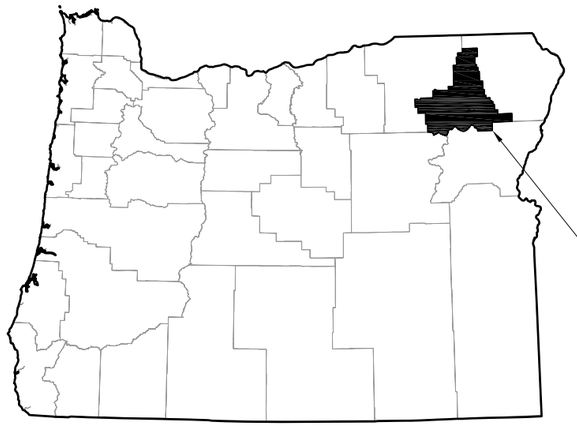
Catherine Creek
RM 37 Restoration Project
Union County, Oregon



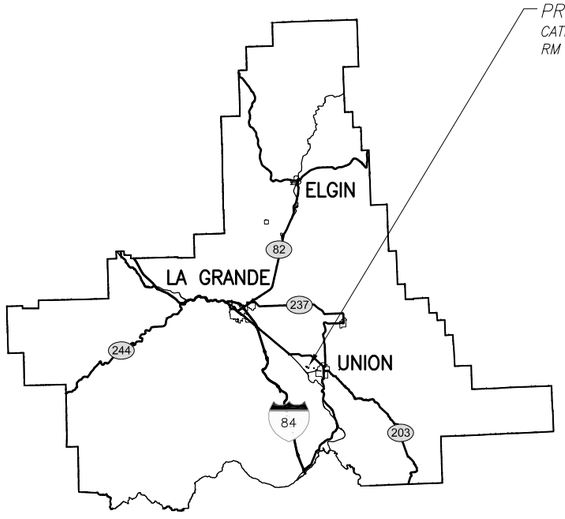
OREGON
NOT TO SCALE

SITE SUMMARY

Union County
Union, Oregon

S4, T4S, R39E

N45°13'00", W117°54'30"



UNION COUNTY, OREGON
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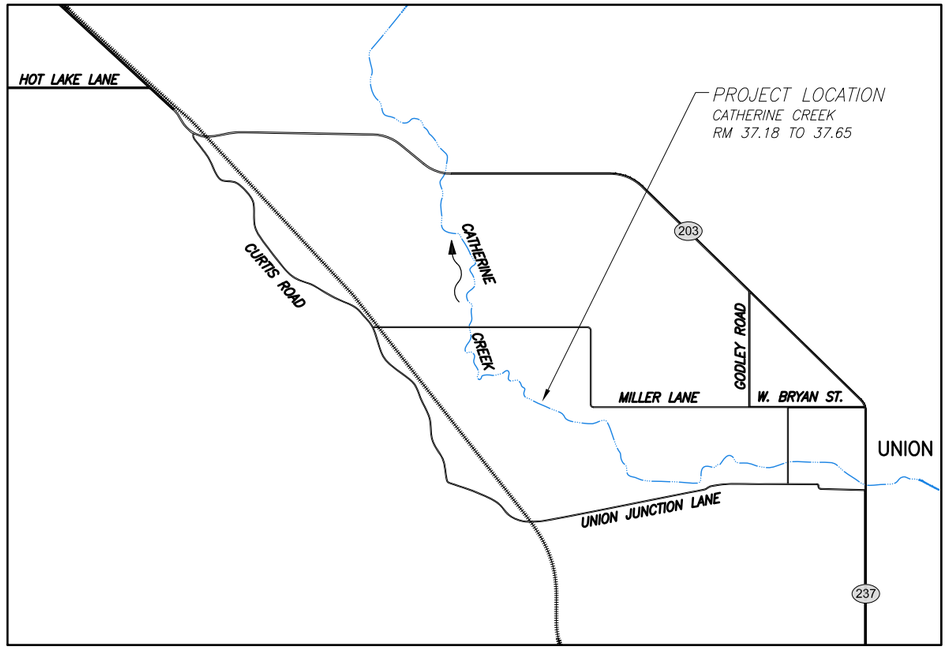

VICINITY MAP
NOT TO SCALE

SHEET INDEX

DRAFT – NOT FOR CONSTRUCTION

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Managing Water in the West

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COLUMBIA-SNAKE RIVER SALMON RECOVERY PROGRAM
FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN

CATHERINE CREEK - RM 37 RESTORATION PROJECT

COVER SHEET

PRELIMINARY DESIGN DRAWINGS

REV NO

DRAWN
D. STRATTEN
N. TRUSCOTT
M. FISHER

ACCEPTED

BOISE, ID 2012-04-12

COVER SHEET

SHEET G-1
SHEET 1 OF 27

DATE AND TIME PLOTTED
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GENERAL NOTES

1. THE WORK SHOWN ON THESE PLANS WILL BE PERFORMED FOR UNION SOIL AND WATER CONSERVATION DISTRICT, HEREIN REFERRED TO AS THE "CONTRACTING AGENCY." THE CONTRACTING AGENCY'S REPRESENTATIVE WILL BE MR. CRAIG SCHELLSMIDT OR OTHER PERSONS ASSIGNED BY THE CONTRACTING AGENCY TO ACT AS THE CONTRACTING AGENCY'S REPRESENTATIVE, HEREIN REFERRED TO AS THE "CONTRACTING OFFICER."
2. HORIZONTAL DATUM: US STATE PLANE COORDINATE SYSTEM, OREGON NORTH ZONE, NAD83, INTERNATIONAL FEET.

   VERTICAL DATUM: NAVD88
3. TOPOGRAPHIC MAPPING WITHIN STREAM BANKS OF THE PROJECT AREA BASED ON SURVEYS PERFORMED WITH GROUND SURVEY EQUIPMENT. TOPOGRAPHIC MAPPING OUTSIDE THE STREAM BANKS IS BASED ON LIDAR IMAGING. DUE TO CONTINUED EROSION OF THE STREAM BANK, THE GEOMETRY OF THE STREAM BANKS AT THE TIME OF CONSTRUCTION COULD BE DIFFERENT THAN SHOWN ON THESE PLANS.
4. ELEVATIONS AND DISTANCES SHOWN ARE IN FEET AND DECIMALS WITH CONTOUR INTERVALS AT ONE FOOT INCREMENTS.
5. 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 NRS CHAPTER 618, IN THE CONSTRUCTION PRACTICES FOR ALL EMPLOYEES DIRECTLY ENGAGED IN THE CONSTRUCTION OF THIS PROJECT.
6. 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.
7. THE CONTRACTOR SHALL PURSUE WORK IN A CONTINUOUS AND DILIGENT MANNER TO ENSURE A TIMELY COMPLETION OF THE PROJECT.
8. CONTRACTOR SHALL CONFIRM THE ACCESS POINT, ROUTE(S), AND LOCATION OF STORAGE OF MATERIALS AND EQUIPMENT WITH THE CONTRACTING OFFICER PRIOR TO TRANSPORTING MATERIALS AND EQUIPMENT TO THE PROJECT SITE. A TEMPORARY CROSSING OF CATHERINE CREEK AT THE LOCATION SHOWN ON SHEET G-4 OF THESE DRAWINGS WILL BE THE ONLY LOCATION THE CONTRACTOR IS ALLOWED TO CROSS THE CREEK.
9. 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.
10. ALL CONSTRUCTION SHALL BE CLOSELY COORDINATED WITH THE CONTRACTING OFFICER SO THAT THE QUALITY OF WORK CAN BE CHECKED FOR APPROVAL.
11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE SITE IN A NEAT AND ORDERLY MANNER THROUGHOUT THE CONSTRUCTION PROCESS. ALL MATERIALS SHALL BE STORED WITHIN APPROVED CONSTRUCTION STAGING AREAS SHOWN ON SHEET G-4 OF THESE DRAWINGS OR AS APPROVED BY THE CONTRACTING OFFICER.
12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING, AT THE CONTRACTOR'S EXPENSE, ALL CONSTRUCTION PERMITS AS REQUIRED BY THE LOCAL AGENCIES. THE CONTRACTOR SHALL PROVIDE ALL MATERIALS, LABOR AND EQUIPMENT REQUIRED TO COMPLY WITH ALL APPLICABLE PERMIT CONDITIONS AND REQUIREMENTS.
13. ANY WORK WITHIN THE ACTIVELY FLOWING CHANNEL OF CATHERINE CREEK SHALL BE LIMITED TO OCCURRING BETWEEN AUGUST 1 AND SEPTEMBER 30.
14. DURING ANY WORK 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. TURBIDITY IN THE CREEK SHALL BE LIMITED TO THE LEVELS LISTED IN THE SPECIFICATIONS, AND THE CONTRACTOR SHALL MODIFY WORK PROCEDURES IF NECESSARY AS LISTED IN THE SPECIFICATIONS.
15. THE CONTRACTOR SHALL NOTIFY THE CONTRACTING OFFICER A MINIMUM OF 5 WORKING DAYS IN ADVANCE OF COFFERDAM CONSTRUCTION AND PLACEMENT OF FILL IN THE CREEK CHANNEL TO COORDINATE FISH REMOVAL. THE CONTRACTING AGENCY WILL BE RESPONSIBLE FOR ALL FISH REMOVAL AND HANDLING.
16. DEWATERING WITHIN COFFERDAMS SHALL BE PERFORMED TO THE EXTENT NECESSARY TO CONSTRUCT THE PROJECT AS SHOWN ON THESE PLANS, AS DETERMINED BY THE CONTRACTOR. DISCHARGE FROM DEWATERING WITHIN THE WORK AREA SHALL BE ROUTED TO FLOODPLAIN AREAS SO AS TO ALLOW THE REMOVAL OF FINE SEDIMENTS OR OTHER CONTAMINANTS PRIOR TO REENTERING CATHERINE CREEK. ALL PUMPS USED BY THE CONTRACTOR FOR DEWATERING SHALL HAVE SCREENED INTAKES THAT MEET ODFW SPECIFICATIONS AND JUVENILE FISH SCREENING CRITERIA.

SUMMARY OF QUANTITIES

ITEM NO.	QUANTITY	UNITS	DESCRIPTION
SITE PREPARATION			
1	LUMP SUM	LS	MOBILIZATION
2	LUMP SUM	LS	COFFERDAMS AND DEWATERING
SITE ACCESS			
3	LUMP SUM	LS	TEMPORARY SITE ACCESS ROUTES
4	LUMP SUM	LS	TEMPORARY CREEK CROSSING
EARTHWORK			
5	21,850	CY	CHANNEL AND FLOODPLAIN EXCAVATION
6	4,820	CY	EXCAVATED SOIL PLACED AND COMPACTED AS FILL ON-SITE
7	17,030	CY	EXCAVATED SOIL DISPOSED OF ON-SITE AT SPOILS AREAS
8	250	EA	IN-CHANNEL HABITAT BOULDERS
9	1,000	CY	SALVAGED COBBLE/GRAVEL FROM ON-SITE PLACED IN CHANNEL
10	165	CY	IMPORTED COBBLE/GRAVEL PLACED IN CHANNEL
11	LUMP SUM	LS	STABILIZED LIVESTOCK CROSSING
12	1	EA	BOULDER/COBBLE SILL
LWD STRUCTURES			
13	57	EA	TYPE 1 LWD STRUCTURE
14	12	EA	TYPE 2 LWD STRUCTURE
15	5	EA	TYPE 3 LWD STRUCTURE
16	8	EA	FULL TREES IN ALCOVE
17	LUMP SUM	LS	RACKING MATERIAL PLACED AS DIRECTED BY C.O.
EROSION CONTROL AND SEEDING			
18	LUMP SUM	LS	TEMPORARY EROSION AND SEDIMENT CONTROL
19	LUMP SUM	LS	SWPPP/SPCC PLAN
20	4.4	AC	SEEDING - SEED MIX 1
21	24.5	AC	SEEDING - SEED MIX 2
22	59.6	TON	STRAW MULCH
23	1,405	SY	SOD SALVAGE AND PLACEMENT
24	4,935	SY	EROSION CONTROL BLANKET

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FCRPS HABITAT IMPROVEMENT PROGRAM

GRANDE RONDE SUBBASIN

CATHERINE CREEK - RM 37 RESTORATION PROJECT
SUMMARY OF QUANTITIES AND NOTES
PRELIMINARY DESIGN DRAWINGS

REV NO

DRAWN
N. TRUSCOTT
M. FISHER

ACCEPTED

BOISE, ID 2012-04-12

SUMMARY OF QUANTITIES AND NOTES

SHEET G-2

SHEET 2 OF 27

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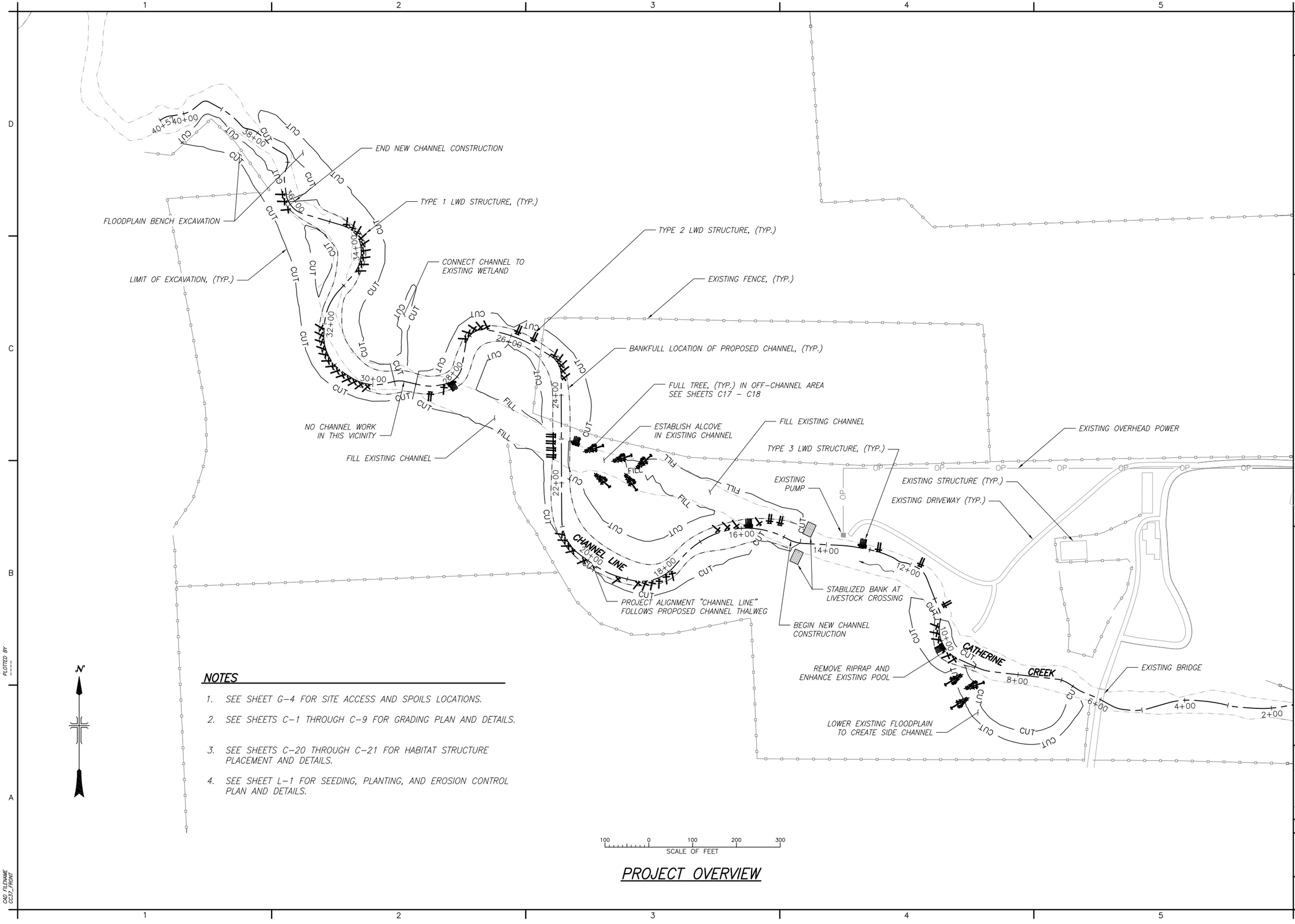

NOTES

1. SEE SHEET G–4 FOR SITE ACCESS AND SPOILS LOCATIONS.
2. SEE SHEETS C–1 THROUGH C–9 FOR GRADING PLAN AND DETAILS.
3. SEE SHEETS C–20 THROUGH C–21 FOR HABITAT STRUCTURE PLACEMENT AND DETAILS.
4. SEE SHEET L–1 FOR SEEDING, PLANTING, AND EROSION CONTROL PLAN AND DETAILS.

N

100 0 100 200 300
SCALE OF FEET

PROJECT OVERVIEW

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PRELIMINARY DESIGN DRAWINGS

Federal Project Only
Not For Construction

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N. TRUSCOTT

ACCEPTED

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PROJECT OVERVIEW

SHEET G–3
SHEET 3 OF 27

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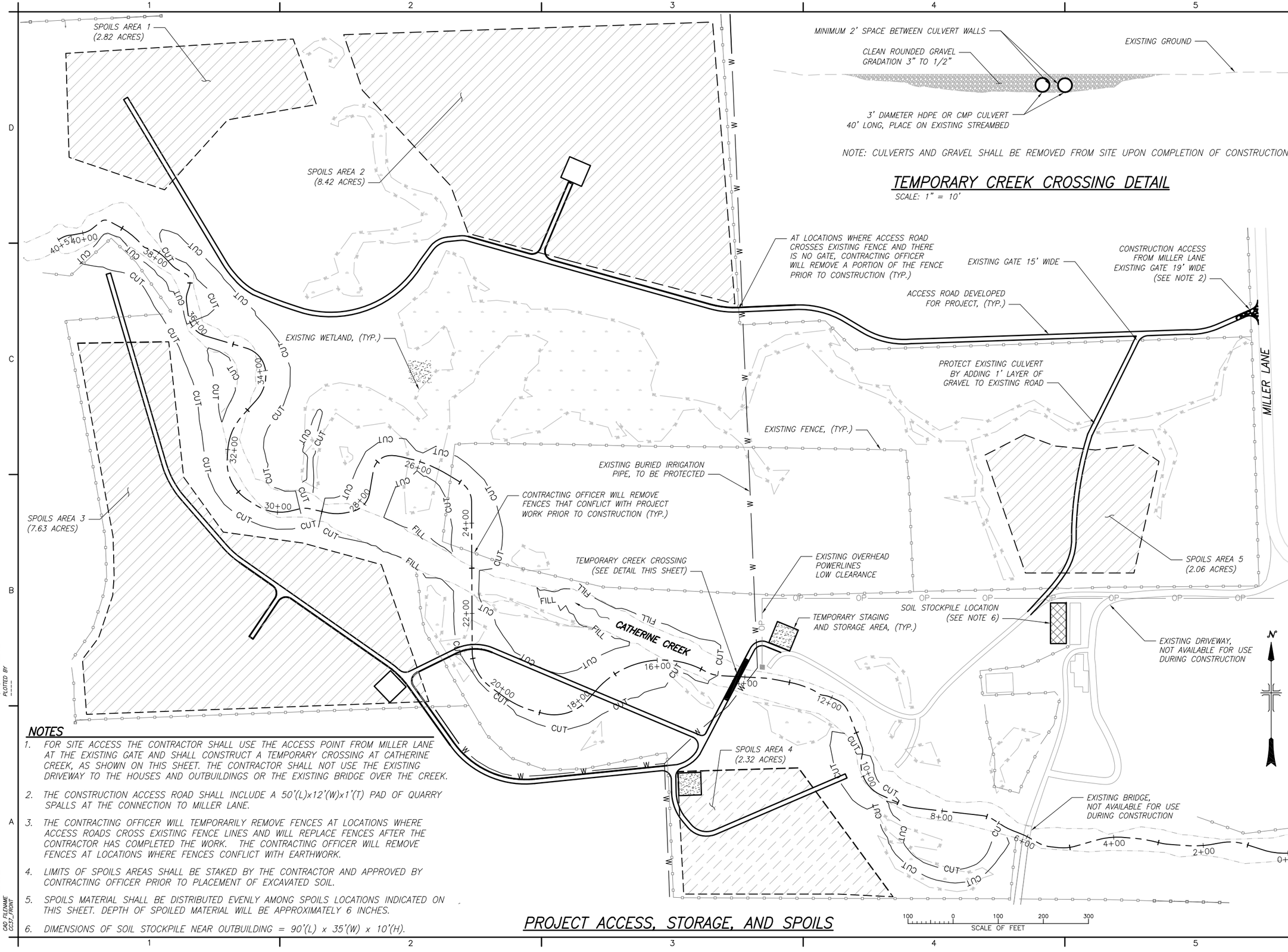

MINIMUM 2' SPACE BETWEEN CULVERT WALLS

CLEAN ROUNDED GRAVEL GRADATION 3" TO 1/2"

EXISTING GROUND

3' DIAMETER HDPE OR CMP CULVERT 40' LONG, PLACE ON EXISTING STREAMBED

NOTE: CULVERTS AND GRAVEL SHALL BE REMOVED FROM SITE UPON COMPLETION OF CONSTRUCTION.

TEMPORARY CREEK CROSSING DETAIL

SCALE: 1" = 10'

NOTES

1. FOR SITE ACCESS THE CONTRACTOR SHALL USE THE ACCESS POINT FROM MILLER LANE AT THE EXISTING GATE AND SHALL CONSTRUCT A TEMPORARY CROSSING AT CATHERINE CREEK, AS SHOWN ON THIS SHEET. THE CONTRACTOR SHALL NOT USE THE EXISTING DRIVEWAY TO THE HOUSES AND OUTBUILDINGS OR THE EXISTING BRIDGE OVER THE CREEK.
2. THE CONSTRUCTION ACCESS ROAD SHALL INCLUDE A 50'(L)x12'(W)x1'(T) PAD OF QUARRY SPALLS AT THE CONNECTION TO MILLER LANE.
3. THE CONTRACTING OFFICER WILL TEMPORARILY REMOVE FENCES AT LOCATIONS WHERE ACCESS ROADS CROSS EXISTING FENCE LINES AND WILL REPLACE FENCES AFTER THE CONTRACTOR HAS COMPLETED THE WORK. THE CONTRACTING OFFICER WILL REMOVE FENCES AT LOCATIONS WHERE FENCES CONFLICT WITH EARTHWORK.
4. LIMITS OF SPOILS AREAS SHALL BE STAKED BY THE CONTRACTOR AND APPROVED BY CONTRACTING OFFICER PRIOR TO PLACEMENT OF EXCAVATED SOIL.
5. SPOILS MATERIAL SHALL BE DISTRIBUTED EVENLY AMONG SPOILS LOCATIONS INDICATED ON THIS SHEET. DEPTH OF SPOILED MATERIAL WILL BE APPROXIMATELY 6 INCHES.
6. DIMENSIONS OF SOIL STOCKPILE NEAR OUTBUILDING = 90'(L) x 35'(W) x 10'(H).

PROJECT ACCESS, STORAGE, AND SPOILS

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PRELIMINARY DESIGN DRAWINGS

REV NO

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N. TRUSCOTT

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PROJECT ACCESS, STORAGE AND SPOILS

SHEET G-4

SHEET 4 OF 27

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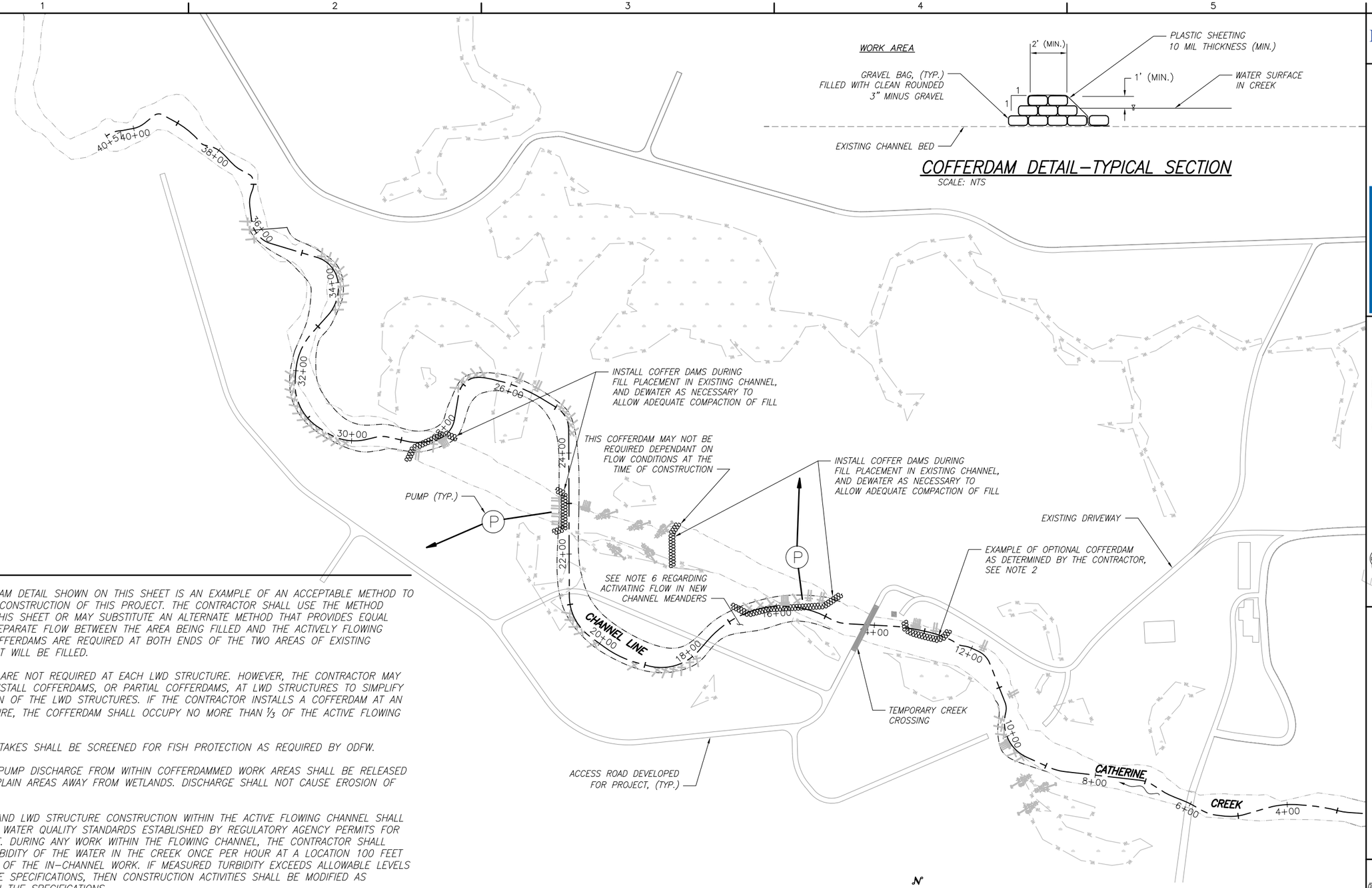
COFFERDAM DETAIL–TYPICAL SECTION

SCALE: NTS



COFFERDAMS AND FLOW CONTROL

NOTES

1. THE COFFERDAM DETAIL SHOWN ON THIS SHEET IS AN EXAMPLE OF AN ACCEPTABLE METHOD TO USE DURING CONSTRUCTION OF THIS PROJECT. THE CONTRACTOR SHALL USE THE METHOD SHOWN ON THIS SHEET OR MAY SUBSTITUTE AN ALTERNATE METHOD THAT PROVIDES EQUAL ABILITY TO SEPARATE FLOW BETWEEN THE AREA BEING FILLED AND THE ACTIVELY FLOWING CHANNEL. COFFERDAMS ARE REQUIRED AT BOTH ENDS OF THE TWO AREAS OF EXISTING CHANNEL THAT WILL BE FILLED.
2. COFFERDAMS ARE NOT REQUIRED AT EACH LWD STRUCTURE. HOWEVER, THE CONTRACTOR MAY DECIDE TO INSTALL COFFERDAMS, OR PARTIAL COFFERDAMS, AT LWD STRUCTURES TO SIMPLIFY CONSTRUCTION OF THE LWD STRUCTURES. IF THE CONTRACTOR INSTALLS A COFFERDAM AT AN LWD STRUCTURE, THE COFFERDAM SHALL OCCUPY NO MORE THAN ⅓ OF THE ACTIVE FLOWING CHANNEL.
3. ALL PUMP INTAKES SHALL BE SCREENED FOR FISH PROTECTION AS REQUIRED BY ODFW.
4. DEWATERING PUMP DISCHARGE FROM WITHIN COFFERDAMMED WORK AREAS SHALL BE RELEASED ONTO FLOODPLAIN AREAS AWAY FROM WETLANDS. DISCHARGE SHALL NOT CAUSE EROSION OF TOPSOIL.
5. EARTHWORK AND LWD STRUCTURE CONSTRUCTION WITHIN THE ACTIVE FLOWING CHANNEL SHALL CONFORM TO WATER QUALITY STANDARDS ESTABLISHED BY REGULATORY AGENCY PERMITS FOR THIS PROJECT. DURING ANY WORK WITHIN THE FLOWING CHANNEL, THE CONTRACTOR SHALL MONITOR TURBIDITY OF THE WATER IN THE CREEK ONCE PER HOUR AT A LOCATION 100 FEET DOWNSTREAM OF THE IN-CHANNEL WORK. IF MEASURED TURBIDITY EXCEEDS ALLOWABLE LEVELS LISTED IN THE SPECIFICATIONS, THEN CONSTRUCTION ACTIVITIES SHALL BE MODIFIED AS DESCRIBED IN THE SPECIFICATIONS.
6. NEW CHANNEL MEANDERS, APPROXIMATELY STA 16+00 TO 22+50 AND STA 23+00 TO 28+00, SHALL BE CONSTRUCTED WITH SEPARATION FROM THE ACTIVELY FLOWING CREEK BY MAINTAINING A SOIL PLUG AT EACH END OF THE NEW MEANDERS. WHEN ALL CONSTRUCTION OF THE NEW MEANDERS ARE COMPLETE, THE NEW MEANDER SHALL BE SLOWLY ACTIVATED TO MINIMIZE TURBIDITY IN THE CREEK DOWNSTREAM. FIRST THE DOWNSTREAM SOIL PLUG WILL BE REMOVED. THEN A PORTION OF THE UPSTREAM SOIL PLUG WILL BE REMOVED TO ALLOW ¼ TO ½ OF THE FLOW IN THE CREEK TO ENTER THE NEW MEANDER. AFTER 12 TO 24 HOURS WHEN TURBIDITY HAS STABILIZED THE EXISTING CHANNEL WILL BE COMPLETELY BLOCKED AND THE REMAINING PORTION OF THE SOIL PLUG WILL BE REMOVED SO ALL FLOW IS DIRECTED THROUGH THE NEW MEANDERS.

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COFFERDAMS AND FLOW CONTROL
PRELIMINARY DESIGN DRAWINGS

REV NO

DRAWN
N. TRUSCOTT

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COFFERDAMS AND FLOW CONTROL

SHEET G-5

SHEET 5 OF 27

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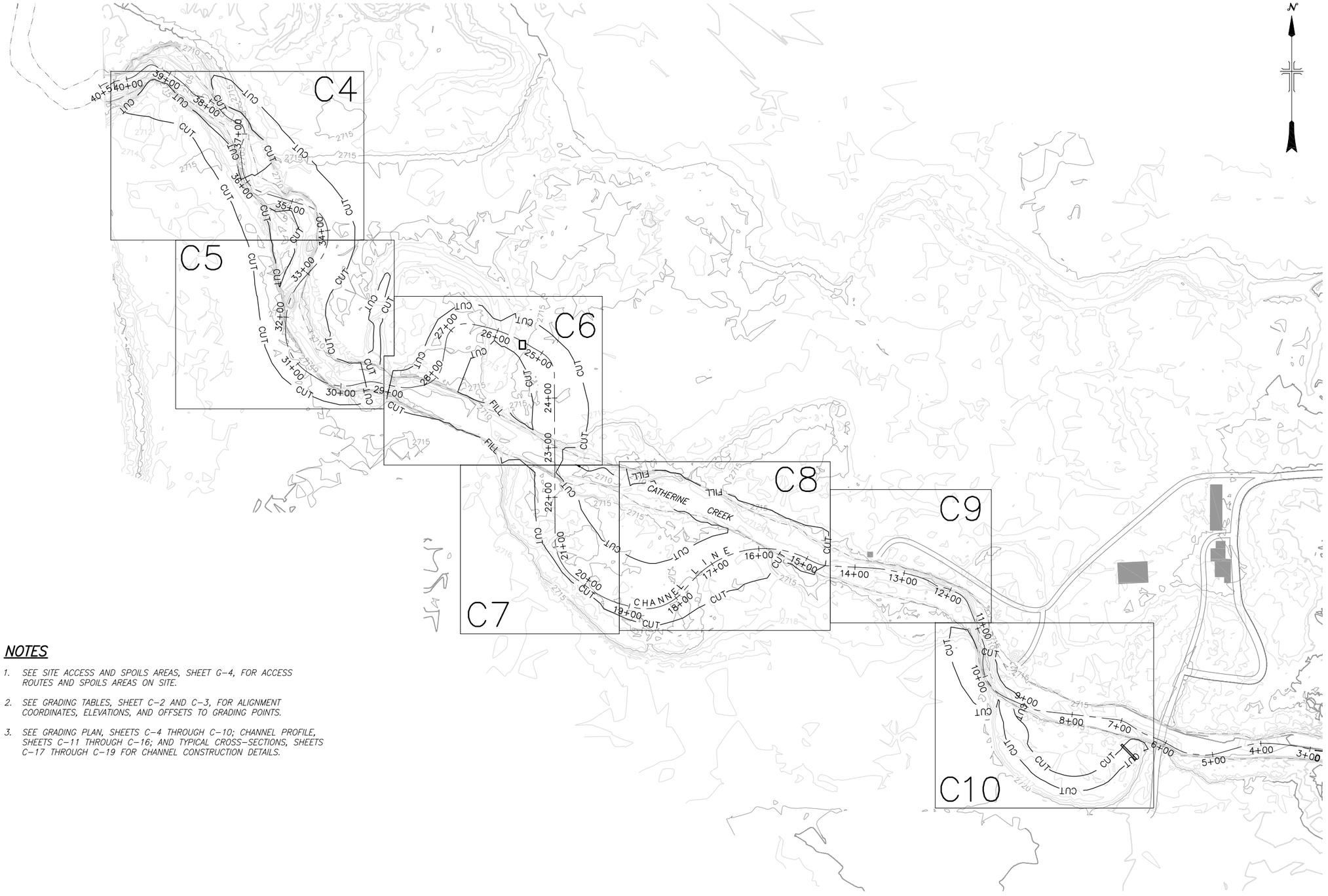

NOTES

1. SEE SITE ACCESS AND SPOILS AREAS, SHEET G-4, FOR ACCESS ROUTES AND SPOILS AREAS ON SITE.
2. SEE GRADING TABLES, SHEET C-2 AND C-3, FOR ALIGNMENT COORDINATES, ELEVATIONS, AND OFFSETS TO GRADING POINTS.
3. SEE GRADING PLAN, SHEETS C-4 THROUGH C-10; CHANNEL PROFILE, SHEETS C-11 THROUGH C-16; AND TYPICAL CROSS-SECTIONS, SHEETS C-17 THROUGH C-19 FOR CHANNEL CONSTRUCTION DETAILS.

GRADING PLAN SHEET INDEX

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CATHERINE CREEK - RM 37 RESTORATION PROJECT

GRADING INDEX

PRELIMINARY DESIGN DRAWINGS

NOT FOR CONSTRUCTION

REV NO

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GRADING INDEX

SHEET C-1

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TABLE 1. CHANNEL STAKING

STATION	NORTHING	EASTING	DESIGN THALWEG	DESIGN BANKFULL	LEFT BANKFULL	LEFT BENCH	LEFT DAYLIGHT	RIGHT BANKFULL	RIGHT BENCH	RIGHT DAYLIGHT
CHANNEL ALIGNMENT			ELEVATIONS		LEFT OFFSETS			RIGHT OFFSETS		
9+00	575383.74	8870699.33	MATCH EX.	–	–	–	–2.90	–	–	4.94'
9+25	575393.97	8870676.52	2711.40	–	–	–		–	–	15.23'
9+50	575404.65	8870653.93	2709.90	2715.90	–11.0'	–	–39.80'	–	–	18.49'
9+75	575420.72	8870634.93	2709.90	2715.90	–11.0'	–36.0'	–48.03'	–	–	22.87'
10+00	575442.10	8870622.19	2709.90	2715.90	–11.0'	–41.0'	–51.21'	–	–	25.75'
10+25	575466.46	8870617.11	2709.90	2715.90	–11.0'	–49.0'	–59.44'	–	–	28.20'
10+50	575491.20	8870620.01	MATCH EX.	2715.90	–14.4'	–	–	–	–	–
14+60	575665.57	8870299.67	MATCH EX.	2715.57	–	–	–	37.5'	42.9'	–
14+75	575668.97	8870285.08	2711.78	2715.28	–	–	–22.96'	37.5'	44.1'	–
15+00	575679.76	8870262.58	2711.65	2715.40	–	–	–28.03'	32.5'	42.7'	–
15+25	575689.33	8870239.50	2711.60	2715.10	–	–	–22.48'	27.5'	40.3'	–
15+50	575695.86	8870215.39	2711.56	2715.06	–	–	–21.41'	22.5'	39.5'	–
15+55	575696.79	8870210.47	2711.55	2715.05	–	–	–20.42'	22.5'	39.8'	–
15+80	575699.52	8870185.64	2709.20	2715.20	–51.0'	–55.5'	–59.31'	11.0'	40.2'	–
16+00	575699.40	8870165.65	2709.16	2715.16	–51.0'	–59.3'	–62.02'	11.0'	39.5'	–
16+25	575696.36	8870140.85	2709.11	2715.11	–51.0'	–62.4'	–64.34'	11.0'	39.0'	–
16+50	575690.15	8870116.65	2709.05	2715.05	–51.0'	–65.0'	–65.30'	11.0'	42.3'	43.63'
16+75	575680.89	8870093.45	2709.00	2715.00	–51.0'	–64.8'	–70.04'	11.0'	46.0'	48.52'
17+00	575668.73	8870071.63	2711.30	2714.80	–22.5'	–61.9'	–64.18'	22.5'	49.5'	51.43'
17+25	575653.87	8870051.55	2711.26	2714.76	–22.5'	–57.7'	–61.06'	22.5'	50.8'	54.87'
17+50	575636.54	8870033.55	2711.21	2714.71	–22.5'	–54.2'	–	22.5'	57.9'	61.09'
17+75	575617.75	8870017.06	2711.17	2714.67	–22.5'	–47.6'	–49.50'	22.5'	76.5'	78.79'
17+85	575610.26	8870010.43	2711.15	2714.65	–22.5'	–44.5'	–44.81'	22.5'	85.0'	86.98'
18+10	575594.27	8869991.30	2708.60	2714.60	–11.0'	–39.4'	–40.93'	51.0'	88.3'	90.35'
18+25	575587.13	8869978.12	2708.57	2714.57	–11.0'	–35.7'	–37.10'	51.0'	89.5'	91.61'
18+50	575579.85	8869954.28	2708.53	2714.53	–11.0'	–33.4'	–36.16'	51.0'	90.6'	92.94'
18+75	575578.70	8869929.37	2708.49	2714.49	–11.0'	–27.0'	–29.17'	51.0'	91.1'	93.74'
19+00	575583.53	8869904.88	2708.44	2714.44	–11.0'	–25.5'	–25.82'	51.0'	91.0'	93.69'
19+25	575590.25	8869880.81	2708.40	2714.40	–11.0'	–21.3'	–21.65'	51.0'	93.3'	95.87'
19+45	575597.37	8869862.13	2708.37	2714.37	–11.0'	–19.3'	–21.01'	51.0'	95.2'	96.95'
19+55	575601.62	8869853.08	2708.35	2714.35	–14.2'	–	–14.16'	51.0'	95.8'	97.19'
19+75	575611.46	8869835.67	2708.32	2714.32	–	–	–10.51'	51.0'	96.3'	98.48'
20+00	575625.85	8869815.24	2708.27	2714.27	–	–	–9.61'	51.0'	95.3'	97.43'
20+25	575640.64	8869795.08	2708.23	2714.23	–	–	–10.14'	51.0'	93.6'	94.20'
20+50	575658.02	8869777.21	2708.19	2714.19	–	–	–9.67'	51.0'	93.2'	94.00'
20+75	575679.29	8869764.19	2708.14	2714.14	–	–	–10.48'	51.0'	92.3'	93.28'
21+00	575703.12	8869756.84	2708.10	2714.10	–20.0'	–	–20.01'	51.0'	91.5'	92.69'
21+25	575728.03	8869755.29	2710.40	2713.90	–22.5'	–33.5'	–34.47'	22.5'	84.8'	87.31'
21+50	575753.03	8869755.19	2710.33	2713.83	–22.5'	–36.0'	–37.64'	22.5'	66.5'	68.88'
21+75	575778.03	8869755.09	2710.26	2713.76	–22.5'	–36.1'	–39.79'	22.5'	51.4'	53.09'
22+00	575803.03	8869754.99	2710.20	2713.70	–22.5'	–36.3'	–40.72'	22.5'	44.2'	46.82'
22+05	575808.03	8869754.97	2710.18	2713.68	–22.5'	–36.3'	–39.66'	–	–	–
22+25	575828.03	8869754.89	2710.13	2713.63	–22.5'	–36.4'	–40.47'	–	–	20.75'
22+35	575838.03	8869754.85	2710.10	2713.60	–22.5'	–36.3'	–41.10'	–	–	16.21'
22+50	575853.03	8869754.79	2709.55	2713.55	–22.0'	–36.1'	–40.75'	–	–	15.09'
22+75	575878.03	8869754.69	2709.52	2713.51	–22.0'	–38.4'	–	–	–	16.06'
22+95	575898.03	8869754.61	2709.49	2713.49	–22.0'	–39.2'	–	–	–	16.75'
23+00	575903.03	8869754.59	2709.48	2713.48	–22.0'	–39.4'	–	22.0'	53.0'	53.50'
23+25	575928.03	8869754.49	2709.45	2713.44	–22.0'	–40.2'	–	22.0'	56.1'	61.94'
23+50	575953.03	8869754.40	2709.41	2713.41	–22.0'	–39.5'	–45.62'	22.0'	59.2'	66.99'
23+75	575978.03	8869754.30	2709.38	2713.37	–22.0'	–38.9'	–44.22'	22.0'	61.4'	68.79'
23+90	575993.03	8869754.24	2709.35	2713.35	–22.0'	–38.5'	–42.92'	22.0'	61.1'	67.82'
24+50	576053.02	8869753.93	2707.25	2713.25	–41.0'	–48.6'	–	11.0'	46.1'	52.51'
24+75	576076.62	8869746.49	2707.21	2713.21	–41.0'	–48.6'	–	11.0'	35.0'	42.01'
25+00	576093.77	8869728.65	2707.17	2713.17	–41.0'	–47.0'	–	11.0'	35.9'	41.52'
25+10	576098.96	8869720.10	2707.15	2713.15	–36.0'	–39.0'	–45.58'	11.0'	37.0'	43.22'
25+35	576111.90	8869698.71	2709.40	2712.90	–22.5'	–25.7'	–31.13'	22.5'	37.4'	45.12'
25+50	576119.23	8869685.63	2709.36	2712.86	–22.5'	–23.3'	–27.31'	22.5'	36.2'	42.33'
25+75	576130.01	8869663.08	2709.30	2712.80	–22.5'	–23.5'	–25.18'	22.5'	33.5'	35.32'
25+80	576131.95	8869658.47	2709.29	2712.79	–22.5'	–	–27.37'	22.5'	42.5'	44.96'
26+00	576138.94	8869639.74	2709.24	–	–	–	–20.94'	–	–	20.52'
26+15	576143.39	8869625.41	2709.20	2712.70	–22.5'	–42.5'	–46.78'	–	–	21.04'
26+40	576149.24	8869601.11	2706.65	2712.65	–41.0'	–51.0'	–	11.0'	36.1'	40.48'
26+50	576151.03	8869591.27	2706.63	2712.63	–41.0'	–	–	11.0'	35.3'	40.48'
26+75	576151.89	8869566.49	2706.57	2712.57	–	–	–	11.0'	30.5'	38.11'
27+00	576139.16	8869545.45	2706.51	2712.51	–	–	–	11.0'	29.8'	34.15'
27+25	576116.53	8869535.72	2706.45	2712.45	–41.0'	–	–	11.0'	33.1'	36.98'
27+50	576091.88	8869531.56	2708.70	2712.20	–22.5'	–44.2'	–54.72'	22.5'	35.2'	42.34'
27+75	576067.24	8869527.37	2708.60	2712.10	–22.5'	–38.0'	–49.23'	22.5'	36.9'	48.46'
28+00	576045.03	8869516.46	2706.05	2712.05	–11.0'	–42.0'	–	31.0'	37.3'	49.04'
28+25	576030.78	8869496.24	2706.05	2712.05	–11.0'	–41.2'	–	31.0'	35.1'	47.32'
28+35	576028.15	8869486.60	2706.05	2712.05	–11.0'	–41.2'	–	31.0'	32.6'	44.78'
28+60	576024.12	8869461.95	2708.00	2711.50	–22.5'	–42.1'	–53.34'	22.5'	24.9'	37.68'
28+75	576024.21	8869446.97	2708.01	2711.51	–22.5'	–35.5'	–46.79'	22.5'	23.1'	34.76'
29+00	576028.73	8869422.40	MATCH EX.	MATCH EX.	–22.5'	–25.3'	–36.32'	22.5'	23.1'	30.28'
29+50	576034.58	8869373.26	MATCH EX.	MATCH EX.	–22.5'	–33.4'	–40.24'	22.5'	33.4'	40.52'
29+75	576028.94	8869348.91	2708.05	2711.55	–22.5'	–30.1'	–39.83'	22.5'	39.8'	45.37'
30+00	576027.23	8869324.03	2705.50	2711.50	–11.0'	–26.2'	–37.88'	41.0'	46.6'	51.79'
30+25	576031.72	8869299.51	2705.46	2711.46	–11.0'	–25.0'	–36.34'	51.0'	52.6'	53.00'
30+50	576042.14	8869276.86	2705.41	2711.41	–11.0'	–27.6'	–37.68'	51.0'	57.7'	57.66'
30+75	576055.63	8869255.81	2705.37	2711.37	–11.0'	–30.1'	–40.30'	51.0'	73.3'	78.75'
31+00	576072.14	8869237.12	2705.32	2711.32	–11.0'	–31.7'	–41.83'	51.0'	78.1'	86.97'
31+25	576092.76	8869223.10	2705.28	2711.28	–11.0'	–32.2'	–42.73'	51.0'	80.2'	89.48'
31+50	576116.21	8869214.62	2705.23	2711.23	–11.0'	–33.9'	–44.74'	51.0'	80.9'	89.31'
31+75	576141.03	8869212.20	2705.19	2711.19	–11.0'	–38.2'	–47.93'	51.0'	80.3'	87.99'
32+00	576165.98	8869213.71	2705.14	2711.14	–11.0'	–43.9'	–53.95'	51.0'	74.3'	82.17'
32+25	576190.56	8869218.06	2705.10	2711.10	–11.0'	–54.8'	–65.08'	51.0'	69.7'	77.62'
32+50	576213.78	8869227.20	2707.30	2710.80	–22.5'	–	–29.41'	22.5'	63.9'	74.20'
32+75	576234.73	8869240.77	2707.26	2710.76	–22.5'	–	–36.83'	22.5'	57.2'	68.78'
33+00	576253.45	8869257.33	2707.22	2710.72	–22.5'	–	–43.49'	22.5'	48.3'	60.75'
33+15	576264.60	8869267.37	2707.20	2710.70	–22.5'	–	–49.15'	22.5'	46.1'	58.54'
33+40	576283.63	8869283.54	2704.70	2710.70	–51.0'	–	–66.25'	11.0'	43.7'	57.12'
33+50	576292.20	8869288.69	2704.70	2710.70	–51.0'	–	–66.08'	11.0'	42.8'	55.33'
33+75	576315.78	8869296.71	2704.70	2710.70	–51.0'	–	–64.88'	11.0'	42.8'	55.80'
34+00	576340.67	8869297.32	2704.70	2710.70	–51.0'	–	–68.04'	11.0'	42.7'	55.35'
34+25	576364.15	8869289.26	2704.70	2710.70	–51.0'	–	–67.38'	11.0'	44.0'	54.61'
34+50	576382.25	8869272.29	2704.70	2710.70	–51.0'	–	–76.01'	11.0'	48.9'	59.98'
34+70	576390.69	8869254.26	2704.70	2710.70	–51.0'	–	–84.81'	11.0'	65.2'	75.71'
34+95	576397.87	8869230.31	2705.60	2710.10	–22.5'	–	–18.90'	22.5'	–	–
35+00	576399.30	8869225.53	2705.57	2710.07	–22.5'	–	–18.44'	22.5'	–	–
35+25	576406.48	8869201.58	2705.42	2709.92	–22.5'	–	–29.38'	22.5'	–	–
35+50	576413.67	8869177.63	2705.27	2709.77	–22.5'	–	–29.37'	22.5'	–	–
35+75	576421.83	8869154.06	2705.12	2709.62	–22.5'	–	–72.98'	22.5'	–	–
36+00	576438.49	8869135.71	2704.97	2709.47	–15.0'	–	–48.63'			
36+10	576447.05	8869130.56	2704.91	2709.41	–8.0'	–	–			

NOTES

1. SEE GRADING PLAN, SHEETS C-4 THROUGH C-10; CHANNEL PROFILE, SHEETS C-11 THROUGH C-16; AND TYPICAL CROSS-SECTIONS, SHEETS C-17 THROUGH C-19 FOR CHANNEL CONSTRUCTION DETAILS.

TABLE 2. BENCH STAKING

THIS TABLE PROVIDES COORDINATES ALONG THE GRADE BREAK AT THE BACK OF THE FLOODPLAIN BENCH AT REGULAR INTERVALS FOR FLOODPLAIN BENCH CONSTRUCTION WHERE STANDARD CHANNEL AND FLOODPLAIN TEMPLATES ARE NOT APPLICABLE. SEE SHEET C-19 FOR FLOODPLAIN BENCH CONSTRUCTION DETAILS.

FLOODPLAIN BENCH – CHANNEL LEFT – STA 10+50 TO 11+10

NORTHING	EASTING	ELEVATION	LEFT (3:1)	RIGHT (FLAT)
575482.48	8870563.56	2715.90	–10.64	43.87
575507.01	8870558.76	2715.90	–11.32	40.17
575531.63	8870554.44	2715.90	–2.58	31.95

FLOODLAIN BENCH – CHANNEL LEFT – STA 32+50 TO 35+50

NORTHING	EASTING	ELEVATION	LEFT (3:1)	RIGHT (FLAT)
576238.73	8869161.11	2711.05	–10.59	34.47
576263.60	8869158.59	2711.03	–10.82	34.41
576288.25	8869154.46	2711.01	–11.18	33.62
576312.44	8869148.17	2710.98	–10.28	36.04
576336.05	8869139.98	2710.96	–11.21	41.76
576359.48	8869131.26	2710.94	–11.65	42.37

FLOODPLAIN BENCH – CHANNEL LEFT – STA 36+10 TO 40+20

NORTHING	EASTING	ELEVATION	LEFT (3:1)	RIGHT (FLAT)
576449.43	8869087.84	2710.84	–11.77	33.49
576470.76	8869074.81	2710.82	–12.10	42.38
576492.10	8869061.78	2710.80	–14.03	42.74
576513.43	8869048.74	2710.77	–12.04	37.09
576534.11	8869034.73	2710.75	–11.13	29.87
576552.07	8869017.39	2710.73	–10.23	29.87
576566.14	8868996.92	2710.71	–10.13	35.13
576570.65	8868972.34	2710.68	–10.81	60.59
576572.58	8868947.42	2710.66	–7.01	72.01
576576.33	8868922.72	2710.64	–5.07	64.25
576584.03	8868898.98	2710.61	–8.42	26.11

FLOODPLAIN BENCH – CHANNEL RIGHT – STA 35+00 TO 38+15

NORTHING	EASTING	ELEVATION	LEFT (FLAT)	RIGHT (3:1)
576481.61	8869247.87	2710.53		13.00
576500.35	8869231.33	2710.52		9.40
576519.10	8869214.79	2710.5	–45.60	10.27
576537.84	8869198.24	2710.49	–35.12	8.95
576556.59	8869181.70	2710.47	–34.53	10.77
576575.33	8869165.16	2710.45	–31.99	9.29
576594.08	8869148.62	2710.42	–29.53	9.48
576609.33	8869129.13	2710.42	–31.33	9.28
576622.48	8869107.87	2710.41	–33.49	11.74
576635.63	8869086.61	2710.39	–28.16	12.56
576648.79	8869065.35	2710.38	–5.03	5.49

ALWAYS THINK SAFETY

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
COLUMBIA SNAKE RIVER SALMON RECOVERY PROGRAM
FCRPS HABITAT IMPROVEMENT PROGRAM
GRANDE RONDE SUBBASIN
CATHERINE CREEK – RM 37 RESTORATION PROJECT
GRADING TABLE
PRELIMINARY DESIGN DRAWINGS

REV NO

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ACCEPTED

BOISE, ID 2012-04-12

GRADING TABLE

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CHANNEL ALIGNMENT

TANGENT DATA

BEGIN STATION	END STATION	BEARING
0+08.32	0+12.59	S 88° 15' 15.4 W
0+63.71	1+04.39	N 72° 13' 16.1 W
1+64.16	1+65.37	S 77° 59' 51.8 W
2+42.82	2+79.40	N 85° 34' 06.9 W
2+97.97	2+98.35	N 74° 55' 35.4 W
3+56.62	3+77.25	N 85° 11' 57.3 W
4+39.13	4+86.97	S 73° 56' 43.1 W
5+25.84	5+42.57	N 83° 46' 48.9 W
5+74.33	5+79.71	N 59° 31' 01.4 W
6+32.95	6+36.71	N 69° 41' 08.9 W
6+58.05	6+85.26	N 57° 27' 31.4 W
7+10.22	8+61.20	N 83° 27' 26.9 W
8+91.95	9+41.35	N 65° 50' 17.5 W
10+44.31	10+49.93	N 12° 22' 21.8 E
10+67.59	11+51.01	N 21° 21' 08.1 W
11+85.89	12+01.18	N 65° 46' 09.3 W
12+17.93	12+18.15	N 84° 57' 50.0 W
12+31.60	12+36.00	N 54° 08' 35.4 W
12+47.10	12+55.31	N 66° 51' 54.3 W
12+99.70	13+29.39	N 78° 58' 30.2 W
13+64.12	14+53.46	N 86° 56' 03.2 W
14+91.65	14+93.68	N 59° 35' 02.4 W
17+56.72	17+81.98	S 41° 12' 49.9 W
18+93.25	19+14.41	N 75° 02' 06.9 W
19+88.66	20+23.59	N 53° 45' 46.9 W
21+17.03	24+47.42	N 00° 13' 40.4 W
24+98.51	25+31.83	N 58° 46' 26.0 W
26+54.99	26+59.87	N 81° 32' 43.3 W
27+21.85	27+73.02	S 09° 34' 26.7 W
28+33.56	28+47.59	S 78° 56' 54.0 W
28+88.99	29+27.28	N 77° 19' 45.4 W
29+49.84	29+71.36	S 76° 48' 46.5 W
30+51.21	30+71.97	N 57° 26' 12.7 W
31+78.49	31+98.48	N 03° 35' 47.7 E
32+82.23	33+29.19	N 41° 59' 01.3 E
34+01.60	34+01.67	N 08° 25' 15.6 W
34+68.60	35+64.74	N 73° 18' 22.9 W
35+94.90	35+98.28	N 38° 44' 48.0 W
36+25.83	36+56.74	N 07° 10' 20.7 W
36+80.67	36+89.86	N 20° 14' 40.8 E
37+09.50	37+12.14	N 17° 15' 35.0 W
37+21.40	37+42.94	N 61° 29' 03.0 W
37+63.71	37+75.86	N 41° 39' 06.2 W
38+02.11	38+05.04	N 56° 41' 37.4 W
38+17.72	38+29.82	N 77° 27' 09.8 W
38+39.57	38+41.05	N 40° 12' 51.6 W
39+05.95	39+34.12	N 61° 27' 48.3 W
39+51.81	39+75.96	S 50° 57' 16.5 W
40+00.77	40+22.40	S 79° 23' 33.4 W
40+25.68	40+25.77	S 86° 55' 26.9 W
40+51.10	40+56.80	S 57° 54' 09.3 W

CURVE DATA

PC STATION	PT STATION	DELTA	RADIUS
0+12.59	0+63.71	19° 31' 28.5 R	150.00'
1+04.39	1+64.16	29° 46' 52.1 L	115.00'
1+65.37	2+42.82	16° 26' 01.3 R	270.00'
2+79.40	2+97.97	10° 38' 31.5 R	100.00'
2+98.35	3+56.62	10° 16' 22.0 L	325.00'
3+77.25	4+39.13	20° 51' 19.6 L	170.00'
4+86.97	5+25.84	22° 16' 28.1 R	100.00'
5+42.57	5+74.33	24° 15' 47.5 R	75.00'
5+79.71	6+32.95	10° 10' 07.5 L	300.00'
6+36.71	6+58.05	12° 13' 37.4 R	100.00'
6+85.26	7+10.22	25° 59' 55.5 L	55.00'
8+61.20	8+91.95	17° 37' 09.4 R	100.00'
9+41.35	10+44.31	78° 12' 39.3 R	75.43'
10+49.93	10+67.59	33° 43' 29.9 L	30.00'
11+51.01	11+85.89	44° 25' 01.2 L	45.00'
12+01.18	12+17.93	19° 11' 40.6 L	50.00'
12+18.15	12+31.60	30° 49' 14.6 R	25.00'
12+36.00	12+47.10	12° 43' 18.9 L	50.00'
12+55.31	12+99.70	12° 06' 35.9 L	210.00'
13+29.39	13+64.12	07° 57' 33.0 L	250.00'
14+53.46	14+91.65	27° 21' 00.7 R	80.00'
14+93.68	17+56.72	77° 38' 46.5 L	194.10'
17+81.98	18+93.25	63° 45' 03.2 R	100.00'
19+14.41	19+88.66	21° 16' 20.5 R	200.00'
20+23.59	21+17.03	53° 32' 07.8 R	100.00'
24+47.42	24+98.51	58° 32' 45.6 L	50.00'
25+31.83	26+54.99	22° 46' 17.3 L	309.91'
26+59.87	27+21.85	88° 52' 50.1 L	39.96'
27+73.02	28+33.56	69° 22' 27.4 R	50.00'
28+47.59	28+88.99	23° 43' 20.5 R	100.00'
29+27.28	29+49.84	25° 51' 28.7 L	50.00'
29+71.36	30+51.21	45° 45' 01.5 R	100.00'
30+71.97	31+78.49	61° 02' 00.3 R	100.00'
31+98.48	32+82.23	38° 23' 13.6 R	125.00'
33+29.19	34+01.60	50° 24' 16.9 L	82.31'
34+01.67	34+68.60	64° 53' 07.4 L	59.09'
35+64.74	35+94.90	34° 33' 35.0 R	50.00'
35+98.28	36+25.83	31° 34' 27.3 R	50.00'
36+56.74	36+80.67	27° 25' 01.5 R	50.00'
36+89.86	37+09.50	37° 30' 15.8 L	30.00'
37+12.14	37+21.40	44° 13' 28.0 L	12.00'
37+42.94	37+63.71	19° 49' 56.8 R	60.00'
37+75.86	38+02.11	15° 02' 31.2 L	100.00'
38+05.04	38+17.72	20° 45' 32.4 L	35.00'
38+29.82	38+39.57	37° 14' 18.2 R	15.00'
38+41.05	39+05.95	21° 14' 56.7 L	175.00'
39+34.12	39+51.81	67° 34' 55.2 L	15.00'
39+75.96	40+00.77	28° 26' 16.9 R	50.00'
40+22.40	40+25.68	07° 31' 53.6 R	25.00'
40+25.77	40+51.10	29° 01' 17.6 L	50.00'

COORDINATE DATA

STATION	NORTHING	EASTING	STATION	NORTHING	EASTING
0+08.32	575271.88	8871563.58	24+98.51	576093.00	8869729.93
0+12.59	575271.75	8871559.31	25+31.83	576110.27	8869701.44
0+63.71	575278.84	8871508.94	26+54.99	576151.80	8869586.34
1+04.39	575291.27	8871470.20	26+59.87	576152.52	8869581.52
1+64.16	575294.25	8871411.17	27+21.85	576119.64	8869536.24
1+65.37	575293.99	8871409.98	27+73.02	576069.18	8869527.73
2+42.82	575288.90	8871332.98	28+33.56	576028.42	8869488.01
2+79.40	575291.72	8871296.50	28+47.59	576025.73	8869474.25
2+97.97	575294.87	8871278.22	28+88.99	576026.32	8869433.14
2+98.35	575294.96	8871277.86	29+27.28	576034.71	8869395.79
3+56.62	575305.01	8871220.54	29+49.84	576034.61	8869373.42
3+77.25	575306.73	8871199.98	29+71.36	576029.70	8869352.47
4+39.13	575300.70	8871138.74	30+51.21	576042.79	8869275.83
4+86.97	575287.47	8871092.77	30+71.97	576053.96	8869258.34
5+25.84	575284.16	8871054.28	31+78.49	576144.51	8869212.36
5+42.57	575285.97	8871037.65	31+98.48	576164.47	8869213.61
5+74.33	575295.89	8871007.73	32+82.23	576240.24	8869245.45
5+79.71	575298.62	8871003.10	33+29.19	576275.14	8869276.86
6+32.95	575321.43	8870955.06	34+01.60	576342.26	8869297.10
6+36.71	575322.74	8870951.54	34+01.67	576342.33	8869297.09
6+58.05	575332.22	8870932.46	34+68.60	576390.28	8869255.60
6+85.26	575346.85	8870909.52	35+64.74	576417.90	8869163.51
7+10.22	575355.13	8870886.21	35+94.90	576434.50	8869138.88
8+61.20	575372.33	8870736.21	35+98.28	576437.14	8869136.76
8+91.95	575380.44	8870706.67	36+25.83	576462.19	8869126.15
9+41.35	575400.66	8870661.60	36+56.74	576492.85	8869122.29
10+44.31	575485.64	8870618.80	36+80.67	576516.40	8869124.99
10+49.93	575491.13	8870620.00	36+89.86	576525.02	8869128.17
10+67.59	575508.48	8870618.64	37+09.50	576544.30	8869128.67
11+51.01	575586.18	8870588.26	37+12.14	576546.82	8869127.89
11+85.89	575610.83	8870564.82	37+21.40	576553.81	8869122.16
12+01.18	575617.10	8870550.89	37+42.94	576564.09	8869103.23
12+17.93	575621.31	8870534.76	37+63.71	576576.93	8869087.05
12+18.15	575621.33	8870534.53	37+75.86	576586.02	8869078.97
12+31.60	575625.97	8870522.09	38+02.11	576603.13	8869059.16
12+36.00	575628.55	8870518.52	38+05.04	576604.74	8869056.71
12+47.10	575634.00	8870508.88	38+17.72	576609.65	8869045.10
12+55.31	575637.23	8870501.32	38+29.82	576612.28	8869033.29
12+99.70	575650.24	8870458.97	38+39.57	576617.24	8869025.09
13+29.39	575655.92	8870429.82	38+41.05	576618.37	8869024.14
13+64.12	575660.18	8870395.39	39+05.95	576659.12	8868974.10
14+53.46	575664.95	8870306.18	39+34.12	576672.58	8868949.36
14+91.65	575675.85	8870269.96	39+51.81	576671.05	8868932.74
14+93.68	575676.88	8870268.20	39+75.96	576655.84	8868913.99
17+56.72	575631.50	8870029.10	40+00.77	576645.52	8868891.70
17+81.98	575612.50	8870012.46	40+22.40	576641.54	8868870.44
18+93.25	575581.78	8869911.41	40+25.68	576641.15	8868867.18
19+14.41	575587.25	8869890.97	40+25.77	576641.15	8868867.10
19+88.66	575619.15	8869824.39	40+51.10	576633.58	8868843.21
20+23.59	575639.80	8869796.21	40+56.80	576630.54	8868838.38
21+17.03	575720.06	8869755.32			
24+47.42	576050.44	8869754.01			

NOTES

1. THIS TABLE INCLUDES THE INFORMATION NECESSARY TO STAKEOUT THE MAIN CHANNEL ALIGNMENT FOR THIS PROJECT.
2. SEE GRADING PLAN, SHEETS C-4 THROUGH C-10; CHANNEL PROFILE, SHEETS C-11 THROUGH C-16; AND TYPICAL CROSS-SECTIONS, SHEETS C-17 THROUGH C-19 FOR CHANNEL CONSTRUCTION DETAILS.

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CATHERINE CREEK - RM 37 RESTORATION PROJECT

GRANDE RONDE SUBBASIN

GRADING TABLE

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GRADING TABLE

SHEET C-3

SHEET 8 OF 27

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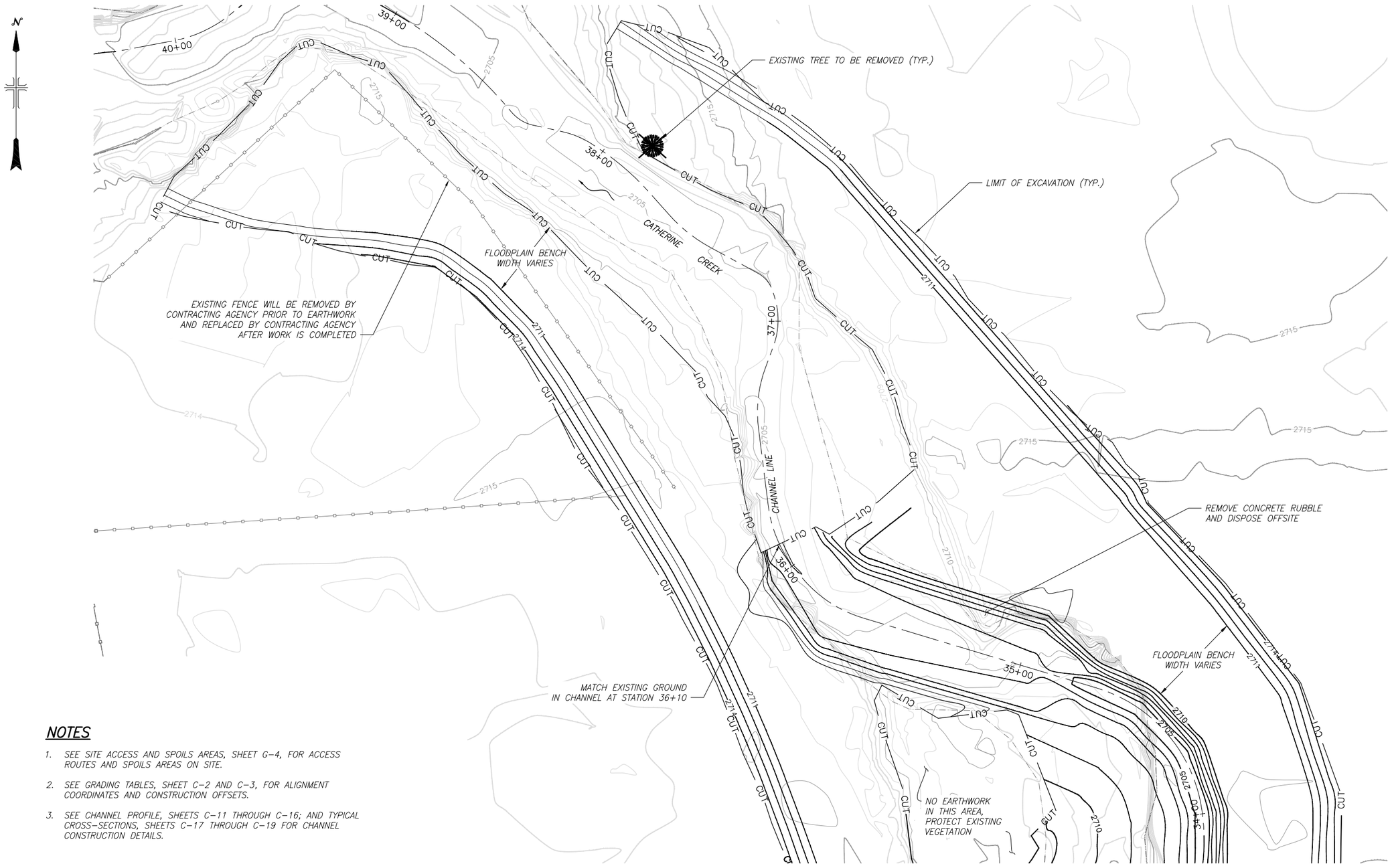

NOTES

1. SEE SITE ACCESS AND SPOILS AREAS, SHEET G-4, FOR ACCESS ROUTES AND SPOILS AREAS ON SITE.
2. SEE GRADING TABLES, SHEET C-2 AND C-3, FOR ALIGNMENT COORDINATES AND CONSTRUCTION OFFSETS.
3. SEE CHANNEL PROFILE, SHEETS C-11 THROUGH C-16; AND TYPICAL CROSS-SECTIONS, SHEETS C-17 THROUGH C-19 FOR CHANNEL CONSTRUCTION DETAILS.

GRADING PLAN

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SHEET C-4

SHEET 9 OF 27

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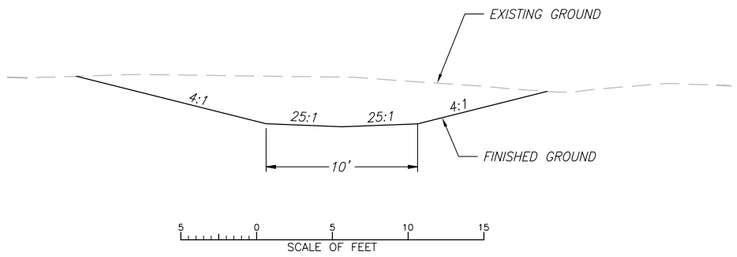
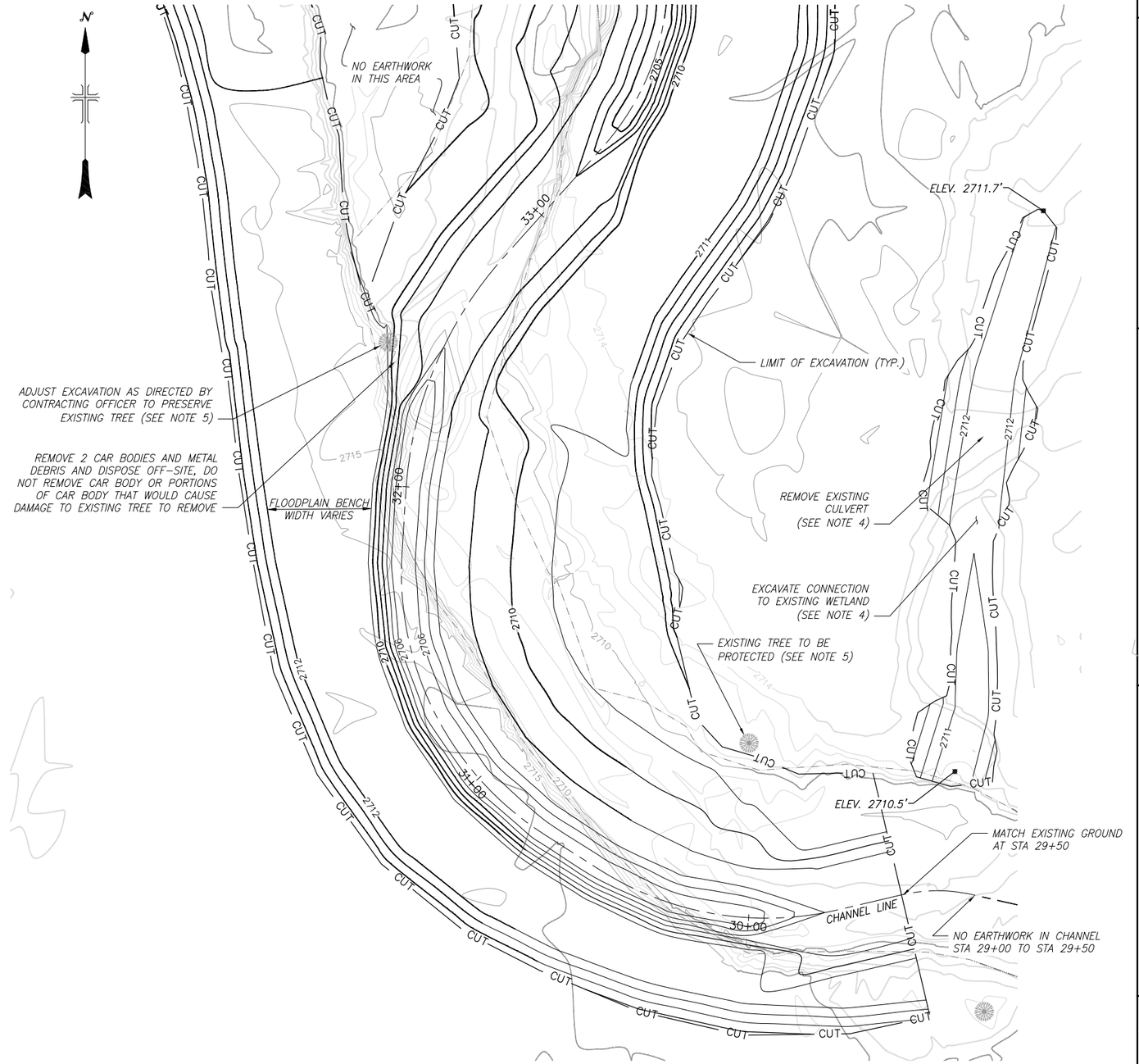


WETLAND CONNECTION TYPICAL CROSS-SECTION



GRADING PLAN

NOTES

1. SEE SITE ACCESS AND SPOILS AREAS, SHEET G-4, FOR ACCESS ROUTES AND SPOILS AREAS ON SITE.
2. SEE GRADING TABLES, SHEET C-2 AND C-3, FOR ALIGNMENT COORDINATES AND CONSTRUCTION OFFSETS.
3. SEE CHANNEL PROFILE, SHEETS C-11 THROUGH C-16; AND TYPICAL CROSS-SECTIONS, SHEETS C-17 THROUGH C-19 FOR CHANNEL CONSTRUCTION DETAILS.
4. EXCAVATE CONNECTION TO EXISTING WETLAND PER THE CROSS-SECTION SHOWN ON THIS SHEET. REMOVE EXISTING CULVERT NEAR MIDPOINT OF EXCAVATION AND DISPOSE OFFSITE. PROFILE OF EXCAVATION SHALL BE AN EVEN SLOPE BETWEEN SPOT ELEVATIONS SHOWN.
5. PROTECT EXISTING TREE WITHIN THE EARTHWORK AREA. EXISTING TREE IS ROOTED AT ELEVATIONS OF PROPOSED GROUND. REMOVE AND DISPOSE OF 2 OF 3 CAR BODIES EMBEDDED IN CREEK BANK AT DIRECTION OF CONTRACTING OFFICER.

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SHEET C-5

SHEET 10 OF 27

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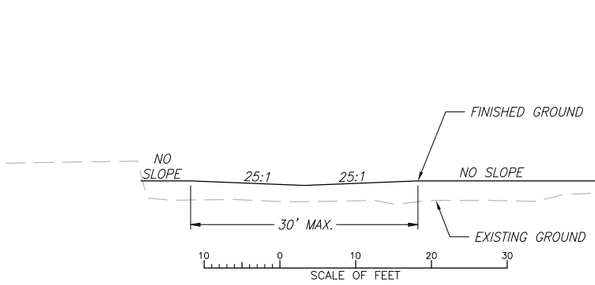
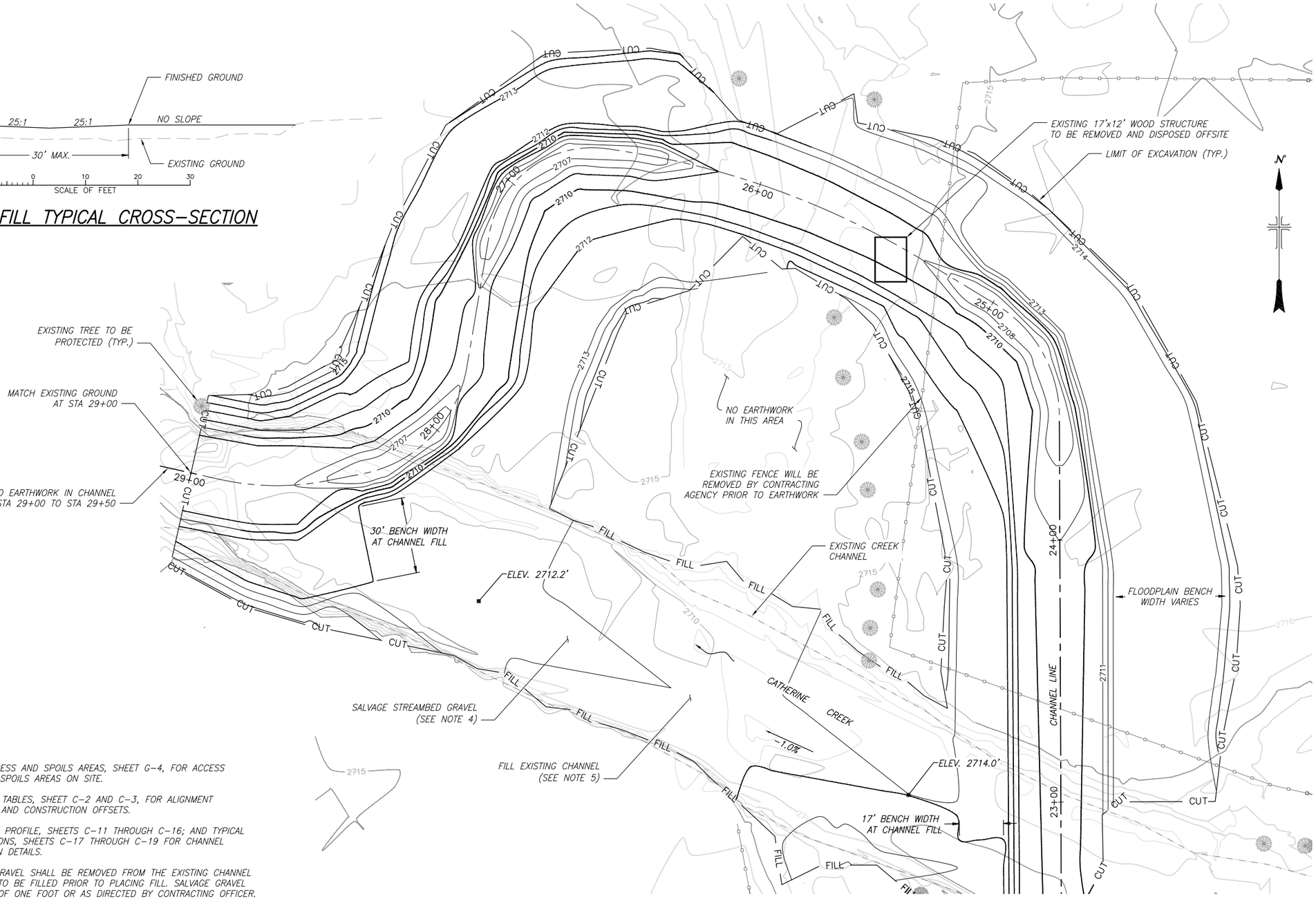


CHANNEL FILL TYPICAL CROSS-SECTION



GRADING PLAN

NOTES

1. SEE SITE ACCESS AND SPOILS AREAS, SHEET G-4, FOR ACCESS ROUTES AND SPOILS AREAS ON SITE.
2. SEE GRADING TABLES, SHEET C-2 AND C-3, FOR ALIGNMENT COORDINATES AND CONSTRUCTION OFFSETS.
3. SEE CHANNEL PROFILE, SHEETS C-11 THROUGH C-16; AND TYPICAL CROSS-SECTIONS, SHEETS C-17 THROUGH C-19 FOR CHANNEL CONSTRUCTION DETAILS.
4. STREAMBED GRAVEL SHALL BE REMOVED FROM THE EXISTING CHANNEL WITHIN AREA TO BE FILLED PRIOR TO PLACING FILL. SALVAGE GRAVEL TO A DEPTH OF ONE FOOT OR AS DIRECTED BY CONTRACTING OFFICER. TOTAL VOLUME IS APPROXIMATELY 500 CUBIC YARDS.
5. FILL THE EXISTING CHANNEL AS SHOWN PER THE CROSS-SECTION SHOWN ON THIS SHEET. PLACE SOIL IN 1' MAXIMUM LIFTS AND COMPACT TO 90% MAXIMUM DENSITY. PROFILE SHALL BE AN EVEN SLOPE BETWEEN SPOT ELEVATIONS SHOWN.

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SHEET C-6

SHEET 11 OF 27

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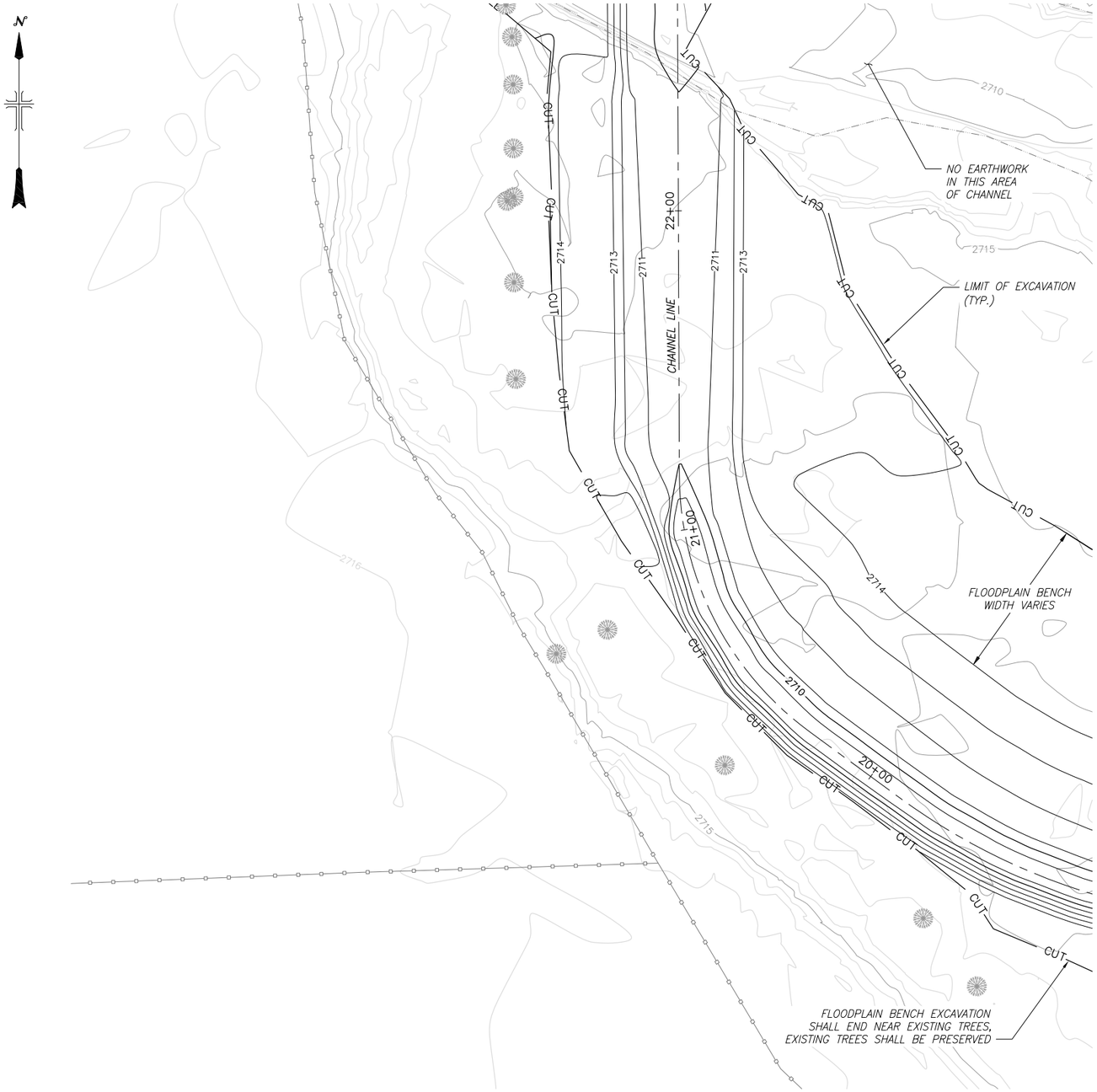

GRADING PLAN

NOTES

1. SEE SITE ACCESS AND SPOILS AREAS, SHEET G-4, FOR ACCESS ROUTES AND SPOILS AREAS ON SITE.
2. SEE GRADING TABLES, SHEET C-2 AND C-3, FOR ALIGNMENT COORDINATES AND CONSTRUCTION OFFSETS.
3. SEE CHANNEL PROFILE, SHEETS C-11 THROUGH C-16; AND TYPICAL CROSS-SECTIONS, SHEETS C-17 THROUGH C-19 FOR CHANNEL CONSTRUCTION DETAILS.

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SHEET C-7

SHEET 12 OF 27

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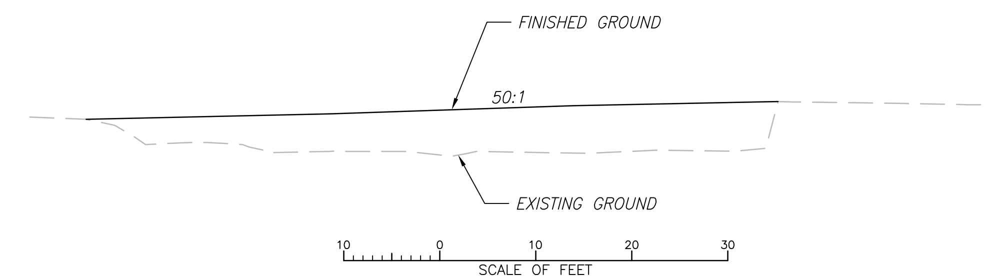
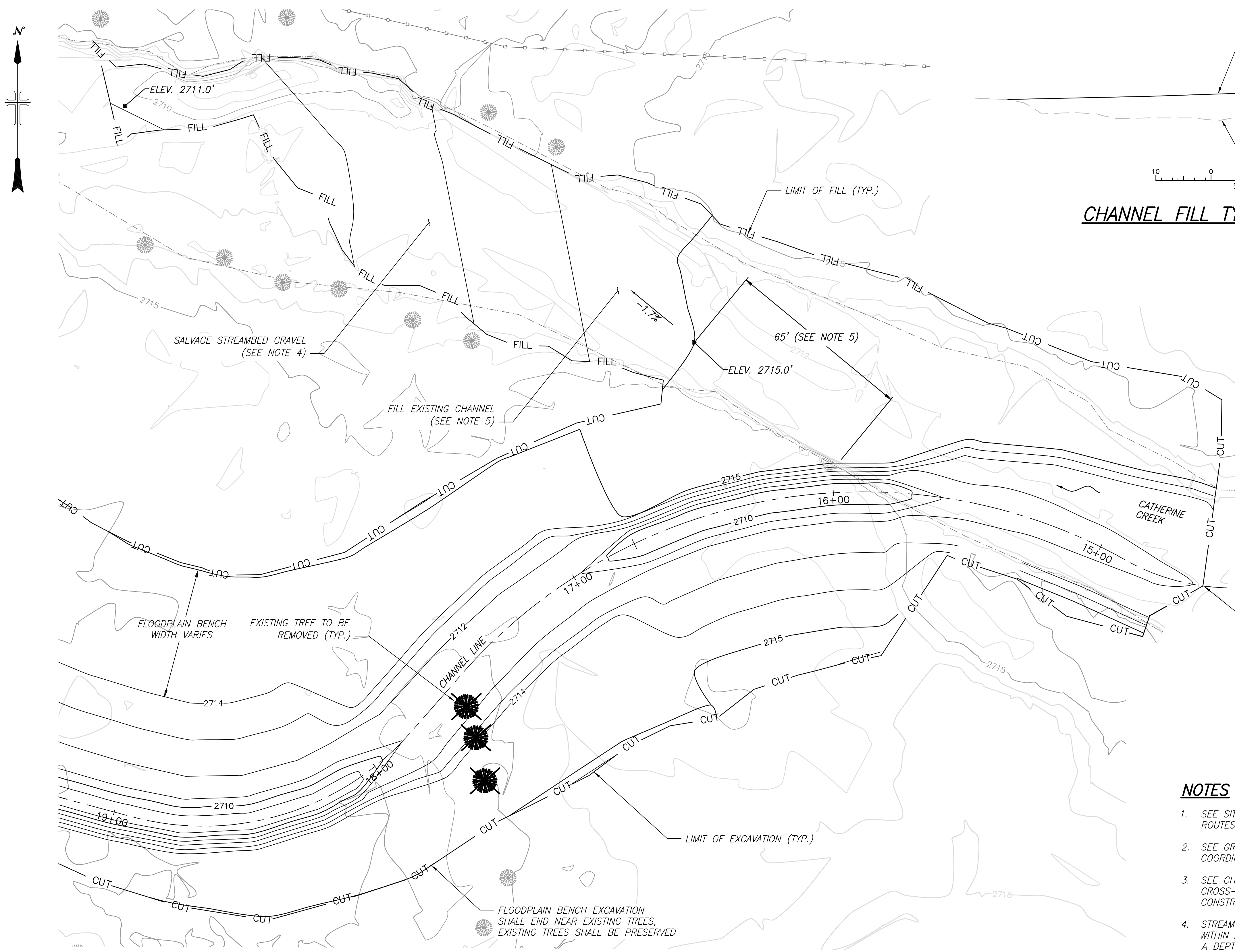


CHANNEL FILL TYPICAL CROSS–SECTION



SCALE OF FEET

GRADING PLAN

NOTES

1. SEE SITE ACCESS AND SPOILS AREAS, SHEET G-4, FOR ACCESS ROUTES AND SPOILS AREAS ON SITE.
2. SEE GRADING TABLES, SHEET C-2 AND C-3, FOR ALIGNMENT COORDINATES AND CONSTRUCTION OFFSETS.
3. SEE CHANNEL PROFILE, SHEETS C-11 THROUGH C-16; AND TYPICAL CROSS-SECTIONS, SHEETS C-17 THROUGH C-19 FOR CHANNEL CONSTRUCTION DETAILS.
4. STREAMBED GRAVEL SHALL BE REMOVED FROM THE EXISTING CHANNEL WITHIN AREA OF FILL PRIOR TO FILLING CHANNEL. SALVAGE GRAVEL TO A DEPTH OF ONE FOOT OR AS DIRECTED BY CONTRACTING OFFICER. TOTAL VOLUME IS APPROXIMATELY 500 CUBIC YARDS.
5. FILL THE EXISTING CHANNEL AS SHOWN PER THE CROSS-SECTION SHOWN ON THIS SHEET. PLACE SOIL IN 1' MAXIMUM LIFTS AND COMPACT TO 90% MAXIMUM DENSITY. FILL 65 FEET OF THE CHANNEL AT THE UPSTREAM END TO ELEVATION 2715', PROCEEDING DOWNSTREAM THE PROFILE SHALL BE AN EVEN SLOPE BETWEEN SPOT ELEVATIONS SHOWN ON THIS SHEET. LARGE FALLEN LIMBS FROM NEARBY TREES SHALL BE REMOVED FROM CHANNEL PRIOR TO PLACING FILL.

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SHEET C-8

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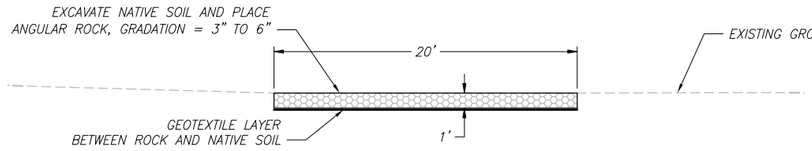
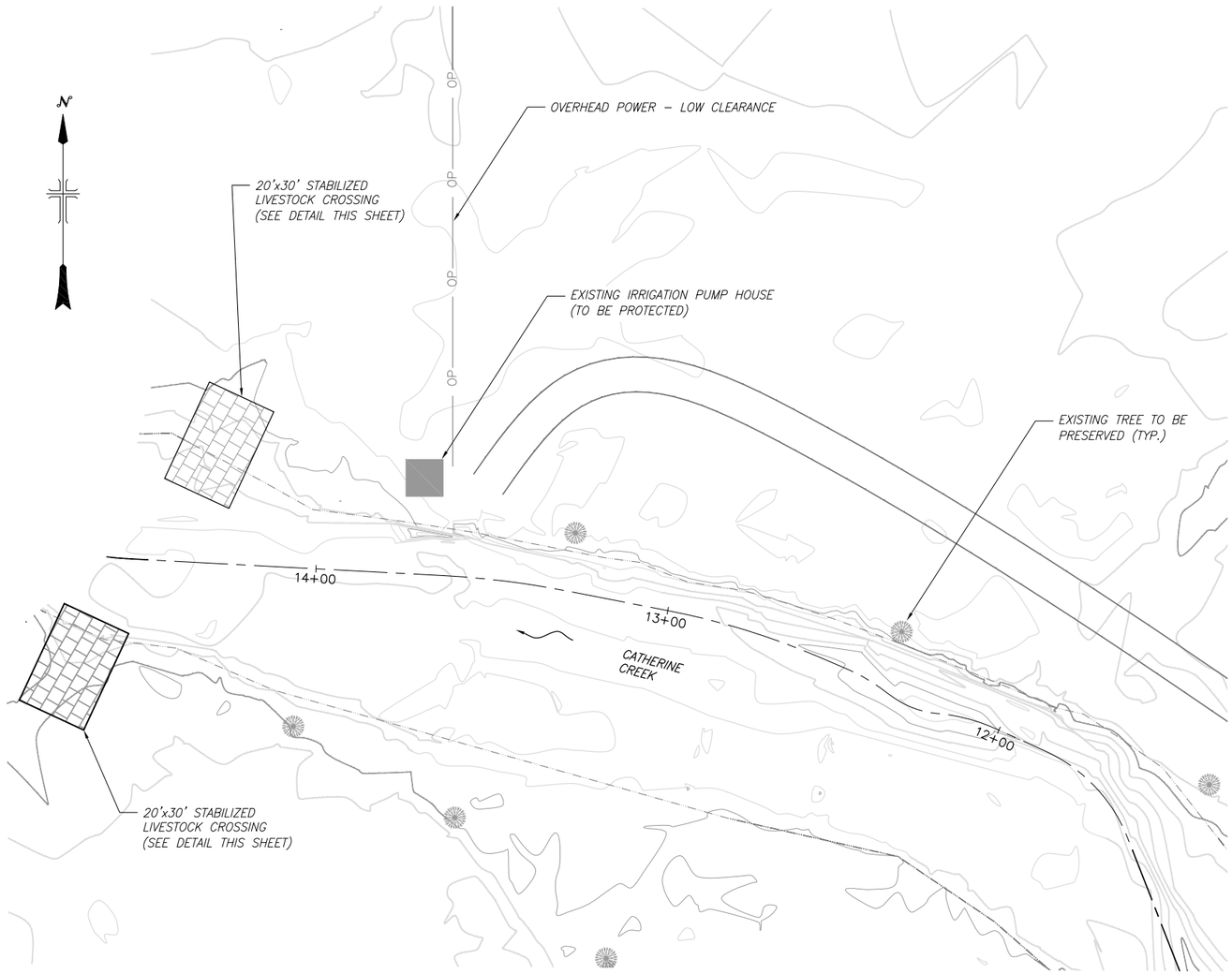


STABILIZED LIVESTOCK CROSSING TYPICAL CROSS-SECTION



GRADING PLAN

NOTES

1. SEE SITE ACCESS AND SPOILS AREAS, SHEET G-4, FOR ACCESS ROUTES AND SPOILS AREAS ON SITE.
2. ROCK USED FOR STABILIZED LIVESTOCK CROSSING SHALL BE ANGULAR QUARRY ROCK WITH A MINIMUM SIZE OF 3" AND MAXIMUM SIZE OF 6".

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SHEET C-9

SHEET 14 OF 27

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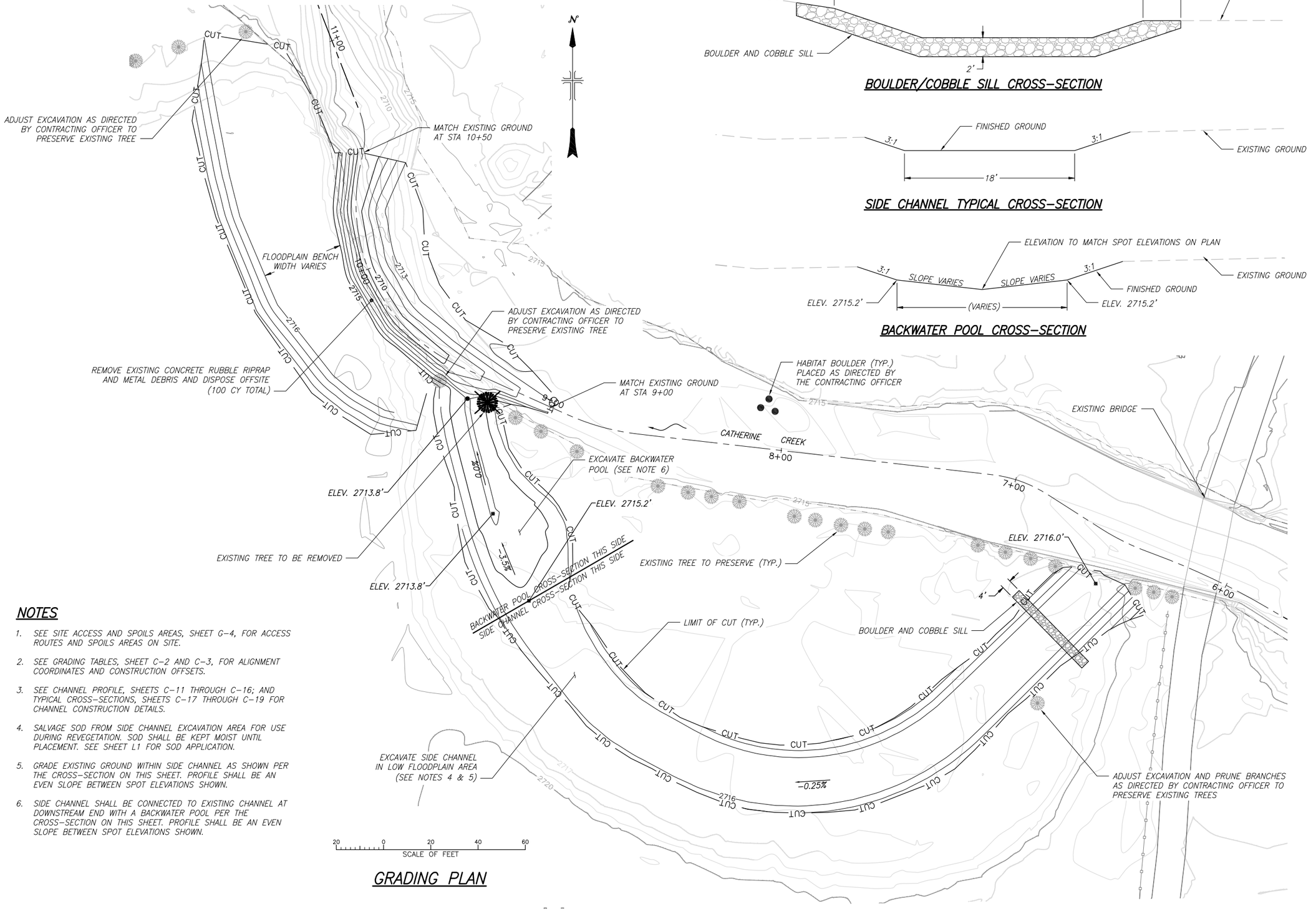

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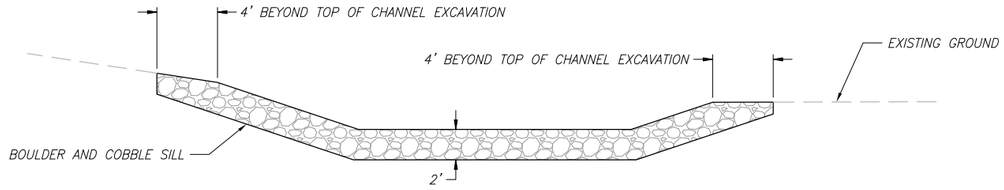

BOULDER/COBBLE SILL CROSS-SECTION

SIDE CHANNEL TYPICAL CROSS-SECTION

BACKWATER POOL CROSS-SECTION

NOTES

1. SEE SITE ACCESS AND SPOILS AREAS, SHEET G–4, FOR ACCESS ROUTES AND SPOILS AREAS ON SITE.
2. SEE GRADING TABLES, SHEET C–2 AND C–3, FOR ALIGNMENT COORDINATES AND CONSTRUCTION OFFSETS.
3. SEE CHANNEL PROFILE, SHEETS C–11 THROUGH C–16; AND TYPICAL CROSS–SECTIONS, SHEETS C–17 THROUGH C–19 FOR CHANNEL CONSTRUCTION DETAILS.
4. SALVAGE SOD FROM SIDE CHANNEL EXCAVATION AREA FOR USE DURING REVEGETATION. SOD SHALL BE KEPT MOIST UNTIL PLACEMENT. SEE SHEET L1 FOR SOD APPLICATION.
5. GRADE EXISTING GROUND WITHIN SIDE CHANNEL AS SHOWN PER THE CROSS–SECTION ON THIS SHEET. PROFILE SHALL BE AN EVEN SLOPE BETWEEN SPOT ELEVATIONS SHOWN.
6. SIDE CHANNEL SHALL BE CONNECTED TO EXISTING CHANNEL AT DOWNSTREAM END WITH A BACKWATER POOL PER THE CROSS–SECTION ON THIS SHEET. PROFILE SHALL BE AN EVEN SLOPE BETWEEN SPOT ELEVATIONS SHOWN.

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SHEET C–10

SHEET 15 OF 27

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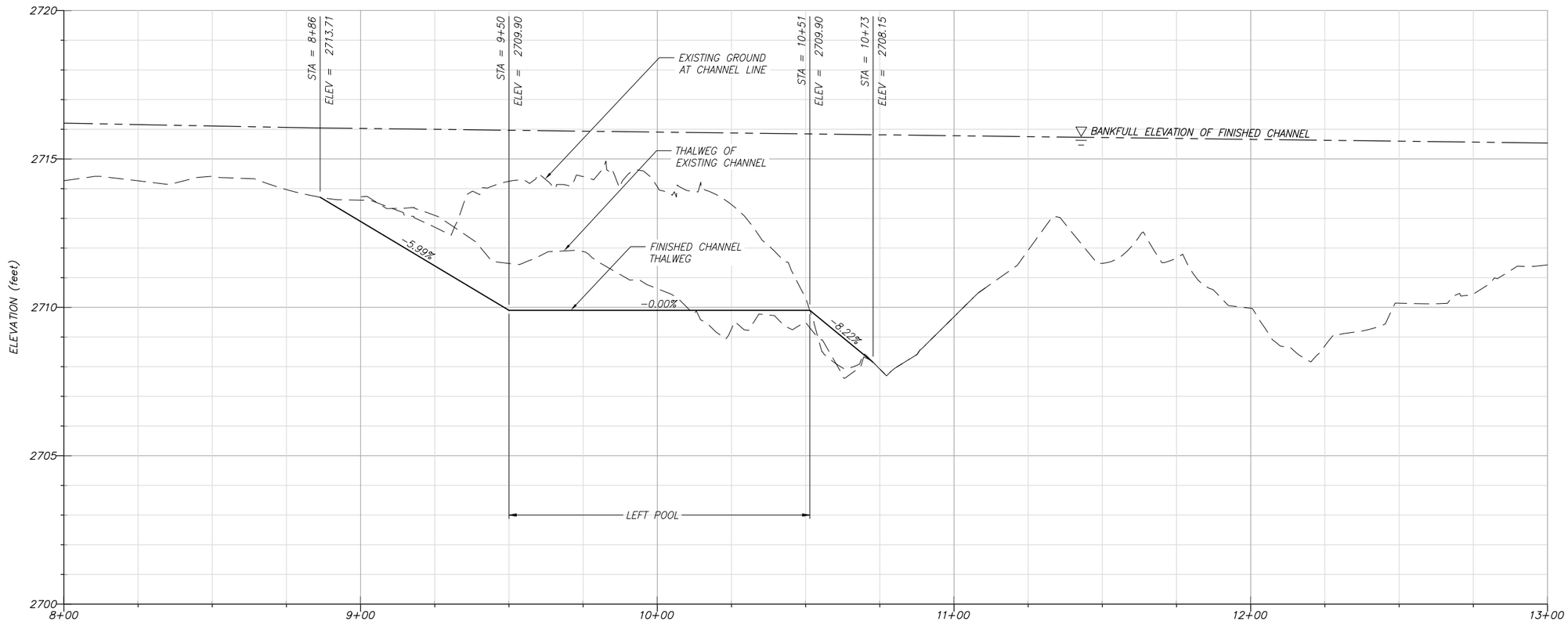

NOTES

1. SEE GRADING TABLES, SHEET C–2 AND C–3, FOR ALIGNMENT COORDINATES AND CONSTRUCTION OFFSETS.
2. SEE GRADING PLAN, SHEETS C–4 THROUGH C–10 AND TYPICAL CROSS–SECTIONS, SHEETS C–17 THROUGH C–19 FOR CHANNEL CONSTRUCTION DETAILS.

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GRADING PROFILE

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GRADING PROFILE

SHEET C–11

SHEET 16 OF 27

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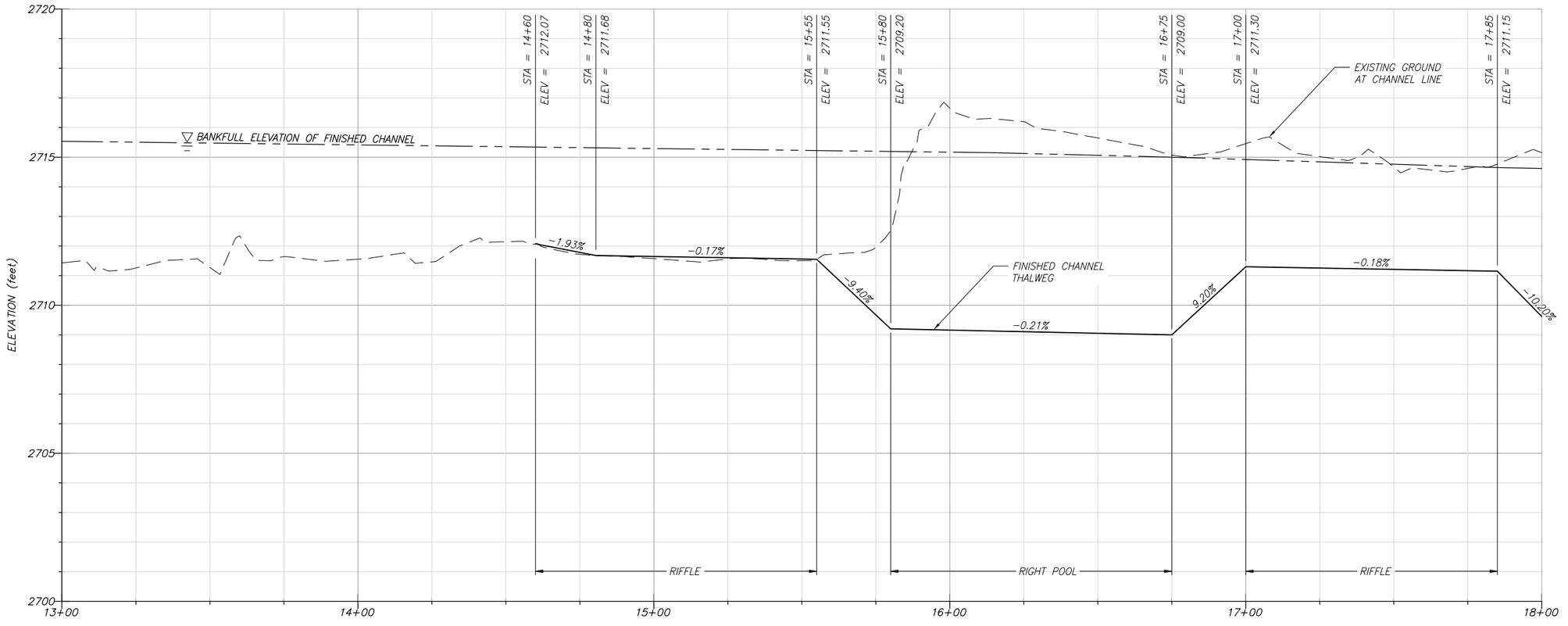

CHANNEL LINE

NOTES

1. SEE GRADING TABLES, SHEET C–2 AND C–3, FOR ALIGNMENT COORDINATES AND CONSTRUCTION OFFSETS.
2. SEE GRADING PLAN, SHEETS C–4 THROUGH C–10 AND TYPICAL CROSS–SECTIONS, SHEETS C–17 THROUGH C–19 FOR CHANNEL CONSTRUCTION DETAILS.

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SHEET C–12

SHEET 17 OF 27

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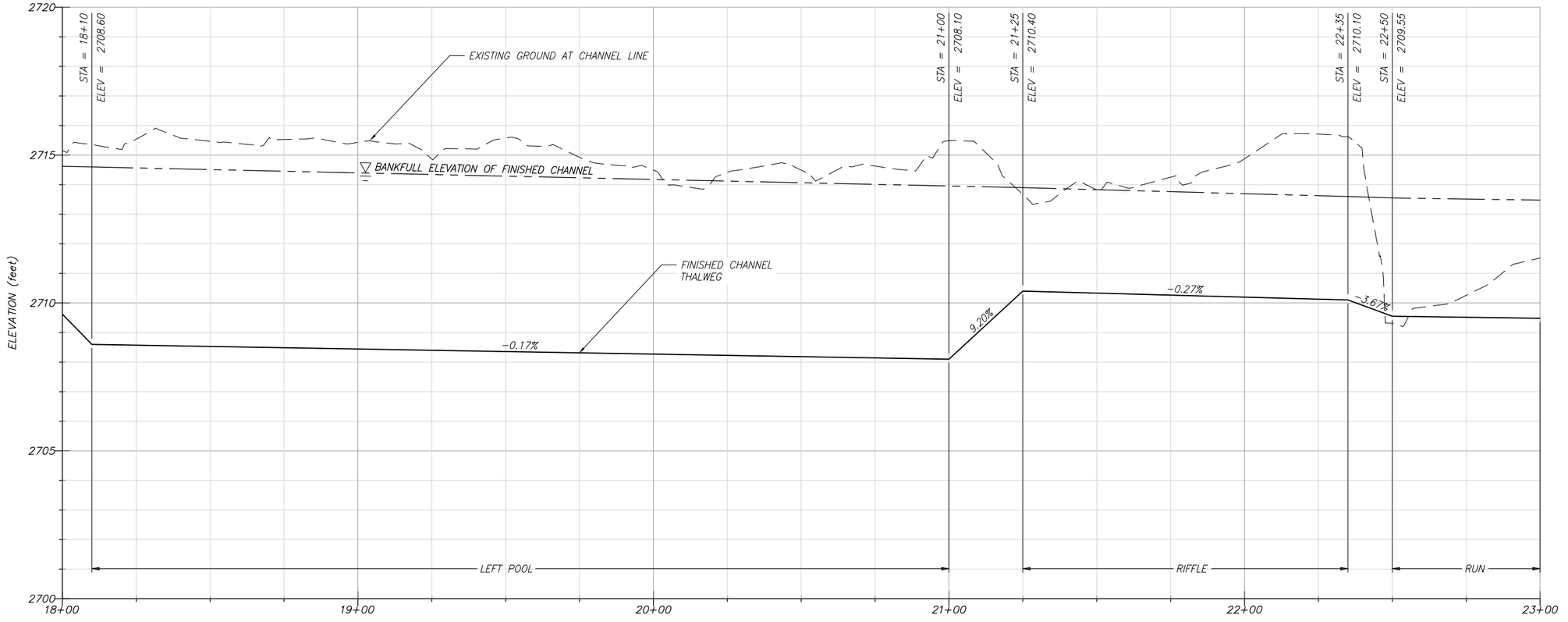

CHANNEL LINE

NOTES

1. SEE GRADING TABLES, SHEET C-2 AND C-3, FOR ALIGNMENT COORDINATES AND CONSTRUCTION OFFSETS.
2. SEE GRADING PLAN, SHEETS C-4 THROUGH C-10 AND TYPICAL CROSS-SECTIONS, SHEETS C-17 THROUGH C-19 FOR CHANNEL CONSTRUCTION DETAILS.

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GRADING PROFILE

SHEET C-13

SHEET 18 OF 27

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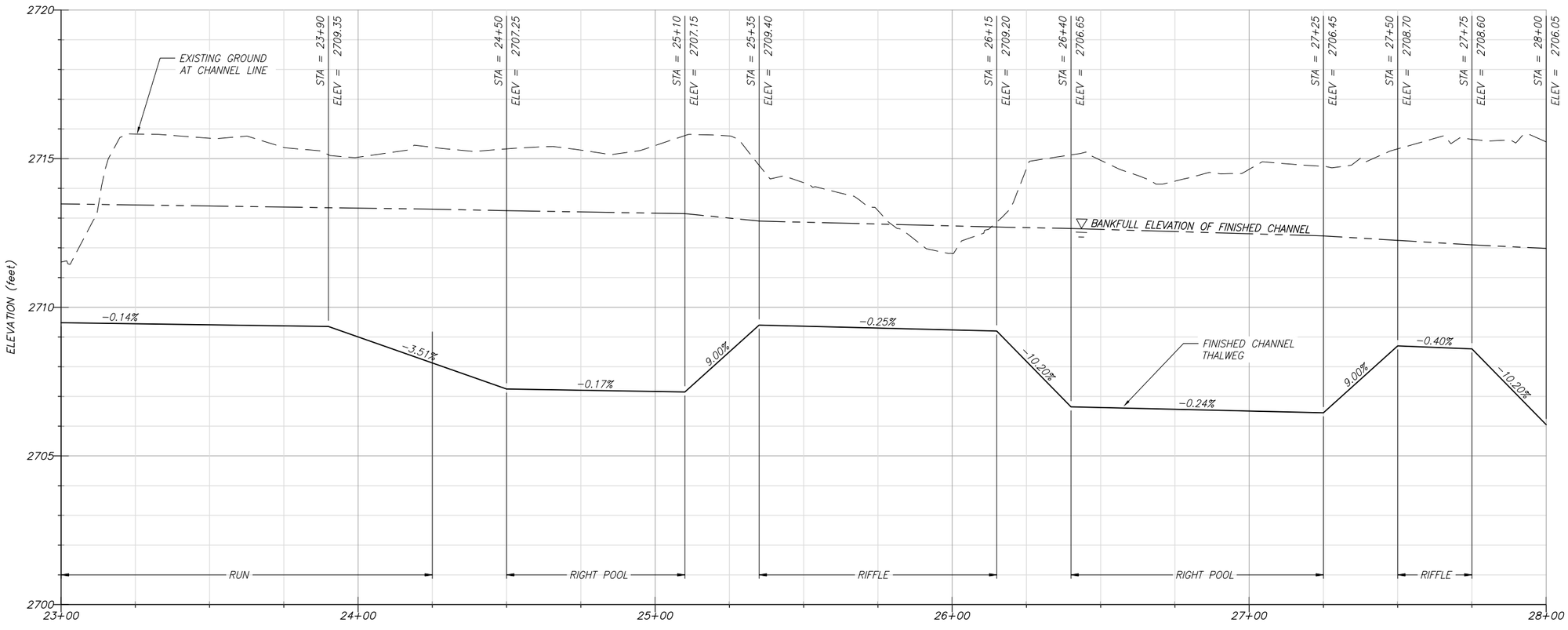

CHANNEL LINE

NOTES

1. SEE GRADING TABLES, SHEET C–2 AND C–3, FOR ALIGNMENT COORDINATES AND CONSTRUCTION OFFSETS.
2. SEE GRADING PLAN, SHEETS C–4 THROUGH C–10 AND TYPICAL CROSS–SECTIONS, SHEETS C–17 THROUGH C–19 FOR CHANNEL CONSTRUCTION DETAILS.

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Federal Design Only
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SHEET C–14

SHEET 19 OF 27

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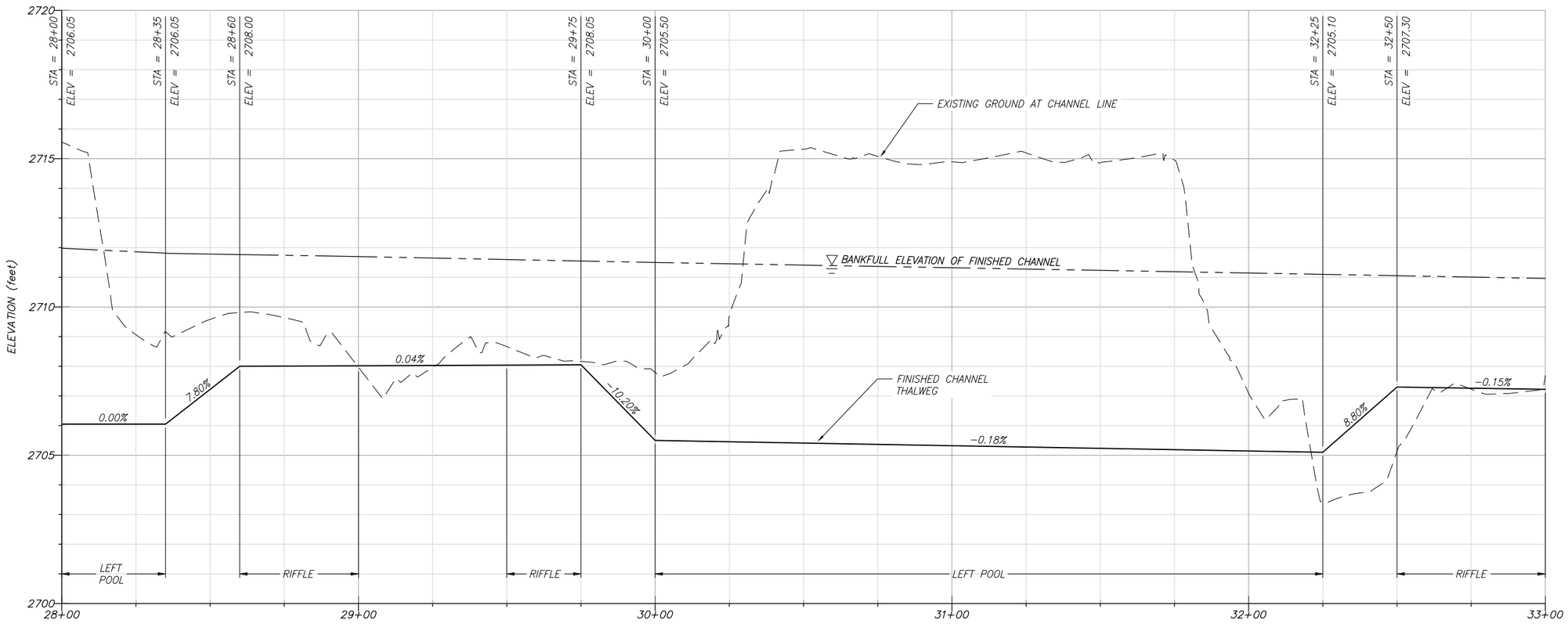

CHANNEL LINE

NOTES

1. SEE GRADING TABLES, SHEET C–2 AND C–3, FOR ALIGNMENT COORDINATES AND CONSTRUCTION OFFSETS.
2. SEE GRADING PLAN, SHEETS C–4 THROUGH C–10 AND TYPICAL CROSS–SECTIONS, SHEETS C–17 THROUGH C–19 FOR CHANNEL CONSTRUCTION DETAILS.

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SHEET C–15

SHEET 20 OF 27

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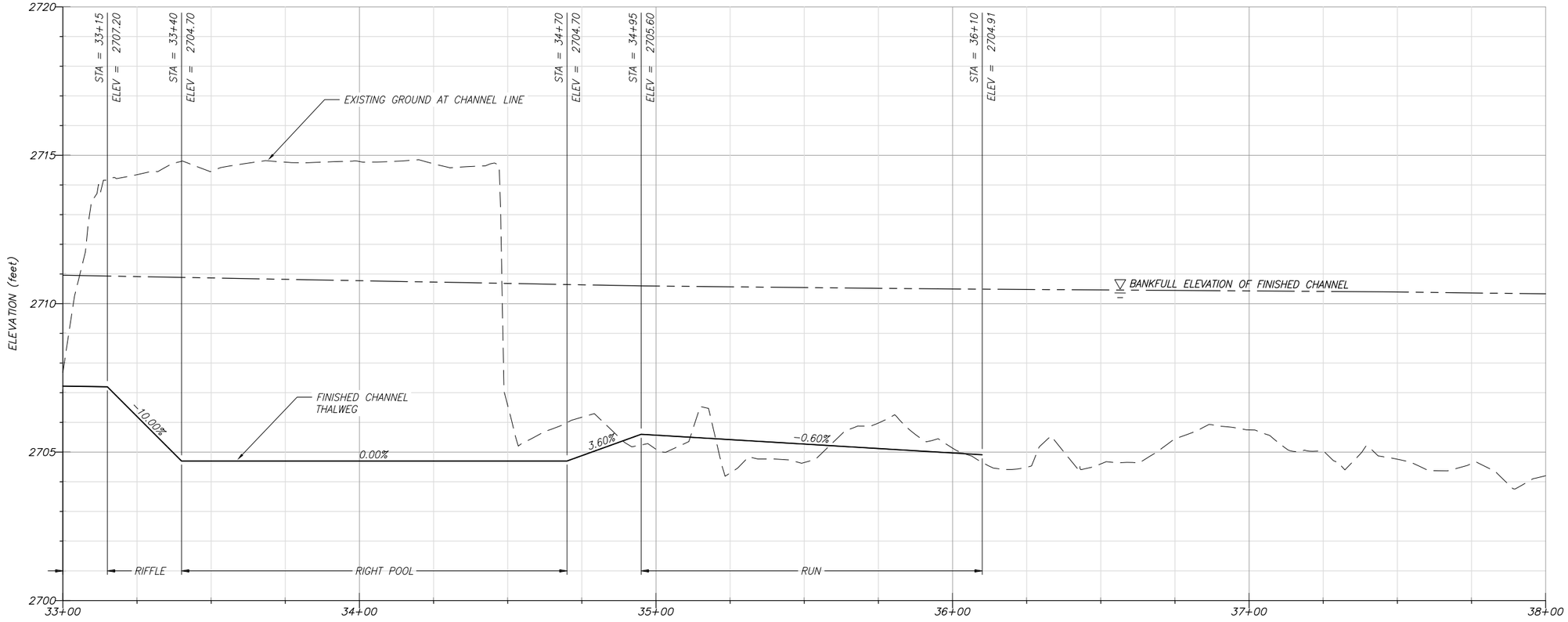

CHANNEL LINE

NOTES

1. SEE GRADING TABLES, SHEET C-2 AND C-3, FOR ALIGNMENT COORDINATES AND CONSTRUCTION OFFSETS.
2. SEE GRADING PLAN, SHEETS C-4 THROUGH C-10 AND TYPICAL CROSS-SECTIONS, SHEETS C-17 THROUGH C-19 FOR CHANNEL CONSTRUCTION DETAILS.

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SHEET C-16

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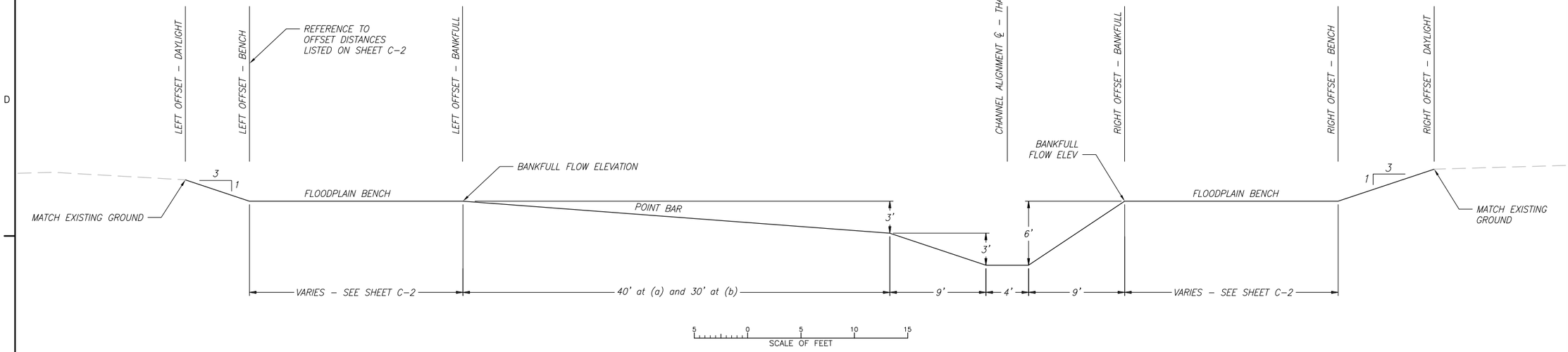
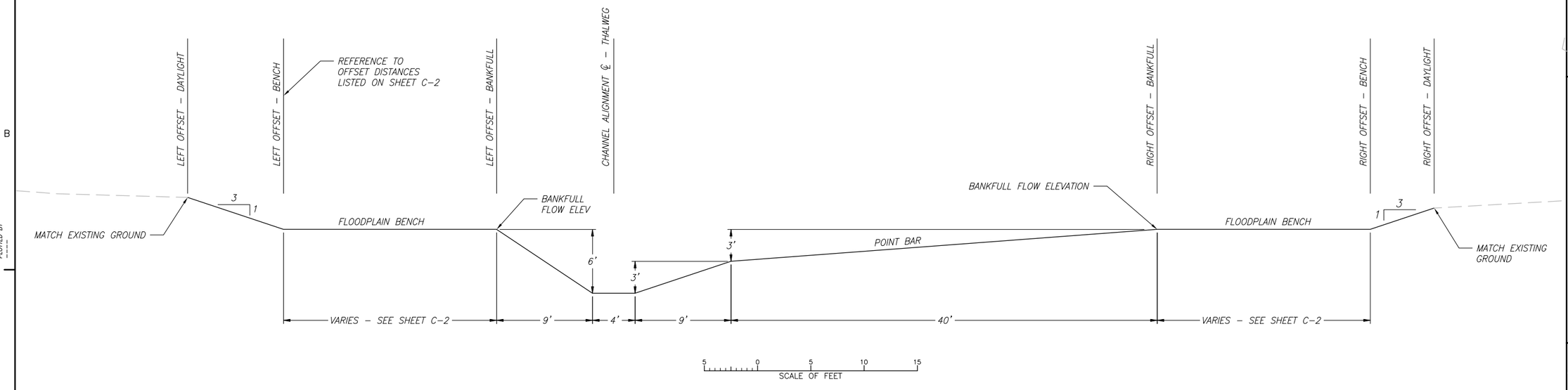


TYPICAL CHANNEL CROSS SECTION – RIGHT POOL

STATION	TO	STATION
15+80		16+75(a)
24+50		25+10(b)
26+40		27+25(b)



TYPICAL CHANNEL CROSS SECTION – LEFT POOL

STATION	TO	STATION
9+50		10+51
18+10		21+00
28+00		28+35
30+00		32+25

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TYPICAL CHANNEL CROSS-SECTIONS

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TYPICAL CHANNEL CROSS-SECTIONS

SHEET C-17

SHEET 22 OF 27

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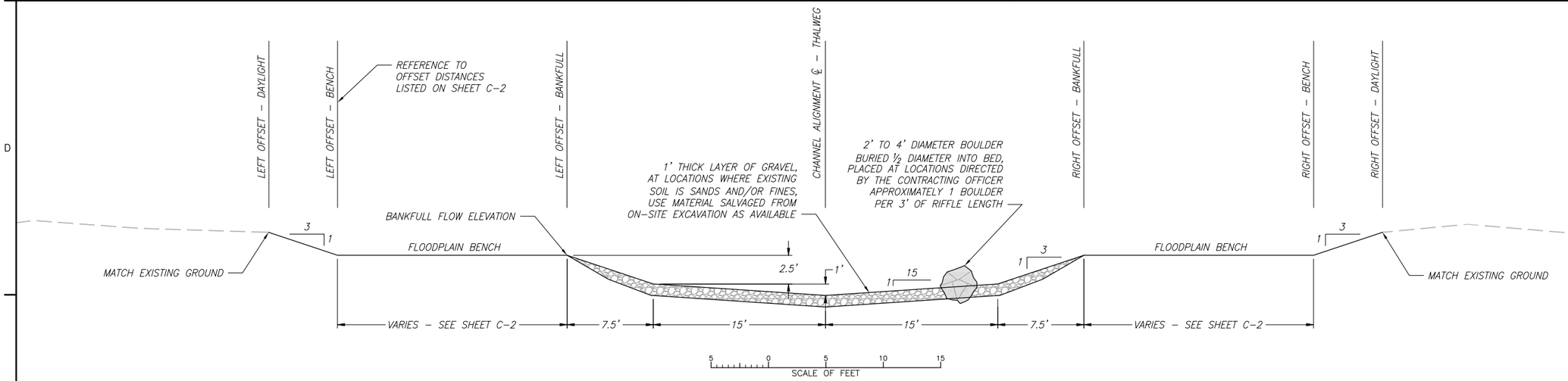
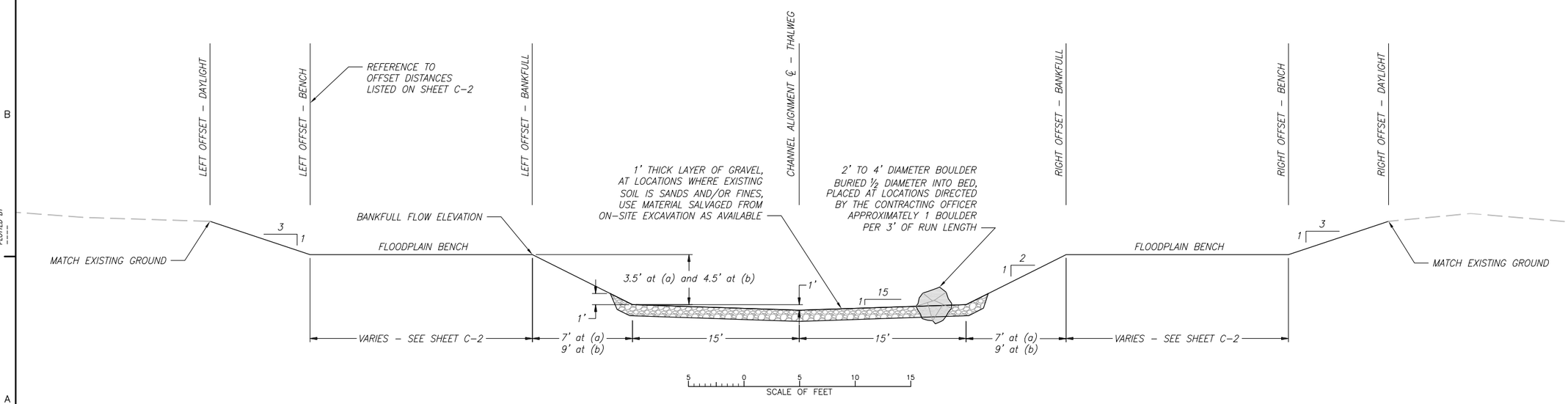
CC-37_TYPICAL SECTIONS



TYPICAL CHANNEL CROSS SECTION – RIFFLE

STATION	TO	STATION	STATION	TO	STATION
14+80		15+55	27+50		27+75
17+00		17+85	28+60		29+00
21+25		22+35	29+50		29+75
25+35		26+15	32+50		33+15



TYPICAL CHANNEL CROSS SECTION – RUN

STATION	TO	STATION
22+50		23+90 (a)
35+50		36+10 (b)

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TYPICAL CHANNEL CROSS-SECTIONS

PRELIMINARY DESIGN DRAWINGS

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TYPICAL CHANNEL CROSS-SECTIONS

SHEET C-18

SHEET 23 OF 27

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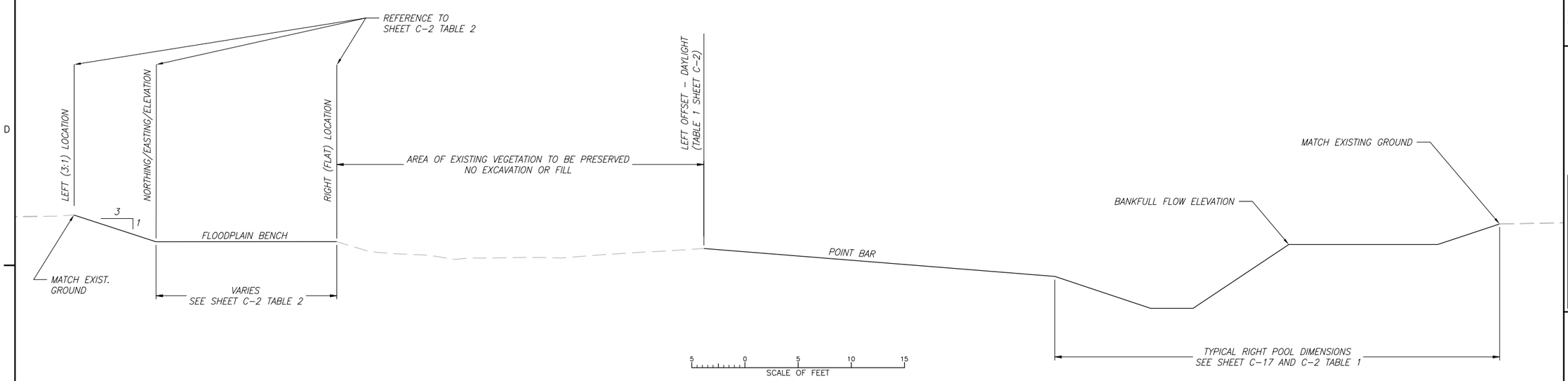
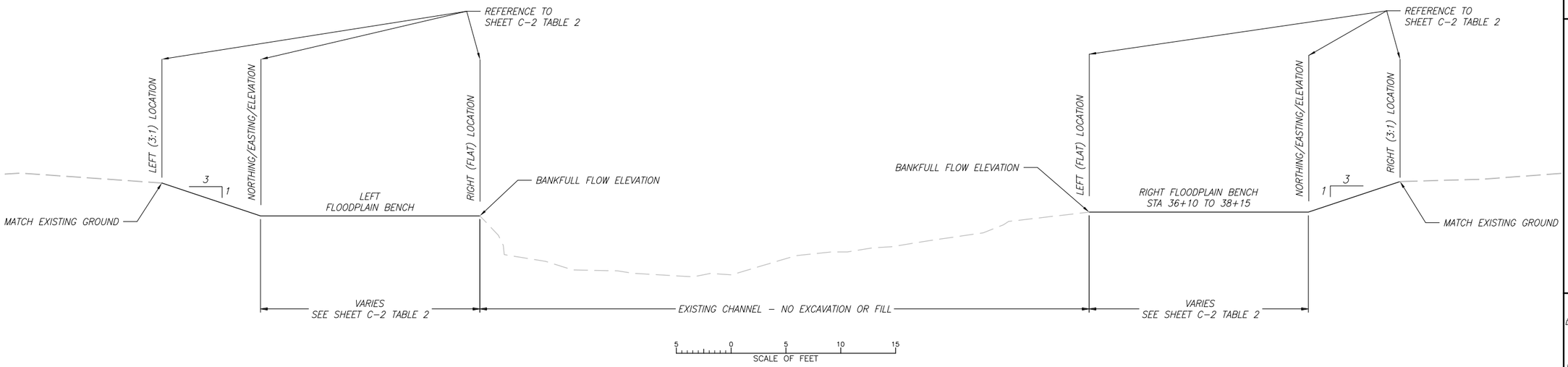
CC-37_TYPICAL SECTIONS



TYPICAL CHANNEL CROSS SECTION – RIGHT POOL WITH PRESERVED VEGETATION

STATION	TO	STATION
33+40		35+50



TYPICAL FLOODPLAIN BENCH CROSS SECTIONS

LEFT FLOODPLAIN BENCH

STATION	TO	STATION
10+50		11+25
36+10		40+10

RIGHT FLOODPLAIN BENCH

STATION	TO	STATION
36+10		38+15

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TYPICAL CHANNEL CROSS-SECTIONS

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TYPICAL CHANNEL CROSS-SECTIONS

SHEET C-19

SHEET 24 OF 27

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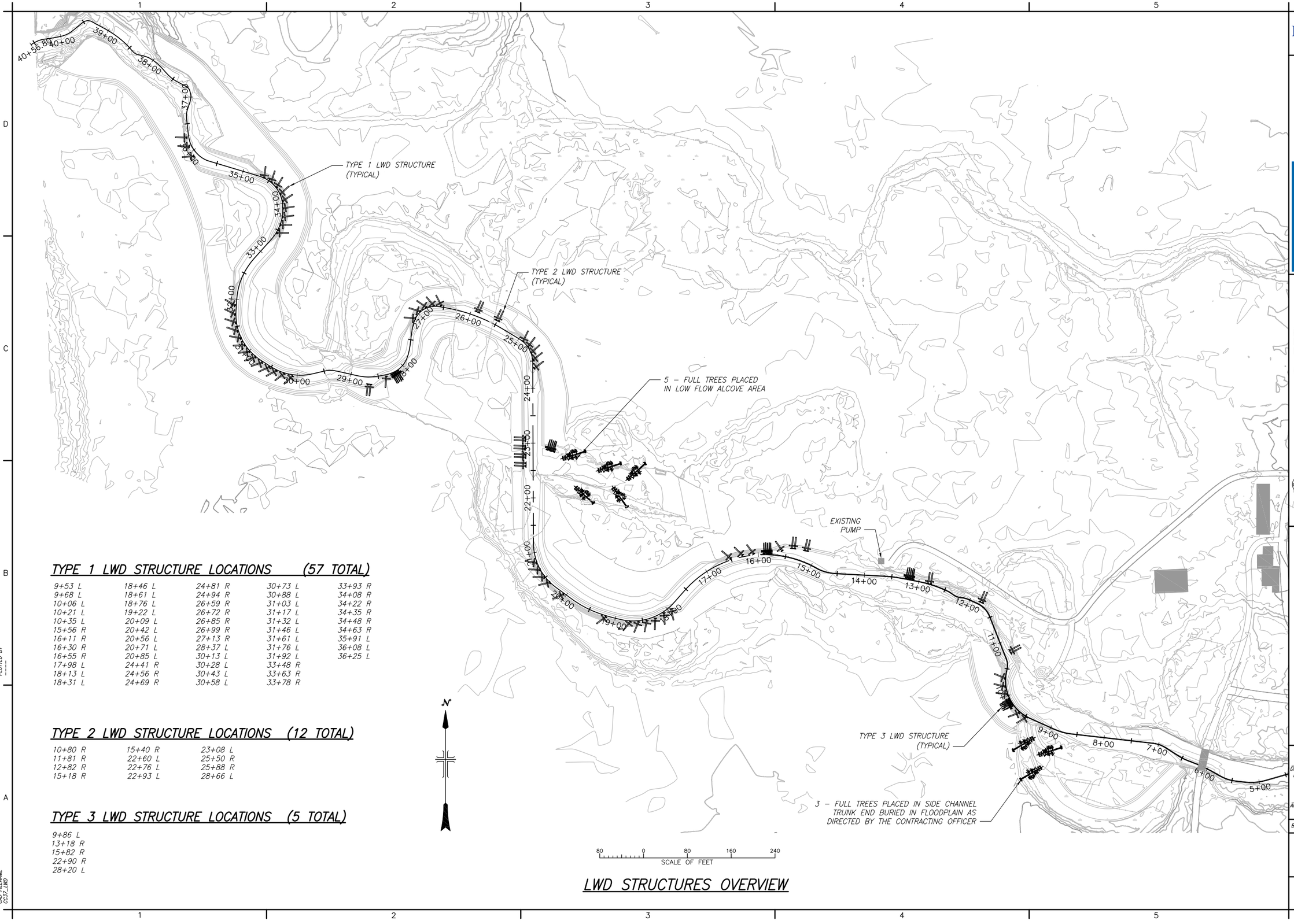

TYPE 1 LWD STRUCTURE LOCATIONS (57 TOTAL)

9+53 L	18+46 L	24+81 R	30+73 L	33+93 R
9+68 L	18+61 L	24+94 R	30+88 L	34+08 R
10+06 L	18+76 L	26+59 R	31+03 L	34+22 R
10+21 L	19+22 L	26+72 R	31+17 L	34+35 R
10+35 L	20+09 L	26+85 R	31+32 L	34+48 R
15+56 R	20+42 L	26+99 R	31+46 L	34+63 R
16+11 R	20+56 L	27+13 R	31+61 L	35+91 L
16+30 R	20+71 L	28+37 L	31+76 L	36+08 L
16+55 R	20+85 L	30+13 L	31+92 L	36+25 L
17+98 L	24+41 R	30+28 L	33+48 R	
18+13 L	24+56 R	30+43 L	33+63 R	
18+31 L	24+69 R	30+58 L	33+78 R	

TYPE 2 LWD STRUCTURE LOCATIONS (12 TOTAL)

10+80 R	15+40 R	23+08 L
11+81 R	22+60 L	25+50 R
12+82 R	22+76 L	25+88 R
15+18 R	22+93 L	28+66 L

TYPE 3 LWD STRUCTURE LOCATIONS (5 TOTAL)

9+86 L
13+18 R
15+82 R
22+90 R
28+20 L

LWD STRUCTURES OVERVIEW

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LWD STRUCTURE LOCATIONS

PRELIMINARY DESIGN DRAWINGS

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LWD STRUCTURE LOCATIONS

SHEET C–20

SHEET 25 OF 27

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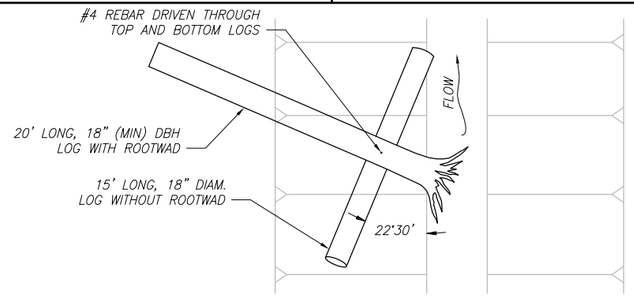
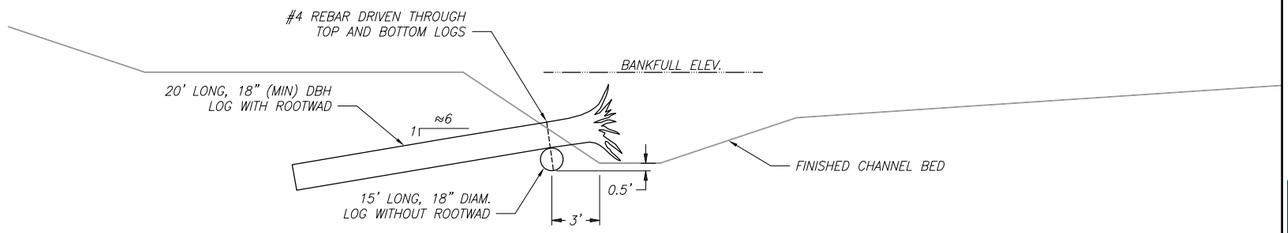
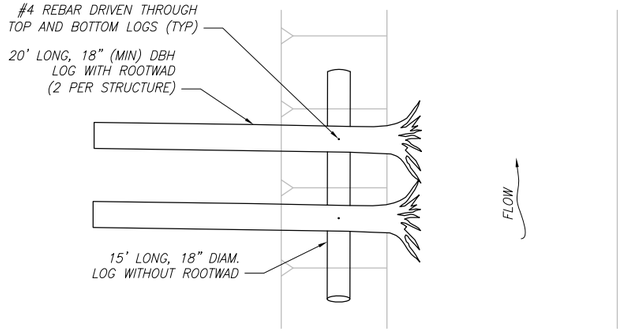


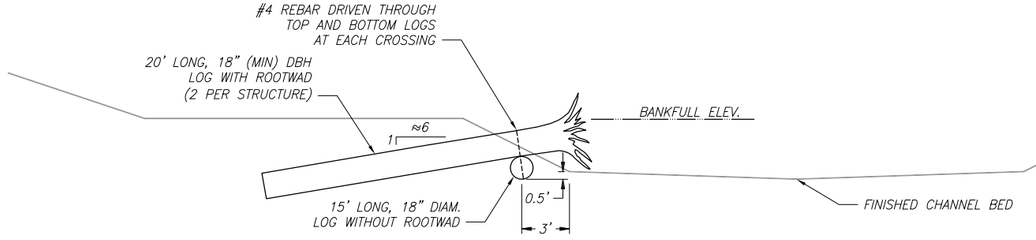
TYPE 1 LWD STRUCTURE – PLAN VIEW



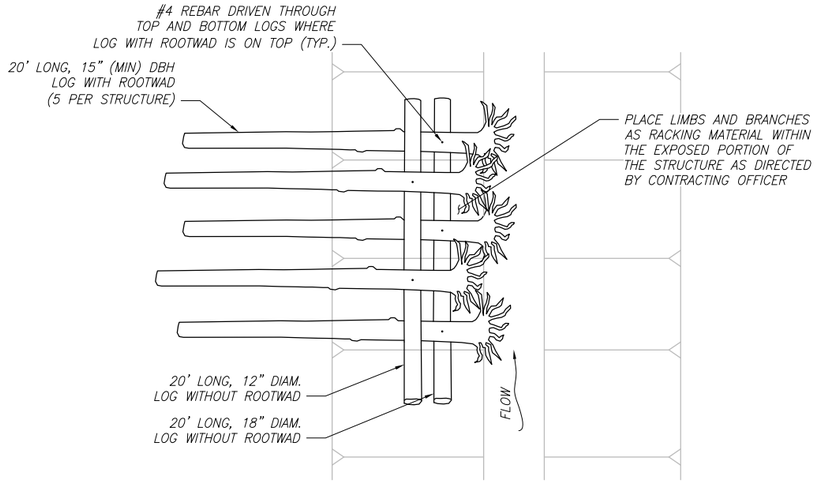
TYPE 1 LWD STRUCTURE – SECTION VIEW



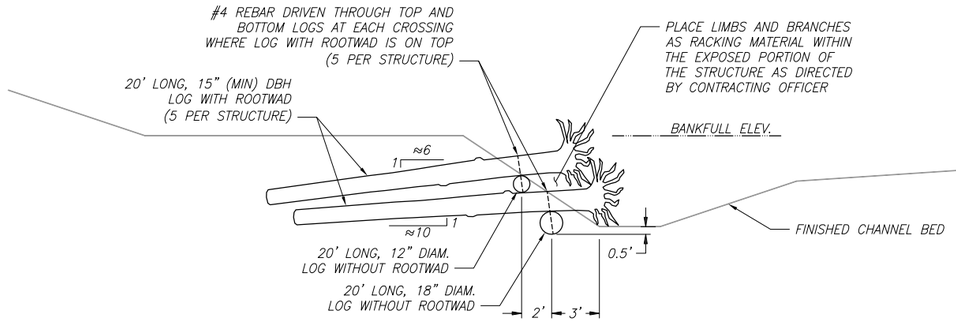
TYPE 2 LWD STRUCTURE – PLAN VIEW



TYPE 2 LWD STRUCTURE – SECTION VIEW



TYPE 3 LWD STRUCTURE – PLAN VIEW



TYPE 3 LWD STRUCTURE – SECTION VIEW

5 0 5 10 15
SCALE OF FEET

LWD STRUCTURE DETAILS

NOTES

1. ALL LOGS SHALL COME FROM DOUGLAS FIR, PONDEROSA PINE, OR WESTERN LARCH TREES.
2. LOGS WITH ROOTWADS SHALL HAVE A DIAMETER AS SHOWN ON THIS SHEET MEASURED AT DBH, DEFINED AS 4.5' ABOVE THE GROUND WHEN THE TREES WAS STANDING. LOGS WITHOUT ROODWADS SHALL HAVE A DIAMETER AS SHOWN ON THIS SHEET MEASURED AT THE SMALLER OF THE TWO CUT ENDS.
3. LOGS WITH ROOTWADS SHALL HAVE AN INTACT ROOTWAD WITH MULTIPLE ROOTS AND A DIAMETER BETWEEN 3' AND 5'. SOIL SHALL BE REMOVED FROM WITHIN THE ROOTWAD TO THE EXTENT PRACTICAL WITHOUT DAMAGING THE ROOTS.
4. AT EACH LOCATION WHERE A LOG WITH ROOTWAD CROSSES OVER A LOG WITHOUT ROOTWAD, THE LOGS SHALL BE CONNECTED USING A PIECE OF #4 REBAR. DRILL A ½" DIAMETER OR SMALLER PILOT HOLE COMPLETELY THROUGH BOTH LOGS. DRIVE THE #4 REBAR PIN COMPLETELY THROUGH BOTH LOGS, FINISHING WITH THE REBAR PIN FLUSH WITH THE TOP SURFACE OF THE TOP LOG. IT IS ALLOWABLE FOR THE REBAR PIN TO EXTEND INTO THE GROUND BELOW THE LOWER LOG.

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LWD STRUCTURE DETAILS

PRELIMINARY DESIGN DRAWINGS

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LWD STRUCTURE DETAILS

SHEET C-21

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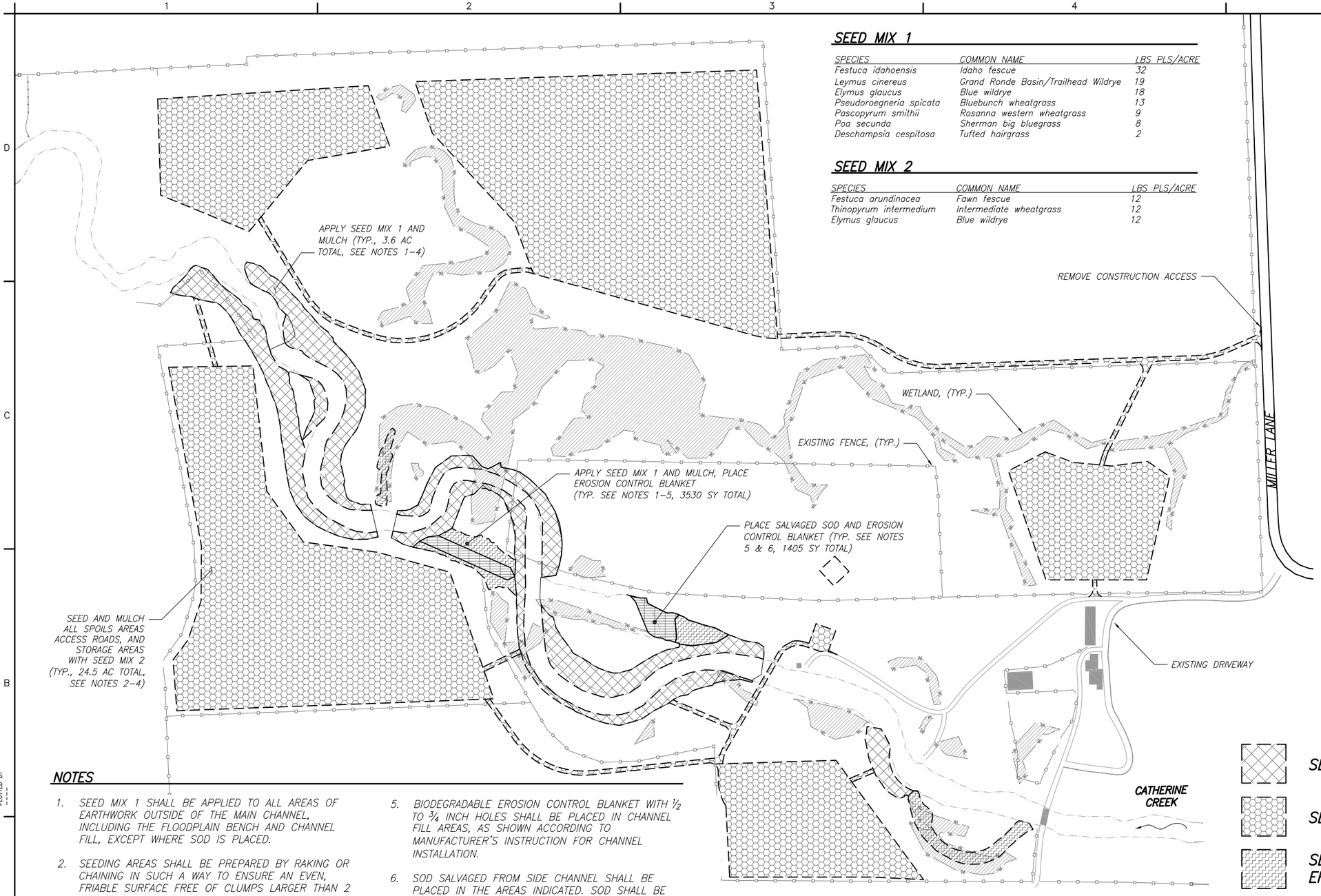
SEED MIX 1

SPECIES	COMMON NAME	LBS PLS/ACRE
Festuca idahoensis	Idaho fescue	32
Leymus cinereus	Grand Ronde Basin/Trailhead Wildrye	19
Elymus glaucus	Blue wildrye	18
Pseudoroegneria spicata	Bluebunch wheatgrass	13
Pascopyrum smithii	Rosanna western wheatgrass	9
Poa secunda	Sherman big bluegrass	8
Deschampsia cespitosa	Tufted hairgrass	2

SEED MIX 2

SPECIES	COMMON NAME	LBS PLS/ACRE
Festuca arundinacea	Fawn fescue	12
Thinopyrum intermedium	Intermediate wheatgrass	12
Elymus glaucus	Blue wildrye	12



SEED MIX 1 AND MULCH

SEED MIX 2 AND MULCH

SEED MIX 1, MULCH & EROSION CONTROL BLANKET

SALVAGED SOD PLACEMENT & EROSION CONTROL BLANKET

NOTES

1. SEED MIX 1 SHALL BE APPLIED TO ALL AREAS OF EARTHWORK OUTSIDE OF THE MAIN CHANNEL, INCLUDING THE FLOODPLAIN BENCH AND CHANNEL FILL, EXCEPT WHERE SOD IS PLACED.
2. SEEDING AREAS SHALL BE PREPARED BY RAKING OR CHAINING IN SUCH A WAY TO ENSURE AN EVEN, FRIABLE SURFACE FREE OF CLUMPS LARGER THAN 2 INCHES IN DIAMETER.
3. SEED SHALL BE APPLIED AT THE RATES SHOWN ON THIS SHEET. SEED SHALL BE GENTLY RAKED OR CHAINED FOLLOWING APPLICATION TO MIX SEED WITH THE TOP HALF INCH OF SOIL.
4. FOLLOWING APPLICATION AND RAKING, SEED SHALL BE MULCHED WITH STRAW AT A RATE OF 2 TONS PER ACRE.
5. BIODEGRADABLE EROSION CONTROL BLANKET WITH ½ TO ¾ INCH HOLES SHALL BE PLACED IN CHANNEL FILL AREAS, AS SHOWN ACCORDING TO MANUFACTURER'S INSTRUCTION FOR CHANNEL INSTALLATION.
6. SOD SALVAGED FROM SIDE CHANNEL SHALL BE PLACED IN THE AREAS INDICATED. SOD SHALL BE PLACED BELOW EROSION CONTROL BLANKET AND SHALL BE HELD IN PLACE BY EROSION CONTROL BLANKET ANCHORING.

125 0 125 250 375
SCALE OF FEET

SEEDING AND EROSION CONTROL PLAN

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SEEDING AND EROSION CONTROL PLAN
PRELIMINARY DESIGN DRAWINGS

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SEEDING AND EROSION CONTROL PLAN

SHEET L-1
SHEET 27 OF 27

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