

BLACK CANYON IRRIGATION DISTRICT GRAVITY IRRIGATION STANDARD DETAILS

ADOPTED JULY 12TH, 2023

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CONTACT INFORMATION

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CALL 48 HOURS BEFORE YOU DIG
ONE CALL 1-800-342-1585

REPORT ALL SPILLS
DEPT. OF ENVIRONMENTAL QUALITY:
1-800-632-8000

ABBREVIATIONS

ACCHD	ASSOCIATION OF CANYON COUNTY HIGHWAY DISTRICTS	FW	FUSION WELD	OD	OUTSIDE DIAMETER
CB	CATCH BASIN	GALV	GALVANIZED	PE	PLAIN END
CDF	CONTROL DENSITY FILL (FLOWABLE CONCRETE FILL)	GI	GRAVITY IRRIGATION	PI	PRESSURE IRRIGATION
CONC	CONCRETE	HDPE	HIGH-DENSITY POLYETHYLENE	PIP	PLASTIC IRRIGATION PIPE
CL	CONSTRUCTION CENTERLINE	HMA	HOT MIXED ASPHALT	PROP	PROPOSED
CTS	COPPER TUBE SIZE	ID	INSIDE DIAMETER	PSI	POUNDS PER SQUARE INCH
DI	DUCTILE IRON	IE	INVERT ELEVATION	PVC	POLYVINYL CHLORIDE
DIAM	DIAMETER	ISPWC	IDAHO STANDARDS FOR PUBLIC WORKS CONSTRUCTION	RCP	REINFORCED CONCRETE PIPE
DWG	DRAWING	ITD	IDAHO TRANSPORTATION DEPARTMENT	RS	RESILIENT SEAT
EG	EXISTING GROUND	LF	LINEAR FEET	SPEC	SPECIFICATIONS
ELEV	ELEVATION	MH	MANHOLE	SST	STAINLESS STEEL
EX	EXISTING	MIP	MALE IRON PIPE	STD	STANDARD
FL	FLANGED	MJ	MECHANICAL JOINT FITTING	STL	STEEL
FG	FINISHED GRADE	NO	NUMBER	SW	SOLVENT WELD
		OC	ON CENTER	TEMP	TEMPORARY
				TYP	TYPICAL

IRRIGATION SYSTEM STANDARD DETAIL

COVER

BLACK CANYON IRRIGATION DISTRICT

FILE: BCID-D-COV.DWG

REVISED: 07/12/2023

DWG NO. GIR01

ADMINISTRATION

1. DELIVERY RATES:
 - 1.1. FIRST UNIT: IRRIGATION WATER DELIVERY RATE IS 1 MINER'S INCH OF WATER ($1/50 = 0.02$ CFS) PER IRRIGABLE ACRE.
 - 1.2. SECOND UNIT: IRRIGATION WATER DELIVERY RATE IS 0.75 MINER'S INCH OF WATER PER IRRIGABLE ACRE ($0.75/50 = 0.015$ CFS)
 - 1.3. THE TOTAL YEARLY QUANTITY (Q_a) OF WATER DELIVERED FOR THE SECOND UNIT IS SCHEDULED TO BE 5 ACRE FEET (IF WATER QUANTITIES ALLOW - BASED ON SEASONAL FLOWS).
2. AN ELECTRONIC AS-BUILT RECORD MUST BE SUBMITTED TO THE DISTRICT BEFORE IRRIGATION SERVICE WILL BE PROVIDED.
3. INTERRUPTION OF AGRICULTURAL IRRIGATION WATER SERVICE TO LANDS DOWNSTREAM OF THE SUBJECT PROPERTY WILL NOT BE PERMITTED.
4. ANY PROPOSED DEVELOPMENT THAT HAS BCID INFRASTRUCTURE IN THE PARCEL OR ADJACENT TO THE PARCEL THAT REQUIRES A LAND-USE ACTION AT THE CITY OR COUNTY LEVEL (INCLUDING ZONING CHANGES, SUBDIVISIONS, LAND DIVISIONS OF GREATER THAN 2 PARCELS, ETC) WILL REQUIRE FENCING OF ANY PIPES, OPEN DITCHES, CANALS, AND DRAINS OPERATED BY BCID. PER BCID RESOLUTION 2023-01.
5. ANY DEVELOPMENT THAT HAS BCID INFRASTRUCTURE ON THE PARCEL OR ADJACENT TO THE PARCEL THAT REQUIRES A LAND-USE ACTION AT THE CITY OR COUNTY LEVEL (INCLUDING ZONING CHANGES, SUBDIVISIONS, LAND DIVISIONS OF GREATER THAN 2 PARCELS, ETC) WILL REQUIRE PIPING (TILING) OF OPEN CANALS AND LATERALS OPERATED BY THE BCID. PER BCID RESOLUTION 2023-02.
6. NO WORK IS PERMITTED DURING IRRIGATION SEASON WITHOUT EXPRESSED WRITTEN AND DISTRICT'S APPROVAL. IRRIGATION OFF SEASON IS TYPICALLY NOVEMBER 1ST THROUGH MARCH 1ST.
7. NOVEMBER 1ST IS THE CUTOFF FOR APPROVED PLANS TO BE CONSTRUCTED.

DESIGN

1. SEE SUMMARY TABLES BELOW FOR PIPE LOCATIONS AND MATERIAL TO BE USED. OTHER PIPES MAY BE ALLOWED WITH DISTRICT APPROVAL.

NON-TRAVELED WAYS (NO WHEEL LOADING)	
PIP	100 PSI SDR 41; GASKETED BELL AND SPIGOT
PVC	CLASS 125 SDR 32.5
HDPE	IPS SDR 17; PE 4710; BUTT FUSION
RCP	CLASS III MINIMUM - GASKETED (ASTM C-76 / ASTM C-4430)

TRAVELED WAYS- ANY WHEEL LOADING (H-25 MIN)	
PVC	AWWA C-900 OR C-905; DR 18 / PR 235; GASKETED BELL AND SPIGOT
HDPE	IPS SDR 17; PE 4710; BUTT FUSION
RCP	CLASS IV MINIMUM; GASKETED
WITH BCID APPROVAL:	POLY-COATED ALUMINIZED TYPE 2 CORRUGATED STEEL; 2-2/3" X 1/2" CORRUGATIONS; 10 GAUGE MIN

IRRIGATION SYSTEM STANDARD DETAIL

**IRRIGATION GENERAL NOTES
PAGE 1 OF 3**

**BLACK CANYON
IRRIGATION DISTRICT**

FILE: BCID-D-CNOTE1.DWG

REVISED: 07/12/2023

DWG NO. GIR02

DESIGN CON'T

2. GRAVITY FLOW PIPE SHALL BE LABELED WITH MANUFACTURER INFORMATION AND DATE OF MANUFACTURE. PVC SDR-35 OR POLY-COATED ALUMINIZED STEEL TYPE 2 CORRUGATED STEEL PIPE (10 GAUGE MINIMUM WALL THICKNESS) MAY BE PERMITTED BY THE DISTRICT IN DRAIN CROSSING LOCATIONS AS DETERMINED BY THE DISTRICT.
3. ALL CONCRETE PIPES SHALL BE MANUFACTURED IN ACCORDANCE WITH ASTM C76 REINFORCED CONCRETE PIPE AND TESTED IN ACCORDANCE WITH ASTM C497. JOINTS SHALL BE IN ACCORDANCE WITH ASTM C 443, RUBBER GASKETED JOINTS. INSTALLED PIPE JOINTS SHALL MEET THE MAXIMUM ALLOWABLE JOINT GAP REQUIREMENTS PER THE PIPE MANUFACTURER. ONLY AIR-TESTED CONCRETE PIPE IS ALLOWED TO BE INSTALLED IN BCID FACILITIES, UNLESS ALLOWED BY THE DISTRICT.
4. ALL PVC PIPES SHALL BE MANUFACTURED IN ACCORDANCE WITH ASTM D2241. JOINTS SHALL BE BELL AND SPIGOT END WITH ASTM F477 ELASTOMERIC GASKETS.
5. WHEN A SMALLER GRAVITY PIPE JOINS A LARGER ONE, THE INVERT OF THE LARGER PIPE SHOULD BE LOWERED SUFFICIENTLY TO MAINTAIN THE SAME ENERGY GRADIENT. PIPING SHALL BE LAID WITH UNIFORM SLOPE AND ALIGNMENT BETWEEN STRUCTURES. PIPE LENGTHS ARE REQUIRED TO BE MAXIMIZED TO REDUCE THE NUMBER OF JOINTS. EIGHT (8) FOOT LENGTHS OR TWELVE (12) FOOT LENGTHS SHALL BE UTILIZED WHERE POSSIBLE. INSTALLATION OF LOCATING WIRE ATTACHED TO THE TOP OF THE PIPE MAY BE REQUIRED AS DETERMINED BY THE DISTRICT.
6. CONCRETE STRUCTURES SHALL BE CAST IN PLACE, UNLESS DIRECTED OTHERWISE. BCID MAY PROVIDE SOME STRUCTURES, IF AVAILABLE, UPON REQUEST.
7. A MINIMUM 12-FOOT WIDE GRAVEL ROAD SHALL BE CONSTRUCTED FOR BCID ACCESS TO THEIR FACILITIES. ACCESS ROAD SHALL BE 3/4" MINUS ROAD MIX 8 INCHES DEEP. PER BCID RESOLUTION 2023-03.
8. SEALING PIPE PENETRATIONS: USE HYDROTITE O-RING, CJ, SS, OR DSS PROFILE BONDED TO PIPE WITH RUBBER ADHESIVE; CENTER O-RING ON THE WALL, MINIMUM 2" FROM THE FACE OF CONCRETE TO HYDROTITE. USE NON-SHRINK GROUT TO FILL IN THE PENETRATION AROUND THE PIPE.
9. MINIMUM PIPE DESIGN PARAMETERS LISTED BELOW. IF THE MINIMUM VELOCITY CAN NOT BE ACHIEVED DUE TO THE EXISTING SHALLOW CANAL SLOPES, THE EXISTING CANAL MAY BE FENCED IN LIEU OF PIPE INSTALLATION. DISTRICT APPROVAL IS REQUIRED.
 - a. ASSUME PIPE 75% FULL
 - b. MINIMUM VELOCITY IS 2.5 FEET PER SECOND
 - c. MAXIMUM VELOCITY IS 5 FEET PER SECOND (MAY EXCEED WITH DISTRICT'S APPROVAL)
 - d. MINIMUM PIPE DIAMETER IS 12 INCHES
 - e. USE "n" VALUE FOR MANNING'S FORMULA OF 0.013

CONSTRUCTION

1. CONSTRUCTION OF IMPROVEMENTS SHALL BE IN ACCORDANCE WITH THE BLACK CANYON IRRIGATION DISTRICT, THE MOST CURRENT VERSION OF THE IDAHO STANDARDS FOR PUBLIC WORKS CONSTRUCTION (ISPMC), AND HIGHWAY STANDARDS AND DEVELOPMENT PROCEDURES FOR THE ASSOCIATION OF CANYON COUNTY HIGHWAY DISTRICTS (ACCHD).
2. A PRECONSTRUCTION CONFERENCE IS REQUIRED PRIOR TO CONSTRUCTION AND 48 HOURS ADVANCE NOTIFICATION OF THE LOCAL MUNICIPALITY, BCID AND ALL AFFECTED UTILITY COMPANIES IS REQUIRED PRIOR TO THE ACTUAL START OF WORK.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLYING WITH THE PROVISIONS OF THE RIGHT-OF-WAY / STREET CONSTRUCTION PERMIT AS ISSUED BY THE LOCAL TRANSPORTATION AGENCY, LOCAL CITY JURISDICTION, AND/OR IDAHO TRANSPORTATION DEPARTMENT FRANCHISE FOR THIS PROJECT.

IRRIGATION SYSTEM STANDARD DETAIL

**IRRIGATION GENERAL NOTES
PAGE 2 OF 3**

**BLACK CANYON
IRRIGATION DISTRICT**

FILE: BCID-D-CNOTE2.DWG

REVISED: 07/12/2023

DWG NO. GIR03

CONSTRUCTION CON'T

4. HIGHWAY CROSSINGS SHALL ADHERE TO OWNER'S STANDARDS.
5. LOCATIONS OF EXISTING UTILITIES SHOWN ON THE PLANS ARE ESTIMATED UNLESS STATED OTHERWISE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY, LOCATE AND PROTECT ALL UTILITIES WITHIN THE PROJECT AREA. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPLACING OR REPAIRING ANY UTILITIES DAMAGED DURING CONSTRUCTION. SHOW ENCOUNTERED UTILITIES ON THE AS-BUILTS.
6. LOCATION AND EXTENT OF UTILITIES WITHIN THE PROJECT LIMITS ARE UNKNOWN. CONTRACTOR SHALL CONTACT PROPERTY OWNERS ADJACENT TO THE PROJECT FOR LOCATING PRIVATE IRRIGATION SYSTEMS. CONTRACTOR IS RESPONSIBLE FOR LOCATING IRRIGATION MAINS AND REPLACING OR REPAIRING PIPELINES DAMAGED DURING CONSTRUCTION. SHOW THESE PIPELINES ON THE AS-BUILTS.
7. CONTRACTOR SHALL POT HOLE A SUFFICIENT DISTANCE AHEAD OF PIPELAYING TO VERIFY DEPTH OF EXISTING UTILITIES AND CROSSING UTILITIES TO ANTICIPATE ANY NECESSARY CHANGES IN FITTINGS OR ALIGNMENT.
8. CONTRACTOR SHALL ONLY DISPOSE OF WASTE MATERIAL AT APPROVED SITES.
9. TRENCH SECTION AND ALL EXCAVATED AREAS SHALL BE BACKFILLED AND COMPACTED IN ACCORDANCE WITH ISPWC DIVISION 200 SECTION 202 CLASS A COMPACTION. SOIL BACKFILL MATERIAL SHALL MEET THE REQUIREMENTS OF ISPWC DIVISION 200 SECTION 203 - SOIL MATERIALS SUBSOIL TYPES S3 OR S4. COMPACTION TESTING IS REQUIRED DURING BACKFILLING OPERATIONS AT THE DISCRETION OF THE DISTRICT. IF TRENCH BACKFILL DOES NOT MEET COMPACTION REQUIREMENTS, CONTRACTOR SHALL EXCAVATE, RECOMPACT AND RETEST MATERIAL AT CONTRACTOR'S EXPENSE.
10. IF CONSTRUCTION IS IN TRAFFIC, AT THE END OF EACH WORKING DAY, A TEMPORARY PATCH OVER THE TRENCH CUTS SHALL BE PLACED SO THAT TRAFFIC IS NOT AFFECTED IN ANY WAY. MATERIAL FOR THESE TEMPORARY PATCHES SHALL BE CRUSHED SURFACING BASE COURSE OR COLD MIX.
11. ALL TRENCHING AND SHORING TO BE DONE IN ACCORDANCE WITH OSHA STANDARDS.
12. ALL PIPES THAT WILL BE OWNED AND OPERATED BY THE DISTRICT SHALL BE PRESSURE TESTED PER ISPWC. IN PRESENCE OF THE ENGINEER AND IN ACCORDANCE WITH ISPWC DIVISION 500 SECTION 501 PART 3.4. CONTRACTOR IS RESPONSIBLE FOR PRESSURE TESTING ALL NEW OR MODIFIED PORTIONS OF DISTRICT INFRASTRUCTURE. FINAL PRESSURE TESTING SHALL BE CONDUCTED AFTER ALL UTILITY INSTALLATION AND BEFORE ANY PAVEMENT PLACEMENT. FINAL ACCEPTANCE AND WARRANTY PERIOD WILL NOT BEGIN PRIOR TO A PASSING PRESSURE TEST.
13. THREE YEAR MINIMUM WORKMANSHIP PRODUCT WARRANTY IS REQUIRED.

IRRIGATION SYSTEM STANDARD DETAIL

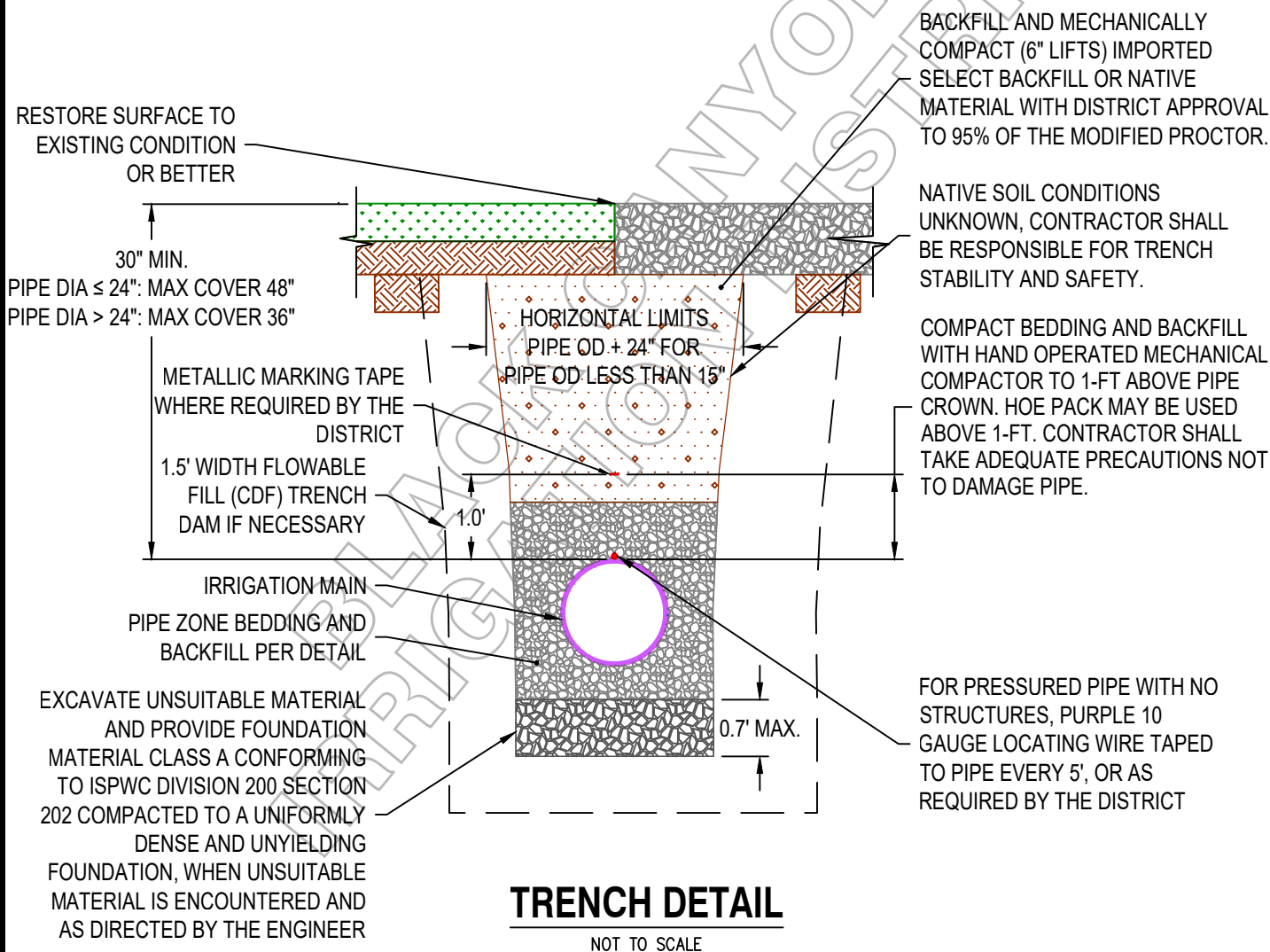
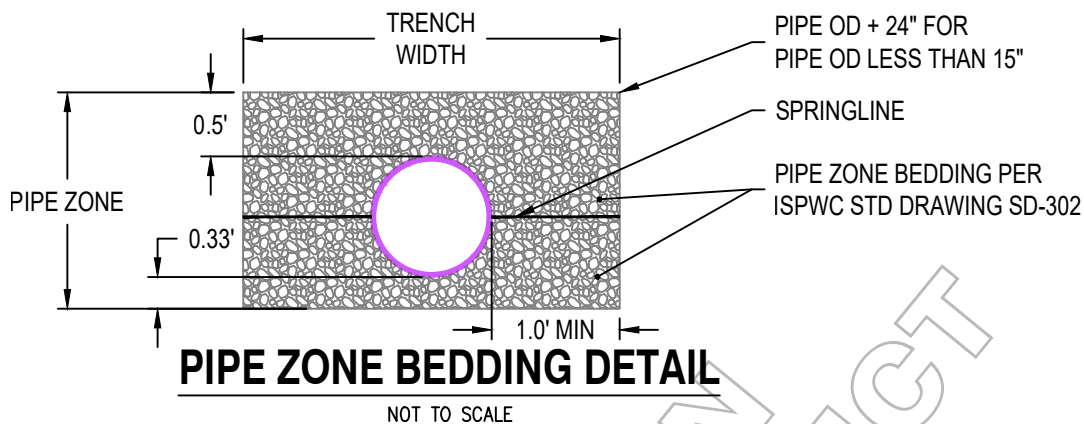
**IRRIGATION GENERAL NOTES
PAGE 3 OF 3**

**BLACK CANYON
IRRIGATION DISTRICT**

FILE: BCID-D-CNOTE3.DWG

REVISED: 07/12/2023

DWG NO. GIR04



IRRIGATION SYSTEM STANDARD DETAIL

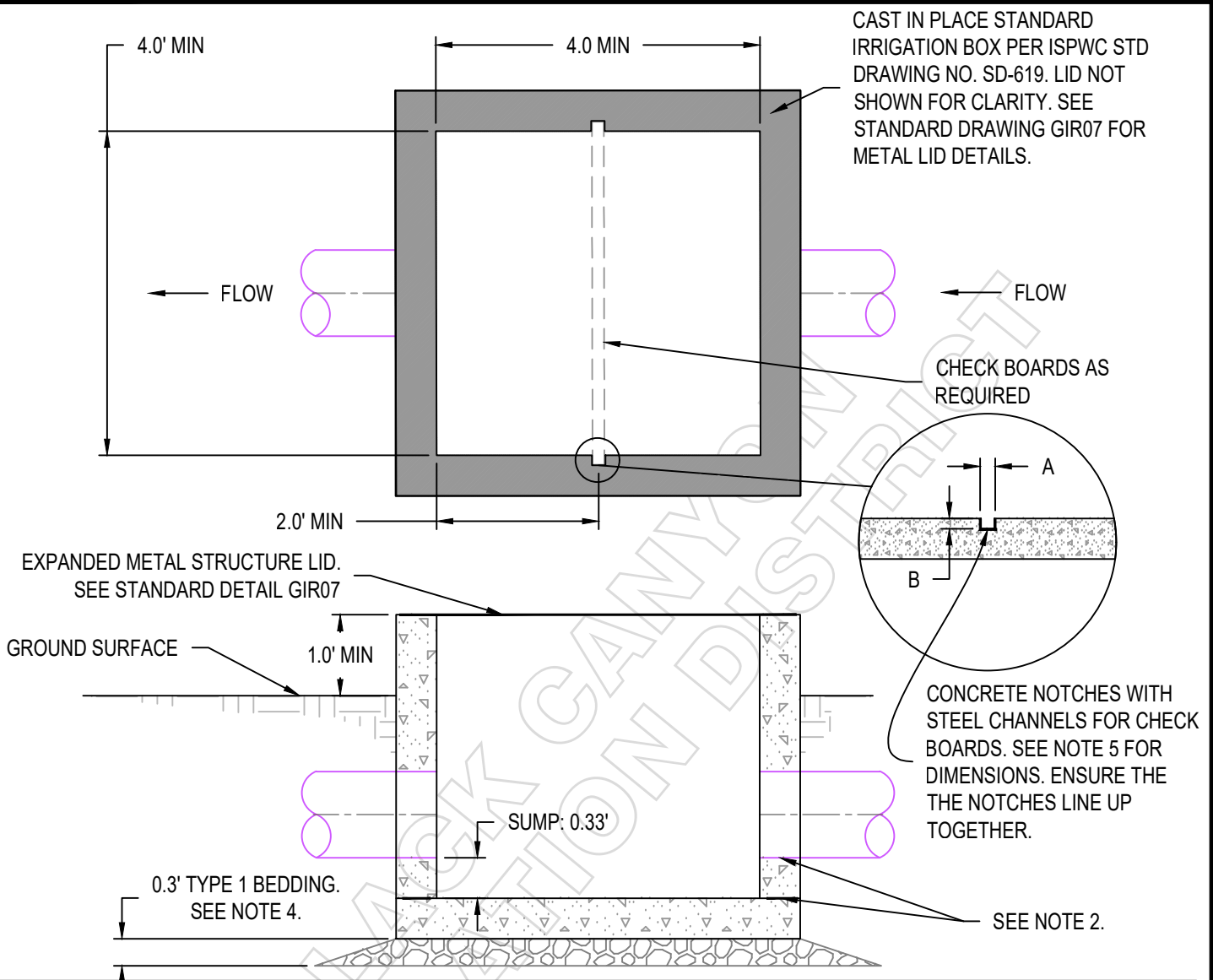
IRRIGATION TRENCH DETAIL

**BLACK CANYON
IRRIGATION DISTRICT**

FILE: BCID-D-TRENCH.DWG

REVISED: 07/12/2023

DWG NO. GIR05

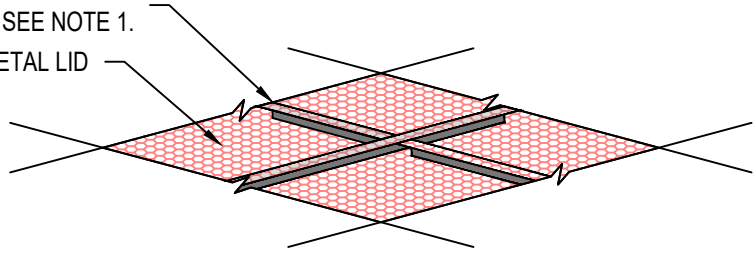


- NOTES:
1. CONCRETE STRUCTURE SHALL BE CAST-IN-PLACE. REINFORCEMENT IS NOT SHOWN. SEE BCID STANDARD DETAILS GIR11 AND GIR12. REINFORCED CONCRETE STRUCTURE SHALL HAVE 28 DAY COMPRESSIVE STRENGTH OF MINIMUM 4000 PSI.
 2. PROVIDE WATERSTOP AT ALL COLD JOINTS. SEE BCID STANDARD DETAIL GIR08.
 3. ALL PIPES SHALL ENTER STRUCTURE AT OR NEAR PERPENDICULAR ANGLES. PROPERLY SEAL ALL JOINTS AND PIPES BY MORTARING. THE PIPE EDGE SHOULD BE FLUSH WITH THE WALL EDGE FOR SMOOTH INTERIOR FINISH. CONTRACTOR TO CUT SNAP TIES AND GROUT BOTH SIDES OF SNAP TIE LOCATIONS. REMOVE STRUCTURE ANCHORS PRIOR TO PLACING LID.
 4. PROVIDE TYPE 1 BEDDING ON PREPARED SUBGRADE PER ISPWC SECTION 502.3.2.
 5. WHEN CHECK BOARD ARE REQUIRED, THE NOTCH DIMENSIONS VARY WITH STRUCTURE SIZE:

STRUCTURES LESS THAN 60 INCH WIDE	STRUCTURES 60 INCHES OR GREATER IN WIDTH
A: 4"	A: 4"
B: 1.5"	B: 2"

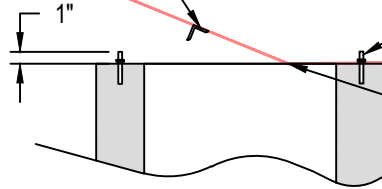
ANGLE IRON FOR REINFORCEMENT BELOW
UNDER EXPANDED METAL. SEE NOTE 1.

EXPANDED METAL LID



SUPPORT ANGLE IRON. SEE
DETAIL THIS SHEET AND NOTE 2.

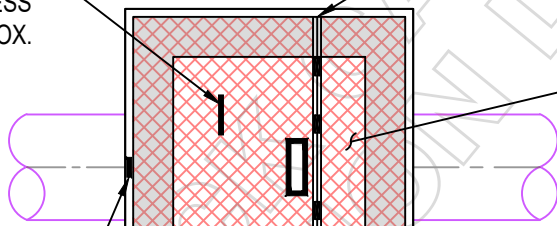
THE LID OPEN PERPENDICULAR
TO ACCESS ROAD



MECHANICAL RED HEAD
THREADED STUD EMBEDDED 3" MIN. FOR
LOCKING PROVIDE 2" LONG x 1" WIDE
OPENING

PROVIDE HINGE FOR ALL
STRUCTURES WITH CHECK
BOARDS TO PROVIDE ACCESS
TO CHECK BOARDS

3/8"x4"x5" SQUARE U BOLT WITH
METAL STRAP. PULL HANDLE
LOCATION TO BE ON ACCESS
ROAD SIDE OF THE BOX.



EXPANDED METAL TOP LID WITH
EDGE RIBBON FOR SAFETY.
REINFORCE WITH CROSS BARS.

← FLOW

← FLOW

MECHANICAL RED HEAD
THREADED STUD EMBEDDED
3" MIN. FOR LOCKING PROVIDE
2" LONG x 1" WIDE OPENING

2/3 OUTSIDE BOX
DIMENSION

1/3 OUTSIDE BOX
DIMENSION

NOTES:

1. STRUCTURE LIDS IN RIGHT OF WAY SHALL BE HS-25 WHEEL LOAD RATED. STRUCTURE LIDS OUTSIDE OF RIGHT OF WAYS SHALL BE DESIGNED TO WITHSTAND A 300 LB POINT LOAD WITH A MAXIMUM DEFLECTION OF 1/2 INCH AT CENTER SPAN AND IN ACCORDANCE WITH IBC.
2. ALL EXPANDED METAL TOPS SHALL BE REINFORCED WITH STEEL ANGLE IRON OR OTHER WITH A MAXIMUM CLEAR OF 6 SQUARE FEET. ANGLE IRON REINFORCEMENT: 2" X 2" X 1/4"
3. ALL EDGES OF EXPANDED METAL TOP (INCLUDING INTERNAL EDGES) SHALL HAVE 2" x 1/8" STEEL FLAT BAR RIBBON WELDED FOR SAFETY.

IRRIGATION SYSTEM STANDARD DETAIL

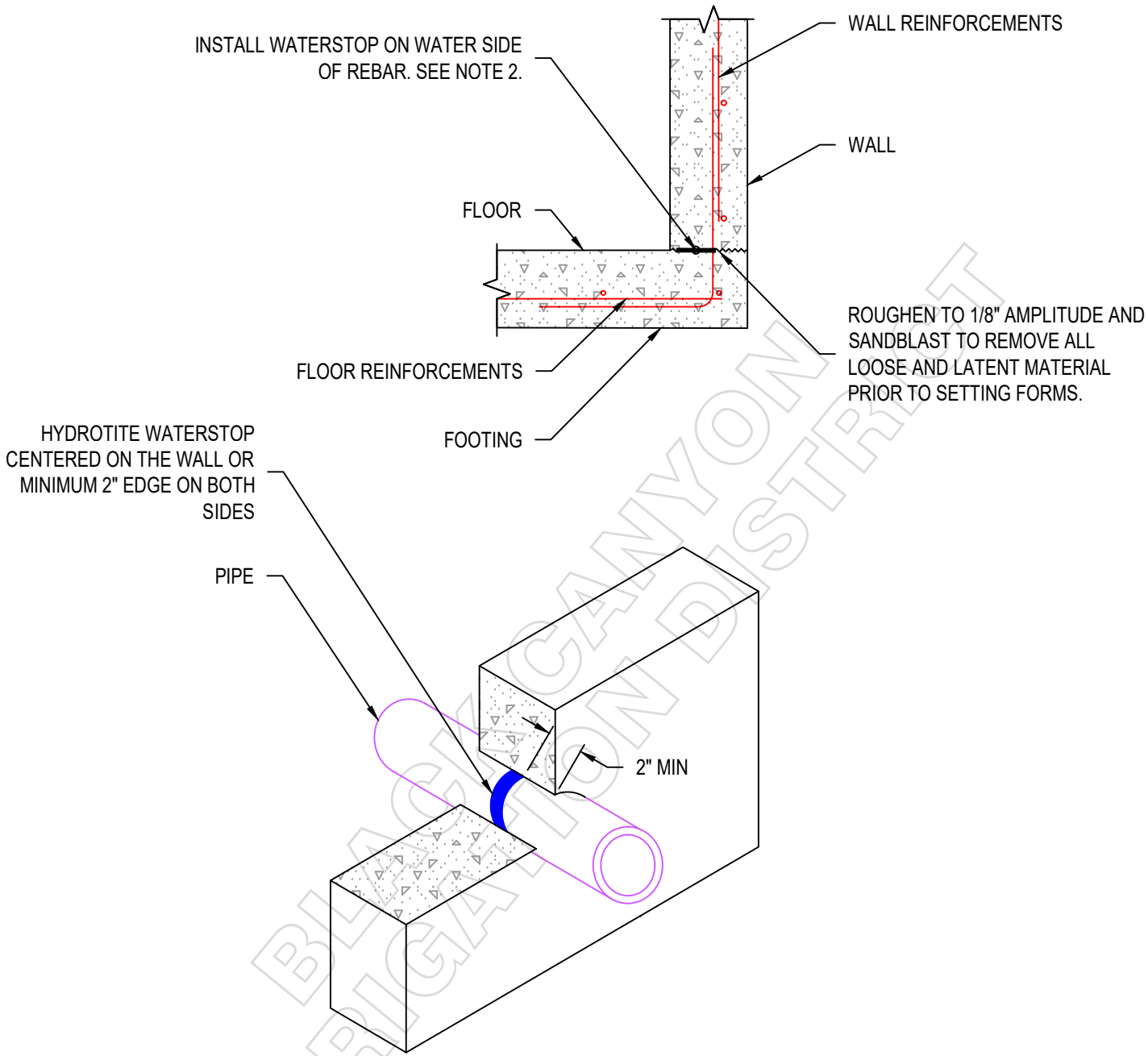
TYPICAL EXPANDED METAL LID
DETAIL

**BLACK CANYON
IRRIGATION DISTRICT**

FILE: BCID-D-METALLID.DWG

REVISED: 07/12/2023

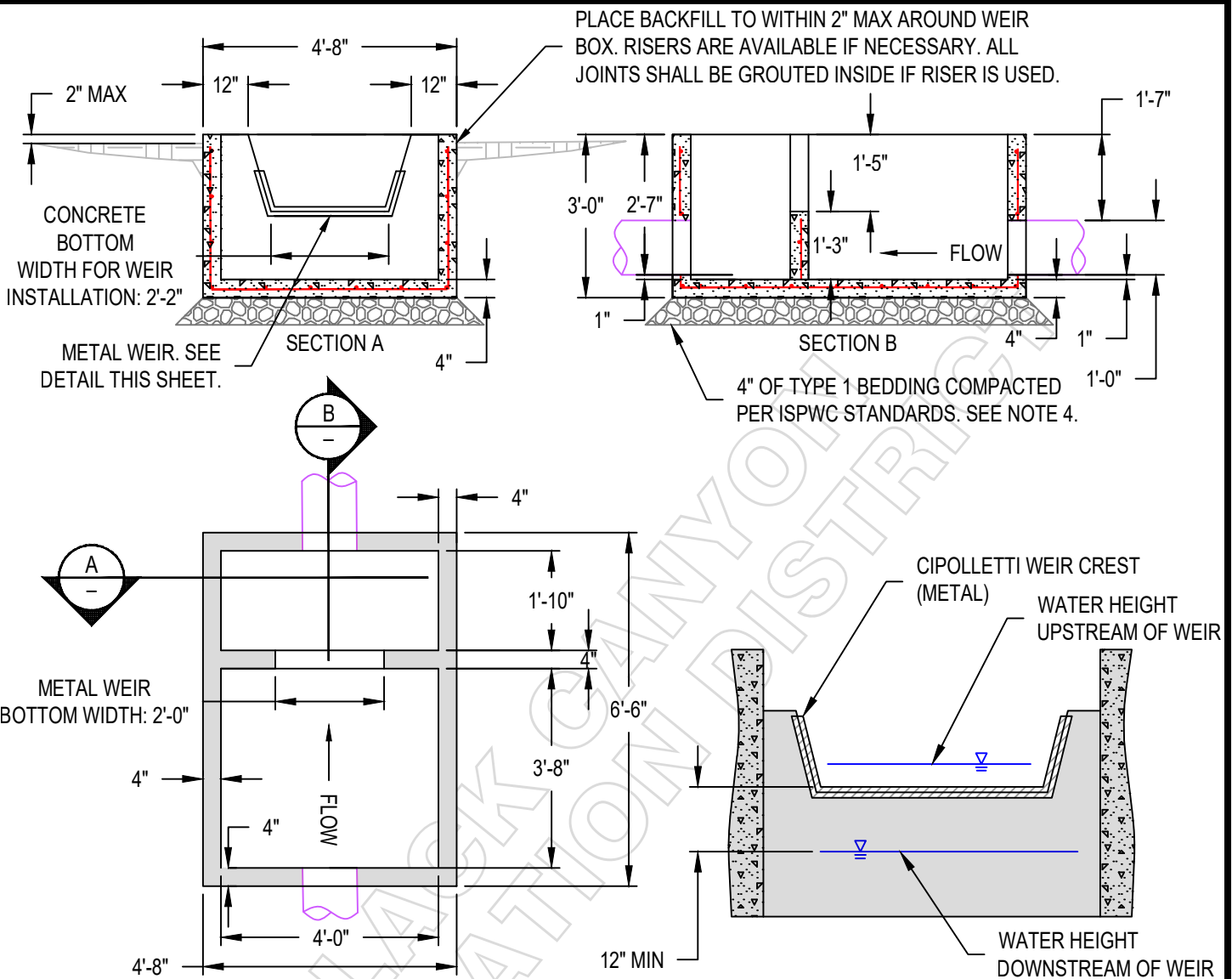
DWG NO. GI07



- NOTES:
1. CONSTRUCTION JOINTS ARE REQUIRED FOR ALL FLOOR TO WALL TRANSITIONS.
 2. FLOOR TO WALL WATERSTOP SHALL BE HYDROTITE WATERSTOP, OR A HYDROPHILIC STRIP BENTONITE BASED WATERSTOP CETCO RX102 FOR WALLS UP TO 6-INCH THICK AND CETCO RX101 FOR WALL 8-INCH AND LARGER.
 3. RUBBER PIPE GASKETS SHALL BE PLACED AROUND ALL PIPE PENETRATIONS PRIOR TO CONCRETE PLACEMENT.
 4. REINFORCING STEEL SHALL BE BCID STANDARD DETAIL GIR11 AND GIR12.
 5. WALL AND FLOOR THICKNESS AND REINFORCEMENT AS SPECIFIED ON THE STRUCTURE DESIGN.

IRRIGATION SYSTEM STANDARD DETAIL		
WATERSTOP		
FILE: BCID-D-WATERSTOP.DWG	REVISED: 07/12/2023	DWG NO. GIR08

BLACK CANYON IRRIGATION DISTRICT



NOTES:

1. YAKIMA BOX STRUCTURES CAN BE BUILT BY THE IRRIGATION DISTRICT UPON REQUEST. CONCRETE STRUCTURE SHALL BE CAST-IN-PLACE. REINFORCEMENT IS NOT SHOWN. SEE BCID STANDARD DETAILS GIR11 AND GIR12. REINFORCED CONCRETE STRUCTURE SHALL HAVE 28 DAY COMPRESSIVE STRENGTH OF MINIMUM 4000 PSI.
2. PROVIDE WATERSTOP AT ALL COLD JOINTS. SEE BCID STANDARD DETAIL GIR08.
3. ALL PIPES SHALL ENTER STRUCTURE AT OR NEAR PERPENDICULAR ANGLES. PROPERLY SEAL ALL JOINTS AND PIPES BY MORTARING. THE PIPE EDGE SHOULD BE FLUSH WITH THE WALL EDGE FOR SMOOTH INTERIOR FINISH. CONTRACTOR TO CUT SNAP TIES AND GROUT BOTH SIDES OF SNAP TIE LOCATIONS. REMOVE STRUCTURE ANCHORS PRIOR TO PLACING LID.
4. PROVIDE TYPE 1 BEDDING ON PREPARED SUBGRADE PER ISPWC SECTION 502.3.2. WEIR SHALL BE PLACED LEVEL.
5. INSTALL AN EXPANDED METAL COVER ON TOP OF STRUCTURE PER BCID STANDARD DRAWING GIR07.
6. STRUCTURE LID SHALL HAVE AN ACCESS HOLE OVER THE CIPOLLETTI WEIR FOR DISTRICT'S ACCESS TO INSERT STAFF GAUGE FOR LEVEL READINGS.
7. WEIR BOX ELEVATION TO BE SET EVEN WITH GATE FROM UPSTREAM STRUCTURE.
8. ADDITIONAL SIZE YAKIMA BOXES MAY BE REQUIRED DUE TO FLOW RATES. MOST COMMON SHOWN HERE.

IRRIGATION SYSTEM STANDARD DETAIL

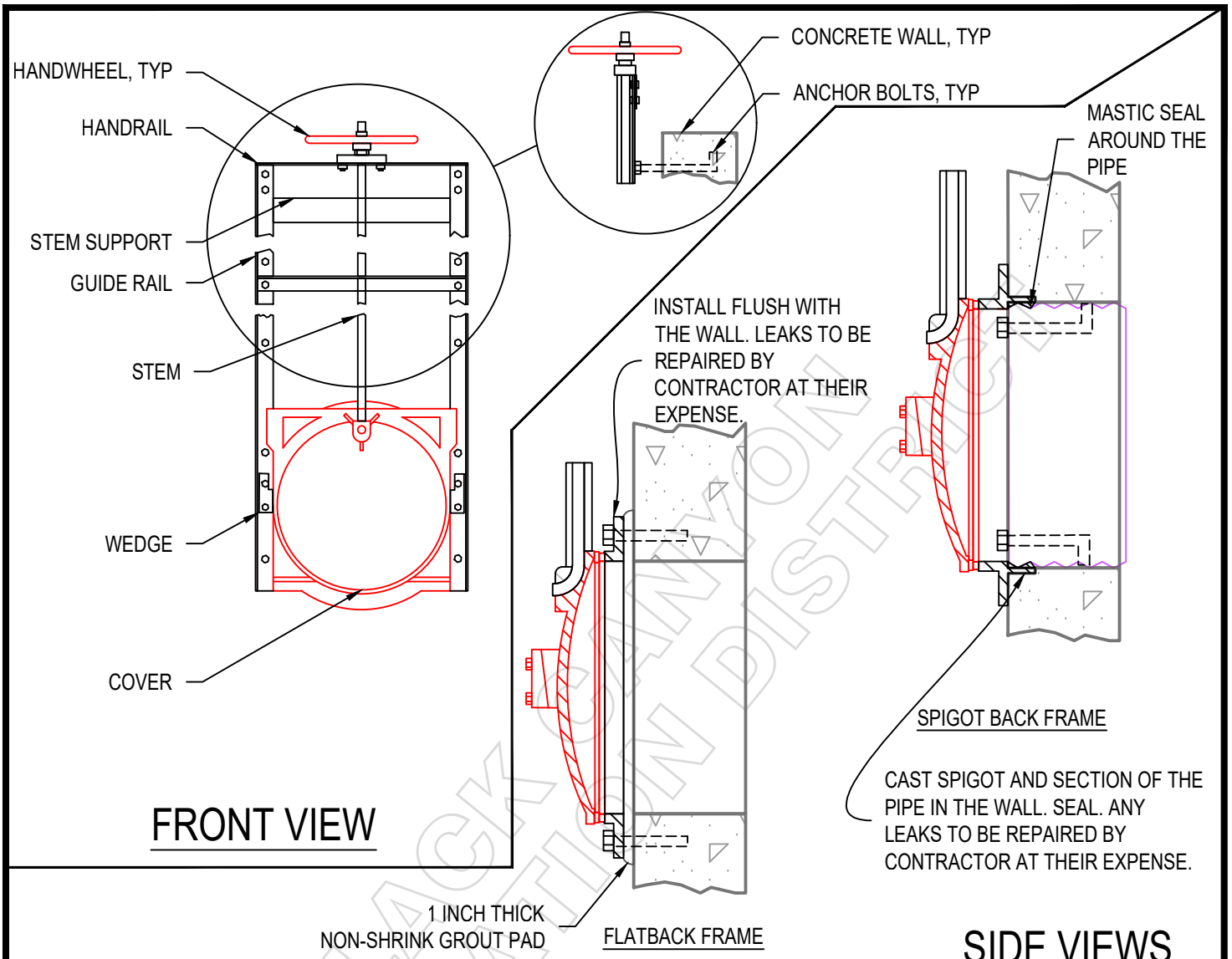
**YAKIMA BOX STRUCTURE DETAIL
FLOW RATES: 0.1 TO 2 CFS**

**BLACK CANYON
IRRIGATION DISTRICT**

FILE: BCID-D-YAKBOX.DWG

REVISED: 07/12/2023

DWG NO. GIR09



NOTES:

1. DRAWING IS NOT TO SCALE.
2. CONCRETE 28 DAY COMPRESSIVE STRENGTH SHALL BE MINIMUM 4,000 PSI. ADD ADDITIONAL REINFORCEMENT AT GATE OPENINGS.
3. ALL PIPES SHALL ENTER STRUCTURES AND HEADWALL AT OR NEAR PERPENDICULAR ANGLES.
4. GATE FRAMES SHALL BE SECURELY BOLTED TO CONCRETE STRUCTURE WITH STAINLESS STEEL BOLTS. TOP ANCHORS SHALL BE INSTALLED WITHIN 8 TO 12 INCHES BELOW OF CONCRETE WALL. BOLTS TO ATTACHED GATES SHALL BE CAST IN PLACE OR SHALL NOT BE INSTALLED VIA DRILLING, AND REDHEAD OR EXPANDABLE BOLTS OR LAGS UNTIL THE RECOMMENDED CURE PERIOD FOR THE CONCRETE MIX DESIGN.
5. CANAL GATES SHALL BE WATERMAN C-10 , XCAD CANAL GATES OR PRE-APPROVED EQUAL WITH GALVANIZED FRAME. SLIDE GATES ARE NOT ACCEPTABLE. INSTALL GATES PER MANUFACTURER'S SPECIFICATIONS. CANAL GATE WHEEL HEIGHT SHALL BE A MINIMUM OF 2-7/8 INCHES ABOVE STRUCTURE AND A MAXIMUM 6 INCHES ABOVE STRUCTURE.
6. PROPERLY SEAL ALL JOINTS AND PIPES BY MORTARING. THE PIPE EDGE SHOULD BE FLUSH WITH THE WALL EDGE FOR SMOOTH INTERIOR FINISH. USE SOFT BRISTLE BRUSH TO BLEND MORTAR AND CONCRETE TOGETHER.

IRRIGATION SYSTEM STANDARD DETAIL

CANAL GATE DETAIL

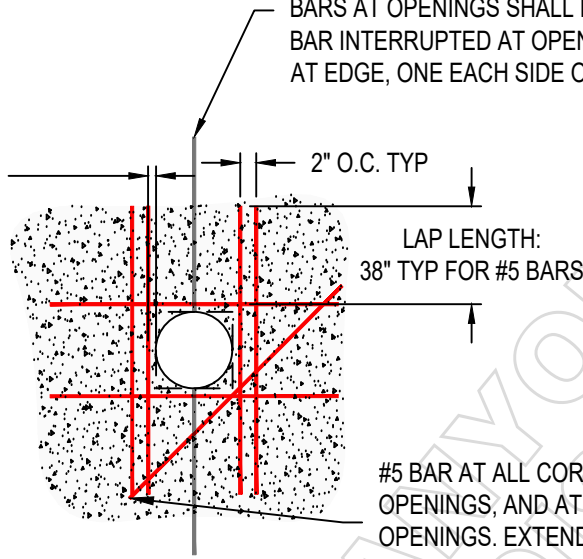
**BLACK CANYON
IRRIGATION DISTRICT**

FILE: BCID-D-GATE.DWG

REVISED: 07/12/2023

DWG NO. GIR10

3" CLEARANCE
TYP. WHERE PIPE
GASKET INCLUDED.
2" CLEARANCE, IF NOT.



FOR EACH BAR INTERRUPTED BY THE OPENING, ADD AN
ADDITIONAL BAR AT THE EDGE OF OPENING AT 2" O.C. TYP.
BARS AT OPENINGS SHALL BE PROVIDED IN PAIRS (EX: IF ONE
BAR INTERRUPTED AT OPENING, PROVIDE TWO EXTRA BARS
AT EDGE, ONE EACH SIDE OF OPENING).

LAP LENGTH:
38" TYP FOR #5 BARS

#5 BAR AT ALL CORNERS OF RECTANGULAR
OPENINGS, AND AT 45° TO REINFORCING AT ROUND
OPENINGS. EXTEND 38 INCHES BEYOND OPENING
OR TO EDGE OF VAULT, WHICHEVER IS SMALLEST.

PENETRATION AND OPENING REINFORCEMENT
NOT TO SCALE

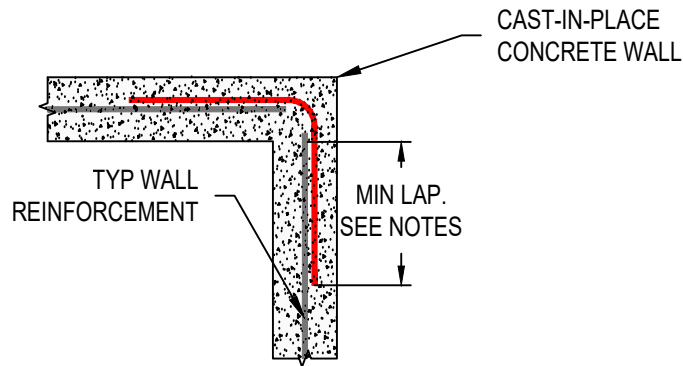
BLACK CANYON IRRIGATION DISTRICT

IRRIGATION SYSTEM STANDARD DETAIL

REINFORCEMENT AT OPENINGS

**BLACK CANYON
IRRIGATION DISTRICT**

FILE: BCID-D-RST-OPNG.DWG | REVISED: 07/12/2023 | DWG NO. GIR11

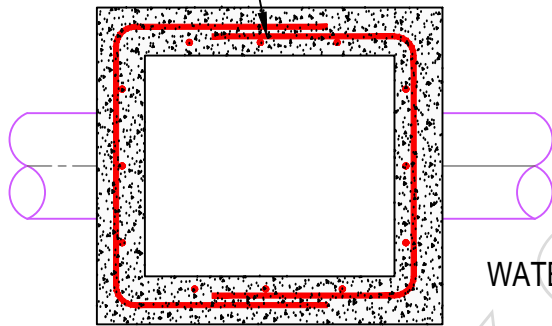


TYPICAL CONCRETE WALL CORNER

NOT TO SCALE

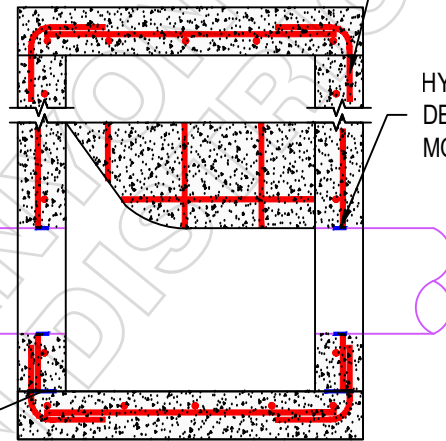
SEE NOTES FOR MINIMUM LAP REQUIREMENTS, TYP

SEE NOTES FOR MINIMUM LAP REQUIREMENTS.



IRRIGATION STRUCTURE - PLAN VIEW

NOT TO SCALE



IRRIGATION STRUCTURE - SECTION VIEW

NOT TO SCALE

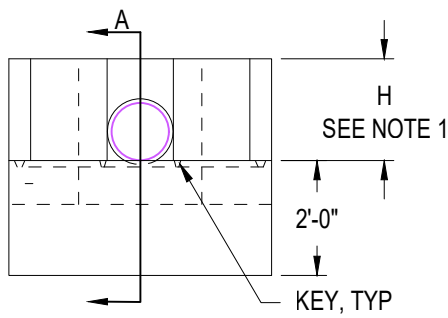
NOTES:

1. PROVIDE WATERSTOP AT ALL COLD JOINTS AND PIPE PENETRATIONS.
2. WALL REINFORCEMENT IS #5 BARS AT 12 INCHES O.C. EACH WAY CENTERED IN EACH SLAB.
3. SEE BCID DETAIL GIR11 FOR PIPE OPENING REINFORCEMENTS.
4. MINIMUM LAP FOR #5 BAR IS 38 INCHES.
5. THE SIZE AND SPACING OF TYPICAL CORNER REINFORCING SHALL MATCH THE SIZE AND SPACING OF HORIZONTAL WALL REINFORCING UNLESS OTHERWISE CALLED OUT.
6. WHERE PERPENDICULAR WALLS HAVE DIFFERENT HORIZONTAL WALL REINFORCING, PROVIDE CORNER BARS TO MATCH THE HORIZONTAL WALL REINFORCING WITH THE GREATEST AREA OF STEEL.
7. ADDITIONAL REINFORCEMENT DESIGN IS REQUIRED WHEN:
 - 7.1. WALL SPANS GREATER THAN 6 FEET
 - 7.2. BASE SLAB IS GREATER THAN 7 FEET BELOW GRADE
 - 7.3. WATER PRESSURE IS GREATER THAN 7 FEET OR 437 PSF
 - 7.4. SINGLE VERTICAL LOAD NEAR THE VAULT IS GREATER THAN 4,000 LB.

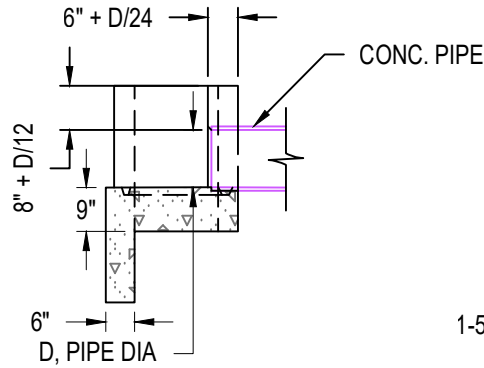
IRRIGATION SYSTEM STANDARD DETAIL

WALL AND WALL CORNER REINFORCEMENT

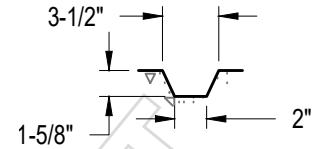
BLACK CANYON IRRIGATION DISTRICT



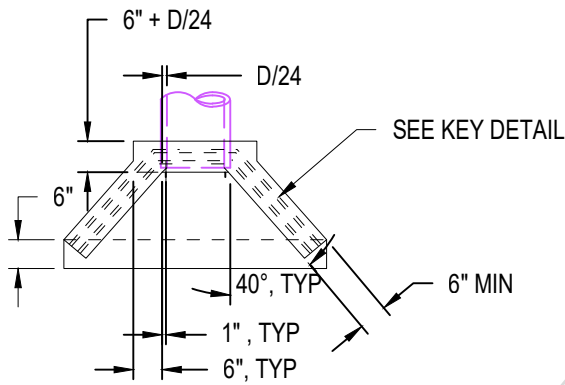
ELEVATION VIEW



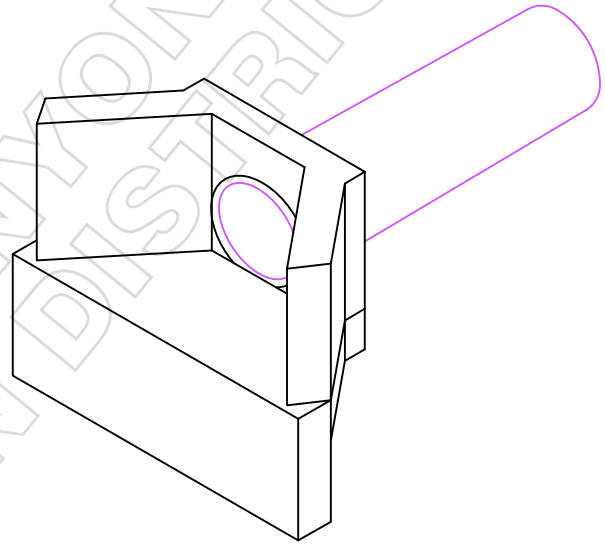
SECTION A-A



KEY DETAIL



PLAN VIEW



ISOMETRIC DETAIL

NOTES:

1. DETAILS ARE NOT TO SCALE. REFER TO ITD STANDARD DRAWING 609-2 FOR DIMENSIONS, REINFORCEMENT, AND INLET GRATE DETAILS.
2. CONCRETE STRUCTURE SHALL BE CAST-IN-PLACE. REINFORCEMENT IS NOT SHOWN. REINFORCED CONCRETE STRUCTURE SHALL HAVE 28 DAY COMPRESSIVE STRENGTH OF MINIMUM 4000 PSI.
3. PROVIDE WATERSTOP AT ALL COLD JOINTS. SEE BCID STANDARD DETAIL GIR08.
4. ALL PIPES SHALL ENTER STRUCTURE AT OR NEAR PERPENDICULAR ANGLES. PROPERLY SEAL ALL JOINTS AND PIPES BY MORTARING. THE PIPE EDGE SHOULD BE FLUSH WITH THE WALL EDGE FOR SMOOTH INTERIOR FINISH.
5. STRUCTURE TO BE DESIGNED BY A PROFESSIONAL STRUCTURAL ENGINEER LICENSED IN THE STATE OF IDAHO FOR PIPES LARGER THAN 42 INCHES.
6. CONSTRUCT 3/4" MIN CHAMFER ON ALL EXPOSED VERTICAL EDGES.
7. SEE BCID STANDARD DRAWINGS GIR02 THROUGH GIR03 FOR PIPE MATERIAL REQUIREMENTS AND SIZING. MINIMUM PIPE DIAMETER IS 12 INCHES.
8. WING WALLS SHALL EXTEND 1 FOOT MINIMUM INTO THE CANAL BANK AT THE HIGH WATER ELEVATION.
9. INSTALL HEADWALL OUTSIDE OF CLEAR ZONE, WHEN POSSIBLE. OTHERWISE, GUARDRAIL IS REQUIRED.
10. STRUCTURE EXCAVATION AND COMPACTION SHALL BE PER ISPWC DIVISION 200.

IRRIGATION SYSTEM STANDARD DETAIL

**CULVERT HEADWALL DETAIL
FOR SINGLE PIPE**

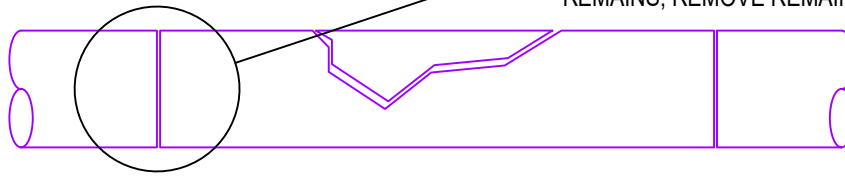
**BLACK CANYON
IRRIGATION DISTRICT**

FILE: BCID-D-HEADWALL.DWG

REVISED: 07/12/2023

DWG NO. GIR13

CUT PIPE SQUARE 2 FT MINIMUM FROM BREAK OR REMOVE TO THE NEAREST JOINT. IF LESS THAN 2 FT REMAINS, REMOVE REMAINING STUB TO JOINT.



DAMAGED IRRIGATION MAIN

NOT TO SCALE

ALIGN PIPE INVERTS, CREATE SMOOTH TRANSITION



REPAIR COUPLER, SEE TABLE

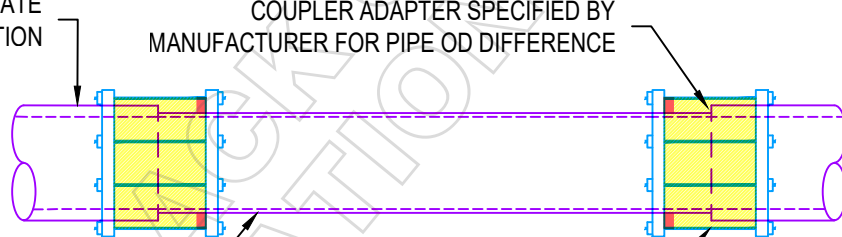
NEW PIPE WITH SAME ID AS EXISTING

MINIMIZE GAP, 1/4" MAX, TYP.

REPAIRED IRRIGATION PIPE (SAME MATERIAL WITH SAME OD)

NOT TO SCALE

ALIGN PIPE INVERTS, CREATE SMOOTH TRANSITION



COUPLER ADAPTER SPECIFIED BY MANUFACTURER FOR PIPE OD DIFFERENCE

NEW PIPE WITH SAME ID AS EXISTING

SHEAR RESISTANT COUPLER

REPAIRED IRRIGATION PIPE (DIFFERENT MATERIAL OR DIFFERENT OD)

NOT TO SCALE

PIPE MATERIAL	COUPLER / REPAIR
CONCRETE	SHEAR RESISTANT, ROMAC 501 LONG PATTERN SLEEVE, OR EQUAL
PVC	
HDPE	ELECTROFUSION

NOTES:

1. COUPLER SHALL HAVE WATER TIGHT SEAL.
2. COUPLING BETWEEN DIFFERENT PIPE MATERIALS OR OUTSIDE DIAMETERS SHALL BE MADE WITH CORRECTLY SIZED GASKETS FOR CORRECT APPLICATION.
3. ALL SLEEVES SHALL BE EPOXY COATED.
4. IN THE CASE OF THE DAMAGED PIPE, BCID SHALL BE IMMEDIATELY NOTIFIED. BCID SHALL INSPECT AND VERIFY REPAIR PRIOR TO BACKFILL.
5. IF CONDITIONS ARE DIFFERENT THAN SHOWN ABOVE, CONTACT BCID.

IRRIGATION SYSTEM STANDARD DETAIL

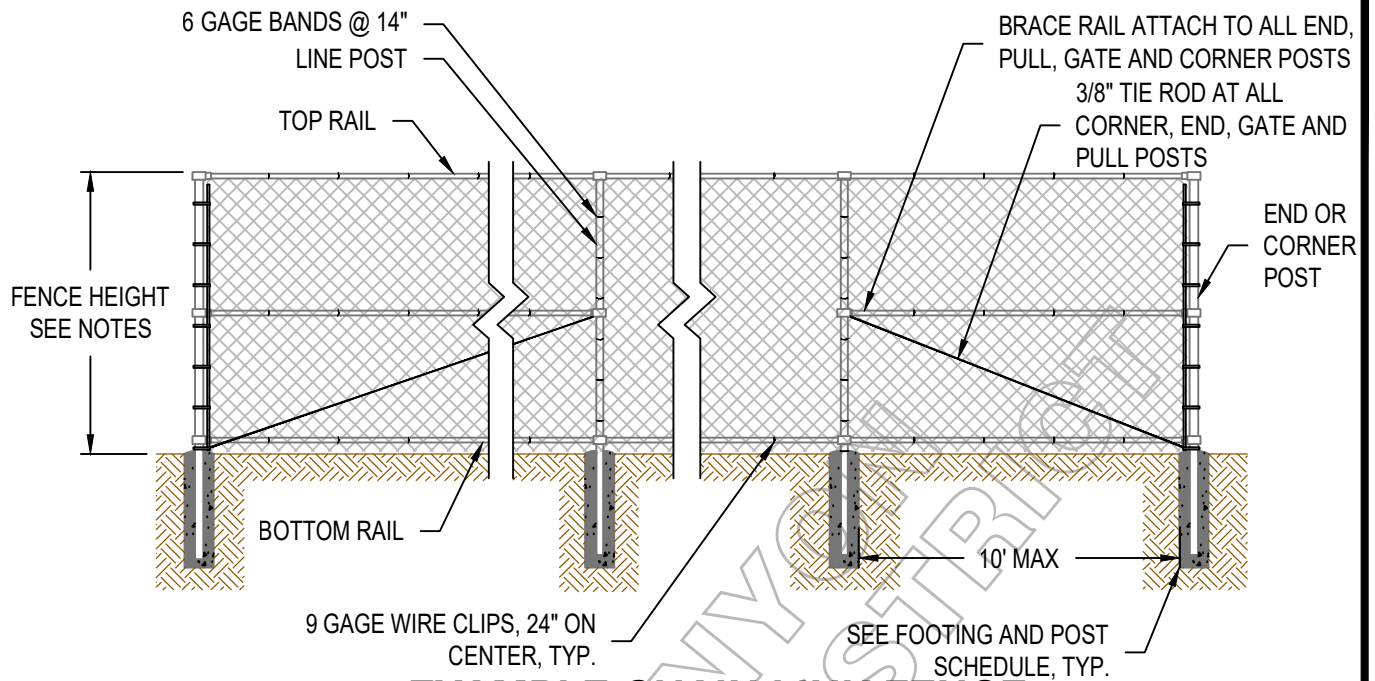
IRRIGATION PIPE REPAIR

**BLACK CANYON
IRRIGATION DISTRICT**

FILE: BCID-D-REPAIR.DWG

REVISED: 07/12/2023

DWG NO. GIR14



EXAMPLE CHAIN LINK FENCE

NOT TO SCALE

FENCE NOTES

FENCE HEIGHT IS MEASURED FROM TOP OF MESH TO FINISHED GROUND SURFACE

ALL POSTS AND RAILS SHALL BE SCHED. 40 STEEL PIPE UNLESS OTHERWISE NOTED,

ALL COMPONENTS SHALL BE GALVANIZED.

ALL FABRIC SHALL BE CORE WIRE GAUGE 9 AND 2-INCH MESH. TOP AND BOTTOM FABRIC SELVAGES SHALL BE TWISTED. TOP SELVAGE OF RAILING EQUIVALENT FENCE SHALL BE KNUCKLED. LEAVE NO MORE THAN 3-INCH GAP BETWEEN FINISHED GROUND SURFACE AND BOTTOM SELVAGE.

UNLESS OTHERWISE NOTED ATTACH CHAINLINK TO RAILS AND HORIZONTAL BRACES USING 13 GAUGE WIRE @ 2' O.C. AND 9 GAUGE WIRE TO LINE POSTS AT 15" O.C.

ADJUST FENCE POST LOCATIONS TO AVOID CONFLICT WITH UTILITIES OR OTHER STRUCTURES. MINIMUM 2' CLEARANCE.

FOOTING SCHEDULE

	FENCE HEIGHT (FT)	FOOTING DIAMETER (IN)	FOOTING DEPTH (IN)	POST EMBEDMENT (MIN IN)
LINE, END, CORNER, AND PULL POST	6	24	48	34
GATE POST (24-FOOT WIDTH MAX)	6	24	48	42

FENCE POST & RAIL SCHEDULE

	POST OR RAIL DIAM, OR WIRE GAGE
LINE POST	2.375
END, CORNER, PULL POST, GATE FRAME	2.875
PEDESTRIAN GATE POSTS	4.6
TOP RAIL, MID RAIL BRACES, BOTTOM RAIL	1.66
BOTTOM WIRE	6 GAGE
COUNTER BALANCE POSTS	6.625

IRRIGATION SYSTEM STANDARD DETAIL

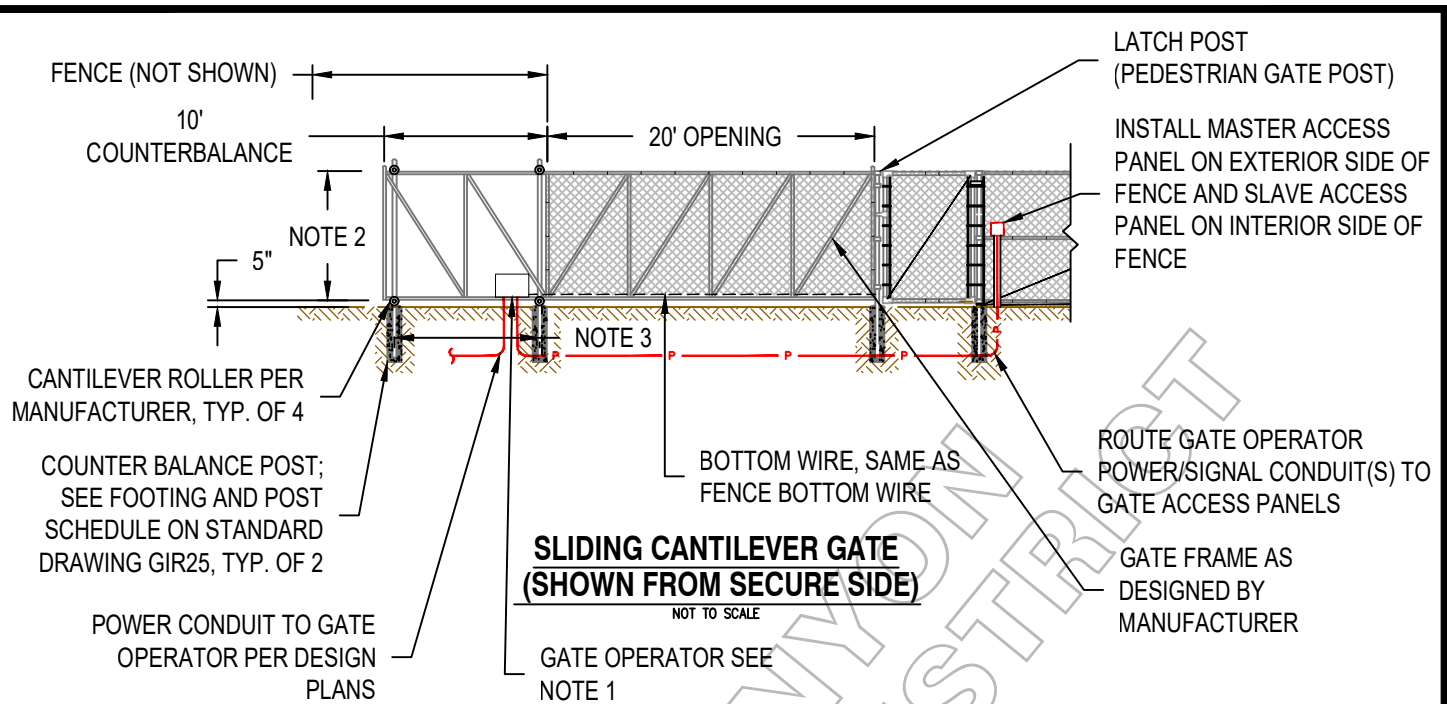
EXAMPLE CHAIN LINK FENCE AND GATE DETAILS 1 OF 2

BLACK CANYON IRRIGATION DISTRICT

FILE: BCID-D-FENCE1.DWG

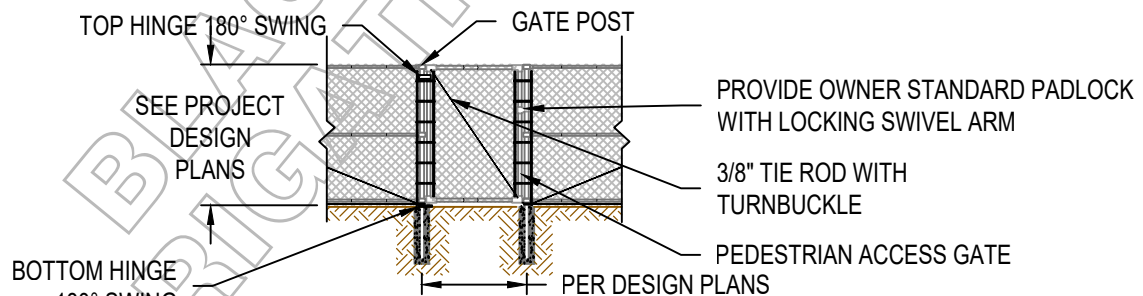
REVISED: 07/12/2023

DWG NO. GIR15



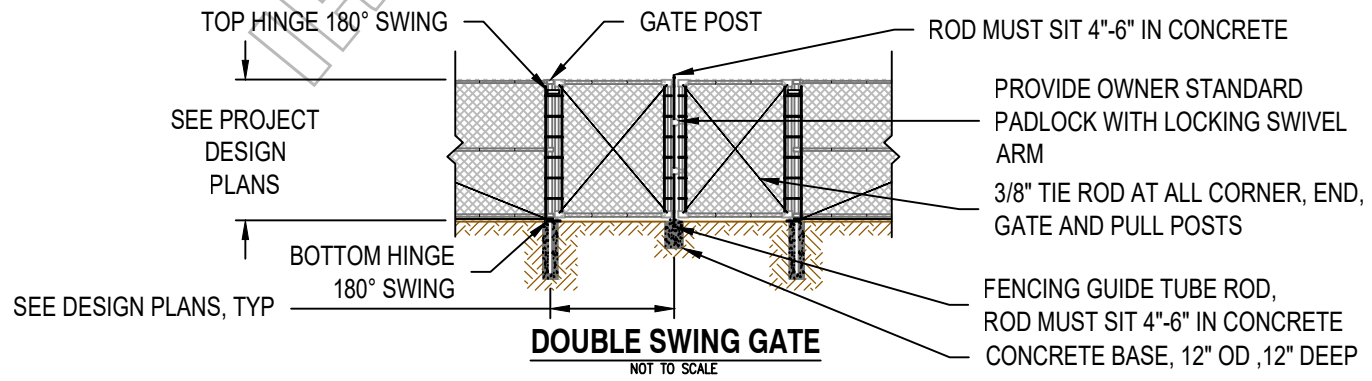
SLIDING CANTILEVER GATE NOTES

1. LOCATION OF GATE OPERATOR SHOWN FOR REPRESENTATION PURPOSES ONLY. FINAL LOCATION TO BE DETERMINED BY MANUFACTURER. PROVIDE ADDITIONAL POST AND CONC SLAB AS REQ'D BY MANUFACTURER. OPERATOR DRIVE RAIL NOT SHOWN FOR CLARITY.
2. GATE HEIGHT TO MATCH FENCE HEIGHT.
3. SPACING AS REQ'D BY MANUFACTURER.
4. PROVIDE AND INSTALL GATE PER ASTM F2200 SECTIONS 4 AND 6.



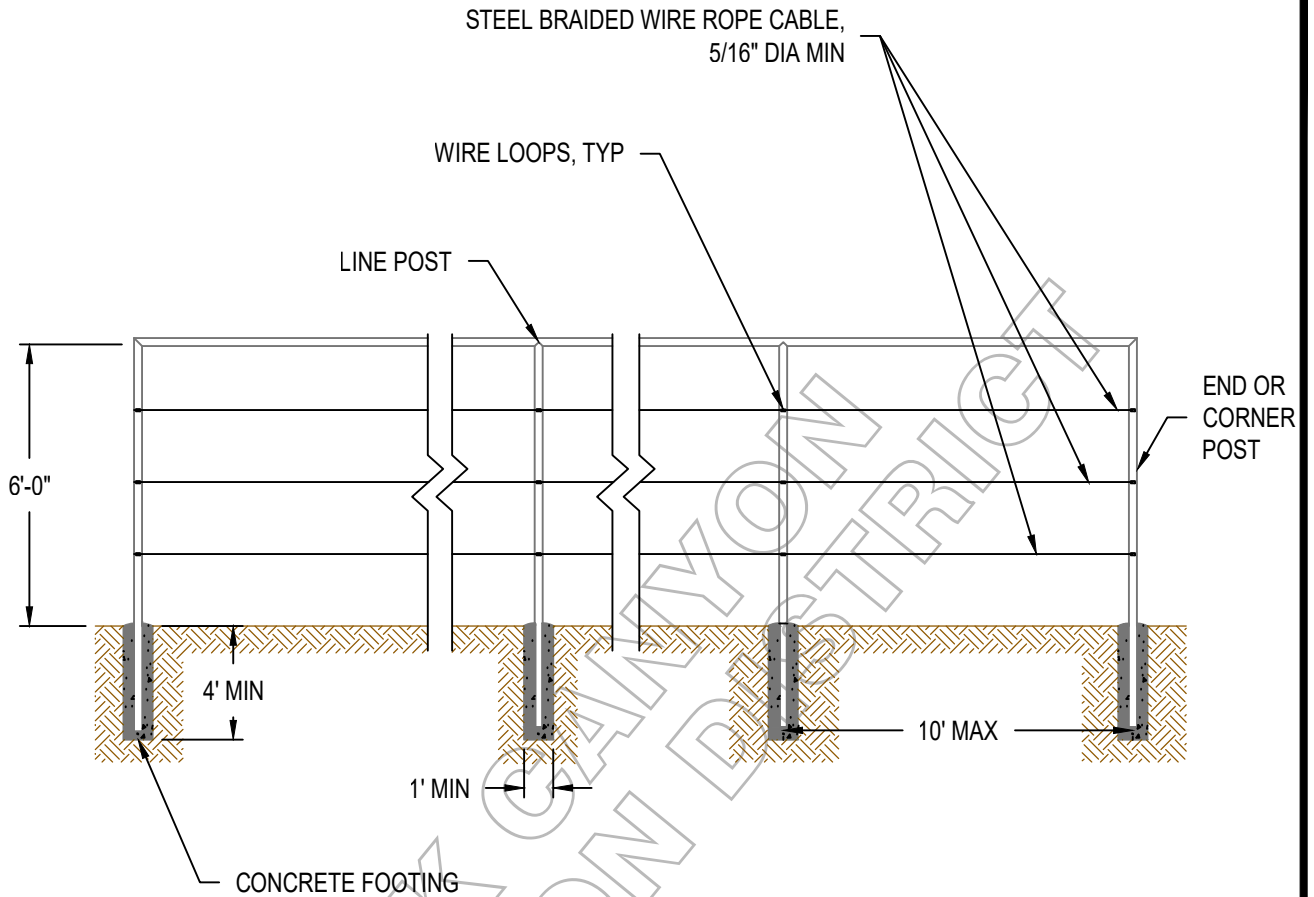
PEDESTRIAN GATE

NOT TO SCALE



DOUBLE SWING GATE

NOT TO SCALE



EXAMPLE - CABLE FENCE

NOT TO SCALE

NOTES:

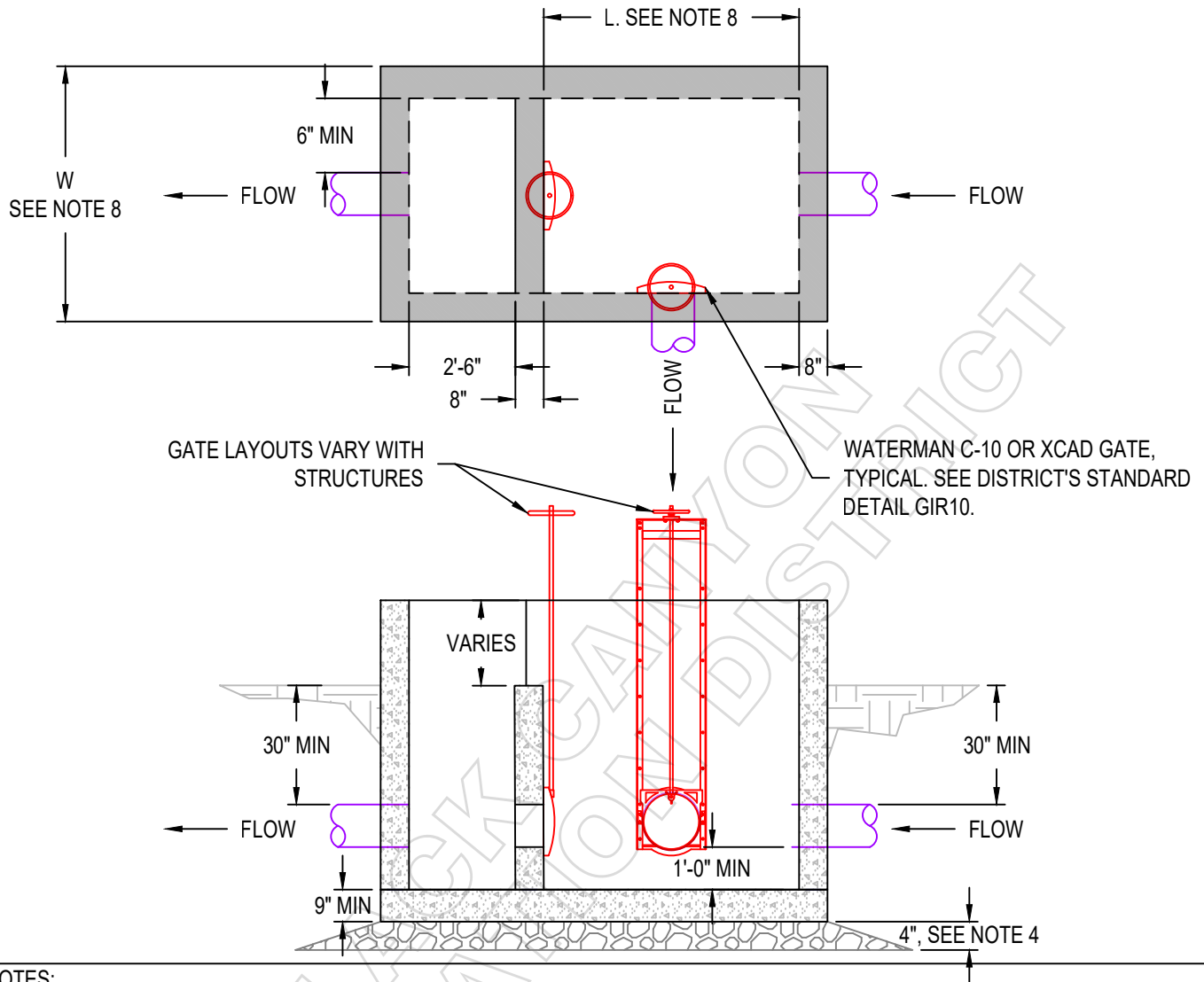
1. ALTERNATIVE FENCING OPTIONS MAY BE USED UPON DISTRICT'S APPROVAL.
2. FENCE HEIGHT IS MEASURED FROM TOP RAIL TO FINISHED GROUND SURFACE.
3. ALL POSTS AND RAILS SHALL BE SCH. 40 STEEL PIPE, UNLESS OTHERWISE NOTED.
4. ALTERNATIVE FENCING REQUIRED TO BE NON-COMBUSTIBLE.
5. ADJUST FENCE POST LOCATIONS TO AVOID CONFLICTS WITH UTILITIES OR OTHER STRUCTURES. MINIMUM 2' CLEARANCE.

IRRIGATION SYSTEM STANDARD DETAIL

EXAMPLE OF ALTERNATIVE FENCING

**BLACK CANYON
IRRIGATION DISTRICT**

FILE: BCID-D-ALT-FENCE.DWG | REVISED: 07/12/2023 | DWG NO. GIR17



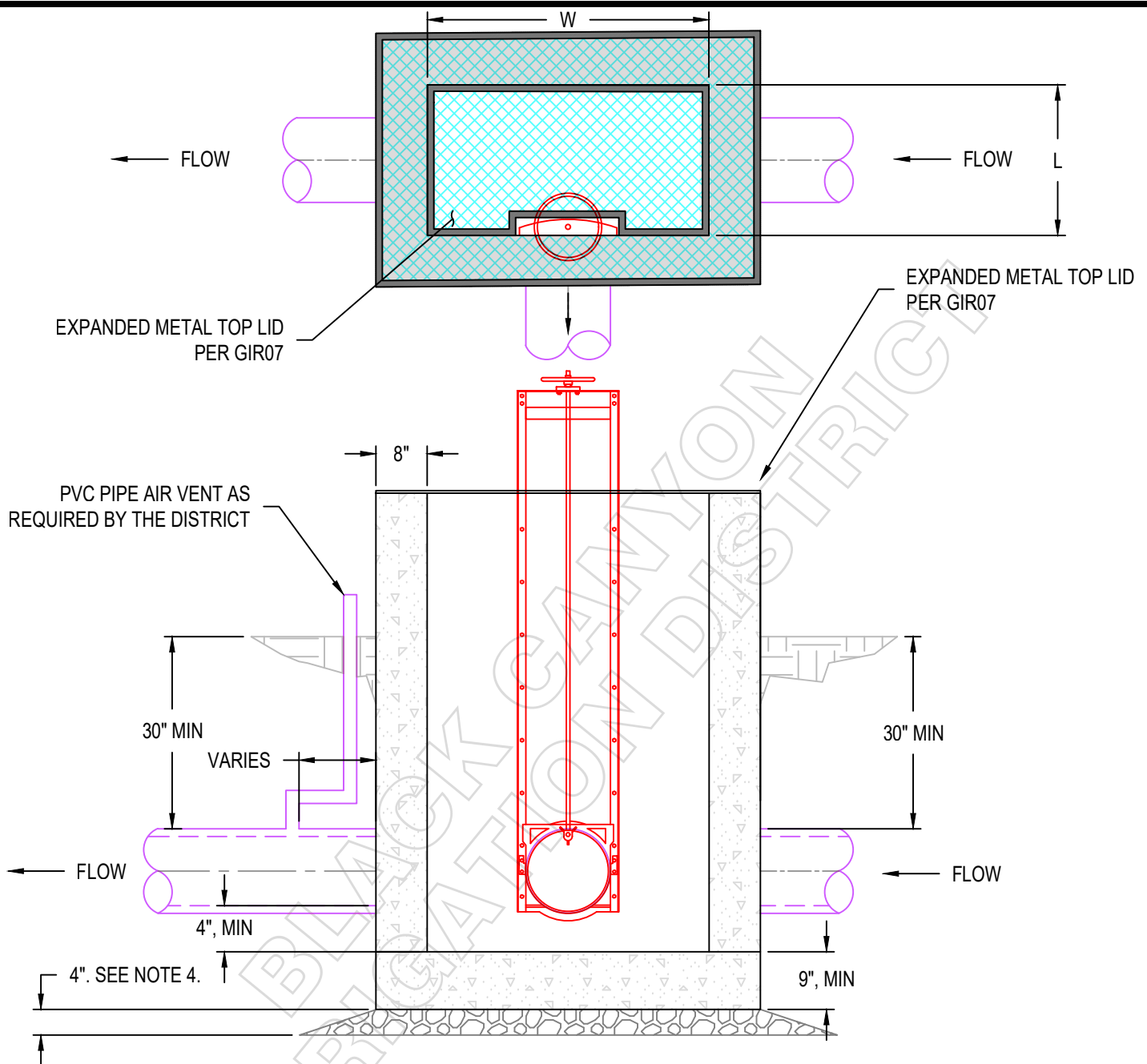
NOTES:

1. CONCRETE STRUCTURE SHALL BE CAST-IN-PLACE. REINFORCEMENT IS NOT SHOWN. SEE BCID STANDARD DETAILS GIR11 AND GIR12. REINFORCED CONCRETE STRUCTURE SHALL HAVE 28 DAY COMPRESSIVE STRENGTH OF MINIMUM 4000 PSI.
2. PROVIDE WATERSTOP AT ALL COLD JOINTS. SEE BCID STANDARD DETAIL GIR08.
3. ALL PIPES SHALL ENTER STRUCTURE AT OR NEAR PERPENDICULAR ANGLES. PROPERLY SEAL ALL JOINTS AND PIPES BY MORTARING. THE PIPE EDGE SHOULD BE FLUSH WITH THE WALL EDGE FOR SMOOTH INTERIOR FINISH. CONTRACTOR TO CUT SNAP TIES AND GROUT BOTH SIDES OF SNAP TIE LOCATIONS. REMOVE STRUCTURE ANCHORS PRIOR TO PLACING LID.
4. PROVIDE TYPE 1 BEDDING ON PREPARED SUBGRADE PER ISPWC SECTION 502.3.2.
5. EXTERNAL LADDERS ARE REQUIRED IF BOX IS GREATER THAN 24" ABOVE GROUND LEVEL.
6. BOX LID SHALL BE EXPANDED METAL WITH ACCESS DOOR. SEE DETAIL GIR07.
7. DETAIL IS TYPICAL. MANY STRUCTURES WILL REQUIRE ADDITIONAL OR MODIFIED DETAILS. ALL STRUCTURES SHALL HAVE DETAIL APPROVED BY BCID PRIOR TO INSTALLATION.
8. WALL THICKNESS AND DIMENSIONS SHALL VARY WITH DEPENDING ON THE PIPE SIZE AND FLOW. (TYPICAL SHOWN.)

IRRIGATION SYSTEM STANDARD DETAIL

TYPICAL CHECK STRUCTURE WITH GATE

BLACK CANYON IRRIGATION DISTRICT



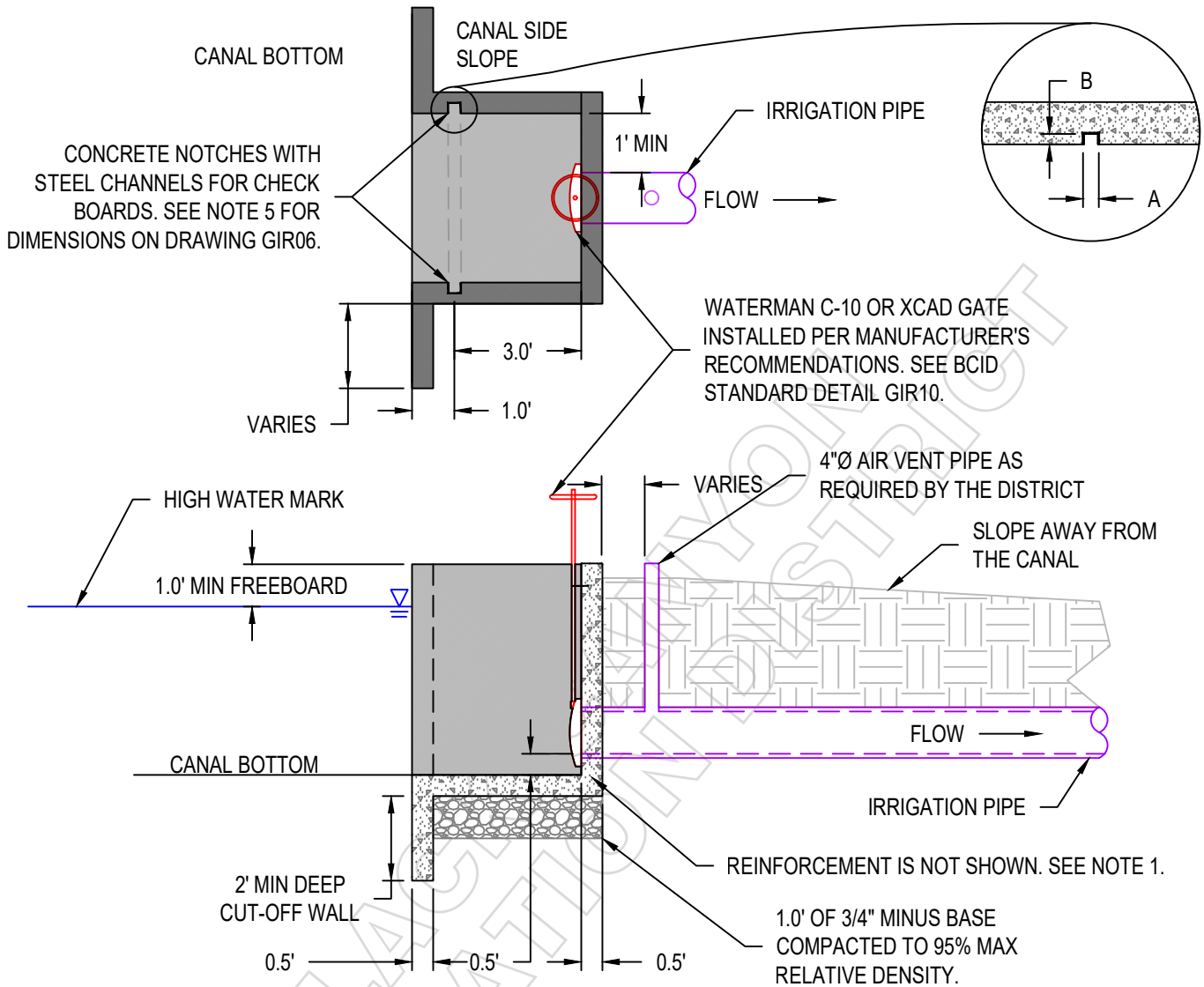
NOTES:

1. STRUCTURE LIDS IN TRAVELED AREAS, INCLUDING RIGHT OF WAY, SHALL BE HS-25 WHEEL LOAD RATED. STRUCTURE LIDS OUTSIDE OF RIGHT OF WAYS SHALL BE DESIGNED TO WITHSTAND A 300 LB POINT LOAD WITH A MAXIMUM DEFLECTION OF 1/2 INCH AT CENTER SPAN AND IN ACCORDANCE WITH IBC.
2. CONCRETE STRUCTURE SHALL BE CAST-IN-PLACE. REINFORCEMENT IS NOT SHOWN. SEE BCID STANDARD DETAILS GIR11 AND GIR12. REINFORCED CONCRETE STRUCTURE SHALL HAVE 28 DAY COMPRESSIVE STRENGTH OF MINIMUM 4000 PSI.
3. PROVIDE WATERSTOP AT ALL COLD JOINTS. SEE BCID STANDARD DETAIL GIR08.
4. PROVIDE 4 INCHES OF TYPE 1 BEDDING ON PREPARED SUBGRADE PER ISPWC SECTION 502.3.2.
5. ALL PIPES SHALL ENTER STRUCTURE AT OR NEAR PERPENDICULAR ANGLES. PROPERLY SEAL ALL JOINTS AND PIPES BY MORTARING. THE PIPE EDGE SHOULD BE FLUSH WITH THE WALL EDGE FOR SMOOTH INTERIOR FINISH. CONTRACTOR TO CUT SNAP TIES AND GROUT BOTH SIDES OF SNAP TIE LOCATIONS. REMOVE STRUCTURE ANCHORS PRIOR TO PLACING LID.

IRRIGATION SYSTEM STANDARD DETAIL

TURNOUT FOR PIPE CONVEYANCE DETAIL

BLACK CANYON IRRIGATION DISTRICT



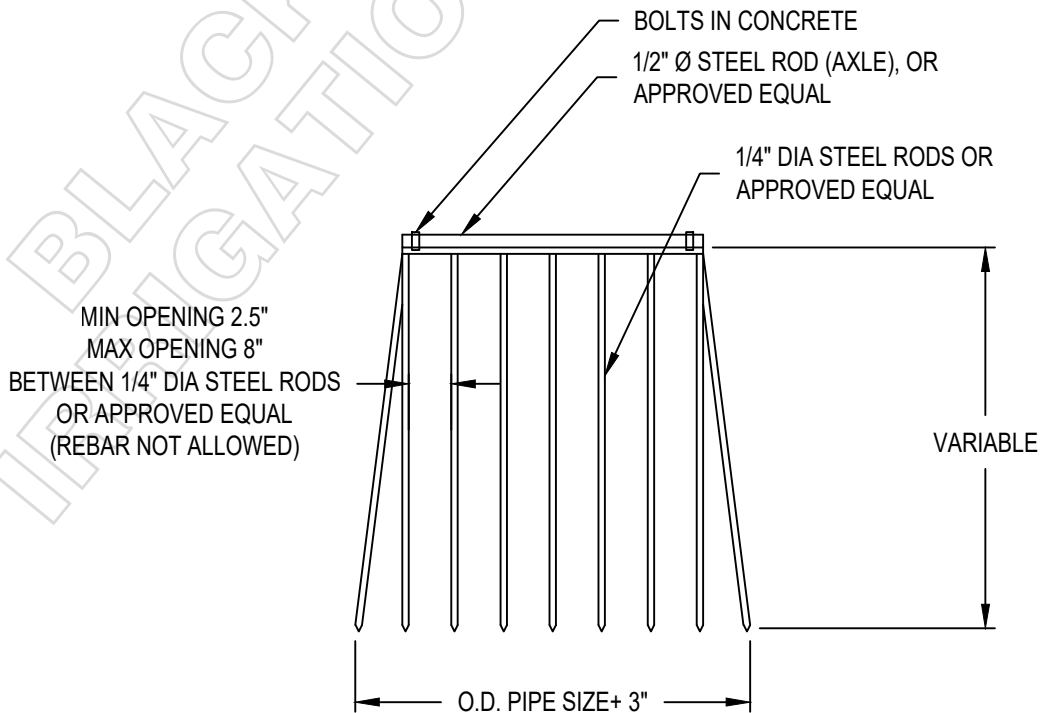
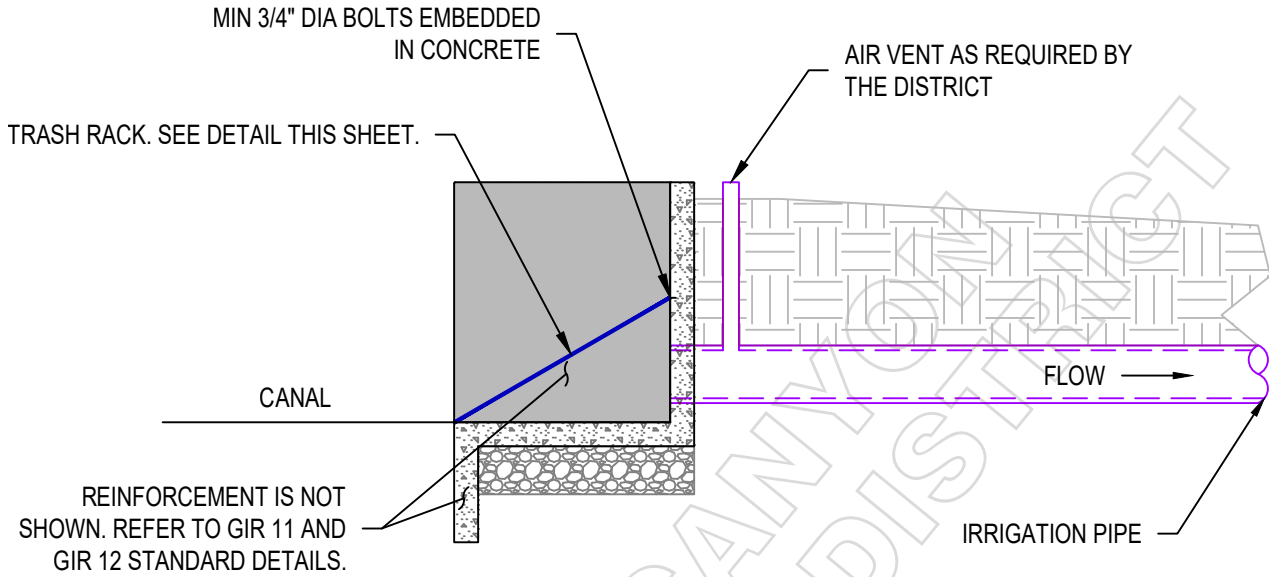
NOTES:

1. TURNOUT STRUCTURE SHALL BE CAST-IN-PLACE. REINFORCEMENT IS NOT SHOWN. SEE BCID STANDARD DETAILS GIR11 AND GIR12. REINFORCED CONCRETE STRUCTURE SHALL HAVE 28 DAY COMPRESSIVE STRENGTH OF MINIMUM 4000 PSI.
2. PROVIDE WATERSTOP AT ALL COLD JOINTS. SEE BCID STANDARD DETAIL GIR08.
3. ALL PIPES SHALL EXIT THE STRUCTURE AT OR NEAR PERPENDICULAR ANGLES. PROPERLY SEAL ALL JOINTS AND PIPES BY MORTARING. THE PIPE EDGE SHOULD BE FLUSH WITH THE WALL EDGE FOR SMOOTH INTERIOR FINISH.
4. SEE BCID STANDARD GIR21 FOR TRASH RACK DETAIL.
5. BACKFILL TRENCH AS REQUIRED BY ISPWC SECTION 306 - TRENCH BACKFILL. SEE STANDARD DETAIL GIR05 FOR IRRIGATION TRENCH DETAIL.
6. BACKFILL STRUCTURES PER ISPWC SECTION 2030.

IRRIGATION SYSTEM STANDARD DETAIL

**TURNOUT FOR CANAL
CONVEYANCE DETAIL**

**BLACK CANYON
IRRIGATION DISTRICT**



IRRIGATION SYSTEM STANDARD DETAIL

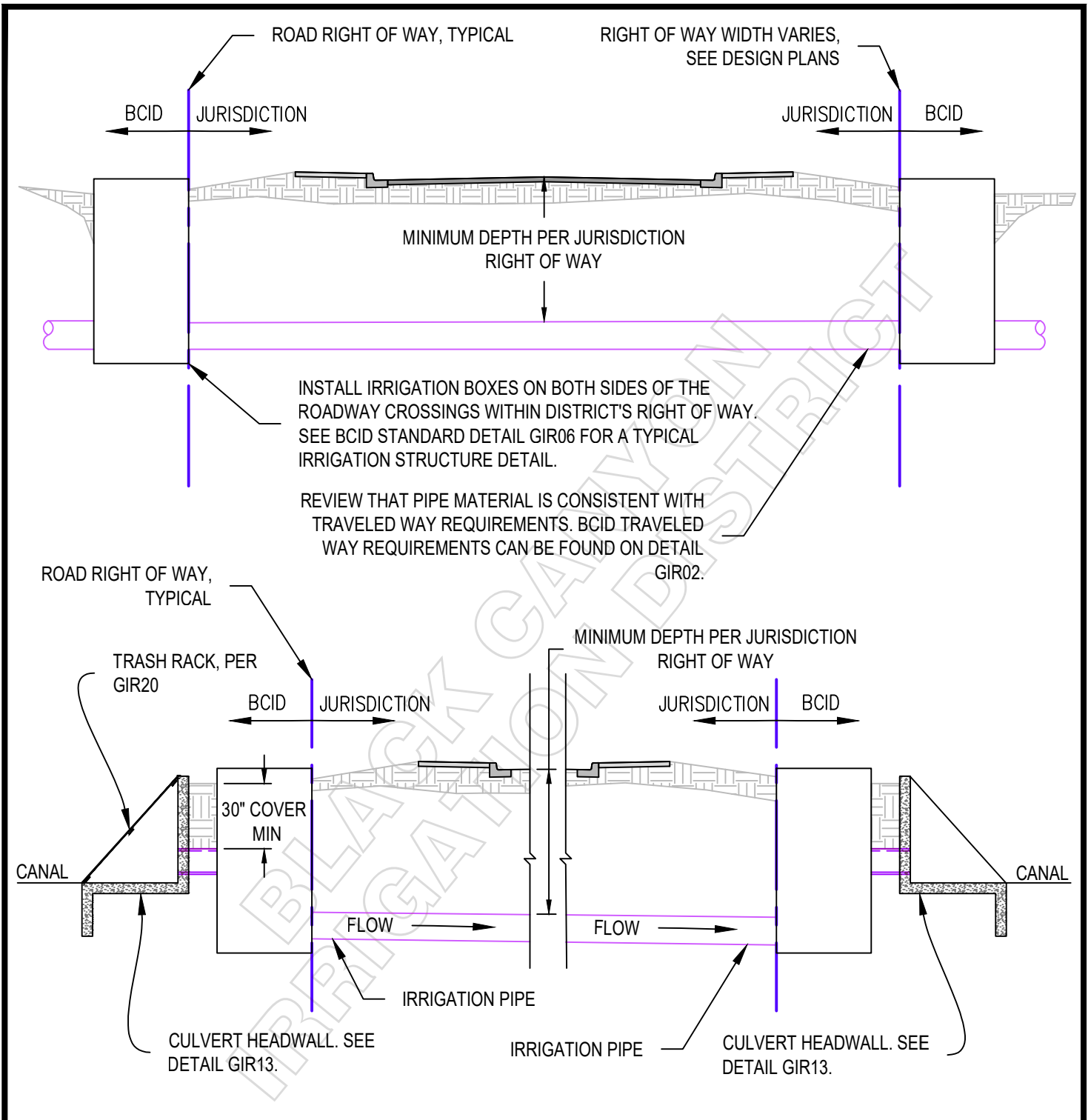
TRASH RACK / GRATE DETAIL

**BLACK CANYON
IRRIGATION DISTRICT**

FILE: BCID-D-GRATE.DWG

REVISED: 07/12/2023

DWG NO. GIR21



NOTES:

1. ALL WORK INSIDE STREET RIGHT OF WAY SHALL MEET SPECIFICATIONS OF THE GOVERNING AGENCY AND THE CURRENT ISPCW SPECIFICATIONS.
2. IRRIGATION BOXES SHALL BE INSTALLED OUTSIDE OF CLEAR ZONES.
3. SUBMERGED INVERTS ARE NOT DESIRED.

IRRIGATION SYSTEM STANDARD DETAIL

ROADWAY CROSSING DETAIL

**BLACK CANYON
IRRIGATION DISTRICT**

FILE:BCID-D-ROAD_XING.DWG

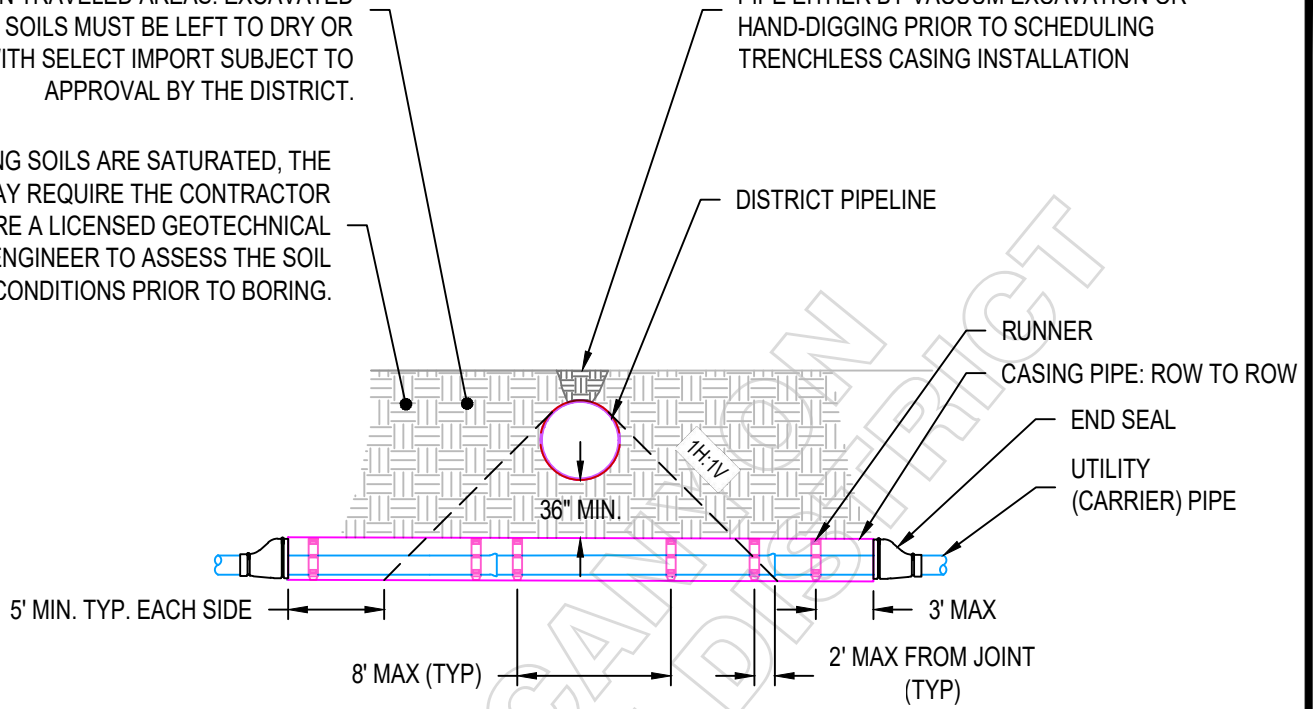
REVISED: 07/12/2023

DWG NO. GIR22

BACKFILL IN 12" LIFTS MAXIMUM TO 85% OF MAXIMUM DENSITY IN UNTRAVELED AREAS, OR 95% IN TRAVELED AREAS. EXCAVATED SATURATED SOILS MUST BE LEFT TO DRY OR REPLACED WITH SELECT IMPORT SUBJECT TO APPROVAL BY THE DISTRICT.

CONTRACTOR SHALL POTHOLE TOP OF EXISTING PIPE EITHER BY VACUUM EXCAVATION OR HAND-DIGGING PRIOR TO SCHEDULING TRENCHLESS CASING INSTALLATION

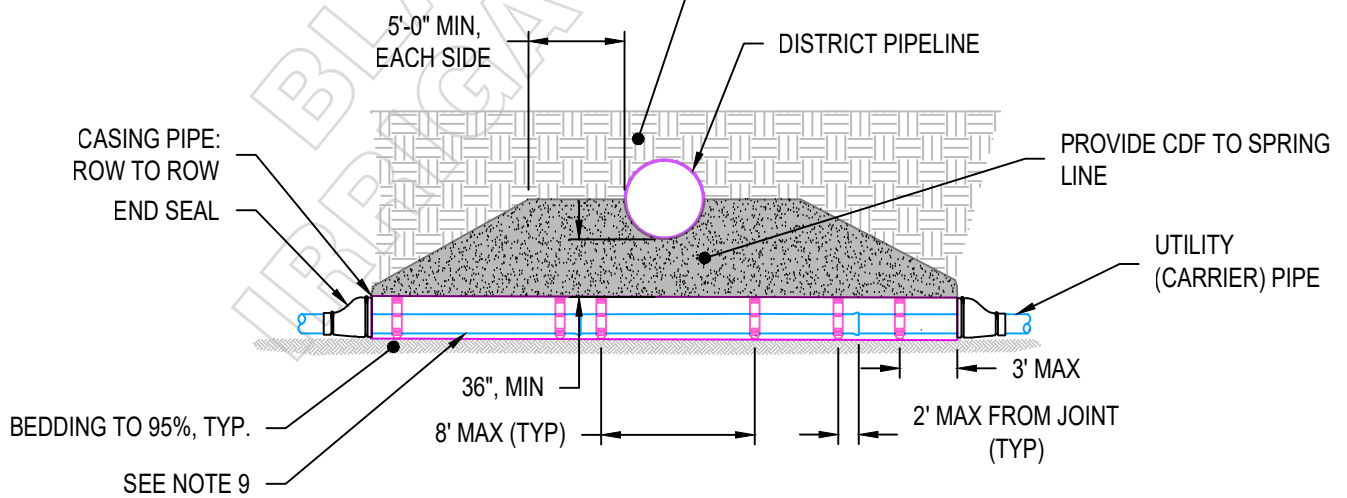
IF EXISTING SOILS ARE SATURATED, THE DISTRICT MAY REQUIRE THE CONTRACTOR TO HIRE A LICENSED GEOTECHNICAL ENGINEER TO ASSESS THE SOIL CONDITIONS PRIOR TO BORING.



TRENCHLESS INSTALLATION - SIDE VIEW

NOT TO SCALE

BACKFILL IN 12" LIFTS MAXIMUM TO 85% OF MAXIMUM DENSITY IN UNTRAVELED AREAS, OR 95% IN TRAVELED AREAS. EXCAVATED SATURATED SOILS MUST BE LEFT TO DRY OR REPLACED WITH SELECT IMPORT SUBJECT TO APPROVAL BY THE DISTRICT.



**OPEN CUT INSTALLATION - SIDE VIEW
CROSSING BELOW DISTRICT PIPE**

NOT TO SCALE

IRRIGATION SYSTEM STANDARD DETAIL

IRRIGATION PIPE CROSSING 1 OF 2

**BLACK CANYON
IRRIGATION DISTRICT**

GENERAL NOTES:

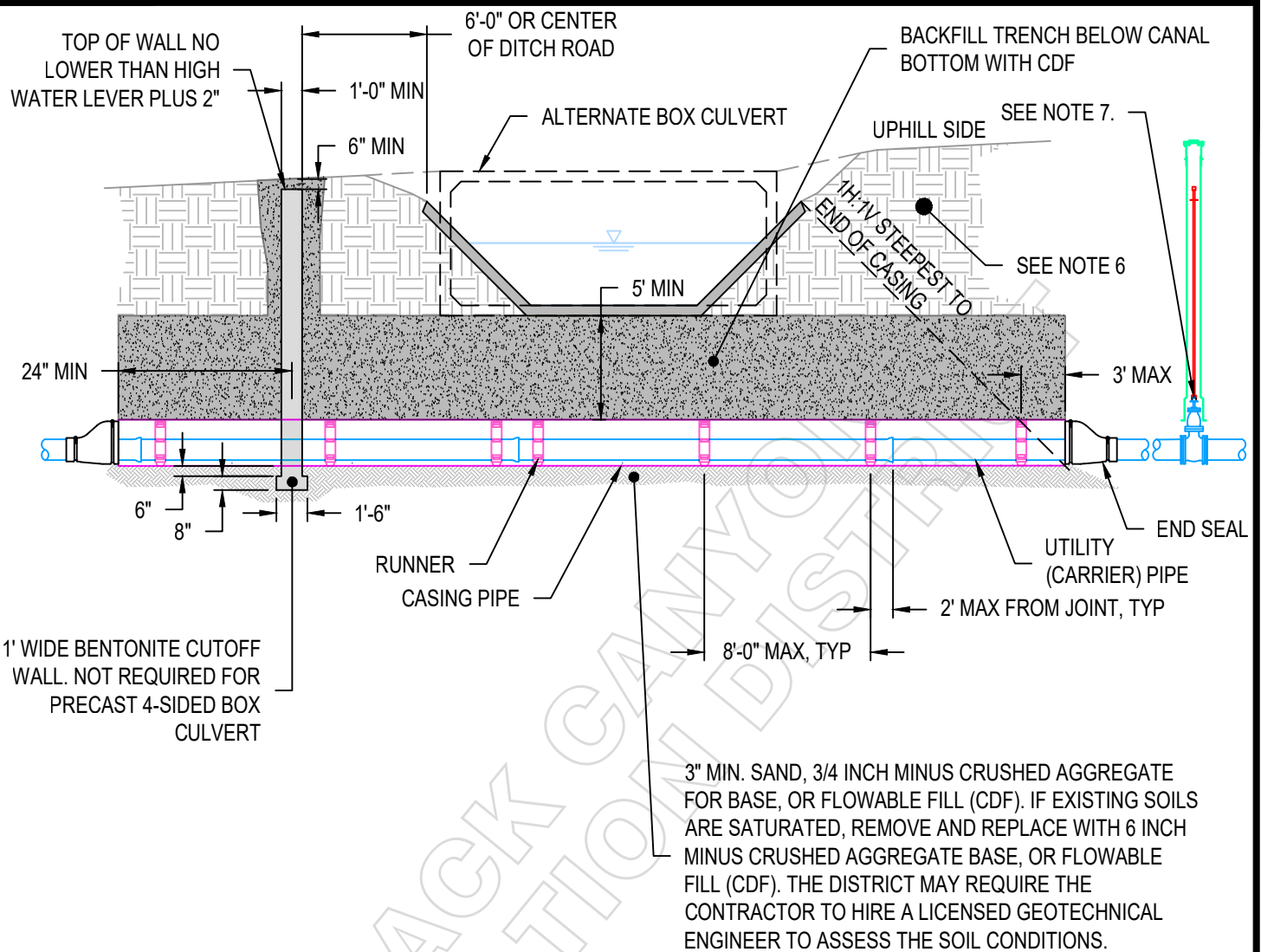
1. UNDERGROUND UTILITY CROSSINGS SHALL BE SLEEVED. SLEEVES SHALL EXTEND THE ENTIRE WIDTH OF THE DISTRICT EASEMENT.
2. CASINGS MUST BE INSTALLED WITH AUGER OR DIRECTIONAL DRILL. RAMMING IS NOT PERMITTED.
3. CONTRACTOR TO PROVIDE WRITTEN TRENCHLESS INSTALLATION PLAN TO DISTRICT FOR REVIEW MIN. 2 WEEKS PRIOR TO INSTALLATION. INCLUDE:
 - a.) NARRATIVE DESCRIPTION OF TRENCHLESS METHOD AND SITE SPECIFIC PROCEDURES
 - b.) POTHOLING RESULTS INCLUDING SOIL TYPE AND ELEVATION OF DISTRICT PIPE
 - c.) CASING AND UTILITY DESIGN INFORMATION
4. CASING PIPE: 3/8" WALL STEEL, CLASS 200 PVC C900 OR C905, OR HIGH DENSITY POLYETHYLENE WITH A MINIMUM WALL THICKNESS MATCHING AN EQUALLY SIZED PVC SLEEVE. IF USING 2 OR MORE STICKS OF CASING PIPE, INSTALL STRAIGHT AND TRUE. CASING SHOULD EXTEND THE ENTIRE WIDTH OF THE DISTRICT'S EASEMENT.
5. CASING RUNNERS: MUST BE MANUFACTURED ITEMS, NOT BLOCKS AND STRAPS. PSI, CALPICO, OR ENGINEER APPROVED EQUAL. SPACE PER MANUFACTURER'S RECOMMENDATIONS, BUT NOT FEWER THAN AS SHOWN. RUNNERS ARE OPTIONAL FOR HDPE CARRIER PIPE.
6. CASING END SEALS: PSI, CALPICO, OR ENGINEER APPROVED EQUAL.
7. FOR PRESSURE PIPES, ALL JOINTS WITHIN THE CASING MUST BE RESTRAINED UNLESS APPROVED OTHERWISE BY THE DISTRICT.
8. PROPOSED UTILITY CARRIER PIPE- UTILIZE SINGLE STICK OF PIPE OF GREATEST AVAILABLE LAY LENGTH, CENTERED ON DISTRICT PIPE
9. UTILITY CROSSINGS SHALL BE WITHIN 10 DEGREES OF PERPENDICULAR TO THE DISTRICT PIPELINE ALIGNMENT. OTHER PROPOSED CROSSING ALIGNMENTS SUBJECT TO REVIEW AND APPROVAL BY DISTRICT

BLACK CANYON IRRIGATION DISTRICT

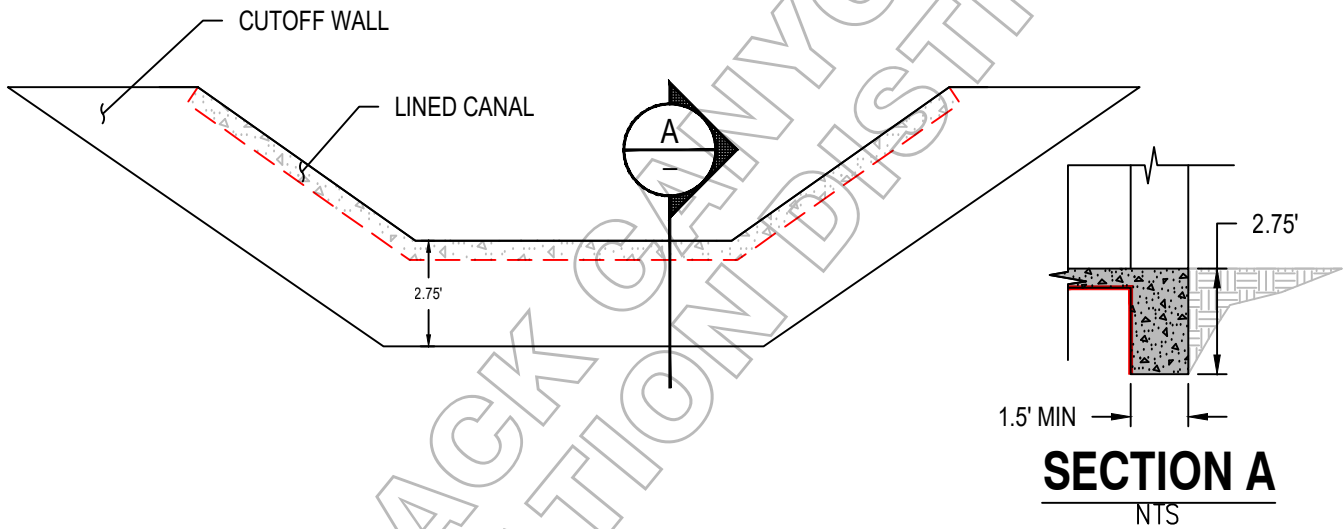
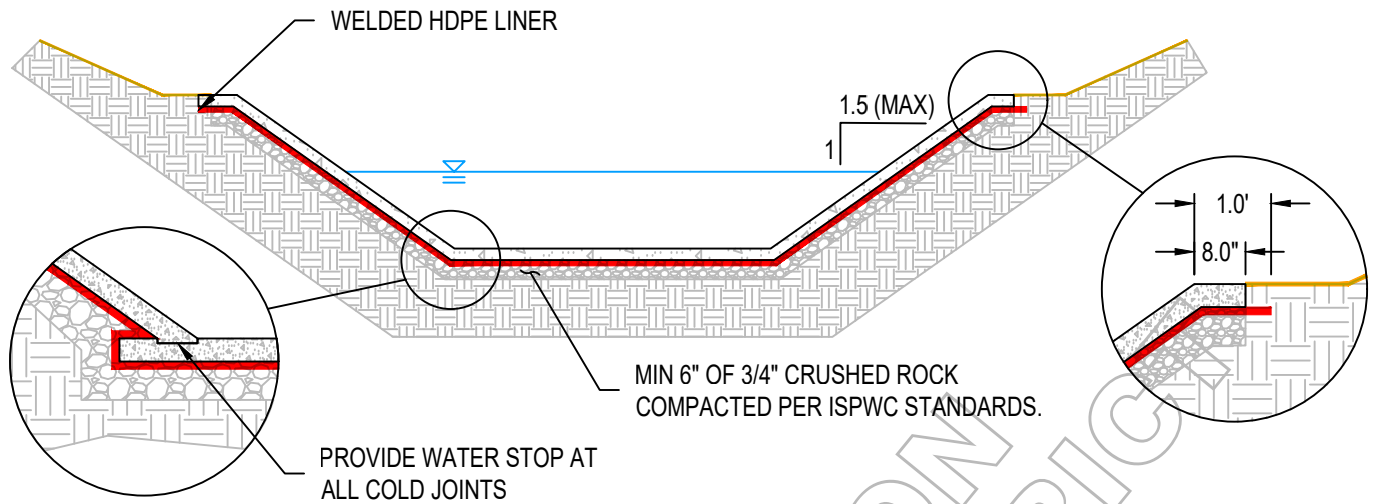
IRRIGATION SYSTEM STANDARD DETAIL

IRRIGATION PIPE CROSSING 2 OF 2

**BLACK CANYON
IRRIGATION DISTRICT**



1. CASING PIPE: 3/8" WALL STEEL, CLASS 200 PVC C900 OR C905, OR HIGH DENSITY POLYETHYLENE WITH A MINIMUM WALL THICKNESS MATCHING AN EQUALLY SIZED PVC SLEEVE. IF USING 2 OR MORE STICKS OF CASING PIPE, INSTALL STRAIGHT AND TRUE. CASING SHOULD EXTEND THE ENTIRE WIDTH OF THE DISTRICT'S EASEMENT.
2. CASING RUNNERS: MUST BE MANUFACTURED ITEMS, NOT BLOCKS AND STRAPS. PSI, CALPICO, OR ENGINEER APPROVED EQUAL. SPACE PER MANUFACTURER'S RECOMMENDATIONS, BUT NOT FEWER THAN AS SHOWN.
3. CASING END SEALS: PSI, CALPICO, OR ENGINEER APPROVED EQUAL.
4. FOR PRESSURE PIPES, ALL JOINTS WITHIN THE CASING MUST BE RESTRAINED UNLESS APPROVED OTHERWISE BY THE DISTRICT.
5. TRENCHLESS CASING INSTALLATION UNDER A BOX CULVERT MAY BE ALLOWED AT THE DISTRICT'S DISCRETION. IF ALLOWED, CASING MUST BE INSTALLED WITH AUGER OR DIRECTIONAL DRILL. RAMMING IS NOT PERMITTED.
6. BACKFILL IN 12" LIFTS MAXIMUM TO 85% OF MAXIMUM DENSITY IN UNTRAVELED AREAS, OR 95% IN TRAVELED AREAS. EXCAVATED SATURATED SOILS MUST BE LEFT TO DRY OR REPLACED WITH SELECT IMPORT SUBJECT TO APPROVAL BY THE DISTRICT.
7. FOR PRESSURE PIPES, INSTALL ISOLATION VALVE NO FARTHER THAN 100 FT FROM UPHILL SIDE OF CANAL.
8. FIBERGLASS REINFORCED COMPOSITE UTILITY MARKING POSTS SHALL BE PLACED IN LINE WITH ALL OPEN CHANNEL UNDERGROUND UTILITY CROSSINGS OF SUPPLY FACILITY AT THE OUTSIDE EDGE OF THE FACILITY EASEMENT. MARKING POSTS SHALL BE LABELED "CAUTION BURIED [UTILITY]".



NOTES:

1. BACKFILL AND SUBGRADE SHALL BE COMPACTED TO MINIMUM 95% RELATIVE DENSITY.
2. REINFORCEMENT IS NOT SHOWN FOR CLARITY.
3. CONCRETE LINING SHALL BE POURED IN PLACE, AT MINIMUM 4 INCHES THICK. CEMENT SHALL BE TYPE II PORTLAND CEMENT. CEMENT SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 4,000 PSI.
4. SHOTCRETE LINING MAY BE INSTALLED AS AN ALTERNATIVE TO CONCRETE LINING. DESIGN MIX SHALL BE PRE-APPROVED BY THE DISTRICT ENGINEER.
5. STRUCTURE TO LINING CONNECTIONS MAY REQUIRE REBAR DOWELS AS DIRECTED BY THE DISTRICT ENGINEER.
6. AQUALASTIC®, AQUASEAL™, OR AN APPROVED EQUAL SHALL BE APPLIED TO ALL EXPANSION JOINTS TO A MINIMUM 1 FOOT ABOVE HIGH WATER ELEVATION. AREA TO BE SEALED SHALL BE PREPPED IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS PRIOR TO APPLYING COATING.
7. POLYPROPYLENE COATED MANHOLE STEPS SHALL BE INSTALLED IN THE CONCRETE LINER TO CREATE EXIT AREAS. EXIT AREAS SHALL BE A MAXIMUM 400 FEET APART. MANHOLE STEPS SHALL BE FIRMLY EMBEDDED AND SHALL WITHSTAND ASTM C-497 PULLOUT TESTING. STEPS SHALL BE ALIGNED VERTICALLY AND SPACED 12 INCHES VERTICALLY ON CENTER. MANHOLE STEPS SHALL BE PLACED NO GREATER THAN 16 INCHES FROM BOTTOM OF LINER AND NO GREATER THAN 24 INCHES FROM TOP OF LINER.

IRRIGATION SYSTEM STANDARD DETAIL

CONCRETE LINED CANAL

**BLACK CANYON
IRRIGATION DISTRICT**