TOWN OF MOUNTAIN VILLAGE
WATERLINE EXTENSION
MOUNTAIN VILLAGE, CO

Town of Mountain Village Approval

"All work shall be constructed to Town of Mountain Village Standards. This Plan Set has been reviewed and found to be in general compliance with these standards. The engineering design and concept remains the responsibility of the professional engineer whose stamp and signature appear hereon."

*ACCEPTED BY:*_____
PUBLIC WORKS DIRECTOR

*DATE:*_____

SHEET LIST TABLE	
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PD-1	PROJECT DATA SHEET
SP-1	OVERALL SITE PLAN
PP-1 to 11	WATERLINE PLAN AND PROFILE
D-1	SAN JOAQUIN TANK CONNECTION DETAIL
D-2	WAPITI TANK CONNECTION DETAIL
D-3 to 5	TYPICAL DETAILS

General Notes:

All materials and workmanship shall be in accordance with the Project Manual and the Town of Mountain Village Ordinance 2013-8. When requirements in the construction specifications or design standards conflict the more stringent requirement shall apply.

The contractor is responsible for obtaining all required permits prior to the commencement of any work on the project. A Town road right-of-way work permit is required for all work in the public right-of-way.

The contractor shall be responsible for notifying the owner/developer of any problems in conforming to the approved plans for any element of the proposed improvements prior to its construction.

The engineer shall be responsible during construction activities to resolve construction problems due to changed conditions or design errors encountered by the contractor during the progress of any portion of the proposed work. Any improvements constructed not in accordance with the approved plans or the approved revised plans, shall be removed and the improvements shall be reconstructed according to the approved plans.

Underground utilities shown on these plans are from physical evidence on the surface, survey performed, and historical maps. The contractor shall be responsible for the horizontal and vertical location of all utilities prior to construction, including potholing if necessary. The contractor shall contact the appropriate agencies for location of all underground utilities at least 72 hours prior to commencement of construction. Where potholing or excavation reveals conflicts between existing and proposed utilities, the contractor shall notify the owner / developer immediately and any revisions to the construction plans shall be approved in writing.

The contractor shall be responsible for providing a copy of "RECORD DRAWINGS" plans to the Town of Mountain Village prior to final acceptance of work.

The contractor shall notify the Public Works Director or his representative at least 24 hours prior to desired inspection.

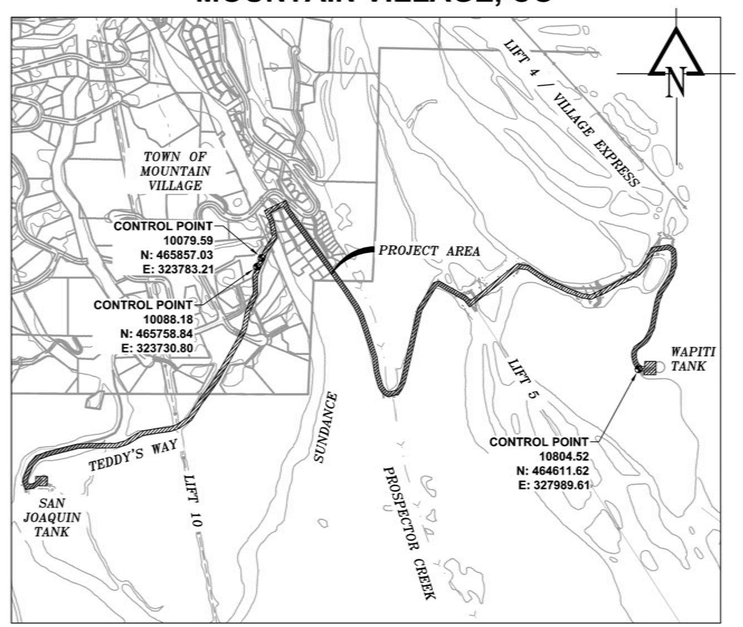
The contractor shall reset all Survey Monuments disturbed during construction within 60 days of project completion.

The contractor shall be solely and completely responsible for conditions at and adjacent to the job site, including safety of all persons and property during performance of the work. The contractor shall also be responsible for confining all work and physical disturbance to a 50-foot easement surrounding the proposed pipe location. This requirement shall apply continuously and not be limited to normal working hours.

The duty of the Town to conduct construction review of the contractor's performance is not intended to include review of the adequacy of the contractor's safety measures in, on, or near the construction site.

Field conditions may exist that require changes to the drawings. If such conditions are encountered, standard engineering practices shall be followed.

Survey data provided by Foley Associates:
GPS Base Station: A HARN monument R02F04 TWIN, a U.S. Forest Service 3 1/4" aluminum cap on a 2 1/2" aluminum pipe on the west side of State Highway 145, just north of the access road to the West Meadows Subdivision, with a Latitude of 37°55'34.87514"N and Longitude of 107°52'57.77195"W and an assumed elevation of 9422.71 feet.



1" = 800' (24X36)
1" = 1,600' (11X17)

Utility Notes:

The contractor shall have in his possession at all times one (1) signed copy of plans and specifications which have been approved by the Town of Mountain Village's Public Works Department.

The contractor shall inform the Town's representative 24 hours in advance when trench will be ready for compaction tests. The Town of Mountain Village shall provide a geotechnical testing laboratory to perform all required tests at the Town's expense. The Contractor shall be responsible for and shall pay all costs in connection with retesting for work or materials found defective or unsatisfactory and all stand-by time charges from the tester due to the Contractor's failure to pave, pour, or fill on schedule for any reason except by action of the Owner's Representative.

The contractor shall repair or replace any public or private improvements in kind including but not limited to: residential services, water lines, sewer lines, or storm drains that are removed or damaged during construction.

The contractor shall excavate trenches by open cut except where boring and jacking is indicated in the drawings. Conform to sheeting, shoring, and bracing requirements of regulating agency or ruling authority.

The contractor shall stockpile suitable material for backfilling a minimum of 4 feet away from trench banks. Remove and waste excavated materials not suitable or not required for backfilling.

The contractor shall provide and maintain dewatering equipment, as necessary, to ensure that all work in trenches is performed under dewatered conditions.

The contractor shall excavate trenches to provide adequate working space and pipe clearances for proper installation and jointing. Trench width at the top of the pipe shall not exceed 16 inches plus pipe width.

All waterline pipe shall be installed with minimum 6-feet of cover over pipe in all locations unless otherwise noted. All water pipelines shall include cathodic protection with an anode installed every 200 linear feet along pipeline.

All HDPE Pipeline geometry is intended to be achieved by bending pipe according to the manufacturer's specifications and recommendations. Horizontal and vertical bends shall be avoided on HDPE lines without prior approval of the Town.

All waterline and snowmaking pipe bedding shall be crusher fines or crushed glass i accordance with the project specifications. At least 12 inches of bedding shall be installed above the pipe and bedding below the pipe equal to ¼ of the outside pipe diameter, but not less than 4 inches. All compaction testing shall be conducted in accordance with ASTM 0698 or AASHTO T99.

LEGEND

EXISTING ELECTRIC UNDERGROUND
EXISTING GAS
EXISTING TELEPHONE
EXISTING WATER
EXISTING SEWER
EXISTING ROAD
EXISTING TRAIL
EXISTING DITCH
EXISTING LOT LINE
EXISTING PROPERTY LINE
EXISTING ROAD CENTERLINE
EXISTING SIDEWALK
EXISTING FENCE
EXISTING CULVERT
EXISTING RETAINING WALL
EXISTING EDGE OF PAVEMENT
EXISTING TREELINE
PROPOSED HDPE WATER
PROPOSED STEEL WATER
EXISTING SIGN
EXISTING WATER VALVE
EXISTING FIRE HYDRANT
EXISTING SEWER MANHOLE

Utility Notes (cont.):

All pipe tees shall have concrete thrust blocks in accordance with the standards and specifications. All concrete thrust blocks shall be 4,000 psi minimum compressive strength plant redimix delivered to the site by truck.

All vertical bends shall have concrete thrust blocks installed.

All valve rings and covers shall be installed with 2 to 3 inches of grade rings with top of cover approximately 2 inches below grade.

The Town of Mountain Village will operate all in service water valves as part of this project. Coordination between the town and the contractor is required for all the water main tie-ins.

12 AWG UF direct burial locator wire to be centered and fastened to HDPE pipe every 6 feet with nylon zip ties.

The contractor shall be responsible for protection of all existing asphalt from construction equipment. Damaged asphalt shall be replaced by the contractor at his expense.

The contractor is responsible for chlorination, de-chlorination, and passing bacteriological testing of all new water mains prior to placing the water main into service.

All vaults shall include a traffic rated lid with lift hooks and a minimum 24-inch access hole. Lids shall be buried a minimum of 2 inches below grade

Structure northing / easting labels are to the center of the proposed structure

Water line shall avoid local high points except where air / vacuum valves are installed. If an area is found to require an air / vacuum valve not called for on the plans, the contractor shall inform the owner / engineer immediately to coordinate any necessary revisions to the plans.

All pipes shall include warning tape laid in the trench 1-ft above the top of pipe.

All sawcuts in asphalt are to intersect at 90° to one another.

Traffic Control Notes:

The contractor shall provide all lights, signs, barricades, flagmen or other devices necessary to provide for public safety in accordance with the current Manual on Uniform Traffic Control Devices.

The contractor shall obtain approval of all traffic control plans from the Town of Mountain Village at least 72 hours prior to the start of construction.

PRELIMINARY

CALL UNCC
TWO WORKING DAYS
BEFORE YOU DIG
1-800-922-1987
UTILITY NOTIFICATION
CENTER OF COLORADO

REVISIONS:

COLORADO REGISTERED PROFESSIONAL ENGINEER
WILLIAM M. FROWICK
22443
11/23/2015

TOWN OF MOUNTAIN VILLAGE
2015 WATERLINE EXTENSION PROJECT
PROJECT DATA SHEET

Russell Planning & Engineering, Inc.
Civil Engineering Services
934 Main Avenue, Unit C
Durango, Colorado 81301
Phone: (970) 385-4546
Fax: (970) 385-4502

Drawn: BN
Drafted: TM
Checked: BF

Date of Submittal
02/16/2015

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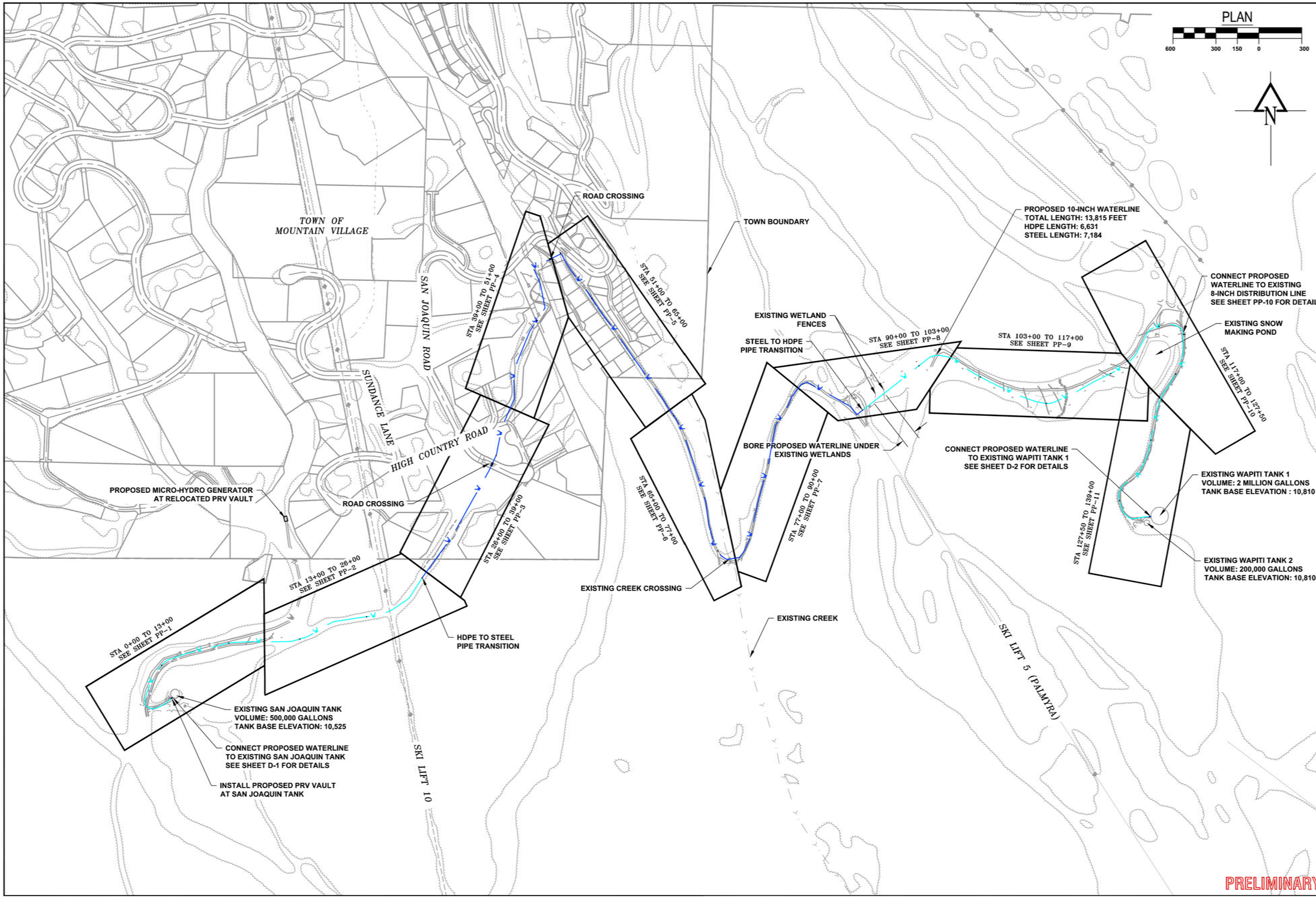

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CENTER OF COLORADO

REVISIONS

COLORADO REGISTERED PROFESSIONAL ENGINEER
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11/23/2015

TOWN OF MOUNTAIN VILLAGE
2015 WATERLINE EXTENSION PROJECT
OVERALL SITE PLAN

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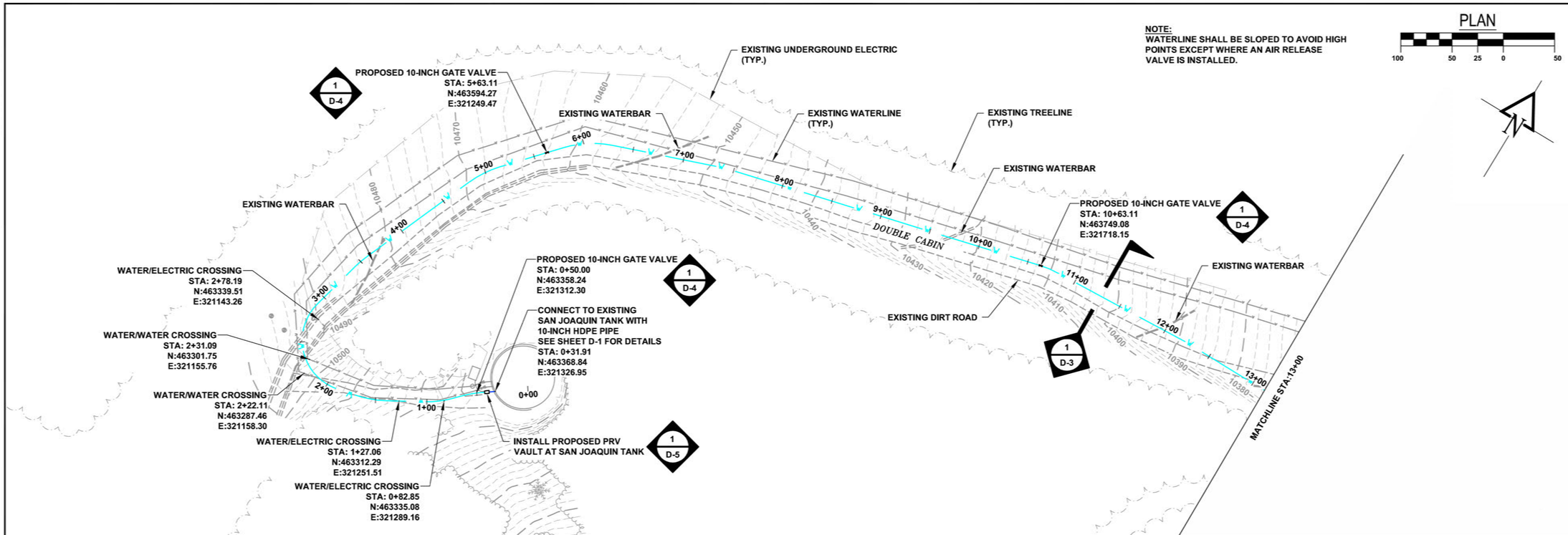
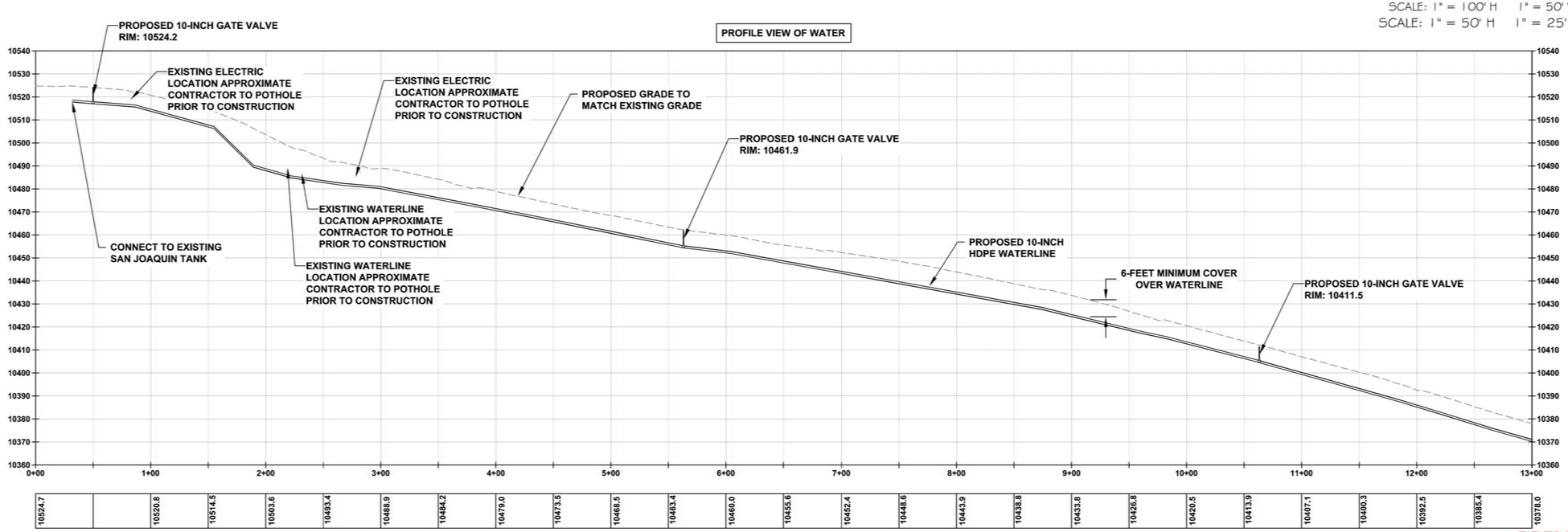
SP-1

File Name: R:\Current Projects\Land Projects 3\Mountain Village Waterline Design Project\ACAD\Level 3 Production Dwgs\SITE PLAN Plotted: 2/16/2015 3:27 PM Plot Style: HALF.STB Plotted By: TRAVIS MOONEY



PROFILE

SCALE: 1" = 100' H 1" = 50' V (11x17)
SCALE: 1" = 50' H 1" = 25' V (24x36)



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REVISIONS:

COLORADO REGISTERED PROFESSIONAL ENGINEER WILLIAM F. FRONTERA 22443 11/23/2015

TOWN OF MOUNTAIN VILLAGE
2015 WATERLINE EXTENSION PROJECT
WATERLINE PLAN AND PROFILE

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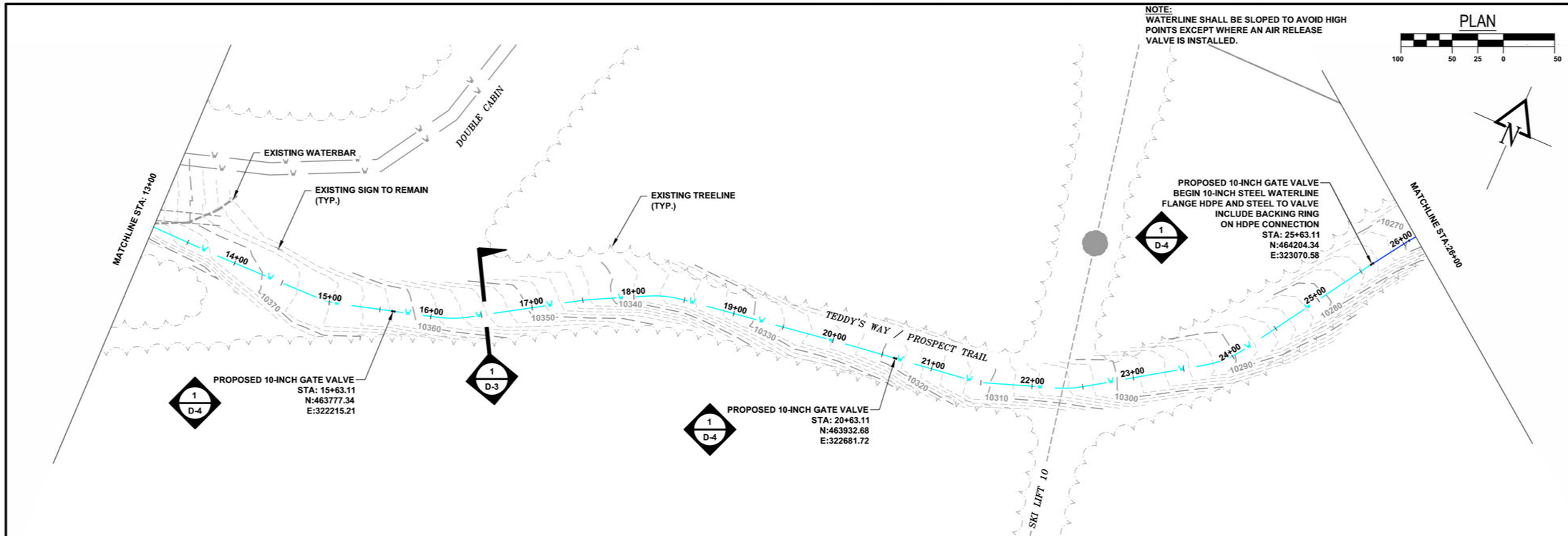
02/16/2015

PP-1

File Name: R:\Current Projects\Land Projects 3\Mountain Village Waterline Design Project\ACAD\Level 3 Production Dwgs\WATER P-PRO Plotted: 2/16/2015 3:28 PM Plot Style: HALF.STB Plotted By: TRAVIS MOONEY



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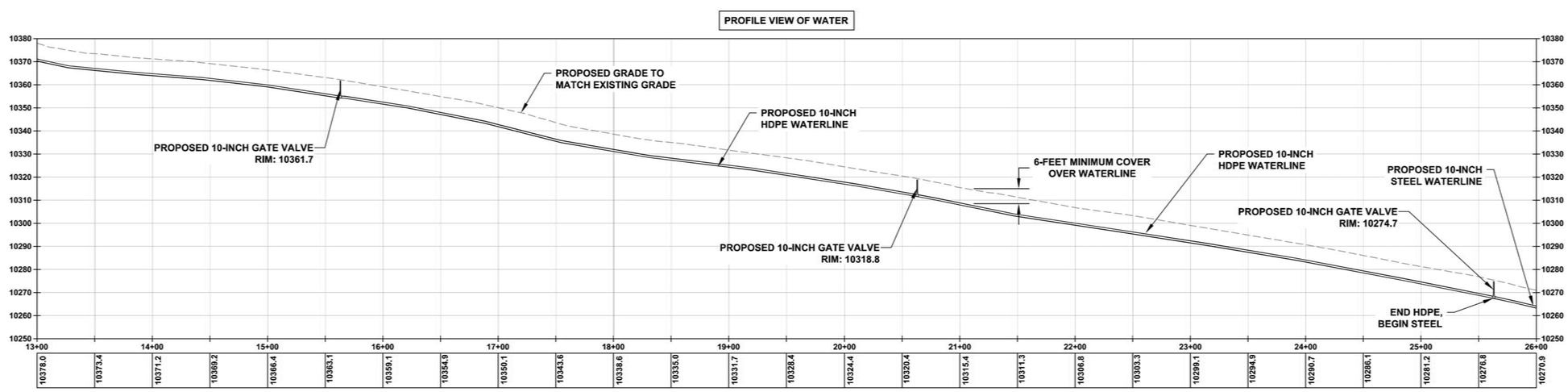

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TOWN OF MOUNTAIN VILLAGE
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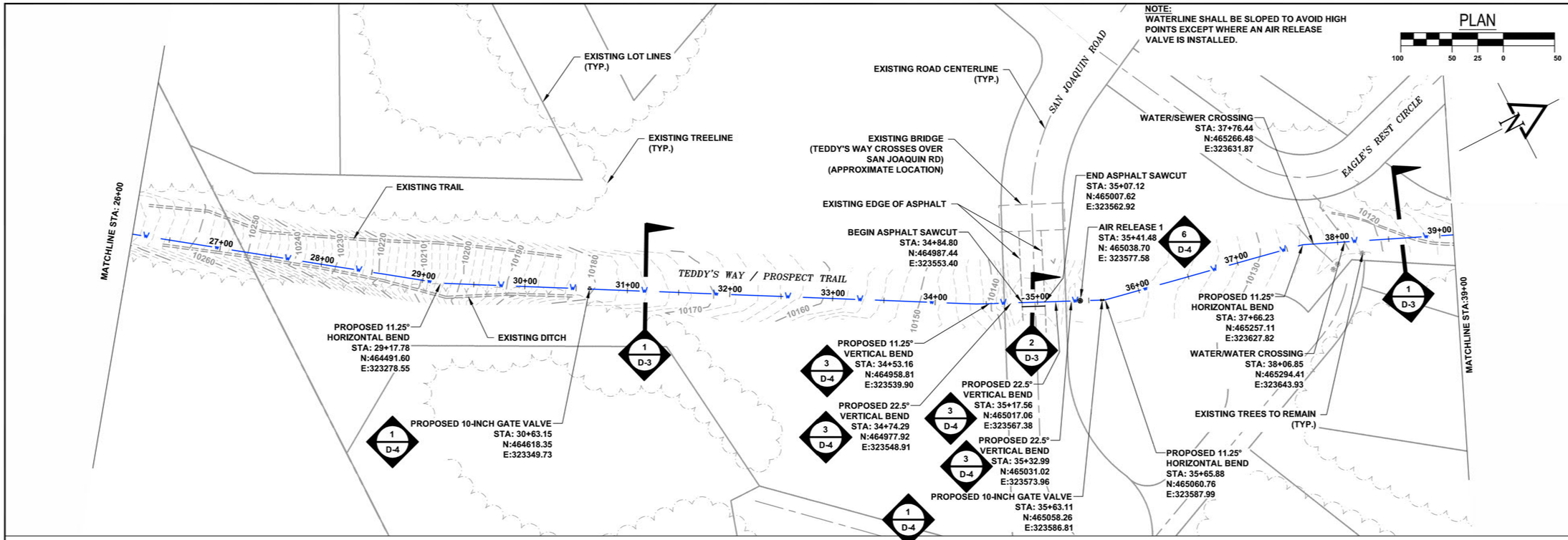
PP-2

File Name: R:\Current Projects\Land Projects 3\Mountain Village Waterline Design Project\ACAD\Level 3 Production Dwgs\WATER P-PRO Plotted: 2/16/2015 3:28 PM Plot Style: HALF.STB Plotted By: TRAVIS MOONEY

NOTE:
WATERLINE SHALL BE SLOPED TO AVOID HIGH POINTS EXCEPT WHERE AN AIR RELEASE VALVE IS INSTALLED.

PLAN



PROFILE

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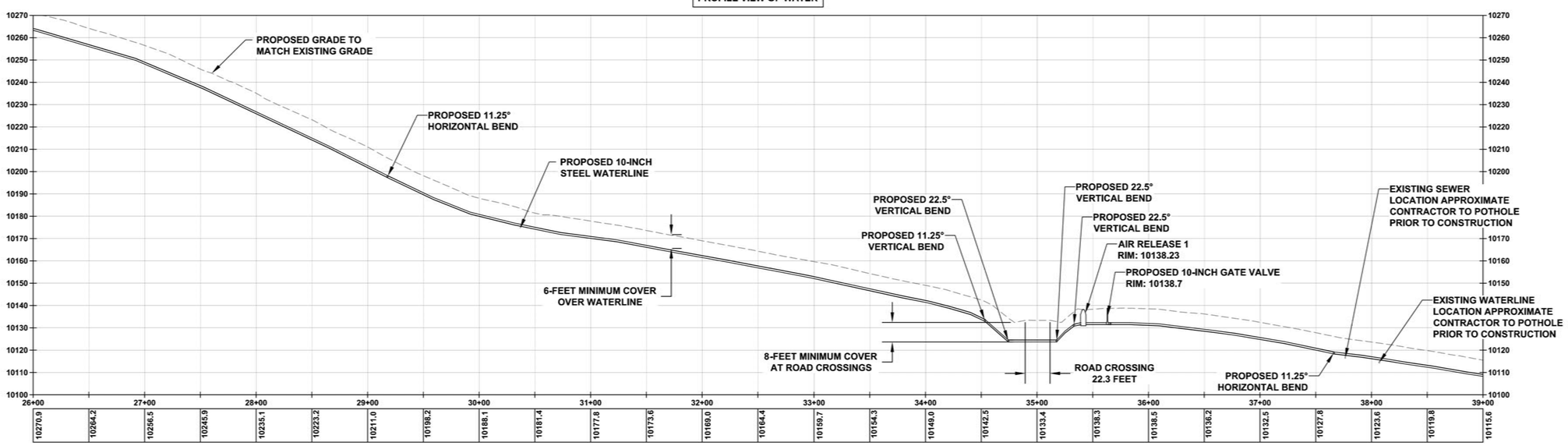
PROFILE VIEW OF WATER



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REVISIONS

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WATERLINE PLAN AND PROFILE

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PP-3

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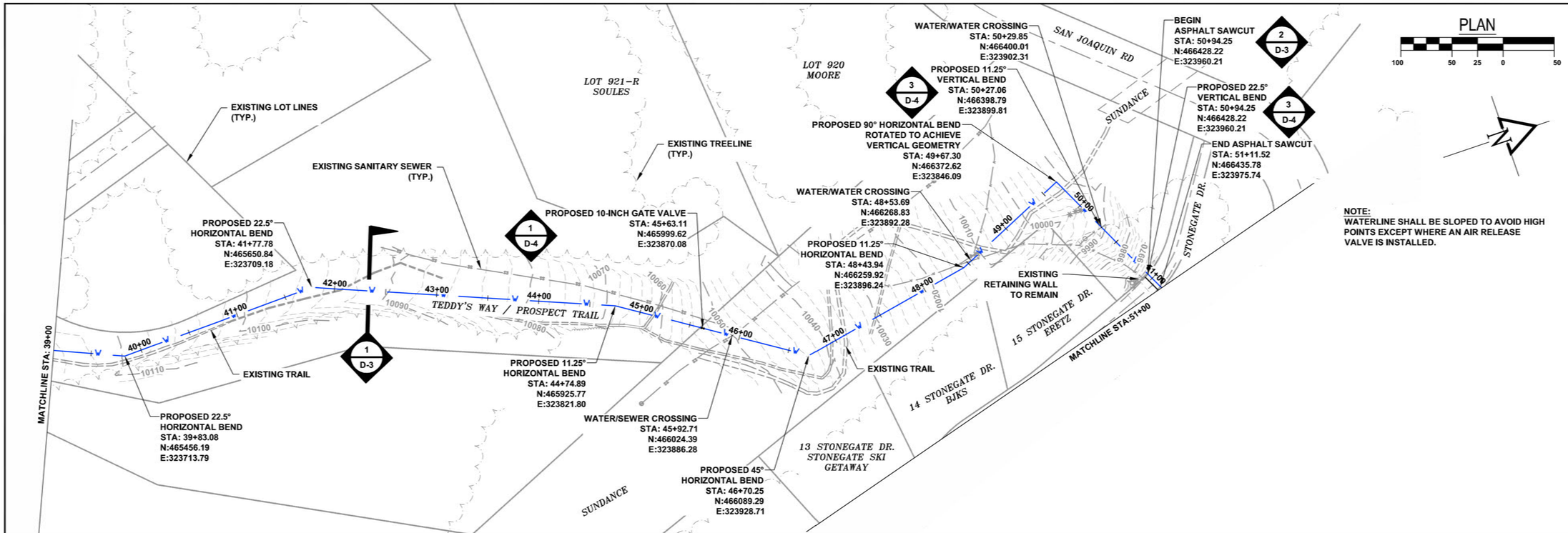

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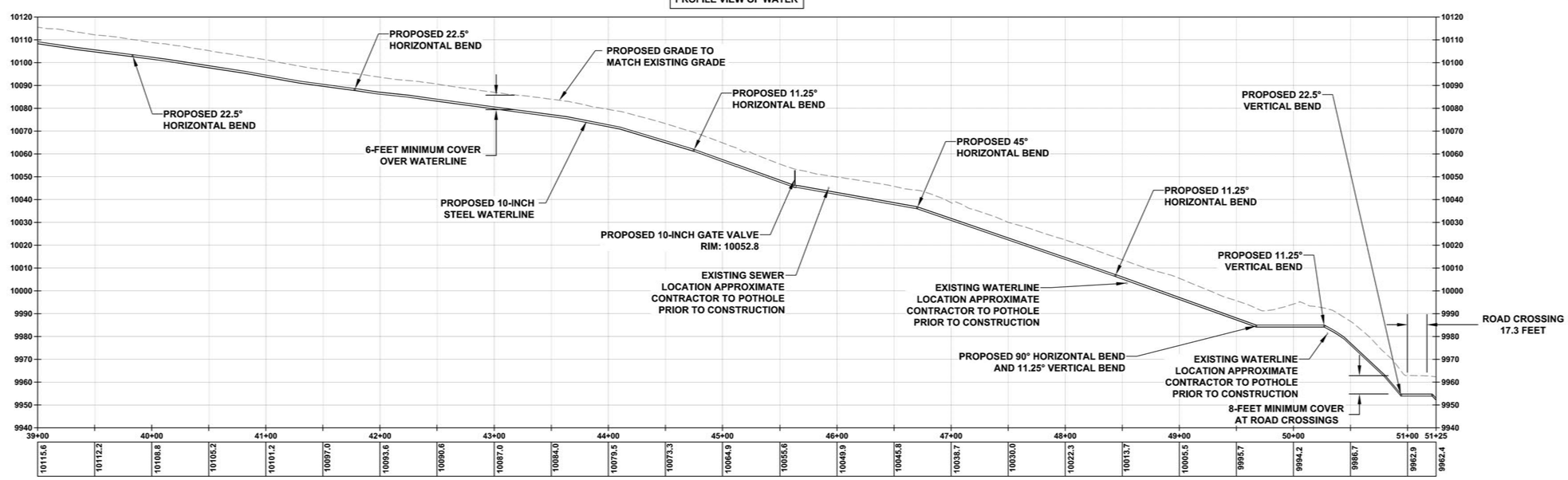
PROFILE VIEW OF WATER



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TOWN OF MOUNTAIN VILLAGE
2015 WATERLINE EXTENSION PROJECT
WATERLINE PLAN AND PROFILE

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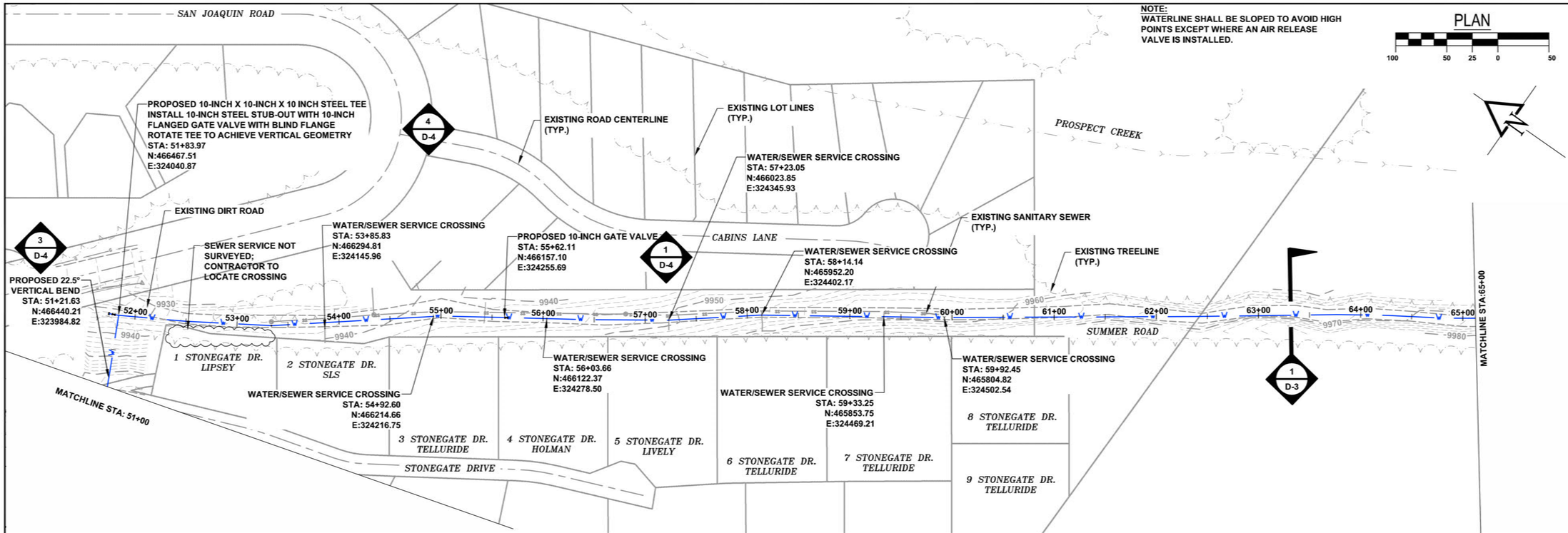
PP-4

File Name: R:\Current Projects\Land Projects 3\Mountain Village Waterline Design Project\ACAD\Level 3 Production Dwgs\WATER P-PRO Plotted: 2/16/2015 3:29 PM Plot Style: HALF.STB Plotted By: TRAVIS MOONEY



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PLAN

100 50 25 0 50

PROFILE

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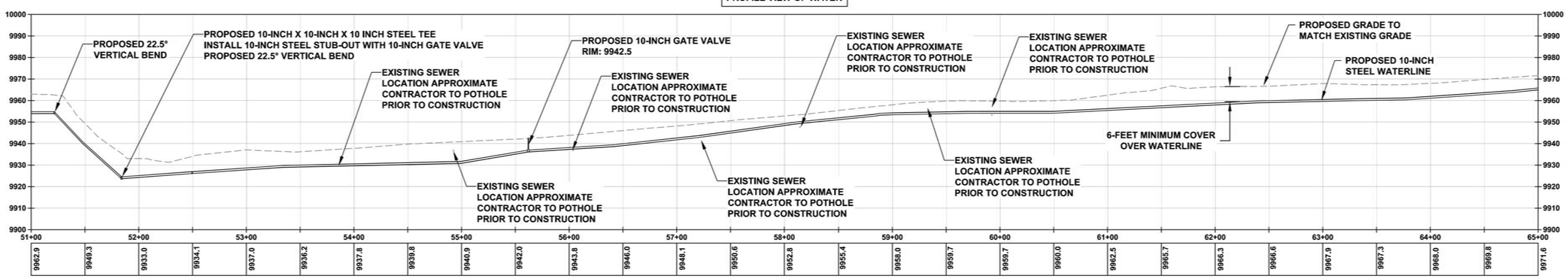
PROFILE VIEW OF WATER



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TOWN OF MOUNTAIN VILLAGE
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PP-5

File Name: R:\Current Projects\Land Projects 3\Mountain Village Waterline Design Project\ACAD\Level 3 Production Dwgs\WATER P-PRO Plotted: 2/16/2015 3:29 PM Plot Style: HALF.STB Plotted By: TRAVIS MOONEY

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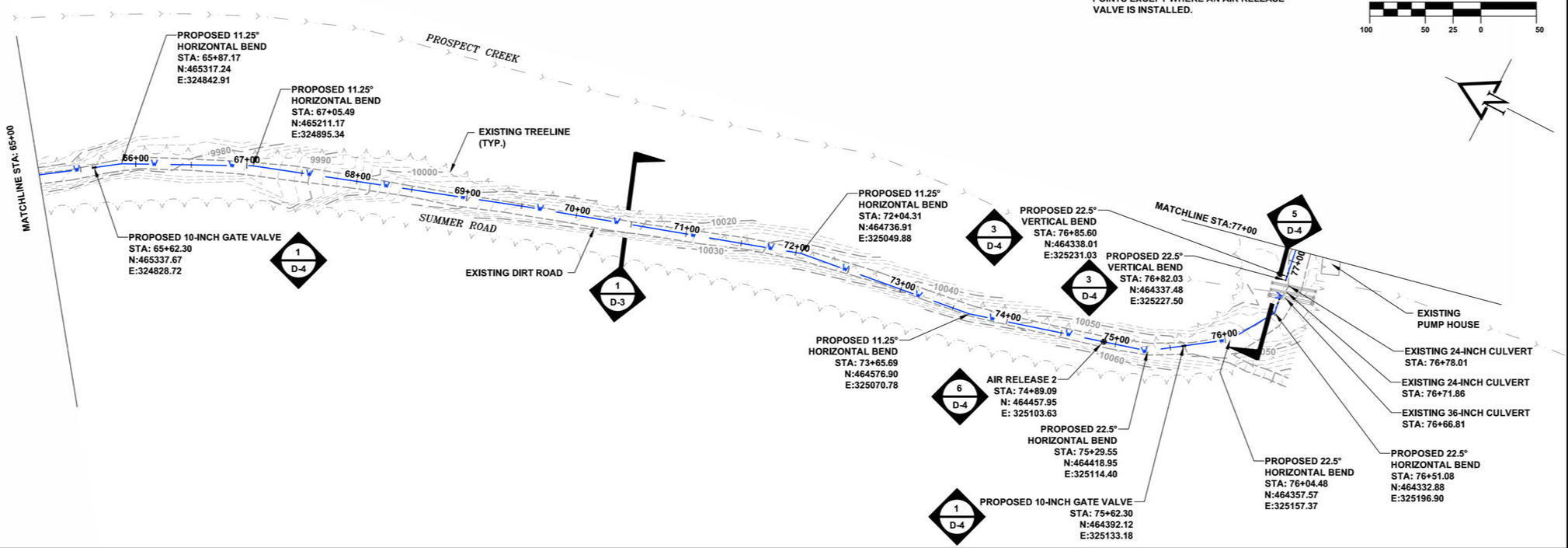
PLAN



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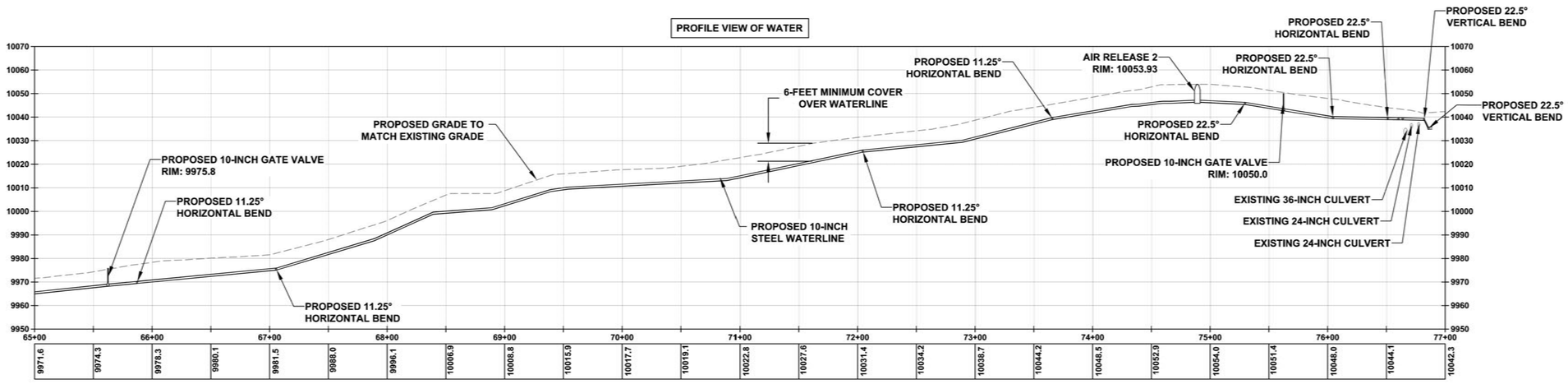

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PP-6

File Name: R:\Current Projects\Land Projects 3\Mountain Village Waterline Design Project\ACAD\Level 3 Production Dwgs\WATER P-PRO Plotted: 2/16/2015 3:29 PM Plot Style: HALF.STB Plotted By: TRAVIS MOONEY

NOTE:
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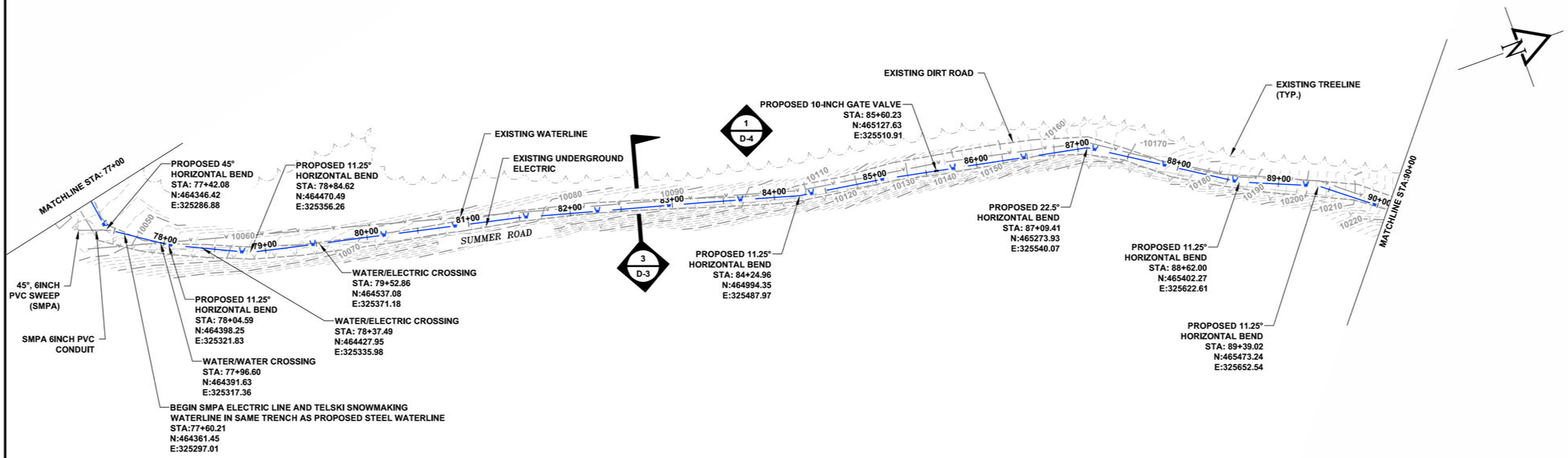
PLAN



PROFILE

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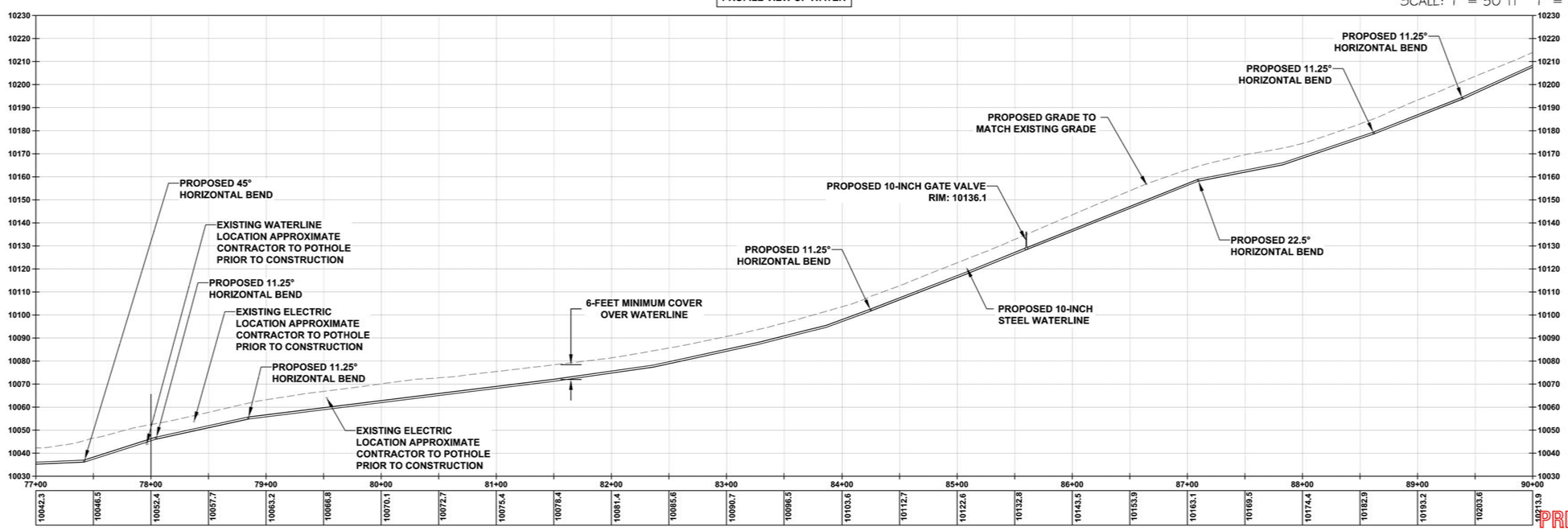
PROFILE VIEW OF WATER



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WATERLINE PLAN AND PROFILE

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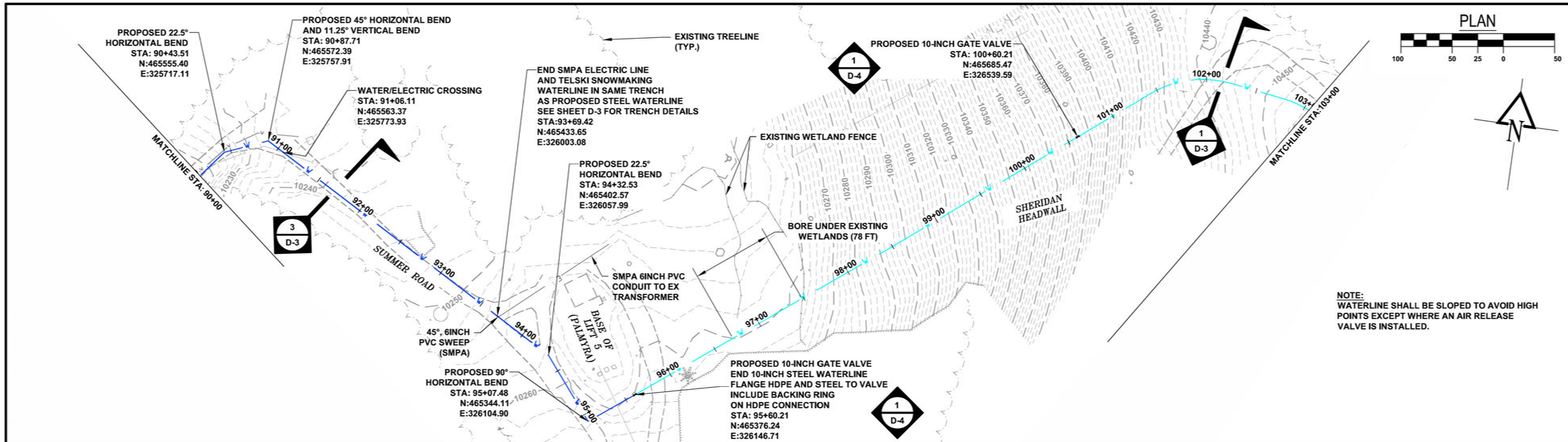
PP-7

File Name: R:\Current Projects\Land Projects 3\Mountain Village Waterline Design Project\ACAD\Level 3 Production Dwgs\WATER P-PRO Plotted: 2/16/2015 3:29 PM Plot Style: HALF.STB Plotted By: TRAVIS MOONEY



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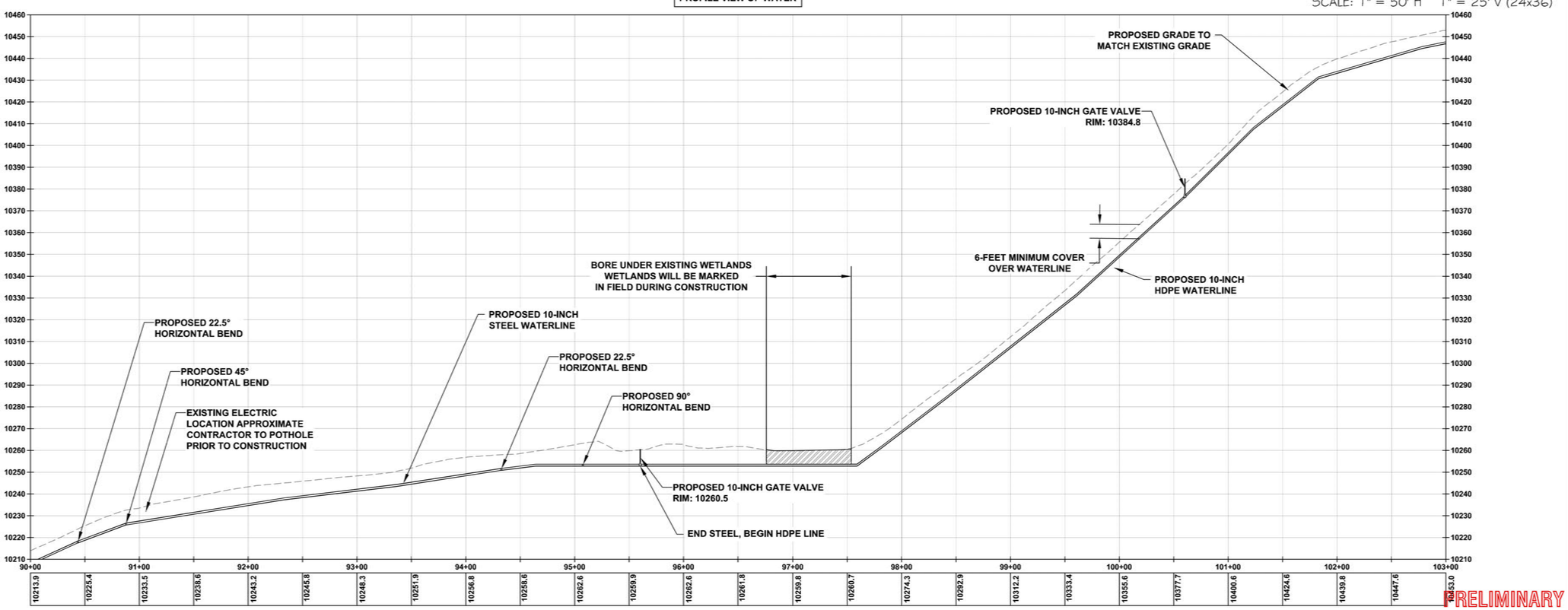
PROFILE VIEW OF WATER



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COLORADO REGISTERED PROFESSIONAL ENGINEER BRIAN FROWNFELTER 22443 11/23/2015

REVISIONS:

TOWN OF MOUNTAIN VILLAGE 2015 WATERLINE EXTENSION PROJECT WATERLINE PLAN AND PROFILE

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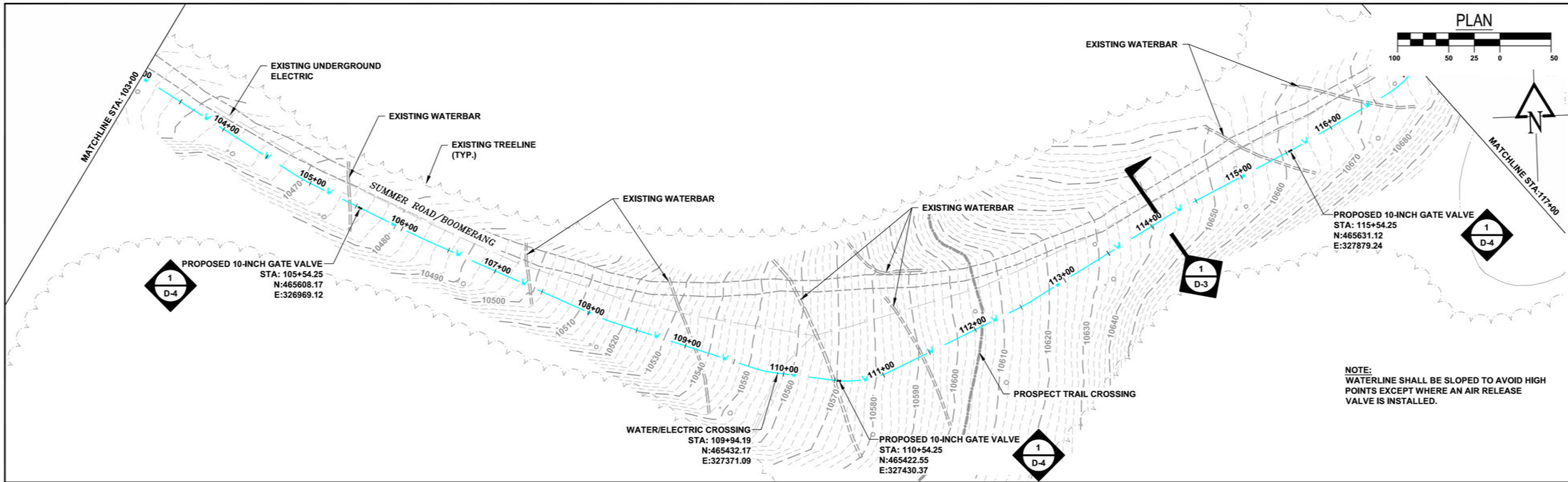
PP-8

File Name: R:\Current Projects\Land Projects 3\Mountain Village Waterline Design Project\ACAD\Level 3 Production Dwgs\WATER P-PRO Plotted: 2/16/2015 3:29 PM Plot Style: HALF.STB Plotted By: TRAVIS MOONEY



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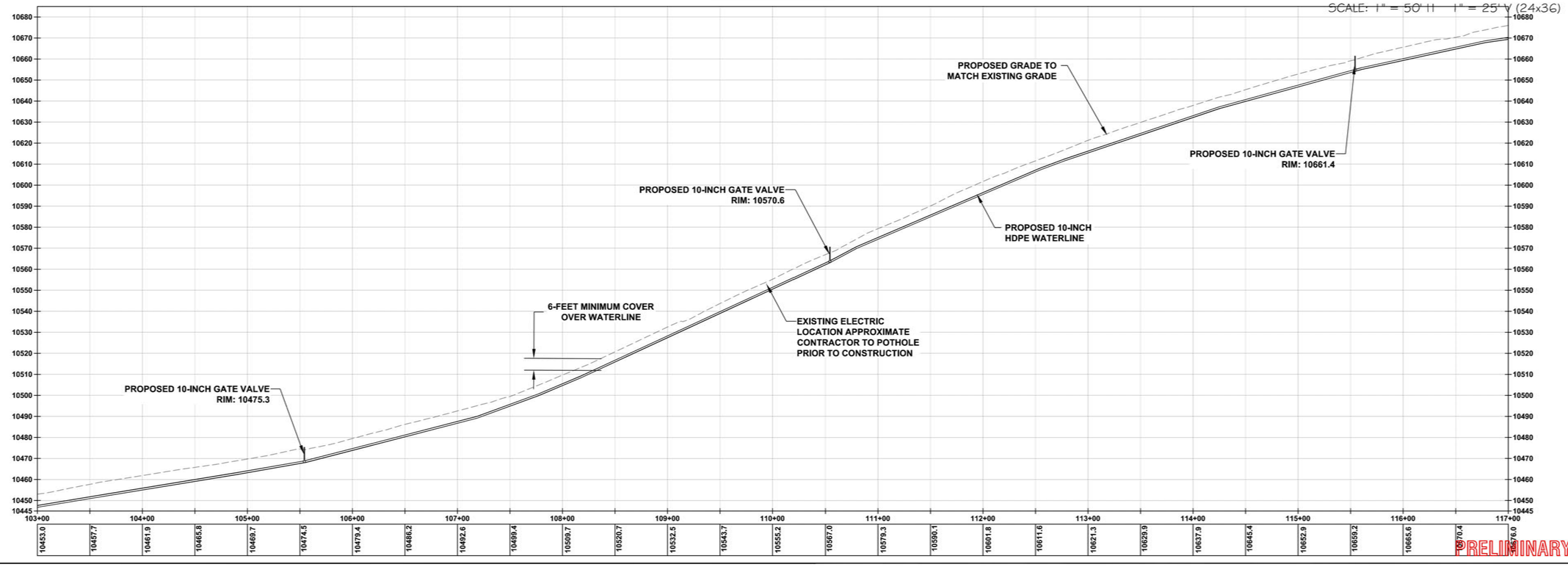
PROFILE

SCALE: 1" = 100' H 1" = 50' V (11x17)
SCALE: 1" = 50' H 1" = 25' V (24x36)



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REVISIONS:

COLORADO REGISTERED PROFESSIONAL ENGINEER
WILLIAM FROWNFELTER
22443
11/23/2015

TOWN OF MOUNTAIN VILLAGE
2015 WATERLINE EXTENSION PROJECT
WATERLINE PLAN AND PROFILE

Russell Planning & Engineering, Inc.
Civil Engineering Services
934 Main Avenue, Unit C
Durango, Colorado 81301
Phone: (970) 385-4546
Fax: (970) 385-4502

Drawn: BN
Drafted: TM
Checked: BF

Date of Submittal
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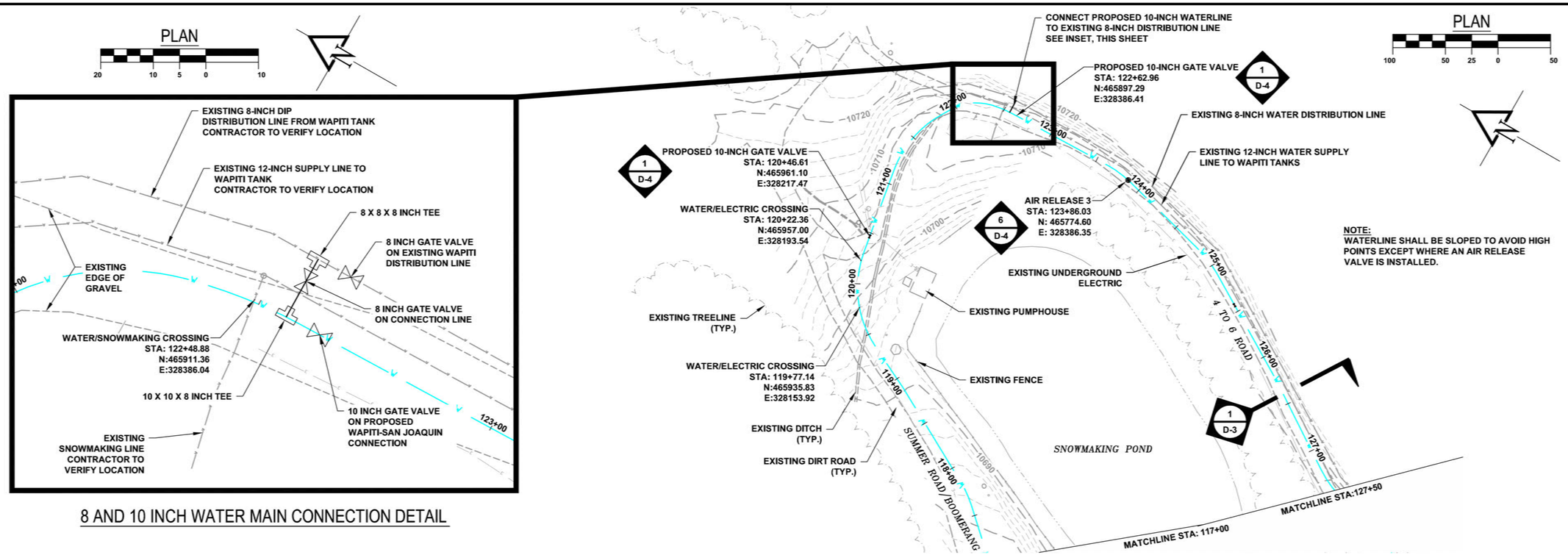
PP-9

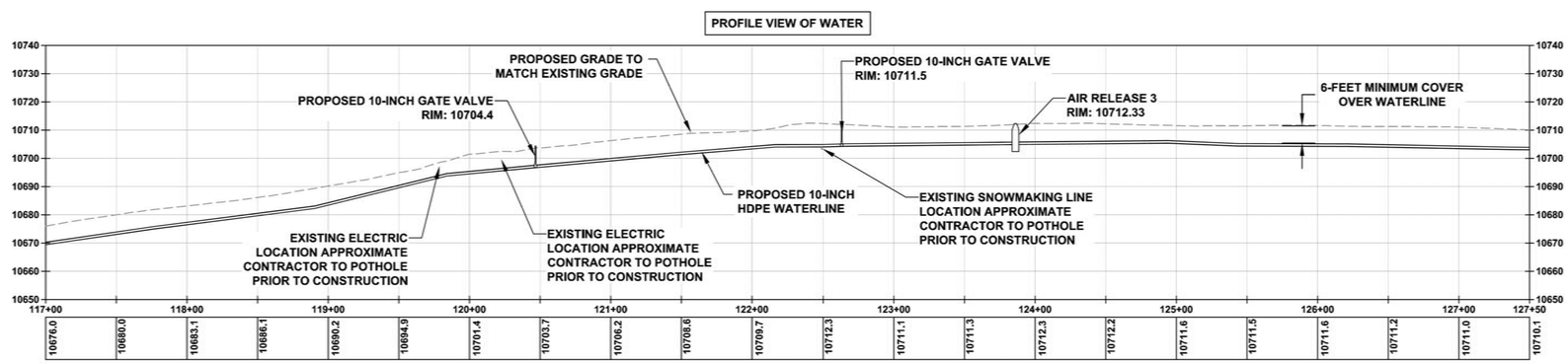
File Name: R:\Current Projects\Land Projects 3\Mountain Village Waterline Design Project\ACAD\Level 3 Production Dwgs\WATER P-PRO Plotted: 2/16/2015 3:30 PM Plot Style: HALF.STB Plotted By: TRAVIS MOONEY



8 AND 10 INCH WATER MAIN CONNECTION DETAIL

PROFILE

SCALE: 1" = 100' H 1" = 50' V (11x17)
SCALE: 1" = 50' H 1" = 25' V (24x36)



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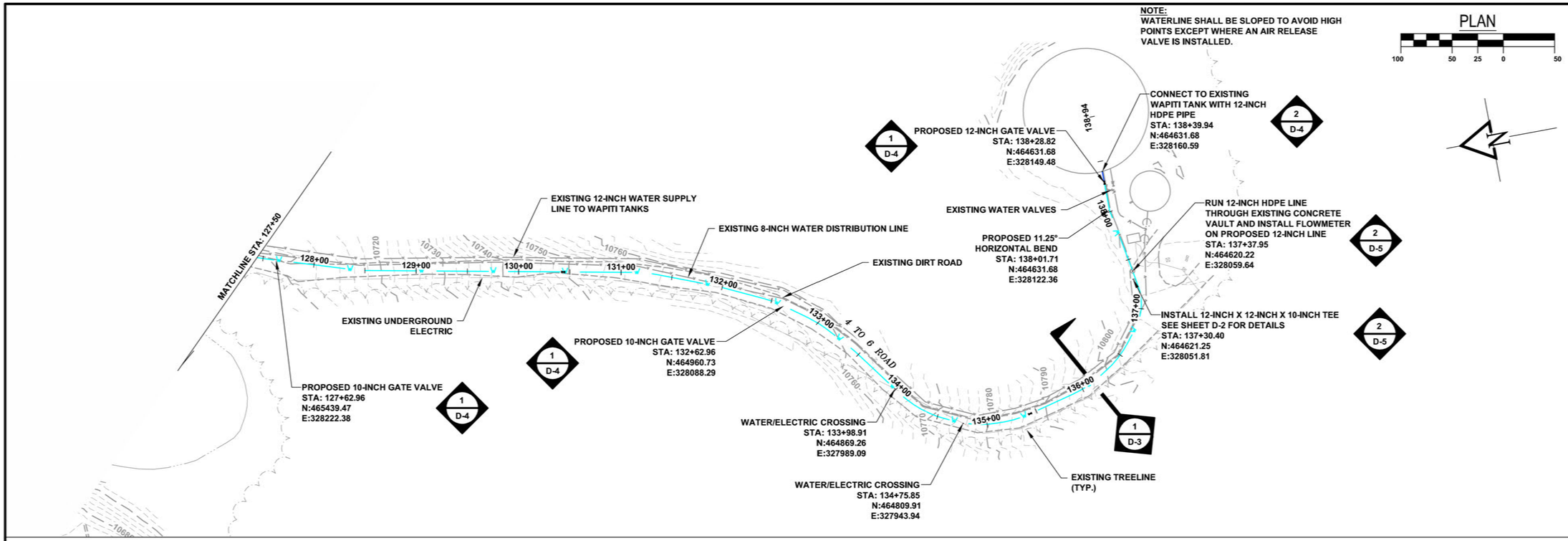
PP-10

File Name: R:\Current Projects\Land Projects 3\Mountain Village Waterline Design Project\ACAD\Level 3 Production Dwgs\WATER P-PRO Plotted: 2/16/2015 3:30 PM Plot Style: HALF.STB Plotted By: TRAVIS MOONEY

NOTE:
WATERLINE SHALL BE SLOPED TO AVOID HIGH POINTS EXCEPT WHERE AN AIR RELEASE VALVE IS INSTALLED.

PLAN



PROFILE

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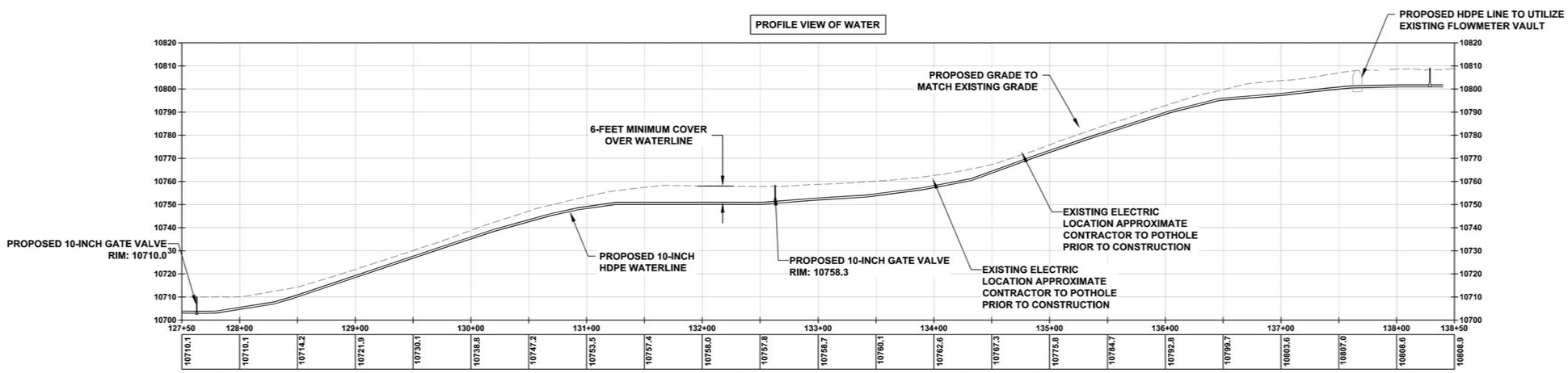
SCALE: 1" = 50' H 1" = 25' V (24x36)



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2015 WATERLINE EXTENSION PROJECT
WATERLINE PLAN AND PROFILE

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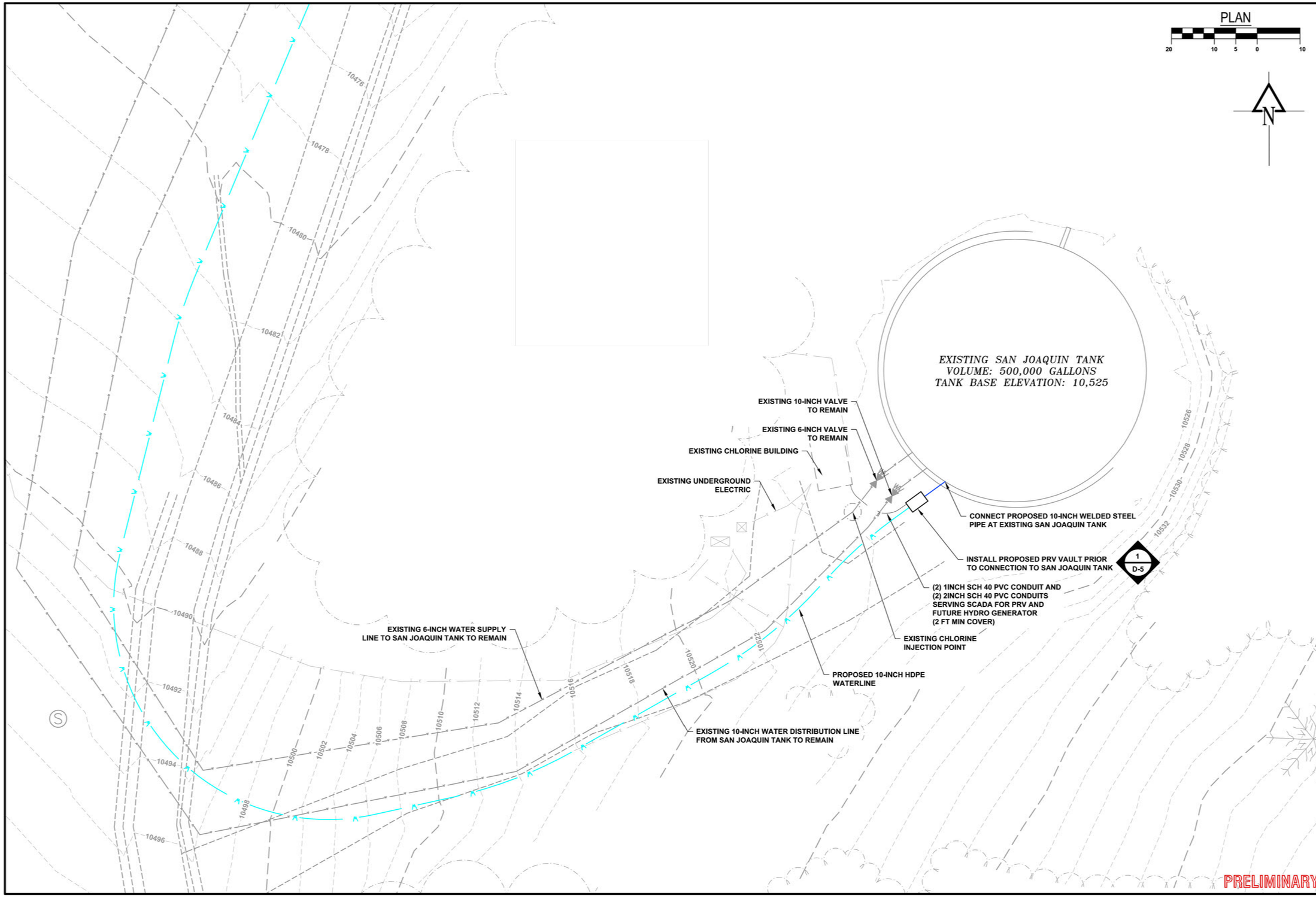
PP-11

File Name: R:\Current Projects\Land Projects 3\Mountain Village Waterline Design Project\ACAD\Level 3 Production Dwgs\WATER P-PRO Plotted: 2/16/2015 3:30 PM Plot Style: HALF.STB Plotted By: TRAVIS MOONEY



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WILLIAM FROWNFELTER
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11/23/2015
PROFESSIONAL ENGINEER

TOWN OF MOUNTAIN VILLAGE
2015 WATERLINE EXTENSION PROJECT
SAN JOAQUIN TANK CONNECTION DETAIL

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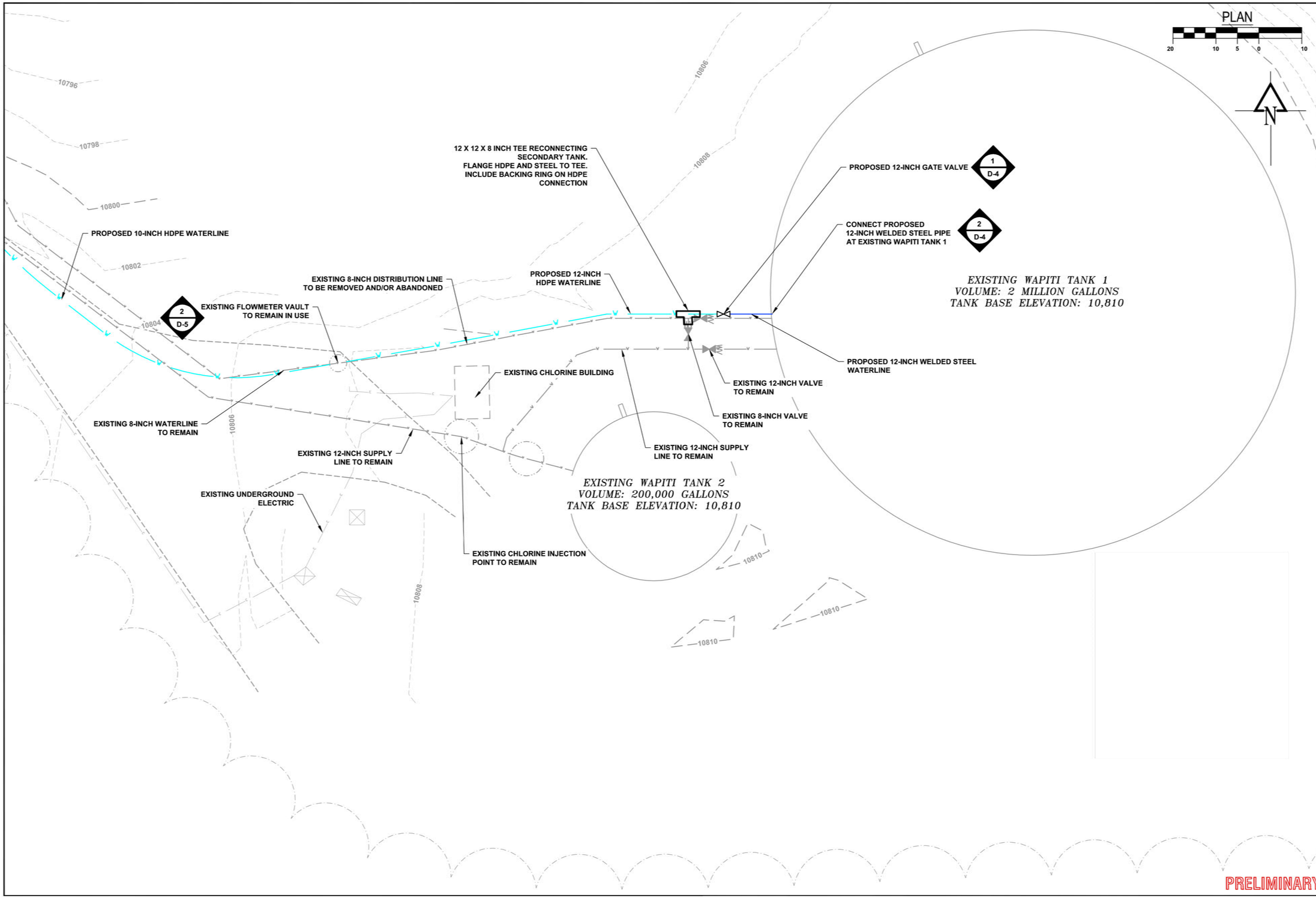
D-1

File Name: R:\Current Projects\Land Projects 3\Mountain Village Waterline Design Project\ACAD\Level 3 Production Dwgs\TANK CONNECTION DETAILS Plotted: 2/16/2015 3:31 PM Plot Style: HALF.STB Plotted By: TRAVIS MOONEY



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22443
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2015 WATERLINE EXTENSION PROJECT
WAPITI TANK CONNECTION DETAIL

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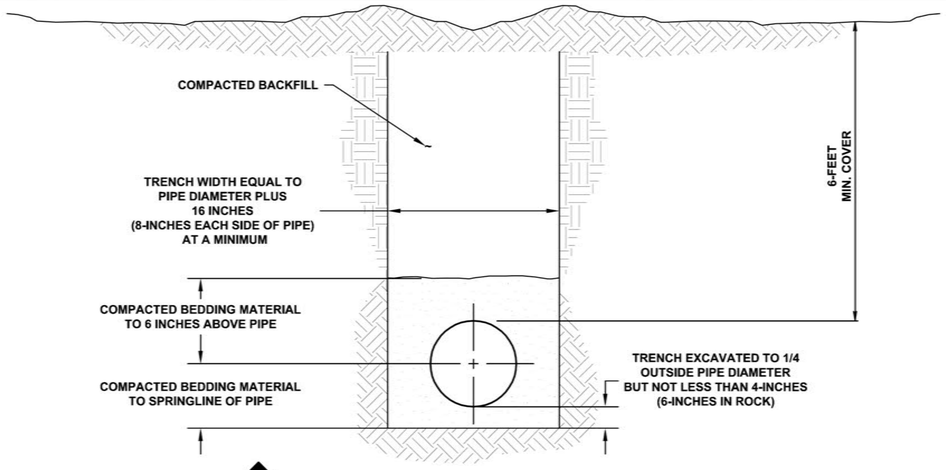
D-2

File Name: R:\Current Projects\Land Projects 3\Mountain Village Waterline Design Project\ACAD\Level 3 Production Dwgs\TANK CONNECTION DETAILS Plotted: 2/16/2015 3:31 PM Plot Style: HALF.STB Plotted By: TRAVIS MOONEY



1 / D-3 STANDARD HDPE PIPE TRENCH AND BEDDING DETAIL

N.T.S.

MINIMUM HORIZONTAL CLEARANCE FROM OTHER UTILITIES

(measured from edge to edge of cables, conduits, gas, sewer and water lines)

SMPA requires that electric lines **not** be located directly over water or sewer lines but be offset horizontally. SMPA requires that gas, telephone and CATV lines **not** be located directly over electric but be offset horizontally. In situation where utilities must cross, a perpendicular crossing with at least 12" vertical clearance is required.

Distance from:	Min. Clearance	Distance from:	Min. Clearance
Gas Line	36"	Telephone	12"
High Pressure Gas Line	60"	CATV	12"
Water Line	36"	Sewer Line	36"

TRENCH BEDDING and COMPACTION

Trenches should be free of rocks prior to laying under-bedding. All trenches need to be smooth bottomed. Access for SMPA's line trucks must be provided alongside trenches for high-voltage cable.

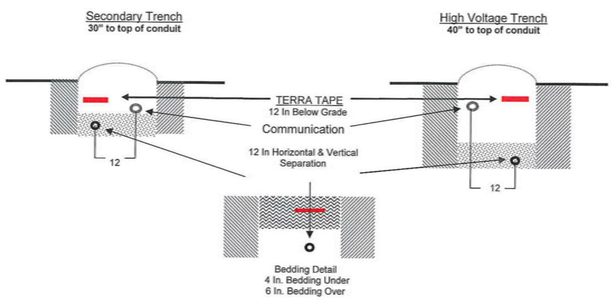
Where bedding is required, 4" will be placed under the conduit/SMPA facilities. After installation, 6" of bedding material will be placed over the conduit/SMPA facilities. Suitable bedding material is defined as soft soil or sand free of rocks or other abrasive objects greater than 1/2" in diameter. Mine tailings are not allowed. The bedding of the conduit/ SMPA facilities must be inspected by SMPA prior to backfilling of the trench.

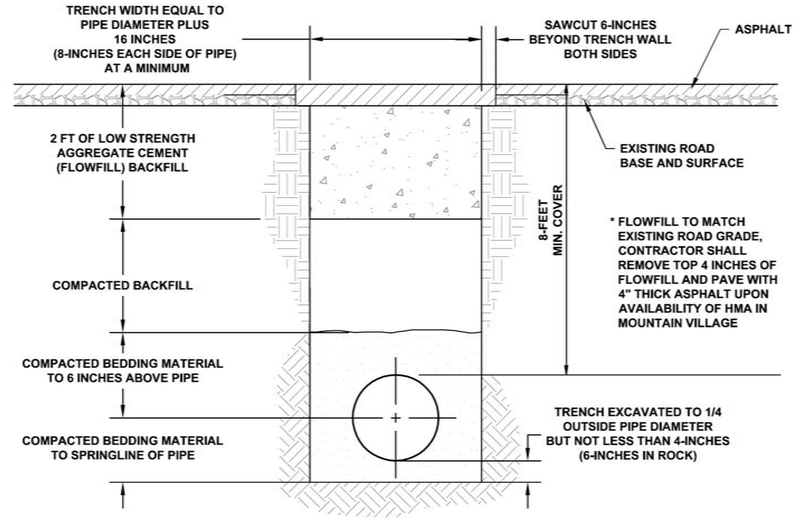
SMPA will supply red terra tape to be installed 1 foot below the surface over the buried conduit/ SMPA facilities

Terra tape is to be used ONLY for power line installations.

Trenches will be compacted after backfilling. Compaction is not allowed until 24" of backfill has been placed over conduit. Care must be taken to not allow equipment to damage cable by driving over it or by falling onto it in the trench.

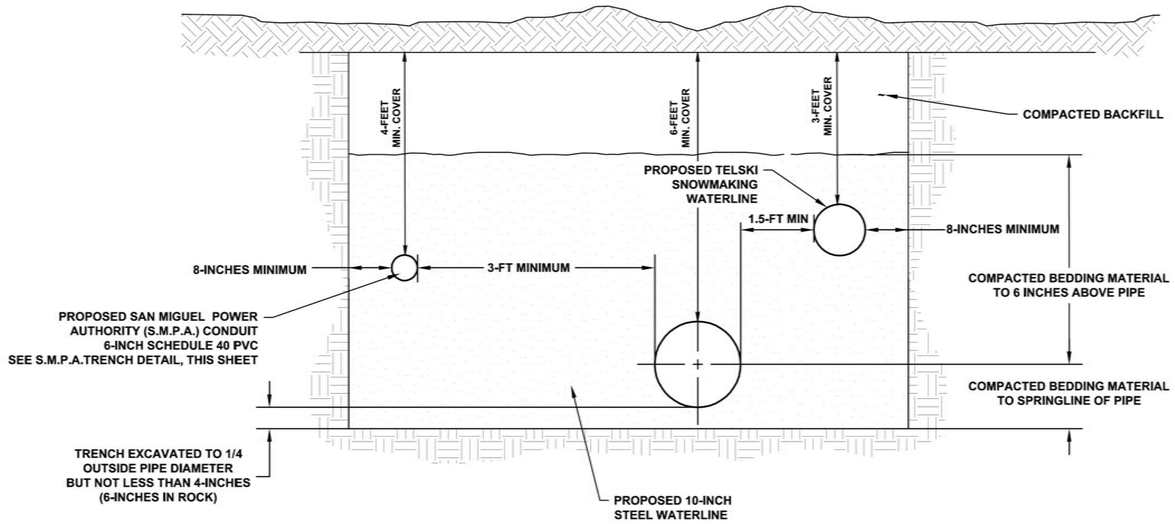
TYPICAL TRENCH DETAIL





2 / D-3 ROAD CROSSING PIPE TRENCH AND BEDDING DETAIL

N.T.S.



3 / D-3 S.M.P.A. SHARED TRENCH PIPE TRENCH AND BEDDING DETAIL

N.T.S.

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WILLIAM F. BROWN
22443
11/23/2015

TOWN OF MOUNTAIN VILLAGE
2015 WATERLINE EXTENSION PROJECT
TYPICAL DETAILS

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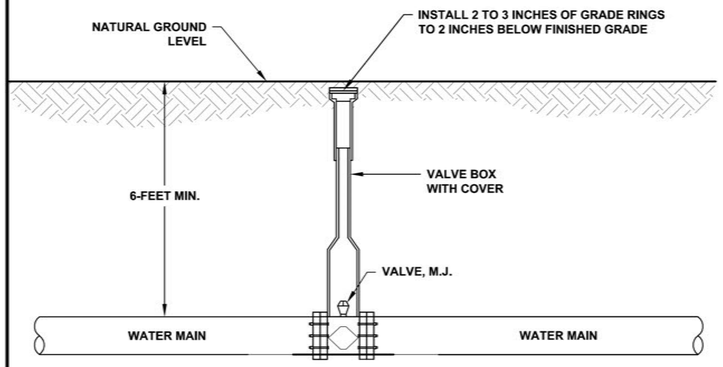
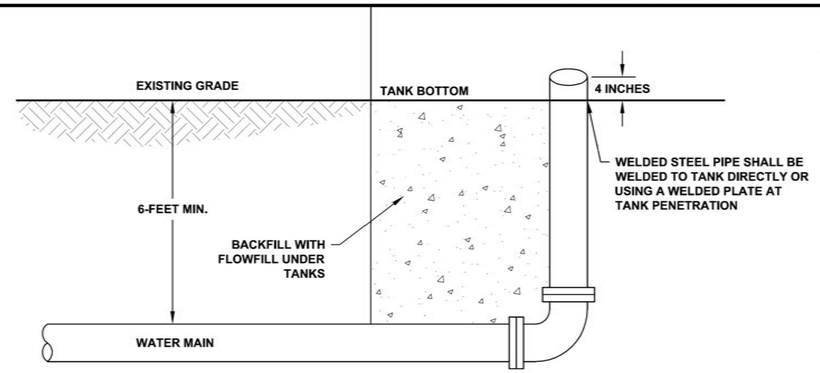
D-3

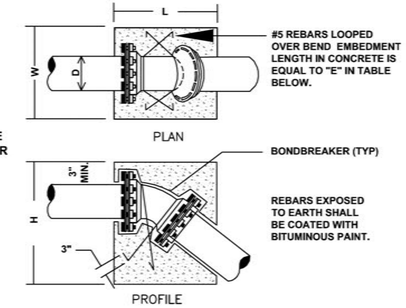
File Name: R:\Current Projects\Land Projects 3\Mountain Village Waterline Design Project\ACAD\Level 3 Production Dwgs\TYPICAL DETAILS Plotted: 2/16/2015 3:32 PM Plot Style: HALF.STB Plotted By: TRAVIS MOONEY



1 / D-4 TYPICAL VALVE DETAIL
N.T.S.



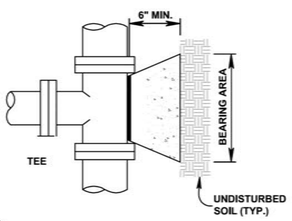
2 / D-4 TANK PENETRATION
N.T.S.



NOTES:
1. VOLUME IS IN CUBIC FEET.
2. ALL CONCRETE TO BE 2500 PSI @ 28 DAYS MIN.
3. BLOCKS TO BE CENTERED HORIZONTALLY ON THE BEND.
4. DESIGN BASED UPON A TEST OF 150 P.S.I. AND A SAFETY FACTOR OF 1.5.
5. $V_B = \frac{S_f \, PA \, SIN(THETA)}{W_m}$
6) W_m = 140#/CU FT.

SIZE OF PIPE (D.)	11.25 DEG.					22.5 DEG.					45 DEG.				
	L"	W"	W"	E"	VOL	L"	W"	W"	E"	VOL	L"	W"	W"	E"	VOL
4"	12	24	24	12	4	12	34	34	12	8	22	37	32	22	15
6"	18	32	27	18	9	15	52	40	15	18	28	64	32	28	33
8"	21	40	33	21	16	22	61	40	22	31	35	64	45	35	58
10"	24	50	36	24	25	30	59	48	30	49	42	72	52	42	90
12"	31	56	36	31	36	36	70	48	36	70	45	80	62	45	129

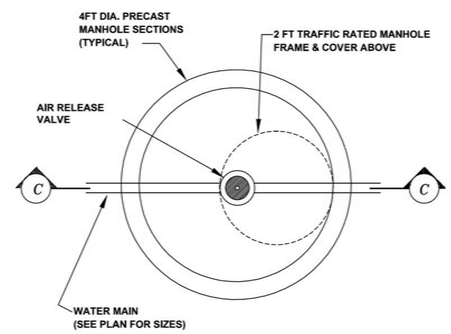
3 / D-4 VERTICAL THRUST BLOCK DETAIL
NTS

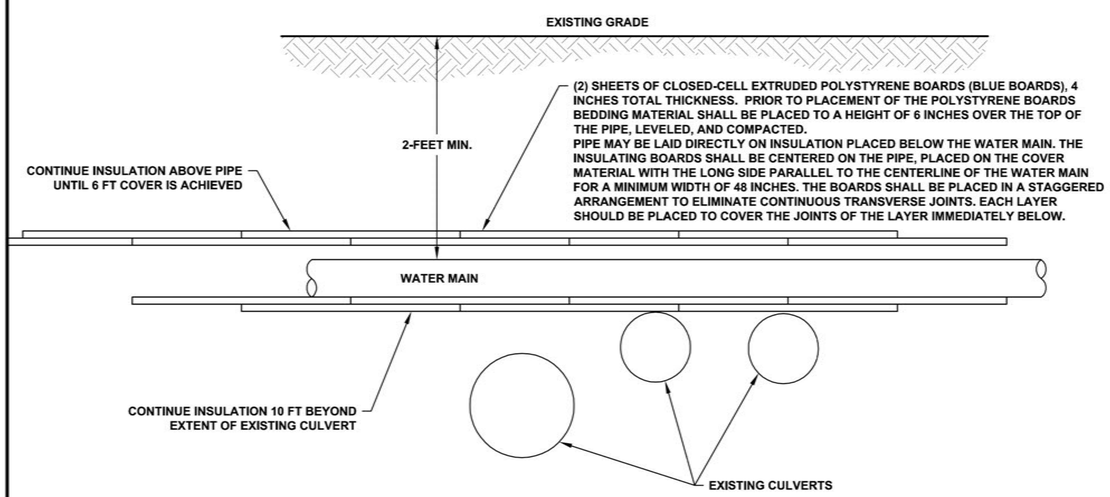


MINIMUM BEARING SURFACE AREA FOR TEES

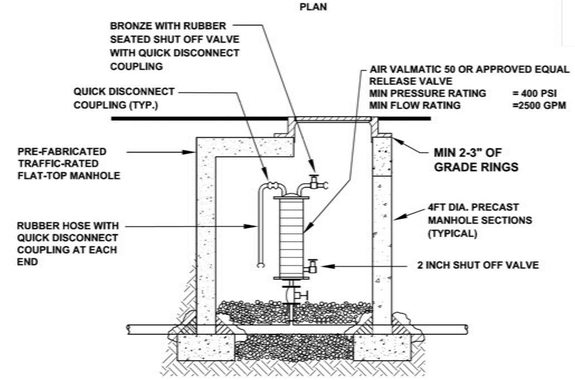
PIPE SIZE	AREA (SQ. FT.)
4"	2
6"	5
8"	8
10"	12
12"	17

4 / D-4 THRUST BLOCK DETAILS
N.T.S.





5 / D-4 LOW COVER CULVERT CROSSING
N.T.S.



NOTES:
1. NO SUBSITUTIONS ON AIR AND VACUUM RELIEF VALVES OR THEIR ACCESSORIES, SUCH AS VALVE MANHOLE SHALL BE INSTALLED UNLESS THEY ARE AUTHORIZED IN WRITING BY THE ENGINEER.

6 / D-4 AIR RELEASE VALVE STATION
N.T.S.

PRELIMINARY

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COLORADO REGISTERED PROFESSIONAL ENGINEER BRIAN K. FOWLER 22443 11/23/2015

TOWN OF MOUNTAIN VILLAGE
2015 WATERLINE EXTENSION PROJECT
TYPICAL DETAILS

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D-4

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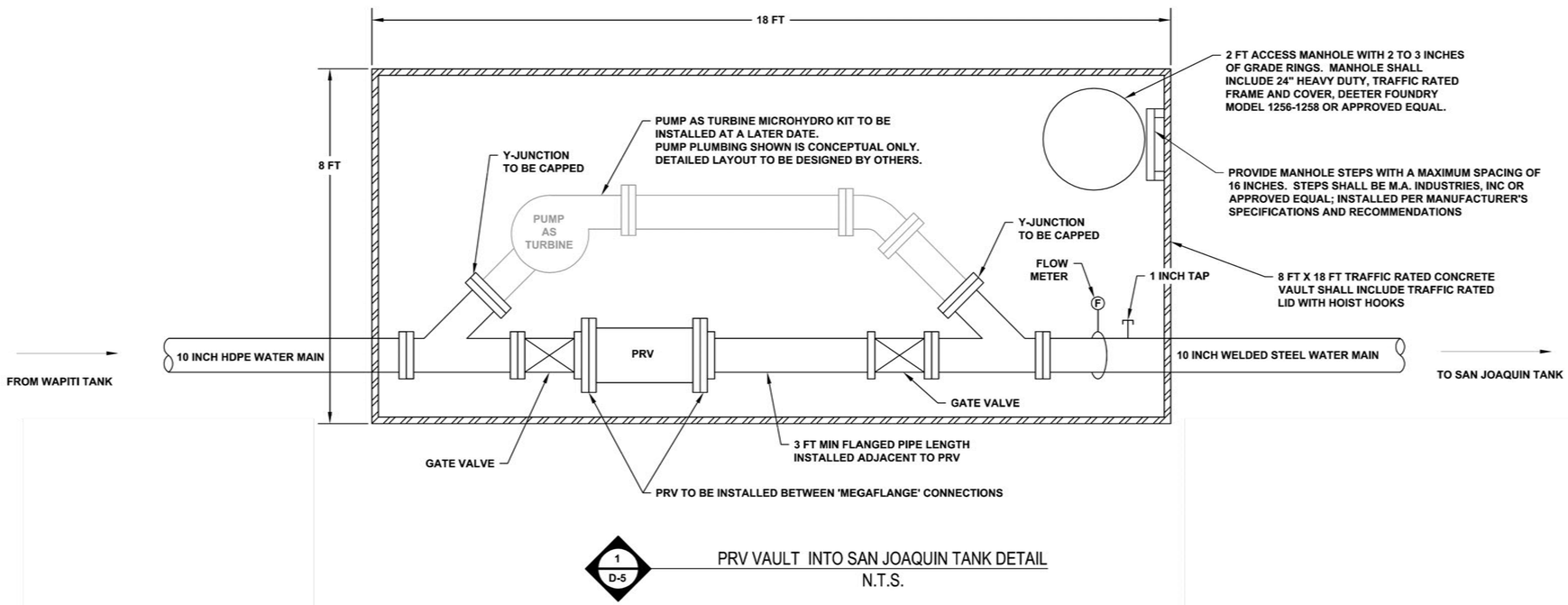
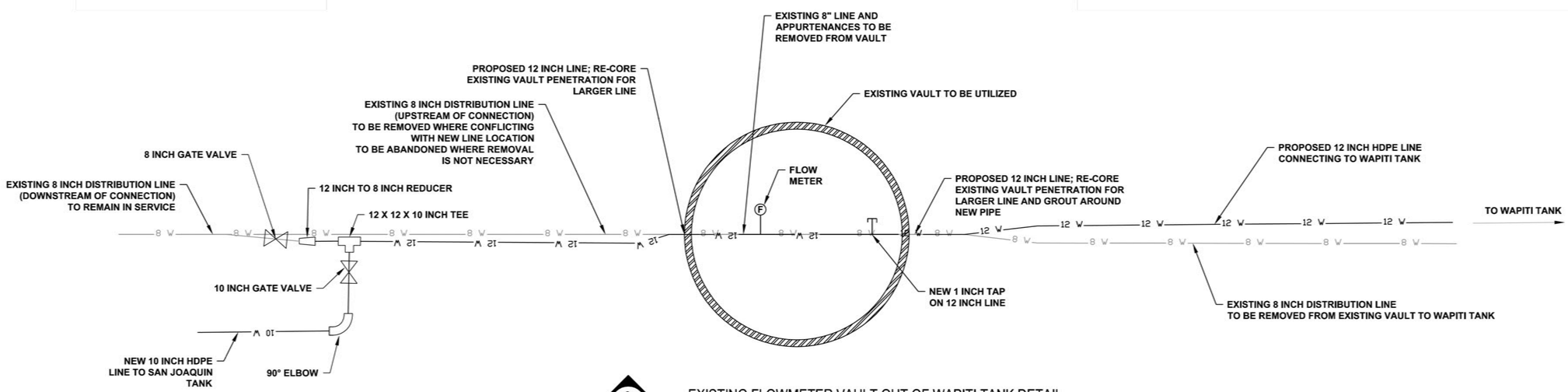


1 / D-5 PRV VAULT INTO SAN JOAQUIN TANK DETAIL
N.T.S.



2 / D-5 EXISTING FLOWMETER VAULT OUT OF WAPITI TANK DETAIL
N.T.S. - LOCATIONS APPROXIMATE

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22443
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