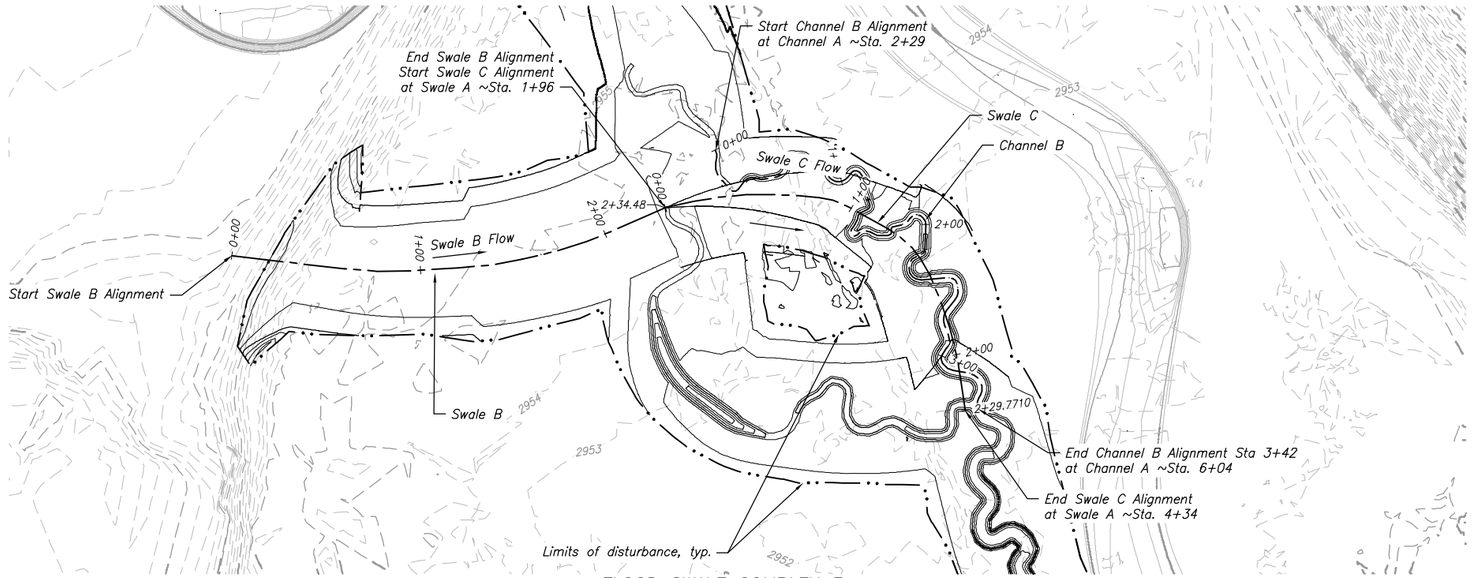
PLAN AND PROFILES

1678–100–2091

SHEET 2 OF 4

DATE AND TIME PLOTTED
AUGUST 14, 2015 10:11
PLOTTED BY
AHATCH

CAD SYSTEM
AutoCAD Rel. 20.0s
CAD FILENAME
1678–100–SWC3.DWG



FLOOD SWALE COMPLEX 3
SWALE B
SWALE C
CHANNEL B

40 0 40 80 120
SCALE OF FEET

NOTES:

1. Two alignments are shown, one for the swale grading feature, and one for the channel feature.
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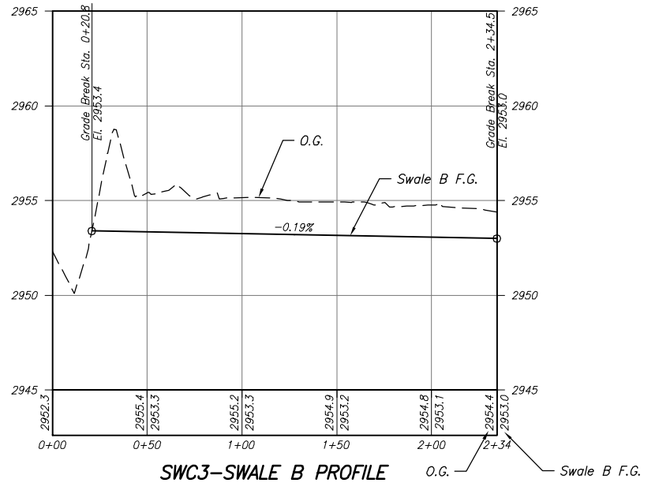
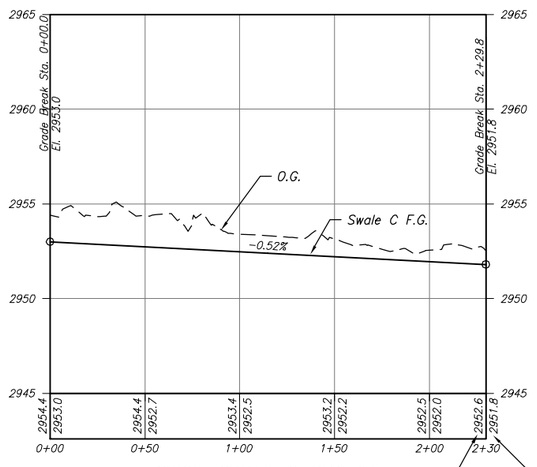
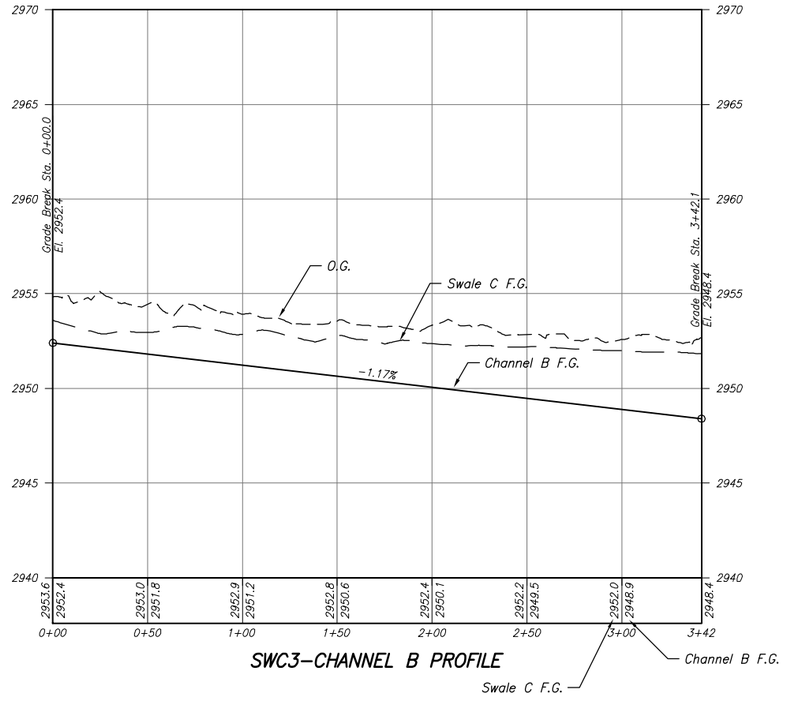
6. Where O.G. is lower than proposed channel F.G. no fill should be placed in channel.



SWC3–SWALE B PROFILE



SWC3–SWALE C PROFILE



SWC3–CHANNEL B PROFILE

1 0 5 10 15
SCALE OF FEET
VERTICAL SCALE

40 0 40 80 120
SCALE OF FEET
HORIZONTAL SCALE

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FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN
CC–44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV. NO.		
1	2015–10–09	100 Added profile labels and notes
		Jeffrey J Fealko P.E.

Jeffrey J Fealko P.E.
DESIGNED
DB/AH/JH
DRAWN
Mike Knutson P.E.
CHECKED
Jeffrey J Fealko P.E.
TECH. APPR.
Steve Montague – Acting
APPROVED
ADMIN. APPROVAL – PROGRAM MANAGER
BOISE, ID 2015–09–14

FLOOD SWALE COMPLEX 3
SWALE B
SWALE C
CHANNEL B

PLAN AND PROFILES

1678–100–2092
SHEET 3 OF 4

DATE AND TIME PLOTTED
AUGUST 14, 2015 10:16
PLOTTED BY
AHATCH

CAD SYSTEM
AutoCAD Rel. 20.0s
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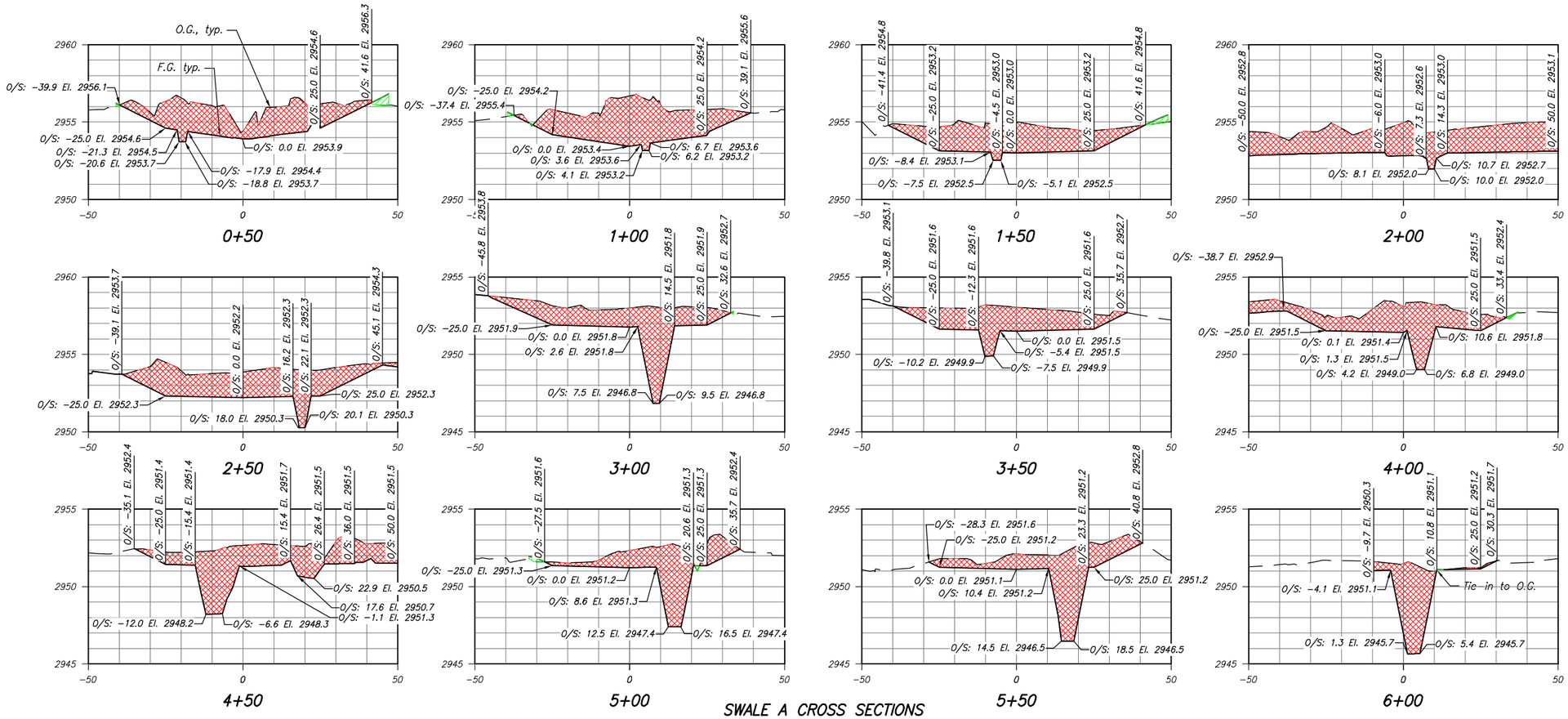
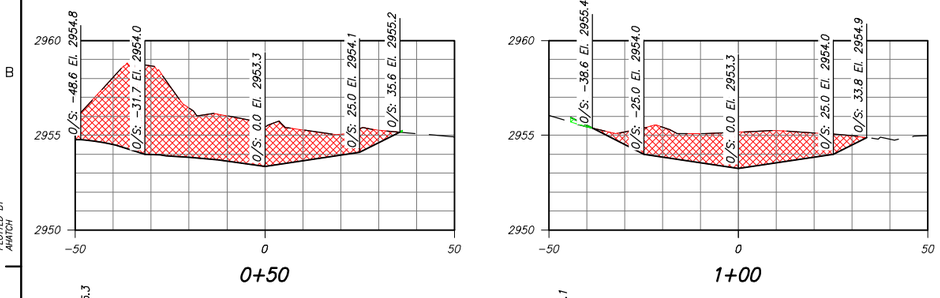
1678–100–SWC3.DWG





NOTES:

1. Cross sections face downstream. Cross section centerline station is located along the thalweg alignment.
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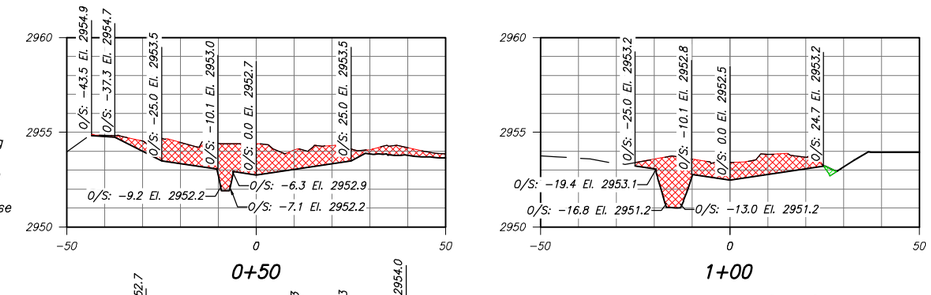
5. Cross–sections that do not daylight to original ground connect to other swale features.

Cut

Fill

SCALE OF FEET



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BUREAU OF RECLAMATION
COLUMBIA/SNAKE RIVER SALMON RECOVERY PROGRAM
FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN
CC–44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV NO	DATE	DESCRIPTION
1	2015–10–09	Corrected draw order of sections and added labels

Jeffrey J Fealko P.E.
DESIGNED
DB/AH/KK
DRAWN
Mike Knutson P.E.
CHECKED
Jeffrey J Fealko P.E.
TECH. APPR.
Steve Montague – Acting
APPROVED
ADMIN. APPROVAL – PROGRAM MANAGER
BOISE, ID
2015–09–14

FLOOD SWALE COMPLEX 3
SWALE A
SWALE B
SWALE C

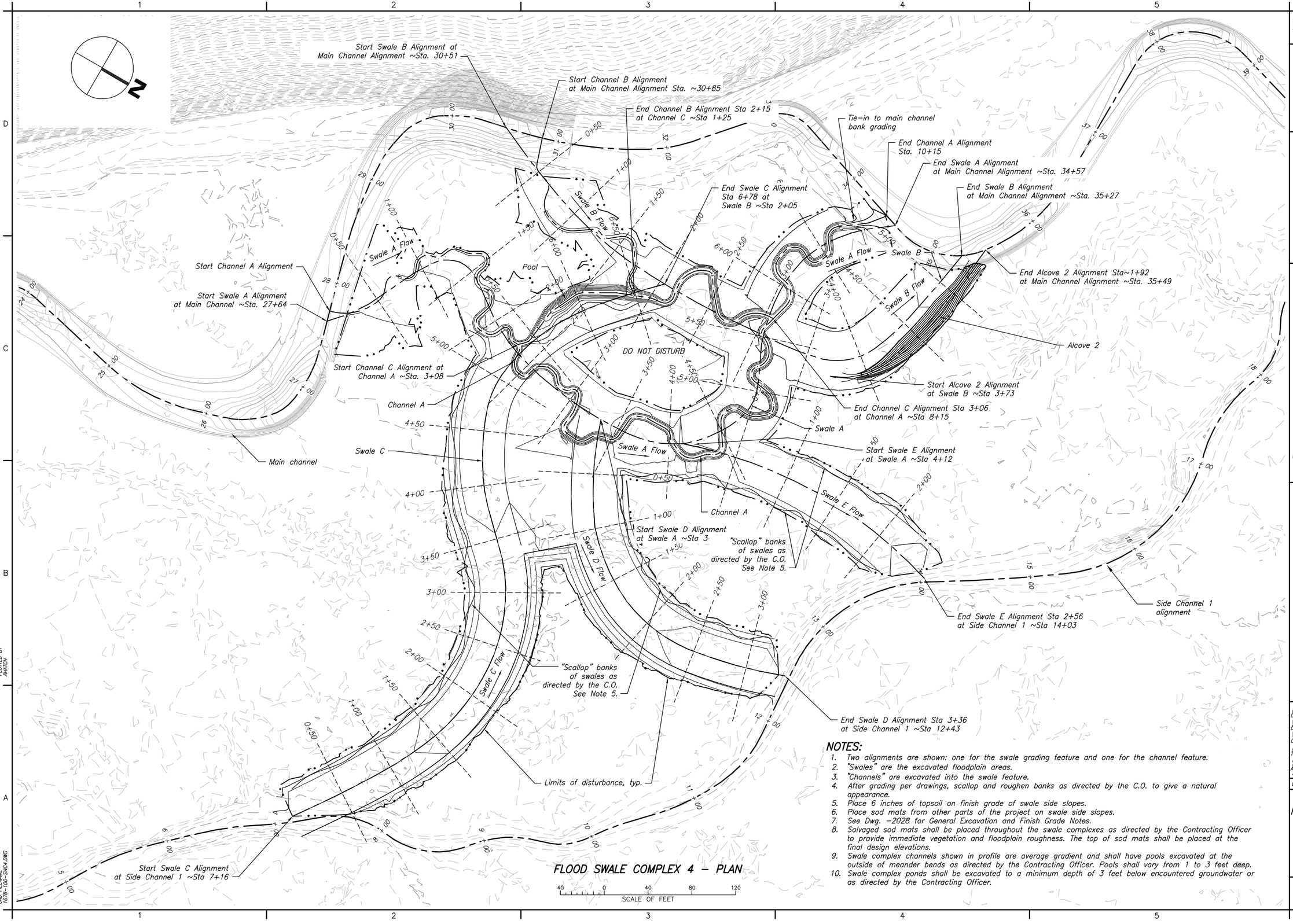
CROSS SECTIONS

1678–100–2093

SHEET 4 OF 4

DATE AND TIME PLOTTED
AUGUST 14, 2015 10:21
PLOTTED BY
AHATCH

CAD SYSTEM
AutoCAD Rel. 20.0s
CAD FILENAME
1678–100–SWC3.DWG



FLOOD SWALE COMPLEX 4 – PLAN

40 0 40 80 120
SCALE OF FEET

NOTES:

1. Two alignments are shown: one for the swale grading feature and one for the channel feature.
2. "Swales" are the excavated floodplain areas.
3. "Channels" are excavated into the swale feature.
4. After grading per drawings, scallop and roughen banks as directed by the C.O. to give a natural appearance.
5. Place 6 inches of topsoil on finish grade of swale side slopes.
6. Place sod mats from other parts of the project on swale side slopes.
7. See Dwg. –2028 for General Excavation and Finish Grade Notes.
8. Salvaged sod mats shall be placed throughout the swale complexes as directed by the Contracting Officer to provide immediate vegetation and floodplain roughness. The top of sod mats shall be placed at the final design elevations.
9. Swale complex channels shown in profile are average gradient and shall have pools excavated at the outside of meander bends as directed by the Contracting Officer. Pools shall vary from 1 to 3 feet deep.
10. Swale complex ponds shall be excavated to a minimum depth of 3 feet below encountered groundwater or as directed by the Contracting Officer.

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FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN

CC-44 PHASE III HABITAT ENHANCEMENT PARCEL 3

REV NO.	DATE	
1	2015-10-09	100 Added labels and corrected linetype scale
		Jeffrey J Fealko P.E.

Jeffrey J. Fealko, P.E.
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BOISE, ID 2015-09-14

FLOOD SWALE COMPLEX 4

PLAN

1678–100–2094

SHEET 1 OF 9

DATE AND TIME PLOTTED
AUGUST 13, 2015 09:15
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CAD FILENAME
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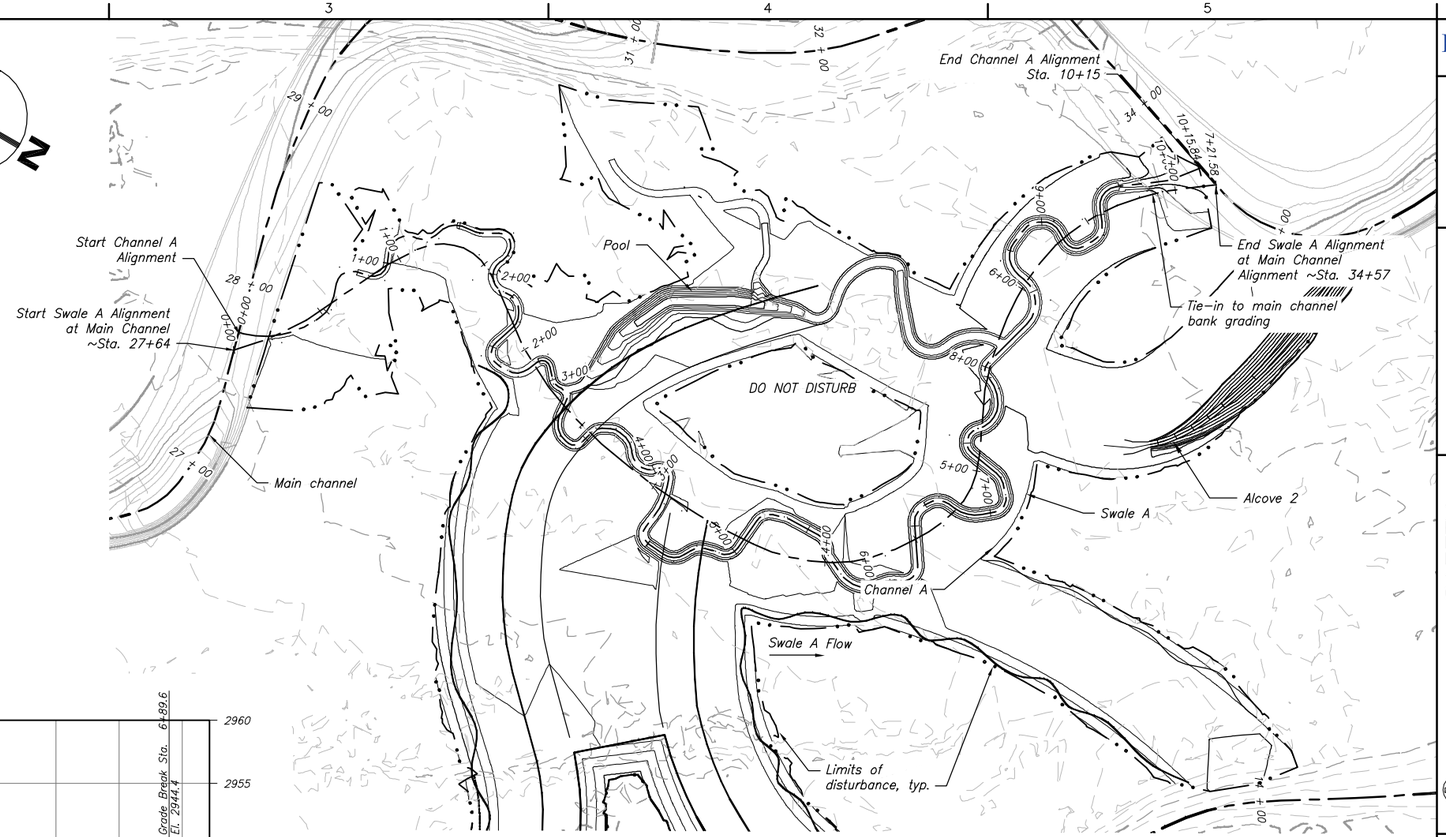
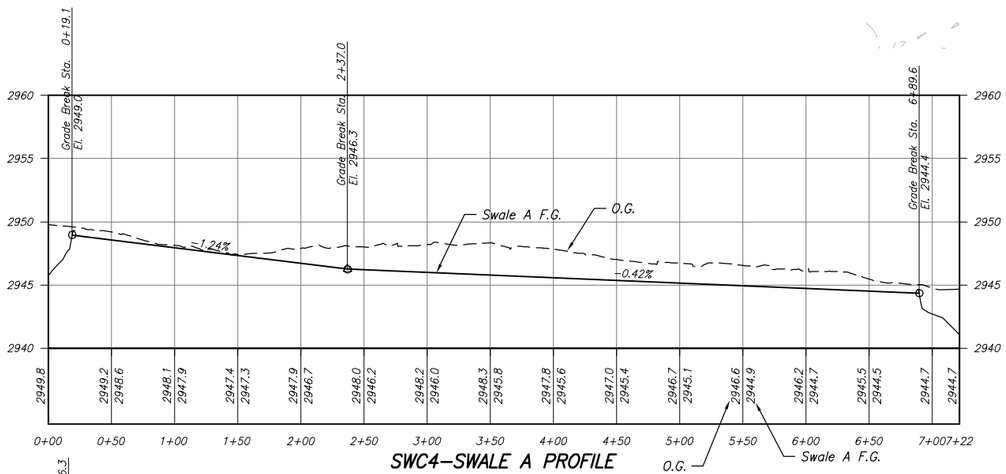
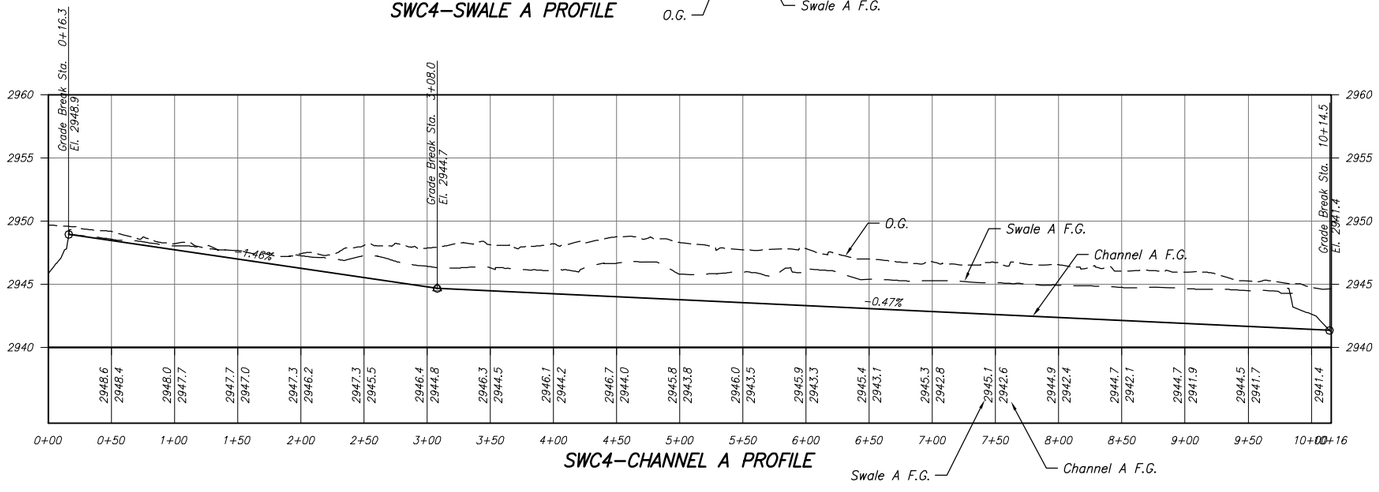


FLOOD SWALE COMPLEX 4
SWALE A
CHANNEL A

40 0 40 80 120
SCALE OF FEET



SWC4–SWALE A PROFILE



SWC4–CHANNEL A PROFILE

NOTES:

1. Salvage sod within the excavation extents of the Channel A alignment from Sta. 5+25 to 12+50 as approved by the C.O. See Dwg. –2028 for Sod Salvage and Transplant Notes and areas within the alignment of channels.
2. Place 6 inches of topsoil on finish grade of channel side slopes.
3. Place sod mats on swale side slopes.
4. See Dwg. –2028 for General Excavation and Finish Grade Notes.
5. See Notes Dwg. –2074
6. Flood Swale Complex 5 only contains channels. No swales are inlcuded in this feature.

60 0 60 120 180
SCALE OF FEET
HORIZONTAL SCALE

6 0 6 12 18
SCALE OF FEET
VERTICAL SCALE

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GRANDE RONDE SUBBASIN
CC–44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV NO	DATE	
1	2015–10–09	Added labels and notes
		Jeffrey J Fealko P.E.

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FLOOD SWALE COMPLEX 4
SWALE A
CHANNEL A

PLAN AND PROFILES

1678–100–2095
SHEET 2 OF 9

DATE AND TIME PLOTTED
AUGUST 13, 2015 09:38
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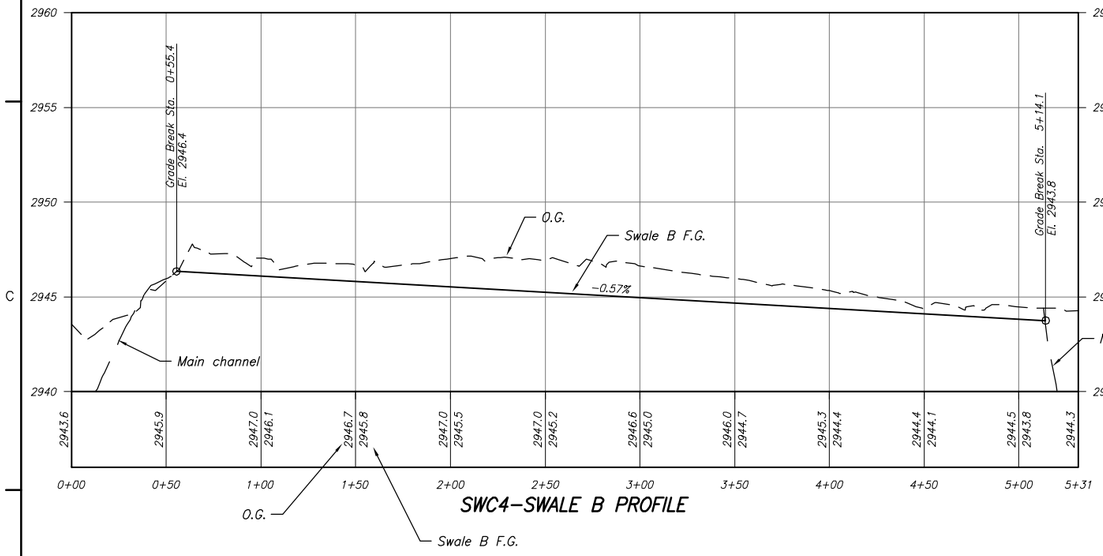
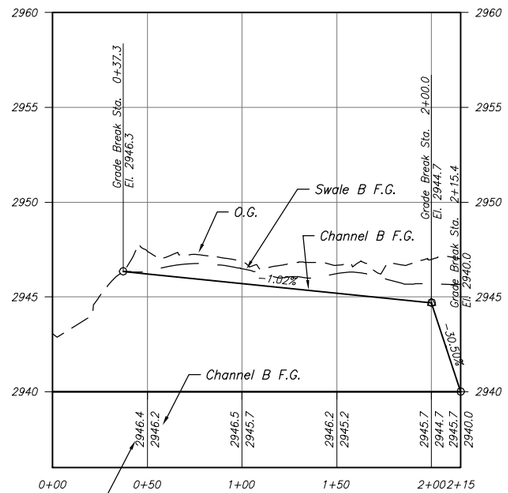
AHATCH

CAD SYSTEM
AutoCAD Rel. 20.0s
CAD FILENAME
1678–100–SWC4.DWG

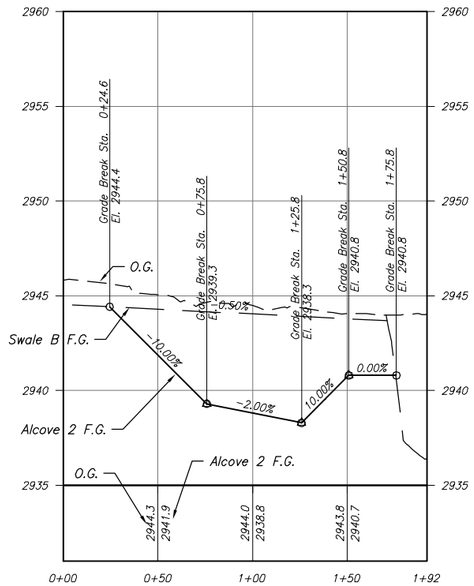
NOTES:
1. Salvage sod within the excavation extents of the Channel A alignment from Sta. 5+25 to 12+50 as approved by the C.O. See Dwg. –2028 for Sod Salvage and Transplant Notes and areas within the alignment of channels.
2. Place 6 inches of topsoil on finish grade of channel side slopes.
3. Place sod mats on swale side slopes.
4. See Dwg. –2028 for General Excavation and Finish Grade Notes.
5. See Notes Dwg. –2074
6. Flood Swale Complex 5 only contains channels. No swales are inlcuded in this feature.



SWC4–SWALE B PROFILE



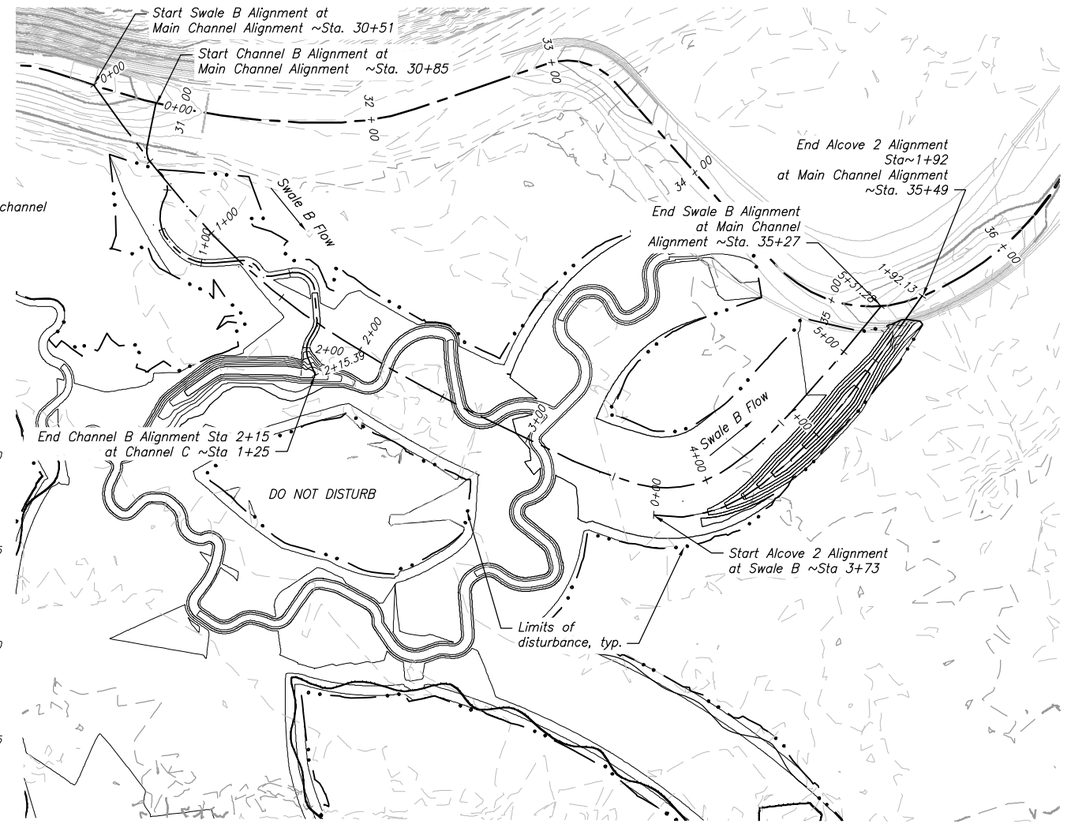
SWC4–CHANNEL B PROFILE



SWC4–ALCOVE 2 PROFILE

HORIZONTAL SCALE
40 0 40 80 120
SCALE OF FEET

VERTICAL SCALE
1 0 5 10 15
SCALE OF FEET



FLOOD SWALE COMPLEX 4
SWALE B
CHANNEL B
ALCOVE 2

40 0 40 80 120
SCALE OF FEET

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GRANDE RONDE SUBBASIN
CC–44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV NO	DATE	DESCRIPTION
1	2015–10–09	Jeffrey J. Fealko P.E. added labels, switched profile positions, revised notes

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BOISE, ID
2015–09–14

FLOOD SWALE COMPLEX 4
SWALE B
CHANNEL B
ALCOVE 2

PLAN AND PROFILES

1678–100–2096

SHEET 3 OF 9

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CAD FILENAME
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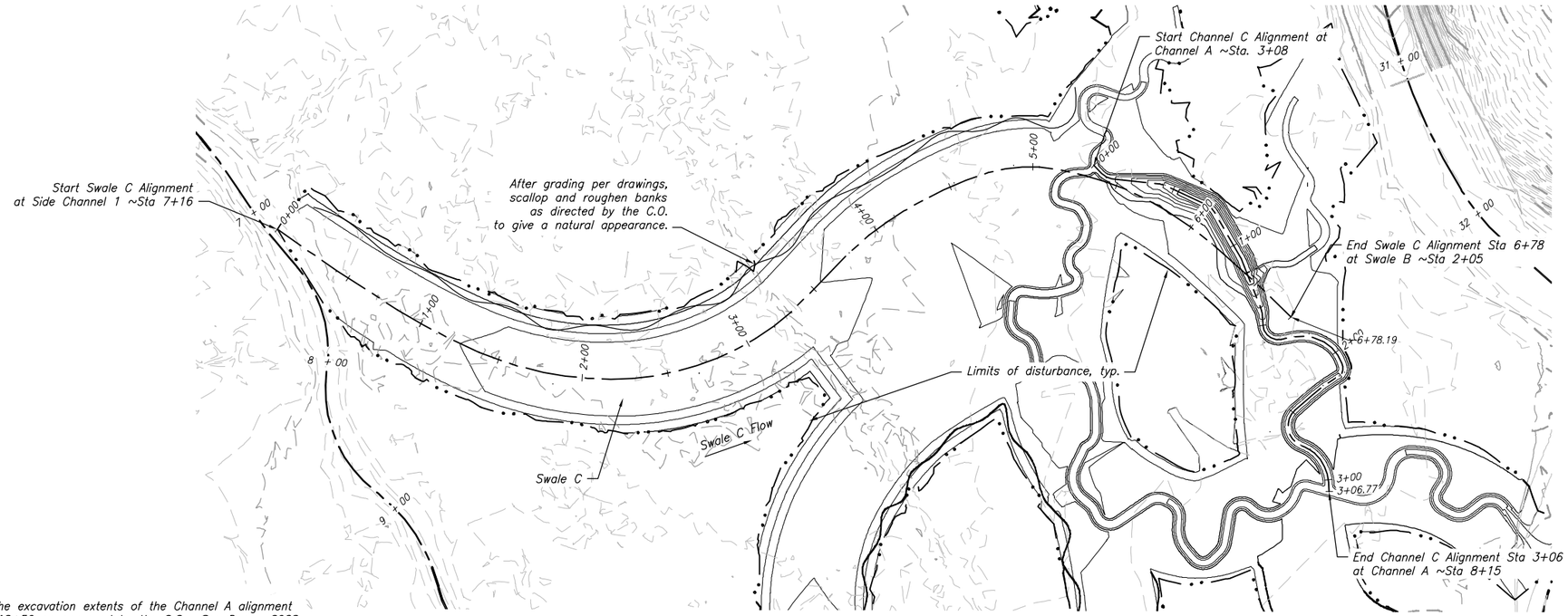
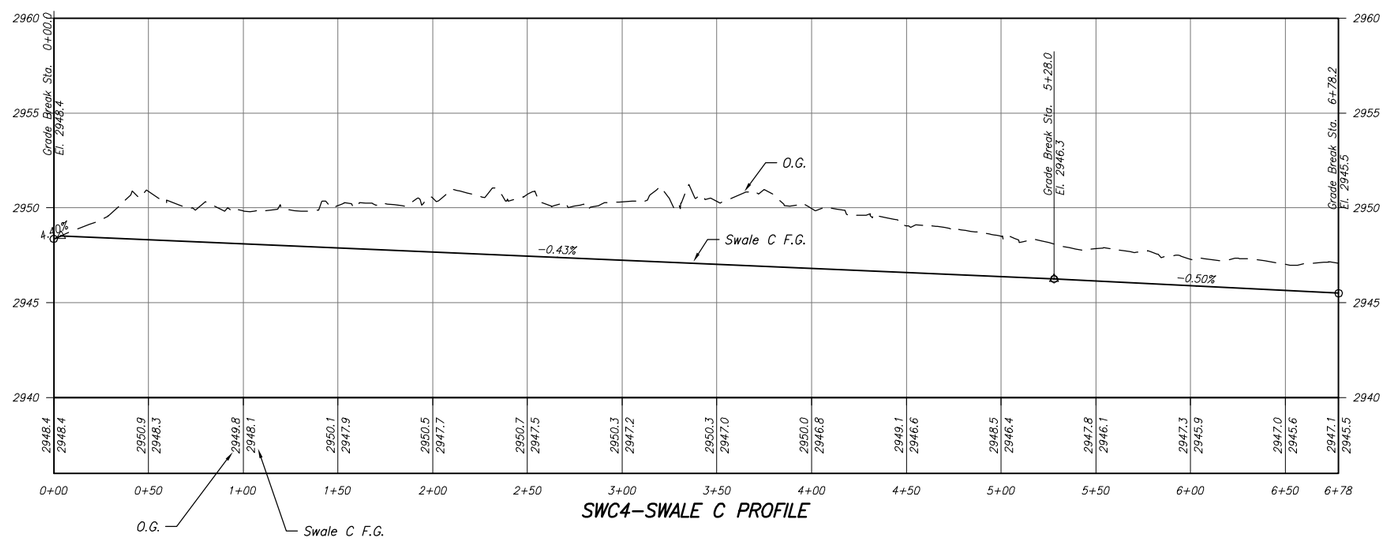


NOTES:

1. Salvage sod within the excavation extents of the Channel A alignment from Sta. 5+25 to 12+50 as approved by the C.O. See Dwg. –2028 for Sod Salvage and Transplant Notes and areas within the alignment of channels.
2. Place 6 inches of topsoil on finish grade of channel side slopes.
3. Place sod mats on swale side slopes.
4. See Dwg. –2028 for General Excavation and Finish Grade Notes.
5. See Notes Dwg. –2074
6. Flood Swale Complex 5 only contains channels. No swales are inlcuded in this feature.

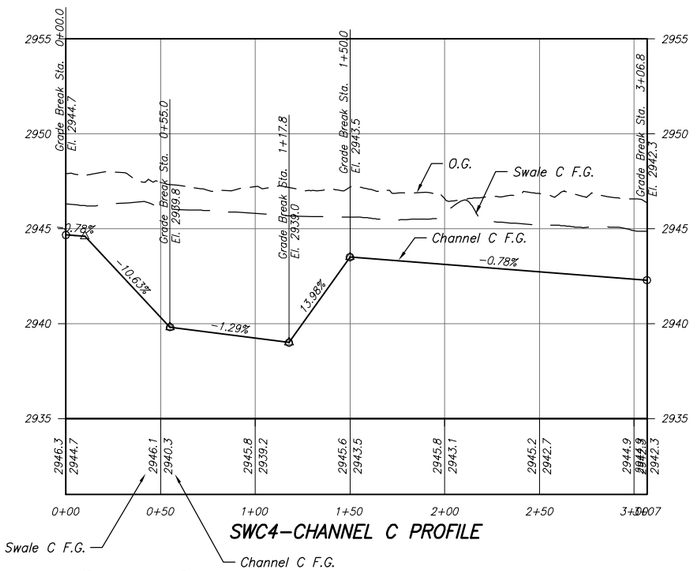
FLOOD SWALE COMPLEX 4
SWALE C
CHANNEL C

40 0 40 80 120
SCALE OF FEET



SWC4–SWALE C PROFILE

40 0 40 80 120
SCALE OF FEET
HORIZONTAL SCALE



SWC4–CHANNEL C PROFILE

1 0 5 10 15
SCALE OF FEET
VERTICAL SCALE

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GRANDE RONDE SUBBASIN
CC–44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV NO	DATE	
1	2015–10–09	100 Added labels and notes
		Jeffrey J Fealko P.E.

Jeffrey J. Fealko, P.E.
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FLOOD SWALE COMPLEX 4
SWALE C
CHANNEL C

PLAN AND PROFILES

1678–100–2097

SHEET 4 OF 9

DATE AND TIME PLOTTED
AUGUST 13, 2015 0842
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AHATCH

CAD SYSTEM
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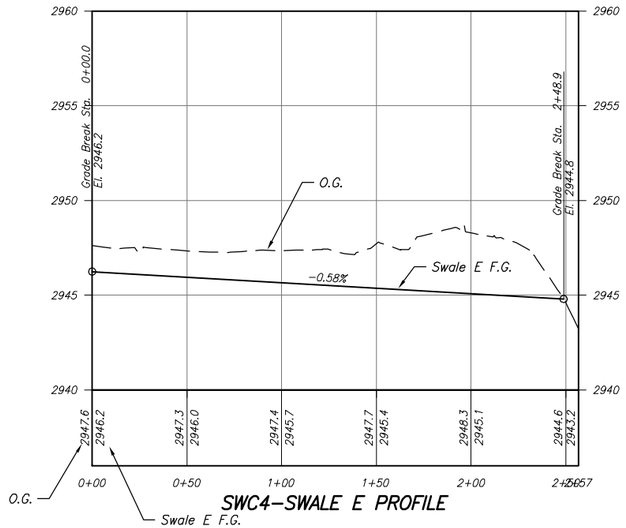
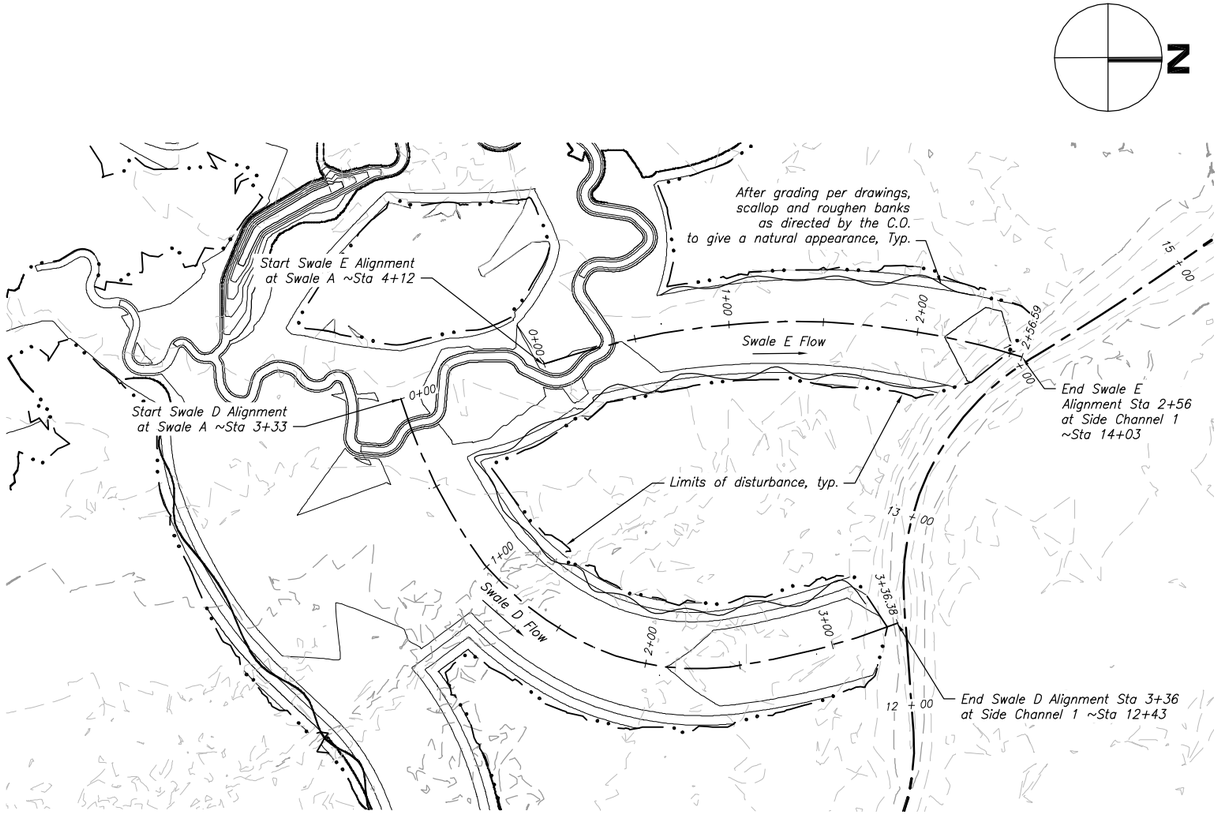
CAD FILENAME
1678–100–SWC4.DWG

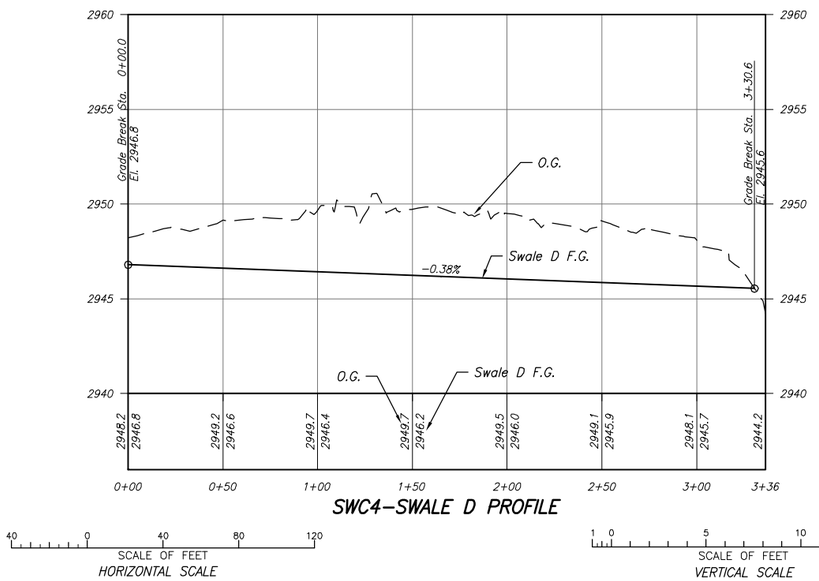


SWC4–SWALE E PROFILE



FLOOD SWALE COMPLEX 4
SWALE D
SWALE E

40 0 40 80 120
SCALE OF FEET



SWC4–SWALE D PROFILE

40 0 40 80 120
SCALE OF FEET
HORIZONTAL SCALE

1 0 5 10 15
SCALE OF FEET
VERTICAL SCALE

NOTES:

1. Salvage sod within the excavation extents of the Channel A alignment from Sta. 5+25 to 12+50 as approved by the C.O. See Dwg. −2028 for Sod Salvage and Transplant Notes and areas within the alignment of channels.
2. Place 6 inches of topsoil on finish grade of channel side slopes.
3. Place sod mats on swale side slopes.
4. See Dwg. −2028 for General Excavation and Finish Grade Notes.
5. See Notes Dwg. −2074
6. Flood Swale Complex 5 only contains channels. No swales are inlcuded in this feature.

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GRANDE RONDE SUBBASIN

CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV NO		
1	2015-10-09	100 Added labels and notes
		Jeffrey J Fealko P.E.

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BOISE, ID 2015-09-14

FLOOD SWALE COMPLEX 4
SWALE D
SWALE E

PLAN AND PROFILES

1678–100–2098

SHEET 5 OF 9

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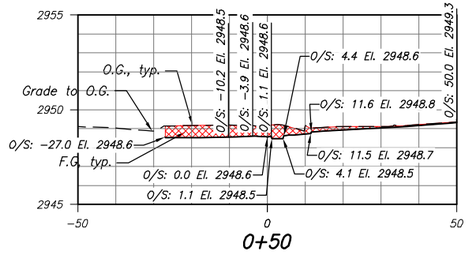

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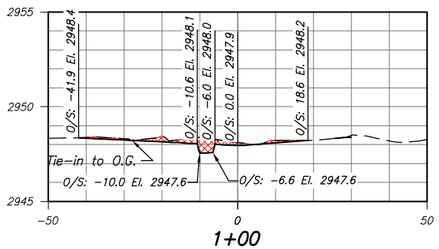

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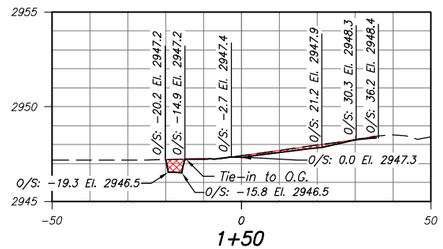

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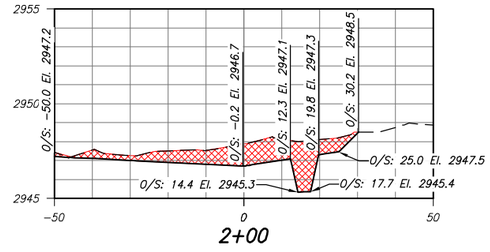

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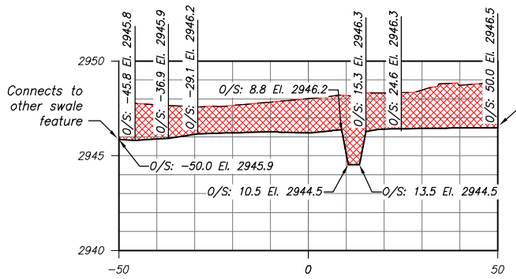

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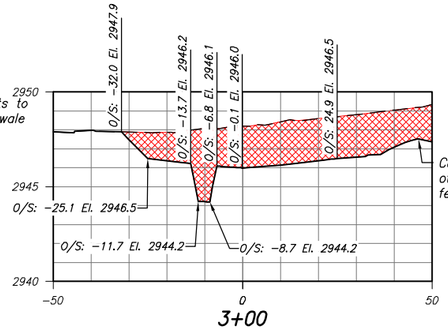

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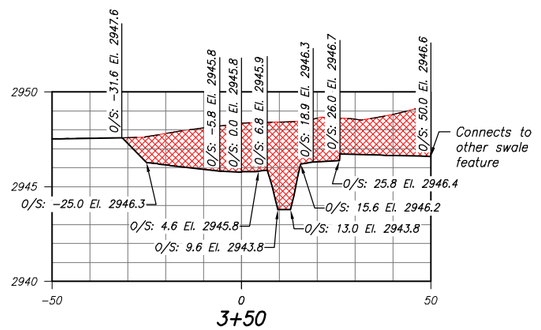

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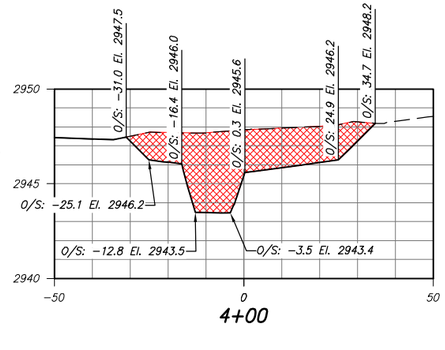

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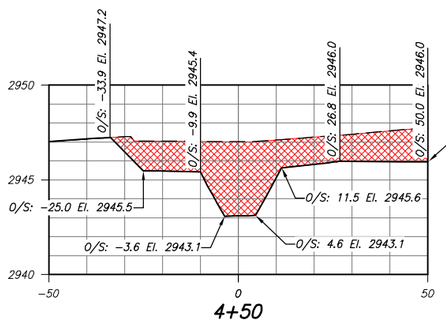

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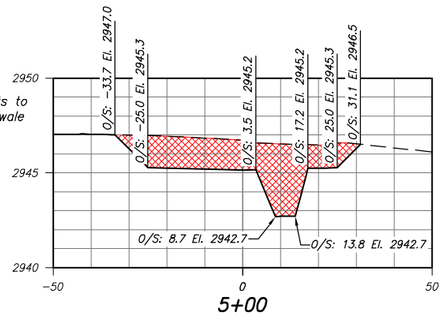

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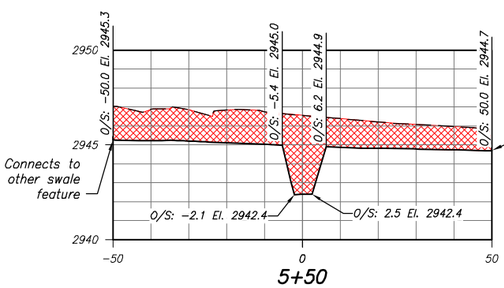

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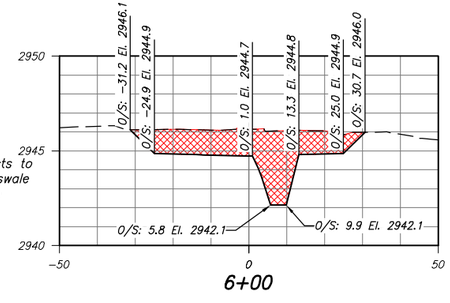

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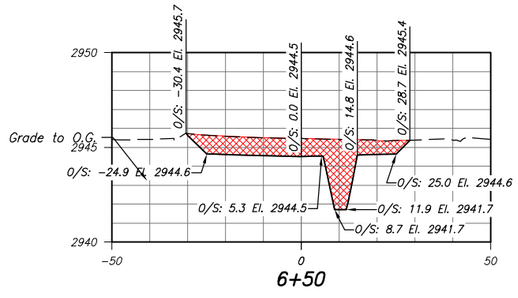

6+50

SWALE A CROSS SECTIONS

SCALE OF FEET: 20 0 20 40 60

Cut

Fill

Notes

1. Cross sections face downstream. Cross section centerline station is located along the thalweg alignment.
2. Y-axis is elevation, X-axis is distance in feet along a chord perpendicular to the thalweg. The zero station shown on these cross sections represents the thalweg alignment.
3. Constructed channel shall transition smoothly between cross sectional geometries shown within these cross sections. Cross section geometry shown represents one point in a smooth transition.
4. Cross-sections are to be used to stake out the channel offsets at the vertical grade breaks of the channel profile.
5. Cross-sections that do not daylight to original ground connect to other swale features.

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FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN
CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV NO		
1	2015-10-09	Corrected section drow order and notes

Jeffrey J. Fealko, P.E.
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BOISE, ID 2015-09-14

FLOOD SWALE COMPLEX 4
SWALE A

CROSS SECTIONS

1678-100-2099

SHEET 6 OF 9

DATE AND TIME PLOTTED
AUGUST 13, 2015 09:45
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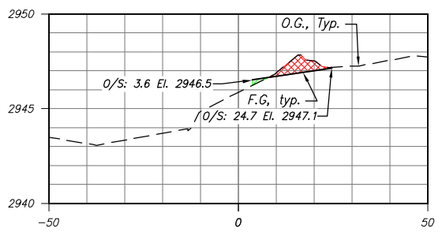
AHATCH

CAD SYSTEM
AutoCAD Rel. 20.0s
CAD FILENAME
1678-100-SWC4.DWG



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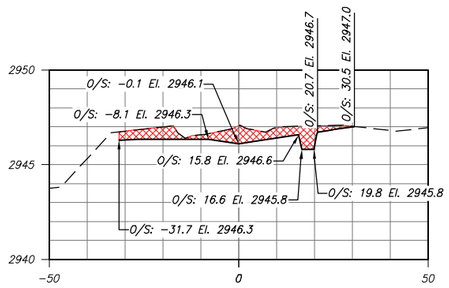

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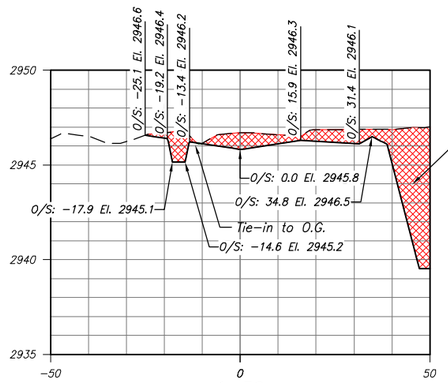

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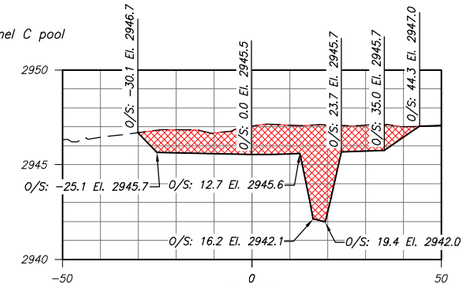

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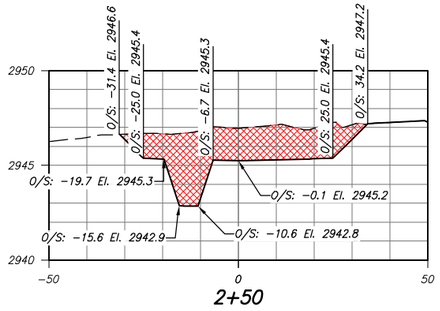

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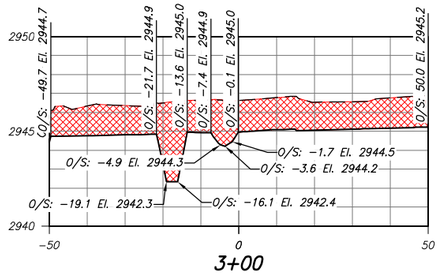

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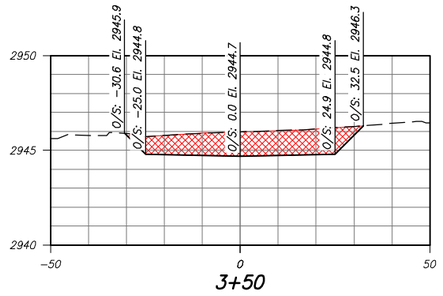

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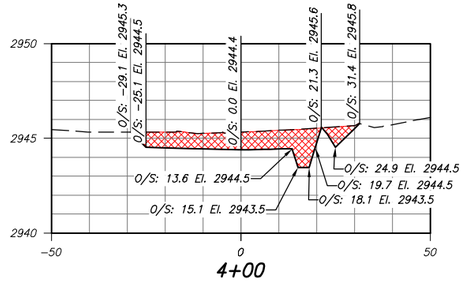

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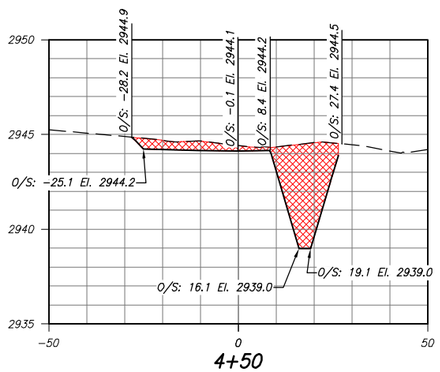

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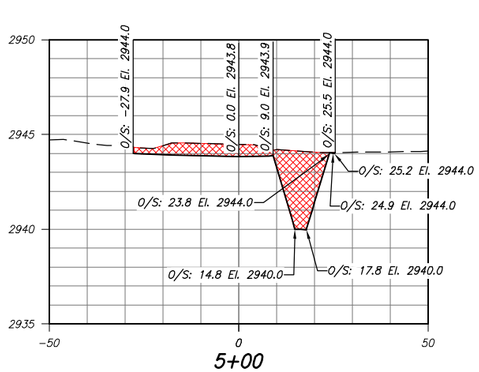

5+00

Notes

1. *Cross sections face downstream. Cross section centerline station is located along the thalweg alignment.*
2. *Y−axis is elevation, X−axis is distance in feet along a chord perpendicular to the thalweg. The zero station shown on these cross sections represents the thalweg alignment.*
3. *Constructed channel shall transition smoothly between cross sectional geometries shown within these cross sections. Cross section geometry shown represents one point in a smooth transition.*
4. *Cross−sections are to be used to stake out the channel offsets at the vertical grade breaks of the channel profile.*
5. *Cross−sections that do not daylight to original ground connect to other swale features.*

Cut

Fill

SWALE B CROSS SECTIONS

20 0 20 40 60

SCALE OF FEET

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FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN

CC−44 PHASE III HABITAT ENHANCEMENT PARCEL 3

REV NO		
1	2015−10−09	100 Corrected section draw order and notes
	Jeffrey J. Fealko P.E.	

Jeffrey J. Fealko, P.E.
DESIGNED
DB/AH/JH
DRAWN
Mike Knutson, P.E.
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Jeffrey J. Fealko, P.E.
TECH. APPR.
Steve Montague−Acting
APPROVED
ADMIN. APPROVAL − PROGRAM MANAGER
BOISE, ID 2015−09−14

FLOOD SWALE COMPLEX 4 SWALE B

CROSS SECTIONS

1678−100−2100

SHEET 7 OF 9

DATE AND TIME PLOTTED
AUGUST 13, 2015 08:46
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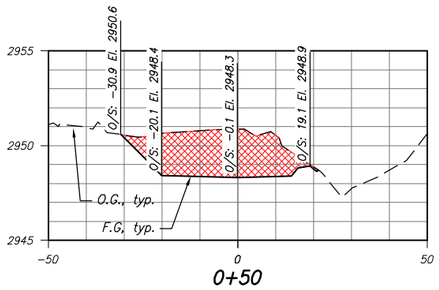
AHATCH

CAD SYSTEM
AutoCAD Rel. 20.0s
CAD FILENAME
1678−100−SWC4.DWG



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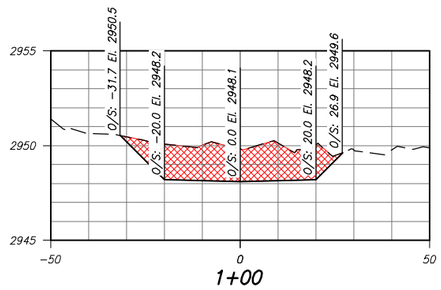

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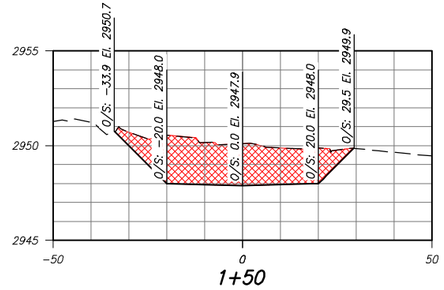

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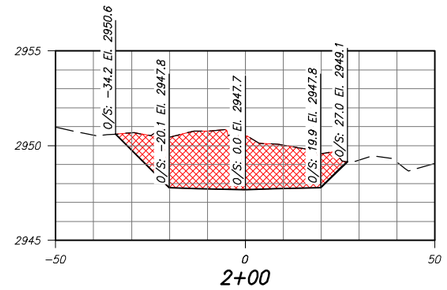

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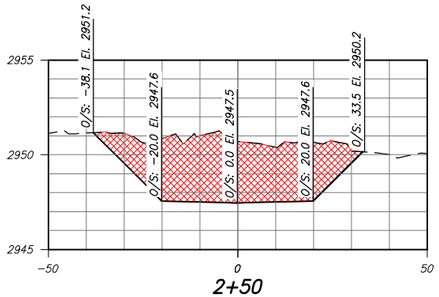

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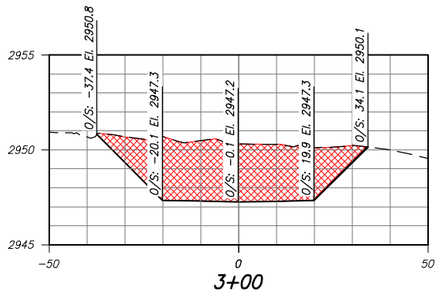

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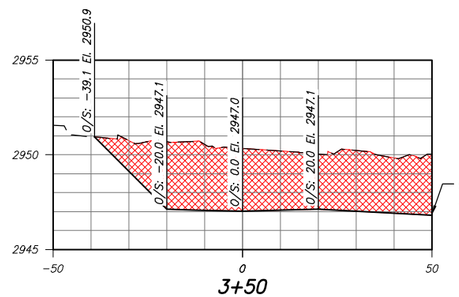

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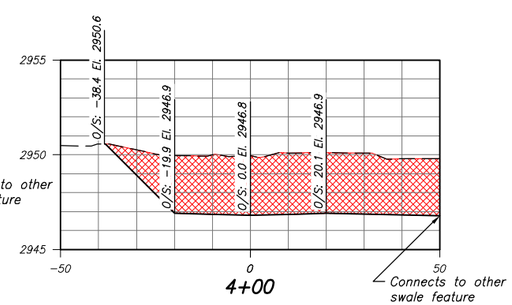

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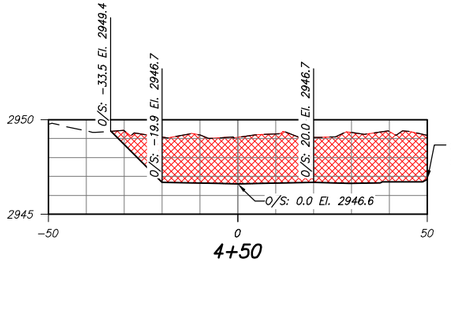

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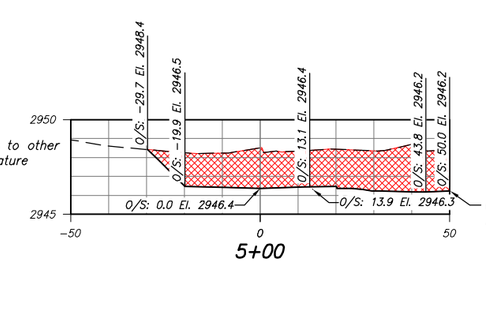

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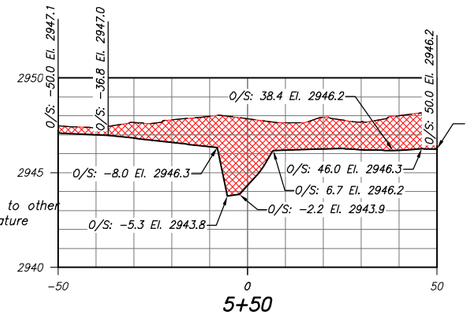

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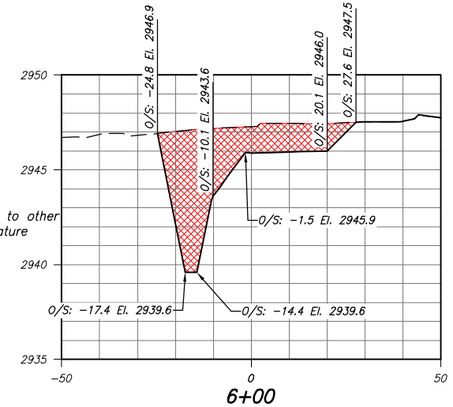

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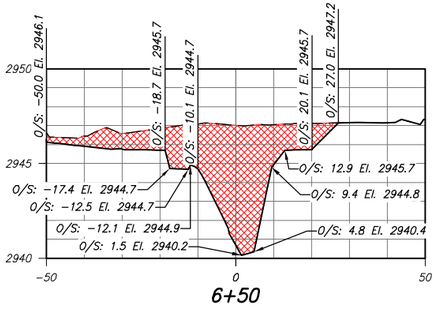

6+50

SWALE C CROSS SECTIONS

SCALE OF FEET: 20 0 20 40 60

Cut

Fill

NOTES:

1. Cross sections face downstream. Cross section centerline station is located along the thalweg alignment.
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FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN
CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV NO.		
1	2015-10-09	100 Corrected section draw order and notes
	Jeffrey J Fealko P.E.	

Jeffrey J. Fealko, P.E.
DESIGNED
DB/AH/JH
DRAWN
Mike Knutson, P.E.
CHECKED
Jeffrey J. Fealko, P.E.
TECH. APPR.
Steve Montague-Acting
APPROVED
ADMIN. APPROVAL - PROGRAM MANAGER
BOISE, ID 2015-09-14

FLOOD SWALE COMPLEX 4
SWALE C

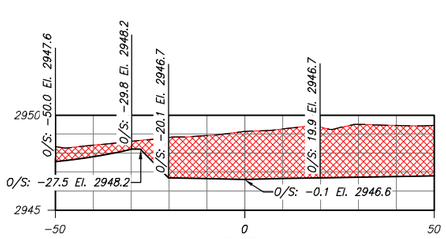
CROSS SECTIONS

1678-100-2101

SHEET 8 OF 9

DATE AND TIME PLOTTED
AUGUST 13, 2015 09:47
PLOTTED BY
AHATCH

CAD SYSTEM
AutoCAD Rel. 20.0s
CAD FILENAME
1678-100-SWC4.DWG



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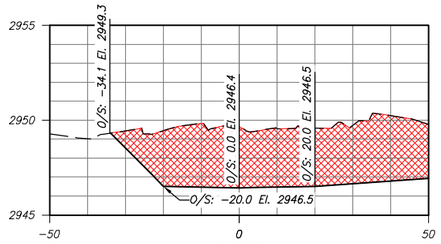

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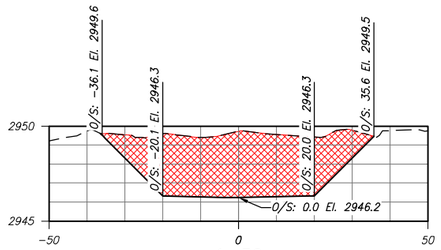

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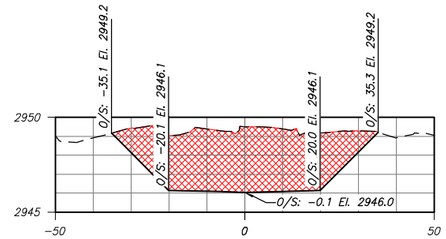

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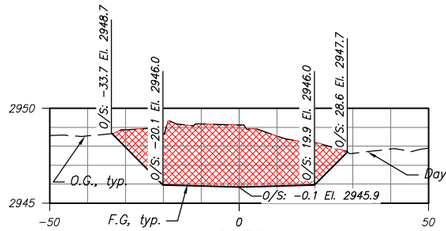

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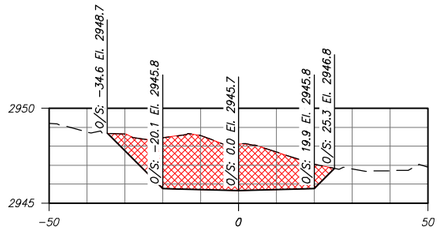

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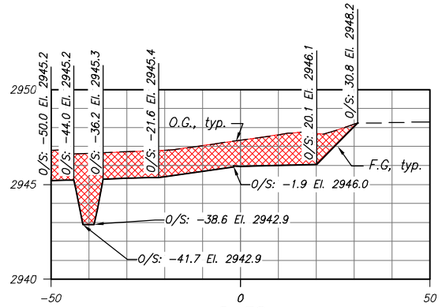
SWALE D SECTIONS



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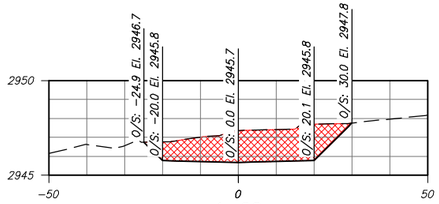

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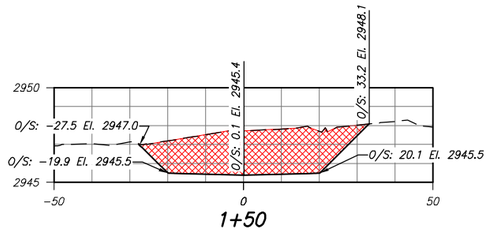

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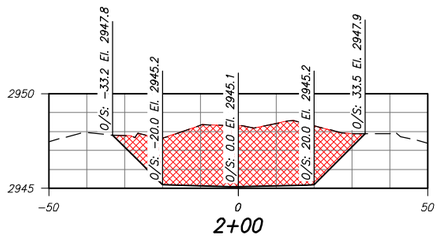

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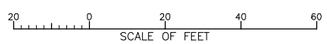
SWALE E SECTIONS



NOTES:

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Cut

Fill

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BUREAU OF RECLAMATION
COLUMBIA/SNAKE RIVER SALMON RECOVERY PROGRAM
FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN
CC–44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV NO	DATE	DESCRIPTION
1	2015–10–09	100 Corrected section drow order and notes
		Jeffrey J Fealko P.E.

Jeffrey J. Fealko, P.E.
DESIGNED
DB/AH/JH
DRAWN
Mike Knutson, P.E.
CHECKED
Jeffrey J. Fealko, P.E.
TECH. APPR.
Steve Montague–Acting
APPROVED
ADMIN APPROVAL – PROGRAM MANAGER
BOISE, ID 2015–09–14

FLOOD SWALE COMPLEX 4
SWALE D
SWALE E

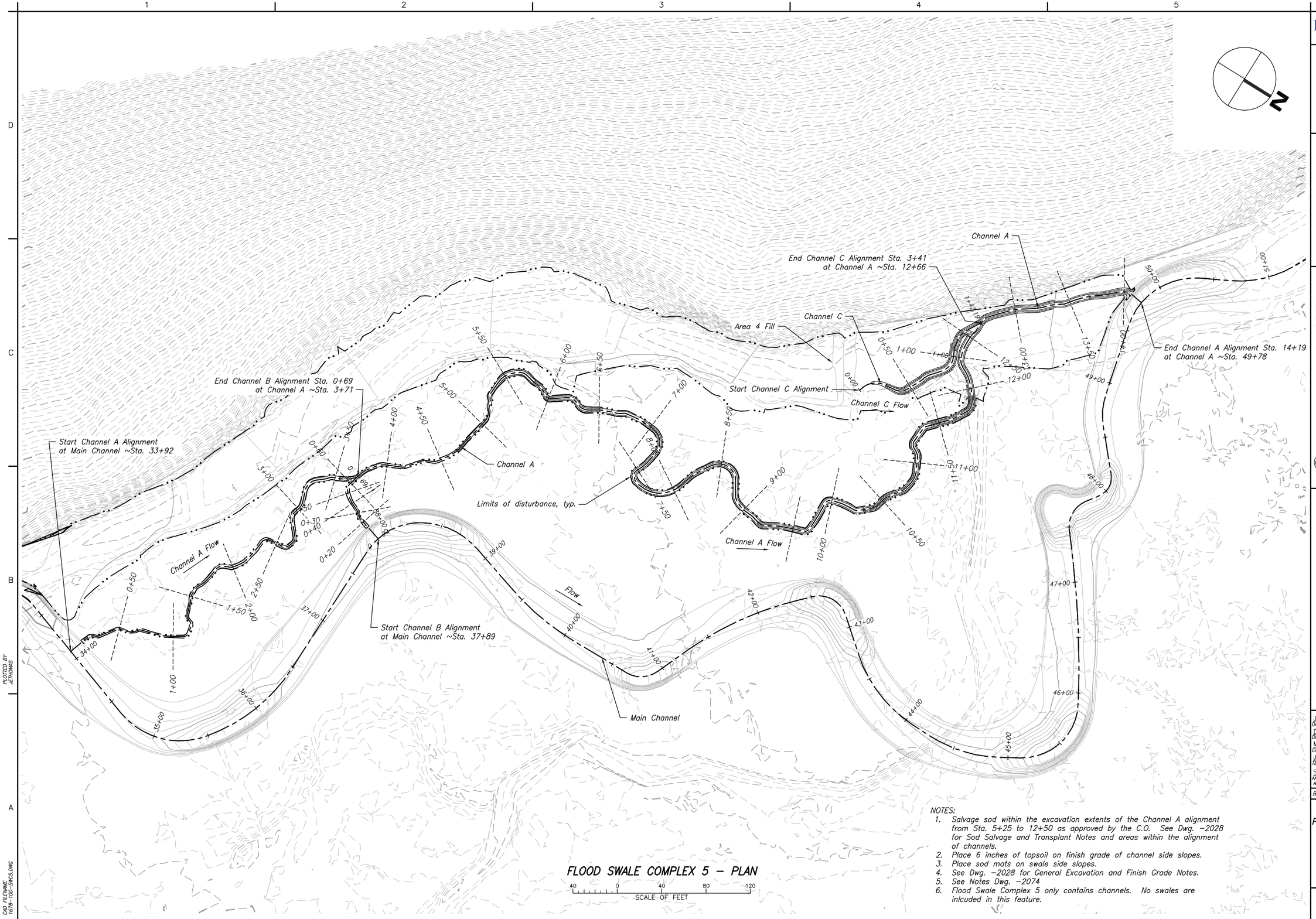
CROSS SECTIONS

1678–100–2102

SHEET 9 OF 9

DATE AND TIME PLOTTED
AUGUST 13, 2015 09:48
PLOTTED BY
AHATCH

CAD SYSTEM
AutoCAD Rel. 20.0s
CAD FILENAME
1678–100–SWC4.DWG



FLOOD SWALE COMPLEX 5 – PLAN

SCALE OF FEET: 40 0 40 80 120

NOTES:

1. Salvage sod within the excavation extents of the Channel A alignment from Sta. 5+25 to 12+50 as approved by the C.O. See Dwg. –2028 for Sod Salvage and Transplant Notes and areas within the alignment of channels.
2. Place 6 inches of topsoil on finish grade of channel side slopes.
3. Place sod mats on swale side slopes.
4. See Dwg. –2028 for General Excavation and Finish Grade Notes.
5. See Notes Dwg. –2074
6. Flood Swale Complex 5 only contains channels. No swales are inlcuded in this feature.

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GRANDE RONDE SUBBASIN
CC–44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV. NO.	DATE	DESCRIPTION
1	2015–10–09	Jeffrey J Fealko P.E.	100 Added sample line label and removed extra Rec. Re-graded Channel C

Jeffrey J. Fealko, P.E.
DESIGNED
DB/AH/JH
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Mike Knutson, P.E.
CHECKED
Jeffrey J. Fealko, P.E.
TECH. APPR.
Steve Montague–Acting
APPROVED
ADMIN APPROVAL – PROGRAM MANAGER
BOISE, ID 2015–09–14

FLOOD SWALE COMPLEX 5

PLAN

1678–100–2103

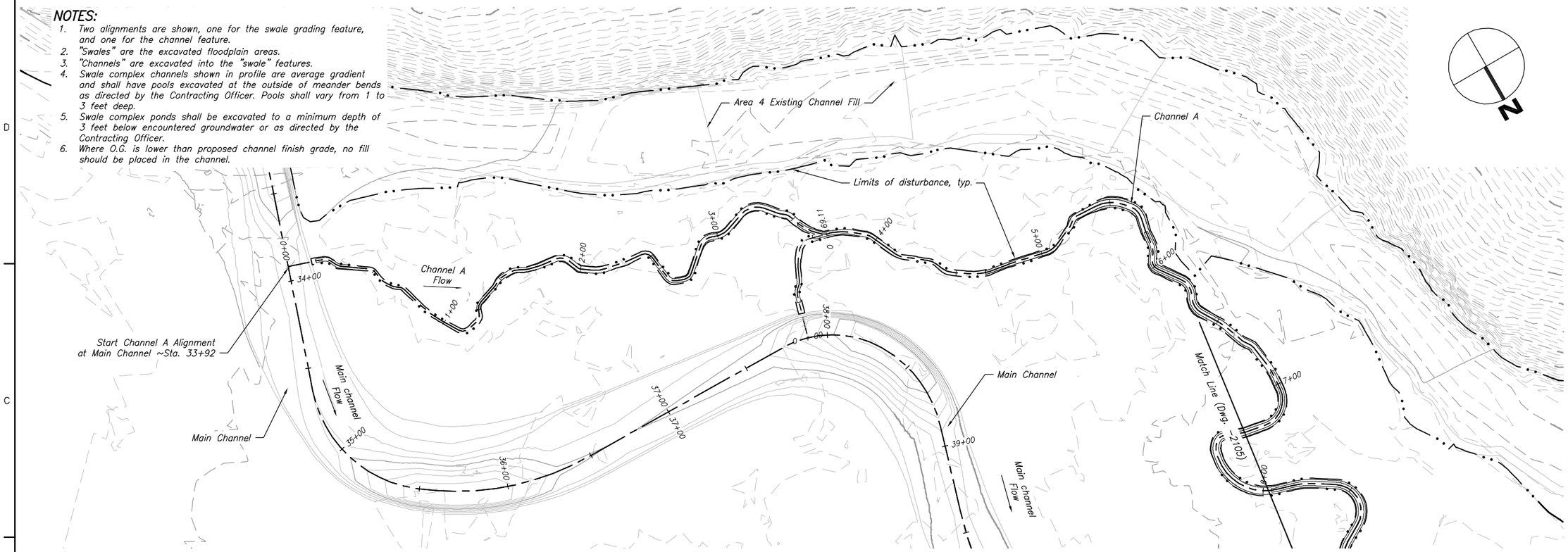
SHEET 1 OF 6

DATE AND TIME PLOTTED
JULY 25, 2015 15:56
PLOTTED BY
JETHOMAS

CAD SYSTEM
AutoCAD Rel. 20.0s
CAD FILENAME
1678–100–SWC5.DWG

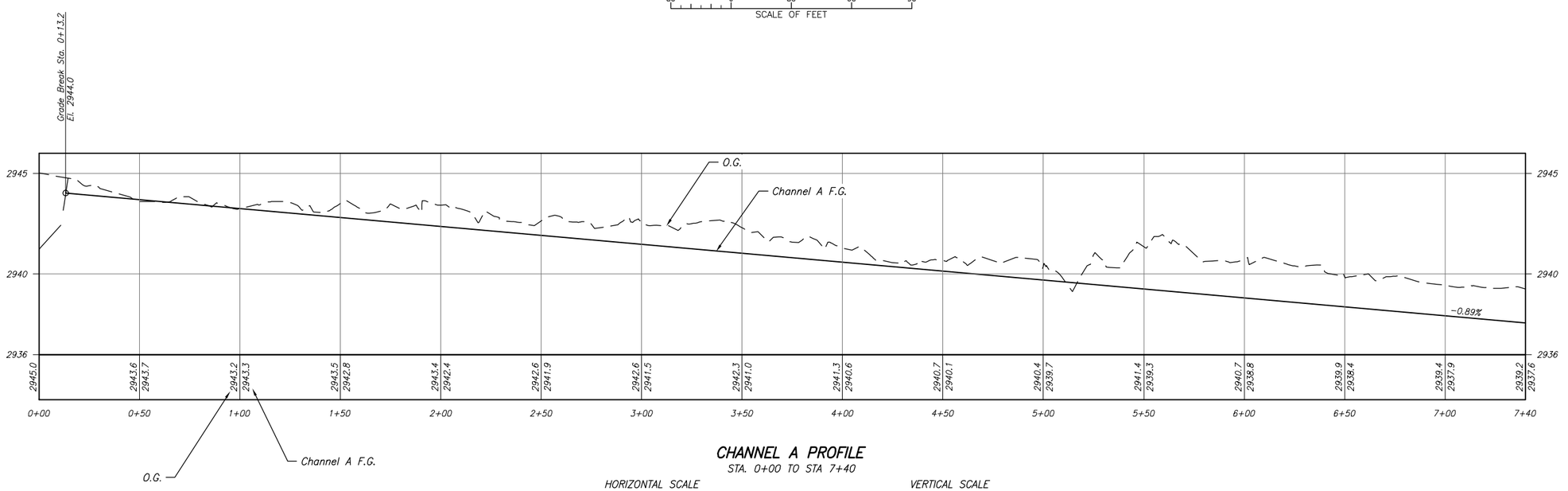
NOTES:

1. Two alignments are shown, one for the swale grading feature, and one for the channel feature.
2. "Swales" are the excavated floodplain areas.
3. "Channels" are excavated into the "swale" features.
4. Swale complex channels shown in profile are average gradient and shall have pools excavated at the outside of meander bends as directed by the Contracting Officer. Pools shall vary from 1 to 3 feet deep.
5. Swale complex ponds shall be excavated to a minimum depth of 3 feet below encountered groundwater or as directed by the Contracting Officer.
6. Where O.G. is lower than proposed channel finish grade, no fill should be placed in the channel.



FLOOD SWALE COMPLEX 5
CHANNEL A
STA 0+00 TO STA 7+40

30 0 30 60 90
SCALE OF FEET



CHANNEL A PROFILE
STA. 0+00 TO STA 7+40

HORIZONTAL SCALE
30 0 30 60 90
SCALE OF FEET

VERTICAL SCALE
3 0 3 6 9
SCALE OF FEET

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GRANDE RONDE SUBBASIN
CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV. NO.	DATE	DESCRIPTION
1	2015-10-09	Jeffrey J Fealko P.E. 100 Revised labels and added notes

Jeffrey J. Fealko, P.E.
DESIGNED
DB/AH/JH
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Mike Knutson, P.E.
CHECKED
Jeffrey J. Fealko, P.E.
TECH. APPR.
Steve Montague-Acting
APPROVED
ADMIN APPROVAL - PROGRAM MANAGER
BOISE, ID. 2015-09-14

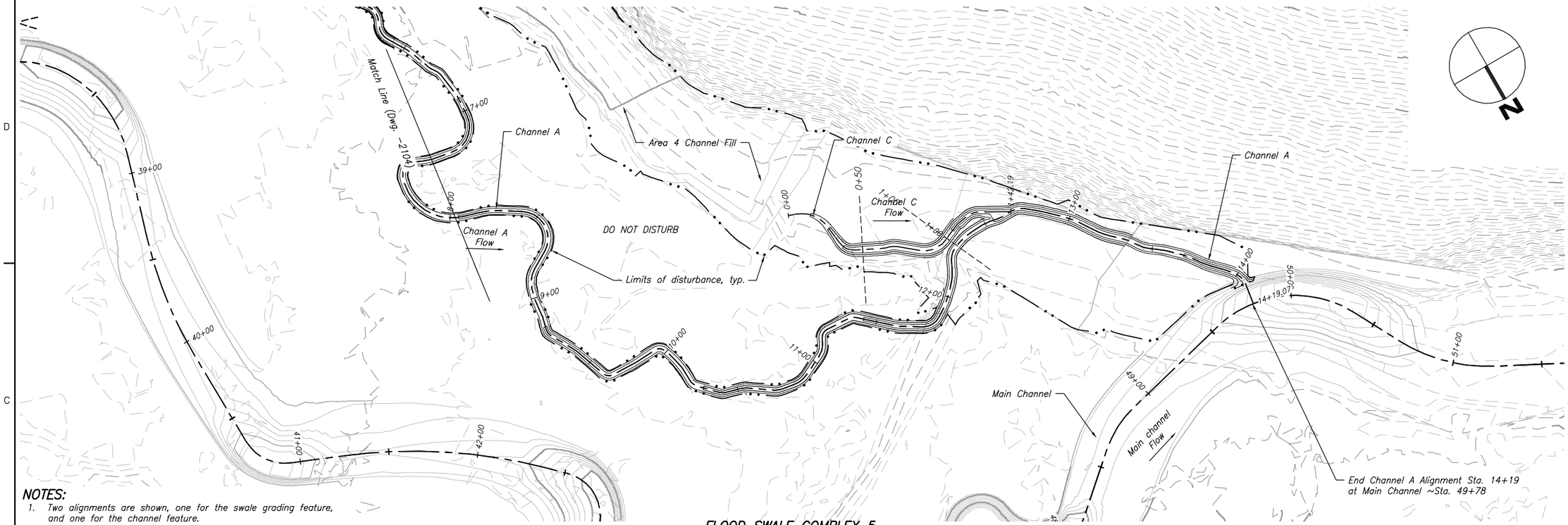
FLOOD SWALE COMPLEX 5
CHANNEL A

PLAN AND PROFILE

1678-100-2104
SHEET 2 OF 6

DATE AND TIME PLOTTED
JULY 25, 2015 15:56
PLOTTED BY
JETHOMAS

CAD SYSTEM
AutoCAD Rel. 20.0s
CAD FILENAME
1678-100-SWC5.DWG



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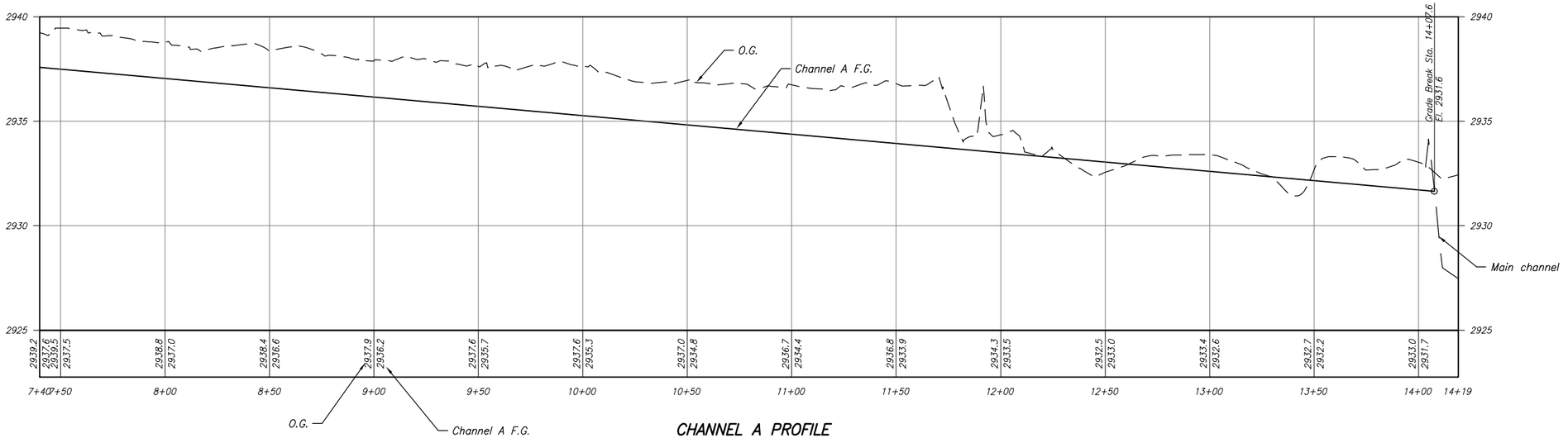
FLOOD SWALE COMPLEX 5
CHANNEL A
STA 7+40 TO STA 14+19



CHANNEL A PROFILE
STA 7+40 TO STA 14+19

HORIZONTAL SCALE
30 0 30 60 90
SCALE OF FEET

VERTICAL SCALE
3 0 3 6 9
SCALE OF FEET

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GRANDE RONDE SUBBASIN
CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV NO	DATE	DESCRIPTION
1	2015-10-09	Revised labels and added notes
		Jeffrey J Fealko P.E.

Jeffrey J. Fealko, P.E. — DESIGNED
DB/AH/JH — DRAWN
Mike Knutson, P.E. — CHECKED
Jeffrey J. Fealko, P.E. — TECH. APPR.
Steve Montague-Acting — APPROVED
ADMIN. APPROVAL - PROGRAM MANAGER
BOISE, ID 2015-09-14

FLOOD SWALE COMPLEX 5
CHANNEL A

PLAN AND PROFILE

1678-100-2105
SHEET 3 OF 6

DATE AND TIME PLOTTED
AUGUST 14, 2015 11:47
PLOTTED BY
AHATCH

CAD SYSTEM
AutoCAD Rel. 20.0s
CAD FILENAME
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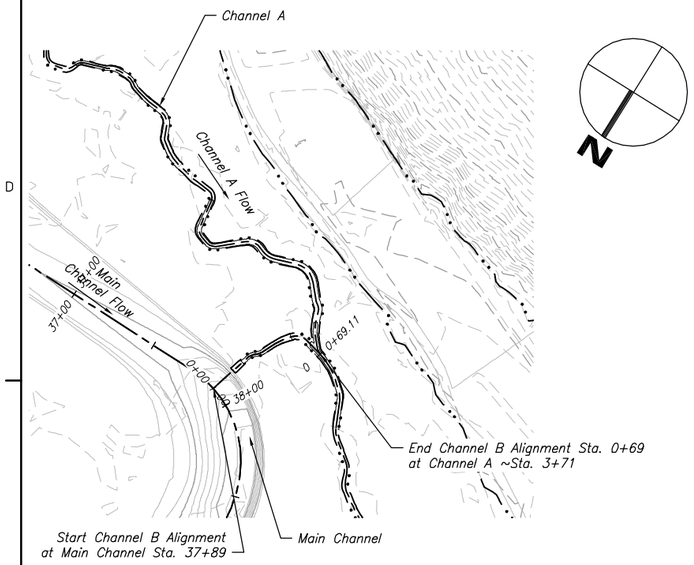
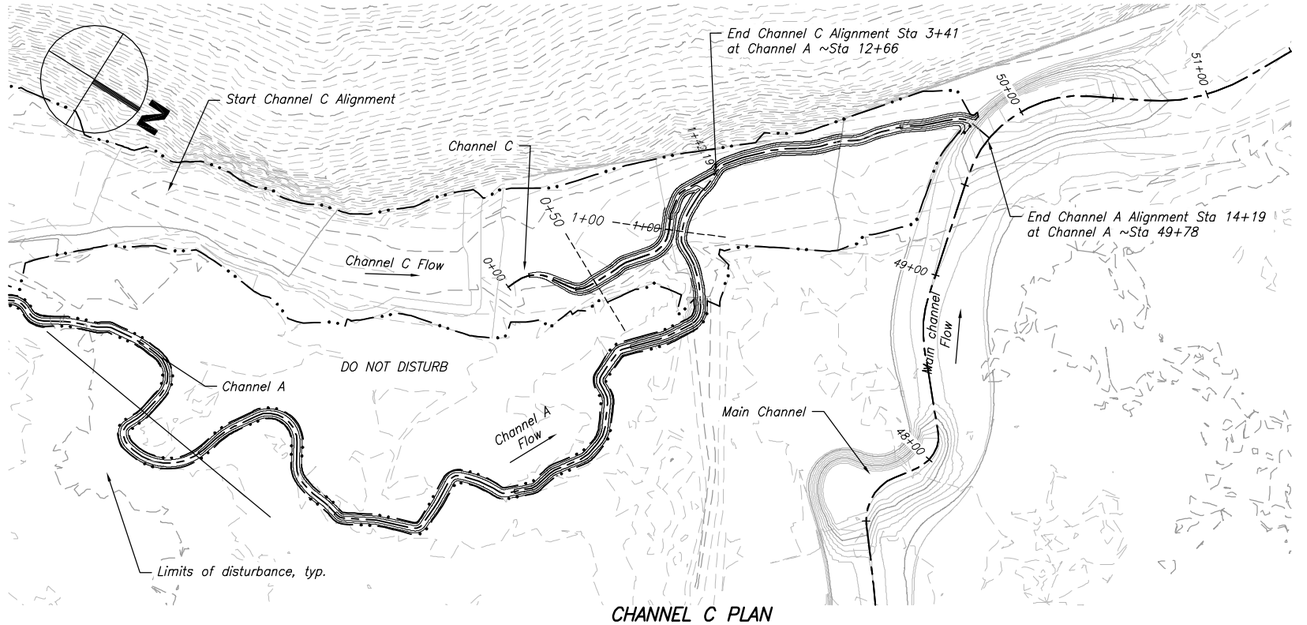


CHANNEL B PLAN

40 0 40 80 120
SCALE OF FEET



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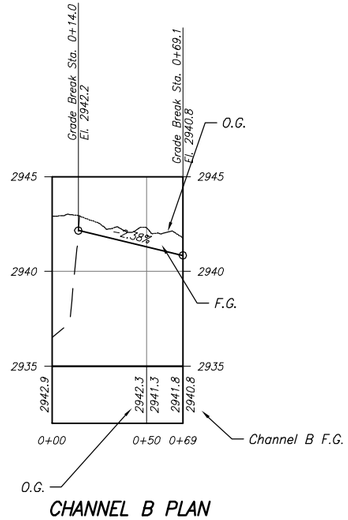
SCALE OF FEET



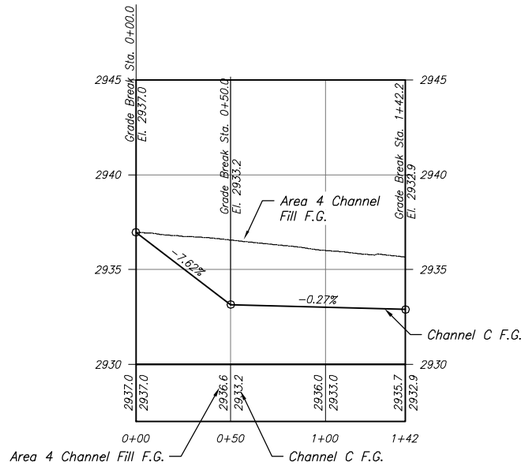
CHANNEL B PLAN

HORIZONTAL SCALE
40 0 40 80 120
SCALE OF FEET

VERTICAL SCALE
4 0 4 8 12
SCALE OF FEET

NOTES:

1. Two alignments are shown, one for the swale grading feature, and one for the channel feature.
2. "Swales" are the excavated floodplain areas.
3. "Channels" are excavated into the "swale" features.
4. Swale complex channels shown in profile are average gradient and shall have pools excavated at the outside of meander bends as directed by the Contracting Officer. Pools shall vary from 1 to 3 feet deep.
5. Swale complex ponds shall be excavated to a minimum depth of 3 feet below encountered groundwater or as directed by the Contracting Officer.
6. Where O.G. is lower than proposed channel finish grade, no fill should be placed in the channel.



CHANNEL C PLAN

HORIZONTAL SCALE
40 0 40 80 120
SCALE OF FEET

VERTICAL SCALE
4 0 4 8 12
SCALE OF FEET

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FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN
CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV NO	DATE	DESCRIPTION
1	2015-10-09	100 Revised labels and added notes. Regraded Channel C.

Jeffrey J. Fealko, P.E.
DESIGNED
DB/AH/JH
DRAWN
Mike Knutson, P.E.
CHECKED
Jeffrey J. Fealko, P.E.
TECH. APPR.
Steve Montague-Acting
APPROVED
ADMIN. APPROVAL - PROGRAM MANAGER
BOISE, ID 2015-09-14

FLOOD SWALE COMPLEX 5
CHANNEL B
CHANNEL C

PLANS AND PROFILES

1678-100-2106
SHEET 4 OF 6

DATE AND TIME PLOTTED
AUGUST 14, 2015 12:39
PLOTTED BY
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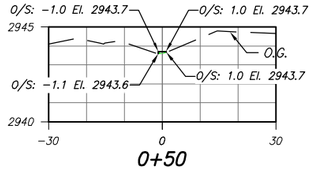

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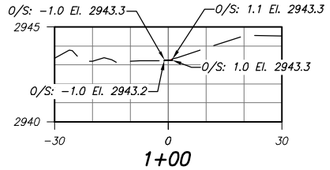

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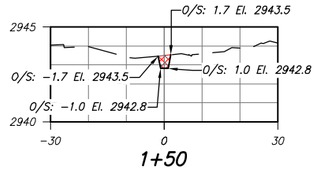

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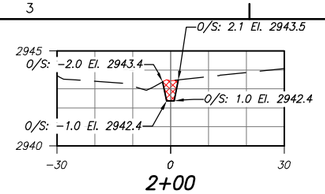

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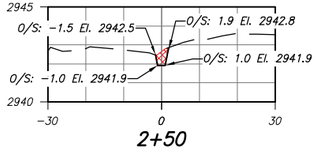

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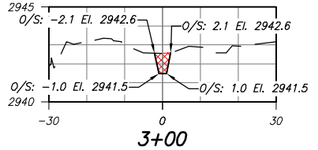

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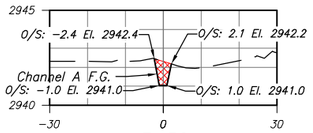

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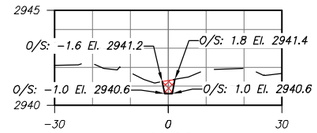

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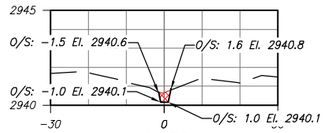

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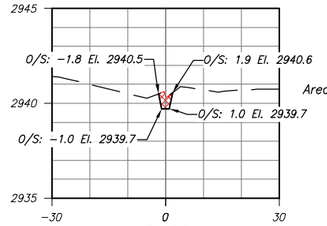

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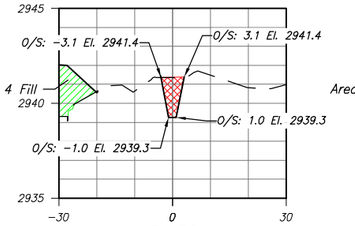

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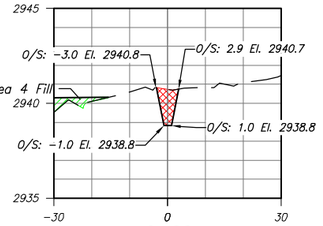

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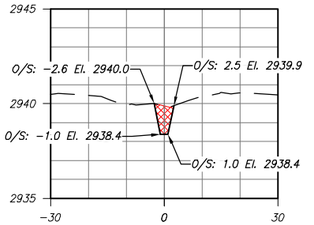

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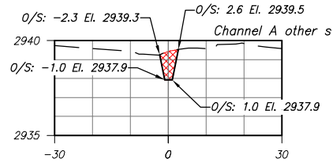

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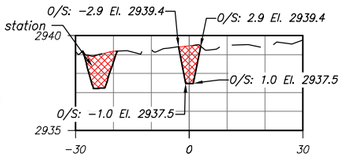

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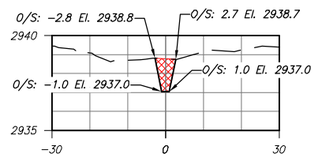

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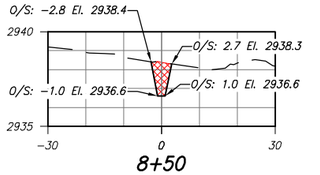

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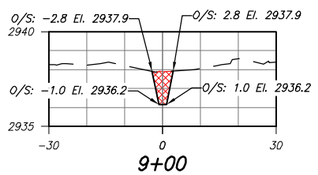

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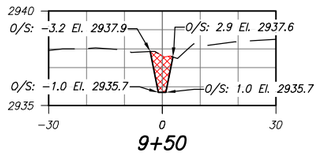

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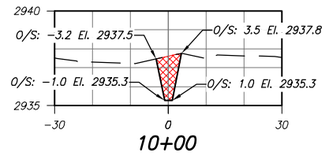

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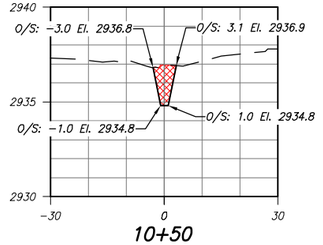

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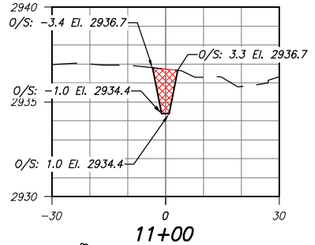

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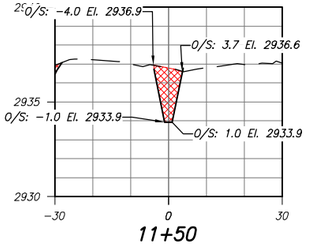

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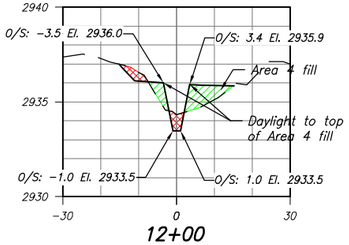

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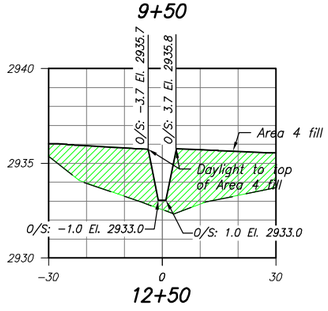

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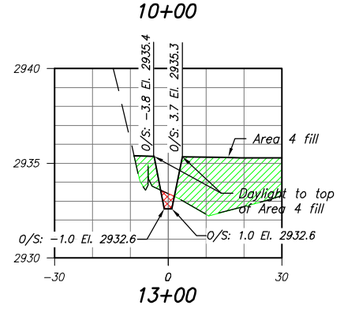

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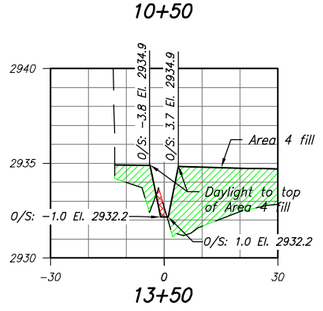

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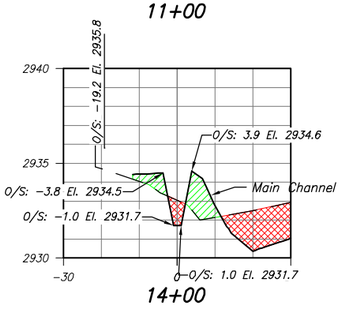

14+00

Notes

1. Cross sections face downstream. Cross section centerline station is located along the thalweg alignment.
2. Y-axis is elevation, X-axis is distance in feet along a chord perpendicular to the thalweg. The zero station shown on these cross sections represents the thalweg alignment.
3. Constructed channel shall transition smoothly between cross sectional geometries shown within these cross sections. Cross section geometry shown represents one point in a smooth transition.
4. Cross-sections are to be used to stake out the channel offsets at the vertical grade breaks of the channel profile.
5. Cross-sections that do not daylight to original ground connect to other swale features.

CHANNEL A CROSS SECTIONS

20 0 20 40 60
SCALE OF FEET

Cut

Fill

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U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
COLUMBIA/SNAKE RIVER SALMON RECOVERY PROGRAM
FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN
CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV NO	DATE	DESCRIPTION
1	2015-10-09	100 Revised labels, added notes, and corrected section draw order

Jeffrey J. Fealko, P.E.
DESIGNED
DB/AH/JH
DRAWN
Mike Knutson, P.E.
CHECKED
Jeffrey J. Fealko, P.E.
TECH. APPR.
Steve Montague-Acting
APPROVED
ADMIN. APPROVAL - PROGRAM MANAGER
BOISE, ID 2015-09-14

FLOOD SWALE COMPLEX 5
CHANNEL A

CROSS SECTIONS

1678-100-2107
SHEET 5 OF 6

DATE AND TIME PLOTTED
AUGUST 14, 2015 13:51
PLOTTED BY
AHATCH

CAD SYSTEM
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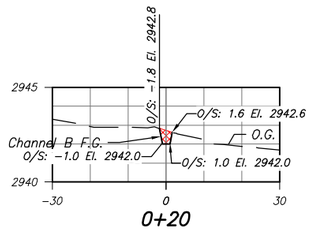

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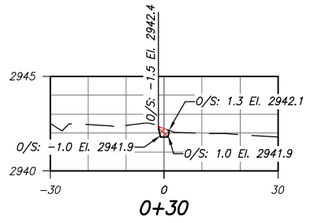

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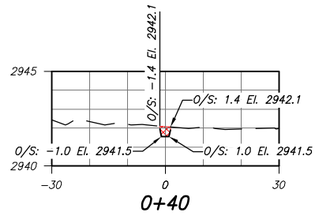

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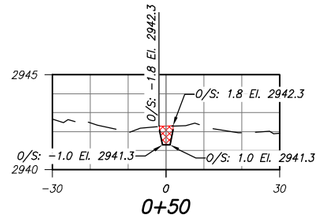

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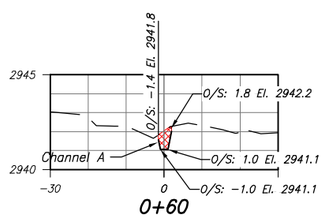

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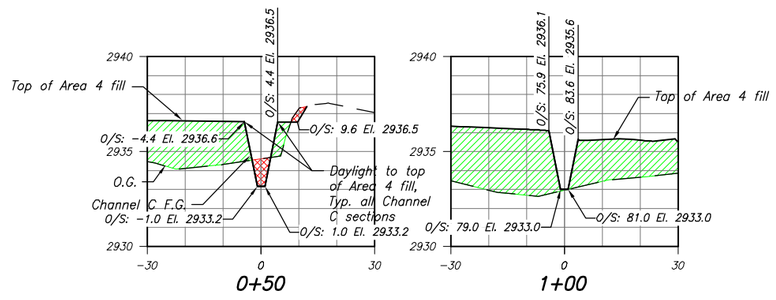
CHANNEL B CROSS SECTIONS

20 0 20 40 60
SCALE OF FEET



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1+00

CHANNEL C CROSS SECTIONS

20 0 20 40 60
SCALE OF FEET

Notes

1. *Cross sections face downstream. Cross section centerline station is located along the thalweg alignment.*
2. *Y−axis is elevation, X−axis is distance in feet along a chord perpendicular to the thalweg. The zero station shown on these cross sections represents the thalweg alignment.*
3. *Constructed channel shall transition smoothly between cross sectional geometries shown within these cross sections. Cross section geometry shown represents one point in a smooth transition.*
4. *Cross−sections are to be used to stake out the channel offsets at the vertical grade breaks of the channel profile.*
5. *Cross−sections that do not daylight to original ground connect to other swale features.*

Cut

Fill

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FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN
CC−44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV NO		
1	2015−10−09	100 Revised labels, added notes, and corrected section view order
	Jeffrey J Fealko P.E.	

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DB/AH/JH
DRAWN
Mike Knutson, P.E.
CHECKED
Jeffrey J. Fealko, P.E.
TECH. APPR.
Steve Montague−Acting
APPROVED
ADMIN APPROVAL − PROGRAM MANAGER
BOISE, ID 2015−09−14

FLOOD SWALE COMPLEX 5
CHANNEL B
CHANNEL C

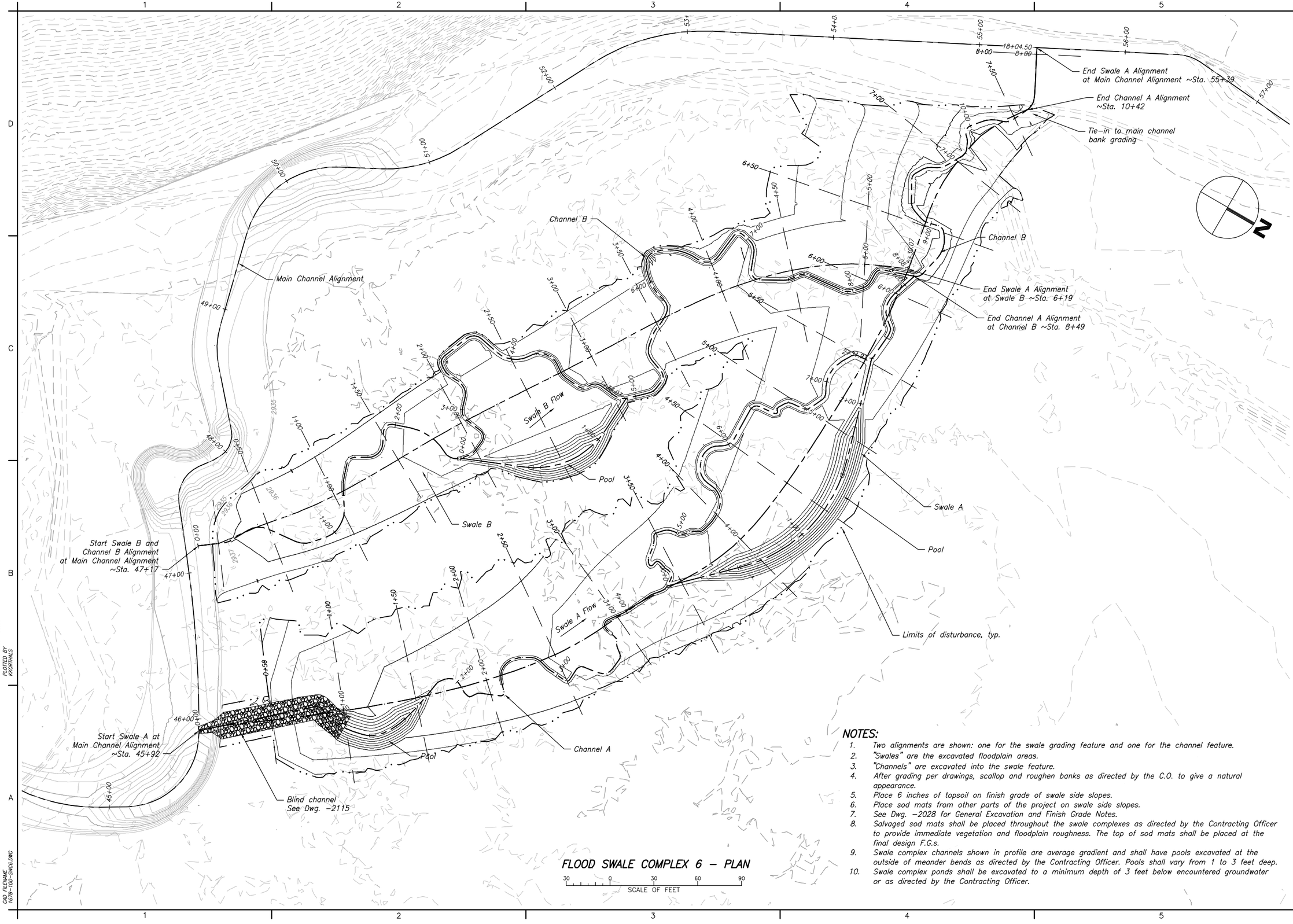
CROSS SECTIONS

1678−100−2108

SHEET 6 OF 6

DATE AND TIME PLOTTED
AUGUST 14, 2015 14:01
PLOTTED BY
AHATCH

CAD SYSTEM
AutoCAD Rel. 20.0s
CAD FILENAME
1678−100−SWC5.DWG



FLOOD SWALE COMPLEX 6 – PLAN

30 0 30 60 90
SCALE OF FEET

NOTES:

1. Two alignments are shown: one for the swale grading feature and one for the channel feature.
2. "Swales" are the excavated floodplain areas.
3. "Channels" are excavated into the swale feature.
4. After grading per drawings, scallop and roughen banks as directed by the C.O. to give a natural appearance.
5. Place 6 inches of topsoil on finish grade of swale side slopes.
6. Place sod mats from other parts of the project on swale side slopes.
7. See Dwg. -2028 for General Excavation and Finish Grade Notes.
8. Salvaged sod mats shall be placed throughout the swale complexes as directed by the Contracting Officer to provide immediate vegetation and floodplain roughness. The top of sod mats shall be placed at the final design F.G.s.
9. Swale complex channels shown in profile are average gradient and shall have pools excavated at the outside of meander bends as directed by the Contracting Officer. Pools shall vary from 1 to 3 feet deep.
10. Swale complex ponds shall be excavated to a minimum depth of 3 feet below encountered groundwater or as directed by the Contracting Officer.

RECLAMATION
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GRANDE RONDE SUBBASIN
CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV NO	DATE	DESCRIPTION
1	2015-10-09 Jeffrey J Fealko P.E.	100% Corrected linetype scale and adjusted limits of disturbance

Jeffrey J Fealko P.E. — DESIGNED
DB/AH/JH — DRAWN
Mike Knutson P.E. — CHECKED
Jeffrey J Fealko P.E. — TECH. APPR.
Steve Montague-Acting — APPROVED
ADMIN. APPROVAL - PROGRAM MANAGER
BOISE, ID 2015-09-14

FLOOD SWALE COMPLEX 6

PLAN

1678-100-2109
SHEET 1 OF 4

DATE AND TIME PLOTTED
JULY 31, 2015 08:00
PLOTTED BY
KKORTHALS

CAD SYSTEM
AutoCAD Rel. 20.0s
CAD FILENAME
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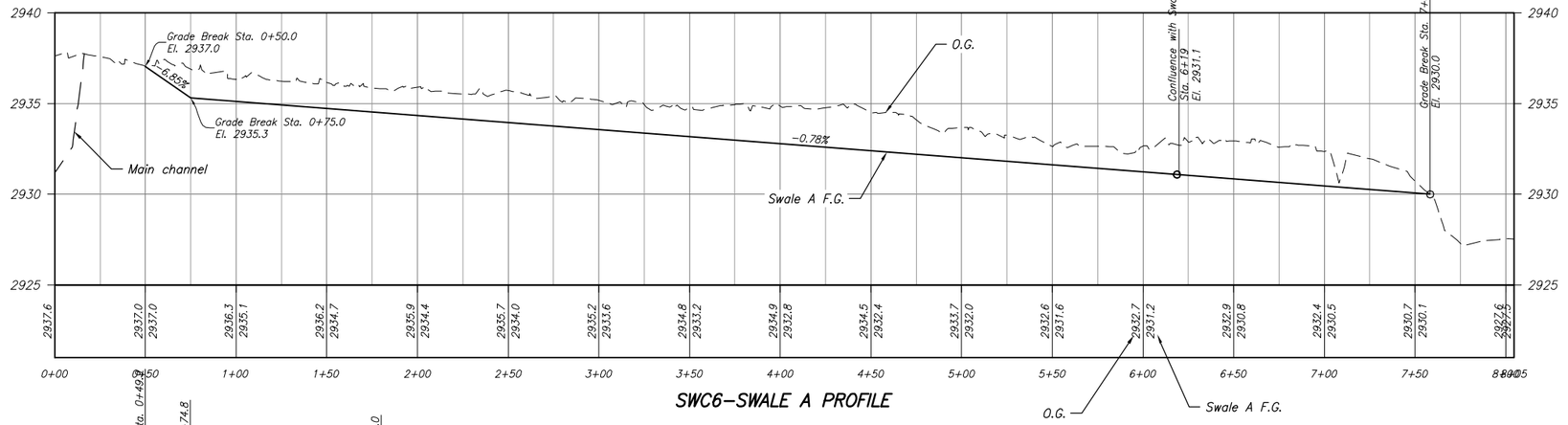
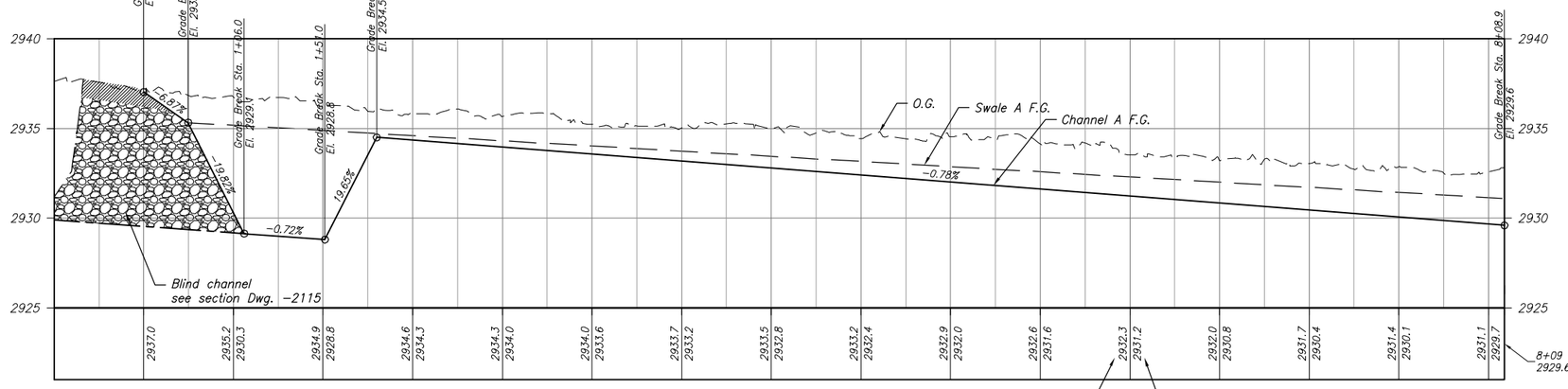
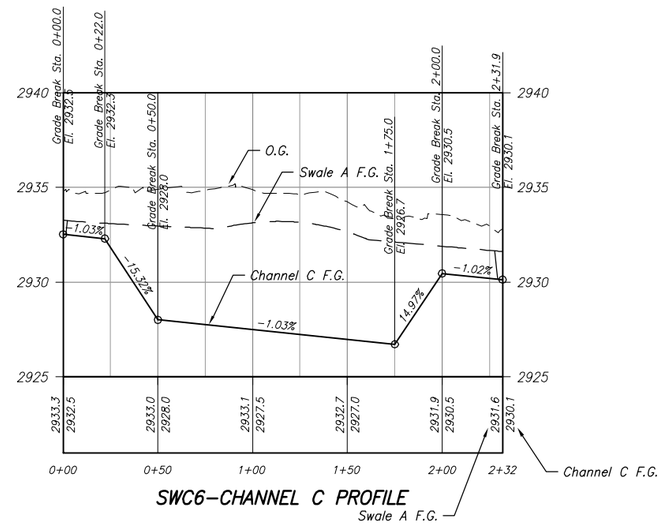


SWC6–SWALE A PROFILE



SWC6–CHANNEL A PROFILE



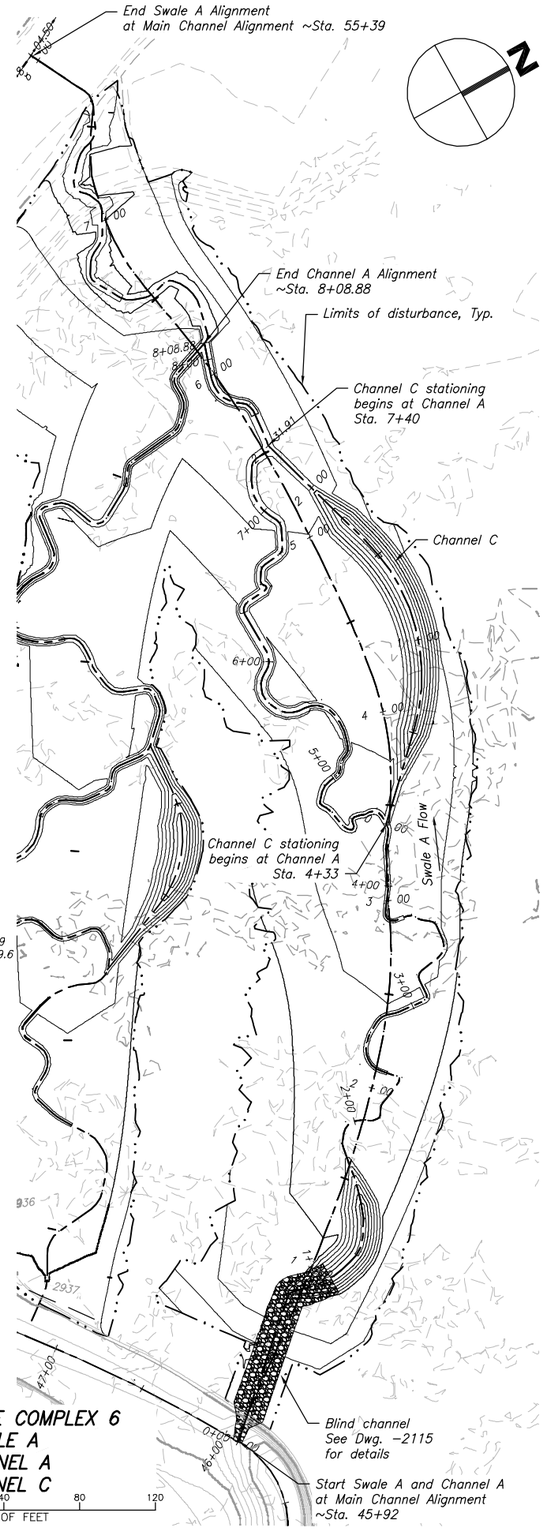
SWC6–CHANNEL C PROFILE

NOTES:

1. Two alignments are shown, one for the swale grading feature, and one for the channel feature.
2. "Swales" are the excavated floodplain areas.
3. "Channels" are excavated into the "swale" features.
4. Swale complex channels shown in profile are average gradient and shall have pools excavated at the outside of meander bends as directed by the Contracting Officer. Pools shall vary from 1 to 3 feet deep.
5. Swale complex ponds shall be excavated to a minimum depth of 3 feet below encountered groundwater or as directed by the Contracting Officer.
6. Where O.G. is lower than proposed channel finish grade, no fill should be placed in the channel.

40 0 40 80 120
SCALE OF FEET
HORIZONTAL SCALE

4 0 4 8 12
SCALE OF FEET
VERTICAL SCALE



FLOOD SWALE COMPLEX 6
SWALE A
CHANNEL A
CHANNEL C

40 0 40 80 120
SCALE OF FEET

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BUREAU OF RECLAMATION
COLUMBIA/SNAKE RIVER SALMON RECOVERY PROGRAM
FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN
CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV NO	DATE	DESCRIPTION
1	2015-10-09	100 Added labels and notes

Jeffrey J Fealko P.E.
DESIGNED
DB/AH/JH
DRAWN
Mike Knutson P.E.
CHECKED
Jeffrey J Fealko P.E.
TECH. APPR.
Steve Montague–Acting
APPROVED
ADMIN. APPROVAL – PROGRAM MANAGER
BOISE, ID 2015-09-14

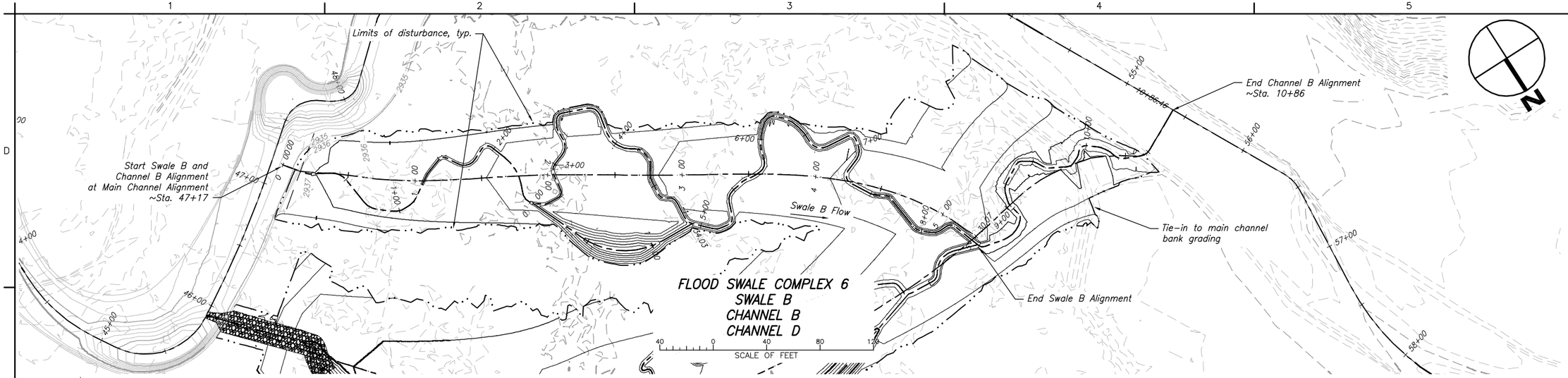
FLOOD SWALE COMPLEX 6
SWALE A
CHANNEL A
CHANNEL C

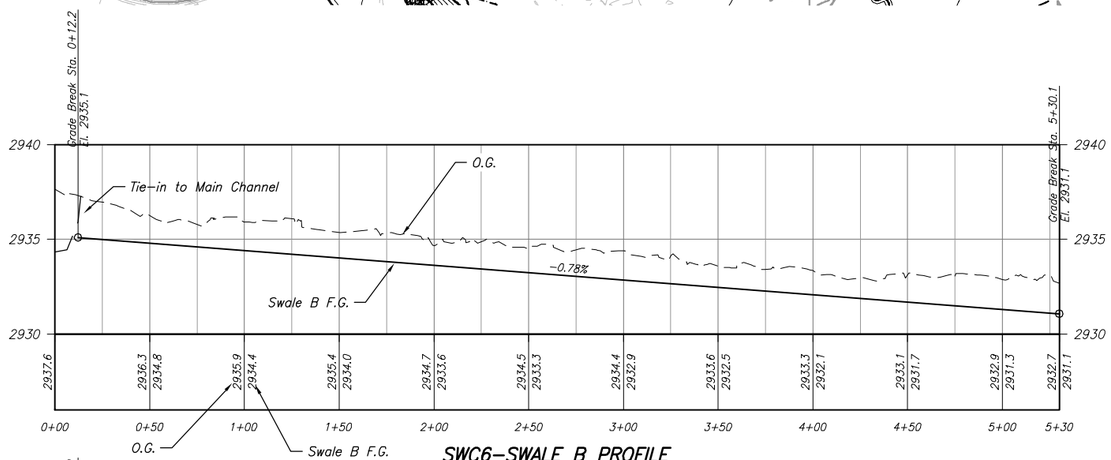
PLAN AND PROFILES

1678–100–2110
SHEET 2 OF 4

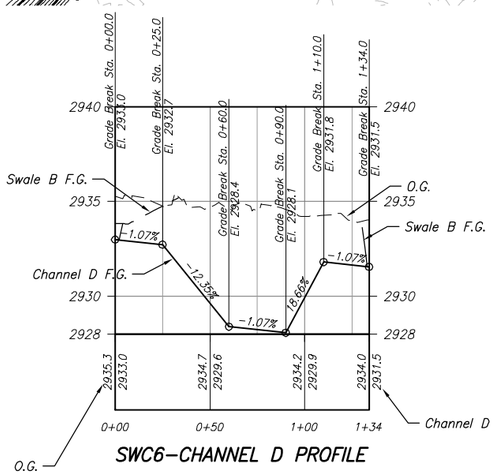
DATE AND TIME PLOTTED
AUGUST 14, 2015 14:44
PLOTTED BY
AHATCH

CAD SYSTEM
AutoCAD Rel. 20.0s
CAD FILENAME
1678-100-SWC6.DWG

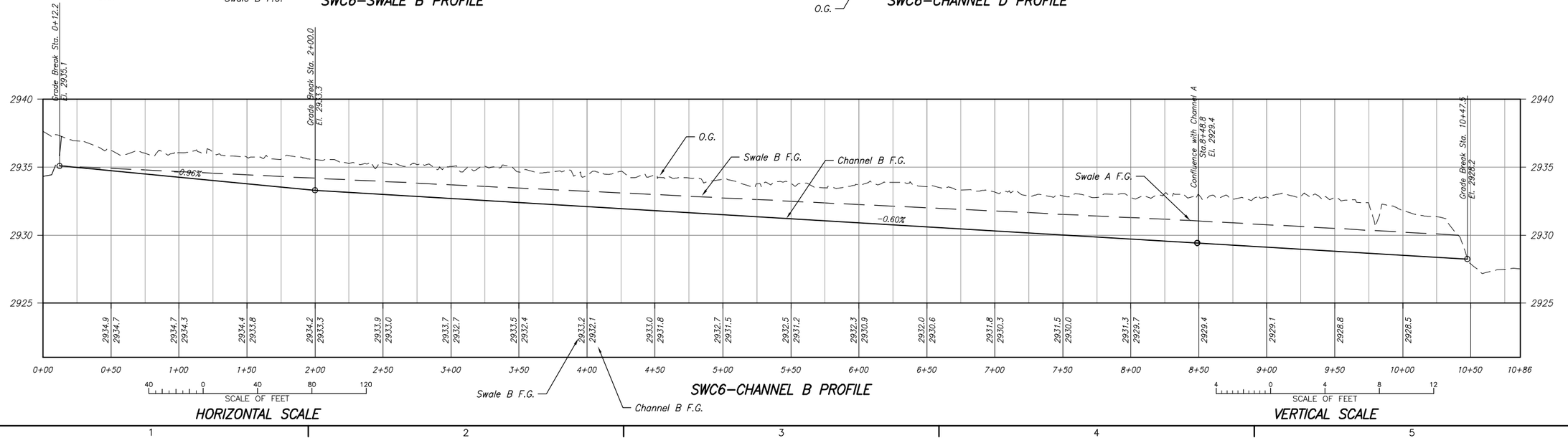




SWC6–SWALE B PROFILE



SWC6–CHANNEL D PROFILE



SWC6–CHANNEL B PROFILE

HORIZONTAL SCALE

VERTICAL SCALE

NOTES:

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FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN
CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV NO	DATE	DESCRIPTION
1	2015-10-09	Added labels and notes

Jeffrey J Fealko P.E.
DESIGNED
DB/AH/JH
DRAWN
Mike Knutson P.E.
CHECKED
Jeffrey J Fealko P.E.
TECH. APPR.
Steve Montague–Acting
APPROVED
ADMIN. APPROVAL – PROGRAM MANAGER
BOISE, ID 2015-09-14

FLOOD SWALE COMPLEX 6
SWALE B
CHANNEL B
CHANNEL D

PLAN AND PROFILES

1678-100-2111
SHEET 3 OF 4

DATE AND TIME PLOTTED
AUGUST 14, 2015 14:48
PLOTTED BY
AHATCH

CAD SYSTEM
AutoCAD Rel. 20.0s
CAD FILENAME
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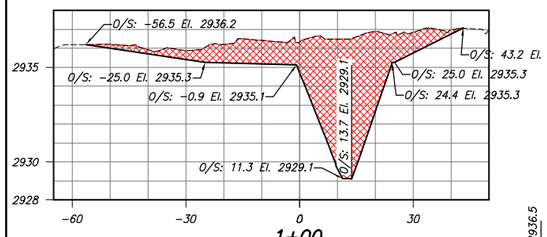

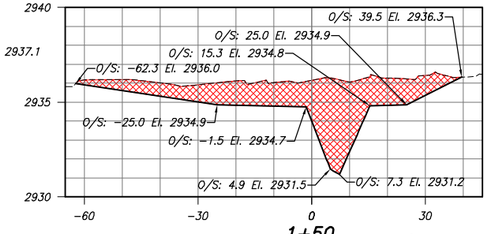

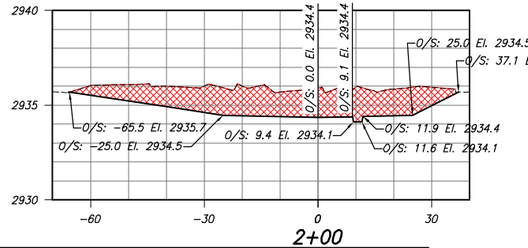

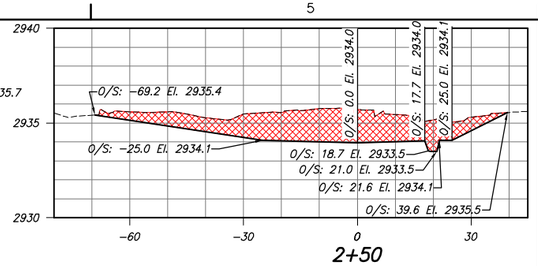

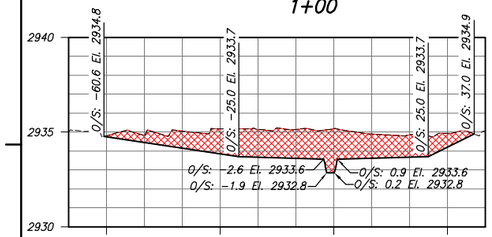

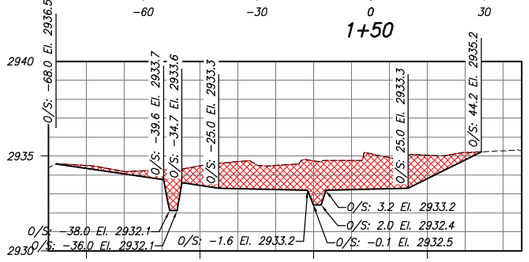

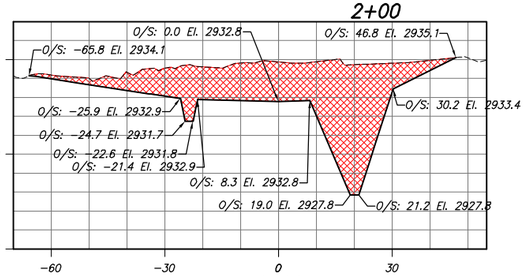

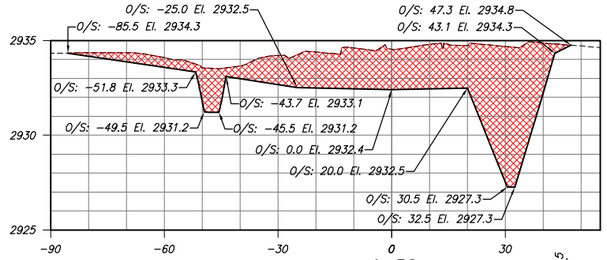

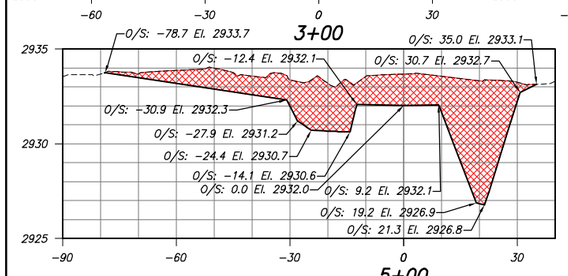

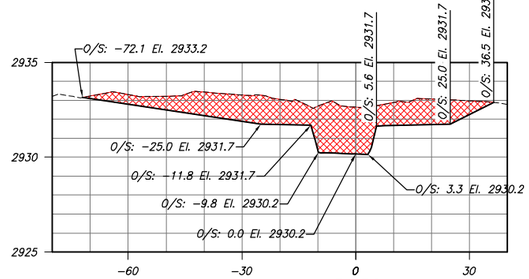

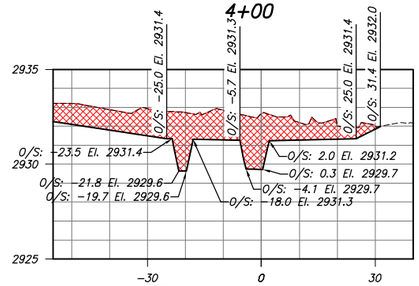

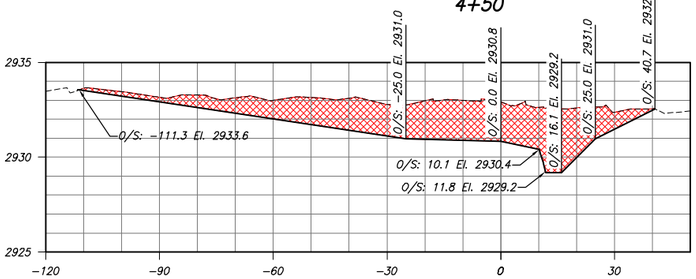

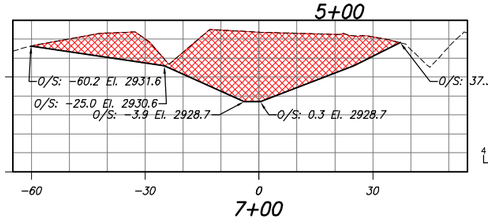

SWALE A CROSS SECTIONS

SCALE OF FEET

VERTICAL SCALE

SCALE OF FEET

HORIZONTAL SCALE

NOTES:

1. Two alignments are shown, one for the swale grading feature, and one for the channel feature.
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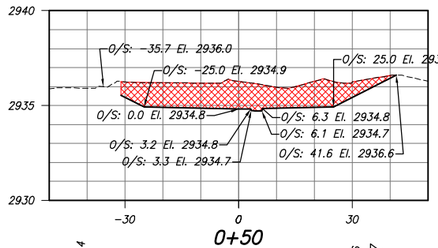

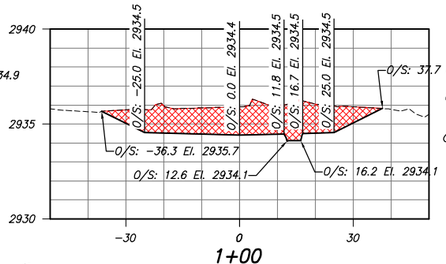

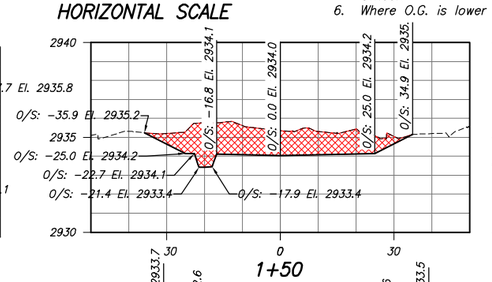

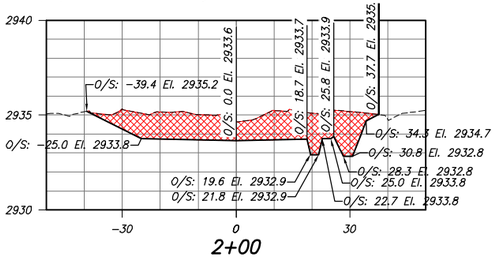

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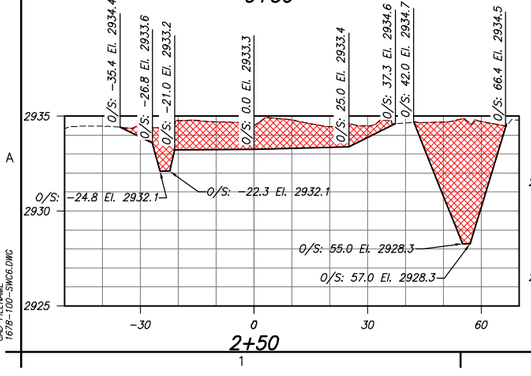
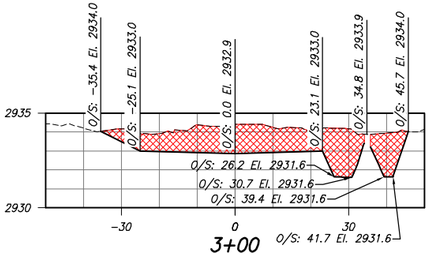
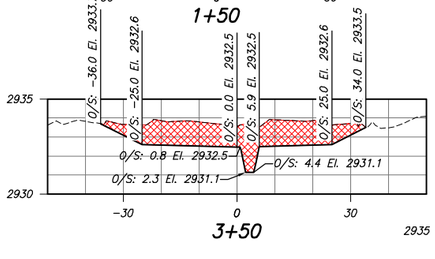
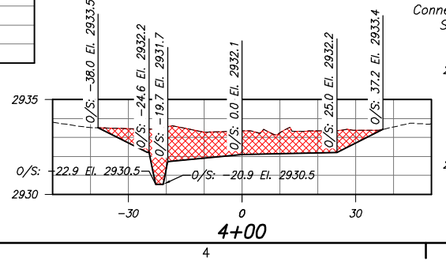
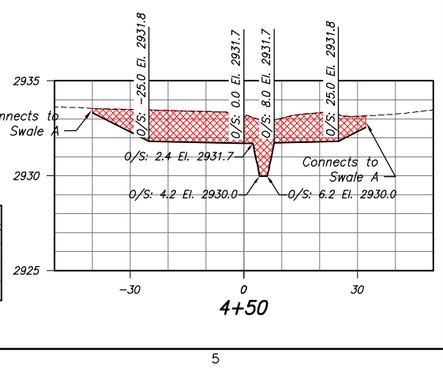
Fill











SWALE B CROSS SECTIONS

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BUREAU OF RECLAMATION
COLUMBIA/SNAKE RIVER SALMON RECOVERY PROGRAM
FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN
CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV. NO.		
1	2015-10-09	100 Added notes
	Jeffrey J Fealko P.E.	

Jeffrey J Fealko P.E.
DESIGNED
DB/AH/JH
DRAWN
Mike Knutson P.E.
CHECKED
Jeffrey J Fealko P.E.
TECH. APPR.
Steve Montague-Acting
APPROVED
ADMIN APPROVAL - PROGRAM MANAGER
BOISE, ID
2015-09-14

FLOOD SWALE COMPLEX 6

CROSS SECTIONS

1678-100-2112

SHEET 4 OF 4

DATE AND TIME PLOTTED
AUGUST 14, 2015 15:04
PLOTTED BY
AHATCH

CAD SYSTEM
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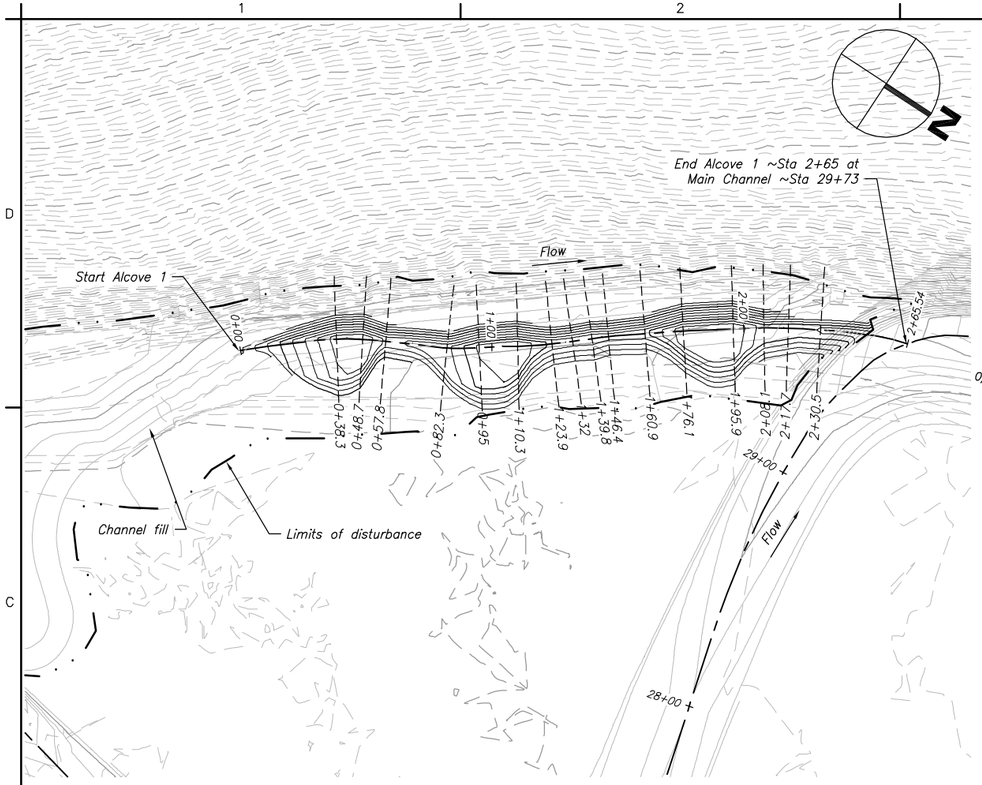
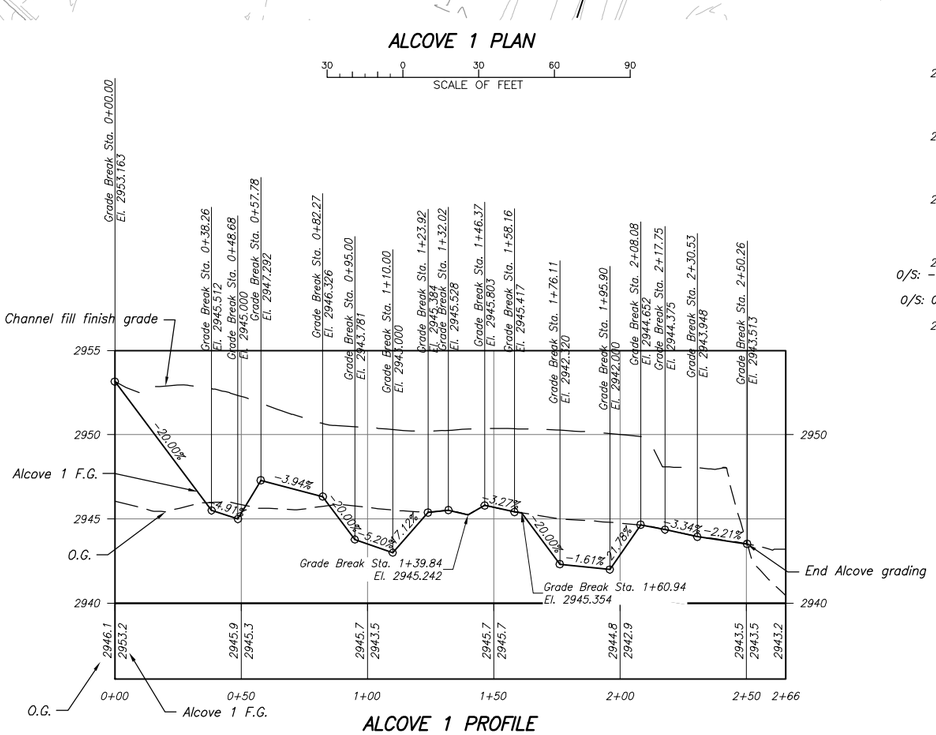
CAD FILENAME
1678-100-SWC6.DWG



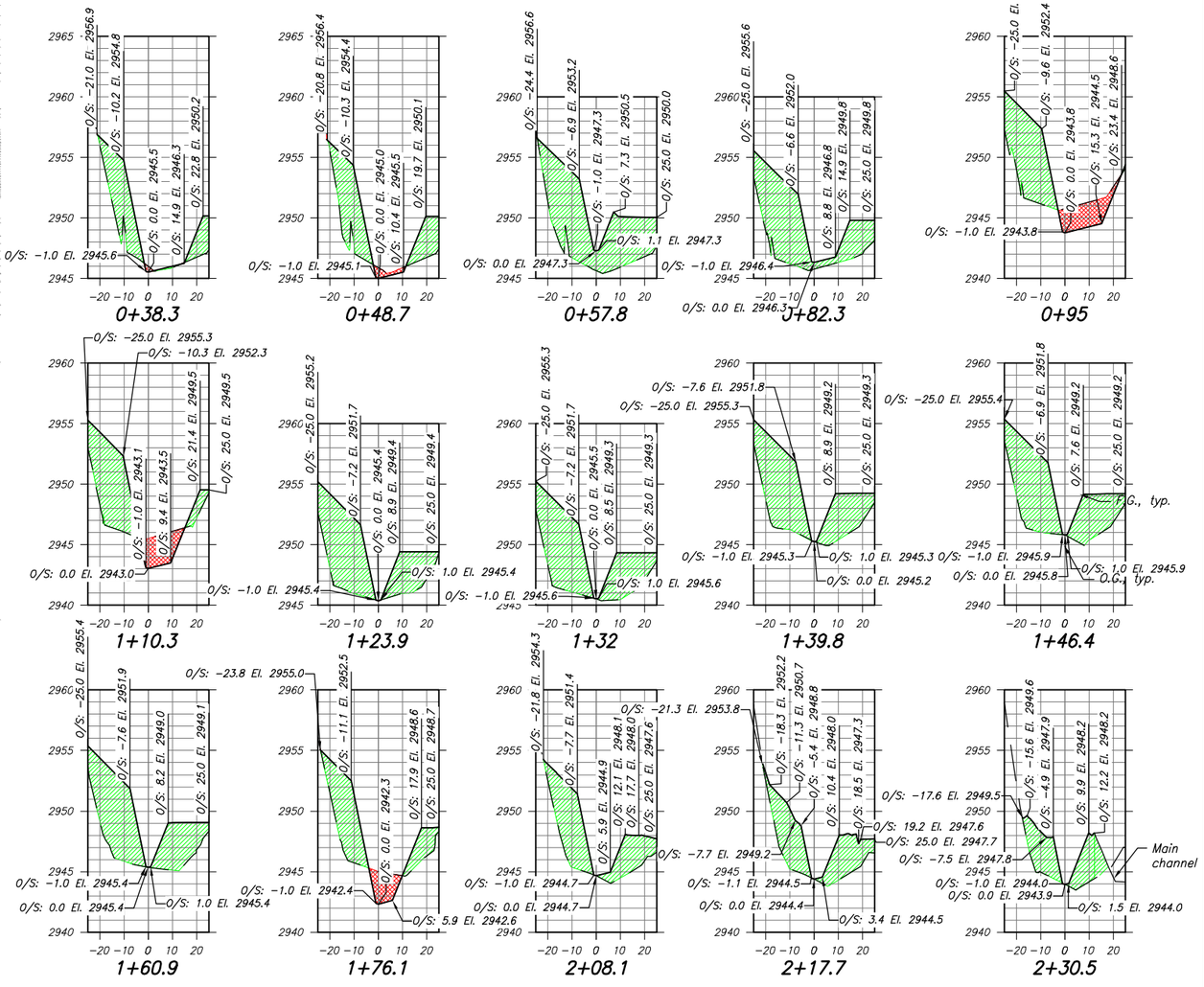
ALCOVE 1 PLAN

SCALE OF FEET 30 0 30 60 90



ALCOVE 1 PROFILE

SCALE OF FEET 30 0 30 60 90



ALCOVE 1 SECTIONS

SCALE OF FEET 30 0 30 60 90

Notes

1. Cross sections face downstream. Cross section centerline station is located along the thalweg alignment.
2. Y-axis is elevation, X-axis is distance in feet along a chord perpendicular to the thalweg. The zero station shown on these cross sections represents the thalweg alignment.
3. Constructed channel shall transition smoothly between cross sectional geometries shown within these cross sections. Cross section geometry shown represents one point in a smooth transition.
4. Cross-sections are to be used to stake out the channel offsets at the vertical grade breaks of the channel profile.

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FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN
CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV. NO.		
1	2015-10-09	100 Added plan view stationing, sample lines, labels, and corrected linetypes
		Jeffrey J Fealko P.E.

Jeffrey J. Fealko, P.E.
DESIGNED
KK
DRAWN
Mike Knutson, P.E.
CHECKED
Jeffrey J. Fealko, P.E.
TECH. APPR.
Steve Montague-Acting
APPROVED
ADMIN APPROVAL - PROGRAM MANAGER
BOISE, IDAHO 2015-09-14

ALCOVE 1

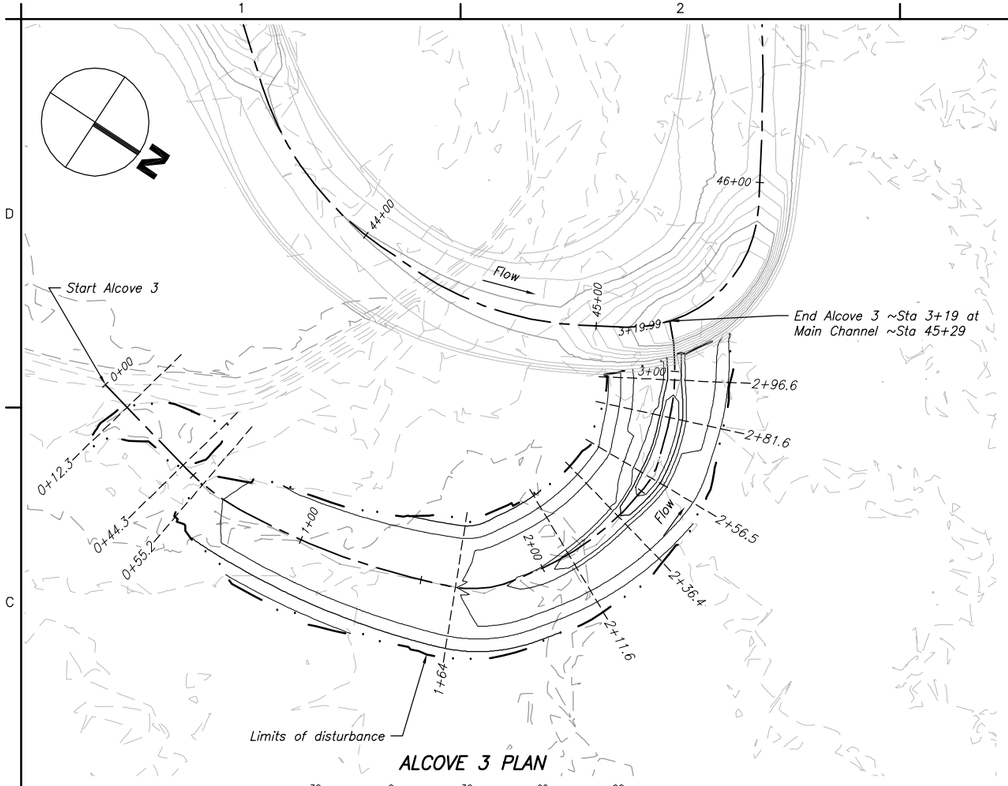
PLAN, PROFILE, AND SECTIONS

1678-100-2113

SHEET 1 OF 1

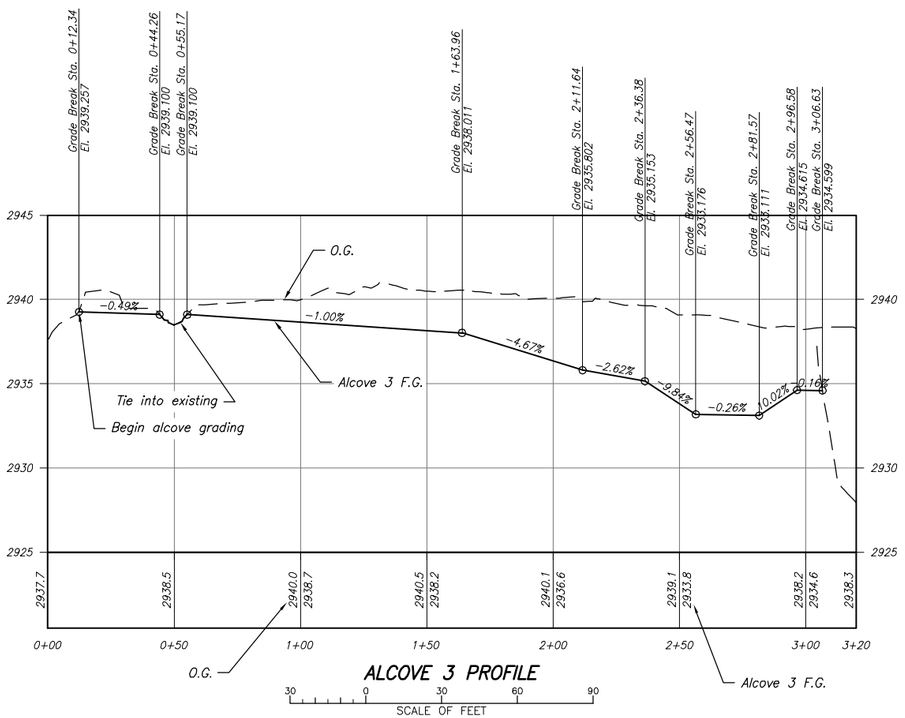
DATE AND TIME PLOTTED
AUGUST 14, 2015 12:21
PLOTTED BY
KKORTHALS

CAD SYSTEM
AutoCAD Rel. 20.0s
CAD FILENAME
1678-100-AC.DWG



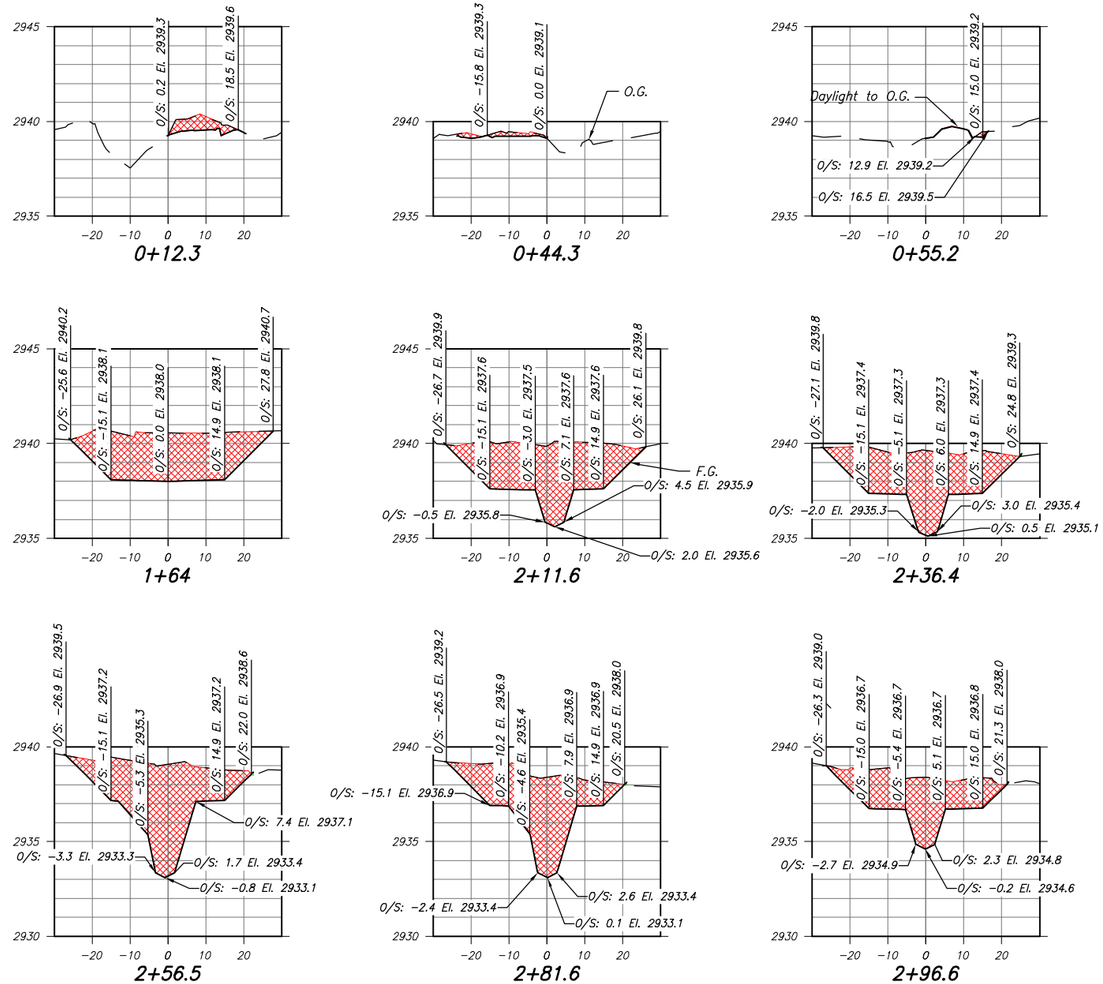
ALCOVE 3 PLAN

SCALE OF FEET



ALCOVE 3 PROFILE

SCALE OF FEET



ALCOVE 3 SECTIONS

SCALE OF FEET

Cut

Fill

NOTES:

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FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN
CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REV NO		
1	2015-10-09	Updated with new sections sampled at profile grade breaks and added labels. Jeffrey J Fealko P.E.

DESIGNED	Jeffrey J. Fealko, P.E.
DRAWN	KK
CHECKED	Mike Knutson, P.E.
TECH. APPR.	Jeffrey J. Fealko, P.E.
APPROVED ADMIN. APPROVAL - PROGRAM MANAGER	Steve Montague-Acting
BOISE, IDAHO	2015-09-14

ALCOVE 3

PLAN, PROFILE, AND SECTIONS

1678-100-2114

SHEET 1 OF 1

DATE AND TIME PLOTTED
AUGUST 14, 2015 15:56
PLOTTED BY
JHOVDE

CAD SYSTEM
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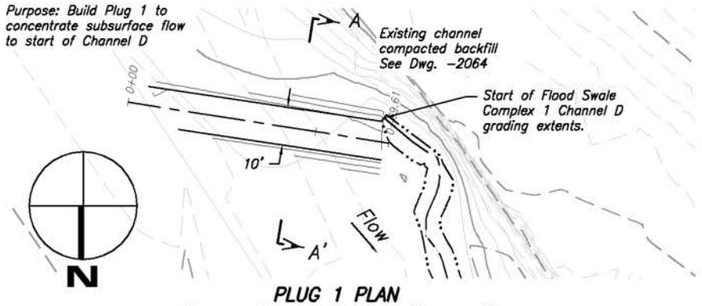
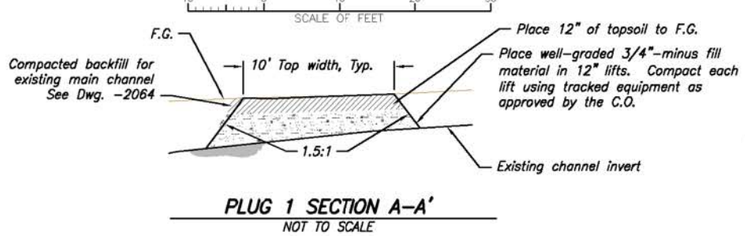
CAD FILENAME
1678-100-AC.DWG



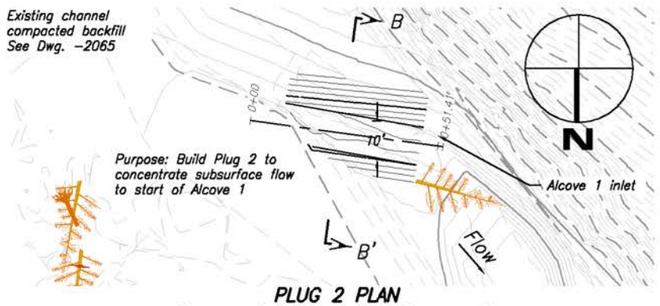
PLUG 1 PLAN

10 0 10 20 30
SCALE OF FEET



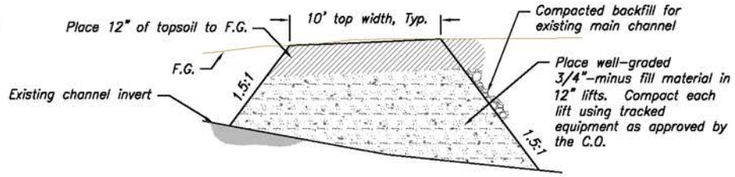
PLUG 1 SECTION A–A'

NOT TO SCALE



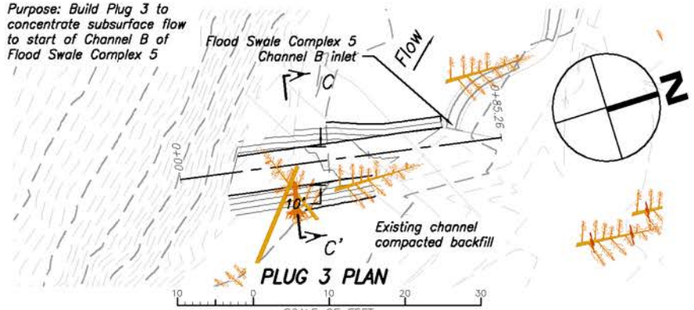
PLUG 2 PLAN

10 0 10 20 30
SCALE OF FEET



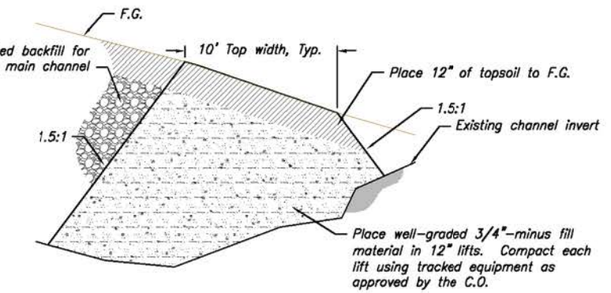
PLUG 2 SECTION B–B'

NOT TO SCALE



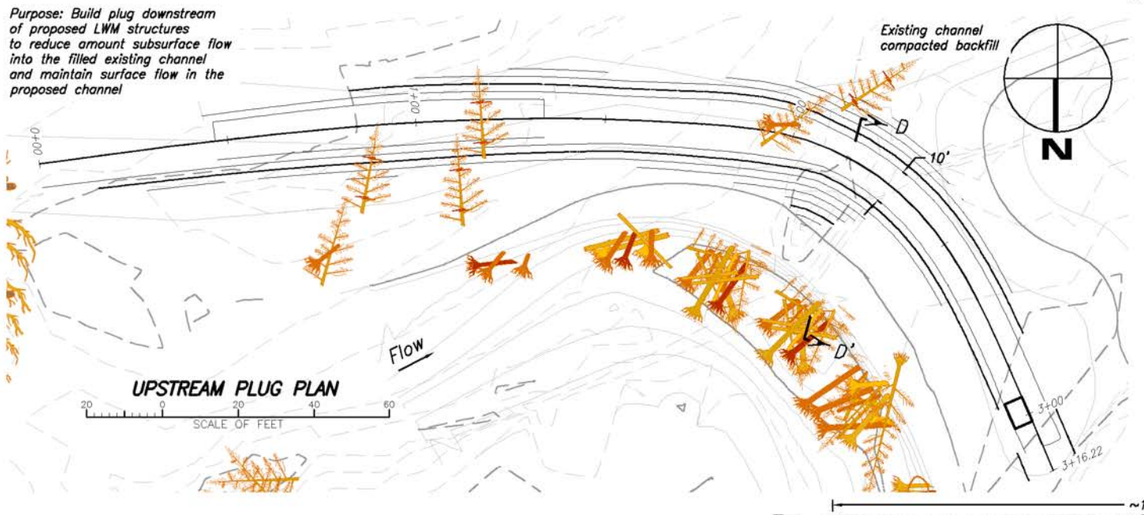
PLUG 3 PLAN

10 0 10 20 30
SCALE OF FEET



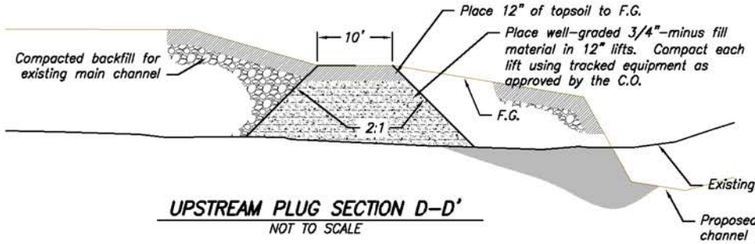
PLUG 3 SECTION C–C'

NOT TO SCALE



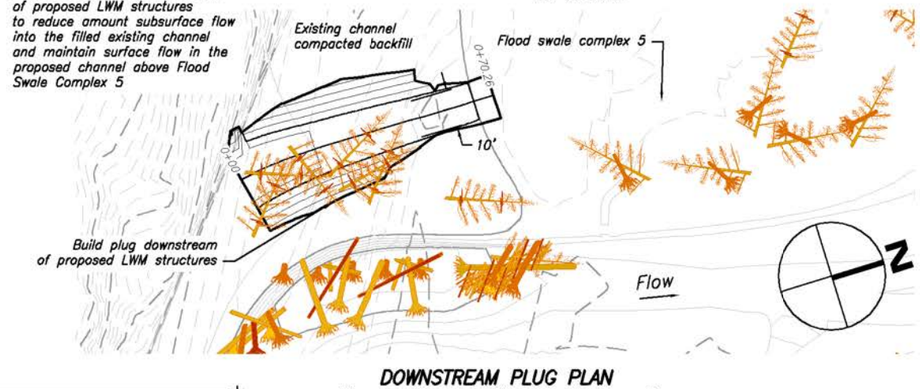
UPSTREAM PLUG PLAN

20 0 20 40 60
SCALE OF FEET



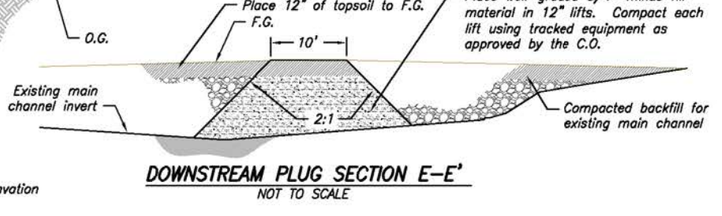
UPSTREAM PLUG SECTION D–D'

NOT TO SCALE



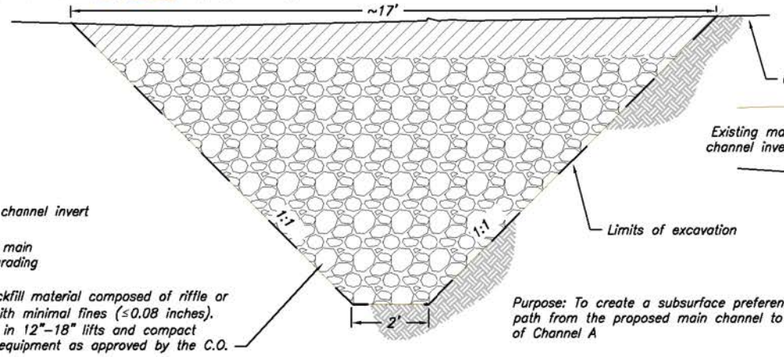
DOWNSTREAM PLUG PLAN

20 0 20 40 60
SCALE OF FEET



DOWNSTREAM PLUG SECTION E–E'

NOT TO SCALE



Compacted backfill material composed of riffle or bar material with minimal fines (≤0.08 inches). Place material in 12"–18" lifts and compact using tracked equipment as approved by the C.O.

Purpose: To create a subsurface preferential flow path from the proposed main channel to the inlet of Channel A

BLIND CHANNEL
FLOOD SWALE COMPLEX 6 SWALE A/CHANNEL A
TYPICAL SECTION

NOT TO SCALE

BLIND CHANNEL NOTES:

1. Excavate blind channel along Flood Swale 6 Swale A alignment with typical section shown in this drawing.
2. Backfill material shall be gravel/cobble mix with no more than 5% fines from excavated channel material.
3. Place specified backfill up to match existing floodplain elevation.
4. Place material in 12" lifts and compact
5. using tracked equipment as approved by the C.O.

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FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN

CC–44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

BY	DATE	REVISION
1	2015–10–09	100 Added flow arrows and updated blind channel notes
		Jeffrey J Fealko P.E.

Jeffrey J. Fealko, P.E.
DESIGNED
DB
DRAWN
Mike Knutson, P.E.
CHECKED
Jeffrey J. Fealko, P.E.
TECH. APPR.
Steve Montague, P.E. – Acting
APPROVED
ADMIN. APPROVAL – PROGRAM MANAGER
BOISE, ID 2015–09–14

EXISTING CHANNEL FILL PLUGS AND BLIND CHANNEL

DETAILS

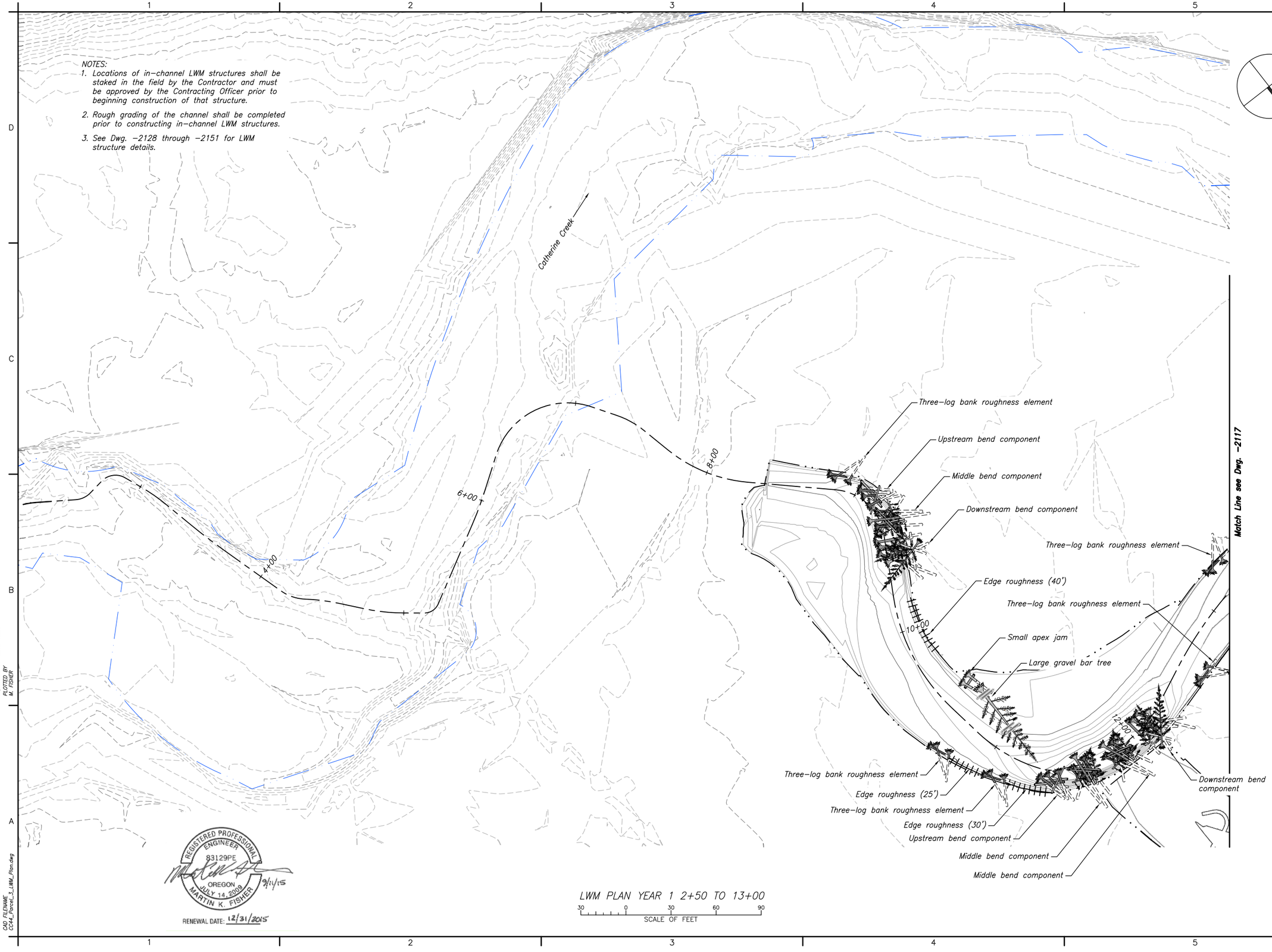
1678–100–2115

SHEET 1 OF 1

DATE AND TIME PLOTTED
Not Plotted
PLOTTED BY
Not Plotted

CAD SYSTEM
AUTOCAD
CAD FILENAME
UNKNOWN

NOTES:
1. Locations of in-channel LWM structures shall be staked in the field by the Contractor and must be approved by the Contracting Officer prior to beginning construction of that structure.
2. Rough grading of the channel shall be completed prior to constructing in-channel LWM structures.
3. See Dwg. -2128 through -2151 for LWM structure details.



LWM PLAN YEAR 1 2+50 TO 13+00

30 0 30 60 90
SCALE OF FEET

REGISTERED PROFESSIONAL ENGINEER
83129PE
OREGON
JULY 14, 2009
MARTIN K. FISHER
9/11/15
RENEWAL DATE: 12/31/2015

DATE AND TIME PLOTTED: September 11, 2015 15:01
PLOTTED BY: M. FISHER

CAD SYSTEM: AutoCAD Civil 3D 2014
CAD FILENAME: CC44_Parcel_3_LWM_Plan.dwg

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CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

N. TRUSCOTT
DRAWN

X Jay Hovde
ACCEPTED

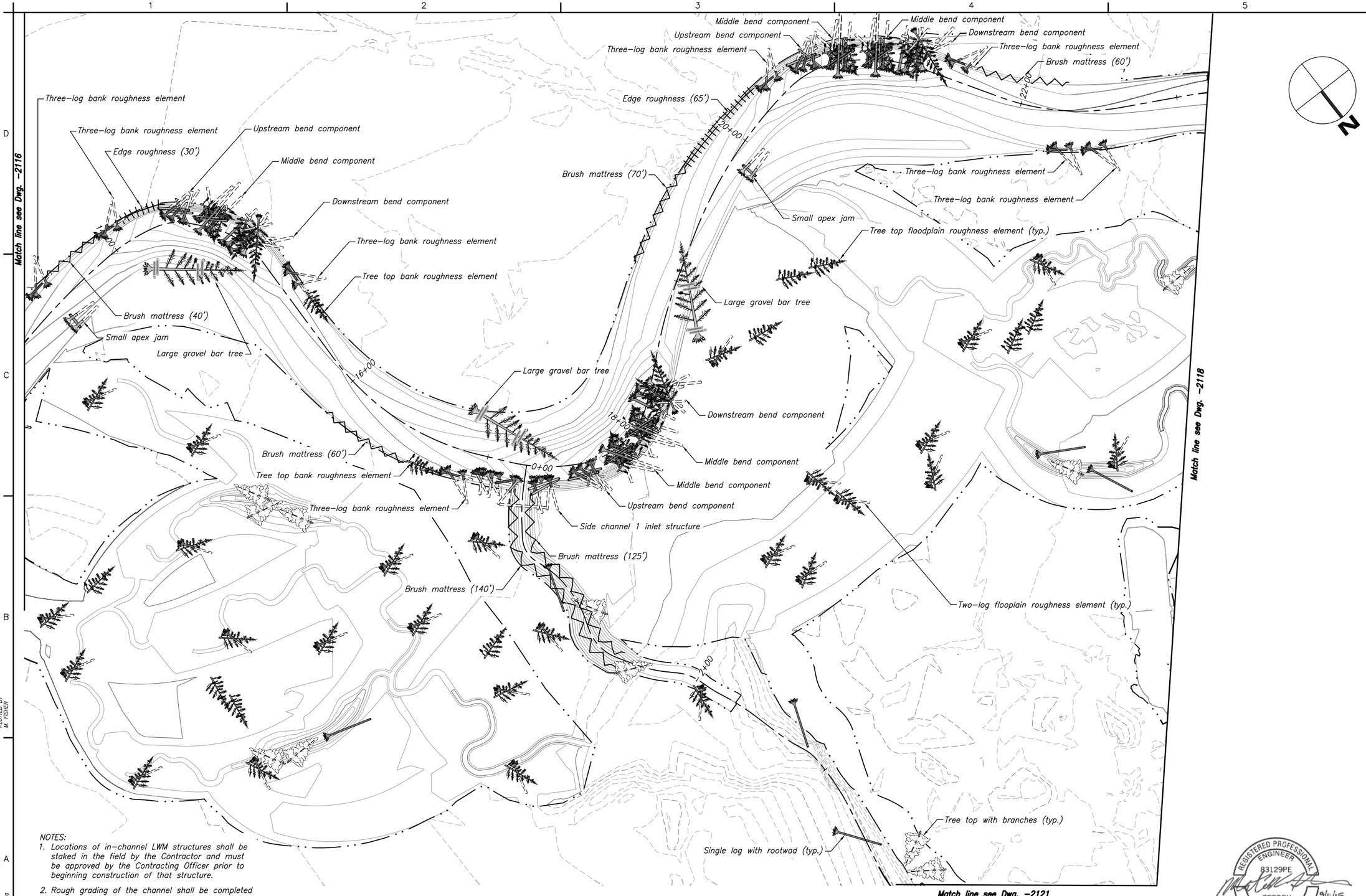
BOISE, ID 2015-09-11

LWM PLAN

YEAR 1
2+50 TO 13+00

1678-100-2116

SHEET 1 OF 12



NOTES:

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2. Rough grading of the channel shall be completed prior to constructing in-channel LWM structures.
3. See Dwg. -2128 through -2151 for LWM structure details.
4. Floodplain and side channel LWM shall be placed as directed by the Contracting Officer; no survey staking is required.

LWM PLAN YEAR 1 13+00 TO 23+00

30 0 30 60 90

SCALE OF FEET

REGISTERED PROFESSIONAL ENGINEER
83129PE
OREGON
JULY 14, 2009
MARTIN K. FISHER
9/11/15

RENEWAL DATE: 12/31/2015

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GRANDE RONDE SUBBASIN

CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

N. TRUSCOTT
DRAWN

X Jay Hovde
ACCEPTED

BOISE, ID 2015-09-11

LWM PLAN

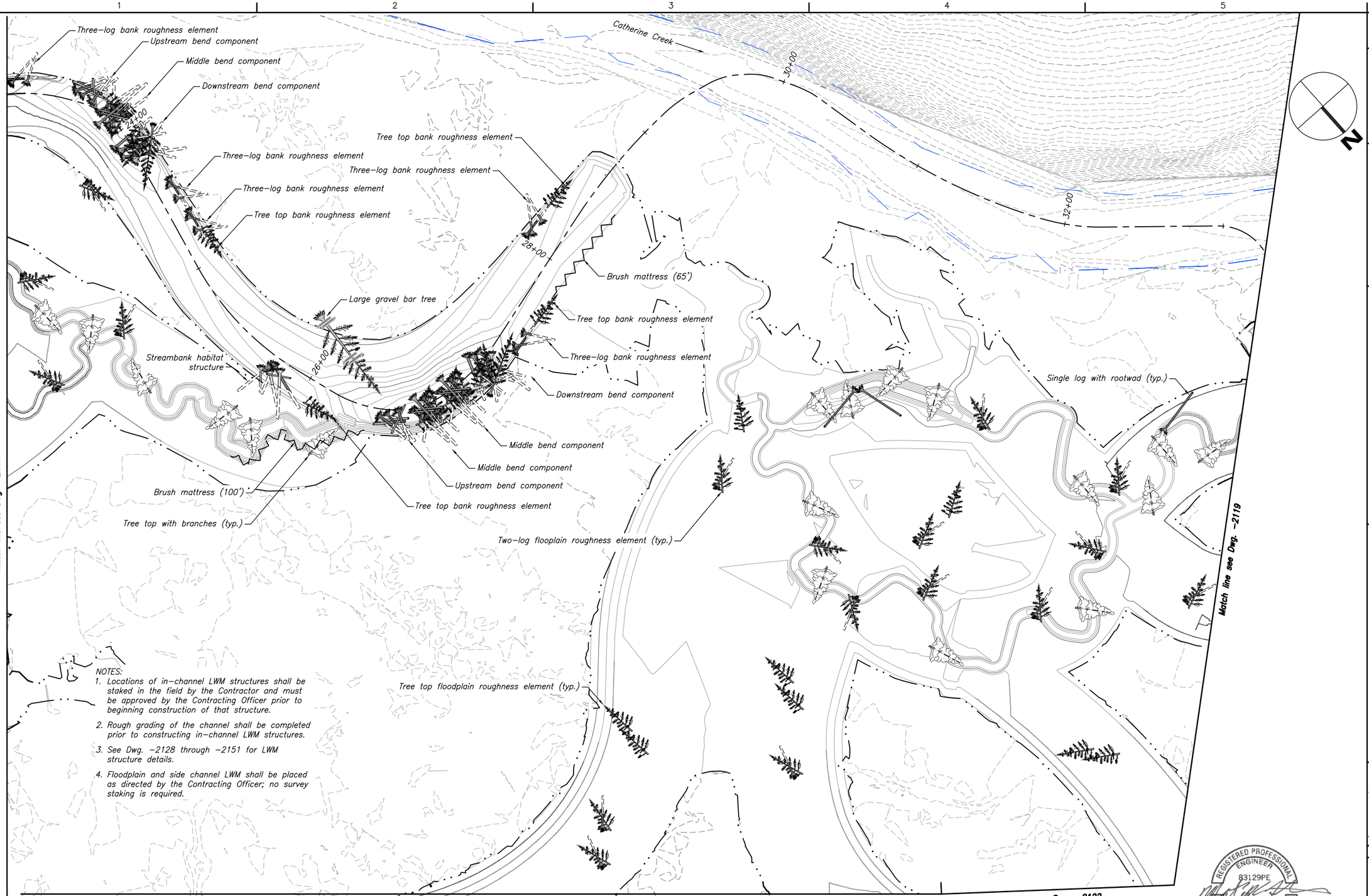
YEAR 1
13+00 TO 23+00

1678-100-2117

SHEET 2 OF 12

DATE AND TIME PLOTTED
September 11, 2015 15:01
PLOTTED BY
M. FISHER

CAD SYSTEM
AutoCAD Civil 3D 2014
CAD FILENAME
CC44_Parcel_3_LWM_Plan.dwg



NOTES:

1. Locations of in–channel LWM structures shall be staked in the field by the Contractor and must be approved by the Contracting Officer prior to beginning construction of that structure.
2. Rough grading of the channel shall be completed prior to constructing in–channel LWM structures.
3. See Dwg. –2128 through –2151 for LWM structure details.
4. Floodplain and side channel LWM shall be placed as directed by the Contracting Officer; no survey staking is required.

LWM PLAN YEAR 1 23+00 TO 33+00

30 0 30 60 90
SCALE OF FEET

REGISTERED PROFESSIONAL ENGINEER
83129PE
OREGON
JULY 14, 2006
MARTIN K. FISHER
9/11/15

RENEWAL DATE: 12/31/2015

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GRANDE RONDE SUBBASIN
CC–44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

N. TRUSCOTT
DRAWN

x Jay Hovde
ACCEPTED

BOISE, ID 2015–09–11

LWM PLAN

YEAR 1
23+00 TO 33+00

1678–100–2118

SHEET 3 OF 12

DATE AND TIME PLOTTED
September 11, 2015 15:01
PLOTTED BY
M. FISHER

CAD SYSTEM
AutoCAD Civil 3D 2014
CAD FILENAME
CC44_Parcel_3_LWM_Plan.dwg

NOTES:
1. Locations of in-channel LWM structures shall be staked in the field by the Contractor and must be approved by the Contracting Officer prior to beginning construction of that structure.
2. Rough grading of the channel shall be completed prior to constructing in-channel LWM structures.
3. See Dwg. -2128 through -2151 for LWM structure details.
4. Floodplain and side channel LWM shall be placed as directed by the Contracting Officer; no survey staking is required.

Catherine Creek

N

34+00
36+00
38+00
40+00
42+00
44+00
20+00
22+00
18+00

Middle bend component
Upstream bend component
Three-log bank roughness element
Middle bend component
Downstream bend component
Edge roughness (65')
Tree top bank roughness element
Tree top bank roughness element
Three-log bank roughness element
Three-log bank roughness element
Brush mattress (60')
Sweeper log structure
Two-log floodplain roughness element (typ.)
Three-log bank roughness element
Three-log bank roughness element
Downstream bend component
Brush mattress (90')
Three-log bank roughness element
Middle bend component
Middle bend component
Brush mattress (25')
Tree top floodplain roughness element (typ.)
Three-log bank roughness element
Three-log bank roughness element
Edge roughness (55')
Upstream bend component
High energy bank structure
Large gravel bar tree
Large gravel bar tree
Sweeper log structure
Sweeper log structure
High energy bank structure
Upstream bend component
Edge roughness (55')
Large gravel bar tree
Three-log bank roughness element
Tree top with branches (typ.)
Single log with rootwad (typ.)

Match line see Dwg. -2118

Match line see Dwg. -2120

Match line see Dwg. -2122

LWM PLAN YEAR 1 33+00 TO 44+50

30 0 30 60 90
SCALE OF FEET

REGISTERED PROFESSIONAL ENGINEER
83129PE
OREGON
JULY 14, 2009
MARTIN K. FISHER
9/11/15
RENEWAL DATE: 12/31/2015

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GRANDE RONDE SUBBASIN

CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

N. TRUSCOTT
DRAWN

x Jay Hovde
ACCEPTED

BOISE, ID 2015-09-11

LWM PLAN

YEAR 1
33+00 TO 44+50

1678-100-2119

SHEET 4 OF 12

DATE AND TIME PLOTTED
September 11, 2015 15:01
PLOTTED BY
M. FISHER

CAD SYSTEM
AutoCAD Civil 3D 2014
CAD FILENAME
CC44_Parcel_3_LWM_Plan.dwg

Catherine Creek

50+00

48+00

46+00

High energy bank structure

Middle bend component

Upstream bend component

Three–log bank roughness element

Three–log bank roughness element

Large gravel bar tree

Small apex jam

Tree top bank roughness element

Three–log bank roughness element

Brush mattress (50')

Large gravel bar tree

Edge roughness (40')

Downstream bend component

Middle bend component

Upstream bend component

Three log bank roughness element

Streambank habitat structure

Edge roughness (60')

Tree top floodplain roughness element (typ.)

Tree top with branches (typ.)

Two–log floodplain roughness element (typ.)

Match line see Dwg. –2119

N

NOTES:

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2. Rough grading of the channel shall be completed prior to constructing in–channel LWM structures.
3. See Dwg. –2128 through –2151 for LWM structure details.
4. Floodplain and side channel LWM shall be placed as directed by the Contracting Officer; no survey staking is required.

REGISTERED PROFESSIONAL ENGINEER
83129PE
OREGON
JULY 14, 2006
MARTIN K. FISHER
9/14/15

RENEWAL DATE: 12/31/2015

LWM PLAN YEAR 1 44+50 TO 51+00

30 0 30 60 90
SCALE OF FEET

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September 11, 2015 15:01
PLOTTED BY
M. FISHER

CAD SYSTEM
AutoCAD Civil 3D 2014
CAD FILENAME
CC44_Parcel_3_LWM_Plan.dwg

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GRANDE RONDE SUBBASIN

CC–44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

N. TRUSCOTT
DRAWN

X Jay Hovde
ACCEPTED

BOISE, ID 2015–09–11

LWM PLAN

YEAR 1
44+50 TO 51+00

1678–100–2120

SHEET 5 OF 12

Match line see Dwg. –2117

Match line see Dwg. –2118

4+00

6+00

8+00

10+00

12+00

Tree top with branches (typ.)

Single log with rootwad (typ.)

Two–log floodplain roughness element (typ.)

Tree top floodplain roughness element (typ.)

Small apex jam

N

Match line see Dwg. –2122

NOTES:
1. See Dwg. –2128 through –2151 for LWM structure details.
2. Floodplain and side channel LWM shall be placed as directed by the Contracting Officer; no survey staking is required.

REGISTERED PROFESSIONAL ENGINEER
83129PE
OREGON
JULY 14, 2006
MARTIN K. FISHER
3/11/15

RENEWAL DATE: 12/31/2015

LWM PLAN YEAR 1 SIDE CHANNEL 1

30 0 30 60 90
SCALE OF FEET

DATE AND TIME PLOTTED
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PLOTTED BY
M. FISHER

CAD SYSTEM
AutoCAD Civil 3D 2014
CAD FILENAME
CC44_Parcel_3_LWM_Plan.dwg

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CC–44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

N. TRUSCOTT
DRAWN

X Jay Hovde
ACCEPTED

BOISE, ID 2015–09–11

LWM PLAN

YEAR 1
SIDE CHANNEL 1

1678–100–2121

SHEET 6 OF 12

Match line see Dwg. –2118

Match line see Dwg. –2119

Match line see Dwg. –2121

14+00

16+00

Single log with rootwad (typ.)

Tree top with branches (typ.)

NOTES:
1. See Dwg. –2128 through –2151 for LWM structure details.
2. Floodplain and side channel LWM shall be placed as directed by the Contracting Officer; no survey staking is required.

LWM PLAN YEAR 1 SIDE CHANNEL 1

30 0 30 60 90
SCALE OF FEET

REGISTERED PROFESSIONAL ENGINEER
83129PE
OREGON
JULY 14, 2009
MARTIN K. FISHER
9/14/15
RENEWAL DATE: 12/31/2015

N

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GRANDE RONDE SUBBASIN

CC–44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

N. TRUSCOTT
DRAWN

X Jay Hovde
ACCEPTED

BOISE, ID 2015–09–11

LWM PLAN

YEAR 1
SIDE CHANNEL 1

1678–100–2122

SHEET 7 OF 12

DATE AND TIME PLOTTED
September 11, 2015 15:02
PLOTTED BY
M. FISHER

CAD SYSTEM
AutoCAD Civil 3D 2014
CAD FILENAME
CC44_Parcel_3_LWM_Plan.dwg

Tree top floodplain roughness element (typ.)

Two–log floodplain roughness element (typ.)

Middle bend component

Middle bend component

Upstream bend component

Three log bank roughness element

Three log bank roughness element

Downstream bend component

Streambank habitat structure

Edge roughness (55')

8+00

6+00

4+00

Large gravel bar tree

Brush mattress (80')

Large gravel bar tree

Place 4 full trees 25' (min.) length with branches on top of existing LWM jam as directed by the C.O., no excavation shall be preformed, care shall be taken to avoid damage to existing trees and the existing LWM jam.

Upstream bend component

Upstream bend component

Tree top with branches (typ.)

14+00

10+00

12+00

Year 1 LWM structure (typ.)

Match line see Dwg. –2124

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3. See Dwg. –2128 through –2151 for LWM structure details.
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LWM PLAN YEAR 2 3+00 TO 14+25

30 0 30 60 90

SCALE OF FEET

REGISTERED PROFESSIONAL ENGINEER
83129PE
OREGON
JULY 14, 2009
MARTIN K. FISHER
9/11/15

RENEWAL DATE: 12/31/2015

DATE AND TIME PLOTTED
September 11, 2015 15:08
PLOTTED BY
M. FISHER

CAD SYSTEM
AutoCAD Civil 3D 2014
CAD FILENAME
CC44_Parcel_3_LWM_Plan_Yr2.dwg

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GRANDE RONDE SUBBASIN
CC–44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

N. TRUSCOTT
DRAWN

x Jay Hovde
ACCEPTED

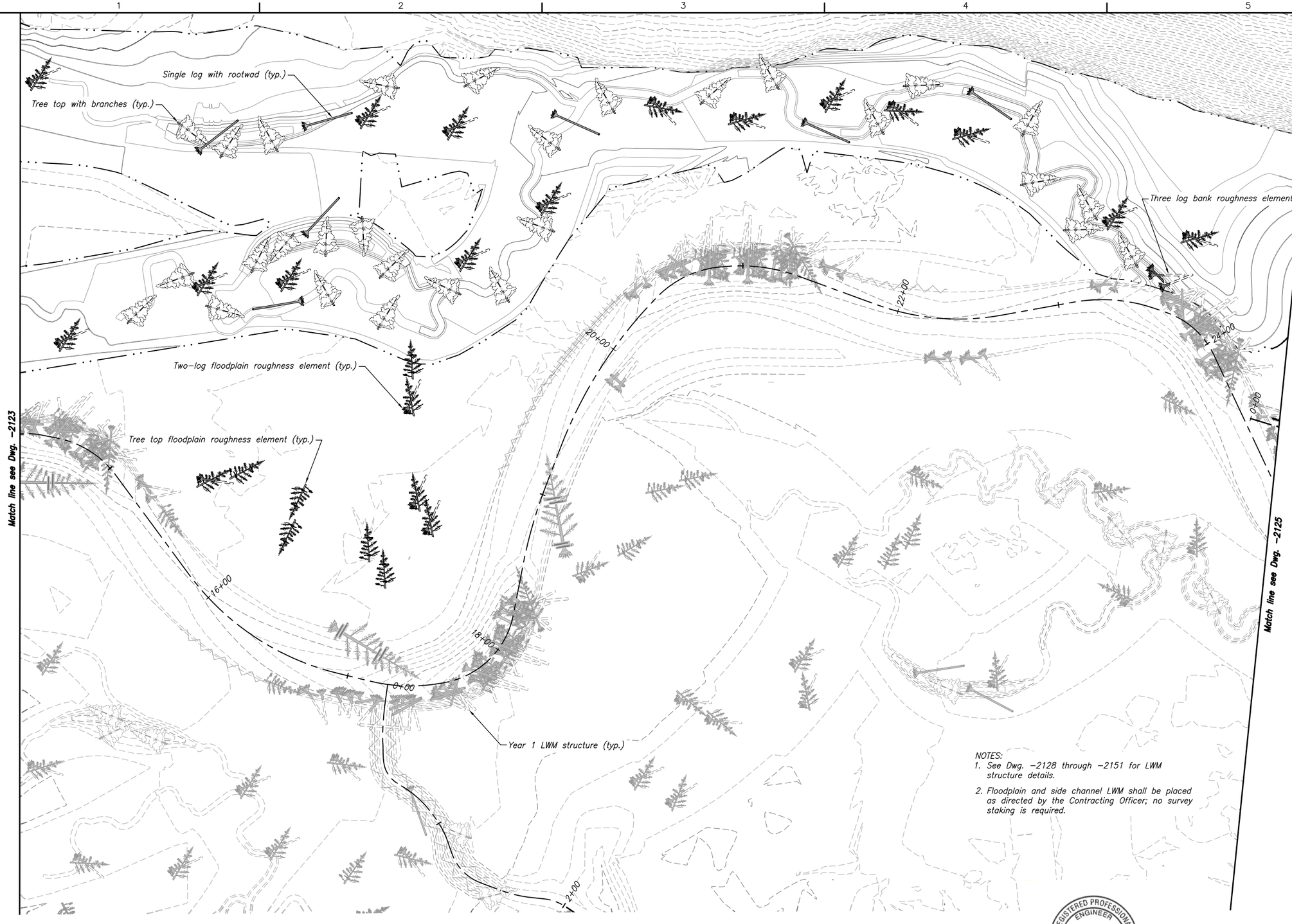
BOISE, ID 2015–09–11

LWM PLAN

YEAR 2
3+00 TO 14+25

1678–100–2123

SHEET 8 OF 12



NOTES:
1. See Dwg. -2128 through -2151 for LWM structure details.
2. Floodplain and side channel LWM shall be placed as directed by the Contracting Officer; no survey staking is required.

LWM PLAN YEAR 2 14+25 TO 25+00

SCALE OF FEET: 30 0 30 60 90

REGISTERED PROFESSIONAL ENGINEER
83129PE
OREGON
JULY 14, 2009
MARTIN K. FISHER
9/14/15

RENEWAL DATE: 12/31/2015

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GRANDE RONDE SUBBASIN

CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

N. TRUSCOTT
DRAWN

x Jay Hovde
ACCEPTED

BOISE, ID 2015-09-11

LWM PLAN

YEAR 2
14+25 TO 25+00

1678-100-2124

SHEET 9 OF 12

DATE AND TIME PLOTTED
September 11, 2015 15:09
PLOTTED BY
M. FISHER

CAD SYSTEM
AutoCAD Civil 3D 2014
CAD FILENAME
CC44_Parcel_3_LWM_Plan_Yr2.dwg

NOTES:
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N

Single log with rootwad (typ.)
Tree top with branches (typ.)
Streambank habitat structure
Two-log floodplain roughness element (typ.)
Three log bank roughness element
Sweeper log structure
30+00
Habitat boulder, 2'-4' diameter, embed ⅓ - ½ of diameter (12 total this sheet)
32+00
Upstream bend component
Field-fit on-site walnut tree
Edge roughness (50')
Brush mattress (40')
Field-fit on-site walnut tree
Tree top floodplain roughness element (typ.)
Brush mattress (45')
Brush mattress (45')
28+00
High energy bank structure
Sweeper log structure
Large gravel bar tree
34+00
Small apex jam
26+00
Year 1 LWM structure (typ.)

Match line see Dwg. -2124

Match line see Dwg. -2126

LWM PLAN YEAR 2 25+00 TO 35+50

30 0 30 60 90
SCALE OF FEET

REGISTERED PROFESSIONAL ENGINEER
63129PE
OREGON
JULY 14, 2009
MARTIN K. FISHER
9/11/15
RENEWAL DATE: 12/31/2015

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Managing Water in the West

ICF INTERNATIONAL

CONFEDERATED TRIBES OF THE UMATILLA INDIAN RESERVATION

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U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
COLUMBIA/SNAKE RIVER SALMON RECOVERY GROUP
FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN
CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

N. TRUSCOTT
DRAWN

X Jay Hovde
ACCEPTED

BOISE, ID 2015-09-11

LWM PLAN

YEAR 2
25+00 TO 35+50

1678-100-2125
SHEET 10 OF 12

DATE AND TIME PLOTTED
September 11, 2015 15:09
PLOTTED BY
M. FISHER

CAD SYSTEM
AutoCAD Civil 3D 2014
CAD FILENAME
CC44_Parcel_3_LWM_Plan_Yr2.dwg

NOTES:
1. See Dwg. –2128 through –2151 for LWM structure details.
2. Floodplain and side channel LWM shall be placed as directed by the Contracting Officer; no survey staking is required.

Match line see Dwg. –2125

Tree top floodplain roughness element (typ.)

Tree top with branches (typ.)

Single log with rootwad (typ.)

Two–log floodplain roughness element (typ.)

Brush mattress (30')

38+00

36+00

40+00

42+00

20+00

Year 1 LWM structure (typ.)

N

REGISTERED PROFESSIONAL ENGINEER
83129PE
OREGON
JULY 14, 2009
MARTIN K. FISHER
9/14/15

RENEWAL DATE: 12/31/2015

LWM PLAN YEAR 2 35+50 TO 44+00

30 0 30 60 90
SCALE OF FEET

RECLAMATION
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CC–44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

N. TRUSCOTT
DRAWN

x Jay Hovde
ACCEPTED

BOISE, ID 2015–09–11

LWM PLAN

YEAR 2
35+50 TO 44+00

1678–100–2126

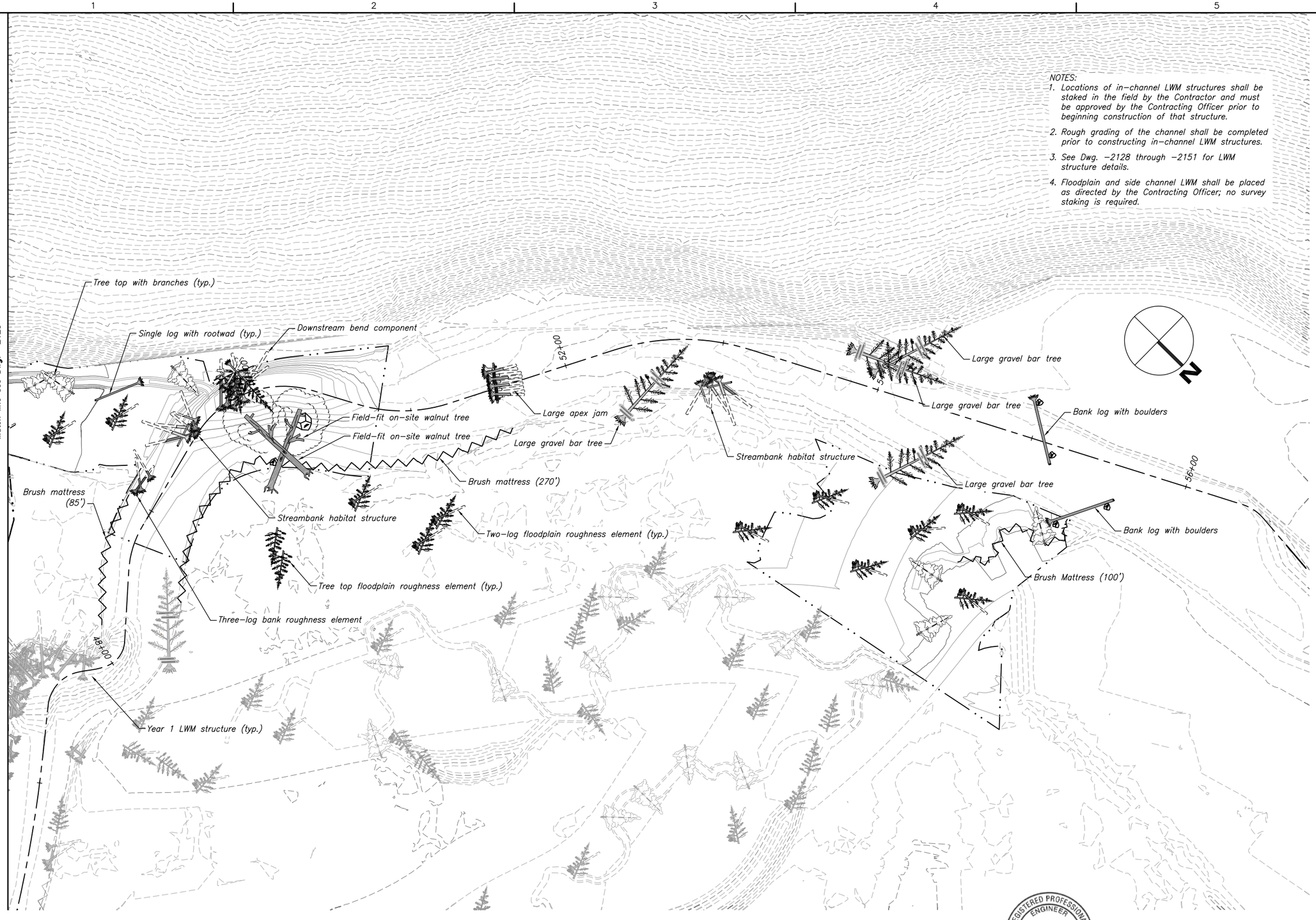
SHEET 11 OF 12

DATE AND TIME PLOTTED
September 11, 2015 15:09
PLOTTED BY
M. FISHER

CAD SYSTEM
AutoCAD Civil 3D 2014
CAD FILENAME
CC44_Parcel_3_LWM_Plan_Yr2.dwg

NOTES:
1. Locations of in-channel LWM structures shall be staked in the field by the Contractor and must be approved by the Contracting Officer prior to beginning construction of that structure.
2. Rough grading of the channel shall be completed prior to constructing in-channel LWM structures.
3. See Dwg. -2128 through -2151 for LWM structure details.
4. Floodplain and side channel LWM shall be placed as directed by the Contracting Officer; no survey staking is required.

Match line see Dwg. -2125



LWM PLAN YEAR 2 46+25 TO 57+00

30 0 30 60 90
SCALE OF FEET

REGISTERED PROFESSIONAL ENGINEER
83129PE
OREGON
JULY 14, 2006
MARTIN K. FISHER
9/11/15

RENEWAL DATE: 12/31/2015

RECLAMATION
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GRANDE RONDE SUBBASIN

CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

N. TRUSCOTT
DRAWN

X Jay Hovde
ACCEPTED

BOISE, ID 2015-09-11

LWM PLAN

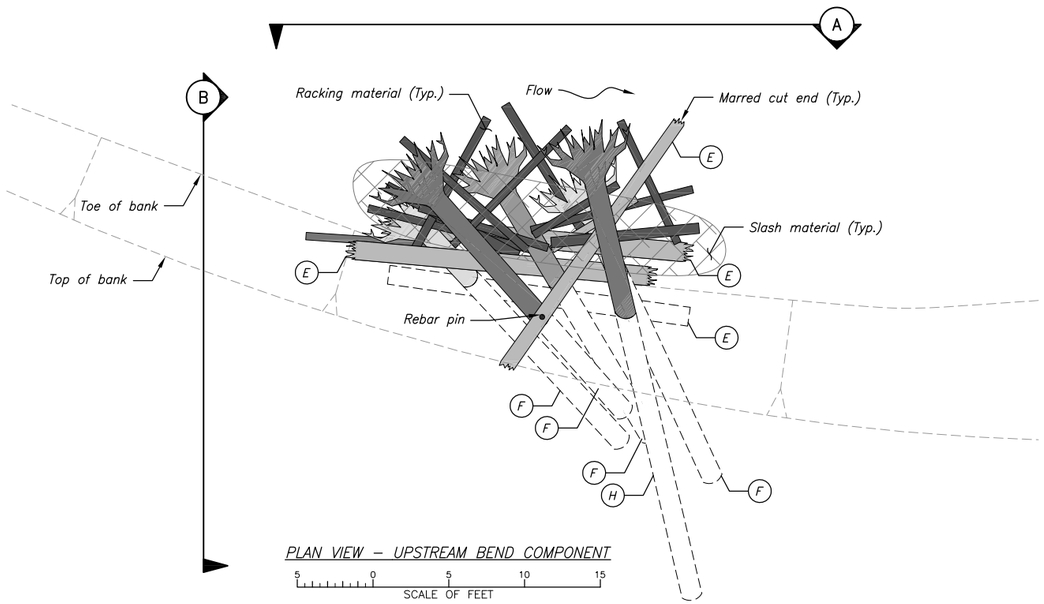
YEAR 2
46+25 TO 57+00

1678-100-2127

SHEET 12 OF 12

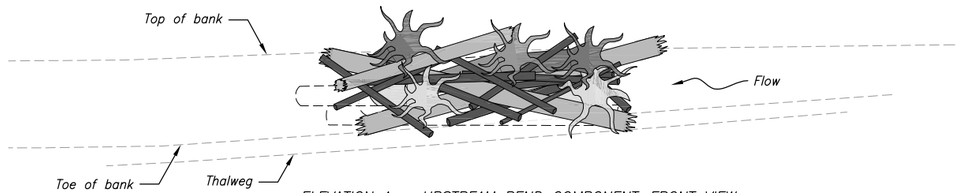
DATE AND TIME PLOTTED
September 11, 2015 15:09
PLOTTED BY
M. FISHER

CAD SYSTEM
AutoCAD Civil 3D 2014
CAD FILENAME
CC44_Parcel_3_LWM_Plan_Yr2.dwg



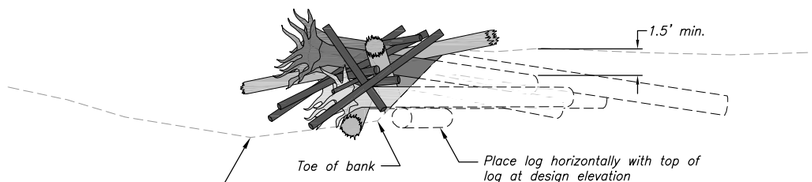
PLAN VIEW – UPSTREAM BEND COMPONENT

5 0 5 10 15
SCALE OF FEET



ELEVATION A – UPSTREAM BEND COMPONENT FRONT VIEW

5 0 5 10 15
SCALE OF FEET



ELEVATION B – UPSTREAM BEND COMPONENT SIDE VIEW

5 0 5 10 15
SCALE OF FEET

NOTES:

1. All logs shall come from fir, pine, or spruce trees.
2. The diameter of logs without rootwads shall be measured at the smallest cut end.
3. The exact location of each upstream bend component shall be staked by the Contractor and approved by the Contracting Officer prior to constructing a specific structure.
4. Rough grading of channel shall be completed prior to constructing in-channel LWM structures.
5. Cut ends of logs that will be exposed at structure completion shall be marred prior to installation. The Contractor shall use an excavator, bulldozer, or other heavy equipment to tear apart wood fibers at the cut end of the log to create the appearance of a log that has naturally broken apart.
6. Racking and slash material shall be incorporated into each upstream bend component by weaving it in between placed logs, placing it in voids, pressing it into the bank, or otherwise including it in the structure as directed by the Contracting Officer. Racking material as shown on this sheet is schematic only and not intended to represent the actual location or orientation of individual pieces.
7. The amount of slash placed in each structure shall be as directed by the Contracting Officer and may vary from structure to structure. The cost of providing and placing slash is not part of the unit cost of constructing this structure. All costs associated with obtaining and placing slash shall be part of the bid item "Slash Material".
8. Rebar pins shall be #6 rebar (minimum). To install rebar pins drill a ¾" diameter (or equal to nominal diameter of rebar if a size larger than #6 is used) pilot hole through both logs. Rebar pin shall extend completely through both logs and be finished flush with the top log.
9. Backfill structure using soil excavated to place logs unless the Contracting Officer determines the native soil is unsuitable for backfill and suitable soil must be imported. Place soil for backfill in 1 foot maximum lifts. Compact each lift using mechanical equipment such as an excavator bucket or equipment tracking.

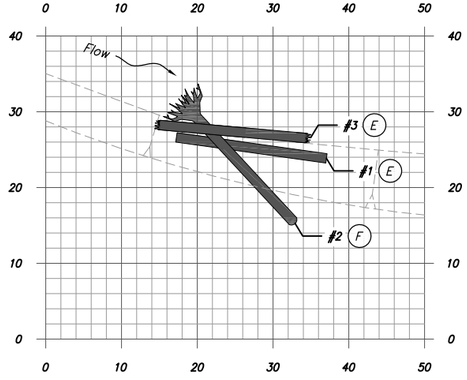
UPSTREAM BEND COMPONENT CONSTRUCTION DETAILS

STRUCTURE STATION	DESIGN ELEVATION
5+05*	2961.0'
5+15*	2961.0'
6+55	2960.7'
9+10	2958.8'
11+40	2957.3'
14+45	2954.0'
17+60	2950.5'
20+60	2950.0'
23+65	2948.2'
26+55	2944.0'
33+00	2941.4'
38+10	2937.0'
40+65	2937.0'
42+55	2934.5'
45+35	2929.5'
47+50	2931.6'

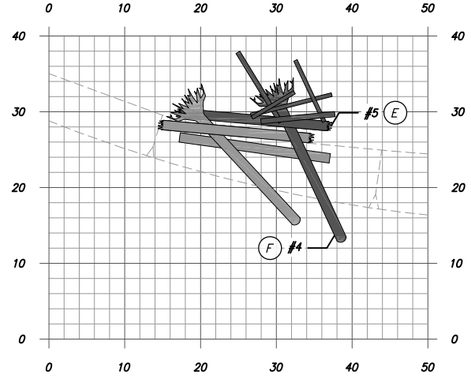
* Structures are located in side channel excavated during phase 3 (stationing is approximate)

RIGHT BANK CONSTRUCTION SEQUENCE

Step 1: Excavate as necessary to place log #1 (footer log) at design elevation. Excavate trench for log #2 and rest it horizontally on top of log #1. Rest log #3 on top of log #2, angled so the downstream end rests on streambed near toe of bank.



Step 2: Excavate as necessary to place log #4; resting it on previously placed logs. Place log #5 as shown, resting it on top of log #4 with the upstream end under the rootwad of log #2 (this will require careful manipulation of log). Incorporate approximately one-third of racking material into structure as directed by the Contracting Officer.



Construction sequencing continued on Dwg. –2129

UPSTREAM BEND COMPONENT MATERIAL SCHEDULE

ITEM	DESCRIPTION	QUANTITY
Log type (E)	20'–25' long, 12" dia. log	4
Log type (F)	20' long, 12" DBH log with rootwad	4
Log type (H)	30' long, 18" DBH log with rootwad	1
Small racking material	6'–15' long, 3"–8" dia. log	8
Large racking material	6'–15' long, 8"–12" dia. log	8
Slash material (see note 7)	Tree tops, limbs with branches and needles	As Directed

REGISTERED PROFESSIONAL ENGINEER
83129PE
OREGON
JULY 14, 2006
MARTIN K. FISHER
9/14/15

RENEWAL DATE: 12/31/2015

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FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN

CC-44 PHASE III HABITAT ENHANCEMENT PARCEL 3

N. TRUSCOTT
DRAWN

x Jay Hovde
ACCEPTED

BOISE, ID 2015-09-11

LWM DETAILS

UPSTREAM BEND COMPONENT

1678-100-2128

SHEET 1 OF 24

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TRUSCOTT, NIC

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CAD FILENAME
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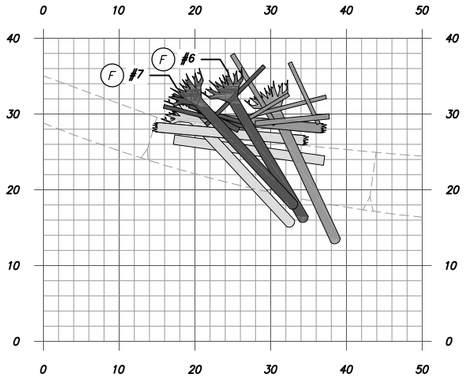
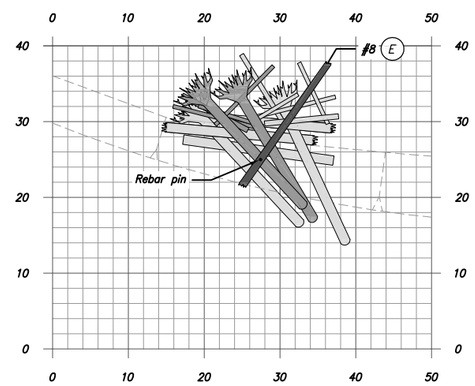
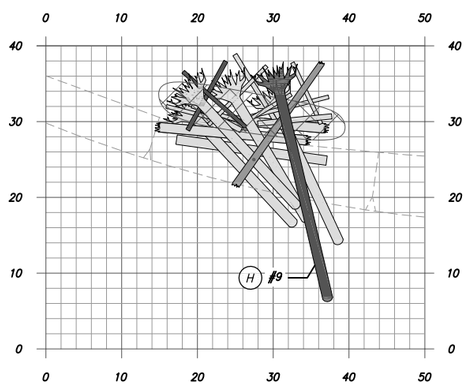
Step 3: Place approximately one-third of racking material as directed by the Contracting Officer. Excavate as necessary to place log #6, angling it into the bank on a minimum slope of 6H:1V. Place log #7 as shown, resting it on previously placed logs.



Step 4: Rest log #8 on top of previously placed logs in the approximate orientation shown. The downstream end of the log shall be angled toward the streambed. Install rebar pin at location shown.

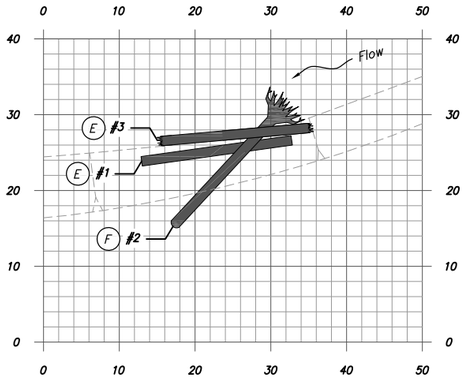


Step 5: Incorporate remaining racking material and slash material as directed by the Contracting Officer. Place log #9 as shown angling it into the bank on a slope of at least 7H:1V then backfill structure to original bank.

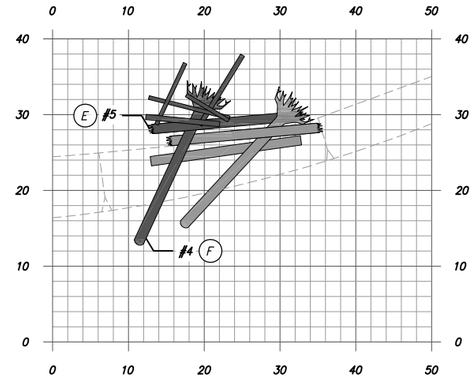


LEFT BANK CONSTRUCTION SEQUENCE

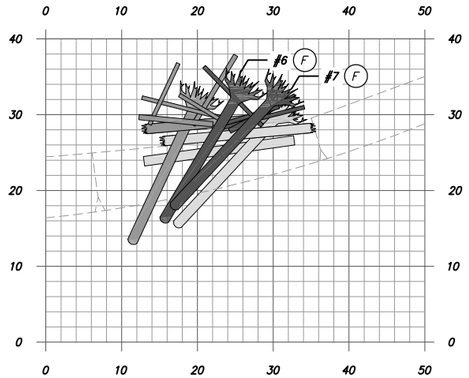
Step 1: Excavate as necessary to place log #1 (footer log) at design elevation. Excavate trench for log #2 and rest it horizontally on top of log #1. Rest log #3 on top of log #2, angled so the downstream end rests on streambed near toe of bank.



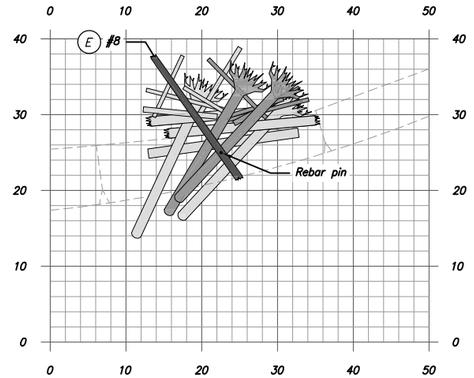
Step 2: Excavate as necessary to place log #4; resting it on previously placed logs. Place log #5 as shown, resting it on top of log #4 with the upstream end under the rootwad of log #2 (this will require careful manipulation of log). Incorporate approximately one-third of racking material into structure as directed by the Contracting Officer.



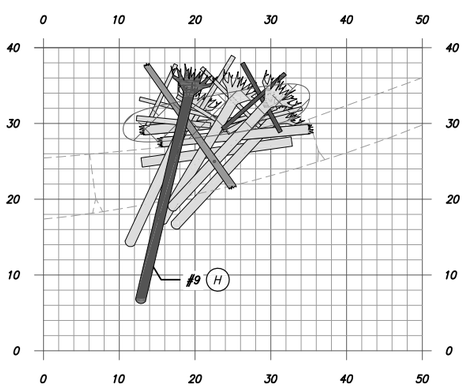
Step 3: Place approximately one-third of racking material as directed by the Contracting Officer. Excavate as necessary to place log #6, angling it into the bank on a minimum slope of 6H:1V. Place log #7 as shown, resting it on previously placed logs.



Step 4: Rest log #8 on top of previously placed logs in the approximate orientation shown. The downstream end of the log shall be angled toward the streambed. Install rebar pin at location shown.



Step 5: Incorporate remaining racking material and slash material as directed by the Contracting Officer. Place log #9 as shown angling it into the bank on a slope of at least 7H:1V then backfill structure to original bank.



DATE AND TIME PLOTTED
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TRUSCOTT, NIC

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GRANDE RONDE SUBBASIN
CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

N. TRUSCOTT
DRAWN

X Jay Hovde
ACCEPTED

BOISE, ID 2015-09-11

LWM DETAILS

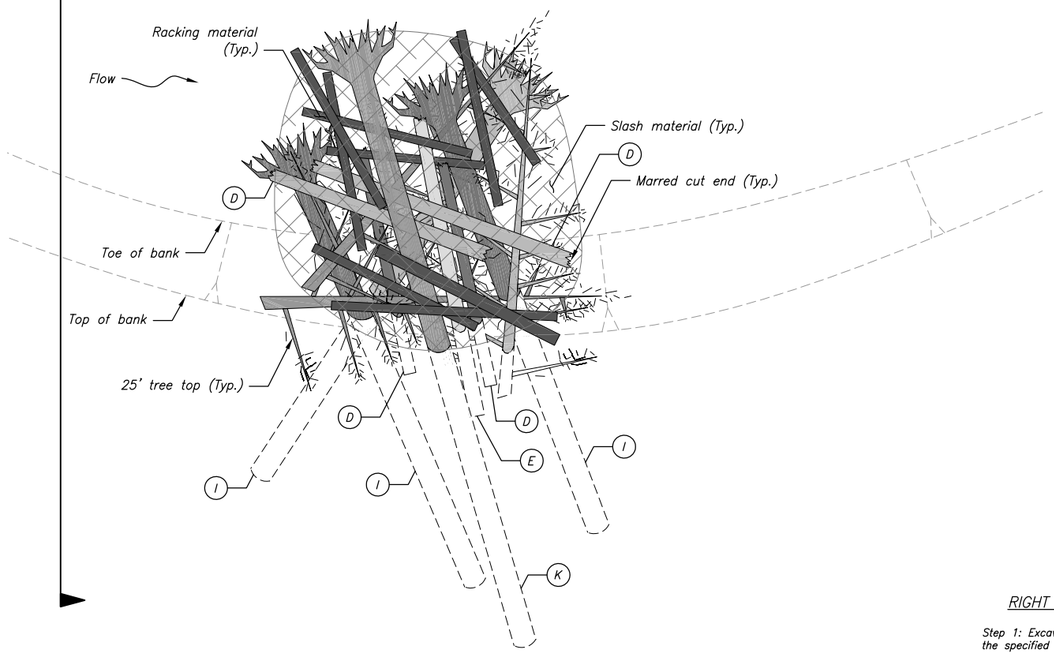
UPSTREAM BEND COMPONENT

1678-100-2129

SHEET 2 OF 24

REGISTERED PROFESSIONAL ENGINEER
83129PE
OREGON
JULY 14, 2009
MARTIN K. FISHER
9/14/15

RENEWAL DATE: 12/31/2015

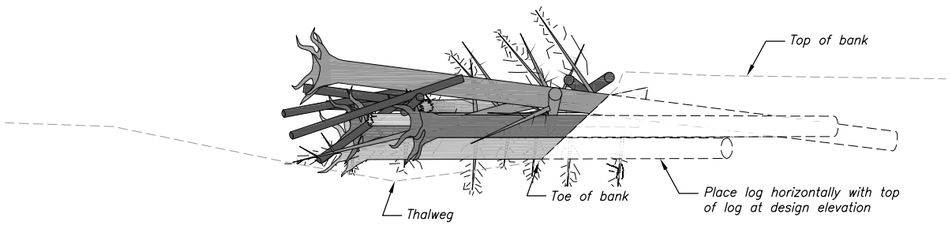


PLAN VIEW – MIDDLE BEND COMPONENT

5 0 5 10 15
SCALE OF FEET

ELEVATION A – MIDDLE BEND COMPONENT FRONT VIEW

5 0 5 10 15
SCALE OF FEET

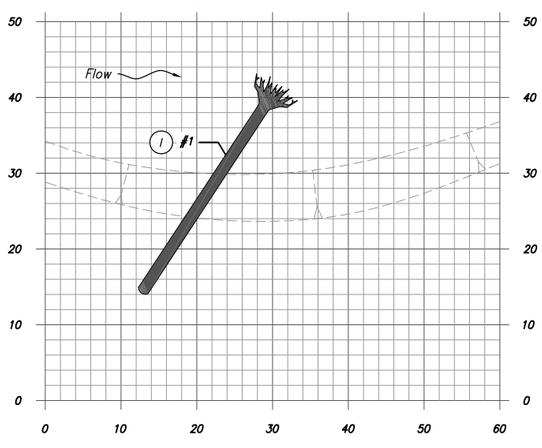


ELEVATION B – MIDDLE BEND COMPONENT SIDE VIEW

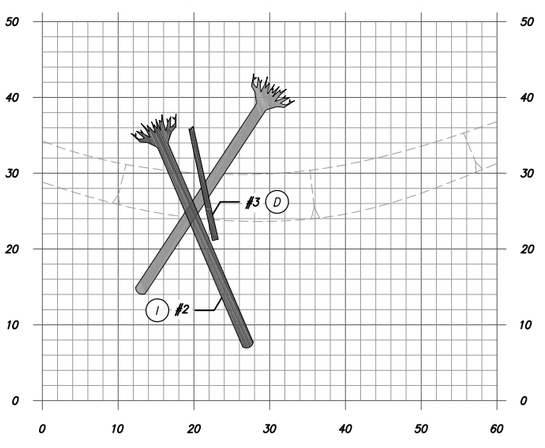
5 0 5 10 15
SCALE OF FEET

RIGHT BANK CONSTRUCTION SEQUENCE

Step 1: Excavate trench to install log #1 horizontally with the top of the log at the specified design elevation.



Step 2: Excavate as necessary to place logs #2 and #3, resting each on top of log #1 and sitting horizontally as shown.



NOTES:

1. All logs shall come from fir, pine, or spruce trees.
2. The diameter of logs without rootwads shall be measured at the smallest cut end.
3. Tree tops shall come from Douglas fir, grand fir, or spruce trees and shall be installed within 30 days of harvest.
4. Tree tops shall be handled with care to minimize breaking of branches. The Contracting Officer may reject any tree tops that have lost significant amounts of branches.
5. The exact location of each middle bend component shall be staked by the Contractor and approved by the Contracting Officer prior to constructing a specific structure.
6. Rough grading of channel shall be completed prior to constructing in-channel LWM structures.
7. Cut ends of logs that will be exposed at structure completion shall be marred prior to installation. The Contractor shall use an excavator, bulldozer, or other heavy equipment to tear apart wood fibers at the exposed cut end(s) of the log to create the appearance of a log that has naturally broken apart.
8. Racking and slash material shall be incorporated into each middle bend component by weaving it in between placed logs, placing it in voids, pressing it into the bank, or otherwise including it in the structure as directed by the Contracting Officer. Racking material as shown on this sheet is schematic only and not intended to represent the exact location or orientation of individual pieces.
9. The amount of slash placed in each structure shall be as directed by the Contracting Officer and may vary from structure to structure. The cost of providing and placing slash is not part of the unit cost of constructing this structure. All costs associated with obtaining and placing slash shall be part of the bid item "Slash Material".
10. Backfill structure using soil excavated to place logs unless the Contracting Officer determines the native soil is unsuitable for backfill and suitable soil must be imported. Place soil for backfill in 1 foot maximum lifts. Compact each lift using mechanical equipment such as an excavator bucket or equipment tracking.

MIDDLE BEND COMPONENT MATERIAL SCHEDULE

ITEM	DESCRIPTION	QUANTITY
Log type (D)	15'–20' long, 12" dia. log	4
Log type (E)	20'–25' long, 12" dia. log	1
Log type (I)	30' long, 18" DBH log with rootwad	3
Log type (K)	40' long, 18" DBH log with rootwad	1
Tree top	25' long tree top with full branches	3
Small racking material	6'–15' long, 3"–8" dia. log	8
Large racking material	6'–15' long, 8"–12" dia. log	8
Slash material (see note 9)	Tree tops, limbs with branches and needles	As Directed

REGISTERED PROFESSIONAL ENGINEER
83129PE
OREGON
JULY 14, 2006
MARTIN K. FISHER
9/14/15

RENEWAL DATE: 12/31/2015

MIDDLE BEND COMPONENT CONSTRUCTION DETAILS

STRUCTURE STATION	DESIGN ELEVATION
6+80	2961.5'
7+00	2960.5'
9+25	2958.9'
11+65	2955.6'
11+85	2955.3'
14+65	2953.9'

MIDDLE BEND COMPONENT CONSTRUCTION DETAILS

STRUCTURE STATION	DESIGN ELEVATION
17+85	2950.6'
18+05	2950.0'
20+80	2950.0'
21+05	2950.0'
23+90	2947.5'
26+80	2944.0'

MIDDLE BEND COMPONENT CONSTRUCTION DETAILS

STRUCTURE STATION	DESIGN ELEVATION
26+95	2944.0'
35+55	2939.6'
35+75	2939.6'
38+30	2937.0'
38+50	2937.0'
45+60	2931.8'
47+60	2930.2'

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GRANDE RONDE SUBBASIN

CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

N. TRUSCOTT
DRAWN

X Jay Hovde
ACCEPTED

BOISE, ID 2015-09-11

LWM DETAILS

MIDDLE BEND COMPONENT

1678-100-2130

SHEET 3 OF 24

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TRUSCOTT, NIC

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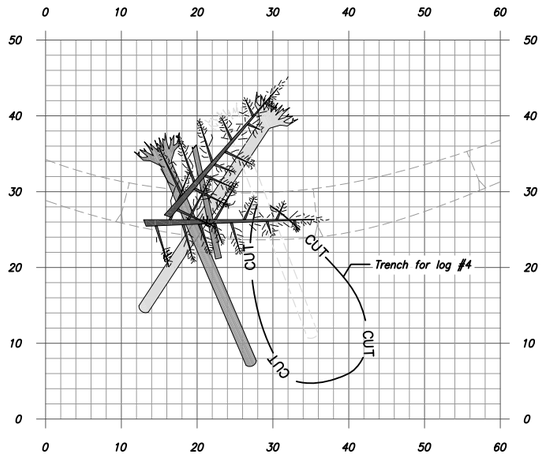
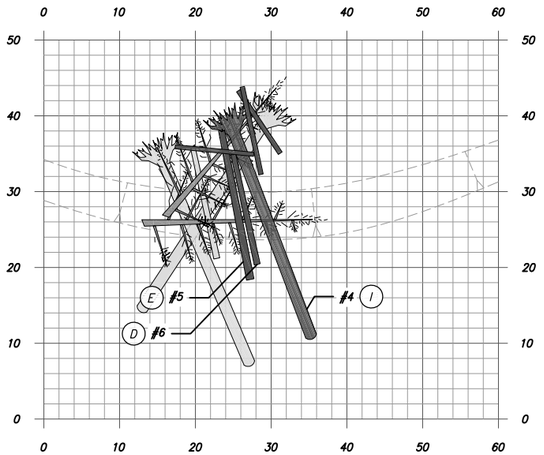
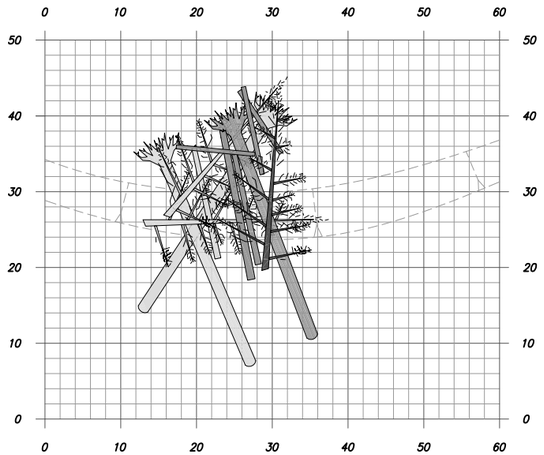
Step 3: Excavate trench for log #4 (see step 4 for placement details) then place two 25' tree tops as shown, resting each on top of log #2.



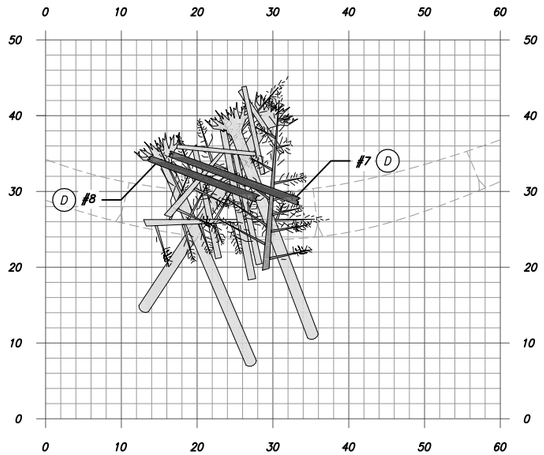
Step 4: Place logs #4, #5, and #6 by placing them so they rest on top of previously placed logs and extend horizontally into the bank. Incorporate approximately one-third of the racking material as directed by the Contracting Officer.



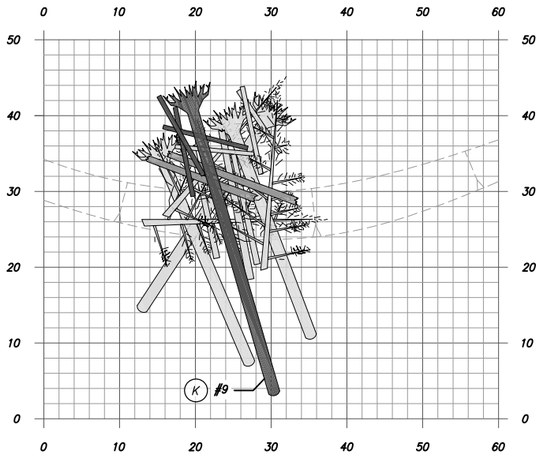
Step 5: Place a 25' tree top as shown, resting it on top of previously placed logs.



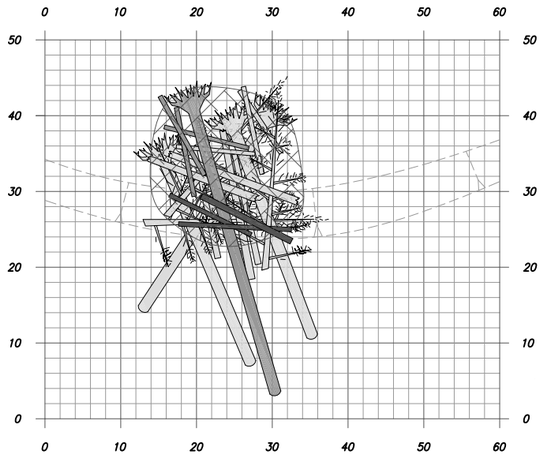
Step 6: Rest logs #7 and #8 on top of previously placed logs as shown.



Step 7: Incorporate another one-third of racking material as directed by the Contracting Officer, then place log #9 as shown, angled on a 8H:1V slope into the bank.



Step 8: Backfill structure to original bank and incorporate remaining racking material and all slash material into the structure as directed by the Contracting Officer.



REGISTERED PROFESSIONAL ENGINEER
83129PE
OREGON
JULY 14, 2009
MARTIN K. FISHER
3/4/15

RENEWAL DATE: 12/31/2015

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TRUSCOTT, NIC

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GRANDE RONDE SUBBASIN

CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

N. TRUSCOTT
DRAWN

X Jay Hovde
ACCEPTED

BOISE, ID 2015-09-11

LWM DETAILS

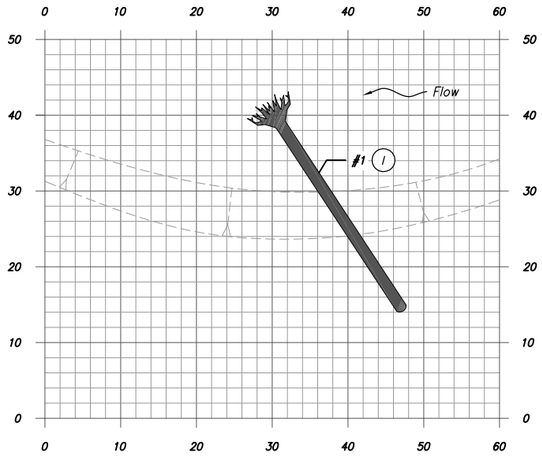
MIDDLE BEND COMPONENT

1678-100-2131

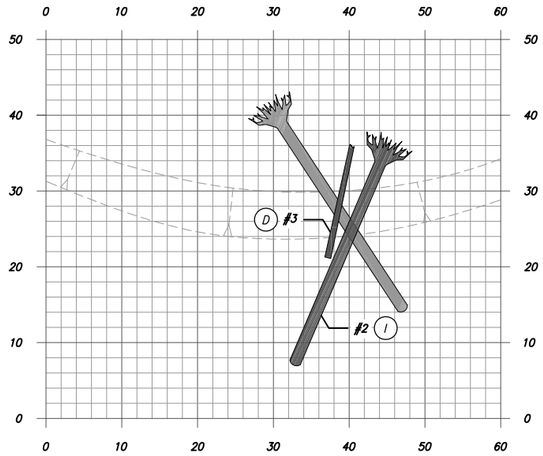
SHEET 4 OF 24

LEFT BANK CONSTRUCTION SEQUENCE

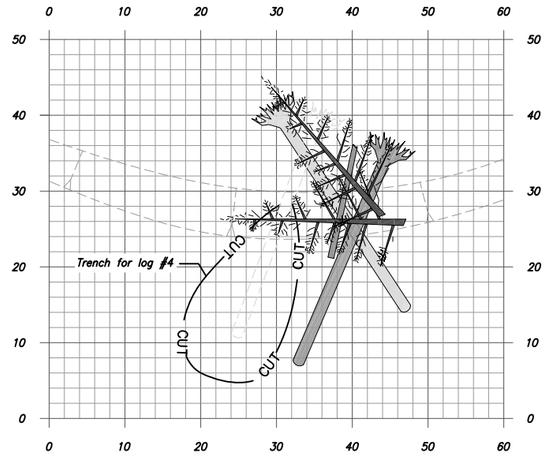
Step 1: Excavate trench to install log #1 horizontally with the top of the log at the specified design elevation.



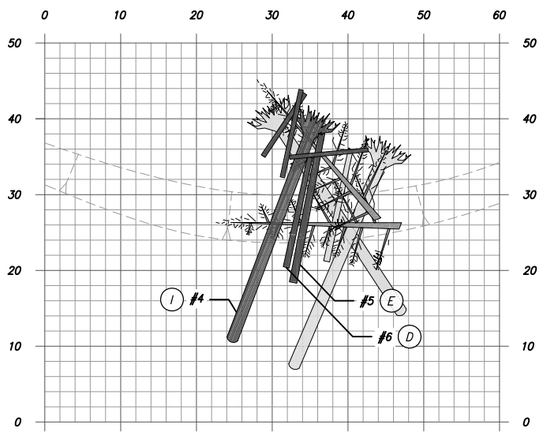
Step 2: Excavate as necessary to place logs #2 and #3, resting each on top of log #1 and sitting horizontally as shown.



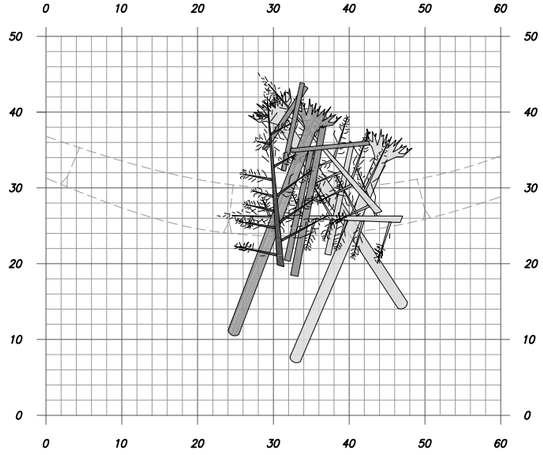
Step 3: Excavate trench for log #4 (see step 4 for placement details) then place two 25' tree tops as shown, resting each on top of log #2.



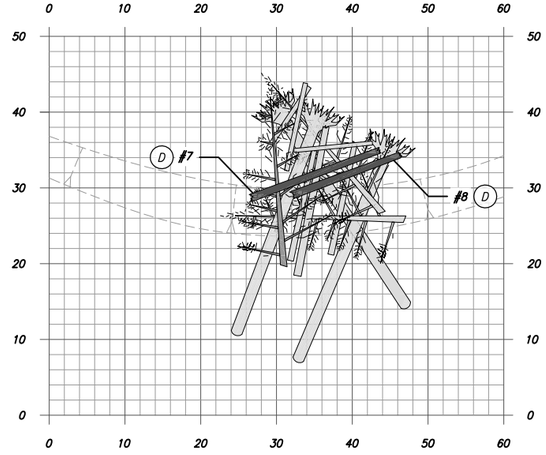
Step 4: Place logs #4, #5, and #6 by placing them so they rest on top of previously placed logs and extend horizontally into the bank. Incorporate approximately one-third of the racking material as directed by the Contracting Officer.



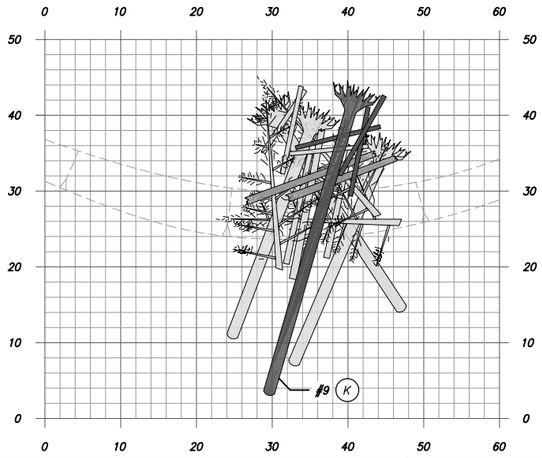
Step 5: Place a 25' tree top as shown, resting it on top of previously placed logs.



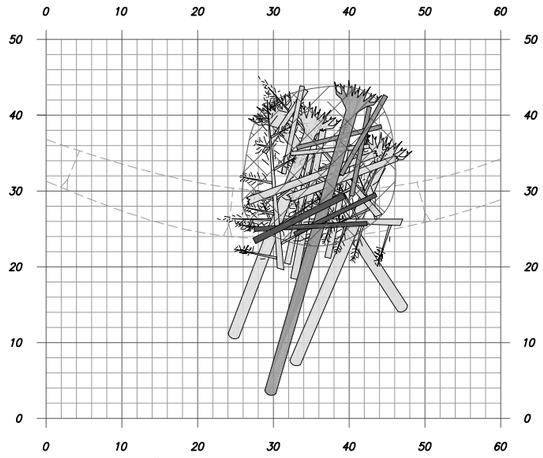
Step 6: Rest logs #7 and #8 on top of previously placed logs as shown.



Step 7: Incorporate another one-third of racking material as directed by the Contracting Officer, then place log #9 as shown, angled on a 8H:1V slope into the bank.



Step 8: Backfill structure to original bank and incorporate remaining racking material and all slash material into the structure as directed by the Contracting Officer.



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GRANDE RONDE SUBBASIN

CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

N. TRUSCOTT
DRAWN

X Jay Hovde
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BOISE, ID 2015-09-11

LWM DETAILS

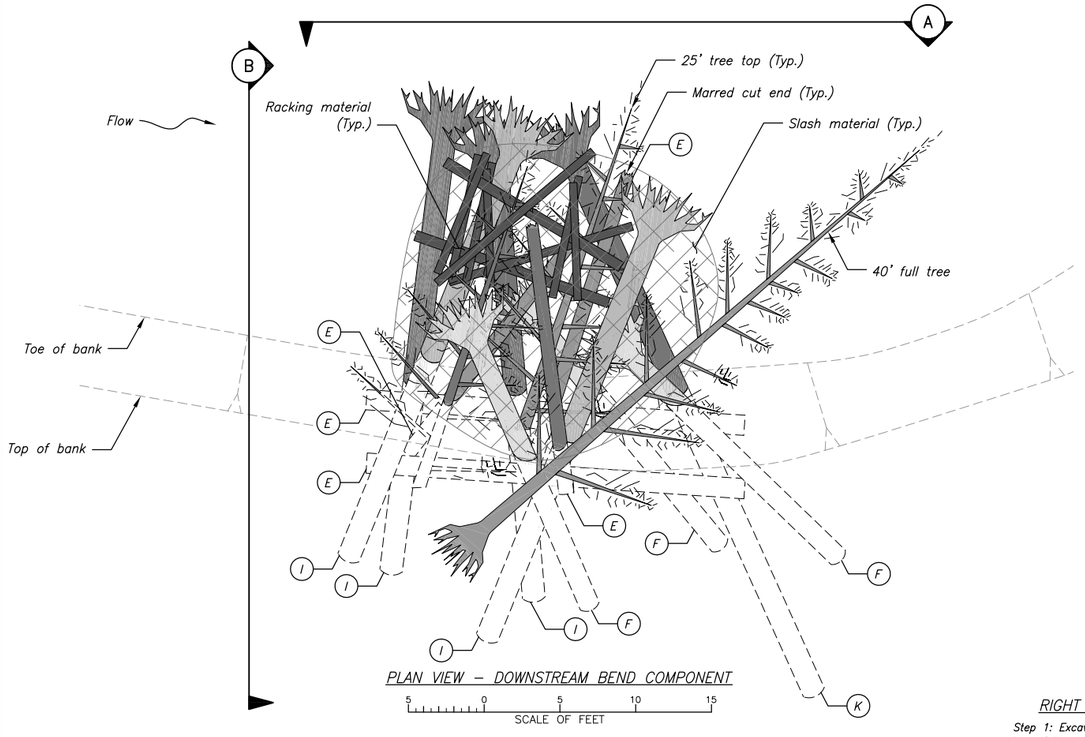
MIDDLE BEND COMPONENT

1678-100-2132

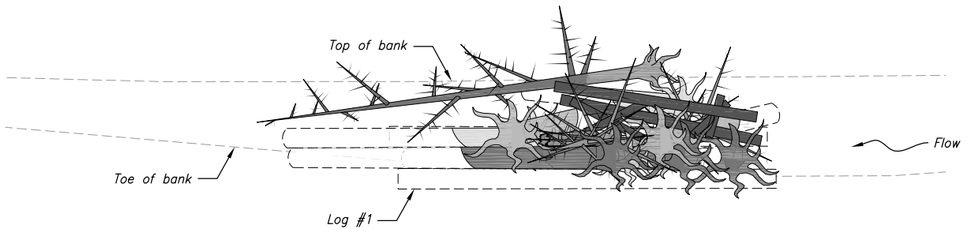
SHEET 5 OF 24

REGISTERED PROFESSIONAL ENGINEER
83129PE
OREGON
JULY 14, 2009
MARTIN K. FISHER
9/14/15

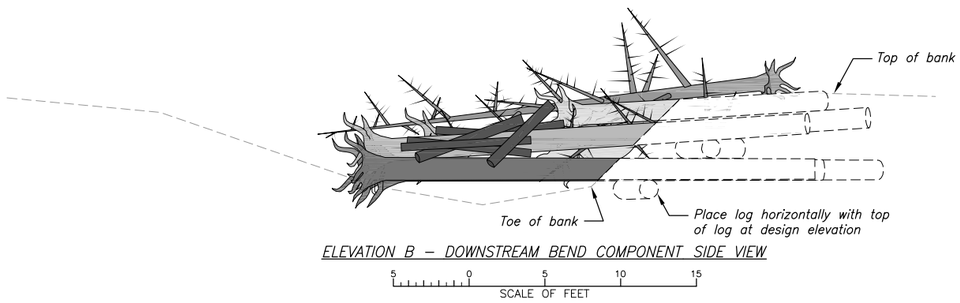
RENEWAL DATE: 12/31/2015



PLAN VIEW – DOWNSTREAM BEND COMPONENT



ELEVATION A – DOWNSTREAM BEND COMPONENT FRONT VIEW



ELEVATION B – DOWNSTREAM BEND COMPONENT SIDE VIEW

NOTES:

1. All logs shall come from fir, pine, or spruce trees.
2. The diameter of logs without rootwads shall be measured at the smallest cut end.
3. Tree tops and full trees shall come from Douglas fir, grand fir, or spruce trees and shall be installed within 30 days of harvest.
4. Tree tops and full trees shall be handled with care to minimize breaking of branches. The Contracting Officer may reject any tree tops or full trees that have lost significant amounts of branches.
5. The exact location of each downstream bend component shall be staked by the Contractor and approved by the Contracting Officer prior to constructing a specific structure.
6. Rough grading of channel shall be completed prior to constructing in-channel LWM structures.
7. Cut ends of logs that will be exposed at structure completion shall be marred prior to installation. The Contractor shall use an excavator, bulldozer, or other heavy equipment to tear apart wood fibers at the exposed cut end(s) of the log to create the appearance of a log that has naturally broken apart.
8. Racking and slash material shall be incorporated into each downstream bend component by weaving it in between placed logs, placing it in voids, pressing it into the bank, or otherwise including it in the structure as directed by the Contracting Officer. Racking material as shown on this sheet is schematic only and not intended to represent the actual location or orientation of individual pieces.
9. The amount of slash placed in each structure shall be as directed by the Contracting Officer and may vary from structure to structure. The cost of providing and placing slash is not part of the unit cost of constructing this structure. All costs associated with obtaining and placing slash shall be part of the bid item "Slash Material".
10. Backfill structure using soil excavated to place logs unless the Contracting Officer determines the native soil is unsuitable for backfill and suitable soil must be imported. Place soil for backfill in 1 foot maximum lifts. Compact each lift using mechanical equipment such as an excavator bucket or equipment tracking.

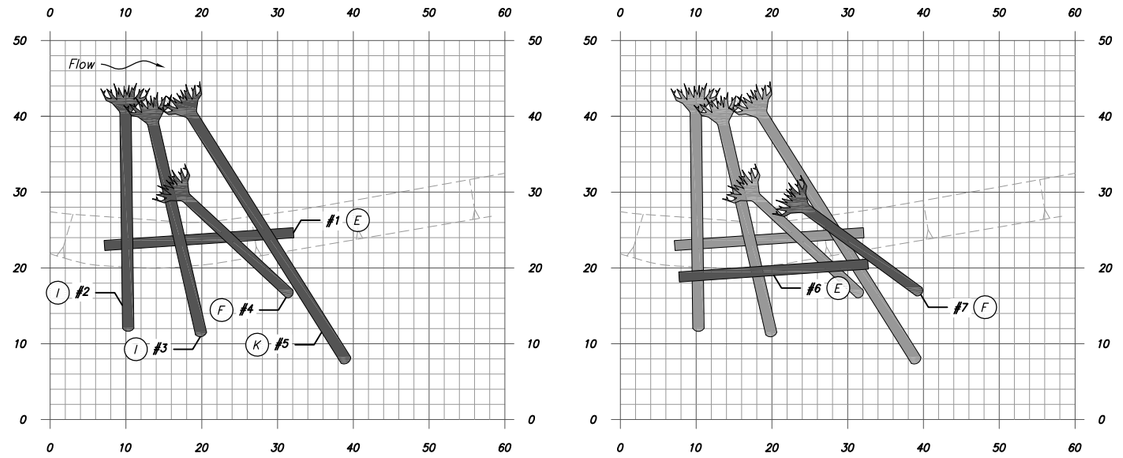
DOWNSTREAM BEND COMPONENT MATERIAL SCHEDULE

ITEM	DESCRIPTION	QUANTITY
Log type (E)	20–25' long, 12" dia. log	5
Log type (F)	20' long, 12" DBH log with rootwad	3
Log type (I)	30' long, 18" DBH log with rootwad	4
Log type (K)	40' long, 18" DBH log with rootwad	1
Tree top	25' long tree top	2
Full tree	40' long full tree	1
Small racking material	6'–15' long, 3"–8" dia. log	10
Large racking material	6'–15' long, 8"–12" dia. log	10
Slash material (see note 9)	Tree tops, limbs with branches and needles	As Directed

RIGHT BANK CONSTRUCTION SEQUENCE

Step 1: Excavate as necessary to place log #1 (footer log) horizontally with the top of the log at the design elevation. Excavate as necessary to place logs #2 – #5 horizontally, resting them on top of log #1. Placing logs #2 – #5 may require a counterweight placed on the cut end to hold them in place until backfilled.

Step 2: Place logs #6 and #7 in the orientations shown, resting them on top of previously placed logs (should be close to horizontal). This may require partial backfill of previously placed logs to hold logs in place.



DOWNSTREAM BEND COMPONENT CONSTRUCTION DETAILS

STRUCTURE STATION	DESIGN ELEVATION
7+25	2958.8'
9+45	2957.2'
12+10	2954.5'
14+85	2952.6'
18+25	2948.5'
21+25	2948.3'

DOWNSTREAM BEND COMPONENT CONSTRUCTION DETAILS

STRUCTURE STATION	DESIGN ELEVATION
24+10	2946.3'
27+15	2942.9'
36+00	2937.8'
38+70	2935.6'
45+80	2930.2'
49+95	2928.0'

REGISTERED PROFESSIONAL ENGINEER 83129PE OREGON JULY 14, 2006 MARTIN K. FISHER 9/1/15

RENEWAL DATE: 12/31/2015

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GRANDE RONDE SUBBASIN

CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

N. TRUSCOTT
DRAWN

X Jay Hovde
ACCEPTED

BOISE, ID 2015-09-11

LWM DETAILS

DOWNSTREAM BEND COMPONENT

1678-100-2133

SHEET 6 OF 24

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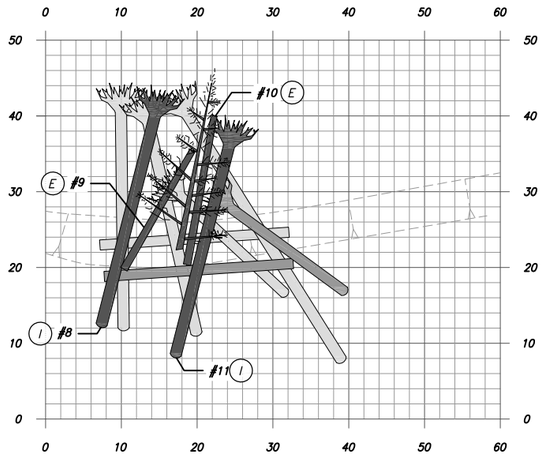
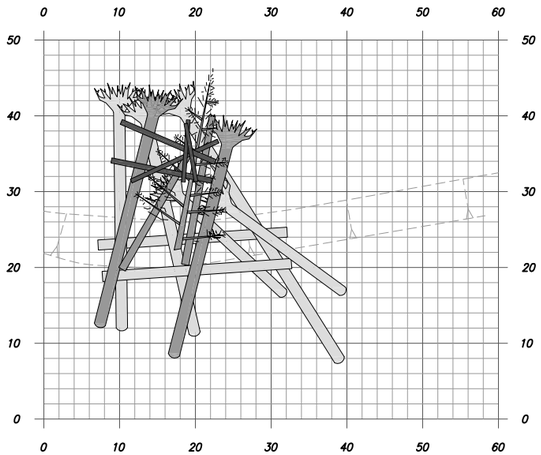
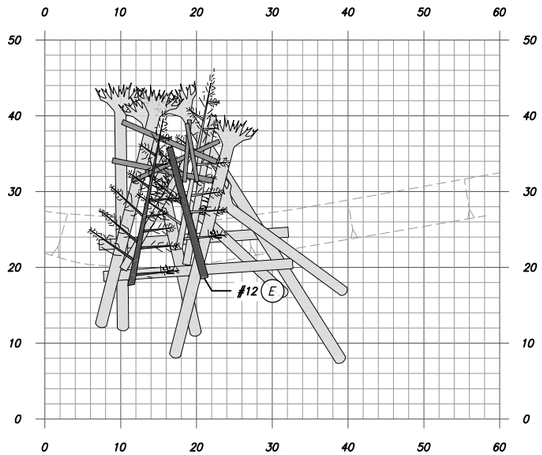
Step 3: Place logs #8 – #11 as shown, resting them on previously placed logs. Place a 25' tree top as shown, resting it on previously placed logs.



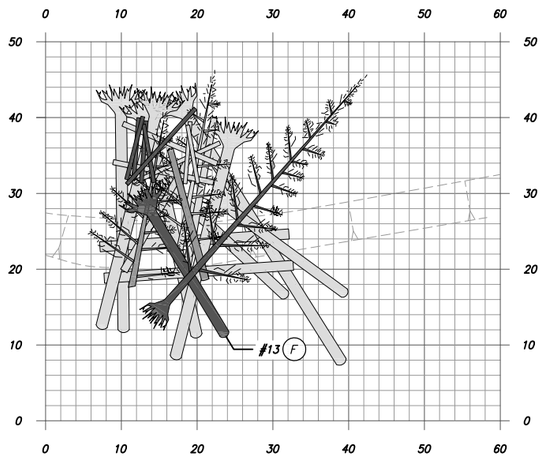
Step 4: Incorporate approximately half of the racking material as directed by the Contracting Officer.



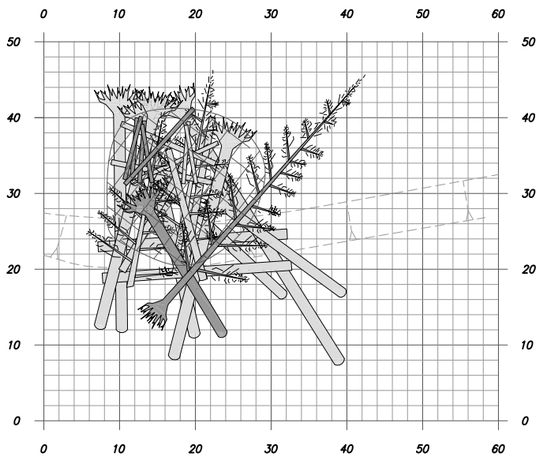
Step 5: Rest log #12 and a 25' tree top on previously placed logs then partially backfill the structure to the top of logs that have been placed.



Step 6: Place log #13 by resting it on previously placed logs. Incorporate remaining racking material and backfill the structure to existing bank; compact lifts by tracking back and forth with heavy equipment. Rest a 40' full tree on top of the bank as shown with its rootwad on the top of bank and angled upstream.



Step 7: Incorporate slash material into the structure as directed by the Contracting Officer.



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LWM DETAILS

DOWNSTREAM BEND COMPONENT

1678-100-2134

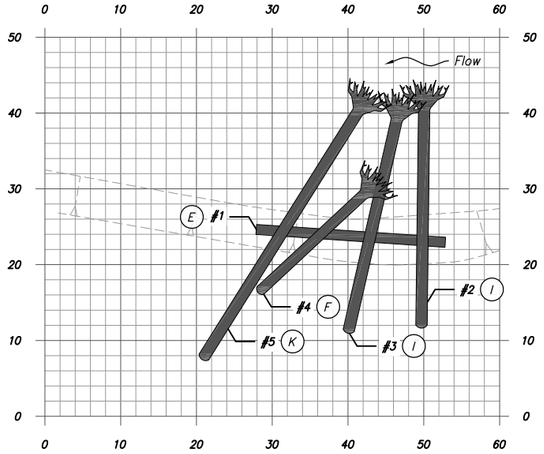
SHEET 7 OF 24

REGISTERED PROFESSIONAL ENGINEER
83129PE
OREGON
JULY 14, 2009
MARTIN K. FISHER
9/14/15

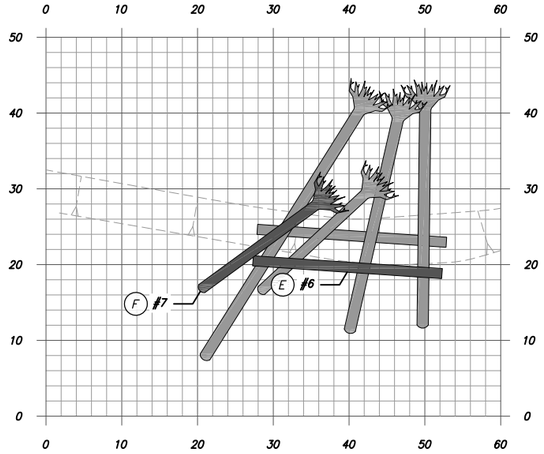
RENEWAL DATE: 12/31/2015

LEFT BANK CONSTRUCTION SEQUENCE

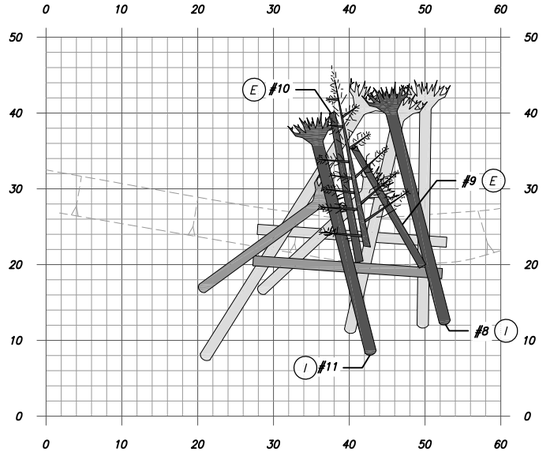
Step 1: Excavate as necessary to place log #1 (footer log) horizontally with the top of the log at the design elevation. Excavate as necessary to place logs #2 – #5 horizontally, resting them on top of log #1. Placing logs #2 – #5 may require a counterweight placed on the cut end to hold them in place until backfilled.



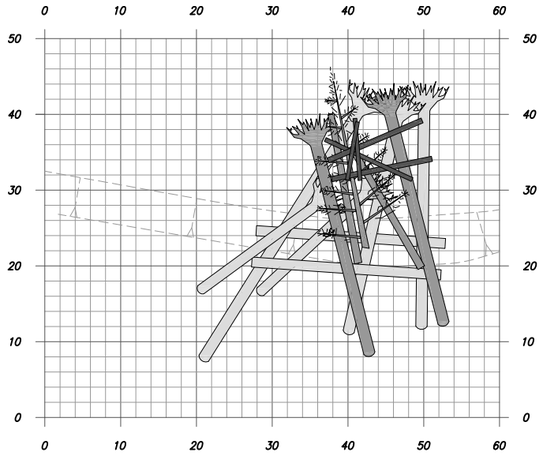
Step 2: Place logs #6 and #7 in the orientations shown, resting them on top of previously placed logs (should be close to horizontal). This may require partial backfill of previously placed logs to hold logs in place.



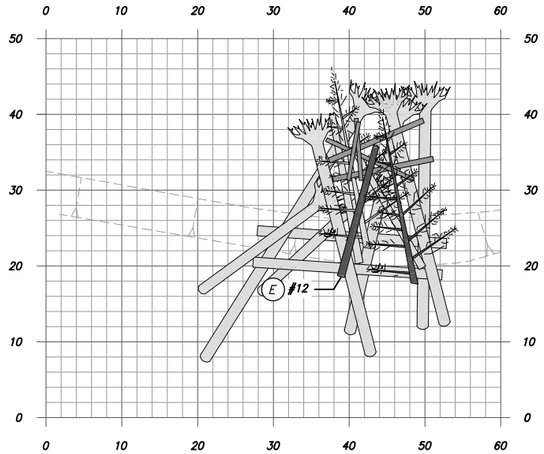
Step 3: Place logs #8 – #11 as shown, resting them on previously placed logs. Place a 25' tree top as shown, resting it on previously placed logs.



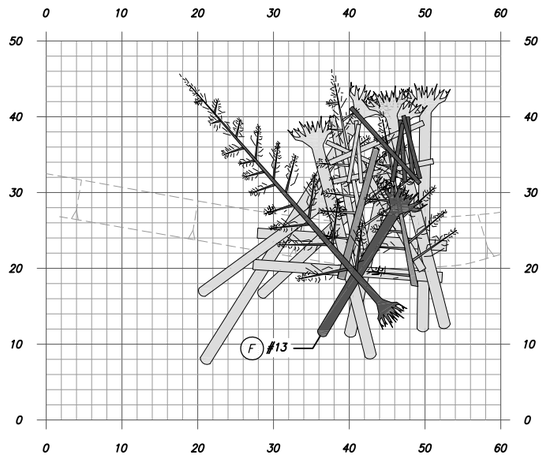
Step 4: Incorporate approximately half of the racking material as directed by the Contracting Officer.



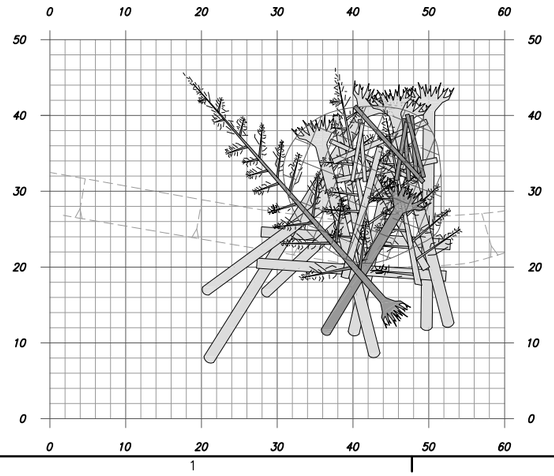
Step 5: Rest log #12 and a 25' tree top on previously placed logs then partially backfill the structure to the top of logs that have been placed.



Step 6: Place log #13 by resting it on previously placed logs. Incorporate remaining racking material and backfill the structure to existing bank; compact lifts by tracking back and forth with heavy equipment. Rest a 40' full tree on top of the bank as shown with its rootwad on the top of bank and angled upstream.



Step 7: Incorporate slash material into the structure as directed by the Contracting Officer.



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BOISE, ID 2015-09-11

LWM DETAILS

DOWNSTREAM BEND COMPONENT

1678-100-2135

SHEET 8 OF 24

REGISTERED PROFESSIONAL ENGINEER
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OREGON
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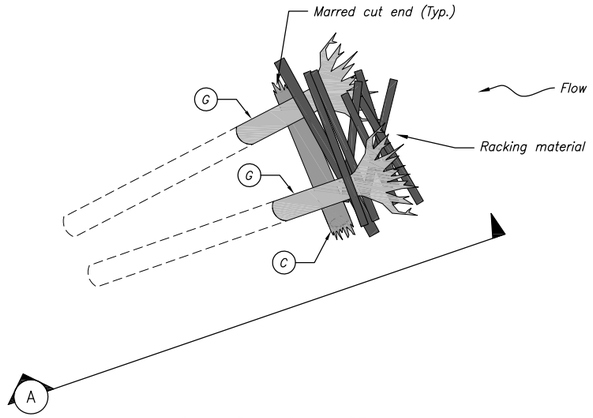
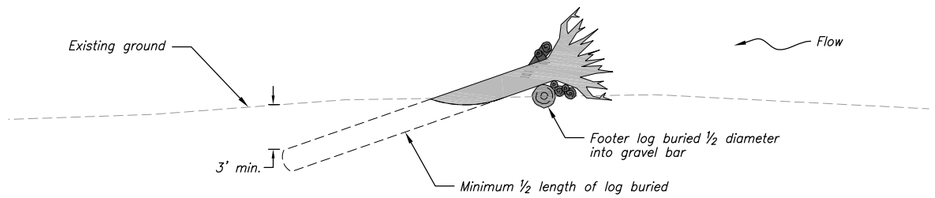
MARTIN K. FISHER
9/14/15
RENEWAL DATE: 12/31/2015



PLAN VIEW – SMALL APEX JAM

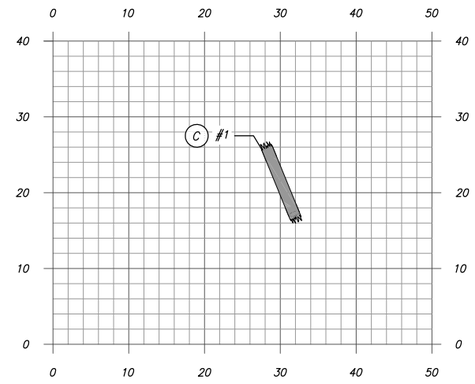
5 0 5 10 15
SCALE OF FEET



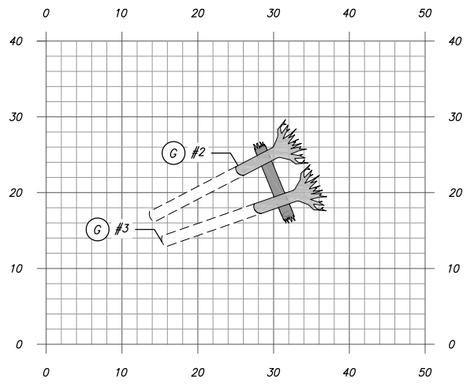
ELEVATION A – SMALL APEX JAM SIDE VIEW

5 0 5 10 15
SCALE OF FEET

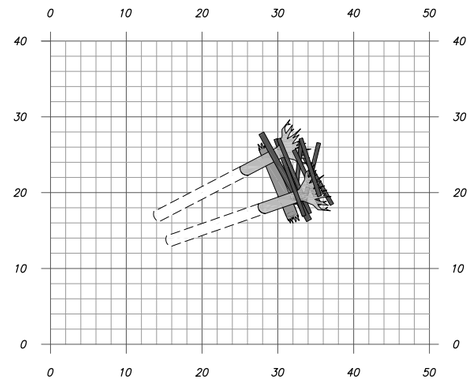
Step 1: Place footer log, buried ½ diameter into gravel bar.



Step 2: Place 2 logs with rootwads over footer log and bury cut ends into gravel bar.



Step 3: Incorporate racking material.



NOTES:

1. All logs shall come from fir, pine, or spruce trees.
2. The diameter of logs without rootwads shall be measured at the smallest cut end.
3. The exact location of each small apex jam shall be staked by the Contractor and approved by the Contracting Officer prior to constructing a specific structure.
4. Rough grading of channel shall be completed prior to constructing in–channel LWM structures.
5. Cut ends of logs that will be exposed at structure completion shall be marred prior to installation. The Contractor shall use an excavator, bulldozer, or other heavy equipment to tear apart wood fibers at the exposed cut end(s) of the log to create the appearance of a log that has naturally broken apart.
6. Racking material shall be incorporated into each small apex jam by weaving it in between placed logs, placing it in voids, pressing it into the bank, or otherwise including it in the structure as directed by the Contracting Officer. Racking material as shown on this sheet is schematic only and not intended to represent the actual location or orientation of individual pieces.
7. Backfill structure using soil excavated to place logs unless the Contracting Officer determines the native soil is unsuitable for backfill and suitable soil must be imported. Place soil for backfill in 1 foot maximum lifts. Compact each lift using mechanical equipment such as an excavator bucket or equipment tracking.

SMALL APEX JAM SCHEDULE

ITEM	DESCRIPTION	QUANTITY
Log type (C)	10' long, 18" dia. log	1
Log type (G)	20' long, 18" DBH log with rootwad	2
Small racking material	6'–15' long, 3"–8" dia. log	5
Large racking material	6'–15' long, 8"–12" dia. log	5

SMALL APEX JAM STRUCTURE STATION
10+50
13+50
19+85
26+35
34+80
47+20

REGISTERED PROFESSIONAL ENGINEER
83129PE
OREGON
JULY 14, 2006
MARTIN K. FISHER
9/14/15

RENEWAL DATE: 12/31/2015

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FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN

CC–44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

M. FISHER
DRAWN

X Jay Hovde
ACCEPTED

BOISE, ID 2015–09–11

LWM DETAILS

SMALL APEX JAM

1678–100–2136

SHEET 9 OF 24

DATE AND TIME PLOTTED
September 11, 2015 15:27
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TRUSCOTT, NIC

CAD SYSTEM
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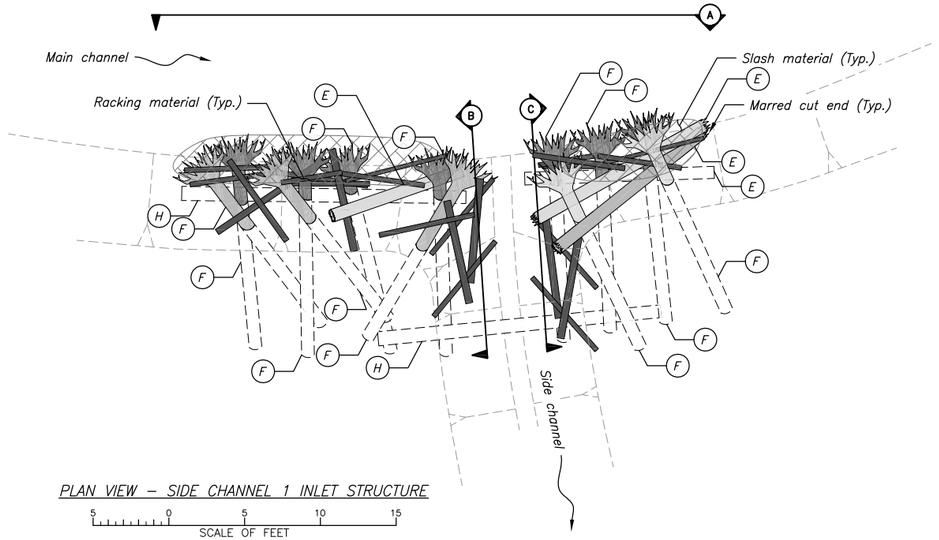
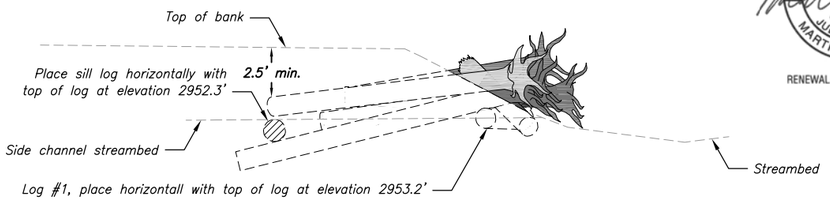


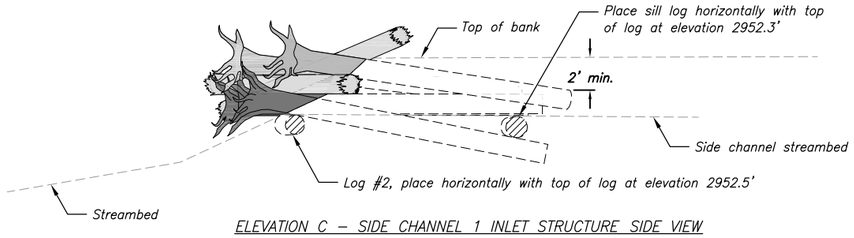
PLAN VIEW – SIDE CHANNEL 1 INLET STRUCTURE

5 0 5 10 15
SCALE OF FEET



ELEVATION B – SIDE CHANNEL 1 INLET STRUCTURE SIDE VIEW

5 0 5 10 15
SCALE OF FEET



ELEVATION C – SIDE CHANNEL 1 INLET STRUCTURE SIDE VIEW

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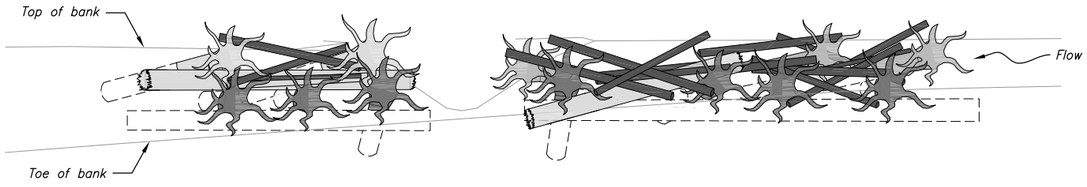
SCALE OF FEET



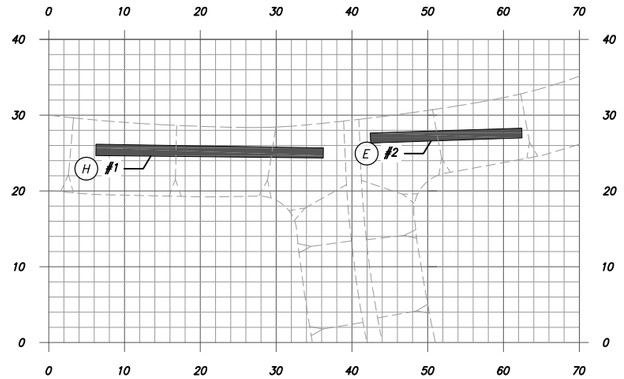
ELEVATION A – SIDE CHANNEL 1 INLET STRUCTURE FRONT VIEW

5 0 5 10 15
SCALE OF FEET

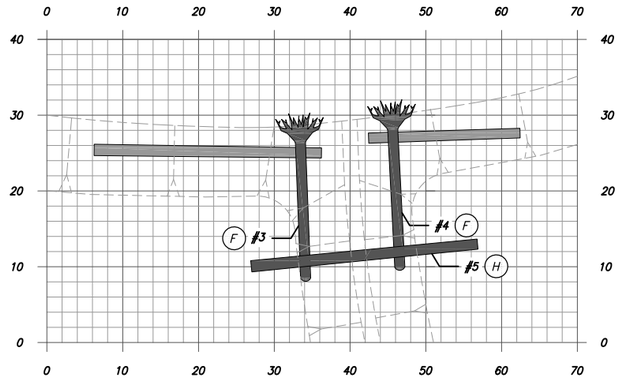
NOTES:

1. All logs shall come from fir, pine, or spruce trees.
2. The diameter of logs without rootwads shall be measured at the smallest cut end.
3. The exact location of the side channel 1 inlet structure shall be staked by the Contractor and approved by the Contracting Officer prior to construction of this structure.
4. Rough grading of channel and side channel shall be completed prior to constructing this structure.
5. Cut ends of logs that will be exposed at structure completion shall be marred prior to installation. The Contractor shall use an excavator, bulldozer, or other heavy equipment to tear apart wood fibers at the exposed cut end(s) of the log to create the appearance of a log that has naturally broken apart.
6. Racking and slash material shall be incorporated into the side channel 1 inlet structure by weaving it in between placed logs, placing it in voids, pressing it into the bank, or otherwise including it in the structure as directed by the Contracting Officer. Racking material as shown on this sheet is schematic only and not intended to represent the actual location or orientation of individual pieces.
7. The amount of slash placed in this structure shall be as directed by the Contracting Officer. The cost of providing and placing slash is not part of the unit cost of constructing this structure. All costs associated with obtaining and placing slash shall be part of the bid item "Slash Material".
8. Backfill structure using soil excavated to place logs unless the Contracting Officer determines the native soil is unsuitable for backfill and suitable soil must be imported. Place soil for backfill in 1 foot maximum lifts. Compact each lift using mechanical equipment such as an excavator bucket or equipment tracking.

Step 1: Place log #1 horizontally as shown with the top of the log at elevation 2953.2'. Place log #2 horizontally as shown with the top of the log at elevation 2952.5'.



Step 2: Place logs #3 and #4 as shown, approximately parallel to the side channel streambed and angled into the ground such that log #5 can sit horizontally on top of logs #3 and #4 with the top of log #5 sitting at the elevation of the side channel streambed.



SIDE CHANNEL 1 INLET STRUCTURE MATERIAL SCHEDULE

ITEM	DESCRIPTION	QUANTITY
Log type (E)	20'–25' long, 12" dia. log	4
Log type (F)	20' long, 12" DBH log with rootwad	12
Log type (H)	30' long, 18" dia. log	2
Small racking material	6'–15' long, 3"–8" dia. log	15
Large racking material	6'–15' long, 8"–12" dia. log	15
Slash material (see note 7)	Tree tops, limbs with branches and needles	As Directed

REGISTERED PROFESSIONAL ENGINEER
83129PE
OREGON
JULY 14, 2009
MARTIN K. FISHER
9/14/15
RENEWAL DATE: 12/31/2015

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FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN

CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

N. TRUSCOTT
DRAWN

X Jay Hovde
ACCEPTED

BOISE, ID 2015-09-11

LWM DETAILS

SIDE CHANNEL 1 INLET STRUCTURE

1678-100-2137

SHEET 10 OF 24

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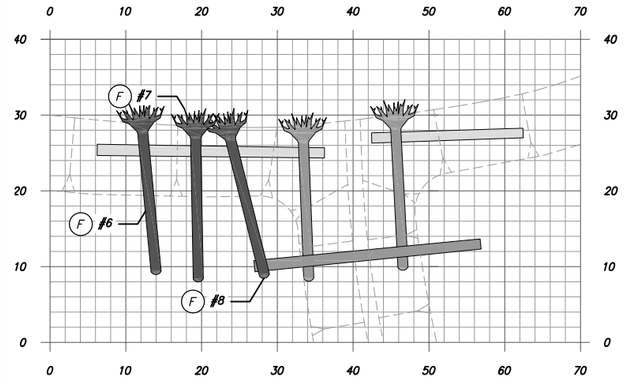
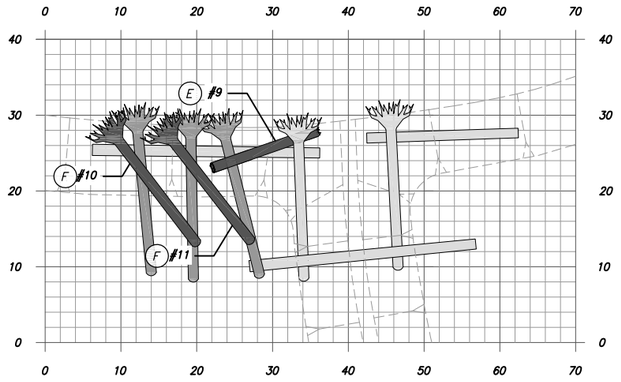
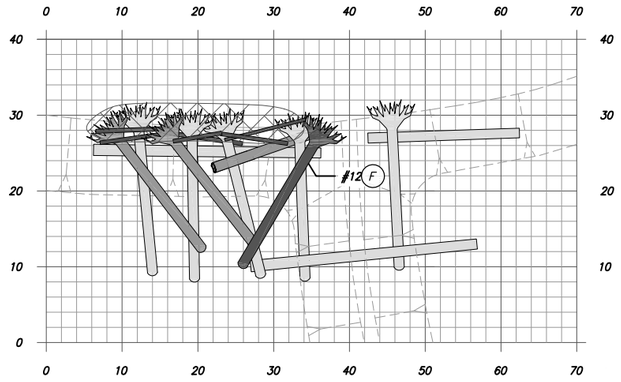
Step 3: Excavate as necessary to place logs #6–8 as shown. All logs shall rest on log #1; logs #6 and #8 shall be placed horizontally, log #7 shall be placed angled into the ground on a 7H:1V slope.



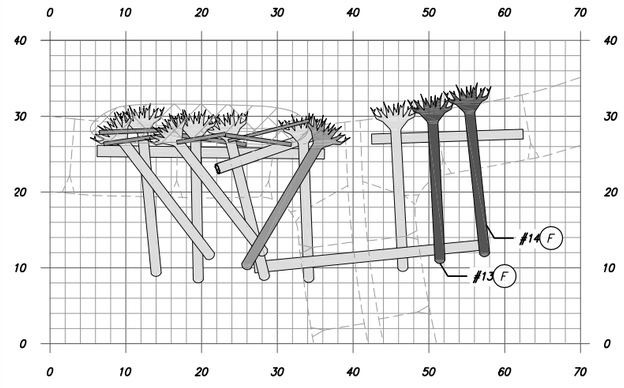
Step 4: Place log #9 as shown, resting it on top of log #8 and threading the downstream end under the rootwad of log #3. Place logs #10–11 as shown, angled into the bank on a slope of 7H:1V.



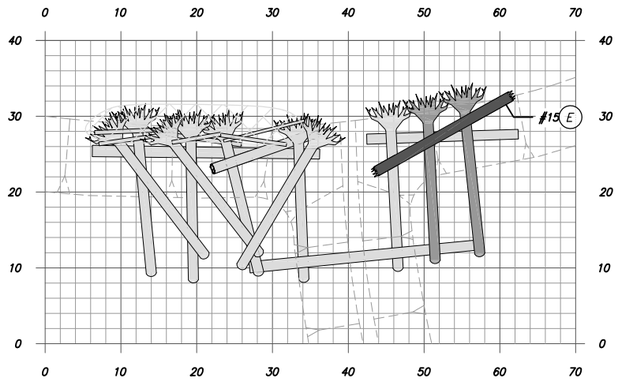
Step 5: Place log #12 as shown, resting it on previously placed logs. Incorporate racking and slash material into the upstream portion of the structure then backfill to the existing bankline, compacting moderately in 1' lifts.



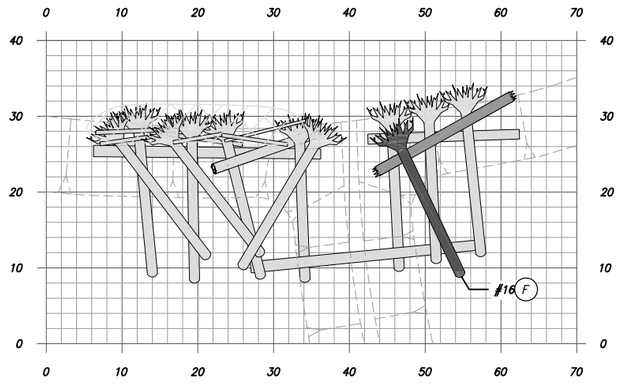
Step 6: Excavate as necessary to place logs #13 and #14 as shown, resting them on previously placed logs.



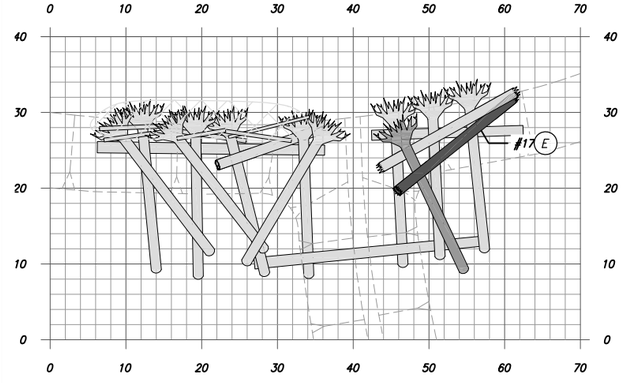
Step 7: Rest log #15 on top of previously placed logs.



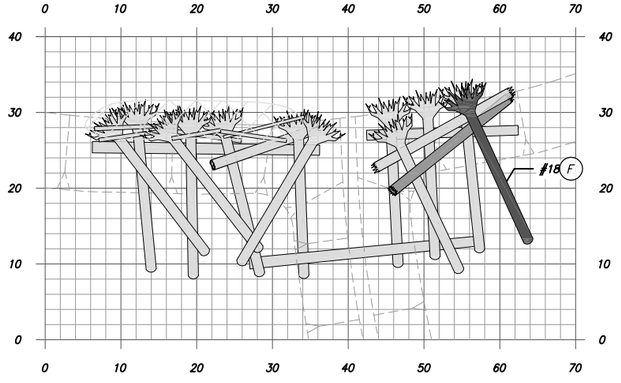
Step 8: Place log #16 as shown, resting it on previously placed logs.



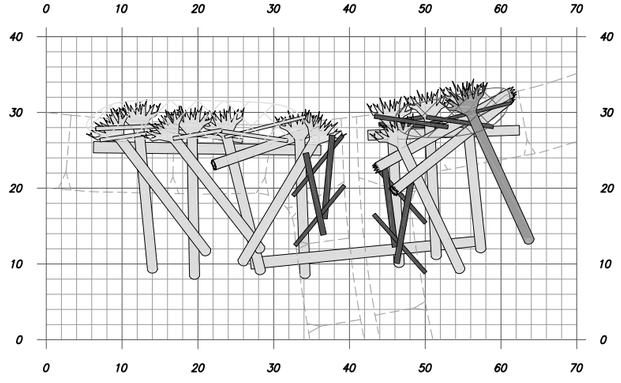
Step 9: Place log #17 in the orientation shown; rest the log on top of log #16 and thread the downstream end of the log so it sits under log #15.



Step 10: Excavate as necessary to place log #18, resting it on top of previously placed logs and angling it into the bank on a slope of 8H:1V.



Step 11: Incorporate racking and slash material into the downstream portion of the structure and on each side of the side channel inlet then backfill to the existing bankline.



REGISTERED PROFESSIONAL ENGINEER
83129PE
OREGON
JULY 14, 2006
MARTIN K. FISHER
9/14/15

RENEWAL DATE: 12/31/2015

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FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN

CC-44 PHASE III HABITAT ENHANCEMENT PARCEL 3

N. TRUSCOTT
DRAWN

X Jay Hovde
ACCEPTED

BOISE, ID 2015-09-11

LWM DETAILS

SIDE CHANNEL 1 INLET STRUCTURE

1678-100-2138

SHEET 11 OF 24

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September 11, 2015 15:28
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TRUSCOTT, NIC

CAD SYSTEM
AutoCAD Civil 3D 2014
CAD FILENAME
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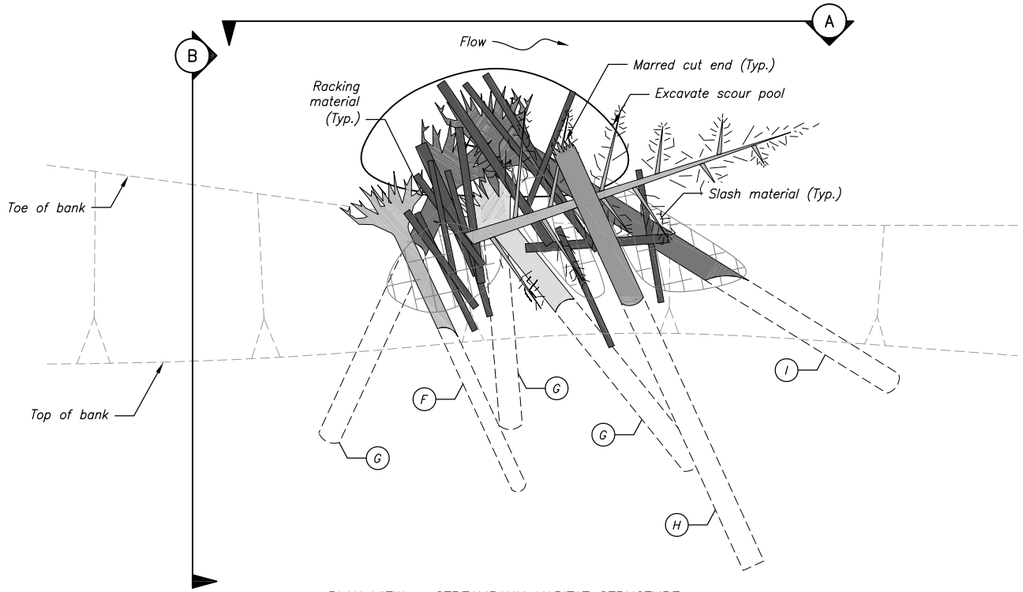
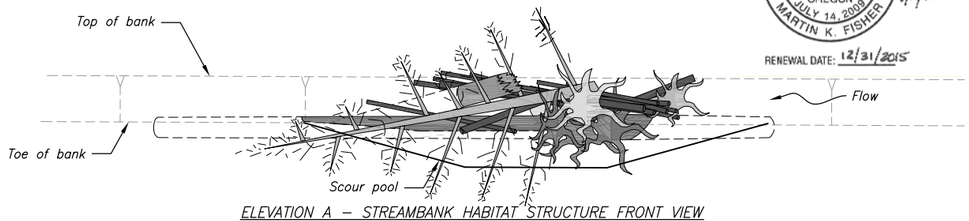


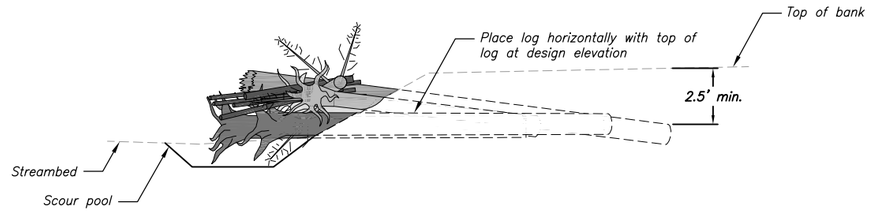
PLAN VIEW – STREAMBANK HABITAT STRUCTURE

SCALE OF FEET 5 0 5 10 15



ELEVATION A – STREAMBANK HABITAT STRUCTURE FRONT VIEW

SCALE OF FEET 5 0 5 10 15



ELEVATION B – STREAMBANK HABITAT STRUCTURE SIDE VIEW

SCALE OF FEET 5 0 5 10 15

REGISTERED PROFESSIONAL ENGINEER
83129PE
OREGON
JULY 14, 2009
MARTIN K. FISHER
3/4/15
RENEWAL DATE: 12/31/2015

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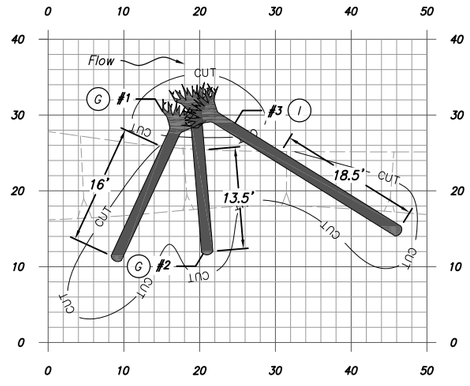
FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN

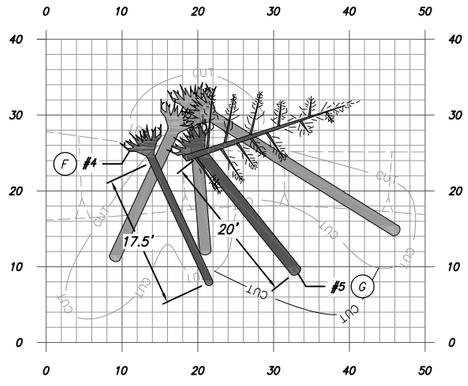
CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

RIGHT BANK CONSTRUCTION SEQUENCE

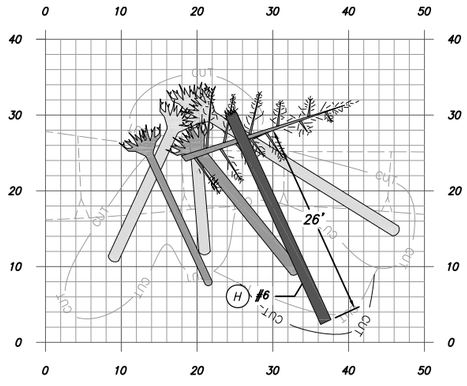
Step 1: Excavate scour pool as directed by Contracting Officer, then excavate trenches for bottom layer of logs; place logs horizontally at the elevation shown on this sheet.



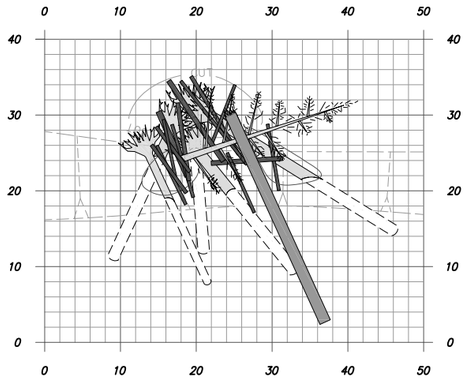
Step 2: Expand trench if necessary, then place logs #4 and #5 in the orientation shown; angled into the bank on a minimum slope of 10H:1V. Rest tree top on top of log #5, angling it the tip into the streambed on the downstream end.



Step 3: Expand trench if necessary to place log #6; rest log #6 on top of tree top and angle into the bank on a minimum slope of 10H:1V.



Step 4: Incorporate racking and slash material into structure by weaving it between logs and pressing pieces into the bank. Backfill the trench to the original bank line.



NOTES:

1. All logs shall come from fir, pine, or spruce trees.
2. The diameter of logs without rootwads shall be measured at the smallest cut end.
3. The exact location of each streambank habitat structure shall be staked by the Contractor and approved by the Contracting Officer prior to constructing a specific structure.
4. Rough grading of channel shall be completed prior to constructing in-channel LWM structures.
5. Cut ends of logs that will be exposed at structure completion shall be marred prior to installation. The Contractor shall use an excavator, bulldozer, or other heavy equipment to tear apart wood fibers at the exposed cut end(s) of the log to create the appearance of a log that has naturally broken apart.
6. Racking and slash material shall be incorporated into each streambank habitat structure by weaving it in between placed logs, placing it in voids, pressing it into the bank, or otherwise including it in the structure as directed by the Contracting Officer. Racking material as shown on this sheet is schematic only and not intended to represent the actual location or orientation of individual pieces.
7. The amount of slash placed in each structure shall be as directed by the Contracting Officer and may vary from structure to structure. The cost of providing and placing slash is not part of the unit cost of constructing this structure. All costs associated with obtaining and placing slash shall be part of the bid item "Slash Material".
8. Backfill structure using soil excavated to place logs unless the Contracting Officer determines the native soil is unsuitable for backfill and suitable soil must be imported. Place soil for backfill in 1 foot maximum lifts. Compact each lift using mechanical equipment such as an excavator bucket or equipment tracking.

STREAMBANK HABITAT STRUCTURE MATERIAL SCHEDULE

ITEM	DESCRIPTION	QUANTITY
Log type (F)	20' long, 12" DBH log with rootwad	1
Log type (G)	20' long, 18" DBH log with rootwad	3
Log type (H)	30' long, 18" dia. log	1
Log type (I)	30' long, 18" DBH log with rootwad	1
Tree top	25' long tree top with full branches	1
Small racking material	6'–15' long, 3"–8" dia. log	8
Large racking material	6'–15' long, 8"–12" dia. log	8
Slash material (see note 7)	Tree tops, limbs with branches and needles	As Directed

STREAMBANK HABITAT STRUCTURE CONSTRUCTION DETAILS

STRUCTURE STATION	DESIGN ELEVATION
7+55	2962.7'
25+80	2948.2'
29+20	2946.7'
45+05	2935.0'
49+55	2932.0'
53+00	2931.1'

N. TRUSCOTT
DRAWN

x Jay Hovde
ACCEPTED

BOISE, ID 2015-09-11

LWM DETAILS

STREAMBANK HABITAT STRUCTURE

1678-100-2139

SHEET 12 OF 24

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TRUSCOTT, NIC

CAD SYSTEM
AutoCAD Civil 3D 2014
CAD FILENAME
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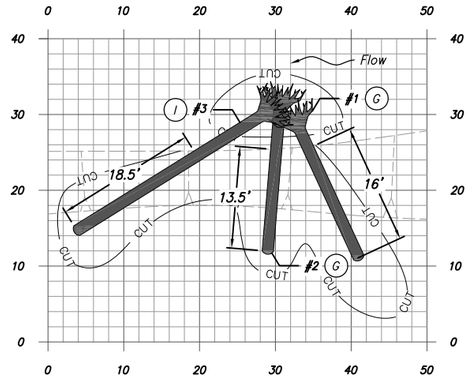
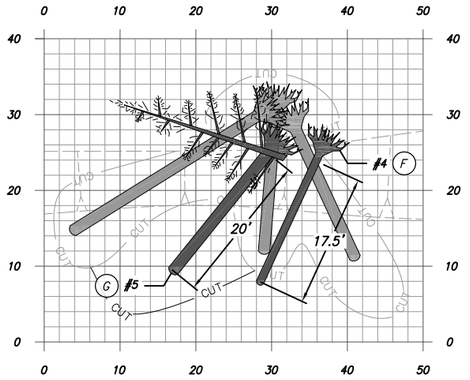
LEFT BANK CONSTRUCTION SEQUENCE

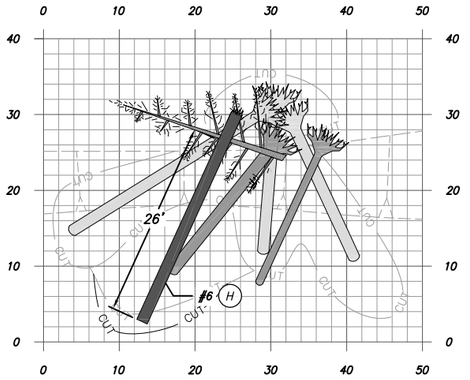
Step 1: Excavate scour pool as directed by Contracting Officer, then excavate trenches for bottom layer of logs; place logs horizontally at the elevation shown on this sheet.



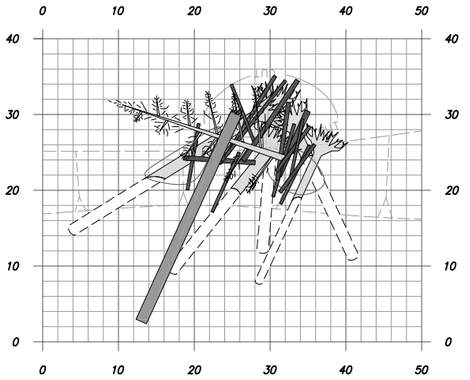
Step 2: Expand trench if necessary, then place logs #4 and #5 in the orientation shown; angled into the bank on a minimum slope of 10H:1V. Rest tree top on top of log #5, angling it the tip into the streambed on the downstream end.



Step 3: Expand trench if necessary to place log #6; rest log #6 on top of tree top and angle into the bank on a minimum slope of 10H:1V.



Step 4: Incorporate racking and slash material into structure by weaving it between logs and pressing pieces into the bank. Backfill the trench to the original bank line.



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COLUMBIA/SNAKE RIVER SALMON RECOVERY GROUP
FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN

CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

REGISTERED PROFESSIONAL ENGINEER
83129PE
OREGON
JULY 14, 2009
MARTIN K. FISHER
9/14/15

RENEWAL DATE: 12/31/2015

N. TRUSCOTT
DRAWN

X Jay Hovde
ACCEPTED

BOISE, ID *2015-09-11*

LWM DETAILS

STREAMBANK HABITAT STRUCTURE

1678-100-2140

SHEET 13 OF 24

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TRUSCOTT, NIC

CAD SYSTEM
AutoCAD Civil 3D 2014
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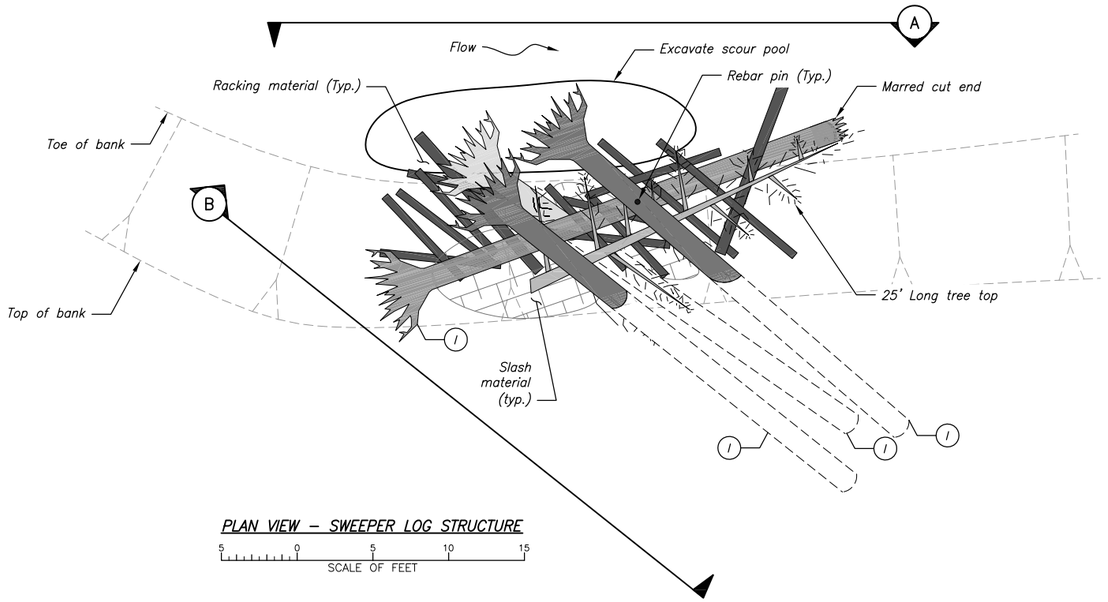
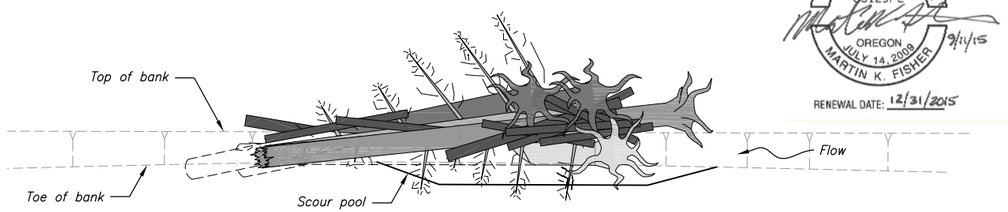


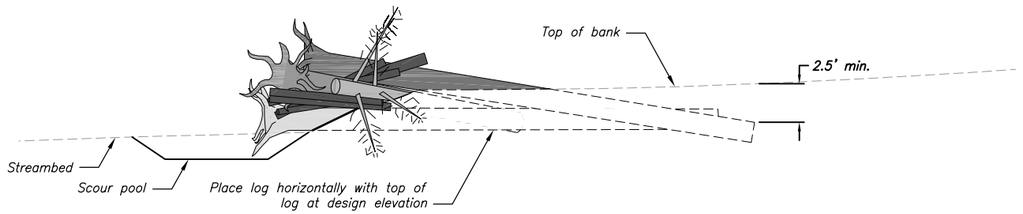
PLAN VIEW – SWEEPER LOG STRUCTURE

5 0 5 10 15
SCALE OF FEET



ELEVATION A – SWEEPER LOG STRUCTURE FRONT VIEW

5 0 5 10 15
SCALE OF FEET



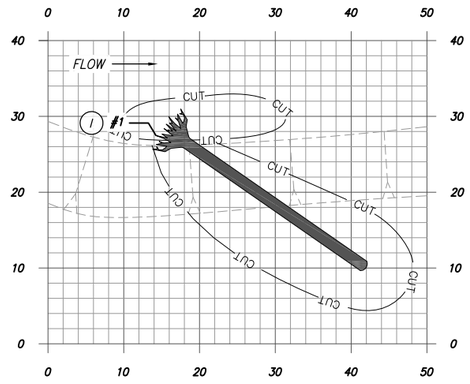
ELEVATION B – SWEEPER LOG STRUCTURE SIDE VIEW

5 0 5 10 15
SCALE OF FEET

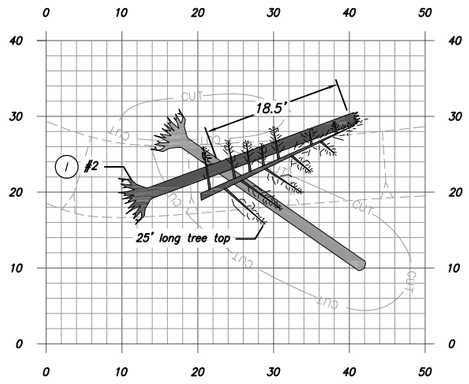
REGISTERED PROFESSIONAL ENGINEER
83129PE
OREGON
JULY 14, 2006
MARTIN K. FISHER
3/4/15
RENEWAL DATE: 12/31/2015

RIGHT BANK (REGULAR) CONSTRUCTION SEQUENCE

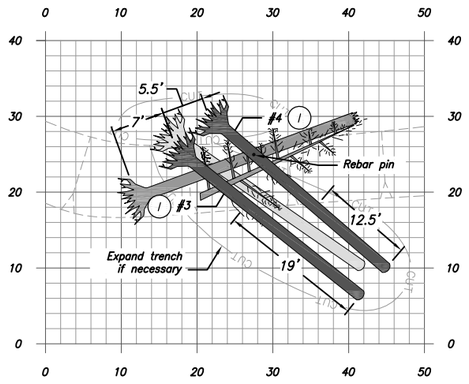
Step 1: Excavate scour pool as directed by Contracting Officer and trench for log #1; place log horizontally at elevation identified on this sheet. Rootwad shall sit just past the toe of bank.



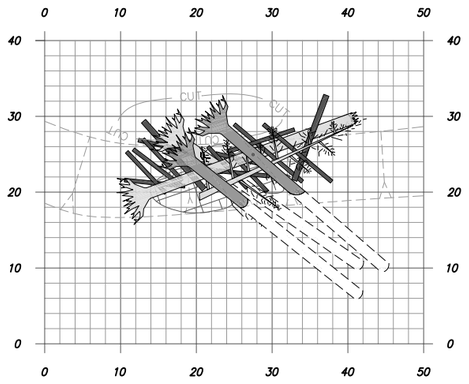
Step 2: Place log #2 with rootwad on or near the top of bank with the cut end angled towards the streambed in the downstream direction. Position 25' long tree top with full branches on the bank side of log #2.



Step 3: Expand trench if necessary to make room for logs #3 and #4; logs shall rest on top of log #2 and hold the tree top in place. Logs shall be angled into bank with a minimum of 2.5' of cover at their cut ends. Pin log #4 to log #2 with rebar pin.



Step 4: Incorporate racking and slash material into structures by weaving it between logs and pressing pieces into the bank. Backfill the excavated trench compacting moderately in 1' lifts to the original bank line.



NOTES:

1. *Two variations of this structure are shown in the Drawings: regular and reverse orientations. Regular orientation is shown on this Dwg., see Dwg. –2142 for construction sequence for left bank and reverse orientations.*
2. *All logs shall come from fir, pine, or spruce trees.*
3. *Tree tops shall come from Douglas fir, grand fir, or spruce trees and shall be installed within 30 days of harvest.*
4. *Tree tops shall be handled with care to minimize breaking of branches. The Contracting Officer may reject any tree tops that have lost significant amounts of branches.*
5. *The exact location of each sweeper log structure shall be staked by the Contractor and approved by the Contracting Officer prior to constructing a specific structure.*
6. *Rough grading of channel shall be completed prior to constructing in–channel LWM structures.*
7. *Cut ends of logs that will be exposed at structure completion shall be marred prior to installation. The Contractor shall use an excavator, bulldozer, or other heavy equipment to tear apart wood fibers at the exposed cut end(s) of the log to create the appearance of a log that has naturally broken apart.*
8. *Racking and slash material shall be incorporated into each sweeper log structure by weaving it in between placed logs, placing it in voids, pressing it into the bank, or otherwise including it in the structure as directed by the Contracting Officer. Racking material as shown on this sheet is schematic only and not intended to represent the exact location or orientation of individual pieces.*
9. *The amount of slash placed in each structure shall be as directed by the Contracting Officer and may vary from structure to structure. The cost of providing and placing slash is not part of the unit cost of constructing this structure. All costs associated with obtaining and placing slash shall be part of the bid item "Slash Material".*
10. *Rebar pins shall be #6 rebar (minimum). To install rebar pins drill a ¾" diameter (or equal to nominal diameter of rebar if a size larger than #6 is used) pilot hole through both logs. Rebar pin shall extend completely through both logs and be finished flush with the top log.*
11. *Backfill structure using soil excavated to place logs unless the Contracting Officer determines the native soil is unsuitable for backfill and suitable soil must be imported. Place soil for backfill in 1 foot maximum lifts. Compact each lift using mechanical equipment such as an excavator bucket or equipment tracking.*

SWEEPER LOG STRUCTURE SCHEDULE

ITEM	DESCRIPTION	QUANTITY
Log type (1)	30' long, 18" DBH log with rootwad	4
Tree top	25' long tree top with full branches	1
Small racking material	6'–15' long, 3"–8" dia. log	8
Large racking material	6'–15' long, 8"–12" dia. log	8
Slash material (see note 9)	Tree tops, limbs with branches and needles	As Directed

SWEEPER LOG STRUCTURE CONSTRUCTION DETAILS

STRUCTURE STATION (ORIENTATION)	DESIGN ELEVATION
29+70 (REVERSE)	2942.8'
33+65 (REGULAR)	2942.0'
35+25 (REVERSE)	2940.7'
41+20 (REGULAR)	2938.5'
43+10 (REGULAR)	2934.3'

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FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN
CC–44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

N. TRUSCOTT
DRAWN

x Jay Hovde
ACCEPTED

BOISE, ID 2015–09–11

LWM DETAILS

SWEEPER LOG STRUCTURE

1678–100–2141

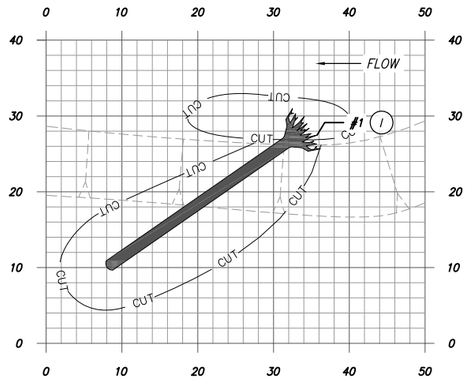
SHEET 14 OF 24

DATE AND TIME PLOTTED
September 11, 2015 15:28
PLOTTED BY
TRUSCOTT, NIC

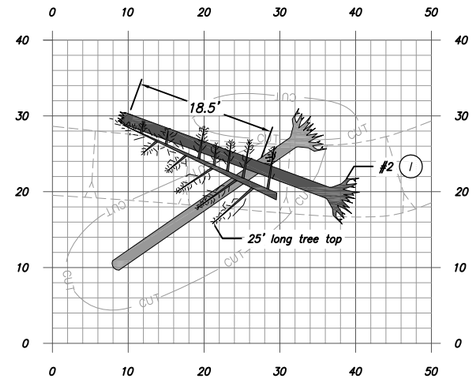
CAD SYSTEM
AutoCAD Civil 3D 2014
CAD FILENAME
CC44_Parcel_3_LWM_Sweeper_Details.dwg

LEFT BANK (REGULAR) CONSTRUCTION SEQUENCE

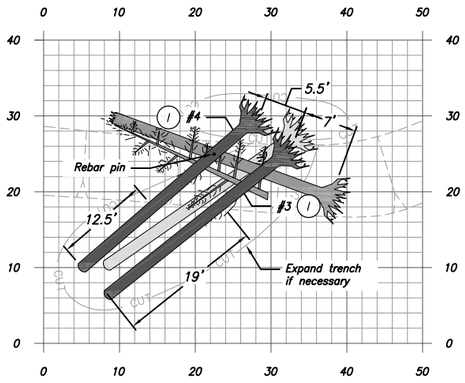
Step 1: Excavate scour pool as directed by Contracting Officer and trench for log #1; place log horizontally at elevation identified on this sheet. Rootwad shall sit just past the toe of bank.



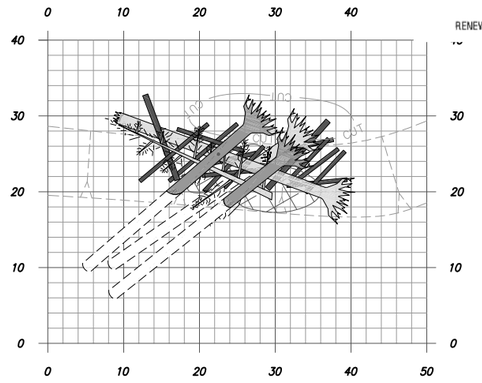
Step 2: Place log #2 with rootwad on or near the top of bank with the cut end angled towards the streambed in the downstream direction. Position 25' long tree top with full branches on the bank side of log #2.



Step 3: Expand trench if necessary to make room for logs #3 and #4; logs shall rest on top of log #2 and hold the tree top in place. Logs shall be angled into bank with a minimum of 2.5' of cover at their cut ends. Pin log #4 to log #2 with rebar pin.

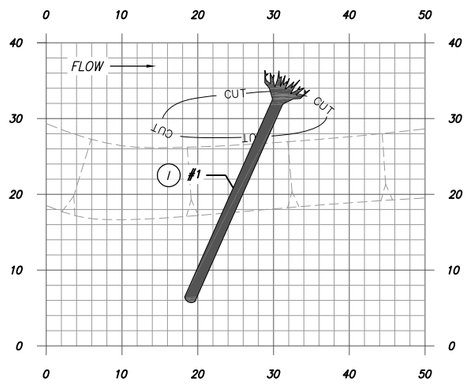


Step 4: Incorporate racking and slash material into structures by weaving it between logs and pressing pieces into the bank. Backfill the excavated trench compacting moderately in 1' lifts to the original bank line.

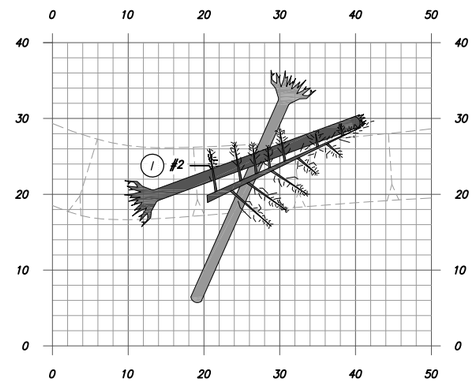


RIGHT BANK (REVERSE) CONSTRUCTION SEQUENCE

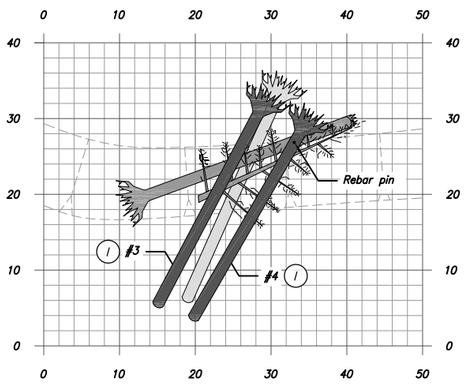
Step 1: Excavate scour pool as directed by Contracting Officer and trench for log #1; place log horizontally at elevation identified on this sheet.



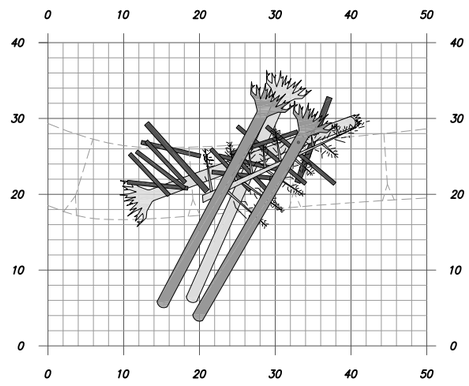
Step 2: Place log #2 with rootwad on or near the top of bank with the cut end angled towards the streambed in the downstream direction. Position 25' long tree top with full branches on the bank side of log #2.



Step 3: Expand trench if necessary to make room for logs #3 and #4; logs shall rest on top of log #2 and hold the tree top in place. Logs shall be angled into bank with a minimum of 2.5' of cover at their cut ends. Pin log #4 to log #2 with rebar pin.

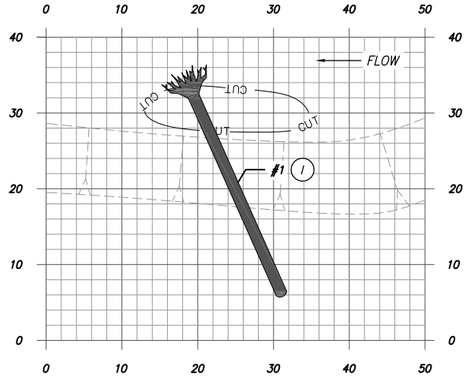


Step 4: Incorporate racking and slash material into structures by weaving it between logs and pressing pieces into the bank. Backfill the excavated trench compacting moderately in 1' lifts to the original bank line.

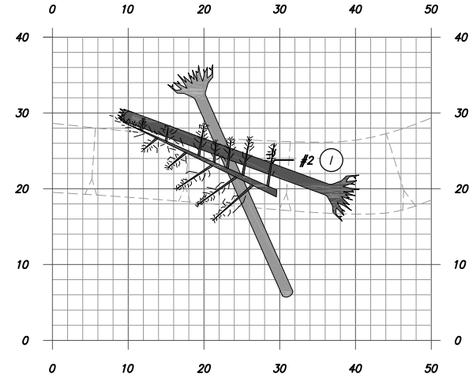


LEFT BANK (REVERSE) CONSTRUCTION SEQUENCE

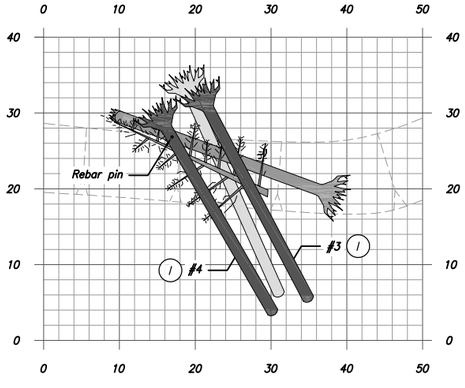
Step 1: Excavate scour pool as directed by Contracting Officer and trench for log #1; place log horizontally at elevation identified on this sheet.



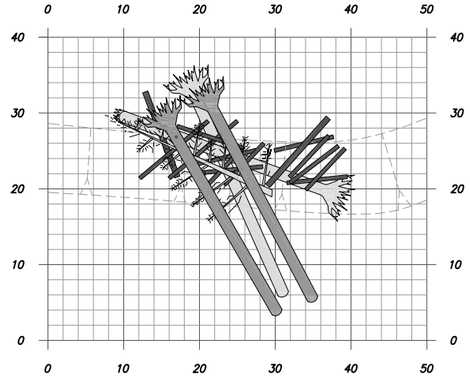
Step 2: Place log #2 with rootwad on or near the top of bank with the cut end angled towards the streambed in the downstream direction. Position 25' long tree top with full branches on the bank side of log #2.



Step 3: Expand trench if necessary to make room for logs #3 and #4; logs shall rest on top of log #2 and hold the tree top in place. Logs shall be angled into bank with a minimum of 2.5' of cover at their cut ends. Pin log #4 to log #2 with rebar pin.



Step 4: Incorporate racking and slash material into structures by weaving it between logs and pressing pieces into the bank. Backfill the excavated trench compacting moderately in 1' lifts to the original bank line.



REGISTERED PROFESSIONAL ENGINEER
83129PE
OREGON
JULY 14, 2009
MARTIN K. FISHER
9/11/15
RENEWAL DATE: 12/31/2015

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GRANDE RONDE SUBBASIN
CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

N. TRUSCOTT
DRAWN

X Jay Hovde
ACCEPTED

BOISE, ID
2015-09-11

LWM DETAILS

SWEEPER LOG STRUCTURE

1678-100-2142

SHEET 15 OF 24

DATE AND TIME PLOTTED
September 11, 2015 15:28
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TRUSCOTT, NIC

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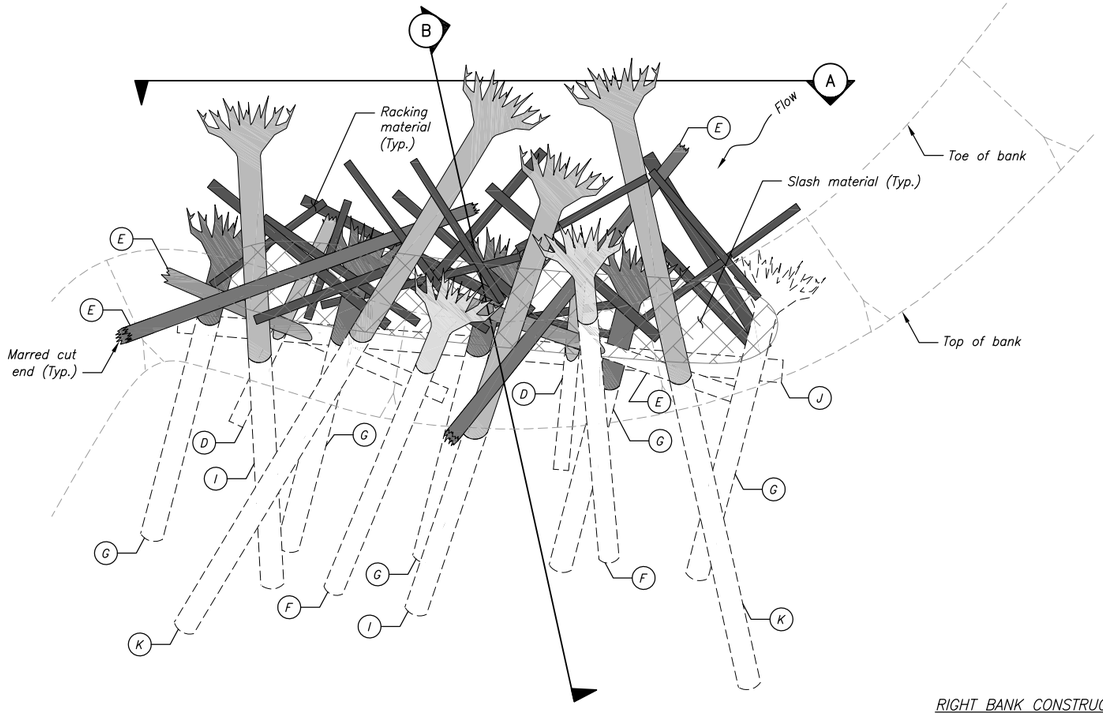
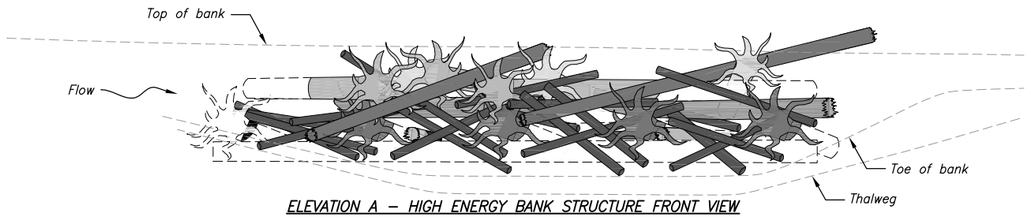
CAD FILENAME
CC44_Parcel_3_LWM_Sweeper_Details.dwg



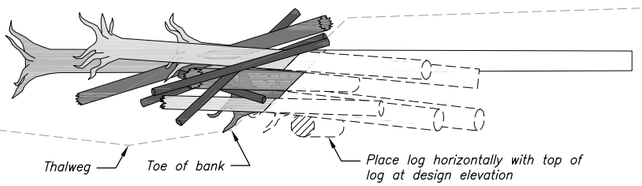
PLAN VIEW – HIGH ENERGY BANK STRUCTURE

5 0 5 10 15
SCALE OF FEET



ELEVATION A – HIGH ENERGY BANK STRUCTURE FRONT VIEW

5 0 5 10 15
SCALE OF FEET



ELEVATION B – HIGH ENERGY BANK STRUCTURE SIDE VIEW

5 0 5 10 15
SCALE OF FEET

NOTES:

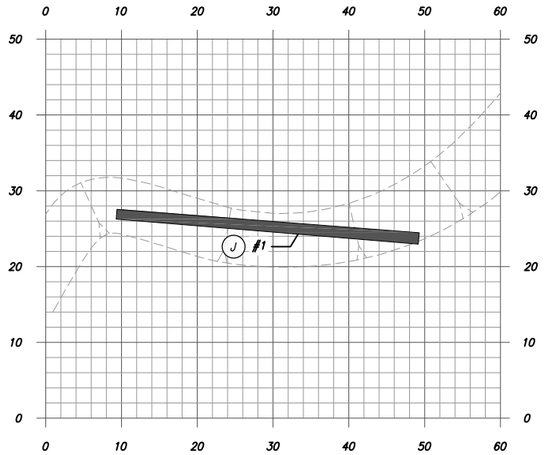
1. All logs shall come from fir, pine, or spruce trees.
2. The diameter of logs without rootwads shall be measured at the smallest cut end.
3. The exact location of each high energy bank structure shall be staked by the Contractor and approved by the Contracting Officer prior to constructing a specific structure.
4. Rough grading of channel shall be completed prior to constructing in–channel LWM structures.
5. Cut ends of logs that will be exposed at structure completion shall be marred prior to installation. The Contractor shall use an excavator, bulldozer, or other heavy equipment to tear apart wood fibers at the cut end of the log to create the appearance of a log that has naturally broken apart.
6. Racking and slash material shall be incorporated into each high energy bank structure by weaving it in between placed logs, placing it in voids, pressing it into the bank, or otherwise including it in the structure as directed by the Contracting Officer. Racking material as shown on this sheet is schematic only and not intended to represent the actual location or orientation of individual pieces.
7. The amount of slash placed in each structure shall be as directed by the Contracting Officer and may vary from structure to structure. The cost of providing and placing slash is not part of the unit cost of constructing this structure. All costs associated with obtaining and placing slash shall be part of the bid item "Slash Material".
8. Backfill structure using soil excavated to place logs unless the Contracting Officer determines the native soil is unsuitable for backfill and suitable soil must be imported. Place soil for backfill in 1 foot maximum lifts. Compact each lift using mechanical equipment such as an excavator bucket or equipment tracking.

HIGH ENERGY BANK STRUCTURE MATERIAL SCHEDULE

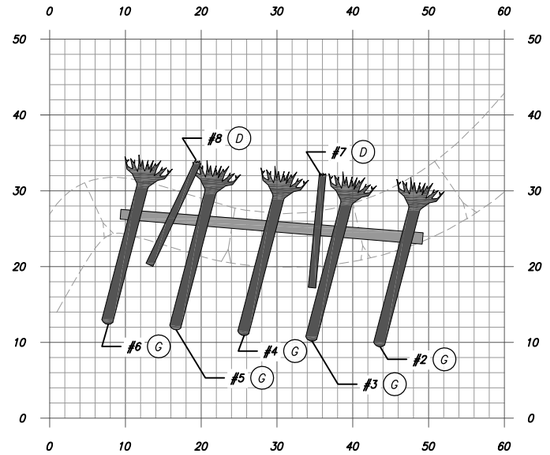
ITEM	DESCRIPTION	QUANTITY
Log type (D)	15'–20' long, 12" dia. log	2
Log type (E)	20'–25' long, 12" dia. log	4
Log type (F)	20' long, 12" DBH log with rootwad	2
Log type (G)	20' long, 18" DBH log with rootwad	5
Log type (I)	30' long, 18" DBH log with rootwad	2
Log type (J)	40' long, 18" dia. log	1
Log type (K)	40' long, 18" DBH log with rootwad	2
Small racking material	6'–15' long, 3"–8" dia. log	15
Large racking material	6'–15' long, 8"–12" dia. log	15
Slash material (see note 7)	Tree tops, limbs with branches and needles	As Directed

RIGHT BANK CONSTRUCTION SEQUENCE

Step 1: Excavate as necessary to place log #1 (footer log) with top of log at design elevation.



Step 2: Excavate as necessary to place logs #2–#8. Logs shall be placed horizontally.



Construction sequencing continued on Dwg. –2144

HIGH ENERGY BANK STRUCTURE CONSTRUCTION DETAILS

STRUCTURE STATION	DESIGN ELEVATION
33+30	2939.5'
40+80	2934.5'
42+75	2932.0'
47+75	2929.1'

REGISTERED PROFESSIONAL ENGINEER
83129PE
OREGON
JULY 14, 2009
MARTIN K. FISHER
3/4/15
RENEWAL DATE: 12/31/2015

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FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN

CC–44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

N. TRUSCOTT
DRAWN

X Jay Hovde
ACCEPTED

BOISE, ID 2015–09–11

LWM DETAILS

HIGH ENERGY BANK STRUCTURE

1678–100–2143

SHEET 16 OF 24

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September 11, 2015 15:32
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TRUSCOTT, NIC

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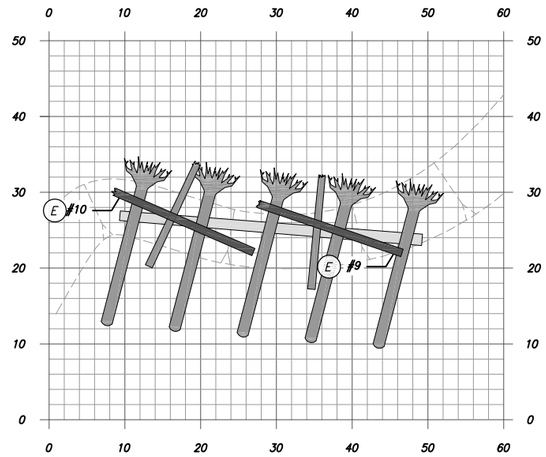
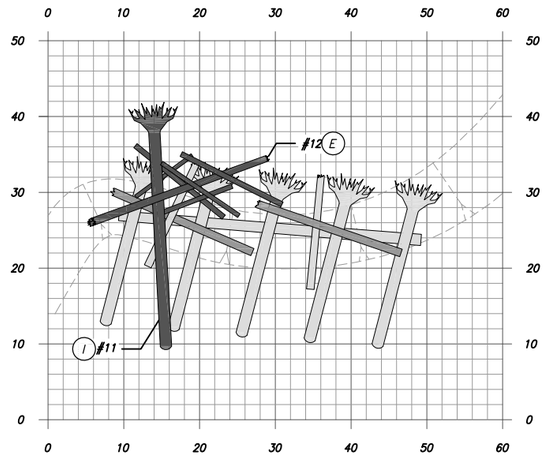
CAD FILENAME
CC44_Phase_3-4_LWM_High_Energy_Bank_Details.dwg

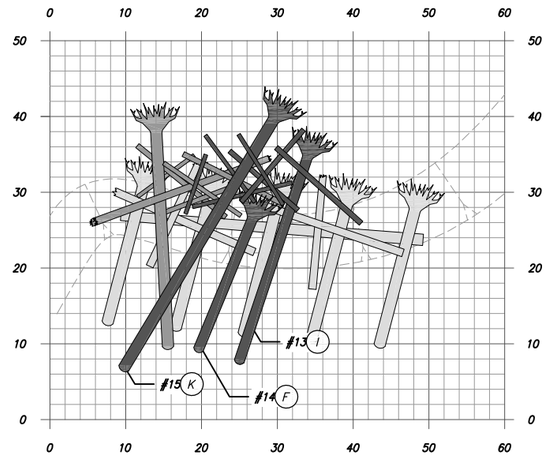
Step 3: Place logs #9 and #10 as shown, resting them on previously placed logs.



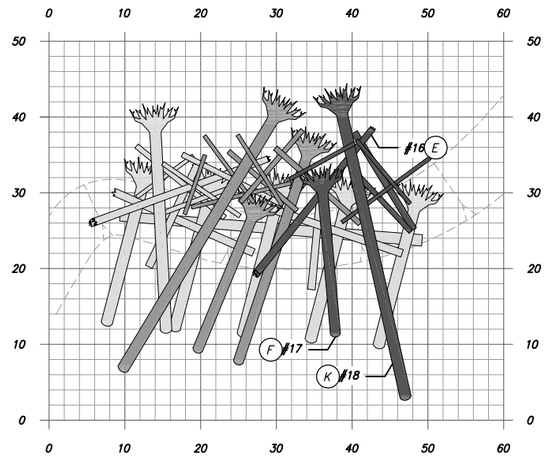
Step 4: Place #11 in the orientation shown, angling it on an 8H:1V slope into the bank. Rest log #12 on top of log #11 with the upstream end angled toward the streambed. Incorporate approximately one-third of the racking material into the structure as directed by the Contracting Officer while completing this step.



Step 5: Expand excavation as necessary to place logs #13-#15. Logs #13 and #15 shall rest on top of previously place logs; angle log #14 on a slope of 8H:1V into the bank. Incorporate approximately one-third of the racking material into the structure as directed by the Contracting Officer while completing this step.



Step 6: Place log #16 as shown, resting it on top of previously placed logs and angling the upstream end toward the streambed. Place logs #17 and #18 horizontally, resting each on top of previously placed logs. Incorporate remaining racking material and slash material into the structure as directed by the Contracting Officer then backfill structure to original bank.



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GRANDE RONDE SUBBASIN

CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

N. TRUSCOTT
DRAWN

x Jay Hovde
ACCEPTED

BOISE, ID 2015-09-11

LWM DETAILS

HIGH ENERGY
BANK STRUCTURE

1678-100-2144

SHEET 17 OF 24

REGISTERED PROFESSIONAL ENGINEER
83129PE
OREGON
JULY 14, 2009
MARTIN K. FISHER
9/14/15

RENEWAL DATE: 12/31/2015

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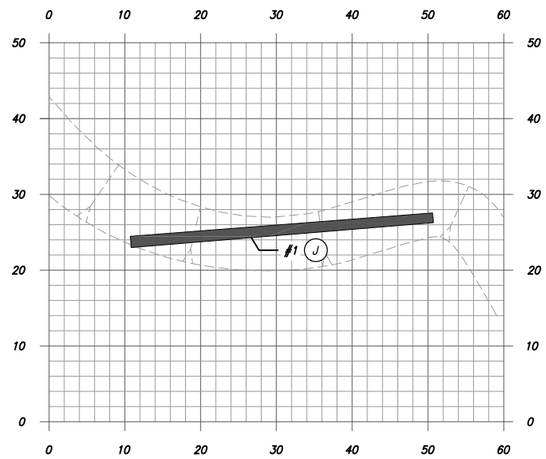
September 11, 2015 15:32
PLOTTED BY
TRUSCOTT, NIC

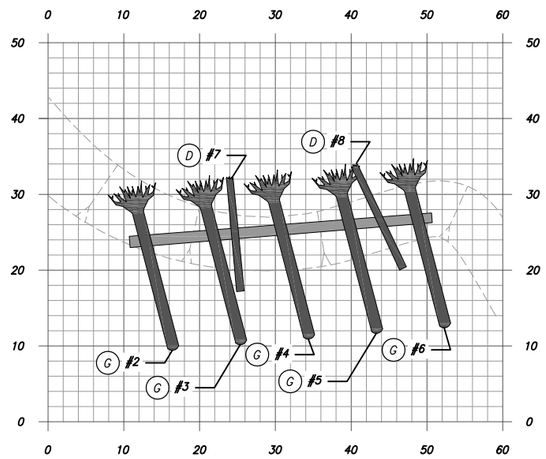
CAD SYSTEM
AutoCAD Civil 3D 2014
CAD FILENAME
CC44_Phase_3-4_LWM_High_Energy_BankStructure_Details.dwg

LEFT BANK CONSTRUCTION SEQUENCE

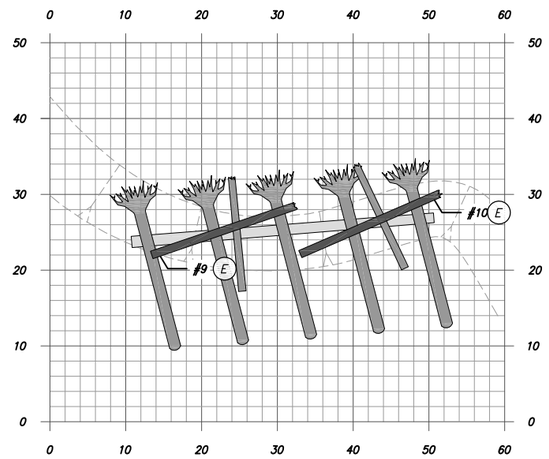
Step 1: Excavate as necessary to place log #1 (footer log) with top of log at design elevation.



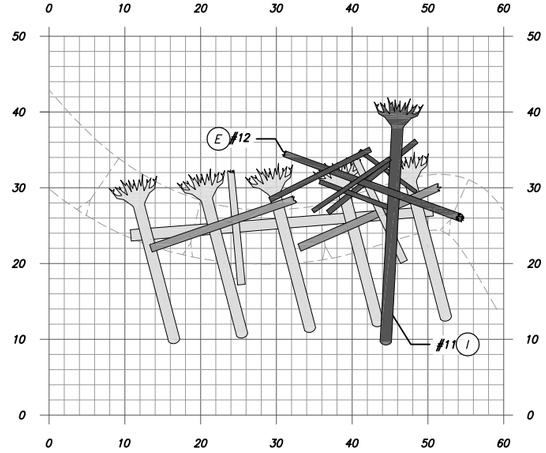
Step 2: Excavate as necessary to place logs #2–#8. Logs shall be placed horizontally.



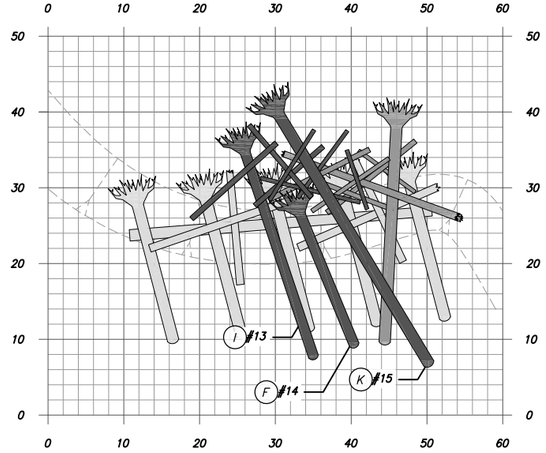
Step 3: Place logs #9 and #10 as shown, resting them on previously placed logs.



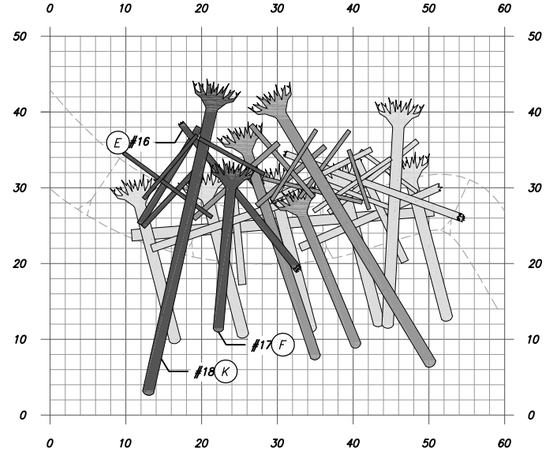
Step 4: Place #11 in the orientation shown, angling it on an 8H:1V slope into the bank. Rest log #12 on top of log #11 with the upstream end angled toward the streambed. Incorporate approximately one–third of the racking material into the structure as directed by the Contracting Officer while completing this step.



Step 5: Expand excavation as necessary to place logs #13–#15. Logs #13 and #15 shall rest on top of previously place logs; angle log #14 on a slope of 8H:1V into the bank. Incorporate approximately one–third of the racking material into the structure as directed by the Contracting Officer while completing this step.



Step 6: Place log #16 as shown, resting it on top of previously placed logs and angling the upstream end toward the streambed. Place logs #17 and #18 horizontally, resting each on top of previously placed logs. Incorporate remaining racking material and slash material into the structure as directed by the Contracting Officer then backfill structure to original bank.



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GRANDE RONDE SUBBASIN

CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

N. TRUSCOTT
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x Jay Hovde
ACCEPTED

BOISE, ID 2015-09-11

LWM DETAILS

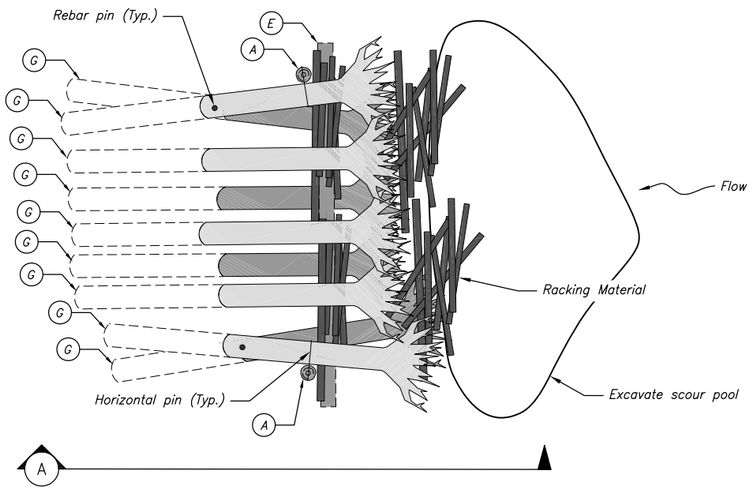
HIGH ENERGY BANK STRUCTURE

1678-100-2145

SHEET 18 OF 24

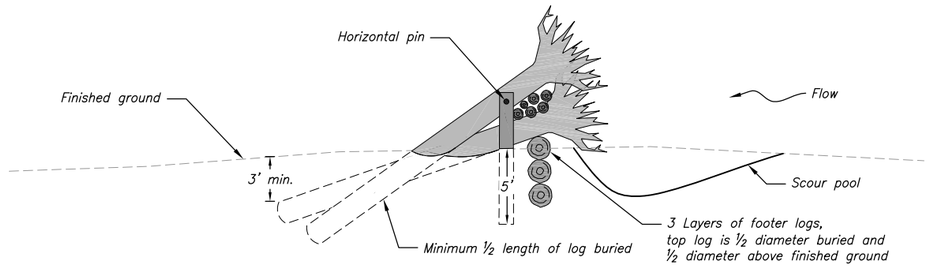
DATE AND TIME PLOTTED
September 11, 2015 15:33
PLOTTED BY
TRUSCOTT, NIC

CAD SYSTEM
AutoCAD Civil 3D 2014
CAD FILENAME
CC44_Phase_3-4_LWM_High_Energy_BankBasalm_Details.dwg



PLAN VIEW – LARGE APEX JAM

5 0 5 10 15
SCALE OF FEET



ELEVATION A – LARGE APEX JAM SIDE VIEW

5 0 5 10 15
SCALE OF FEET

NOTES:

1. *All logs shall come from fir, pine, or spruce trees.*
2. *The diameter of logs without rootwads shall be measured at the smallest cut end.*
3. *The exact location of the large apex jam shall be staked by the Contractor and approved by the Contracting Officer prior to constructing it.*
4. *Cut ends of logs that will be exposed at structure completion shall be marred prior to installation. The Contractor shall use an excavator, bulldozer, or other heavy equipment to tear apart wood fibers at the exposed cut end(s) of the log to create the appearance of a log that has naturally broken apart.*
5. *Racking and slash material shall be incorporated into the large apex jam by weaving it in between placed logs, placing it in voids, or otherwise including it in the structure as directed by the Contracting Officer. Racking material as shown on this sheet is schematic only and not intended to represent the actual location or orientation of individual pieces.*
6. *Rebar pins shall be #6 rebar (minimum). To install rebar pins drill a ¾" diameter (or equal to nominal diameter of rebar if a size larger than #6 is used) pilot hole through both logs. Rebar pin shall extend completely through both logs and be finished flush with the top log.*
7. *Horizontal pins shall be 1" diameter all–thread. Drill 1 ¼" hole through vertical log and top layer log with rootwad. Insert 1" diameter all–thread through hole. Place washer at each end and secure with nut at each end. Cut excess length of all–thread so end is flush with nut.*
8. *Backfill structure using soil excavated to place logs unless the Contracting Officer determines the native soil is unsuitable for backfill and suitable soil must be imported. Place soil for backfill in 1 foot maximum lifts. Compact each lift using mechanical equipment such as an excavator bucket or equipment tracking.*

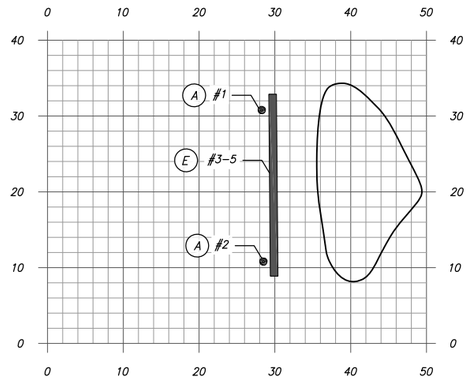
LARGE APEX JAM SCHEDULE

ITEM	DESCRIPTION	QUANTITY
Log type (A)	10' long, 12" dia. log	2
Log type (E)	20'–25' long, 12" dia. log	3
Log type (G)	20' long, 18" DBH log with rootwad	9
Small racking material	6'–15' long, 3"–8" dia. log	20
Large racking material	6'–15' long, 8"–12" dia. log	20

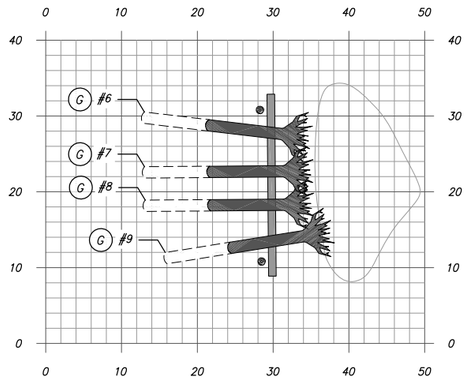
LARGE APEX JAM CONSTRUCTION DETAILS
STRUCTURE STATION

51+50

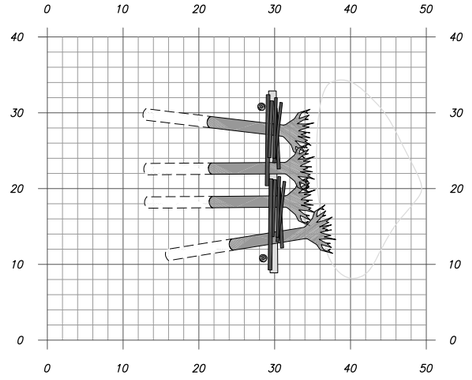
Step 1: Place footer logs and vertical piling logs then backfill to existing channel bed. Excavate scour pool to dimensions directed by Contracting Officer after footer logs and pilings have been placed.



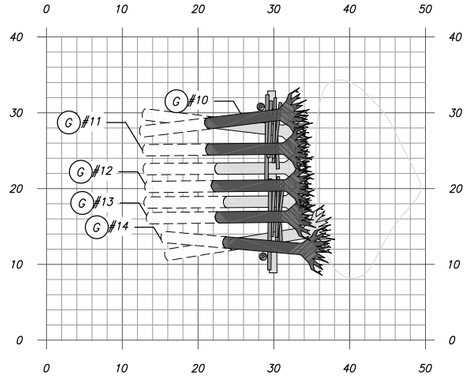
Step 2: Place lower row of apex jam logs with rootwads.



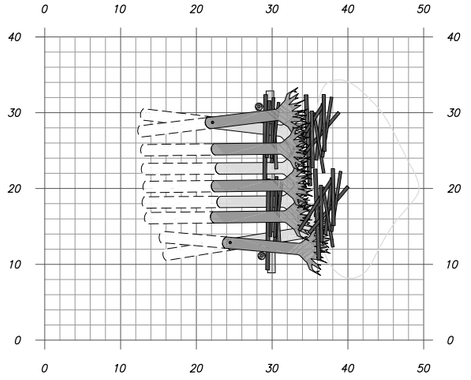
Step 3: Place racking material over lower row of apex jam logs and in front of vertical piling logs.



Step 4: Place second layer of apex jam logs with rootwads.



Step 5: Place racking material in front of apex jam. Install 2 rebar pins, 1 at each location where upper layer log with rootwad crosses lower layer log with rootwad. Install 2 horizontal pins, 1 connecting each pile to adjacent log with rootwad.



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GRANDE RONDE SUBBASIN

CC–44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

M. FISHER
DRAWN

X Jay Hovde
ACCEPTED

BOISE, ID 2015–09–11

LWM DETAILS

LARGE APEX JAM

1678–100–2146

SHEET 19 OF 24

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September 11, 2015 15:33
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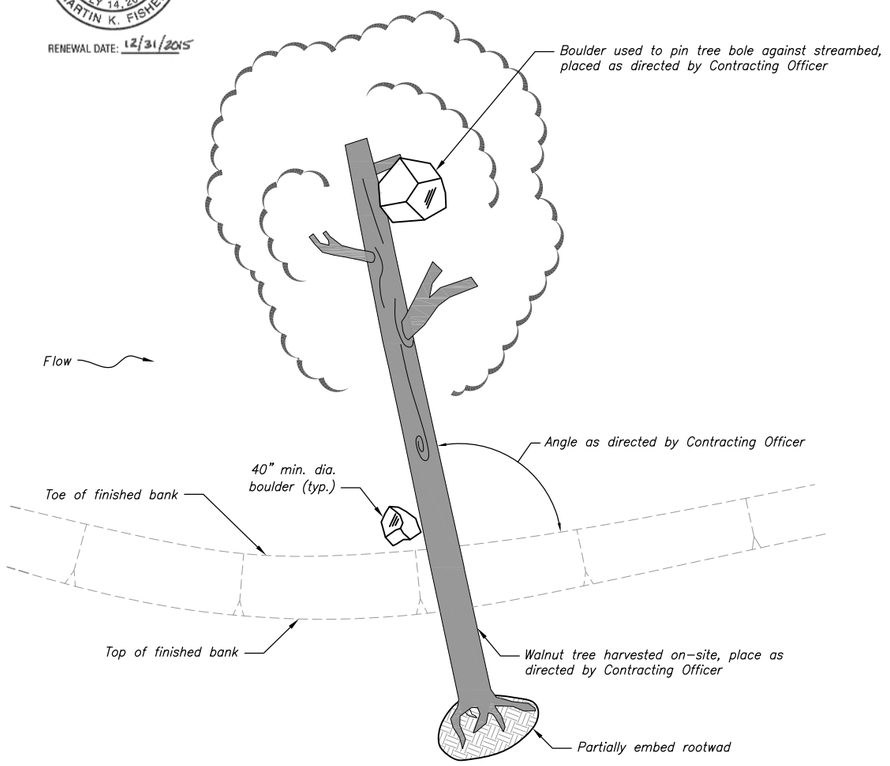
TRUSCOTT, WC

CAD SYSTEM
AutoCAD Civil 3D 2014
CAD FILENAME
CC44_Parcel_3_LWM_BIOApex_Details.dwg

ONSITE WALNUT TREE PLACEMENT DETAIL

REGISTERED PROFESSIONAL ENGINEER
83129PE
OREGON
JULY 14, 2009
MARTIN K. FISHER
9/11/15
RENEWAL DATE: 12/31/2015

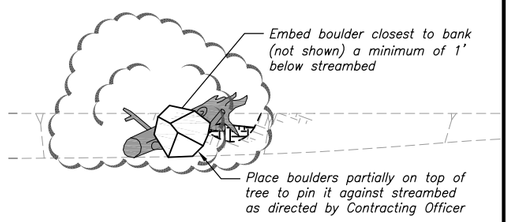


PLAN VIEW – ONSITE WALNUT TREE PLACEMENT

N.T.S.

ONSITE WALNUT TREE PLACEMENT CONSTRUCTION DETAILS

STRUCTURE	STATION
	As Directed (x4)



ELEVATION VIEW – ONSITE WALNUT TREE PLACEMENT

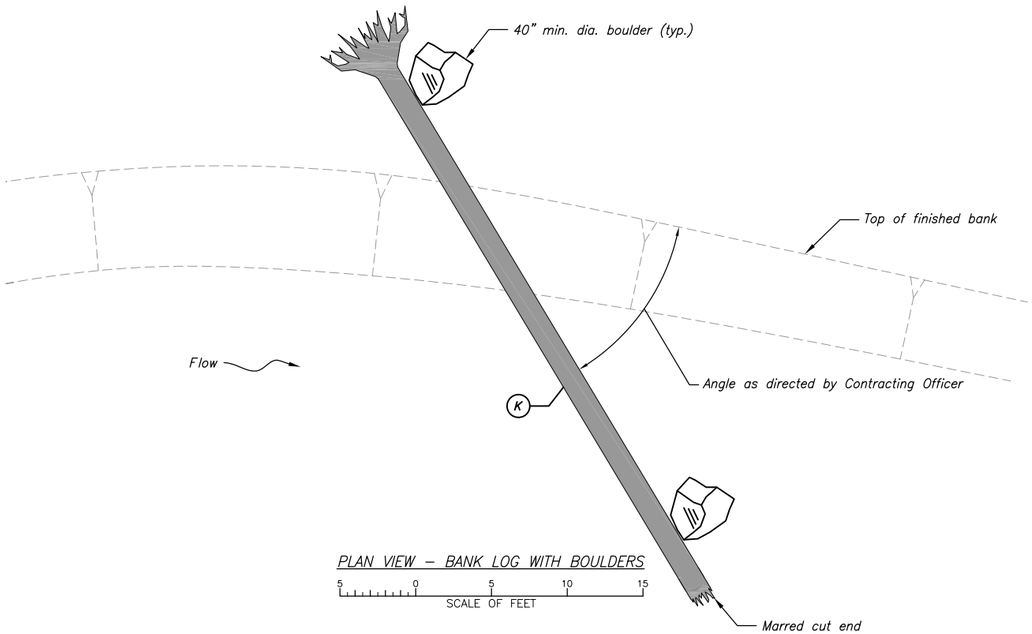
10 0 10 20 30
SCALE OF FEET

ON-SITE FIELD-FIT TREE MATERIAL SCHEDULE

ITEM	DESCRIPTION	QUANTITY
Black walnut tree	Length and DBH vary, identified by C.O.	1
Boulder	40" min. dia.	2

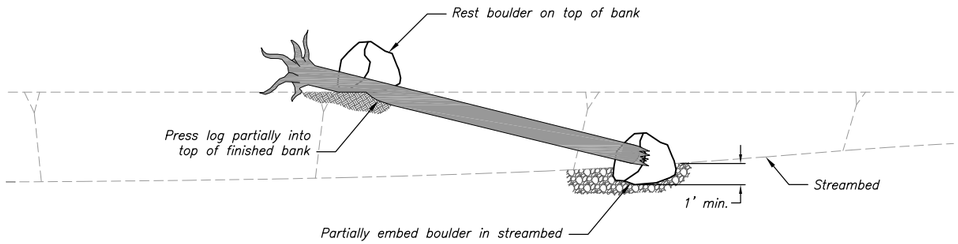
Notes:
1. Onsite walnut tree placements shall be placed as directed by the Contracting Officer.
2. All logs for field-fit on-site trees shall come from the project site. The Contractor will be required to transport and place logs as directed by the Contracting Officer.
3. The Contracting Officer will identify trees for harvest; trees are walnut and range from approximately 36" to 60" DBH. Trees shall be limbed and trimmed as directed by the Contracing Officer prior to placement.
4. Boulders shall be placed as directed by the Contracting Officer. Two large boulders are available for salvage and use from on-site. On-site boulder diameters range from approximately 4' to over 8' in diameter. Placing the boulders as directed by the Contracting Officer will required careful manipulation with heavy equipment. Boulders shall be placed at least partially on top of each tree to hold it down.
5. Imported boulders shall be naturally occurring or processed stone that is competent and free of seams, cracks, or other defects. Boulders shall be generally spherical and have a minimum diameter of 40" as determined by averaging the measured lengths along the three major axes.

BANK LOG WITH BOULDERS DETAIL



PLAN VIEW – BANK LOG WITH BOULDERS

5 0 5 10 15
SCALE OF FEET



ELEVATION VIEW – BANK LOG WITH BOULDERS

5 0 5 10 15
SCALE OF FEET

Notes:
1. Bank logs with boulders shall be constructed as shown on this sheet unless otherwise directed by the Contracting Officer.
2. The exact location of each bank log with boulders shall be determined by the Contracting Officer.
3. Logs shall come from fir, pine, or spruce trees.
4. The cut end of the log shall be marred prior to installation. The Contractor shall use an excavator, bulldozer, or other heavy equipment to tear apart wood fibers at the cut end of the log to create the appearance of a log that has naturally broken apart.
5. Boulders shall be naturally occurring or processed stone that is competent and free of seams, cracks, or other defects. Boulders shall be generally spherical and have a minimum diameter of 40" as determined by averaging the measured lengths along the three major axes.

BANK LOG WITH BOULDERS MATERIAL SCHEDULE

ITEM	DESCRIPTION	QUANTITY
Log type (K)	40' long, 18" DBH log with rootwad	1
Boulder	40" min. dia.	2

BANK LOG WITH BOULDERS CONSTRUCTION DETAILS

STRUCTURE	STATION
	55+00
	55+30

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GRANDE RONDE SUBBASIN

CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

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x Jay Hovde
ACCEPTED

BOISE, ID 2015-09-11

LWM DETAILS

ONSITE WALNUT TREE PLACEMENT & BANK LOG WITH BOULDERS

1678-100-2147

SHEET 20 OF 24

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CAD FILENAME
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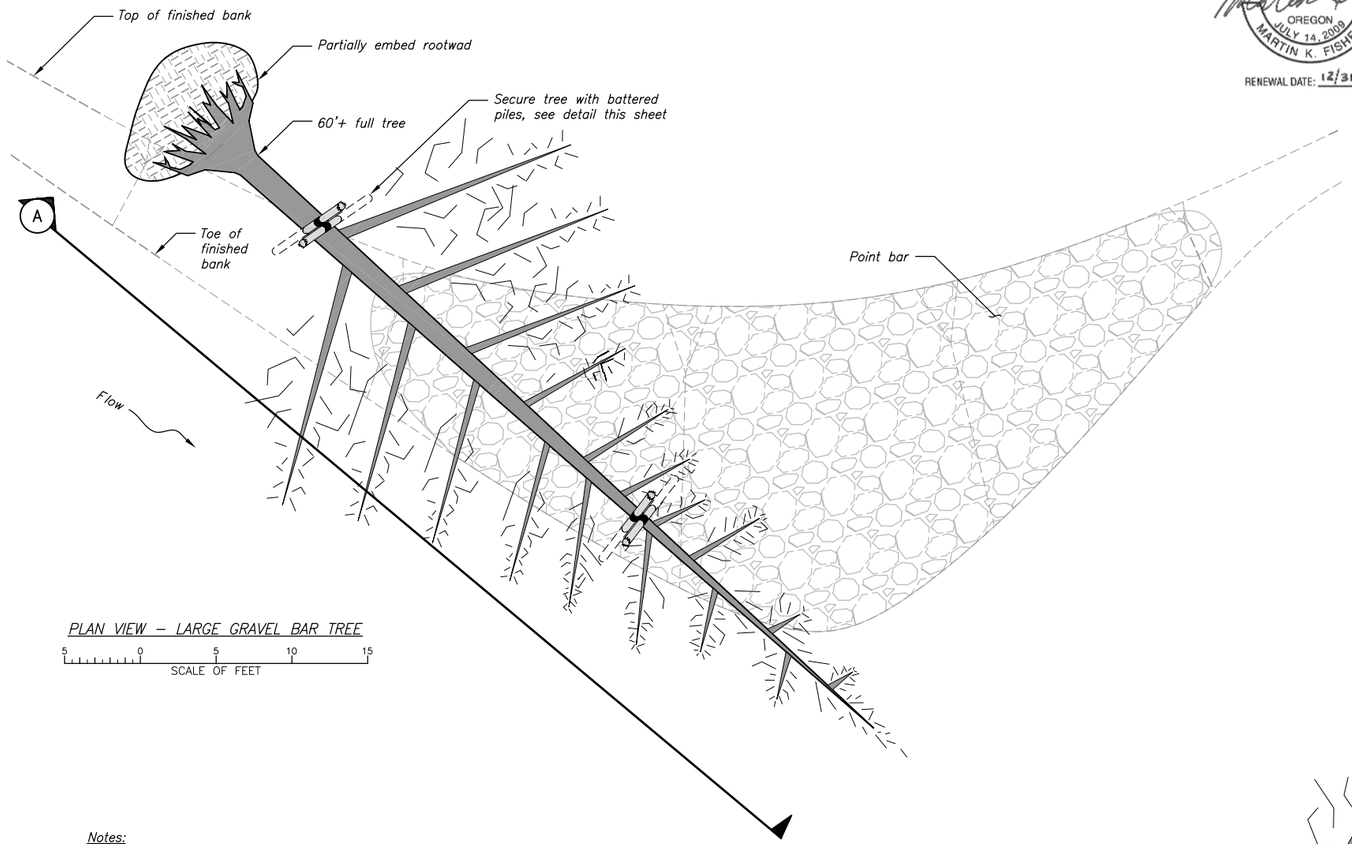
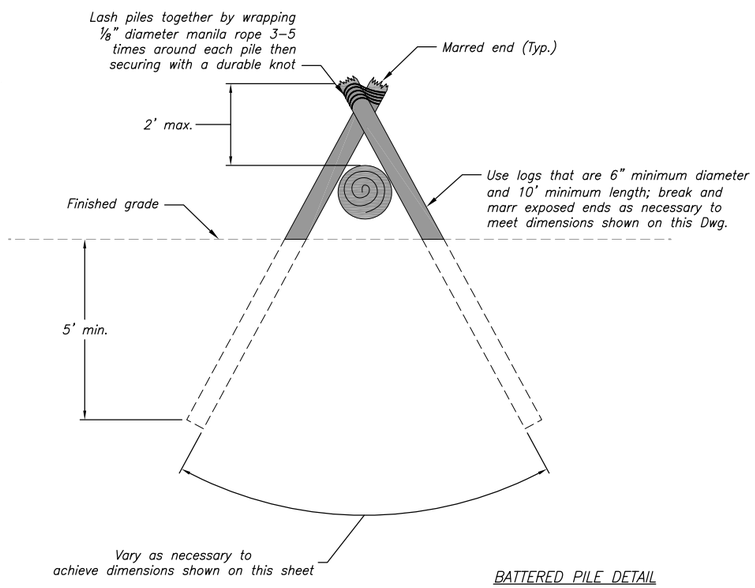


PLAN VIEW – LARGE GRAVEL BAR TREE

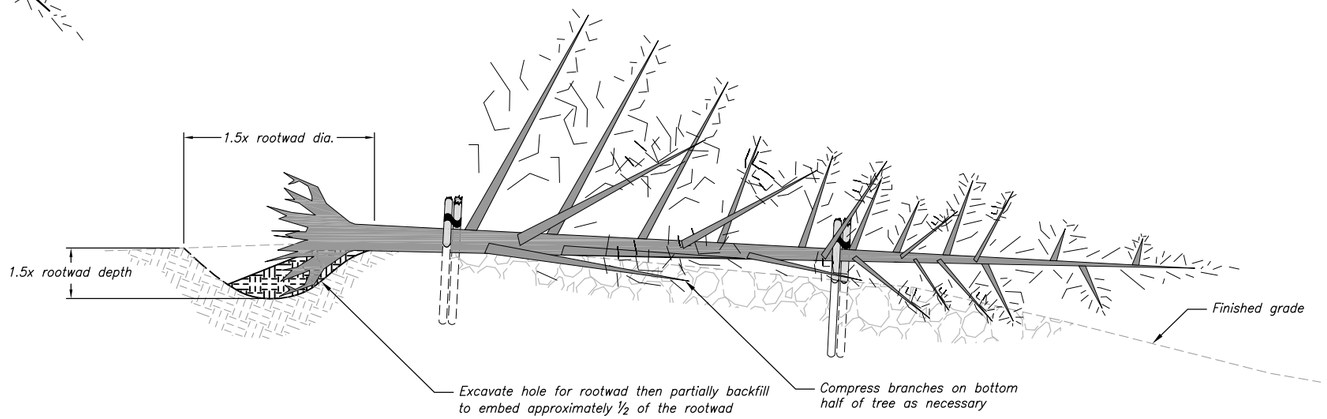
5 0 5 10 15
SCALE OF FEET

REGISTERED PROFESSIONAL ENGINEER
83129PE
OREGON
JULY 14, 2009
MARTIN K. FISHER
9/14/15
RENEWAL DATE: 12/31/2015



BATTERED PILE DETAIL

2 0 2 4 6
SCALE OF FEET



ELEVATION A – LARGE GRAVEL BAR TREE

5 0 5 10 15
SCALE OF FEET

LARGE GRAVEL BAR TREE DETAILS

Notes:

1. The exact location of each large gravel bar tree shall be staked by the Contractor and approved by the Contracting Officer prior to constructing a specific structure.
2. Trees shall be a minimum length of 60', shall be Douglas fir, grand fir, or spruce trees and shall be installed within 30 days of harvest.
3. Trees shall be handled with care to minimize breaking of branches. The Contracting Officer may reject any trees that have lost significant amounts of branches.
4. Rough grading of channel shall be completed prior to constructing in-channel LWM structures.
5. Piles shall be 6" minimum diameter logs with a minimum length of 10'. Piles may be installed by driving (using a small pile driver or excavator-mounted driving attachment), augering, or excavating.
6. Piles shall be embedded at least 5' below the finished ground surface; piles shall be lashed together with manila rope as shown in the battered pile detail on this sheet.
7. Cut ends of piles that will be exposed at structure completion shall be marred prior to installation. The Contractor shall use an excavator, bulldozer, or other heavy equipment to tear apart wood fibers at the exposed cut end(s) of the log to create the appearance of a log that has naturally broken apart.
8. Excavate as necessary to embed half of the rootwad.

ON-SITE FIELD-FIT TREE MATERIAL SCHEDULE

ITEM	DESCRIPTION	QUANTITY
Pile-log	10' min. length, 6" dia. log	4
Large gravel bar tree	60' min. length full tree with branches	1

LARGE GRAVEL BAR TREE CONSTRUCTION DETAILS

STRUCTURE STATION	
4+20	40+25
8+50	42+00
11+00	44+20
14+50	44+60
17+00	48+25
19+00	52+60
26+00	53+90
32+80	54+00
	54+30

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CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

N. TRUSCOTT
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x Jay Hovde
ACCEPTED

BOISE, ID 2015-09-11

LWM DETAILS

LARGE GRAVEL BAR TREE

1678-100-2148

SHEET 21 OF 24

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TRUSCOTT, NIC

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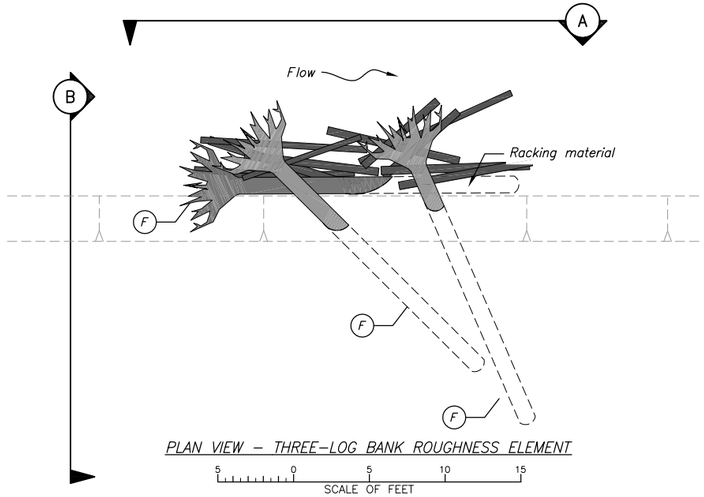
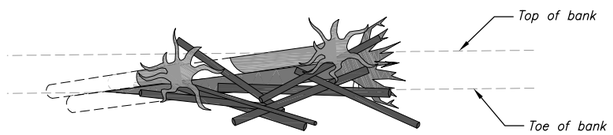
CAD FILENAME
CC44_Parcel_3_LWM_Margin_Tree_Details.dwg

THREE–LOG BANK ROUGHNESS ELEMENT DETAIL



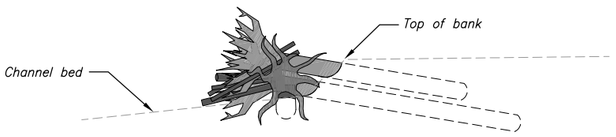
PLAN VIEW – THREE–LOG BANK ROUGHNESS ELEMENT

5 0 5 10 15
SCALE OF FEET



ELEVATION VIEW – THREE–LOG BANK ROUGHNESS ELEMENT

5 0 5 10 15
SCALE OF FEET



SECTION VIEW – THREE–LOG BANK ROUGHNESS ELEMENT

5 0 5 10 15
SCALE OF FEET

NOTES:
1. Three–log bank roughness elements shall be constructed as shown on this sheet unless otherwise directed by the Contracting Officer.
2. All logs shall come from fir, pine, or spruce trees.
3. The exact location of each bank roughness elements shall be staked by the Contractor and approved by the Contracting Officer prior to constructing a specific structure.
4. Rough grading of channel shall be completed prior to constructing in–channel LWM structures.
5. Racking and slash material shall be incorporated into each three–log bank roughness element by weaving it in between placed logs, placing it in voids, pressing it into the bank, or otherwise including it in the structure as directed by the Contracting Officer. Racking material as shown on this sheet is schematic only and not intended to represent the actual location or orientation of individual pieces.
6. Backfill structure using soil excavated to place logs unless the Contracting Officer determines the native soil is unsuitable for backfill and suitable soil must be imported. Place soil for backfill in 1 foot maximum lifts. Compact each lift using mechanical equipment such as an excavator bucket or equipment tracking.

THREE–LOG BANK ROUGHNESS ELEMENT MAIN CHANNEL STRUCTURE STATION (BANK)

6+15 (L)	24+75 (L)
6+35 (L)	27+50 (R)
8+90 (L)	28+15 (L)
10+75 (R)	35+05 (R)
11+10 (R)	36+25 (R)
12+60 (R)	37+10 (R)
13+25 (L)	37+90 (L)
13+50 (L)	39+30 (L)
14+05 (L)	40+15 (R)
15+25 (L)	40+45 (R)
16+85 (R)	42+40 (L)
20+40 (L)	44+50 (R)
21+60 (L)	46+60 (R)
22+30 (R)	47+00 (L)
22+45 (R)	47+25 (L)
23+30 (L)	49+15 (L)
24+50 (L)	

THREE–LOG BANK ROUGHNESS ELEMENT SIDE CHANNEL 1 STATION (BANK)

22+65 (R)	22+80 (R)

THREE–LOG BANK ROUGHNESS ELEMENT FLOOD SWALE COMPLEX 1 – CHANNEL A STATION (BANK)

16+25 (L)

THREE–LOG BANK ROUGHNESS ELEMENT SIDE CHANNEL 2 STATION (BANK)

4+25 (L)

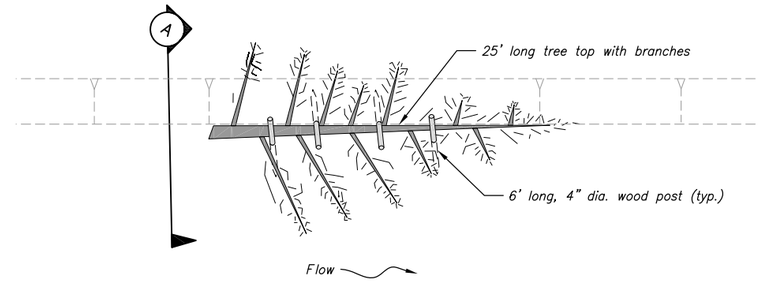
THREE–LOG BANK ROUGHNESS ELEMENT ALCOVE 3 STATION (BANK)

2+95 (R)

THREE–LOG BANK ROUGHNESS ELEMENT

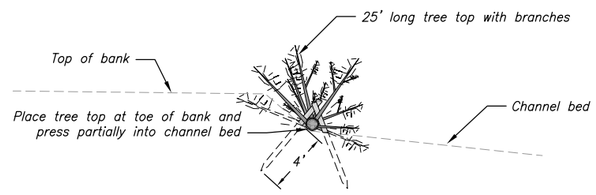
ITEM	DESCRIPTION	QUANTITY
Log type (F)	20' long, 12" DBH log with rootwad	3
Small racking material	6'–15' long, 3"–8" dia. log	5
Large racking material	6'–15' long, 8"–12" dia. log	5

TREE TOP BANK ROUGHNESS ELEMENT DETAIL



PLAN VIEW – TREE TOP BANK ROUGHNESS ELEMENT

5 0 5 10 15
SCALE OF FEET



ELEVATION VIEW – TREE TOP BANK ROUGHNESS ELEMENT

5 0 5 10 15
SCALE OF FEET

Notes:
1. Tree top bank roughness elements shall be constructed as shown on this sheet unless otherwise directed by the Contracting Officer.
2. Tree tops shall come from Douglas fir, grand fir, or spruce trees and shall be installed within 30 days of harvest.
3. Tree tops shall be handled with care to minimize breaking of branches. The Contracting Officer may reject any tree tops that have lost significant amounts of branches.
4. Wood posts may be installed by driving (using a small pile driver or excavator–mounted driving attachment), augering, or excavating.
5. The exact location of each bank roughness elements shall be staked by the Contractor and approved by the Contracting Officer prior to constructing a specific structure.
6. Rough grading of channel shall be completed prior to constructing in–channel LWM structures.

TREE TOP BANK ROUGHNESS ELEMENT MAIN CHANNEL STRUCTURE STATION (BANK)

15+45 (L)	28+35 (L)
16+60 (R)	38+90 (L)
24+90 (L)	39+10 (L)
26+15 (R)	46+80 (R)
27+70 (R)	

TREE TOP BANK ROUGHNESS DETAIL

ITEM	DESCRIPTION	QUANTITY
Tree top	25' long tree top with branches	1
Wood post	6' long, 4" dia. log	4

REGISTERED PROFESSIONAL ENGINEER
83129PE
OREGON
JULY 14, 2009
MARTIN K. FISHER
9/4/15

RENEWAL DATE: 12/31/2015

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FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN

CC–44 PHASE III HABITAT ENHANCEMENT PARCEL 3

N. TRUSCOTT
DRAWN

X Jay Hovde
ACCEPTED

BOISE, ID 2015–09–11

LWM DETAILS

BANK ROUGHNESS ELEMENTS

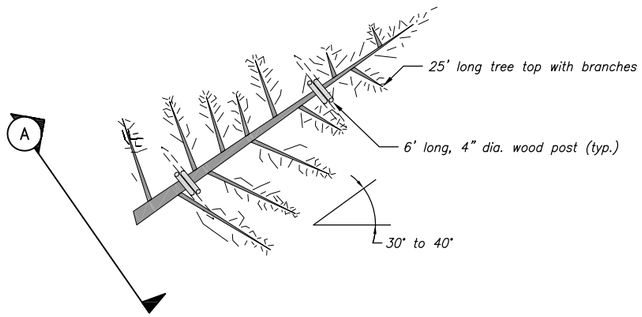
1678–100–2149

SHEET 22 OF 24

DATE AND TIME PLOTTED
September 11, 2015 15:33
PLOTTED BY
TRUSCOTT, NIC

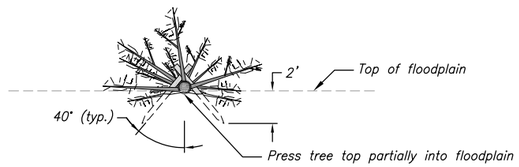
CAD SYSTEM
AutoCAD Civil 3D 2014
CAD FILENAME
CC44_Phase_3–4_LWM_Bank_Roughness_3Details.dwg

TREE TOP FLOODPLAIN ROUGHNESS ELEMENT DETAIL



PLAN VIEW – TREE TOP FLOODPLAIN ROUGHNESS ELEMENT

5 0 5 10 15
SCALE OF FEET



ELEVATION VIEW – TREE TOP FLOODPLAIN ROUGHNESS ELEMENT

5 0 5 10 15
SCALE OF FEET

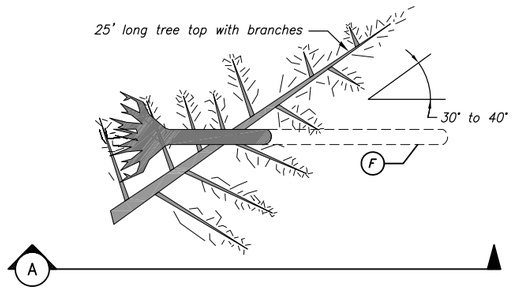
Notes:

1. *Tree top floodplain roughness elements shall be constructed as shown on this sheet unless otherwise directed by the Contracting Officer.*
2. *Tree tops shall come from Douglas fir, grand fir, or spruce trees and shall be installed within 30 days of harvest.*
4. *Tree tops shall be handled with care to minimize breaking of branches. The Contracting Officer may reject any tree tops that have lost significant amounts of branches.*
5. *Wood posts may be installed by driving (using a small pile driver or excavator–mounted driving attachment), augering or excavating.*
6. *Tree top floodplain roughness elements shall be installed in groups and shall be "shingled" together such that the downstream element is protected from floodplain flow by the element immediately upstream.*
7. *The exact location of each tree top floodplain roughness element shall be determined by the Contracting Officer.*

TREE TOP FLOODPLAIN ROUGHNESS ELEMENT

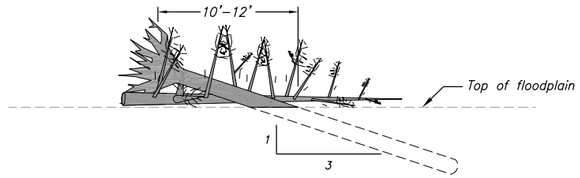
ITEM	DESCRIPTION	QUANTITY
Tree top	25' long tree top with branches	1
Wood post	6' long, 4" dia. log	4

TWO–LOG FLOODPLAIN ROUGHNESS ELEMENT DETAIL



PLAN VIEW – TWO–LOG FLOODPLAIN ROUGHNESS ELEMENT

5 0 5 10 15
SCALE OF FEET



ELEVATION VIEW – TWO–LOG FLOODPLAIN ROUGHNESS ELEMENT

5 0 5 10 15
SCALE OF FEET

Notes:

1. *Two–log floodplain roughness elements shall be constructed as shown on this sheet unless otherwise directed by the Contracting Officer.*
2. *Logs with rootwads shall come from fir, pine, or spruce trees.*
3. *Tree tops shall come from Douglas fir, grand fir, or spruce trees and shall be installed within 30 days of harvest.*
4. *Tree tops shall be handled with care to minimize breaking of branches. The Contracting Officer may reject any tree tops that have lost significant amounts of branches.*
5. *Two–log floodplain roughness elements shall be installed in groups and shall be "shingled" together such that the downstream element is protected from floodplain flow by the element immediately upstream.*
6. *The exact location of each two–log floodplain roughness element shall be determined by the Contracting Officer.*
7. *Backfill using soil excavated to place logs unless the Contracting Officer determines the native soil is unsuitable for backfill and suitable soil must be imported. Place soil for backfill in 1 foot maximum lifts. Compact each lift using mechanical equipment such as an excavator bucket or equipment tracking.*

TWO–LOG FLOODPLAIN ROUGHNESS ELEMENT

ITEM	DESCRIPTION	QUANTITY
Log type (F)	15'–20' long, 12" dia. log	1
Tree top	25' long tree top with branches	1

REGISTERED PROFESSIONAL ENGINEER
83129PE
OREGON
JULY 14, 2009
MARTIN K. FISHER
9/14/15

RENEWAL DATE: 12/31/2015

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FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN

CC–44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

N. TRUSCOTT
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X Jay Hovde
ACCEPTED

BOISE, ID 2015–09–11

LWM DETAILS

FLOODPLAIN ROUGHNESS ELEMENTS

1678–100–2150

SHEET 23 OF 24

DATE AND TIME PLOTTED
September 11, 2015 15:37
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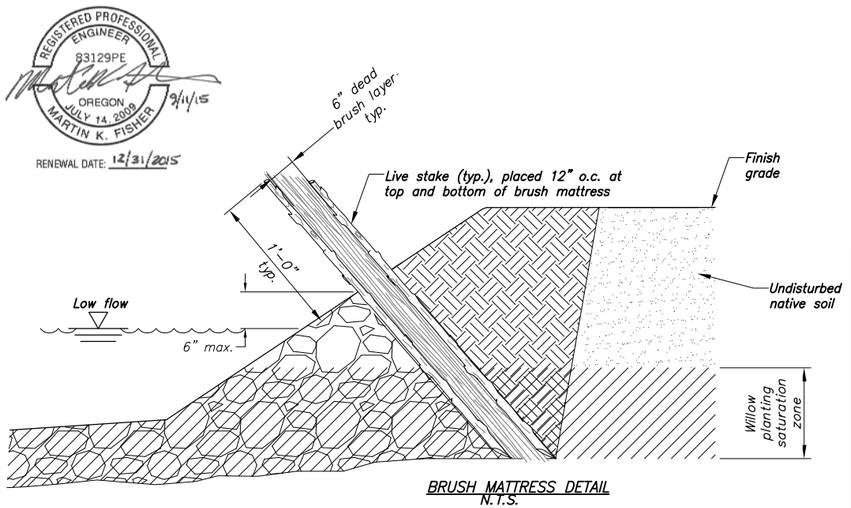
TRUSCOTT, NIC

CAD SYSTEM
AutoCAD Civil 3D 2014
CAD FILENAME
CC44_Phase_3–4_LWM_Fldpln_Roughness3Details.dwg



BRUSH MATTRESS DETAIL
N.T.S.

BRUSH MATTRESS MATERIAL SCHEDULE (PER 10 FT LENGTH)

ITEM	DESCRIPTION	QUANTITY
Live Cuttings	4' long, live willow cutting	20
Dead Brush Layer	6" thick layer of dead brush when compressed	~0.8 CY

Notes:
1. Brush mattress shall be composed of a 6 inch layer of dead branches of native species, between two layers of live cuttings. Live cuttings will be supplied by the Contracting Officer.
2. A trench shall be excavated at location identified in these plans so the bottom of the brush mattress is within the saturation zone.
3. Live cuttings shall be placed every 12 inches for the entire length of trench. Live cuttings shall be installed with buds oriented upward.
4. Dead branches shall be placed uniformly along the trench on top of the live cuttings to a compressed depth of 6 inches.
5. A top layer of live cuttings shall be placed every 12 inches along the length of the brush mattress. Live cuttings shall be installed with buds oriented upward.
6. Soil shall be backfilled in 6 inch lifts. The first lift shall be washed into the brush mat with water to eliminate voids. Supplemental lifts shall be compacted.
7. The exact location of each occurrence of brush mattress shall be staked by the Contractor and approved by the Contracting Officer prior to constructing a particular occurrence.
8. Rough grading of channel shall be completed prior to constructing in-channel LWM structures.

BRUSH MATTRESS LOCATIONS – MAIN CHANNEL

FROM	TO	LENGTH	BANK
7+70	8+30	80'	R
13+55	13+95	40'	L
16+00	16+55	60'	R
19+00	19+70	70'	L
21+65	22+30	60'	L
27+80	28+45	65'	R
28+40	28+80	40'	L
34+25	34+95	90'	R
36+35	36+95	60'	R
45+95	46+45	50'	R
48+25	49+00	85'	L
48+40	51+55	270'	R

BRUSH MATTRESS LOCATIONS
FLOOD SWALE COMPLEX 3 – CHANNEL A

FROM	TO	LENGTH	BANK
7+70	8+55	100'	R

BRUSH MATTRESS LOCATIONS
FLOOD SWALE COMPLEX 5 – CHANNEL A

FROM	TO	LENGTH	BANK
0+10	0+40	30'	R

BRUSH MATTRESS LOCATIONS
FLOOD SWALE COMPLEX 6 – CHANNEL A

FROM	TO	LENGTH	BANK
9+60	10+40	100'	R

BRUSH MATTRESS LOCATIONS – SIDE CHANNEL 1

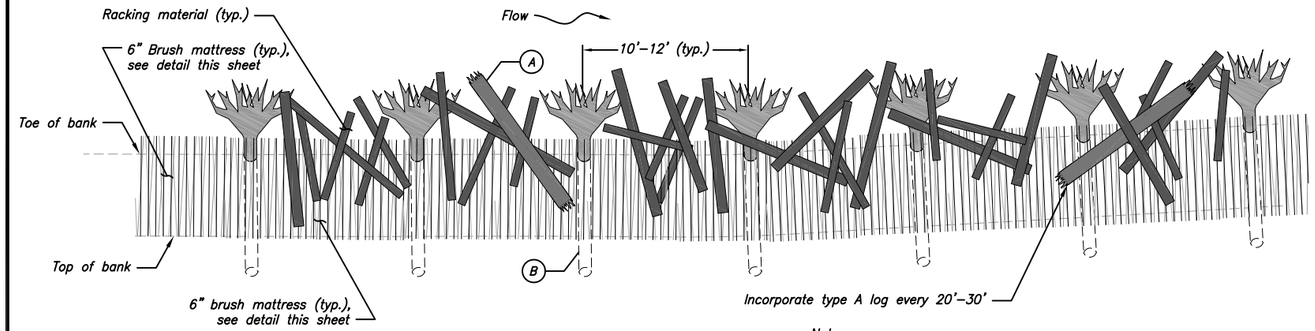
FROM	TO	LENGTH	BANK
0+15	1+50	140'	R
0+20	1+50	125'	L

BRUSH MATTRESS LOCATIONS – SIDE CHANNEL 2

FROM	TO	LENGTH	BANK
0+15	0+60	45'	L
0+20	0+65	45'	R

BRUSH MATTRESS LOCATIONS – ALCOVE 2

FROM	TO	LENGTH	BANK
1+55	1+80	25'	R

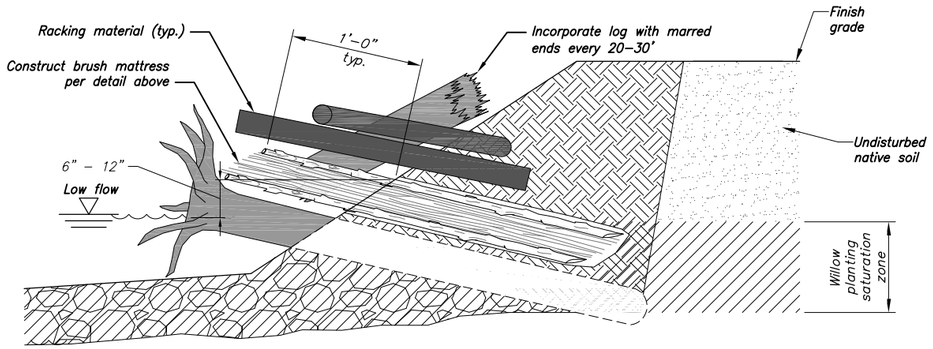


EDGE ROUGHNESS PLAN VIEW

5 0 5 10 15
SCALE OF FEET

Notes:
1. A trench shall be excavated at location identified in these plans so the bottom of the brush mattress layer is within the saturation zone.
2. Place logs with rootwads on the bottom of the trench, then place a 3" lift of soil on top of the logs with rootwads.
3. Live cuttings shall be placed every 12 inches for the entire length of trench. Live cuttings shall be installed with buds oriented upward.
4. Dead branches shall be placed uniformly along the trench on top of the live cuttings to a compressed depth of 6 inches.
5. A top layer of live cuttings shall be placed every 12 inches along the length of the brush mattress. Live cuttings shall be installed with buds oriented upward.
6. Racking material and logs with marred ends shall be incorporated into the trench as it is backfilled. Racking material and logs with marred ends shall be placed in various orientations to provide an irregular face on the bank of the channel.
7. Soil shall be backfilled in 6 inch lifts. The first lift shall be washed into the brush mat with water to eliminate voids. Supplemental lifts shall be compacted.
8. The exact location of each occurrence of edge roughness shall be staked by the Contractor and approved by the Contracting Officer prior to constructing a particular occurrence.
9. Rough grading of channel shall be completed prior to constructing in-channel LWM structures.

Notes:
1. All logs shall come from Douglas fir, lodgepole pine, or ponderosa pine.
2. Embedded logs with rootwads shall be placed approximately every 10'–12' on center and placed with their rootwads oriented slightly upstream.
3. Logs shall be placed such that approximately ⅓ of the total length (including rootwad) is exposed. logs shall be placed on a slope of approximately 10H:1V into the bank.
4. Logs shall be placed prior to the layer of brush mattress.



EDGE ROUGHNESS DETAIL
N.T.S.

EDGE ROUGHNESS MATERIAL SCHEDULE (PER 10 FT LENGTH)

ITEM	DESCRIPTION	QUANTITY
Log type (A)	10' long, 12" dia. log	⅓ (1 every 20'–30')
Log type (B)	10' long, 12" DBH log with rootwad	1
Live cuttings	4' long, live willow cutting	20
Dead brush layer	6" thick layer of dead brush when compressed	~0.8 CY
Small racking material	6'–15' long, 3"–8" dia. log	5
Large racking material	6'–15' long, 8"–12" dia. log	5

EDGE ROUGHNESS LOCATIONS – ALCOVE 3

FROM	TO	LENGTH	BANK
2+35	2+90	60'	R

EDGE ROUGHNESS LOCATIONS – MAIN CHANNEL

FROM	TO	LENGTH	BANK
7+80	8+45	55'	L
9+80	10+25	40'	L
10+80	11+05	25'	R
11+15	11+40	30'	R
14+10	14+35	30'	L
19+70	20+30	65'	L
30+35	30+85	50'	R
37+15	37+80	65'	L
41+75	42+25	55'	L
43+65	44+15	55'	R
44+60	44+95	40'	R

RENEWAL DATE: 12/31/2015

DATE AND TIME PLOTTED: September 11, 2015 15:37
PLOTTED BY: TRUSCOTT, NIC

CAD SYSTEM: AutoCAD Civil 3D 2014
CAD FILENAME: CC44_Parcel_3_LWM_Edge_Rough_Details.dwg

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GRANDE RONDE SUBBASIN
CC-44 PHASE III HABITAT ENHANCEMENT
PARCEL 3

N. TRUSCOTT
DRAWN

x Jay Hovde
ACCEPTED

BOISE, ID 2015-09-11

LWM DETAILS

BRUSH MATTRESS & EDGE ROUGHNESS

1678-100-2151

SHEET 24 OF 24