

2024 TREATED WATER SYSTEM IMPROVEMENTS E 93RD AVE AND RIVERDALE ROAD PRV STATION REPLACEMENT AND WESTERN HILLS WATER TANK ALTITUDE VALVE STATION REPLACEMENT

PROJECT NO. 24-37
CITY OF THORNTON, COLORADO

LEGEND		
EXISTING	FEATURE	PROPOSED
	PROPERTY BOUNDARY	
— 5670 —	MAJOR CONTOUR	
— 5671 —	MINOR CONTOUR	
— □ —	WOODEN FENCE	
ΣWV	WATER VALVE	Σ
— SS —	SANITARY SEWER LINE	
— SD —	STORM SEWER LINE	
— W —	WATER LINE	— W —
— P-UG —	UNDERGROUND ELECTRICAL LINE	— E —
— G —	GAS LINE	
	UNDERGROUND CABLE LINE	
⊙	BUSH	
⚠ 100	CONTROL POINT	
⊙ B1	SOIL BORING	
⊙	UTILITY POT HOLE	
⊙	VENT PIPE	
⊙ W	WATER MANHOLE	
⊙ GM	GAS METER	
ΣIRR	IRRIGATION VALVE	
⊙	TREE	
⊙ S	SANITARY MANHOLE	
⊙	SIGN	
	ASPHALT	
	CONCRETE	
	LANDSCAPING AREA	
	RIVER ROCKS	
	THRUST BLOCK	▲
	IRRIGATION LINE	
— — — — —	LIMITS OF CONSTRUCTION	
	SAWCUT OF SIDEWALK	
	SAWCUT OF ASPHALT	

UTILITY CONTACTS			
UTILITY:	OWNER:	CONTACT:	TELEPHONE NO.
CABLE TELEVISION	XFINITY	KIP WEST	720-347-9992
GAS & ELECTRIC	XCEL ENERGY	JEREMY HUTAFF	303-425-3823
TELECOMMUNICATIONS	AT&T	FEDDIE GEORGE	303-620-2753
TELECOMMUNICATIONS	CENTURYLINK	NICOLE FRANK	303-514-6331
WATER	CITY OF THORNTON	KYLE WALLIS	720-935-6664
SANITARY SEWER	CITY OF THORNTON	KYLE JOHNSON	720-974-0611



VICINITY MAP
SCALE: NTS

CITY OF THORNTON

JASON PIERCE, P.E., INFRASTRUCTURE ENGINEERING DIRECTOR DATE

MARK MAZZUCCO, PROJECT MANAGER DATE

JOSH REDMAN, UTILITIES OPERATIONS MANAGER DATE

PREPARED BY:

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1/4/2025	COLLIER'S ENGINEERING - SUBSURFACE UTILITIES ENGINEERING PLAN

LIST OF ABBREVIATIONS	
ABBREVIATION	DESCRIPTION
ACP	ASBESTOS CEMENT PIPE
B	BORE HOLE
B.O.C.	BACK OF CURB
B.O.W.	BACK OF WALK
CP	CONTROL POINT
CWA	CONCRETE WASHOUT AREA
DESC.	DESCRIPTION
DI	DUCTILE IRON
DIA	DIAMETER
E	EASTING
ELEV.	ELEVATION
GPM	GALLONS PER MINUTE
HORZ.	HORIZONTAL
LF	LINEAR FEET
M.J.	MECHANICAL JOINT
MIL	MILLIMETER
MIN.	MINIMUM
N	NORTHING
NTS	NOT TO SCALE
P.S.F.	POUNDS PER SQUARE FOOT
PC	POINT OF CURVATURE
PH	POT HOLE
PSI	POUNDS PER SQUARE INCH
PT	POINT OF TANGENT
PVC	POLYVINYL CHLORIDE
SF	SQUARE FEET
STA.	STATION
SY	SQUARE YARDS
T.B.	THRUST BLOCK
T.O.P.	TOP OF PIPE
TYP	TYPICAL
VERT.	VERTICAL
W/	WITH

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REVISIONS DESCRIPTION		REVISIONS	
REV. NO.	DATE		

COVER SHEET		2026	
2024 TREATED WATER SYSTEM IMPROVEMENTS PRV'S REPLACEMENT PROJECT		THORNTON, COLORADO	

drawn by: CAU
checked by: CAU
approved by: CAU
QA/QC by: CAU
project no.: 024-03983
drawing no.: TTL
date: 2026-03-06

SHEET
1 of 18

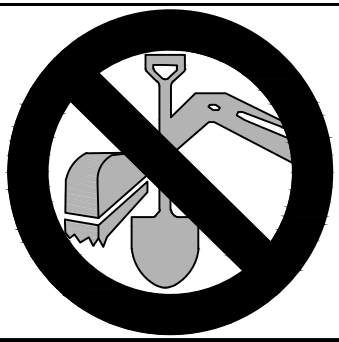
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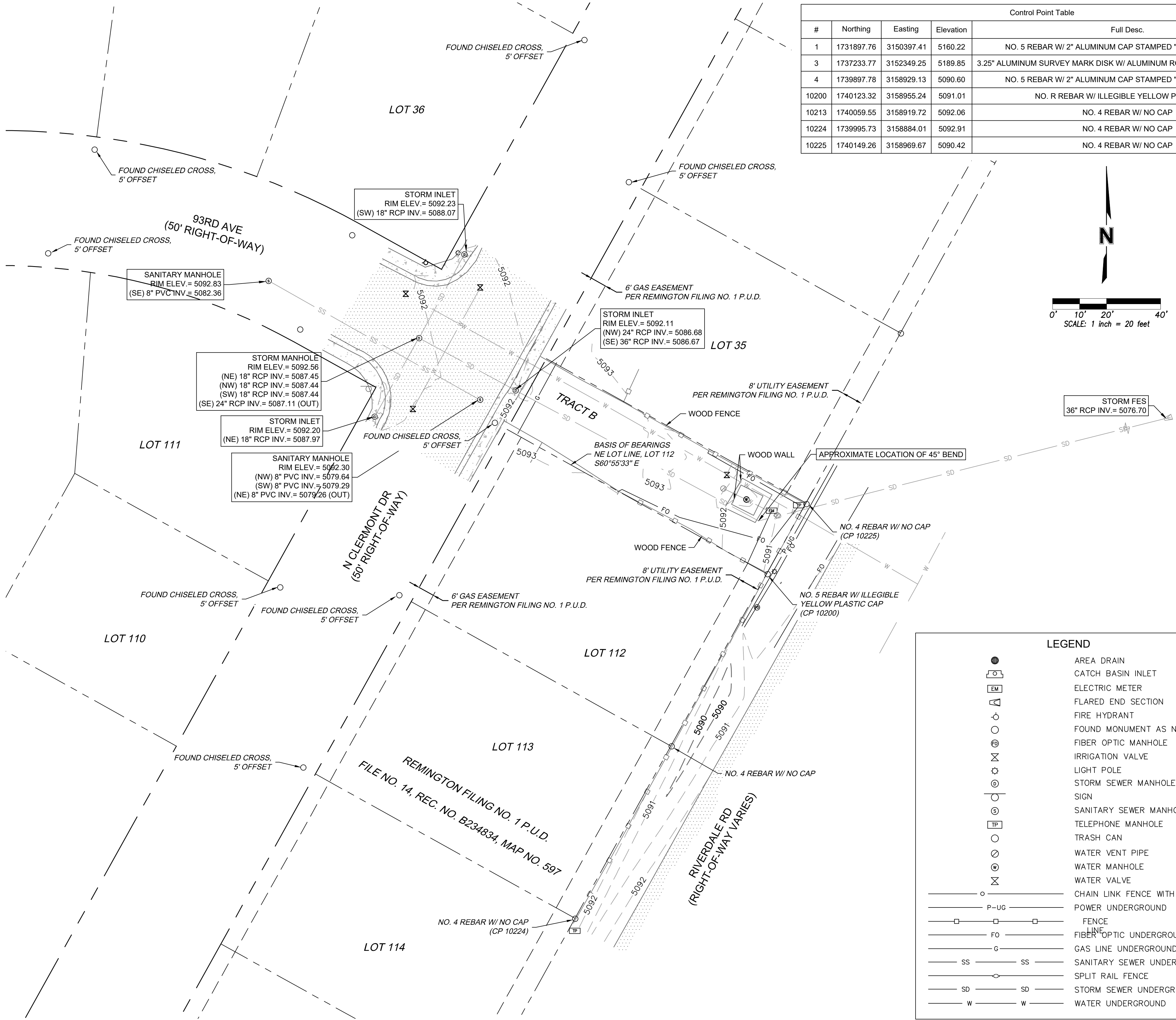


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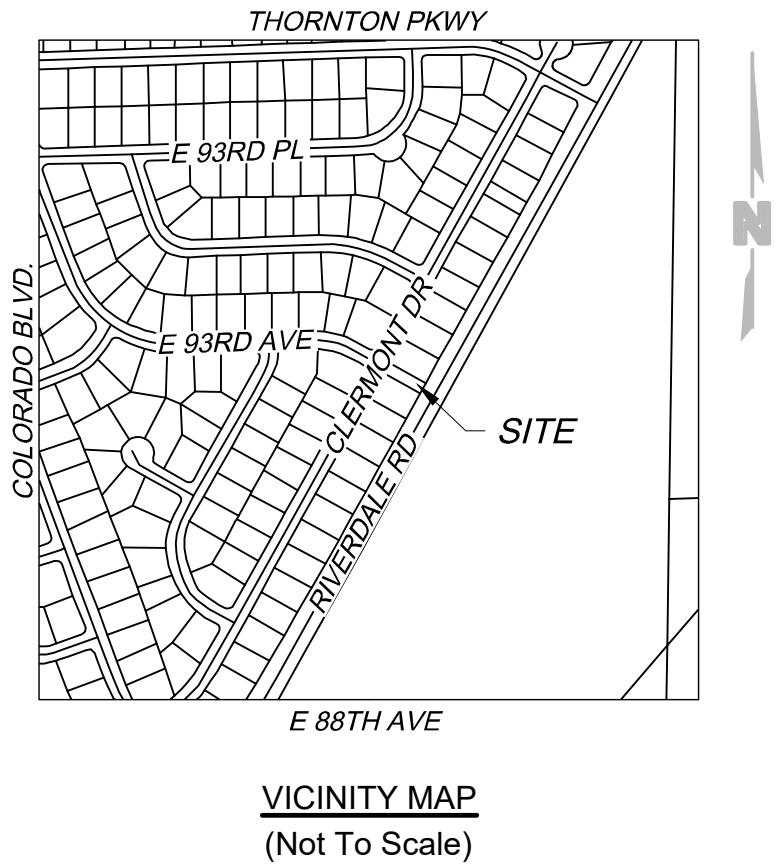
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SURVEY CONTROL SHEET
PART OF THE SOUTHWEST QUARTER OF SECTION 19, TOWNSHIP 2 SOUTH,
RANGE 67 WEST OF THE 6TH PRINCIPAL MERIDIAN, CITY OF THORNTON, COUNTY OF ADAMS, STATE OF COLORADO



Control Point Table				
#	Northing	Easting	Elevation	Full Desc.
1	1731897.76	3150397.41	5160.22	NO. 5 REBAR W/ 2" ALUMINUM CAP STAMPED "OLSSON CONTROL"
3	1737233.77	3152349.25	5189.85	3.25" ALUMINUM SURVEY MARK DISK W/ ALUMINUM ROD STAMPED "95.0211 1995"
4	1739897.78	3158929.13	5090.60	NO. 5 REBAR W/ 2" ALUMINUM CAP STAMPED "OLSSON CONTROL"
10200	1740123.32	3158955.24	5091.01	NO. R REBAR W/ ILLEGIBLE YELLOW PLASTIC CAP
10213	1740059.55	3158919.72	5092.06	NO. 4 REBAR W/ NO CAP
10224	1739995.73	3158884.01	5092.91	NO. 4 REBAR W/ NO CAP
10225	1740149.26	3158969.67	5090.42	NO. 4 REBAR W/ NO CAP



GENERAL NOTES

- BASIS OF BEARINGS: THE NORTHEAST LINE OF LOT 112 IS ASSUMED TO BEAR S60°55'3"E, BEING MONUMENTED AS SHOWN HEREON.
- UNITS SHOWN ARE U.S. SURVEY FEET, GROUND DISTANCES.
- CONTOURS ARE SHOWN AT 1 FOOT INTERVALS.
- ELEVATIONS ARE BASED ON THE ADAMS COUNTY CONTROL # 95.0210 HAVING A PUBLISHED ELEVATION OF 5189.81 (NAVD88)
- HORIZONTAL COORDINATES ARE BASED ON THE NORTH AMERICAN DATUM OF 1983 (NAD83) COLORADO STATE PLANE COORDINATE SYSTEM - CENTRAL ZONE (502) AND MODIFIED TO GROUND VALUES USING A COMBINED SCALE FACTOR OF 1.00022460 / 0.99977545 ABOUT OLSSON CONTROL POINT 1.
- UNDERGROUND UTILITIES SHOWN HERON HAVE BEEN MARKED OR LOCATED FOR THIS SURVEY PER TREATED WATER SYSTEM IMPROVEMENTS SUE INVESTIGATION PROVIDED BY COLLIERS ENGINEERING AND DESIGN.

SURVEYOR'S NOTES

- NOTICE:** PURSUANT TO COLORADO REVISED STATUTES TITLE 13, ARTICLE 80, SECTION 105 (C.R.S. 13-80-105) - YOU MUST COMMENCE ANY LEGAL ACTION BASED UPON ANY DEFECT IN THIS SURVEY WITHIN THREE YEARS AFTER YOU FIRST DISCOVER SUCH DEFECT. IN NO EVENT MAY ANY ACTION BASED UPON ANY DEFECT IN THIS SURVEY BE COMMENCED MORE THAN TEN YEARS FROM THE DATE OF THE CERTIFICATION SHOWN HEREON.
- THE USE OF THE WORD "CERTIFY" OR "CERTIFICATION" BY A REGISTERED PROFESSIONAL LAND SURVEYOR, IN THE PRACTICE OF LAND SURVEYING, CONSTITUTES AN EXPRESSION OR PROFESSIONAL OPINION REGARDING THOSE FACTS OR FINDINGS WHICH ARE SUBJECT OF THE CERTIFICATION AND DOES NOT CONSTITUTE A WARRANTY OR GUARANTEE, EITHER EXPRESSED OR IMPLIED.

SURVEYOR'S CERTIFICATE

THIS SURVEY CONTROL SHEET WAS PREPARED BY ME OR UNDER MY RESPONSIBLE CHARGE, IS BASED UPON MY KNOWLEDGE, INFORMATION AND BELIEF, AND IS IN ACCORDANCE WITH APPLICABLE STANDARDS OF PRACTICE. THIS CONTROL SHEET DOES NOT CONSTITUTE A MONUMENTED LAND SURVEY PER COLORADO STATE REQUIREMENTS. THIS STATEMENT IS NOT A GUARANTY OR WARRANTY, EITHER EXPRESSED OR IMPLIED.

ON BEHALF OF OLSSON,

MATT ROBERT EISENACH
PROFESSIONAL LAND SURVEYOR
COLORADO REGISTRATION NUMBER: 38257

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SURVEY CONTROL - E 79TH AVE AND RIVERDALE ROAD		2026
2024 TREATED WATER SYSTEM IMPROVEMENTS PRV'S REPLACEMENT PROJECT		THORNTON, COLORADO

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Survey Control sheet

PART OF THE NORTHEAST QUARTER OF SECTION 33 AND THE NORTHWEST QUARTER OF SECTION 34,
TOWNSHIP 2 SOUTH, RANGE 68 WEST OF THE 6TH PRINCIPAL MERIDIAN, COUNTY OF ADAMS, STATE OF COLORADO

Control Point Table				
#	Northing	Easting	Elevation	Full Desc.
1	1731897.76	3150397.41	5160.22	NO. 5 REBAR W/ 2" ALUMINUM CAP STAMPED "OLSSON CONTROL"
2	1731813.39	3141176.10	5390.16	1.50" METAL DISK W/ PK NAIL STAMPED "OLSSON"
3	1737233.72	3150231.02	5400.00	PARCEL AT BOOK 2192, PAGE 5 SURVEY MARK DISK W/ ALUMINUM ROD STAMPED "95.0211 1995"
5	1731902.66	3141109.07	5385.67	PK NAIL
6	1731723.26	3141093.35	5380.10	PK NAIL



VICINITY MAP
(Not To Scale)

GENERAL NOTES

- BASIS OF BEARINGS: THE LINE BETWEEN THE NORTHWEST CORNER OF SECTION 34, TOWNSHIP 2 SOUTH, RANGE 68 WEST OF THE 6TH P.M., BEING MONUMENTED AT SAID CORNER BY A 3.25 INCH ALUMINUM CAP MARKED "LS7276" AND OLSSON CONTROL POINT 5, BEING MONUMENTED WITH A PK NAIL SET IN CONCRETE, IS ASSUMED TO BEAR N86°42'11"W.
- UNITS SHOWN ARE U.S. SURVEY FEET, GROUND DISTANCES.
- CONTOURS ARE SHOWN AT 1 FOOT INTERVALS.
- ELEVATIONS ARE BASED ON THE ADAMS COUNTY CONTROL # 95.0210 HAVING A PUBLISHED ELEVATION OF 5189.81 (NAVD88)
- HORIZONTAL COORDINATES ARE BASED ON THE NORTH AMERICAN DATUM OF 1983 (NAD83) COLORADO STATE PLANE COORDINATE SYSTEM - CENTRAL ZONE (502) AND MODIFIED TO GROUND VALUES USING A COMBINED SCALE FACTOR OF 1.00022460 / 0.99977545 ABOUT OLSSON CONTROL POINT 1.
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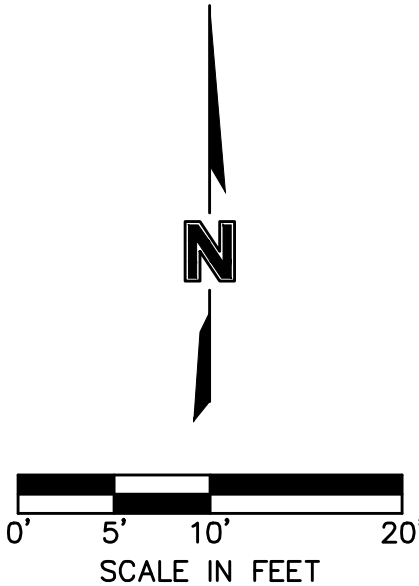
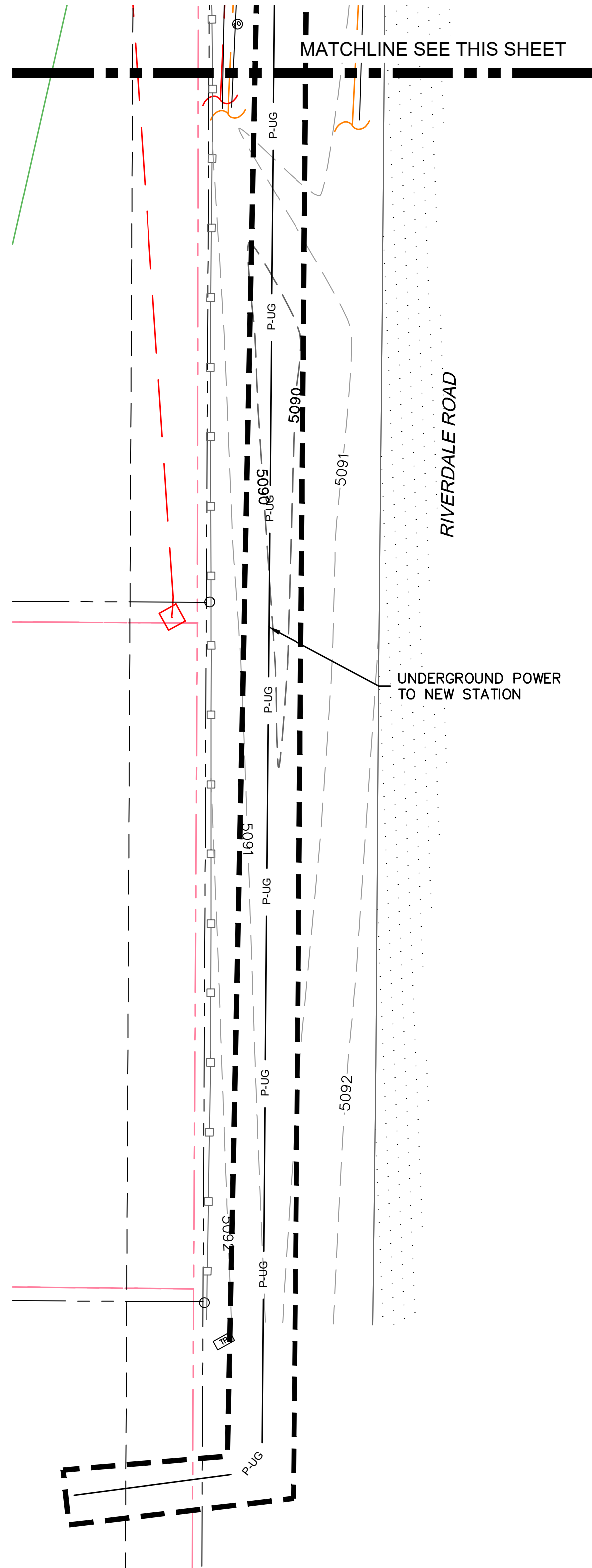
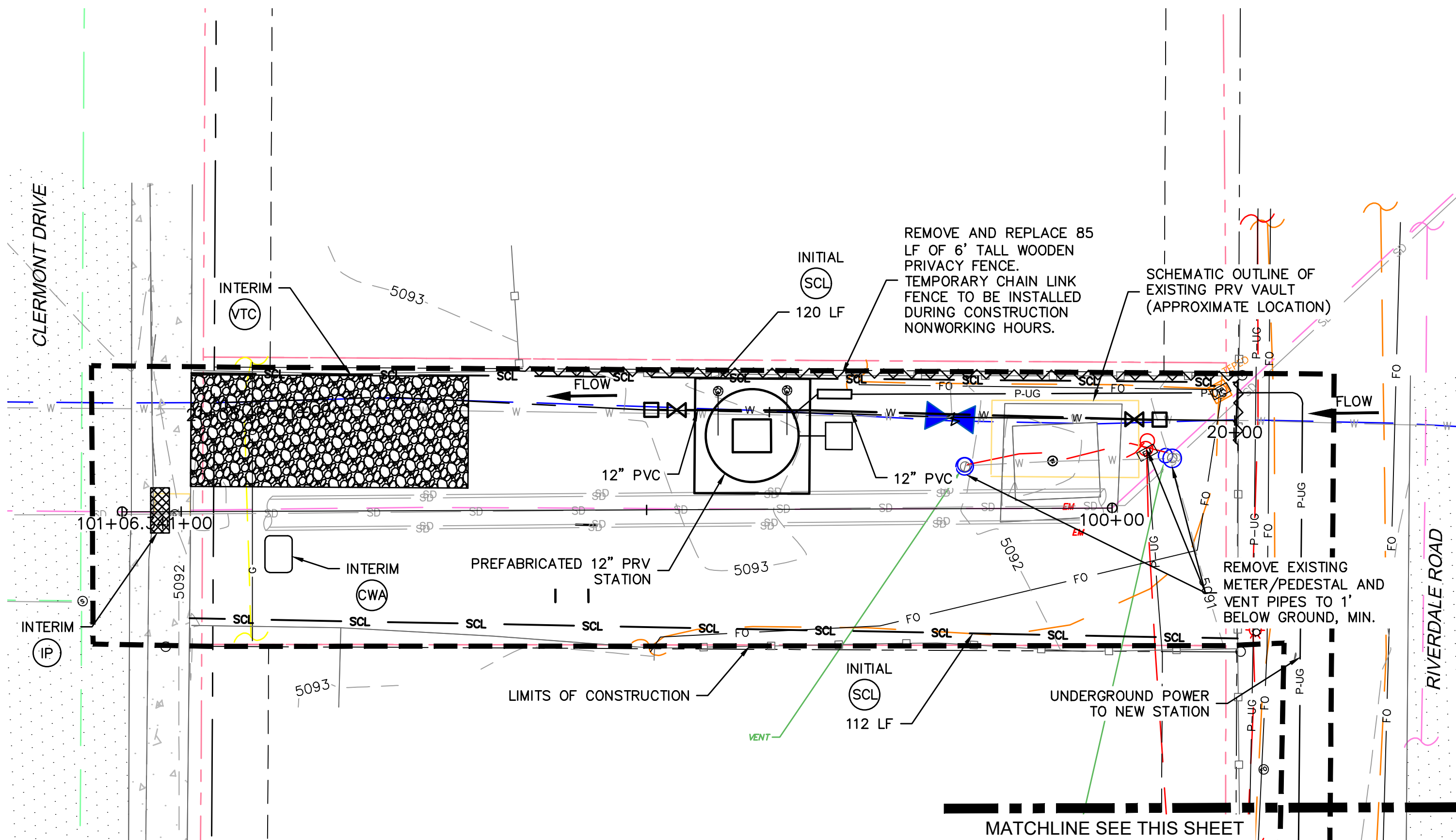
SURVEY CONTROL - WESTERN HILLS WATER TANK		2026
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THORNTON, COLORADO		

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EROSION AND SEDIMENT CONTROL LEGEND

-  (RS) ROCK SOCK
-  (VTC) VEHICLE TRACKING CONTROL
-  (CWA) CONCRETE WASHOUT (SEE SHEET 8 FOR NOTES ON PORTABLE CWA)
-  (IP) INLET PROTECTION
-  SCL SEDIMENT CONTROL LOGS

*NOTE: EROSION CONTROL DETAILS ARE ON SHEETS 7-9



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EROSION AND SEDIMENT CONTROL AND SITE PREPARATION AND DEMO PLAN	2026
2024 TREATED WATER SYSTEM IMPROVEMENTS PRV'S REPLACEMENT PROJECT	
THORNTON, COLORADO	

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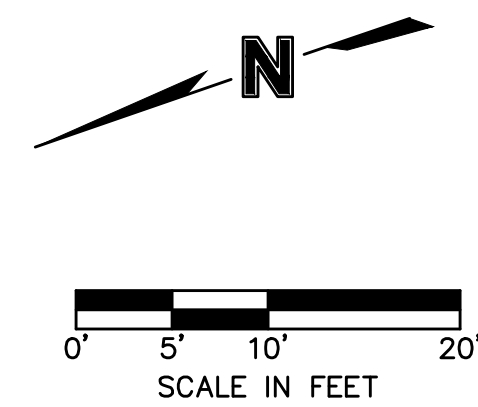
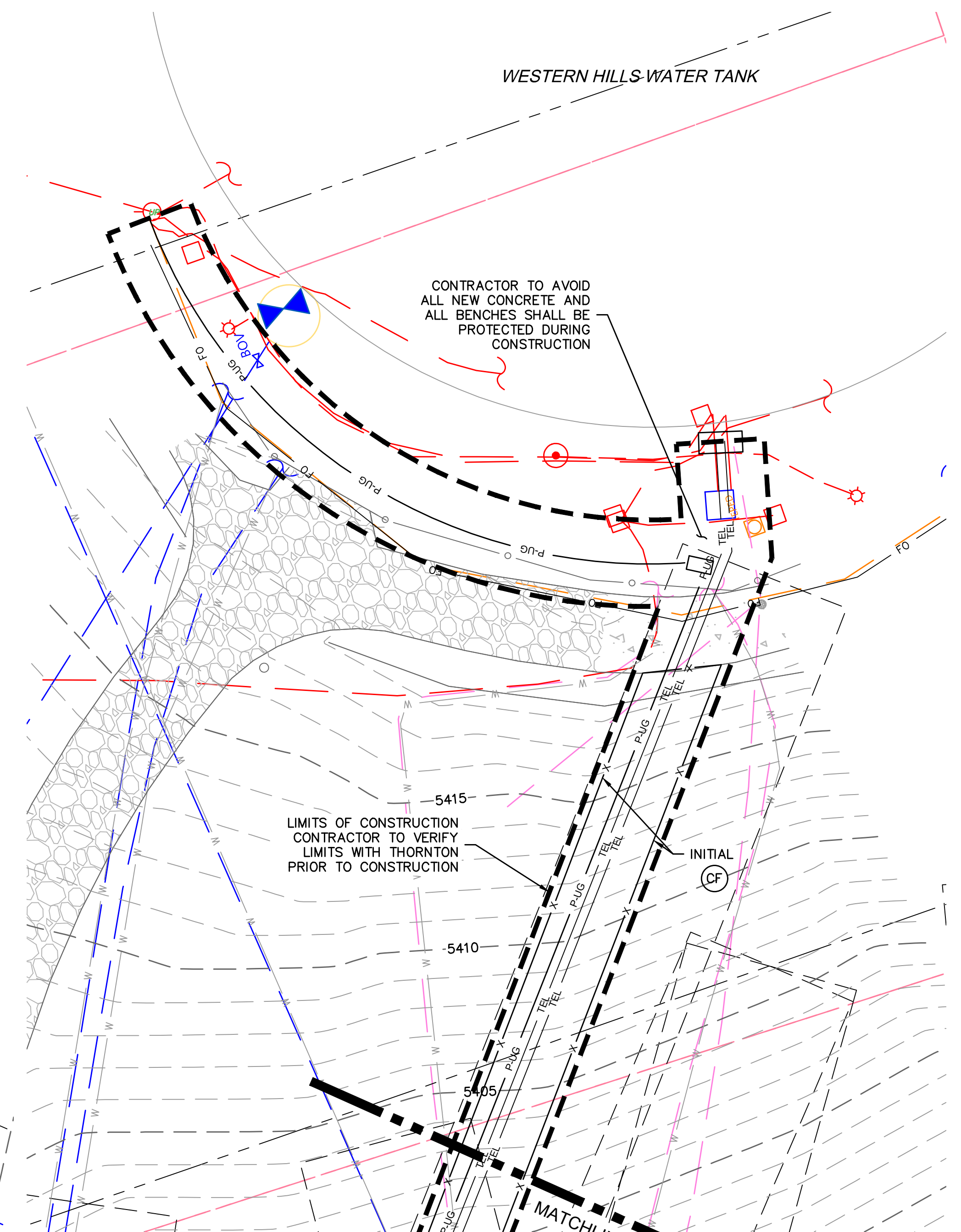
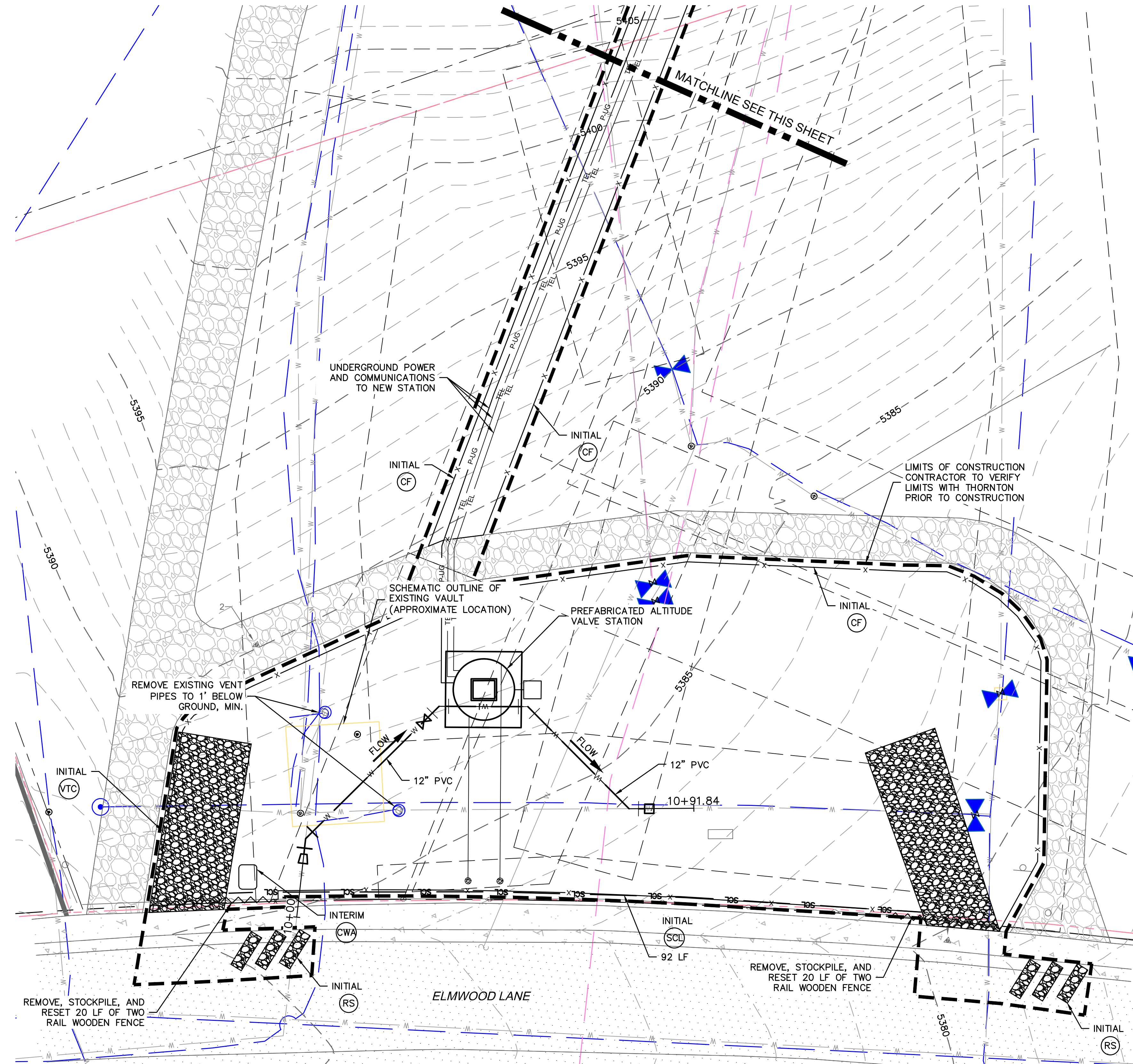
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		ROCK SOCK
		VEHICLE TRACKING CONTROL
		CONCRETE WASHOUT (SEE SHEET 8 FOR NOTES ON PORTABLE CWA)
		INLET PROTECTION
		TEMPORARY CONSTRUCTION FENCE
		SEDIMENT CONTROL LOGS

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SITE PREPARATION AND DEMO PLAN

2024 TREATED WATER SYSTEM IMPROVEMENT PRV'S REPLACEMENT PROJECT

SITE PREPARATION AND DEMO PLAN
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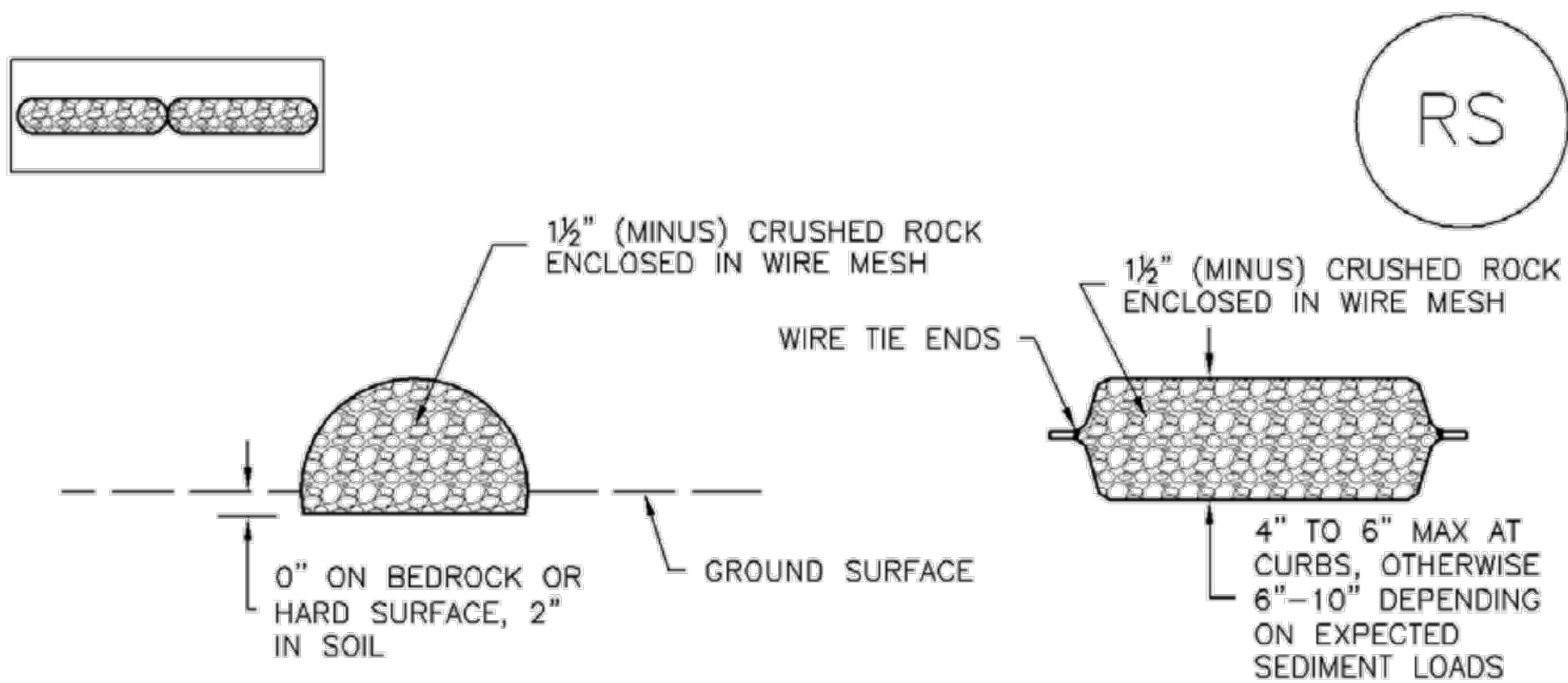
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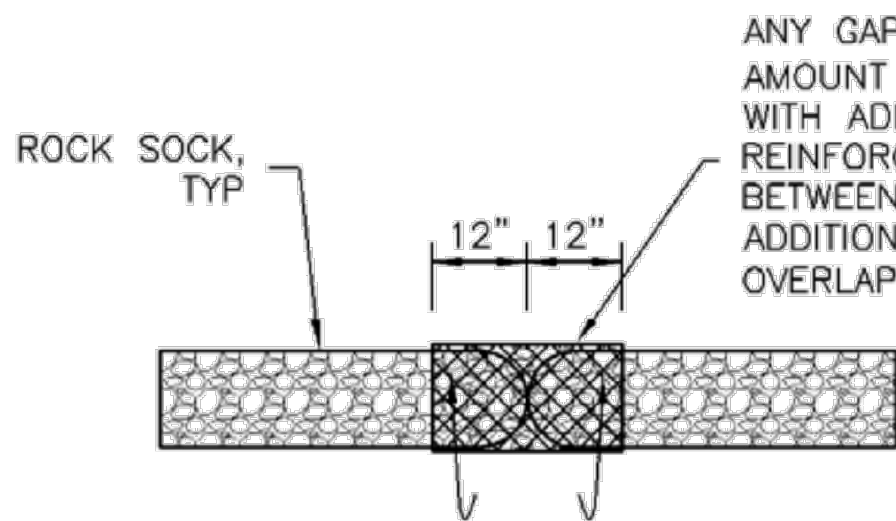
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ROCK SOCK SECTION

ROCK SOCK PLAN



ROCK SOCK JOINTING

GRADATION TABLE	
SIEVE SIZE	MASS PERCENT PASSING SQUARE MESH SIEVES
	NO. 4
2"	100
1 1/2"	90 - 100
1"	20 - 55
3/4"	0 - 15
3/8"	0 - 5
MATCHES SPECIFICATIONS FOR NO. 4 COARSE AGGREGATE FOR CONCRETE PER AASHTO M43. ALL ROCK SHALL BE FRACTURED FACE, ALL SIDES.	

ROCK SOCK INSTALLATION NOTES

- SEE PLAN VIEW FOR:
-LOCATION(S) OF ROCK SOCKS.
- CRUSHED ROCK SHALL BE 1 1/2" (MINUS) IN SIZE WITH A FRACTURED FACE (ALL SIDES) AND SHALL COMPLY WITH GRADATION SHOWN ON THIS SHEET (1 1/2" MINUS).
- WIRE MESH SHALL BE FABRICATED OF 10 GAGE POULTRY MESH, OR EQUIVALENT, WITH A MAXIMUM OPENING OF 1/2", RECOMMENDED MINIMUM ROLL WIDTH OF 48"
- WIRE MESH SHALL BE SECURED USING "HOG RINGS" OR WIRE TIES AT 6" CENTERS ALONG ALL JOINTS AND AT 2" CENTERS ON ENDS OF SOCKS.
- SOME MUNICIPALITIES MAY ALLOW THE USE OF FILTER FABRIC AS AN ALTERNATIVE TO WIRE MESH FOR THE ROCK ENCLOSURE.

RS-1. ROCK SOCK PERIMETER CONTROL

ROCK SOCK MAINTENANCE NOTES

- INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.
- FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.
- WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.
- ROCK SOCKS SHALL BE REPLACED IF THEY BECOME HEAVILY SOILED, OR DAMAGED BEYOND REPAIR.
- SEDIMENT ACCUMULATED UPSTREAM OF ROCK SOCKS SHALL BE REMOVED AS NEEDED TO MAINTAIN FUNCTIONALITY OF THE BMP, TYPICALLY WHEN DEPTH OF ACCUMULATED SEDIMENTS IS APPROXIMATELY 1/2 OF THE HEIGHT OF THE ROCK SOCK.
- ROCK SOCKS ARE TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND APPROVED BY THE LOCAL JURISDICTION.
- WHEN ROCK SOCKS ARE REMOVED, ALL DISTURBED AREAS SHALL BE COVERED WITH TOPSOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED AS APPROVED BY LOCAL JURISDICTION.

(DETAIL ADAPTED FROM TOWN OF PARKER, COLORADO AND CITY OF AURORA, COLORADO, NOT AVAILABLE IN AUTOCAD)

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM UDFCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

NOTE: THE DETAILS INCLUDED WITH THIS FACT SHEET SHOW COMMONLY USED, CONVENTIONAL METHODS OF ROCK SOCK INSTALLATION IN THE DENVER METROPOLITAN AREA. THERE ARE MANY OTHER SIMILAR PROPRIETARY PRODUCTS ON THE MARKET. UDFCD NEITHER NDORSES NOR DISCOURAGES USE OF PROPRIETARY PROTECTION PRODUCTS; HOWEVER, IN THE EVENT PROPRIETARY METHODS ARE USED, THE APPROPRIATE DETAIL FROM THE MANUFACTURER MUST BE INCLUDED IN THE SWMP AND THE BMP MUST BE INSTALLED AND MAINTAINED AS SHOWN IN THE MANUFACTURER'S DETAILS.

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REVISIONS DESCRIPTION

DATE

REV.
NO.

REVISIONS

EROSION AND SEDIMENT CONTROL DETAILS

2024 TREATED WATER SYSTEM IMPROVEMENTS
PRV'S REPLACEMENT PROJECT

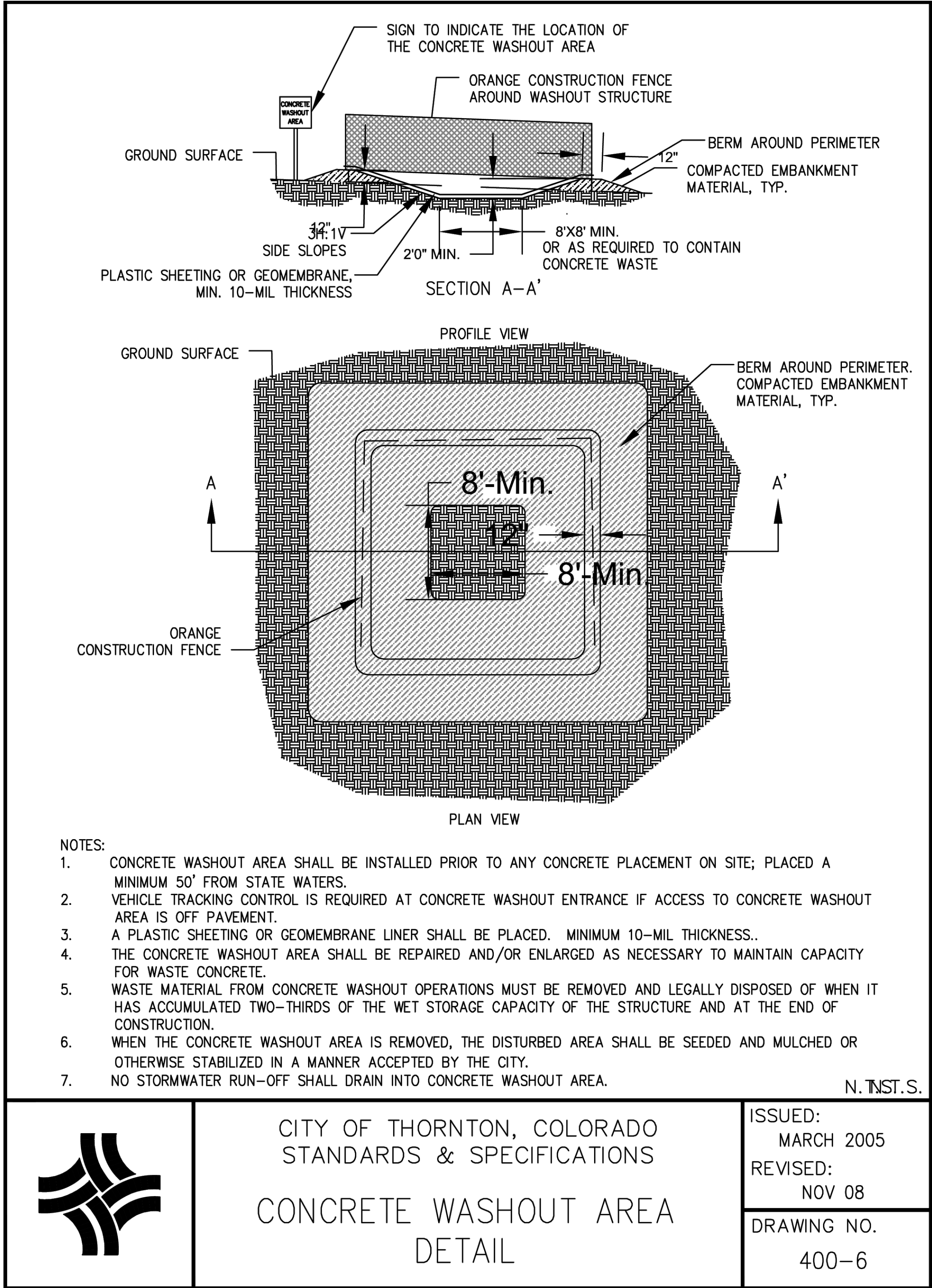
THORNTON, COLORADO

2026

drawn by: CAU
checked by: CAU
approved by: CAU
QA/QC by: CAU
project no.: 024-03983
drawing no.: DTL1
date: 2026-03-06

SHEET
7 of 18

DWG: F:\2024\03501-04000\024-03983\40-Design\AutoCAD\Final Plans\Sheets\WTS\W-DTL01_02403983.dwg
DATE: Sep 15, 2026 10:55am
USER: cuhrich



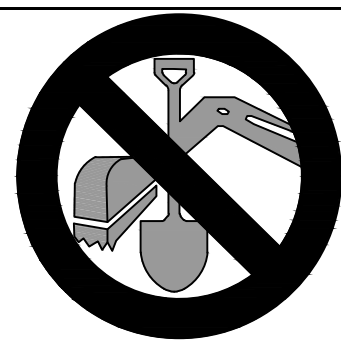
CITY OF THORNTON, COLORADO
STANDARDS & SPECIFICATIONS
CONCRETE WASHOUT AREA
DETAIL

ISSUED:
MARCH 2005
REVISED:
NOV 08
DRAWING NO.
400-6

CALL UTILITY NOTIFICATION
CENTER OF COLORADO

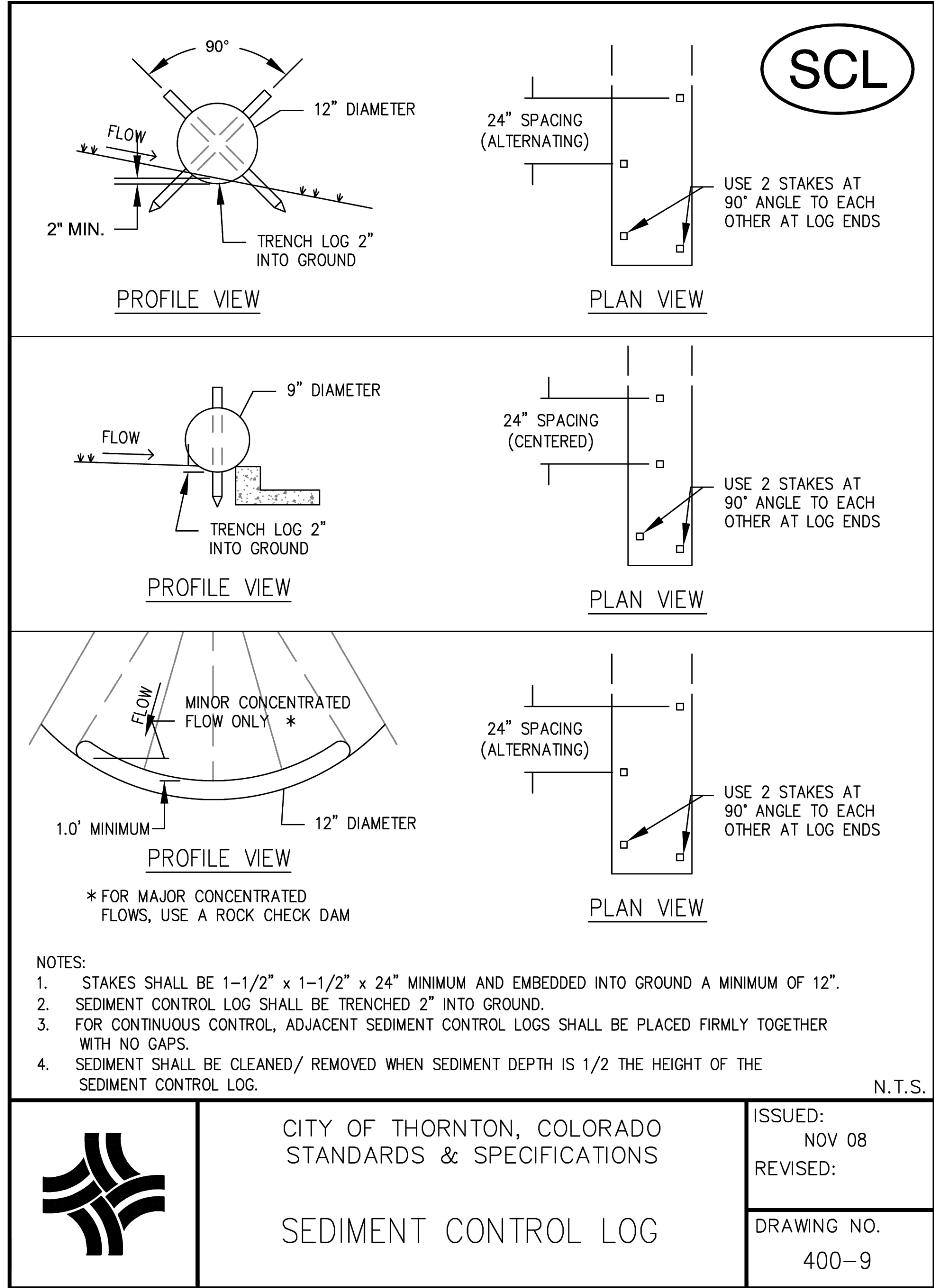
811

CALL 3-BUSINESS DAYS IN ADVANCE
BEFORE YOU DIG, GRADE, OR EXCAVATE
FOR THE MARKING OF UNDERGROUND
MEMBER UTILITIES.



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CITY OF THORNTON, COLORADO
STANDARDS & SPECIFICATIONS
SEDIMENT CONTROL LOG

ISSUED:
NOV 08
REVISED:
DRAWING NO.
400-9

drawn by: CAU
checked by: CAU
approved by: CAU
QA/QC by: CAU
project no.: 024-03983
drawing no.: DTL2
date: 2026-03-06

SHEET
8 of 18

EROSION AND SEDIMENT CONTROL DETAILS

2024 TREATED WATER SYSTEM IMPROVEMENTS
PRV'S REPLACEMENT PROJECT

THORNTON, COLORADO

2026

REVISIONS DESCRIPTION

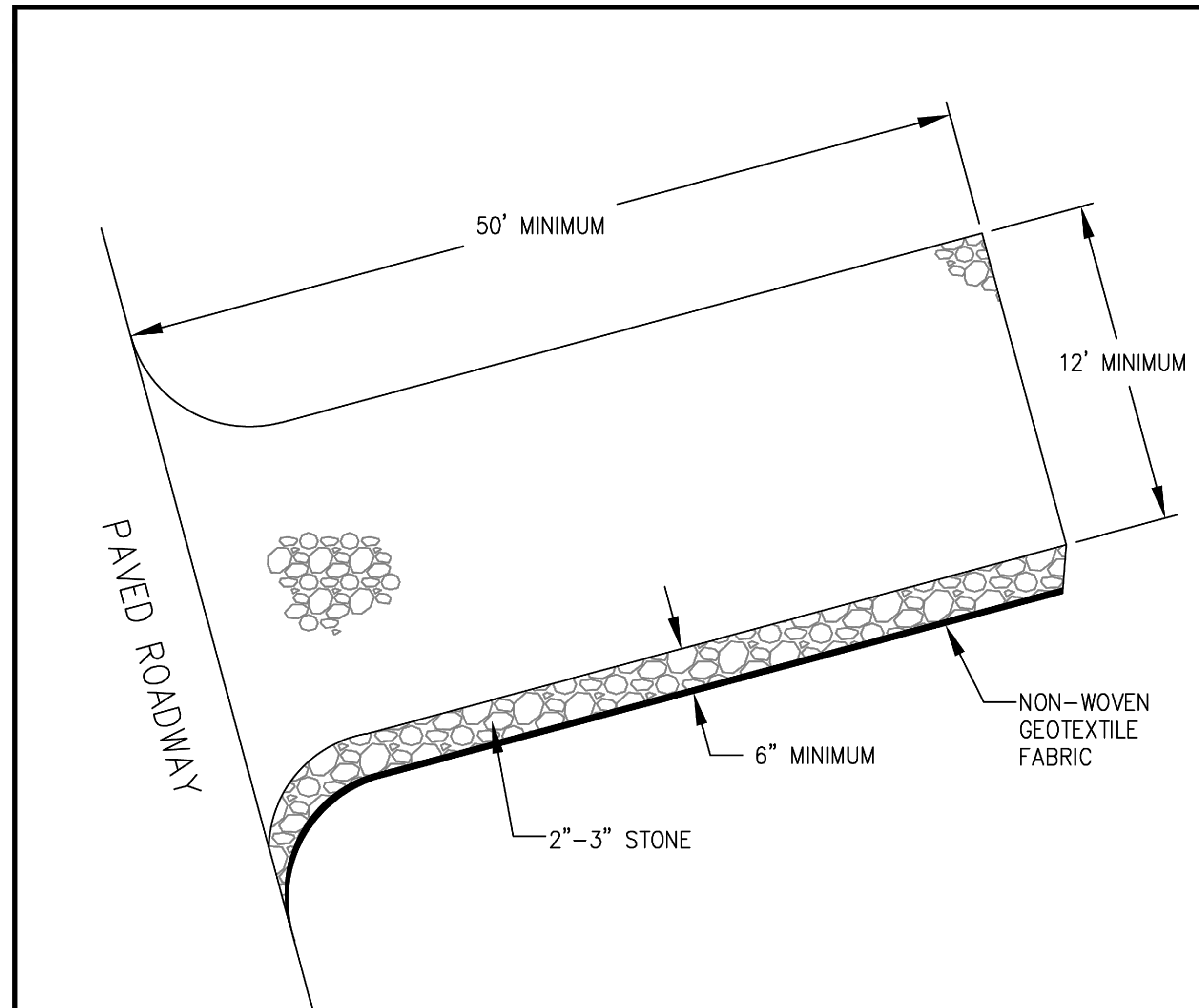
DATE

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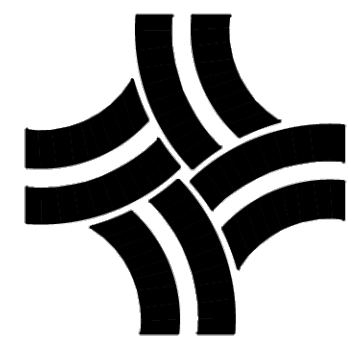
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NOTES:

1. PAVED ROADWAY TO BE KEPT CLEAN OF MUD, DIRT, ROCKS, AND DEBRIS AT ALL TIMES.
2. GEOTEXTILE FABRIC SHALL COMPLY WITH CDOT 712.08b.
3. 2"—3" STONE SHALL CONTAIN LESS THAN 10% FINES.
4. CONSTRUCTION EXIT SHALL BE MAINTAINED AT ALL TIMES. STONE SHOULD BE BLADED AND/OR ADDITIONAL 2"—3" STONE SHOULD BE PLACED IF VOIDS BEGIN FILLING WITH DEBRIS.
5. IF A DRAINAGE DITCH EXISTS NEXT TO ROADWAY, INSTALL TEMPORARY CULVERT UNDERNEATH STONE CONSTRUCTION EXIT TO CONVEY FLOW.
6. PROVIDE INLET PROTECTION FOR ANY INLETS LOCATED IMMEDIATELY ADJACENT TO THE CONSTRUCTION EXIT.
7. IF TRACKOUT DOES OCCUR, ROADWAY SHOULD BE SWEEPED IMMEDIATELY.
8. RECYCLED CONCRETE OR RECYCLED ASPHALT SHALL NOT BE USED.

N.T.S.



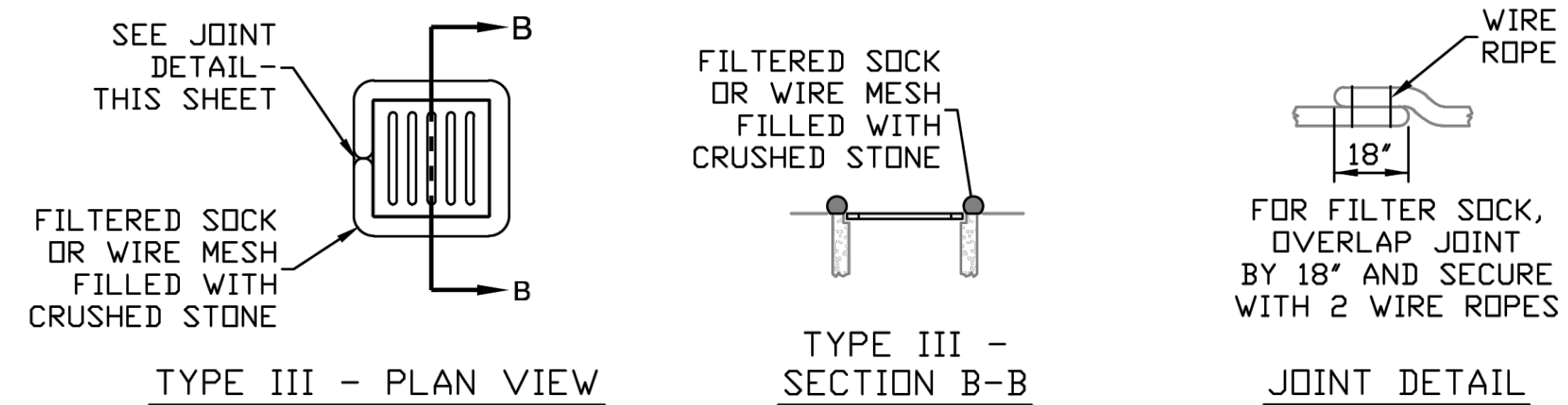
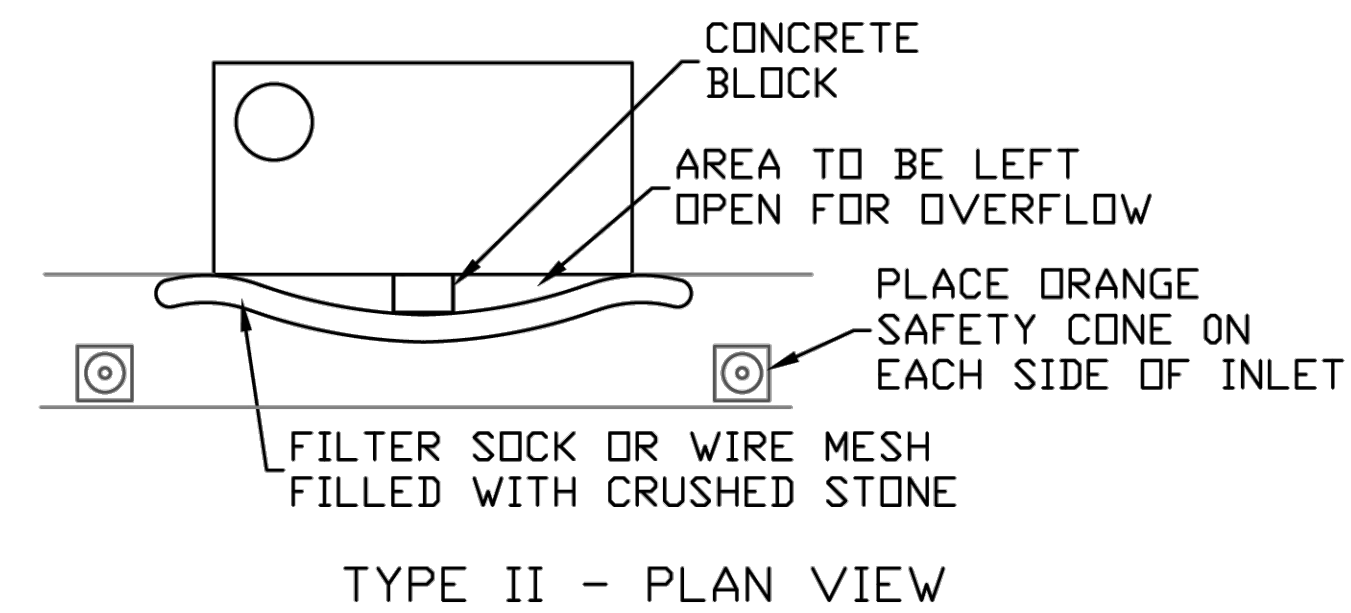
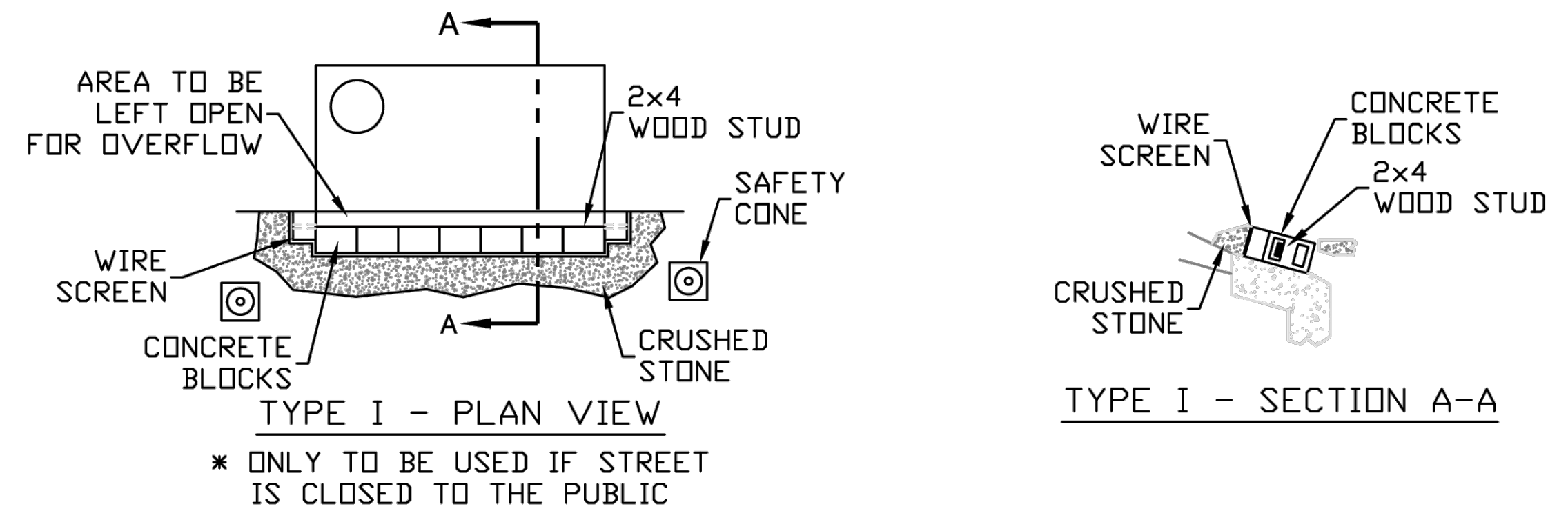
CITY OF THORNTON, COLORADO

STANDARDS & SPECIFICATIONS

VEHICLE TRACKING PAD

ISSUED:
NOV 08
REVISED:

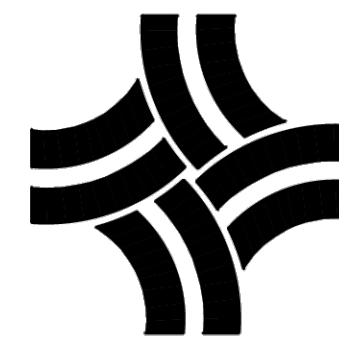
DRAWING NO.
400-7



NOTES:

1. CRUSHED STONE SHALL BE NO. 4 STONE WITH 0% PASSING THE 3/4" SIEVE.
2. SEDIMENT SHALL BE REMOVED WHEN SEDIMENT ACCUMULATION REACHES 1/2 THE INLET PROTECTION HEIGHT.
3. INLET PROTECTION SHALL BE PLACED IN A MANNER NOT TO CAUSE SIGNIFICANT FLOODING IN PUBLIC STREETS OR AREAS.
4. INSET FILTER BAGS WITH OVERFLOW PORTS MAY BE USED IN HIGH TRAFFIC AREAS AS A SUBSTITUTE.
5. IF LARGE DEPOSITS OF SEDIMENT ENTERS THE STORM SEWER, THE CONTRACTOR SHALL CLEAN THE STORM SEWER TO THE SATISFACTION OF THE CITY.

N.T.S.

CITY OF THORNTON, COLORADO
STANDARDS & SPECIFICATIONS

INLET PROTECTION

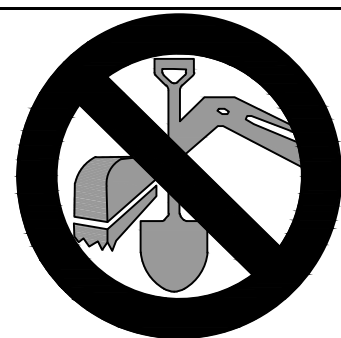
ISSUED:
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[illegible]

EROSION AND SEDIMENT CONTROL DETAILS

2024 | TREATED WATER SYSTEM IMPROVEMENTS
PRV'S REPLACEMENT PROJECT

THORNTON, COLORADO

Drawn by:	CAU
Checked by:	CAU
Approved by:	CAU
QA/QC by:	CAU
Project no.:	024-03983
Drawing no.:	DTL2
Date:	2026-03-06

SHEET
of 18

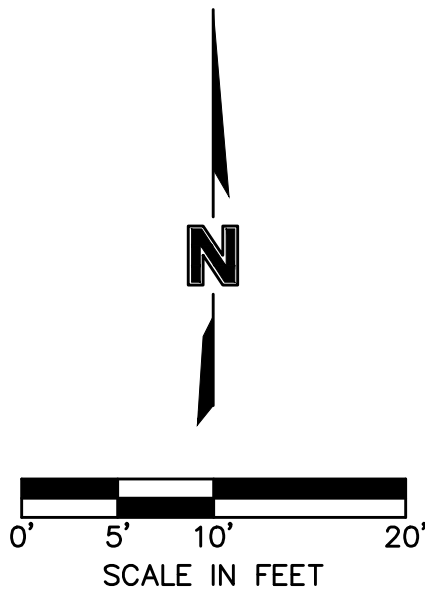
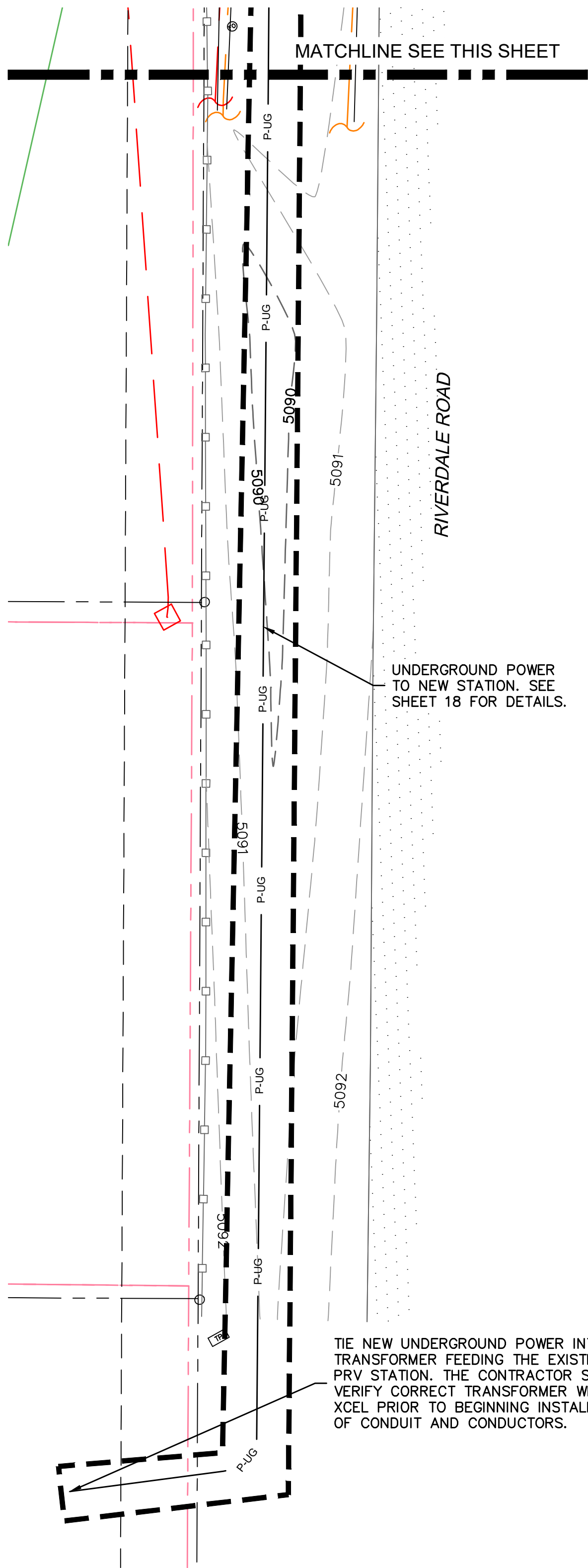
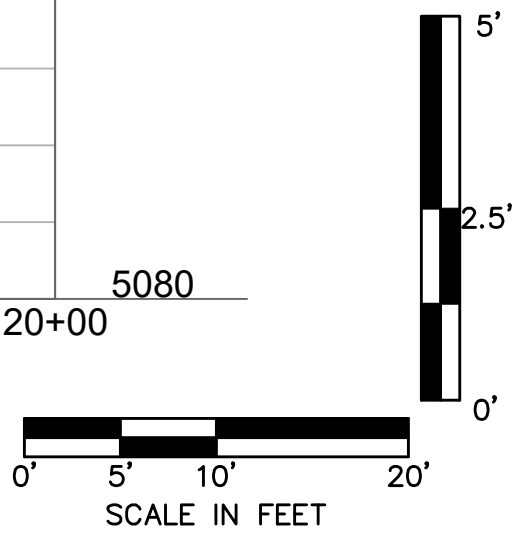
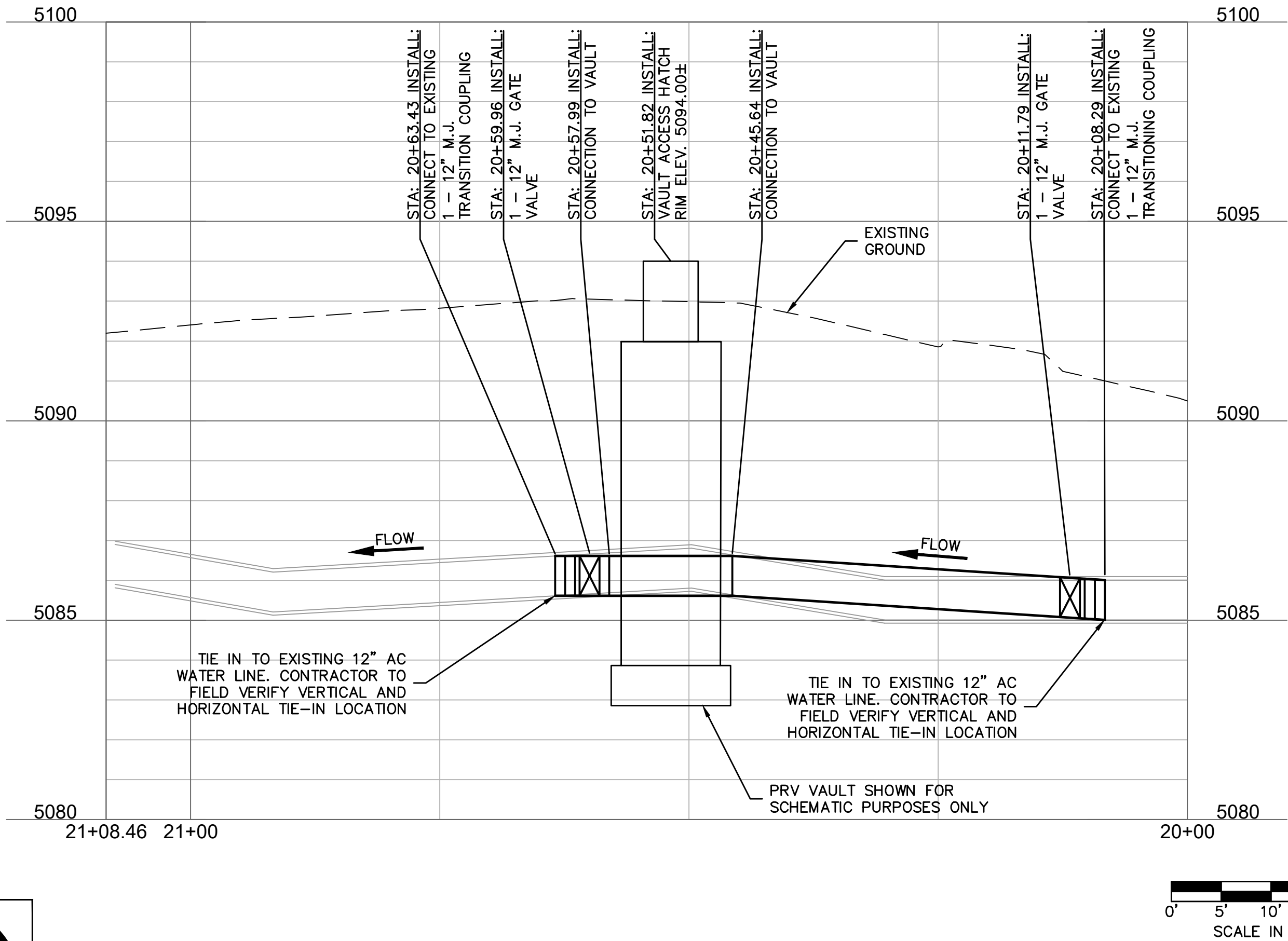
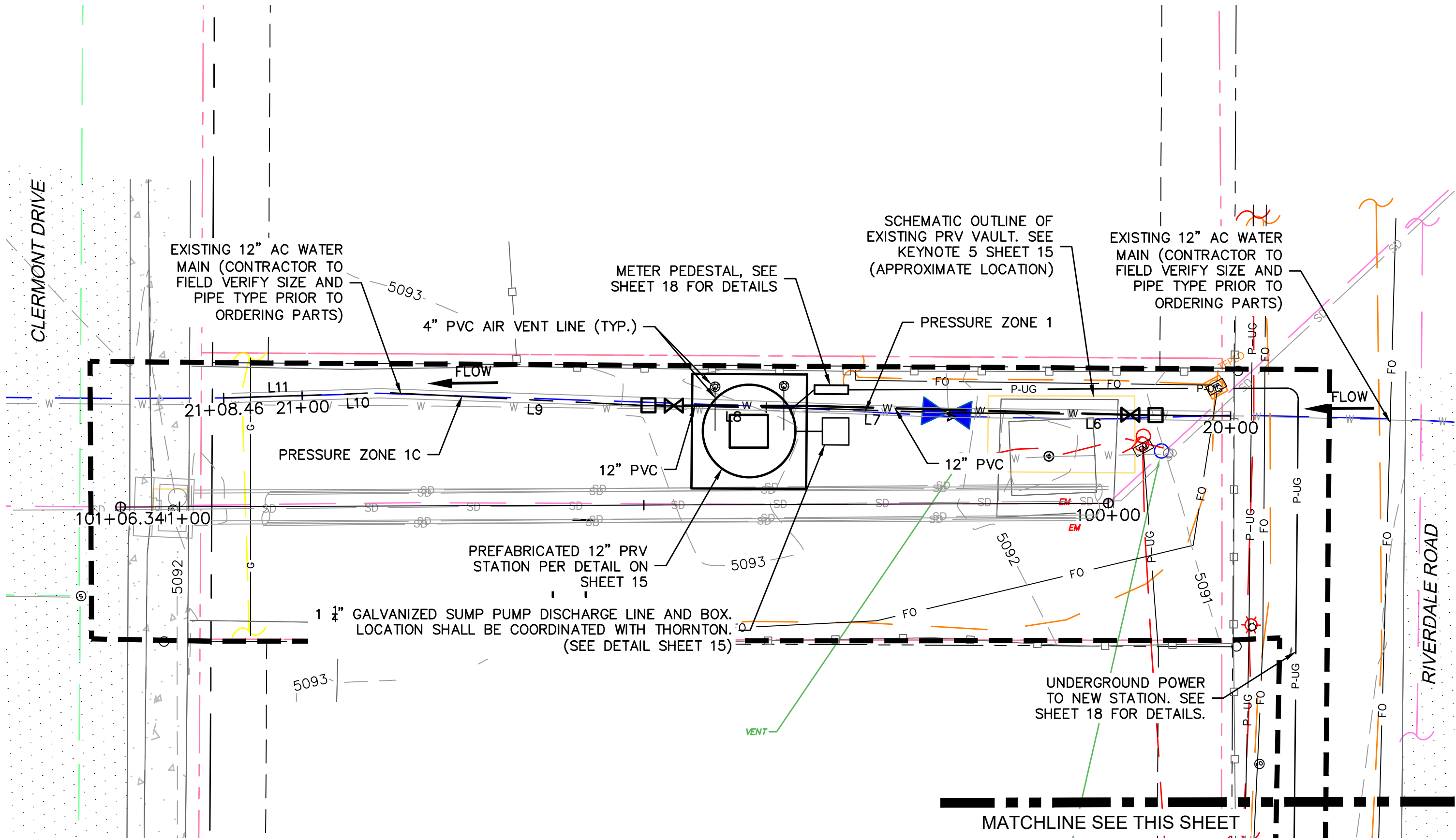
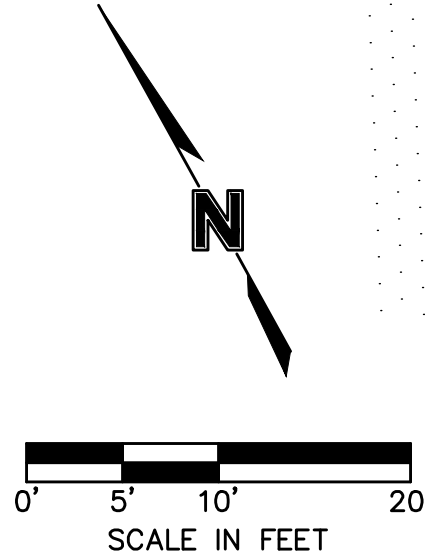
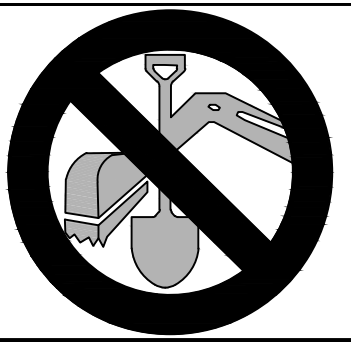
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P_PBASE_02403983
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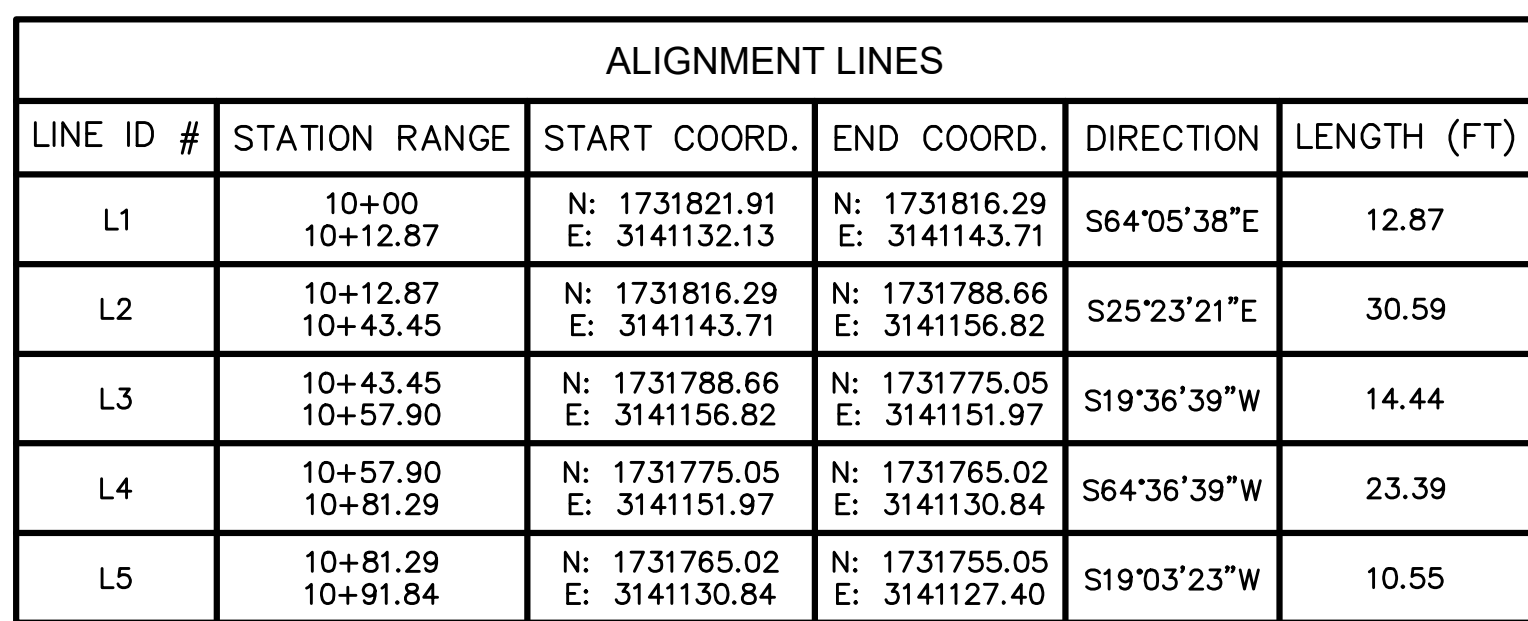
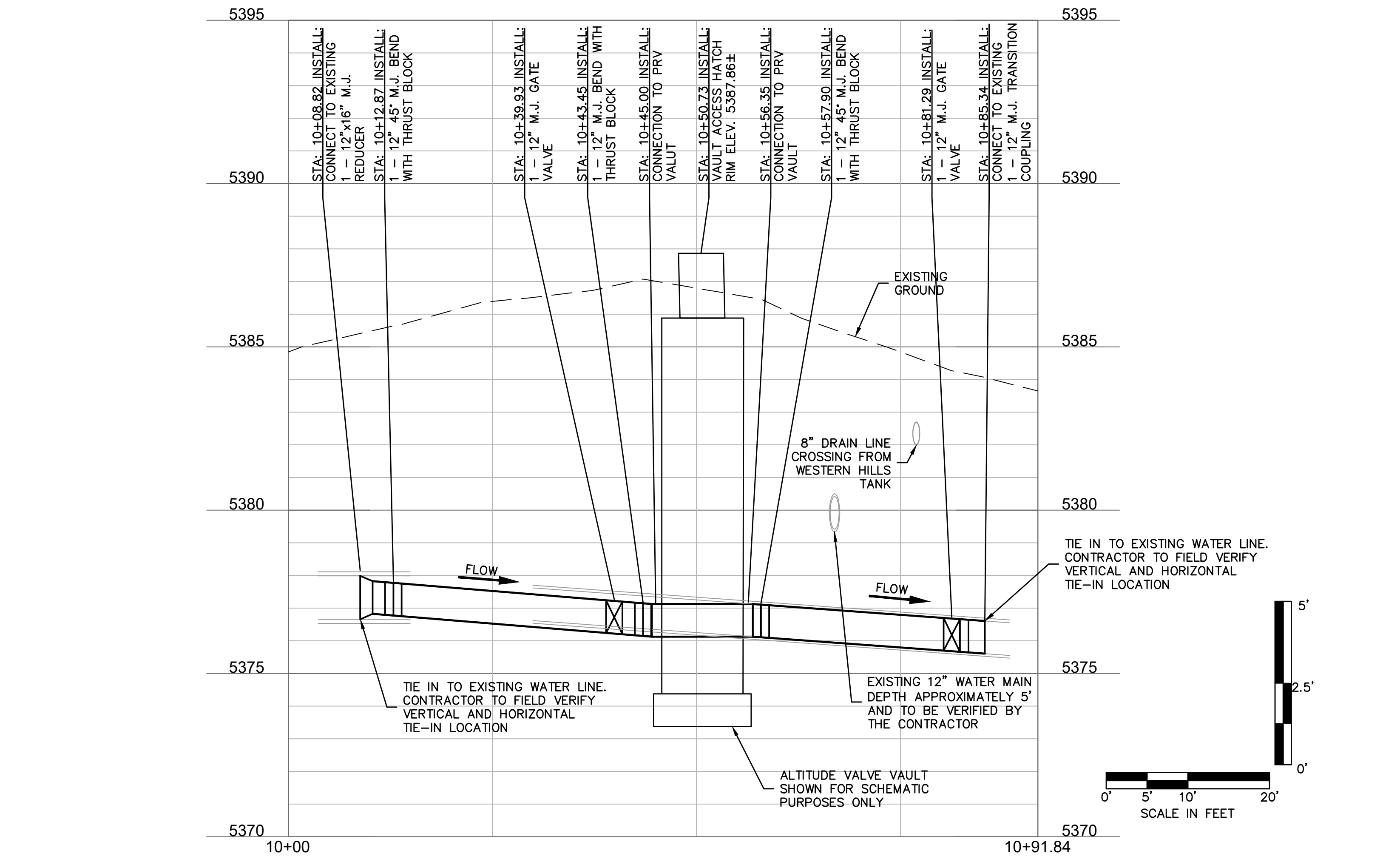


ALIGNMENT LINES					
LINE ID #	STATION RANGE	START COORD.	END COORD.	DIRECTION	LENGTH (FT)
L6	20+00 20+30.38	N: 1740145.39 E: 3158966.65	N: 1740160.31 E: 3158940.19	N60°34'42"W	30.38
L7	20+30.38 20+43.16	N: 1740160.31 E: 3158940.19	N: 1740166.82 E: 3158929.19	N59°23'15"W	12.77
L8	20+43.16 20+63.43	N: 1740166.82 E: 3158929.19	N: 1740176.90 E: 3158911.61	N60°10'28"W	20.27
L9	20+63.43 20+91.70	N: 1740176.90 E: 3158911.61	N: 1740191.72 E: 3158887.52	N58°23'08"W	28.28
L10	20+91.70 20+95.89	N: 1740191.72 E: 3158887.52	N: 1740193.54 E: 3158883.75	N64°19'09"W	4.19
L11	20+95.89 21+08.46	N: 1740193.54 E: 3158883.75	N: 1740199.26 E: 3158872.56	N62°55'29"W	12.57

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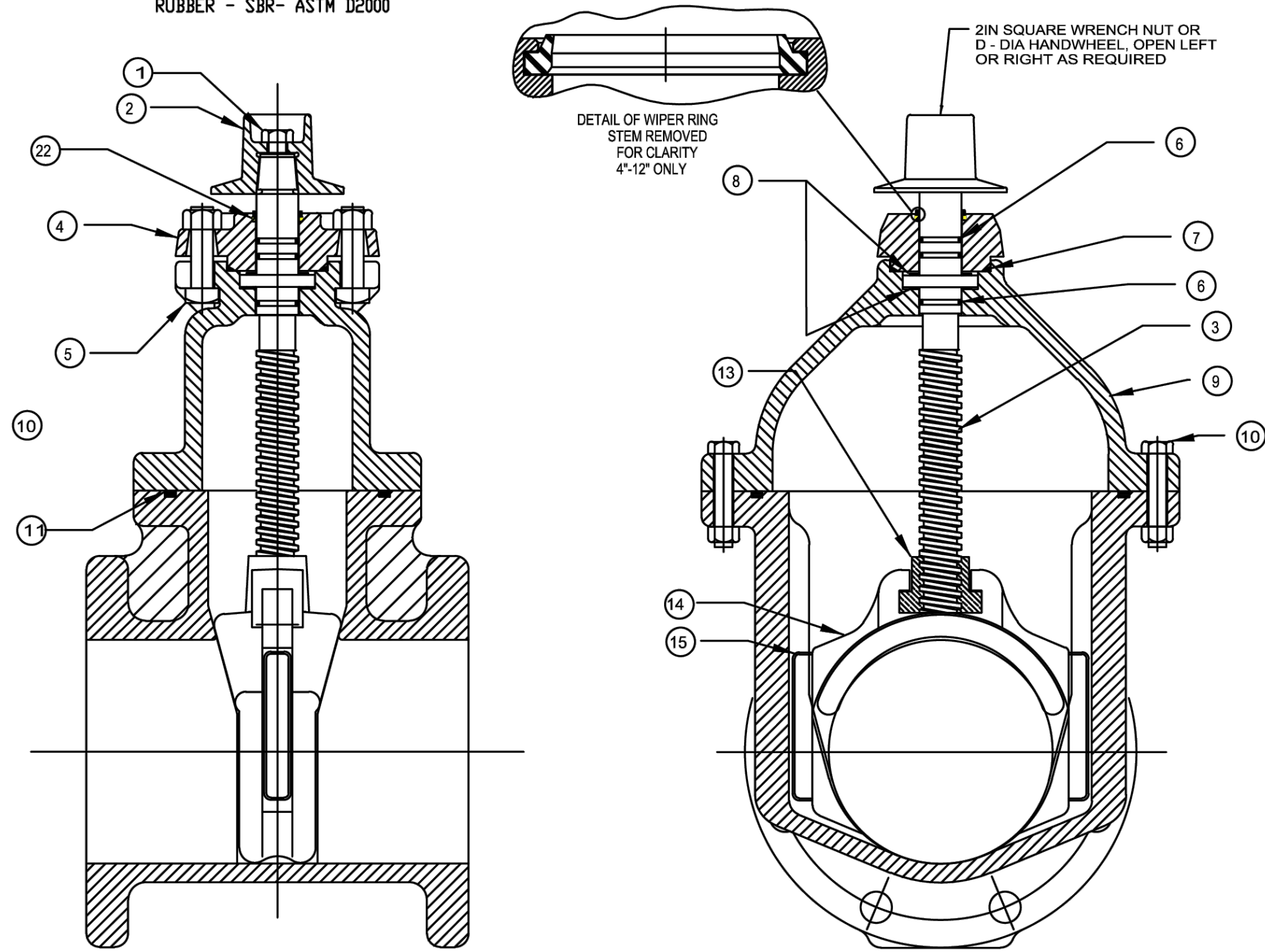
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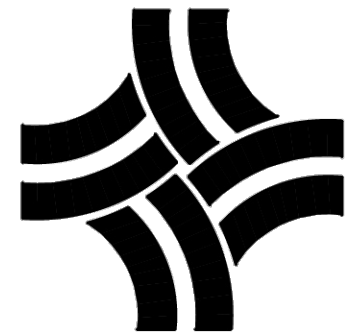
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DATE: Sep 15, 2026 10:59am
USER: cuhrich
XREFS: W_PTBK_02403983

NOTES:
1. RUBBER ENCAPSULATED CAST IRON DISC
CAST IRON - ASTM A126 CLASS B
RUBBER - SBR- ASTM D2000



PART LIST				
ITEM	DESCRIPTION	REQ'D	MATERIAL	ASTM
1	CAP SCREW	1	304 STAINLESS STEEL	A193 GRADE B8
2	WRENCH NUT	1	CAST IRON	A126 CLASS B
3	STEM	1	BRONZE	B138 ALLOY C67600
4	STUFFING BOX	1	CAST IRON	A126 CLASS B
5	STUFFING BOX BOLTS	2	304 STAINLESS STEEL	A193 GRADE B8
	STUFFING BOX NUTS		304 STAINLESS STEEL	F594 GROUP 1
6	O-RING	3	RUBBER	D2000 NITRILE
7	O-RING	1	RUBBER	D2000 NITRILE
8	ANTI-FRICTION WASHER	2	CELCON	
9	BONNET	1	CAST IRON	A126 CLASS B
10	BONNET BOLTS	"Z"	304 STAINLESS STEEL	A193 GRADE B8
	BONNET NUTS		304 STAINLESS STEEL	F594 GROUP 1
11	BONNET GASKET (O-RING)	1	RUBBER	D2000 NITRILE
13	DISC NUT	1	BRONZE	B62 ALLOY C83600
14	DISC	1	SEE NOTE 1	
15	GUIDE CAP	2	CELCON	
16	BODY - FLANGE ENDS	1	CAST IRON	CLASS B
17	HANDWHEEL	1	CAST IRON	A126 CLASS B
18	BODY - MJ ENDS	1	CAST IRON	A126 CLASS B
19	BODY - SLIP-ON ENDS	1	CAST IRON	A126 CLASS B
20	BODY - FLANGE x MJ END	1	CAST IRON	A126 CLASS B
21	BODY - FLANGE x SLIP-ON END	1	CAST IRON	A126 CLASS B
22	WIPER RING	1	RUBBER	

N.T.S.

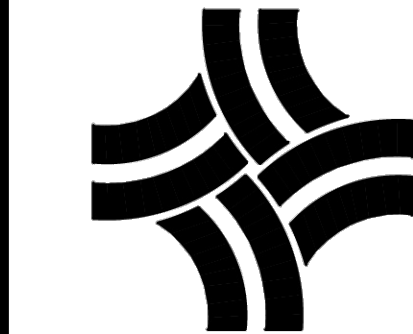


CITY OF THORNTON, COLORADO
STANDARDS & SPECIFICATIONS

GATE VALVE DETAIL

ISSUED:
APRIL 2010
REVISED:

DRAWING NO.
200-6A



CITY OF THORNTON, COLORADO
STANDARDS & SPECIFICATIONS

GATE VALVE AND VALVE BOX
NOTES

ISSUED:
APRIL 2010
REVISED:

DRAWING NO.
200-6B

N.T.S.

GATE VALVES

VALVES SHALL BE MANUFACTURED AND TESTED IN ACCORDANCE WITH AWWA STANDARD C-500, "METAL-SEATED GATE VALVES FOR WATER", OR AWWA C-509 "RESILIENT-SEATED GATE VALVES, 3 THROUGH 12 NPS, FOR WATER AND SEWAGE SYSTEMS" WITH THE FOLLOWING ADDITIONAL REQUIREMENTS OR EXCEPTIONS:

VALVES MEETING AWWA STANDARD C-500 SHALL BE OF A MODIFIED WEDGE DISC CONSTRUCTION, COATED BOTH INSIDE AND OUT WITH A TOUGH, DURABLE EPOXY TO PREVENT CORROSION, CAST IRON BODY, FULLY BRONZE MOUNTED WITH NON-RISING STEMS.

VALVES SHALL BE SUITABLE FOR FREQUENT OPERATION, AS WELL AS SERVICE INVOLVING LONG PERIODS OF INACTIVITY. THE OPERATING PRESSURE FOR VALVES SIX (6) INCHES THROUGH TWELVE (12) INCHES SHALL BE 200 PSI.

VALVE STEMS SHALL BE MADE OF BRONZE AND THREADED SO THAT VALVES SHALL OPEN BY TURNING TO THE LEFT (COUNTERCLOCKWISE). EACH VALVE SHALL BE FURNISHED WITH A TWO (2) INCH SQUARE OPERATING NUT. THE OPERATING NUT SHALL HAVE AN ARROW SHOWING THE DIRECTION OF OPENING AND THE WORD "OPEN" CAST ON THE NUT. THE STEM SEAL SHALL CONSIST OF TWO (2) O-RINGS, ONE OR BOTH POSITIONED ABOVE THE THRUST COLLAR WITH THE VALVE UNDER PRESSURE IN THE FULL OPEN POSITION.

BOLTS AND HEX NUTS USED ON THE BONNET OF THE VALVE SHALL BE THE MANUFACTURER'S STANDARD FABRICATED FROM A LOW ALLOY STEEL FOR CORROSION RESISTANCE.

FLANGES SHALL BE SIZED AND DRILLED IN ACCORDANCE WITH ANSI B-16.1 CLASS 125 SPECIFICATIONS. FLANGES SHALL BE MACHINED IN A FLAT FACE OR MACHINED TO A FLAT SURFACE WITH A SERRATED FINISH IN ACCORDANCE WITH AWWA STANDARD C-207 "STEEL PIPE FLANGES."

THE COMPONENTS OF THE MECHANICAL JOINT SHALL CONFORM TO ANSI A-21.11 (AWWA STANDARD C-111). THE TEE-HEAD BOLTS AND HEXAGON NUTS SHALL BE FABRICATED FROM A HIGH STRENGTH, STAINLESS STEEL, OR AN APPROVED EQUAL.

AFTER APPROVED FACTORY ASSEMBLY, EACH VALVE SHALL BE GIVEN THE OPERATION AND HYDROSTATIC TESTS IN ACCORDANCE WITH THE REFERENCED SPECIFICATIONS.

WEDGE DISC VALVES SHALL BE LIMITED TO THE FOLLOWING MANUFACTURERS OR APPROVED EQUIVALENT: WATEROUS SERIES-500, MUELLER-A-2360, KENSEAL, CLOW R/N. RESILIENT-SEATED GATE VALVES SHALL BE LIMITED TO THE AMERICAN-80 "CRS" GATE VALVE OR THE U.S. PIPE "METROSEAL" GATE VALVE.

THE MANUFACTURER SHALL FURNISH A CERTIFIED STATEMENT THAT THE INSPECTION AND SPECIFIED TESTS HAVE BEEN MADE AND THE RESULTS THEREOF COMPLY WITH THE REQUIREMENTS OF THE APPLICABLE STANDARD(S) HEREIN SPECIFIED. A COPY OF THE CERTIFICATION SHALL BE SENT TO THE DEVELOPMENT ENGINEERING MANAGER UPON REQUEST.

CORROSION PROTECTION SHALL BE COVERED IN SUBSECTION 204.2 OF THESE STANDARDS AND SPECIFICATIONS.

VALVES SHALL BE HANDLED IN SUCH A MANNER AS TO PREVENT ANY INJURY OR DAMAGE AND SHALL BE THOROUGHLY CLEANED BEFORE INSTALLATION. VALVES SHALL BE SET IN SUCH A MANNER THAT THE VALVE STEMS ARE PLUMB. VALVES SHALL BE LOCATED AT POINTS AS SPECIFIED IN SUBSECTION 203.8 OF THESE STANDARDS AND SPECIFICATIONS.

VALVE BOXES

VALVE BOX PARTS SHALL BE MANUFACTURED BY TYLER, SERIES 6860 OR AN APPROVED EQUIVALENT MANUFACTURER AND MADE OF GRAY CAST IRON, BUFFALO TYPE WITH NO. 160 OVAL BASE. A FIVE AND ONE-QUARTER (5 1/4) INCH SCREW-TYPE SHAFT SHALL BE ADJUSTABLE FROM 45 INCHES TO 66 INCHES. VALVE BOX LIDS SHALL BE MARKED WITH THE WORD "WATER" AND SHALL HAVE A LIP OR FLANGE EXTENDING INTO THE VALVE BOX SHAFT. NO SLIP-TYPE BOXES SHALL BE ALLOWED. THE VALVE BOX SHALL BE OF A DESIGN WHICH SHALL NOT TRANSMIT SHOCK OR STRESS TO THE VALVE AND SHALL BE CENTERED AND PLUMB OVER THE OPERATING NUT OF THE VALVE WITH THE BOX COVER FLUSH WITH THE SURFACE OF THE PAVEMENT. IN NON-PAVED AREAS, A 24 INCH SQUARE CONCRETE COLLAR IS REQUIRED AROUND VALVE BOX COVER AS PER THE STANDARD DETAIL IN SECTION 200 OF THESE STANDARDS AND SPECIFICATIONS. IN UNIMPROVED ROADWAYS THE VALVE BOX COVER SHALL BE SET SIX (6) INCHES BELOW FINAL GRADE WITH A MARKER POST INDICATING THE LOCATION AS PER THE STANDARD DETAIL DRAWING.

THE MANUFACTURER SHALL FURNISH A CERTIFIED STATEMENT THAT THE INSPECTION AND SPECIFIED TESTS HAVE BEEN MADE AND THE RESULTS THEREOF COMPLY WITH THE REQUIREMENTS OF THE APPLICABLE STANDARD(S) HEREIN SPECIFIED. A COPY OF THE CERTIFICATION SHALL BE SENT TO THE DEVELOPMENT ENGINEERING MANAGER UPON REQUEST.

FOR VALVE BOXES ALONG FIRE SPRINKLER LINES THE LID SHALL BE LABELED "FIRE".

CORROSION PROTECTION SHALL BE COVERED IN SUBSECTION 204.2 OF THESE STANDARDS AND SPECIFICATIONS.

FINAL ELEVATION OF VALVE BOXES SHALL BE LEFT TO THE DISCRETION OF THE DEVELOPMENT ENGINEERING MANAGER.

VALVE BOXES SHALL BE INSTALLED PLUMB.

VALVE BOXES WHICH HAVE SHIFTED DURING BACKFILL OPERATIONS AND ARE NO LONGER PLUMB, SHALL BE RE-EXCAVATED AND RE-ALIGNED TO THE SATISFACTION OF THE DEVELOPMENT ENGINEERING MANAGER.

FOR GREENBELT AREA APPLICATION, REFER TO DETAIL 200-7

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REVISIONS DESCRIPTION

REV. NO.

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REVISIONS

GATE VALVE AND VALVE BOX DETAILS

2024 TREATED WATER SYSTEM IMPROVEMENTS
PRV'S REPLACEMENT PROJECT

THORNTON, COLORADO

2026

drawn by: CAU
checked by: CAU
approved by: CAU
QA/QC by: CAU
project no.: 024-03983
drawing no.: DTL3
date: 2026-03-06

SHEET
12 of 18

Ø 11/16

4 anchor holes

A diagram of a mesh screen cap assembly. It consists of a cylindrical body with a flat top. The top is covered by a mesh screen, which is held in place by a cap. The cap is labeled "Cap" and the mesh screen is labeled "Mesh Screen". The assembly is shown with a side view and a top view.

NOTE:

1. ADD CONCRETE REINFORCEMENT BASE TO VENTS TO INCLUDE SS316 MOUNTING HARDWARE WITH WEATHER SEAL BETWEEN CONCRETE AND VENT STACK

AIR VENT PIPE TO BE CAST
DIRECTLY INTO FOUNDATION

Technical drawings of a monument, showing front, side, and cross-section views with dimensions and labels.

Front View (Left):

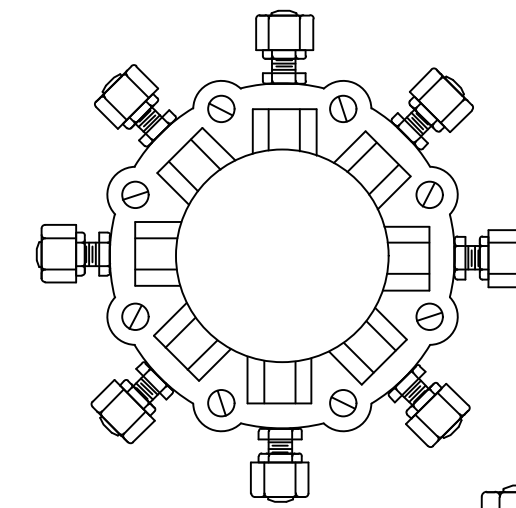
- Overall height: 38 5/8"
- Top width: 9 7/16"
- Top label: B
- Base width: 14 3/16"
- Base label: B_d
- Label: CAST ANCHOR (pointing to the base)

Side View (Right):

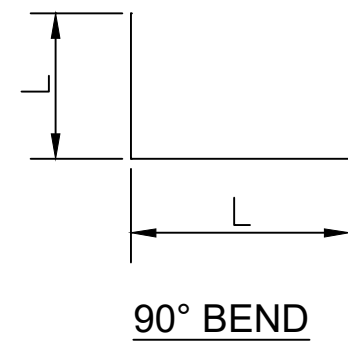
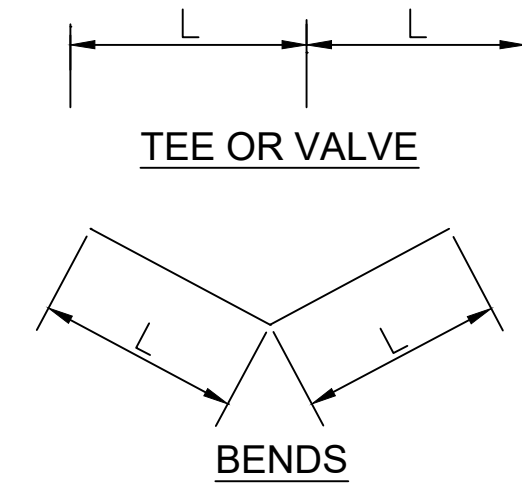
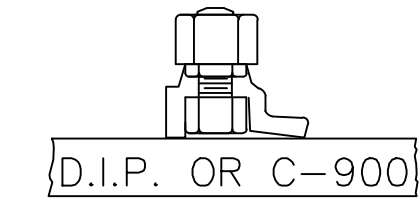
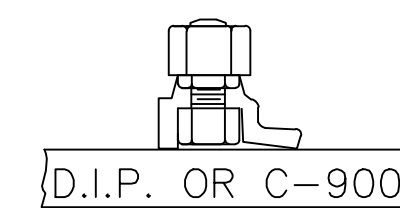
- Top label: Cap
- Label: Mesh Screen
- Label: Base
- Label: Branding area
- Top width: 6"
- Base width: 7 7/8"
- Base label: 1/4" CHAMFER
- Label: GRADE

Cross-section View (Bottom):

- Section label: SECTION B-B
- Height: 36"
- Width: 12"
- Label: CONCRETE FOOTING
- Label: 3-#6 HOOP BARS
- Label: 3-#4 TIES



FOR INSTALLATION ON C-900 PVC OR DUCTILE IRON PIPE USE AS
RECEIVED
AND INSTALL PER INSTRUCTIONS.



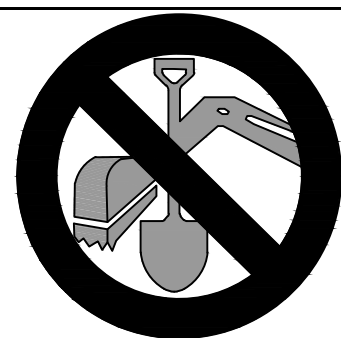
NOMINAL PIPE SIZE	SHIPPING WEIGHT	PIPE O.D.	
		P.V.C. AWWA C900	DUCTILE IRON ASTM A53
4"	8.8	4.800	4.800
6"	12.1	6.900	6.900
8"	16.3	9.050	9.050
10"	26.0	11.10C	11.10C
12"	31.4	13.20C	13.20C

PIPE SIZE	4"			6"			8"		
FITTING	D	L	G	D	L	G	D	L	G
PLUG, TEE OR 90° BEND	3/4"	30'	M.S.	3/4"	45'	M.S.	3/4"	60'	M.S.
45° BEND	3/4"	9'	M.S.	3/4"	13'	M.S.	3/4"	18'	M.S.
22-1/2° BEND	3/4"	1'	M.S.	3/4"	5'	M.S.	3/4"	6'	M.S.
11-1/4° BEND	—	—	—	—	—	—	3/4"	3'	M.S.

1. LENGTH OF RESTRAINED PIPE MEASURED EACH WAY FROM BENDS.
2. CLAMPS AND RODS SHALL BE EXTENDED TO NEXT PIPE.
3. D = DIAMETER, L = LENGTH, G = GRADE, M.S. = MILD STEEL, H.S. = HIGH STRENGTH STEEL.
4. MINIMUM 6.0' OF GROUND COVER IS REQUIRED.
5. BASED ON 200 P.S.I., INTERNAL PRESSURE.
6. M.S.=MILD STEEL ROD, A.S.T.M. STANDARD DESIGNATION A-36.
7. H.S.=HIGH STRENGTH ROD, A.S.T.M. STANDARD DESIGNATION A-193, GRADE B-7.
8. NUTS SHALL BE A.S.T.M., STANDARD DESIGNATION A-307, GRADE A OR B, HEXAGON HEAVY SERIES.
9. LENGTH REFERS TO THE AMOUNT OF PIPE WHICH MUST BE RESTRAINED TOGETHER, AND IS NOT NECESSARILY THE LENGTH OF THE RODS.
10. LENGTH OF RESTRAINED PIPE TABLE IS ALSO FOR THE LENGTH OF JOINT RESTRAINT FOR MEGALUGS.

811

**CALL 3-BUSINESS DAYS IN ADVANCE
BEFORE YOU DIG, GRADE, OR EXCAVATE
FOR THE MARKING OF UNDERGROUND
MEMBER UTILITIES.**



September 15, 2026
DATE PRINTED
OLSSON

olson

Suite 400
Denver, CO 80204
TEL 303.237.2072 www.olsson.com

LESSON ASSUMES NO RESPONSIBILITY FOR EXISTING UTILITY LOCATIONS (HORIZONTAL OR VERTICAL). THE EXISTING UTILITIES SHOWN IN THIS DRAWING HAVE BEEN OBTAINED FROM THE BEST AVAILABLE INFORMATION. IT IS HOWEVER THE RESPONSIBILITY OF THE CONTRACTOR TO FIELD VERIFY THE LOCATION OF ALL UTILITIES PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION ACTIVITIES.

[illegible]

AIR VENT AND MECHANICAL JOINT RESISTANCE DETAILS

2024 I REATED WATER SYSIEM IMPROVEMENT IS
PRV'S REPLACMENT PROJECT

THORNION, COLORADO

Drawn by: CAU
 Checked by: CAU
 Approved by: CAU
 A/QC by: CAU
 Project no.: 024-03983
 Drawing no.: DTL3
 Date: 2026-03-06

SHEET
of 18

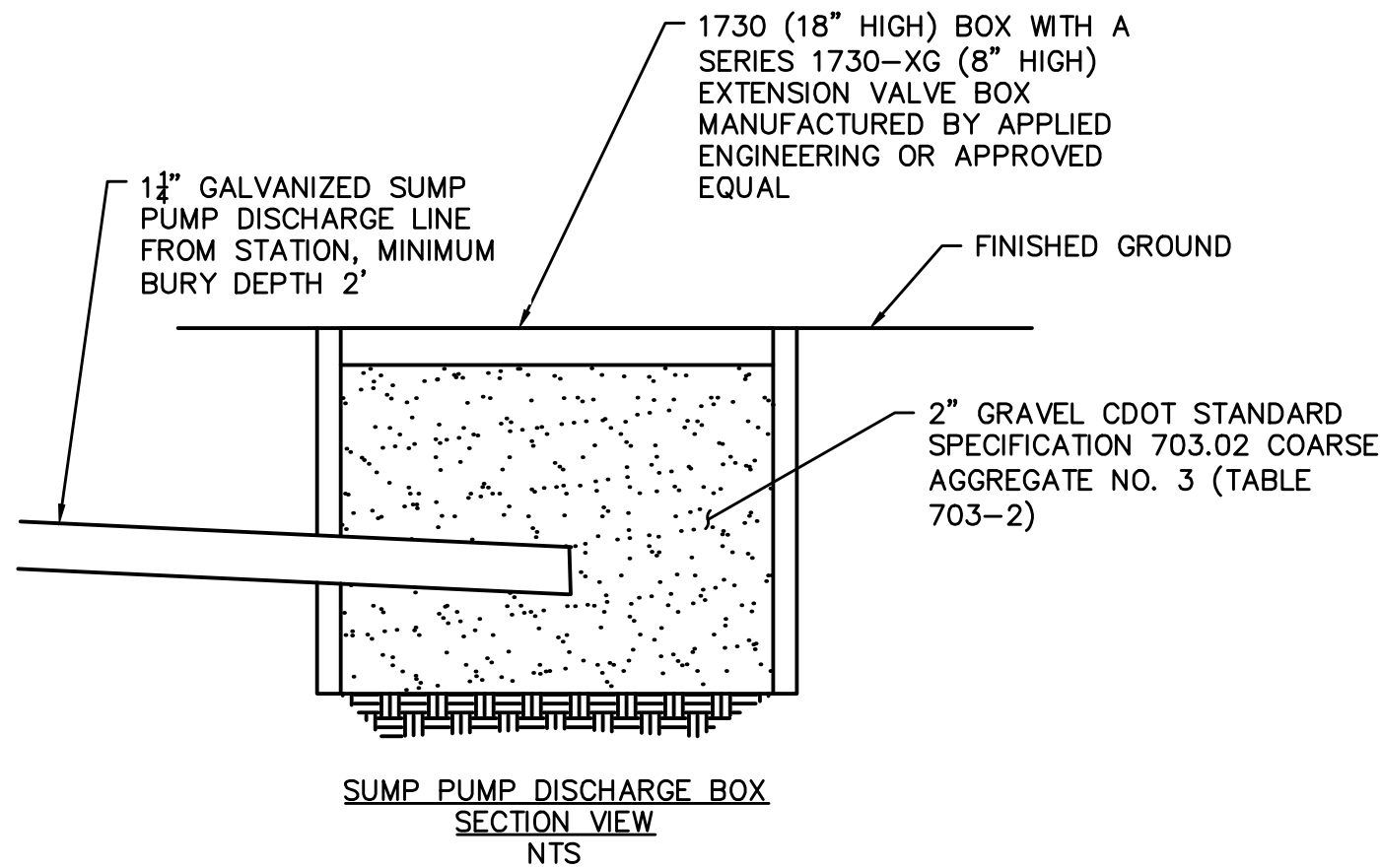
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USER: culrich

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PRV VAULT KEY NOTES

- THE PRESSURE REDUCING VALVE (PRV) VAULT SHALL CONFORM TO THE CITY OF THORNTON PRESSURE REDUCING VAULT STANDARD DETAIL AS SEEN ON THIS SHEET, INCLUDING THE ADDITIONAL REQUIREMENTS IN NOTE 2 BELOW AND BE MANUFACTURED BY ENGINEERED FLUID, INC., DAKOTA PUMPS OR APPROVED EQUIVALENT.
- THE CITY OF THORNTON PRV VAULT SHALL HAVE THE FOLLOWING ADDITIONAL REQUIREMENTS:
 - ITEM 2 (PRESSURE GAUGES) SHALL BE MOUNTED ON A 1/8-INCH THICK STAINLESS STEEL PLATE AND BE MOUNTED TO THE WALL.
 - ITEM 7 (AIR VENTS) VENTILATION STACKS ARE TO BE PER DETAIL ON SHEET 14.
 - ITEM 21 (ENTRANCE HATCH) SHALL BE A BILCO E-50 OR APPROVED EQUIVALENT. IF HATCH IS LOCATED IN GRASS, SPRAY OUTSIDE CURB WITH RUBBERIZED UNDERCOAT.
 - ITEM 25 (POWER PANEL) SHALL BE PROVIDED WITH MAIN BREAKER.
 - ITEM 28 (CATHOTIC PROTECTION) SHALL BE INSTALLED PER MANUFACTURERS RECOMMENDATIONS AND INCLUDE A TEST STATION LOCATED INSIDE THE VAULT. TEST STATION SHALL INCLUDE OPERATING RANGE AND MINIMUM INFORMATION FROM MANUFACTURER FOR ALL GAUGES.
 - ALL CONTROL LINES SHALL BE BRAIDED 316 STAINLESS STEEL.
 - THE INFLOW AND OUTFLOW LINES SHALL BE RESTRAINED TO THE PRV VAULT SHELL.
 - ITEM 23 (SUMP PUMP DISCHARGE LINE) SHALL BE GALVANIZED STEEL.
 - THERE SHALL BE SCREENS ON ALL WYES.
 - INTERIOR SHALL BE LINED WITH VINYL LINING OF "RHINO" STANDARD, OR APPROVED EQUAL, 18-INCHES UP THE WALL.
 - THERE SHALL BE AN ELECTRONIC AND ANALOGUE GAUGE ON THE STATION'S INFLOW AND OUTFLOW LINES.
 - THE HIGH WATER SENSOR SHALL BE CYLINDRICAL, MODEL: DWYER F7-BT.
 - A STRAINER SHALL BE INSTALLED UPSTREAM OF THE GATE VALVE (ITEM 17).
 - REINFORCED CONCRETE PAD AND ANCHOR BOLTS BY INSTALLING CONTRACTOR IN ACCORDANCE WITH DIMENSIONS SHOWN ON THE SUPPLIERS SHOP DRAWINGS AND AS DIRECTED BY RESPONSIBLE PARTY. REVIEW WITH C.O.T. REGARDING RESPONSIBLE PARTY.
 - IF VAULT DOES NOT SLOPE TOWARDS SUMP, CONTRACTOR MUST ADJUST VAULT ACCORDINGLY TO ALLOW FOR PROPER DRAINAGE OF THE VAULT.
- AT E 93RD AVENUE AND RIVERDALE ROAD, THE PRV SHALL BE CAPABLE OF PROVIDING A PRESSURE REDUCTION OF A MINIMUM 34 PSI IN THE OPERATING RANGE OF AT LEAST 92 PSI TO 126 PSI.
- FOUNDATION FOR THE PRESSURE REDUCING VAULT TO BE DESIGNED BY COLORADO REGISTERED PROFESSIONAL ENGINEER IN ACCORDANCE WITH THE GEOTECHNICAL ENGINEERING STUDY BY OLSSON DATED DECEMBER 3, 2025. FOUNDATION DESIGN AND BUOYANCY CALCULATIONS ARE TO BE SUPPLIED AS PART OF THE PRESSURE REDUCING VAULT SUBMITTAL. THE FOUNDATION COST SHALL BE INCLUDED IN THE PRV VAULT LINE ITEM.
- ABANDON EXISTING PRV VAULT AND WATER MAIN INCLUDES REMOVAL OF THE EXISTING INTERNAL COMPONENTS, BACKFILLING THE VAULT WITH FLO-FILL, REMOVAL OF THE EXISTING PRV VAULT SUMP PUMP DISCHARGE PIPE, VENT PIPE OR ANY OTHER EXISTING EXTERNAL COMPONENTS THAT CONFLICT WITH THE INSTALLATION OF THE NEW PRV STATION AND ASSOCIATED COMPONENTS AND CUTTING AND FLO-FILLING THE EXISTING WATER MAIN. THE REMOVED PRV VAULT INTERNAL COMPONENTS SHALL BE RETURNED TO THE CITY OF THORNTON. INSTALLATION OF PROPOSED WATER MAIN THROUGH ABANDONED PRV VAULT SHALL CONSIST OF EXCAVATION OF FLO-FILL, INSTALLATION OF PIPE AT REQUIRED DEPTH AND BACKFILL OF TRENCH WITH FLOW FILL.
- CONTRACTOR SHALL VERIFY LIMITS OF CONSTRUCTION, PRV STATION LOCATION AND ASPHALT AND CONCRETE REMOVAL WITH CITY PRIOR TO CONSTRUCTION.
- GATE VALVES SHALL REPLACE ALL BUTTERFLY VALVES DEPICTED IN PRV DETAIL.
- CONTRACTOR SHALL GRADE GROUND AROUND HATCH TO MAINTAIN POSITIVE DRAINAGE AND TIE TO EXISTING GROUND ELEVATION AT THE R.O.W. LINE.



NOTES:

- CONTRACTOR TO CONFIRM DEPTHS OF PIPELINES AT THE PROPOSED VAULT LOCATION BEFORE CONSTRUCTION.
- SLOPE SUMP DISCHARGE LINE DOWN TO DISCHARGE BOX @ 0.5%.
- SUMP PUMP DISCHARGE LIE SHALL HAVE A CHECK VALVE INSIDE THE PRV VAULT.

CALL UTILITY NOTIFICATION
CENTER OF COLORADO

811

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FOR THE MARKING OF UNDERGROUND
MEMBER UTILITIES.



FINAL DESIGN
NOT TO BE USED FOR CONSTRUCTION

September 15, 2026
DATE PRINTED
OLSSON

THE PRESSURE REDUCING VAULT SHALL BE MANUFACTURED BY ENGINEERED FLUID, INC., DAKOTA PUMP INC. OR OTHER APPROVED BY DEVELOPMENT ENGINEERING MANAGER.

THE VAULT SHALL ALSO BE EQUIPPED WITH FOLLOWING:

- SUMP PUMPS SHALL BE HYDRO-MATIC OSP50AB, OR AN APPROVED EQUIVALENT. A PIPE UNION SHALL BE INSTALLED IN THE DISCHARGE LINE BETWEEN THE PUMP AND THE CHECK VALVE. DISCHARGE LINE SHALL BE MADE OF IRON AND SHALL DIRECT FLOWS TO A LOCATION APPROVED BY CITY OF THORNTON INSPECTOR.
- VENTILATION FANS SHALL BE AS MANUFACTURED BY ILG, OR AN APPROVED EQUIVALENT, MODEL PTD DIRECT-DRIVE TUBEAXIAL DUCT FAN SIZE PTD 123 (811 CFM @ 3/8" S.P.) WITH A ONE-SIXTH (1/6) HP, 120-VOLT CONSTANT SPEED, SINGLE PHASE, 60HZ ELECTRIC MOTOR. CONTROL SWITCH FOR THE FAN SHALL BE MOUNTED NEXT TO THE ENTRYWAY SO THAT IT CAN BE OPERATED WITHOUT COMPLETELY ENTERING THE VAULT. THE DISCHARGE OF THE VENT FAN SHALL BE TOTALLY ENCLOSED AND ATTACHED TO THE OPENING OF THE EXHAUST VENT PIPE.
- DEHUMIDIFIERS SHALL BE DAYTON MODEL# 5EAJ7, OR AN APPROVED EQUIVALENT. PROVIDE CONDENSATE DRAIN PIPE FROM DRIP TRAY TO WITHIN SIX (6) INCHES OF THE FINISHED FLOOR.

ALL CONTROL LINES AND FITTINGS SHALL BE STAINLESS STEEL AND INCLUDE ISOLATION TO ALL PRV CONTROL LINES

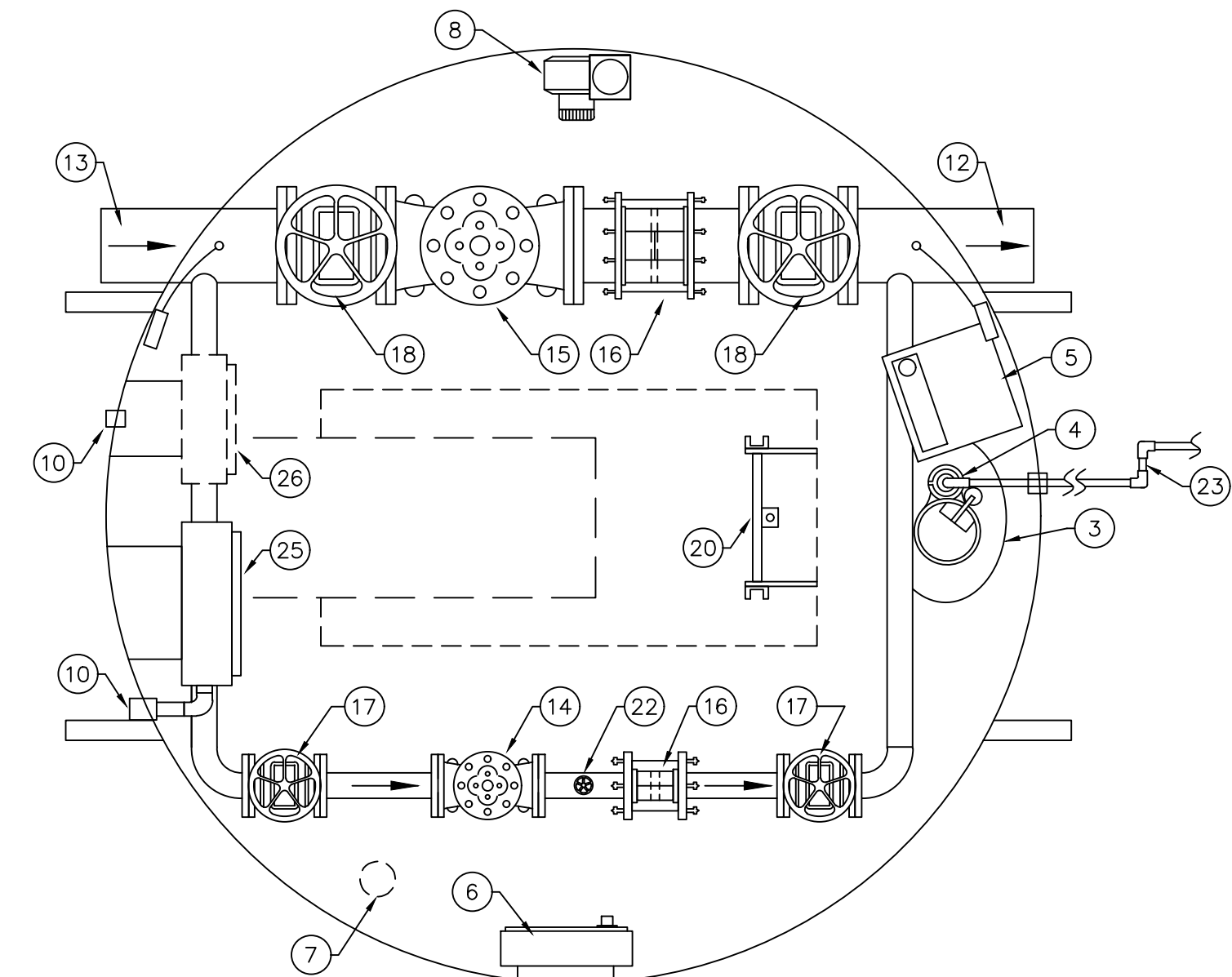
SEE SECTION 204.1(G) AND 204.1(J) OF THE CITY OF THORNTON STANDARDS AND SPECIFICATIONS.

LOW FLOW BYPASS SIZES

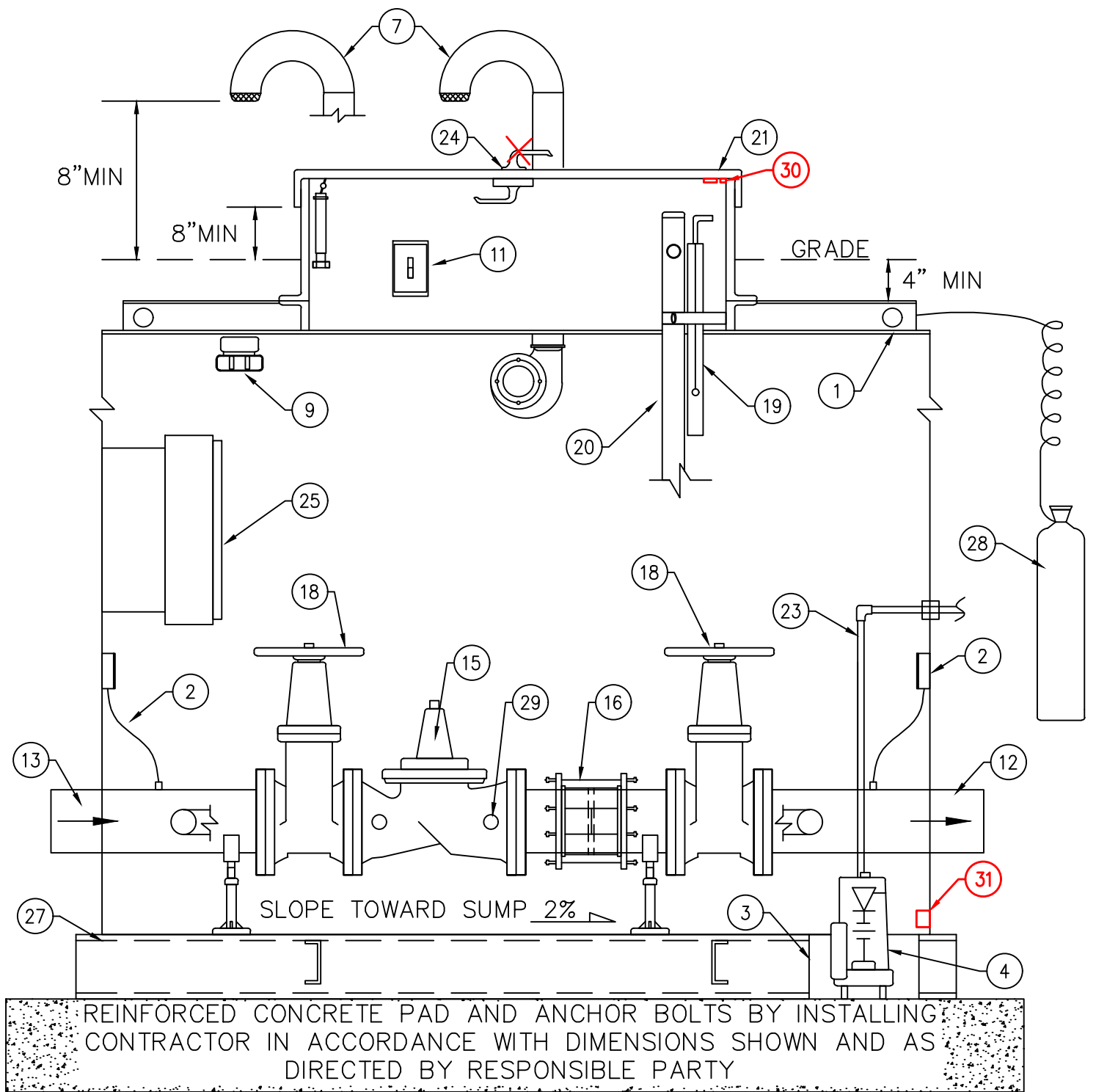
PRV	MIN. BYPASS SIZE
8"	2-1/2"
12"	4"
16"	6" w/2" BYPASS

Legend

1	Lifting Hooks (Add to any equipment in excess of 60 lbs)
2	Pressure Gauges (stainless steel w/ isolation viv & purge line) (2)
3	Sump Well (18" deep 12" wide)
4	Sump Pump
5	Dehumidifier
6	Station Heater
7	Air Ducts
8	Ventilation Blower
9	Station Light
10	1.5" Conduit (provide a minimum of two conduits)
11	Light and Fan Switch (accessible from outside the vault)
12	Main Outlet
13	Main Inlet
14	Low Flow Bypass
15	Pressure Reducing Valve (With rising stem indicator)
16	Coupling
17	GATE Valves
18	BUTTERFLY valves — GATE Valves
19	Safety Post
20	Entrance Ladder
21	Entrance Hatch (weather tight cover with overhang skirt)
22	3/4" Hose Bib
23	Sump discharge (IRON pipe with swivel joint for settlement)
24	Lock with AH1 keys or "BEST" locking assembly (no external handle)
25	Power Panel Enclosure
26	Telemetry Panel
27	Capsule reinforcement
28	Cathodic Protection
29	Control lines (stainless steel w/ stainless steel isolation valves)
30	Intrusion switch (incorporate lights and fan to come on)
31	High water sensor

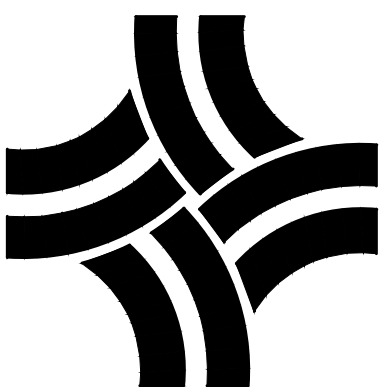


PLAN VIEW



PROFILE VIEW

N.T.S.



CITY OF THORNTON, COLORADO
STANDARDS & SPECIFICATIONS

PRESSURE REDUCING VAULT
DETAIL

ISSUED:
APRIL 2010
REVISED:

DRAWING NO.
200-12

NOTE:
1. PRESSURE REDUCING VAULT DETAIL
SHALL INCLUDE THE ADDITIONAL
REQUIREMENTS LISTED IN THE KEY
NOTES, THIS SHEET

olsson
1525 Raleigh Street
Suite 400
Denver, CO 80204
TEL 303.237.2072
www.olsson.com

OLSSON ASSUMES NO RESPONSIBILITY FOR EXISTING UTILITY LOCATIONS (HORIZONTAL OR VERTICAL). THE EXISTING UTILITIES SHOWN ON THIS DRAWING HAVE BEEN PLOTTED FROM THE BEST AVAILABLE INFORMATION. IT IS HOWEVER THE RESPONSIBILITY OF THE CONTRACTOR TO FIELD VERIFY THE LOCATION OF ALL UTILITIES PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION ACTIVITIES.

REVISIONS DESCRIPTION

DATE

REV. NO.

REVISIONS

PRESSURE REDUCING VAULT DETAILS

2024 TREATED WATER SYSTEM IMPROVEMENTS
PRV'S REPLACEMENT PROJECT

2026

THORNTON, COLORADO

drawn by: CAU
checked by: CAU
approved by: CAU
QA/QC by: CAU
project no.: 024-03983
drawing no.: DTL3
date: 2026-03-06

SHEET

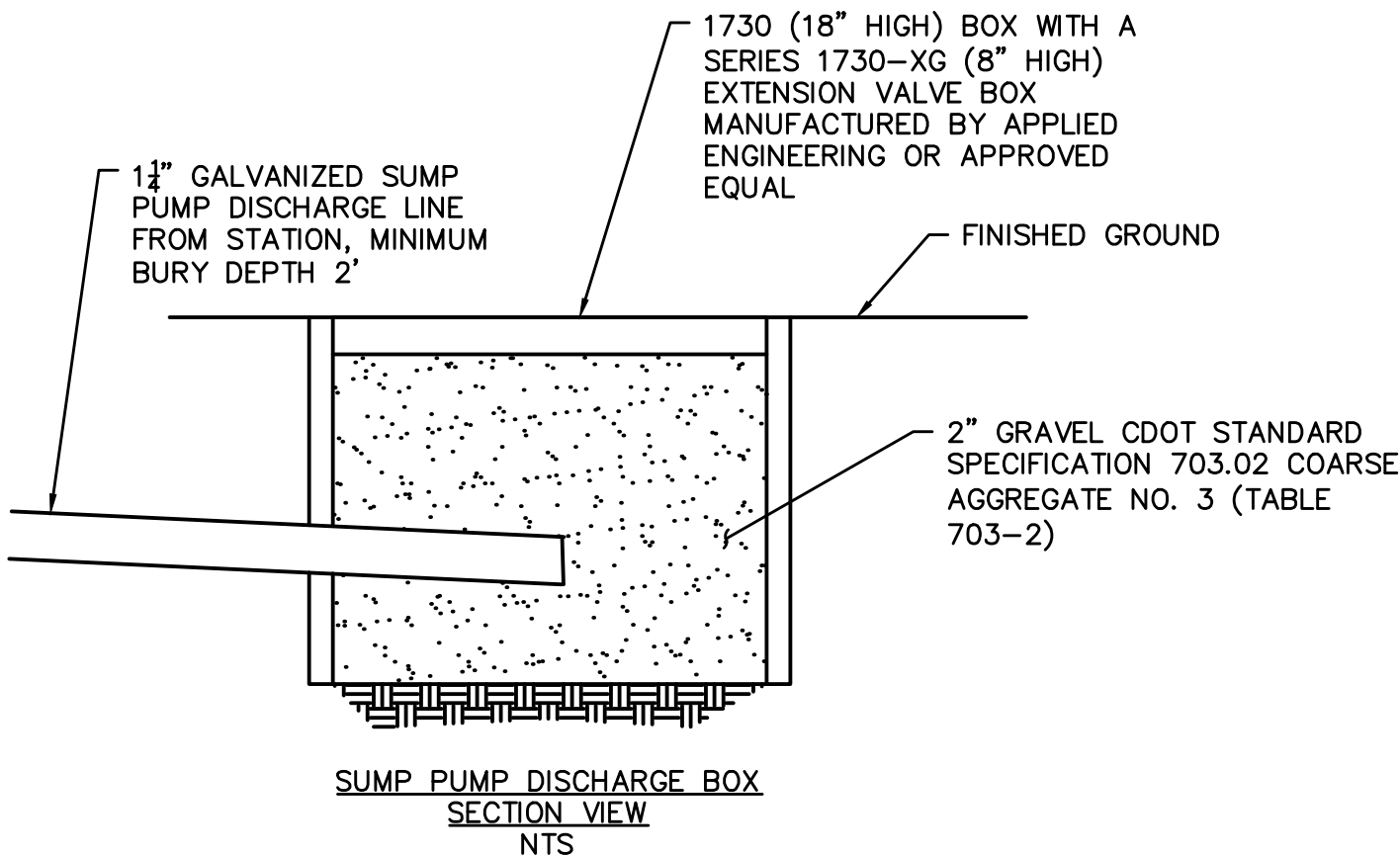
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USER: culrich

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DATE: Sep 15, 2026 11:00am XREFS: W_PITBLK_02403983

ALTITUDE VALVE VAULT KEY NOTES

1. THE ALTITUDE VALVE VAULT SHALL CONFORM TO THE CITY OF THORNTON PRESSURE REDUCING VAULT STANDARD DETAIL AS SEEN ON THIS SHEET, MODIFIED AND/OR INCLUDING THE ADDITIONAL REQUIREMENTS IN NOTE 2 BELOW AND BE MANUFACTURED BY ENGINEERED FLUID, INC., DAKOTA PUMPS OR APPROVED EQUIVALENT.
2. THE CITY OF THORNTON PRV VAULT SHALL HAVE THE FOLLOWING ADDITIONAL REQUIREMENTS:
- 2.1. ITEM 2 (PRESSURE GAUGES) SHALL BE MOUNTED ON A 1/8-INCH THICK STAINLESS STEEL PLATE AND BE MOUNTED TO THE WALL.
- 2.2. ITEM 7 (AIR VENTS) VENTILATION STACKS ARE TO BE PER DETAIL ON SHEET 14.
- 2.3. ITEM 15 (ALTITUDE VALVE) AT THE WESTERN HILLS WATER TANK SITE, FURNISH CLA-VAL 131 CONTROL VALVE, CAPABLE OF MODULATING SERVICE FOR TANK ALTITUDE CONTROL. CONTRACTOR IS RESPONSIBLE FOR SIZING ALTITUDE CONTROL VALVE AND PROVIDING ALL APPURTENANCES NECESSARY FOR AN OPERATIONAL SYSTEM CAPABLE OF MODULATING TANK FILL FLOW RATE. FURNISH THE FOLLOWING APPURTENANCES FOR MODULATING SERVICE AT A MINIMUM:
- 2.3.1. X117D FLOW TRANSMITTER
- 2.3.2. E-X114 FLOW TRANSMITTER
- 2.3.3. VC-22D VALVE CONTROLLER, CAPABLE OF MODBUS RS-485 COMMUNICATIONS WITH CUSTOMERS SCADA
- 2.3.4. VALVE CONTROLLER POWER SUPPLY
- 2.4. ITEM 21 (ENTRANCE HATCH) SHALL BE A BILCO E-50 OR APPROVED EQUIVALENT. IF HATCH IS LOCATED IN GRASS, SPRAY OUTSIDE CURB WITH RUBBERIZED UNDERCOAT.
- 2.5. ITEM 25 (POWER PANEL) SHALL BE PROVIDED WITH MAIN BREAKER.
- 2.6. ITEM 28 (CATHOTIC PROTECTION) SHALL BE INSTALLED PER MANUFACTURERS RECOMMENDATIONS AND INCLUDE A TEST STATION LOCATED INSIDE THE VAULT. TEST STATION SHALL INCLUDE OPERATING RANGE AND MINIMUM INFORMATION FROM MANUFACTURER FOR ALL GAUGES.
- 2.7. ALL CONTROL LINES SHALL BE BRAIDED 316 STAINLESS STEEL.
- 2.8. THE INFLOW AND OUTFLOW LINES SHALL BE RESTRAINED TO THE PRV VAULT SHELL.
- 2.9. ITEM 23 (SUMP PUMP DISCHARGE LINE) SHALL BE GALVANIZED STEEL.
- 2.10. THERE SHALL BE SCREENS ON ALL WYES.
- 2.11. INTERIOR SHALL BE LINED WITH VINYL LINING OF "RHINO" STANDARD, OR APPROVED EQUAL, 18-INCHES UP THE WALL.
- 2.12. THERE SHALL BE AN ELECTRONIC AND ANALOGUE GAUGE ON THE STATION'S INFLOW AND OUTFLOW LINES.
- 2.13. THE HIGH WATER SENSOR SHALL BE CYLINDRICAL, MODEL: DWYER F7-BT.
- 2.14. A STRAINER SHALL BE INSTALLED UPSTREAM OF THE GATE VALVE (ITEM 17).
- 2.15. REINFORCED CONCRETE PAD AND ANCHOR BOLTS BY INSTALLING CONTRACTOR IN ACCORDANCE WITH DIMENSIONS SHOWN ON THE SUPPLIERS SHOP DRAWINGS AND AS DIRECTED BY RESPONSIBLE PARTY. REVIEW WITH C.O.T. REGARDING RESPONSIBLE PARTY.
- 2.16. IF VAULT DOES NOT SLOPE TOWARDS SUMP, CONTRACTOR MUST ADJUST VAULT ACCORDINGLY TO ALLOW FOR PROPER DRAINAGE OF THE VAULT.
- 2.17. THE CONTRACTOR SHALL FURNISH A MODBUS RS-485 TO ETHERNET COMMUNICATION PROTOCOL GATEWAY (RED LION OR EQUAL), TO BE INSTALLED AND CONFIGURED BY OWNER, FOR COMMUNICATIONS WITH VALVE MANUFACTURER'S VALVE CONTROLLER.
3. FOUNDATION FOR THE PRESSURE REDUCING VAULT TO BE DESIGNED BY COLORADO REGISTERED PROFESSIONAL ENGINEER IN ACCORDANCE WITH THE GEOTECHNICAL ENGINEERING STUDY BY OLSSON DATED DECEMBER 3, 2025. FOUNDATION DESIGN AND BUOYANCY CALCULATIONS ARE TO BE SUPPLIED AS PART OF THE PRESSURE REDUCING VAULT SUBMITTAL. THE FOUNDATION COST SHALL BE INCLUDED IN THE PRV VAULT LINE ITEM.
4. ABANDON EXISTING PRV VAULT AND WATER MAIN INCLUDES REMOVAL OF THE EXISTING INTERNAL COMPONENTS, BACKFILLING THE VAULT WITH FLO-FILL, REMOVAL OF THE EXISTING PRV VAULT SUMP PUMP DISCHARGE PIPE, VENT PIPE OR ANY OTHER EXISTING EXTERNAL COMPONENTS THAT CONFLICT WITH THE INSTALLATION OF THE NEW PRV STATION AND ASSOCIATED COMPONENTS AND CUTTING AND FLO-FILLING THE EXISTING WATER MAIN. THE REMOVED PRV VAULT INTERNAL COMPONENTS SHALL BE RETURNED TO THE CITY OF THORNTON. INSTALLATION OF PROPOSED WATER MAIN THROUGH ABANDONED PRV VAULT SHALL CONSIST OF EXCAVATION OF FLO-FILL, INSTALLATION OF PIPE AT REQUIRED DEPTH AND BACKFILL OF TRENCH WITH FLOW FILL.
5. CONTRACTOR SHALL VERIFY LIMITS OF CONSTRUCTION, PRV STATION LOCATION AND ASPHALT AND CONCRETE REMOVAL WITH CITY PRIOR TO CONSTRUCTION.
6. GATE VALVES SHALL REPLACE ALL BUTTERFLY VALVES DEPICTED IN PRV DETAIL.
7. CONTRACTOR SHALL GRADE GROUND AROUND HATCH TO MAINTAIN POSITIVE DRAINAGE.



NOTES:

1. CONTRACTOR TO CONFIRM DEPTHS OF PIPELINES AT THE PROPOSED VAULT LOCATION BEFORE CONSTRUCTION.
2. SLOPE SUMP DISCHARGE LINE DOWN TO DISCHARGE BOX @ 0.5%.
3. SUMP PUMP DISCHARGE LIE SHALL HAVE A CHECK VALVE INSIDE THE PRV VAULT.

CALL UTILITY NOTIFICATION
CENTER OF COLORADO

811

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MEMBER UTILITIES.



FINAL DESIGN

NOT TO BE USED FOR CONSTRUCTION

September 15, 2026

DATE PRINTED

OLSSON

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THE VAULT SHALL ALSO BE EQUIPPED WITH FOLLOWING:

- A. SUMP PUMPS SHALL BE HYDRO-MATIC OSP50AB, OR AN APPROVED EQUIVALENT. A PIPE UNION SHALL BE INSTALLED IN THE DISCHARGE LINE BETWEEN THE PUMP AND THE CHECK VALVE. DISCHARGE LINE SHALL BE MADE OF IRON AND SHALL DIRECT FLOWS TO A LOCATION APPROVED BY CITY OF THORNTON INSPECTOR.
- B. VENTILATION FANS SHALL BE AS MANUFACTURED BY ILG, OR AN APPROVED EQUIVALENT, MODEL PTD DIRECT-DRIVE TUBEAXIAL DUCT FAN SIZE PTD 123 (811 CFM @ 3/8" S.P.) WITH A ONE-SIXTH (1/6) HP, 120-VOLT CONSTANT SPEED, SINGLE PHASE, 60HZ ELECTRIC MOTOR. CONTROL SWITCH FOR THE FAN SHALL BE MOUNTED NEXT TO THE ENTRYWAY SO THAT IT CAN BE OPERATED WITHOUT COMPLETELY ENTERING THE VAULT. THE DISCHARGE OF THE VENT FAN SHALL BE TOTALLY ENCLOSED AND ATTACHED TO THE OPENING OF THE EXHAUST VENT PIPE.
- C. DEHUMIDIFIERS SHALL BE DAYTON MODEL# 5EAJ7, OR AN APPROVED EQUIVALENT. PROVIDE CONDENSATE DRAIN PIPE FROM DRIP TRAY TO WITHIN SIX (6) INCHES OF THE FINISHED FLOOR.

ALL CONTROL LINES AND FITTINGS SHALL BE STAINLESS STEEL AND INCLUDE ISOLATION TO ALL PRV CONTROL LINES

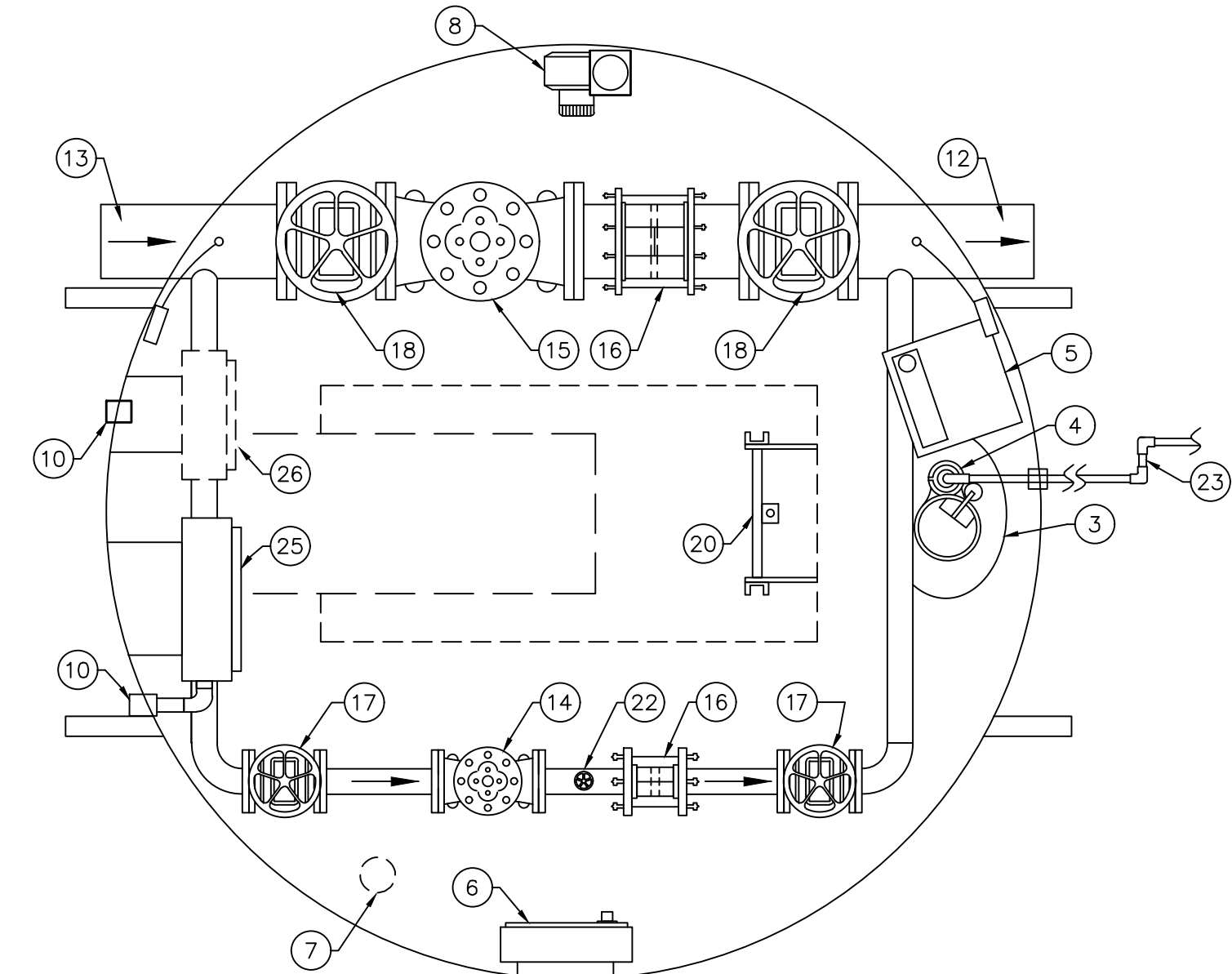
SEE SECTION 204.1(G) AND 204.1(J) OF THE CITY OF THORNTON STANDARDS AND SPECIFICATIONS.

LOW FLOW BYPASS SIZES

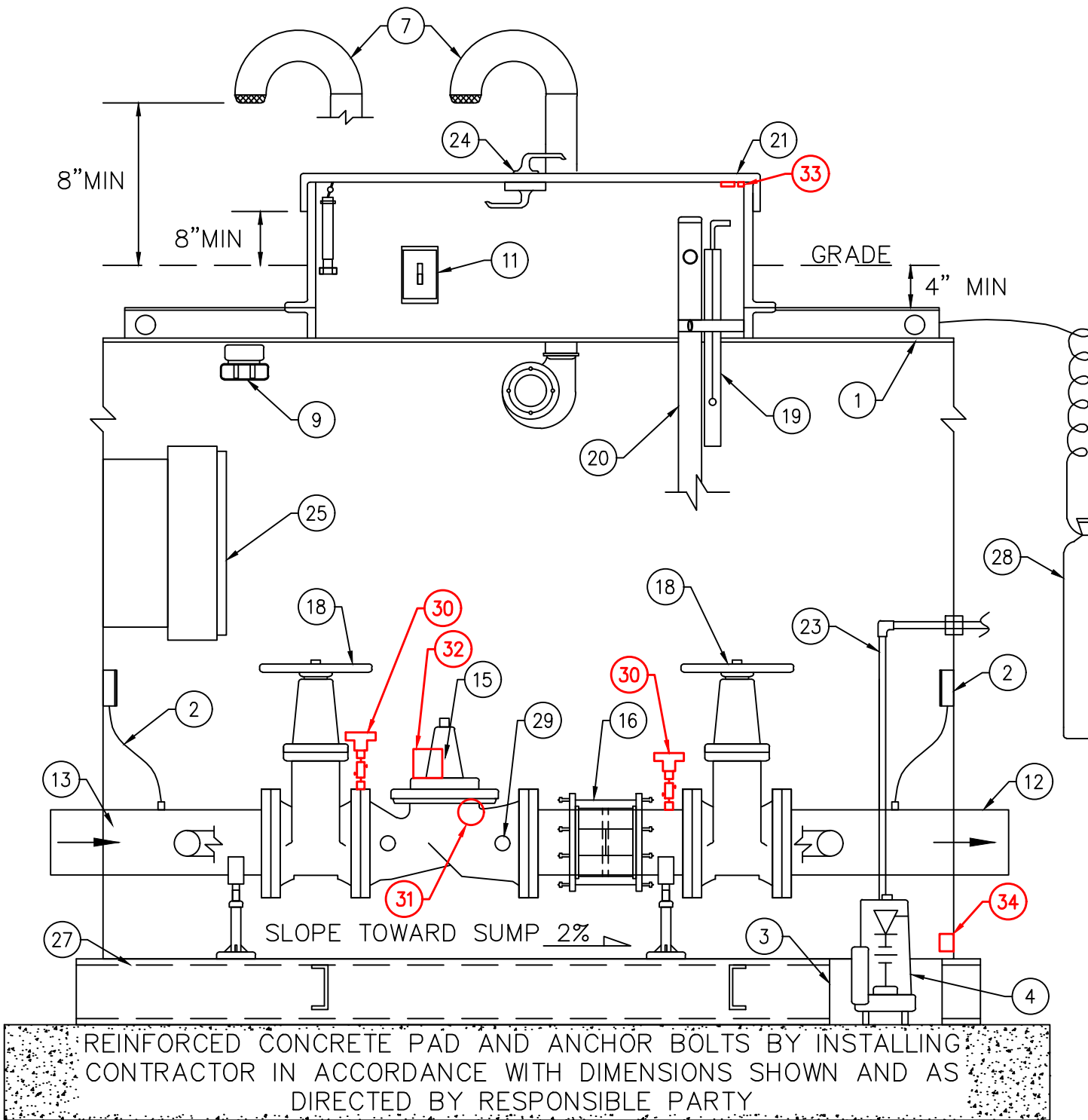
PRV	MIN. BYPASS SIZE
8"	2-1/2"
12"	4"
16"	6" w/2" BYPASS

Legend

1	Lifting Hooks (Add to any equipment in excess of 60 lbs)
2	Pressure Gauges (stainless steel w/ isolation vlv & purge line) (2)
3	Sump Well (18" deep 12" wide)
4	Sump Pump
5	Dehumidifier
6	Station Heater
7	Air Ducts
8	Ventilation Blower
9	Station Light
10	1.5" Conduit (provide a minimum of two conduits) 2"
11	Light and Fan Switch (accessible from outside the vault)
12	Main Outlet
13	Main Inlet
14	Low Flow Bypass (Pressure Reducing Valve)
15	Pressure Reducing Valve (With rising stem indicator)
16	Coupling
17	GATE Valves
18	BUTTERFLY valves GATE Valves
19	Safety Post
20	Entrance Ladder
21	Entrance Hatch (weather tight cover with overhang skirt)
22	3/4" Hose Bib
23	Sump discharge (IRON pipe with swivel joint for settlement)
24	Lock with AH1 keys or "BEST" locking assembly
25	Power Panel Enclosure
26	Telemetry Panel
27	Capsule reinforcement
28	Cathodic Protection
29	Control lines (stainless steel w/ stainless steel isolation valves)
30	Pressure Indicating Transmitter w/ Stainless Steel Hardware and Manufacturer's Block and Bleed Manifold (locate between gate valves)
31	Valve Flow Transmitter
32	Valve Position Transmitter
33	Intrusion switch (incorporate lights and fan to come on)
34	High water sensor

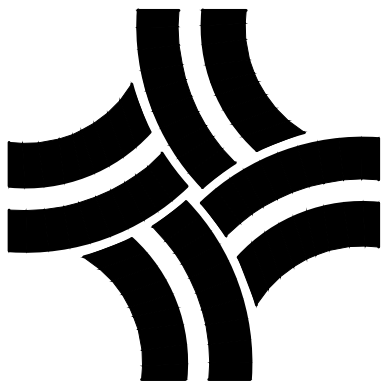


PLAN VIEW



PROFILE VIEW

N.T.S.



CITY OF THORNTON, COLORADO
STANDARDS & SPECIFICATIONS
~~ALTITUDE VALVE~~
~~PRESSURE REDUCING VAULT~~
DETAIL

ISSUED:
APRIL 2010

REVISED:

DRAWING NO.
200-12

NOTE:

1. ALTITUDE VALVE VAULT SHALL BE A MODIFICATION OF THE STANDARD CITY OF THORNTON PRESSURE REDUCING VAULT DETAIL AND SHALL INCLUDE THE ADDITIONAL REQUIREMENTS LISTED IN THE KEY NOTES, THIS SHEET

olsson

1525 Raleigh Street
Suite 400
Denver, CO 80204

TEL 303.237.2072
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OLSSON ASSUMES NO RESPONSIBILITY FOR EXISTING UTILITY LOCATIONS (HORIZONTAL OR VERTICAL). THE EXISTING UTILITIES SHOWN ON THIS DRAWING HAVE BEEN PLOTTED FROM THE BEST AVAILABLE INFORMATION. IT IS HOWEVER THE RESPONSIBILITY OF THE CONTRACTOR TO FIELD VERIFY THE LOCATION OF ALL UTILITIES PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION ACTIVITIES.

REV. NO.		DATE	REVISIONS DESCRIPTION

ALTITUDE VALVE VAULT DETAILS

2024 TREATED WATER SYSTEM IMPROVEMENTS
PRV'S REPLACEMENT PROJECT

THORNTON, COLORADO

2026

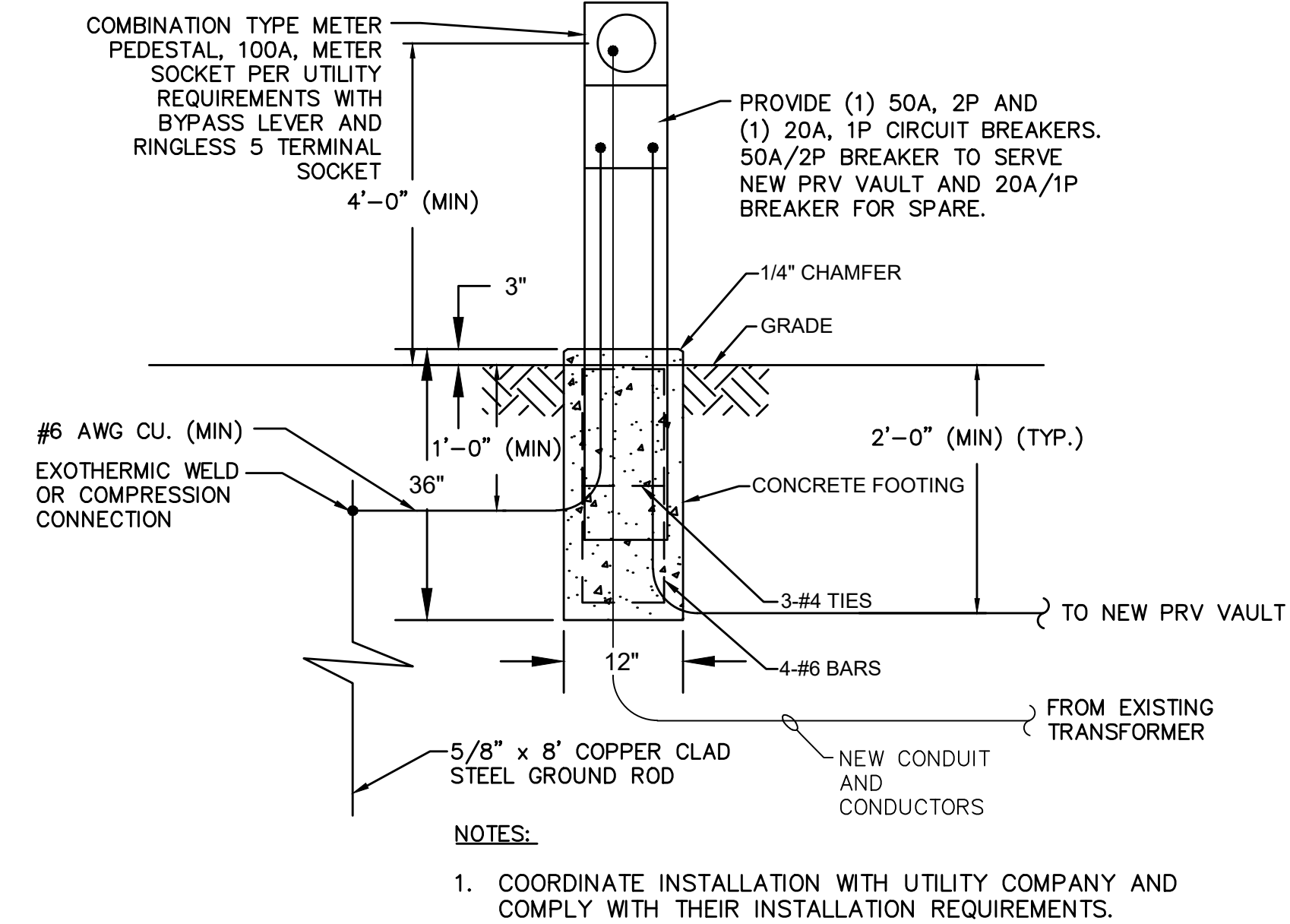
REVISIONS

drawn by:	CAU
checked by:	CAU
approved by:	CAU
QA/QC by:	CAU
project no.:	024-03983
drawing no.:	DTL3
date:	2026-03-06

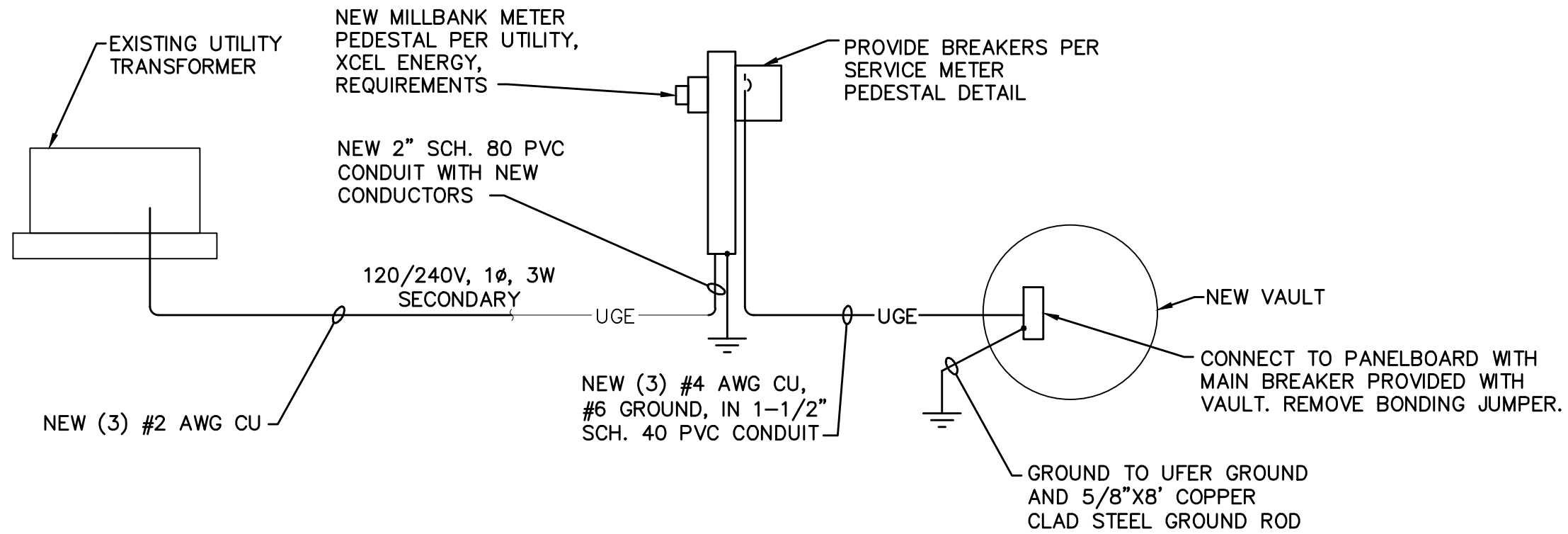
SHEET

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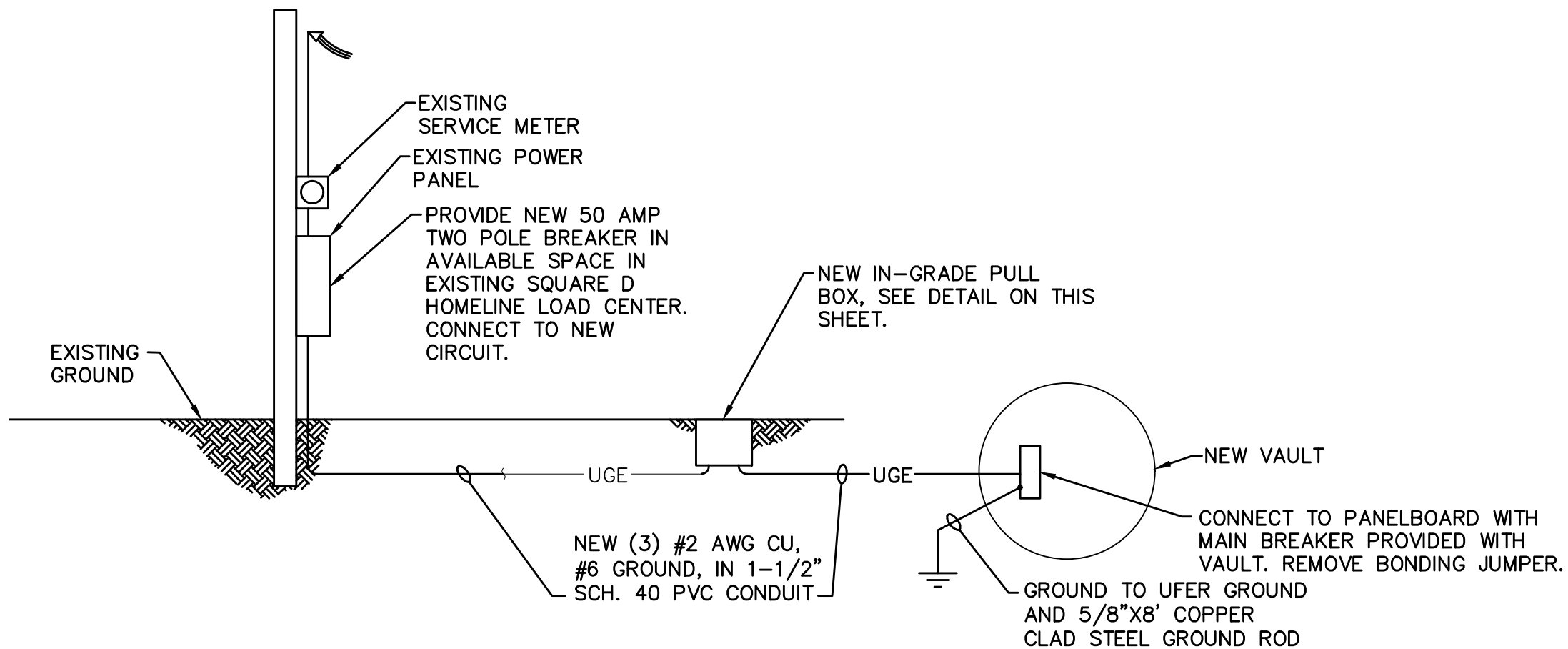
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DATE: Sep 15, 2026 11:00am
USER: cuhrich
XREFS: W_PITBLK_02403983



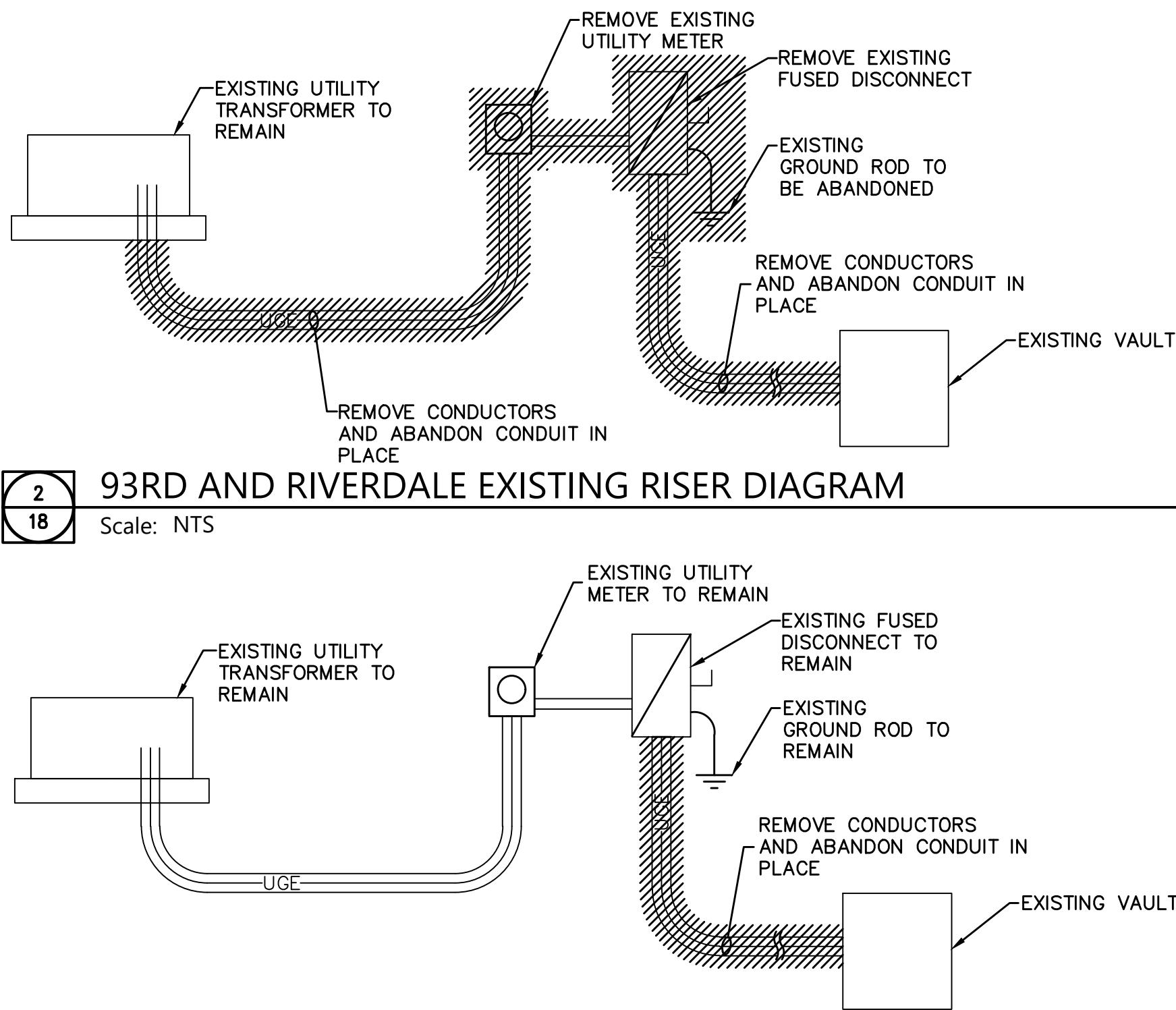
1 18 93RD AND RIVERDALE SERVICE METER PEDESTAL
Scale: NTS



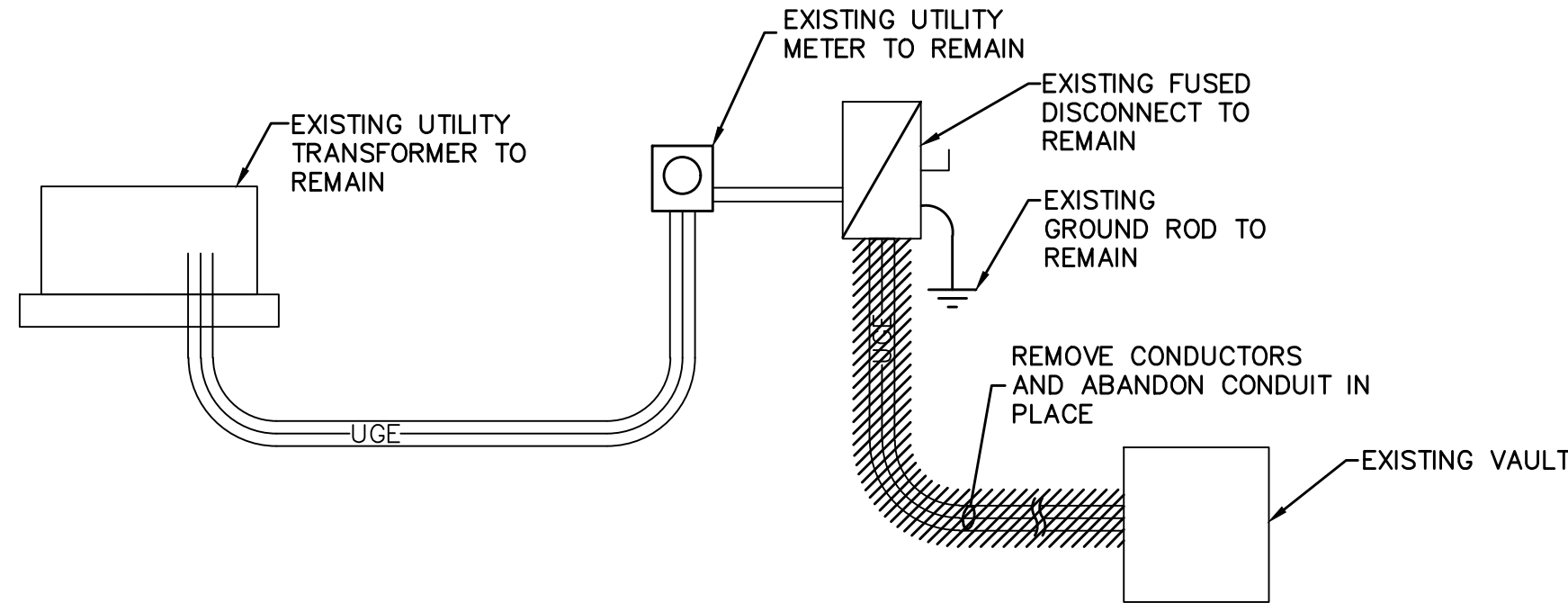
4 18 93RD AND RIVERDALE NEW RISER DIAGRAM
Scale: NTS



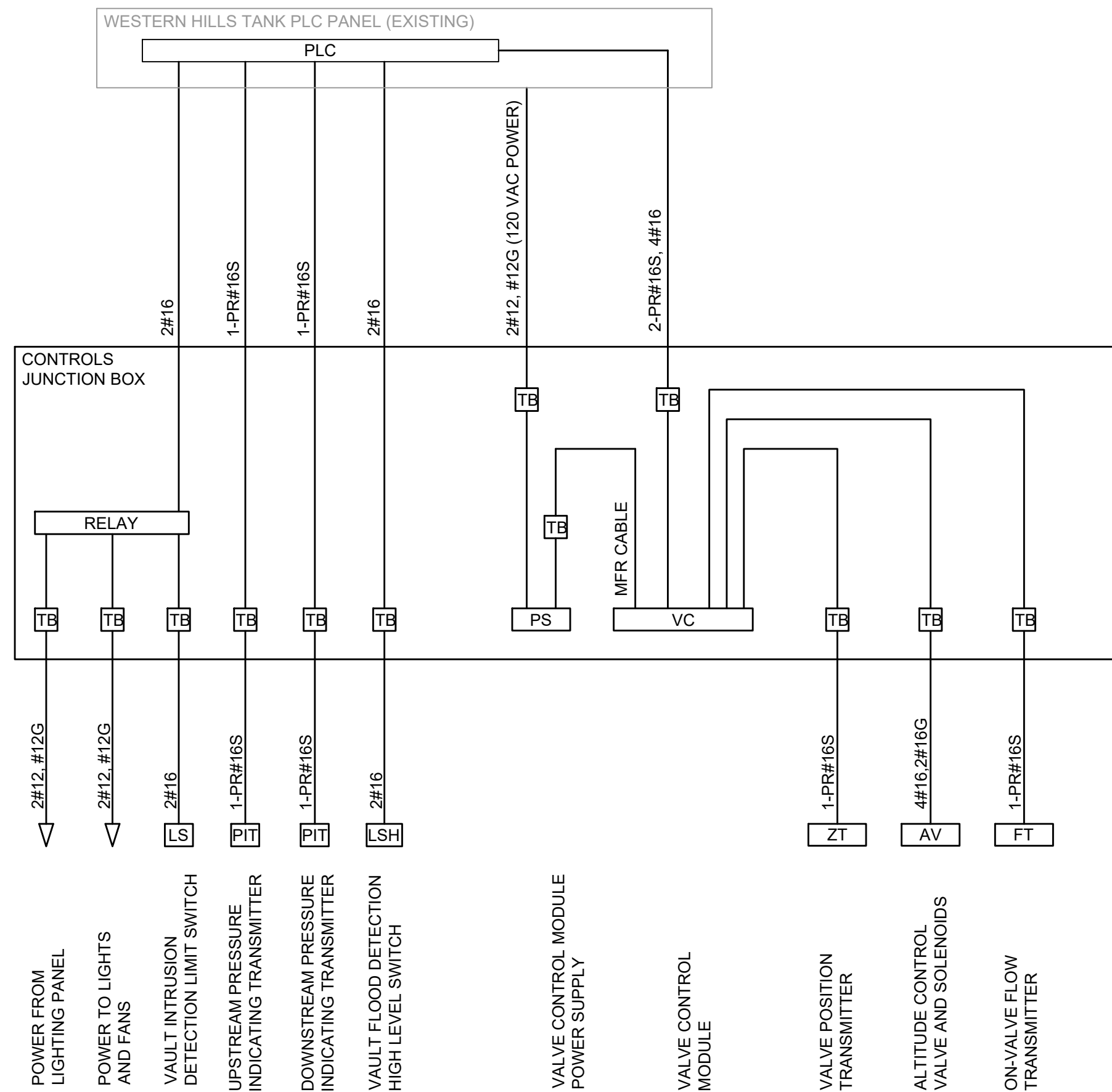
5 18 WESTERN HILLS TANK NEW RISER DIAGRAM
Scale: NTS



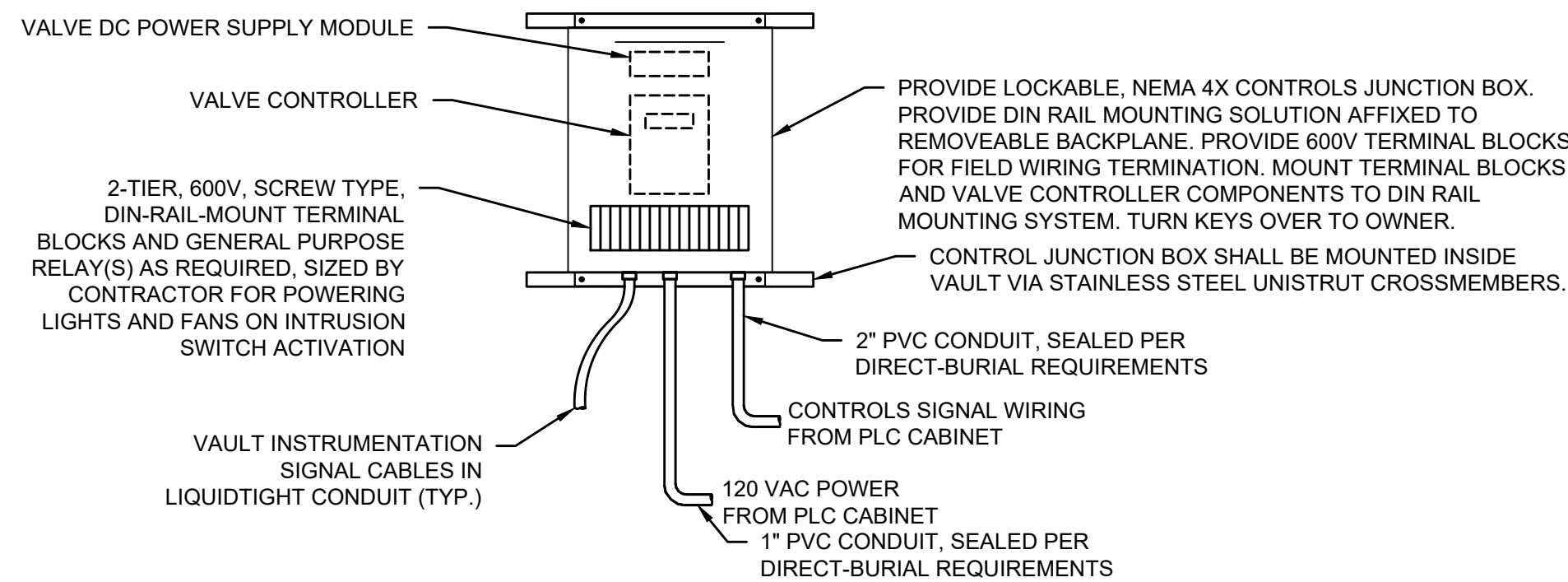
2 18 93RD AND RIVERDALE EXISTING RISER DIAGRAM
Scale: NTS



3 18 WESTERN HILLS TANK EXISTING RISER DIAGRAM
Scale: NTS



6 18 SCADA ONE LINE DIAGRAM
Scale: NTS

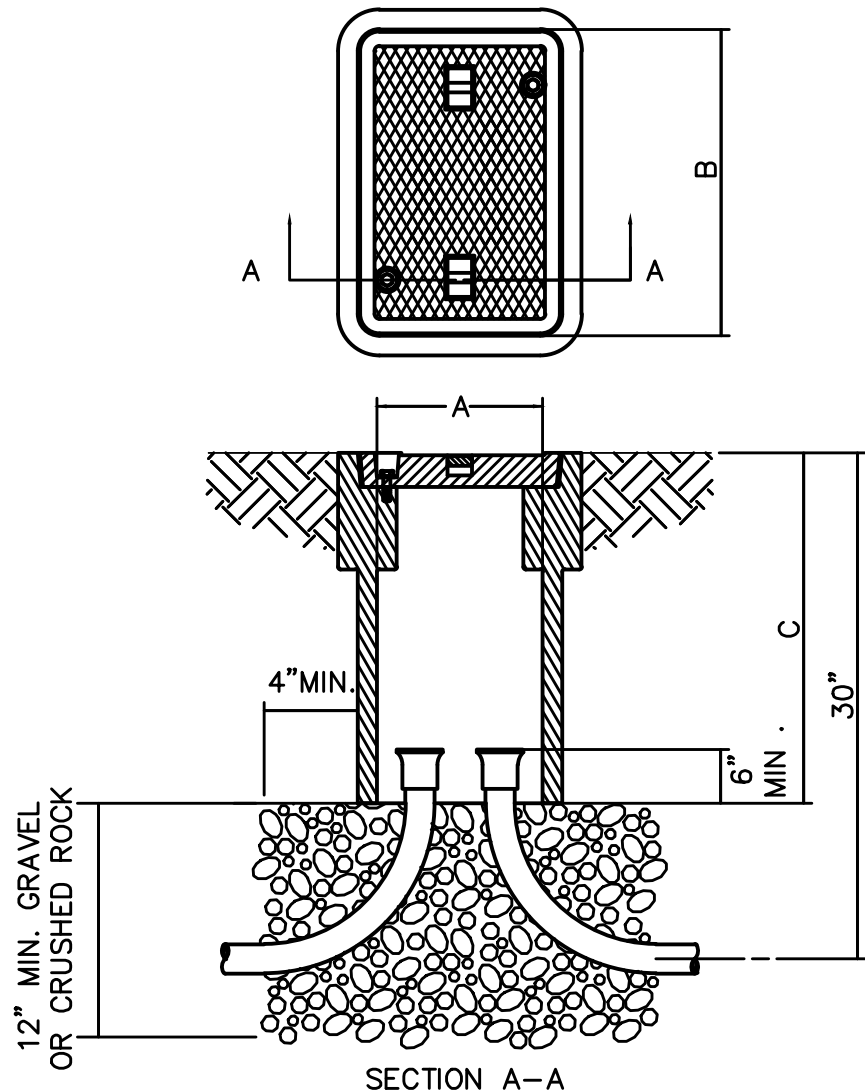


7 18 CONTROL JUNCTION BOX INSTALLATION DETAIL
Scale: NTS

NOTES

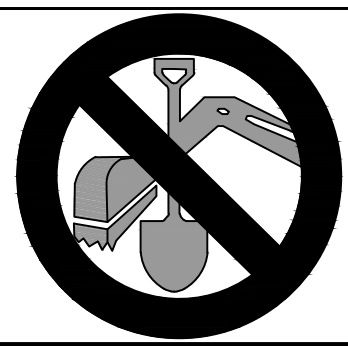
- ACCESS DUCTS, BENDS AND/OR SWEEPS, ARE SUBSIDIARY TO THE ITEM "PULL BOX, TYPE PB".
- FILL MATERIAL SHALL BE GRAVEL OR CRUSHED ROCK COMPOSED OF CLEAN, HARD, DURABLE AND UNCOATED
- PROLONGED EXPOSURE OF THE PULL BOX AND COVER TO SUNLIGHT, COMMON ICE MELTING CHEMICALS OR FERTILIZERS SHALL NOT CAUSE SIGNIFICANT DAMAGE TO THE PULL BOX OR COVER, OR IMPAIR ITS FUNCTION.
- CONDUIT TERMINATIONS IN PULL BOX SHALL BE FITTED WITH BELL OR FLARED END.
- PULL BOXES SHALL BE OF A POLYMER CONCRETE MATERIAL.
- PULL BOXES ARE IN GROUND, GRADE LEVEL ENCLOSURES INTENDED TO BE INSTALLED WHERE NON-DELIBERATE VEHICULAR TRAFFIC IS ANTICIPATED.
- PULL BOX ILLUSTRATIONS ARE TYPICAL AND ARE NOT INTENDED TO LIMIT DESIGN. BOXES OF SQUARE OR CIRCULAR PLAN-SECTION AND OF EQUAL OR GREATER VOLUME ARE ACCEPTABLE. A MINIMUM DEPTH OF 18 INCHES, MUST BE MAINTAINED.
- THE PULL BOX ENCLOSURES (BOX AND COVER) SHALL BE NON-METALLIC AND GREEN OR GRAY IN COLOR.
- PULL BOX COVERS SHALL BE OF HEAVY-DUTY CONSTRUCTION TO WITHSTAND THE STRUCTURAL REQUIREMENTS OF THE SPECIFICATIONS. COVERS SHALL FIT SUFFICIENTLY TIGHT TO PREVENT THE ENTRANCE OF RUN-OFF WATER. COVERS SHALL BE EMBOSSED WITH AN ANTI-SLIP SURFACE, THE MANUFACTURER'S NAME AND THE LOGO "ELECTRIC" OR "COMM". COVERS SHALL BE HELD SECURELY IN PLACE BY TWO OR MORE 3/8" (MIN. DIA.) STAINLESS STEEL HEX HEAD BOLTS WITH FLAT WASHER. BOLTS SHALL BE HELD CAPTIVE TO THE COVER. ALL COVERS SHALL BE EQUIPPED WITH A RECESSED "LIFT PIN" AND HAVE A MINIMUM 0.50 COEFFICIENT OF FRICTION SKID RESISTANT SURFACE.
- EACH PULL BOX ASSEMBLY (BOX WITH HEAVY-DUTY COVER SECURELY ATTACHED) SHALL CONFORM TO ALL TEST PROVISIONS AND REQUIREMENTS FOR TIER 22 APPLICATIONS AS OUTLINED IN THE LATEST ISSUE OF THE ANSI/SCTE 77 2002 STANDARD TITLED "SPECIFICATION FOR UNDER GROUND ENCLOSURE INTEGRITY". INDEPENDENT THIRD-PARTY TEST REPORTS TOGETHER WITH CERTIFICATION THAT ALL TEST PROVISIONS OF THE ANSI/SCTE 77 2002 STANDARD HAVE BEEN MET WILL BE REQUIRED FOR EACH TYPE OF PULL BOX BEING FURNISHED. ALL TESTS SHALL BE DATED AND SIGNED BY A REGISTERED PROFESSIONAL ENGINEER AND SHALL BEAR THE LETTERHEAD OF THE TESTING AGENCY.

MINIMUM APPROXIMATE DIMENSIONS			
	A	B	C
POWER	17"	30"	18"
COMM	24"	36"	18"



8 18 IN-GROUND PULL BOX DETAIL
Scale: NTS

CALL UTILITY NOTIFICATION
CENTER OF COLORADO
811
CALL 3-BUSINESS DAYS IN ADVANCE
BEFORE YOU DIG, GRADE, OR EXCAVATE
FOR THE MARKING OF UNDERGROUND
MEMBER UTILITIES.



FINAL DESIGN
NOT TO BE USED FOR CONSTRUCTION
September 15, 2026
DATE PRINTED
OLSSON

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1525 Raleigh Street
Suite 400
Denver, CO 80204
TEL 303.237.2072
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THE EXISTING UTILITIES SHOWN
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AVAILABLE INFORMATION. IT IS
HOWEVER THE RESPONSIBILITY
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VERIFY THE LOCATION OF ALL
UTILITIES PRIOR TO THE
COMMENCEMENT OF ANY
CONSTRUCTION ACTIVITIES.

REVISIONS DESCRIPTION		DATE	REV. NO.

SCADA AND ELECTRICAL DETAILS
2024 TREATED WATER SYSTEM IMPROVEMENTS
PRV'S REPLACEMENT PROJECT
THORNTON, COLORADO
2026

drawn by: CAU
checked by: CAU
approved by: CAU
QA/QC by: CAU
project no.: 024-03983
drawing no.: DTL3
date: 2026-03-06

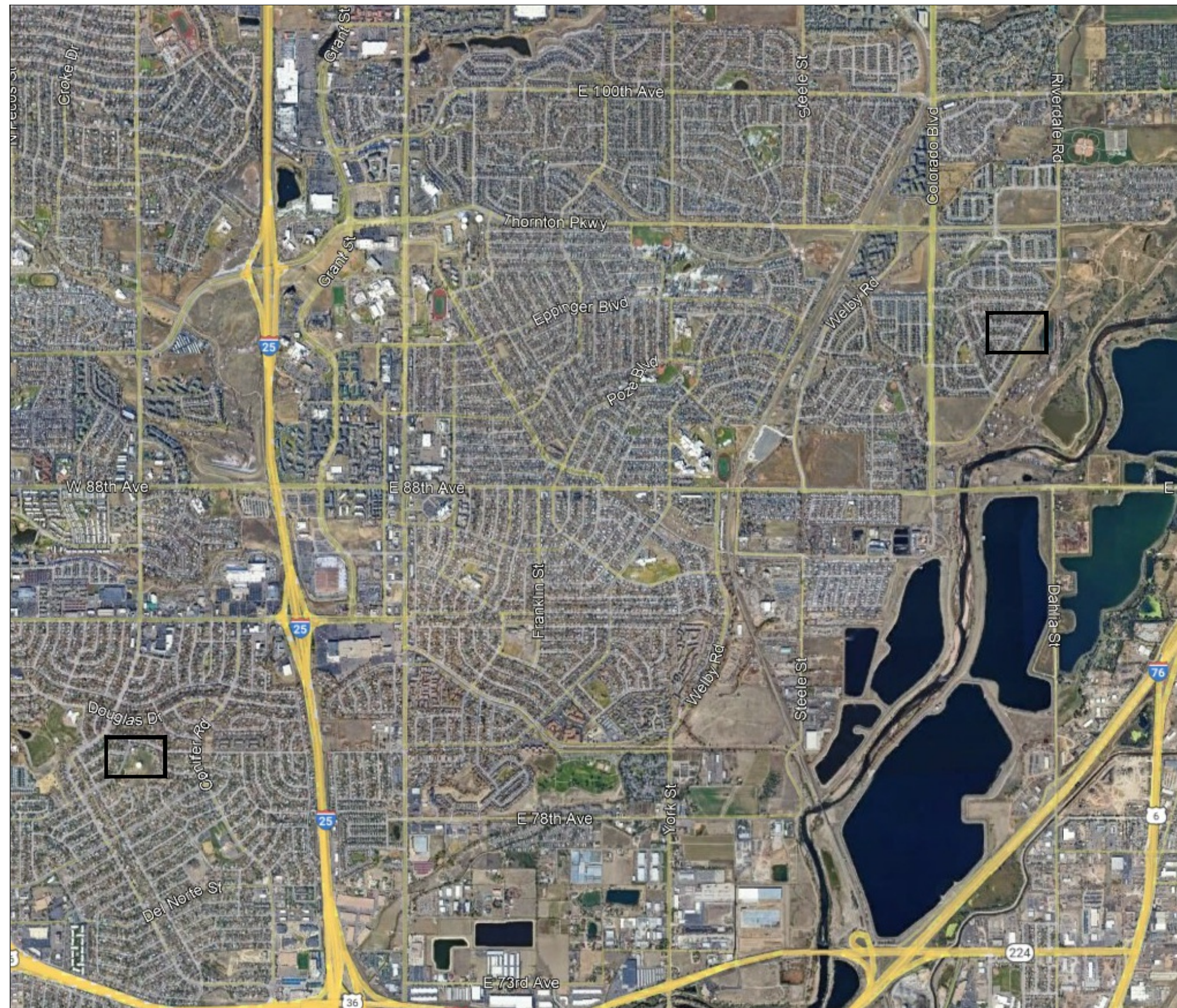
SHEET
18 of 18

TREATED WATER SYSTEM IMPROVEMENTS
SUE INVESTIGATION
FOR
OLSSON

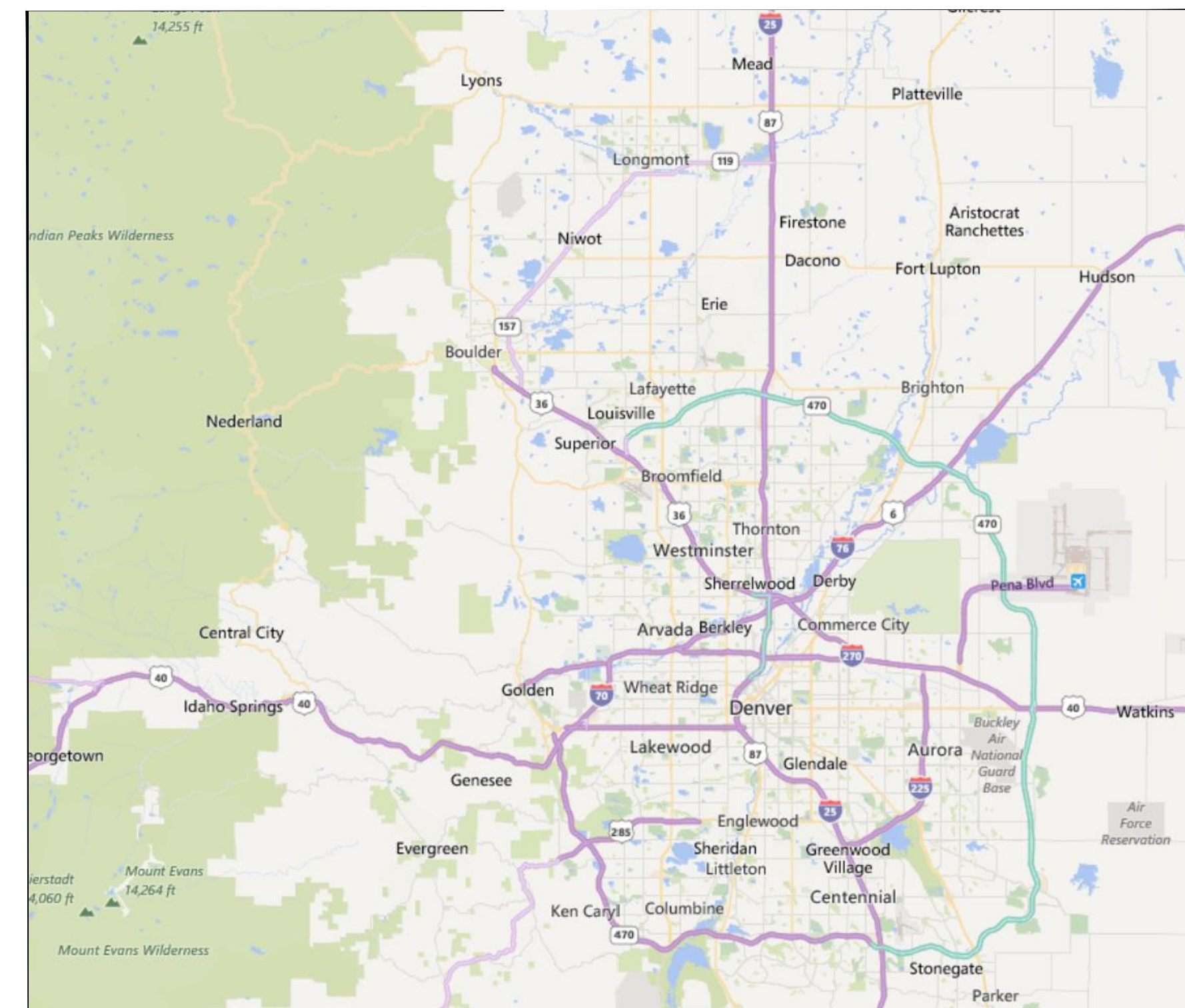
INDEX OF SHEETS		
SHT. No.	DESCRIPTION	LATEST REVISION
1	COVER SHEET	-
2	LEGEND & NOTES	3
3	UTILITIES PLAN	4
4	UTILITIES PLAN	3

SUBSURFACE UTILITY ENGINEERING MANAGER:
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SHEET INDEX MAP
SOURCE: GOOGLE EARTH
NTS



VICINITY MAP
SOURCE: GOOGLE EARTH
NTS

[illegible]

	ELECTRIC MANHOLE (VAULT)		DRAINAGE INLET (CURB & SQ.)
	ELECTRIC METER		STORM (DRAIN) MANHOLE
	LIGHT POLE		FLARED END SECTION
	UTILITY HAND HOLE		SANITARY MANHOLE
	FIBER HANDHOLE		GAS MANHOLE
	TELEPHONE MANHOLE		UTILITY VENT
	TELEPHONE\CTV PEDESTAL		SIGN
	HYDRANT		GUY WIRE & ANCHOR
	WATER VALVE		TRAFFIC SIGNAL POLE
	WATER MANHOLE		FLAG POLE
	IRRIGATION VALVE		END OF INFORMATION (EOI)(COLOR VARIES)
	UTILITY VENT		DESIGNATED END POINT (DEP)(COLOR VARIES)
			RAILROAD CROSSING LIGHT/GATE


 QUALITY LEVEL C
 DATA LOCATION

RCP	REINFORCED CONCRETE PIPE	TEL	TELEPHONE
ERCP	ELLIPTICAL REINFORCED CONCRETE PIPE	VCP	VITRIFIED CLAY PIPE
DIP	DUCTILE IRON PIPE	HDPE	HIGH-DENSITY POLYETHYLENE PIPE
CIP	CAST IRON PIPE	DD	DIGITAL DEPTH
CPP	CORRUGATED PLASTIC PIPE	APPROX	APPROXIMATE
INV	PIPE INVERT	ROW	RIGHT OF WAY
GAS	GAS UTILITY	CATV	CABLE TV
SAN	SANITARY SEWER	ELEC	ELECTRIC
		FO	FIBER OPTIC
		WATER	WATER UTILITY

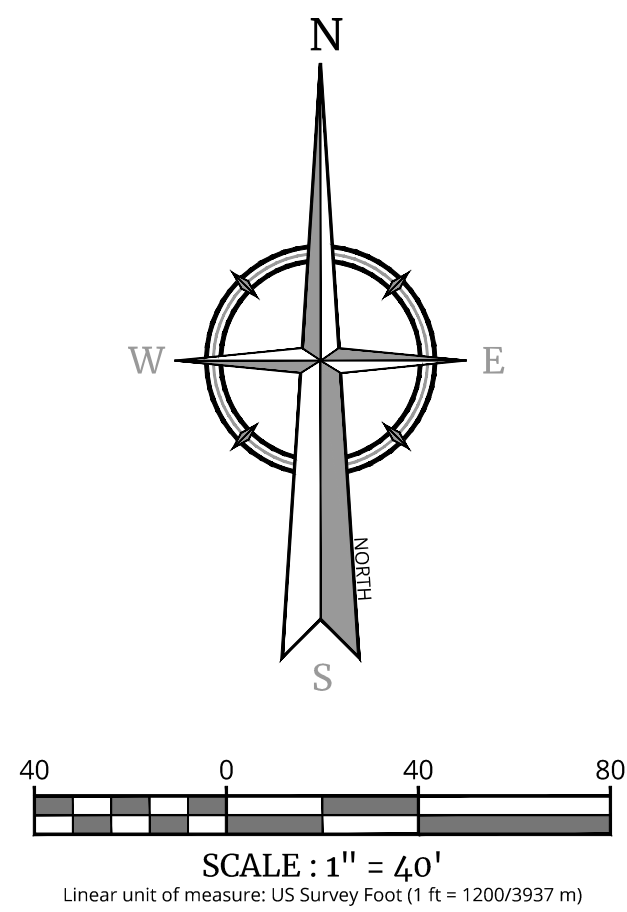
	UNDERGROUND WATER LINE (QUALITY LEVEL B)
	UNDERGROUND FIBER OPTIC LINE (QUALITY LEVEL B)
	UNDERGROUND CABLE TELEVISION LINE (QUALITY LEVEL B)
	UNDERGROUND TELEPHONE LINE (QUALITY LEVEL B)
	UNDERGROUND ELECTRIC LINE (QUALITY LEVEL B)
	UNDERGROUND TRAFFIC CONTROL LINE (QUALITY LEVEL B)
	UNDERGROUND GAS LINE (QUALITY LEVEL B)
	UNDERGROUND IRRIGATION LINE (QUALITY LEVEL B)
	UNDERGROUND UNKNOWN LINE (QUALITY LEVEL B)
	UNDERGROUND STORM CULVERT WALL (QUALITY LEVEL C)
	UNDERGROUND STORM LINE (QUALITY LEVEL C)
	UNDERGROUND SANITARY SEWER LINE (QUALITY LEVEL C)
	UNDERGROUND WATER LINE (QUALITY LEVEL D)

1. THE PURPOSE OF THIS DRAWING IS TO PROVIDE OLSSON WITH A LOCATION SURVEY OF THE EXISTING UTILITY INFRASTRUCTURE AROUND THE FOLLOWING AREA:
PROJECT AREA ONE (PAGE 3) IS LOCATED AT THE ADDRESS OF 970-1110 ELMWOOD LN, DENVER, CO 80221. AND, PROJECT AREA TWO (PAGE 4) IS LOCATED AT THE INTERSECTION OF E. 93RD AVE & CLERMONT DR AND TO THE SOUTHEAST TO THE EAST EDGE OF PAVEMENT OF RIVERDALE RD IN THORNTON, CO 80229.
2. WHERE INDICATED, SUBSURFACE UTILITIES HAVE BEEN DEPICTED IN ACCORDANCE WITH ASCE 38-22 STANDARD GUIDELINE FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA. UNLESS OTHERWISE NOTED OR DEPICTED, UTILITY SEGMENTS SHOWN HEREON ARE QUALITY LEVEL B (QL-B) DATA THAT WERE DESIGNATED THROUGH THE APPLICATION OF APPROPRIATE SURFACE GEOPHYSICAL METHODS. SURFACE GEOPHYSICAL TECHNIQUES WERE UTILIZED TO DETERMINE THE EXISTENCE AND APPROXIMATE HORIZONTAL POSITION OF THE INDICATED SUBSURFACE UTILITIES. IN ACCORDANCE WITH THE ASCE 38-22 STANDARD, QL-B DATA SHOULD BE REPRODUCIBLE BY SURFACE GEOPHYSICS AT ANY POINT OF THEIR DEPICTION. THIS INFORMATION WAS SURVEYED TO APPLICABLE TOLERANCES DEFINED BY THE PROJECT AND REDUCED ONTO PLAN DOCUMENTS. THE USER OF THESE DOCUMENTS SHALL BE AWARE THAT THE HORIZONTAL LOCATION MARKS SHOWN HEREON AS RELATED TO DESIGNATING AND LOCATING ACTIVITIES MAY NOT INTERSECT THE HORIZONTAL ALIGNMENT, AND ANY CORRESPONDING DEPTH VALUES ARE APPROXIMATE AND REQUIRE VERIFICATION PRIOR TO CONSTRUCTION.
3. UTILITY SEGMENTS INDICATED HEREON AS QUALITY LEVEL A (QL-A) DATA WERE OBTAINED, WHERE POSSIBLE, THROUGH EXPOSURE OF THE UTILITY LINE THROUGH MINIMALLY INTRUSIVE EXCAVATION, BY MANUALLY MEASURING DOWN FROM THE EXISTING GRADE, AND SURVEYING APPLICABLE TOLERANCES TO DETERMINE BOTH HORIZONTAL AND VERTICAL LOCATIONS OF THE SUBSURFACE UTILITIES. UTILITY LINE DEPTHS SHOWN HEREON, WHEN INDICATED AS A PHYSICAL MEASUREMENT THROUGH EXPOSURE, ARE MEASURED TO THE TOP OF THE UTILITY INFRASTRUCTURE WITH THE EXCEPTION OF PIPE INVERTS FOR GRAVITY-FED SYSTEMS. DEPTHS AT TOP OF PIPES FOR GRAVITY-FED SYSTEMS ARE SHOWN AT APPROXIMATE DEPTHS BASED ON INVERT MEASUREMENTS. POTENTIAL CONFLICT LOCATIONS SHOWING INVERT ELEVATIONS ARE BASED ON CALCULATED INTERPOLATIONS FROM THE GRAVITY-FED SYSTEMS INVERT SURVEY DATA.
4. WHEN EXCAVATION DID NOT OCCUR, A DIGITAL DEPTH (DD) MAY BE OBTAINED THROUGH THE USE OF ELECTROMAGNETIC INSTRUMENTS. DIGITAL DEPTHS SHOWN HEREON ARE APPROXIMATE, ARE FOR INFORMATION PURPOSES ONLY, AND REQUIRE VERIFICATION BY THE USER OF THIS DOCUMENT. THE USER OF THESE DOCUMENTS IS CAUTIONED THAT DIGITAL DEPTHS AND SUBSEQUENTLY DERIVED UTILITY PROFILES ARE SUBJECT TO LIMITATIONS AND POTENTIAL ERROR. ELECTROMAGNETICALLY-COLLECTED SUBSURFACE UTILITY DATA CAN BE INFLUENCED BY FACTORS BEYOND OUR CONTROL INCLUDING, BUT NOT LIMITED TO, CONDUCTIVITY OF MATERIALS AND THEIR SURROUNDINGS, SOIL MOISTURE, DEPTH OF THE TARGETED UTILITY INFRASTRUCTURE, AND PROXIMITY OF OTHER UNDERGROUND UTILITIES OR STRUCTURES. OUR PERSONNEL MADE EVERY REASONABLE EFFORT TO PROPERLY IDENTIFY AND INTERPRET ELECTROMAGNETIC DEPTH MEASUREMENTS IN ACCORDANCE WITH THE PERFORMANCE LIMITATIONS OF THE TECHNOLOGY USED AND TO PROVIDE THE RESULTING INFORMATION IN ACCORDANCE WITH SOUND ENGINEERING JUDGMENT AND PROPER STANDARD OF CARE FOR THE SUBSURFACE UTILITY ENGINEERING (SUE) INDUSTRY. ELECTROMAGNETIC EQUIPMENT MANUFACTURERS STATE DEPTH VARIABLES OF GREATER THAN + OR - 10% OF THE MEASURED DEPTH + 1/2 OF THE PIPE DIAMETER OF THE TARGETED UTILITY INFRASTRUCTURE. THEREFORE, ELECTROMAGNETIC DEPTH MEASUREMENTS (I.E. DIGITAL DEPTHS) AND SUBSEQUENTLY DERIVED UTILITY PROFILES ARE STRICTLY CONSIDERED A "VALUE-ADDED" SERVICE AND ARE NOT WARRANTED TO MEET A SPECIFIC DEGREE OF ACCURACY AND ALL SUCH DATA IS PROVIDED FOR INFORMATION PURPOSES ONLY. THE USE OF SUCH DATA / INFORMATION CONTAINED HEREON DOES NOT ALLEVIATE THE USER'S RESPONSIBILITY TO UTILIZE THEIR PRUDENT ENGINEERING JUDGMENT OR TO CONDUCT UTILITY DEPTH VERIFICATION / INVESTIGATION THROUGH VACUUM EXCAVATION TEST HOLES OR OTHER SUITABLE MEANS ACCEPTABLE TO THE UTILITY OWNER.
5. OTHER UTILITY INFRASTRUCTURE WHICH WERE NOT OBSERVED AND ARE NOT SHOWN HEREON MAY EXIST. IT IS THE RESPONSIBILITY OF THE USER OF THESE DOCUMENTS TO VERIFY THOSE UTILITY LOCATIONS PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION. COLLIER'S ENGINEERING & DESIGN CANNOT ASSUME RESPONSIBILITY FOR MISIDENTIFICATION OR OMISSION OF ANY UNDERGROUND UTILITY INFORMATION.
6. THE USER OF THESE DOCUMENTS IS CAUTIONED THAT EXISTING UTILITY LINES DEPICTED HEREON MAY END AT OR NEAR THE LIMIT OF THE PROJECT OR INVESTIGATIONAL AREA AND MAY APPEAR AS "DEAD ENDS" BUT ACTUALLY MAY CONTINUE BEYOND THE EXTENTS OF DESIGNATION AND LOCATION DEPICTED HEREON.
7. PROPERTY LINES AND RIGHT-OF-WAY LINES SHOWN HEREON PER INFORMATION OBTAINED FROM ADAMS COUNTY GIS.
8. THIS LOCATION SURVEY OF THE EXISTING UTILITY INFRASTRUCTURE DOES NOT REPRESENT A LAND SURVEY PLAT, AN IMPROVEMENT SURVEY PLAT OR A BOUNDARY SURVEY. THIS LOCATION SURVEY IS BASED ON EXISTING PHYSICAL EVIDENCE THAT WAS OBTAINED BETWEEN THE FOLLOWING DATES: 9/10/24 - 9/17/24.
9. REFERENCE CONTROL POINT: COORDINATES AND ELEVATIONS USED HEREON BASED ON OLSSON CONTROL POINT #1, ALL CONTROL POINTS PROVIDED BY OLSSON. COORDINATES ARE IN STATE PLANE COLORADO CENTRAL ZONE 0502, ELLIPSOID GRS 80 AND HAVE BEEN MODIFIED TO GROUND USING THE COMBINED FACTOR 1.0002246000. ELEVATIONS ARE BASED ON OLSSON CP #1 HAVING AN ELEVATION OF 5200.00' (NAVD 88)
10. THE ENGINEER'S SEAL HEREON IS TO CERTIFY THAT THE UTILITY INFRASTRUCTURE SHOWN HEREON HAVE BEEN INVESTIGATED IN THE IMMEDIATE VICINITY OF THE PROPOSED INFRASTRUCTURE ONLY AND IN ACCORDANCE WITH STANDARD SUE INDUSTRY PRACTICES AS DESCRIBED ABOVE, IN ORDER TO ESTIMATE THE HORIZONTAL & VERTICAL LOCATIONS OF EXISTING UTILITY INFRASTRUCTURE IN THIS VICINITY. ALL OTHER INFORMATION HEREON HAS BEEN PROVIDED BY OTHERS AND IS NOT A PART OF THIS CERTIFICATION.
11. AERIAL IMAGERY SOURCE: GEOLOCATION VIA CIVIL3D.
12. ONLY STRUCTURES AND INVERTS SURVEYED FOR EXISTING STORM AND SANITARY GRAVITY SYSTEMS. AS SUCH, THESE SYSTEMS ARE SHOWN AS QL-C. UTILITY RODDING NOT PART OF WORK SCOPE AND AS SUCH, THESE SYSTEMS CANNOT BE VERIFIED AS QL-B.
13. ANY UTILITIES THAT FIELD CREWS DEEMED UNLOCATABLE HAVE BEEN DRAFTED ON THE QL-D LINETYPE. THEIR EXISTENCE AND LOCATION IS BASED ON RECORDS AND/OR PROFESSIONAL JUDGEMENT AND IS NOT GUARANTEED TO BE ACCURATE.

	UNDERGROUND GAS LINE (QUALITY LEVEL D)
	UNDERGROUND SANITARY SEWER LINE (QUALITY LEVEL D)
	UNDERGROUND STORM LINE (QUALITY LEVEL D)
	OVERHEAD WIRE (QUALITY LEVEL D)
	UNDERGROUND IRRIGATION LINE (QUALITY LEVEL D)
	UNDERGROUND FIBER OPTIC LINE (QUALITY LEVEL D)
	UNDERGROUND CABLE TELEVISION LINE (QUALITY LEVEL D)
	UNDERGROUND TELEPHONE LINE (QUALITY LEVEL D)
	UNDERGROUND ELECTRIC LINE (QUALITY LEVEL D)



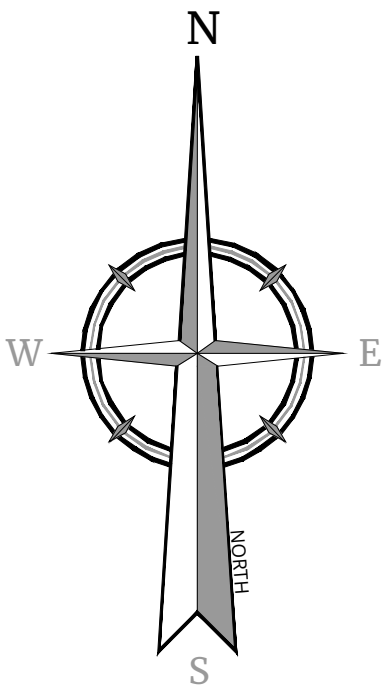
TEST HOLE SUMMARY																
TEST HOLE #	NORTHING (FT)	EASTING (FT)	GRADE		TOP OF PIPE ELEVATION CALC. (FT)	PAVEMENT (TYPE) & DIMENSION		METHOD TO LOCATE	FEATURE DIMENSION & TYPE		GENERAL UTILITY DIRECTION	UTILITY TYPE	UTILITY OWNER	UTILITY ADDRESS/LANDMARKS/NOTES	DATE PERFORMED	ADDITIONAL COMMENTS
			ELEVATION (FT)	DEPTH (FT)		(TYPE)	(IN)		QL-A	(IN)						
B6	1185484.85	3141128.17	5384.07	7.33	5376.74	NATURAL GROUND	N/A	VACUUM EXCAVATION	12	STEEL	E->W	WATER	CITY OF THORNTON	SOUTHEAST CORNER OF W 79TH PL & ELMWOOD LANE, THORNTON CO 80229	2025-05-27	TEST HOLE COMPLETED
B7	1185516.38	3141139.66	5385.46	7.84	5377.62	NATURAL GROUND	N/A	VACUUM EXCAVATION	12	DIP	E->W	WATER	CITY OF THORNTON	SOUTHEAST CORNER OF W 79TH PL & ELMWOOD LANE, THORNTON CO 80229	2025-05-27	TEST HOLE COMPLETED
B8	1185534.83	3141141.94	5385.80	7.81	5377.99	NATURAL GROUND	N/A	VACUUM EXCAVATION	16	STEEL	E->W	WATER	CITY OF THORNTON	SOUTHEAST CORNER OF W 79TH PL & ELMWOOD LANE, THORNTON CO 80229	2025-05-27	TEST HOLE COMPLETED
B9	1185490.60	3141145.32	5385.80	6.00	N/A	NATURAL GROUND	N/A	VACUUM EXCAVATION	N/A	N/A	E->W	WATER	CITY OF THORNTON	SOUTHEAST CORNER OF W 79TH PL & ELMWOOD LANE, THORNTON CO 80229	2025-05-29	UTILITY NOT FOUND. CREW DUG TO 6' WITHOUT FINDING UTILITY.
B10	1185529.54	3141160.50	5387.78	13.00	N/A	NATURAL GROUND	N/A	VACUUM EXCAVATION	16	STEEL	E->W	WATER	CITY OF THORNTON	SOUTHEAST CORNER OF W 79TH PL & ELMWOOD LANE, THORNTON CO 80229	2025-05-27	UTILITY NOT FOUND. CREW DUG A TRENCH 6'W X 13'H. LARGE ASPHALT PIECES FOUND IN TEST HOLE COULD NOT CONTINUE.
B10A	1185532.78	3141160.08	5387.78	10.31	N/A	NATURAL GROUND	N/A	VACUUM EXCAVATION	N/A	N/A	NW->SE	WATER	CITY OF THORNTON	SOUTHEAST CORNER OF W 79TH PL & ELMWOOD LANE, THORNTON CO 80229	2025-05-29	UTILITY NOT FOUND. CREW DUG A SLOT TRENCH CONNECTING TO TH10 WITHOUT FINDING THE WATER LINE. SOIL COLLAPSE PREVENTED FURTHER EXCAVATION.
B10B	1185527.51	3141158.97	5387.39	6.74	5380.65	NATURAL GROUND	N/A	VACUUM EXCAVATION	6	STEEL	NW->SE	WATER	CITY OF THORNTON	SOUTHEAST CORNER OF W 79TH PL & ELMWOOD LANE, THORNTON CO 80229	2025-05-29	TEST HOLE COMPLETED. WATER VENT PIPE FOUND.
B11	1185486.97	3141133.12	5384.59	1.91	5382.68	NATURAL GROUND	N/A	VACUUM EXCAVATION	8	RCP	NW->SE	STORM SEWER	CITY OF THORNTON	SOUTHEAST CORNER OF W 79TH PL & ELMWOOD LANE, THORNTON CO 80229	2025-08-26	TEST HOLE COMPLETED. OD = APPROX. 10"
B12	1731765.68	3141149.47	5385.96	5.03	5380.93	NATURAL GROUND	N/A	VACUUM EXCAVATION	12	AC	NW->SE	WATER	CITY OF THORNTON	SOUTHEAST CORNER OF W 79TH PL & ELMWOOD LANE, THORNTON CO 80229	2026-01-20	TEST HOLE COMPLETED ON A LOCATION DERIVED FROM FIELD OBSERVATION + AS-BUILTS. ASBESTOS CONCRETE LINE DISCOVERED WITH NO TRACER WIRE. AS SUCH, NO SIGNAL WAS ABLE TO BE PICKED UP AND LINE MUST REMAIN QL-D.

[illegible]



SHEET INDEX MAP
SOURCE: GOOGLE EARTH
NTS

TEST HOLE SUMMARY																
TEST HOLE #	NORTHING (FT)	EASTING (FT)	GRADE		TOP OF PIPE ELEVATION CALC. (FT)	PAVEMENT (TYPE) & DIMENSION		METHOD TO LOCATE	FEATURE DIMENSION & TYPE		GENERAL UTILITY DIRECTION	UTILITY TYPE	UTILITY OWNER	UTILITY ADDRESS/LANDMARKS/NOTES	DATE PERFORMED	ADDITIONAL COMMENTS
			ELEVATION (FT)	DEPTH (FT)		(TYPE)	(IN)		QL-A	(IN)						
1	1193919.60	3158864.26	5092.21	5.23	5086.98	NATURAL GROUND	N/A	VACUUM EXCAVATION	12	STEEL	NW->SE	WATER	CITY OF THORNTON	SOUTHEAST CORNER OF E 93RD AVE & CLERMONT DR, THORNTON CO 80229	2025-05-28	TEST HOLE COMPLETED.
1A	1193919.69	3158865.49	5092.05	2.44	5089.61	NATURAL GROUND	N/A	VACUUM EXCAVATION	3	HDPE	NW->SE	GAS	XCEL	SOUTHEAST CORNER OF E 93RD AVE & CLERMONT DR, THORNTON CO 80229	2025-05-28	TEST HOLE COMPLETED.
2	1193912.40	3158878.42	5092.53	6.24	5086.29	NATURAL GROUND	N/A	VACUUM EXCAVATION	12	STEEL	NW->SE	WATER	CITY OF THORNTON	SOUTHEAST CORNER OF E 93RD AVE & CLERMONT DR, THORNTON CO 80229	2025-05-28	TEST HOLE COMPLETED.
3	1193873.68	3158896.97	5092.98	0.50	5092.48	NATURAL GROUND	N/A	VACUUM EXCAVATION	1	PE	NW->SE	COMMUNICATION	COMCAST	SOUTHEAST CORNER OF E 93RD AVE & CLERMONT DR, THORNTON CO 80229	2025-05-28	TEST HOLE COMPLETED.
4	1193883.88	3158904.05	5093.24	4.50	5088.74	NATURAL GROUND	N/A	VACUUM EXCAVATION	36	RCP	NW->SE	STORM SEWER	CITY OF THORNTON	SOUTHEAST CORNER OF E 93RD AVE & CLERMONT DR, THORNTON CO 80229	2025-05-28	TEST HOLE COMPLETED.
5	1193890.93	3158914.58	5093.12	6.23	5086.89	NATURAL GROUND	N/A	VACUUM EXCAVATION	12	STEEL	NW->SE	WATER	CITY OF THORNTON	SOUTHEAST CORNER OF E 93RD AVE & CLERMONT DR, THORNTON CO 80229	2025-05-28	TEST HOLE COMPLETED.



SCALE : 1" = 40'
Linear unit of measure: US Survey Foot (1 ft = 1200/9937 m)



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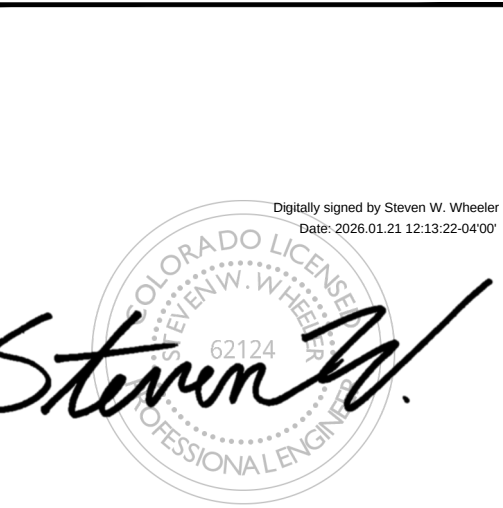
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Doing Business as MASER CONSULTING



FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM

REV	DATE	DRAWN BY	DESCRIPTION
1	7/6/2025	SWW	ADDED Q.L. + PUNCHLIST DATA.
2	8/26/25	SJB	ADDED TH B11 ON STORM LINE AT WATER TANK.
3	1/7/26	SJB	SHIFTED TO COLORADO STATE PLANE CENTRAL.
4	1/2/26	SJB	ADDED TH B12 ON WATER LINE AT WATER TANK.



TREATED WATER SYSTEM
IMPROVEMENT'S
SUE INVESTIGATION
FOR



CITY OF THORNTON
ADAMS COUNTY
COLORADO

DENVER
365 Inverness Pkwy.
Suite 100
Englewood, CO 80112
Phone: 303.731.6216
COLLIERS ENGINEERING & DESIGN, INC.
DOING BUSINESS AS MASER CONSULTING

SCALE: AS SHOWN DATE: 9/27/2024 DRAWN BY: SJB CHECKED BY: SWW

PROJECT NUMBER: 24006741A DRAWING NAME: V-SURV_MOD_SPC

SHEET TITLE: UTILITIES PLAN

SHEET NUMBER: 4 of 4

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.