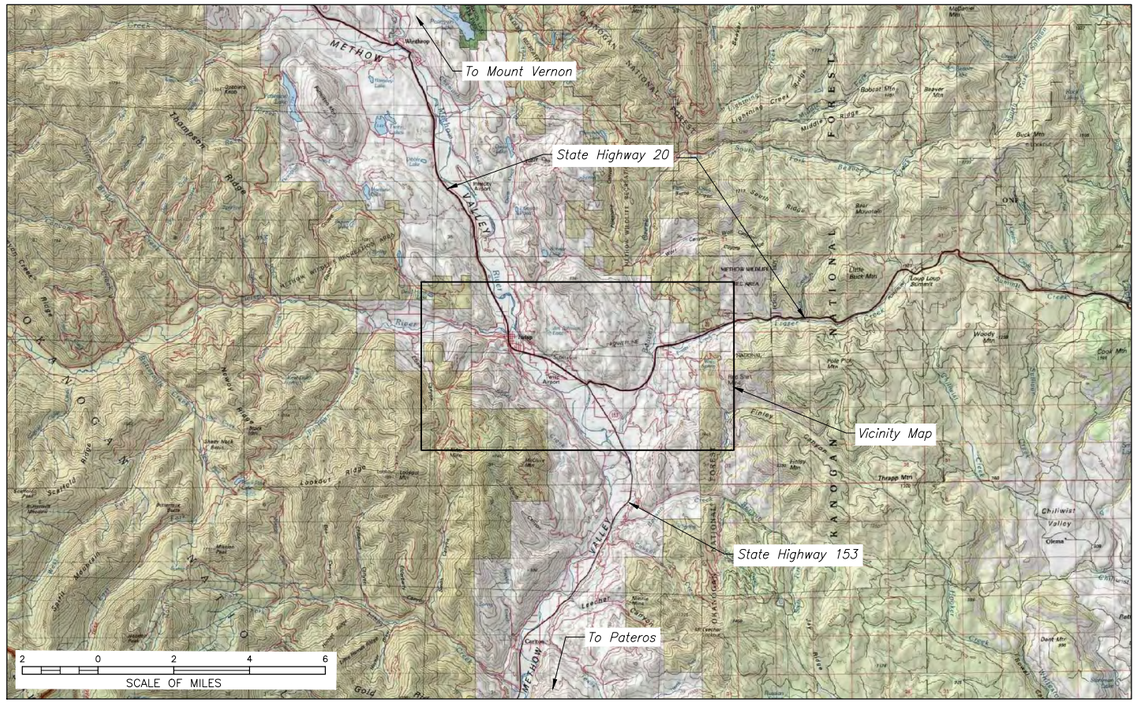
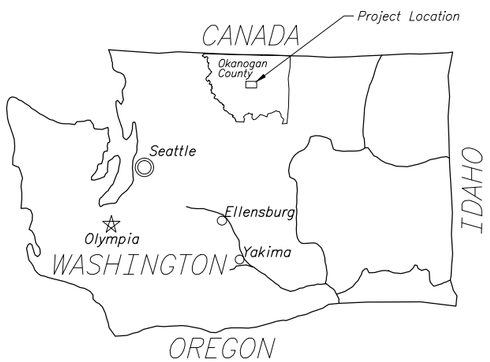
Columbia/Snake Salmon Recovery Program
FCRPS Habitat Improvement Project
Methow Subbasin

Methow Valley Irrigation District
Instream Flow Improvement Project
East Main Pipeline



LOCATION MAP



VICINITY MAP

SITE SUMMARY

Okanogan County
Twisp, Washington
N48°21'50", W120°7'11"

RECLAMATION
Managing Water in the West

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DEPARTMENT OF THE INTERIOR
U.S. BUREAU OF RECLAMATION

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

METHOW SUBBASIN
MVID - INSTREAM FLOW IMPROVEMENT PROJECT
LOCATION AND COVER SHEET

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DESIGNED	X
DRAWN	X
CHECKED	X
TECH. APPR.	X NAME, PROF. ABBR.
ADMIN. APPROVAL	X NAME TITLE
BOISE, ID	2013-09-04

LOCATION AND COVER SHEET

1678-100-

SHEET 1 OF 1

DATE AND TIME PLOTTED
MAY 30, 2014 17:16
PLOTTED BY
JHNELSEN

CAD SYSTEM
AutoCAD Rel. 19.0s
CAD FILENAME
LOCATION AND COVER SHEET.DWG

GENERAL NOTES

1. ALL COMPONENTS OF THE CONTRACT DOCUMENTS SHALL FULLY APPLY TO THE WORK WHETHER SPECIFICALLY REFERENCED IN THE DRAWINGS OR NOT. ANY ITEMS NOT SPECIFICALLY DISCUSSED IN NOTES ON SHEETS IN THE PLANS SHALL BE AS DESCRIBED IN THE SPECIFICATIONS.
2. STATIONING, DISTANCES, AND LENGTHS SHOWN ON THE DRAWINGS ARE BASED ON HORIZONTAL MEASUREMENTS ALONG THE PIPE INVERT CENTERLINE. CROSS SECTIONS, CROSSING DETAILS, AND REFERENCES TO LEFT (L) AND RIGHT (R) ON THE DRAWINGS ASSUME LOOKING IN THE DIRECTION OF INCREASING STATION ALONG PIPE INVERT CENTERLINE ALIGNMENT (FACING DOWNSTREAM).
3. ALL DIMENSIONS, INCLUDING, BUT NOT LIMITED TO, ELEVATIONS, STATIONS, AND DISTANCES ARE IN STANDARD ENGLISH UNITS.
4. ANY DISCREPANCIES FOUND BETWEEN THE DRAWINGS AND ACTUAL SITE CONDITIONS; OR ANY INCONSISTENCIES OR AMBIGUITIES BETWEEN THE DRAWINGS AND OTHER COMPONENTS OF THE CONTRACT DOCUMENTS SHALL BE IMMEDIATELY REPORTED IN WRITING TO THE ENGINEER. THE ENGINEER WILL PROMPTLY CORRECT INCONSISTENCIES OR AMBIGUITIES IN WRITING. WORK DONE BY THE CONTRACTOR INVOLVING SUCH DISCREPANCIES WITHOUT A WRITTEN REPORT AND RESPONSE FROM THE ENGINEER SHALL BE DONE AT THE CONTRACTOR'S SOLE RISK AND EXPENSE.
5. CONTRACTOR SHALL NOT DISTURB OR DESTROY ANY EXISTING SURVEY MONUMENTS OR BENCHMARKS. ANY BENCHMARKS DISTURBED OR DESTROYED BY THE CONTRACTOR SHALL BE REPLACED TO THE ENGINEER'S SATISFACTION AT THE CONTRACTOR'S SOLE EXPENSE.
6. CONTRACTOR IS ADVISED THAT NORTH ARROWS AND ORIENTATION OF PLAN VIEW SHEETS VARY TO ALLOW FOR LEFT-TO-RIGHT STATIONING AND STATIONING IN THE DIRECTION OF PIPE FLOW.
7. CONTRACTOR SHALL ENSURE THAT OPERATION OF EXISTING SEWER, DRAINAGE, DOMESTIC WATER, AND OTHER UTILITY SYSTEMS ARE CONTINUOUS DURING CONSTRUCTION.
8. IF APPLICABLE, CONSTRUCTION EASEMENTS SHALL NOT BE USED IN ANY MANNER THAT WILL CAUSE PERMANENT DAMAGE TO THE PROPERTY. DESCRIPTIONS OF THE EASEMENTS ACQUIRED FOR THE WORK WILL BE ON FILE AT THE OFFICE OF THE OWNER. CONTRACTOR SHALL COMPLY WITH ALL PROVISIONS OF THE EASEMENT AGREEMENTS.
9. CONTRACTOR SHALL KEEP ALL CONSTRUCTION ACTIVITIES WITHIN THE CONSTRUCTION LIMITS AND ANY TEMPORARY CONSTRUCTION OR PERMANENT EASEMENTS OBTAINED FOR THIS PROJECT, IF APPLICABLE. THIS INCLUDES, BUT IS NOT LIMITED TO, VEHICLES AND EQUIPMENT, LIMITS OF EXCAVATION, STOCKPILED EXCAVATED AND IMPORTED MATERIAL, BACKFILL MATERIAL, PIPE MATERIAL, AND PIPE APPURTENANCE MATERIAL. IF THE CONTRACTOR REQUIRES ADDITIONAL CONSTRUCTION EASEMENTS, IT IS THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN SUCH EASEMENTS FROM INDIVIDUAL PROPERTY OWNERS AND BEAR ALL ASSOCIATED COSTS.
10. UNLESS OTHERWISE INDICATED ON THE DRAWINGS OR SPECIFICATIONS, ALL EXISTING ITEMS INCLUDING, BUT NOT LIMITED TO, STRUCTURES, IMPROVEMENTS, GROUNDWATER WELLS, SIGNS, FENCES, GATES, CURBS, PAVEMENT, BRIDGES, UTILITIES, ON FARM IRRIGATION PIPELINES AND DITCHES, ETC. SHALL BE PROTECTED BY THE CONTRACTOR. IF SUCH ITEMS ARE DAMAGED OR MUST BE REMOVED OR MODIFIED TO FACILITATE CONSTRUCTION, CONTRACTOR SHALL FIRST NOTIFY THE OWNER AND THEN REPLACE THE ITEMS TO A LIKE OR BETTER CONDITION AT CONTRACTOR'S EXPENSE TO SATISFACTION OF OWNER OF FACILITIES.
11. REQUIREMENTS RELATED TO THE PROTECTION AND/OR REMOVAL OF TREES, VEGETATION, AND STRUCTURES WITHIN THE WORK AREA ARE DETAILED IN THE SPECIFICATIONS.
12. CONTRACTOR IS SOLELY RESPONSIBLE FOR DETERMINING THE TRENCH LIMITS NEEDED TO COMPLETE THE WORK IN CONFORMANCE WITH LOCAL, STATE AND FEDERAL CODES GOVERNING SHORING, SHEETING, BRACING OF EXCAVATIONS AND TRENCHES, AND FOR PROTECTION AND SAFETY OF THE WORKERS AND OTHER CONSTRUCTION RELATED PERSONNEL.
13. EXCAVATION SHALL MEET THE REQUIREMENTS OF OSHA 29 CFR PART 1926, SUBPART P, EXCAVATIONS. ACTUAL SLOPES SHALL NOT EXCEED THE MAXIMUM ALLOWABLE SLOPES (SUBPART P. APPENDIX B).
14. HORIZONTAL DATUM IS NAD83/91. HORIZONTAL COORDINATES SHOWN HEREIN ARE WASHINGTON STATE PLANE COORDINATE SYSTEM, NORTH ZONE, US SURVEY FEET.
15. VERTICAL DATUM IS NAVD 88, FEET.
16. ELEVATIONS GIVEN ARE TO FINISH GRADE UNLESS OTHERWISE INDICATED.
17. SLOPE UNIFORMLY BETWEEN CONTOURS AND SPOT ELEVATIONS SHOWN.
18. THE CONTRACTOR IS RESPONSIBLE FOR PRODUCING, IMPLEMENTING, ADHERING TO, AND MAINTAINING A STORMWATER POLLUTION PREVENTION PLAN IN ACCORDANCE WITH THE REGULATIONS AND GUIDELINES SET FORTH AND SUBJECT TO APPROVAL BY THE STATE OF WASHINGTON, DEPARTMENT OF ECOLOGY, WATER QUALITY PROGRAM. CONTRACTOR SHALL IMPLEMENT AND DOCUMENT ANY ADDITIONAL MEASURES NECESSARY TO PREVENT ANY EROSION OR HAZARDOUS MATERIALS FROM LEAVING THE SITE, DISCHARGING, BEING ENTRAINED, ABSORBED OR OTHERWISE ENTERING SURFACE WATERS, GROUND WATER OR SOILS.
19. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL TEMPORARY AND PERMANENT EROSION CONTROL MEASURES AT ALL TIMES. MAINTENANCE OF TEMPORARY AND PERMANENT EROSION CONTROL MEASURES SHALL BE CONSIDERED INCIDENTAL.
20. THE CONTRACTOR SHALL BE HELD SOLELY RESPONSIBLE FOR ANY NPDES OR OTHER APPLICABLE ENVIRONMENTAL PERMIT VIOLATIONS AND FINES.
21. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION STAKING AND LAYOUT, UNLESS OTHERWISE SPECIFIED IN THE PLANS. CONTRACTOR SHALL ALSO USE ESTABLISHED CONTROL POINTS TO SET LINES AND GRADES FOR THE CONSTRUCTION OF THE PROJECT. SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS. ELECTRONIC BASE MAP DATA SHALL BE PROVIDED TO CONTRACTOR BY THE ENGINEER FOR USE IN ESTABLISHING CONTROL FOR CONSTRUCTION SURVEY.
22. THE CONTRACTOR SHALL MAINTAIN HAND DRAWN REDLINES, FIELD NOTES, AND PHOTOGRAPHS OF ALL IMPROVEMENTS AS THE WORK PROGRESSES. THE CONTRACTOR'S DOCUMENTATION SHALL BE MAINTAINED ON SITE AND SHALL BE AVAILABLE FOR REVIEW BY THE CONTRACTING OFFICER AT ALL TIMES. THE CONTRACTOR SHALL PROVIDE ALL DOCUMENTATION TO THE CONTRACTING OFFICER FOR THE PREPARATION OF CERTIFIED RECORD DRAWINGS PRIOR TO PROJECT ACCEPTANCE.
23. THIS DESIGN DOES NOT VALIDATE THE CONDITION OF ANY EXISTING OR USED PART OF THE PIPELINE/IRRIGATION SYSTEM INCLUDING ON FARM INFRASTRUCTURE OR LATERALS. FAILURE OF ANY EXISTING PART OF THE EXISTING IRRIGATION SYSTEM WILL BE REPAIRED AT THE INDIVIDUAL LANDOWNER OR MVID EXPENSE.
24. THIS DESIGN IN NO WAY GUARANTEES A MINIMUM SUPPLY OF WATER TO THE PROPOSED PIPELINE. OPERATION OF THE DIVERSION STRUCTURE AND ON FARM IRRIGATION SYSTEMS WILL BE ADJUSTED ACCORDINGLY TO MATCH AVAILABLE WATER SUPPLY.

UTILITY NOTES

1. THE LOCATION OF EXISTING UTILITIES SHOWN ON THE DRAWINGS ARE APPROXIMATE AND HAVE NOT BEEN FIELD VERIFIED. UTILITY LOCATION AND PROTECTION IS THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE EXACT TYPE, OWNER, LOCATION, AND ELEVATION OF ALL BURIED AND OVERHEAD UTILITIES. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PERFORM THE WORK IN A SAFE MANNER AND IN ACCORDANCE WITH ANY REQUIREMENTS SET FORTH BY THE UTILITY OWNER AND APPLICABLE LAWS AND REGULATIONS.
2. CONTRACTOR SHALL NOTIFY UTILITY OWNERS WITHIN THE LIMITS OF CONSTRUCTION A MINIMUM OF TWO WEEKS PRIOR TO EXCAVATION, OR OTHER CONSTRUCTION ACTIVITY THAT MAY IMPACT THE UTILITY. CONTRACTOR SHALL ALSO CONTACT THE CONTRACTING OFFICER PRIOR TO ANY CONSTRUCTION ACTIVITY IN THE AREA. CONTRACTOR SHALL PROVIDE ACCESS TO UTILITY OWNERS FOR MAINTENANCE AND WORK ON THEIR UTILITIES DURING THE COURSE OF THE WORK.
3. RELOCATIONS AND/OR REPLACEMENTS OF EXISTING UTILITIES SHALL BE COORDINATED BY THE CONTRACTOR WITH THE UTILITY OWNER. CONTRACTOR SHALL CONTACT, SCHEDULE, AND ESTABLISH UTILITY SHUT DOWN TIMES AND DETERMINE THE RELOCATION AND/OR REPLACEMENT REQUIREMENTS OF EXISTING UTILITIES PRIOR TO THE START OF ANY WORK. THE UTILITY SHALL BE RELOCATED OR REPLACED TO THE SATISFACTION OF THE UTILITY OWNER.
4. ALL ABANDONED UTILITIES WHICH INTERFERE WITH THE EXECUTION OF THE WORK SHALL BE VERIFIED BY THE CONTRACTING OFFICER AND THE UTILITY OWNER PRIOR TO DISTURBANCE OR MODIFICATION. ONLY AFTER WRITTEN APPROVAL HAS BEEN RECEIVED FROM THE UTILITY OWNER BY THE CONTRACTING OFFICER, MAY THE CONTRACTOR TAKE ACTION.
5. THE SIZE, LOCATION AND TYPE OF UNDERGROUND UTILITIES EXPOSED OR MODIFIED BY THE CONTRACTOR SHALL BE ACCURATLEY NOTED AND PLACED ON THE CONTRACTOR'S AS-BUILT DRAWINGS.

ABBREVIATIONS

AASHTO	AMERICAN ASSOCIATION OF STATE HIGHWAY SAFETY OFFICIALS
APPROX	APPROXIMATE
ASTM	AMERICAN SOCIETY OF TESTING & MATERIALS
BM	BENCHMARK
℄	CENTERLINE
CDF	CONTROLLED DENSITY FILL
CMP	CORRUGATED METAL PIPE
CONC	CONCRETE
CONT	CONTINUOUS
CP	CONTROL POINT
CSBC	CRUSHED SURFACING BASE COURSE
CSTC	CRUSHED SURFACING TOP COURSE
CY	CUBIC YARD
E	EAST
EA	EACH
EF	EACH FACE
EL	ELEVATION
EXST	EXISTING
G	GRADE
GPM	GALLONS PER MINUTE
H	HORIZONTAL
L	LENGTH
LF	LINEAR FOOT
LS	LUMP SUM
MAX	MAXIMUM
MVID	METHOW VALLEY IRRIGATION DISTRICT
MIN	MINIMUM
N	NORTH
NO.	NUMBER
NTS	NOT TO SCALE
OC	ON CENTER
OG	ORDINARY GROUND
OHW	ORDINARY HIGH WATER
PIP	Plastic Irrigation Pipe
PSI	POUNDS PER SQUARE INCH
PT	POINT
Q	FLOW
ROW	RIGHT-OF-WAY
S	SOUTH
SF	SQUARE FOOT
SPEC	SPECIFICATION
SST	STAINLESS STEEL
STA	STATION
SY	SQUARE YARD
T & B	TOP & BOTTOM
TU	TU
TYP	TYPICAL
W	WEST
WSDOT	WASHINGTON STATE DEPARTMENT OF TRANSPORTATION
WSE	WATER SURFACE ELEVATION

PROJECT DESCRIPTION

The scope of the project entails installing approximately 23,600 LF of pipeline in the existing MVID East Canal, modifying an existing spill to become a screen/pipe intake structure, connecting to existing laterals, and to allow for connecting to individual on-farm irrigation turnouts.

PIPELINE HYDRAULICS INFORMATION

The pipeline is sized to deliver approximately 9 gpm/acre resulting in a maximum flow rate of 13 cfs at the beginning of the pipeline. The pipeline tapers down in size as individual turnouts and laterals are served.

WaterCad was run for static conditions. The maximum static pressure is approximately 30 psi at the end of the pipeline.

All pipe velocities are designed at or below 5 ft/s.

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1	1678-100-XXXX	Location and Cover Sheet
2	1678-100-XXXX	General Notes and Sheet Index
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19	1678-100-XXXX	Plan and Profile 15
20	1678-100-XXXX	Intake Structure Layout
21	1678-100-XXXX	Intake Structure Details
22	1678-100-XXXX	End of Pipeline – Plan and Profile
23	1678-100-XXXX	End of Pipeline – Sections
24	1678-100-XXXX	Pipe Specifications and Trench Details
25	1678-100-XXXX	Pipe Crossing Details
26	1678-100-XXXX	Turnout and Lateral Connection Details
27	1678-100-XXXX	Air Valve and Thrust Block Details

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FCRPS HABITAT IMPROVEMENT PROJECT

METHOW SUBBASIN

MVID – INSTREAM FLOW IMPROVEMENT PROJECT
GENERAL NOTES AND SHEET INDEX

X DESIGNED
X DRAWN
X CHECKED
X TECH. APPR. NAME, PROF. ABBR.
X ADMIN. APPROVAL NAME TITLE

BOISE, ID 2013-09-30

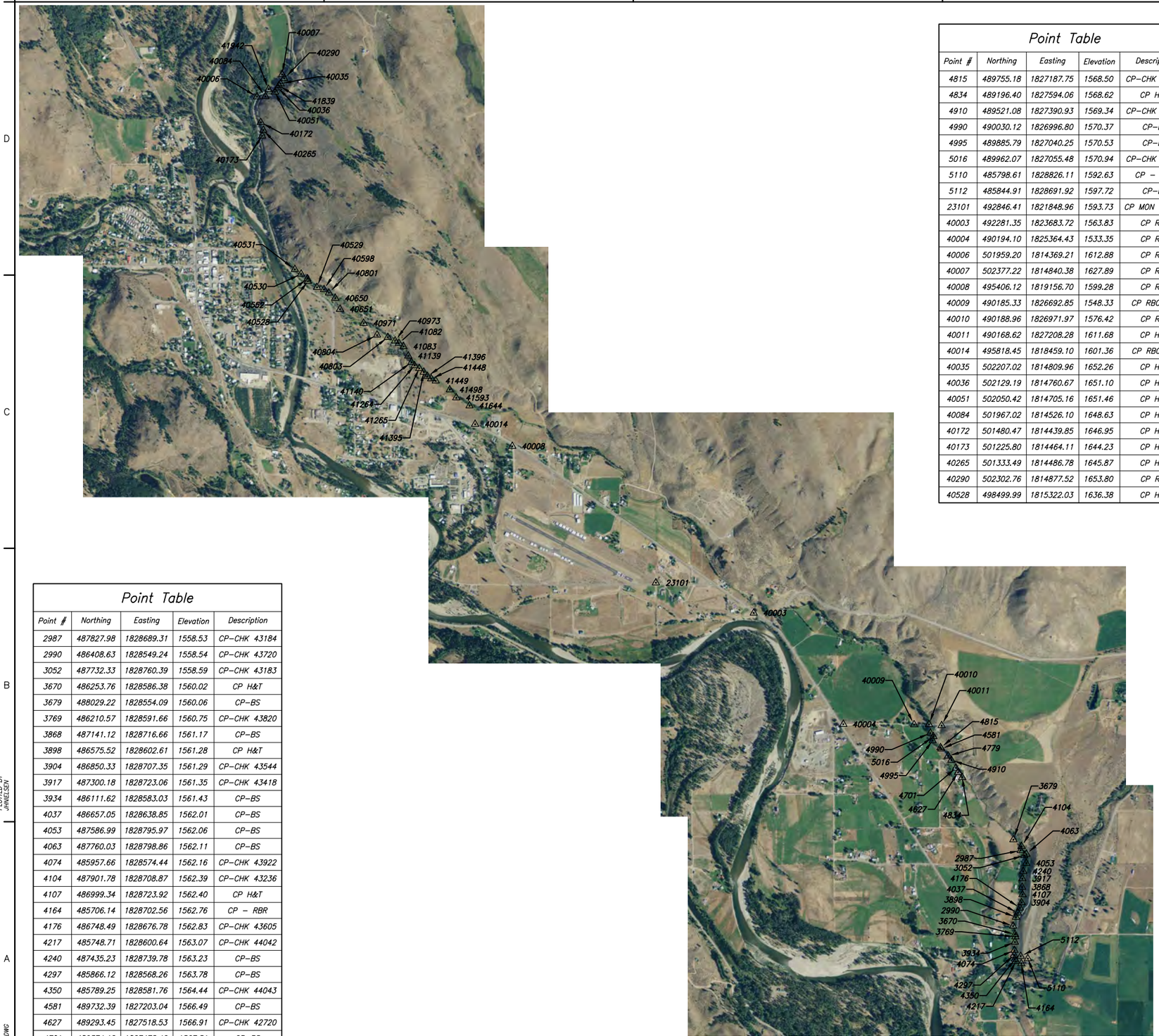
GENERAL NOTES AND SHEET INDEX

1678-100-XXXX

SHEET 1 OF 1

DATE AND TIME PLOTTED MAY 30, 2014 13:38 PLOTTED BY JAHNELSEN

CAD SYSTEM AutoCAD Rel. 19.0s CAD FILENAME GENERAL NOTES.DWG



Point Table

Point #	Northing	Easting	Elevation	Description
4815	489755.18	1827187.75	1568.50	CP–CHK 42467
4834	489196.40	1827594.06	1568.62	CP H&T
4910	489521.08	1827390.93	1569.34	CP–CHK 42488
4990	490030.12	1826996.80	1570.37	CP–BS
4995	489885.79	1827040.25	1570.53	CP–BS
5016	489962.07	1827055.48	1570.94	CP–CHK 42355
5110	485798.61	1828826.11	1592.63	CP – RBR
5112	485844.91	1828691.92	1597.72	CP–BS
23101	492846.41	1821848.96	1593.73	CP MON 100001
40003	492281.35	1823683.72	1563.83	CP RBC
40004	490194.10	1825364.43	1533.35	CP RBC
40006	501959.20	1814369.21	1612.88	CP RBC
40007	502377.22	1814840.38	1627.89	CP RBC
40008	495406.12	1819156.70	1599.28	CP RBC
40009	490185.33	1826692.85	1548.33	CP RBC 309
40010	490188.96	1826971.97	1576.42	CP RBC
40011	490168.62	1827208.28	1611.68	CP H&T
40014	495818.45	1818459.10	1601.36	CP RBC 301
40035	502207.02	1814809.96	1652.26	CP H&T
40036	502129.19	1814760.67	1651.10	CP H&T
40051	502050.42	1814705.16	1651.46	CP H&T
40084	501967.02	1814526.10	1648.63	CP H&T
40172	501480.47	1814439.85	1646.95	CP H&T
40173	501225.80	1814464.11	1644.23	CP H&T
40265	501333.49	1814486.78	1645.87	CP H&T
40290	502302.76	1814877.52	1653.80	CP RBC
40528	498499.99	1815322.03	1636.38	CP H&T

Point Table

Point #	Northing	Easting	Elevation	Description
40529	498385.73	1815493.57	1635.68	CP H&T
40530	498636.46	1815194.82	1636.91	CP H&T
40531	498721.85	1815077.37	1638.17	CP H&T
40552	498547.32	1815314.04	1639.30	CP scribed X
40598	498346.95	1815624.57	1635.56	CP H&T
40650	498181.94	1815836.14	1636.65	CP H&T
40651	497975.04	1815925.90	1634.92	CP H&T
40801	498282.15	1815716.53	1636.54	CP H&T
40803	497450.74	1816822.15	1634.56	CP H&T
40804	497491.39	1816619.92	1626.27	CP H&T
40971	497713.29	1816369.45	1637.97	CP H&T
40973	497383.30	1816957.73	1627.37	CP H&T
41082	497336.06	1817029.06	1622.68	CP H&T
41083	497276.50	1817117.08	1621.83	CP H&T
41139	497100.20	1817204.56	1621.63	CP H&T
41140	496980.23	1817265.18	1619.96	CP H&T
41264	496918.70	1817323.16	1619.36	CP H&T
41265	496866.37	1817410.76	1617.95	CP H&T
41395	496796.09	1817495.97	1617.34	CP H&T
41396	496718.12	1817564.16	1616.67	CP H&T
41448	496672.18	1817635.30	1615.24	CP H&T
41449	496632.26	1817721.04	1614.23	CP H&T
41498	496467.25	1817983.21	1613.76	CP H&T
41593	496315.47	1818105.33	1613.99	CP H&T
41644	496165.03	1818354.00	1613.59	CP H&T
41839	502167.74	1814777.76	1647.52	CP H&T
41942	502100.57	1814585.50	1614.70	CP H&T

Point Table

Point #	Northing	Easting	Elevation	Description
2987	487827.98	1828689.31	1558.53	CP–CHK 43184
2990	486408.63	1828549.24	1558.54	CP–CHK 43720
3052	487732.33	1828760.39	1558.59	CP–CHK 43183
3670	486253.76	1828586.38	1560.02	CP H&T
3679	488029.22	1828554.09	1560.06	CP–BS
3769	486210.57	1828591.66	1560.75	CP–CHK 43820
3868	487141.12	1828716.66	1561.17	CP–BS
3898	486575.52	1828602.61	1561.28	CP H&T
3904	486850.33	1828707.35	1561.29	CP–CHK 43544
3917	487300.18	1828723.06	1561.35	CP–CHK 43418
3934	486111.62	1828583.03	1561.43	CP–BS
4037	486657.05	1828638.85	1562.01	CP–BS
4053	487586.99	1828795.97	1562.06	CP–BS
4063	487760.03	1828798.86	1562.11	CP–BS
4074	485957.66	1828574.44	1562.16	CP–CHK 43922
4104	487901.78	1828708.87	1562.39	CP–CHK 43236
4107	486999.34	1828723.92	1562.40	CP H&T
4164	485706.14	1828702.56	1562.76	CP – RBR
4176	486748.49	1828676.78	1562.83	CP–CHK 43605
4217	485748.71	1828600.64	1563.07	CP–CHK 44042
4240	487435.23	1828739.78	1563.23	CP–BS
4297	485866.12	1828568.26	1563.78	CP–BS
4350	485789.25	1828581.76	1564.44	CP–CHK 44043
4581	489732.39	1827203.04	1566.49	CP–BS
4627	489293.45	1827518.53	1566.91	CP–CHK 42720
4701	489374.12	1827475.42	1567.51	CP–BS
4779	489598.47	1827329.94	1568.20	CP H&T

CONTROL POINTS

1000 0 1000 2000 3000
SCALE OF FEET

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COLUMBIA/SNAKE RIVER SALMON RECOVERY PROGRAM
FCRPS HABITAT IMPROVEMENT PROJECT

METHOW SUBBASIN

MVID - INSTREAM FLOW IMPROVEMENT PROJECT

EAST MAIN PIPELINE

REV NO

X (Preparer signs here)
DESIGNED
X (Author signs here)
DRAWN
X (Reviewer signs here)
CHECKED
X (Tech Appr signs here)
TECH. APPR. NAME, PROF. ABBR.
X (Approver signs here)
ADMIN. APPROVAL
NAME
TITLE

BOISE, ID 2014-05-30

CONTROL POINTS

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SHEET 1 OF 1

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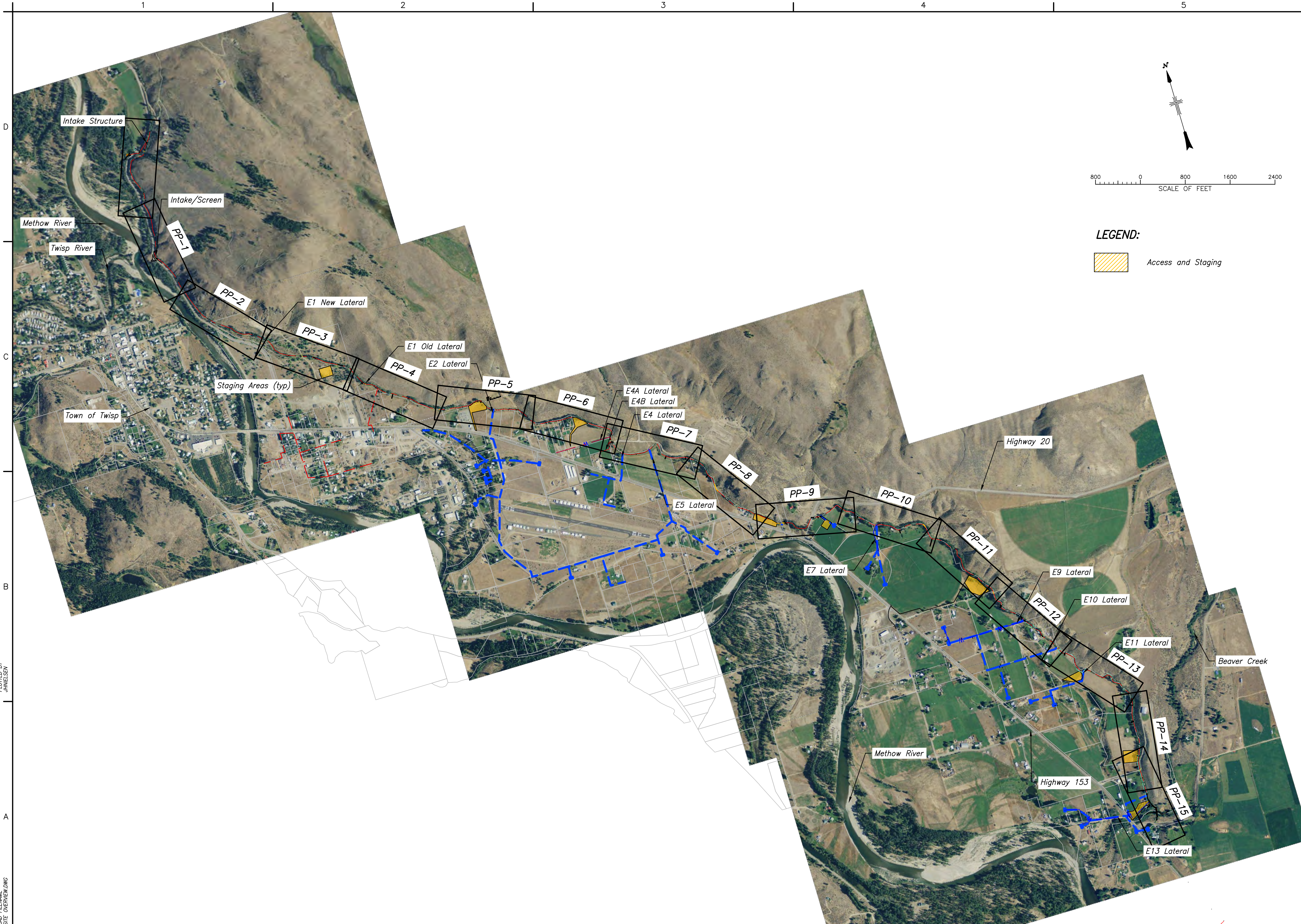

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FCRPS HABITAT IMPROVEMENT PROJECT

METHOW SUBBASIN

MVID – INSTREAM FLOW IMPROVEMENT PROJECT
OVER VIEW MAP

REV NO

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DESIGNED
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DRAWN
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TECH. APPR. NAME, PROF. ABBR.
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ADMIN. APPROVAL
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BOISE, ID 2013-10-24

OVER VIEW MAP

1678-100-XXXX

SHEET 1 OF 1

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JHNIELSEN

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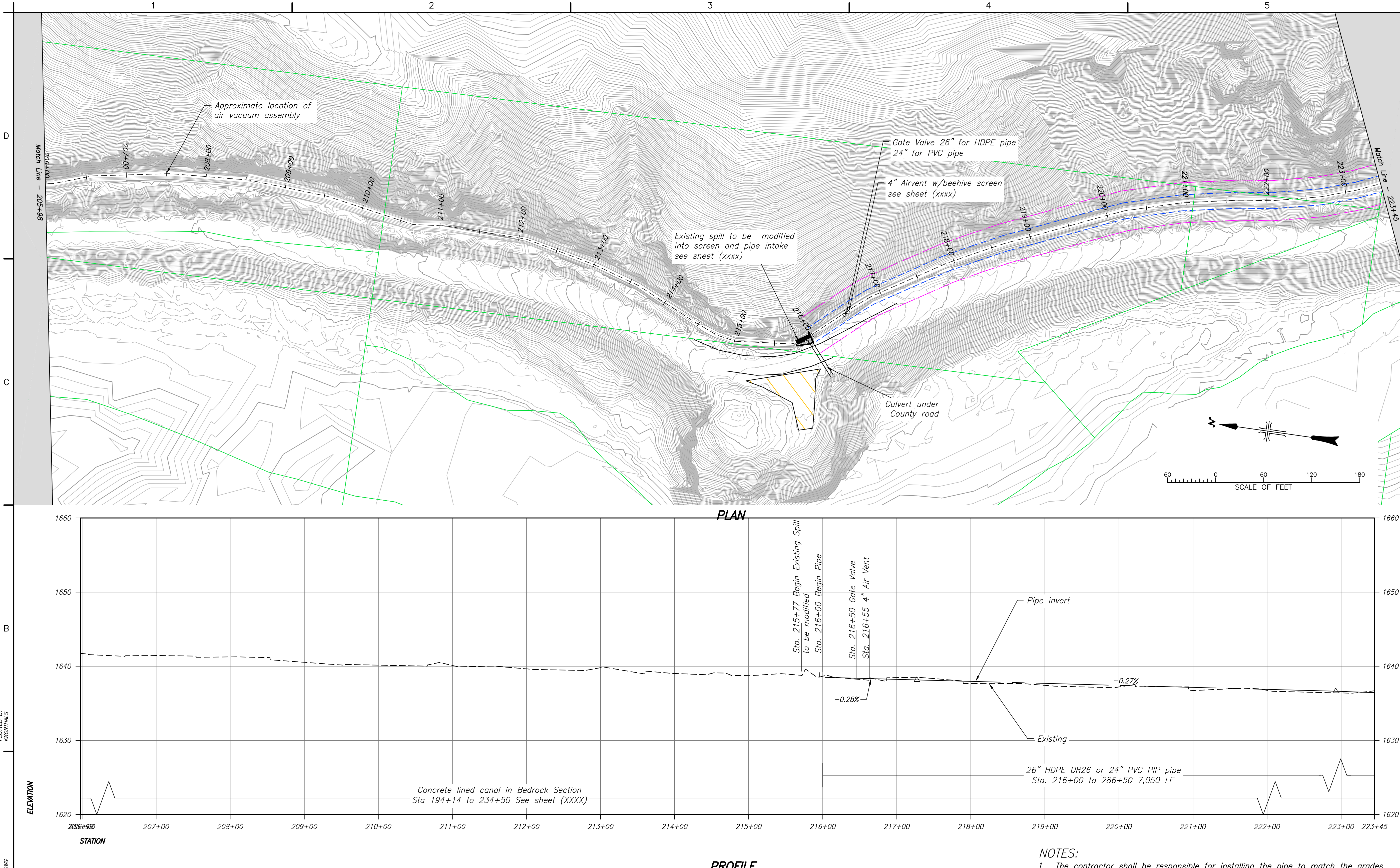

NOTES:

1. The contractor shall be responsible for installing the pipe to match the grades shown. The horizontal alignment shown is intended for PVC pipe and uses standard fittings when possible. The contractor is allowed to vary from this horizontal alignment as long as the vertical profile is maintained and the adjusted alignment stays within the pipeline corridor under the direction of the contracting officer.
2. The contractor shall furnish additional fittings or bend the pipe per the manufacturer's recommendations to match the alignments and grades shown.
3. The contractor's attention is called to the steep hill slopes surrounding the existing canal. In many locations the centerline of the canal will be the optimum location for the pipe horizontal alignment. Native backfill may not exist in locations of the canal and fill will need to be imported.

LEGEND

- Pipeline Corridor
- Clearing Limits
- Property Boundaries
- Staging Area

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METHOW SUBBASIN
M/D – INSTREAM FLOW IMPROVEMENT PROJECT
EAST CANAL

DESIGNED
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ADMIN. APPROVAL NAME TITLE

BOISE, ID 2013-09-30

MAIN PLAN AND PROFILE
STA. 205+98 TO 223+45

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SHEET 1 OF 1

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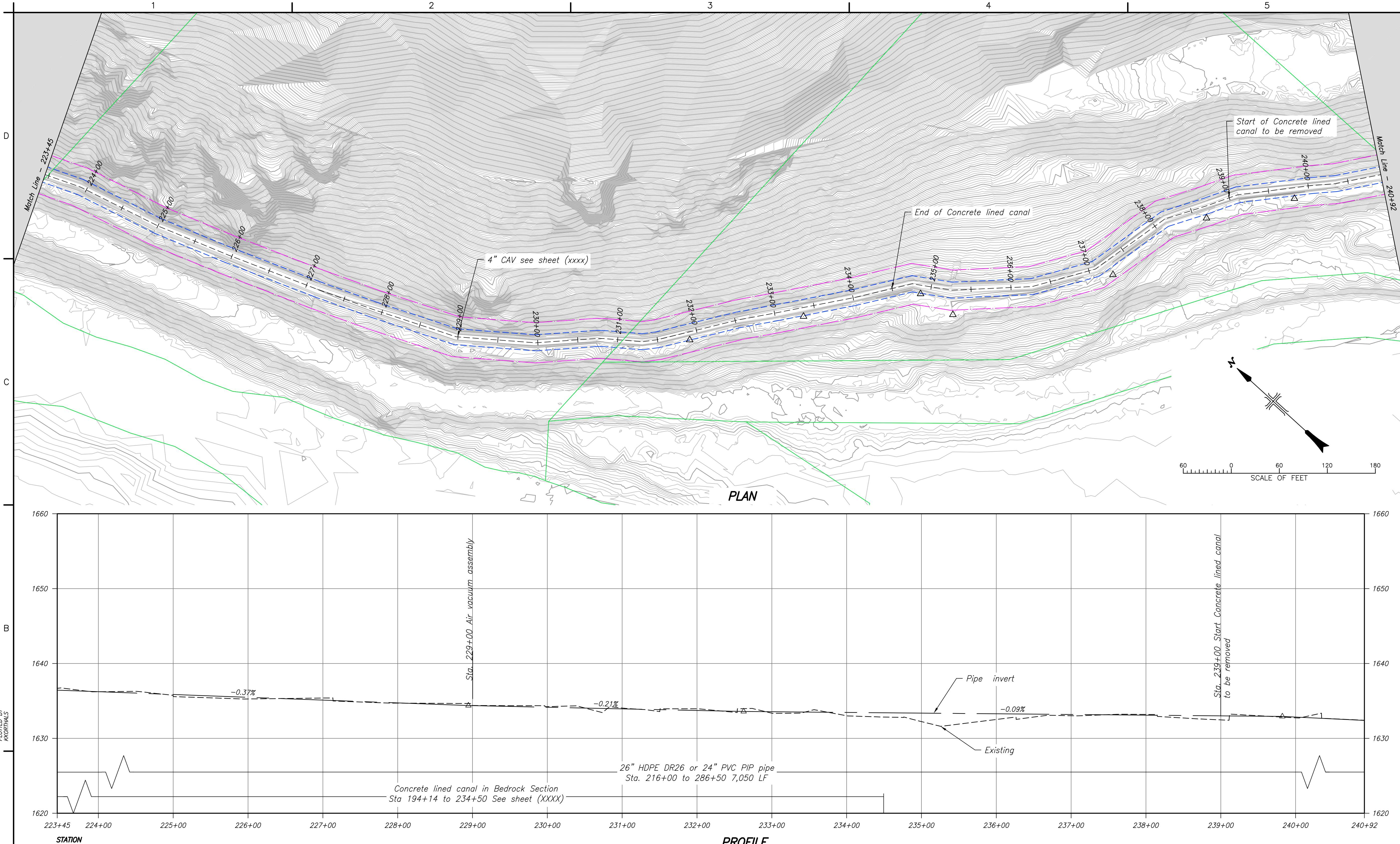
CAD FILENAME PLANPROFILE AND PIPE NETWORK_PVC30PTS.DWG



NOTES:

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LEGEND

- Pipeline Corridor
- Clearing Limits
- Property Boundaries
- Staging Area

DATE AND TIME PLOTTED
MAY 30, 2014 16:18
PLOTTED BY
KKORTHALS

CAD SYSTEM
AutoCAD Rel. 19.1s
CAD FILENAME
PLANPROFILE AND PIPE NETWORK_PVC90PSI.DWG

RECLAMATION
Managing Water in the West

ALWAYS THINK SAFETY

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

METHOW SUBBASIN
MVID – INSTREAM FLOW IMPROVEMENT PROJECT
EAST CANAL

REV NO

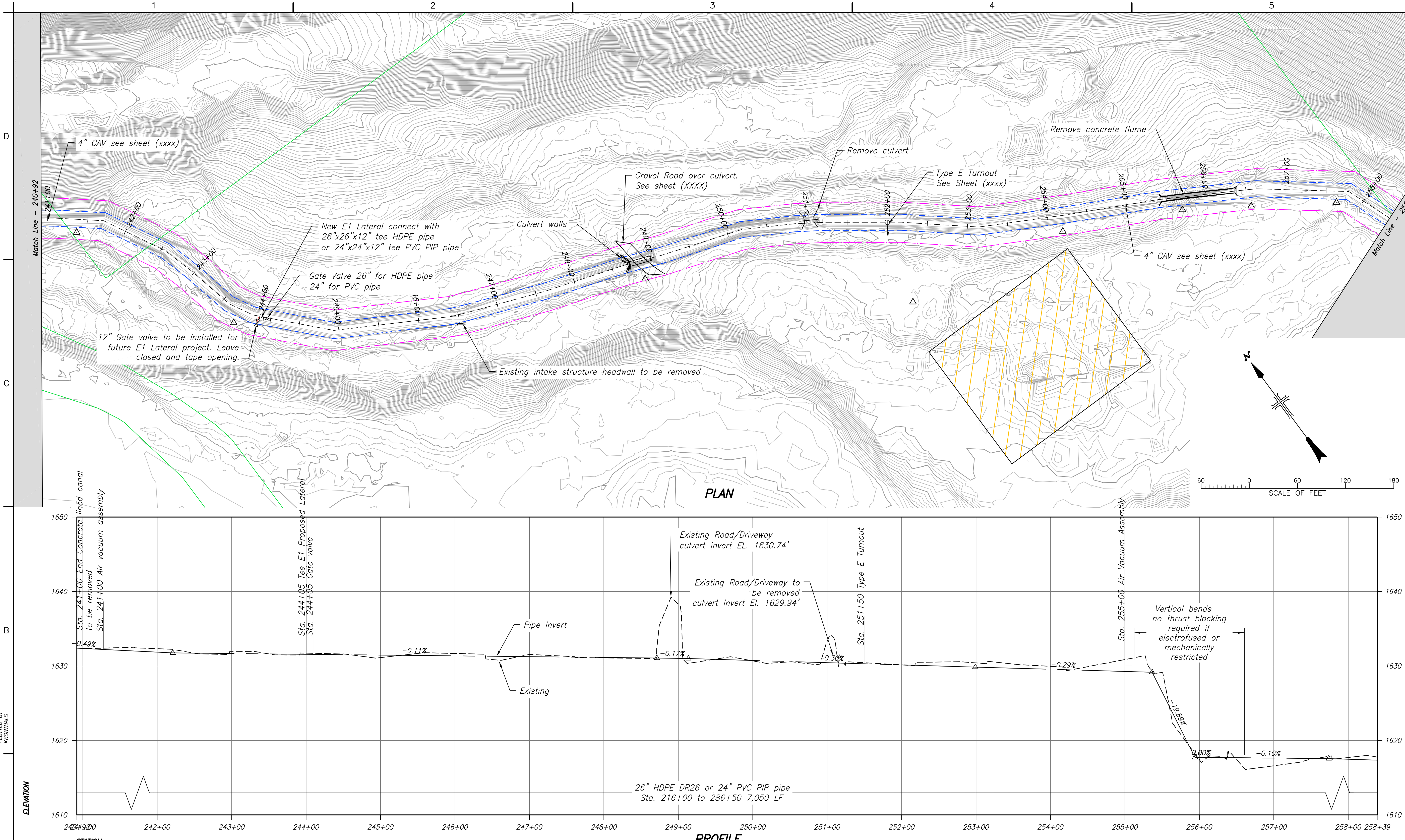
X DESIGNED
X DRAWN
X CHECKED
X TECH. APPR. NAME, PROF. ABBR.
X ADMIN. APPROVAL
NAME
TITLE

BOISE, ID 2013-09-30

MAIN PLAN AND PROFILE
STA. 223+45 TO 240+92

1678–100–XXXX

SHEET 1 OF 1



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LEGEND

- Pipeline Corridor
- Clearing Limits
- Property Boundaries
- Staging Area

DATE AND TIME PLOTTED MAY 30, 2014 16:20
PLOTTED BY KKORTHALS

CAD SYSTEM AutoCAD Rel. 19.1s
CAD FILENAME PLAN/PROFILE AND PIPE NETWORK_PVC30P1.DWG

RECLAMATION
Managing Water in the West

ALWAYS THINK SAFETY

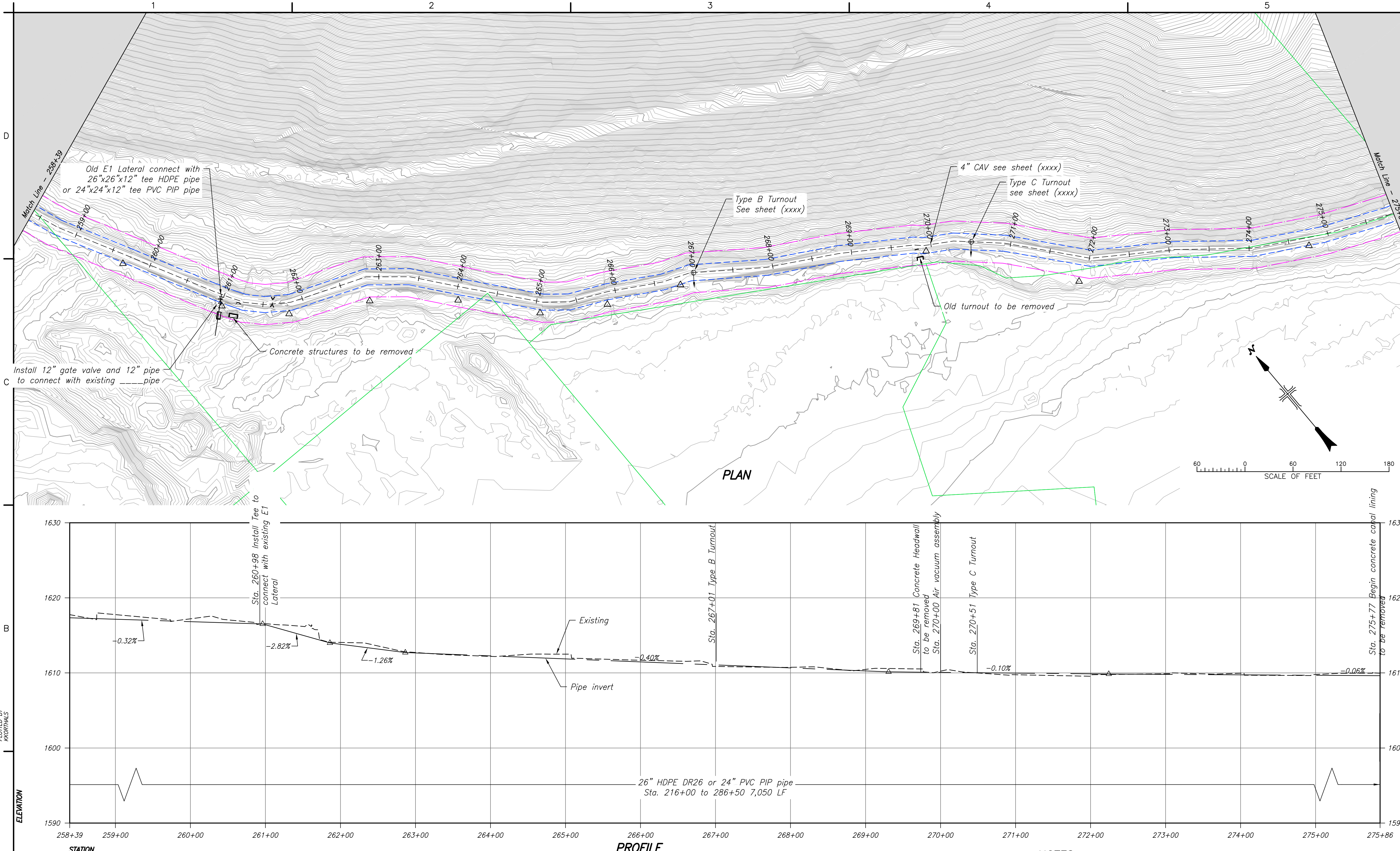
U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
COLUMBIA/SNAKE SALMON RECOVERY PROGRAM
FCRPS HABITAT IMPROVEMENT PROGRAM
METHOW SUBBASIN
MVID – INSTREAM FLOW IMPROVEMENT PROJECT
EAST CANAL

DESIGNED
DRAWN
CHECKED
TECH. APPR.
ADMIN. APPROVAL

BOISE, ID 2013-09-30

MAIN PLAN AND PROFILE
STA. 240+92 TO 258+39

1678-100-XXXX



LEGEND

- Pipeline Corridor
- Clearing Limits
- Property Boundaries
- Staging Area

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RECLAMATION
Managing Water in the West

ALWAYS THINK SAFETY

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

METHOW SUBBASIN
MVID – INSTREAM FLOW IMPROVEMENT PROJECT
EAST CANAL

REV NO

X DESIGNED
X DRAWN
X CHECKED
X TECH. APPR. NAME, PROF. ABBR.
X ADMIN. APPROVAL NAME TITLE

BOISE, ID 2013-09-30

MAIN PLAN AND PROFILE
STA. 258+39 TO 275+86

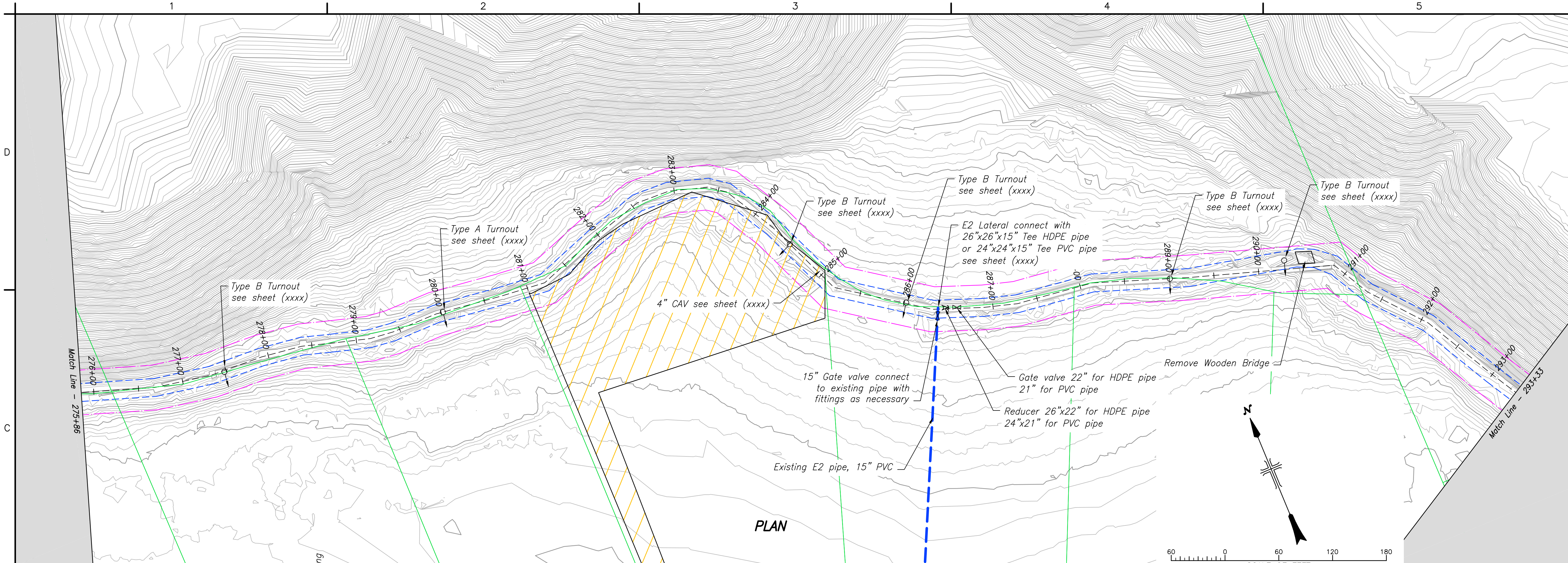
1678–100–XXXX

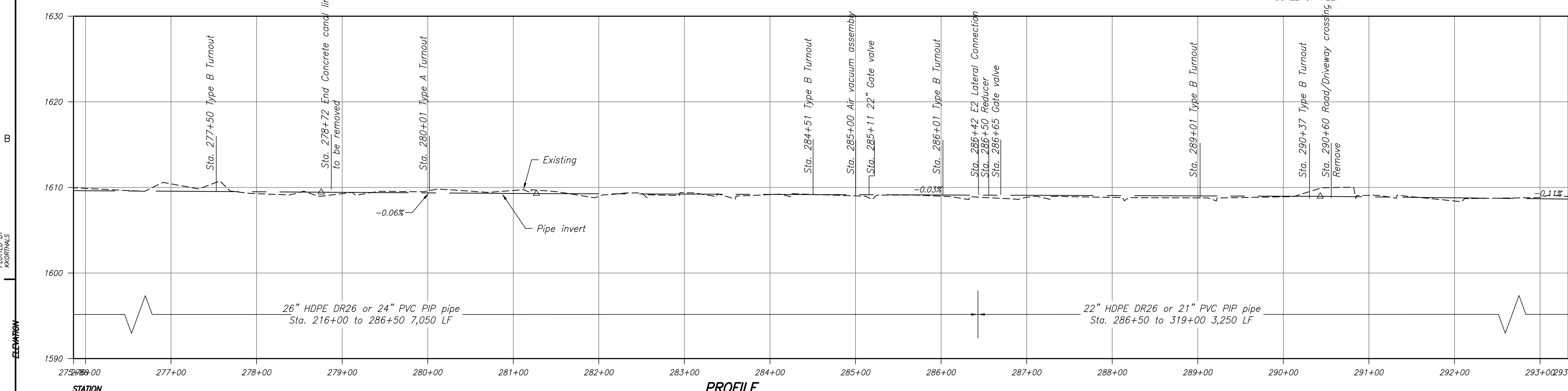
SHEET 1 OF 1

DATE AND TIME PLOTTED MAY 30, 2014 16:22
PLOTTED BY KKORTHALS

CAD SYSTEM AutoCAD Rel. 19.1s
CAD FILENAME PLANPROFILE AND PIPE NETWORK_PVC30PTS.DWG

RECLAMATION
Managing Water in the West





LEGEND

- Pipeline Corridor
- Clearing Limits
- Property Boundaries
- Staging Area

NOTES:

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ALWAYS THINK SAFETY

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

COLUMBIA/SNAKE RIVER SALMON RECOVERY PROGRAM
FCRPS HABITAT IMPROVEMENT PROJECT

METHOW SUBBASIN
MVID – INSTREAM FLOW IMPROVEMENT PROJECT
EAST CANAL

X DESIGNED
X DRAWN
X CHECKED
X TECH. APPR. NAME, PROF. ABBR.
X ADMIN. APPROVAL NAME TITLE

BOISE, ID 2013-09-30

MAIN PLAN AND PROFILE
STA. 275+86 TO 293+33

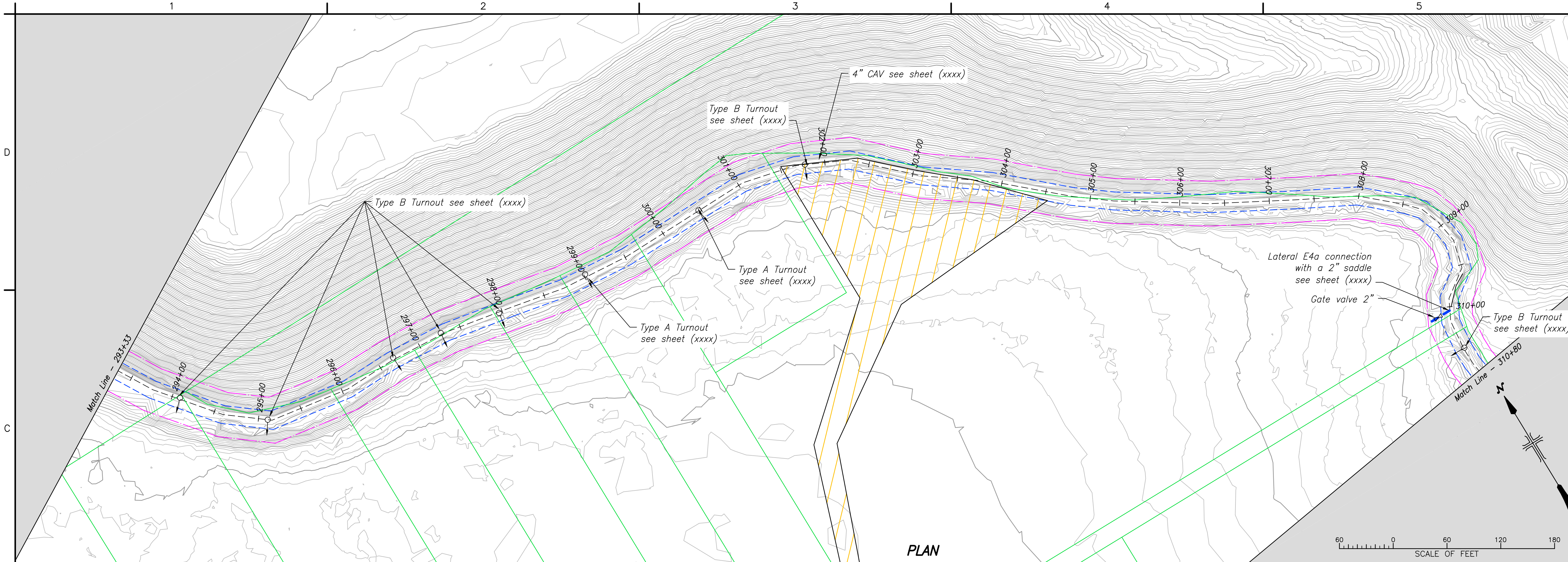
1678-100-XXXX

SHEET 1 OF 1

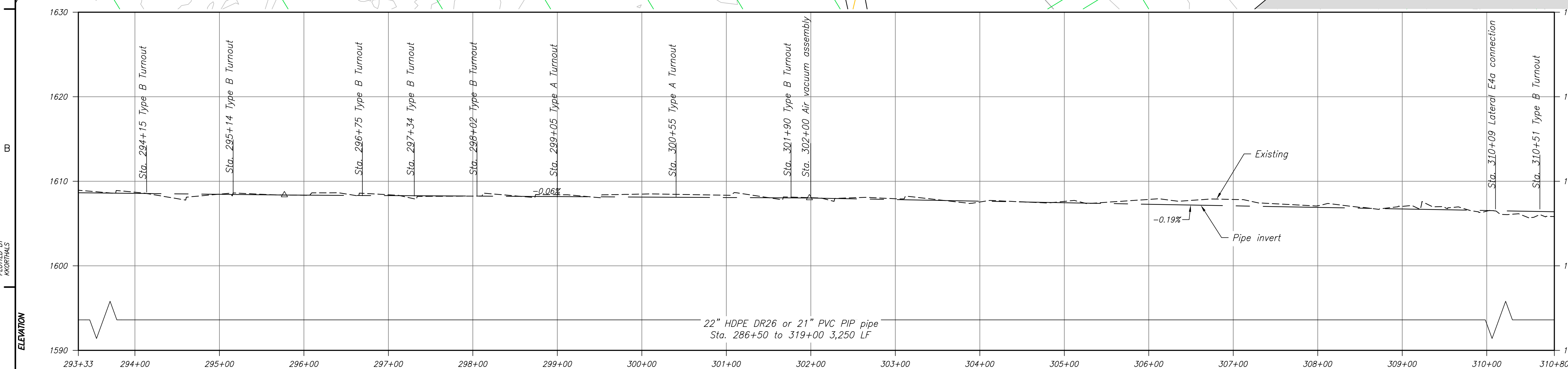
DATE AND TIME PLOTTED MAY 30, 2014 16:24
PLOTTED BY KKORTHALS

CAD SYSTEM AutoCAD Rel. 19.1s
CAD FILENAME PLANPROFILE AND PIPE NETWORK_PVC30PT8.DWG

RECLAMATION
Managing Water in the West



PLAN



PROFILE

LEGEND

- Pipeline Corridor
- Clearing Limits
- Property Boundaries
- Staging Area

NOTES:

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ALWAYS THINK SAFETY

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
COLUMBIA/SNAKE RIVER SALMON RECOVERY PROGRAM
FCRPS HABITAT IMPROVEMENT PROJECT
METHOW SUBBASIN
MVID – INSTREAM FLOW IMPROVEMENT PROJECT
EAST CANAL

X
DESIGNED
DRAWN
CHECKED
TECH. APPR. NAME, PROF. ABBR.
ADMIN. APPROVAL
NAME
TITLE
BOISE, ID 2013-09-30

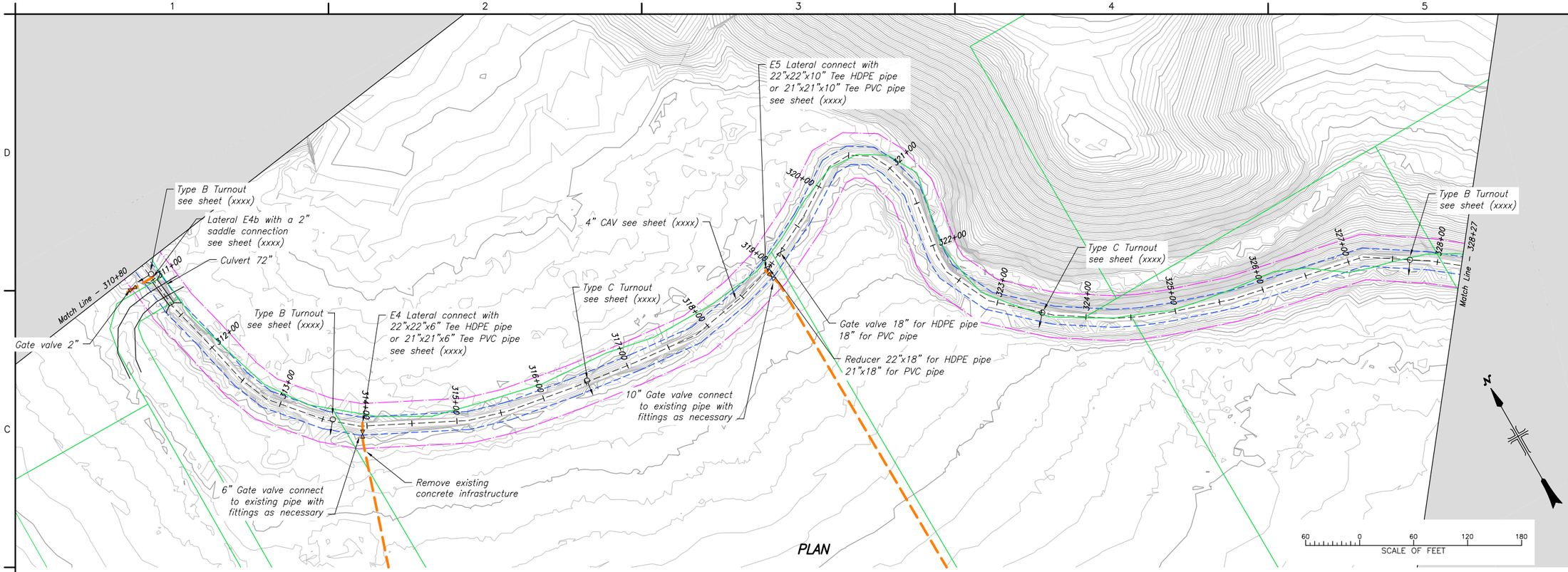
MAIN PLAN AND PROFILE
STA. 293+33 TO 310+80

1678-100-XXXX

SHEET 1 OF 1

DATE AND TIME PLOTTED
MAY 30, 2014 16:30
PLOTTED BY
KKORTHALS

CAD SYSTEM
AutoCAD Rel. 19.1s
CAD FILENAME
PLANPROFILE AND PIPE NETWORK_PVC30PIPS.DWG



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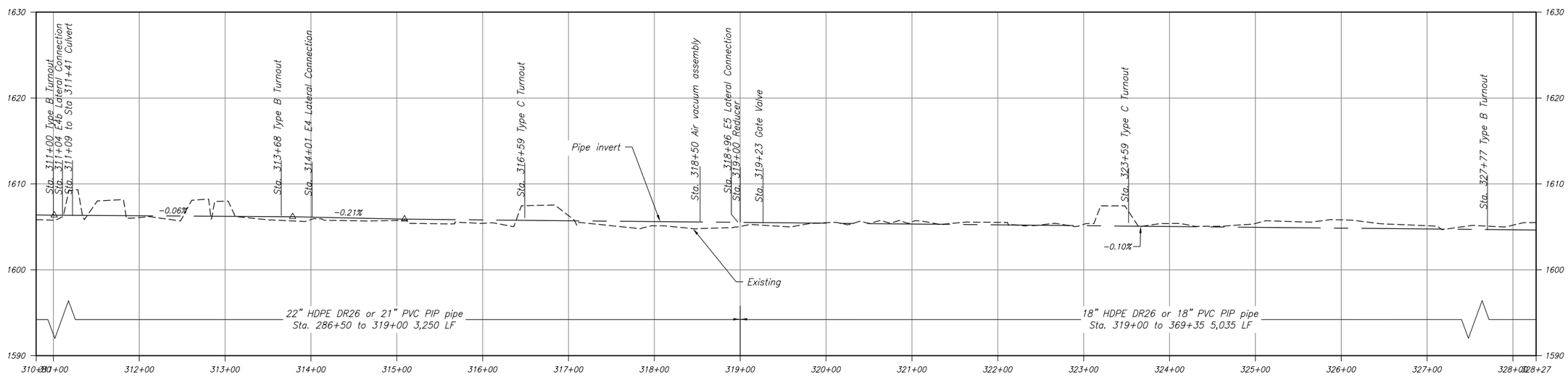

PROFILE

LEGEND

- Pipeline Corridor
- Clearing Limits
- Property Boundaries
- Staging Area

NOTES:

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RECLAMATION
Managing Water in the West

ALWAYS THINK SAFETY

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

COLUMBIA/SNAKE RIVER SALMON RECOVERY PROGRAM
FCRPS HABITAT IMPROVEMENT PROJECT

METHOW SUBBASIN

INSTREAM FLOW IMPROVEMENT PROJECT

EAST CANAL

NAVD 88

REV NO

DESIGNED X
DRAWN X
CHECKED X
TECH. APPR. X NAME, PROF. ABBR.
ADMIN. APPROVAL X NAME TITLE

BOISE, ID 2013-09-30

MAIN PLAN AND PROFILE
STA. 310+80 TO 328+27

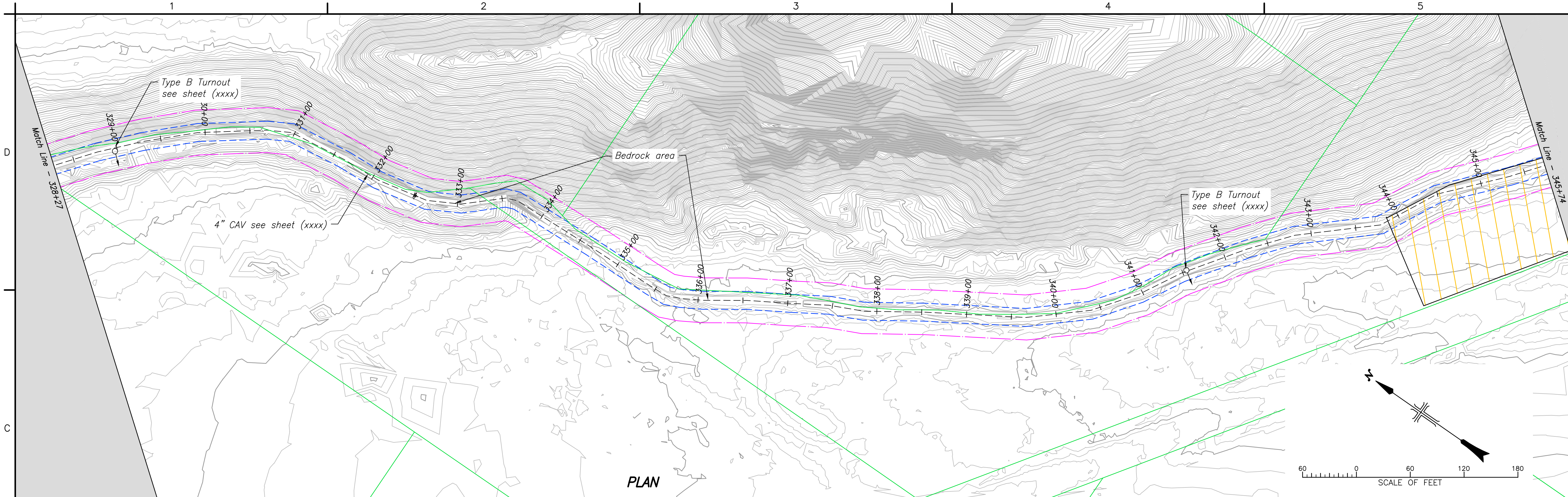
1678-100-XXXX

SHEET 1 OF 1

DATE AND TIME PLOTTED
MAY 30, 2014 16:35
PLOTTED BY
KKORTHALS

CAD SYSTEM
AutoCAD Rel. 19.1s
CAD FILENAME
PLANPROFILE AND PIPE NETWORK_PVCSDR26.DWG

RECLAMATION
Managing Water in the West



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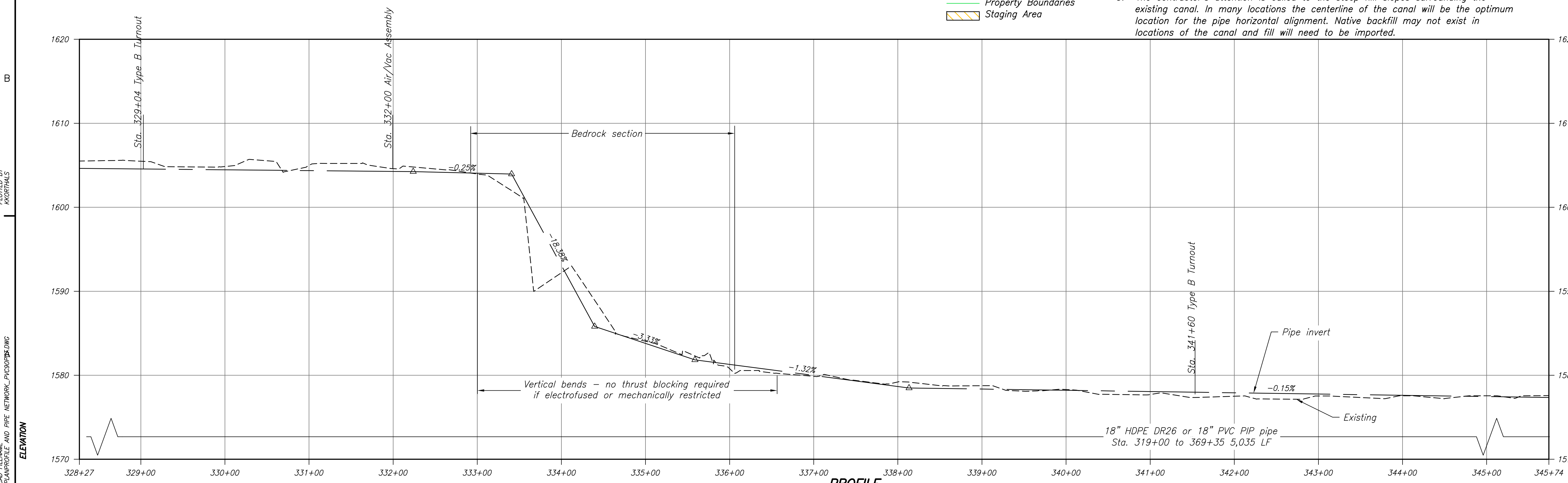
LEGEND

- Pipeline Corridor
- Clearing Limits
- Property Boundaries
- Staging Area



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MAY 30, 2014 16:41
PLOTTED BY
KKORTHALS

CAD SYSTEM
AutoCAD Rel. 19.1s
CAD FILENAME
PLANPROFILE AND PIPE NETWORK_PVC90PTS.DWG

ALWAYS THINK SAFETY

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

METHOW SUBBASIN
MVID – INSTREAM FLOW IMPROVEMENT PROJECT
EAST CANAL

REV NO

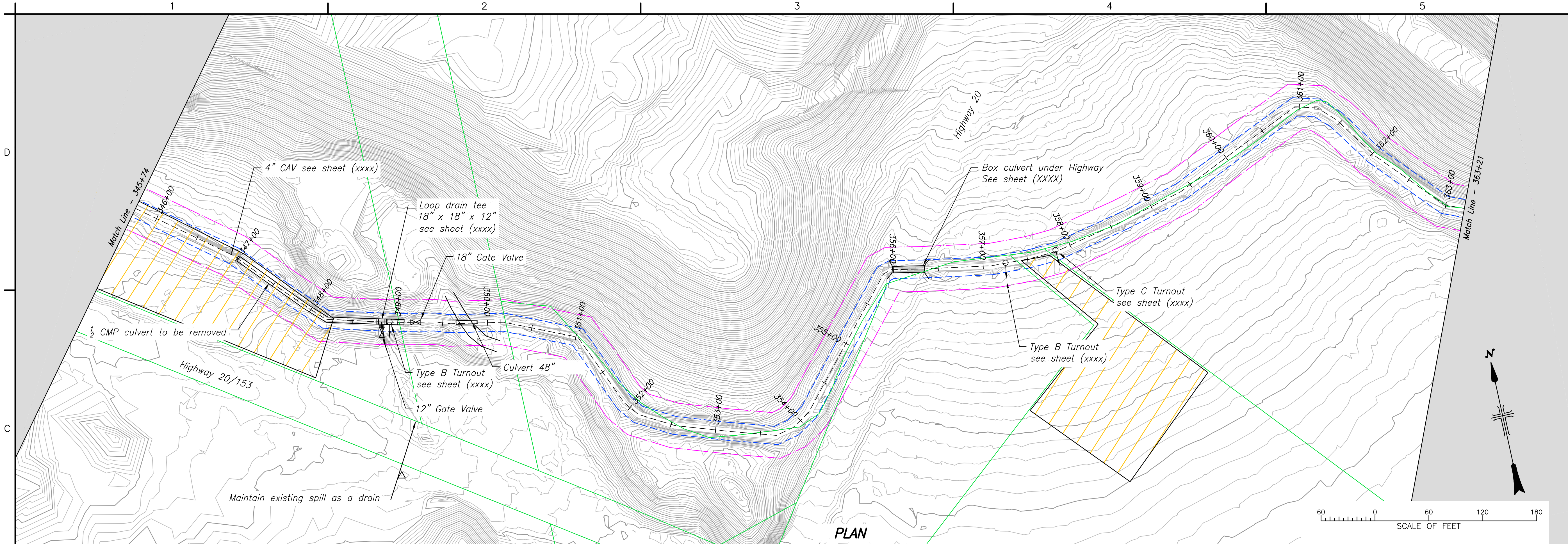
X DESIGNED
X DRAWN
X CHECKED
X TECH. APPR. NAME, PROF. ABBR.
X ADMIN. APPROVAL NAME TITLE

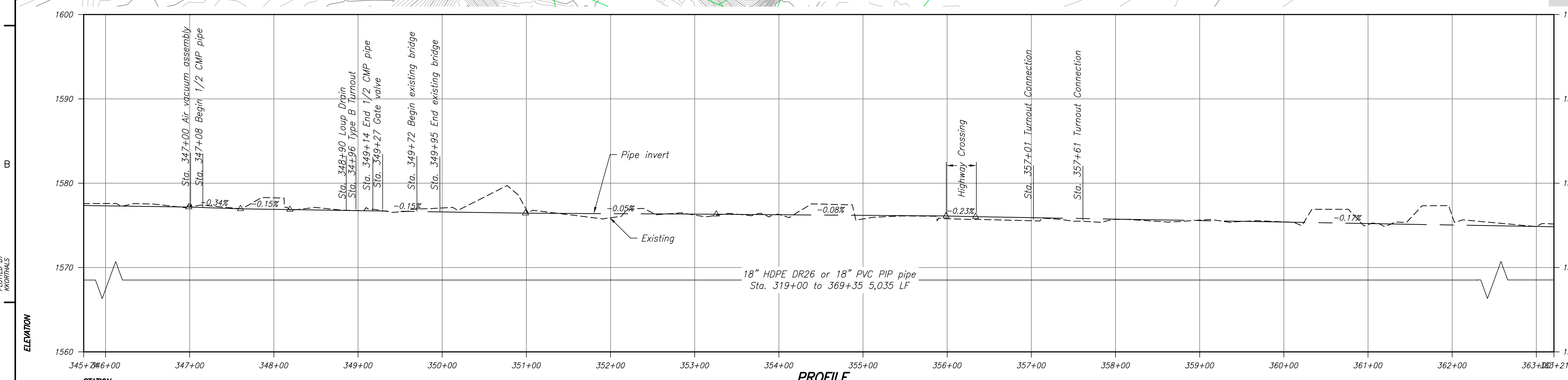
BOISE, ID 2013-09-30

MAIN PLAN AND PROFILE
STA. 328+27 TO 345+74

1678-100-XXXX

SHEET 1 OF 1





LEGEND

- Pipeline Corridor
- Clearing Limits
- Property Boundaries
- Staging Area

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RECLAMATION
Managing Water in the West

ALWAYS THINK SAFETY

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

METHOW SUBBASIN
MVID - INSTREAM FLOW IMPROVEMENT PROJECT
EAST CANAL

REV NO

X DESIGNED
X DRAWN
X CHECKED
X TECH. APPR. NAME, PROF. ABBR.
X ADMIN. APPROVAL NAME TITLE

BOISE, ID 2013-09-30

MAIN PLAN AND PROFILE
STA. 345+74 TO 363+21

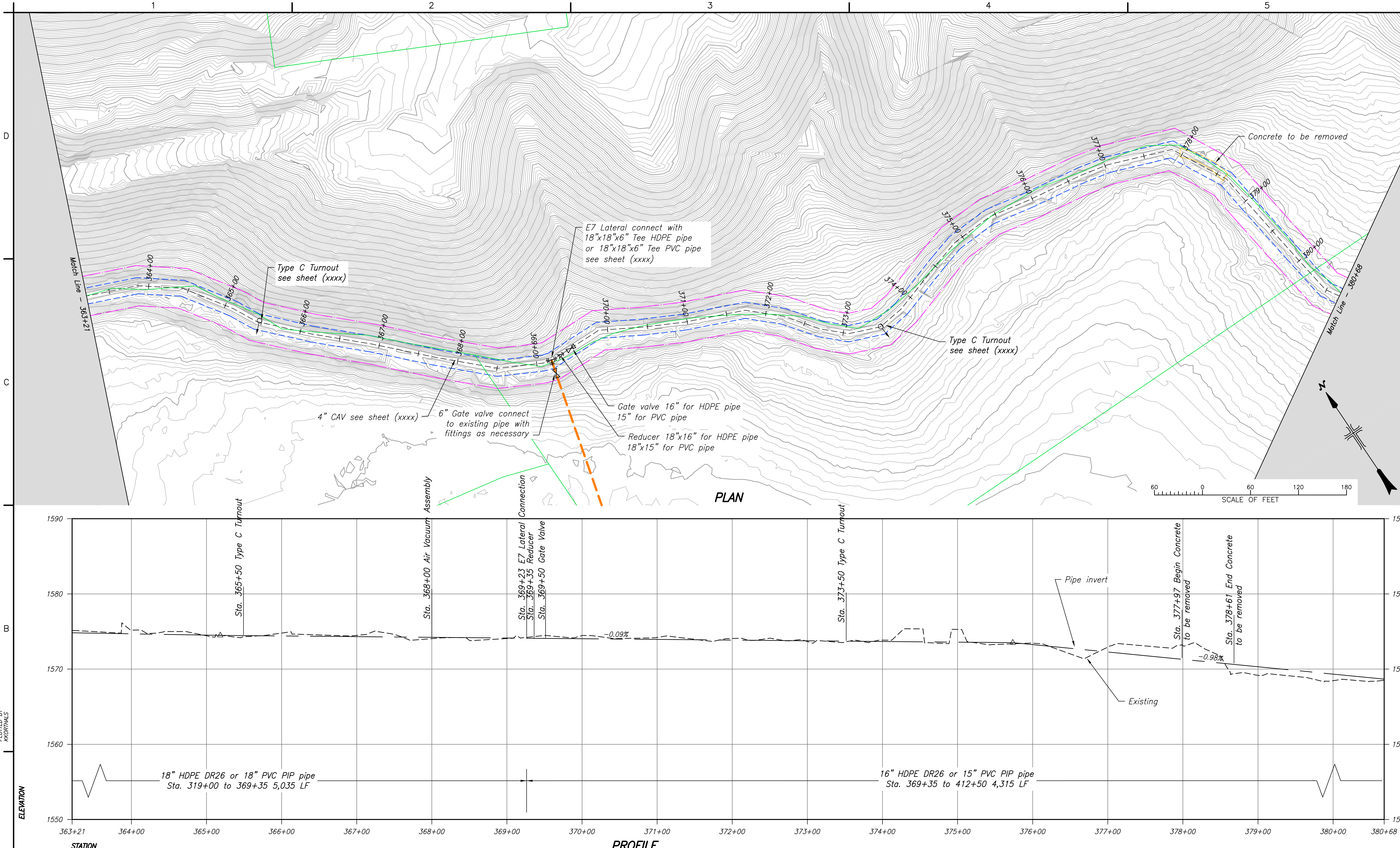
1678-100-XXXX

SHEET 1 OF 1

DATE AND TIME PLOTTED MAY 30, 2014 17:07
PLOTTED BY KKORTHALS

CAD SYSTEM AutoCAD Rel. 19.1s
CAD FILENAME PLANPROFILE AND PIPE NETWORK_PVC30PIPS.DWG

RECLAMATION
Managing Water in the West



LEGEND

- Pipeline Corridor
- Clearing Limits
- Property Boundaries
- Staging Area

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ALWAYS THINK SAFETY

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

COLUMBIA/SNAKE RIVER SALMON RECOVERY PROGRAM
FCRPS HABITAT IMPROVEMENT PROJECT

METHOW SUBBASIN
MVID – INSTREAM FLOW IMPROVEMENT PROJECT
EAST CANAL

DESIGNED
DRAWN
CHECKED
TECH. APPR.
ADMIN. APPROVAL

BOISE, ID 2013-09-30

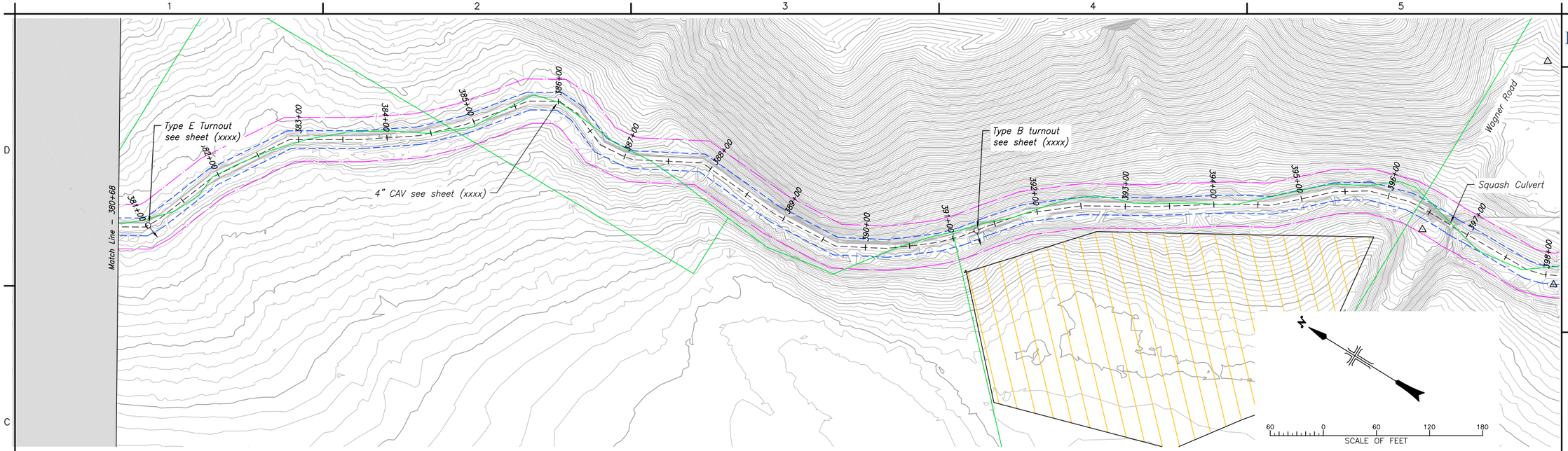
MAIN PLAN AND PROFILE
STA. 363+21 TO 380+68

1678-100-XXXX

SHEET 1 OF 1

DATE AND TIME PLOTTED MAY 30, 2014 17:07
PLOTTED BY KKORTHALS

CAD SYSTEM AutoCAD Rel. 19.1s
CAD FILENAME PLANPROFILE AND PIPE NETWORK_PVC3OPTS.DWG



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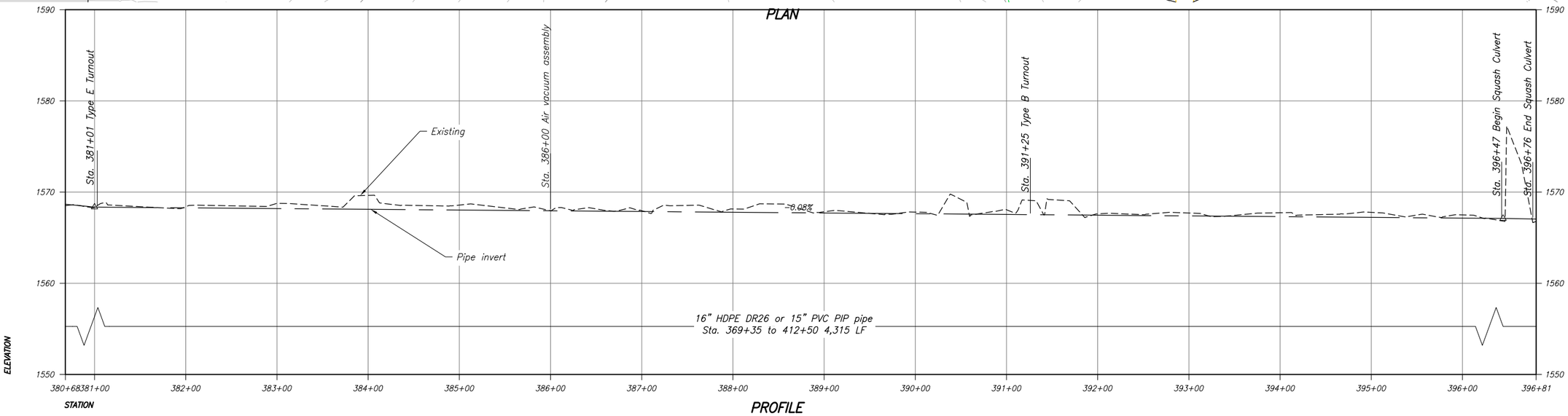

PROFILE

LEGEND

- Pipeline Corridor
- Clearing Limits
- Property Boundaries
- Staging Area

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RECLAMATION
Managing Water in the West

ALWAYS THINK SAFETY

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

COLUMBIA SNAKE RIVER SALMON RECOVERY PROGRAM
FCRPS HABITAT IMPROVEMENT PROJECT

METHOW SUBBASIN

MVID – INSTREAM FLOW IMPROVEMENT PROJECT

EAST CANAL

REV. NO

X DESIGNED
X DRAWN
X CHECKED
X TECH. APPR. NAME, PROF. ABBR.
X ADMIN. APPROVAL NAME TITLE

BOISE, ID 2013-09-30

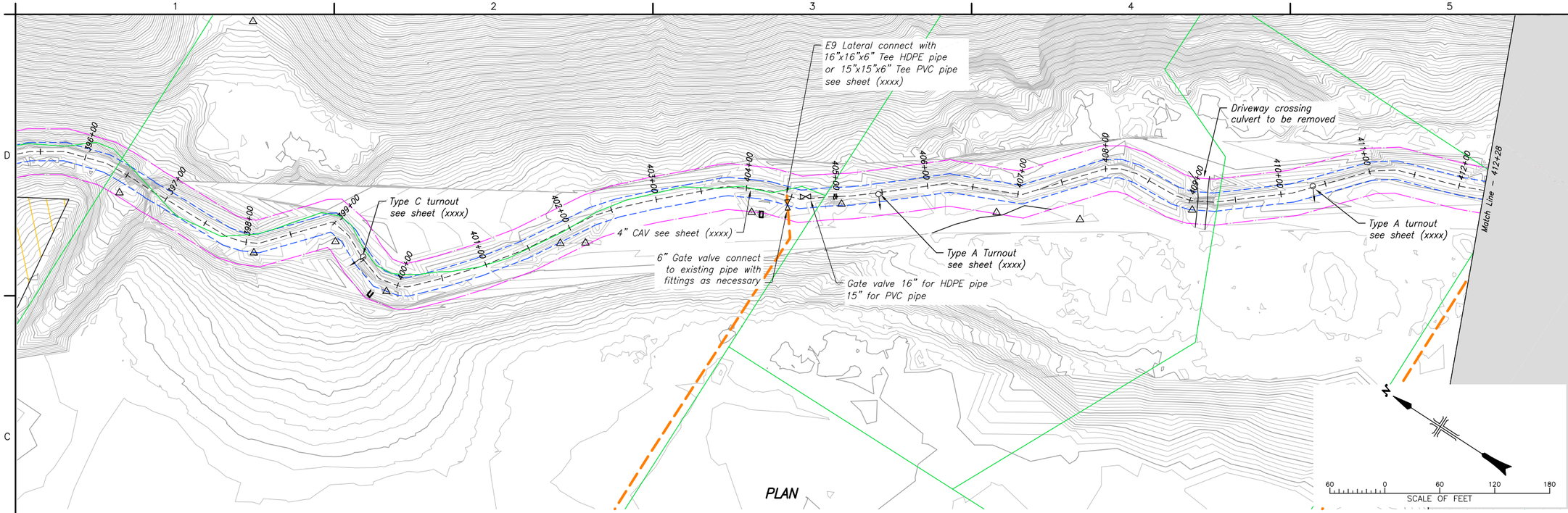
MAIN PLAN AND PROFILE STA. 380+68 TO 396+81

1678-100-XXXX

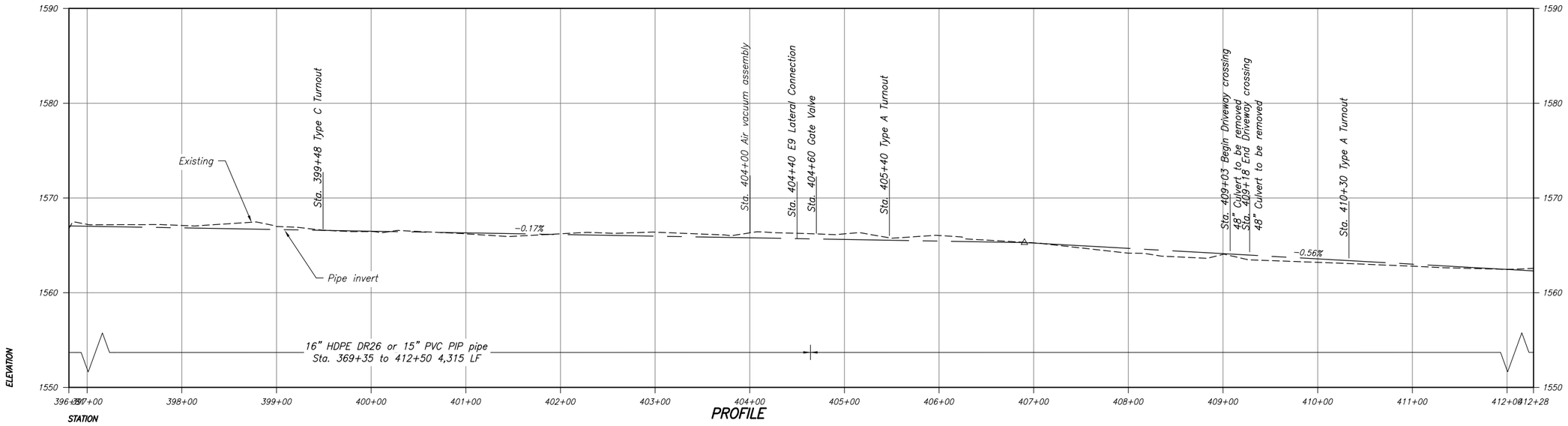
SHEET 1 OF 1

DATE AND TIME PLOTTED
MAY 30, 2014 17:08
PLOTTED BY
KKORTHALS

CAD SYSTEM
AutoCAD Rel. 19.1s
CAD FILENAME
PLANPROFILE AND PIPE NETWORK_PVC90PSLOWG



PLAN



PROFILE

LEGEND

- Pipeline Corridor
- Clearing Limits
- Property Boundaries
- Staging Area

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RECLAMATION
Managing Water in the West

ALWAYS THINK SAFETY

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

COLUMBIA/SNAKE SALMON RECOVERY PROGRAM
FCRPS HABITAT IMPROVEMENT PROJECT

METHOW SUBBASIN

NMD - INSTREAM FLOW IMPROVEMENT PROJECT

EAST CANAL

REV. NO

X DESIGNED
X DRAWN
X CHECKED
X TECH. APPR. NAME, PROF. ABBR.
X ADMIN. APPROVAL NAME TITLE

BOISE, ID 2013-10-24

MAIN PLAN AND PROFILE STA. 396+81 TO 412+28

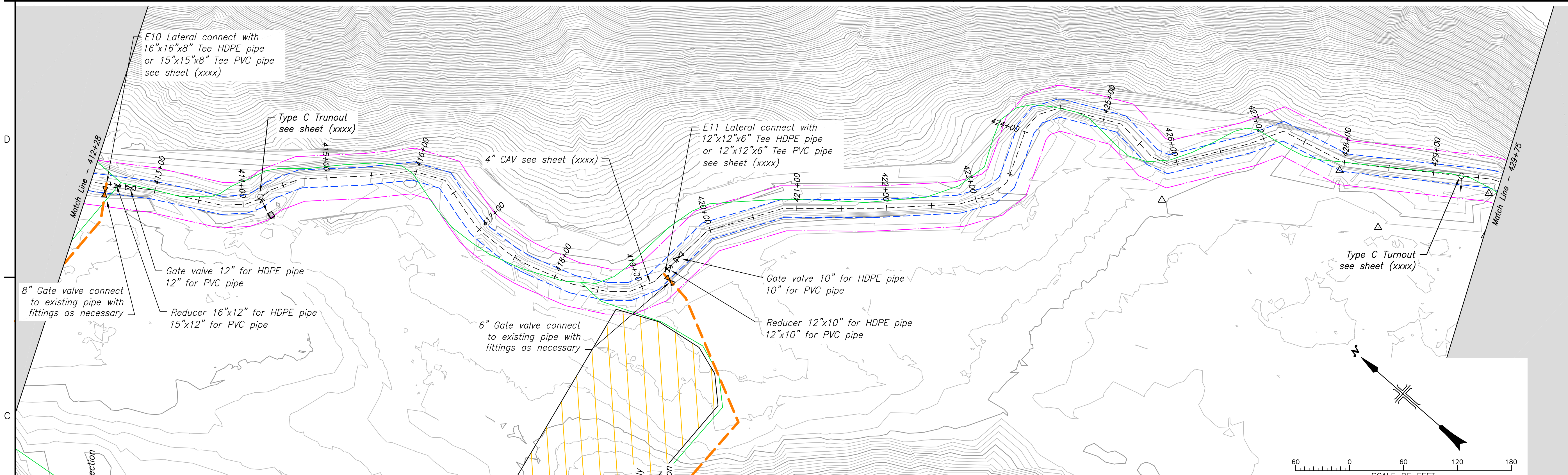
1678-100-XXXX

SHEET 1 OF 1

DATE AND TIME PLOTTED MAY 30, 2014 17:09
PLOTTED BY KKORTHALS

CAD SYSTEM AutoCAD Rel. 19.1s
CAD FILENAME PLANPROFILE AND PIPE NETWORK_PVC90PTS.DWG

RECLAMATION
Managing Water in the West



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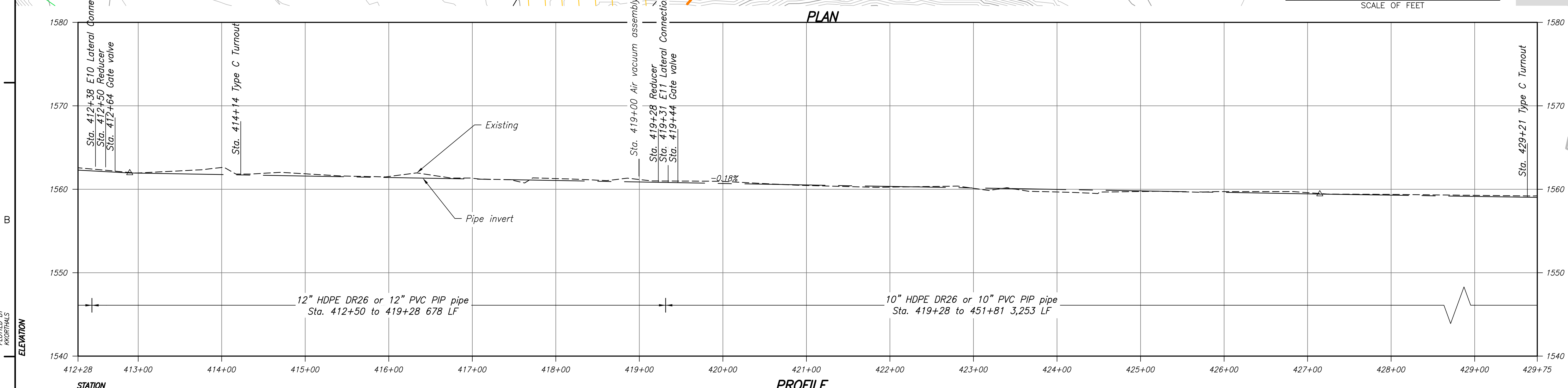

PROFILE

LEGEND

- Pipeline Corridor
- Clearing Limits
- Property Boundaries
- Staging Area

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ALWAYS THINK SAFETY

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
COLUMBIA/SNAKE RIVER SALMON RECOVERY PROGRAM
FCRPS HABITAT IMPROVEMENT PROJECT
METHOW SUBBASIN
MVID – INSTREAM FLOW IMPROVEMENT PROJECT
EAST CANAL

REV NO

X DESIGNED
X DRAWN
X CHECKED
X TECH. APPR. NAME, PROF. ABBR.
X ADMIN. APPROVAL NAME TITLE

BOISE, ID 2013-10-24

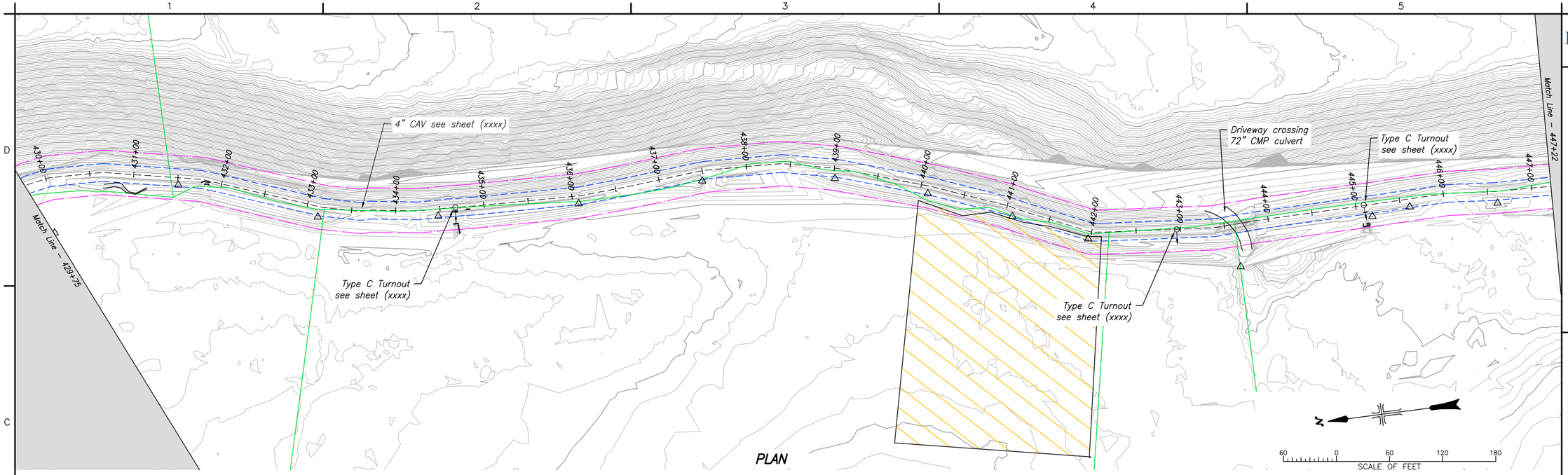
MAIN PLAN AND PROFILE
STA. 412+28 TO 429+75

1678–100–XXXX

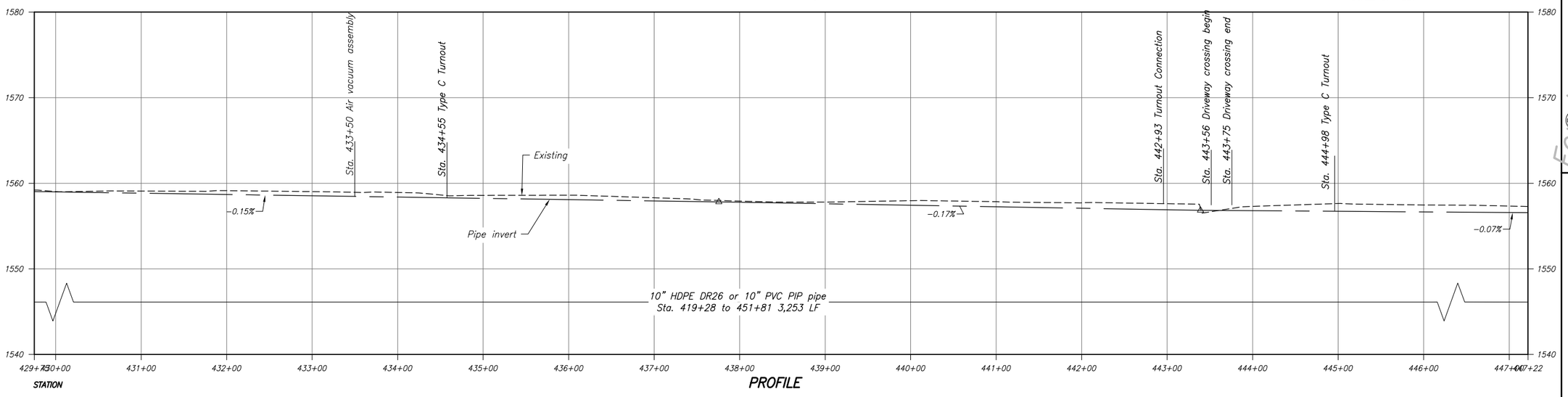
SHEET 1 OF 1

DATE AND TIME PLOTTED
MAY 30, 2014 17:10
PLOTTED BY
KKORTHALS

CAD SYSTEM
AutoCAD Rel. 19.1s
CAD FILENAME
PLANPROFILE AND PIPE NETWORK_PVC30PIP5.DWG



PLAN



PROFILE

LEGEND

- Pipeline Corridor
- Clearing Limits
- Property Boundaries
- Staging Area

NOTES:

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2. The contractor shall furnish additional fittings or bend the pipe per the manufacturer's recommendations to match the alignments and grades shown.
3. The contractor's attention is called to the steep hill slopes surrounding the existing canal. In many locations the centerline of the canal will be the optimum location for the pipe horizontal alignment. Native backfill may not exist in locations of the canal and fill will need to be imported.

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COLUMBIA/SNAKE RIVER SALMON RECOVERY PROGRAM
FCRPS HABITAT IMPROVEMENT PROJECT

METHOW SUBBASIN

MVD – INSTREAM FLOW IMPROVEMENT PROJECT

EAST CANAL

MVD

REV. NO

X DESIGNED	
X DRAWN	
X CHECKED	
X TECH. APPR.	NAME, PROF. ABBR.
X ADMIN. APPROVAL	NAME TITLE
BOISE, ID	2013-10-24

MAIN PLAN AND PROFILE
STA. 429+75 TO 447+22

1678-100-XXXX

SHEET 1 OF 1

DATE AND TIME PLOTTED
MAY 30, 2014 17:11
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CAD SYSTEM
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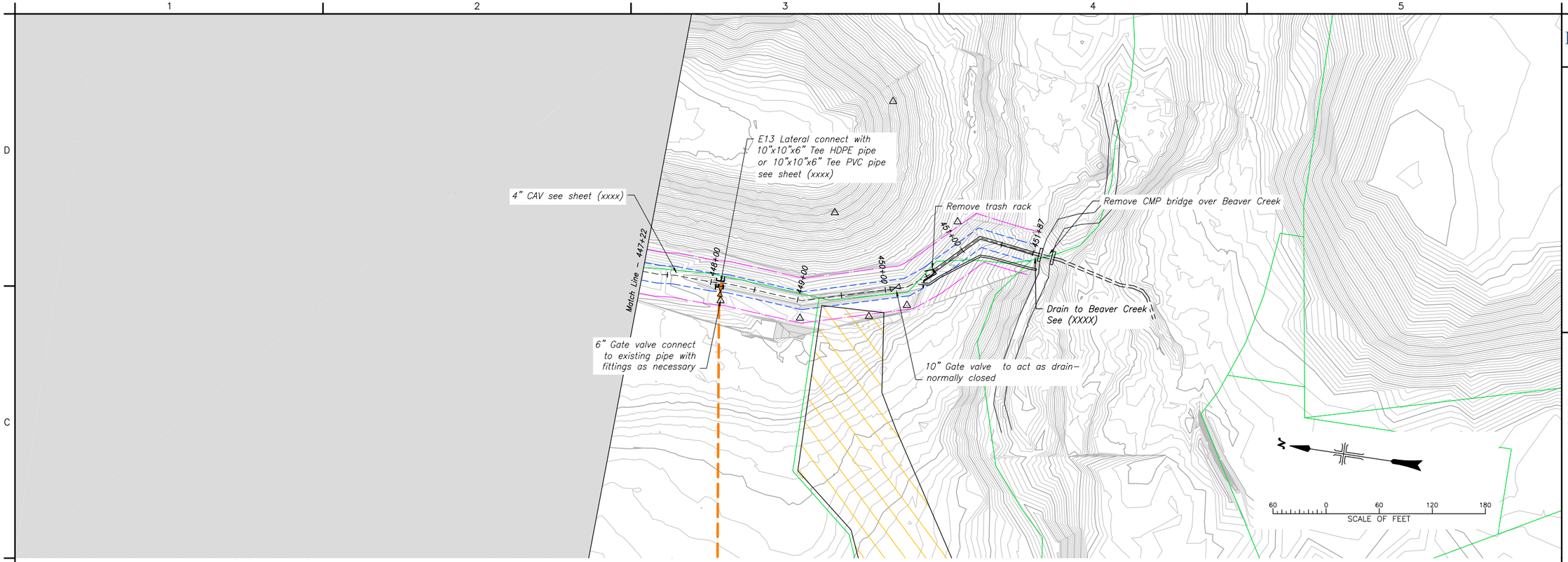
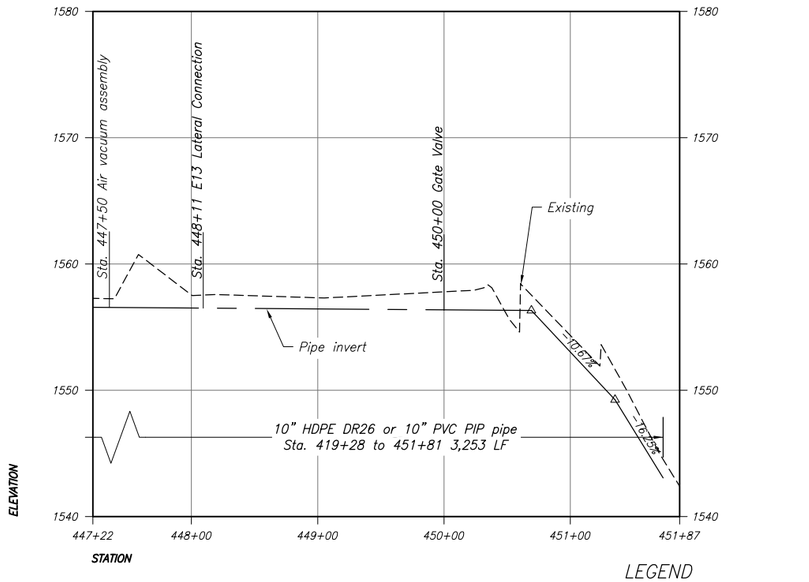
CAD FILENAME
PLANPROFILE AND PIPE NETWORK_PVC90PTS.DWG



PLAN



PROFILE

LEGEND
- Pipeline Corridor
- Clearing Limits
- Property Boundaries
- Staging Area

NOTES:
1. The contractor shall be responsible for installing the pipe to match the grades shown. The horizontal alignment shown is intended for PVC pipe and uses standard fittings when possible. The contractor is allowed to vary from this horizontal alignment as long as the vertical profile is maintained and the adjusted alignment stays within the pipeline corridor under the direction of the contracting officer.
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METHOW SUBBASIN

MVID - INSTREAM FLOW IMPROVEMENT PROJECT

EAST CANAL

REV NO

X DESIGNED	
X DRAWN	
X CHECKED	
X TECH. APPR.	NAME, PROF. ABBR.
X ADMIN. APPROVAL	NAME TITLE
BOISE, ID	2013-10-24

MAIN PLAN AND PROFILE
STA. 447+22 TO 451+87

1678-100-XXXX

SHEET 1 OF 1

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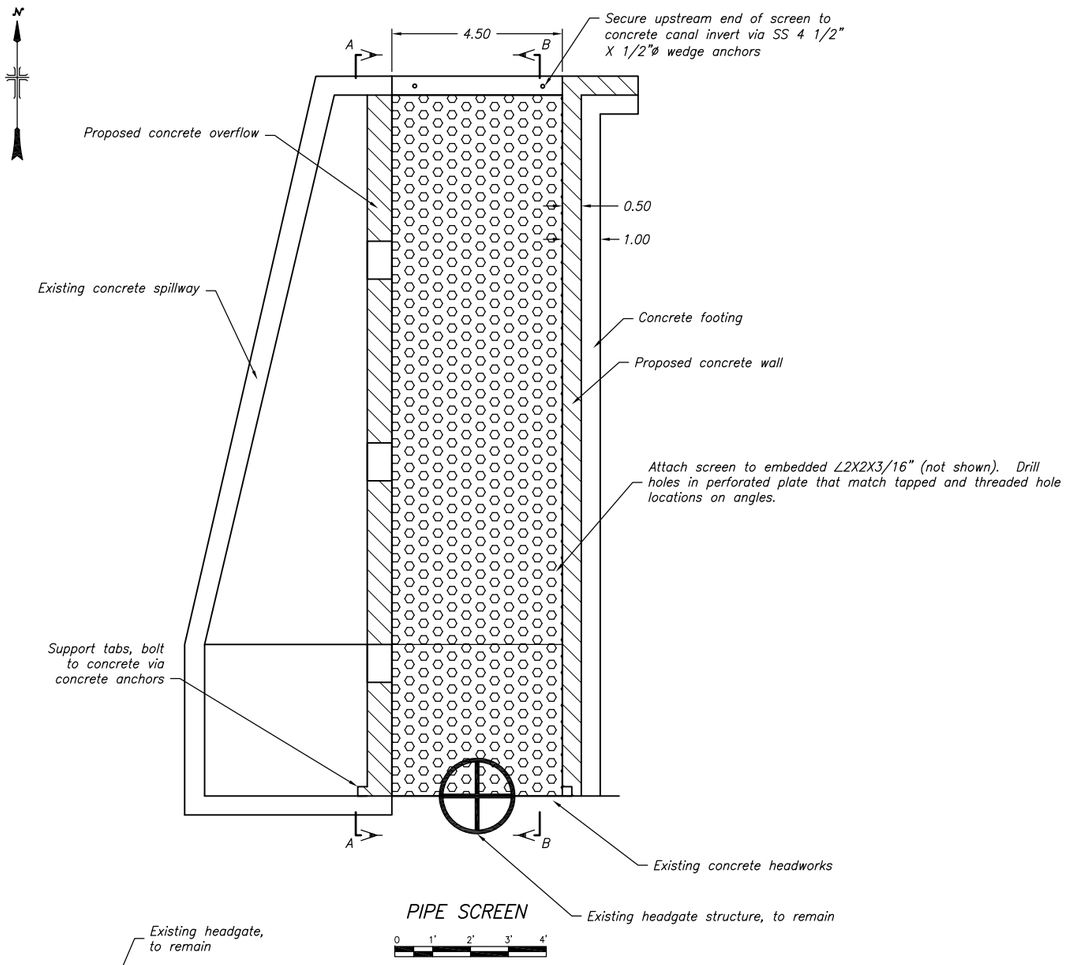

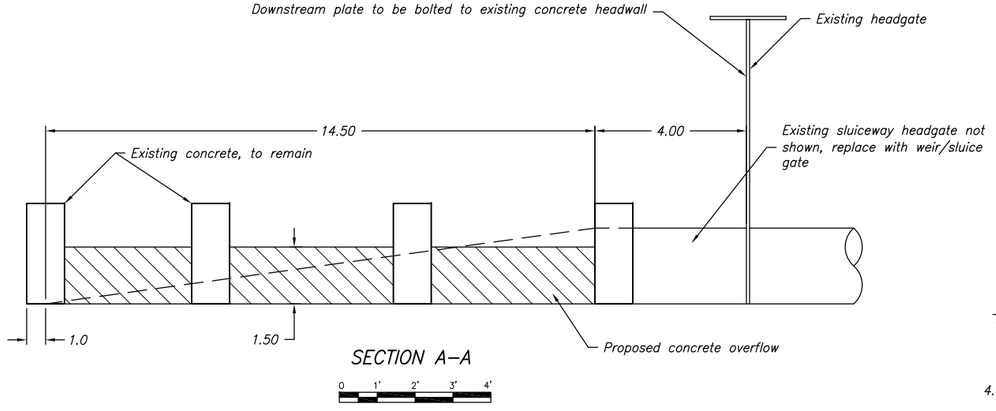

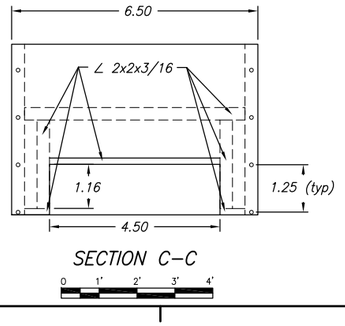

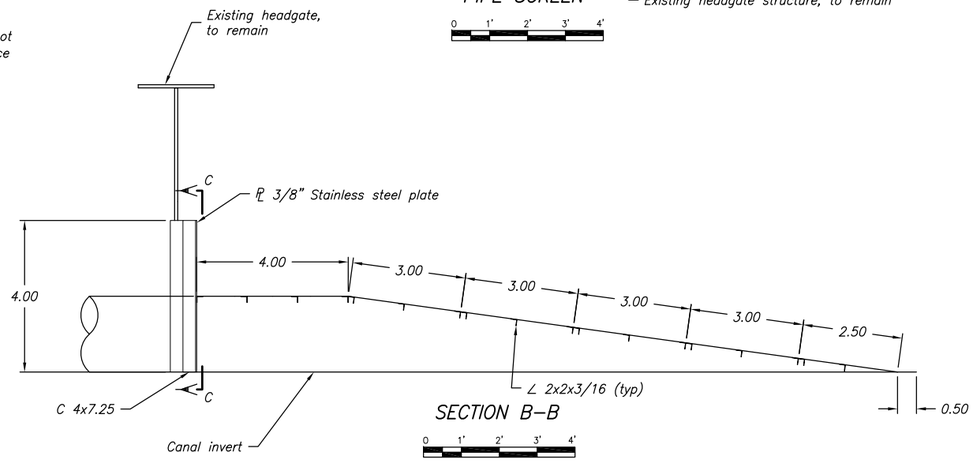

NOTES

1. Perforated plate is 12 gauge, A304 SS, 1/8"ø holes with staggered spacing, and no less than 40% open area.

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METHOW SUBBASIN

METHOW-INSTREAM FLOW IMPROVEMENT PROJECT

PLAN AND SECTIONS

REV. NO

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DESIGNED		
X		(Drafter signs here)
DRAWN		
X		(Drafter signs here)
CHECKED		
X		(Dept. Manager signs here)
TECH. APPR.	NAME, PROF. ABBR.	
X		(Reviewer signs here)
ADMIN. APPROVAL		
NAME		
TITLE		
STATION NAME (CITY, ST)		YYYY-MM-DD

EAST CANAL SCREEN STRUCTURE

XXXX

SHEET 1 OF 1

20

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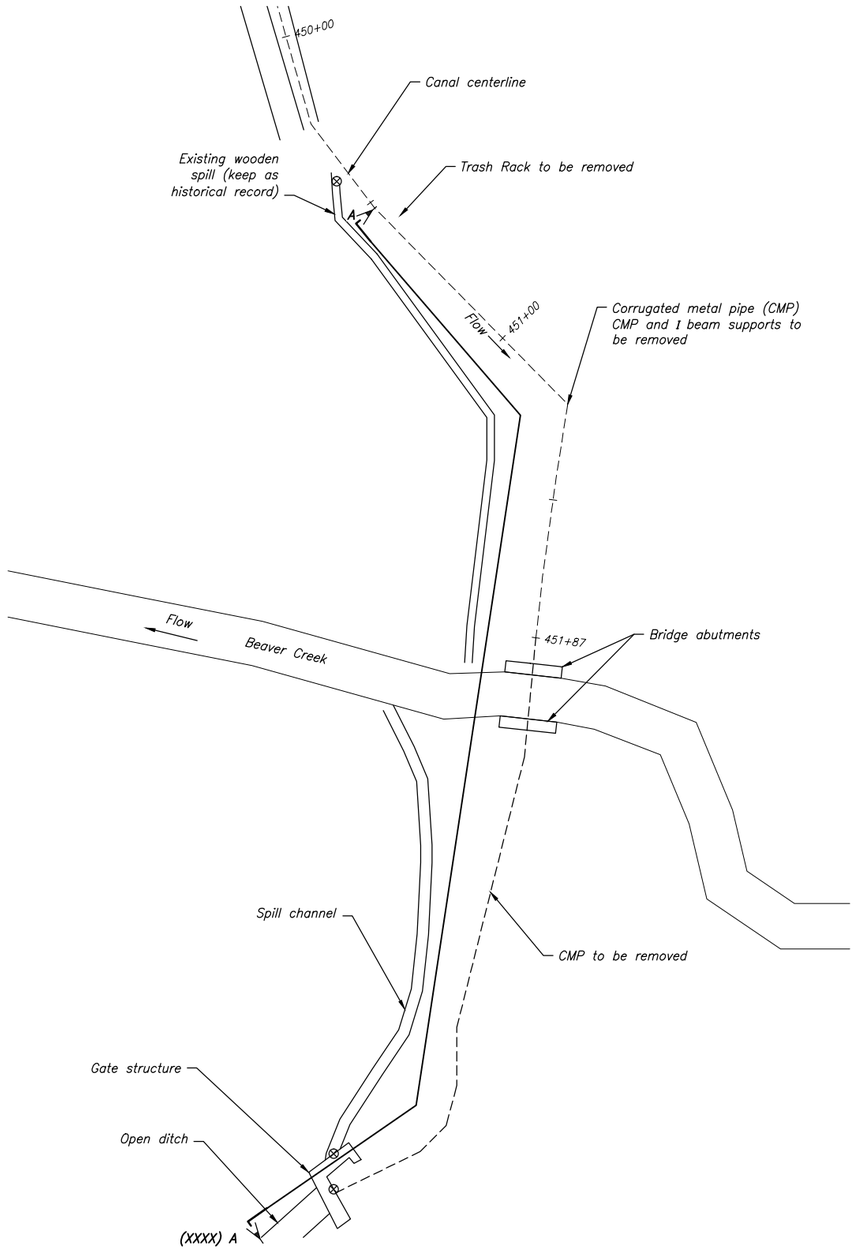
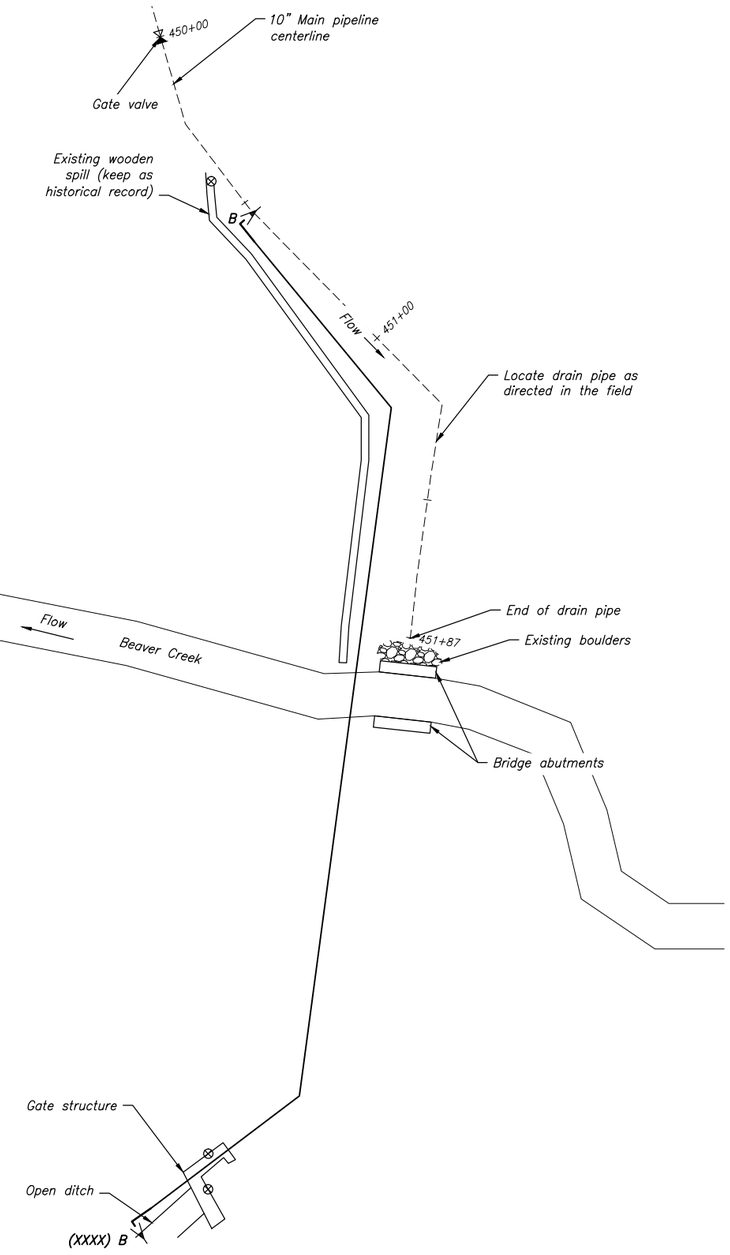


BEAVER CREEK SPILL – EXISTING CONDITIONS

20 0 20 40 60
SCALE OF FEET



BEAVER CREEK SPILL – PROPOSED CONDITIONS

20 0 20 40 60
SCALE OF FEET

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MID INSTREAM FLOW IMPROVEMENT PROJECT
END OF PIPELINE PLAN

REV NO

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X	DRAWN	
X	CHECKED	
X	TECH. APPR.	NAME, PROF. ABBR.
X	ADMIN. APPROVAL	
	NAME	
	TITLE	

BOISE, ID 2013-11-20

END OF PIPELINE PLAN

1678-100-XXXX

SHEET 1 OF 1

22

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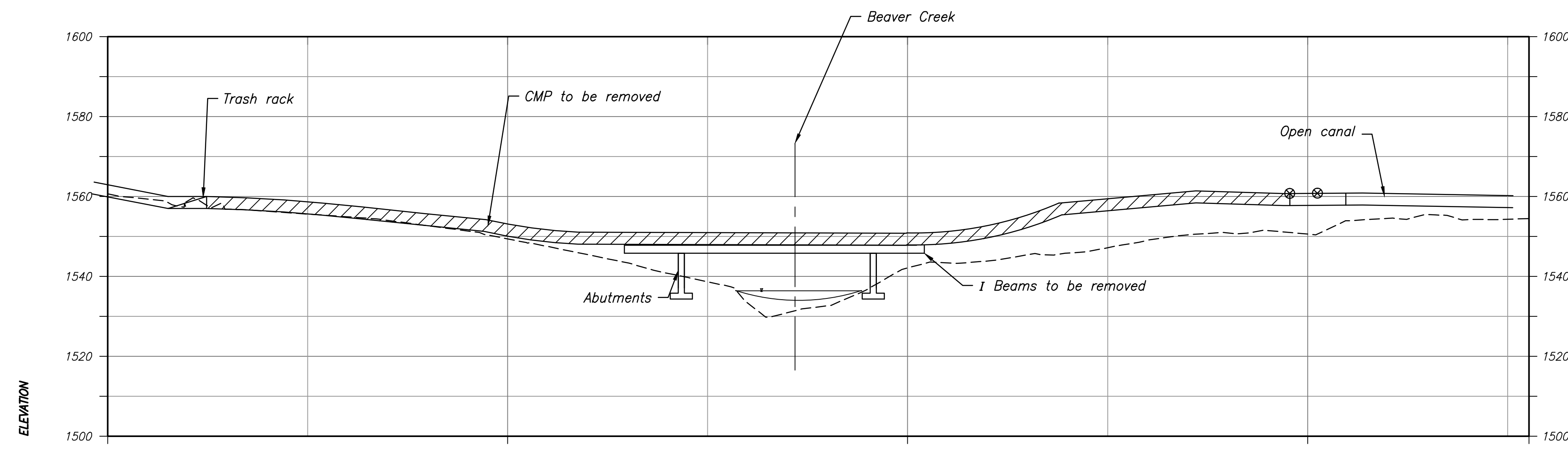
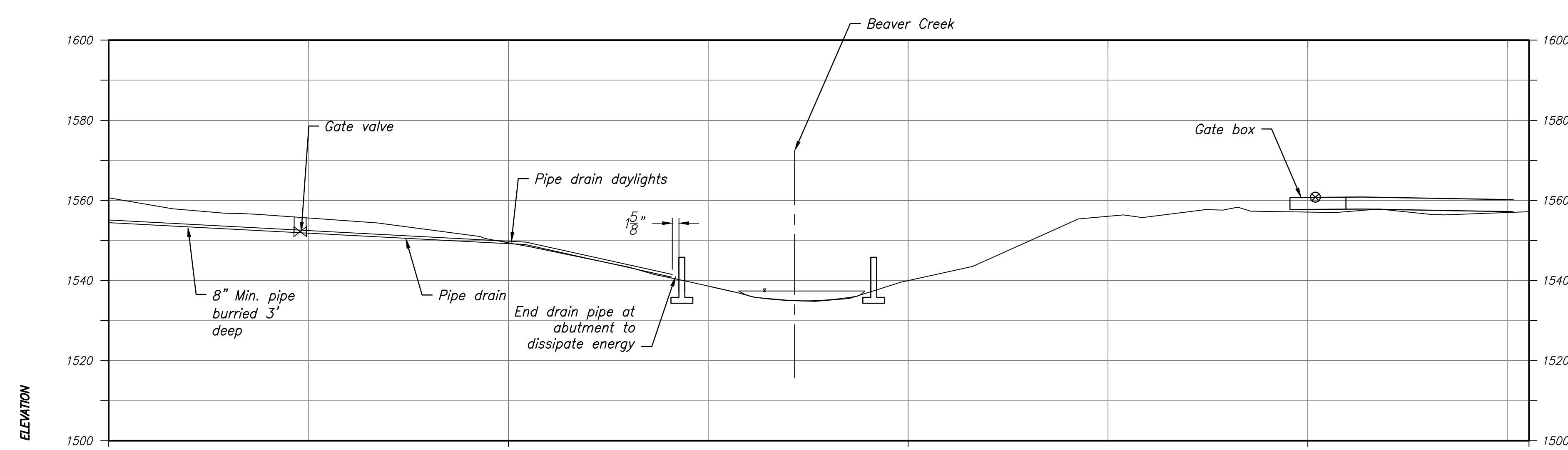
END OF PIPELINE.DWG



SECTION A–A (XXXX)
EXISTING CONDITIONS

SCALE OF FEET



SECTION B–B (XXXX)
PROPOSED CONDITIONS

SCALE OF FEET

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JHNIELSEN

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END OF PIPELINE.DWG

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MVID INSTREAM FLOW IMPROVEMENT PROJECT
END OF PIPELINE SECTIONS

REV NO

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X DRAWN
X CHECKED
X TECH. APPR. NAME, PROF. ABBR.
X ADMIN. APPROVAL
NAME
TITLE

BOISE, ID 2013–11–20

END OF PIPELINE
SECTIONS AND DETAILS

1678–100–XXXX

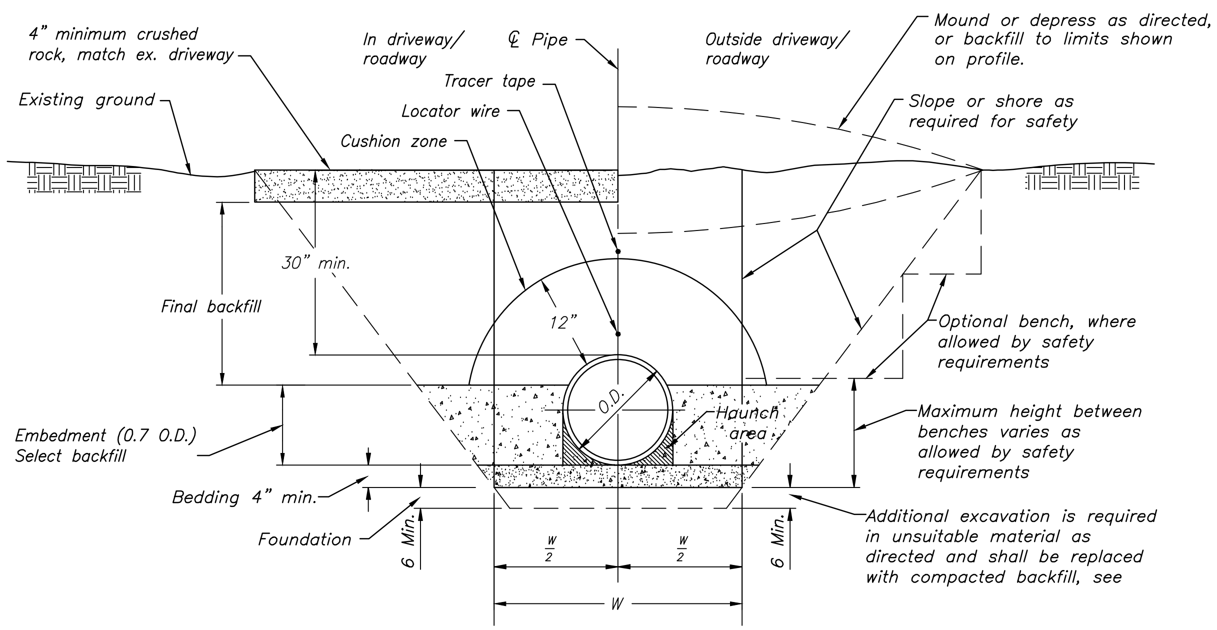
SHEET 1 OF 1

MVID MAIN PIPELINE PVC SPECIFICATION							
Start Station (ft)	End Station (ft)	Pipe Length (ft)	Pipe Diameter (inches)	Pipe Pressure Rating (psi)	Pipe Material Specification	Minimum Pipe Bending Radius (ft)	Comment
216+00	286+50	7,050	24	80	PVC IPS, DR 51, P.I.P	0	Deflection allowed only according to manufacturers specification
286+50	319+00	3,250	21	80	PVC IPS, DR 51, P.I.P	0	Deflection allowed only according to manufacturers specification
319+00	369+35	5,035	18	80	PVC IPS, DR 51, P.I.P	0	Deflection allowed only according to manufacturers specification
369+35	412+50	4,315	15	80	PVC IPS, DR 51, P.I.P	0	Deflection allowed only according to manufacturers specification
412+50	419+28	678	12	80	PVC IPS, DR 51, P.I.P	250	Deflection allowed only according to manufacturers specification
419+28	451+81	3,253	10	80	PVC IPS, DR 51, P.I.P	300	Deflection allowed only according to manufacturers specification

MVID MAIN PIPELINE HDPE SPECIFICATION							
Start Station (ft)	End Station (ft)	Pipe Length (ft)	Pipe Diameter (inches)	Pipe Pressure Rating (psi)	Pipe Material Specification	Minimum Pipe Bending Radius (ft)	Comment
216+00	286+50	7,050	26	80	HDPE IPS, DR 26, PE 4710	59	Deflection allowed only according to manufacturers specification
286+50	319+00	3,250	22	80	HDPE IPS, DR 26, PE 4710	50	Deflection allowed only according to manufacturers specification
319+00	369+35	5,035	18	80	HDPE IPS, DR 26, PE 4710	41	Deflection allowed only according to manufacturers specification
369+35	412+50	4,315	16	80	HDPE IPS, DR 26, PE 4710	36	Deflection allowed only according to manufacturers specification
412+50	419+28	678	12	80	HDPE IPS, DR 26, PE 4710	29	Deflection allowed only according to manufacturers specification
419+28	451+81	3,253	10	80	HDPE IPS, DR 26, PE 4710	24	Deflection allowed only according to manufacturers specification

Pipeline Notes:

1. The Contractor is allowed to construct the pipeline from either HDPE and/or PVC PIP according to the pipeline specification and manufacturer's specification. The plan and profile drawings are laid out according to a typical PVC PIP design utilizing common fittings when possible. For HDPE pipe, the contractor may bend the pipe according to the specifications and avoid using fittings.
2. Pressure piping systems that are joined by heat fusion, electrofusion, flanges, and MJ adapters are fully restrained and do not require external joint restraints or thrust block joint anchors. Pipe thrust blocking shall be provided for 4" and larger pipe sizes if the above conditions are not met according to the specifications.
3. Maintain minimum cover 2.5–feet; except where otherwise shown on plan and profiles.
4. Sloping shoring, and benching shall be in accordance with OSHA Standards.



TYPICAL TRENCH DETAILS

MINIMUM INSTALLATION WIDTH

PIPE I.D. (INCHES)	W (FEET)
6 and less	2.0
Over 6 thru 26	pipe O.D. + 2 min.

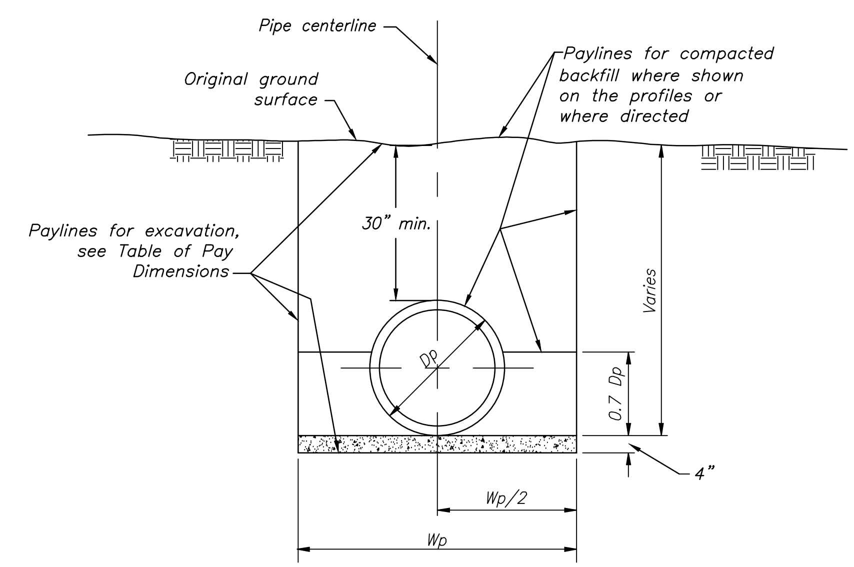
GRADATION LIMITS FOR SELECT MATERIAL

SIZE *	PERCENT BY WEIGHT
Passing No. 200 sieve	5 or less
Passing No. 50 sieve	25 or less

* Maximum size shall not exceed $\frac{3}{4}$ inch.

TABLE OF PAY DIMENSIONS

Pipe I.D. (Inches)	Dp (Inches)	Wp (Feet)
6 and less	I.D. + 2	2.0
Over 6 thru 26	I.D. + 4	pipe Dp + 2



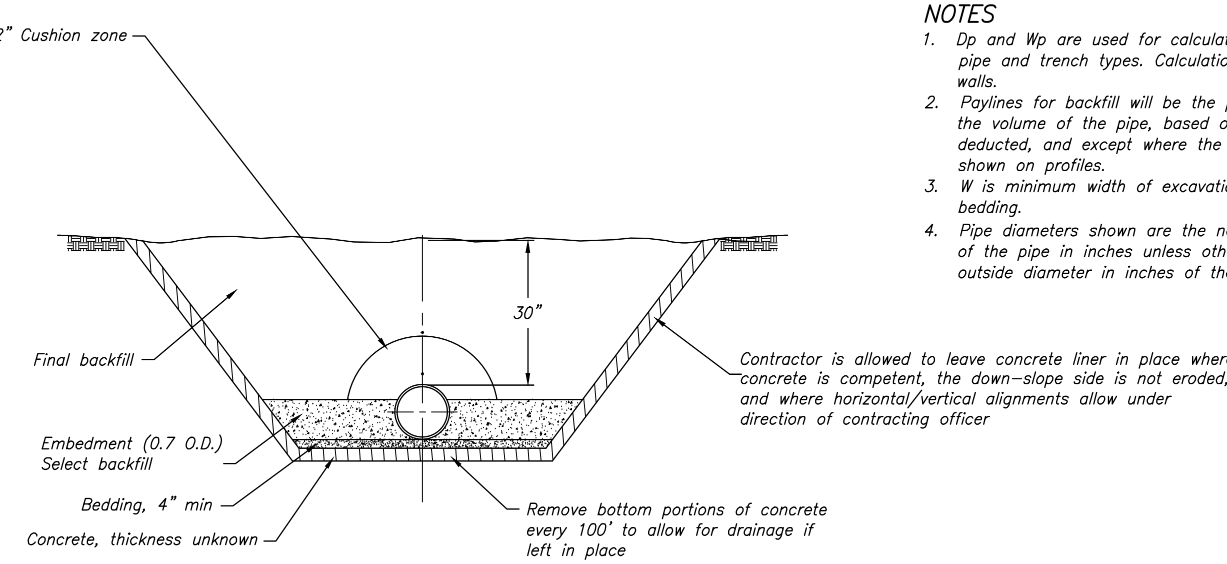
TRENCH FOR PAYLINES ONLY

NOTES

1. Dp and Wp are used for calculating pay quantities for all pipe and trench types. Calculations are based on vertical walls.
2. Paylines for backfill will be the paylines for excavation, except the volume of the pipe, based on the diameter Dp will be deducted, and except where the depth of backfill is limited as shown on profiles.
3. W is minimum width of excavation in feet at bottom of bedding.
4. Pipe diameters shown are the nominal inside diameter (I.D.) of the pipe in inches unless otherwise indicated, O.D. is outside diameter in inches of the pipe actually installed.

TYPICAL TRENCH NOTES:

1. Minimum cover for all pipe shall be thirty inches (30") from top of pipe to finish grade unless otherwise shown on the plans or approved by the Contracting Officer.
2. Foundation – If excavated trench bottom is unstable or not suitable, the Contractor shall excavate to a depth required by the Contracting Officer and backfill with pipe bedding. Place pipe bedding in maximum 6–inch lifts and compact to 90% of maximum dry density. Bottom of trench will be free of rock and smoothed to prevent bridging.
2. Pipe bedding – Select backfill for pipe bedding shall be at least 6 inches deep and shall meet the requirements of the specifications. Bedding may be compacted or un–compacted depending on the recommendations of the pipe manufacturer.
3. Embedment – Select backfill for embedment shall be placed at least 70% of the pipe diameter (O.D.) deep and shall meet the requirements of the specifications. Place select backfill in 6–inch lifts and compact to 90% of maximum dry density.
4. Inner Cushion Zone – The Contractor shall backfill the area within 12" of the pipe with excavated native material or imported material that has a maximum particle size of 0.75" and is free from organic material. The backfill shall be well drained and suitable for placement and compaction. Place backfill in maximum 6–inch lifts and compact to 90% of maximum dry density with the exception of the area directly over the top of the pipe. The area directly over the top of the pipe shall not be mechanically compacted until there is a minimum of 12" of cover over the pipe.
5. Final backfill – The Contractor shall backfill the remaining portion of the trench to the lines and grades shown with excavated native material or imported material that has a maximum particle size of 3 inches and is free from organic material. The backfill shall be well drained and suitable for placement and compaction. Place backfill in maximum 6–inch lifts and compact to 90% of maximum dry density.
6. Tracer tape and locator wire – Tracer tape shall meet the requirements of section 9–15.18 of the WSDOT "Standard Specifications for Road, Bridge, and Municipal Construction" (2014 edition). Locator wire shall be 12 ga. copper multi–strand RHW, certified for direct burial. The tracer tape and locator wire shall be installed along the entire profile of the pressurized pipe (Sta. XX+XX to end).
7. Existing soil conditions – No subsurface exploration has been done along the alignment of the proposed pipeline. The Contractor shall be responsible for assessing existing soil, and ground water conditions before trench excavation.



TRENCH SECTION THROUGH EXISTING CONCRETE LINED CANAL

Sta. 216+50 to Sta. 234+50

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METHOW SUBBASIN
MVID – INSTREAM FLOW IMPROVEMENT PROJECT
PIPE SPECIFICATION AND TRENCHING DETAILS

DESIGNED
DRAWN
CHECKED
TECH. APPR.
ADMIN. APPROVAL
BOISE, ID 2013–09–11

PIPE SPECIFICATIONS AND TRENCH DETAILS

1678–100–
SHEET 1 OF 1
24

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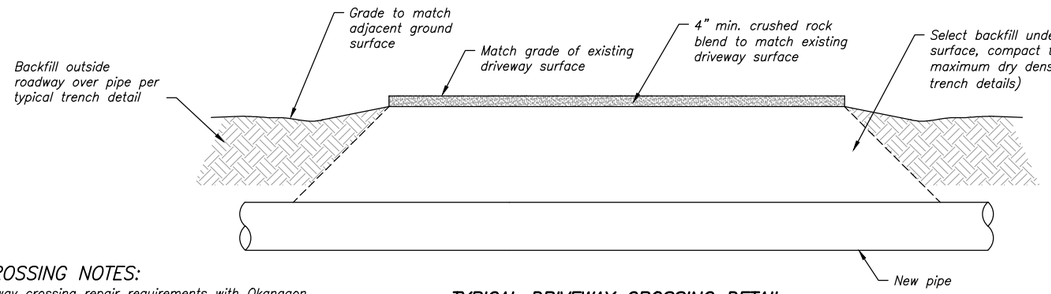
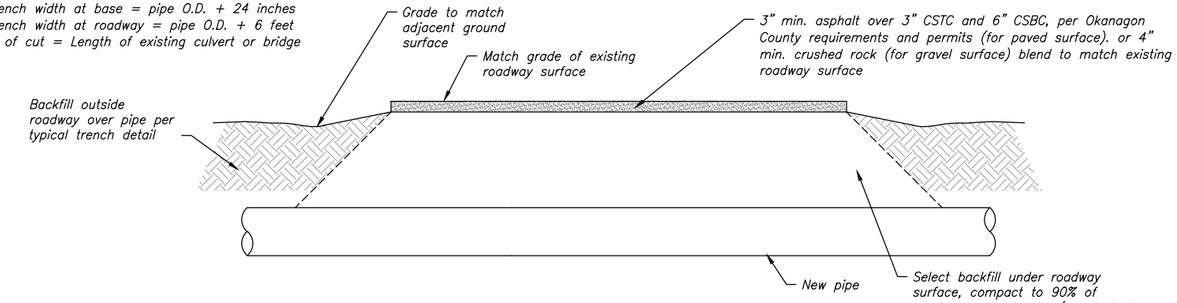
CAD SYSTEM AutoCAD Rel. 19.0s
CAD FILENAME PIPE DETAILS II_JN.DWG



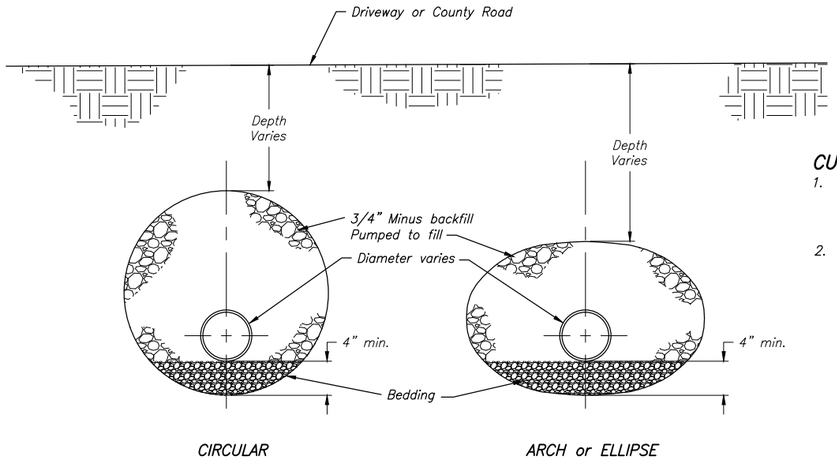
TYPICAL DRIVEWAY CROSSING DETAIL
(Private driveway or roadway)
N.T.S.

TYPICAL CROSSING NOTES:

1. Verify roadway crossing repair requirements with Okanagon County prior to constructing roadway crossing.
2. For payment of materials, trench across roadway shall be as follows:
   Max trench width at base = pipe O.D. + 24 inches
   Max trench width at roadway = pipe O.D. + 6 feet
   Length of cut = Length of existing culvert or bridge



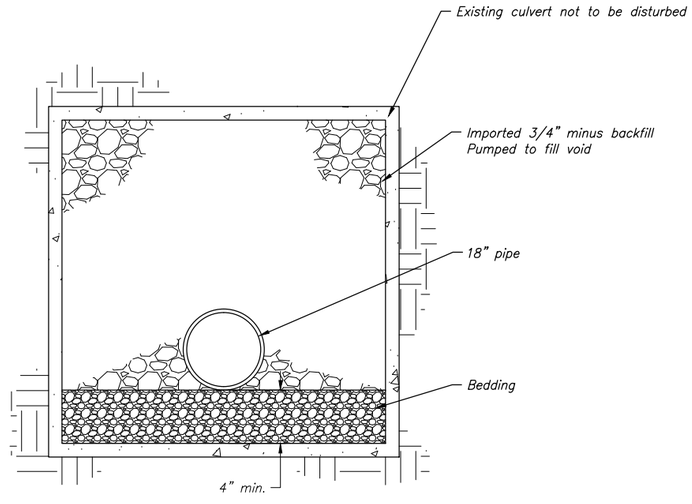
TYPICAL ROADWAY CROSSING DETAIL
(County roadway)
N.T.S.



TYPICAL CULVERT DETAIL
N.T.S.

CULVERT NOTES:

1. With the exception of Highway 20 culvert which must be slipped, contractor can elect to slip the pipe through existing culverts or remove culverts under the direction of the contracting officer.
2. Pipes slipped through existing culverts shall have a minimum of 4" of bedding material and completely embedded in 3/4" minus backfill for support.



BOX CULVERT
HIGHWAY 20 CROSSING
N.T.S.

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FCRPS HABITAT IMPROVEMENT PROGRAM

METHOW SUBBASIN

MVID - INSTREAM FLOW IMPROVEMENT PROJECT
PIPE CROSSING DETAILS

REV NO

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DESIGNED	X	(Designer signs here)
DRAWN	X	(Designer signs here)
CHECKED	X	(Check signs here)
TECH. APPR.	X	(Supervisor signs here)
ADMIN. APPROVAL	NAME, PROF. ABBR.	
	NAME	
	TITLE	
BOISE, ID		2013-09-11

PIPE CROSSING DETAILS

1678-100-

SHEET 1 OF 1

25

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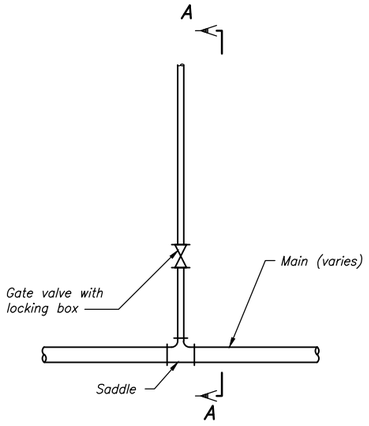
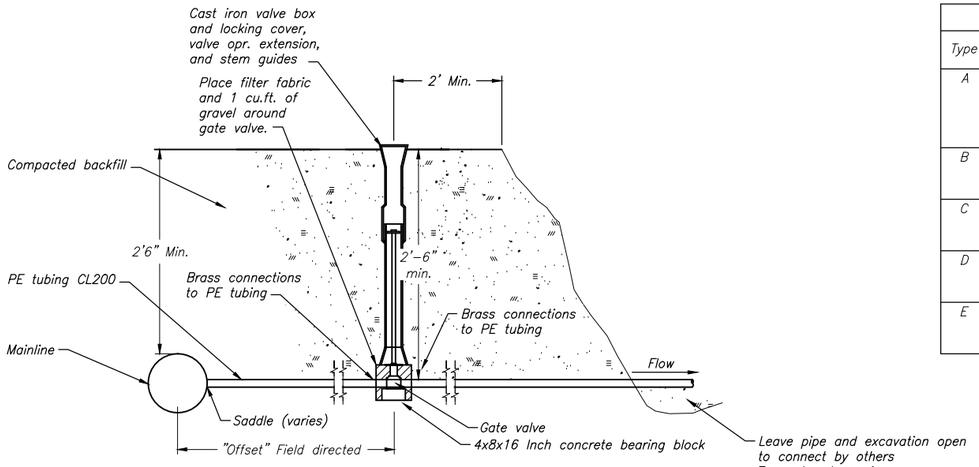
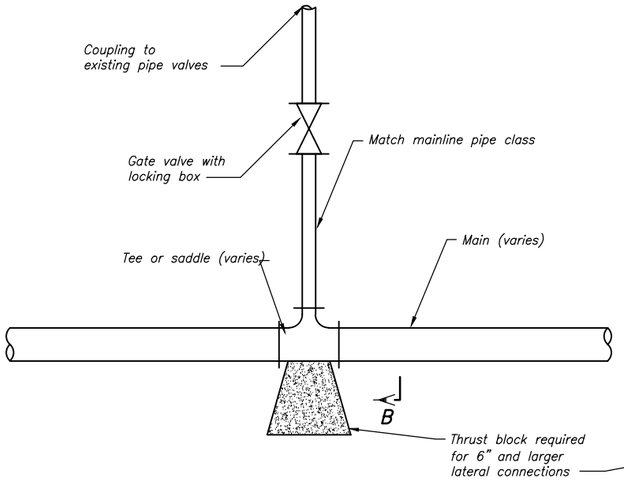


TURNOUT CONNECTION
NOT TO SCALE

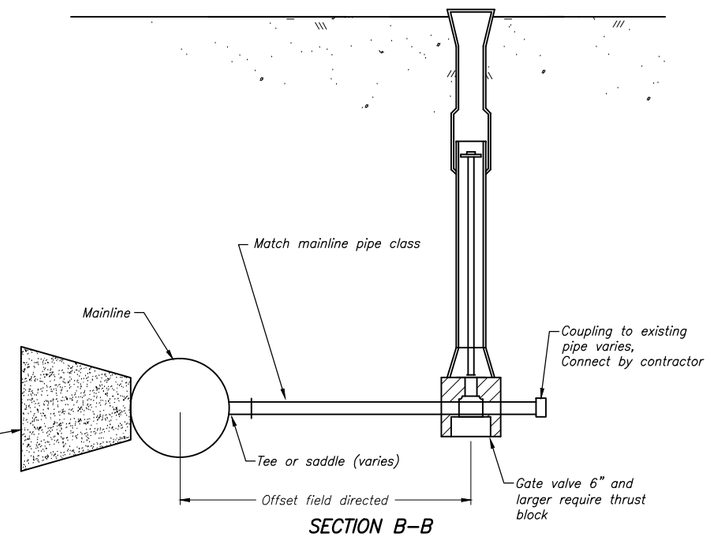


SECTION A–A
(Tee or saddle, pipe, valve, and fittings sized to match turnout type)
NOT TO SCALE

TURNOUT PIPE SIZE				
Type	Pipe Size	Acres	Quantity	Saddle
A	1–1/2"	<1	8	Double Strap Saddle Tap, Romac 202S FIPT, or approved equivalent
B	2"	1–5	20	Double Strap Saddle Tap, Romac 202S FIPT, or approved equivalent
C	3"	5–10	9	Clamp on Saddle Tap, Morrill Industries 1095 or 1096 FIPT, or approved equivalent
D	4"	10 to 20		Clamp on Saddle Tap, Morrill Industries 1095 or 1096 FIPT, or approved equivalent
E	6"	>20	2	Clamp on Saddle Tap, Morrill Industries 1095 or 1096 FIPT, or approved equivalent



LATERAL CONNECTION DETAIL
NOT TO SCALE



SECTION B–B
NOT TO SCALE
(Tee or saddle, pipe, valve, and fittings sized to match lateral pipe specification)

LATERAL CONNECTION SPECIFICATIONS			
A Lateral	Mainline Station Lateral Connection	B Gate Valve Size (in)	Existing Pipe
E1 new	244+05	12	New 12"–Match Mainline Pipe Type and Class
E1 old	260+98	12	Unknown
E2	286+42	15	15" PVC
E4a	310+09	2	New 2" Class 200 Poly Ethylene Tubing
E4b	311+04	2	New 2" Class 200 Poly Ethylene Tubing
E4 Existing	314+01	6	6"–PVC
E5	318+96	10	10" PVC
E7	369+23	6	Unknown
E9	404+40	6	Unknown
E10	412+38	8	Unknown
E11	419+31	6	Unknown
E13	449+56	6	6" PVC

Notes:
1. Locate valve boxes out of traffic areas, as approved.
2. Compact backfill at bends, tee outlets for deliveries, drains and valves, other pipe crossings.
3. Maintain minimum cover 2.5–feet; except where otherwise shown on plan and profiles.

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METHOW SUBBASIN
MVID – INSTREAM FLOW IMPROVEMENT PROJECT
TURNOUT AND LATERAL CONNECTION DETAILS

REV NO

DESIGNED	X	(Designer signs here)
DRAWN	X	(Drafter signs here)
CHECKED	X	(Check signs here)
TECH. APPR.	X	(Approver signs here) NAME, PROF. ABBR.
ADMIN. APPROVAL	X	(Approver signs here) NAME TITLE

BOISE, ID 2013–09–11

TURNOUT AND LATERAL CONNECTION DETAILS

1678–100–

SHEET 1 OF 1

26

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CAD SYSTEM AutoCAD Rel. 19.0s
CAD FILENAME PIPE DETAILS IL_IN.DWG

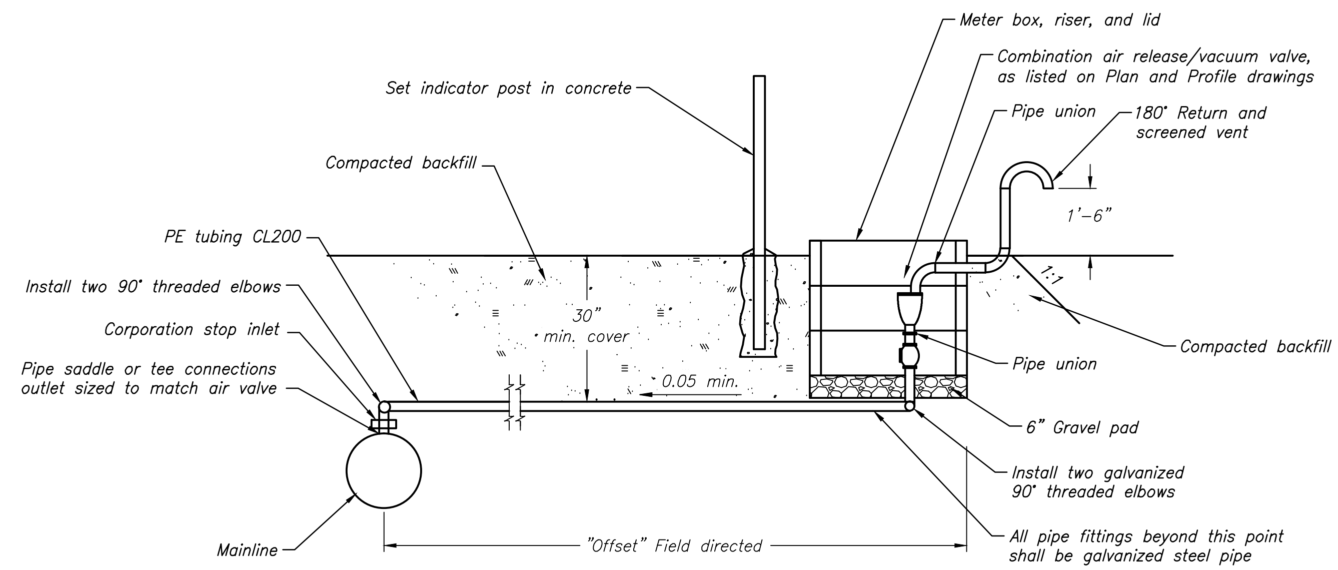
AIR/VACUUM VALVE SPECIFICATIONS

Station	Continuous Acting Air/Vac Valve Diameter (inches)	Number of Valves	Valve Specification	Body Style	Installation Type	Pressure Rating (psi)
229+00	4	1	4" Val-Matic Model No. 204-C.2	Single	Off Set Vault	80
241+00	4	1	4" Val-Matic Model No. 204-C.2	Single	Off Set Vault	80
255+00	4	1	4" Val-Matic Model No. 204-C.2	Single	Off Set Vault	80
270+00	4	1	4" Val-Matic Model No. 204-C.2	Single	Off Set Vault	80
285+00	4	1	4" Val-Matic Model No. 204-C.2	Single	Off Set Vault	80
302+00	4	1	4" Val-Matic Model No. 204-C.2	Single	Off Set Vault	80
318+50	4	1	4" Val-Matic Model No. 204-C.2	Single	Off Set Vault	80
332+00	4	1	4" Val-Matic Model No. 204-C.2	Single	Off Set Vault	80
347+00	4	1	4" Val-Matic Model No. 204-C.2	Single	Off Set Vault	80
368+00	4	1	4" Val-Matic Model No. 204-C.2	Single	Off Set Vault	80
386+00	4	1	4" Val-Matic Model No. 204-C.2	Single	Off Set Vault	80
404+00	4	1	4" Val-Matic Model No. 204-C.2	Single	Off Set Vault	80
419+00	4	1	4" Val-Matic Model No. 204-C.2	Single	Off Set Vault	80
433+50	4	1	4" Val-Matic Model No. 204-C.2	Single	Off Set Vault	80
447+50	4	1	4" Val-Matic Model No. 204-C.2	Single	Off Set Vault	80

Equivalent valves from other manufacturers are acceptable.

THRUST BLOCK MIN. BEARING AREA AGAINST UNDISTURBED SOIL SQUARE FEET

Pipe Size (in)	11.25°	22.5°	30°	45°	90°	Tee/ Dead End/ Reducer	Gate Valve
4	0	0	1	1	2	1	1
6	0	1	1	2	3	2	2
8	1	2	2	3	6	4	3
10	1	2	3	5	9	6	5
12	2	3	5	7	12	9	7
15	3	5	7	11	19	14	11
18	4	8	11	16	29	21	16
21	6	11	15	22	40	29	22
24	7	14	19	28	51	36	28



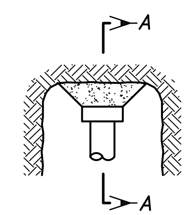
AIR RELEASE/VACUUM VALVE LAYOUT

(Pipe, valve, and fittings sized to match pipe outlet diameters)

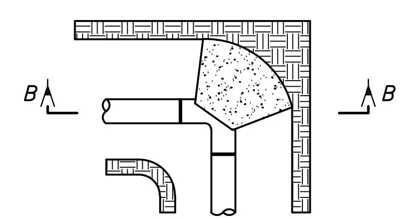
NOT TO SCALE

VERTICAL BLOCKING FOR BENDS

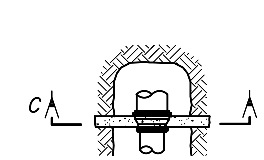
Pipe Size (in)	Vertical Bend	CU FT	X (ft)	Rod Dia	L (ft)
4	11.25°	3	1.5	3/4"	1.0
4	22.5°	6	1.8	3/4"	1.3
4	30°	8	2.0	3/4"	1.5
4	45°	12	2.3	3/4"	1.1
6	11.25°	6	1.8	3/4"	1.3
6	22.5°	12	2.3	3/4"	1.8
6	30°	15	2.5	3/4"	2.0
6	45°	23	2.8	3/4"	1.4
8	11.25°	10	2.2	3/4"	1.7
8	22.5°	20	2.7	3/4"	2.2
8	30°	27	3.0	3/4"	2.5
8	45°	40	3.4	3/4"	1.7
10	11.25°	16	2.5	3/4"	2.0
10	22.5°	32	3.2	3/4"	2.7
10	30°	42	3.5	3/4"	3.0
10	45°	63	4.0	3/4"	2.0
12	11.25°	23	2.8	3/4"	2.3
12	22.5°	46	3.6	3/4"	3.1
12	30°	61	3.9	3/4"	3.4
12	45°	90	4.5	3/4"	2.2
15	11.25°	36	3.3	1"	2.8
15	22.5°	72	4.2	1"	3.7
15	30°	95	4.6	1"	4.1
15	45°	141	5.2	1"	2.6
18	11.25°	54	3.8	1 1/8"	3.3
18	22.5°	107	4.7	1 1/8"	4.2
18	30°	142	5.2	1 1/8"	4.7
18	45°	210	5.9	1 1/8"	3.0
21	11.25°	75	4.2	1 1/4"	3.7
21	22.5°	149	5.3	1 1/4"	4.8
21	30°	198	5.8	1 1/4"	5.3
21	45°	292	6.6	1 1/4"	3.3
24	11.25°	95	4.6	1 3/8"	4.1
24	22.5°	188	5.7	1 3/8"	5.2
24	30°	250	6.3	1 3/8"	5.8
24	45°	370	7.2	1 3/8"	3.6



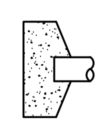
DEAD END



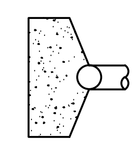
HORIZONTAL BEND



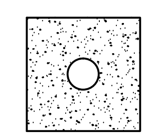
REDUCER



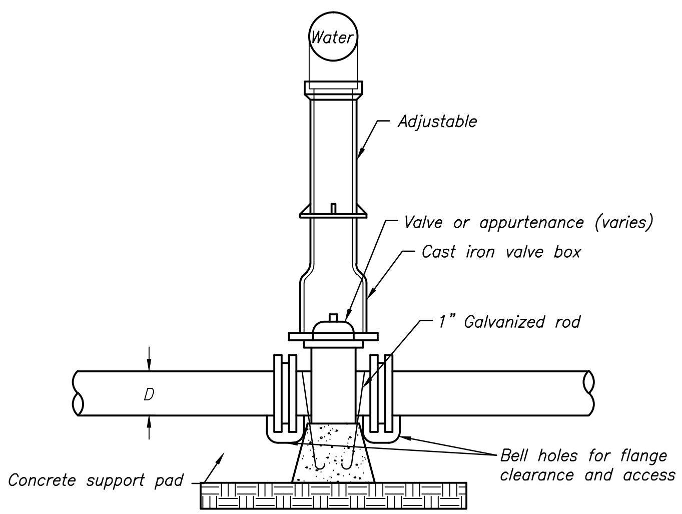
A-A



B-B

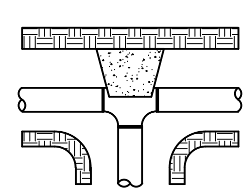


C-C

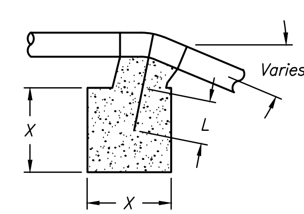


APPURTENANCE SUPPORT PAD

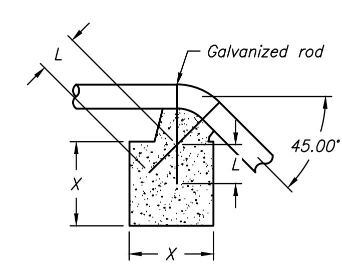
NOT TO SCALE



TEE OR WYE



VERTICAL THRUST BLOCK
11.25°, 22.5° AND 30° BENDS



VERTICAL THRUST BLOCK
45° BEND

RECLAMATION
Managing Water in the West

ALWAYS THINK SAFETY

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

COLUMBIA/SNAKE RIVER SALMON RECOVERY PROGRAM
SUB DIVISION (DIVISION AND UNIT) OR STATE

METHOW SUBBASIN

MVD – INSTREAM FLOW IMPROVEMENT PROJECT
AIR VALVE AND THRUST BLOCK DETAILS

REV NO

DESIGNED
DRAWN
CHECKED
TECH. APPR.
NAME, PROF. ABBR.
ADMIN. APPROVAL
NAME
TITLE

STATION NAME (CITY, ST) YYYY-MM-DD

AIR VALVE AND THRUST BLOCK DETAILS

PRJ-STA-SEQ

SHEET 1 OF 1

27

DATE AND TIME PLOTTED
MAY 30, 2014 10:43
PLOTTED BY
JHNIELSEN

CAD SYSTEM
AutoCAD Rel. 19.0s
CAD FILENAME
PIPE DETAILS II_IN.DWG