

BIRCH CREEK CULINARY WATER COMPANY BIRCH CREEK WATER PROJECT

BIRCH CREEK, ID

2026

BIRCH CREEK CULINARY WATER COMPANY

Brady Henderson President

ENGINEERING CONSULTANTS (SE)

Sunrise Engineering

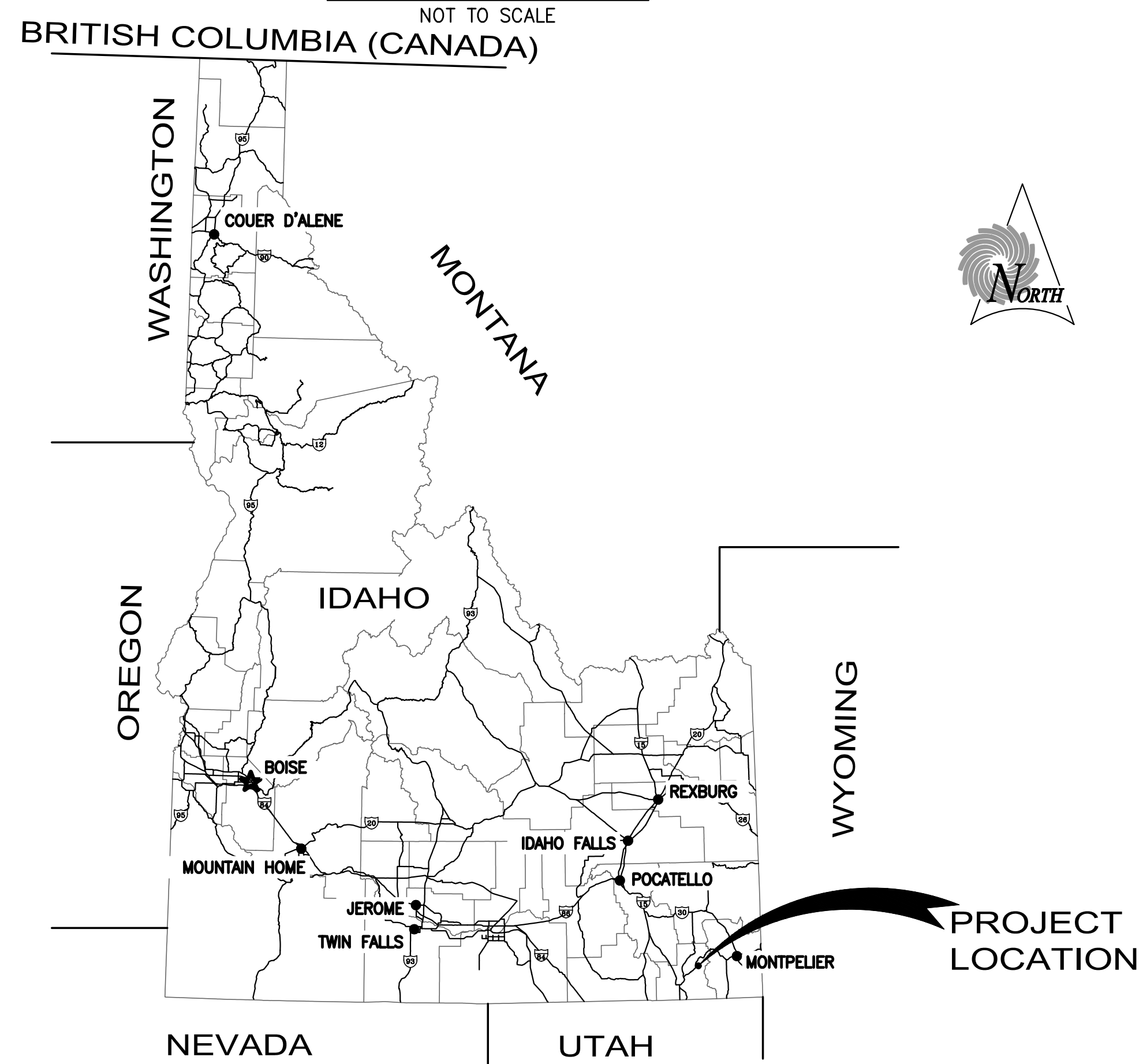
Scott Archibald, P.E. Principal Engineer

Seth Thompson, P.E. Project Engineer

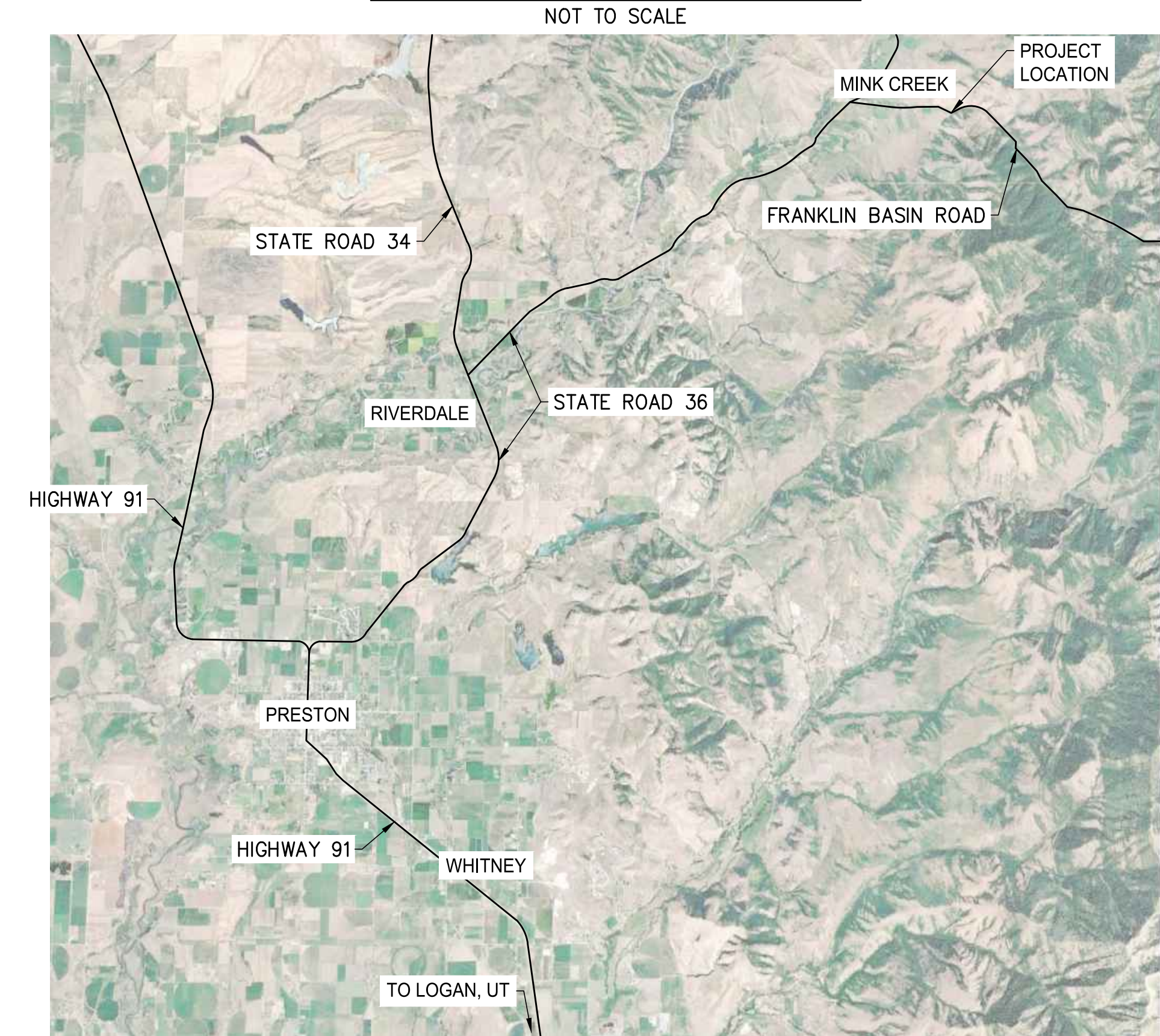


2100 NORTH MAIN STREET
NORTH LOGAN, UTAH 84341
TEL 435.563.3734
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AREA MAP



LOCATION MAP



SOUTHEAST IDAHO
42°13'28.53" N 111°41'40.04" W

SHEET INDEX

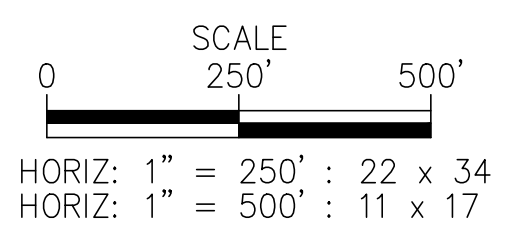
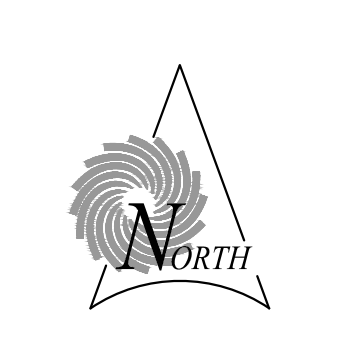
	DWG. NO.	SHEET NO.
1 - GENERAL:		
COVER SHEET	GN1	1
AREA MAPS AND SHEET INDEX	GN2	2
NOTES, ABBREVIATIONS, AND LEGEND	GN3	3
PROJECT OVERVIEW MAP AND INDEX	GN4	4
2 - WATER LINE:		
PLAN AND PROFILE	PP1-PP9	5-13
3 - UTILITY PLAN:		
WATER METER WORK	UP1-UP2	14-15
3 - DETAILS:		
SITE DETAILS	D1-D4	16-19
CHAINLINK FENCE DETAILS	D5	20
THRUST BLOCK DETAILS	D6	21



REV. NO.	COMMENT	DATE

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SEI NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.	
16897	SBB	JJ	SDT	2 of 21	GN2



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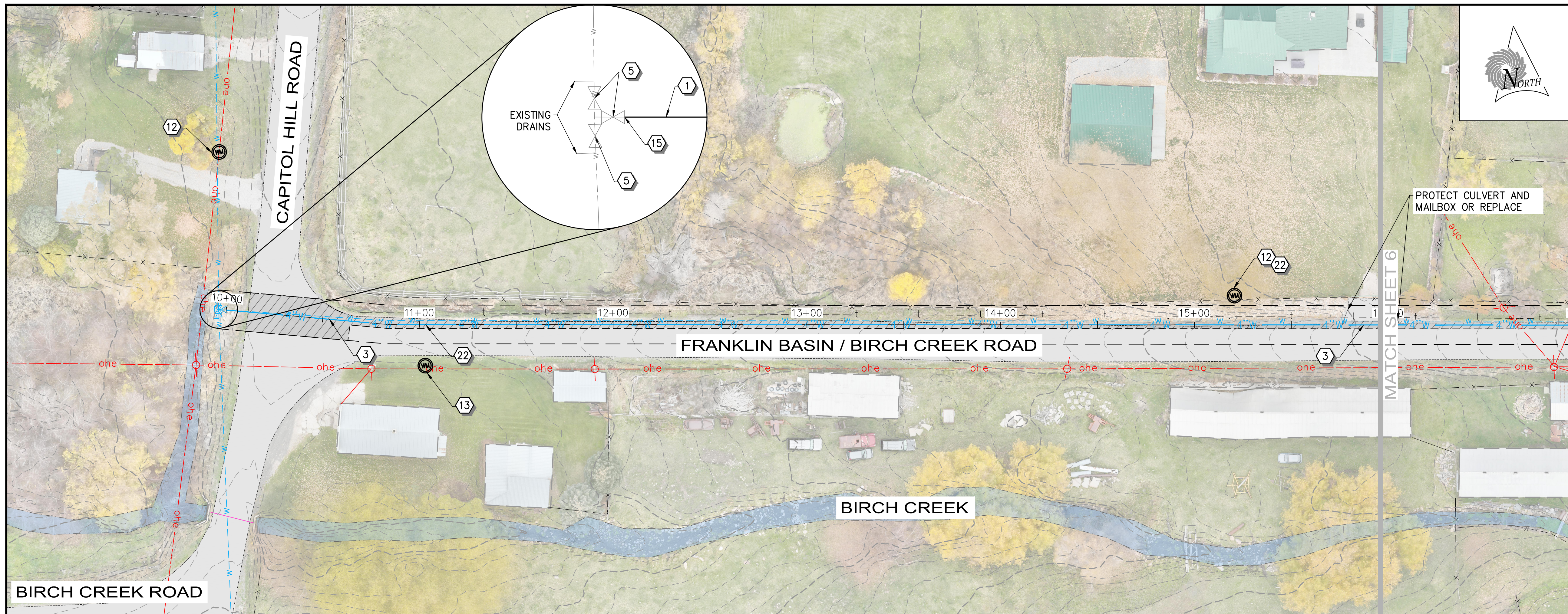


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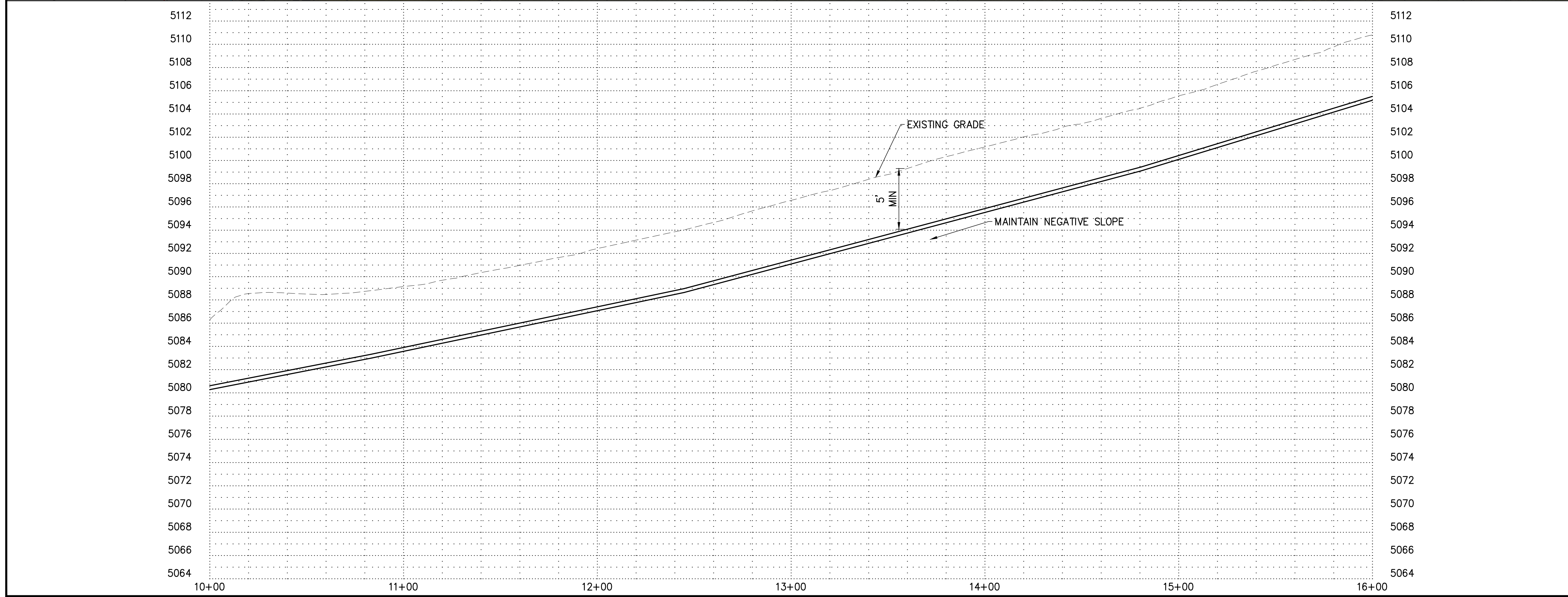
BIRCH CREEK CULINARY WATER CO.
BIRCH CREEK WATER PROJECT
GENERAL
PROJECT OVERVIEW MAP AND INDEX

REV. NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.	GN4
16897	SBB	JJ	SDT	4 of 21	GN4

P:\Birch Creek Culinary Water Company\16897 Birch Creek Water Project\DWG\Sheets\BC-GN4.dwg Apr 27, 2026 9:40am jolley



- ### CONSTRUCTION NOTES
1. INSTALL 4" PVC C900 DR25 WATER LINE (A, D1)
 2. INSTALL 4" PVC C900 DR25 WATER LINE - PATCH AND REPAIR GRAVEL ROAD / DRIVE (B, D1)
 3. INSTALL 4" PVC C900 DR25 WATER LINE - PATCH AND REPAIR ASPHALT ROAD SURFACE (C, D1)
 4. INSTALL 24" PVC C900 DR25 WATER LINE (A, C, D1, D2)
 5. PROTECT EXISTING WATER LINE AND VALVES IN PLACE
 6. REPLACE GATE VALVES IN TANK (H, D1)
 7. CONNECT NEW PIPE TO EXISTING PIPE - CAP AND ABANDON EXISTING PIPE IN PLACE
 8. INSTALL FITTING PER PLAN
 9. INSTALL AIR/VAC COMBINATION VALVE (F, D1)
 10. INSTALL GATE VALVE (D, D1)
 11. INSTALL 4" DRAIN (C, D3)
 12. INSTALL WATER METER (A, D2)
 13. INSTALL WATER METER - EXACT SERVICE LOCATION UNKNOWN (A, D2)
 14. INSTALL TANK AIR GAP (D, D3)
 15. CONNECT NEW PIPELINE TO EXISTING TEE (G, D1)
 16. PROTECT EXISTING POWER LINE
 17. INSTALL SPRING PROTECTION LINER (E, D4)
 18. REMOVE AND REPLACE BARBED WIRE FENCE (B, D2)
 19. STREAM BED TRENCH RESTORATION (D, E, D2)
 20. REMOVE AND REPLACE CHAIN LINK FENCE (A, D5)
 21. INSTALL SPRING BOX INTAKE (E, D3)
 22. INSTALL 1" SERVICE CONNECTION AND LATERAL (A, D2)
 23. INSTALL CUTOFF DITCH (D, D4)
 24. INSTALL CASING UNDER ROADWAY (A, D4)



- ### GENERAL NOTES
1. PROTECT EXISTING WATER LINE IN PLACE DURING CONSTRUCTION OF NEW LINE - ABANDON AND CAP LINE AFTER NEW LINE IS OPERATIONAL
 2. NEW WATER MAIN MUST BE DISINFECTED IN ACCORDANCE WITH AWWA STANDARD C651
- SCALE
 0 30' 60'
 HORIZ: 1" = 30' : 22 x 34
 HORIZ: 1" = 60' : 11 x 17
 VERT: 1" = 5' : 22 x 34
 VERT: 1" = 10' : 11 x 17
- 811** Know what's below. Call before you dig. 1-800-342-1585

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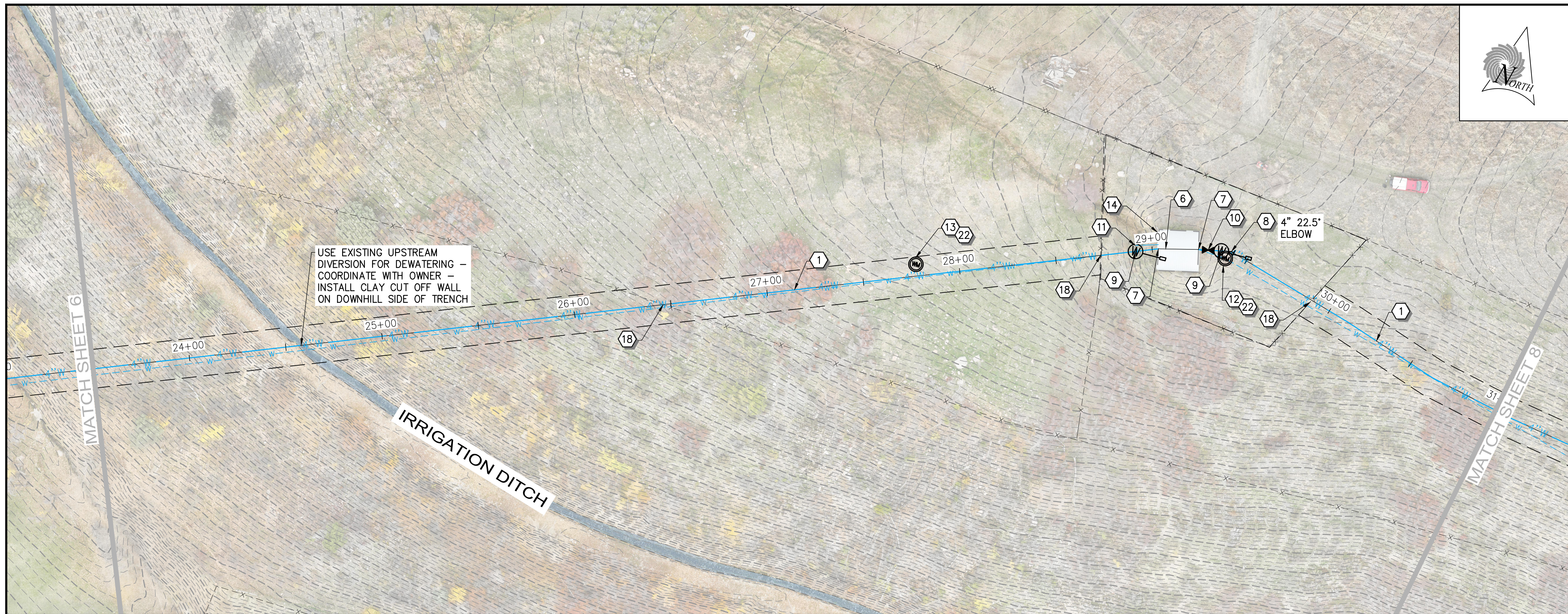
PROFESSIONAL ENGINEER
 STATE OF UTAH
 9271940
 SEYMOUR D. THOMPSON

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 2100 NORTH MAIN STREET
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BIRCH CREEK CULINARY WATER CO.
BIRCH CREEK WATER PROJECT
WATER LINE
PLAN AND PROFILE

SEI NO. 16897	DESIGNED SBB	DRAWN JJ	CHECKED SDT	SHEET NO. 5 of 21	PP1
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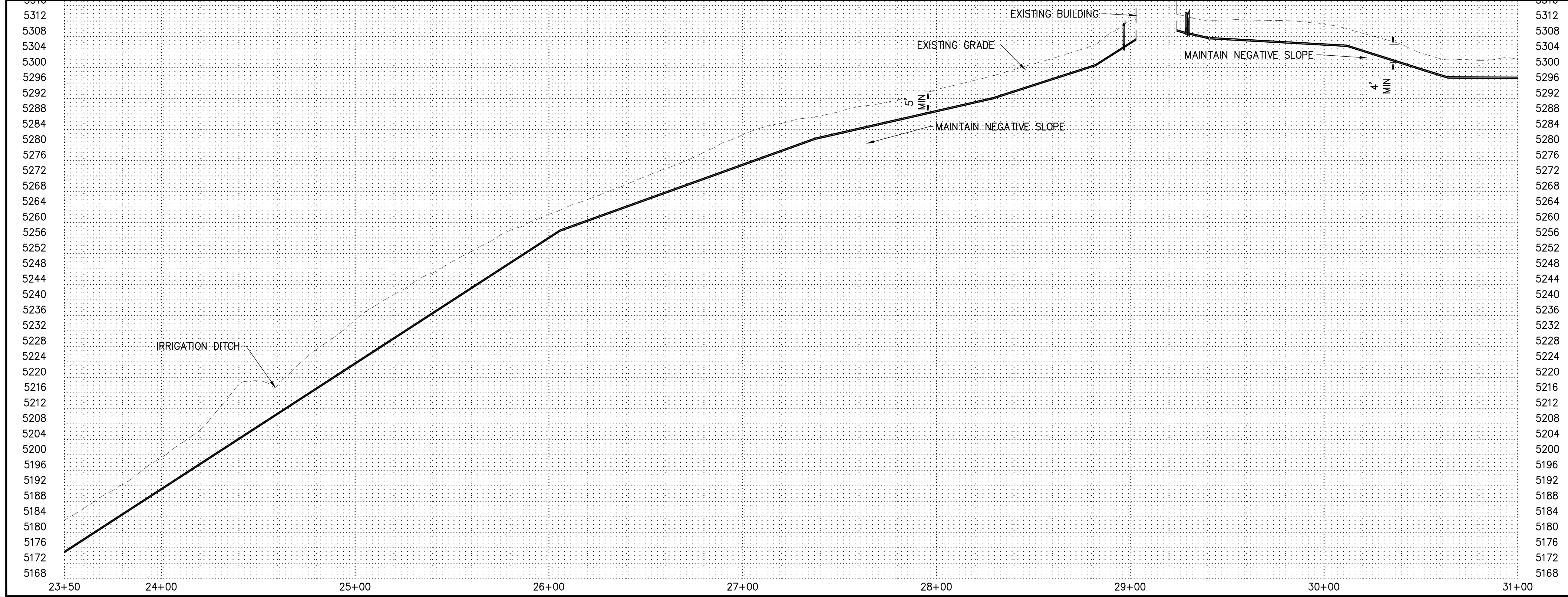
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USE EXISTING UPSTREAM DIVERSION FOR DEWATERING - COORDINATE WITH OWNER - INSTALL CLAY CUT OFF WALL ON DOWNHILL SIDE OF TRENCH

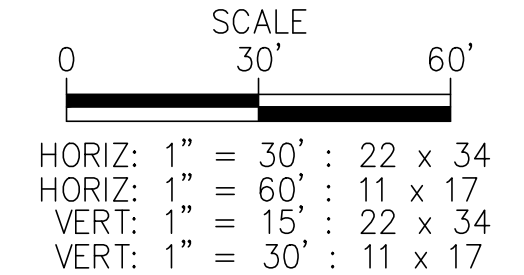
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- 4 INSTALL 24" PVC C900 DR25 WATER LINE (A/D1, C/D2)
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- 9 INSTALL AIR/VAC COMBINATION VALVE (F/D1)
- 10 INSTALL GATE VALVE (D/D1)
- 11 INSTALL 4" DRAIN (C/D3)
- 12 INSTALL WATER METER (A/D2)
- 13 INSTALL WATER METER - EXACT SERVICE LOCATION UNKNOWN (A/D2)
- 14 INSTALL TANK AIR GAP (D/D3)
- 15 CONNECT NEW PIPELINE TO EXISTING TEE (G/D1)
- 16 PROTECT EXISTING POWER LINE
- 17 INSTALL SPRING PROTECTION LINER (E/D4)
- 18 REMOVE AND REPLACE BARBED WIRE FENCE (B/D2)
- 19 STREAM BED TRENCH RESTORATION (D,E/D2)
- 20 REMOVE AND REPLACE CHAIN LINK FENCE (A/D5)
- 21 INSTALL SPRING BOX INTAKE (E/D3)
- 22 INSTALL 1" SERVICE CONNECTION AND LATERAL (A/D2)
- 23 INSTALL CUTOFF DITCH (D/D4)
- 24 INSTALL CASING UNDER ROADWAY (A/D4)



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BIRCH CREEK CULINARY WATER CO.
BIRCH CREEK WATER PROJECT
WATER LINE
PLAN AND PROFILE

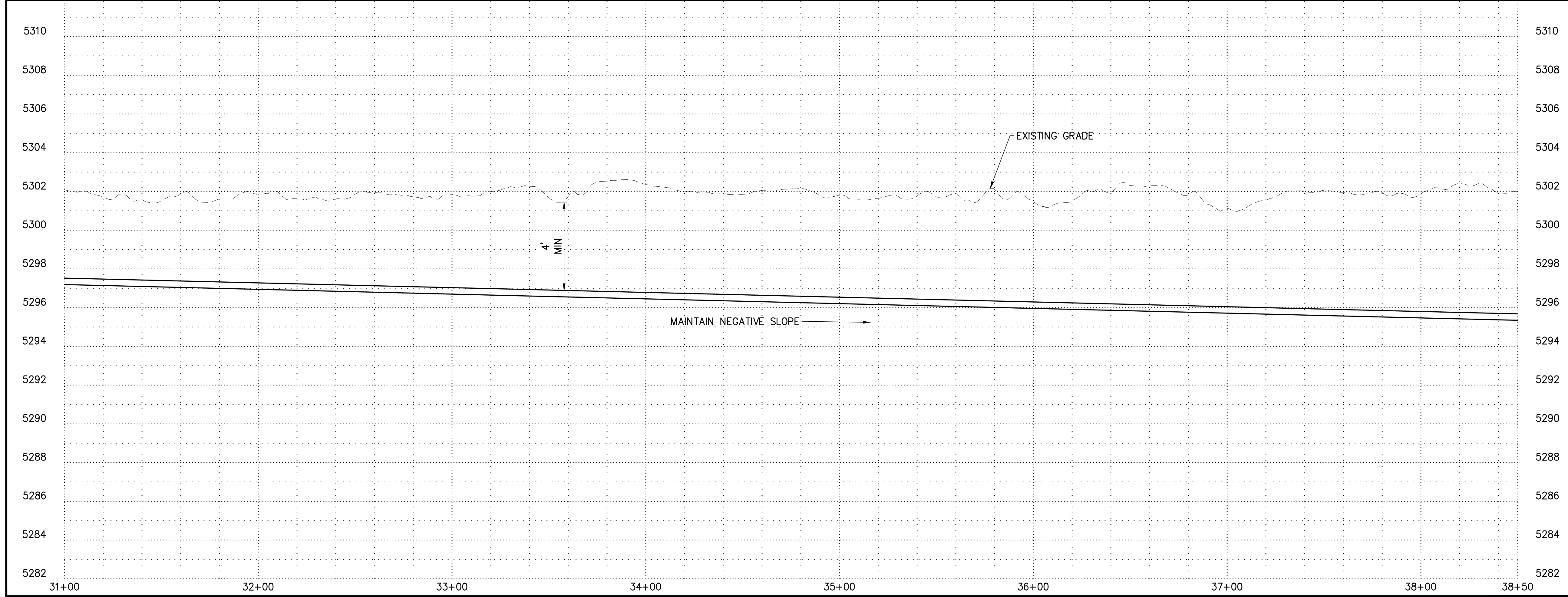
REV. NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.	
	SBB	JJ	SDT	7 of 21	PP3

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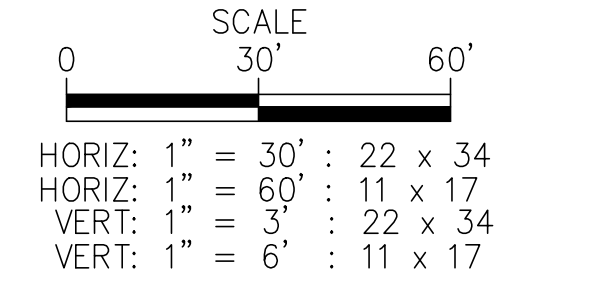
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- 11 INSTALL 4" DRAIN (C/D3) (A/D2)
- 12 INSTALL WATER METER (A/D2)
- 13 INSTALL WATER METER - EXACT SERVICE LOCATION UNKNOWN (A/D2)
- 14 INSTALL TANK AIR GAP (D/D3)
- 15 CONNECT NEW PIPELINE TO EXISTING TEE (G/D1)
- 16 PROTECT EXISTING POWER LINE
- 17 INSTALL SPRING PROTECTION LINER (E/D4)
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- 19 STREAM BED TRENCH RESTORATION (D,E/D2)
- 20 REMOVE AND REPLACE CHAIN LINK FENCE (A/D5)
- 21 INSTALL SPRING BOX INTAKE (E/D3)
- 22 INSTALL 1" SERVICE CONNECTION AND LATERAL (A/D2)
- 23 INSTALL CUTOFF DITCH (D/D4)
- 24 INSTALL CASING UNDER ROADWAY (A/D4)



GENERAL NOTES

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SETH D. THOMPSON
9271940
STATE OF UTAH

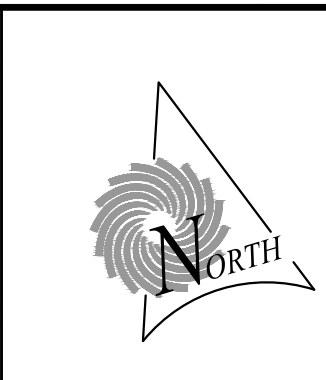
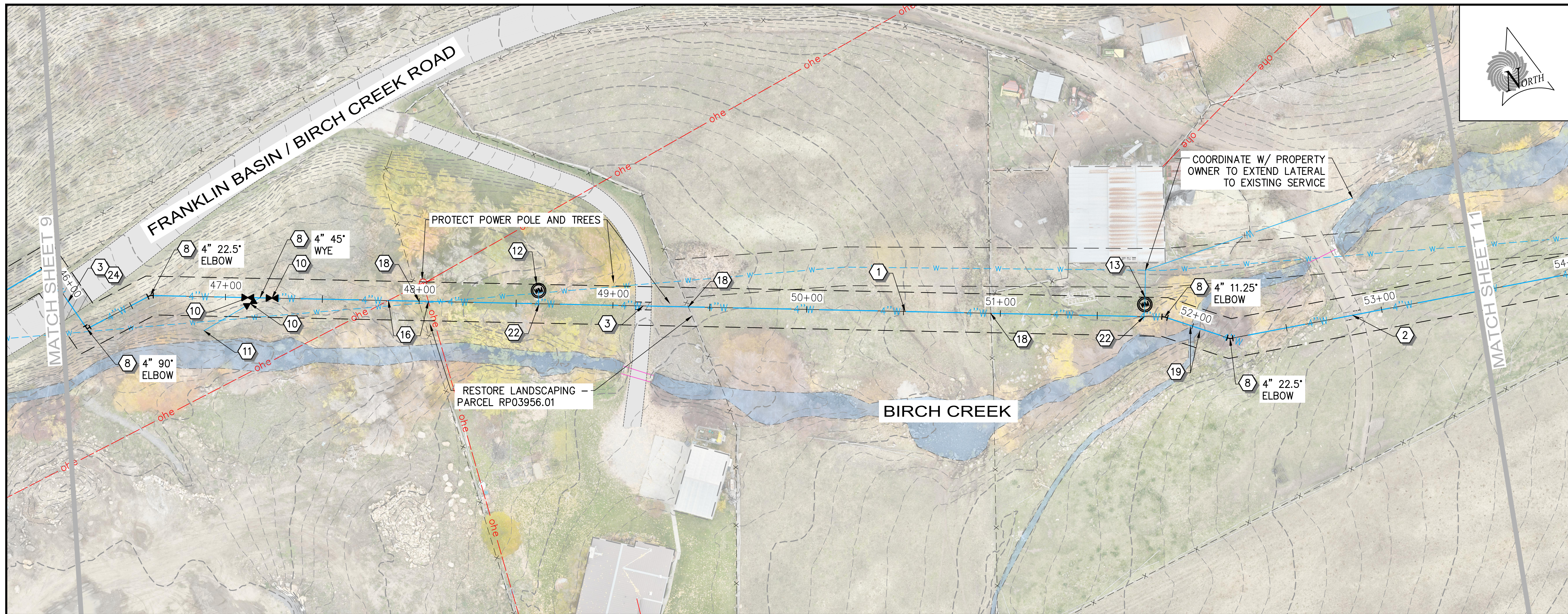
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BIRCH CREEK CULINARY WATER CO.
BIRCH CREEK WATER PROJECT
WATER LINE
PLAN AND PROFILE

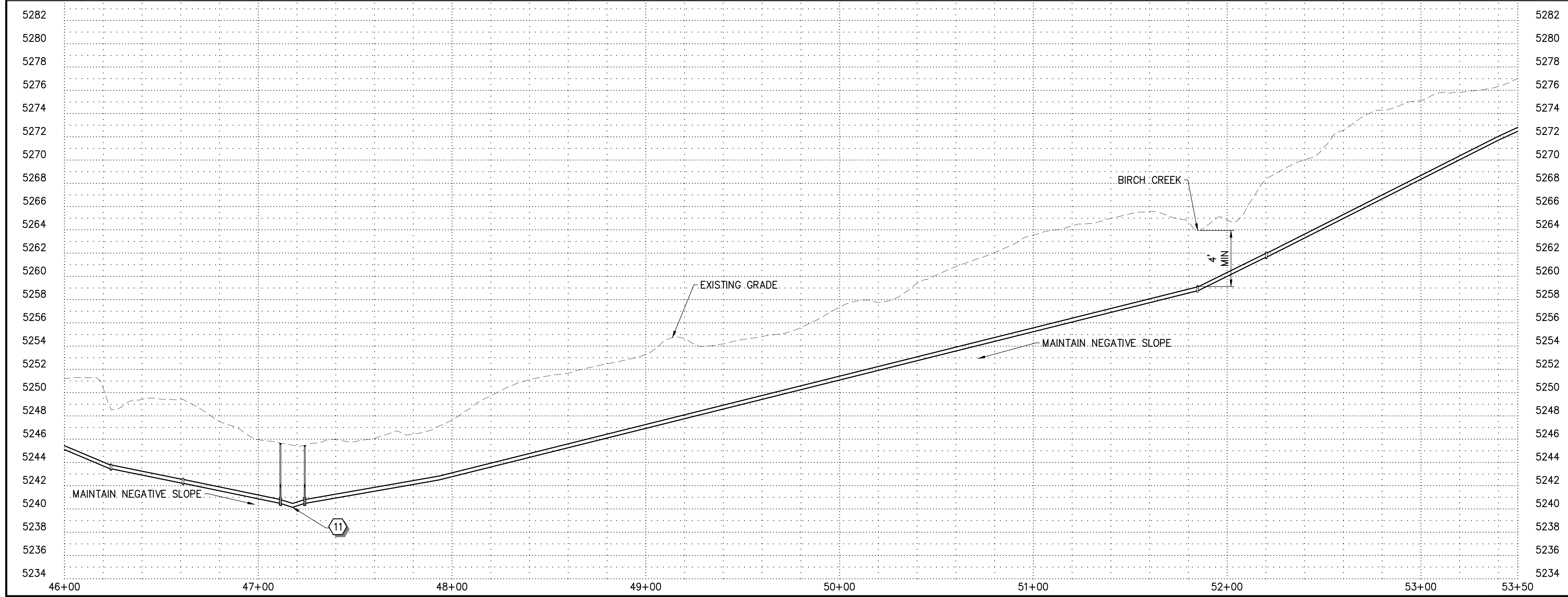
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CONSTRUCTION NOTES

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- 14 INSTALL TANK AIR GAP (D/D3)
- 15 CONNECT NEW PIPELINE TO EXISTING TEE (G/D1)
- 16 PROTECT EXISTING POWER LINE
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- 18 REMOVE AND REPLACE BARBED WIRE FENCE (B/D2)
- 19 STREAM BED TRENCH RESTORATION (D,E/D2)
- 20 REMOVE AND REPLACE CHAIN LINK FENCE (A/D5)
- 21 INSTALL SPRING BOX INTAKE (E/D3)
- 22 INSTALL 1" SERVICE CONNECTION AND LATERAL (A/D2)
- 23 INSTALL CUTOFF DITCH (D/D4)
- 24 INSTALL CASING UNDER ROADWAY (A/D4)



GENERAL NOTES

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SCALE
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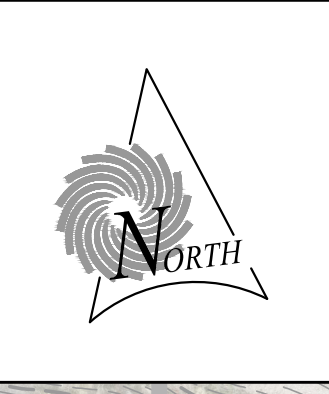
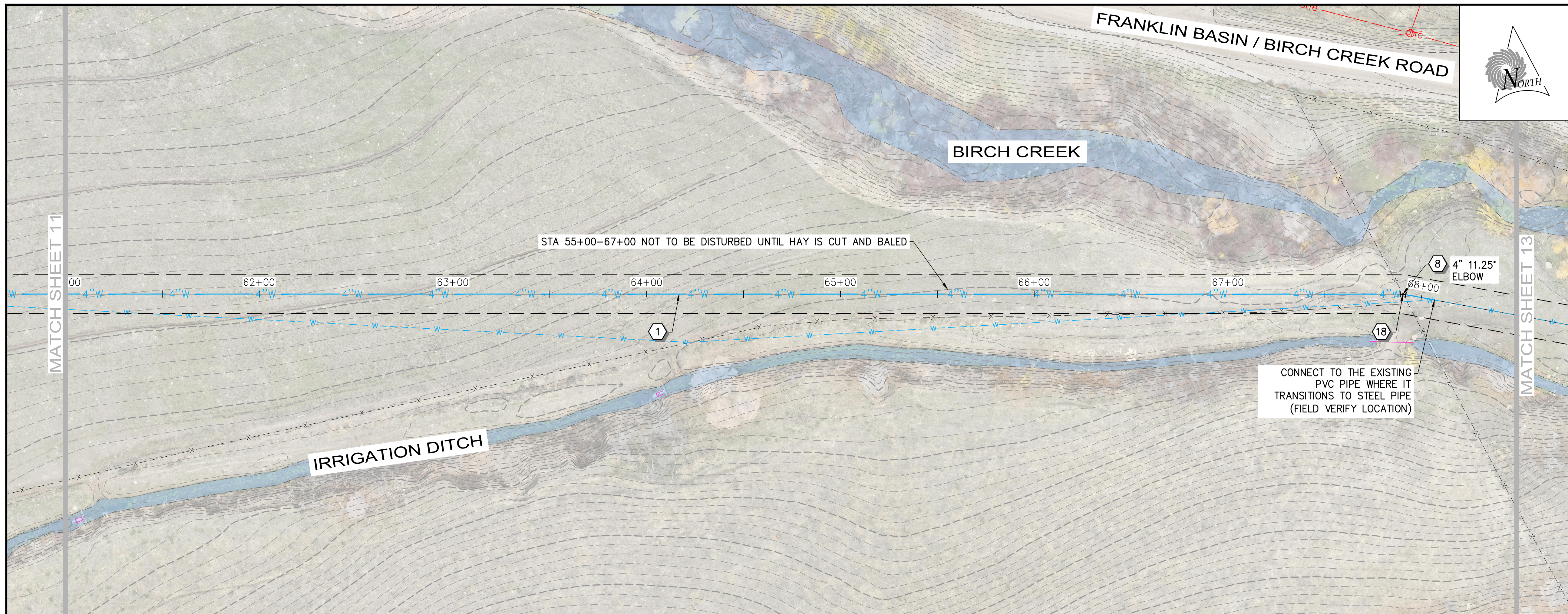
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BIRCH CREEK WATER PROJECT
 WATER LINE
 PLAN AND PROFILE

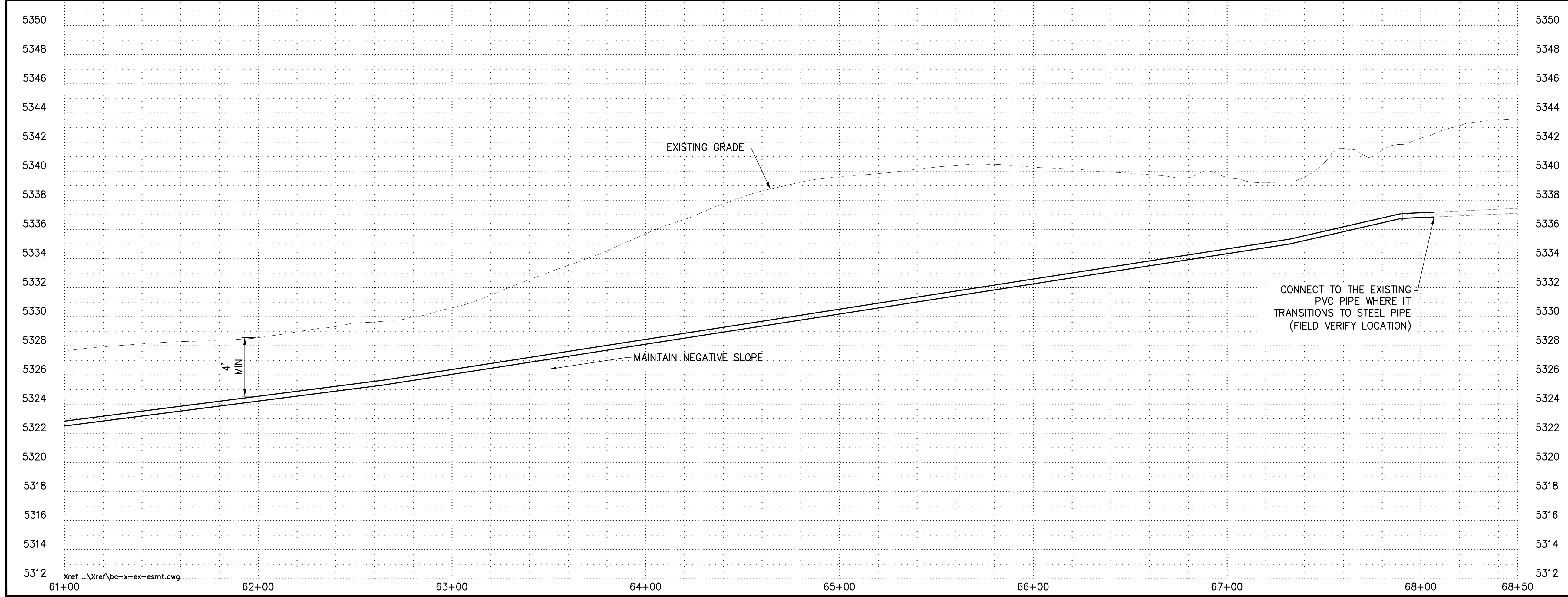
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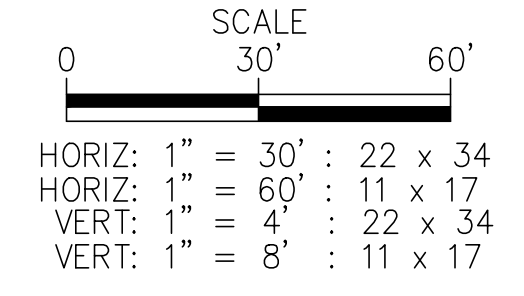
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- 7 CONNECT NEW PIPE TO EXISTING PIPE - CAP AND ABANDON EXISTING PIPE IN PLACE
- 8 INSTALL FITTING PER PLAN (4" 11.25' ELBOW)
- 9 INSTALL AIR/VAC COMBINATION VALVE (F/D1)
- 10 INSTALL GATE VALVE (D/D1)
- 11 INSTALL 4" DRAIN (C/D3)
- 12 INSTALL WATER METER (A/D2)
- 13 INSTALL WATER METER - EXACT SERVICE LOCATION UNKNOWN (A/D2)
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- 18 REMOVE AND REPLACE BARBED WIRE FENCE (B/D2)
- 19 STREAM BED TRENCH RESTORATION (D,E/D2)
- 20 REMOVE AND REPLACE CHAIN LINK FENCE (A/D5)
- 21 INSTALL SPRING BOX INTAKE (E/D3)
- 22 INSTALL 1" SERVICE CONNECTION AND LATERAL (A/D2)
- 23 INSTALL CUTOFF DITCH (D/D4)
- 24 INSTALL CASING UNDER ROADWAY (A/D4)



GENERAL NOTES

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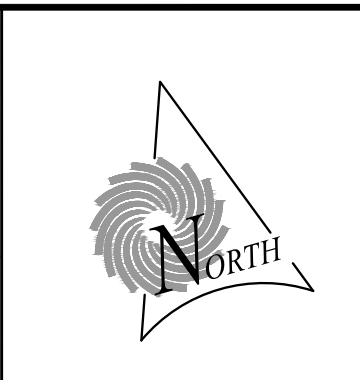
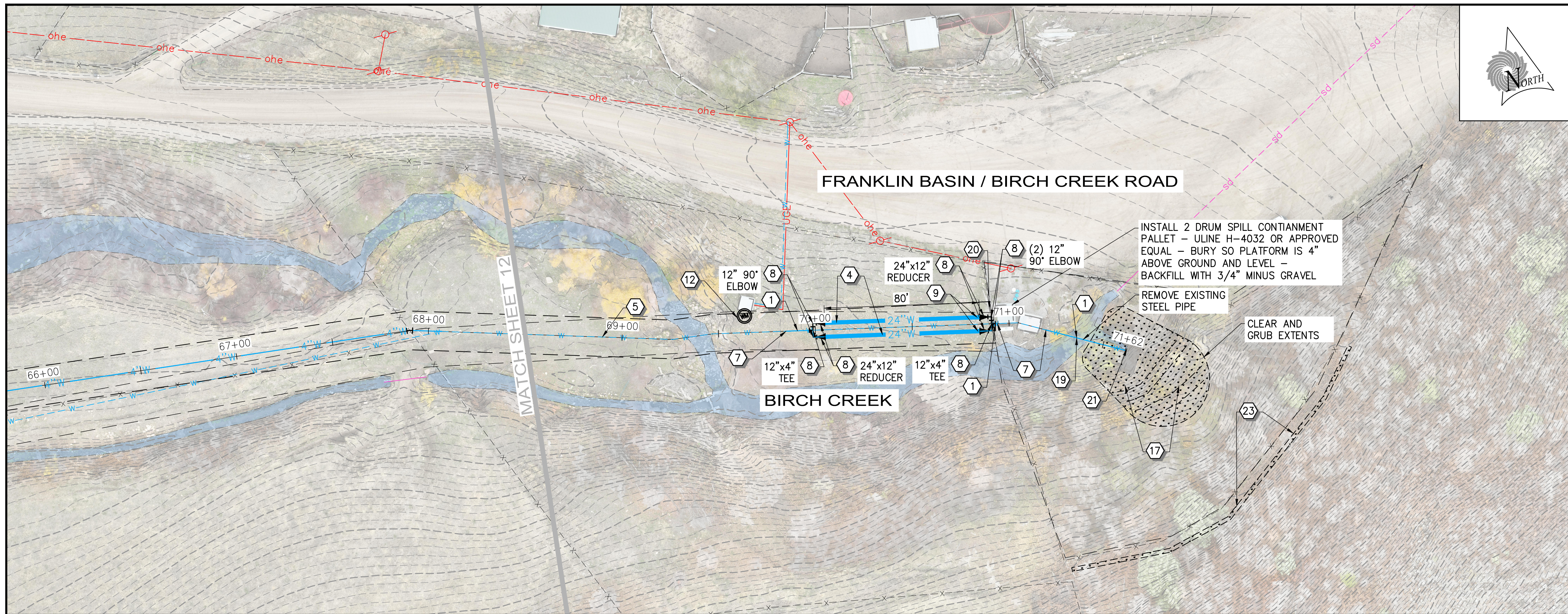
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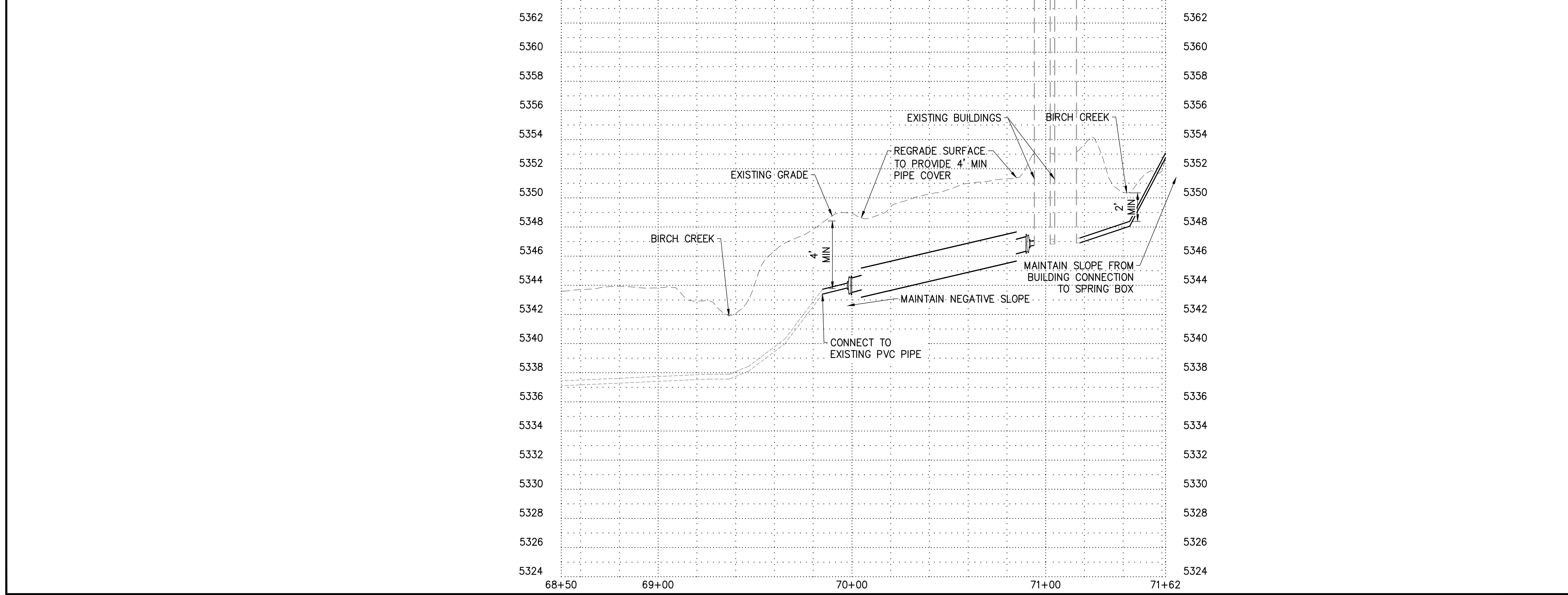
SEI NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.	PP8
16897	SBB	JJ	SDT	12 of 21	

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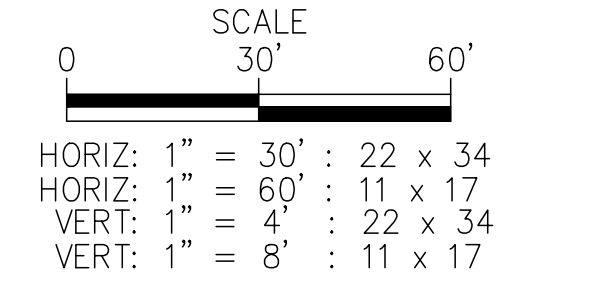
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- 20 REMOVE AND REPLACE CHAIN LINK FENCE (A/D5)
- 21 INSTALL SPRING BOX INTAKE (E/D3)
- 22 INSTALL 1" SERVICE CONNECTION AND LATERAL (A/D2)
- 23 INSTALL CUTOFF DITCH (D/D4)
- 24 INSTALL CASING UNDER ROADWAY (A/D4)



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BIRCH CREEK CULINARY WATER CO.

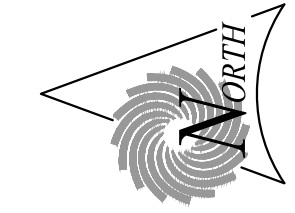
BIRCH CREEK WATER PROJECT

WATER LINE

PLAN AND PROFILE

SEI NO. 16897	DESIGNED SBB	DRAWN JJ	CHECKED SDT	SHEET NO. 13 of 21	PP9
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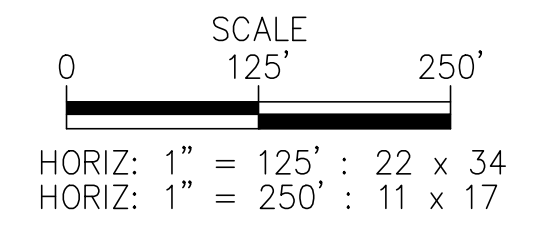


CONSTRUCTION NOTES

- 1 INSTALL WATER METER (E/D2)
- 2 INSTALL WATER METER - EXACT SERVICE LOCATION UNKNOWN (E/D2)

GENERAL NOTES

- 1. LOCATION OF EXISTING SURFACE LINE AND/OR METER LOCATION TO BE ACCOMPLISHED BY POT HOLING IF NECESSARY.
- 2. RESTORE SURFACE TO EQUAL OR BETTER CONDITION AFTER LOCATION AND INSTALL



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REV NO.	COMMENT	DATE

PROFESSIONAL ENGINEER
SETH D. THOMPSON
9271940
STATE OF IDAHO

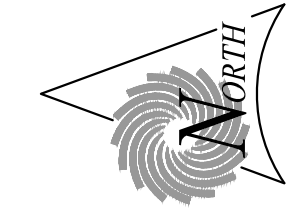
SUNRISE ENGINEERING

2100 NORTH MAIN STREET
NORTH LOGAN, UTAH 84341
TEL 435.563.3734
www.sunrise-eng.com

BIRCH CREEK CULINARY WATER CO.
BIRCH CREEK WATER PROJECT
UTILITY PLAN
WATER METER WORK

SEI NO. 16897	DESIGNED SBB	DRAWN JJ	CHECKED SDT	SHEET NO. 14 of 21	UP1
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P:\Birch Creek Culinary Water Company\16897 Birch Creek Water Project\DWG\Sheets\BC-UP.dwg Apr 27, 2026 9:49am jolley

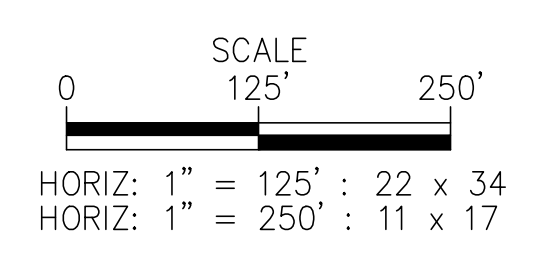


CONSTRUCTION NOTES

- 1 INSTALL WATER METER E
D2
- 2 INSTALL WATER METER - EXACT SERVICE LOCATION UNKNOWN E
D2

GENERAL NOTES

1. LOCATION OF EXISTING SURFACE LINE AND/OR METER LOCATION TO BE ACCOMPLISHED BY POT HOLING IF NECESSARY.
2. RESTORE SURFACE TO EQUAL OR BETTER CONDITION AFTER LOCATION AND INSTALL



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REV NO.	COMMENT	DATE

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STATE OF IDAHO
9271940

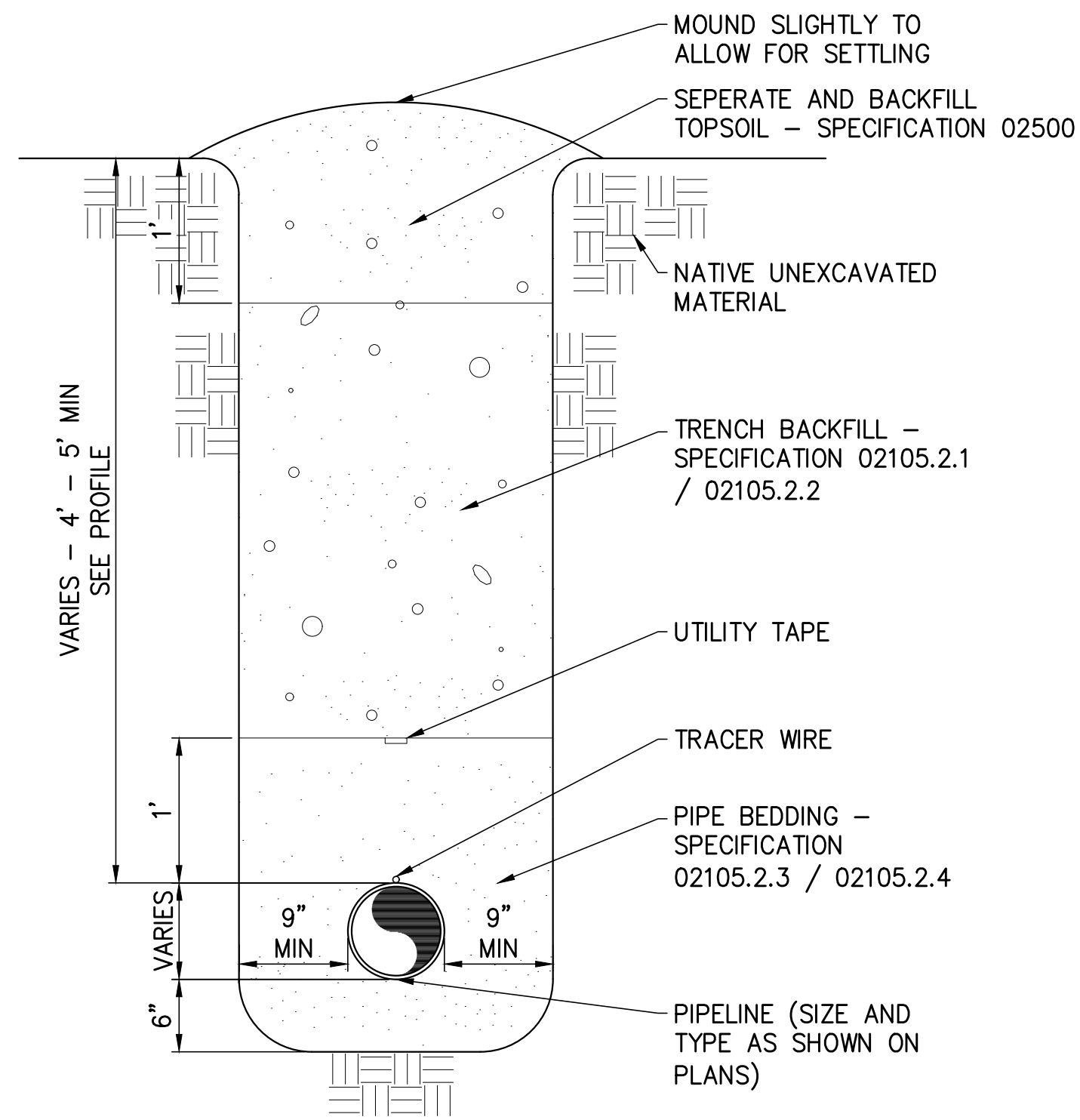
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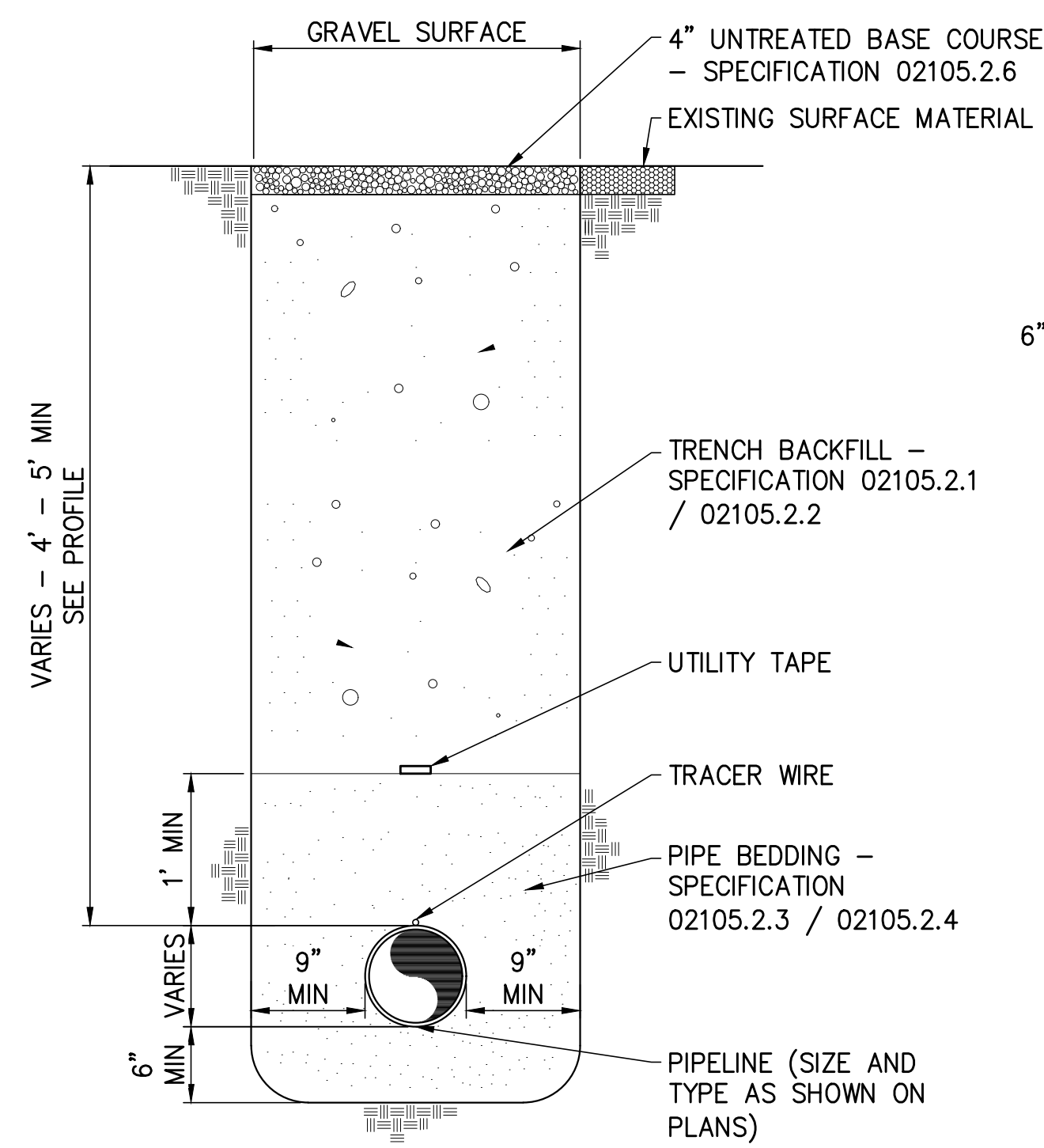
SEI NO. 16897	DESIGNED SBB	DRAWN JJ	CHECKED SDT	SHEET NO. 15 of 21	UP2
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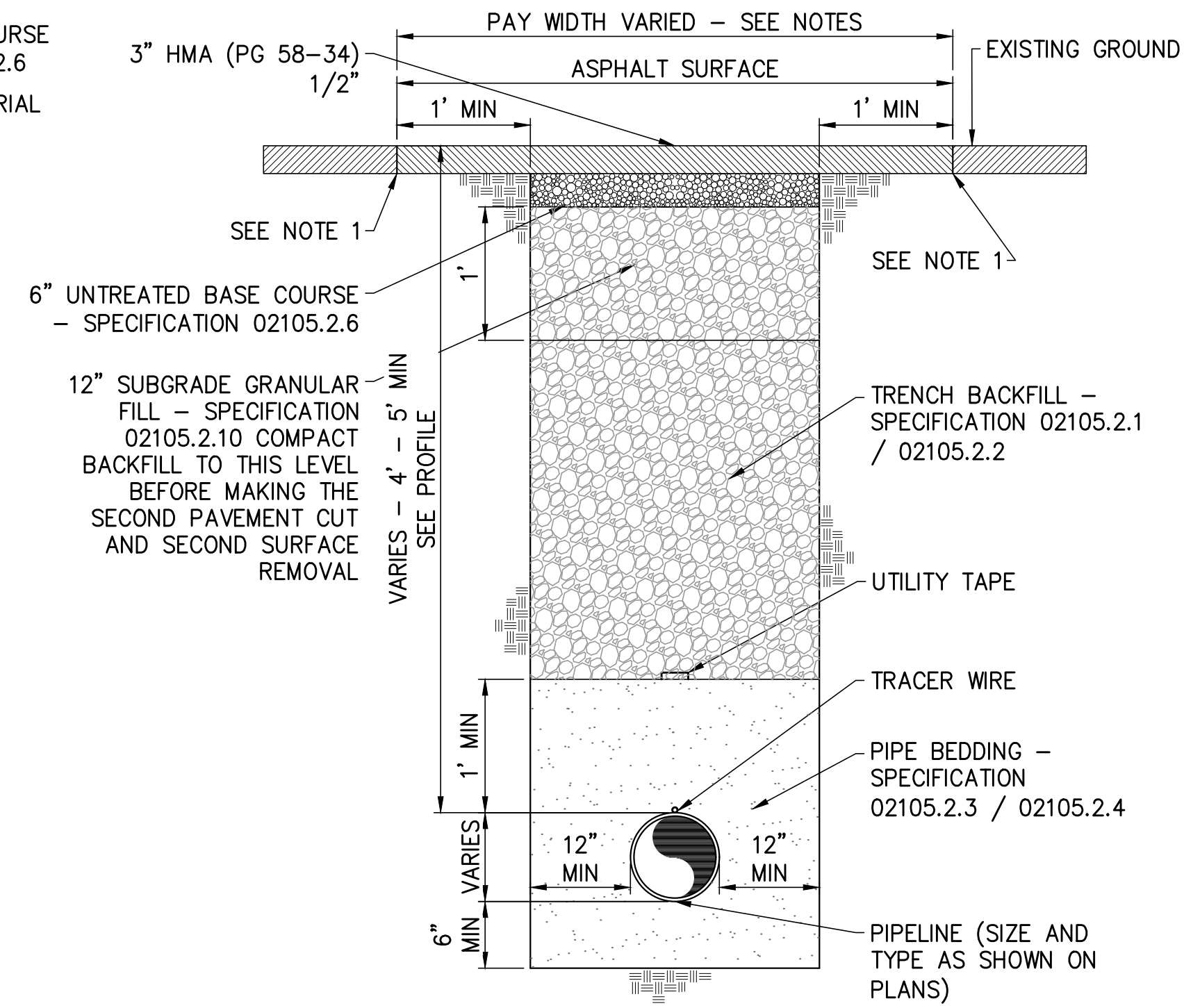
- SEE TRENCH EXCAVATION AND BACKFILL SPEC 02200.3.14.2 FOR COMPACTION REQUIREMENTS.
- ALL PIPE FITTINGS ARE INCIDENTAL TO THE PIPE & WILL BE ACCOUNTED FOR IN THE PIPE INSTALLATION BID ITEMS

A DETAIL - TRENCH THROUGH NATIVE EARTH
NOT TO SCALE



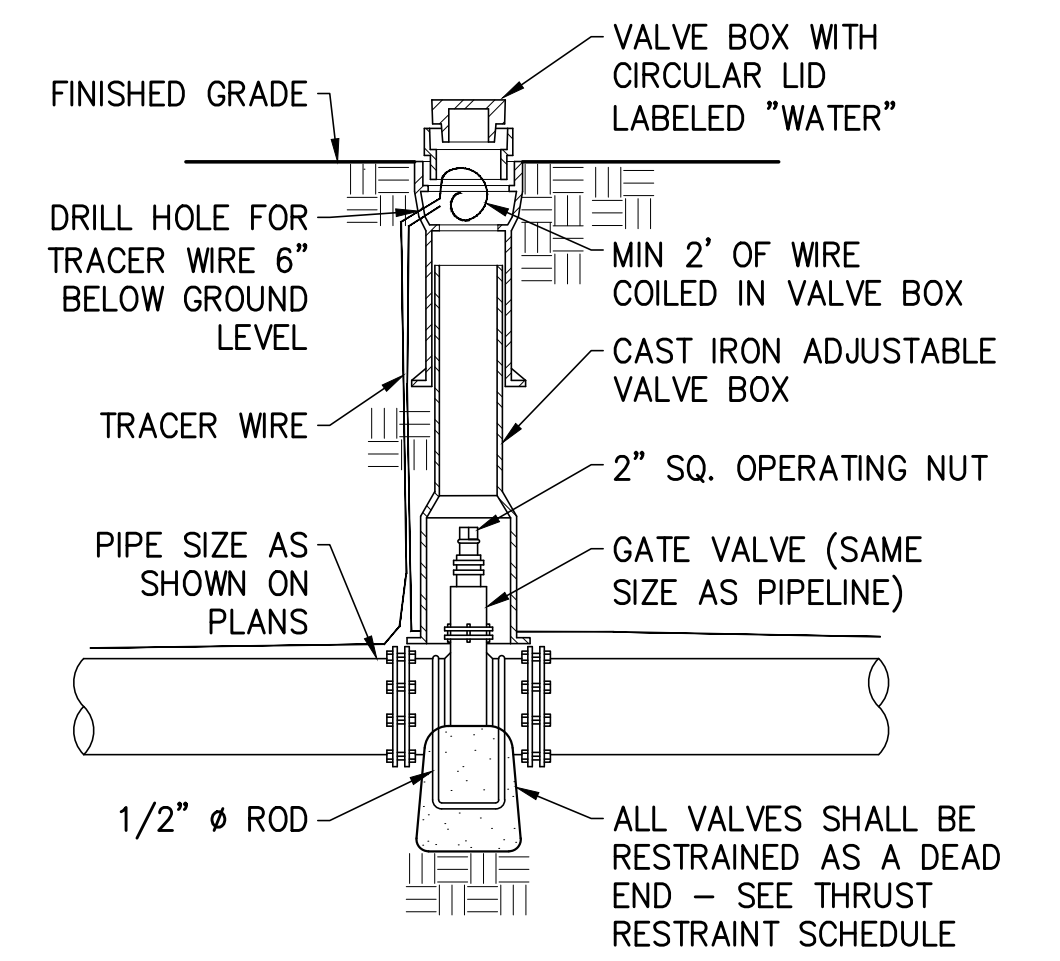
- SEE TRENCH EXCAVATION AND BACKFILL SPEC 02200.3.14.2 FOR COMPACTION REQUIREMENTS.
- ALL PIPE FITTINGS ARE INCIDENTAL TO THE PIPE & WILL BE ACCOUNTED FOR IN THE PIPE INSTALLATION BID ITEMS

B DETAIL - TRENCH THROUGH GRAVEL ROAD
NOT TO SCALE

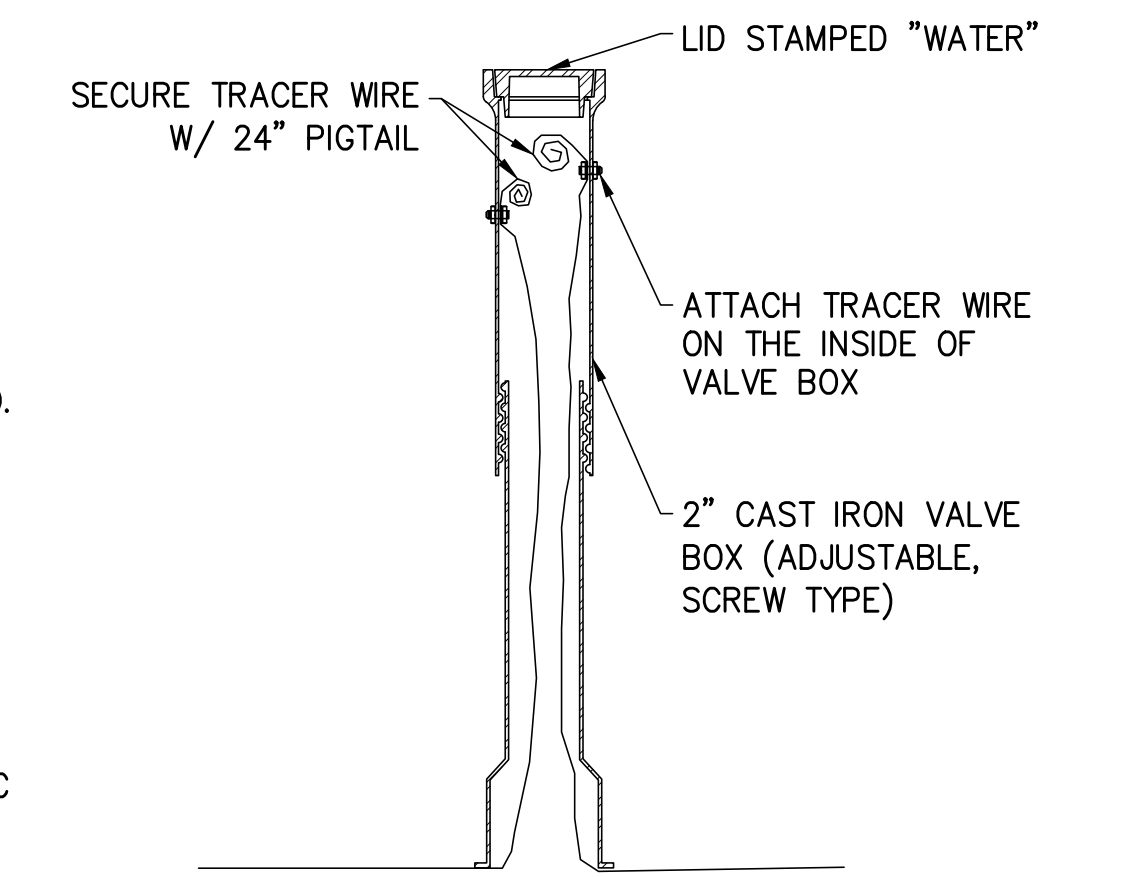


- SAW CUT PAVEMENT EDGES. IF CUT RESULTS IN <2' ASPHALT TO EDGE OF PAVEMENT THEN REPLACE TO EDGE.
- APPLY A HOT-POUR RUBBERIZED ASPHALT JOINT SEALANT OR APPROVED EQUAL, APPLIED AFTER PATCH IS INSTALLED.
- SEE TRENCH EXCAVATION AND BACKFILL SPEC 02200.3.14.2 FOR COMPACTION REQUIREMENTS.
- ALL PIPE FITTINGS ARE INCIDENTAL TO THE PIPE & WILL BE ACCOUNTED FOR IN THE PIPE INSTALLATION BID ITEMS
- WORK IN FRANKLIN COUNTY RIGHT OF WAY MUST ABIDE BY THE REQUIREMENTS OF THE COUNTY ROW PERMIT INCLUDING THE 3 YEAR WARRANTY ON THE ROAD REPAIR
- MINIMUM CUTBACK BEYOND THE TRENCH LIMITS SHALL BE ONE (1) FOOT FOR TRENCHES PARALLEL TO THE ROADWAY
- 11 NO LONGITUDINAL ASPHALT PATH SEAMS SHALL FALL IN THE WHEEL PATH FOR VEHICULAR TRAFFIC SD-303B ISPPWC 300.3.8.J.1. PROVIDE FULL WIDTH RESTORATION IF MORE THAN 50% OR MORE OF EXISTING SURFACE AREA HAS BEEN REMOVED OR DAMAGED

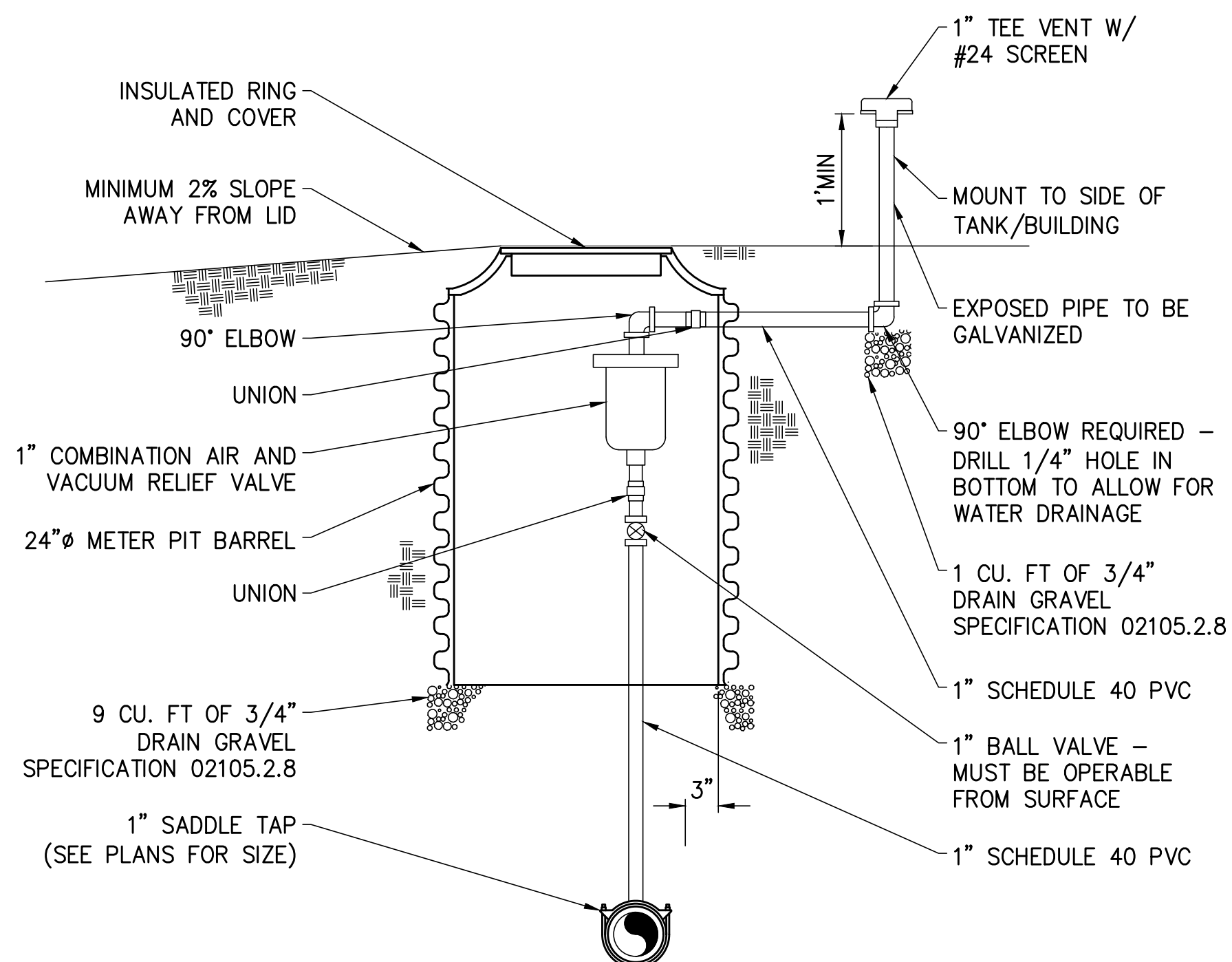
C DETAIL - TRENCH THROUGH ASPHALT ROAD
NOT TO SCALE



D DETAIL - ISOLATION VALVE
NOT TO SCALE

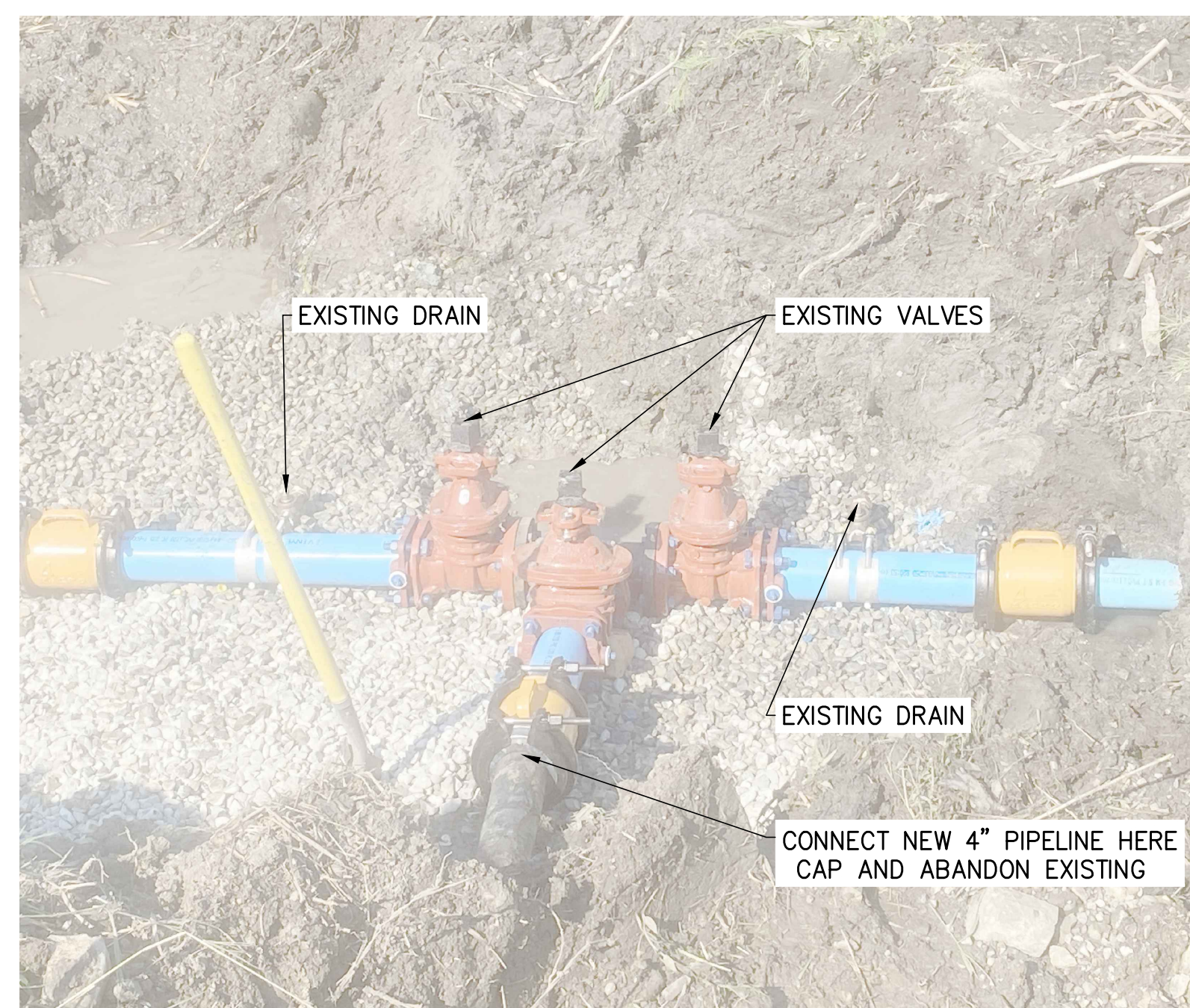


E DETAIL - TRACER WIRE CURB BOX
NOT TO SCALE

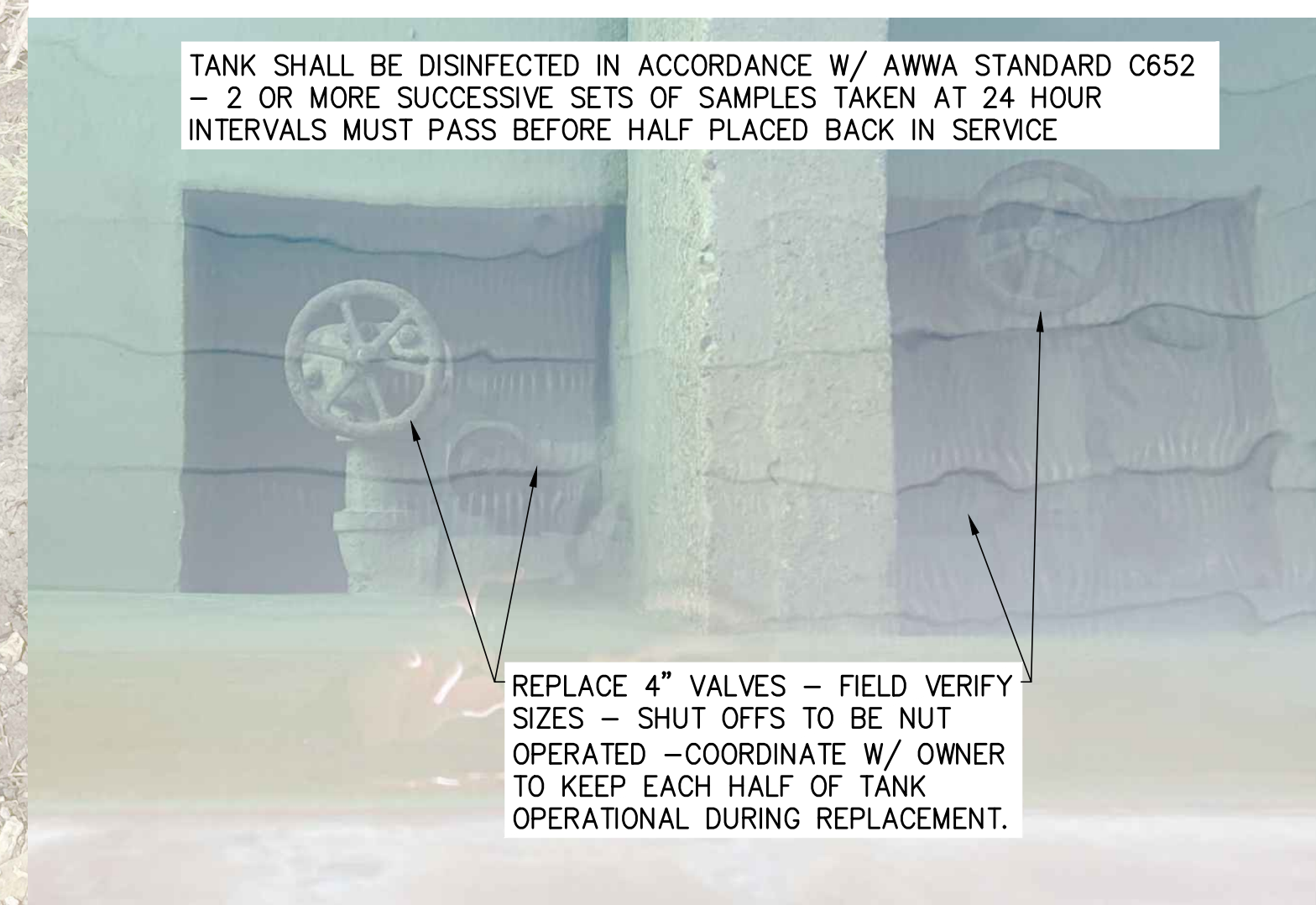


- AIR VAC COMBO VALVE AT STA 70+75 TO COMBINE BOTH 1" LINES WITH TEE INTO SINGLE ASSEMBLY. CONSTANT SLOPE MUST ALLOW FOR AIR RELEASE OF BOTH LINES

F DETAIL - AIR VAC COMBINATION
NOT TO SCALE



G DETAIL - EXISTING TEE CONNECTION
NOT TO SCALE



TANK SHALL BE DISINFECTED IN ACCORDANCE W/ AWWA STANDARD C652 - 2 OR MORE SUCCESSIVE SETS OF SAMPLES TAKEN AT 24 HOUR INTERVALS MUST PASS BEFORE HALF PLACED BACK IN SERVICE

REPLACE 4" VALVES - FIELD VERIFY SIZES - SHUT OFFS TO BE NUT OPERATED - COORDINATE W/ OWNER TO KEEP EACH HALF OF TANK OPERATIONAL DURING REPLACEMENT.

H DETAIL - VALVES IN TANK
NOT TO SCALE

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REV. NO.	COMMENT	DATE

PROFESSIONAL ENGINEER
REGISTERED
9271940
04/27/2026
SETY D. THOMPSON

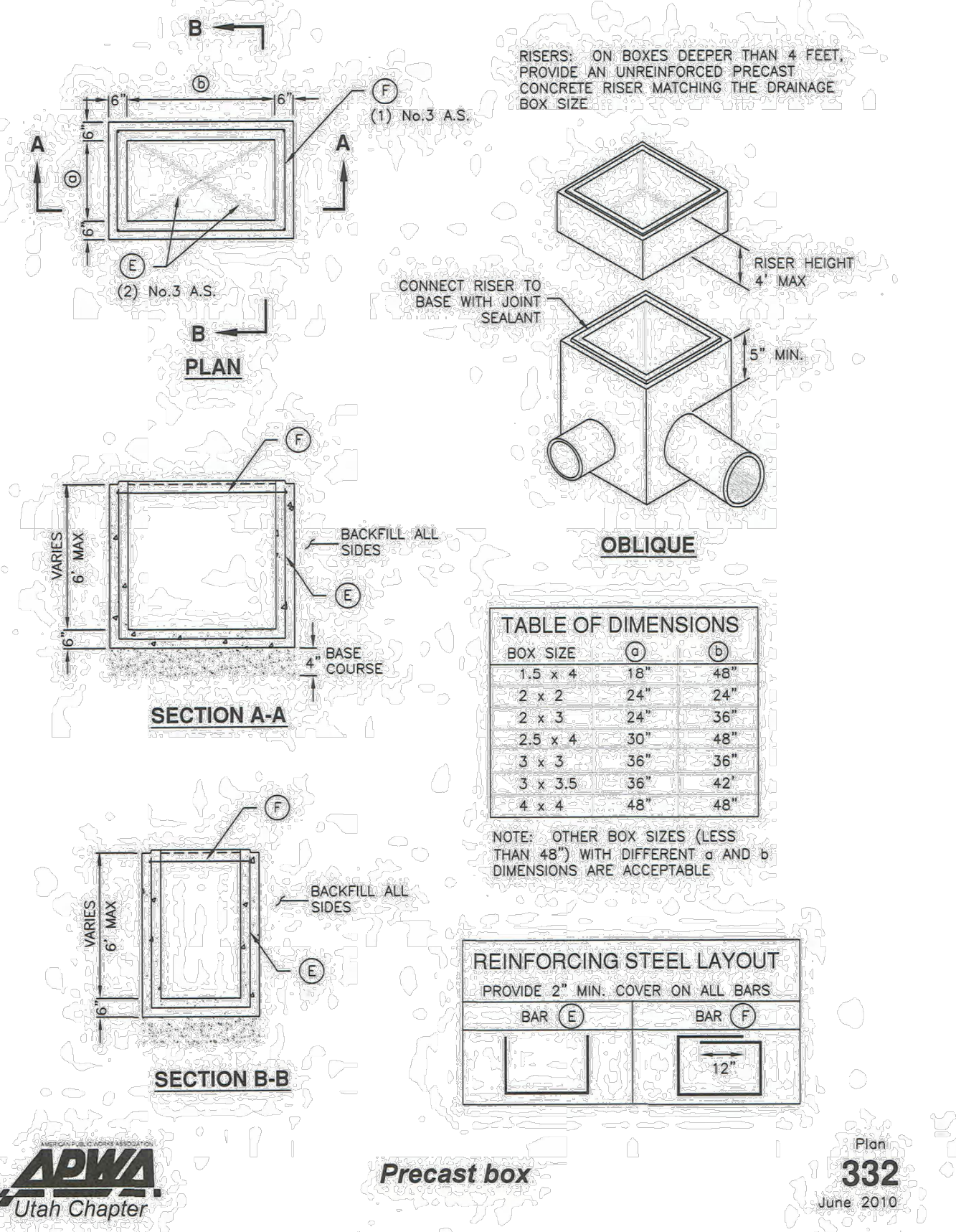
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TEL 435.563.3734
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BIRCH CREEK CULINARY WATER CO.
BIRCH CREEK WATER PROJECT
DETAILS
SITE DETAILS

SEI NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.	D1
16897	SBB	JJ	SDT	16 of 21	

Precast box

1. **GENERAL**
 - A. The drawing shows typical pipe connections. Refer to construction drawings for connection locations or refer to field location of existing piping when engineering pipe connection to the box.
 - B. This drawing is acceptable where the water table elevation is less than 3 feet above the floor of the box. If elevation of water table is higher, engineering calculations and drawings must be submitted to and approved by the ENGINEER.
 - C. Submit bar design detail for ENGINEER'S review.
2. **PRODUCTS**
 - A. Base Course: Untreated base course, APWA Section 32 11 23. Do not use gravel as a base course without ENGINEER'S permission.
 - B. Backfill: Common fill, APWA Section 31 05 13. Maximum particle size 2-inches.
 - C. Precast Concrete: Class 4000 precast, APWA Section 03 40 00.
 - D. Reinforcement: Deformed, 60 ksi yield grade steel, ASTM A615. Coated steel is not required for small drainage structures shown on this drawing.
 - E. Frame and Cover (or Grate): Use the appropriate unit indicated in the Contract Documents.
 - F. Joint Sealant: Rubber-based, compressible.
3. **EXECUTION**
 - A. Concrete Placement: Provide 2-inches of concrete cover over reinforcing steel.
 - B. Lifting Points: Provide at least 2 lifting points per section that avoid interference with the reinforcing steel and that are designed according to PCI (Prestressed Concrete Institute) design handbook. Lift only from the engineered lifting points.
 - C. Depth: Drainage boxes and riser combinations that exceed 8-feet from finished grade to the bottom of the box requires ENGINEER'S approval. Submit design calculations and shop drawings.
 - D. Core Holes:
 - 1) Provide core holes that are at least 4" larger than attaching outer pipe diameter. Cut core holes at the manufacturing plant unless ENGINEER permits field core holes.
 - 2) Center core holes to leave 2" of concrete measured horizontally from inside wall of the box to core hole. Locate core hole vertically so bottom of core hole will be at or above floor elevation with at least 5-inches of concrete directly above the core hole to the top of the box.
 - 3) Deviations from core hole tolerances require shop drawings. Shop drawings will identify lifting point number and location.
 - E. Precast Top: Design precast top for AASHTO HL-93 live loads and submit rebar detail and stamped design drawings to ENGINEER. Show connection detail for frame and grate or cover.

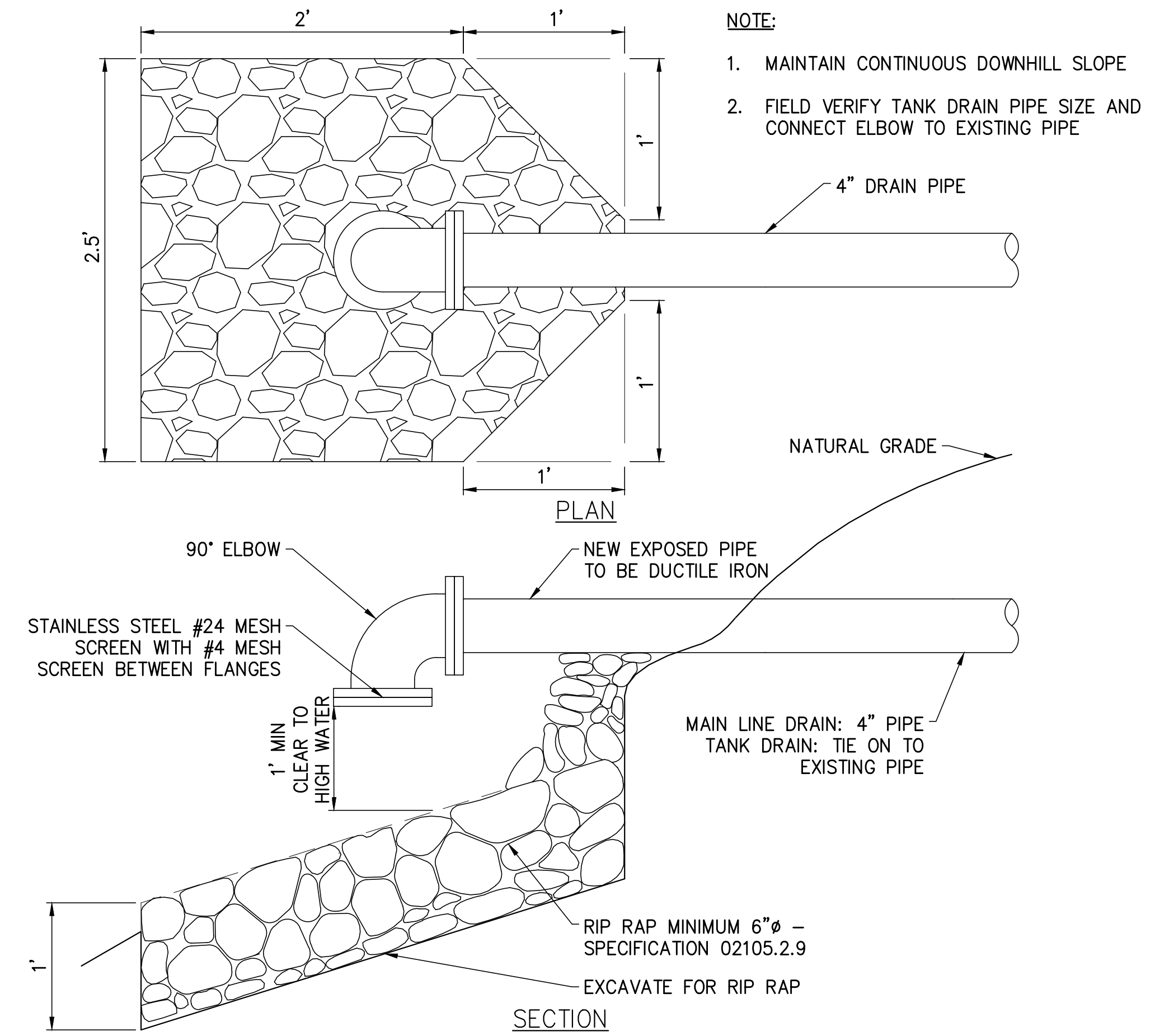


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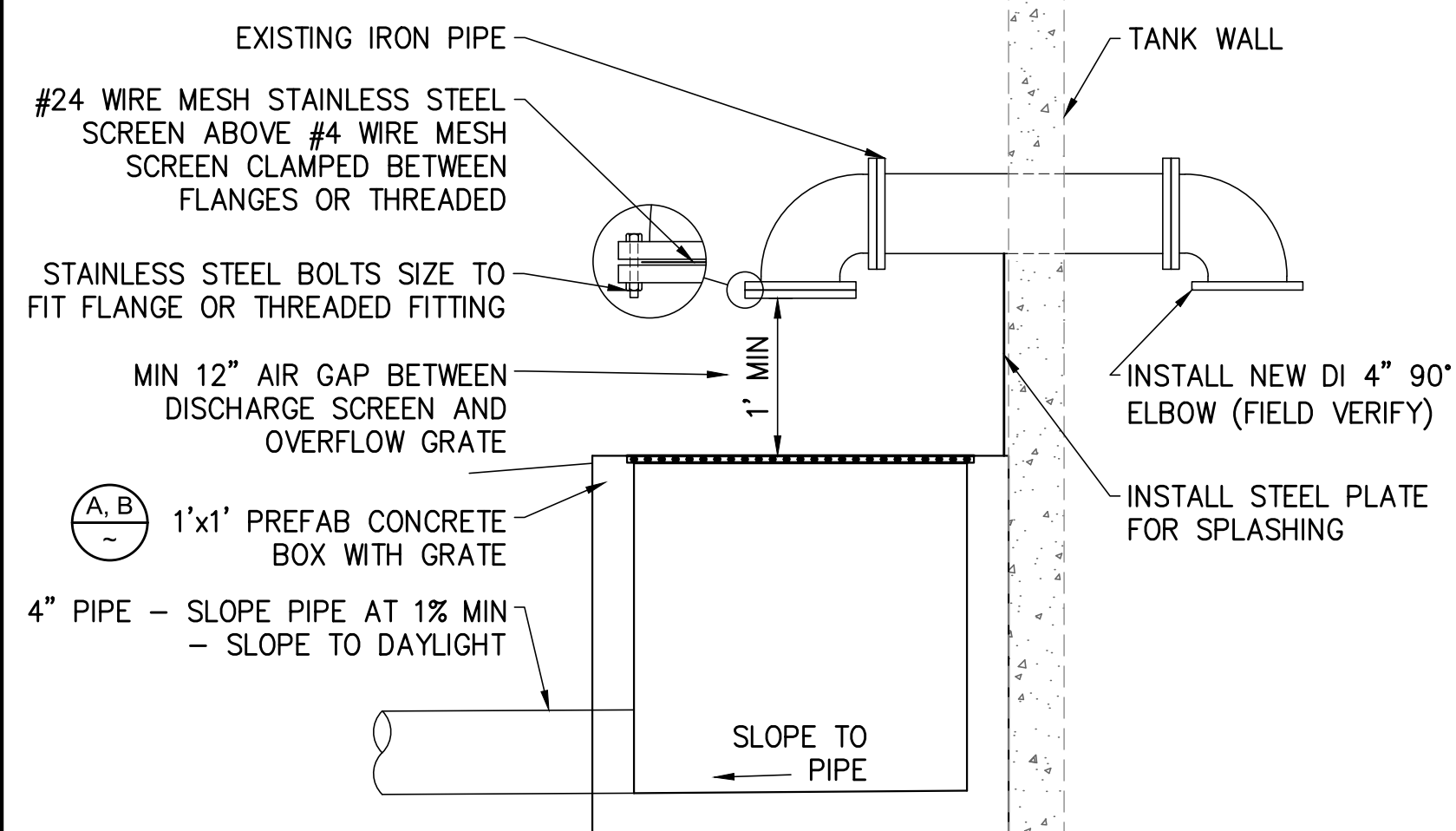
(A) **DETAIL - PRECAST BOX**
NOT TO SCALE

(B) **DETAIL - FRAME AND GRATE**
NOT TO SCALE

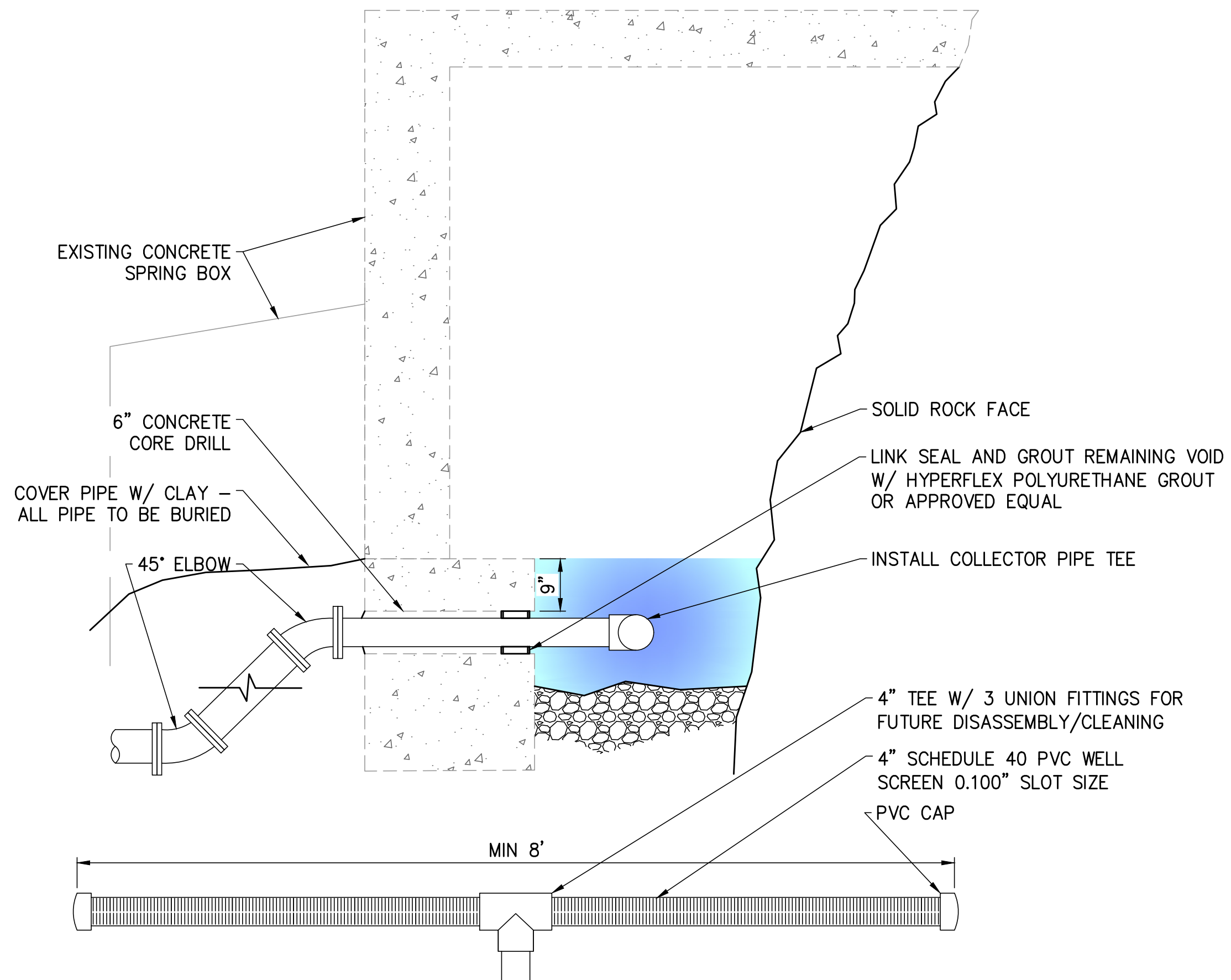
(C) **DETAIL - DRAIN PIPE END PROTECTION**
NOT TO SCALE



- NOTE:**
1. PIPE PENETRATIONS TO BE LINK SEALED W/ NON-SHRINK GROUT
 2. SEE IMAGE ABOVE FOR CLARITY



(D) **DETAIL - AIR GAP**
NOT TO SCALE



(E) **DETAIL - SPRING BOX INTAKE**
NOT TO SCALE



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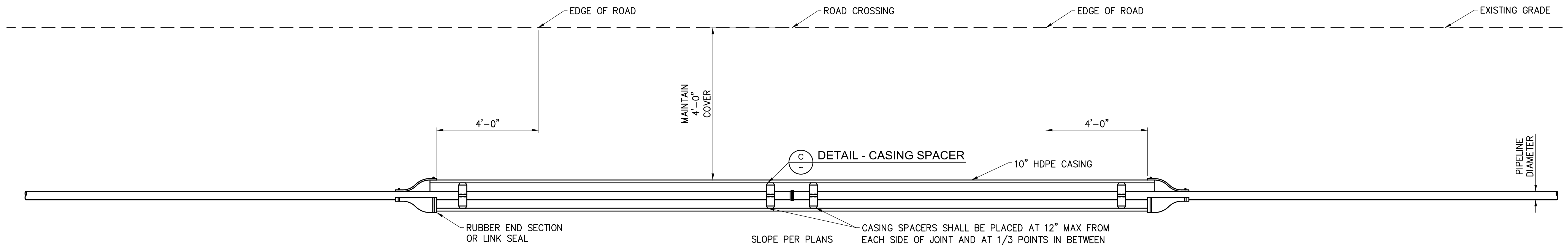
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DETAILS
SITE DETAILS

SEI NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.
16897	SBB	JJ	SDT	18 of 21

D3



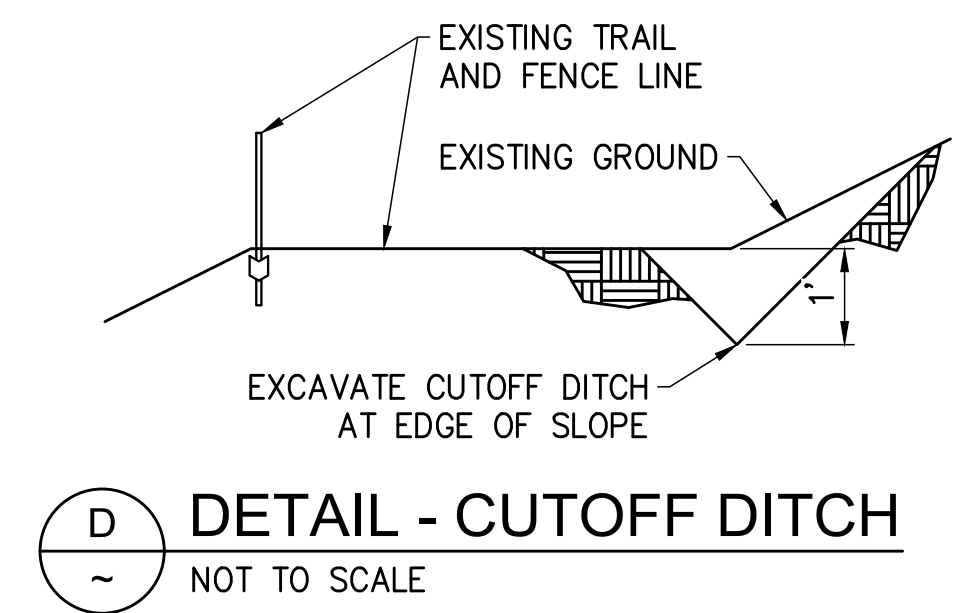
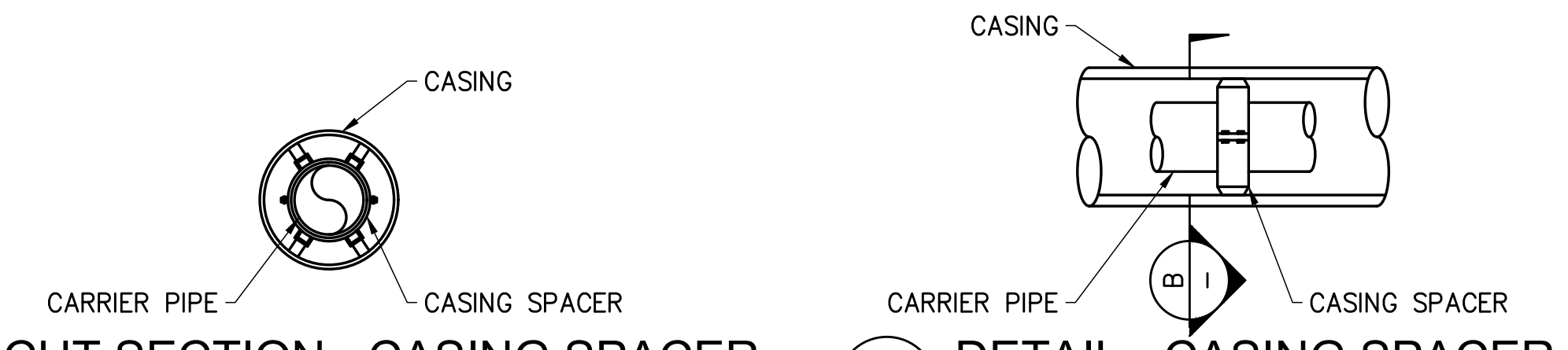
NOTES:

1. CASING PIPE TO BE 10" DIAMETER DUAL WALL CORRUGATED HDPE PIPE (CPP) OR APPROVED EQUAL.
2. WHERE JOINT RESTRAINT HARNESS IS REQUIRED FOR BELL AND SPIGOT CARRIER PIPE, THE CASING PIPE SHALL BE SIZED ACCORDING TO THE HARNESS SCHEDULE SHOWN ON THE DRAWINGS AND SHALL BE LARGE ENOUGH IN DIAMETER TO ACCOMMODATE THE HARNESS.
3. CASING SPACERS SHALL BE COMMERCIALY AVAILABLE SPACERS SUCH AS ARE SUPPLIED BY CASCADE WATERWORKS MANUFACTURING COMPANY OR APPROVED EQUAL. CASING SPACERS SHALL BE MANUFACTURED OF STAINLESS STEEL WITH POLYMER BEARING SURFACES ON THE RUNNERS. THEY SHALL BE OF BOLT-ON DESIGN WITH A TWO-PIECE SHELL AND SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
4. CARRIER PIPE TO CASING PIPE END SEALS SHALL BE INSTALLED ON BOTH ENDS OF THE CASING AND SHALL BE APPROPRIATELY SIZED FOR THE APPLICATION. SEALS SHALL BE AS MANUFACTURED BY PIPELINE SEAL & INSULATOR, INC., OR APPROVED EQUAL. SEALS SHALL BE OF SYNTHETIC RUBBER WITH STAINLESS STEEL BANDS AND CLAMPS, SUITABLE FOR PERMANENT INSTALLATION IN THE GROUND.
5. MECHANICAL RESTRAINT SHALL BE INSTALLED ON EVERY JOINT OF RUBBER GASKET (SLIP) JOINTED CARRIER PIPE INSTALLED IN THE CASING PIPE.

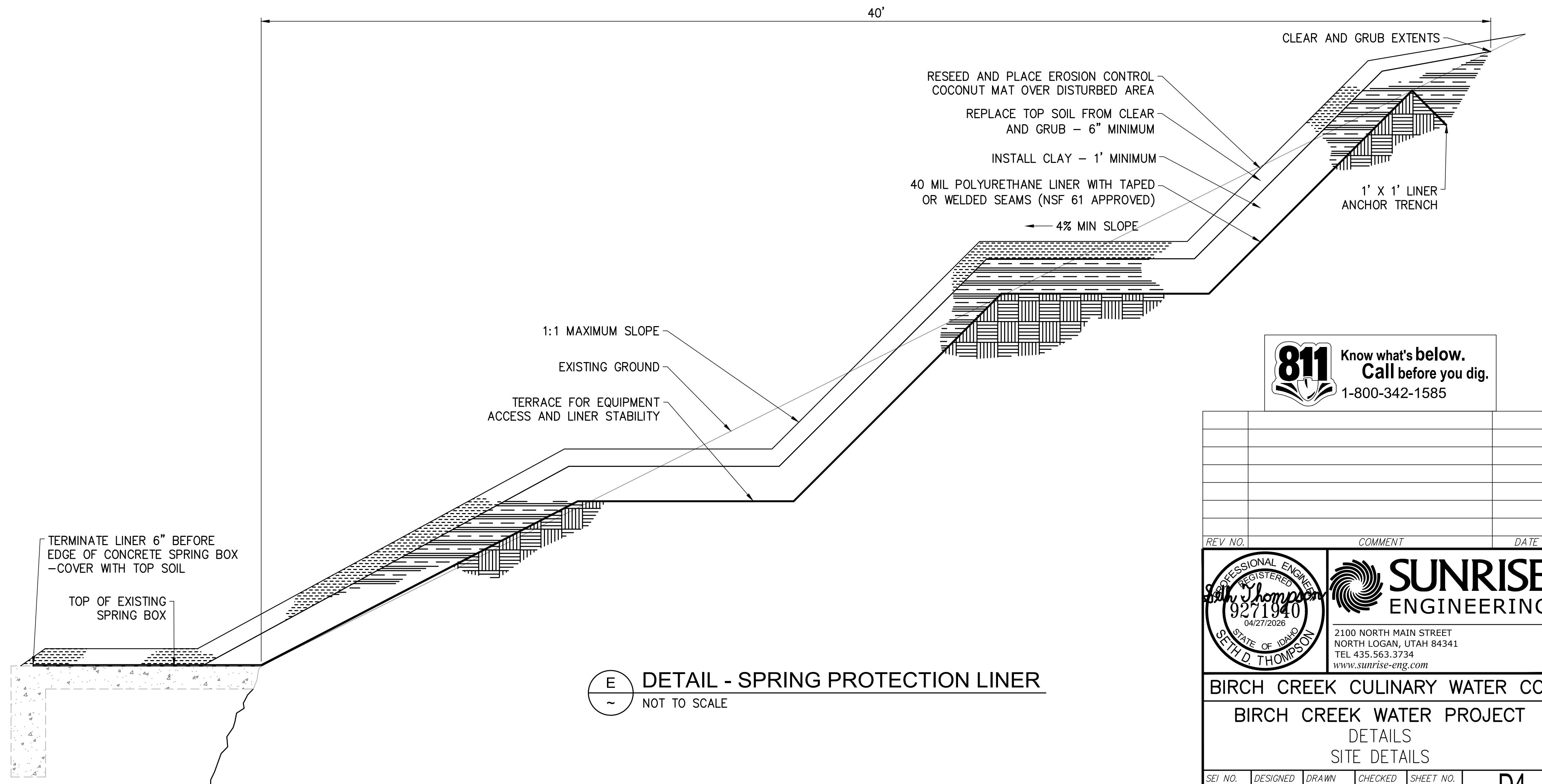
A **DETAIL - PIPE CASING**
~ NOT TO SCALE

B **CUT SECTION - CASING SPACER**
~ NOT TO SCALE

C **DETAIL - CASING SPACER**
~ NOT TO SCALE



D **DETAIL - CUTOFF DITCH**
~ NOT TO SCALE



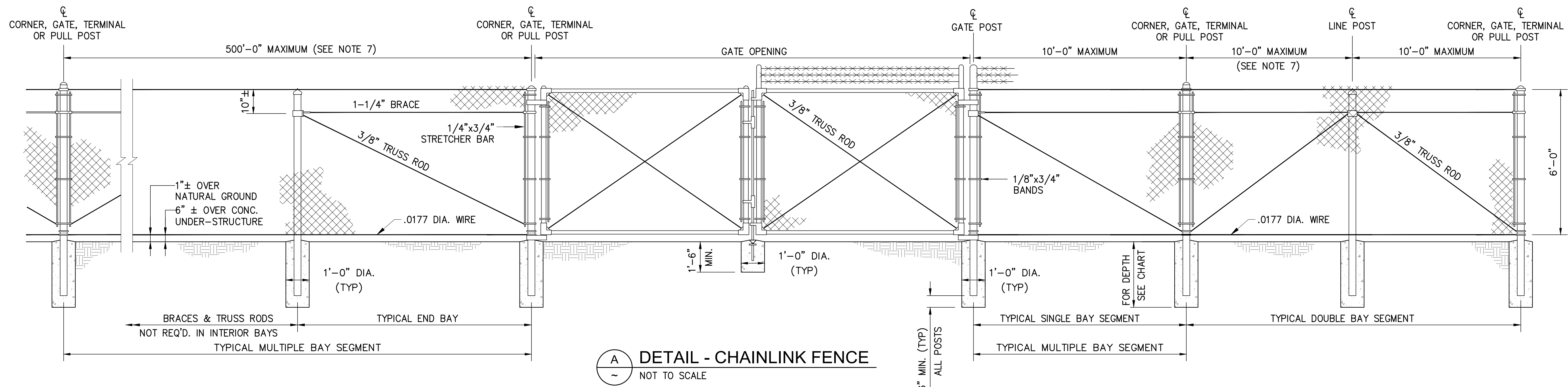
E **DETAIL - SPRING PROTECTION LINER**
~ NOT TO SCALE

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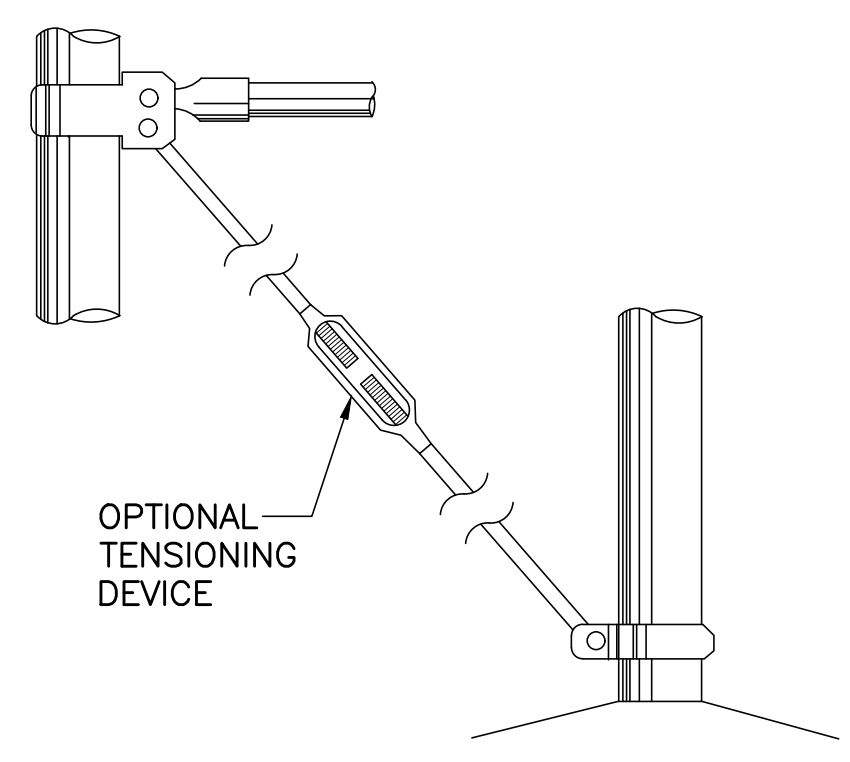
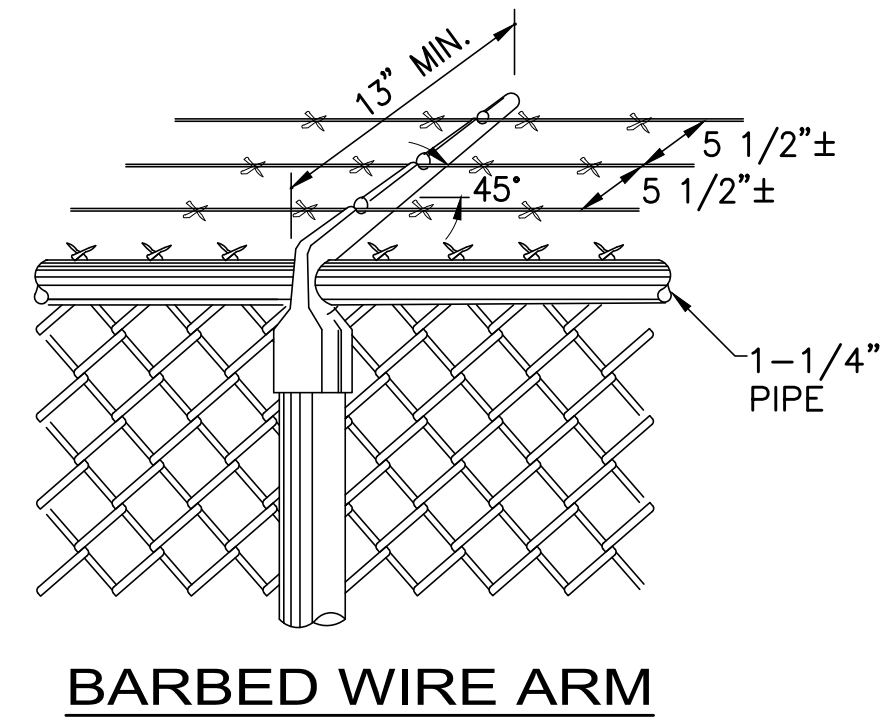
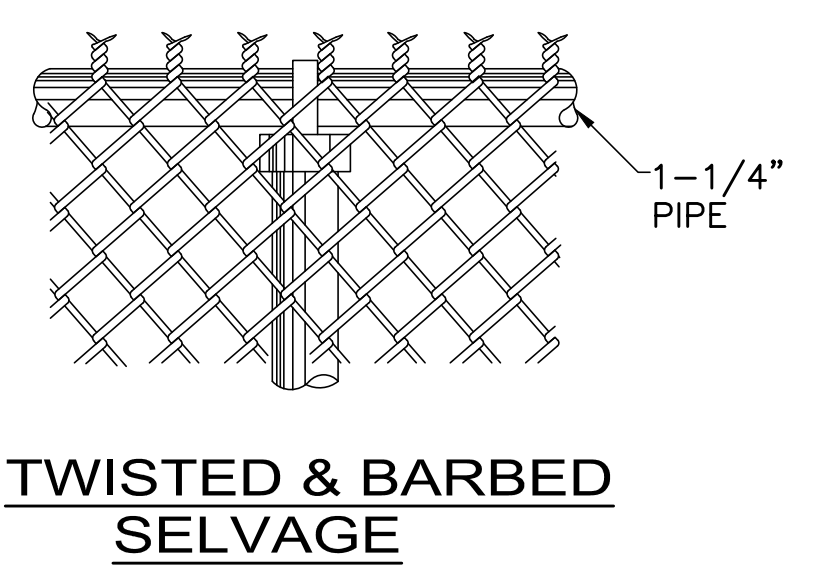
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		<p>BIRCH CREEK CULINARY WATER CO.</p> <p>BIRCH CREEK WATER PROJECT</p> <p>DETAILS</p> <p>SITE DETAILS</p>			
SEI NO. 16897	DESIGNED SBB	DRAWN JJ	CHECKED SDT	SHEET NO. 19 of 21	D4

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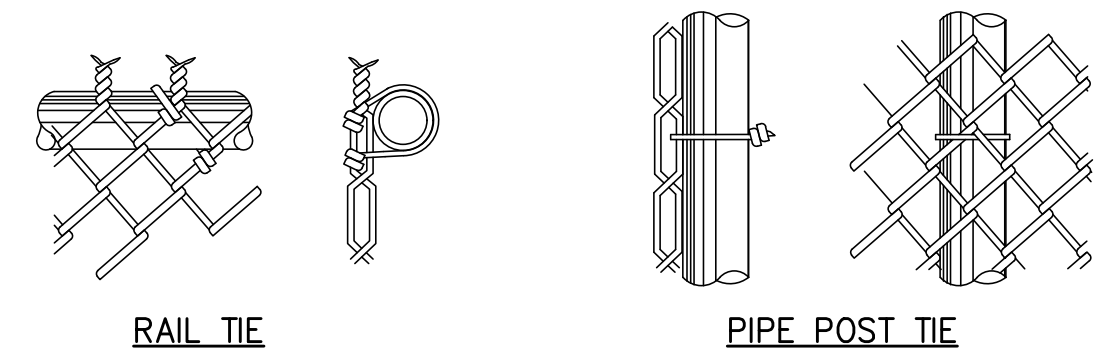


A **DETAIL - CHAINLINK FENCE**
NOT TO SCALE

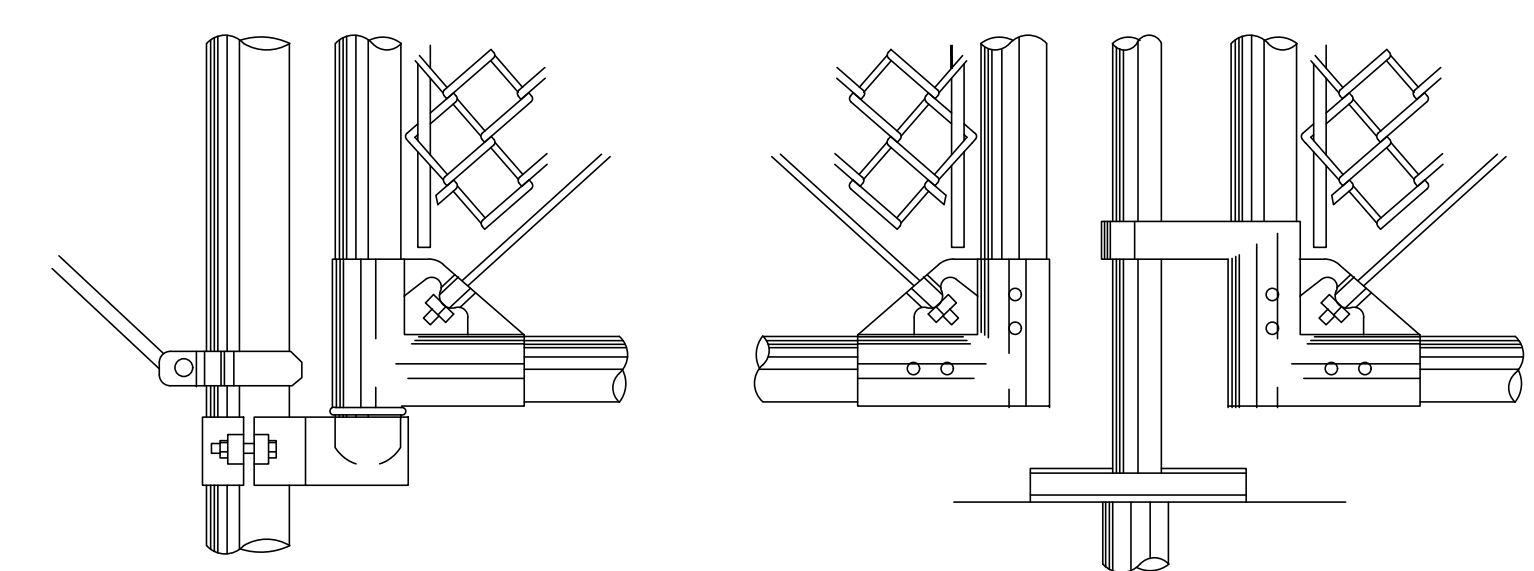
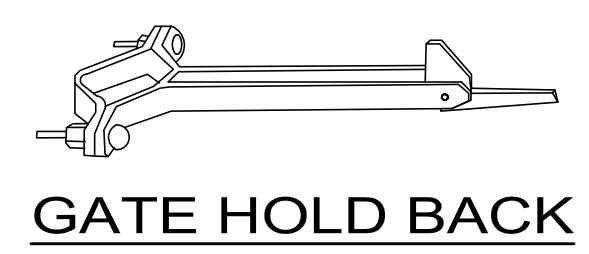


BRACE & TRUSS CONNECTIONS

- NOTES:**
- MATERIALS, CONSTRUCTION AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE WRITTEN SPECIFICATIONS.
 - THE TOP SUPPORT SHALL BE TUBULAR RAIL.
 - BARBED WIRE SHALL BE USED. THE EXTENSION ARM SHALL EXTEND TO THE OUTSIDE OF FENCE.
 - TWISTED AND BARBED SELVAGE, TOP AND BOTTOM, SHALL BE USED.
 - ALL STEEL PIPE MEMBERS SHALL CONFORM TO THE REQUIREMENTS OF ASTM DESIGNATION A-120, SCHEDULE 40, HOT DIPPED ZINC COATED STEEL PIPE.
 - OPTIONS EXERCISED SHALL BE UNIFORM THROUGHOUT THE PROJECT.
 - LINE POSTS SHALL BE LOCATED AT EQUAL SPACINGS FOR EACH SEGMENT WITH MAXIMUM SPACING AS FOLLOWS: A) TANGENT SECTIONS TO 500 FEET RADIUS—NOT MORE THAN 10 FEET. B) UNDER 500 FEET RADIUS TO 200 FEET RADIUS—NOT MORE THAN 8 FEET. C) UNDER 200 FEET RADIUS TO 100 FEET RADIUS—NOT MORE THAN 6 FEET. D) UNDER 100 FEET RADIUS—NOT MORE THAN 5 FEET.
 - THE MINIMUM HEIGHT OF FABRIC ON FENCES AND GATES SHALL BE 6 FEET.
 - ALL CONCRETE SHALL HAVE A MINIMUM OF 5 SACKS OF CEMENT PER CUBIC YARD.
 - FASTEN FABRIC TO TOP RAIL AND BOTTOM TENSION CABLE AT 24 INCH INTERVALS. FASTEN TO LINE POSTS AT 14 INCH INTERVALS.

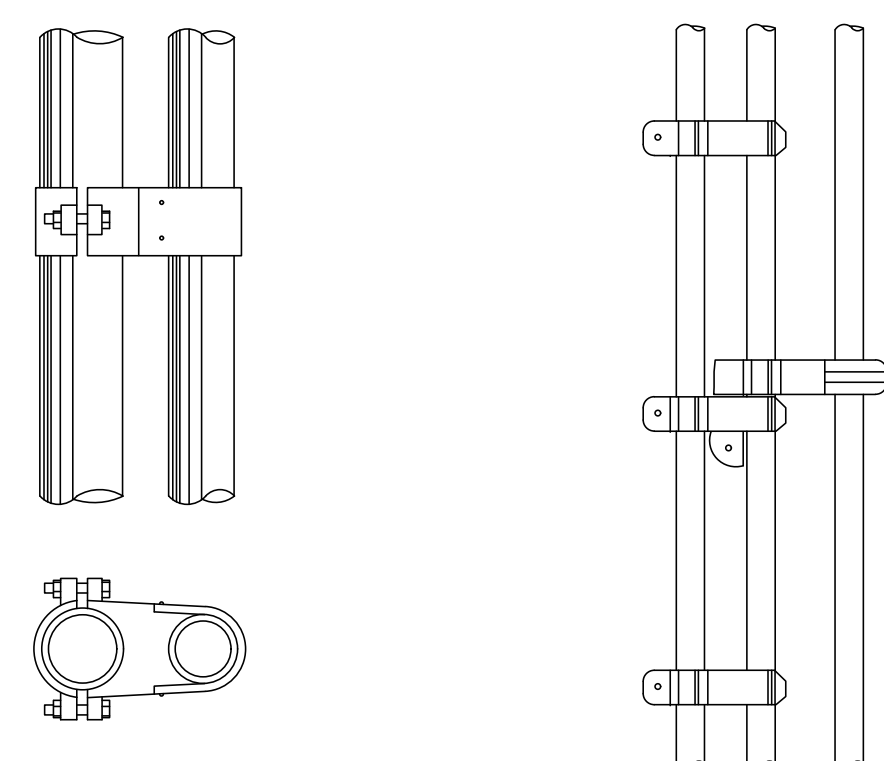


TYPICAL TIE DETAILS



BOTTOM GATE HINGE & GATE DETAILS **CENTER GATE STOP & GATE DETAILS**

(NOTE: OPTIONAL WELDED OR RIVETED CONSTRUCTION)



TOP GATE HINGE **DROP ROD ASSEMBLY**

GATES			
GATE POSTS AND GATE FRAMES			
HEIGHT	GATE OPENING	GATE POST	GATE FRAME
UNDER 6 FEET	SINGLE TO 6' OR DOUBLE TO 12'	2"	1"
	SINGLE OVER 6' TO 8' OR DOUBLE OVER 12' TO 16'	2-1/2"	1-1/2"
	SINGLE OVER 8' TO 12' OR DOUBLE 16' TO 24'	3-1/2"	1-1/2"
6 FEET AND OVER	SINGLE TO 6' OR DOUBLE TO 12'	2-1/2"	1-1/2"
	SINGLE OVER 6' TO 13' OR DOUBLE OVER 12' TO 24'	3-1/2"	1-1/2"
	SINGLE OVER 13' TO 18' OR DOUBLE OVER 24' TO 36'	6"	1-1/2"
	SINGLE OVER 18' OR DOUBLE OVER 36'	8"	

GAGE OF FABRIC	HEIGHT OF FABRIC	DEPTH OF POSTS	LENGTH OF END, CORNER OR PULL POSTS	LENGTH OF LINE POSTS	SIZE OF POSTS				GATE POST
					END, CORNER & PULL		LINE POSTS (MIN SIZE)		
					PIPE OPTION	RECTANGULAR OPTION	PIPE OPTION	H POST OPTION	
	7'	3'	10'	9'-8"	2-1/2"	3-1/2"	2"	1-7/8"x1-5/8"	SEE GATE POST TABLE
	6'	3'	9'	8'-8"	2-1/2"	3-1/2"	2"	1-7/8"x1-5/8"	
	5'	3'	8'	7'-8"	2"	3-1/2"	1-1/2"	1-5/16"x1-1/2"	
	4'	2'	6'	5'-8"	2"	3-1/2"	1-1/2"	1-5/16"x1-1/2"	
	3'	2'	5'	4'-8"	2"	3-1/2"	1-1/2"	1-5/16"x1-1/2"	

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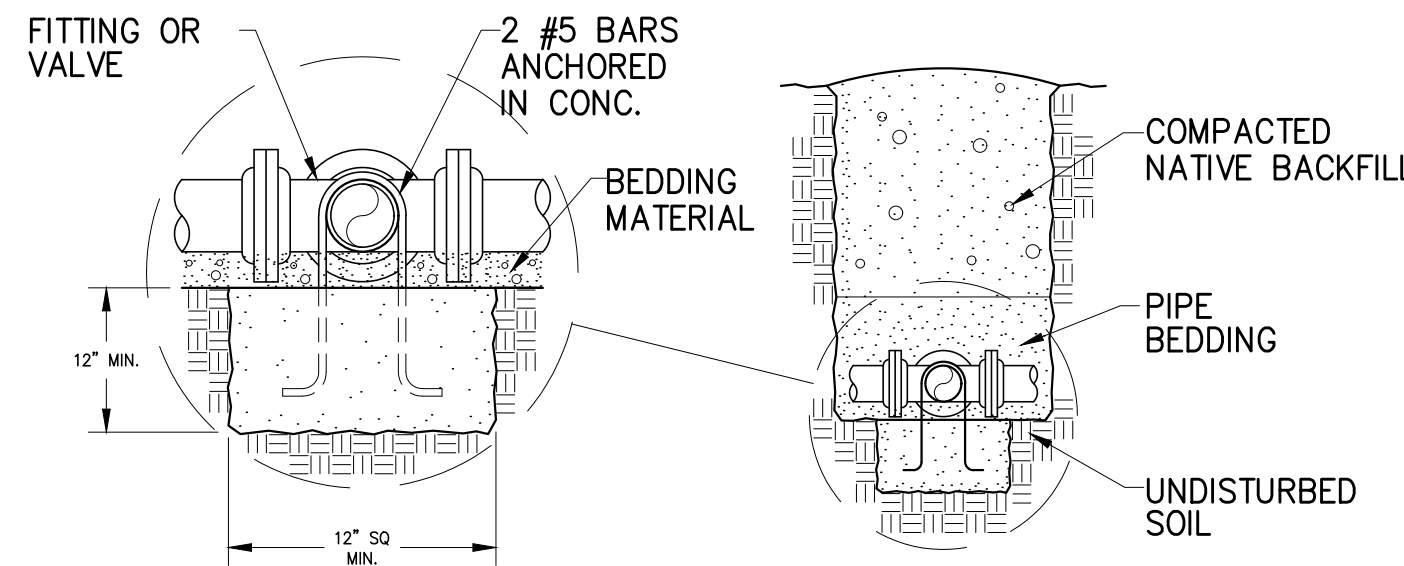
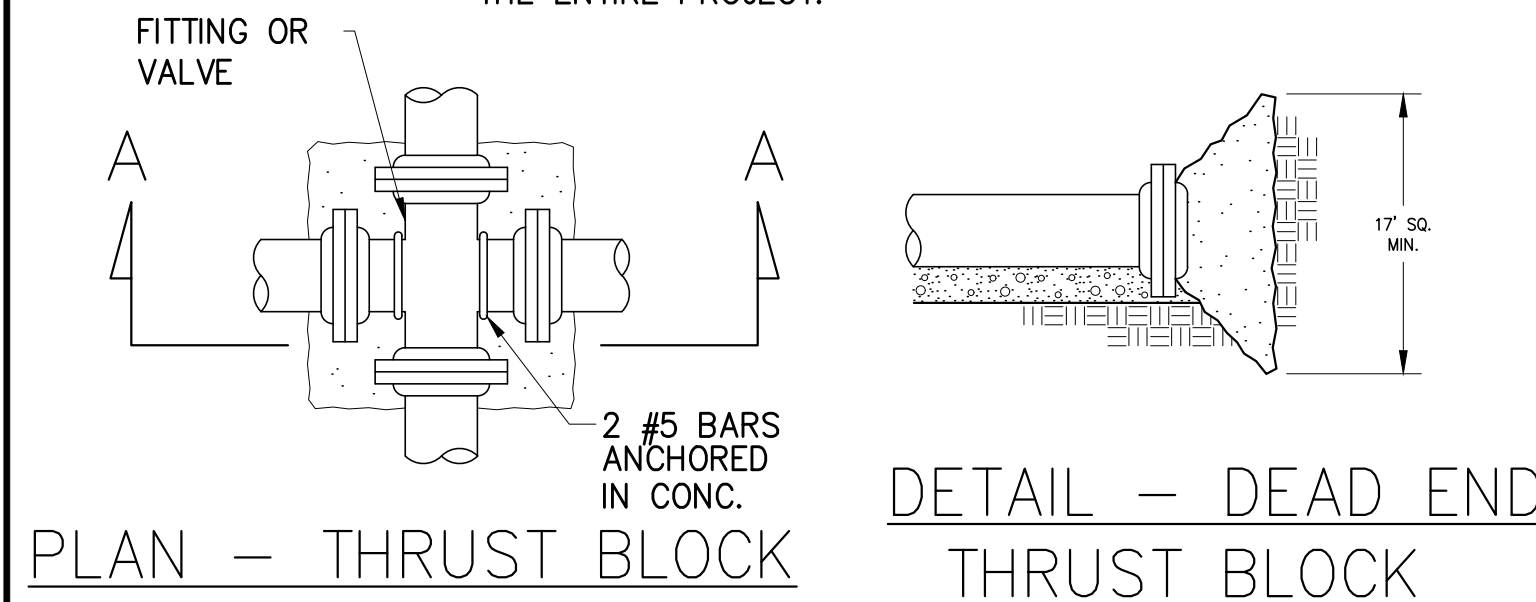
BIRCH CREEK CULINARY WATER CO.
BIRCH CREEK WATER PROJECT
DETAILS
CHAINLINK FENCE DETAILS

SEI NO. 16897 DESIGNED SBB DRAWN JJ CHECKED SDT SHEET NO. 20 of 21 **D5**

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CONCRETE THRUST BLOCK RESTRAINING SYSTEM DETAILS

NOTE
CONTRACTOR SHALL USE EITHER MEGALUG OR
CONCRETE THRUST RESTRAINING SYSTEM FOR
THE ENTIRE PROJECT.



SECTION A-A

THRUST BLOCK BEARING AREA IN SQ. FT.

PIPE SIZE	CROSS	TEE	WYE	DEAD END	VALVE	90° BEND	45° BEND	22.5° BEND	11.25° BEND
4	2.4	1.7	1.7	1.7	1.7	2.4	1.3	1.0	1.0
6	5.4	3.8	3.8	3.8	3.8	5.4	2.9	1.5	1.0
8	9.6	6.8	6.8	6.8	6.8	9.6	5.2	2.7	1.4
10	15.0	10.6	10.6	10.6	10.6	15.0	8.1	4.2	2.1
12	21.5	15.2	15.2	15.2	15.2	21.5	11.7	6.0	3.0
14	29.3	20.7	20.7	20.7	20.7	29.3	15.9	8.1	4.1
16	38.2	27.0	27.0	27.0	27.0	38.2	20.7	10.6	5.3
18	48.4	34.2	34.2	34.2	34.2	48.4	26.2	13.4	6.7
20	59.7	42.2	42.2	42.2	42.2	59.7	32.3	16.5	8.3
24	85.9	60.8	60.8	60.8	60.8	85.9	46.5	23.7	11.9

REDUCER

D2 \ D1	6	8	10	12	14	16	18	20	24
4	2.1	5.1	8.8	13.4	-	-	-	-	-
6	-	3.0	6.7	11.3	16.8	23.1	-	-	-
8	-	-	3.8	8.4	13.8	20.1	27.2	-	-
10	-	-	-	4.6	10.1	16.3	23.5	31.4	-
12	-	-	-	-	5.5	11.7	18.8	26.8	45.2
14	-	-	-	-	-	6.3	13.4	21.3	39.8
16	-	-	-	-	-	-	7.1	15.1	33.5
18	-	-	-	-	-	-	-	8.0	26.3
20	-	-	-	-	-	-	-	-	18.4

NOTES:

- ALL THRUST BLOCK BEARING FACES SHALL BE PLACED AGAINST UNDISTURBED SOIL OR APPROVED COMPACTED BACKFILL.
- SQUARE ALL EDGES TO RECEIVE CONCRETE.
- CONCRETE SHALL BE CLASS C.
- CALCULATED ON 200 PSI TEST PRESSURE AND ALLOWABLE BEARING PRESSURE OF 1500 LBS. PER SQ. FT.
- IN POORER SOILS SPECIAL DESIGN IS REQUIRED.
- ALL FITTINGS AND VALVES SHALL BE ANCHORED WITH TWO #5 REBAR. ONLY ONE REQ'D FOR REDUCER
- CENTER ALL FITTINGS OVER THRUST BLOCKS.

A DETAIL - THRUST BLOCK
NOT TO SCALE

MEGALUG THRUST RESTRAINING SYSTEM DETAILS

NOTE
CONTRACTOR SHALL USE EITHER MEGALUG OR
CONCRETE THRUST RESTRAINING SYSTEM FOR
THE ENTIRE PROJECT.

* CALCULATIONS DERIVED FROM EBAA IRON SALES

BASED ON:
TEST PRESSURE 200 PSI
SOIL TYPE: GM - SILTY GRAVEL, GRAVEL-SAND-SILT MIXTURE
BURIAL DEPTH: 4 FT.
TRENCH TYPE: 5 - PIPE BEDDED IN COMPACTED GRANULAR

MATERIAL TO THE CENTER LINE OF PIPE, 4" MIN. UNDER PIPE.
COMPACTED GRANULAR OR SELECT MATERIAL TO TOP OF PIPE.
(APPROX. 90% STANDARD PROCTOR, AASHTO T-99)
SAFETY FACTOR: 1.5

PVC VERTICLE BEND RESTRAINED LENGTHS IN FT. (L₁ - BEFORE CONNECTION / L₂ - AFTER CONNECTION)

BEND ANGLE	PIPE SIZE									
	4	6	8	10	12	14	16	18	20	24
11.25	4/1	5/2	7/2	9/3	10/3	12/4	13/4	15/5	16/5	19/6
22.5	8/3	11/4	15/5	17/6	21/7	24/8	27/9	30/9	33/10	38/12
45	16/5	23/8	30/10	36/12	43/14	49/16	56/18	62/20	68/21	79/25

CALCULATIONS BASED ON THE ELEVATION OF THE PIPE REMAINING CONSTANT WITH THE CONTOUR OF THE GROUND. FOR TWO WAY FLOW, SUCH AS FOUND IN DISTRIBUTION SYSTEMS, USE L₁ ON BOTH SIDES OF FITTING.

PVC HORIZONTAL BEND RESTRAINED LENGTHS L, IN FT.

BEND ANGLE	PIPE SIZE									
	4	6	8	10	12	14	16	18	20	24
11.25	1	2	2	3	3	4	4	5	5	6
22.5	3	4	5	6	7	8	9	9	10	12
45	5	8	10	12	14	16	18	20	21	25
90	13	18	24	29	34	38	43	47	52	60

1. ALL JOINTS WITHIN THE "L" DISTANCE SHALL BE RESTRAINED

PVC TEE RESTRAINED LENGTHS L, IN FT.

BRANCH SIZE DIA.	RUN SIZE DIAMETER									
	4	6	8	10	12	14	16	18	20	24
4	*	*	*	*	*	*	*	*	*	*
6	-	*	*	*	*	*	*	*	*	*
8	-	-	*	*	*	*	*	*	*	*
10	-	-	-	*	*	*	*	*	*	*
12	-	-	-	-	*	*	*	*	*	*
14	-	-	-	-	-	*	*	*	*	*
16	-	-	-	-	-	-	7	*	*	*
18	-	-	-	-	-	-	-	20	4	*
20	-	-	-	-	-	-	-	-	34	3
24	-	-	-	-	-	-	-	-	-	60

* = FOR THIS CONDITION NEED ONLY RESTRAIN THE OUTLETS OF TEE
NOTES:

- RESTRAIN THE THREE MECHANICAL JOINTS ON THE TEE.
- ALL JOINTS WITHIN THE "L" DISTANCE ON THE BRANCH SIDE OF TEE SHALL BE RESTRAINED AND ALL JOINTS WITHIN 18' ON THE RUN SIDE OF THE TEE SHALL BE RESTRAINED.

PVC REDUCER RESTRAINED LENGTHS L, IN FT. (SMALL SIDE/LARGE SIDE)

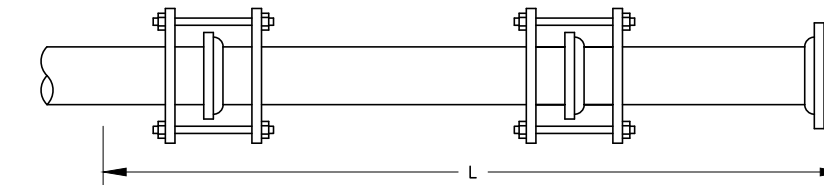
D2 \ D1	6	8	10	12	14	16	18	20	24
4	42/29	100/52	171/71	258/90	-	-	-	-	-
6	-	40/31	88/54	147/75	217/95	297/113	-	-	-
8	-	-	37/29	82/55	135/77	197/98	266/117	-	-
10	-	-	-	36/30	79/56	128/80	183/100	244/120	-
12	-	-	-	-	36/30	77/57	123/80	174/102	293/142
14	-	-	-	-	-	35/30	74/57	118/81	219/124
16	-	-	-	-	-	-	34/30	73/57	161/104
18	-	-	-	-	-	-	-	34/30	111/82
20	-	-	-	-	-	-	-	-	70/57

1. ALL JOINTS WITHIN THE "L" DISTANCE SHALL BE RESTRAINED

PVC DEAD END RESTRAINED LENGTHS L, IN FT.

PIPE SIZE										
4	6	8	10	12	14	16	18	20	24	
39	55	73	88	104	119	134	149	163	192	

1. ALL JOINTS WITHIN THE "L" DISTANCE SHALL BE RESTRAINED



EXAMPLE:
PIPE TYPE = DIP
PIPE SIZE = 10"
L = 57'

B DETAIL - MECHANICAL THRUST RESTRAINING SYSTEM DETAILS FOR PRESSURE SYSTEMS
NOT TO SCALE

DIP VERTICLE BEND RESTRAINED LENGTHS IN FT. (L₁ - BEFORE CONNECTION / L₂ - AFTER CONNECTION)

BEND ANGLE	PIPE SIZE									
	4	6	8	10	12	14	16	18	20	24
11.25	2/1	4/2	5/2	6/2	7/3	8/3	8/4	9/4	10/4	12/5
22.5	5/2	7/3	9/4	11/5	13/6	15/6	17/7	19/8	21/9	24/10
45	11/5	15/6	20/8	23/10	28/12	32/13	36/15	40/17	43/18	51/21

CALCULATIONS BASED ON THE ELEVATION OF THE PIPE REMAINING CONSTANT WITH THE CONTOUR OF THE GROUND.

DIP HORIZONTAL BEND RESTRAINED LENGTHS L, IN FT.

BEND ANGLE	PIPE SIZE									
	4	6	8	10	12	14	16	18	20	24
11.25	1	2	2	2	3	3	4	4	4	5
22.5	2	3	4	5	6	6	7	8	9	10
45	5	6	8	10	12	13	15	17	18	21
90	11	15	20	24	28	32	36	40	44	51

1. ALL JOINTS WITHIN THE "L" DISTANCE SHALL BE RESTRAINED

DIP TEE RESTRAINED LENGTHS L, IN FT.

BRANCH SIZE DIA.	RUN SIZE DIAMETER									
	4	6	8	10	12	14	16	18	20	24
4	*	*	*	*	*	*	*	*	*	*
6	-	*	*	*	*	*	*	*	*	*
8	-	-	*	*	*	*	*	*	*	*
10	-	-	-	*	*	*	*	*	*	*
12	-	-	-	-	*	*	*	*	*	*
14	-	-	-	-	-	*	*	*	*	*
16	-	-	-	-	-	-	12	2	*	*
18	-	-	-	-	-	-	-	21	12	*
20	-	-	-	-	-	-	-	-	30	12
24	-	-	-	-	-	-	-	-	-	47

* = FOR THIS CONDITION NEED ONLY RESTRAIN THE OUTLETS OF TEE
NOTES:

- RESTRAIN THE THREE MECHANICAL JOINTS ON THE TEE.
- ALL JOINTS WITHIN THE "L" DISTANCE ON THE BRANCH SIDE OF TEE SHALL BE RESTRAINED AND ALL JOINTS WITHIN 18' ON THE RUN SIDE OF THE TEE SHALL BE RESTRAINED.

DIP REDUCER RESTRAINED LENGTHS L, IN FT. (SMALL SIDE/LARGE SIDE)

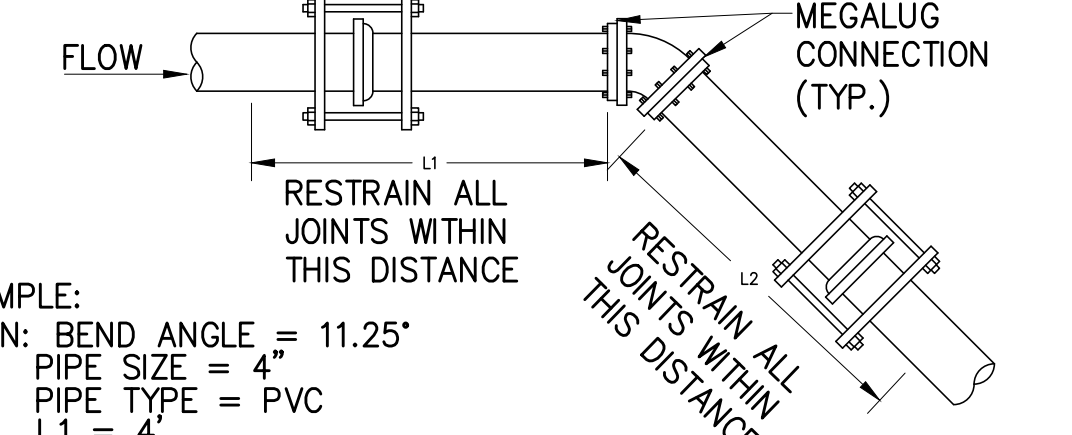
D2 \ D1	6	8	10	12	14	16	18	20	24
4	27/18	65/34	110/46	166/58	-	-	-	-	-
6	-	26/20	57/35	95/48	140/61	192/73	-	-	-
8	-	-	24/19	53/35	87/50	127/63	171/75	-	-
10	-	-	-	23/20	51/36	82/51	118/64	158/77	-
12	-	-	-	-	23/20	49/37	79/52	112/66	188/91
14	-	-	-	-	-	22/20	48/37	76/52	141/80
16	-	-	-	-	-	-	22/19	47/37	103/67
18	-	-	-	-	-	-	-	22/19	72/53
20	-	-	-	-	-	-	-	-	45/37

1. ALL JOINTS WITHIN THE "L" DISTANCE SHALL BE RESTRAINED

DIP DEAD END RESTRAINED LENGTHS L, IN FT.

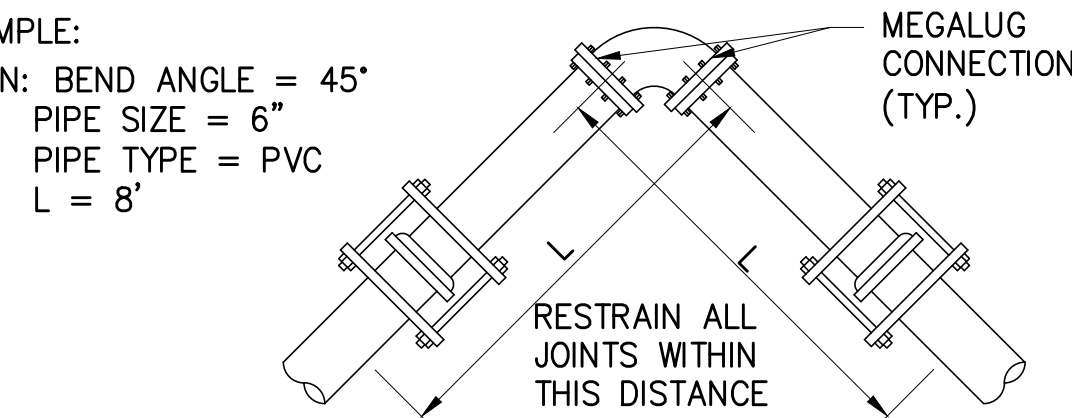
PIPE SIZE										
4	6	8	10	12	14	16	18	20	24	
25	36	47	57	67	76	86	95	105	123	

1. ALL JOINTS WITHIN THE "L" DISTANCE SHALL BE RESTRAINED



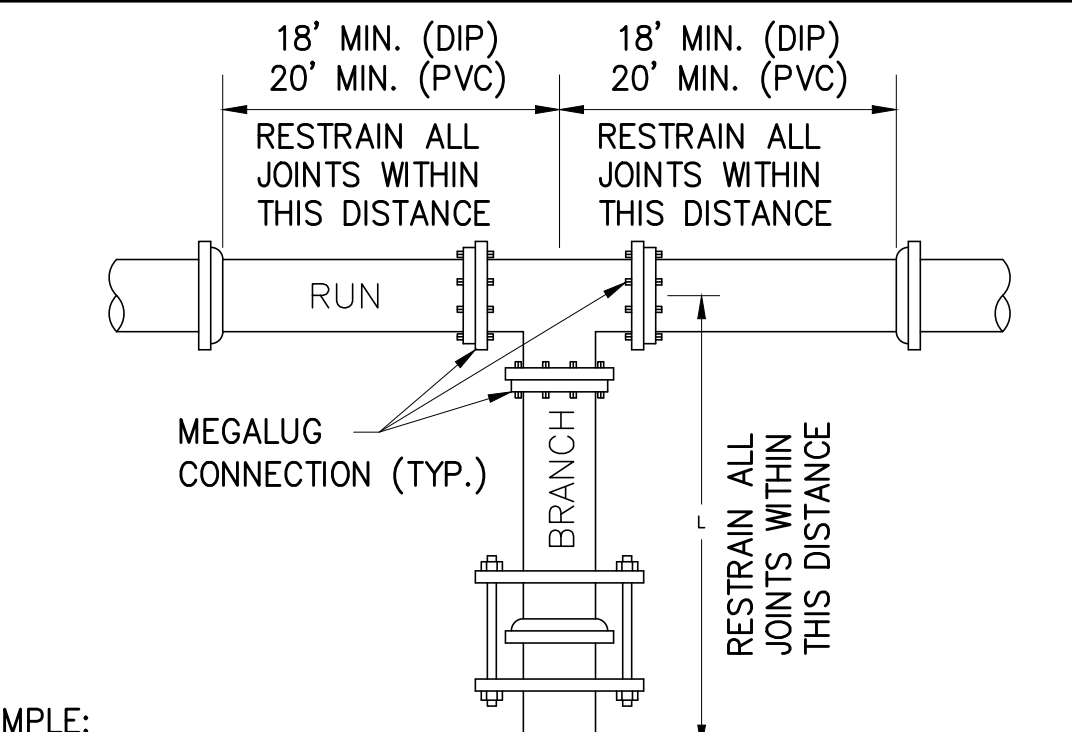
EXAMPLE:
GIVEN: BEND ANGLE = 11.25°
PIPE SIZE = 4"
PIPE TYPE = PVC
L1 = 4'
L2 = 1'

ELEVATION



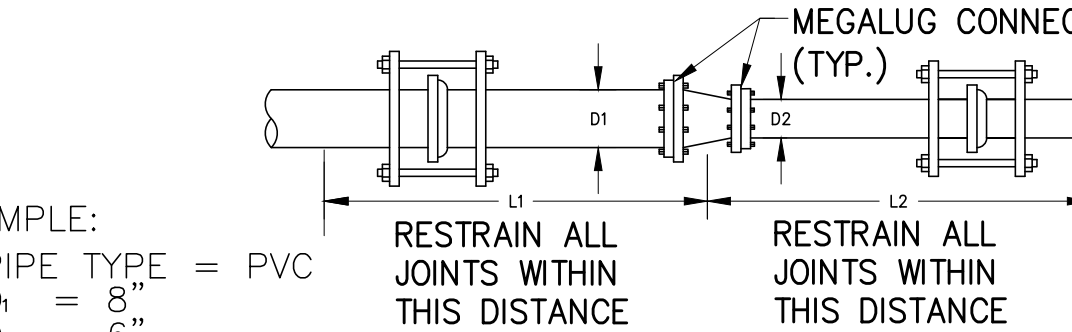
EXAMPLE:
GIVEN: BEND ANGLE = 45°
PIPE SIZE = 6"
PIPE TYPE = PVC
L = 8'

PLAN



EXAMPLE:
PIPE TYPE = DIP
PIPE SIZE = 16"
L = 12'

PLAN



EXAMPLE:
PIPE TYPE = PVC
D1 = 8"
D2 = 6"
L1 = 31'
L2 = 40'

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REV. NO.	COMMENT	DATE

SUNRISE ENGINEERING
2100 NORTH MAIN STREET
NORTH LOGAN, UTAH 84341
TEL 435.563.3734
www.sunrise-eng.com

BIRCH CREEK CULINARY WATER CO.

BIRCH CREEK WATER PROJECT DETAILS THRUST BLOCK DETAILS

REV. NO.	DESIGNED	DRAWN	CHECKED	SHEET NO.	
16897	SBB	JJ	SDT	21 of 21	D6

P:\Birch Creek Culinary Water Company\16897 Birch Creek Water Project\DWG\Sheets\B6-D6.dwg Apr 27, 2026 9:50am jjoiley