

Project Title: Homestake ARD Improvements**Deere & Ault Project No.:** 0652.002**Project Dates:** July 2018 - November 2019**Contractor:**

Tezak Heavy Equipment Co., Inc.
1755 Telstar Drive, Suite 300
Colorado Springs, CO 80920

Owner:

Homestake Water Project
37200 US-24
Buena Vista, CO 81211

Summary of Construction Activities:

Construction of the Homestake Arkansas River Diversion (ARD) Improvements Project began in July of 2018. The project consisted of replacing the existing diversion dam crest with a concrete weir and rockfill spillway channel set adjacent to a low-flow channel on the left bank for recreational use and a fishway on the right bank. The improvements to the ARD also included the replacement of the existing intake structure with a new cast-in-place concrete intake structure and replacing approximately 350 ft of the existing 66-in. diameter concrete pipe with new steel pipe downstream of the intake.

The work was generally split into two phases. Phase 1 consisted of the spillway, fishway, divide wall and temporary access bridge construction; while Phase 2 focused on the construction of the boater channel, intake and pipeline connections on the east bank. The following is a brief overview of construction activities on a monthly basis:

July 2018 – Establishment of BMPs

August 2018 – Road grading, construction of temporary bridge abutments

September 2018 – Diversion of water, assembly of Acrow Bridge, casting of weir wall

October 2018 – Beginning of divide wall, spillway and fishway construction

November 2018 – Continuation of divide wall, spillway & fishway construction

December 2018 – Completion of divide wall, continuation of spillway & fishway construction

January 2019 – Completion of spillway and fishway construction; diversion flipped to run over spillway

February 2019 – Winter Shutdown

March 2019 – Winter Shutdown

April 2019 – Winter Shutdown

May 2019 – Demolition of existing intake and RCP pipe, beginning of valve vault construction

June 2019 – Setting of steel pipe from Sta 0+66 to the first valve vault

July 2019 – Beginning of boater channel construction and intake excavation with a soil nail wall

August 2019 – Setting of pipe around the intake structure, casting of boater channel drops

September 2019 – Steel pipe tie-in to OIP during shutdown, casting of intake slab, walls, and bulkheads

October 2019 – Completion of pipe and intake construction, continuation of boater channel construction

November 2019 – Completion of boater channel construction and commissioning of the ARD.

Commissioning of the ARD took place over a one week period in November with CSU, Aurora, Homestake, Deere & Ault, and Tezak staff in addition to one day of public testing focused around the boater channel. The testing indicated three items that needed remediation – finalization of the upstream approach grade to meet plan elevations, adjustment of the exit to boater channel drop No.2 to meet design grades, and the addition of a drop downstream of the boater channel to help support tailwater through the last drop. The design of this final drop is currently being completed in anticipation of construction of this drop in the Spring of 2020. In addition to these items, before the closeout the project Tezak must still complete the site revegetation and remove two loose boulders on the spillway that fell in during construction of the boater channel.

Beyond these punch list items, the ARD appears to have been built per the design documents and is operating well. The intake is capable of receiving water and does not pose an entrapment hazard to passing swimmers; no leaks have been detected in the steel pipe since flowing water from Twin Lakes; the fishway is functioning at a desirable attraction flow and drop heights; the spillway is operating as intended; the boater channel is passable by a wide variety of whitewater craft and is currently open to the public. Notice of substantial Completion was given earlier this month.

Remaining Construction Punch List:

1. Finalize upstream approach grades in front of the intake
2. Removal of random/loose boulders in spillway channel
3. Fix the apron of Boater Channel Drop No.2 to meet design grades
4. Design and construction of one additional drop downstream of the boater channel
5. Completion of site revegetation

Photographs:

01 – Established phase 1 diversion through the existing intake structure.



02 – Placement of the temporary Acrow Bridge across the Arkansas River for construction access.



03 – Cast weir wall across the spillway and fishway.



04 – Initial divide wall and spillway construction.



05 – October 10, 2018 Site Progress Photo.



06 – November 9, 2018 Site Progress Photo.



07 – November 31, 2018 Spillway/Fishway Progress Photo.



08 – December 24, 2018 Spillway/Fishway Progress Photo



09 – Completed Phase 1 Construction (January 2019).



10 – Partially backfilled steel pipe from the intake structure to the junction structure.



11 – June 11, 2019 diversion at 2,400 cfs.



12 – Boater channel construction.



13 – August 30, 2019 Progress Photo.



14 – OIP section of pipeline installation.



15 – September Progress Photos



16 – Completed intake and boater channel before pulling the cofferdam.



17 – Boater channel flowing at approximately 300 cfs.



18 – Kayaker through the boater channel during the public testing day.



19 – Commissioning of the ARD Boater Channel.



Field Representative: Bryant Charlo, PE

HOMESTAKE ARKANSAS RIVER

DIVERSION IMPROVEMENTS

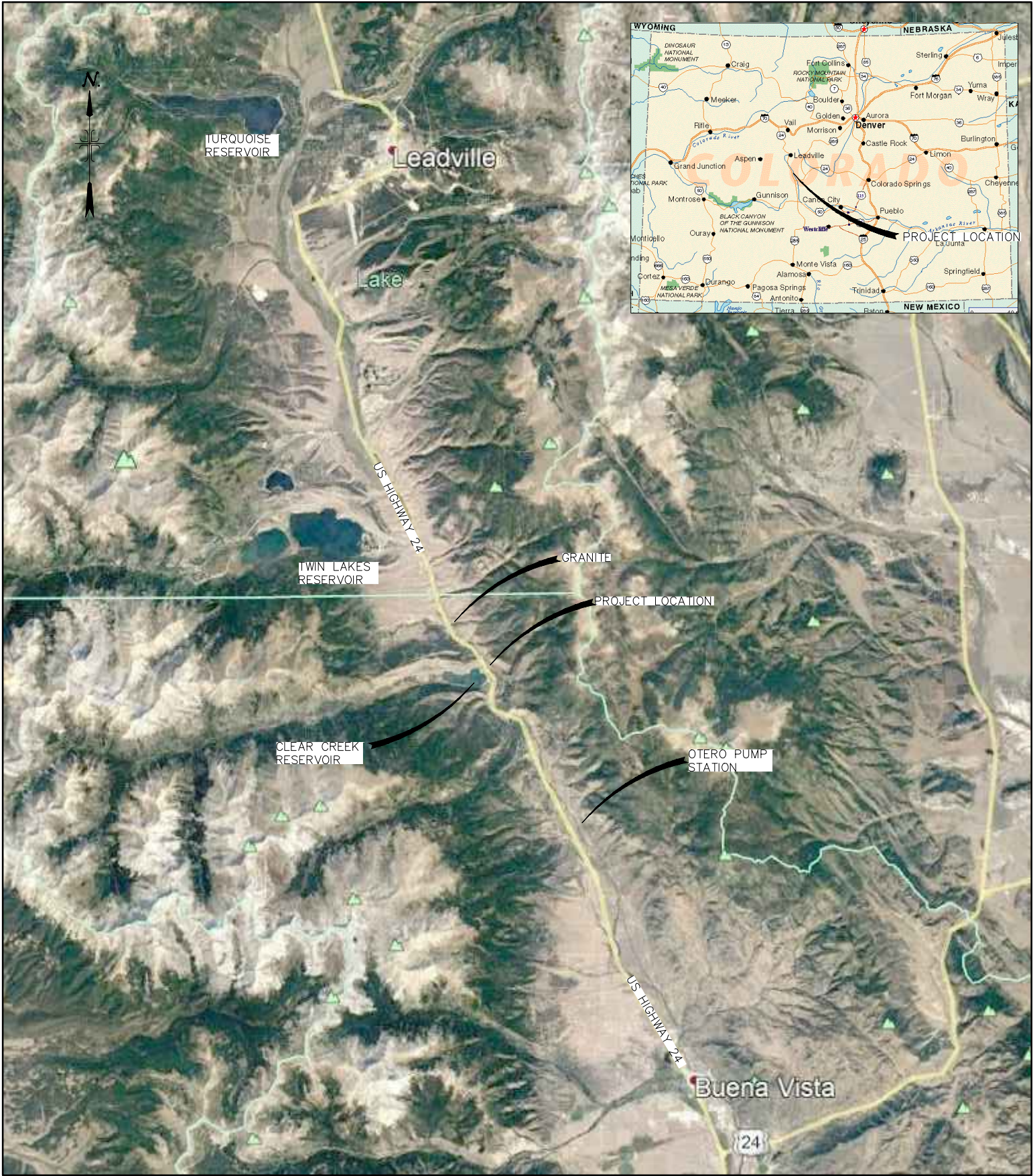
RECORD DRAWINGS

DECEMBER 20, 2019



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VICINITY MAP

DRAWING LIST

GENERAL

- G-1 TITLE SHEET
G-2 VICINITY MAP AND DRAWING LIST
G-3 GENERAL NOTES
G-3 SYMBOLS AND ABBREVIATIONS

- GC-1 GENERAL CIVIL DETAILS I
GC-2 GENERAL CIVIL DETAILS II

- GS-1 GENERAL STRUCTURAL DETAILS I
GS-2 GENERAL STRUCTURAL DETAILS II

- GM-1 GENERAL MECHANICAL SCHEDULES
GM-2 GENERAL MECHANICAL DETAILS

CIVIL

- D-1 DEMOLITION AND SALVAGE PLAN

C-1 EXISTING SITE PLAN
C-2 SITE PLAN
C-3 EROSION AND SEDIMENT CONTROL PLAN AND SITE ACCESS
C-4 COORDINATE TABLES
C-5 PIPELINE PLAN AND PROFILE
C-6 SPILLWAY PLAN AND PROFILE
C-7 FISHWAY PLAN AND PROFILE
C-8 SPILLWAY AND FISHWAY SECTIONS
C-9 BOATER CHANNEL PLAN AND PROFILE
C-10 BOATER CHANNEL SECTIONS

STRUCTURAL

- S-1 INTAKE PLAN, SECTIONS AND DETAILS
S-2 TRASH RACK ELEVATION AND SECTIONS
S-3 BULKHEAD ELEVATION AND SECTIONS
S-4 DIVERSION WEIR
S-5 VAULT, OUTFALL AND JUNCTION STRUCTURE
S-6 BRIDGE SITUATION AND LAYOUT
S-7 BRIDGE ABUTMENT PLAN AND SECTIONS

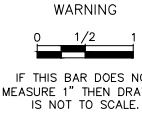
MECHANICAL

- M-1 INTAKE PLAN AND SECTIONS
M-2 VAULT, OUTFALL AND JUNCTION STRUCTURE

REV	DATE	BY	DESCRIPTION
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SCALE:
AS NOTED



DESIGNED: B. CHARLO
DRAWN: P. HUNTER
CHECKED: K. FRITZ

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HOMESTAKE PROJECT
ARKANSAS RIVER DIVERSION

VICINITY MAP AND DRAWING LIST

SHEET

G-1

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GENERAL

- 1. STRUCTURAL DIMENSIONS CONTROLLED BY EXISTING CONDITIONS OR RELATED TO MECHANICAL OR ELECTRICAL EQUIPMENT SHALL BE COORDINATED BY THE CONTRACTOR PRIOR TO PLACING CONCRETE. BOLT SIZES, TYPES, AND PATTERNS SHALL BE VERIFIED WITH THE MANUFACTURER. ALL BOLT PATTERNS SHALL BE TEMPLATED TO INSURE ACCURACY OF PLACEMENT.
- 2. MECHANICAL AND ELECTRICAL EQUIPMENT SUPPORTS, ANCHORAGES, OPENINGS, RECESSES AND REVEALS NOT SHOWN ON THE STRUCTURAL DRAWINGS BUT REQUIRED BY OTHER CONTRACT DRAWINGS, SHALL BE PROVIDED FOR PRIOR TO PLACING CONCRETE.
- 3. STRUCTURAL DRAWINGS SHALL BE USED IN COORDINATION WITH MECHANICAL, ELECTRICAL, ARCHITECTURAL, CIVIL DRAWINGS AND SHOP DRAWINGS PROVIDED BY MANUFACTURERS OF EQUIPMENT.
- 4. STRUCTURES HAVE BEEN DESIGNED FOR OPERATIONAL, HYDROSTATIC, AND BACKFILL LOADS ON THE COMPLETED STRUCTURES. THESE PLANS DO NOT INCLUDE THE NECESSARY COMPONENTS FOR SAFETY OF THE BUILDING OR EQUIPMENT DURING CONSTRUCTION. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL WORK RELATING TO CONSTRUCTION, ERECTION METHODS, BRACING, SHORING, RIGGING, GUYS, SCAFFOLDING, FORMWORK, AND OTHER WORK REQUIRED TO SAFELY PERFORM THE WORK SHOWN.
- 5. UNLESS OTHERWISE SHOWN, ON ALL STRUCTURAL DRAWINGS THE FINISHED GRADE AROUND STRUCTURES IS SHOWN THUS INDICATING EITHER GROUND SURFACE, TOP OF CONCRETE SLAB, OR AC PAVEMENT. FOR DETAILS OF FINISH SURFACES SEE CIVIL AND MECHANICAL DRAWINGS.

STRUCTURAL STEEL

- 1. STEEL CONSTRUCTION SHALL CONFORM TO THE SPECIFICATIONS AND STANDARDS AS CONTAINED IN THE LATEST EDITION OF THE LRFD MANUAL OF STEEL CONSTRUCTION.
- 2. STEEL SHALL BE STAINLESS STEEL TYPE 304 UNLESS NOTED OTHERWISE.
- 3. STEEL JOISTS, BEAMS, AND GIRDERS SHALL NOT BE NOTCHED, CUT OR RELOCATED WITHOUT APPROVAL BY THE ENGINEER.
- 4. ALL WELDING SHALL BE BY THE SHIELDED ARC METHOD AND SHALL CONFORM TO AWS CODE FOR ARC AND GAS WELDING IN BUILDING CONSTRUCTION. QUALIFICATIONS OF WELDERS SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS FOR STANDARD QUALIFICATION PROCEDURE OF THE AWS. CONTRACTOR SHALL SUBMIT WFS.
- 5. ALL DETAILING, FABRICATION AND PLACING SHALL CONFORM TO AISC CODE OF STANDARD PRACTICE, LATEST EDITION.
- 6. HEADED CONCRETE ANCHORS (HCA) SHALL BE 3/8" DIAMETER MINIMUM AND DEFORMED BAR ANCHORS (DBA) SHALL BE #6 MINIMUM UNLESS NOTED OTHERWISE. WELDED ANCHORS SHALL BE AS MANUFACTURED BY NELSON STUD.

CONCRETE

- 1. ALL CONCRETE DESIGN AND CONSTRUCTION SHALL CONFORM TO ACI 350 AND ACI 318.
- 2. UNLESS OTHERWISE NOTED OR SPECIFIED, MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS FOR ALL STRUCTURAL CONCRETE SHALL BE 4000 PSI.
- 3. REINFORCING STEEL SHALL BE DEFORMED BARS CONFORMING IN QUALITY TO THE REQUIREMENTS OF ASTM A-615, "SPECIFICATIONS FOR DEFORMED BILLET-STEEL BARS FOR CONCRETE REINFORCEMENT", GRADE 60. EXCEPTION: BARS RECEIVING WELDS SHALL CONFORM TO ASTM A706.
- 4. ALL DETAILING, FABRICATION AND PLACING OF REINFORCING BARS, UNLESS OTHERWISE INDICATED, SHALL BE IN ACCORDANCE WITH ACI-315, "MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES", LATEST EDITION.
- 5. ALL CONSTRUCTION JOINTS AND SURFACES OF EXISTING CONCRETE RECEIVING ADJACENT PLACEMENT OF FRESH CONCRETE SHALL BE ROUGH AND THOROUGHLY CLEANED FOR BOND AS SPECIFIED.
- 6. LOCATION OF ALL CONSTRUCTION JOINTS SHALL BE AS SHOWN ON THE DRAWINGS OR APPROVED BY THE ENGINEER.
- 7. DOWELS, PIPE, BASE PLATES, AND OTHER EMBEDDED MATERIALS AND ACCESSORIES SHALL BE HELD SECURELY IN POSITION. THE FOLLOWING SHALL BE ADDED:
 - A) IN SLABS #5 RISER BARS AT 36 INCHES OC MAXIMUM TO SUPPORT TOP REINFORCING BARS.
 - B) IN WALLS WITH 2 CURTAINS #3 U OR Z SHAPE SPACERS AT 6 FEET OC EACH WAY.
- 8. SEALANT SHALL BE PLACED AT THE TOP OF ALL JOINTS RECEIVING EXPANSION JOINT FILLER. SEALANT DEPTH SHALL BE THE JOINT FILL THICKNESS OR 1/2", WHICHEVER IS LESS.
- 9. NOT USED.
- 10. TOLERANCES SHALL BE AS INDICATED. FABRICATION AND PLACEMENT OF GATES SHALL RESULT IN THE ALIGNMENT REQUIRED FOR OPERATION OF THE MECHANICAL SYSTEMS WITH WATER TIGHT SEAL IN ALL POSITIONS.
- 11. ADHESIVE ANCHORS SHALL BE 3/8" DIA STAINLESS STEEL THREADED ROD EMBEDDED 6" MIN UNLESS OTHERWISE NOTED. ADHESIVE SHALL BE HILTI HIT-HY 200.
- 12. MECHANICAL ANCHORS SHALL BE 3/8" DIA STAINLESS STEEL HILTI KWIK BOLT TZ EMBEDDED 4" UNLESS OTHERWISE NOTED.
- 13. UNLESS OTHERWISE SHOWN CONCRETE WALLS AND SLABS SHALL BE REINFORCED AS FOLLOWS: #4@12" EW, CENTER OF 6" SECTIONS; #5@12" EW, CENTER OF 8" SECTIONS; #5@12" EW EF OF 12" SECTIONS; #7 @ 12" EW EF OF 14" AND THICKER SECTIONS.
- 14. NO METAL WIRES, CLIPS AND SUPPORTS SHALL BE PLACED IN CONTACT WITH THE FORMS OR THE SUBGRADE. SUPPORTS FOR BARS ABOVE SUBGRADE SHALL BE IN SUFFICIENT NUMBERS TO MAINTAIN LOCATION SHOWN, BUT IN NO CASE SHALL SUCH SUPPORT BE CONTINUOUS.
- 15. DOWELS AND CAST IN PLACE EMBEDS SHALL BE WIRED OR OTHERWISE HELD IN POSITION PRIOR TO PLACEMENT OF CONCRETE.
- 16. UNLESS OTHERWISE INDICATED ON THE DRAWINGS, LAPS OF REINFORCEMENT SHALL BE AS SHOWN ON GS-1.
- 17. LOCATE TWO 3/4 INCH GALVANIZED RICHMOND ROCKET INSERTS, HOHMANN & BARNARD OR EQUAL, STRADDLING CENTERLINE OF EQUIPMENT OVER ALL PUMPS, FLANGE OR METAL PARTS EMBEDDED IN CONCRETE, A MINIMUM OF 2 INCHES CLEARANCE SHALL BE PROVIDED AT ALL TIMES.
- 18. REINFORCING BARS, EMBEDS, AND ACCESSORIES SHALL NOT BE IN CONTACT WITH PIPE, PIPE FLANGE OR METAL PARTS EMBEDDED IN CONCRETE, A MINIMUM OF 2 INCHES CLEAR CONCRETE COVER SHALL BE PROVIDED AT ALL TIMES.
- 19. UNLESS OTHERWISE SHOWN ON THE DRAWINGS ALL ITEMS EMBEDDED IN CONCRETE SHALL BE SPACED ON CENTER AT LEAST 4 TIMES THEIR OUTSIDE DIMENSION. THE OUTSIDE DIMENSION SHALL NOT EXCEED ONE THIRD OF THE MEMBER THICKNESS.
- 20. ELECTRICAL CONDUIT EMBEDDED IN CONCRETE SHALL NOT BE SPACED CLOSER THAN 3 OUTSIDE DIAMETERS ON CENTER. ALUMINUM CONDUIT SHALL NOT BE ENCASED IN CONCRETE.

- 21. UNLESS OTHERWISE SHOWN ON THE DRAWINGS CONCRETE COVER FOR REINFORCING BARS SHALL BE AS FOLLOWS:

FOR CONCRETE PLACED AGAINST EARTH
SEE CONSTRUCTION JOINT DETAILS FOR
THIN SLABS-ON-GRADE. BOTTOM COVER
MAY BE LESS THAN 3" IF SO INDICATED 3"

FOR SURFACES IN CONTACT WITH WATER OR WEATHER
AND FORMED SURFACES IN CONTACT WITH EARTH. 2"

FOR CONCRETE NOT EXPOSED TO WEATHER,
OR IN CONTACT WITH WATER OR EARTH. 1 1/2"

- 22. UNLESS OTHERWISE NOTED, WALLS AND SLABS SHOWN WITH A SINGLE LAYER OF REINFORCEMENT SHALL HAVE THAT REINFORCEMENT CENTERED.
- 23. SLABS WITH SLOPING SURFACES SHALL HAVE THE INDICATED SLAB THICKNESS MAINTAINED AS THE MINIMUM. SLAB BOTTOMS MAY EITHER SLOPE WITH THE TOP SURFACE OR BE LEVEL. REINFORCING IN SLABS WITH SLOPING SURFACES SHALL BE PLACED AT THE REQUIRED CLEARANCE FROM THE SLAB SURFACES.

STRUCTURAL WOOD

- 1. ALL WOOD CONSTRUCTION SHALL CONFORM TO CHAPTER 23 OF THE UNIFORM BUILDING CODE.
- 2. ALL STRESS GRADE LUMBER SHALL COMPLY WITH THE GRADING RULES AS PUBLISHED BY WWPA.
- 3. ALL LUMBER SHALL BE DOUGLAS FIR - LARCH NO. 2 OR BETTER, UNLESS OTHERWISE NOTED.
- 4. BOLT HOLES SHALL BE BORED NOT MORE THAN 1/8 INCH OVERSIZE AND ALL BOLTS SHALL BE PROVIDED WITH 3/16 INCH X 3 INCH SQUARE PLATE WASHERS UNDER NUTS SET AT 100 FT-LBS TORQUE. LAG SCREWS AND NAILS LARGER THAN 20D SHALL BE INSTALLED THROUGH LEAD HOLES EQUAL IN DIAMETER AT THE ROOT OF THE THREADS, MINUS 1/8 INCH.
- 5. ALL WOOD PRODUCTS PLACED WITHIN 8 INCHES OF EARTH OR AGAINST CONCRETE OR MASONRY SHALL BE PRESSURE TREATED WITH A WATER BORNE PRESERVATIVE IN ACCORDANCE WITH AWPA STANDARDS P5, C1, C2 AND C15. TREATMENT SHALL BE APPLIED TO EXPOSED SURFACES OF CUT LUMBER.

RIPRAP

- 1. ELEVATIONS SHOWN REFER TO TOP OF STONE.
- 2. MEAN STONE DIAMETER SHALL BE AS FOLLOWS (SEE SPECIFICATION 02050 FOR INFORMATION NOT SHOWN):

RIPRAP.....30"
LARGE GROUTED RIPRAP.....42"
SMALL GROUTED RIPRAP.....24"
RIPRAP BEDDING.....6"
RIPRAP FILTER BLANKET.....2"

- 3. GROUT DEPTHS FOR PROJECT FEATURES SHALL BE AS FOLLOWS:

SPILLWAY.....60% OF STONE HEIGHT
FISHWAY.....60% OF STONE HEIGHT
FISHWAY WEIR CRESTS.....90% OF STONE HEIGHT
BOATER CHANNEL.....70% OF STONE HEIGHT
DIVIDE WALL TOP.....60% OF STONE HEIGHT
DIVIDE WALL - BOATER CHANNEL SIDE...75% OF STONE HEIGHT
DIVIDE WALL - SPILLWAY SIDE.....60% OF STONE HEIGHT
FISHWAY SILL.....90% OF STONE HEIGHT
INTAKE WINGWALL.....75% OF STONE HEIGHT

DESIGN CRITERIA

DESIGN IN ACCORDANCE WITH THE 2015 EDITION OF THE INTERNATIONAL BUILDING CODE, EXCEPT WHERE OTHER APPLICABLE CODES OR THE FOLLOWING NOTES ARE MORE RESTRICTIVE.

BRIDGE DESIGN SHALL CONFORM TO 2012 EDITION OF AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS WITH INTERIMS.

LOADINGS
SOIL LOADS:

ALLOWABLE BEARING PRESSURE
DEAD PLUS LIVE (PSF) 4,000 PSF

PLATFORM LIVE LOADS:

UNIFORM LIVE LOAD (PSF) 200 PSF

WIND LOADS:

BASE WIND SPEED (3 SEC - MPH) 85
WIND IMPORTANCE FACTOR (1w) 1.0
BUILDING CATEGORY II
EXPOSURE CATEGORY C
INTERNAL PRESSURE COEFFICIENT PER CODE
COMPONENTS AND CLADDING (PSF) PER CODE

SEISMIC LOADS:

SEISMIC USE GROUP III
SPECTRAL RESPONSE COEFFICIENT (Ss) 0.267 g
SPECTRAL RESPONSE COEFFICIENT (S1) 0.079 g
SITE CLASS B
SEISMIC DESIGN CATEGORY C
SEISMIC IMPORTANCE FACTOR (Ie) 1.50

BRIDGE TRUCK LOADS:

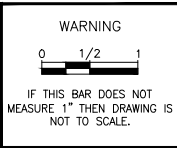
TEMPORARY BRIDGE HS20
WEIGHT OF 20 FT SECTION OF EXISTING PCP 27,000 lb

0	12/20/19	BC	RECORD DRAWINGS
REV	DATE	BY	DESCRIPTION



SCALE:

AS NOTED



DESIGNED: K. FRITZ

DRAWN: P. HUNTER

CHECKED: R. ELDRIDGE

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HOMESTAKE PROJECT
ARKANSAS RIVER DIVERSION
GENERAL NOTES

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ABBREVIATIONS

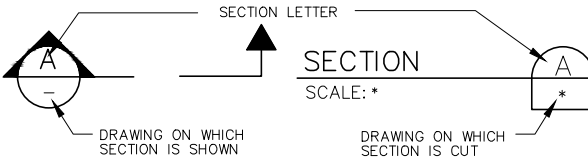
AB	ANCHOR BOLT	MAN	MANUAL
AC	ASPHALT CONCRETE	MAX	MAXIMUM
ACI	AMERICAN CONCRETE INSTITUTION	MCC	MOTOR CONTROL CENTER
ADJ	ADJUSTABLE	MECH	MECHANICAL
AFF	ABOVE FINISH FLOOR	MFR	MANUFACTURER
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION	MIN	MINIMUM OR MINUTE
ALUM	ALUMINUM	MISC	MISCELLANEOUS
APPO	APPROVED	MJ	MECHANICAL JOINT
APPROX	APPROXIMATE	MOD	MODULATING
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS	N	NORTH
AWS	AMERICAN WELDING SOCIETY	NIC	NOT IN CONTRACT
AWWA	AMERICAN WATER WORKS ASSOCIATION	NTS	NOT TO SCALE
BLK	BLACK OR BLOCK	OC	ON CENTER
BM	BEAM OR BENCH MARK	OD	OUTSIDE DIAMETER
BP	BYPASS PIPE	OH	OVER HEAD
CC	CENTER TO CENTER	OP	OVERHEAD POWER
CCP	CONCRETE CYLINDER PIPE	OPER	OPERATOR OR OPERATING
CI	CAST IRON	ORPER	ORP EXHIBIT RETURN
CJ	CONSTRUCTION JOINT	ORPER	ORP EXHIBIT SUPPLY
CKV	CHECK VALVE	OZS	OZONE SOLUTION
CL	CHAIN LINK OR CENTERLINE	PCP	PRESTRESSED CONCRETE PIPE
CLR	CLEAR	PIT	PRESSURE INDICATING TRANSMITTER
CLS	CHLORINE SOLUTION	PL	PLATE, PROPERTY LINE OR PLACE
CMP	CORRUGATED METAL PIPE	POS	POSITION INDICATING
CMU	CONCRETE MASONRY UNIT	PSF	POUNDS PER SQUARE FOOT
CONC	CONCRETE OR CONCENTRIC	PSI	POUNDS PER SQUARE INCH
CONSTR	CONSTRUCTION OR CONSTRUCT	PVC	POLYVINYL CHLORIDE PIPE
COTG	CLEANOUT TO GRADE	QTY	QUANTITY
CPLG	COUPLING	R	RADIUS, RISER, RETURN
CTR	CENTER	RED	REDUCER
CTSK	COUNTERSINK	REINF	REINFORCE OR REINFORCED
CV	CONTROL VALVE	REQ'D	REQUIRED
D	DRAIN	REV	REVISION
DET	DETAIL	RPM	REVOLUTIONS PER MINUTE
DIA	DIAMETER	RT	RIGHT
DIP	DUCTILE IRON PIPE	R/W	RIGHT OF WAY
DP	DIFFERENTIAL PRESSURE	S	SOUTH, SINK, SECOND OR SLOPE
DWG	DRAWING	SCH	SCHEDULE
E	EAST	SECT	SECTION
EA	EACH	SHT	SHEET
EF	EACH FACE OR EXHAUST FAN	SIM	SIMILAR
EL	ELEVATION	STL	STEEL
ELEC	ELECTRICAL OR ELECTRONIC	STRUCT	STRUCTURAL OR STRUCTURE
EQUIP	EQUIPMENT	SYM	SYMMETRICAL OR SYMBOL
EXIST	EXISTING	SPECS	SPECIFICATIONS
EXP JT	EXPANSION JOINT	SQ	SQUARE
EW	EACH WAY	SS	STAINLESS STEEL
FCLER	FREE CHLORINE EXHIBIT RETURN	STA	STATION
FD	FLOOR DRAIN	STD	STANDARD
FG	FINISHED GRADE	TCLER	TOTAL CHLORINE EXHIBIT RETURN
FIG	FIGURE	TURER	TURBIDITY EXHIBIT RETURN
FIN	FINISHED	TURES	TURBIDITY EXHIBIT SUPPLY
FIT	FLOW INDICATOR TRANSMITER	TYP	TYPICAL
FLG	FLANGED	UNO	UNLESS NOTED OTHERWISE
FLR	FLOOR	VAR	VARIES OR VARIABLE
FPS	FEET PER SECOND	VERT	VERTICAL
FT	FEET OR FOOT	VOL	VOLUME
FTG	FOOTING	W	WEST OR WASTE
GA	GAGE OR GAUGE	W/	WITH
GAL	GALLON	W/O	WITHOUT
GALV	GALVANIZED	WPS	WELDING PROCEDURE SPECIFICATION
HE	HEAT EXCHANGER	WS	WATER SURFACE
HCA	HEADED CONCRETE ANCHOR	WSE	WATER SURFACE ELEVATION
HP	HORSEPOWER OR HIGH PRESSURE	WT	WEIGHT
HORIZ	HORIZONTAL	WWM	WELDED WIRE MESH
HV	HAND VALVE	WWM	WELDED WIRE MESH
HYD	HYDRAULIC OR HYDRANT	XFMR	TRANSFORMER
IE	INVERT ELEVATION	YD	YARD
ID	INSIDE DIAMETER	YR	YEAR
IF	INSIDE FACE		
IN	INCH		
INV	INVERT		
JT	JOINT		
LB	POUND		
LIT	LEVEL INDICATING TRANSMITTER		
LRFD	LOAD RESISTANCE FACTOR DESIGN		

SYMBOLS

	BALL VALVE		STRAINER
	CHECK VALVE		DRAIN
	SOLENOID VALVE		ELBOW (45)
	MULTIPORT VALVE - 3 WAY		CENTRIFUGAL OR TURBINE PUMP, OR FAN
	NEEDLE VALVE		FLOW ARROW
	MOTOR OPERATOR FOR VALVES (P = PNEUMATIC)		CHANGE IN PIPING MATERIAL
	MOTOR OPERATOR FOR VALVES (M = ELECTRIC)		EARTH
	PRESSURE GAUGE		GRAVEL/DRAINROCK/AGGREGATE BASE
	PRESSURE GAUGE WITH DIAPHRAGM SEAL		ASPHALT
	PRESSURE SWITCH		GRAVEL
	PRESSURE SWITCH WITH DIAPHRAGM SEAL		FENCE
	PIPE SUPPORT (IN PLAN)		NORTH ARROW
	SCREWED, WELDED, SOCKET-WELD, BELL AND SPIGOT OR HUBLESS FITTING		WATER SURFACE ELEVATION
	TEE (TOP VIEW)		BREAK LINE
	TEE (SIDE VIEW)		BENCH MARK (BM)
	ELBOW (90)		SURVEY MONUMENT
	ELBOW (DOWN)		BOREHOLE
	ELBOW / TEE (SIDE)		SURVEY CONTROL POINT
	PIPE END		COORDINATE NUMBER
	PIPE CUT		REVISION NUMBER
	VICTAULIC COUPLING		REVISION CLOUD
	FLEXIBLE COUPLING		
	UNION		
	QUICK DISCONNECT COUPLER		
	CAPPED END OR PLUGGED END		
	BLIND FLANGE		
	REDUCER OR INCREASER		

SECTION AND DETAIL IDENTIFICATION

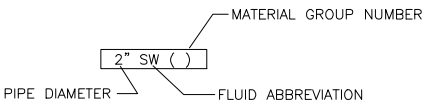
SECTION IDENTIFICATION



DETAIL IDENTIFICATION

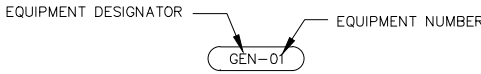


PIPE IDENTIFICATION



EQUIPMENT IDENTIFICATION

SEE EQUIPMENT SCHEDULE/SPECIFICATIONS



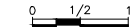
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SCALE:

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WARNING



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DESIGNED: K. FRITZ

DRAWN: P. HUNTER

CHECKED: R. ELDRIDGE

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HOMESTAKE PROJECT

ARKANSAS RIVER DIVERSION

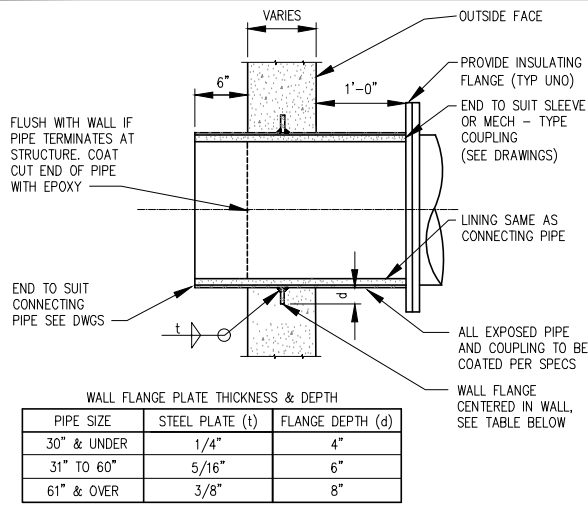
SYMBOLS AND ABBREVIATIONS

SHEET

G-3

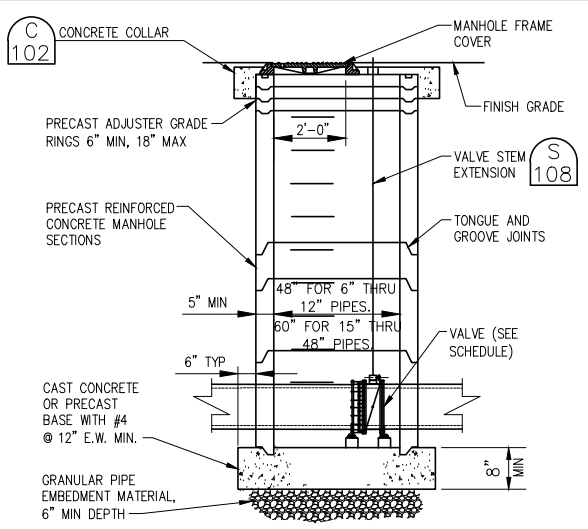
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STEEL PIPE THROUGH OR TERMINATING AT WALL

C 100

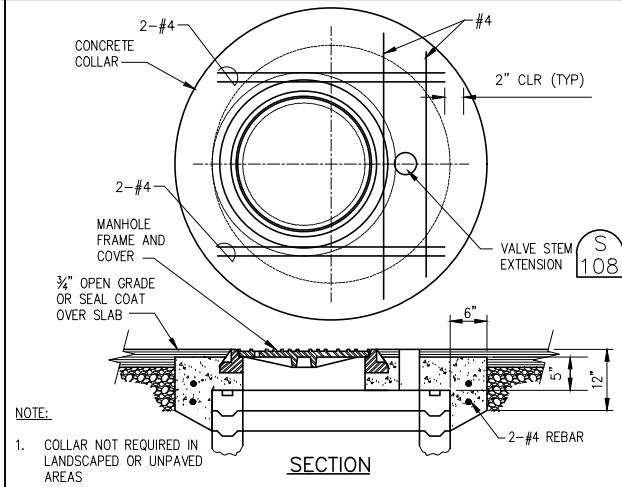


PRECAST MANHOLE

C 101

NOTES:

1. CONSTRUCT WATER TIGHT CONNECTION TO MANHOLE SECTION.
2. MANHOLE SECTION LENGTHS ARRANGED TO FIT DEPTH.
3. SET AND SEAL MANHOLE SECTION JOINTS WITH RN103-RAM-NEK OR EQUAL.
4. ESTABLISHED HIGHWATER ELEVATION AS SHOWN ON DRAWINGS.
5. LADDER RUNGS TO BE CAPABLE OF SUPPORTING A 300# POINT LOAD AND BE OSHA AND ANSI APPROVED.



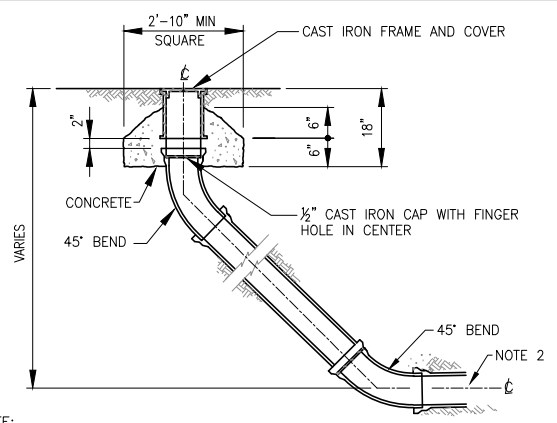
NOTE:

1. COLLAR NOT REQUIRED IN LANDSCAPED OR UNPAVED AREAS
2. PLACE REINF IN CENTER OF CONCRETE 2" CLR OF METAL OBJECTS.

SECTION

CONCRETE COLLAR

C 102

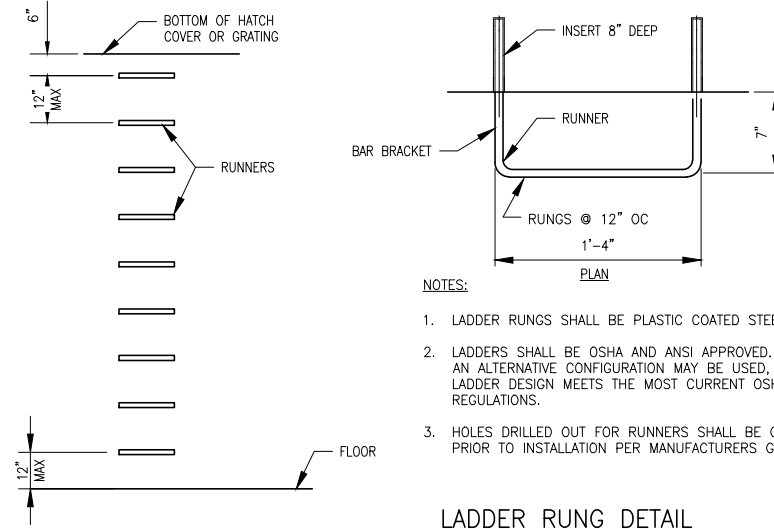


NOTE:

1. IF IN UNIMPROVED AREA TOP SHALL BE 6" ABOVE GRADE.
2. SEE PLAN FOR LOCATION AND ELEVATION. PIPE AND FITTINGS SHALL BE OF THE SAME MATERIAL AS THE MAIN LINE.

CLEANOUT TO GRADE (COTG)

C 103

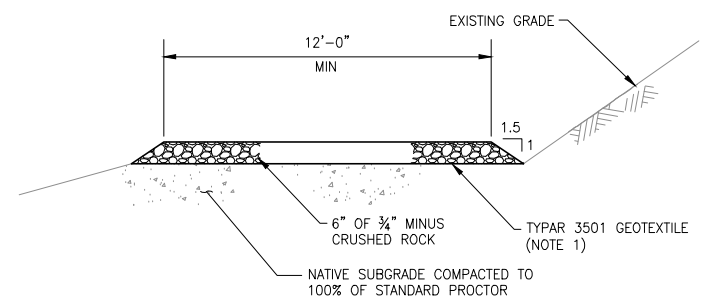


NOTES:

1. LADDER RUNGS SHALL BE PLASTIC COATED STEEL.
2. LADDERS SHALL BE OSHA AND ANSI APPROVED. A LADDER WITH AN ALTERNATIVE CONFIGURATION MAY BE USED, PERMITTING THE LADDER DESIGN MEETS THE MOST CURRENT OSHA AND ANSI REGULATIONS.
3. HOLES DRILLED OUT FOR RUNNERS SHALL BE CLEANED OUT PRIOR TO INSTALLATION PER MANUFACTURERS GUIDELINES.

LADDER RUNG DETAIL

C 104



NOTE:

1. GEOTEXTILE REQUIRED ONLY ON TEMPORARY BRIDGE APPROACHES. SEE DRAWING C-3 FOR EXTENTS.

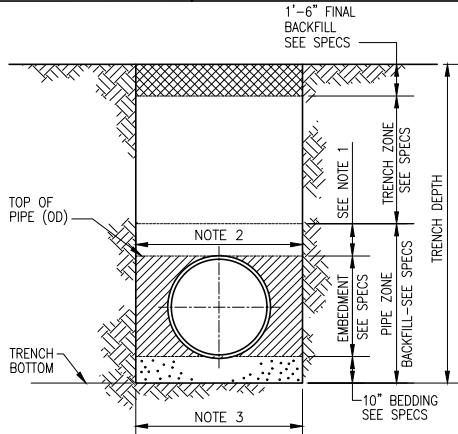
GRAVEL ROADWAY

C 106

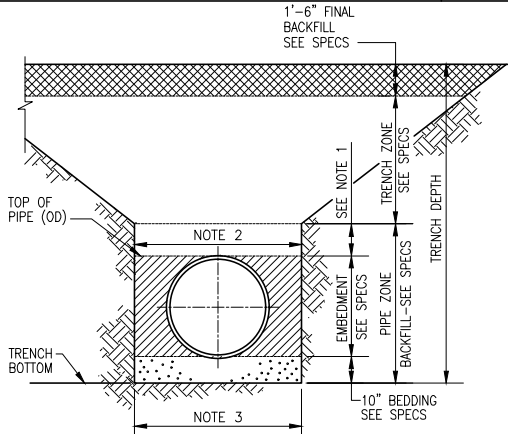
- A. FLEXIBLE PIPE REFERS TO ALL STEEL, DUCTILE-IRON AND PLASTIC PIPES.
- B. TYPICAL TRENCH SECTIONS (I AND II) ARE TO BE USED ONLY WHERE STABLE, COMPACT SOIL CONDITIONS EXIST. IF BOULDER OR LARGE OBSTRUCTIONS WOULD BE ENCOUNTERED, TRENCH SECTIONS MAY BE DEEPER OR WIDER THAN SHOWN. THE ENGINEER SHOULD BE ADVISED SHOULD THIS OCCUR.
- C. THE NEED FOR PROTECTIVE SYSTEMS, AND EXCAVATION SLOPES SHALL BE DETERMINED CONSIDERING APPLICABLE LOCAL, STATE AND FEDERAL (OSHA) SAFETY STANDARDS AND REGULATIONS AND GEOTECHNICAL CONSULTANTS' RECOMMENDATIONS.
- D. PROTECTIVE SYSTEMS SHALL BE DESIGNED AND BUILT IN ACCORDANCE WITH THE APPLICABLE LOCAL, STATE AND FEDERAL (OSHA) SAFETY STANDARDS AND REGULATIONS.
- E. SUPPORTING DOCUMENTATION SHALL BE SUBMITTED TO THE ENGINEER REGARDING PIPE DESIGN AND COMPLIANCE WITH APPLICABLE LOCAL, STATE AND FEDERAL (OSHA) SAFETY STANDARDS.
- F. UNSUPPORTED VERTICAL AND/OR SLOPING TRENCH WALL SLOPES SHALL NOT BE STEEPER THAN ALLOWED BY APPLICABLE LOCAL, STATE AND FEDERAL (OSHA) SAFETY STANDARDS AND REGULATIONS. UNLESS SUPPORTING DOCUMENTATION IS SUBMITTED, ACCORDING TO AFOREMENTIONED SAFETY STANDARDS.
- G. TRENCH SECTIONS OTHER THAN THE TYPICAL SECTIONS SHOWN MAY BE UTILIZED PROVIDED THEY COMPLY WITH APPLICABLE LOCAL, STATE AND FEDERAL (OSHA) SAFETY STANDARDS AND REGULATIONS. DOCUMENTATION SUPPORTING THIS COMPLIANCE AND PIPE DESIGN CALCULATIONS SHALL BE SUBMITTED TO THE ENGINEER.
- H. IF OVER-EXCAVATION DUE TO POOR FOUNDATION MATERIAL IS ORDERED BY THE ENGINEER, THE BACKFILL MATERIAL SHALL BE ACCORDING TO THE EARTHWORK SECTION OF THE SPECIFICATIONS ARTICLE ENTITLED, "USE OF FILL, BACKFILL AND EMBANKMENT MATERIAL TYPES."
- I. IF DURING CONSTRUCTION, THE WATER TABLE WILL BE DISCOVERED TO BE ABOVE THE TRENCH BOTTOM, THE ENGINEER SHALL BE NOTIFIED, AND APPROPRIATE DEWATERING SHALL BE IMPLEMENTED TO LOWER THE WATER LEVEL BELOW THE TRENCH BOTTOM. THE BACKFILL MATERIAL SHALL BE ACCORDING TO THE EARTHWORK SECTIONS OF THE SPECIFICATIONS, OR AS ORDERED BY THE ENGINEER.

NOTES:

1. 6" MIN FOR PIPE DIAMETER < 24"
- 12" MIN FOR PIPE DIAMETER > 24"
2. MAX TRENCH WIDTH @ TOP OF PIPE OD + 36" FOR, 18" & LARGER PIPE OD OD + 24" FOR LESS THAN 18"
3. MIN TRENCH BOTTOM WIDTH: OD + 24" FOR MECHANICAL COMPACTION



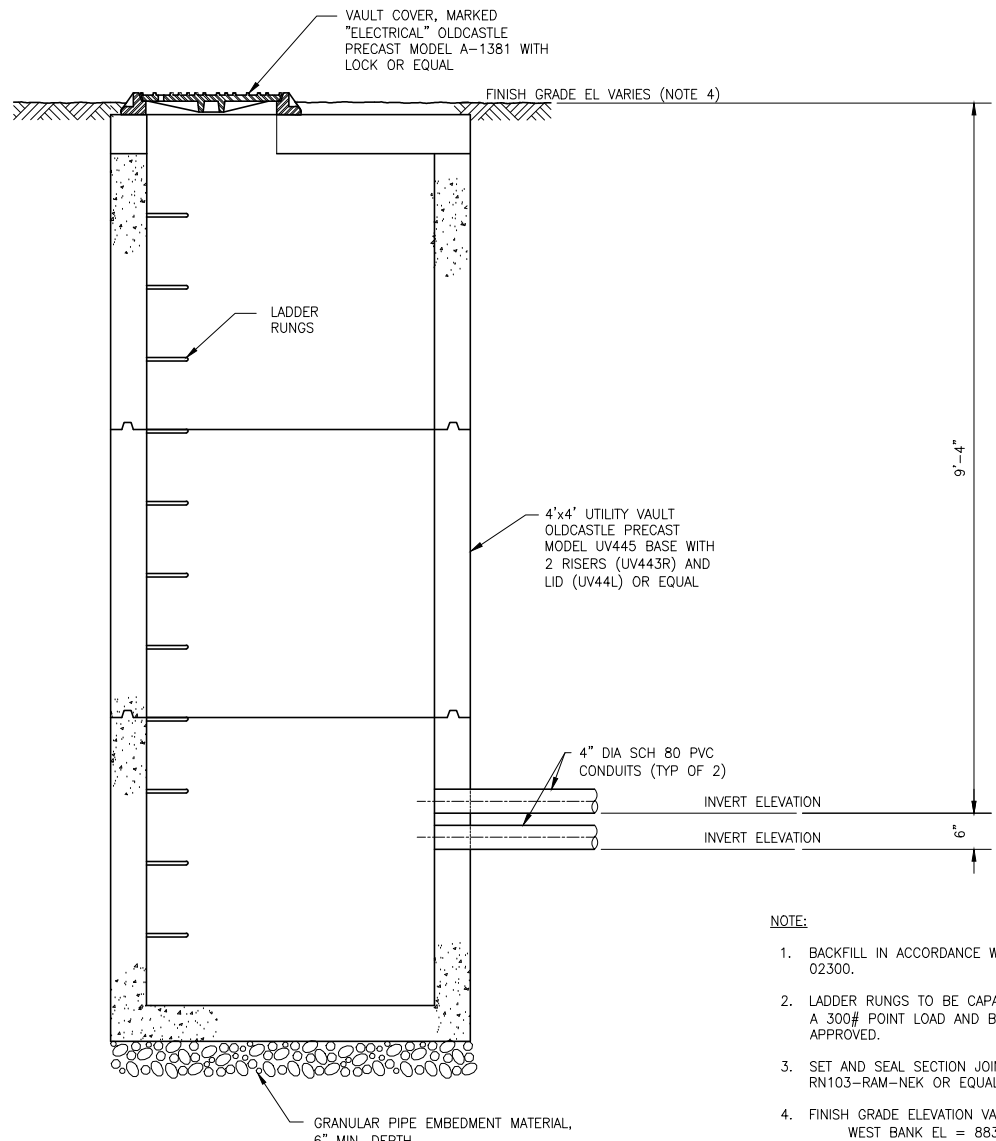
TRENCH SECTION - TYPE I



TRENCH SECTION - TYPE II

TRENCH SECTION FLEXIBLE PIPE

C 107



NOTE:

1. BACKFILL IN ACCORDANCE WITH SPECIFICATION 02300.
2. LADDER RUNGS TO BE CAPABLE OF SUPPORTING A 300# POINT LOAD AND BE OSHA AND ANSI APPROVED.
3. SET AND SEAL SECTION JOINTS WITH RN103-RAM-NEK OR EQUAL.
4. FINISH GRADE ELEVATION VARIES AT EACH BANK. WEST BANK EL = 8837.00' EAST BANK EL = 8844.22'

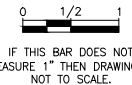
UTILITY VAULT

C 108

SCALE:

AS NOTED

WARNING



DESIGNED: B. CHARLO

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HOMESTAKE PROJECT
ARKANSAS RIVER DIVERSION

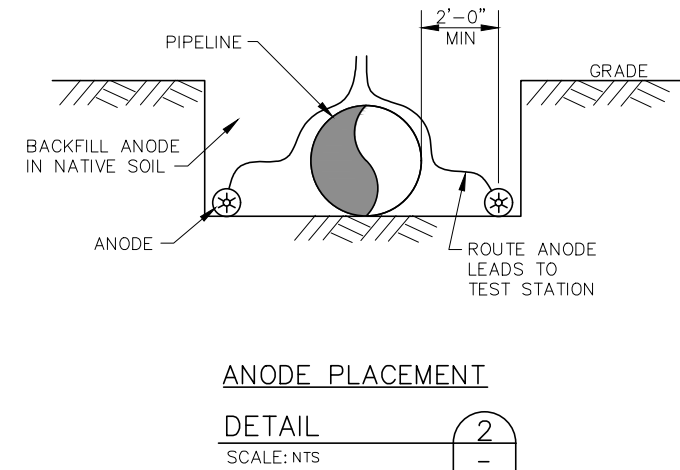
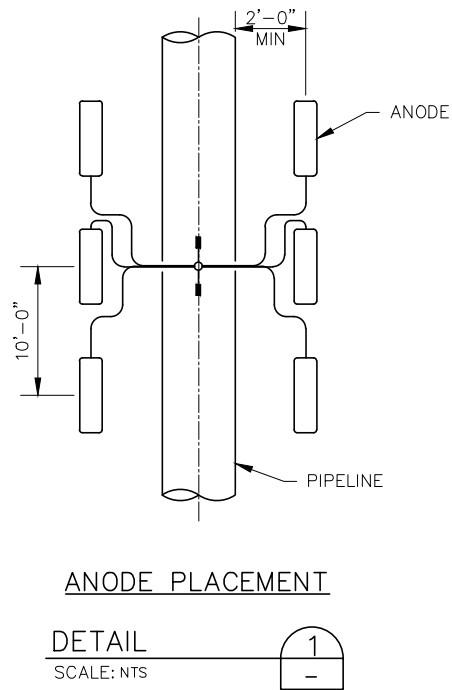
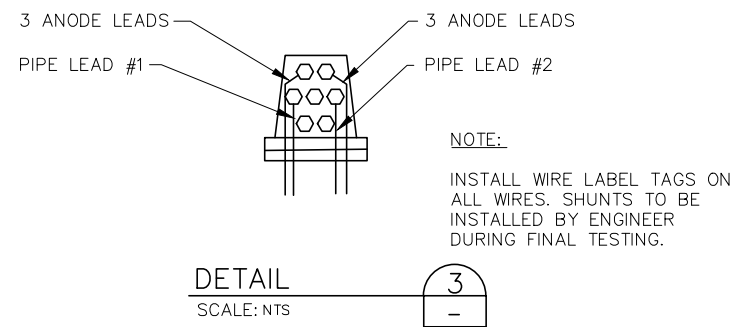
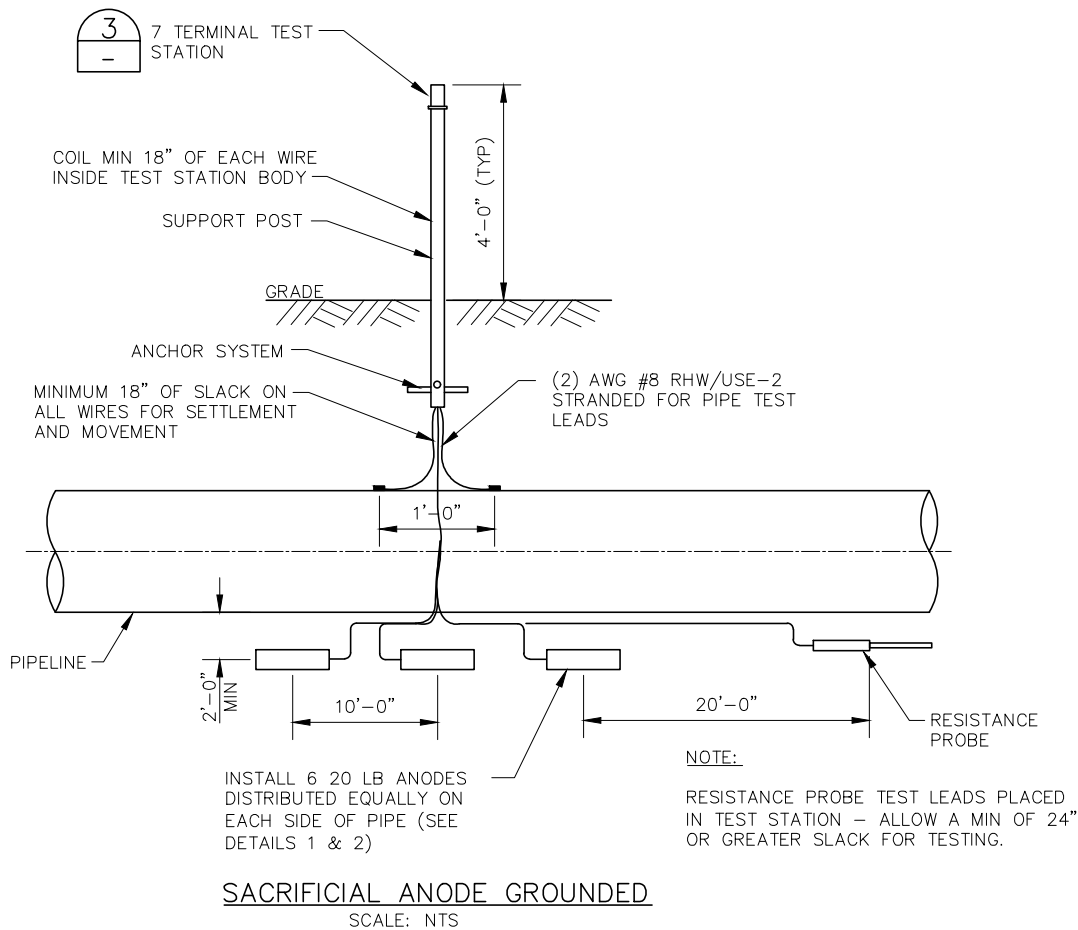
GENERAL CIVIL DETAILS I

SHEET

GC-1

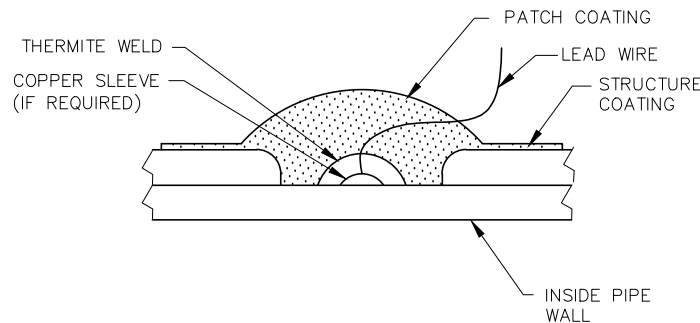
REV	DATE	BY	DESCRIPTION
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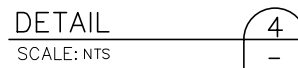
NOTES:

- CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER OF ANY DISCREPANCIES BETWEEN THE PLANS FOR THIS PROJECT AND ACTUAL FIELD CONDITIONS WHICH MAY INTERFERE WITH THIS PROJECT.
- CONDUCTORS SHALL BE MINIMUM #10 AWG, RHW/USE-2 UNLESS OTHERWISE INDICATED
- NO BELOW GRADE SPLICING OF CATHODIC PROTECTION WIRES IS ALLOWED WITHOUT PRIOR APPROVAL FROM THE ENGINEER. CONTRACTOR SHALL ENSURE ALL WIRES ARE OF SUFFICIENT LENGTH FOR EACH INTENDED APPLICATION.
- INSTALL ANODES A MINIMUM OF 3' AND MAXIMUM OF 10' FROM THE PROTECTED STRUCTURE AND ANY OTHER UNDERGROUND METALLIC STRUCTURES.
- INSTALL ANODES A MINIMUM OF 10' FROM EACH OTHER (FROM CENTER).
- REMOVE ANODES AND REFERENCE ELECTRODES FROM PLASTIC OR OTHER SHIPPING BAG AND POSITION ACCORDING TO DRAWINGS. DO NOT REMOVE CLOTH SACK.
- BACKFILL WITH NATIVE SOIL A MINIMUM OF 12" AROUND ANY ANODES AND REFERENCE ELECTRODES THEN FLOOD EACH ANODE WITH A MINIMUM OF 5 GALLONS OF FRESH WATER. AFTER WATER ABSORPTION, CONTINUE BACKFILLING AS PER SPECIFICATIONS.
- ROUTE ALL STRUCTURE AND ANODE LEADS TO A TEST STATION IF PRESENT. DO NOT INSTALL ANY SHUNTS OR MAKE WIRE TO WIRE CONNECTIONS. THIS WILL BE ACCOMPLISHED DURING SYSTEM COMMISSIONING AND TESTING.
- TYPICAL WIRE INSULATION:
BLUE: PRIMARY STRUCTURE
WHITE: FOREIGN STRUCTURE
YELLOW: REFERENCE ELECTRODE
BLACK: ANODE OR JOINT BOND
ORANGE: CASING PIPING
GREEN: COUPON
- PROVIDE JOINT BOND WIRES BETWEEN SLEEVE COUPLINGS AND CONNECTING STEEL PIPE



NOTES:

- REMOVE APPROXIMATELY 4" DIA OF PIPELINE COATING AT STRUCTURE CONNECTION LOCATION.
- CLEAN AREA APPROXIMATELY 2" DIA TO BRIGHT METAL.
- REMOVE 2" OF INSULATION FROM END OF WIRE.
- WELD CONDUCTOR TO PIPE. USE APPROPRIATE GRAPHITE MOLD AND CARTRIDGE CHARGE SIZE.
- TEST THE THERMITE WELD CONNECTION BY STRIKING THE COMMON SEVERAL BLOWS ON THE SIDE USING A ONE POUND HAMMER. TOP OF WELD MAY BE HAMMERED FLAT IF REQUIRED.
- APPLY ROYSTON HANDY-CAP PER MANUFACTURERS INSTRUCTIONS.



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WARNING
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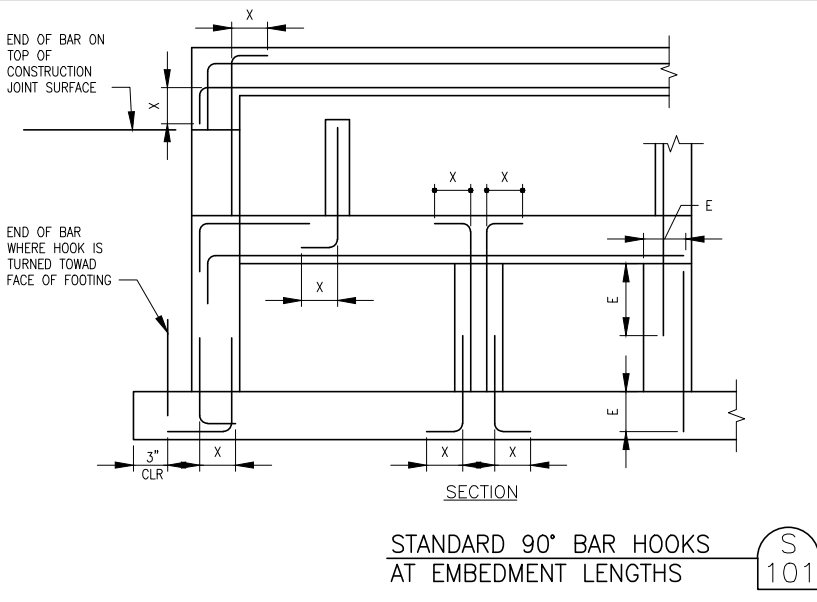
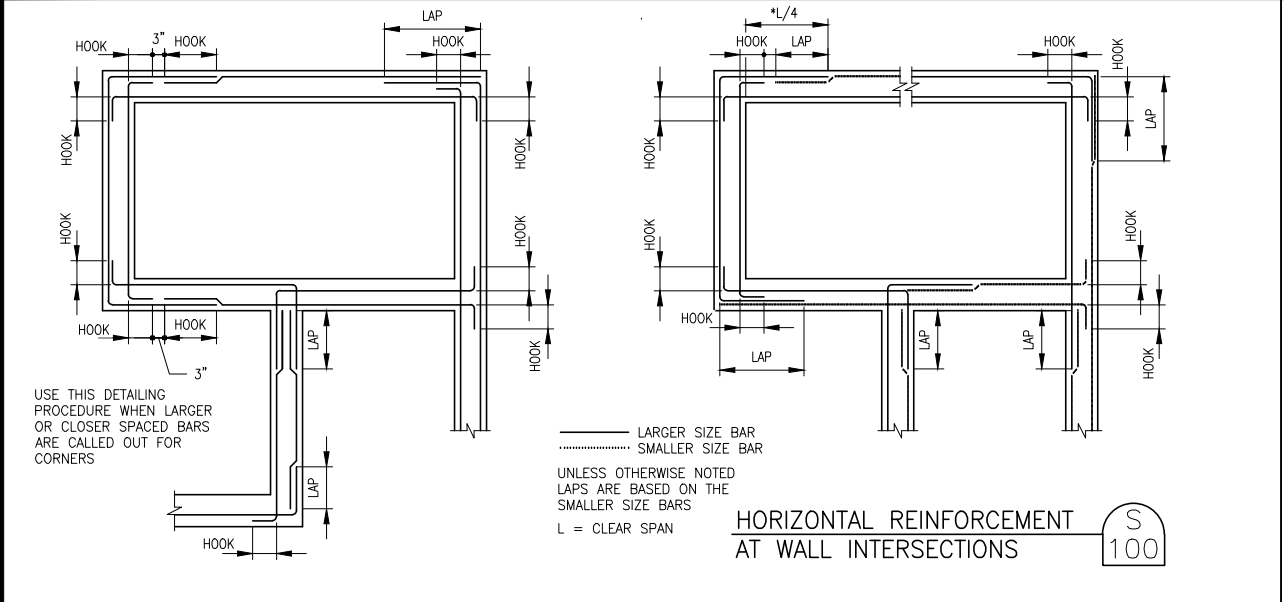
DESIGNED: B. CHARLO
DRAWN: P. HUNTER
CHECKED: K. FRITZ

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HOMESTAKE PROJECT
ARKANSAS RIVER DIVERSION
GENERAL CIVIL DETAILS II

SHEET
GC-2

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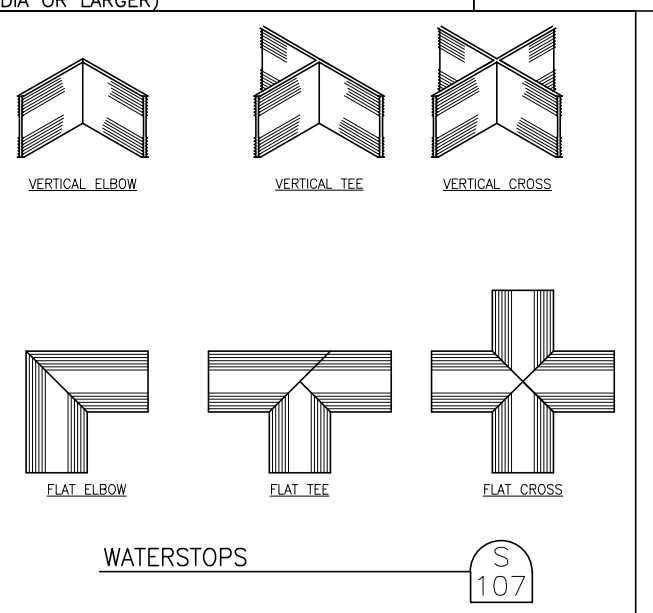
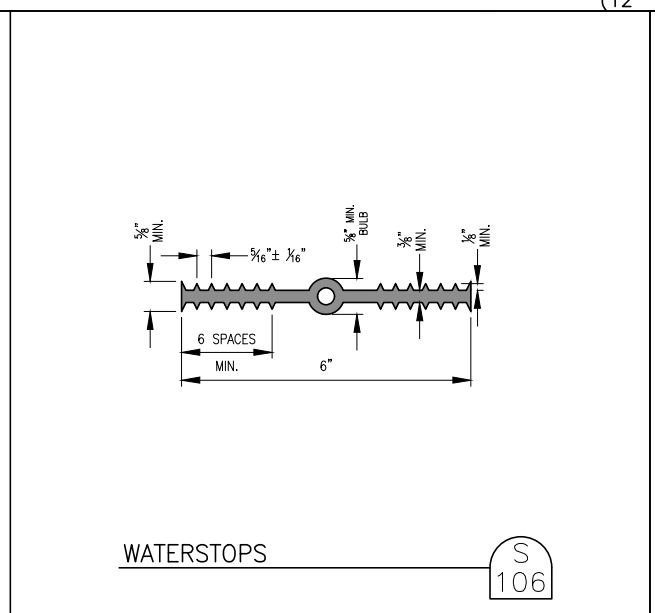
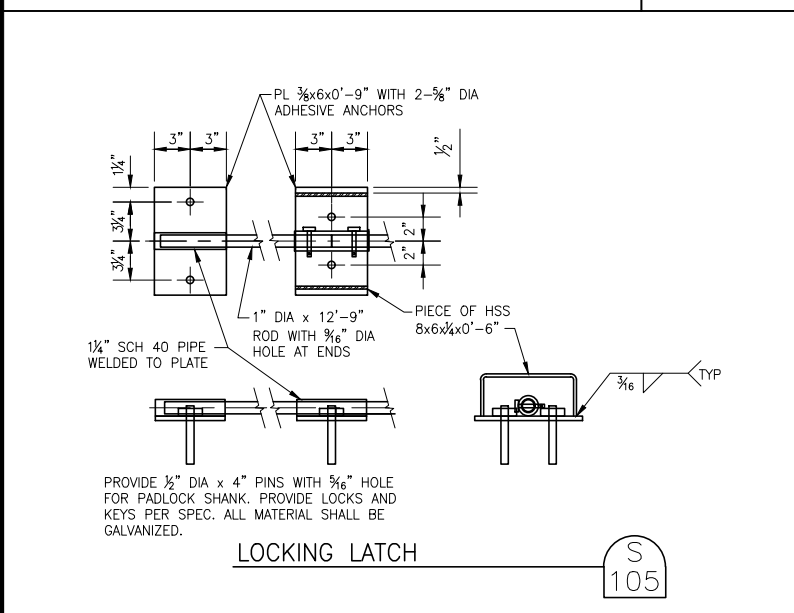
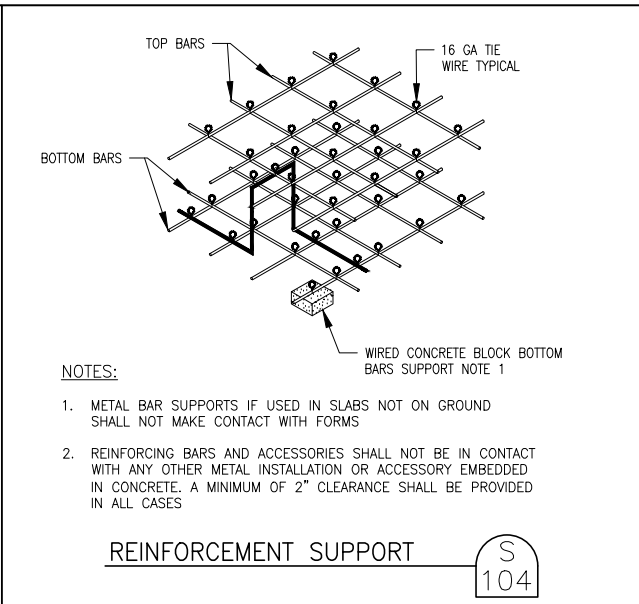
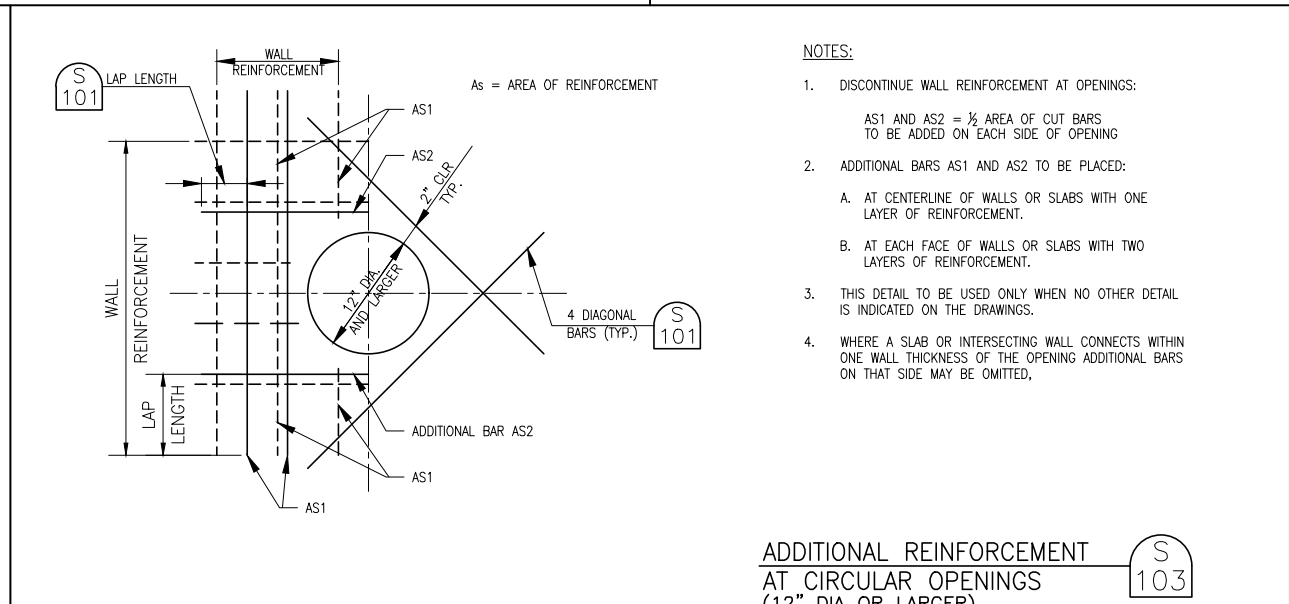
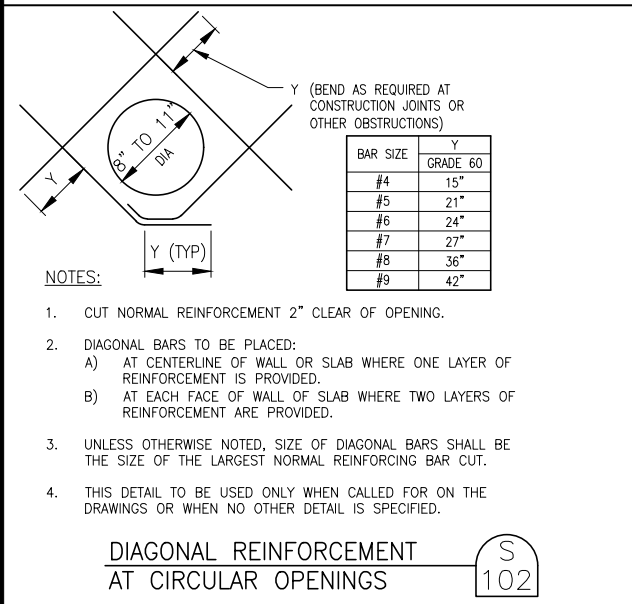


LENGTH (*)			
BAR SIZE	HOOK X	LAP	EMBEDMENT E
#3	6"	16" (21")	12" (16")
#4	8"	16" (21")	12" (16")
#5	10"	20" (26")	15" (20")
#6	12"	28" (37")	22" (28")
#7	14"	48" (62")	37" (48")
#8	16"	62" (81")	48" (62")
#9	19"	79" (102")	61" (79")
#10	22"	100" (130")	77" (100")
#11	24"	123" (160")	95" (123")

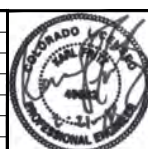
* USE LENGTH IN PARENTHESIS FOR WALL HORIZONTAL REBARS AND SLAB BARS WITH 12" OR MORE OF FRESH CONCRETE UNDERNEATH

NOTES:

- USE LAP LENGTHS AS DETERMINED FOR THESE TABLES UNLESS SHOWN OTHERWISE.
- THE TABLES SHOWN ARE FOR $f'_c=4000\text{psi}$, $f_y=50,000\text{psi}$, 1.5" MIN CONCRETE COVER AND 3" MIN BAR SPACING.
- WHEN BARS OF DIFFERENT SIZES ARE LAP SPLICED, LAP LENGTH SHALL BE THE LARGER OF:
4. EMBEDMENT LENGTH OF LARGER BAR
5. LAP LENGTH OF SMALLER BAR
- STAGGER ADJACENT BAR SPLICES IN SLABS AND IN WALLS.
EXCEPTION: SPLICES OF VERTICAL BARS AT DOWELS EMBEDDED IN BASE SLABS OR FOOTINGS NEED NOT BE STAGGERED.
- ALL DOWEL BARS SHALL EXTEND AN EMBEDMENT LENGTH E INTO ANOTHER MEMBER OR ACROSS A CONSTRUCTION JOINT UNLESS SHOWN TO SPLICE WITH OTHER BARS OR TO EXTEND TO THE FAR FACE OF THE MEMBER AND END WITH A STANDARD HOOK.



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SCALE:
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WARNING
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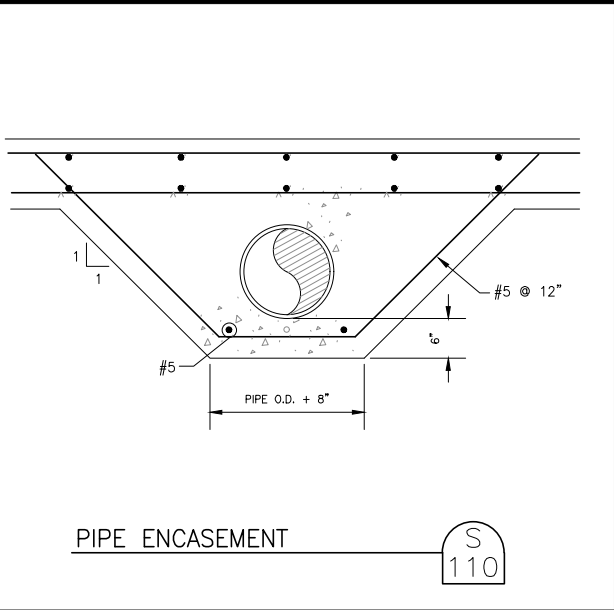
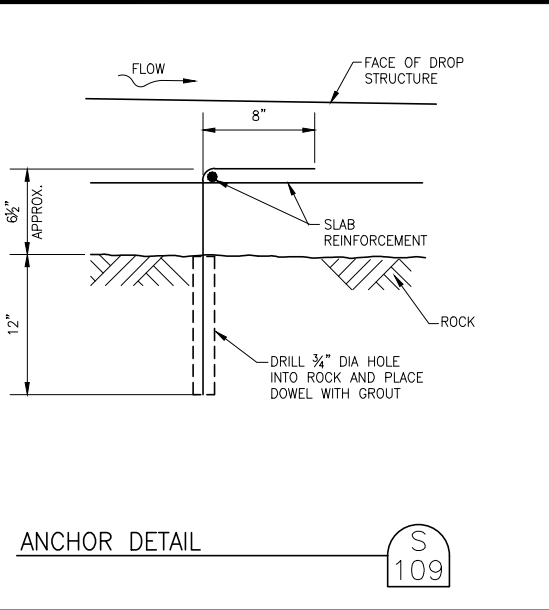
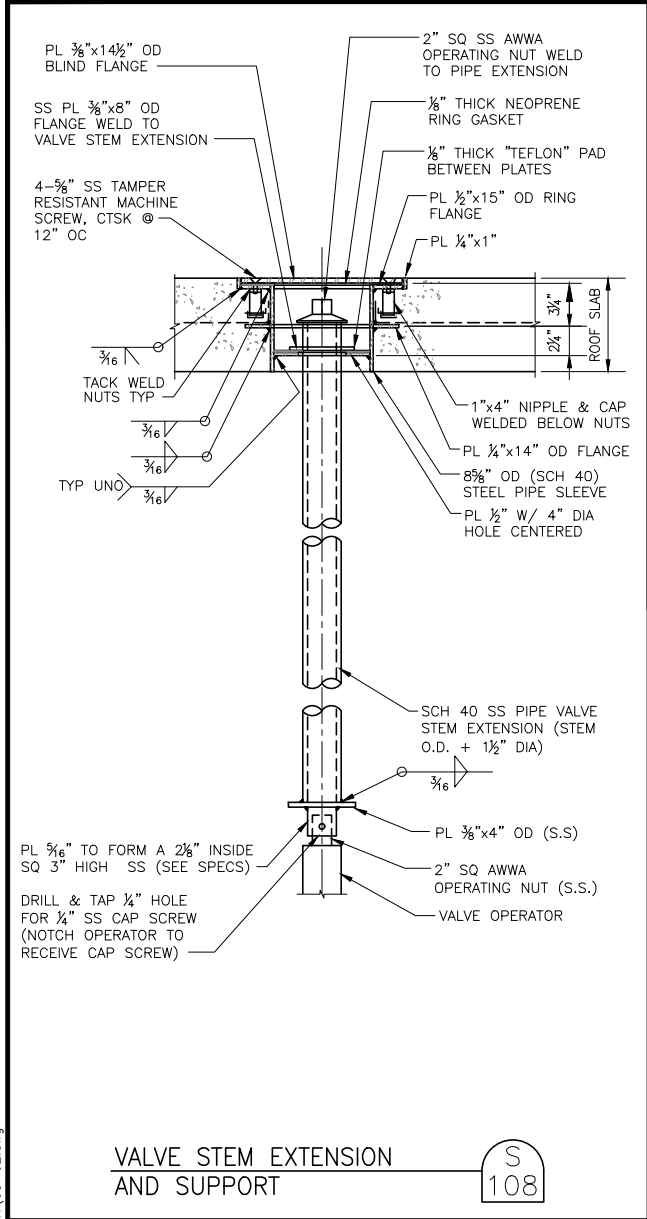
DESIGNED: K. FRITZ
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HOMESTAKE PROJECT
ARKANSAS RIVER DIVERSION
GENERAL STRUCTURAL DETAILS I

SHEET
GS-1

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HOMESTAKE PROJECT
ARKANSAS RIVER DIVERSION
GENERAL STRUCTURAL DETAILS II

SHEET
GS-2

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NOTES:

GENERAL NOTE
ALTHOUGH SEVERAL PIPE MATERIAL GROUPS MAY BE LISTED ON THIS SHEET FOR A GIVEN FLUID SERVICE, CONTRACTORS SHALL PROVIDE ONLY THE PIPE MATERIAL GROUP SHOWN ON THE DRAWINGS AND SPECIFIED FOR THAT FLUID SERVICE.

NOTE 1
PROPRIETARY NAMES HAVE BEEN QUOTED FOR IDENTIFICATION PURPOSES ONLY. SUBSTITUTIONS WILL BE PERMITTED SUBJECT TO PROVISIONS OF THE SPECIFICATIONS.

NOTE 2
LEAKAGE ALLOWANCE IS AS FOLLOWS:
(A) PIPES SO DESIGNATED SHALL SHOW ZERO LEAKAGE.
(B) PIPES SO DESIGNATED SHALL SHOW ZERO LEAKAGE FOR UNBURIED PIPE AND NOT MORE THAN 0.02 GALLON PER HOUR PER INCH DIAMETER PER 100 FEET OF BURIED PIPE.

NOTE 3
FOR FIELD TEST PROCEDURES AND ADDITIONAL TEST REQUIREMENTS, SEE SPECIFICATIONS.

NOTE 4
NO SUBSTITUTIONS UNLESS ACCEPTED BY THE ENGINEER PER THE SPECIFICATIONS.

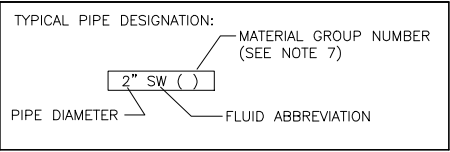
NOTE 5
NO APPARENT LEAKS UNDER NORMAL OPERATING CONDITIONS.

NOTE 6
FOR VALVES 8 INCHES AND LARGER SEE VALVE SCHEDULE. FOR SPECIAL VALVES SEE SPECIFICATIONS.

NOTE 7
CHANGE IN PIPING MATERIAL GROUP NUMBER IS INDICATED THUS: —◆—

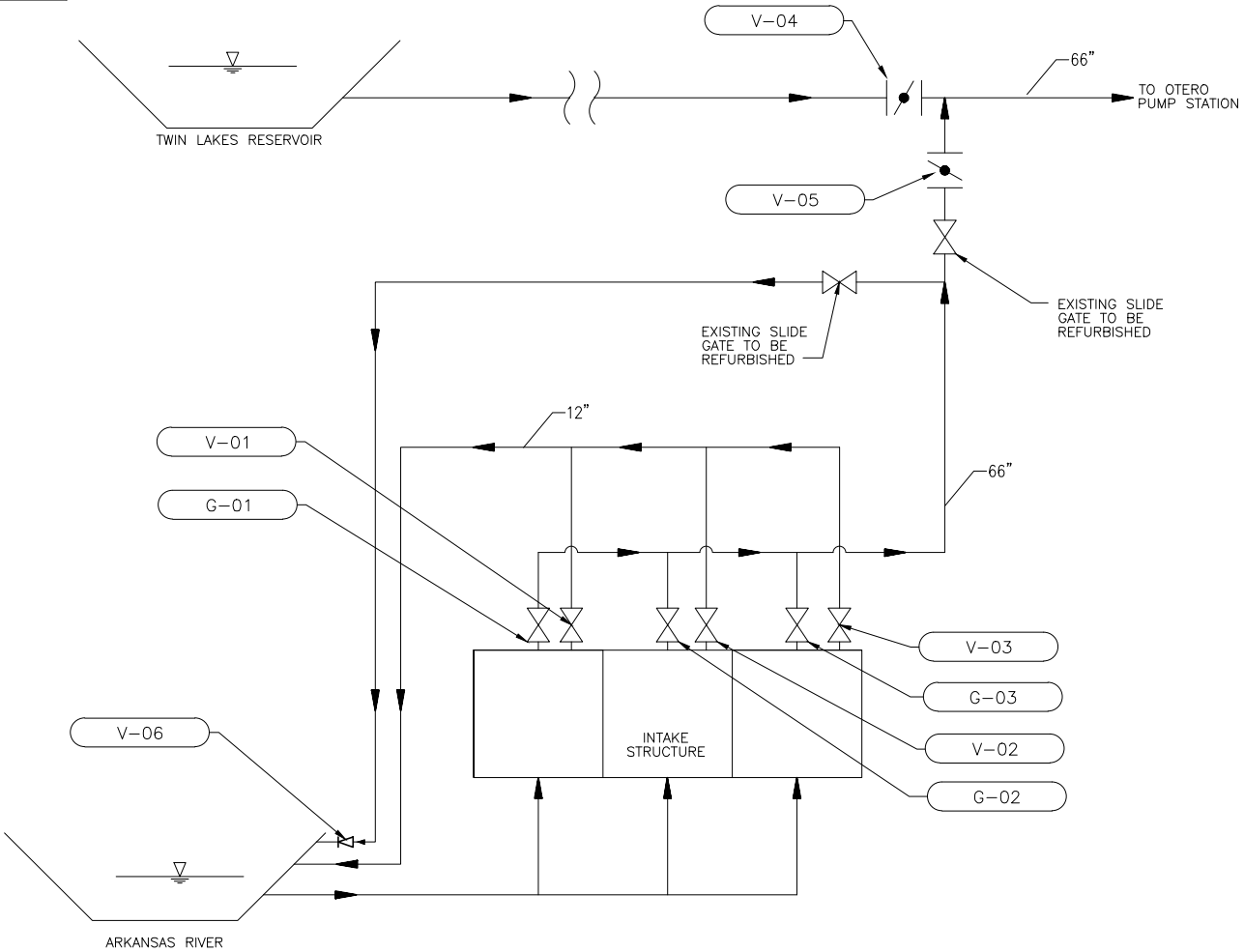
NOTE 8
FOR VALVE ENDS, SEE SPECIFICATIONS.

PIPING MATERIAL SCHEDULE			
GROUP NO	PIPE	FITTINGS	VALVES, 6" AND SMALLER (SEE NOTES 1, 6 & 8)
4	WELDED STEEL AWWA C200, POLYURETHANE COATED & CEMENT-MORTAR LINED, 0.375 WALL	WELDED STEEL AWWA C200 FABRICATED	-----
17	HIGH-DENSITY POLYETHYLENE, DR 17, ASTM D3035 AND AWWA C901. REMOVE ALL INTERIOR BEADS THAT RESULT FROM PIPE FUSING. PER SPECIFICATIONS.	HIGH-DENSITY POLYETHYLENE, ASTM D3035 AND AWWA C901, HEAT FUSED ASTM D3261.	-----



FLUID ABBREVIATION	FUNCTION THIS LIST INCLUDES SOME PIPELINE TYPE NOT USED IN THIS PROJECT	PIPING MATERIALS (SEE PIPING MATERIAL SCHEDULE)				FIELD TEST REQUIREMENTS (SEE NOTE 3 AND NOTE 4)		
		EXPOSED PIPING		BURIED PIPING		MINIMUM TEST PRESSURE PSI	TEST MEDIUM	LEAKAGE ALLOWANCE (SEE NOTE 2)
		2" DIA AND SMALLER	2½" DIA AND LARGER	2" DIA AND SMALLER	2½" DIA AND LARGER			
D	DRAIN	--	--	--	17	100	WATER	(A)
GT	GRAVEL TRAP	--	--	--	17	100	WATER	(A)
SW	SURFACE WATER	--	--	--	4	100	WATER	(A)

VALVES AND GATES SCHEDULE							
NUMBER	NAME	LOCATION	SERVICE	TYPE	SIZE (IN)	OPERATOR	REMARKS
V-01	GRAVEL TRAP ISOLATION	INTAKE	ISOLATION	PINCH	8	2" SQ. NUT	
V-02	GRAVEL TRAP ISOLATION	INTAKE	ISOLATION	PINCH	8	2" SQ. NUT	
V-03	GRAVEL TRAP ISOLATION	INTAKE	ISOLATION	PINCH	8	2" SQ. NUT	
V-04	OTERO PIPELINE ISOLATION	OTERO PIPELINE	ISOLATION	BUTTERFLY	66	GEARED HANDWHEEL	TRIPLE OFFSET SS VALVE
V-05	INTAKE ISOLATION	ARD PIPELINE	ISOLATION	BUTTERFLY	66	GEARED HANDWHEEL	TRIPLE OFFSET SS VALVE
V-06	GRAVEL TRAP OUTFALL	GRAVEL TRAP OUTFALL	BACKFLOW PREVENTION	CHECK VALVE	12	N/A	RED VALVE, SERIES 35-1, FLANGED, NEOPRENE
V-07	VALVE VAULT ISOLATION	ARD PIPELINE VAULT DRAIN	ISOLATION	GATE VALVE	4	2" SQ. NUT	BURIED VALVE
V-08	VALVE VAULT ISOLATION	OTERO PIPELINE VAULT DRAIN	ISOLATION	GATE VALVE	4	2" SQ. NUT	BURIED VALVE
V-09	MANHOLE ISOLATION	INTAKE MANHOLE DRAIN	ISOLATION	GATE VALVE	4	2" SQ. NUT	BURIED VALVE
V-10	MANHOLE ISOLATION	INTAKE MANHOLE DRAIN	ISOLATION	GATE VALVE	4	2" SQ. NUT	BURIED VALVE
V-11	MANHOLE ISOLATION	INTAKE MANHOLE DRAIN	ISOLATION	GATE VALVE	4	2" SQ. NUT	BURIED VALVE
G-01	INTAKE CELL 1 ISOLATION	INTAKE	ISOLATION	SLIDE GATE	48x48	2" SQ. NUT	NON-RISING STEM, CAST IRON
G-02	INTAKE CELL 2 ISOLATION	INTAKE	ISOLATION	SLIDE GATE	48x48	2" SQ. NUT	NON-RISING STEM, CAST IRON
G-03	INTAKE CELL 3 ISOLATION	INTAKE	ISOLATION	SLIDE GATE	48x48	2" SQ. NUT	NON-RISING STEM, CAST IRON



- NOTES:
- V-05 TO REMAIN CLOSED DURING NORMAL OPERATION OF THE EXISTING TWIN LAKES COLLECTION SYSTEM.
 - V-04 TO BE CLOSED DURING ARD INTAKE OPERATION.

ARD PIPE SCHEMATIC

REV	DATE	BY	DESCRIPTION
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AS NOTED

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0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.

DESIGNED: B. CHARLO
DRAWN: P. HUNTER
CHECKED: K. FRITZ

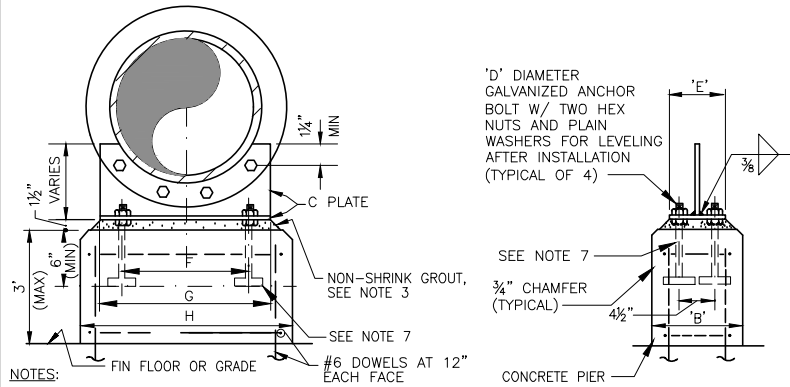
DEERE & AULT
CONSULTANTS, INC.
420 WEST MAIN STREET, SUITE 202
BOISE, IDAHO 83702
TEL 208.331.9736

HOMESTAKE PROJECT
ARKANSAS RIVER DIVERSION
GENERAL MECHANICAL SHEDULES

SHEET
GM-1

B:\Colorado Springs Utilities\1 - Arkansas River Diversion\600 - DRAWINGS\DWG-GEN\GM-02.dwg

12/17/2019 5:55 PM

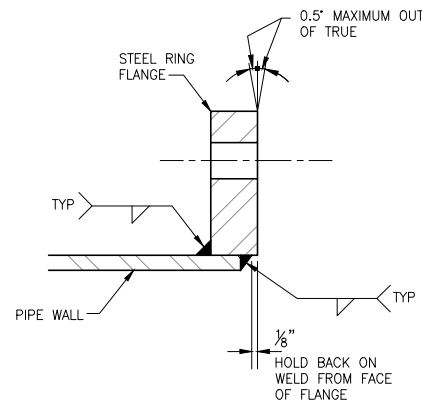


- NOTES:
1. WHEN SUPPORTING PIPE AND FLANGE ALTERNATELY ON THE SAME LINE, CONCRETE PIERS FOR PIPE SUPPORTS SHALL ALL HAVE THE SAME DIMENSION 'H' FOR FLANGE
 2. PIPE SUPPORTS SHALL BE LOCATED IN PLAN AT POINTS MARKED THUS: (X)
 3. WHERE DIFFERENTIAL SETTLEMENT IS LIKELY TO OCCUR, OMIT GROUT AS DIRECTED BY THE ENGINEER
 4. GALVANIZE ALL PARTS AFTER FABRICATION
 5. WHERE REQUIRED FOR EMBEDMENT OF ANCHORS, BOTTOM OF PIERS SHALL EXTEND BELOW BOTTOM OF SLAB
 6. WHERE PIPE SUPPORT OCCURS ON GRADE REFER TO STRUCTURAL DRAWINGS FOR DETAILS
 7. GALVANIZED ANCHOR BOLT OR CONCRETE ANCHOR WITH TWO NUTS AND ONE LOCKWASHER. PROVIDE BAR 1/4x3x3 PLATE WASHER. (TYP OF 4) 4" CLEAR TO SURFACE.

DIMENSIONS IN INCHES												
NOMINAL PIPE SIZE	PIPE				FLANGE							
	B	C	D	E	F	G	H	F	G	H		
6	12	3/8	5/8	6	4 1/2	6	12	6 1/2	9	16		
8	12	3/8	5/8	6	5	8	13	7 1/2	9	16		
10	12	3/8	5/8	6	6	9	15	9	13	18		
12	12	3/8	5/8	6	7	11	17	10	15	20		
14	12	3/8	5/8	6	8	12	17	11	16	21		
16	12	3/8	5/8	6	9	13	19	12	18	24		
18	12	3/8	5/8	6	10	14	20	13	19	24		
20	12	3/8	5/8	6	10	15	21	15	21	26		
22	12	3/8	5/8	6	12	18	24	16	23	28		
24	12	3/8	5/8	6	13	19	24	16	24	30		
26	12	3/8	3/4	6	14	21	27	18	26	32		
30	12	3/8	3/4	6	16	23	28	20	29	34		
34	15	3/8	3/4	6	18	26	32	22	33	39		
36	15	3/8	3/4	6	19	27	32	24	34	40		
42	18	1/2	1	8	21	31	36	27	39	45		
48	18	1/2	1	8	24	36	42	30	44	50		
54	18	1/2	1	8	28	40	46	34	48	56		
60	18	1/2	1 1/8	8	32	45	52	36	54	60		
66	18	1/2	1 1/8	8	33	49	56	40	59	66		
72	18	1/2	1 1/8	8	36	53	60	44	63	70		

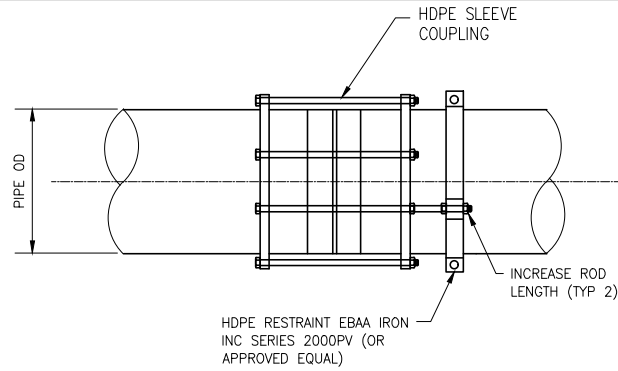
PIPE SUPPORT
(FOR PIPE 72" DIAMETER AND SMALLER)

M
100



FLANGE WELDING DETAIL

M
101

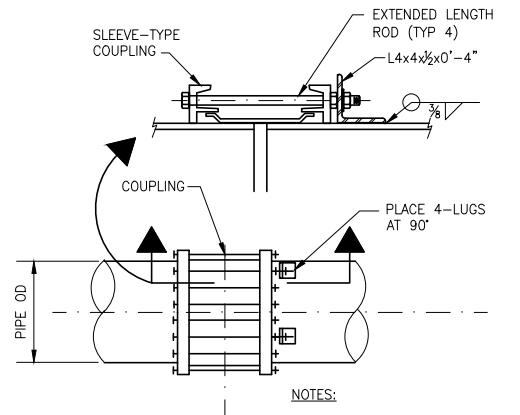


NOTES:

1. WHERE BURIED TIE-BOLTS, HEX NUTS AND WASHERS SHALL BE TYPE 316 STAINLESS STEEL.
2. SLEEVE COUPLING SHALL BE EPOXY COATED JCM 201 STEEL COUPLING.
3. INSTALL WITH INTERNAL SS PIPE STIFFENERS.

HDPE SLEEVE COUPLING JOINT

M
103

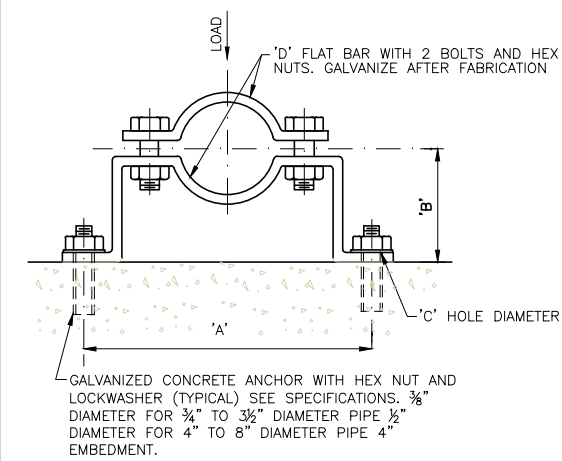


NOTES:

1. LUGS SHALL BE SHOP WELDED AND COATED.
2. APPLICABLE FOR ALL SLEEVE COUPLINGS ON STEEL PIPE UNO.

STEEL SLEEVE COUPLING JOINT

M
108



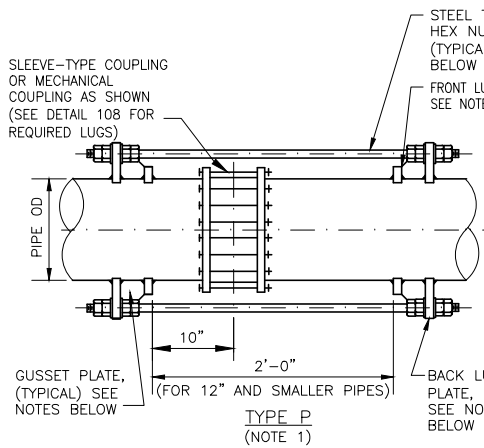
DIMENSIONS IN INCHES						LOAD RATING LBS
PIPE DIAMETER	'A'	'B' SEE NOTE 3 BELOW	'C' HOLE DIAMETER	'D' FLAT BAR SIZE		
3/4	5 15/16	2 1/2	7/16	3/16 x 1 1/4		190
1	6 1/4	2 5/8	7/16	3/16 x 1 1/4		190
1 1/4	6 11/16	2 3/4	7/16	3/16 x 1 1/4		190
1 1/2	6 15/16	3	7/16	3/16 x 1 1/4		190
2	8 5/16	3 3/16	7/16	1/4 x 1 1/4		420
2 1/2	8 7/8	3 7/16	7/16	1/4 x 1 1/4		420
3	9 1/8	3 3/4	7/16	1/4 x 1 1/4		420
3 1/2	10 1/16	4	7/16	1/4 x 1 1/4		420
4	10 9/16	4 1/4	9/16	1/4 x 1 1/2		610
5	11 3/4	4 3/4	9/16	1/4 x 1 1/2		610
6	14 3/8	5 5/16	9/16	3/8 x 1 1/2		870
8	16 5/8	6 5/16	9/16	3/8 x 1 1/2		870

NOTES:

1. WHERE SUBMERGED, PIPE CLAMP, ANCHORS, SHIELD, NUTS AND LOCKWASHER TO BE TYPE 316 STAINLESS STEEL.
2. WHEN USED WITH PVC OR FIBERGLASS PIPE, PROVIDE STEEL SHIELD WITH LOOSE FIT AROUND PIPE AT CLAMP. WRAP COPPER TUBING WITH 2" WIDE STRIP OF RUBBER AT CLAMP.
3. FOR FLANGED PIPING, INCREASE 'B' DIMENSION AS REQUIRED.
4. FOR PIPES SMALLER THAN 3/4" SEE STANDARD M-121.

PIPE CLAMP FOR
INDIVIDUAL PIPES
(FOR PIPE 8" DIAMETER AND SMALLER)

M
102

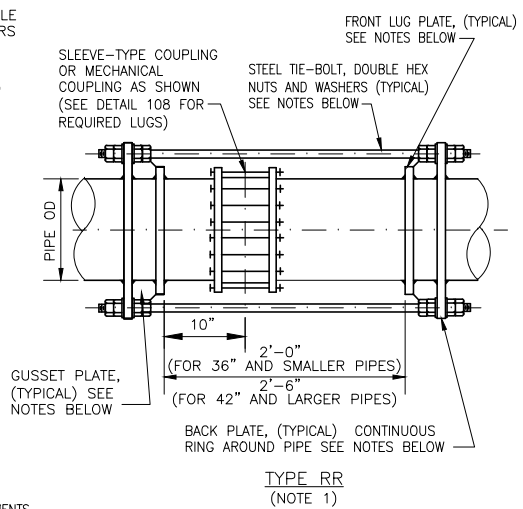


NOTES:

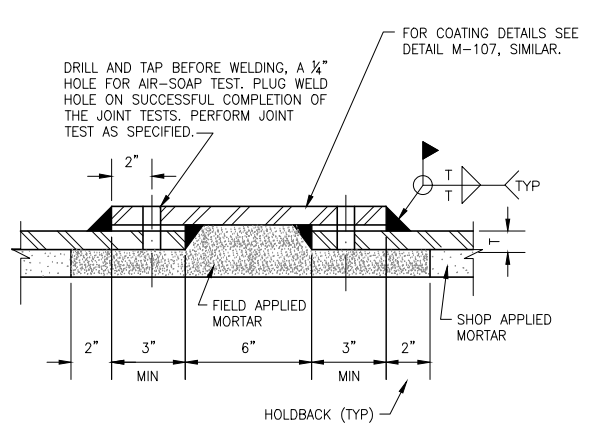
1. SEE AWWA MANUAL M-11 FOR HARNESS SET SIZE, TYPE AND DESIGN REQUIREMENTS.
2. WHERE BURIED TIE-BOLTS, HEX NUTS AND WASHERS SHALL BE TYPE 316 STAINLESS STEEL.
3. DOUBLE NUT AND WEDGE TIGHT WITH 1" SLACK IN ROD

HARNESSED JOINT

M
104

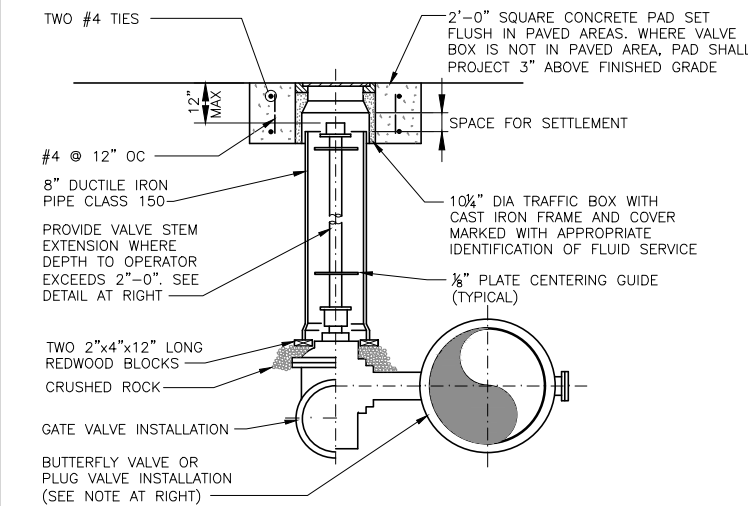


TYPE RR
(NOTE 1)



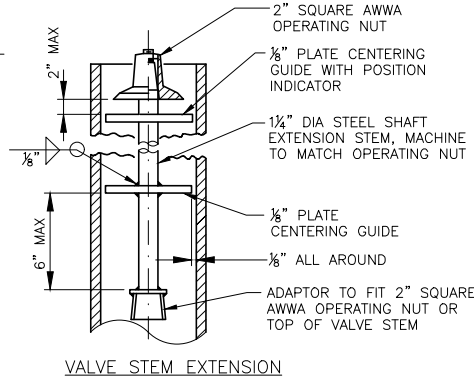
BUTT STRAP JOINT

M
109



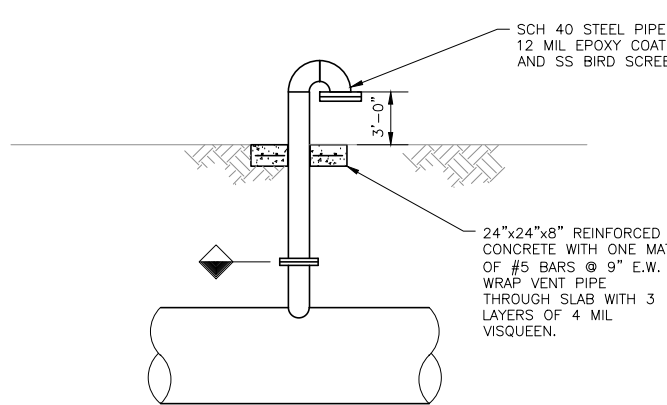
BURIED VALVE

M
105



NOTE:

COVERS SHALL BE SECURED WITH PENTA BOLTS

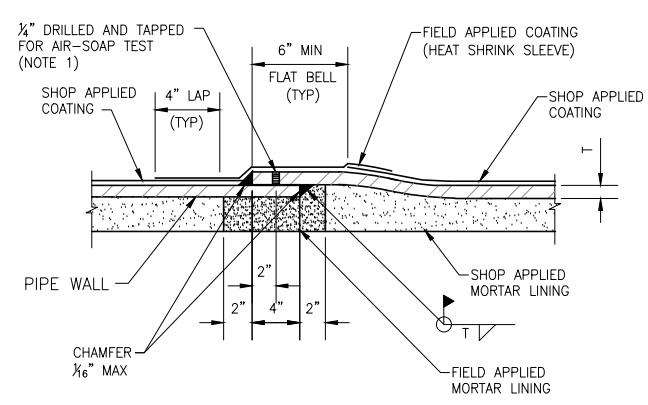


NOTES:

1. USE 12" DIA VENT ON 66" DIA STEEL PIPE AND 4" DIA VENT ON 12" HDPE PIPE.
2. ALL FLANGES TO BE 150# CLASS WITH T304 STAINLESS STEEL HARDWARE.

AIR VENT

M
106



NOTES:

1. DRILL AND TAP BEFORE WELDING A 1/4" HOLE FOR AIR-SOAP TESTS. PLUG WELD HOLE ON SUCCESSFUL COMPLETION OF THE JOINT TESTS. PERFORM JOINT TESTS AS SPECIFIED.

DOUBLE LAP-WELDED JOINT

M
107



SCALE:
AS NOTED

WARNING
0 1/2 1
IF THIS BAR DOES NOT
MEASURE 1" THEN DRAWING IS
NOT TO SCALE.

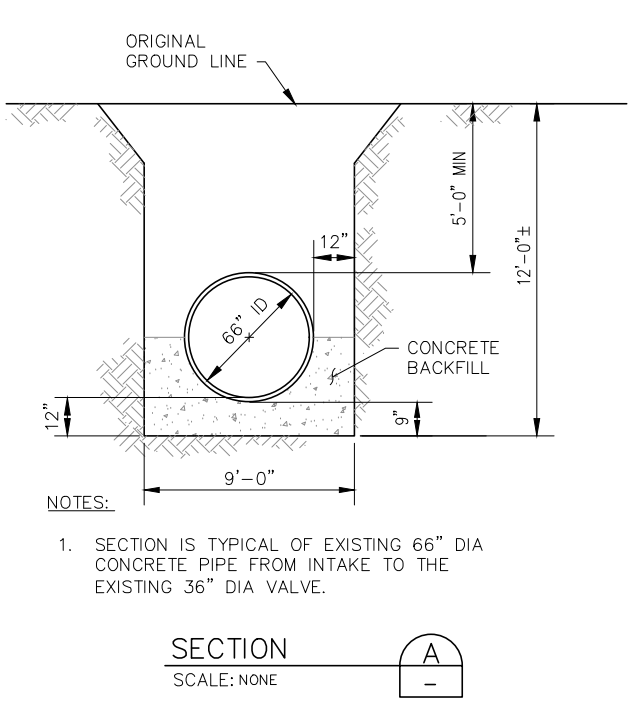
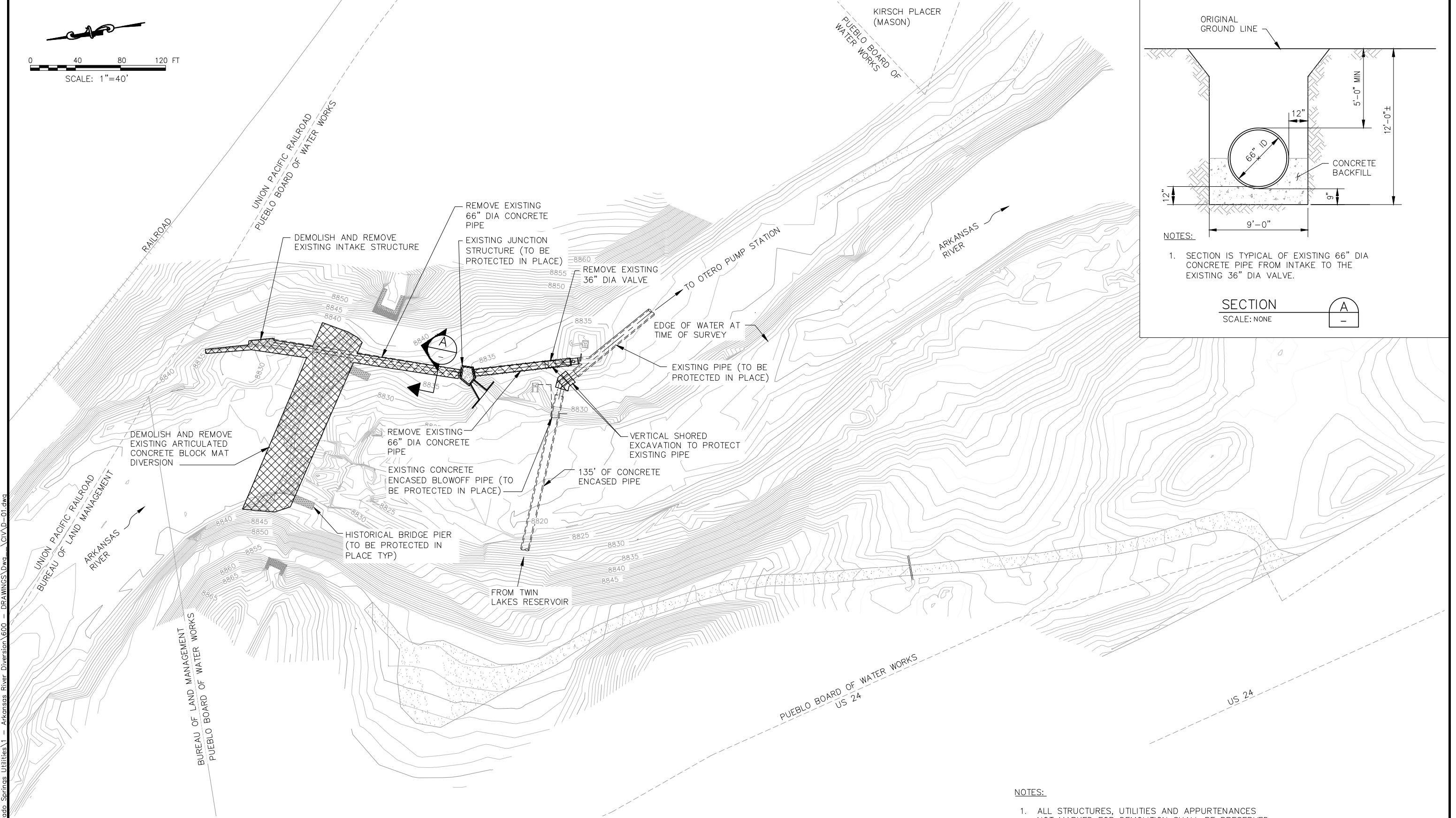
DESIGNED: B. CHARLO
DRAWN: P. HUNTER
CHECKED: K. FRITZ

DEERE & AULT
CONSULTANTS, INC.

420 WEST MAIN STREET, SUITE 202
BOISE, IDAHO 83702
TEL 208.331.9736

HOMESTAKE PROJECT
ARKANSAS RIVER DIVERSION
GENERAL MECHANICAL DETAILS

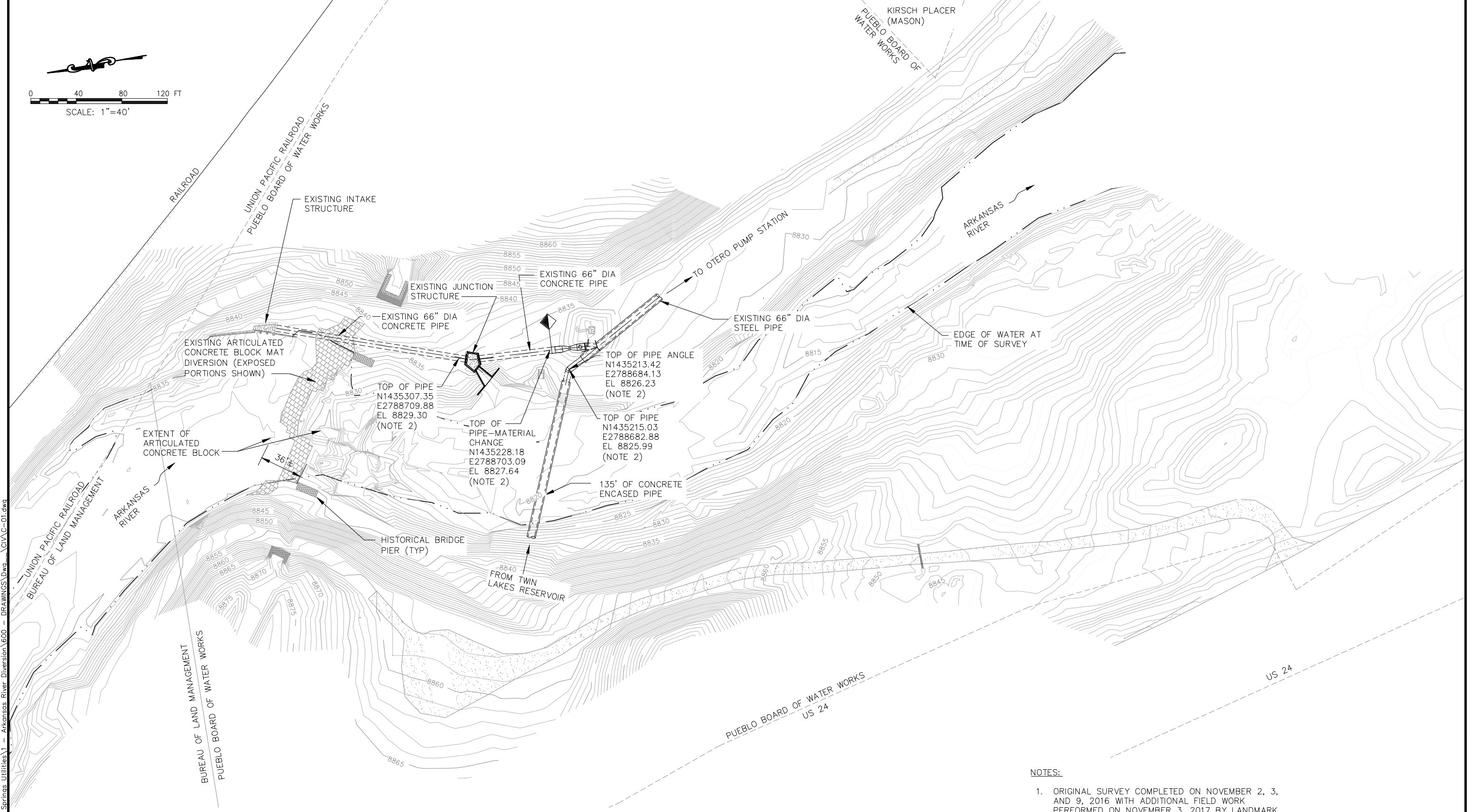
SHEET
GM-2



SITE PLAN

- NOTES:
1. ALL STRUCTURES, UTILITIES AND APPURTENANCES NOT MARKED FOR DEMOLITION SHALL BE PRESERVED AND PROTECTED.
 2. REFER TO SPECIFICATIONS FOR COMPLETE DISPOSAL REQUIREMENTS.

12/18/2019 11:32 AM B:\Colorado Springs Utilities\1 - Arkansas River Diversion\600 - DRAWINGS\Drawings\GV0-01.dwg					SCALE:	WARNING 0 1/2 1 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.	DESIGNED: B. CHARLO	DEERE & AULT CONSULTANTS, INC. 420 WEST MAIN STREET, SUITE 202 BOISE, IDAHO 83702 TEL 208.331.9736	HOMESTAKE PROJECT		SHEET D-1
					AS NOTED		DRAWN: P. HUNTER		ARKANSAS RIVER DIVERSION		
							CHECKED: K. FRITZ		DEMOLITION AND SALVAGE PLAN		
REV	DATE	BY	DESCRIPTION								



- NOTES:
- 1. ORIGINAL SURVEY COMPLETED ON NOVEMBER 2, 3, AND 9, 2016 WITH ADDITIONAL FIELD WORK PERFORMED ON NOVEMBER 3, 2017 BY LANDMARK SURVEYING.
 - 2. SPOT ELEVATIONS TAKEN AUGUST 23, 2017 BY LANDMARK SURVEYING.

SITE PLAN

0	12/20/19	BC	RECORD DRAWINGS	
REV	DATE	BY	DESCRIPTION	



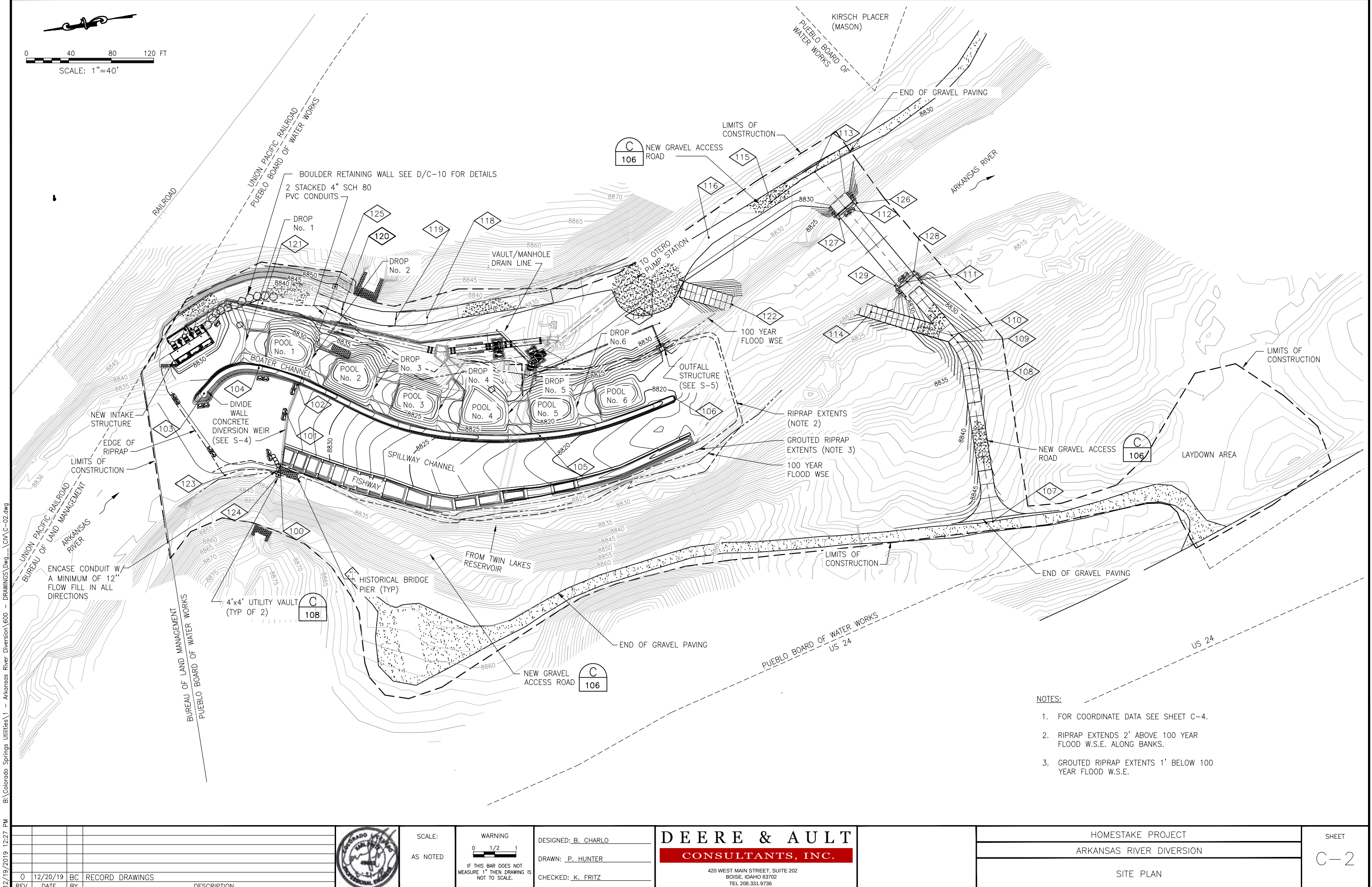
SCALE: AS NOTED	WARNING 0 1/2 1 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.	DESIGNED: B. CHARLO DRAWN: P. HUNTER CHECKED: K. FRITZ
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CONSULTANTS, INC.

420 WEST MAIN STREET, SUITE 202
BOISE, IDAHO 83702
TEL 208.331.9736

HOMESTAKE PROJECT	SHEET C-1
ARKANSAS RIVER DIVERSION	
EXISTING SITE PLAN	



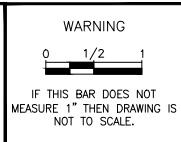
- NOTES:
- 1. FOR COORDINATE DATA SEE SHEET C-4.
 - 2. RIPRAP EXTENDS 2' ABOVE 100 YEAR FLOOD W.S.E. ALONG BANKS.
 - 3. GROUTED RIPRAP EXTENDS 1' BELOW 100 YEAR FLOOD W.S.E.

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REV	DATE	BY	DESCRIPTION
0	12/20/19	BC	RECORD DRAWINGS



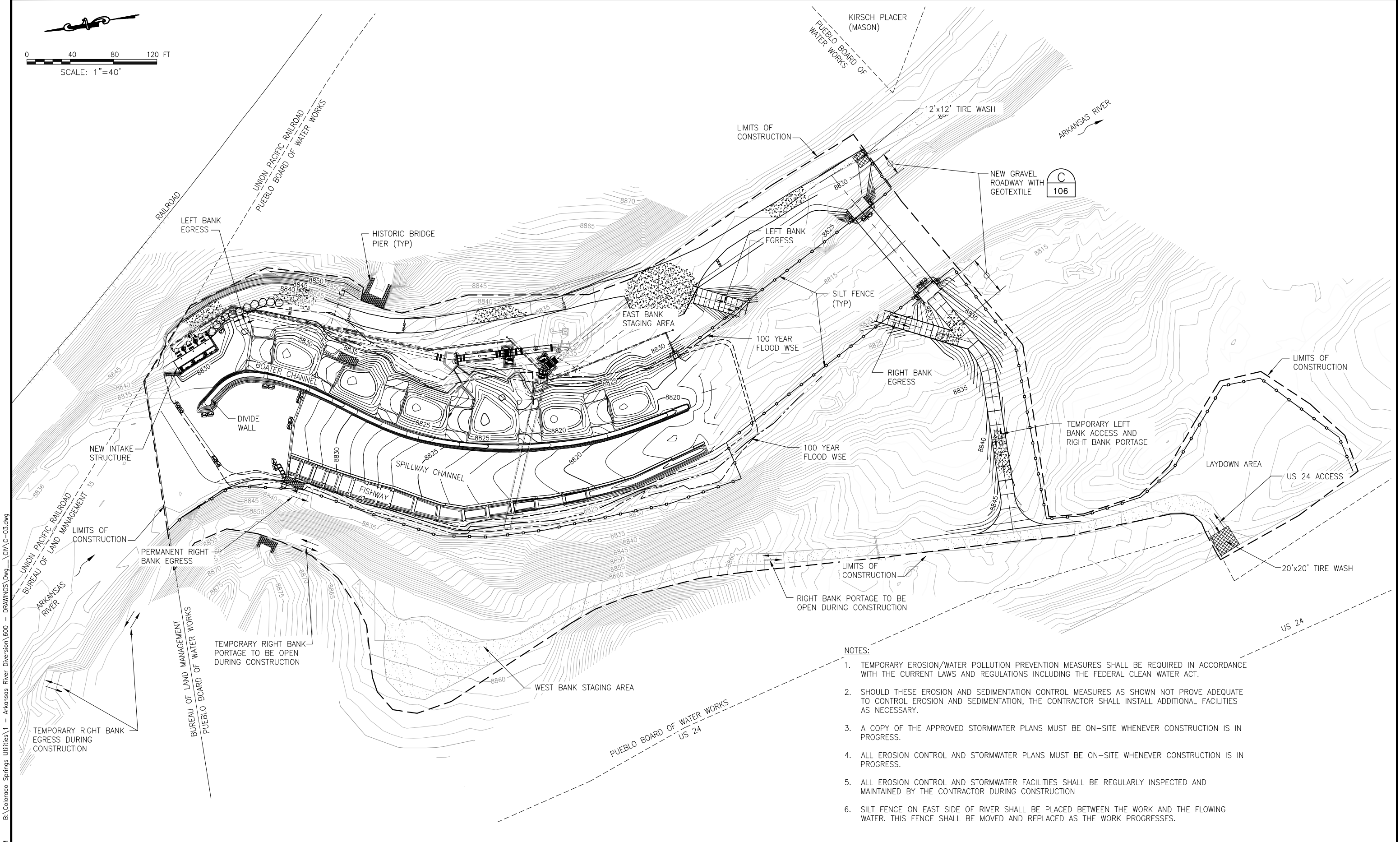
SCALE:
AS NOTED



DESIGNED: B. CHARLO
DRAWN: P. HUNTER
CHECKED: K. FRITZ

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BOISE, IDAHO 83702
TEL 208.331.9736

HOMESTAKE PROJECT	SHEET C-2
ARKANSAS RIVER DIVERSION	
SITE PLAN	



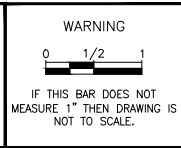
- NOTES:
1. TEMPORARY EROSION/WATER POLLUTION PREVENTION MEASURES SHALL BE REQUIRED IN ACCORDANCE WITH THE CURRENT LAWS AND REGULATIONS INCLUDING THE FEDERAL CLEAN WATER ACT.
 2. SHOULD THESE EROSION AND SEDIMENTATION CONTROL MEASURES AS SHOWN NOT PROVE ADEQUATE TO CONTROL EROSION AND SEDIMENTATION, THE CONTRACTOR SHALL INSTALL ADDITIONAL FACILITIES AS NECESSARY.
 3. A COPY OF THE APPROVED STORMWATER PLANS MUST BE ON-SITE WHENEVER CONSTRUCTION IS IN PROGRESS.
 4. ALL EROSION CONTROL AND STORMWATER PLANS MUST BE ON-SITE WHENEVER CONSTRUCTION IS IN PROGRESS.
 5. ALL EROSION CONTROL AND STORMWATER FACILITIES SHALL BE REGULARLY INSPECTED AND MAINTAINED BY THE CONTRACTOR DURING CONSTRUCTION
 6. SILT FENCE ON EAST SIDE OF RIVER SHALL BE PLACED BETWEEN THE WORK AND THE FLOWING WATER. THIS FENCE SHALL BE MOVED AND REPLACED AS THE WORK PROGRESSES.

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REV	DATE	BY	DESCRIPTION
0	12/20/19	BC	RECORD DRAWINGS



SCALE:
AS NOTED



DESIGNED: B. CHARLO
DRAWN: P. HUNTER
CHECKED: K. FRITZ

DEERE & AULT
CONSULTANTS, INC.
420 WEST MAIN STREET, SUITE 202
BOISE, IDAHO 83702
TEL 208.331.9736

HOMESTAKE PROJECT
ARKANSAS RIVER DIVERSION
EROSION AND SEDIMENT CONTROL PLAN AND SITE ACCESS

SHEET
C-3

SITE COORDINATE TABLE

PT NO	NORTHING	EASTING	ELEVATION	DESCRIPTION
100	N1435465.52	E2788627.26	8832.50	TOP OF CONCRETE WEIR
101	N1435451.33	E2788674.76	8832.50	TOP OF CONCRETE WEIR
102	N1435436.02	E2788699.75	8832.50	TOP OF CONCRETE WEIR
103	N1435525.59	E2788706.71	8839.00	UPSTREAM END OF DIVIDE WALL
104	N1435469.93	E2788721.39	8838.00	START OF SLOPE ON DIVIDE WALL
105	N1435219.52	E2788613.31	8828.00	GRADE CHANGE ON DIVIDE WALL
106	N1435088.70	E2788627.38	8824.00	DOWNSTREAM END OF DIVIDE WALL
107	N1434812.68	E2788461.31	8832.00	MATCH EDGE OF EXISTING ROAD
108	N1434809.99	E2788607.43	8832.00	CENTERLINE PC ACCESS ROAD
109	N1434816.74	E2788633.45	8832.00	CENTERLINE PT ACCESS ROAD
110	N1434821.01	E2788640.81	8831.00	POB PORTAGE TRAIL
111	N1434853.89	E2788697.42	8831.00	TOP OF BRIDGE DECK
112	N1434899.42	E2788775.94	8831.00	TOP OF BRIDGE DECK
113	N1434921.88	E2788814.55	8830.00	PT OF INTERSECTION ACCESS ROAD
114	N1434892.21	E2788675.47	8822.00	END OF RIGHT BANK PORTAGE TRAIL
115	N1434967.43	E2788793.67	8833.00	CENTERLINE PT ACCESS ROAD
116	N1435030.96	E2788757.05	8830.00	CENTERLINE PC ACCESS ROAD
117	N1435090.60	E2788739.88	8830.00	CENTERLINE PT ACCESS ROAD
118	N1435305.41	E2788741.65	8839.00	CENTERLINE PC ACCESS ROAD
119	N1435334.55	E2788745.18	8840.00	CENTERLINE PT ACCESS ROAD
120	N1435382.66	E2788763.17	8840.00	CENTERLINE POINT ACCESS ROAD
121	N1435456.12	E2788780.84	8834.00	END OF ACCESS ROAD
122	N1435019.88	E2788704.51	8817.35	END OF LEFT BANK PORTAGE TRAIL
123	N1435518.41	E2788627.34	8835.00	EDGE OF UPSTREAM RIPRAP ON RIGHT BANK
124	N1435468.66	E2788619.02	8837.00	CENTER OF RIGHT BANK UTILITY VAULT
125	N1435385.81	E2788784.86	8844.22	CENTER OF LEFT BANK UTILITY VAULT
126	N1434887.69	E2788778.45	8819.00	TOP OF BRIDGE FOUNDATION CORNER
127	N1434906.88	E2788766.66	8819.00	TOP OF BRIDGE FOUNDATION CORNER
128	N1434845.60	E2788706.44	8819.00	TOP OF BRIDGE FOUNDATION CORNER
129	N1434865.77	E2788695.80	8819.00	TOP OF BRIDGE FOUNDATION CORNER

SEE DWG C-2 FOR COORDINATE LOCATIONS

INTAKE AND PIPELINE COORDINATE TABLE

PT NO	NORTHING	EASTING	ELEVATION	DESCRIPTION
200	N1435546.16	E2788736.14	8839.00	TOP OF INTAKE CORNER
201	N1435508.33	E2788751.95	8839.00	TOP OF INTAKE CORNER
202	N1435550.57	E2788759.75	CL 8827.75	START OF 66" DIA PIPELINE
203	N1435488.32	E2788785.64	CL 8827.75	66" DIA PIPELINE ANGLE POINT 45°
204	N1435531.67	E2788771.59	CL 8823.24	12"x8" DIA TEE
205	N1435488.33	E2788789.60	CL 8823.24	12" DIA 45° ELBOW
206	N1435315.82	E2788718.78	CL 8822.11	12" DIA 20° ELBOW
207	N1435239.85	E2788714.40	CL 8821.70	12" DIA COMBINATION 60° ELBOW (45°H, 45°V)
208	N1435237.21	E2788710.66	CL 8816.47	12" DIA 45° ELBOW
209	N1435210.19	E2788672.50	CL 8816.47	12" DIA COMBINATION 60.5° ELBOW (60°H, 10°V)
210	N1435184.20	E2788678.28	CL 8821.16	12" DIA 10° ELBOW
211	N1435097.41	E2788697.49	CL 8820.62	12" DIA 90° ELBOW
212	N1435091.84	E2788672.71	CL 8820.47	END OF 12" LINE AT OUTFALL STRUCTURE
213	N1435248.40	E2788710.31	8834.00	TOP OF VALVE VAULT CORNER
214	N1435249.40	E2788693.17	8834.00	TOP OF VALVE VAULT CORNER
215	N1435218.69	E2788694.15	8834.00	TOP OF VALVE VAULT CORNER
216	N1435210.68	E2788698.24	8834.00	TOP OF VALVE VAULT CORNER
217	N1435090.53	E2788730.00	IE 8817.00	4" DRAIN BLIND FLANGE
218	N1435306.35	E2788710.30	CL 8826.31	CL OF SLEEVE COUPLING
219	N1435302.92	E2788708.87	CL 8826.29	FACE OF EXISTING OUTLET (SHEET S-5)
220	N1435291.84	E2788706.19	CL 8827.04	FACE OF EXISTING OUTLET (SHEET S-5)
221	N1435288.24	E2788706.01	CL 8826.96	CL OF SLEEVE COUPLING

SEE DWG C-5 FOR COORDINATE LOCATIONS

SPILLWAY COORDINATE TABLE									
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PT NO	NORTHING	EASTING	ELEVATION	DESCRIPTION
300	N1435487.59	E2788697.32	8835.82	SPILLWAY CL BEG
301	N1435365.17	E2788622.65	8825.78	SPILLWAY CL
302	N1435303.09	E2788596.31	8822.96	SPILLWAY CL
303	N1435198.37	E2788588.12	8819.54	SPILLWAY CL
304	N1435149.27	E2788589.94	8818.13	SPILLWAY CL
305	N1435088.29	E2788606.14	8817.75	SPILLWAY CL END
306	N1435421.56	E2788690.91	8832.00	LEFT EDGE SPILLWAY
307	N1435440.49	E2788668.46	8832.00	CENTER SPILLWAY
308	N1435442.42	E2788638.54	8832.00	RIGHT EDGE SPILLWAY
309	N1435395.06	E2788671.62	8830.00	LEFT EDGE SPILLWAY
310	N1435413.63	E2788652.15	8830.00	CENTER SPILLWAY
311	N1435418.53	E2788625.09	8832.00	RIGHT EDGE SPILLWAY
312	N1435369.00	E2788653.31	8828.00	LEFT EDGE SPILLWAY
313	N1435390.35	E2788638.01	8828.00	CENTER SPILLWAY
314	N1435394.60	E2788612.26	8830.00	RIGHT EDGE SPILLWAY
315	N1435337.51	E2788636.23	8826.00	LEFT EDGE SPILLWAY
316	N1435367.66	E2788624.07	8826.00	CENTER SPILLWAY
317	N1435369.72	E2788600.83	8826.00	RIGHT EDGE SPILLWAY
318	N1435292.58	E2788620.91	8824.00	LEFT EDGE SPILLWAY
319	N1435324.18	E2788605.26	8823.92	CENTER SPILLWAY
320	N1435321.22	E2788575.61	8825.00	RIGHT EDGE SPILLWAY
321	N1435241.98	E2788610.93	8822.00	LEFT EDGE SPILLWAY
322	N1435276.69	E2788594.25	8822.10	CENTER SPILLWAY
323	N1435265.95	E2788570.64	8822.00	RIGHT EDGE SPILLWAY
324	N1435177.58	E2788607.94	8820.00	LEFT EDGE SPILLWAY
325	N1435211.59	E2788589.18	8820.00	CENTER SPILLWAY
326	N1435186.80	E2788569.30	8822.00	RIGHT EDGE SPILLWAY
327	N1435088.44	E2788623.05	8818.37	LEFT EDGE SPILLWAY
328	N1435136.90	E2788593.23	8818.05	CENTER SPILLWAY
329	N1435115.44	E2788582.68	8820.00	RIGHT EDGE SPILLWAY

SEE DWG C-6 FOR COORDINATE LOCATIONS

FISHWAY COORDINATE TABLE									
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PT NO	NORTHING	EASTING	ELEVATION	DESCRIPTION
400	N1435469.69	E2788641.96	8832.50	FISHWAY CL BEG
401	N1435450.11	E2788630.82	8829.00	WEIR CREST
402	N1435439.21	E2788624.63	8830.40	WEIR CREST
403	N1435428.32	E2788618.44	8828.00	WEIR CREST
404	N1435417.30	E2788612.00	8828.58	WEIR CREST
405	N1435406.22	E2788606.62	8827.67	WEIR CREST
406	N1435395.12	E2788600.83	8826.76	WEIR CREST
407	N1435383.87	E2788595.30	8825.85	WEIR CREST
408	N1435372.62	E2788589.76	8824.94	WEIR CREST
409	N1435352.20	E2788579.70	8824.03	WEIR CREST
410	N1435335.56	E2788571.50	--	FISHWAY CL
411	N1435331.43	E2788570.03	8822.00	WEIR CREST
412	N1435312.65	E2788563.42	--	FISHWAY CL
413	N1435309.01	E2788563.33	8822.00	WEIR CREST
414	N1435286.26	E2788562.90	8821.30	WEIR CREST
415	N1435263.10	E2788562.39	8819.00	WEIR CREST
416	N1435240.36	E2788561.75	8819.48	WEIR CREST
417	N1435228.57	E2788561.40	--	FISHWAY CL
418	N1435214.88	E2788561.96	8818.57	WEIR CREST
419	N1435193.46	E2788562.85	--	FISHWAY CL
420	N1435192.13	E2788562.96	8817.66	WEIR CREST
421	N1435148.55	E2788567.39	--	FISHWAY CL
422	N1435052.33	E2788593.69	8820.00	FISHWAY CL END
423	N1435466.35	E2788626.63	--	FISHWAY SPUR DIKE
424	N1435471.15	E2788638.72	--	FISHWAY SPUR DIKE

SEE DWG C-7 FOR COORDINATE LOCATIONS

BOATER CHANNEL COORDINATE TABLE

PT NO	NORTHING	EASTING	ELEVATION	DESCRIPTION
500	N1435492.05	E2788753.39	8830.50	BOATER CHANNEL CL BEG
501	N1435448.96	E2788739.41	8826.00	BOATER CHANNEL CL
502	N1435414.91	E2788720.59	8829.40	BOATER CHANNEL CL
503	N1435365.91	E2788684.09	8827.75	BOATER CHANNEL CL
504	N1435308.85	E2788654.61	8825.75	BOATER CHANNEL CL
505	N1435287.96	E2788647.58	8822.50	BOATER CHANNEL CL
506	N1435253.77	E2788640.86	8820.80	BOATER CHANNEL CL
507	N1435234.08	E2788638.02	8822.80	BOATER CHANNEL CL
508	N1435180.99	E2788634.35	8821.75	DROP NO. 6 CREST
509	N1435138.10	E2788637.38	8817.30	BOATER CHANNEL CL
510	N1435052.78	E2788658.04	8817.00	BOATER CHANNEL CL END
511	N1435477.49	E2788748.67	8831.75	DROP NO. 1 CREST
512	N1435418.33	E2788722.48	8829.75	DROP NO. 2 CREST
513	N1435365.91	E2788684.09	8827.75	DROP NO. 3 CREST
514	N1435308.85	E2788654.61	8825.75	DROP NO. 4 CREST
515	N1435244.98	E2788639.59	8823.75	DROP NO. 5 CREST
516	N1435453.12	E2788752.62	8829.00	POOL 1
517	N1435417.20	E2788735.16	8829.00	POOL 1
518	N1435428.17	E2788715.18	8829.00	POOL 1
519	N1435460.24	E2788730.98	8829.00	POOL 1
520	N1435394.81	E2788717.53	8827.00	POOL 2
521	N1435370.84	E2788712.16	8827.00	POOL 2
522	N1435363.70	E2788696.14	8827.00	POOL 2
523	N1435375.94	E2788678.03	8827.00	POOL 2
524	N1435407.29	E2788700.82	8827.00	POOL 2
525	N1435341.07	E2788684.06	8825.00	POOL 3
526	N1435308.02	E2788666.91	8825.00	POOL 3
527	N1435317.51	E2788646.57	8825.00	POOL 3
528	N1435351.76	E2788664.02	8825.00	POOL 3
529	N1435275.98	E2788675.27	8823.00	POOL 4
530	N1435248.23	E2788650.83	8823.00	POOL 4
531	N1435252.37	E2788628.90	8823.00	POOL 4
532	N1435291.25	E2788637.12	8823.00	POOL 4
533	N1435223.48	E2788648.21	8821.00	POOL 5
534	N1435185.29	E2788645.30	8821.00	POOL 5
535	N1435185.85	E2788624.24	8821.00	POOL 5
536	N1435224.68	E2788626.04	8821.00	POOL 5
537	N1435160.25	E2788646.35	8819.00	POOL 6
538	N1435123.80	E2788652.06	8819.00	POOL 6
539	N1435118.60	E2788630.76	8819.00	POOL 6
540	N1435158.00	E2788624.78	8819.00	POOL 6
541	N1435483.67	E2788729.64	8834.60	TOE DIVIDE WALL DROP 1
542	N1435428.00	E2788704.97	8832.60	TOE DIVIDE WALL DROP 2
543	N1435375.09	E2788666.32	8830.60	TOE DIVIDE WALL DROP 3
544	N1435315.23	E2788635.42	8829.00	TOE DIVIDE WALL DROP 4
545	N1435248.66	E2788619.44	8827.00	TOE DIVIDE WALL DROP 5
546	N1435179.57	E2788614.40	8824.60	TOE DIVIDE WALL DROP 6

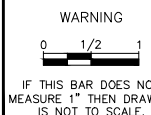
SEE DWG C-9 FOR COORDINATE LOCATIONS

NOTE:

ELEVATION CONVERSION FROM BECHTEL
CORP DRAWINGS 3/20/1964, TO CONVERT
DATUM, NAVD 88, IS +8.54'.



SCALE:
AS NOTED



DESIGNED: B. CHARLO
DRAWN: P. HUNTER
CHECKED: K. FRITZ

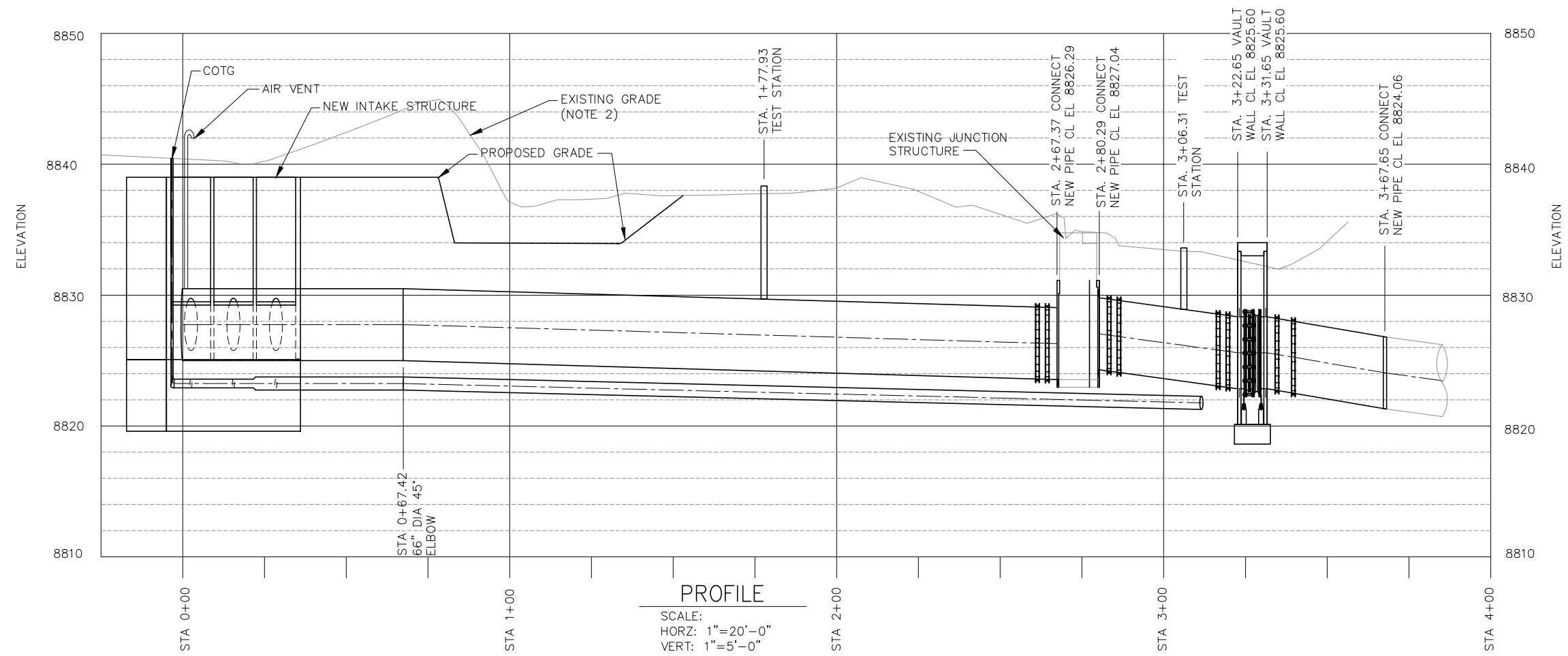
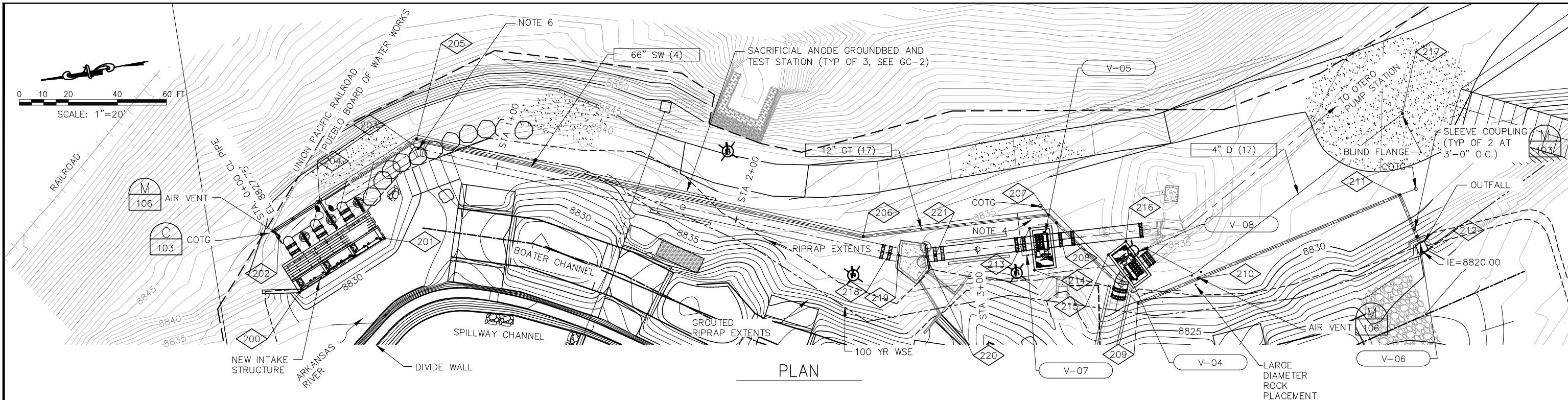
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BOISE, IDAHO 83702
TEL 208.331.9736

HOMESTAKE PROJECT
ARKANSAS RIVER DIVERSION

COORDINATE TABLES

SHEET

C-4



- NOTES:
1. FOR COORDINATE DATA SEE SHEET C-4.
 2. EXCAVATE FOR CONSTRUCTION AND RETURN TO EXISTING GRADE UNO.
 3. FIELD VERIFY ELEVATIONS WHERE CONNECTING TO EXISTING FEATURES
 4. DIP IN 12" DIA GT LINE TO PASS UNDER BOTH 66" DIA LINES. SEE COORDINATES.
 5. LOCATE 12" DIA GT AIR VENT AT ELBOW POINT IN LINE.
 6. AT THE CONTRACTOR'S DISCRETION, BUTT STRAP JOINTS (DETAIL M/109) ARE ACCEPTABLE AT 66" DIA 45' ELBOW.
 7. AS-BUILT PIPE ANGLES, DIMENSIONS, ELEVATIONS AND LOCATIONS ARE TAKEN FROM BLACK & VEATCH 1984 AS-BUILT DRAWINGS AND THOMPSON PIPE & STEEL CO. SHOP DRAWINGS.

12/19/2019 9:44 AM B:\Colorado Springs Utilities\ - Arkansas River Diversion\600 - DRAWINGS\Draw - CIV\C-05.dwg

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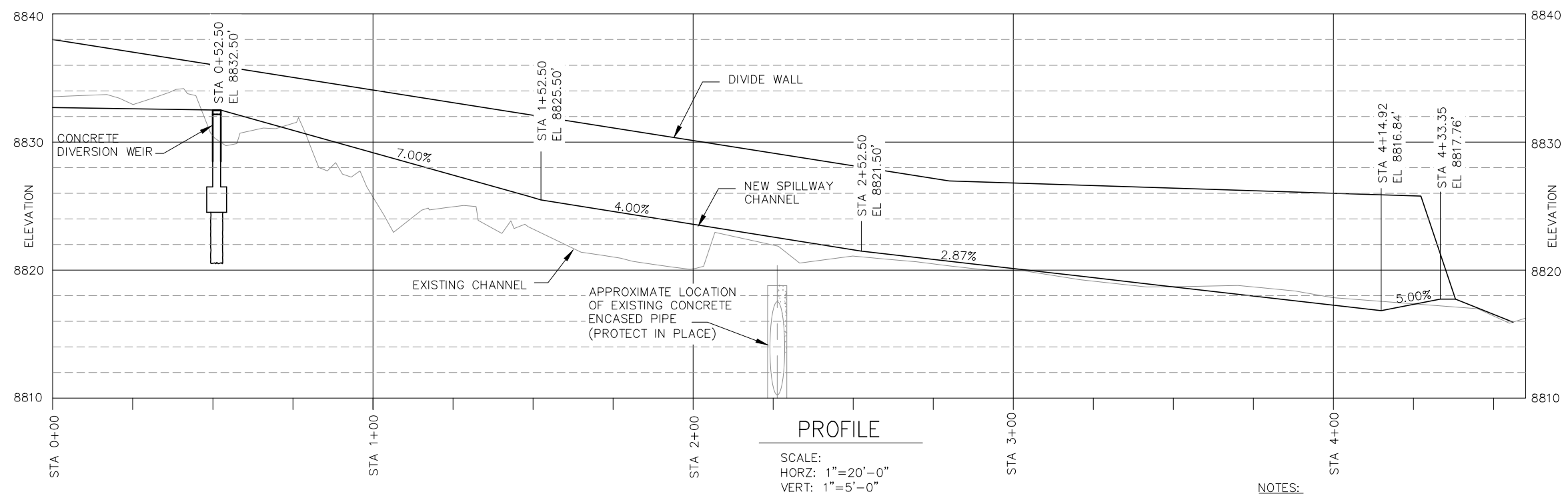
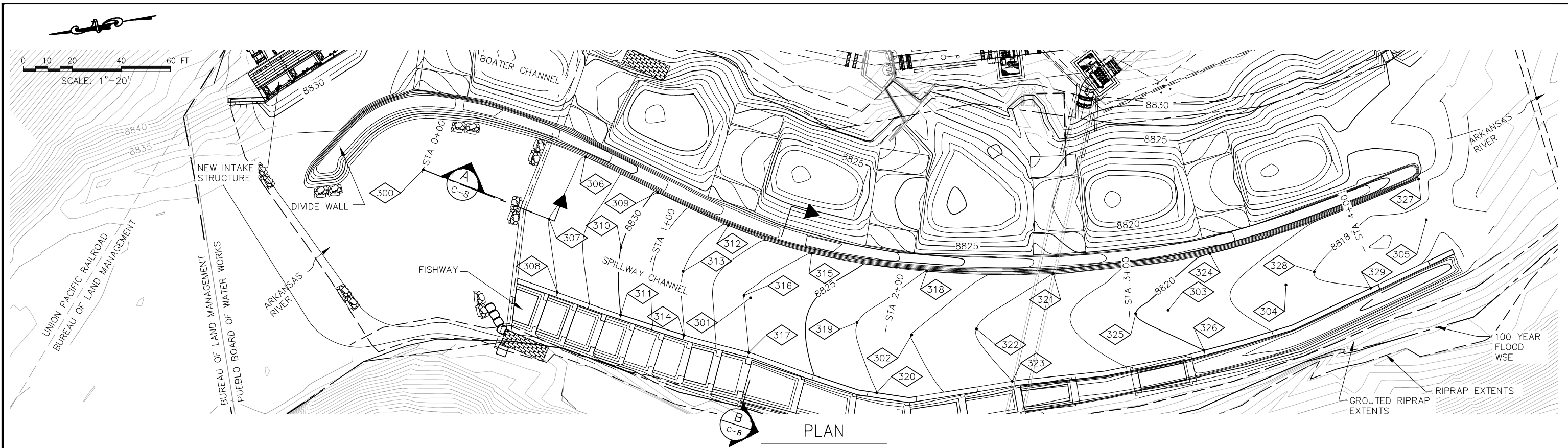
SCALE:
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WARNING
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HOMESTAKE PROJECT	SHEET
ARKANSAS RIVER DIVERSION	C-5
PIPELINE PLAN AND PROFILE	



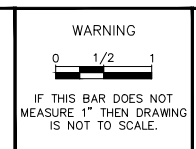
- NOTES:
1. FOR COORDINATE DATA SEE SHEET C-4.
 2. FIELD VERIFY LOCATION OF EXISTING CONCRETE ENCASED PIPE

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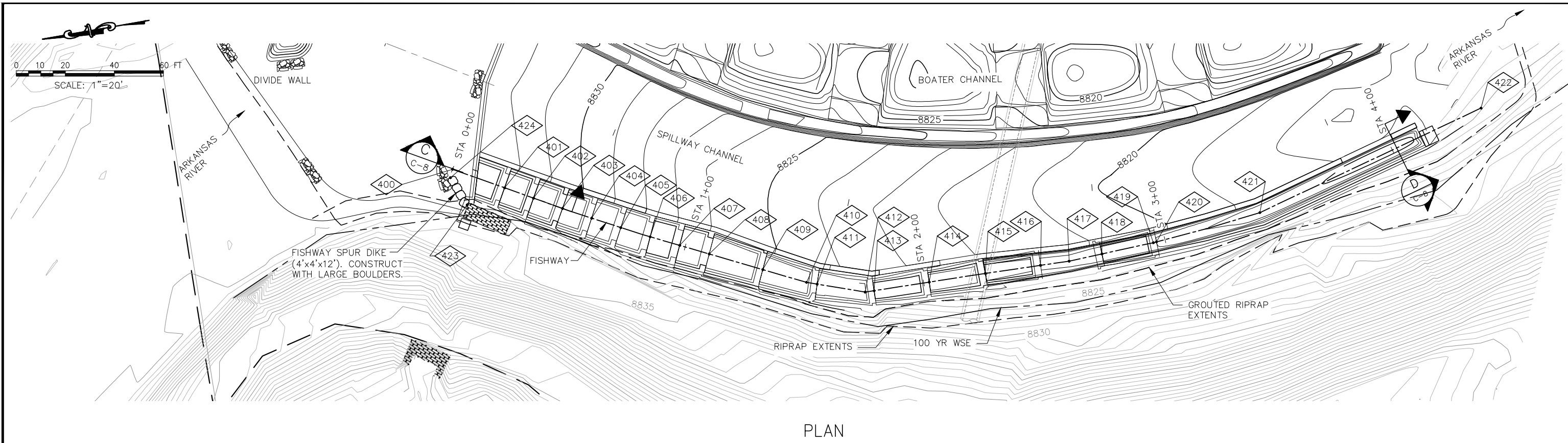
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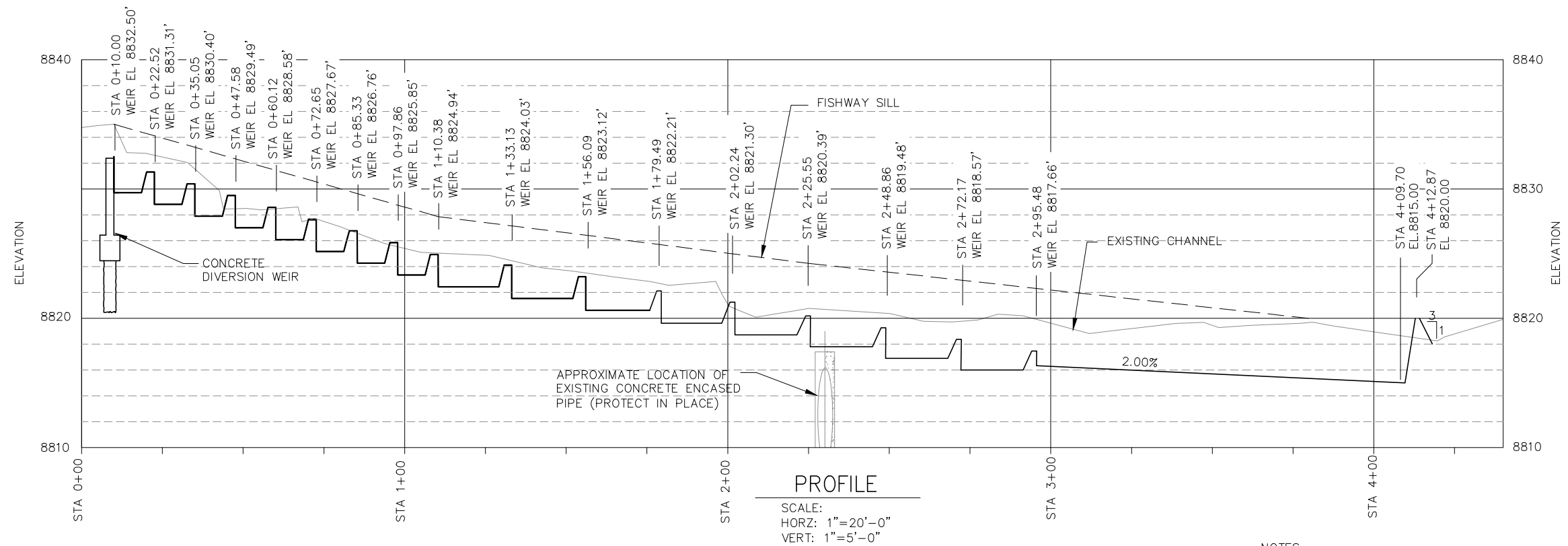


HOMESTAKE PROJECT
ARKANSAS RIVER DIVERSION
SPILLWAY PLAN AND PROFILE

SHEET
C-6



PLAN



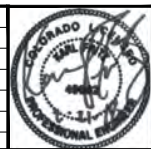
PROFILE

NOTES:

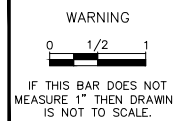
1. FOR COORDINATE DATA SEE SHEET C-4.
2. FIELD VERIFY LOCATION OF EXISTING CONCRETE ENCASED PIPE.

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REV	DATE	BY	DESCRIPTION
0	12/20/19	BC	RECORD DRAWINGS



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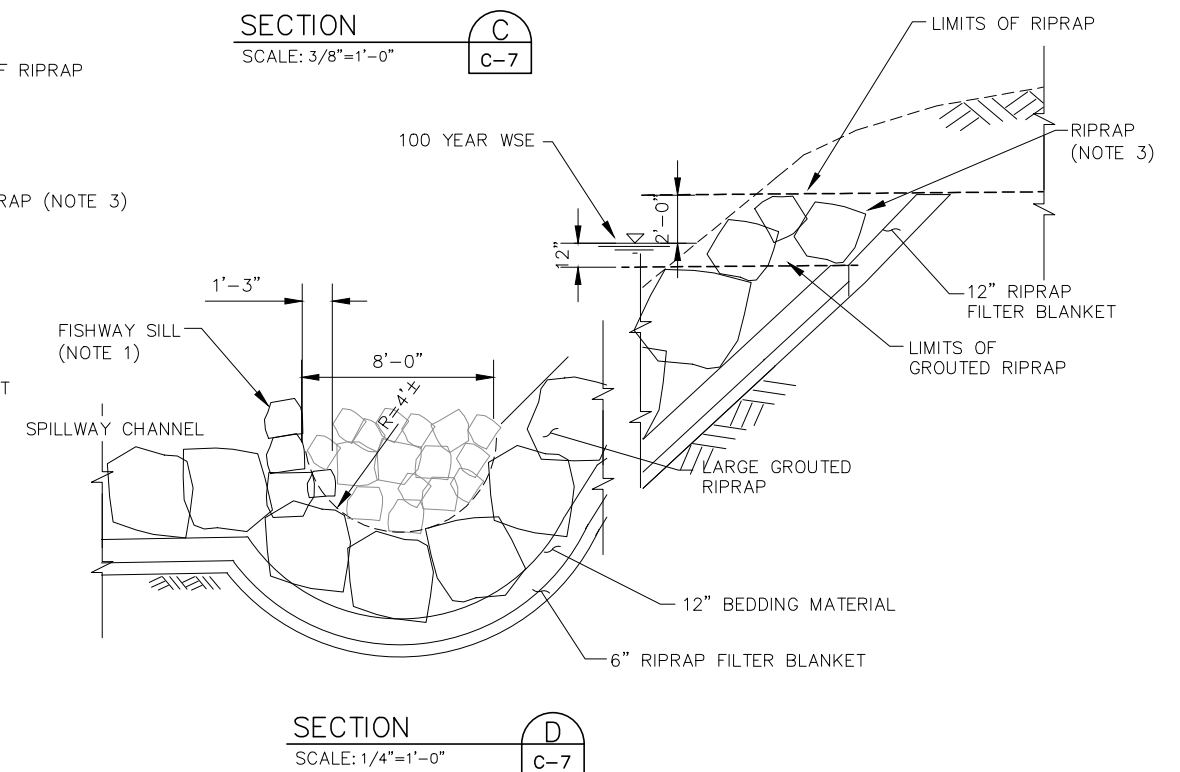
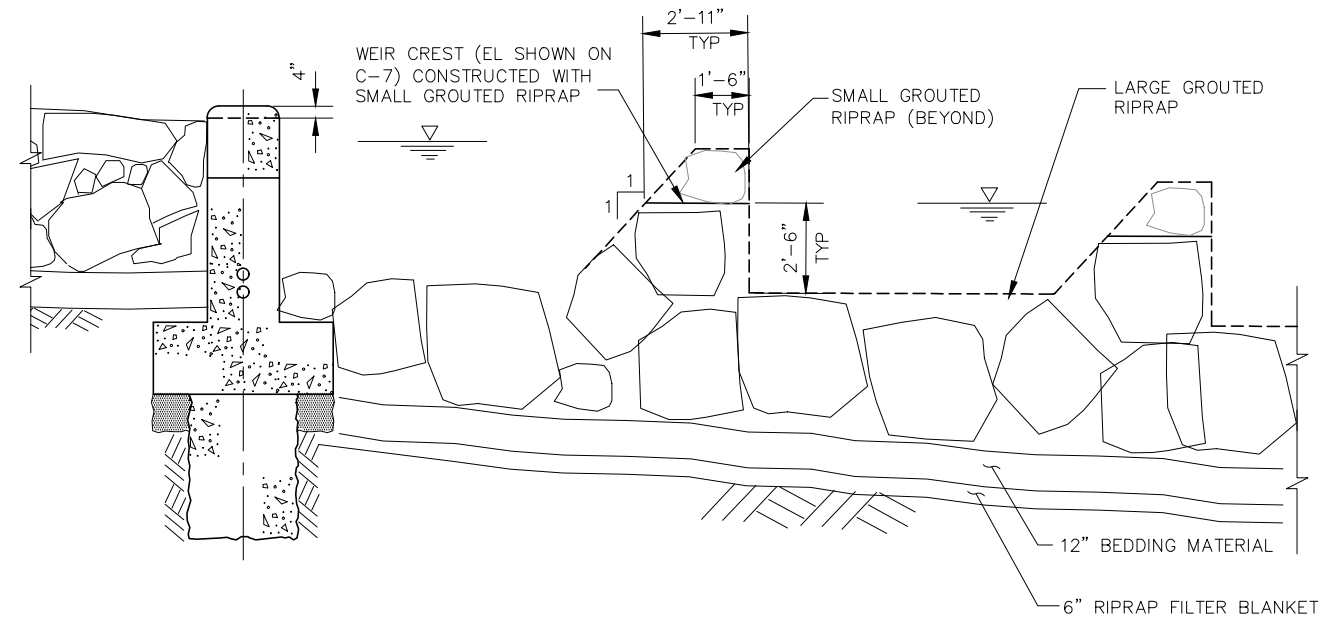
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HOMESTAKE PROJECT
ARKANSAS RIVER DIVERSION
FISHWAY PLAN AND PROFILE

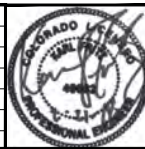
SHEET

C-7



1. FISHWAY SILL SHALL BE CONSTRUCTED OF SMALL GROUTED RIPRAP.
2. ELEVATIONS OF FISHWAY SILL SHOWN ON SHEET C-7.
3. INTERSTICES OF RIPRAP TO BE FILLED WITH NATIVE MATERIAL PER SPECIFICATIONS. MINIMUM DEPTH OF RIPRAP FILL TO BE 4'-6"

0	12/20/19	BC	RECORD DRAWINGS
REV	DATE	BY	DESCRIPTION



AS NOTED

0 1/2 1

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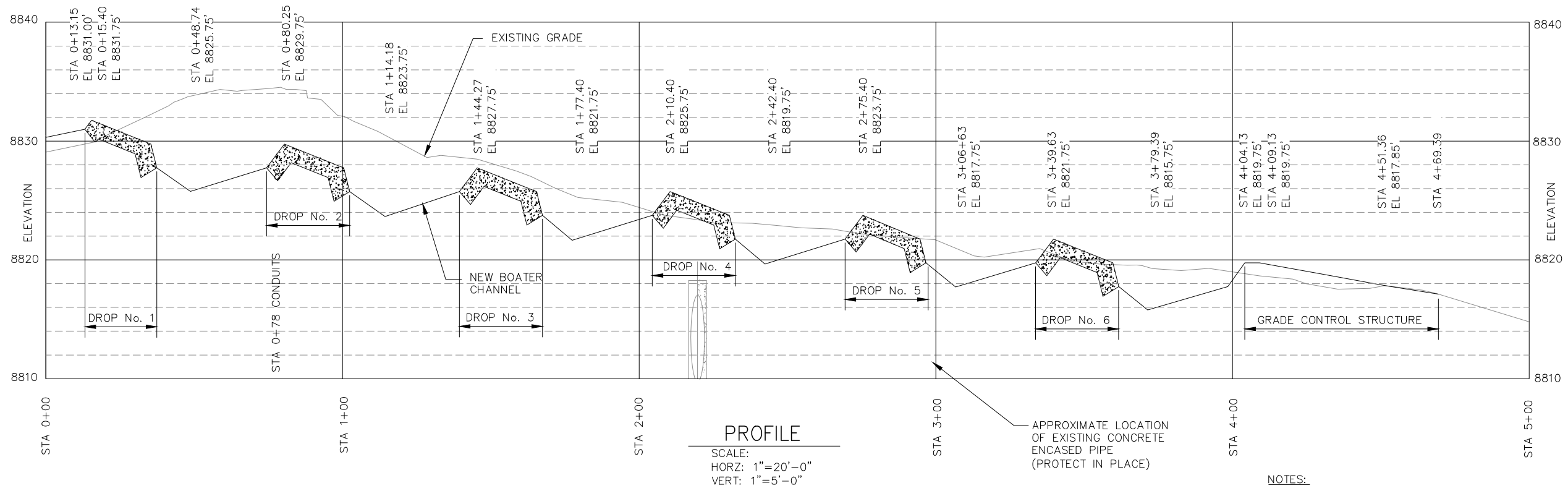
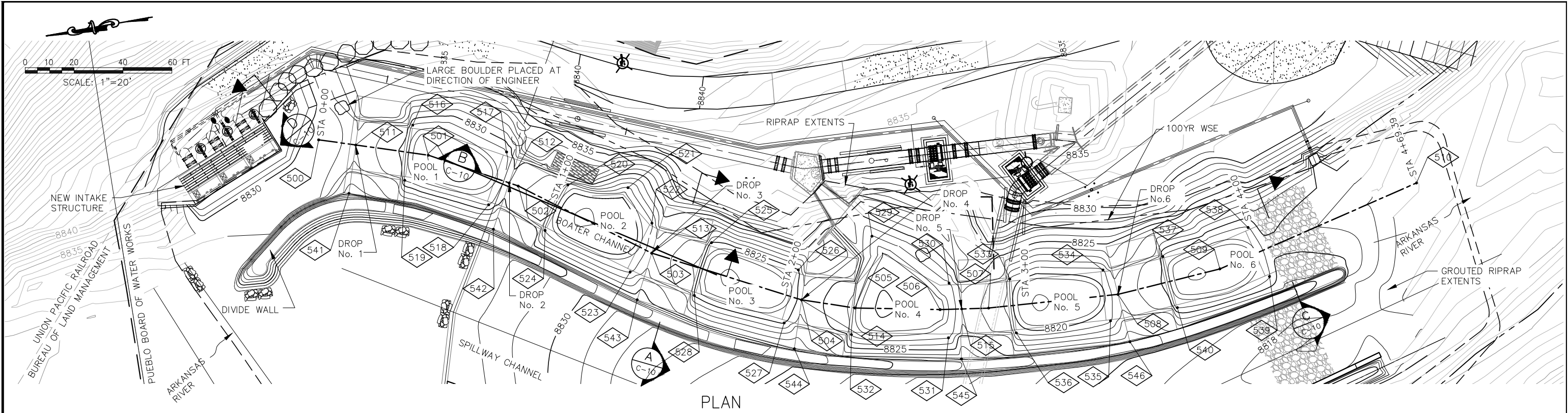
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ARKANSAS RIVER DIVERSION

SPILLWAY AND FISHWAY SECTIONS

C-8

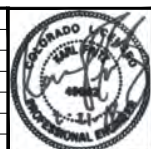


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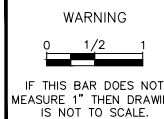
1. FOR COORDINATE DATA SEE SHEET C-4.
2. FIELD VERIFY LOCATION OF EXISTING CONCRETE ENCASED PIPE.

12/18/2019 4:16 PM B:\Colorado Springs Utilities\1 - Arkansas River Diversion\600 - DRAWINGS\dwg - CIV-C-09.dwg

REV	DATE	BY	DESCRIPTION
0	12/20/19	BC	RECORD DRAWINGS



SCALE:
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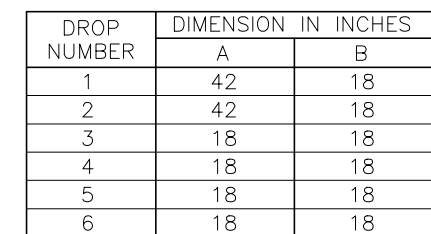


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DRAWN: P. HUNTER
CHECKED: K. FRITZ

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HOMESTAKE PROJECT
ARKANSAS RIVER DIVERSION
BOATER CHANNEL PLAN AND PROFILE

SHEET
C-9



6'-0" (TYP)

20'-0" (TYP)

45'-0"

2'-0" (TYP)

12"

10

1

1

1

LARGE GROUTED RIPRAP

#5 DEFORMED BAR ANCHORS AT 48" MAX EACH WAY

12" BEDDING MATERIAL

6" RIPRAP FILTER BLANKET

FRACTURED STONE UNDER CONCRETE SLAB ONLY

SECTION C-9

SCALE: 1/4"=1'-0"

S 109

B C-9

FRACTURED STONE UNDER CONCRETE SLAB ONLY

MATCH EXISTING GRADE
 LIMITS OF RIPRAP
 RIPRAP (NOTE 2)
 100 YEAR WSE
 BOATER CHANNEL (GRADE CONTROL STRUCTURE)
 EL. 8819.75
 LIMITS OF GROUTED RIPRAP
 12" RIPRAP FILTER BLANKET
 FINAL PLACEMENT OF STONE TO BE APPROVED BY ENGINEER BEFORE GROUTING OF THE GRADE CONTROL STRUCTURE
 6" RIPRAP FILTER BLANKET
 12" BEDDING MATERIAL
 LARGE GROUTED RIPRAP
 SPILLWAY CHANNEL
 3'-6"

12" OFFSET (TYP)

EL. 8839.0

LARGE GROUTED RIPRAP

4'-0" ±

12" BEDDING MATERIAL

6" RIPRAP FILTER BLANKET

EL. 8828.0

4'-6"

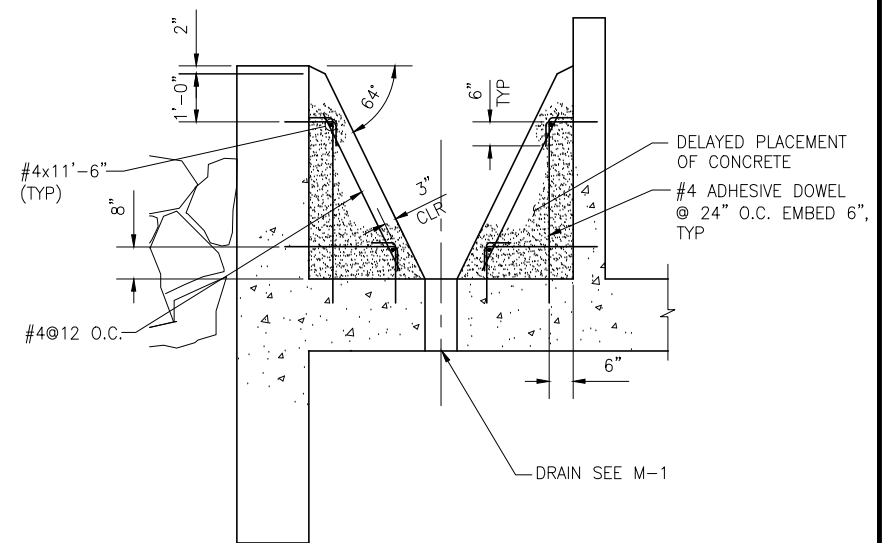
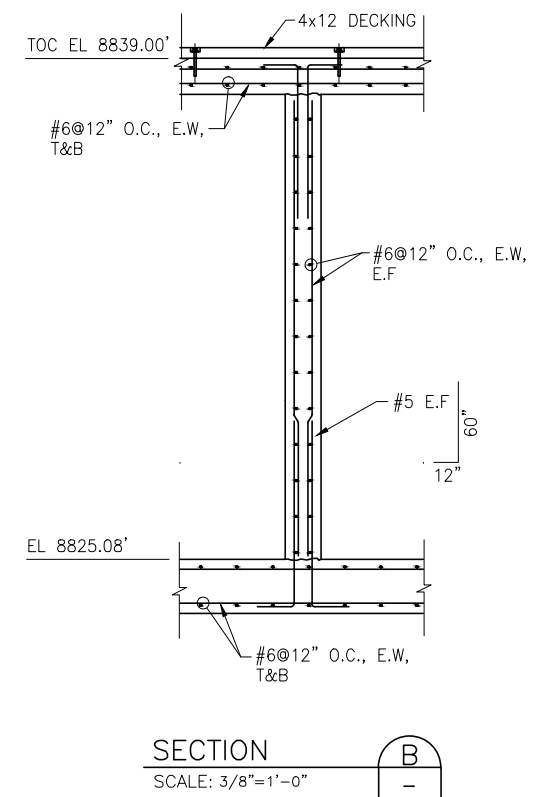
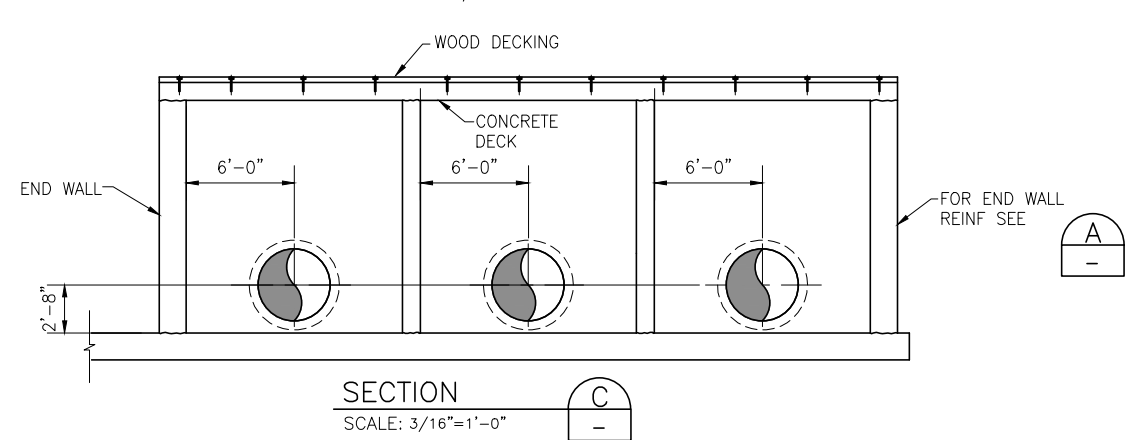
RIPRAP

12" RIPRAP FILTER BLANKET

SECTION _____
SCALE: 1/4"=1'-0"

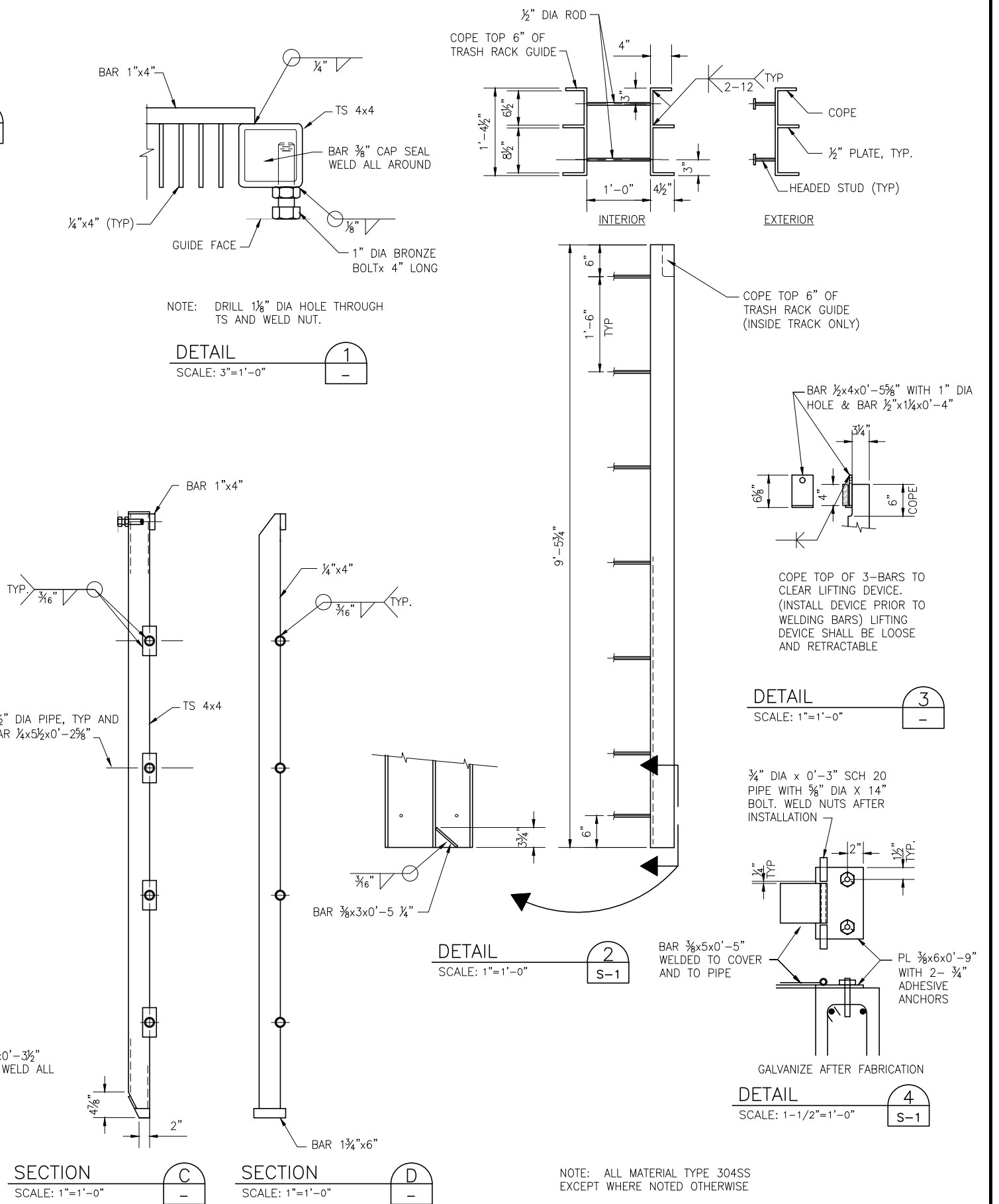
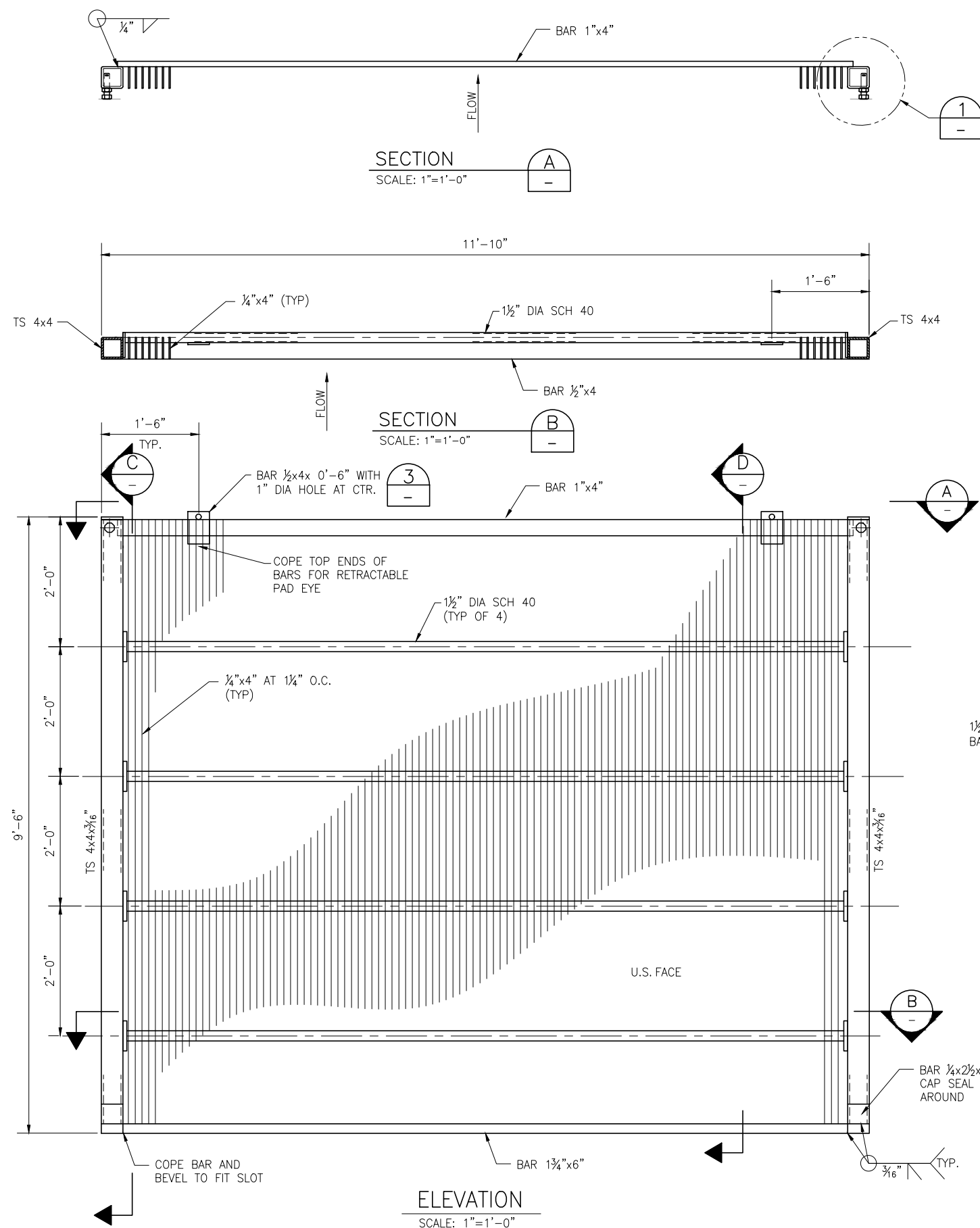
1. MINIMUM COVER OVER REBAR TO BE 4".
2. INTERSTICES OF RIPRAP TO BE FILLED WITH NATIVE MATERIAL PER SPECIFICATIONS. MINIMUM DEPTH OF RIPRAP FILL TO BE 4'-6".
3. BOATER CHANNEL CONCRETE SHALL BE BURLAP FINISHED PER SPECIFICATIONS.

DROP NUMBER	DIMENSION IN INCHES	
	A	B
1	42	18
2	42	18
3	18	18
4	18	18
5	18	18
6	18	18



3. PROVIDE 3 TRASH RACKS (SEE S-2). PROVIDE 3 BULKHEAD (SEE S-3). PROVIDE 6-HINGED COVERS (SEE DETAIL 4/S-2). PROVIDE ANTI-PRY LOCKING DEVICE FOR EACH HINGED COVER (SEE GS-1).
4. CONTRACTOR SHALL USE OWNER FURNISHED FORM LINER ON UPSTREAM HEADWALL FACE. COORDINATE FORM LINER INSTALLATION, REMOVAL AND RE-USE WITH ENGINEER.

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REV	DATE	BY	DESCRIPTION
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SCALE:
AS NOTED

WARNING
0 1/2 1
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DRAWN: P. HUNTER
CHECKED: R. ELDRIDGE

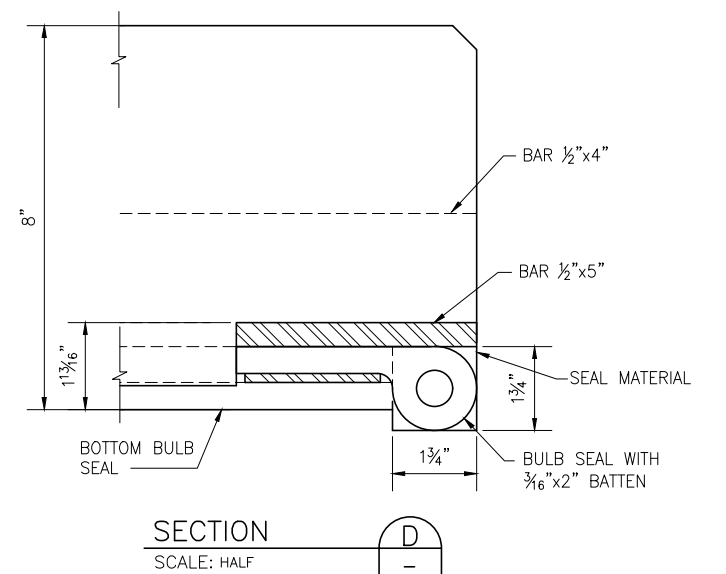
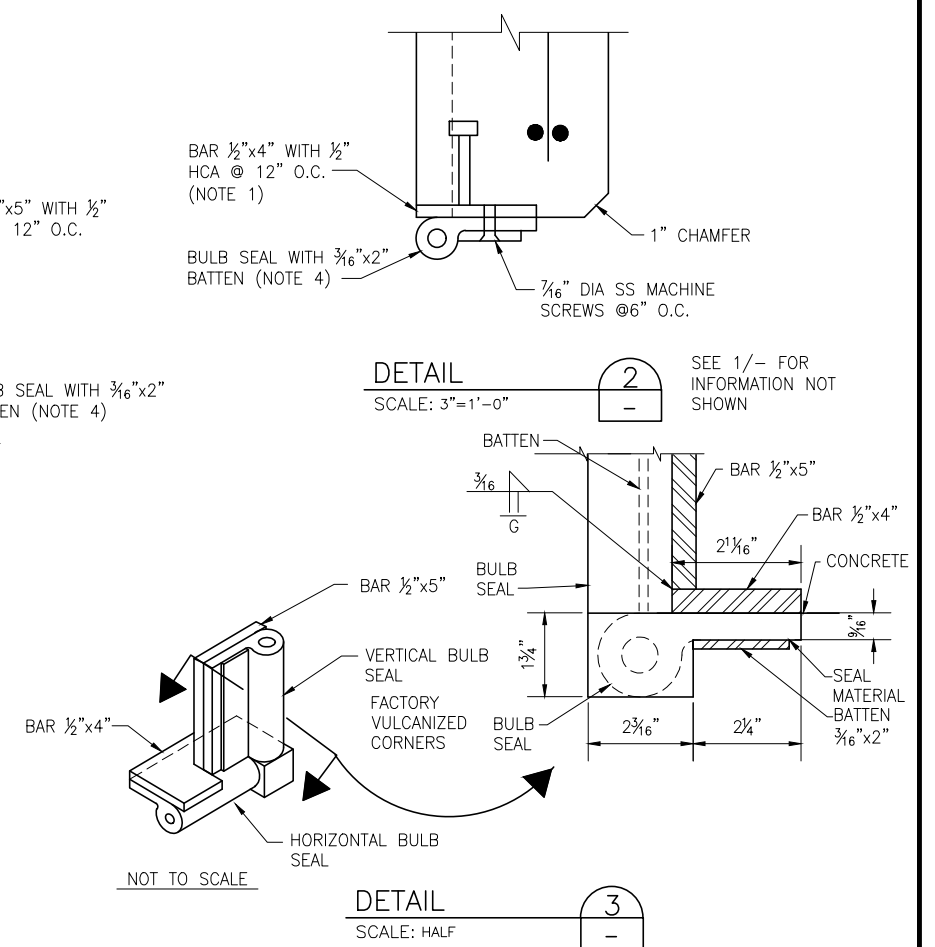
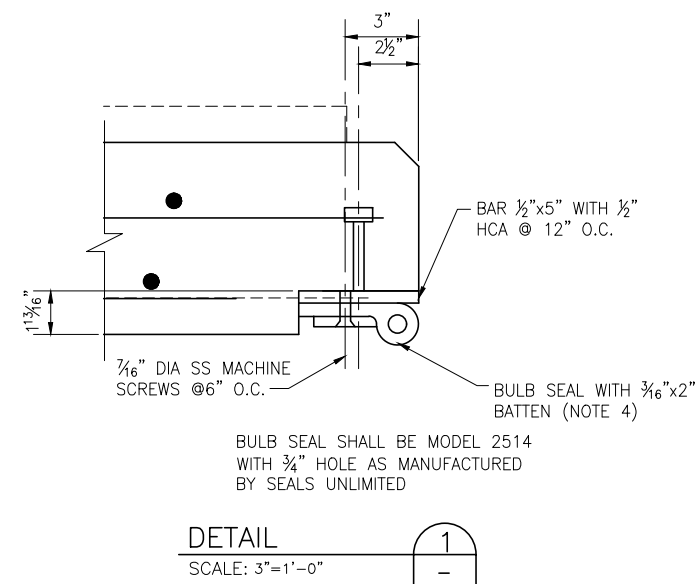
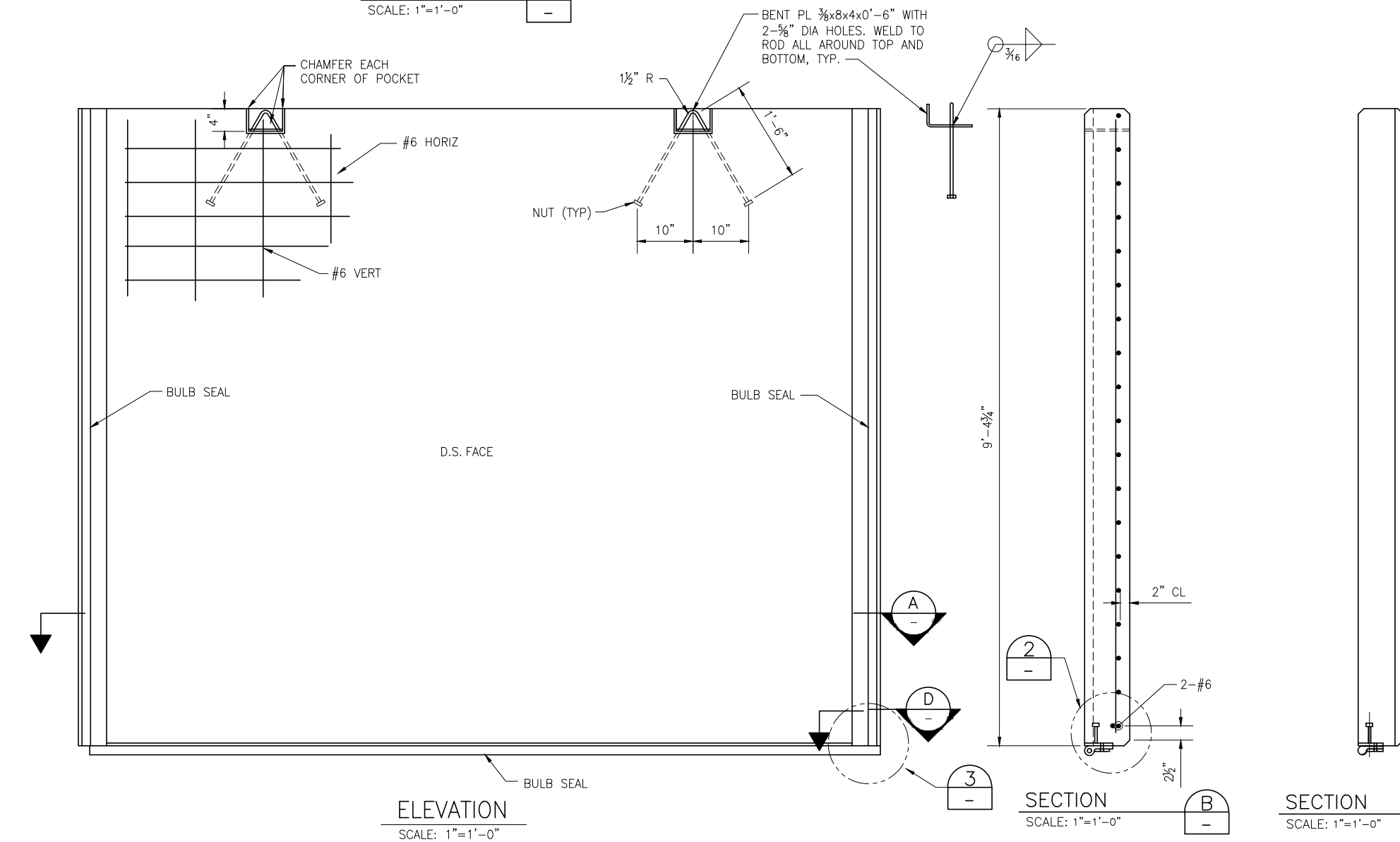
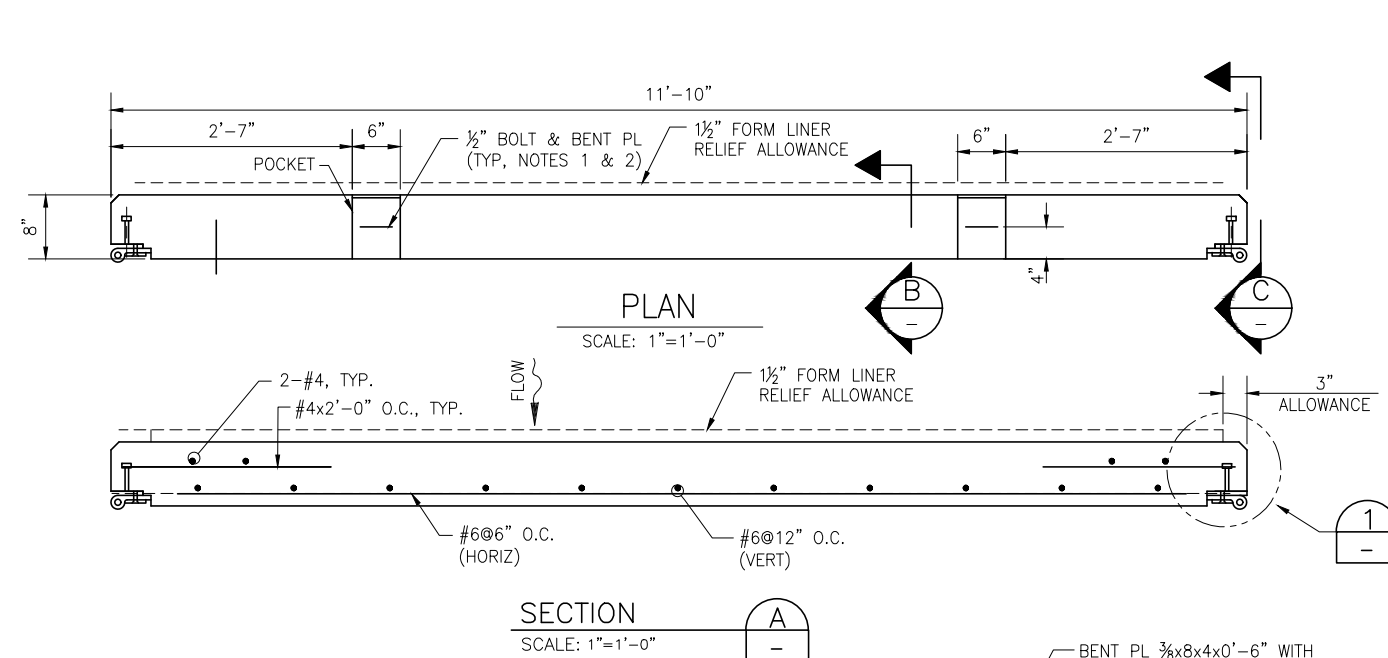
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BOISE, IDAHO 83702
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SECTION C
SCALE: 1"=1'-0"

SECTION D
SCALE: 1"=1'-0"

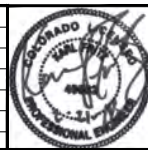
HOMESTAKE PROJECT
ARKANSAS RIVER DIVERSION
TRASH RACK ELEVATION AND SECTIONS

SHEET
S-2

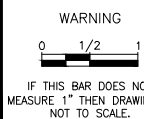


- NOTE:
1. ALL EXPOSED STEEL SHALL BE TYPE 304 STAINLESS.
 2. KEEP EXPOSED STEEL CLEAR OF REINFORCEMENT BY 1" MIN.
 3. CONTRACTOR SHALL USE OWNER FURNISHED FORM LINER ON UPSTREAM BULKHEAD FACE. COORDINATE FORM LINER INSTALLATION, REMOVAL AND RE-USE WITH ENGINEER.
 4. DRILL ¼" HOLES AND COUNTERSINK AND TAP. KEEP 1" CLEAR OF STUDS. INSTALL SCREWS WITH ANTI-SEIZE DOPE.

0	12/20/19	BC	RECORD DRAWINGS		
REV	DATE	BY		DESCRIPTION	



SCALE:
AS NOTED



DESIGNED: K. FRITZ
DRAWN: P. HUNTER
CHECKED: B.CHARLO

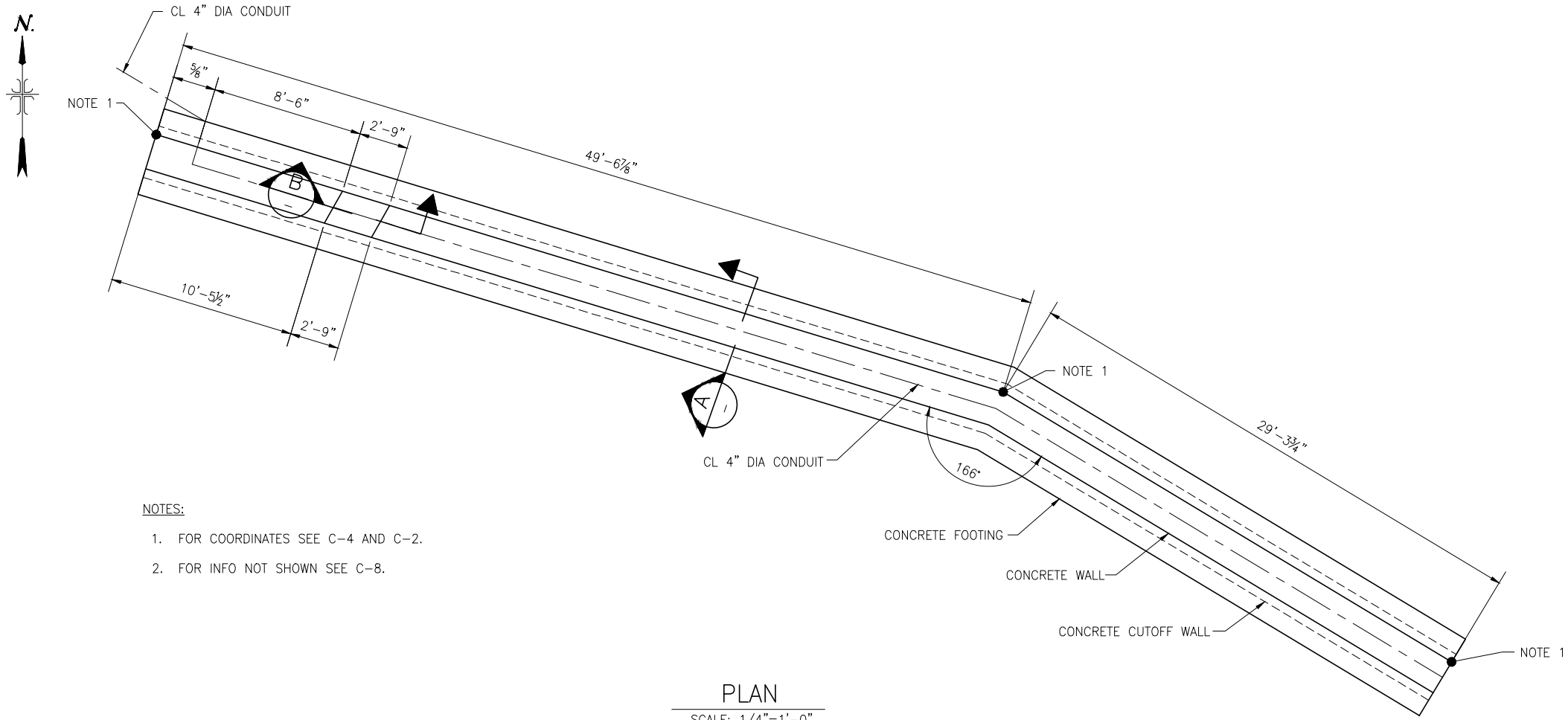
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HOMESTAKE PROJECT ARKANSAS RIVER DIVERSION BULKHEAD ELEVATIONS AND SECTIONS

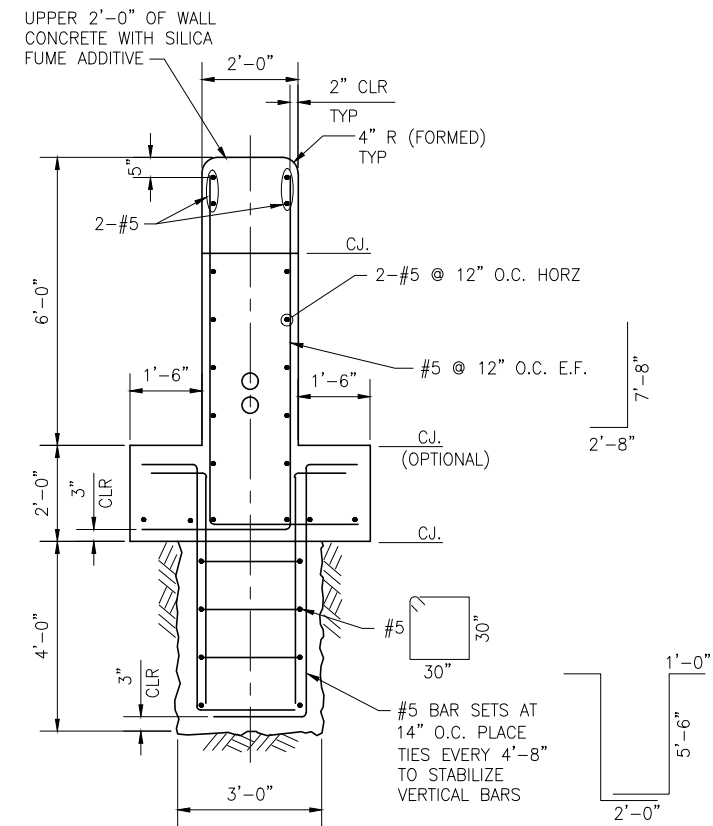
— 3

12/19/2019 6:29 AM B:\Colorado Springs Utilities\1 - Arkansas River Diversion\600 - DRAWINGS\Dwg... \STR\S-04.dwg



NOTES:

1. FOR COORDINATES SEE C-4 AND C-2.
2. FOR INFO NOT SHOWN SEE C-8.

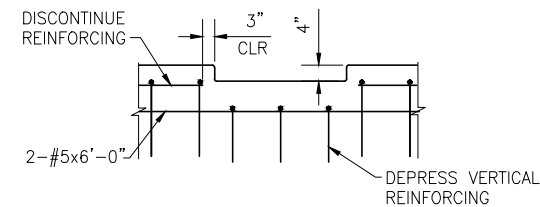


NOTES:

1. UPPER 2'-0" OF WEIR CONCRETE WITH SILICA FUME ADDITIVE.

SECTION

SCALE: 1/2"=1'-0"



SECTION

SCALE: 1/2"=1'-0"



12/19/2019 6:29 AM

REV	DATE	BY	DESCRIPTION
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SCALE:
AS NOTED

WARNING
0 1/2 1
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DRAWN: P. HUNTER
CHECKED: R. ELDRIDGE

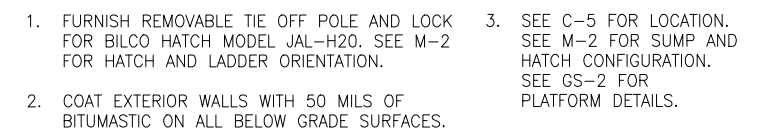
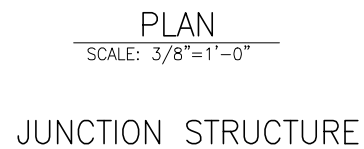
DEERE & AULT
CONSULTANTS, INC.

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BOISE, IDAHO 83702
TEL 208.331.9736

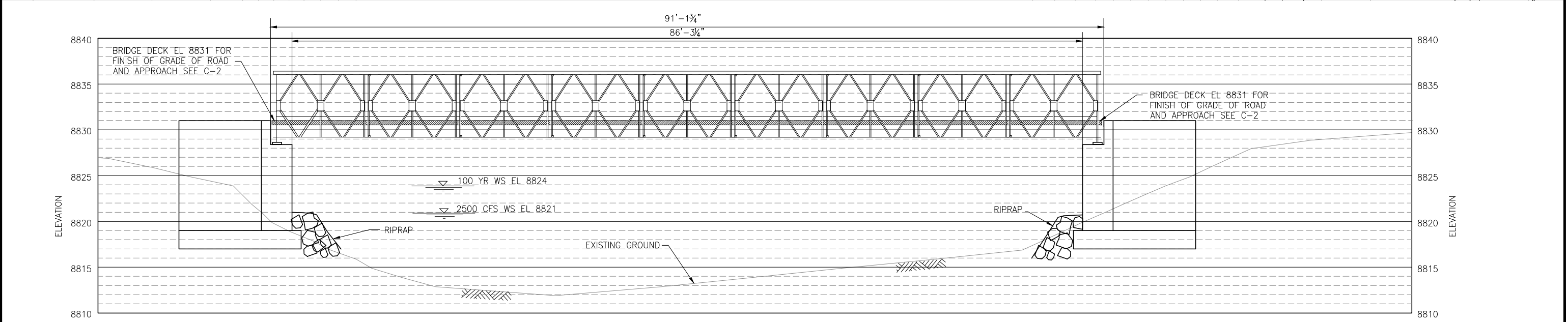
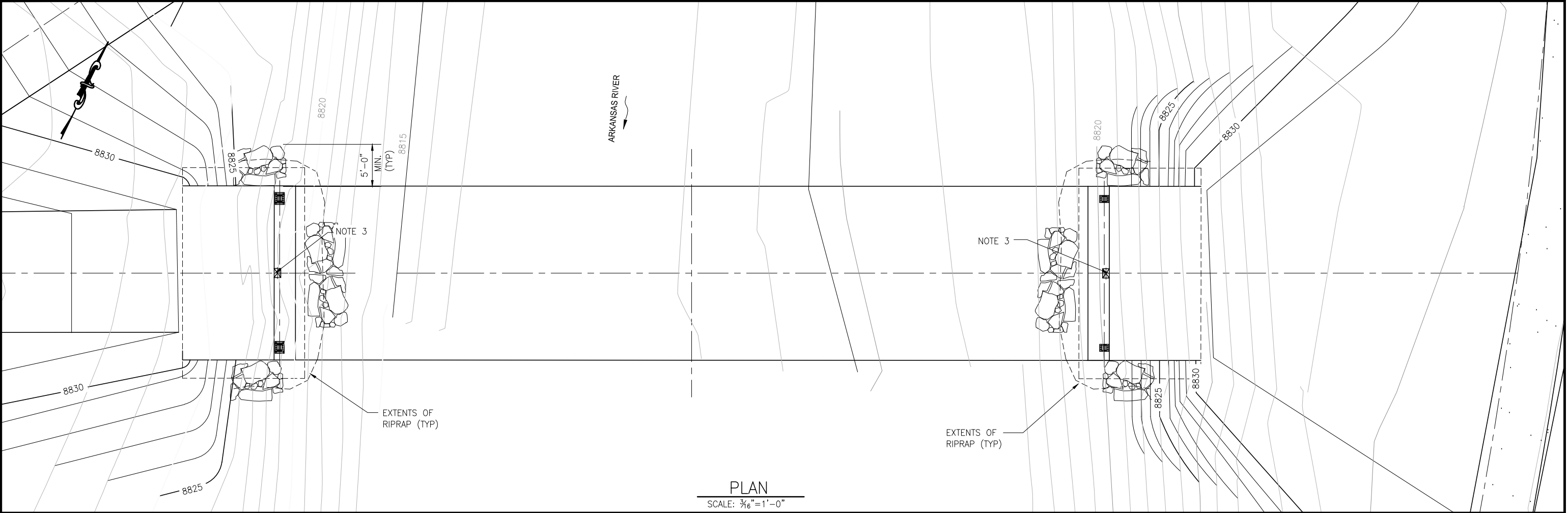
HOMESTAKE PROJECT
ARKANSAS RIVER DIVERSION
DIVERSION WEIR

SHEET

S-4



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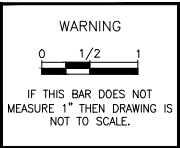


- NOTES:
- 1. RAILCAR BRIDGE, SEE SPECIFICATIONS.
 - 2. FOR ABUTMENT DETAILS SEE S-7.
 - 3. SEE C-2 FOR COORDINATES.
 - 4. PLACE RIPRAP AT A MINIMUM DEPTH OF 4'-6\".

REV	DATE	BY	DESCRIPTION
0	12/20/19	BC	RECORD DRAWINGS



SCALE:
AS NOTED



DESIGNED: K. FRITZ
DRAWN: P. HUNTER
CHECKED: R. ELDRIDGE

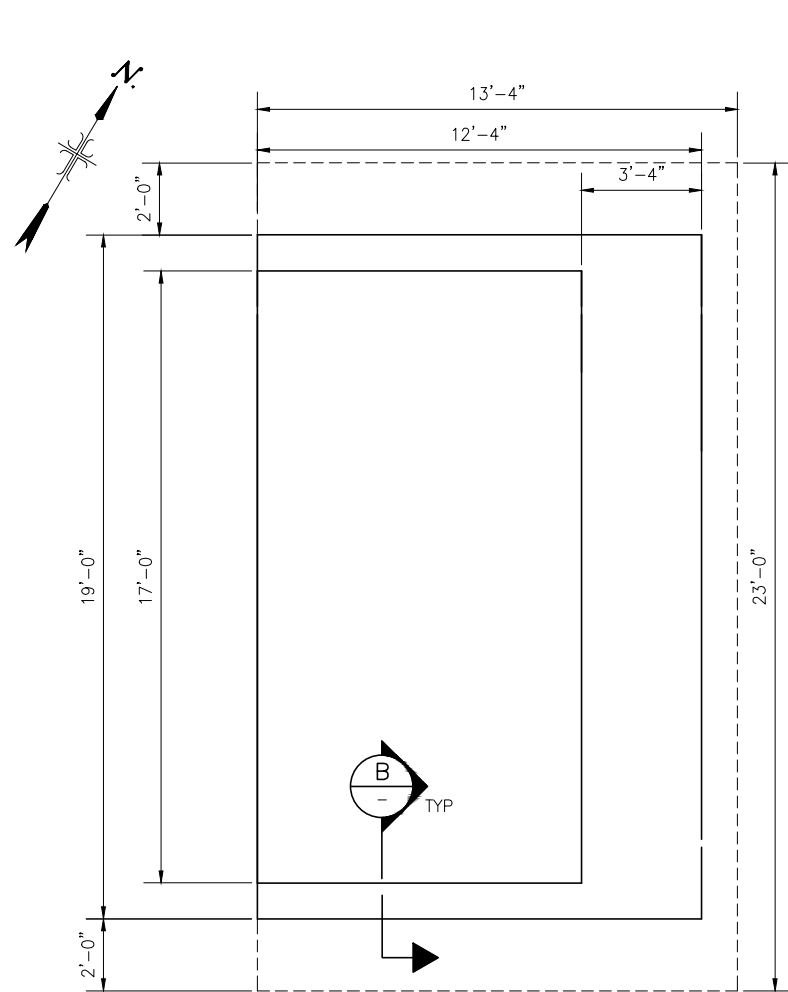
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CONSULTANTS, INC.
420 WEST MAIN STREET, SUITE 202
BOISE, IDAHO 83702
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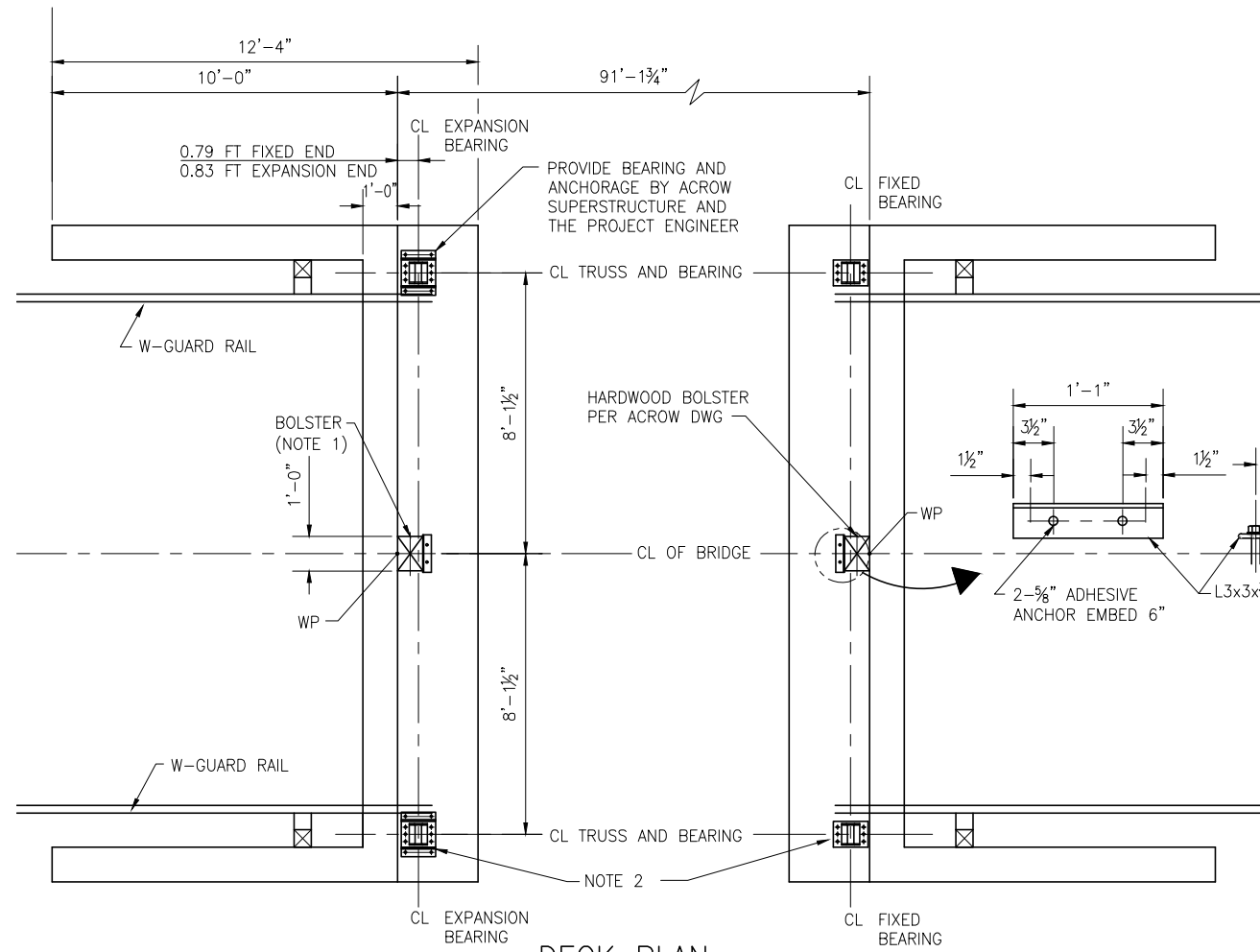
HOMESTAKE PROJECT
ARKANSAS RIVER DIVERSION
BRIDGE SITUATION AND LAYOUT

SHEET
S-6

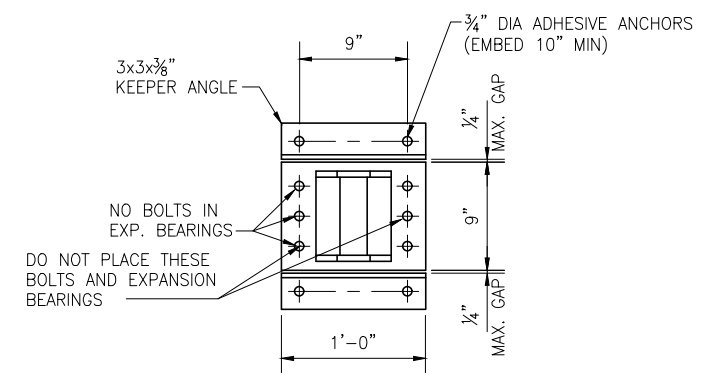
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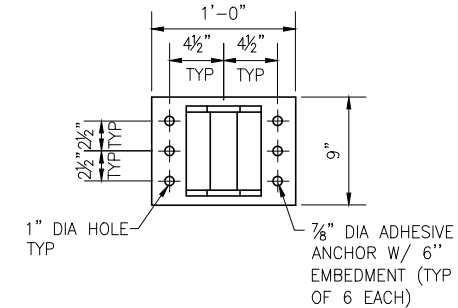
FOUNDATION PLAN
SCALE: 3/8"=1'-0"



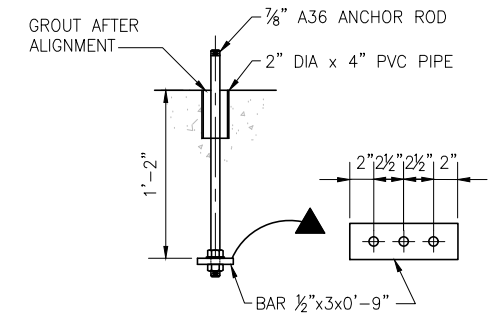
DECK PLAN
SCALE: 3/8"=1'-0"



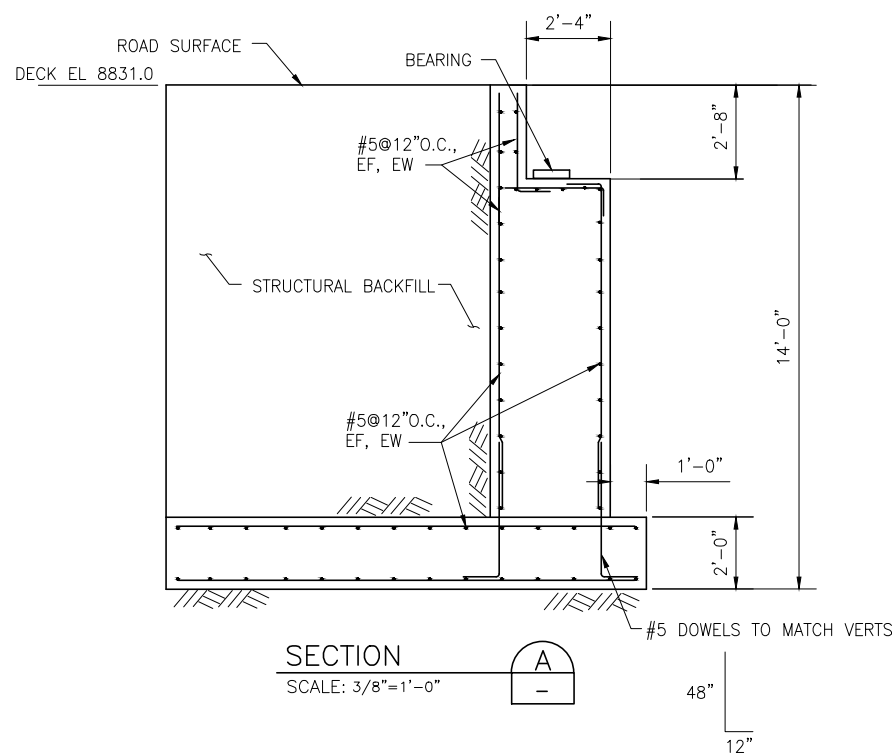
EXPANSION END - BEARING DETAIL
SCALE: 1-1/2"=1'-0"



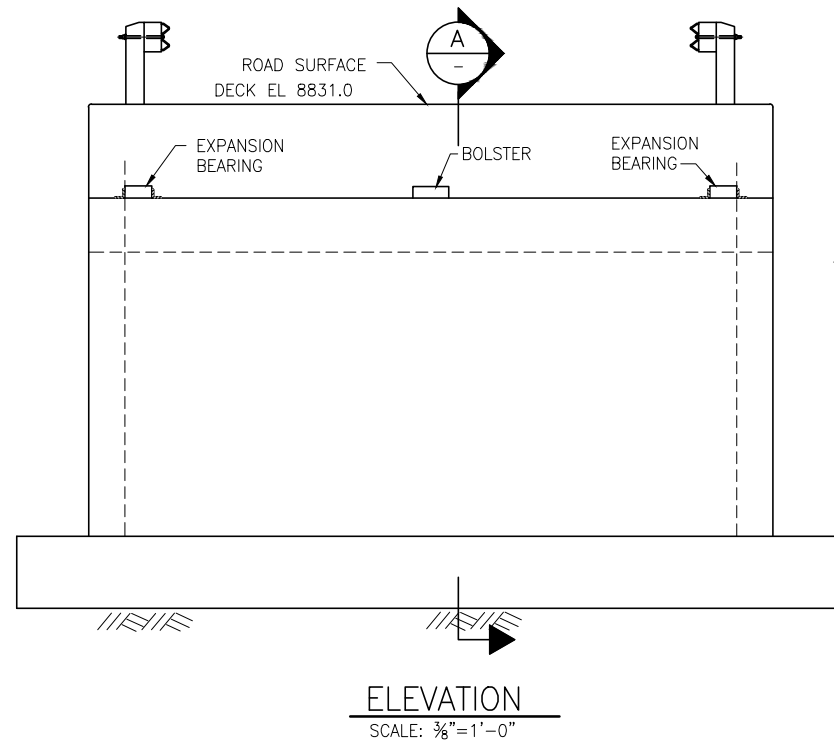
FIXED END - BEARING DETAIL
SCALE: 1-1/2"=1'-0"



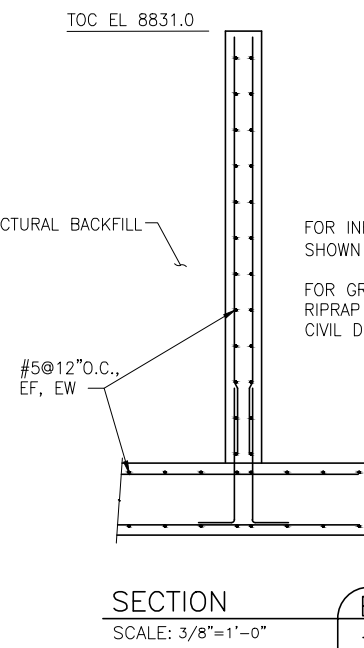
ANCHOR BOLT DETAIL
SCALE: 1-1/2"=1'-0"



SECTION A
SCALE: 3/8"=1'-0"



ELEVATION
SCALE: 3/8"=1'-0"

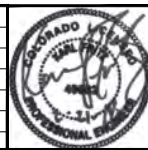


SECTION B
SCALE: 3/8"=1'-0"

FOR INFORMATION NOT SHOWN SEE A/-
FOR GRADING AND RIPRAP DETAILS SEE CIVIL DRAWINGS

NOTES:

1. PLACE BOLSTERS PER ACROW REQUIREMENTS.
2. PLACE CONCRETE BEARING SURFACE 1/8" HIGH. GRIND FLAT AND LEVEL AT FINAL BEARING ELEVATION.
3. SEE DRAWING GS-1 FOR REINFORCEMENT DETAILS.



SCALE:
AS NOTED

WARNING
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.

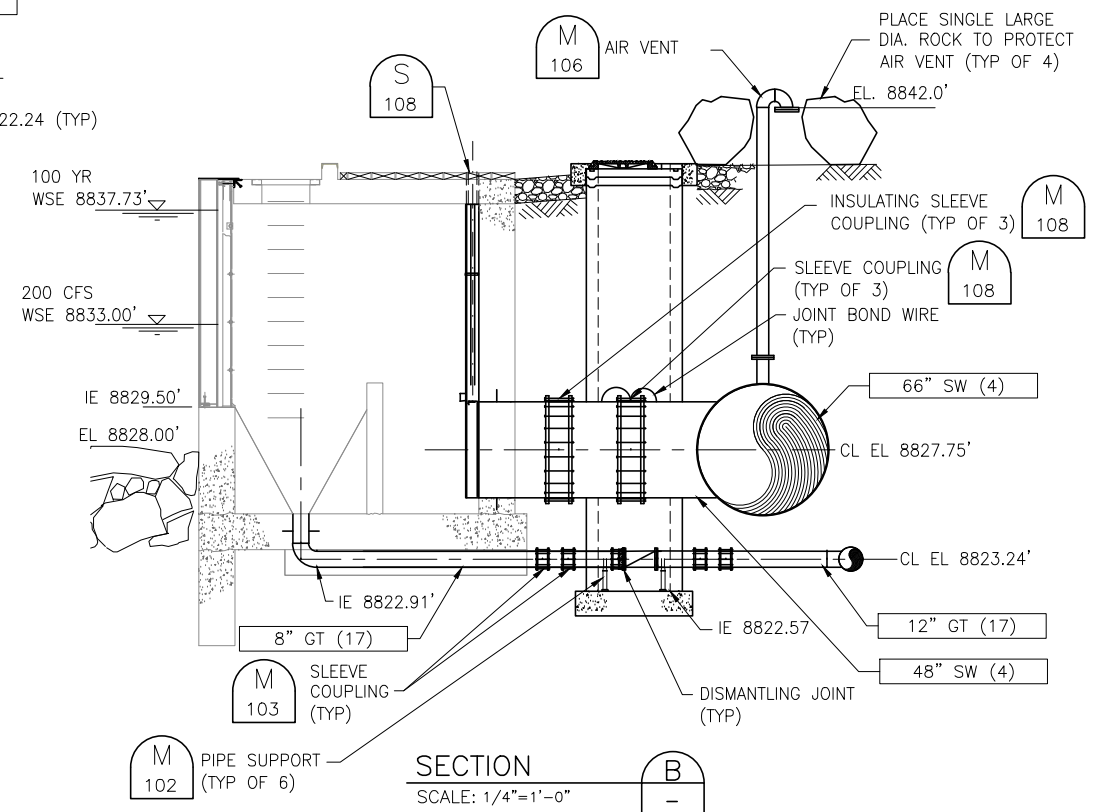
DESIGNED: K. FRITZ
DRAWN: P. HUNTER
CHECKED: R. ELDRIDGE

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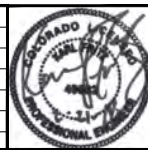
HOMESTAKE PROJECT
ARKANSAS RIVER DIVERSION
BRIDGE ABUTMENT PLAN AND SECTIONS

SHEET

S-7



0	12/20/19	BC	RECORD DRAWINGS	
REV	DATE	BY		DESCRIPTION



WARNING

0 1/2 1



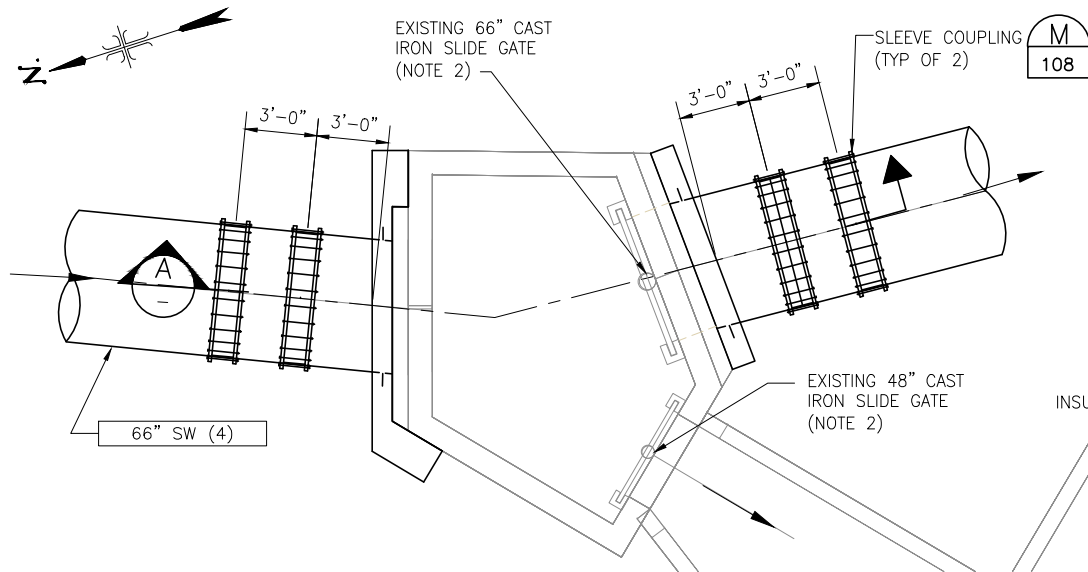
IF THIS BAR DOES NOT
MEASURE 1" THEN DRAWING IS
NOT TO SCALE.

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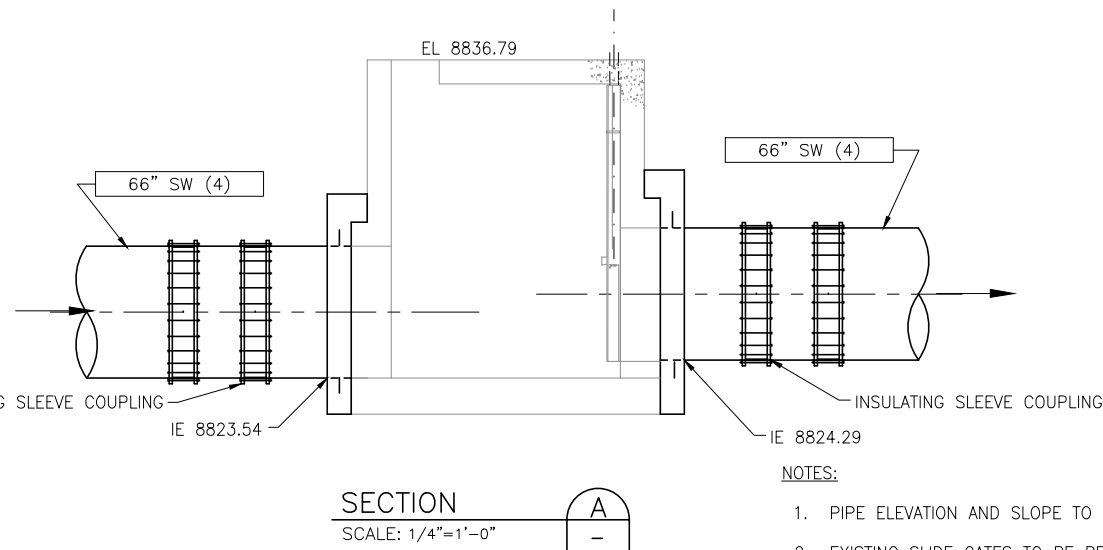
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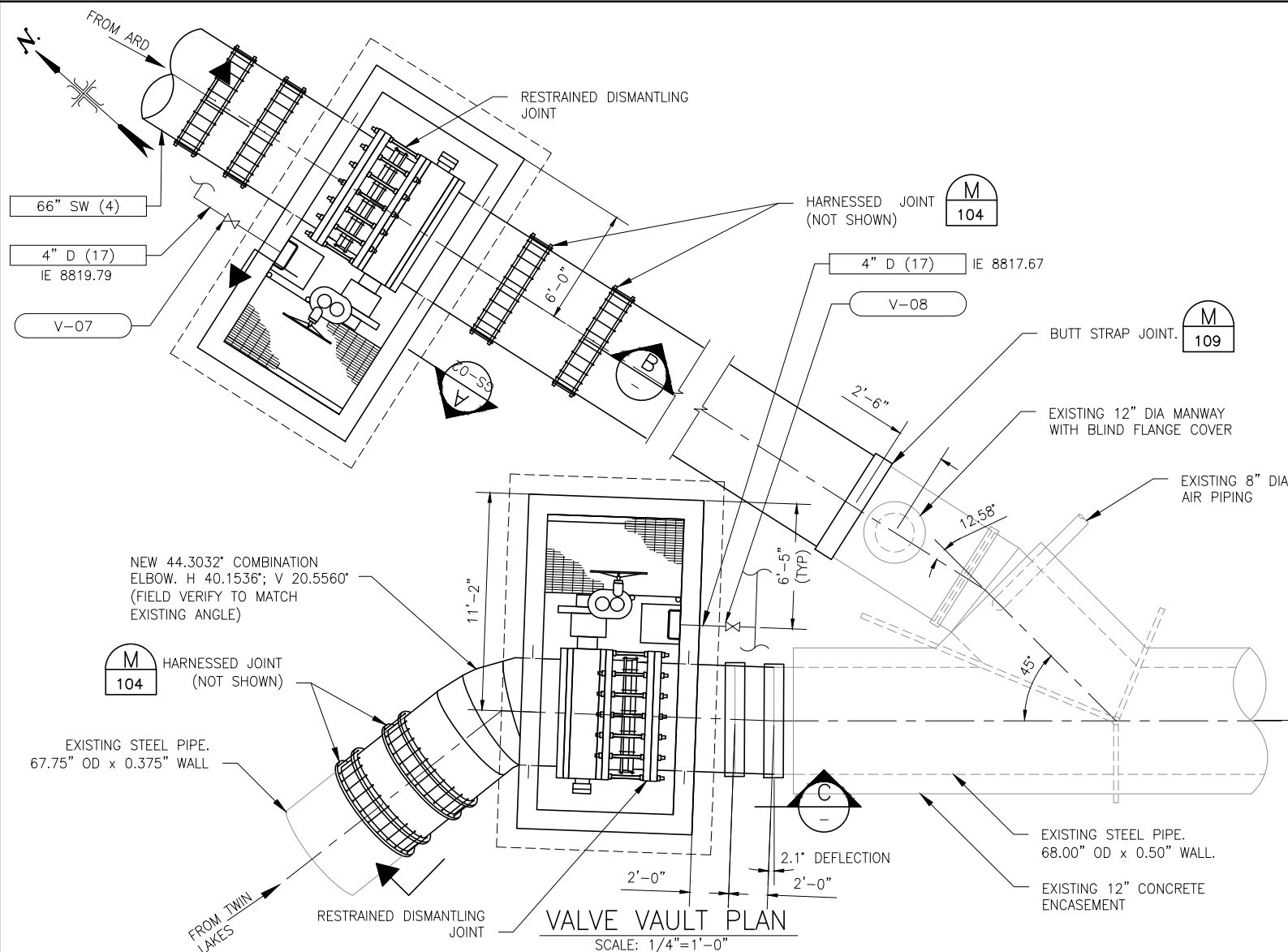


JUNCTION STRUCTURE PLAN
SCALE: 1/4"=1'-0"

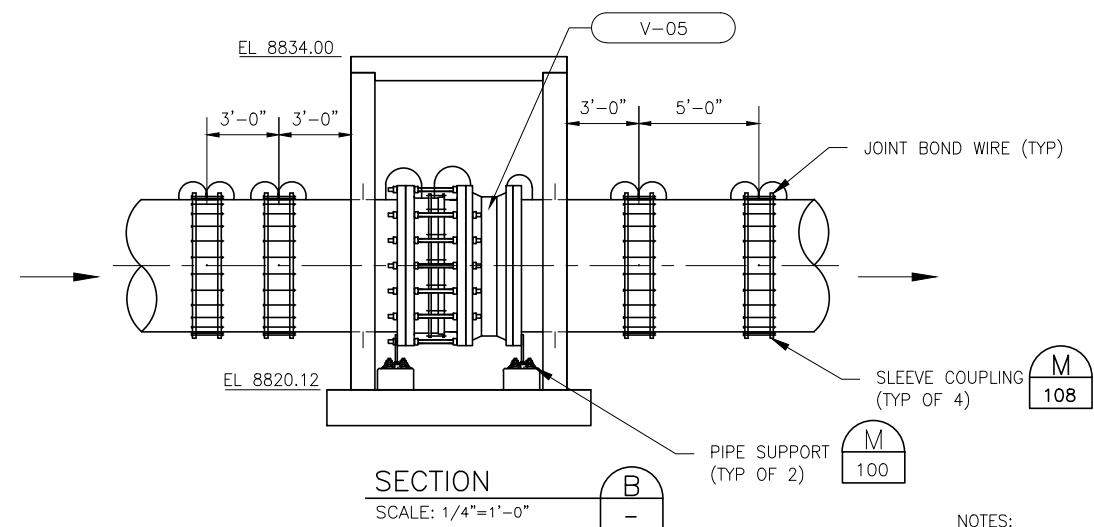


SECTION A
SCALE: 1/4"=1'-0"

- NOTES:
1. PIPE ELEVATION AND SLOPE TO MATCH EXISTING.
 2. EXISTING SLIDE GATES TO BE REFURBISHED. SEE SPECIFICATIONS SECTION 15106.

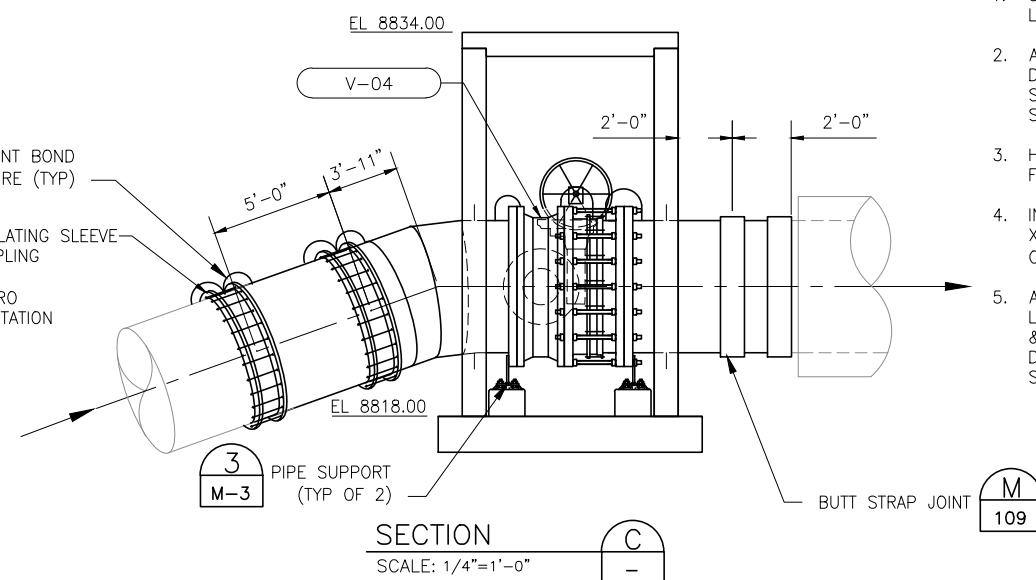


VALVE VAULT PLAN
SCALE: 1/4"=1'-0"



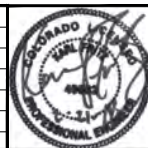
SECTION B
SCALE: 1/4"=1'-0"

- NOTES:
1. SEE CIVIL PLANS FOR CORNER LOCATIONS AND COORDINATES.
 2. ALL SLEEVE COUPLINGS AND DISMANTLING JOINTS SHOWN HERE SHALL BE CLASS 300, FLANGES SHALL BE CLASS E.
 3. HARNESS BOLTS MUST BE SLEEVED FOR ELECTRICAL ISOLATION.
 4. INSTALL 40psi STYROFOAM HIGHLOAD XPS INSULATION ON THE EXTERIOR OF THE VAULT'S VERTICAL WALLS.
 5. AS-BUILT ANGLES, DIMENSIONS AND LOCATIONS ARE TAKEN FROM BLACK & VEATCH 1984 AS-BUILT DRAWINGS AND THOMPSON PIPE & STEEL CO. SHOP DRAWINGS.

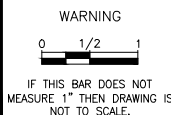


SECTION C
SCALE: 1/4"=1'-0"

REV	DATE	BY	DESCRIPTION
0	12/20/19	BC	REVISED DRAWINGS



SCALE:
AS NOTED

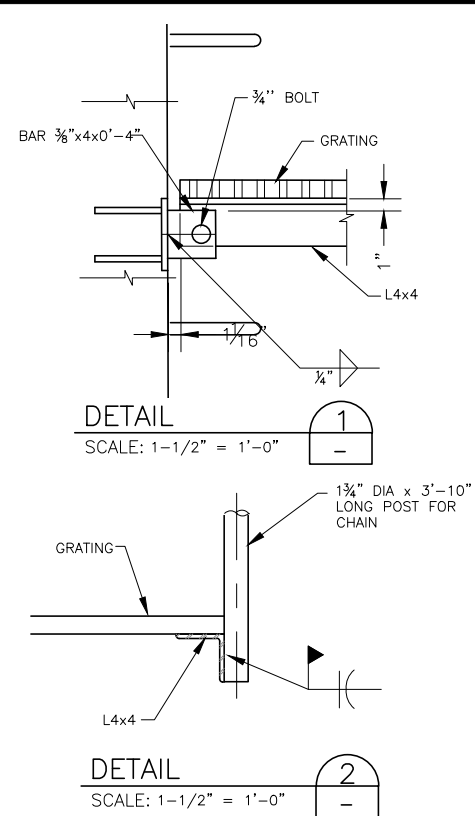
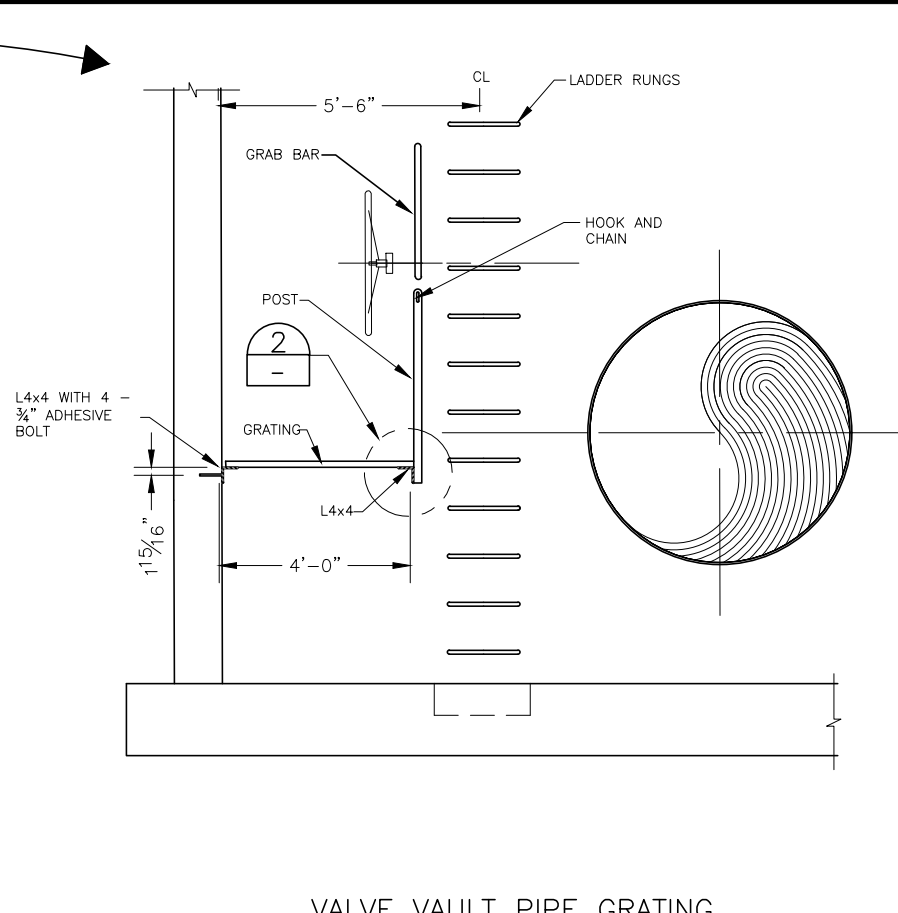
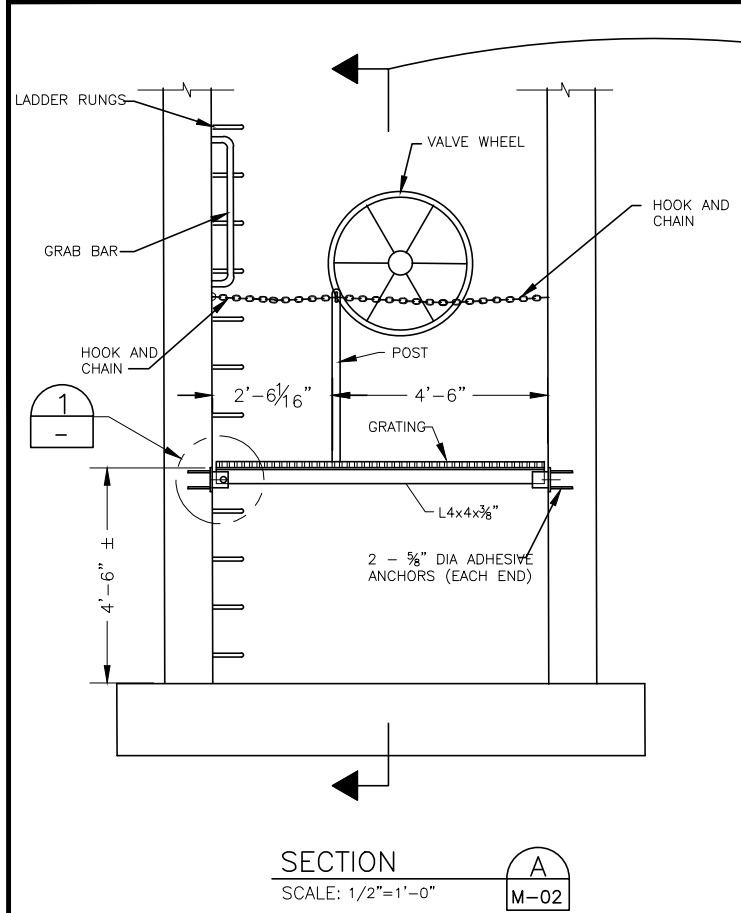


DESIGNED: B. CHARLO
DRAWN: P. HUNTER
CHECKED: K. FRITZ

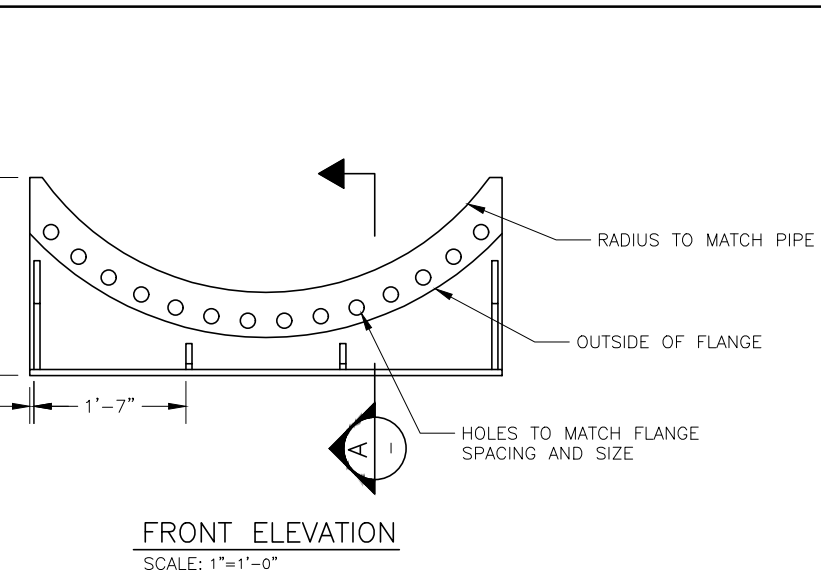
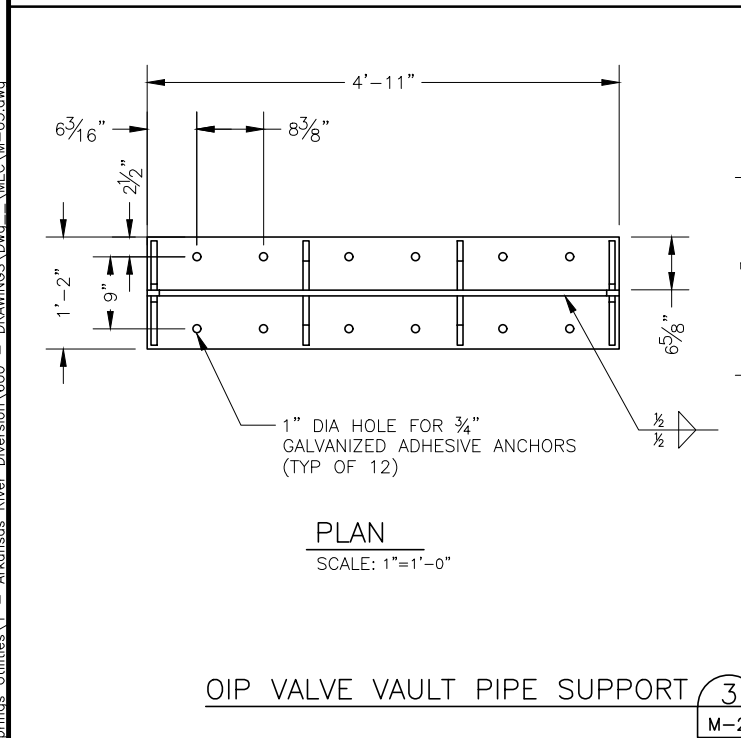
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HOMESTAKE PROJECT
ARKANSAS RIVER DIVERSION
VAULT, OUTFALL AND JUNCTION STRUCTURE

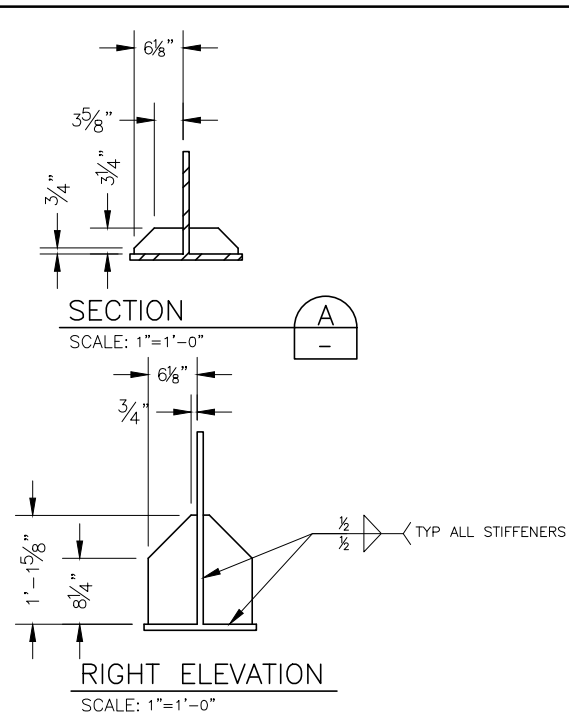
SHEET
M-2



- NOTE:
1. BAR GRATING SHALL BE 4 - 1"x3/16", 60 POUNDS MAX UNITS.
 2. ALL MATERIAL ZINC PLATED OR HOT DIPPED GALVANIZED. FIELD WELDS SHALL BE FIELD COATED.
 3. SAFETY CHAIN SHALL BE TRADE SIZE 1/8" LOOP CHAIN OF 0.016" DIAMETER MATERIAL WITH WORKING LOAD OF 400 LB. ANCHOR TO POSTS WITH WELDED LINK. ANCHOR TO CONCRETE WALL WITH 1/2" DIA HILTI HDI DROP IN ANCHOR, 1/2" DIA EYE BOLT, 1/4" QUICK LINKS AND 1/4" SPRING CARIBINERS.



- NOTE:
1. ALL PLATE AND STIFFENERS SHALL BE 3/4" THICK.
 2. ANCHOR BOLTS AND PLATE SHALL BE GALVANIZED AFTER FABRICATION.
 3. HOUSKEEPING PAD REINFORCEMENT SHALL BE #8 @ 2" O.C., EW, EF.
 4. MATCH GROUT PAD AND CONCRETE HOUSKEEPING PAD DIMENSIONS AS SHOWN IN GENERAL DETAIL M/100.



REV	DATE	BY	DESCRIPTION
0	12/20/19	BC	RECORD DRAWINGS

SCALE:
AS NOTED

WARNING
0 1/2 1
IF THIS BAR DOES NOT
MEASURE 1" THEN DRAWING
IS NOT TO SCALE.

DESIGNED: K. FRITZ
DRAWN: P. HUNTER
CHECKED: R. ELDRIDGE

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HOMESTAKE PROJECT
ARKANSAS RIVER DIVERSION
MECHANICAL DETAILS

SHEET
M-3