

# STERLING RANCH FILING 4

## COUNTY OF EL PASO, STATE OF COLORADO

### WATER SYSTEMS PLAN

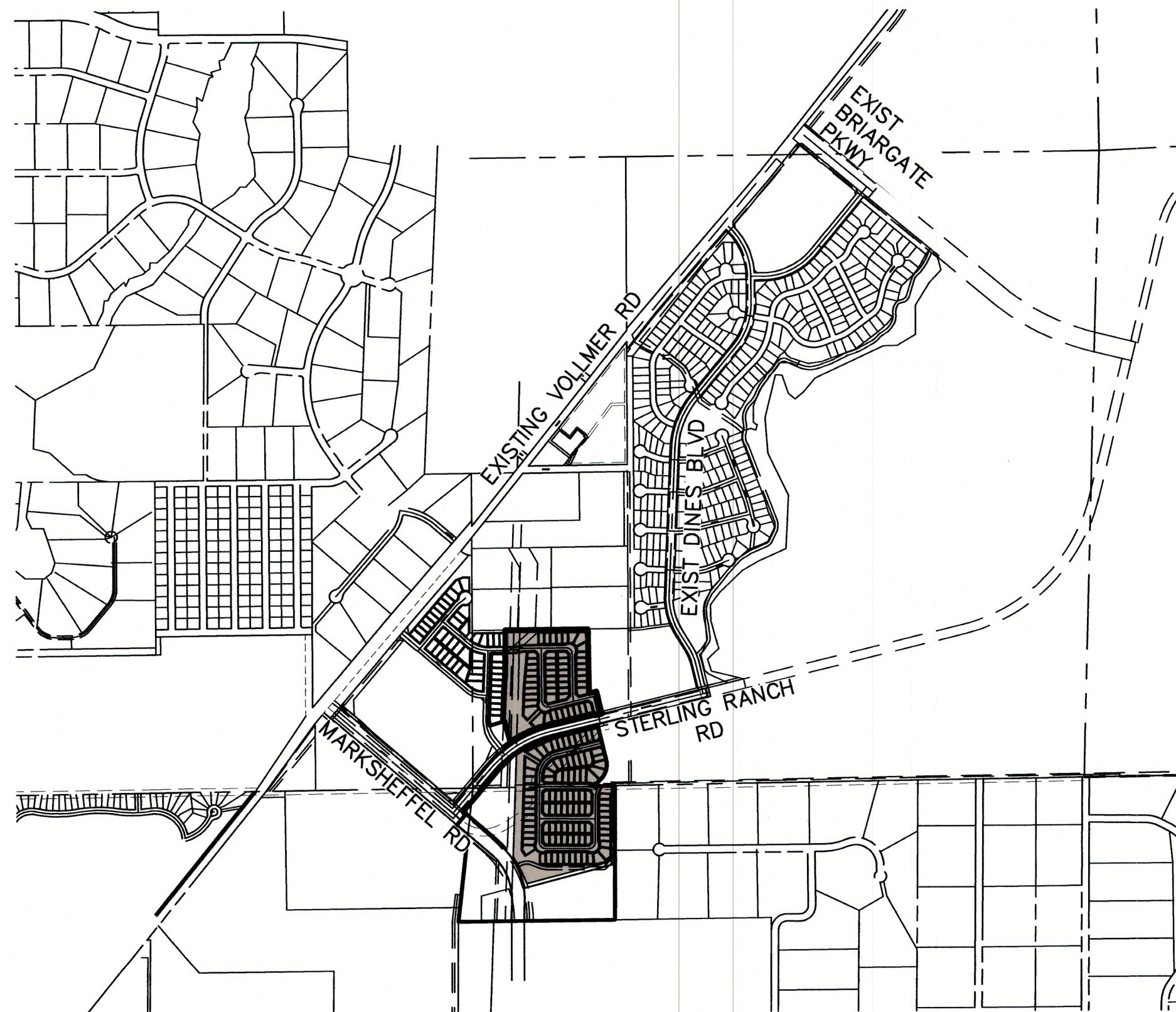
#### OCTOBER 2023

### GENERAL NOTES

- ALL UTILITY CONSTRUCTION TO BE CONDUCTED IN CONFORMANCE WITH THE CURRENT STERLING RANCH METROPOLITAN DISTRICT (SRMD, THE DISTRICT) SPECIFICATIONS.
- ALL PLANS ON THE JOB SITE SHALL BE SIGNED BY THE DISTRICT AND THE DISTRICT'S ENGINEER. ANY REVISION TO THE PLANS SHALL BE SO NOTED WITH THE OLD DRAWING MARKED NOT VALID.
- ALL STATIONING IS CENTERLINE UNLESS OTHERWISE NOTED. ALL ELEVATIONS ARE CENTERLINE UNLESS OTHERWISE NOTED.
- ALL MATERIALS AND WORKMANSHIP SHALL BE SUBJECT TO INSPECTION BY THE DISTRICT. THE DISTRICT RESERVES THE RIGHT TO ACCEPT OR REJECT ANY SUCH MATERIALS AND WORKMANSHIP THAT DOES NOT CONFORM TO ITS STANDARDS AND SPECIFICATIONS.
- ALL WATER AND SEWER SERVICE LOCATIONS SHALL BE CLEARLY MARKED ON EITHER THE CURB HEAD OR THE FACE OF THE CURB, WITH AN "S" FOR SEWER AND A "W" FOR WATER.
- DUCTILE IRON PIPES, INCLUDING FITTINGS, VALVES AND FIRE HYDRANTS, SHALL BE WRAPPED WITH POLYETHYLENE TUBING, DOUBLE BONDED AT EACH JOINT AND ELECTRICALLY ISOLATED. BONDING AND ANODE CONNECTIONS SHALL BE THOROUGHLY COATED WITH BITUMINOUS COATINGS.
- ALL DUCTILE IRON PIPE LESS THAN 12 INCHES AND FITTINGS SHALL HAVE CATHODIC PROTECTION USING TWO NO. 6 WIRES WITH 17 LB MAGNESIUM ANODES EVERY 400 FEET AND 9 LB MAGNESIUM ANODES AT EACH FITTING. ALL DUCTILE IRON PIPE 12 INCHES AND GREATER AND FITTINGS SHALL HAVE CATHODIC PROTECTION USING TWO NO. 6 WIRES WITH 17 LB MAGNESIUM ANODES EVERY 300 FEET AND 9 LB MAGNESIUM ANODES AT EACH FITTING.
- ALL PIPE MATERIAL, BACKFILL AND INSTALLATION SHALL CONFORM TO THE APPLICABLE SPECIFICATIONS OF THE CITY OF COLORADO SPRINGS, COLORADO DEPARTMENT OF TRANSPORTATION, EL PASO COUNTY DEPARTMENT OF TRANSPORTATION, COLORADO SPRINGS UTILITIES AND THE GEOTECHNICAL ENGINEER.
- COMPACTION TESTS SHALL BE 95% STANDARD PROCTOR AS DETERMINED BY ASTM D698, UNLESS OTHERWISE APPROVED BY THE DISTRICT OR HIGHER STANDARD AS IMPOSED BY ANOTHER AGENCIES HAVING RIGHT-OF-WAY JURISDICTION. THIS SHALL INCLUDE ALL VALVES, FIRE HYDRANT RUNS, WATER & SEWER SERVICE LINES AND MANHOLES. ALL REPORTS SHALL BE SUBMITTED TO THE DISTRICT FOR REVIEW AND APPROVAL.
- THE LOCATION OF ALL EXISTING UTILITIES SHOWN ON THE DRAWINGS ARE APPROXIMATE ONLY. THE LOCATION OF ALL UTILITIES SHALL BE FIELD VERIFIED PRIOR TO COMMENCING CONSTRUCTION ACTIVITIES. THE DISTRICT SHALL BE NOTIFIED OF ANY DEVIATIONS TO THE LINE AND/OR GRADE AS DEPICTED ON THE PLANS. CONTRACTOR SHALL SUBMIT TO THE DISTRICT AND THE ENGINEER OF RECORD A REPORT OF THE FIELD VERIFIED INFORMATION PRIOR TO THE START OF CONSTRUCTION. ALL BENDS SHALL BE FIELD STAKED PRIOR TO THE START OF CONSTRUCTION.
- BENDS, DEFLECTION & CUT PIPE LENGTHS SHALL BE USED TO HOLD HORIZONTAL ALIGNMENT OF SEWER AND WATER LINES TO NO MORE THAN 0.5' FROM THE DESIGNED ALIGNMENT. CONSTRUCTION STAKES TO BE AT 25' INTERVALS ALONG CURVES TO ASSURE LOCATION OF PIPE LINE CONSTRUCTION.
- AT ALL LOCATIONS WHERE CAP AND STUB IS NOTED ON DRAWINGS, PROVIDE A PLUG AT THE END OF THE PIPE JOINT NEAREST THE SPECIFIED STATION. PROVIDE A REVERSE ANCHOR AT ALL WATER LINE PLUGS.
- ALL UNUSED SALVAGED WATER UTILITY MATERIAL SHALL BE RETURNED TO THE METROPOLITAN DISTRICT AS REQUESTED.
- AT THE CONTRACTOR'S EXPENSE, ALL UTILITY MAINS SHALL BE SUPPORTED AND PROTECTED SUCH THAT THEY SHALL FUNCTION CONTINUOUSLY DURING CONSTRUCTION OPERATIONS. SHOULD A UTILITY MAIN FAIL AS A RESULT OF THE CONTRACTOR'S OPERATION, IT SHALL BE REPLACED IMMEDIATELY BY THE CONTRACTOR OR BY THE DISTRICT AT FULL COST OF LABOR AND MATERIALS TO THE CONTRACTOR/DEVELOPER.
- PUMPING OR BYPASS OPERATIONS SHALL BE REVIEWED AND APPROVED BY BOTH THE DISTRICT AND THE DISTRICT ENGINEER PRIOR TO EXECUTION.
- THE CONTRACTOR SHALL REPLACE OR REPAIR DAMAGE TO ALL SURFACE IMPROVEMENTS, INCLUDING BUT NOT LIMITED TO FENCES, LANDSCAPING, CURB AND GUTTER AND/OR ASPHALT THAT MAY BE CAUSED DURING CONSTRUCTION.
- ALL CONTRACTORS WORKING ON OR NEAR A WATER OR SEWER FACILITY (TO INCLUDE SERVICE LINE) SHALL HAVE LIABILITY INSURANCE NAMING THE DISTRICT AS AN ADDITIONAL INSURED AND SHALL PROVIDE A CURRENT COPY OF WORKERS COMPENSATION INSURANCE ON FILE WITH THE DISTRICT. NO WORK CAN PROCEED WITHOUT CURRENT CERTIFICATES ON FILE AT THE DISTRICTS' OFFICE.
- THE CONTRACTOR SHALL NOTIFY THE DISTRICT AND ALL AFFECTED UTILITY COMPANIES ADJACENT TO THE PROPOSED UTILITY CONSTRUCTION A MINIMUM OF 48 HOURS AND A MAXIMUM OF 96 HOURS PRIOR TO THE START OF CONSTRUCTION. A WEEKLY CONSTRUCTION MEETING SHALL BE REQUIRED WITH THE CONTRACTOR, DISTRICT ENGINEER AND ALL OTHER PARTIES AS DEEMED NECESSARY BY THE DISTRICT.
- COMMENCEMENT OF CONSTRUCTION OF WATER/SEWER SYSTEMS WITHIN THE METROPOLITAN DISTRICT:
  - PRIOR TO THE START OF CONSTRUCTION, A PRE-CONSTRUCTION MEETING IS REQUIRED A MINIMUM OF 48 HOURS IN ADVANCE OF COMMENCEMENT OF WORK. A REPRESENTATIVE OF THE OWNER OR DEVELOPER, A REPRESENTATIVE OF THE CONTRACTOR AND DESIGN ENGINEER ARE REQUIRED TO ATTEND. CONTACT THE DISTRICT TO SCHEDULE THE PRE-CONSTRUCTION MEETING. NO PRE-CONSTRUCTION MEETING CAN BE SCHEDULED PRIOR TO FOUR (4) SIGNED/ APPROVED PLAN SETS ARE RECEIVED BY THE DISTRICT.
  - THE CONTRACTOR IS REQUIRED TO NOTIFY THE DISTRICT A MINIMUM OF 48 HOURS AND A MAXIMUM OF 2 WEEKS PRIOR TO THE START OF CONSTRUCTION. THE CONTRACTOR SHALL ALSO NOTIFY AFFECTED UTILITY COMPANIES AT LEAST 48 HOURS PRIOR TO THE START OF CONSTRUCTION ADJACENT TO THE KNOWN UTILITY LINES.
- TESTING OF FACILITIES:
  - THE CONTRACTOR SHALL NOTIFY THE DISTRICT A MINIMUM OF 48 HOURS AND A MAXIMUM OF 96 HOURS PRIOR TO THE START OF ANY TESTING.
  - ALL SECTIONS OF WATER LINE ARE TO MEET THE FOLLOWING PRESSURE TESTING REQUIREMENTS:
    - TEST 100% OF ALL LINES
    - MUST PASS PRESSURE TEST TO 200 PSI FOR TWO HOURS (UNLESS OTHERWISE APPROVED ON THE PLANS).
  - ALL SANITARY SEWER FACILITIES ARE TO MEET THE FOLLOWING TESTING REQUIREMENTS:
    - ALL LINES SHALL BE JET CLEANED PRIOR TO VACUUM OR PRESSURE TESTING
    - ALL MANHOLES SHALL BE VACUUM TESTED WITH DISTRICT STAFF PRESENT PRIOR TO CCTV INSPECTION.
    - SEWER MAINS TO BE PRESSURE TEST PRIOR TO CCTV INSPECTION
    - ALL LINES SHALL BE CCTV INSPECTED AND VIDEO SHALL BE SUBMITTED TO THE DISTRICT FOR REVIEW AND APPROVAL.
- PRELIMINARY ACCEPTANCE SHALL BE DEFINED AS THE POINT IN TIME THAT THE DISTRICT ACCEPTS THE FACILITY FOR USE. ALL SURFACE IMPROVEMENTS AND RESTORATION SHALL BE COMPLETED WITHIN 30 DAYS OF COMMENCEMENT. SHOULD THE CONTRACTOR FAIL TO COMPLETE ALL SURFACE IMPROVEMENTS AND RESTORATION WITHIN 30 DAYS OF COMMENCEMENT OF SERVICE, THE DISTRICT, AT THEIR DISCRETION, MAY ELECT TO COMPLETE THE IMPROVEMENTS AT THE CONTRACTORS COST.
- FINAL ACCEPTANCE BY THE DISTRICT OF ANY LINE OR SYSTEM SHALL NOT OCCUR UNTIL COMPLETION OF FINAL ASPHALT LAYERS AND/OR FINAL COMPLETION AND/OR RESTORATION OF ALL SURFACE IMPROVEMENTS. THE WARRANTY PERIOD FOR ALL FACILITIES PRIOR TO FINAL ACCEPTANCE SHALL BE 24 MONTHS COMMENCING AFTER PRELIMINARY ACCEPTANCE.
- ACCEPTANCE:
  - THE DISTRICT MAY GIVE PRELIMINARY ACCEPTANCE ONCE ALL OF THE TESTS ON ALL THE LINES HAVE BEEN COMPLETED AND A WALK-THRU HAS OCCURRED.
  - A SECOND ACCEPTANCE MAY OCCUR ONCE FIRST LIFT OF ASPHALT GOES DOWN AND A SECOND WALK-THRU OF THE SYSTEM OCCURS. IF ALL FACILITIES ARE CLEAN AND ACCESSIBLE, A FINAL ACCEPTANCE MAY OCCUR (THE DISTRICT MAY REQUIRE CLEANING AND RE-VIDEO OF THE SYSTEM, DEPENDING ON THE SEVERITY OF THE CONTAMINATION).
- ALL WATER AND SEWER MAINS, INCLUDING SERVICE LINES, SHALL HAVE "AS-BUILT" DRAWINGS PREPARED AND APPROVED PRIOR TO PRELIMINARY ACCEPTANCE BY THE DISTRICT.
- ALL COMMERCIAL/BUSINESS DEVELOPMENTS SHALL HAVE AN EIGHT INCH (MIN.) WATER MAIN LOOPED THROUGH THE PROPOSED PROPERTY WITH GATE VALVES LOCATED WHERE THE MAIN ENTERS THE PROPERTY LINE. AN EIGHT INCH SEWER MAIN SHALL BE INSTALLED FOR SERVICE TO COMMERCIAL/BUSINESS DEVELOPMENTS, AND A MANHOLE SHALL BE LOCATED WHERE THE MAIN ENTERS THE PROPERTY. THE END OF THE MAINS SHALL BE MARKED WITH THE APPROPRIATE COLORED CARSONITE MARKER ALONG WITH TRACER WIRE.
- AFTER REVIEW AND APPROVAL OF PLANS FOR THE EXTENSION OF LINES, FACILITIES AND/OR SERVICES, CONSTRUCTION MUST BE COMMENCED WITHIN 18 MONTHS FOR RESIDENTIAL SUBDIVISIONS AND 12 MONTHS FOR ANY COMMERCIAL INSTALLATIONS.
- INSPECTION FEES: CALL THE DISTRICT (719-495-2500) FOR FEE SCHEDULE.

### WATER SYSTEM INSTALLATION NOTES

- ALL WATER AND FORCE MAIN PIPE SHALL BE AWWA C900 PVC, OR EQUAL, PRESSURE CLASS 200. ALL WATER AND FORCE MAIN FITTINGS SHALL HAVE MECHANICAL RESTRAINTS AND THRUST BLOCKS. ALL WATER AND FORCE MAIN PIPE SHALL HAVE A MINIMUM COVER DEPT OF FIVE AND ON-HALF (5.5) FEET.
- ALL WATER VALVES ASSOCIATED WITH THE POTABLE WATER SYSTEM SHALL BE OPEN CLOCKWISE. ALL VALVES INSTALLED IN LANDSCAPED AREAS AND/OR NOT WITHIN PAVED STREETS SHALL BE MARKED WITH CARSONITE MARKERS. ALL VALVES ASSOCIATED WITH THE RAW WATER SYSTEM SHALL BE OPEN COUNTERCLOCKWISE AND MARKED WITH CARSONITE MARKERS AS APPLICABLE.
- THE DEVELOPER OR HIS ENGINEER SHALL LOCATE ALL FIRE HYDRANTS AND SERVICE STUB-OUTS FOR FUTURE DEVELOPMENT. ANY REQUIRED REALIGNMENT, (HORIZONTAL OR VERTICAL), SHALL BE AT THE EXPENSE OF THE DEVELOPER. FIRE HYDRANT LOCATION SHALL BE REVIEWED AND APPROVED BY THE APPLICABLE FIRE AUTHORITY.
- FIRE HYDRANTS SHALL BE OPEN RIGHT WITH 7/8" x 7/8" SQUARE TAPERED ALONG WITH SERVICE CAPS. LUBRICATION TYPE: (GREASE). ACCEPTABLE BRANDS ARE AMERICAN AVK SERIES 2700 (MODERN) AND MUELLER SUPER CENTURION 250.
- ALL MAIN LINES (PVC & DUCTILE IRON) SHALL BE INSTALLED WITH COATED #12 TRACER WIRE WITH TEST STATIONS AT INTERVALS NO GREATER THAN 500 FT (VALVE BOXES CAN BE USED AT INTERSECTIONS AND SERVICE STUBS).
- CONTRACTOR SHALL MAKE CONNECTIONS TO EXISTING WATER LINE WITHOUT SHUTDOWN, OR ELSE NOTIFY THE DISTRICT OF ANY SERVICE SHUTDOWNS NECESSARY TO CONNECT TO EXISTING LINES.
- IRRIGATION SERVICES SHALL HAVE A STOP AND WASTE CURB STOP VALVE INSTALLED ALONG WITH TRACER WIRE EXTENDING BACK TO THE MAIN LINE.
- COMMENCEMENT OF USE OF WATER LINES AND/OR SYSTEMS:
  - NO WATER FACILITY SHALL BE PLACED IN SERVICE UNTIL AFTER THE COMPLETION OF ALL PRESSURE TESTING, FLUSHING, BAC-T TESTING, COMPACTION TESTING, AND AS-BUILT DRAWINGS ARE SUBMITTED AND APPROVED BY THE DISTRICT.
  - NO WATER FACILITY SHALL BE PLACED IN SERVICE UNTIL ALL SERVICE LINES ARE COMPLETED AND THE FIRST LIFT OF ASPHALT IS COMPLETED OVER THE LINE. IN THE CASE WHERE NO ASPHALT IS TO BE PLACED OVER THE LINE, SURFACE IMPROVEMENTS SHALL BE COMPLETED PRIOR TO USE OF THE FACILITY.
  - ALL EASEMENTS (PLATTED OR DEEDED) ARE DEDICATED, EXECUTED BY THE DISTRICT, AND RECORDED.



VICINITY MAP  
SCALE: 1"=1,000'

### SHEET INDEX

1	-	COVER SHEET
2-5	-	WATER PLANS
6-7	-	UTILITY SERVICE PLAN
8-9	-	STANDARD DETAILS

### BENCHMARKS

- THE TOP OF AN ALUMINUM SURVEYORS CAP, STAMPED "9853", AT THE SOUTHEAST BOUNDARY CORNER OF BARBARICK SUBDIVISION  
NORTHING = 411416.273  
EASTING = 235167.071  
ELEVATION = 7023.42
- THE TOP OF A RED PLASTIC SURVEYORS CAP, ILLEGIBLE, AT THE NORTHWEST BOUNDARY CORNER OF PAWNEE RANCHEROS SUBDIVISION  
NORTHING = 410095.404  
EASTING = 235052.131  
ELEVATION = 7000.40
- THE TOP OF A RED PLASTIC SURVEYORS CAP, STAMPED "38141", AT THE SOUTHWEST BOUNDARY CORNER OF BARBARICK SUBDIVISION  
NORTHING = 411399.962  
EASTING = 233849.817  
ELEVATION = 7030.82

### LEGEND

ROW	RIGHT OF WAY
FL-FL	FLOWLINE TO FLOWLINE
BOP	BOTTOM OF PIPE
TOP	TOP OF PIPE
SS	SANITARY SEWER
STM	STORM SEWER
WL	WATER
STA	STATION
9	LOT NUMBER
BT	BEGIN TRANSITION
ET	END TRANSITION
PCR	POINT OF CURB RETURN
PRC	POINT OF REVERSE CURVE
PCC	POINT OF COMPOUND CURVE
PC	POINT OF CURVE
PT	POINT OF TANGENT
*	SPECIAL BEDDING NOTES

### AGENCIES

OWNER/DEVELOPER:	SR LAND, LLC 20 BOULDER CRESCENT, SUITE 201 COLORADO SPRINGS, CO 80903 JAMES F. MORLEY (719) 471-1742	FIRE DISTRICT:	BLACK FOREST FIRE PROTECTION DISTRICT 11445 TEACHOUT ROAD COLORADO SPRINGS, CO 80908 CHIEF BRYAN JACK (719) 495-4300
CIVIL ENGINEER:	JR ENGINEERING, LLC 5475 TECH CENTER DRIVE COLORADO SPRINGS, CO 80919 MIKE BRAMLETT P.E. (303) 267-6240	GAS DEPARTMENT:	COLORADO SPRINGS UTILITIES 7710 DURANT DR. COLORADO SPRINGS, CO 80947 TIM WENDT (719) 668-3556
COUNTY ENGINEERING:	EL PASO COUNTY PLANNING AND COMMUNITY DEVELOPMENT 2880 INTERNATIONAL CIRCLE, SUITE 110 COLORADO SPRINGS, CO 80910 JEFF RICE, P.E. (719) 520-6300	ELECTRIC DEPARTMENT:	MOUNTAIN VIEW ELECTRIC 11140 E. WOODMAN ROAD FALCON, CO 80831 495-2283
TRAFFIC ENGINEERING:	EL PASO COUNTY DEPT. OF PUBLIC WORKS 3275 AKERS DRIVE COLORADO SPRINGS, CO 80922 JOSHUA PALMER, P.E. (719) 520-6460	COMMUNICATIONS:	QWEST COMMUNICATIONS LOCATORS (800) 922-1987 AT&T (LOCATORS) (719) 635-3674
WATER RESOURCES:	STERLING RANCH METRO DISTRICT ENGINEERS JDS-HYDRO CONSULTANTS 545 E. PIKES PEAK AVE., SUITE 300 COLORADO SPRINGS, CO 80903 JOHN MCGINN (719) 668-8769		

### EL PASO COUNTY STATEMENT

COUNTY PLAN REVIEW IS PROVIDED ONLY FOR GENERAL CONFORMANCE WITH COUNTY DESIGN CRITERIA. THE COUNTY IS NOT RESPONSIBLE FOR THE ACCURACY AND ADEQUACY OF THE DESIGN, DIMENSIONS, AND/OR ELEVATIONS WHICH SHALL BE CONFIRMED AT THE JOB SITE. THE COUNTY THROUGH THE APPROVAL OF THIS DOCUMENT ASSUMES NO RESPONSIBILITY FOR COMPLETENESS AND/OR ACCURACY OF THIS DOCUMENT.

FILED IN ACCORDANCE WITH THE REQUIREMENTS OF THE EL PASO COUNTY LAND DEVELOPMENT CODE, DRAINAGE CRITERIA MANUAL, VOLUMES 1 AND 2, AND ENGINEERING CRITERIA MANUAL AS AMENDED.

IN ACCORDANCE WITH EGM SECTION 1.12, THESE CONSTRUCTION DOCUMENTS WILL BE VALID FOR CONSTRUCTION FOR A PERIOD OF 2 YEARS FROM THE DATE SIGNED BY THE EL PASO COUNTY ENGINEER. IF CONSTRUCTION HAS NOT STARTED WITHIN THOSE 2 YEARS, THE PLANS WILL NEED TO BE RESUBMITTED FOR APPROVAL, INCLUDING PAYMENT OF REVIEW FEES AT THE PLANNING AND COMMUNITY DEVELOPMENT DIRECTORS DISCRETION.

JOSHUA PALMER, P.E. \_\_\_\_\_ DATE \_\_\_\_\_

COUNTY ENGINEER/ECM ADMINISTRATOR

### WATER & SEWER MAIN EXTENSIONS

ANY CHANGES OR ALTERATIONS AFFECTING THE GRADE, ALIGNMENT, ELEVATION AND/OR DEPTH OF COVER OF ANY WATER OR SEWER MAINS OR OTHER APPURTENANCE SHOWN ON THIS DRAWING SHALL BE THE RESPONSIBILITY OF THE OWNER/DEVELOPER. THE OWNER/DEVELOPER SHALL BE RESPONSIBLE FOR ALL OPERATIONAL DAMAGES AND DEFECTS IN INSTALLATION AND MATERIAL FOR MAINS AND SERVICES FROM THE DATE OF APPROVAL UNTIL FINAL ACCEPTANCE IS ISSUED.

SIGNED *James F. Morley* DATE *8/14/23*  
JAMES F. MORLEY

SR LAND, LLC  
20 BOULDER CRESCENT, SUITE 201  
COLORADO SPRINGS, CO 80903  
(719) 471-1742

### FALCON AREA WATER & WASTEWATER AUTHORITY ENGINEER

THESE CONSTRUCTION DOCUMENTS HAVE BEEN REVIEWED AND APPROVED FOR THE SANITARY SEWER, WATER MAIN AND ASSOCIATED UTILITY SERVICE CONSTRUCTION. RESPONSIBILITY FOR COMPLETENESS AND ACCURACY REMAINS WITH THE DESIGN ENGINEER.

SIGNED *John P. Moran* DATE *10/23/2023*  
FAWWA ENGINEER

### FIRE AUTHORITY APPROVAL

THE NUMBER OF FIRE HYDRANTS AND HYDRANT LOCATIONS SHOWN ON THIS WATER INSTALLATION PLAN ARE CORRECT AND ADEQUATE TO SATISFY THE FIRE PROTECTION REQUIREMENTS AS SPECIFIED BY THE FIRE DISTRICT SERVING THE PROPERTY NOTED ON THE PLANS.

FIRE PROTECTION DISTRICT: \_\_\_\_\_  
SIGNED \_\_\_\_\_ DATE \_\_\_\_\_  
FIRE PROTECTION DISTRICT

### ENGINEER'S STATEMENT

THIS WATER SYSTEM PLAN WAS PREPARED UNDER MY DIRECTION AND SUPERVISION AND IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF. SAID PLAN HAS BEEN PREPARED ACCORDING TO THE CRITERIA ESTABLISHED BY THE COUNTY FOR WASTEWATER SYSTEM PLANS. I ACCEPT RESPONSIBILITY FOR ANY LIABILITY CAUSED BY ANY NEGLIGENT ACTS, ERRORS OR OMISSIONS ON MY PART IN PREPARING THIS PLANS.

*Mike A. Bramlett* 10/10/23  
MIKE A. BRAMLETT, P.E.  
COLORADO P.E. 32314  
FOR AND ON BEHALF OF JR ENGINEERING, LLC

UNTIL SUCH TIME AS THESE DRAWINGS ARE APPROVED BY THE APPROPRIATE REVIEWING AGENCIES, OR ENGINEERING ONLY FOR THE PURPOSES DESIGNATED BY WRITTEN AUTHORIZATION.

PREPARED FOR  
SR LAND, LLC  
20 BOULDER CRESCENT  
SUITE 201  
COLORADO SPRINGS, CO 80903  
JAMES F. MORLEY  
(719) 471-1742

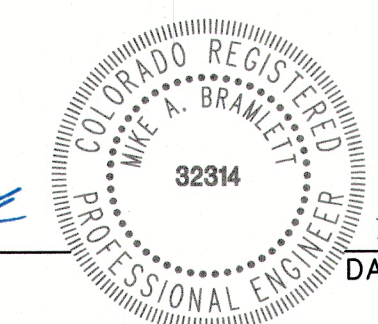
JR ENGINEERING  
A Westman Company  
Central 303-746-9888 • Colorado Springs 719-589-2583  
Fort Collins 970-491-9888 • www.jrengineering.com

DATE	BY	REVISION
10/09/23 <td>N/A <td></td> </td>	N/A <td></td>	
10/09/23 <td>MMC <td></td> </td>	MMC <td></td>	
<td>MMC <td></td> </td>	MMC <td></td>	

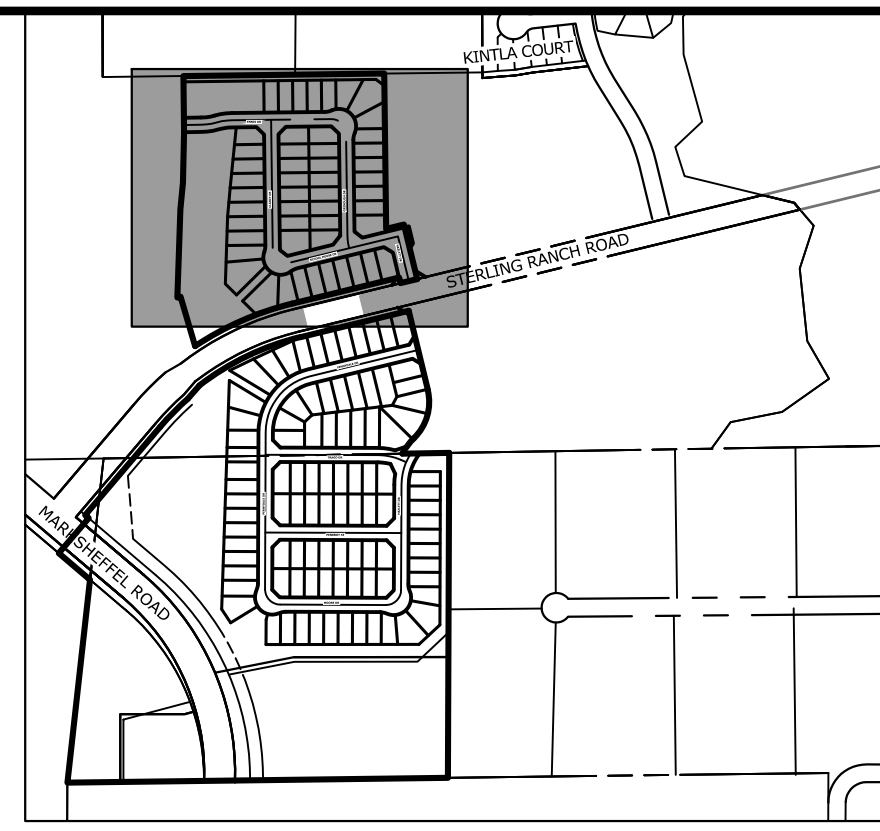
STERLING RANCH FILING 4  
COVER SHEET  
SHEET 1 OF 9  
JOB NO. 25188.11



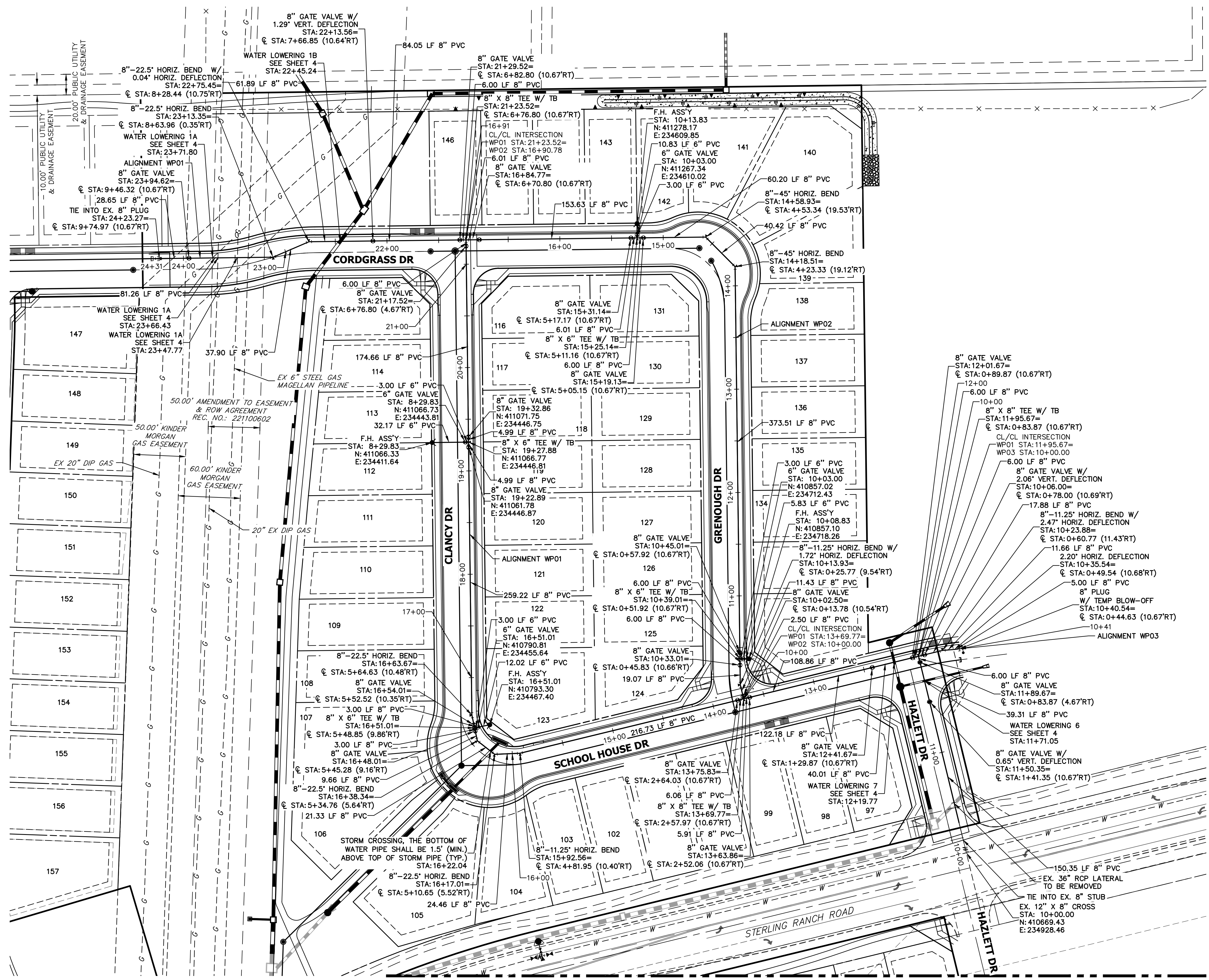
Know what's below.  
Call before you dig.







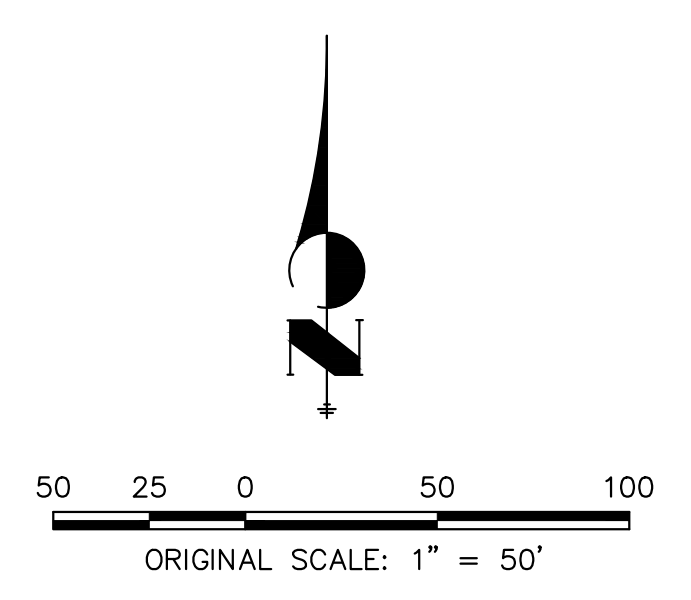
**KEY MAP**  
SCALE: 1"=1000'



THE LOCATIONS OF EXISTING ABOVE GROUND AND UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE CAUSED BY HIS FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL ABOVE GROUND AND UNDERGROUND UTILITIES.

**WATER NOTES**

1. ALL VERTICAL BENDS WILL REQUIRE MJR AND ALL PIPES ABOVE 10" VERTICAL SLOPE MUST BE RESTRAINED
2. ALL WATER MAINS SHALL BE INSTALLED AT A STANDARD DEPTH OF 5'-6" UNLESS OTHERWISE SHOWN
3. MAINTAIN A MINIMUM CLEARANCE OF 1.5 FT. WHEN CROSSING ANY UTILITIES



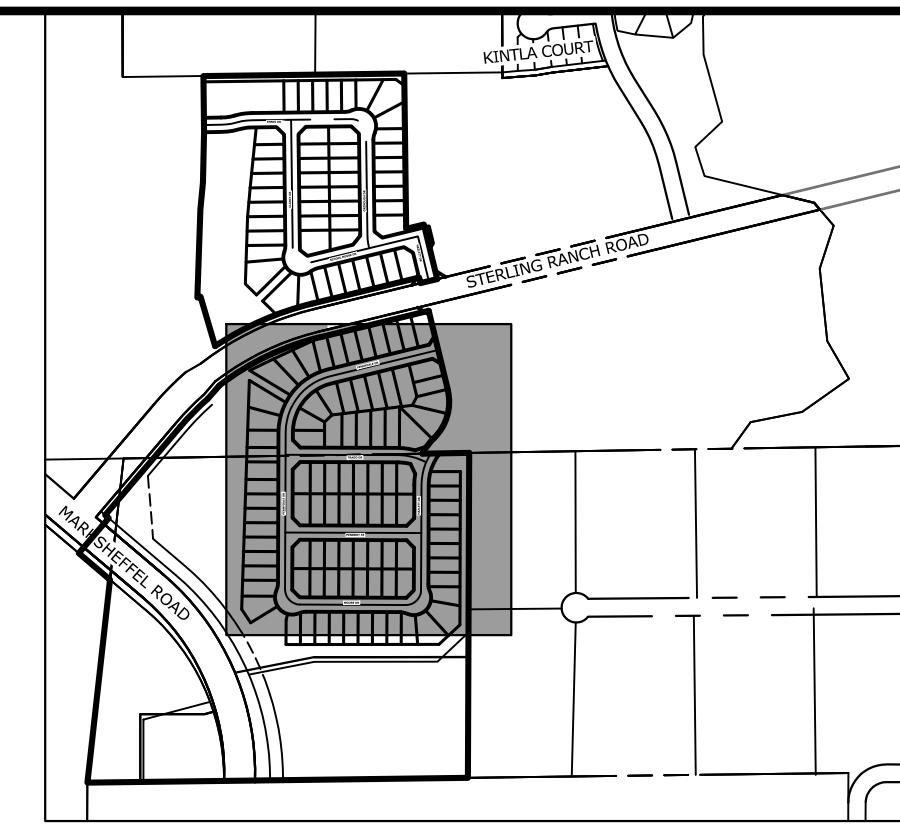
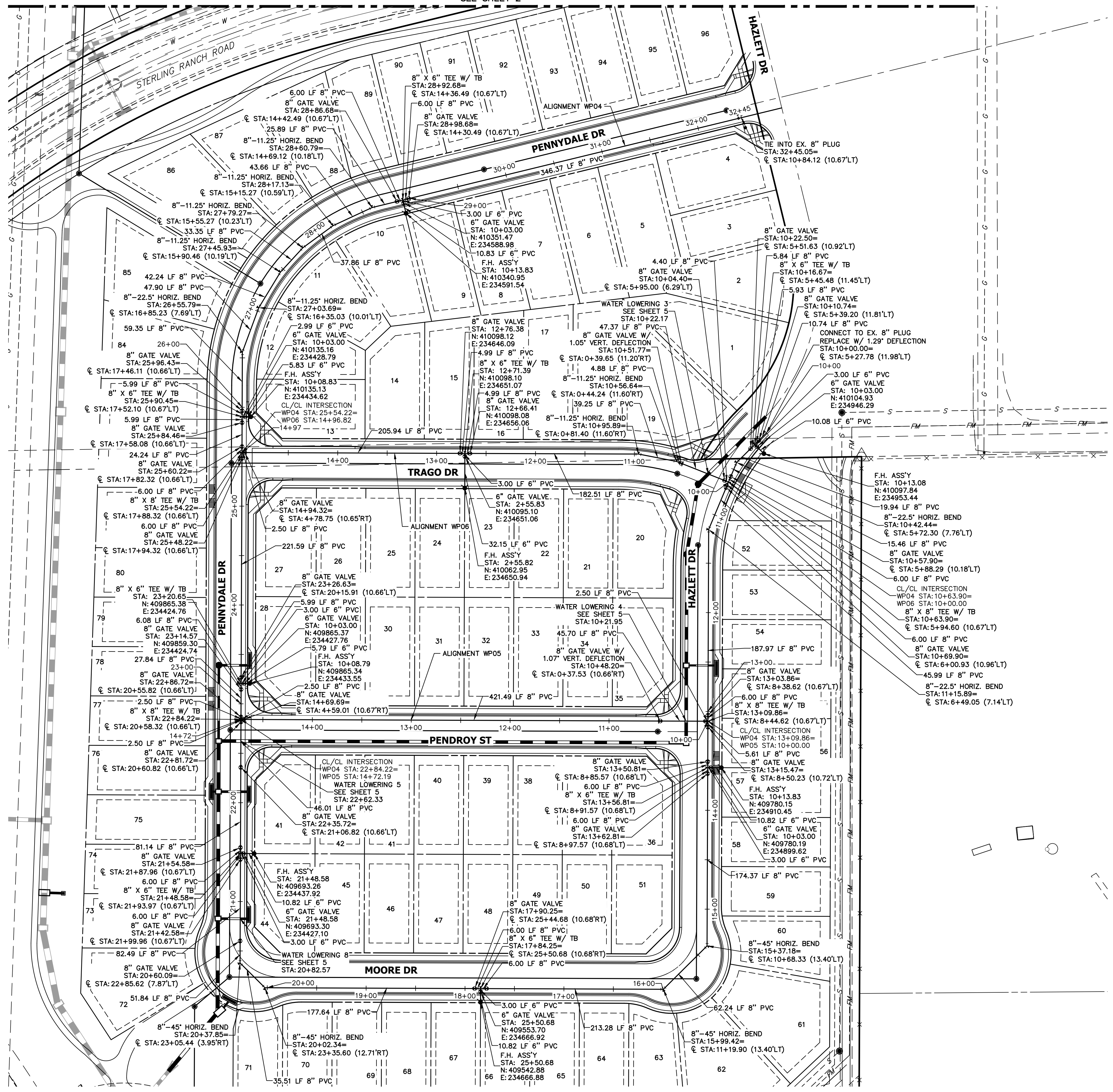
**ENGINEER'S STATEMENT**

PREPARED UNDER MY DIRECT SUPERVISION AND ON BEHALF OF JR ENGINEERING  
  
 MIKE A. BRAMLETT, P.E.  
 COLORADO P.E. 32314  
 FOR AND ON BEHALF OF JR ENGINEERING, INC.  
 DATE: 10/10/23

STERLING RANCH FILING 4	WATER PLAN	SHEET 2 OF 9	JOB NO. 25188.11	UNTIL SUCH TIME AS THESE DRAWINGS ARE APPROVED BY THE APPROPRIATE REVIEWING AGENCIES, JR ENGINEERING APPROVES THEIR USE AND DESIGNATED BY WRITTEN AUTHORIZATION. PREPARED FOR: SR LAND, LLC 20 BOULDER CRESCENT SUITE 201 COLORADO SPRINGS, CO 80903 JAMES F. MORLEY (719) 471-1742
BY DATE				
No. REVISION				
H-SCALE	1"=50'	DESIGNED BY	MMC	CHECKED BY
V-SCALE	1"=5'	DRAWN BY	MMC	
DATE	10/09/23			



SEE SHEET 2

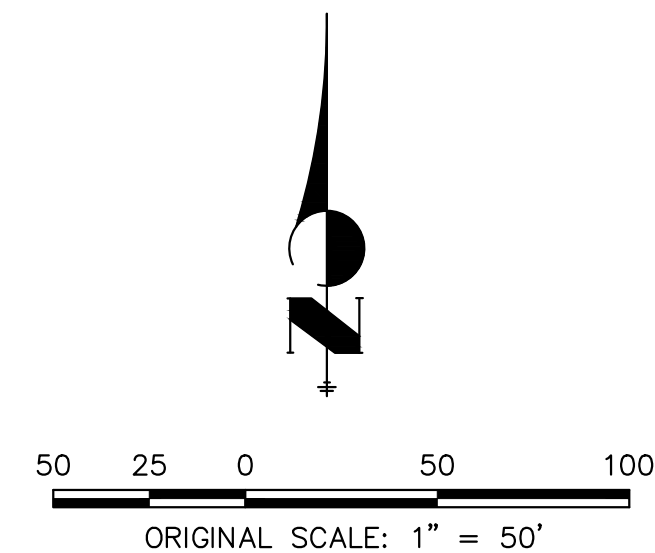


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**ENGINEER'S STATEMENT**

PREPARED UNDER MY DIRECT SUPERVISION AND ON BEHALF OF JR ENGINEERING

*Mike Bramlett* 32314 10/10/23

MIKE A. BRAMLETT, P.E.  
COLORADO P.E. 32314  
FOR AND ON BEHALF OF JR ENGINEERING, A PROFESSIONAL ENGINEERING FIRM

PREPARED FOR  
**SR LAND, LLC**  
20 BOULDER CRESCENT  
SUITE 201  
COLORADO SPRINGS, CO 80903  
DESIGNATED BY WRITTEN AUTHORIZATION  
JAMES F. MORLEY  
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**J.R. ENGINEERING**  
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No.	REVISION	BY	DATE

H-SCALE	V-SCALE	DATE	DESIGNED BY	MM/C	MM/C	DRAWN BY	CHECKED BY
1"=50'	1"=5'	10/09/23					

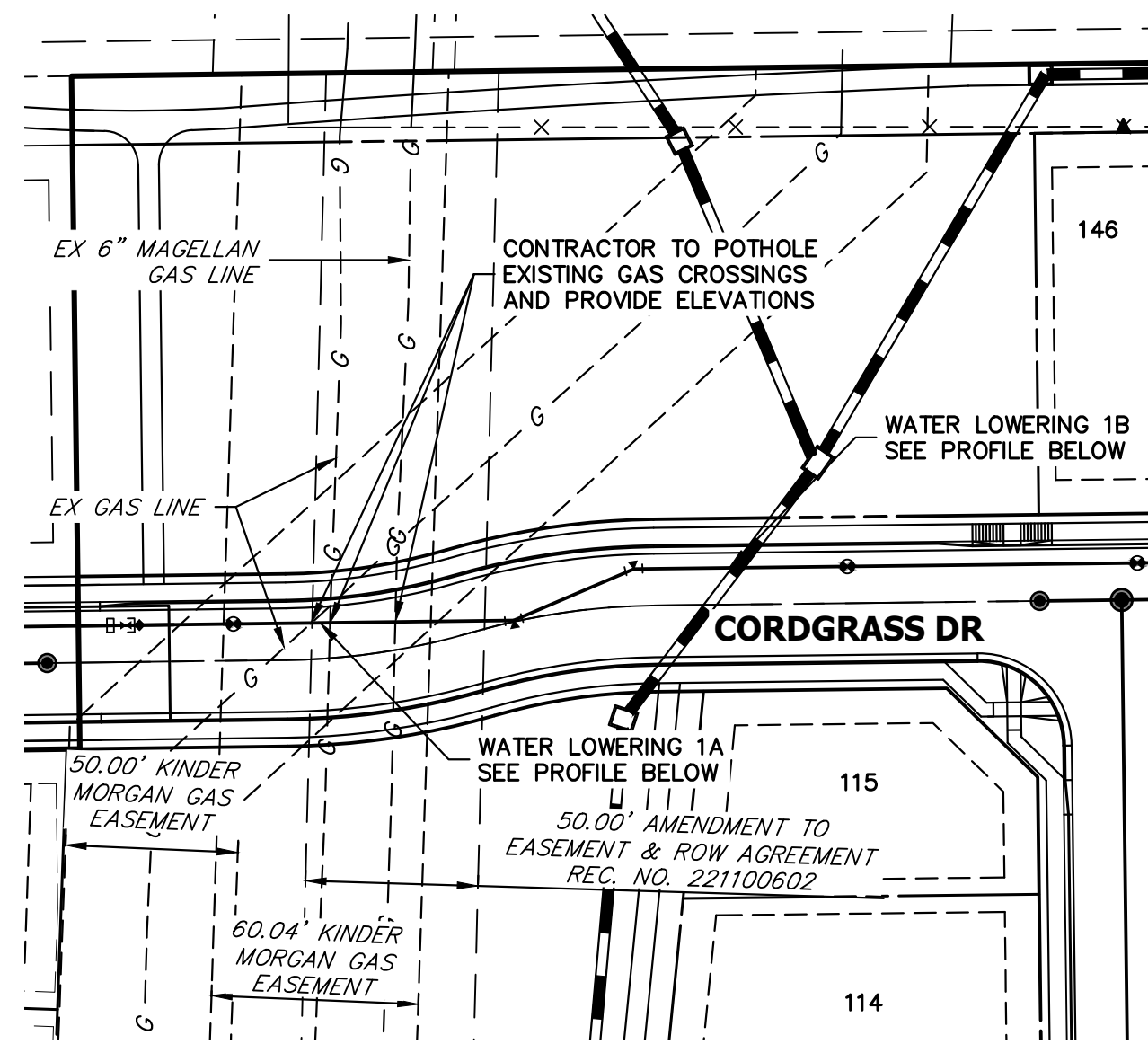
STERLING RANCH FILING 4

WATER PLAN

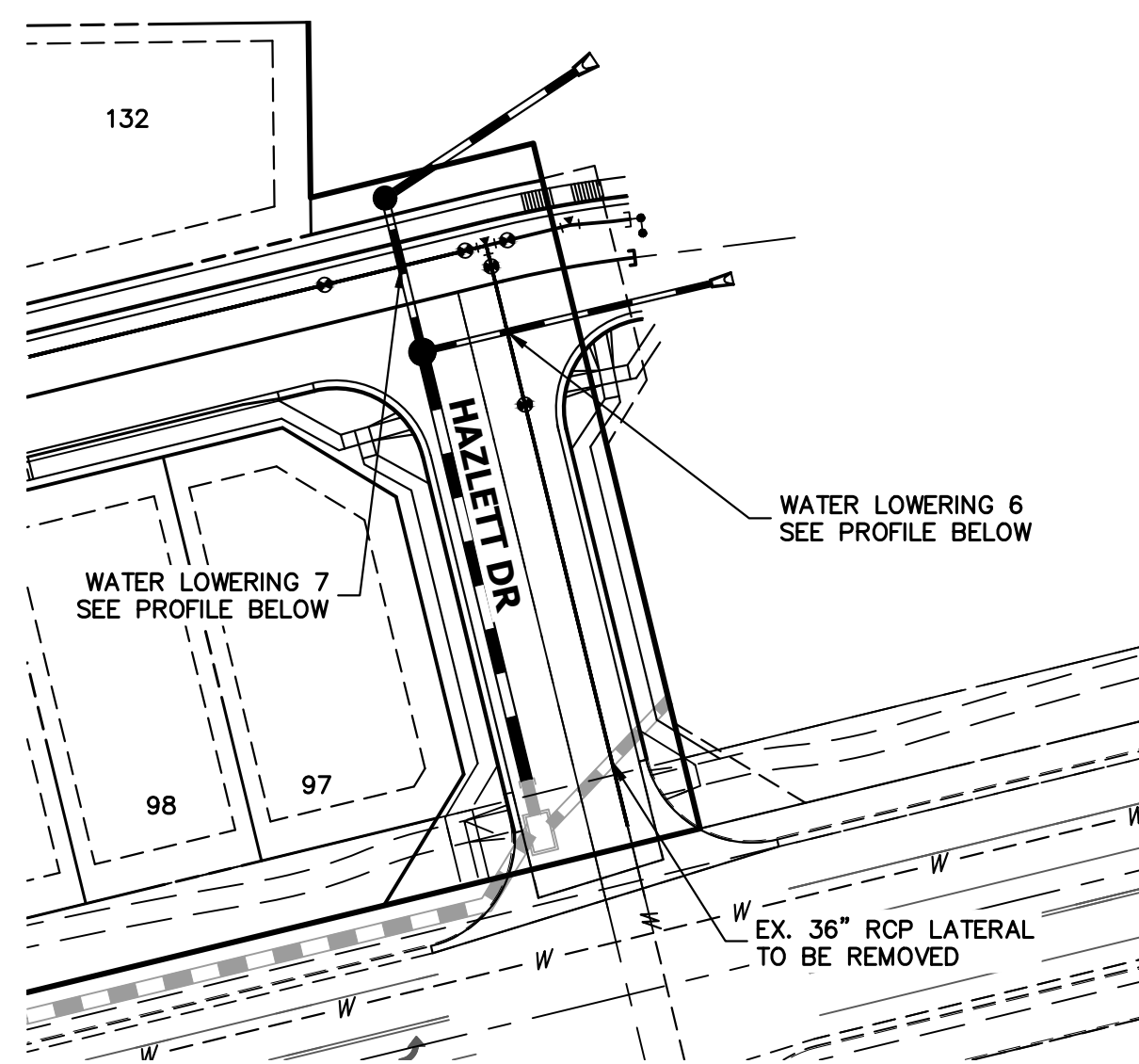
SHEET 3 OF 9

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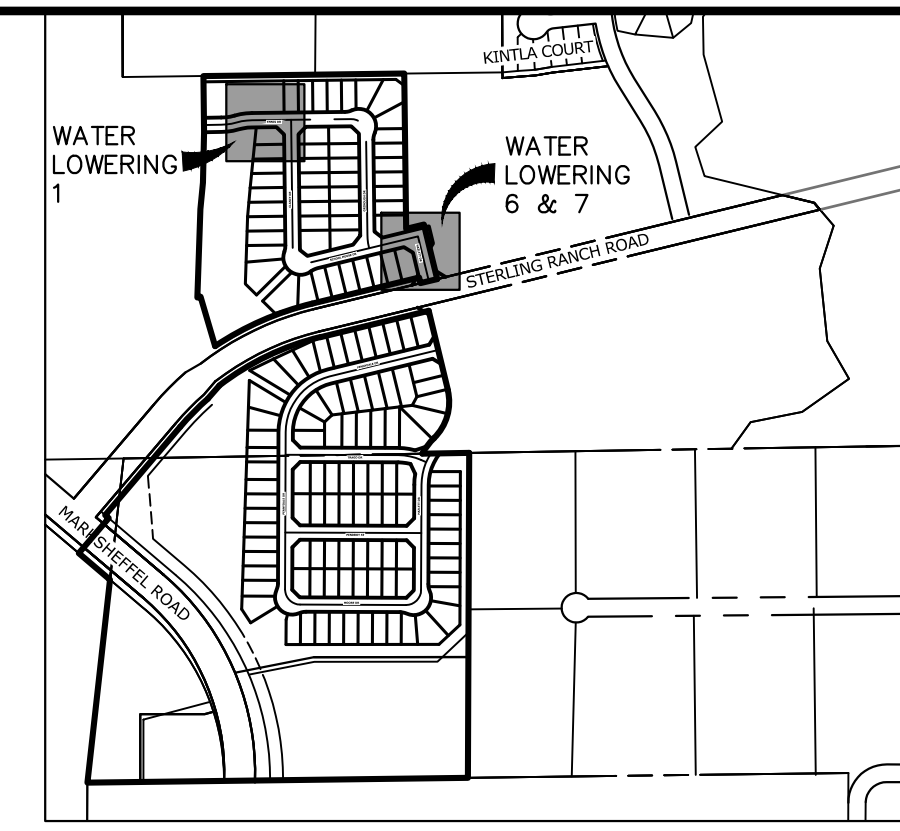




**WATER LOWERING 1A & 1B: WP01 ALIGNMENT**

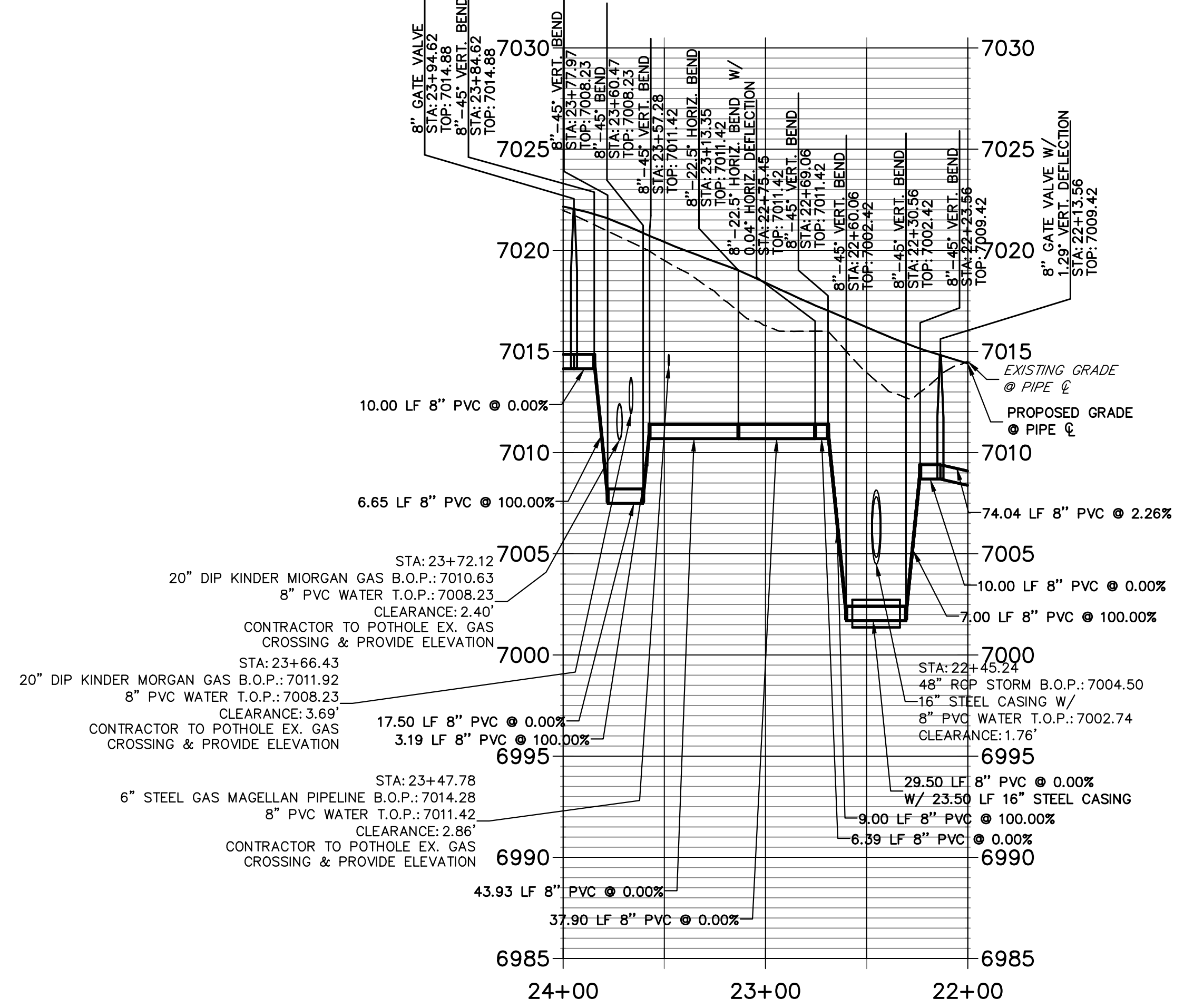


**WATER LOWERING 6 & 7: WP01 ALIGNMENT**

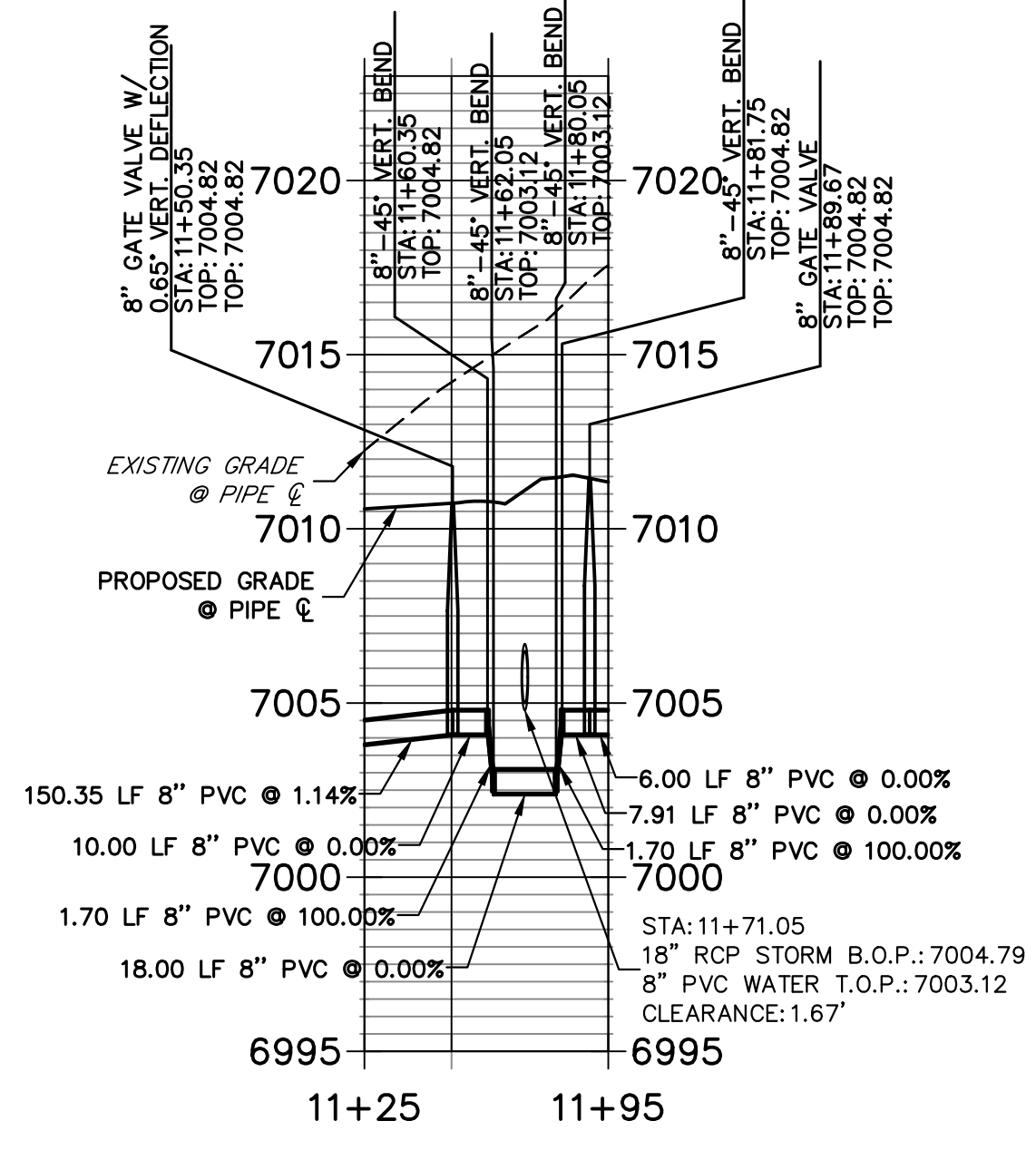


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SCALE: 1"=1000'

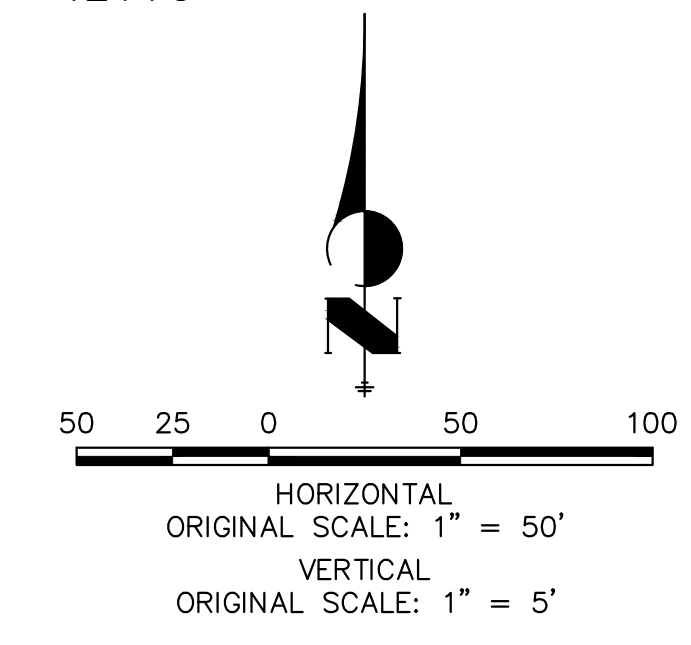
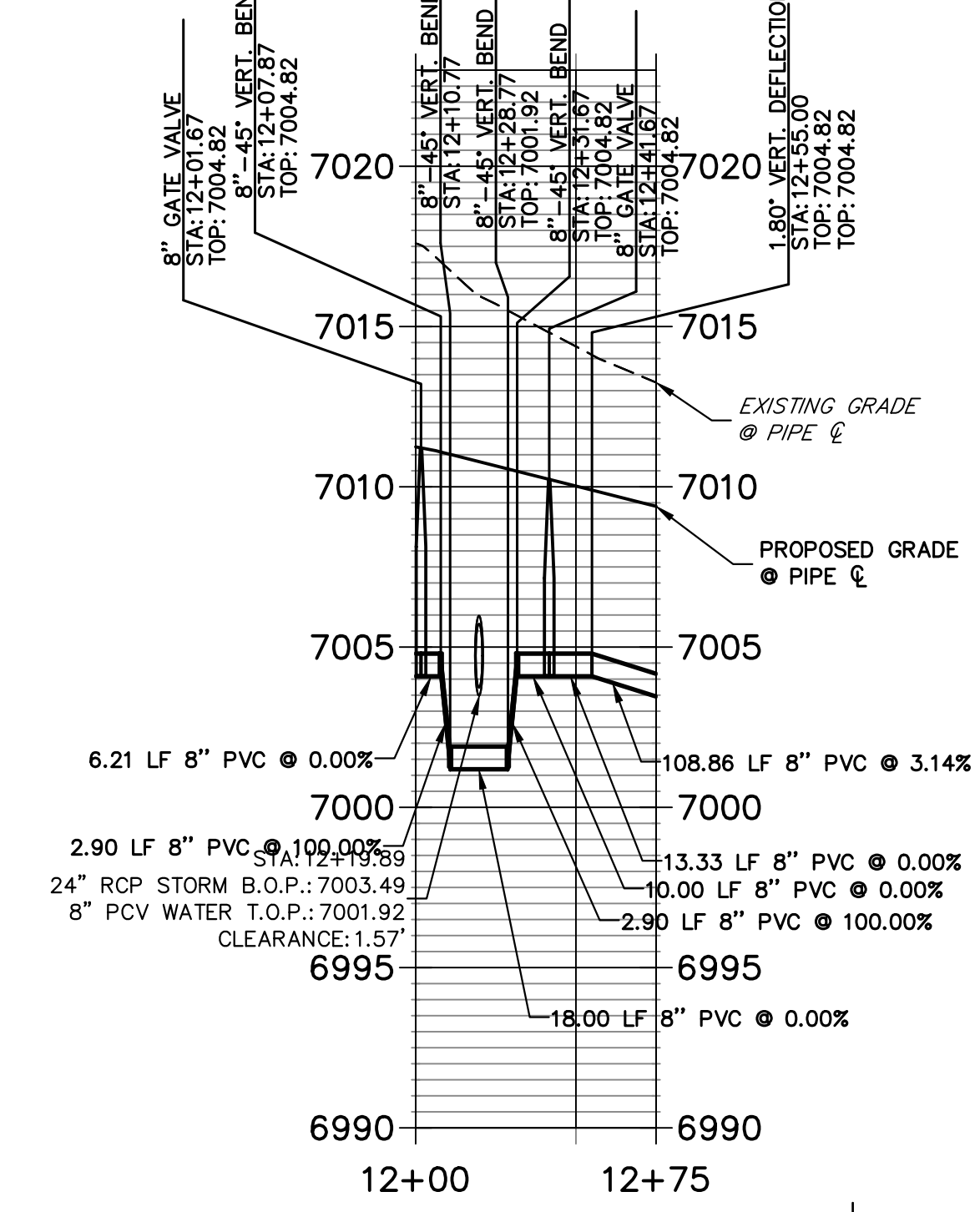
**WATER LOWERING 1A & 1B: WP01 ALIGNMENT  
STA 22+00.00 TO 24+00.00**



**WATER LOWERING 6: WP01 ALIGNMENT  
STA 11+25.00 TO 11+95.00**



**WATER LOWERING 7: WP01 ALIGNMENT  
STA 12+00.00 TO 12+75.00**



**WARNING  
HIGH-PRESSURE PIPELINE(S)**  
EXCAVATION AND/OR CONSTRUCTION PROHIBITED  
WITHOUT COMPLIANCE WITH STATE ONE-CALL, AND  
WITHOUT WRITTEN PERMISSION FROM  
MAGELLAN PIPELINE COMPANY, LP.

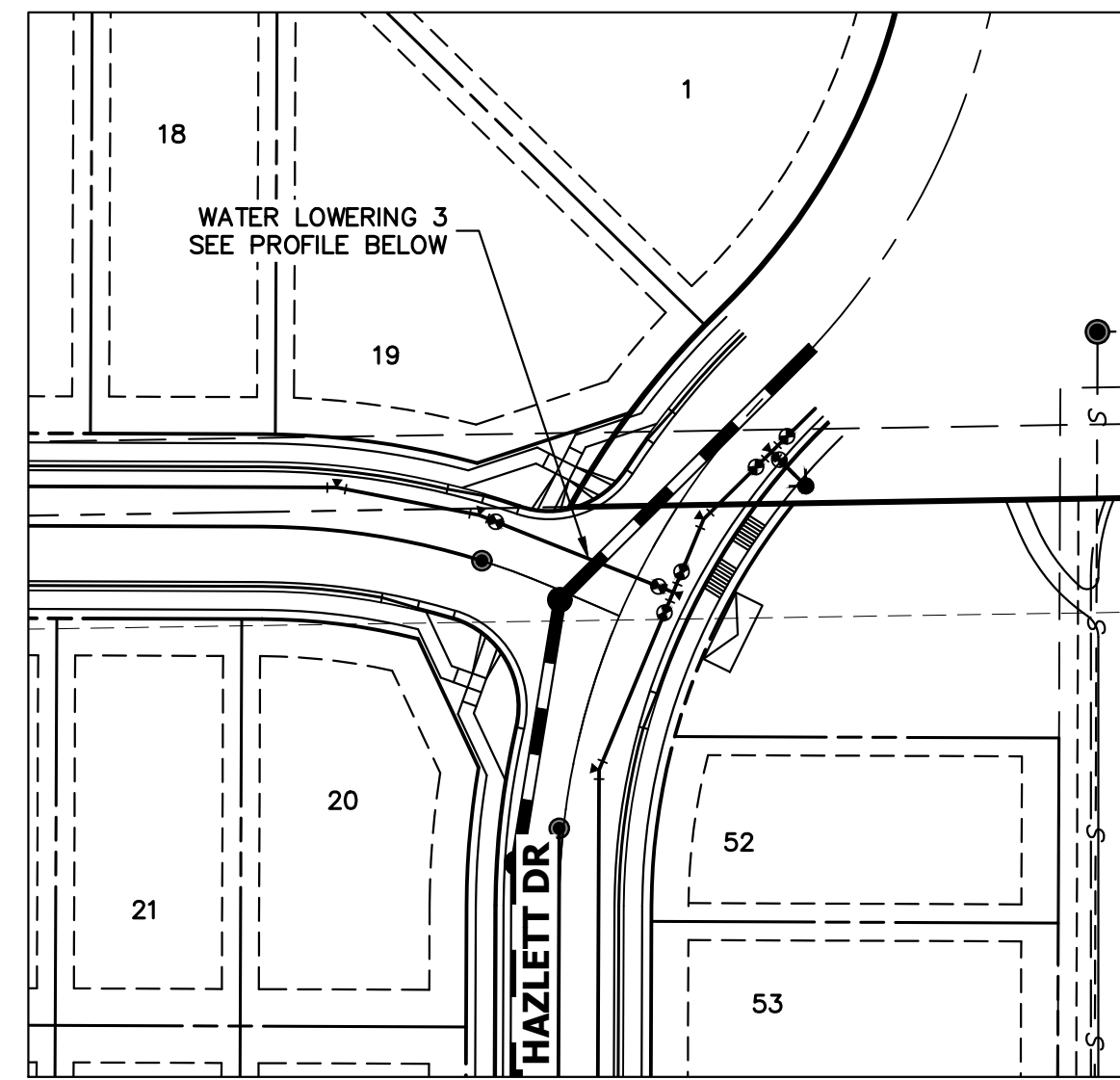
THE LOCATIONS OF EXISTING ABOVE GROUND AND UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE CAUSED BY HIS FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL ABOVE GROUND AND UNDERGROUND UTILITIES.

- WATER NOTES**
- ALL VERTICAL BENDS WILL REQUIRE MJR AND ALL PIPES ABOVE 10% VERTICAL SLOPE MUST BE RESTRAINED
  - ALL WATER MAINS SHALL BE INSTALLED AT A STANDARD DEPTH OF 5'-6" UNLESS OTHERWISE SHOWN
  - MAINTAIN A MINIMUM CLEARANCE OF 1.5 FT. WHEN CROSSING ANY UTILITIES

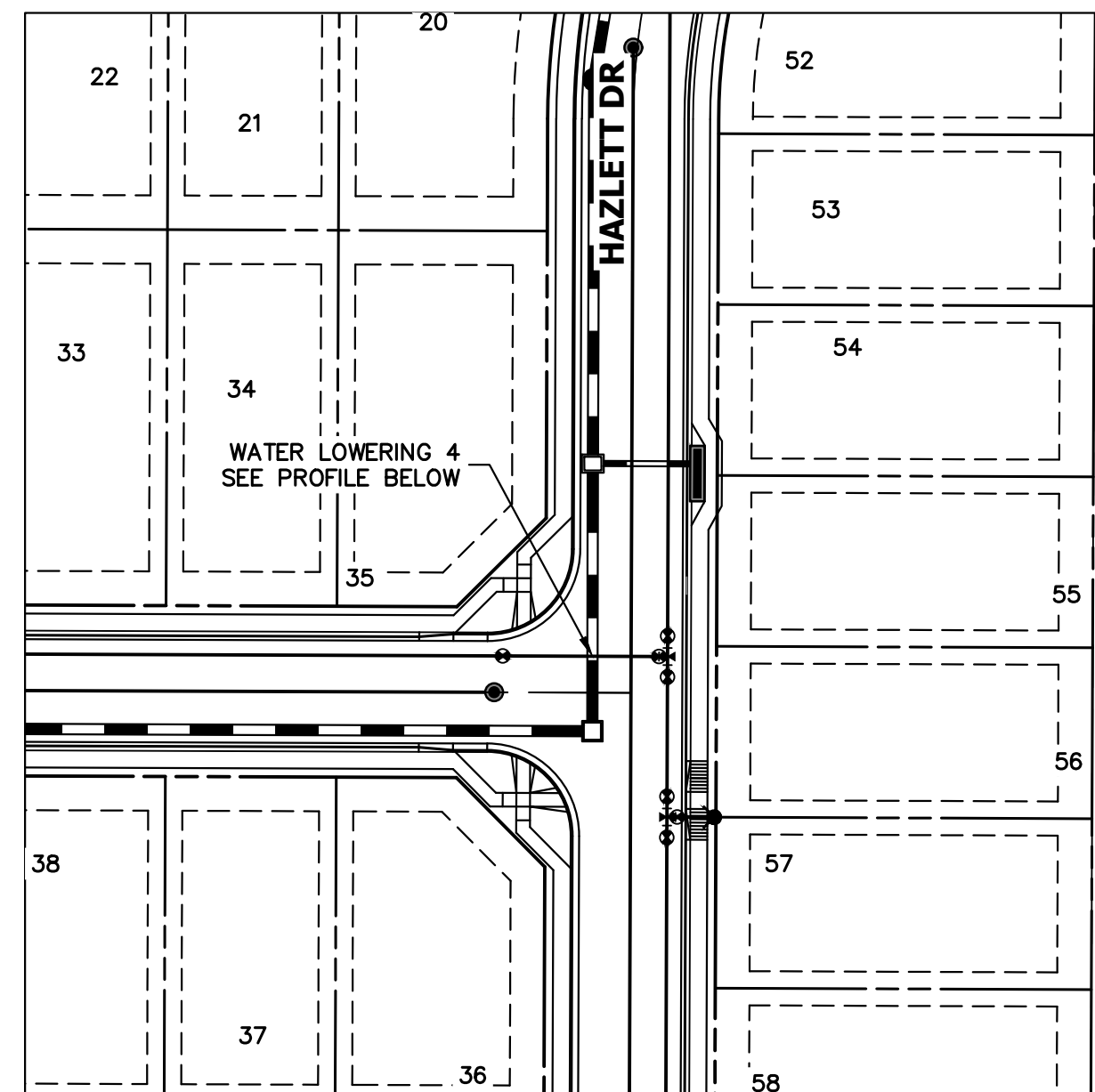
**ENGINEER'S STATEMENT**  
PREPARED UNDER MY DIRECT SUPERVISION AND ON BEHALF OF JR ENGINEERING  
*Mike Bramlett*  
MIKE A. BRAMLETT, P.E.  
COLORADO P.E. 32314  
FOR AND ON BEHALF OF JR ENGINEERING, INC. LOCAL ENGINEER  
DATE: 10/10/23

PREPARED FOR <b>SR LAND, LLC</b> 20 BOULDER CRESCENT SUITE 201 COLORADO SPRINGS, CO 80903 JAMES F. MORLEY (719) 471-1742	UNTIL SUCH TIME AS THESE DRAWINGS ARE APPROVED BY THE APPROPRIATE REVIEWING AGENCIES, JR ENGINEERING APPROVES THEIR USE AS DESIGNATED BY WRITTEN AUTHORIZATION.	<b>J.R. ENGINEERING</b> A Westman Company Centennial 300-740-0888 • Colorado Springs 719-583-2583 Fort Collins 970-491-9888 • www.jrengineering.com	BY	DATE					
			No.	REVISION					
H-SCALE	1"=50'	V-SCALE	1"=5'	DESIGNED BY	MMC	DRAWN BY	MMC	CHECKED BY	
STERLING RANCH FILING 4		WATER PLAN		SHEET 4 OF 9		JOB NO. 25188.11			

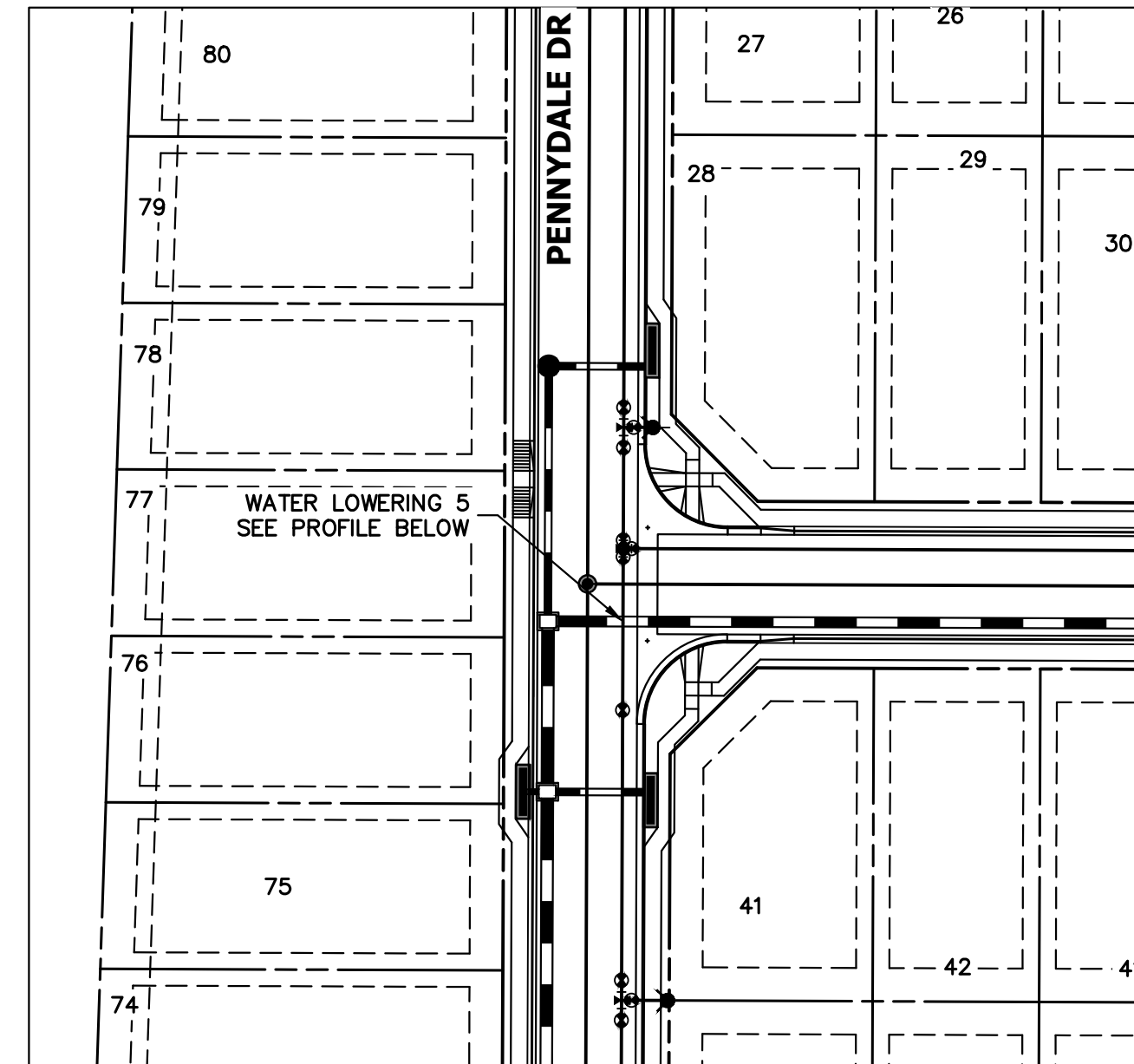




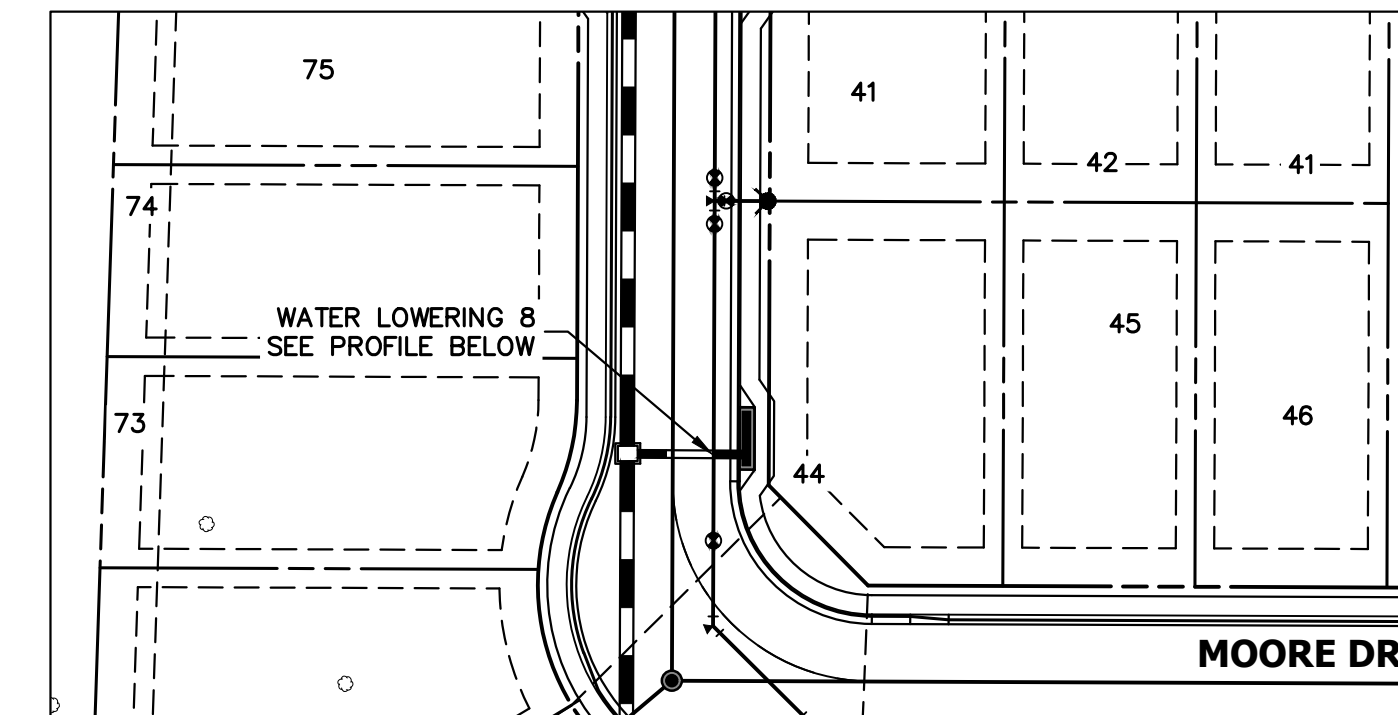
**WATER LOWERING 3: WP06 ALIGNMENT**



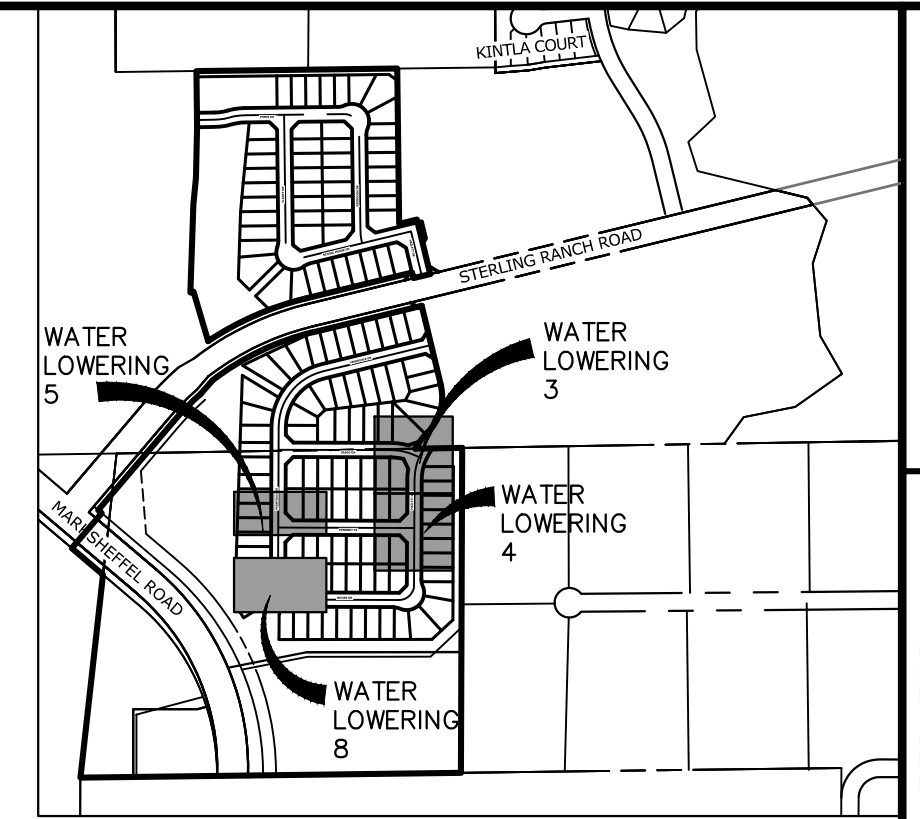
**WATER LOWERING 4: WP06 ALIGNMENT**



**WATER LOWERING 5: WP04 ALIGNMENT**

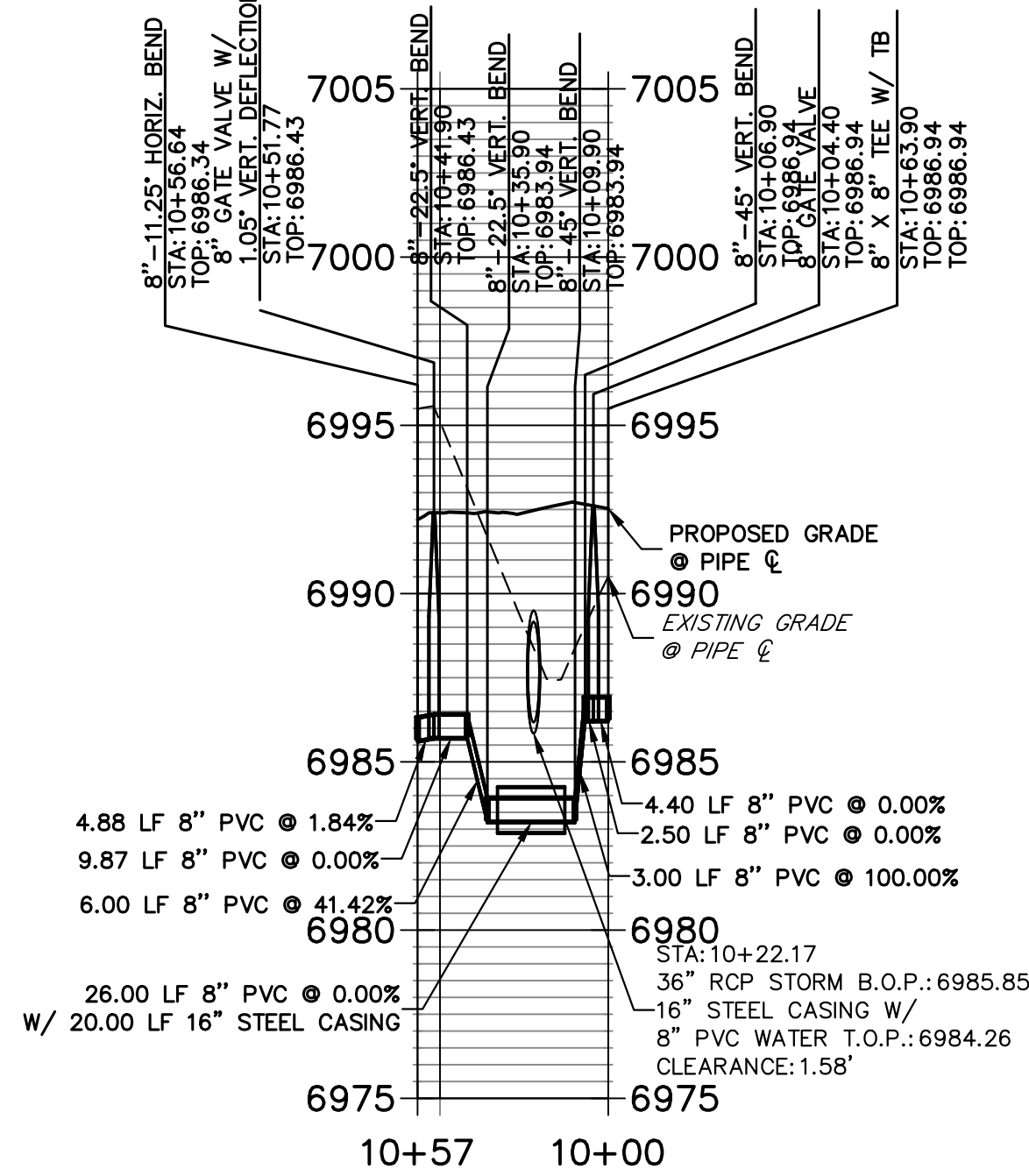


**WATER LOWERING 8: WP04 ALIGNMENT**

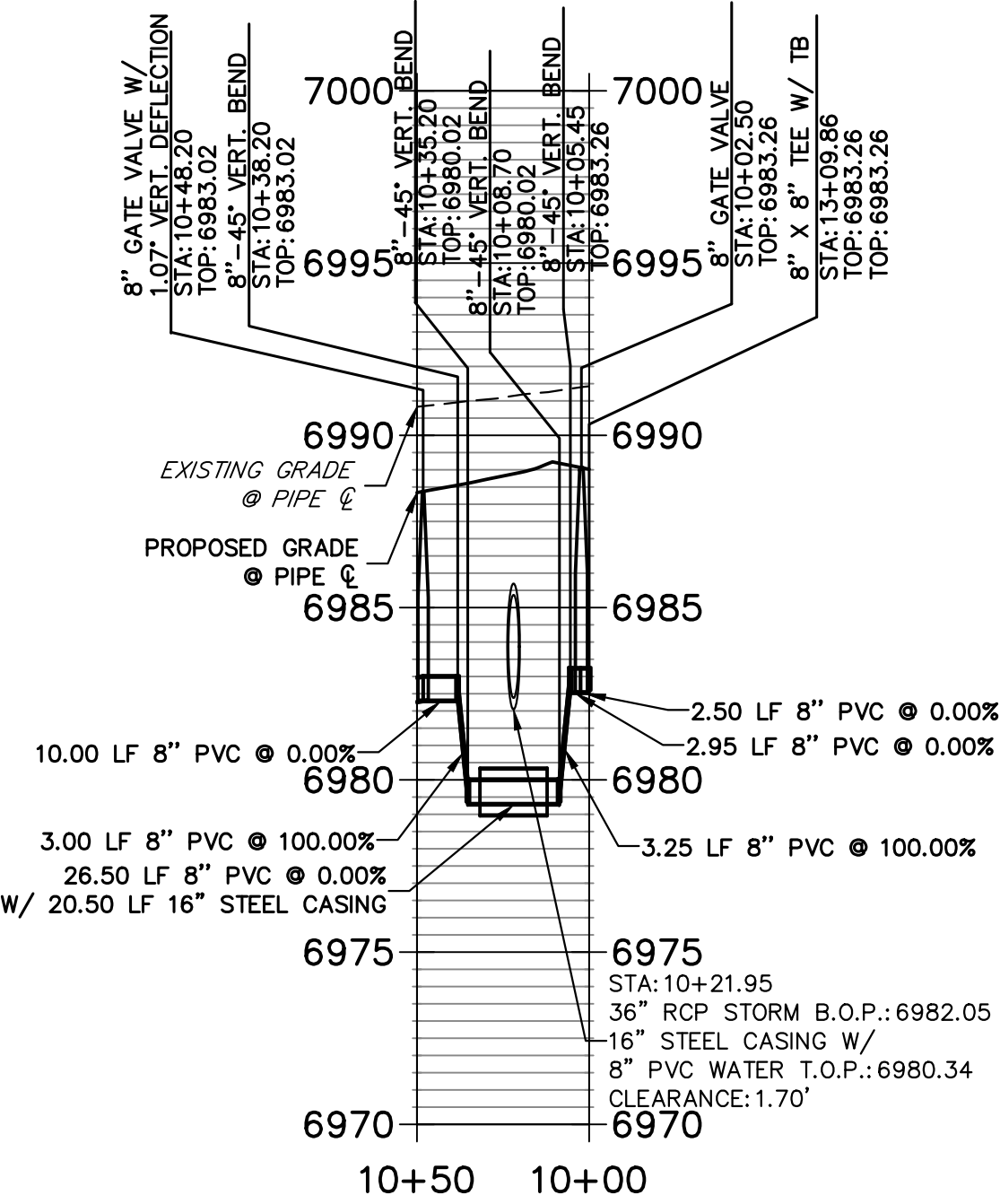


**KEY MAP**  
SCALE: 1"=1000'

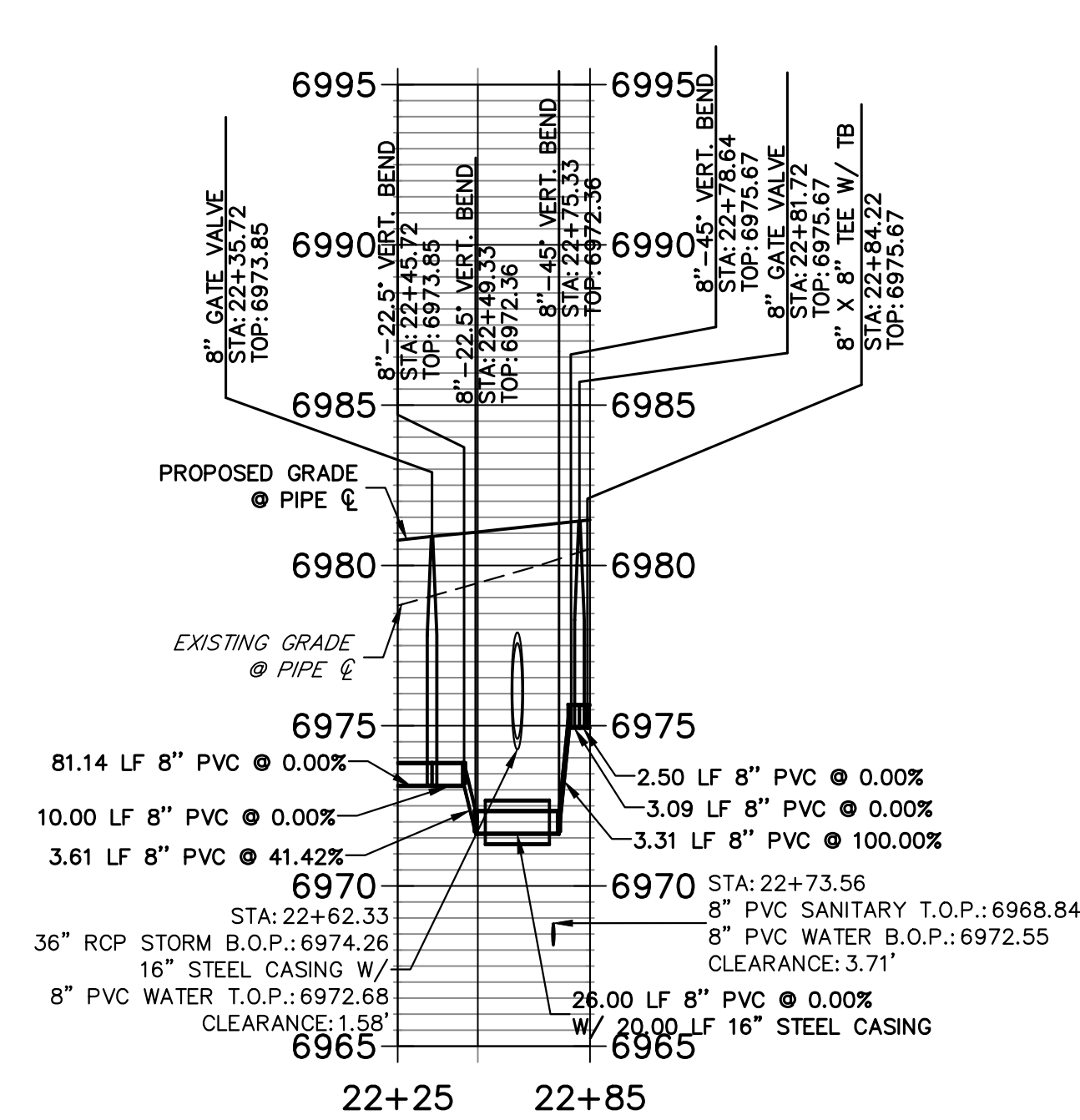
**WATER LOWERING 3: WP06 ALIGNMENT  
STA 10+00.00 TO 10+56.64**



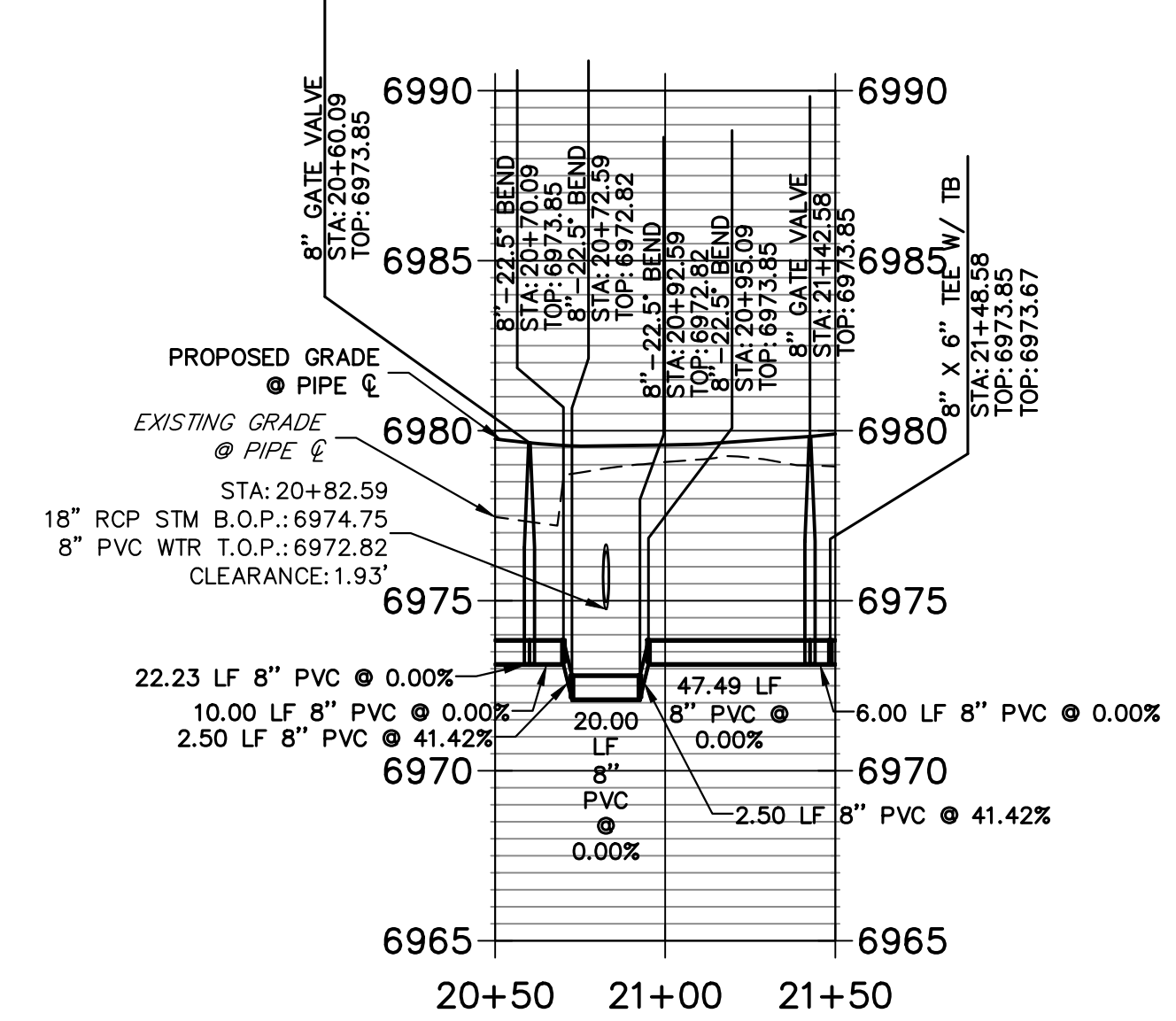
**WATER LOWERING 4: WP05 ALIGNMENT  
STA 10+00.00 TO 10+50.00**



**WATER LOWERING 5: WP04 ALIGNMENT  
STA 22+25.00 TO 22+85.00**



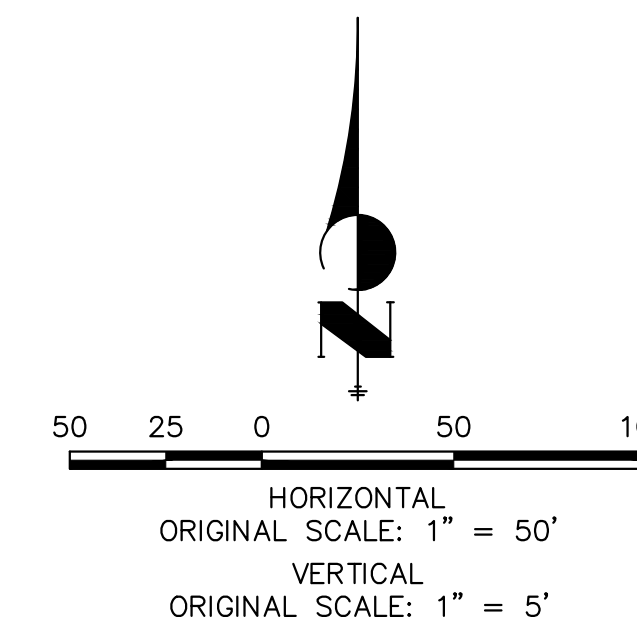
**WATER LOWERING 8: WP04 ALIGNMENT  
STA 20+50.00 TO 21+50.00**



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**WATER NOTES**

1. ALL VERTICAL BENDS WILL REQUIRE MJR AND ALL PIPES ABOVE 10% VERTICAL SLOPE MUST BE RESTRAINED
2. ALL WATER MAINS SHALL BE INSTALLED AT A STANDARD DEPTH OF 5'-6" UNLESS OTHERWISE SHOWN
3. MAINTAIN A MINIMUM CLEARANCE OF 1.5 FT. WHEN CROSSING ANY UTILITIES



**ENGINEER'S STATEMENT**

PREPARED UNDER MY DIRECT SUPERVISION AND ON BEHALF OF JR ENGINEERING  
 MIKE A. BRAMLETT, P.E.  
 COLORADO P.E. 32314  
 FOR AND ON BEHALF OF JR ENGINEERING, INC.  
 DATE: 10/10/23



PREPARED FOR  
**SR LAND, LLC**  
 20 BOULDER CRESCENT  
 SUITE 201  
 COLORADO SPRINGS, CO 80903  
 JAMES F. MORLEY  
 (719) 471-1742

**J.R. ENGINEERING**  
 A Westman Company  
 Central 303-740-9888 • Colorado Springs 719-583-2583  
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BY	DATE	No.	REVISION

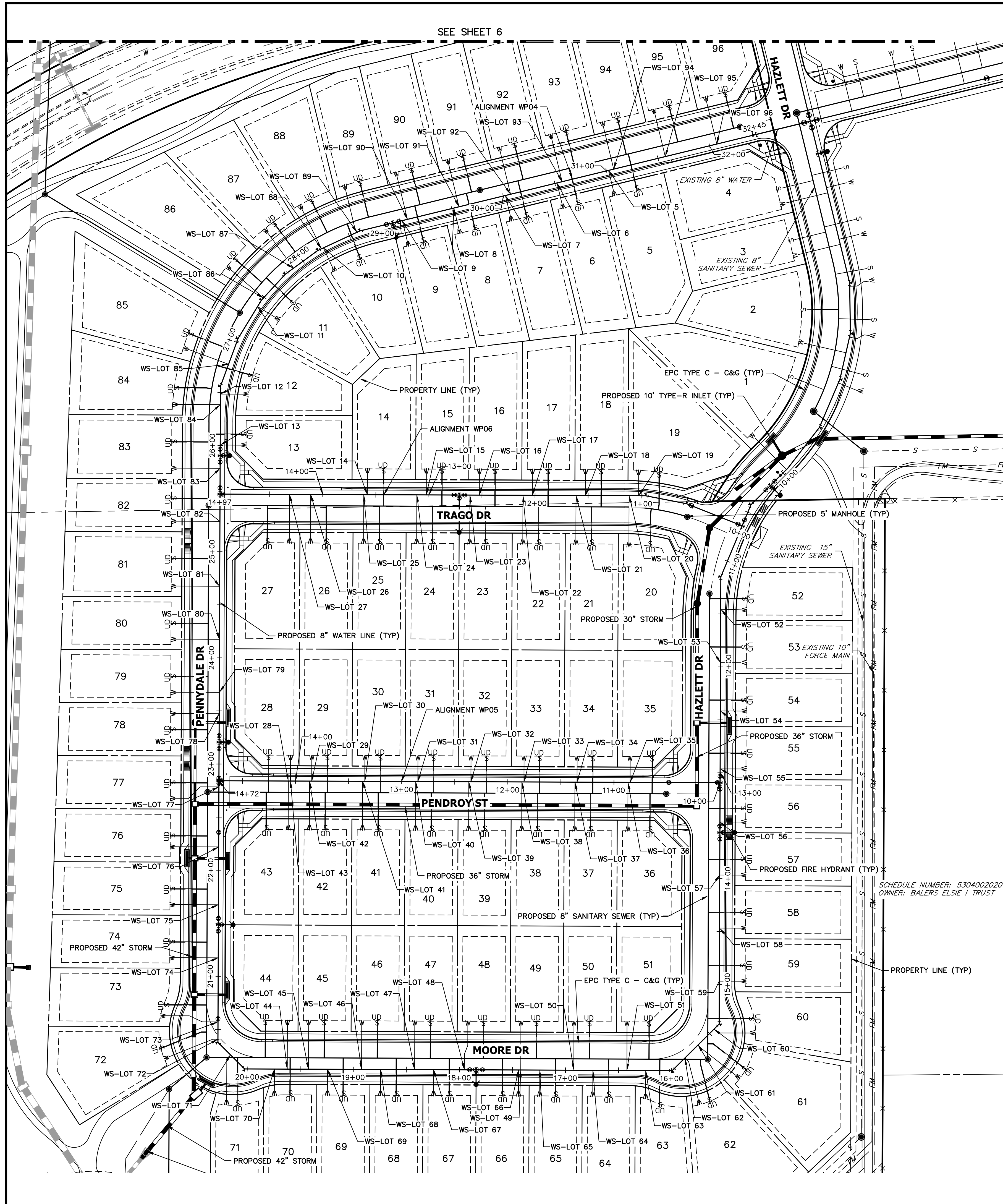
H-SCALE 1"=50'  
 V-SCALE 1"=5'  
 DATE 10/09/23  
 DESIGNED BY MMC  
 DRAWN BY MMC  
 CHECKED BY

STERLING RANCH FILING 4  
 WATER PLAN  
 SHEET 5 OF 9  
 JOB NO. 25188.11



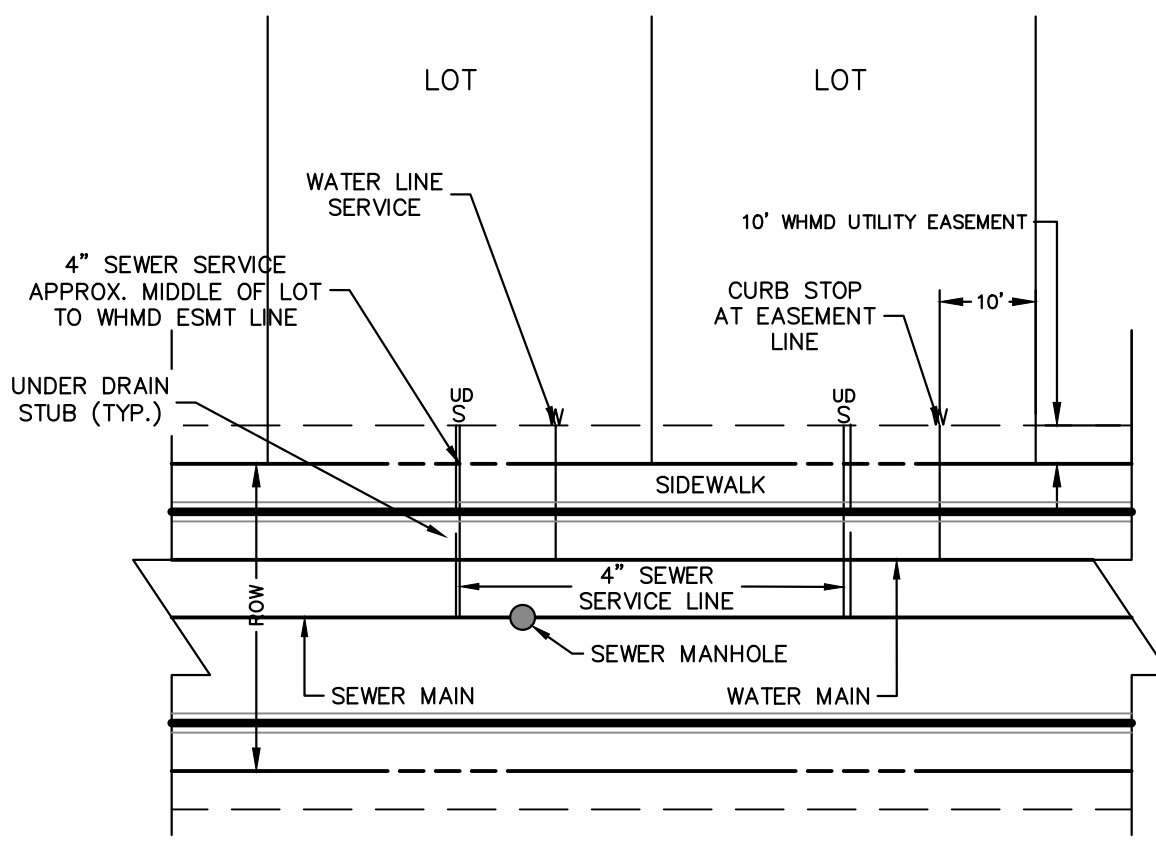




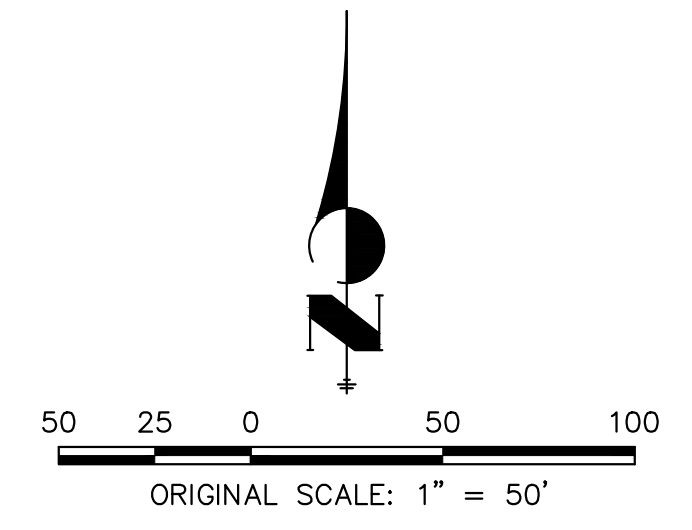


WATER SERVICE TABULATION			WATER SERVICE TABULATION		
SERVICE/LOT #	STATION	ALIGNMENT	SERVICE/LOT #	STATION	ALIGNMENT
WS-LOT 5	31+02.05	WP04	WS-LOT 25	13+36.76	WP05
WS-LOT 6	30+52.05	WP04	WS-LOT 26	13+86.76	WP05
WS-LOT 7	30+02.05	WP04	WS-LOT 27	14+06.76	WP05
WS-LOT 8	29+52.05	WP04	WS-LOT 28	14+06.77	WP05
WS-LOT 9	29+02.05	WP04	WS-LOT 29	13+84.77	WP05
WS-LOT 10	28+23.06	WP04	WS-LOT 30	13+34.77	WP05
WS-LOT 11	27+39.04	WP04	WS-LOT 31	12+84.77	WP05
WS-LOT 12	26+48.49	WP04	WS-LOT 32	12+34.77	WP05
WS-LOT 13	26+00.43	WP04	WS-LOT 33	11+84.77	WP05
WS-LOT 14	13+33.35	WP05	WS-LOT 34	11+34.77	WP05
WS-LOT 15	12+77.85	WP05	WS-LOT 35	10+84.77	WP05
WS-LOT 16	12+27.85	WP05	WS-LOT 36	10+86.77	WP05
WS-LOT 17	11+77.85	WP05	WS-LOT 37	11+36.77	WP05
WS-LOT 18	11+27.85	WP05	WS-LOT 38	11+86.77	WP05
WS-LOT 19	10+77.86	WP05	WS-LOT 39	12+36.77	WP05
WS-LOT 20	10+86.76	WP05	WS-LOT 40	12+86.77	WP05
WS-LOT 21	11+36.76	WP05	WS-LOT 41	13+36.77	WP05
WS-LOT 22	11+86.76	WP05	WS-LOT 42	13+86.77	WP05
WS-LOT 23	12+36.76	WP05	WS-LOT 43	14+04.77	WP05
WS-LOT 24	12+86.76	WP05	WS-LOT 44	19+62.19	WP04

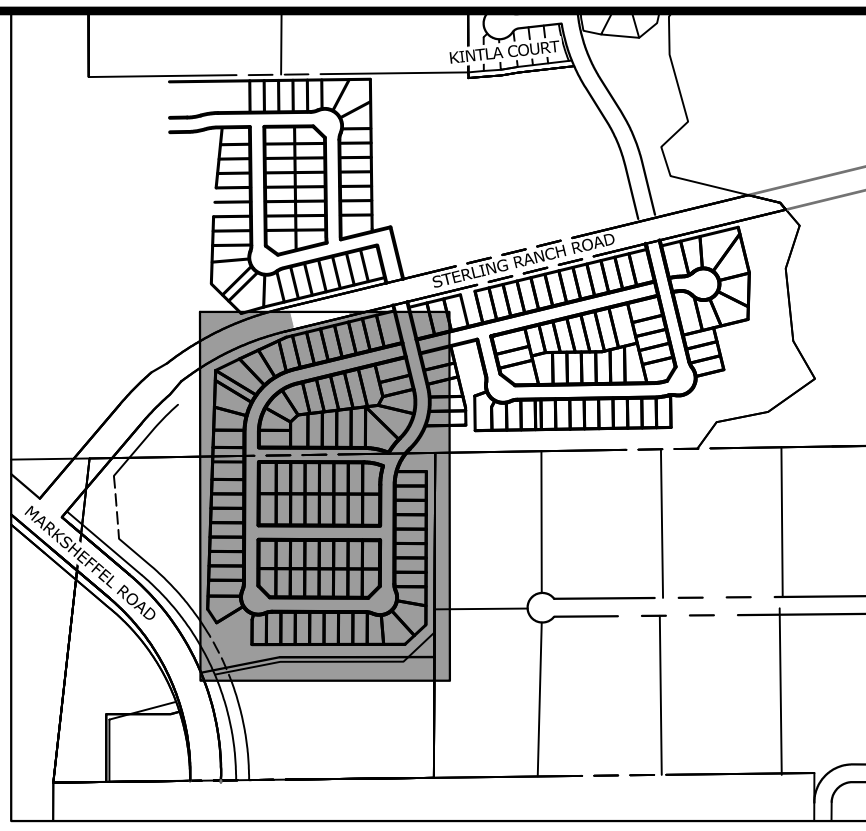
WATER SERVICE TABULATION			WATER SERVICE TABULATION			WATER SERVICE TABULATION		
SERVICE/LOT #	STATION	ALIGNMENT	SERVICE/LOT #	STATION	ALIGNMENT	SERVICE/LOT #	STATION	ALIGNMENT
WS-LOT 45	19+42.19	WP04	WS-LOT 65	17+24.25	WP04	WS-LOT 85	26+77.94	WP04
WS-LOT 46	18+92.19	WP04	WS-LOT 66	17+44.25	WP04	WS-LOT 86	27+48.93	WP04
WS-LOT 47	18+42.19	WP04	WS-LOT 67	18+24.25	WP04	WS-LOT 87	27+88.87	WP04
WS-LOT 48	17+95.25	WP04	WS-LOT 68	18+74.25	WP04	WS-LOT 88	28+21.01	WP04
WS-LOT 49	17+42.19	WP04	WS-LOT 69	19+24.25	WP04	WS-LOT 89	28+57.89	WP04
WS-LOT 50	16+92.19	WP04	WS-LOT 70	19+74.25	WP04	WS-LOT 90	29+07.05	WP04
WS-LOT 51	16+42.19	WP04	WS-LOT 71	20+21.06	WP04	WS-LOT 91	29+57.05	WP04
WS-LOT 52	11+46.50	WP04	WS-LOT 72	20+40.73	WP04	WS-LOT 92	30+07.05	WP04
WS-LOT 53	11+96.81	WP04	WS-LOT 73	20+57.09	WP04	WS-LOT 93	30+57.05	WP04
WS-LOT 54	12+42.31	WP04	WS-LOT 74	21+17.44	WP04	WS-LOT 94	31+07.05	WP04
WS-LOT 55	12+96.81	WP04	WS-LOT 75	21+67.44	WP04	WS-LOT 95	31+57.05	WP04
WS-LOT 56	13+46.81	WP04	WS-LOT 76	22+21.94	WP04	WS-LOT 96	32+07.05	WP04
WS-LOT 57	13+96.81	WP04	WS-LOT 77	22+78.48	WP04			
WS-LOT 58	14+46.81	WP04	WS-LOT 78	23+47.44	WP04			
WS-LOT 59	14+96.81	WP04	WS-LOT 79	23+67.44	WP04			
WS-LOT 60	15+44.04	WP04	WS-LOT 80	24+17.44	WP04			
WS-LOT 61	15+65.22	WP04	WS-LOT 81	24+67.44	WP04			
WS-LOT 62	15+82.66	WP04	WS-LOT 82	25+28.58	WP04			
WS-LOT 63	16+24.46	WP04	WS-LOT 83	25+78.58	WP04			
WS-LOT 64	16+74.25	WP04	WS-LOT 84	26+38.57	WP04			



- NOTES:**
1. WATER SERVICE TO BE 10' FROM "DOWNSTREAM" PROPERTY LINE AND EXTENDED TO WHMD UTILITY EASEMENT LINE.
  2. SEWER SERVICE TO BE PLACED APPROXIMATELY IN THE MIDDLE OF THE LOT AND EXTENDED TO WHMD UTILITY EASEMENT LINE.
  3. SERVICE SHALL BE MARKED WITH 2"x4" POST AT TERMINATION POINT FOR LOCATION DURING CONNECTION TO RESIDENCE. POSTS SHALL BE SPRAY-PAINTED BLUE FOR WATER AND GREEN FOR SEWER.



**ENGINEER'S STATEMENT**  
 PREPARED UNDER MY DIRECT SUPERVISION AND ON BEHALF OF JR ENGINEERING  
 Mike A. Bramlett, P.E.  
 COLORADO P.E. 32314  
 FOR AND ON BEHALF OF JR ENGINEERING, INC. LOCAL ENGINEER  
 DATE: 10/10/23



UNTIL SUCH TIME AS THESE DRAWINGS ARE APPROVED BY THE APPROPRIATE REVIEWING AGENCIES, JR ENGINEERING APPROVES THEIR USE AS SHOWN. REVISES DESIGNATED BY WRITTEN AUTHORIZATION.  
 PREPARED FOR  
**SR LAND, LLC**  
 20 BOULDER CRESCENT  
 SUITE 201  
 COLORADO SPRINGS, CO 80903  
 JAMES F. MORLEY  
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H-SCALE	V-SCALE	DATE	DESIGNED BY	DRAWN BY	CHECKED BY	No.	REVISION	BY	DATE
STERLING RANCH FILING 4									
WATER PLAN									
SHEET 7 OF 9									
JOB NO. 25188.11									



NOTE: USE DETAIL "B" WHEN INSTALLING TO PAVEMENT ELEVATION

**DETAIL "B"**  
NOT TO SCALE

CONCRETE REVERSE ANCHOR ASSEMBLY: SEE DETAIL DRAWING A4-8

VALVE BOX TOP SECTION

3" - 4" ABOVE FINAL GRADE

FINAL GRADE

2" GALV. STEEL PIPE

17-LB ANODE

MJ VALVE

PIPE

2" GALV. STEEL PIPE

2" SCREW ON VALVE

1/2" TO 1" ROCK (MIN 1/3 CY)

4" MIN

ROLL BEND APPROX 22.5' TO EITHER SIDE WHEN STAND PIPE IS ABOVE GROUND. SEE NOTE 1 (2-45° BENDS MAY BE USED)

MECHANICAL JOINT RESTRAINT W/CRA (2) MJS ON PVC (2) MJS ON DIP

MECHANICAL JOINT RESTRAINT

**NOTES:**

- IF APPROPRIATE LOCATION FOR DISCHARGED WATER CANNOT BE REACHED BY ROLLING THE BEND ADDITIONAL BENDS MAY BE REQUIRED BY THE COLORADO SPRINGS UTILITIES INSPECTOR.
- COAT THE RODS, BEAM AND GALVANIZED STEEL PIPE. SEE DETAIL DRAWING A8-11.
- ENTIRE BLOW-OFF ASSEMBLY MUST BE ADEQUATELY SUPPORTED. CONCRETE PAVER STONES MAY BE REQUIRED.
- PIPE DOPE APPROVED FOR USE IN POTABLE WATER SYSTEMS MUST BE USED ON ALL THREADED FITTINGS.
- TEMPORARY BLOW-OFF VALVE ASSEMBLIES SHALL BE INSPECTED BY THE COLORADO SPRINGS UTILITIES INSPECTOR PRIOR TO BACKFILL. BACKFILL COMPACTION TO BE SAME AS PIPE COMPACTION SPECIFICATIONS.
- 2" GALVANIZED PIPE MUST BE RATED TO 250 PSI AND CONFORM TO NSF-61 SPECIFICATIONS.
- THE COLORADO SPRINGS UTILITIES INSPECTOR MAY REQUIRE THE BACK RODS IN ADDITION TO THE MJ RESTRAINTS DEPENDING ON FIELD CONDITIONS AND SYSTEM PRESSURES. SEE THE BACK-ROD DETAIL DRAWING A2-4.

**TEMPORARY BLOW-OFF ASSEMBLIES - 4", 6" & 8" MAINS WITH MECHANICAL JOINT PLUG**

A4-5  
DATED 01/2017

PER SLIP JOINT OF DIP PIPE

PIPE DATA	MPRS DEFLECT.	DESIGN DEFLECTION (80% MAX.)		APPROX. RADII FOR DEFLECTING CURVES WITHOUT BENDS	
		HORIZ. DEFLECT.	VERT. DEFLECT.	20L	18L
4"	9'00"	4'00"	6.99%	286'	298'
6"	9'00"	4'00"	6.99%	386'	322'
8"	9'00"	4'00"	6.99%	477'	430'
10"	9'00"	4'00"	6.99%	558'	501'
12"	9'00"	4'00"	6.99%	639'	572'
14"	9'00"	4'00"	6.99%	720'	643'
16"	9'00"	4'00"	6.99%	801'	714'
18"	9'00"	4'00"	6.99%	882'	785'
20"	9'00"	4'00"	6.99%	963'	856'
24"	9'00"	4'00"	6.99%	1124'	1017'
30"	9'00"	4'00"	6.99%	1385'	1278'
36"	9'00"	4'00"	6.99%	1646'	1539'
42"	9'00"	4'00"	6.99%	1907'	1800'

SHADED COLUMN IS MANUFACTURERS REFERENCE ONLY

PER SLIP JOINT OF PVC PIPE WHICH DEFLECTION COUPLINGS

PIPE DATA	MPRS TOTAL JOINT DEFLECT. COUPL.	DESIGN DEFLECTION (80% MAX.)		MIN. RADII FOR DEFLECTING CURVES WITH HIGH DEFLECT. COUPLINGS	
		HORIZ. DEFLECT.	VERT. DEFLECT.	20L	18L
4"	9'00"	4'00"	6.99%	286'	298'
6"	9'00"	4'00"	6.99%	386'	322'
8"	9'00"	4'00"	6.99%	477'	430'
10"	9'00"	4'00"	6.99%	558'	501'
12"	9'00"	4'00"	6.99%	639'	572'
14"	9'00"	4'00"	6.99%	720'	643'
16"	9'00"	4'00"	6.99%	801'	714'
18"	9'00"	4'00"	6.99%	882'	785'
20"	9'00"	4'00"	6.99%	963'	856'
24"	9'00"	4'00"	6.99%	1124'	1017'
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36"	9'00"	4'00"	6.99%	1646'	1539'
42"	9'00"	4'00"	6.99%	1907'	1800'

SHADED COLUMN IS MANUFACTURERS REFERENCE ONLY

**NOTES:**

- COLORADO SPRINGS UTILITIES USES A 1.25 SAFETY FACTOR TO AVOID OVER DEFLECTION OF THE PIPE.
- SLIP JOINT PVC PIPE SHALL NOT BE DEFLECTED WITHOUT THE USE OF HIGH DEFLECTION COUPLINGS (HDC).

**MAXIMUM PIPELINE DEFLECTION DATA FOR DIP AND PVC PIPE**

A4-1  
DATED 03/2014

THRUST BLOCK DIMENSIONS AND VOLUMES - PVC & DIP 250 psi

MAIN SIZE (in.)	TYPE OF FITTING	MINIMUM BEARING SURFACE AREA (sq ft)	MINIMUM BEARING SURFACE AREA (sq ft)			APPROXIMATE VOLUME (cu ft)
			A <sub>1</sub> (R)	A <sub>2</sub> (R)	A <sub>3</sub> (R)	
4"	11.25° BEND	1.00	1.00	1.00	0.25	
4"	22.5° BEND	2.00	1.41	1.41	0.21	
4"	45° BEND	3.00	1.87	1.87	0.42	
4"	TEE & DEAD END	4.75	2.18	2.18	0.67	
6"	11.25° BEND	2.00	1.41	1.41	0.20	
6"	22.5° BEND	3.75	1.94	1.94	0.30	
6"	45° BEND	7.25	2.89	2.89	0.58	
6"	TEE & DEAD END	9.00	3.08	3.08	0.83	
8"	11.25° BEND	3.25	1.80	1.80	0.34	
8"	22.5° BEND	6.50	2.55	2.55	0.48	
8"	45° BEND	12.50	3.57	3.57	0.87	
8"	TEE & DEAD END	16.25	4.64	4.64	1.18	

THRUST BLOCK DIMENSIONS AND VOLUMES - PVC (Maximum Static Pressure = 170 psi)

MAIN SIZE (in.)	TYPE OF FITTING	MINIMUM BEARING SURFACE AREA (sq ft)	MINIMUM BEARING SURFACE AREA (sq ft)			APPROXIMATE VOLUME (cu ft)
			A <sub>1</sub> (R)	A <sub>2</sub> (R)	A <sub>3</sub> (R)	
12"	11.25° BEND	4.75	2.18	2.18	0.43	
12"	22.5° BEND	9.25	3.04	3.04	0.64	
12"	45° BEND	18.00	4.92	4.92	1.00	
12"	TEE & DEAD END	23.50	6.42	6.42	1.48	
16"	11.25° BEND	8.00	2.83	2.83	0.44	
16"	22.5° BEND	16.00	4.27	4.27	0.66	
16"	45° BEND	31.00	8.27	8.27	1.33	
16"	TEE & DEAD END	40.50	10.80	10.80	1.75	

THRUST BLOCK DIMENSIONS AND VOLUMES - DIP (Maximum Static Pressure = 250 psi)

MAIN SIZE (in.)	TYPE OF FITTING	MINIMUM BEARING SURFACE AREA (sq ft)	MINIMUM BEARING SURFACE AREA (sq ft)			APPROXIMATE VOLUME (cu ft)
			A <sub>1</sub> (R)	A <sub>2</sub> (R)	A <sub>3</sub> (R)	
12"	11.25° BEND	6.75	2.80	2.80	0.43	
12"	22.5° BEND	13.50	3.89	3.89	0.64	
12"	45° BEND	26.25	7.17	7.17	1.00	
12"	TEE & DEAD END	34.25	9.36	9.36	1.48	
16"	11.25° BEND	11.75	3.43	3.43	0.44	
16"	22.5° BEND	23.25	5.20	5.20	0.66	
16"	45° BEND	46.50	12.13	12.13	1.33	
16"	TEE & DEAD END	59.50	15.87	15.87	1.82	

**NOTES:**

- THE MINIMUM BEARING SURFACE AREAS SHOWN ARE BASED ON A MAX STATIC PIPE PRESSURE OF 170/250 POUNDS PER SQUARE INCH PLUS A SAFETY FACTOR OF 1.5 AND AN ALLOWABLE SOIL BEARING CAPACITY OF 1000 POUNDS PER SQUARE FOOT. BEARING SURFACE AREA IS ROUNDED UP TO THE NEAREST 0.25 SQUARE FEET. REFERENCE AWWA M-23 AND M-41.
- THE DESIGN ENGINEER IS RESPONSIBLE FOR VERIFYING ASSUMPTIONS BASED ON ACTUAL SITE CONDITIONS. IF SITE CONDITIONS VARY FROM THE ASSUMPTIONS THE DESIGN ENGINEER SHALL PROVIDE A SITE SPECIFIC DESIGN IN ACCORDANCE WITH AWWA M-23, PVC PIPE - DESIGN AND INSTALLATION AND AWWA M-41, DUCTILE IRON PIPE AND FITTINGS. SITE SPECIFIC DESIGNS INCLUDING GEOTECHNICAL INFORMATION SHALL BE SUBMITTED TO COLORADO SPRINGS UTILITIES FOR REVIEW.
- THE MINIMUM BEARING SURFACE AREA AND APPROXIMATE VOLUME OF CONCRETE SHALL BE SHOWN ON THE CONSTRUCTION PLANS FOR ALL CONCRETE THRUST BLOCKS. CONCRETE MIX SHALL BE PER MATERIAL CHAPTER 4.
- THE APPROXIMATE VOLUMES SHOWN ARE BASED ON THE MINIMUM BEARING SURFACE AREA AND THE MINIMUM TRENCH DIMENSIONS. THE APPROXIMATE VOLUME IS ROUNDED UP TO THE NEAREST 0.25 CUBIC YARDS.
- THESE CHARTS MAY ONLY BE USED IF THE BLOCK HEIGHT (H<sub>1</sub>) IS EQUAL TO OR LESS THAN ONE HALF THE TOTAL DEPTH (H<sub>2</sub>) FROM THE FINISHED GRADE TO THE BOTTOM OF THE BLOCK. THE MINIMUM DIMENSIONS SHOWN ARE BASED ON A PIPE DEPTH OF 5 FEET. SEE DETAIL DRAWING A4-3.
- A SITE SPECIFIC DESIGN SHALL BE REQUIRED FOR PIPES LARGER THAN 18 INCHES OR MAX STATIC PIPE PRESSURES GREATER THAN 250 POUNDS PER SQUARE INCH. THE DESIGN ENGINEER HAS THE OPTION OF PROVIDING A SITE SPECIFIC DESIGN FOR PIPES SMALLER THAN 18 INCHES OR MAX STATIC PRESSURES LESS THAN 250 POUNDS PER SQUARE INCH.
- ALL CALCULATIONS SHALL BE PROVIDED TO COLORADO SPRINGS UTILITIES FOR REVIEW.

**CONCRETE THRUST REACTION BLOCKS**

A4-2  
DATED 03/2014

CONCRETE THRUST REACTION BLOCK REQUIREMENTS FOR TEES OR TAPS

WATER MAIN SIZE (INCHES)

CONNECTION OR FITTING SIZE (INCHES)

INDICATES THAT A CONCRETE THRUST REACTION BLOCK IS REQUIRED

BEARING PRESSURE

UNDISTURBED SOIL

45°

**NOTES:**

- A SITE SPECIFIC DESIGN SHALL BE REQUIRED FOR CONNECTIONS OR FITTING SIZE COMBINATIONS NOT SHOWN ABOVE.
- THE CONCRETE THRUST REACTION BLOCK SHALL BEAR AGAINST UNDISTURBED SOIL.
- THE CONCRETE THRUST REACTION BLOCK SHALL BE INSTALLED WITH A 45° ANGLE FROM THE FITTING TO THE UNDISTURBED SOIL AS SHOWN IN THE DRAWING ABOVE.
- REFER TO DETAIL DRAWING A4-2 FOR STANDARD CONCRETE THRUST REACTION BLOCK DIMENSIONS AND VOLUMES.
- DUCTILE IRON FITTINGS AND PIPE SHALL BE WRAPPED IN POLYETHYLENE TUBING WHERE ADJACENT TO CONCRETE.

**CONCRETE THRUST REACTION BLOCKS**

A4-3  
DATED 03/2014

L = MINIMUM RESTRAINED PIPE LENGTH (FEET)

PIPE DIAMETER	45° BEND			22-1/2° BEND			11-1/4° BEND			DEAD END VALVE OR PLUGS TO INCLUDE IN LINE VALVES (SEE NOTE 9)		
	MAX. STATIC PRESSURE (psi)	100-150	150-200	100-150	150-200	100-150	150-200	100-150	150-200			
8 INCH DUCTILE IRON AND PVC	6	9	12	3	5	6	2	3	3	49	73	97
8 INCH DUCTILE IRON AND PVC	8	12	16	4	6	8	2	3	4	63	94	125
12 INCH DUCTILE IRON AND PVC	12	17	23	6	8	11	3	4	6	89	133	177
16 INCH DUCTILE IRON AND PVC	15	22	29	7	11	14	4	5	7			
20 INCH DUCTILE IRON AND PVC	18	26	35	9	13	17	4	6	8			
24 INCH DUCTILE IRON AND PVC	20	30	40	10	15	20	5	7	10			
30 INCH DUCTILE IRON AND PVC	24	36	48	12	18	24	6	9	12			
36 INCH DUCTILE IRON AND PVC	28	42	56	14	20	27	7	10	14			

UNRESTRAINED BELL

BELL HARNESS RESTRAINTS (TYP.)

MECHANICAL JOINT BEND

**NOTES:**

- PRESSURE GREATER THAN 200 PSI REQUIRE SPECIAL DESIGN APPROVED BY SPRINGS UTILITIES. APPROVED BY COLORADO SPRINGS UTILITIES.
- LENGTH IS BASED ON MINIMUM 5 FEET OF GROUND COVER AND SOIL COMPACTION ACCORDING TO CHAPTER 5 OF THESE WATER LESS. IF THE DEPTH IS LESS THAN 5 FEET RESTRAINED LENGTH MUST BE DESIGNED BY THE DESIGN ENGINEER.
- APPROVED METHODS OF RESTRAINED PIPE BEYOND INITIAL FITTINGS SHALL BE IN ACCORDANCE WITH CHAPTER 4.
- RESTRAINED PIPE LENGTH APPLIES TO CONDITIONS WHERE NO CONCRETE THRUST REACTION BLOCK IS PRESENT.
- CALCULATIONS ARE BASED ON A POORLY GRADED SANDS, GRAVEL, AND GRAVEL-SAND MIXTURE, LITTLE OR NO FINES, TYPE 4 BEDDING CONDITIONS - PIPE BEDDED IN SAND, GRAVEL OR CRUSHED STONE TO A DEPTH OF 18 PIPE DIAMETER (4" MIN.), FACTOR OF SAFETY 2.1.
- FIGURES ARE BASED ON DIP WRAPPED IN POLYETHYLENE MATERIAL.
- MEASUREMENTS ARE IN FEET.
- USE CRA FOR DOWN TURNING BENDS.
- RESTRAINED LENGTH FOR DEAD END MAY BE USED AT THE DISCRETION OF COLORADO SPRINGS UTILITIES.

**RESTRAINED PIPE LENGTH (FEET) W/MECHANICAL JOINT RESTRAINTS**

A4-4  
DATED 02/2014

CONCRETE THRUST REACTION BLOCK SEE DETAIL DRAWING A4-2

30" (MIN.) SPACER PIPE (TYP.)

MJ VALVE (TYP.)

PVC OR DIP PIPE

MECHANICAL JOINT RESTRAINTS (TYP.)

**TEE INSTALLATION**

PVC OR DIP PIPE

10" (TYP.) RESTRAINED OR SOLID PIPE

MECHANICAL JOINT RESTRAINT W/CRA (2) MJS ON PVC (2) MJS ON DIP SEE DETAIL DRAWING A4-8

MJ VALVE (TYP.)

30" (MIN.) SPACER PIPE (TYP.)

MJ VALVE (TYP.)

MECHANICAL JOINT RESTRAINTS (TYP.)

**IN LINE VALVE INSTALLATION**

MECHANICAL JOINT RESTRAINTS (TYP.)

**CROSS INSTALLATION**

**NOTES:**

- MECHANICAL JOINT RESTRAINTS SHALL BE APPROVED ACCORDING TO CHAPTER 4 FOR DIP AND PVC PIPE.
- DUCTILE IRON FITTINGS AND PIPE SHALL BE WRAPPED IN POLYETHYLENE TUBING WHERE ADJACENT TO CONCRETE.

**VALVE AND FITTINGS W/ MECHANICAL JOINT RESTRAINTS**

A4-5  
DATED 06/2015

STANDARD PIPE JOINT

MECHANICAL JOINT RESTRAINTS (TYP.)

CONCRETE THRUST REACTION BLOCK SEE DWG A4-2

MECHANICAL JOINT BEND

**HORIZONTAL BENDS W/MJ RESTRAINTS AND CTRB**

STANDARD PIPE JOINT

MECHANICAL JOINT RESTRAINTS (TYP.)

LENGTH OF MJ RESTRAINED PIPE SEE NOTE 2

MECHANICAL JOINT BEND

LENGTH OF MJ RESTRAINED PIPE SEE NOTE 2

**HORIZONTAL BENDS W/MJ RESTRAINTS WITHOUT CTRB**

CONCRETE REVERSE ANCHOR SEE DETAIL DRAWING A4-8

MECHANICAL JOINT BEND

RESTRAINED JOINT PIPE THROUGHOUT THE SLOPE

MECHANICAL JOINT BEND

**VERTICAL BENDS W/ CONCRETE REVERSE ANCHORS ON SLOPES 10% OR GREATER**

**NOTES:**

- MECHANICAL JOINT RESTRAINTS SHALL BE APPROVED ACCORDING TO CHAPTER 4 FOR DIP AND PVC PIPE.
- LENGTH OF PIPE REQUIRING JOINT RESTRAINT SHALL BE DETERMINED FROM CHART ON DETAIL DRAWING A4-4.
- DUCTILE IRON FITTINGS AND PIPE SHALL BE WRAPPED IN POLYETHYLENE TUBING WHERE ADJACENT TO CONCRETE.

**BEND CONFIGURATIONS AND RESTRAINTS**

A4-6  
DATED 06/2015

2' FROM BACK OF CURB

5' MIN.

DETACHED SIDEWALK

LOT 1

LOT 2

FACE OF CURB

ATTACHED SIDEWALK

2' FROM BACK OF SIDEWALK

PROPERTY LINE/ROW OR EASEMENT

IN LINE EXCEPT AT FLAG LOTS (SEE NOTE 2)

IN LINE EXCEPT AT FLAG LOTS (SEE NOTE 2)

5' MIN.

5' MIN. FROM CENTER OF HYDRANT

ANY ABOVE GROUND STRUCTURE

**FLAG LOT LOCATIONS**

**LOT LINE LOCATIONS**

**PAD AND VAULT ACCESS CLEARANCES**

FIRE HYDRANT

ELECTRIC VAULT AND PAD

**NOTES:**

- HYDRANT NOZZLE SHALL BE POSITIONED AT RIGHT ANGLES TO THE NEAREST CURB. IF NO CURB OR SIDEWALK EXIST, NOZZLE SHALL BE PLACED AT RIGHT ANGLE TO STREET OR ALLEY.
- HYDRANTS INSTALLED AT FLAG LOT LINES SHALL BE OFFSET 3' FROM THE LOT LINE.
- HYDRANTS SHALL BE PLACED A MINIMUM OF 5.0 FEET FROM ANY UTILITY OR DRAINAGE STRUCTURE. (TO BE COORDINATED WITH JOINT TRENCH INSTALLATION).
- EASEMENTS MUST BE PROVIDED FOR ANY PUBLIC HYDRANT WHICH IS CLOSER THAN 5.0 FEET INSIDE THE RIGHT-OF-WAY LINE.
- A SAFE WORKING CLEARANCE IS NECESSARY FOR THE FIRE DEPARTMENT TO IDENTIFY, ATTACH HOSES TO AND OPERATE A FIRE HYDRANT IN CASE OF AN EMERGENCY. A 3 FOOT CLEAR SPACE SHALL BE MAINTAINED AROUND THE CIRCUMFERENCE OF FIRE HYDRANTS EXCEPT AS OTHERWISE REQUIRED OR APPROVED BY THE COLORADO SPRINGS FIRE DEPARTMENT.
- FIRE HYDRANTS SHALL BE INSTALLED WITH CLEARANCES PER THE MOST CURRENT APPROVED IFC.

**FIRE HYDRANT LOCATIONS**

A4-1  
DATED 03/2014

Colorado Springs Utilities  
It's how we're all connected

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**ENGINEER'S STATEMENT**  
STANDARD DETAILS SHOWN WERE REVIEWED ONLY AS TO THEIR APPLICATION ON THIS PROJECT

Mike A. Bramlett, P.E.  
32314  
DATE: 10/10/23

PREPARED FOR  
**SR LAND, LLC**  
20 BOULDER CRESCENT  
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UNLESS SUCH TIME AS THESE DRAWINGS ARE APPROVED BY THE AGENCIES, OR ENGINEERING APPROVES THEIR USE, THESE DRAWINGS ARE NOT TO BE USED WITHOUT WRITTEN AUTHORIZATION.

**J.R. ENGINEERING**  
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STERLING RANCH FILING 4

WATER DETAILS

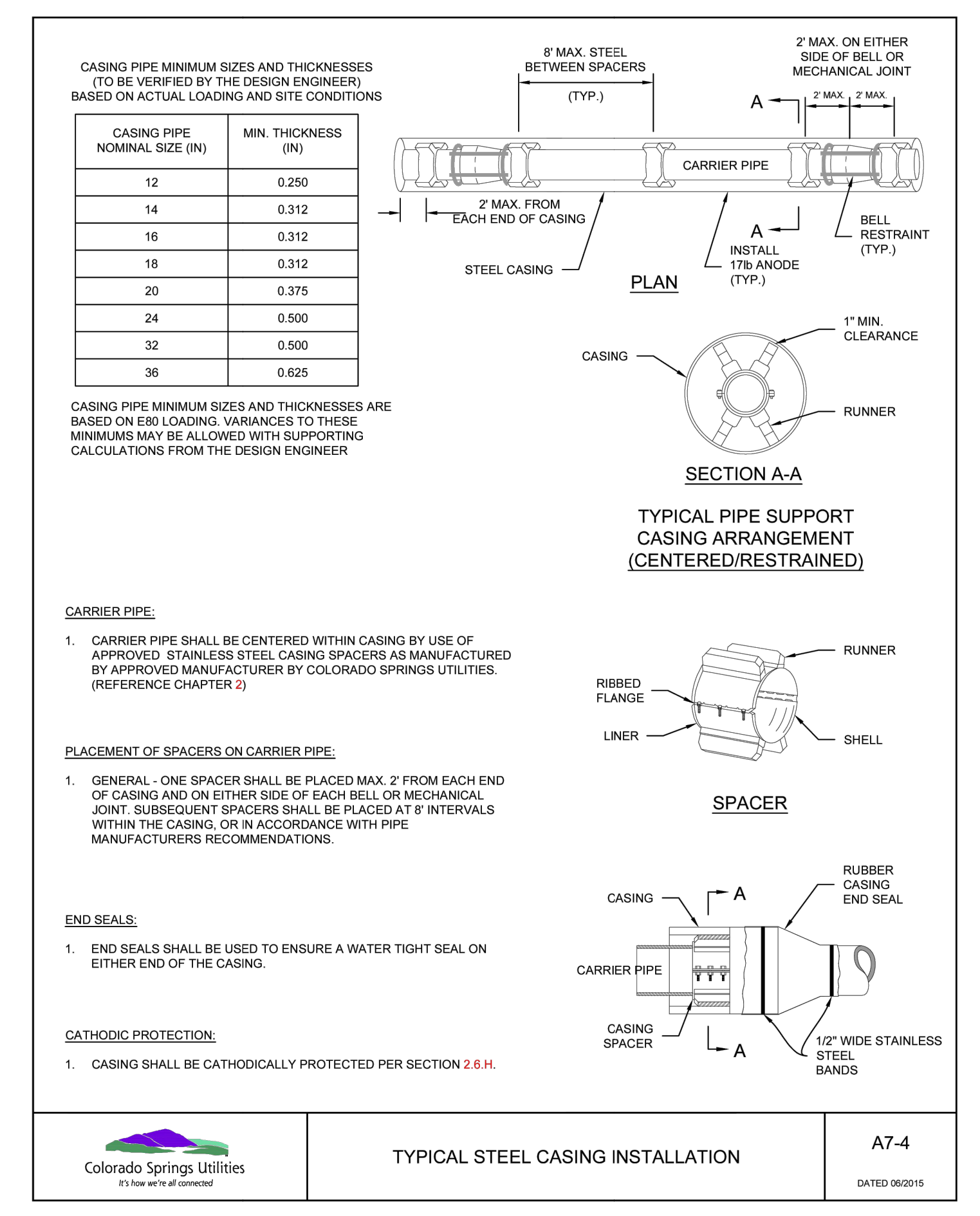
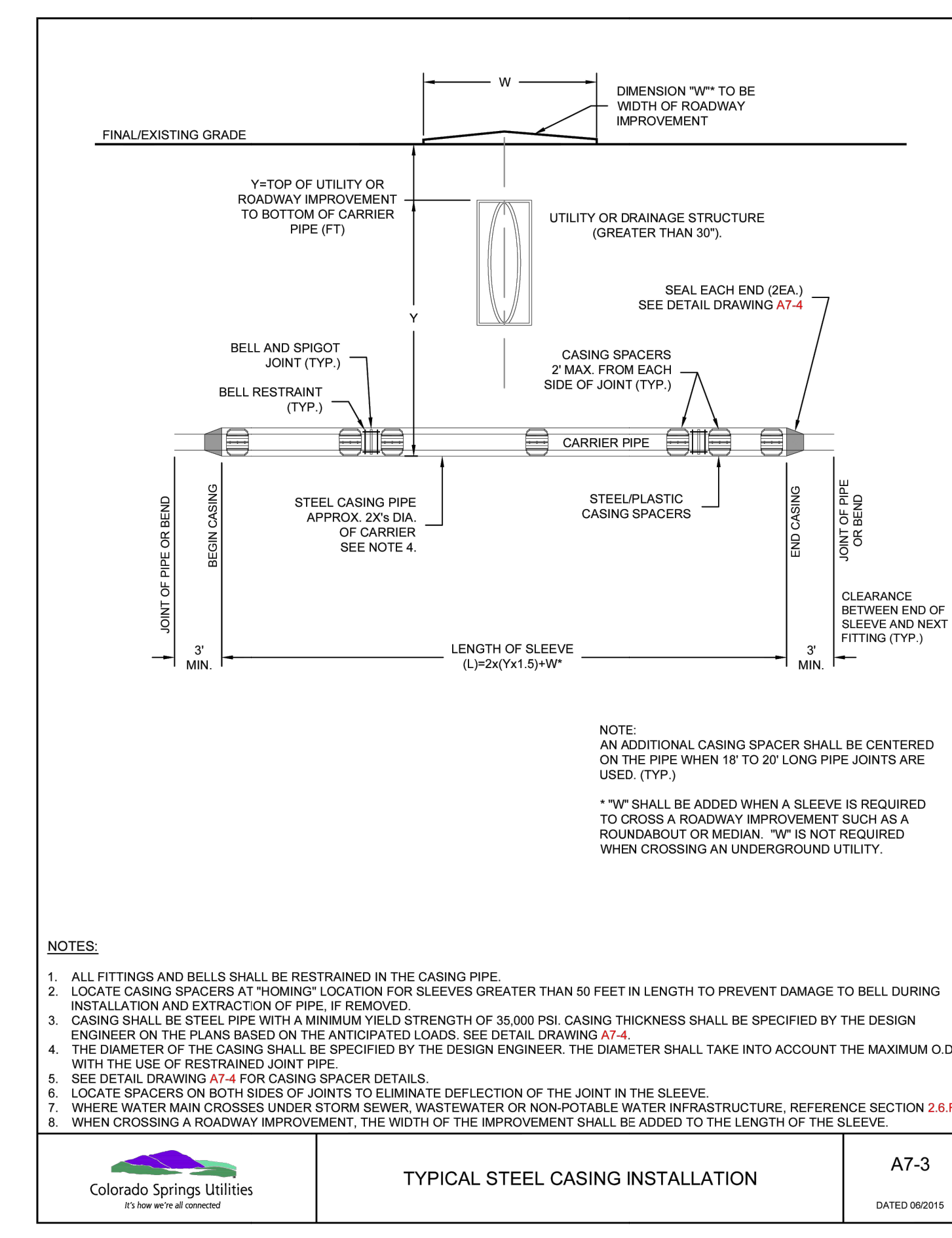
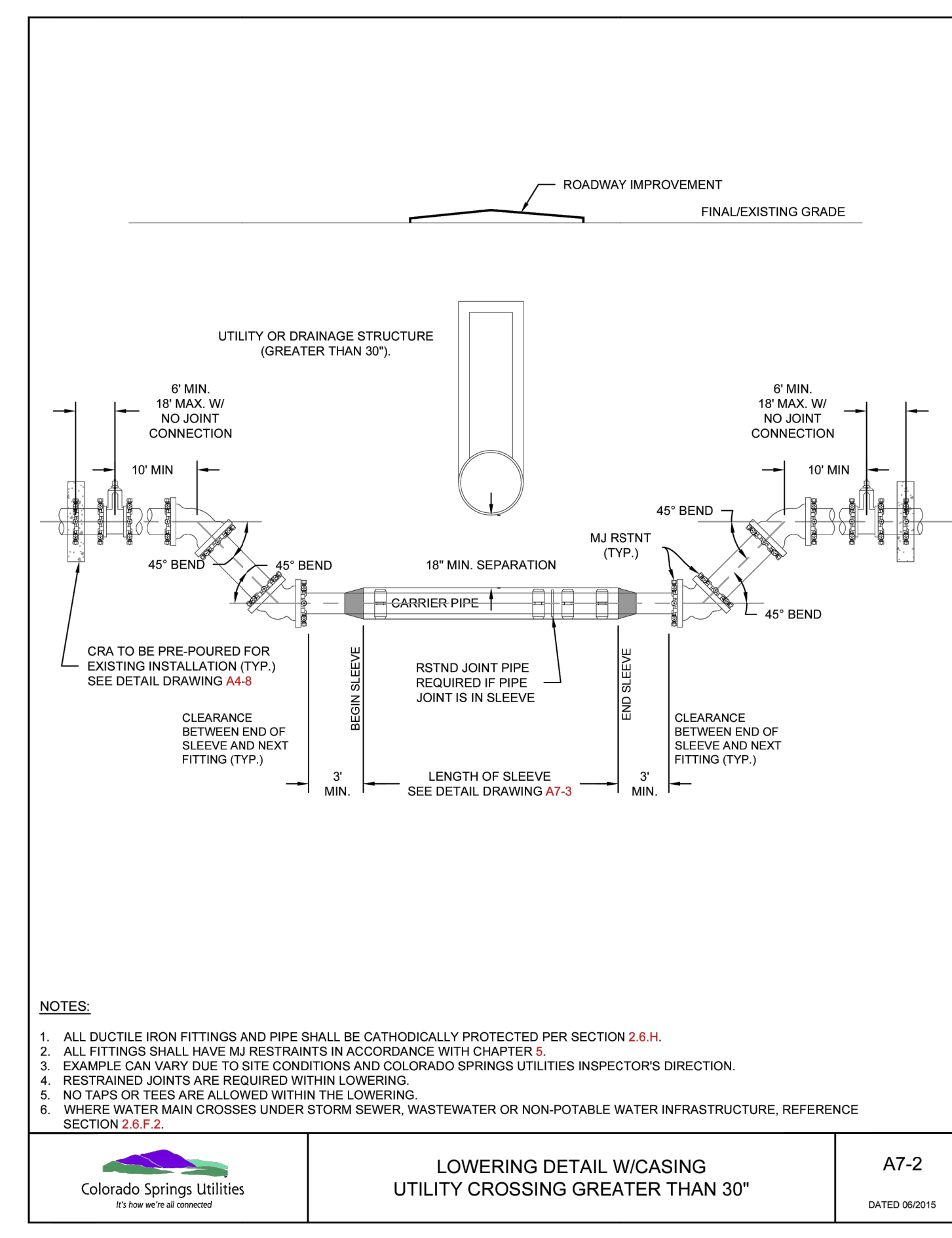
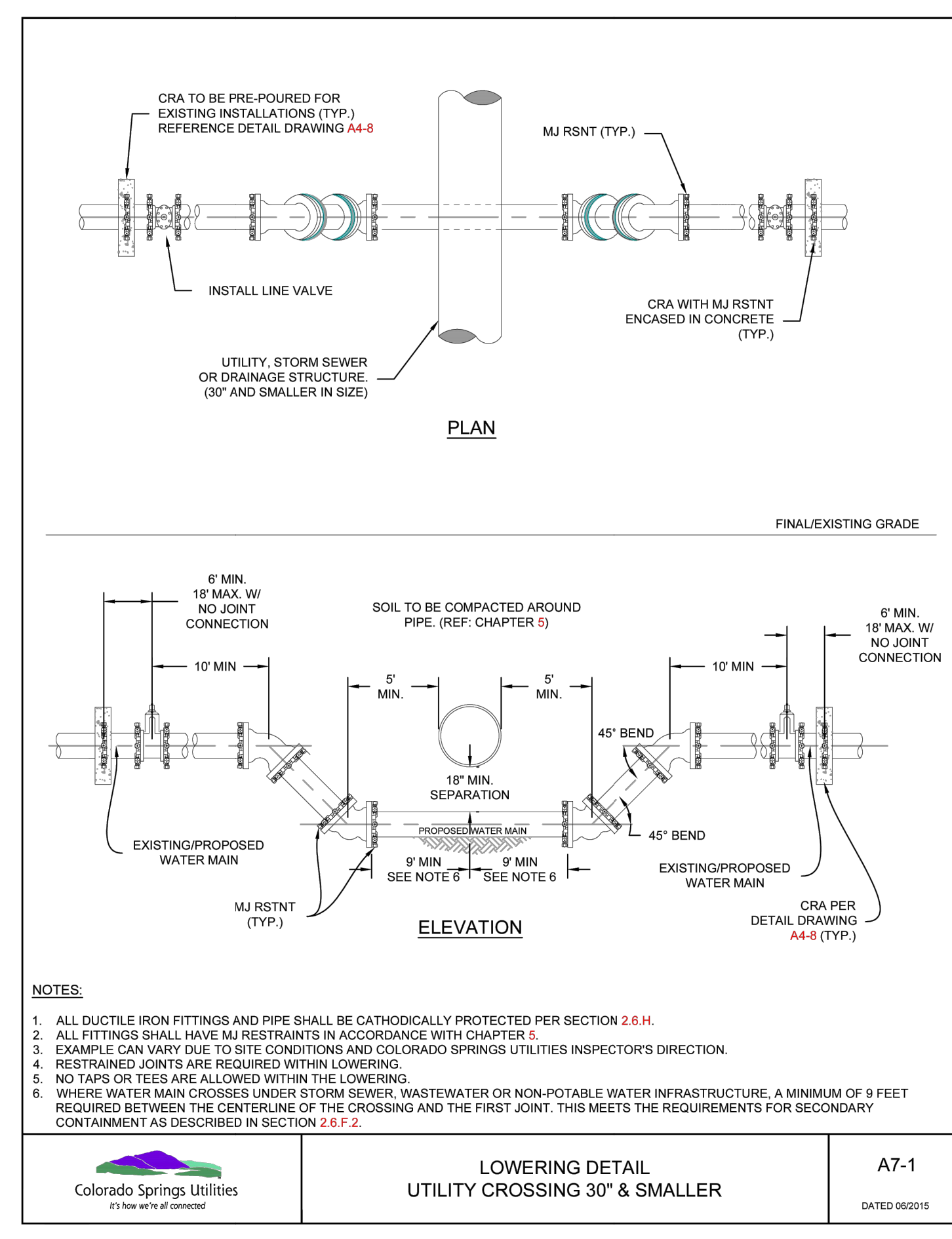
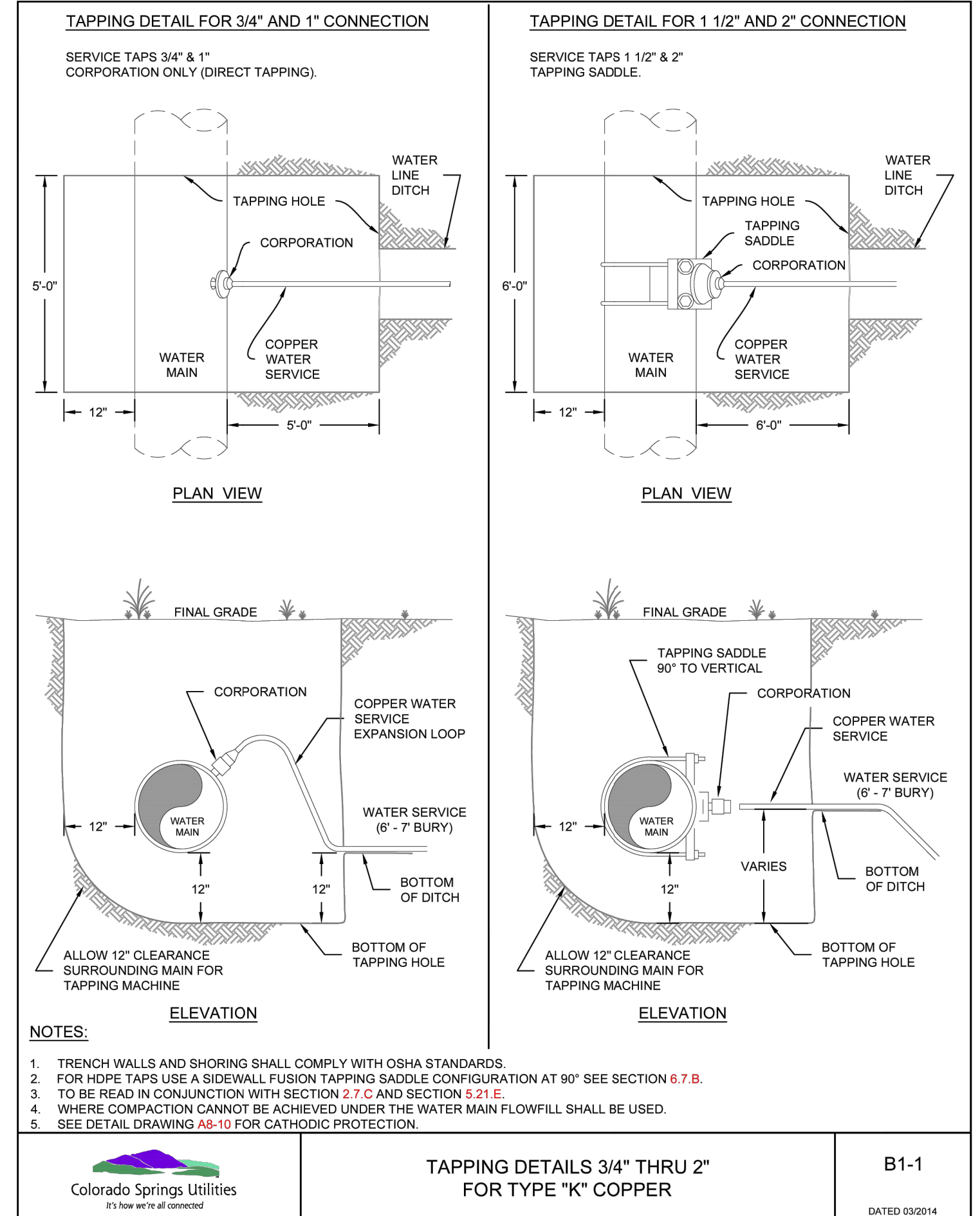
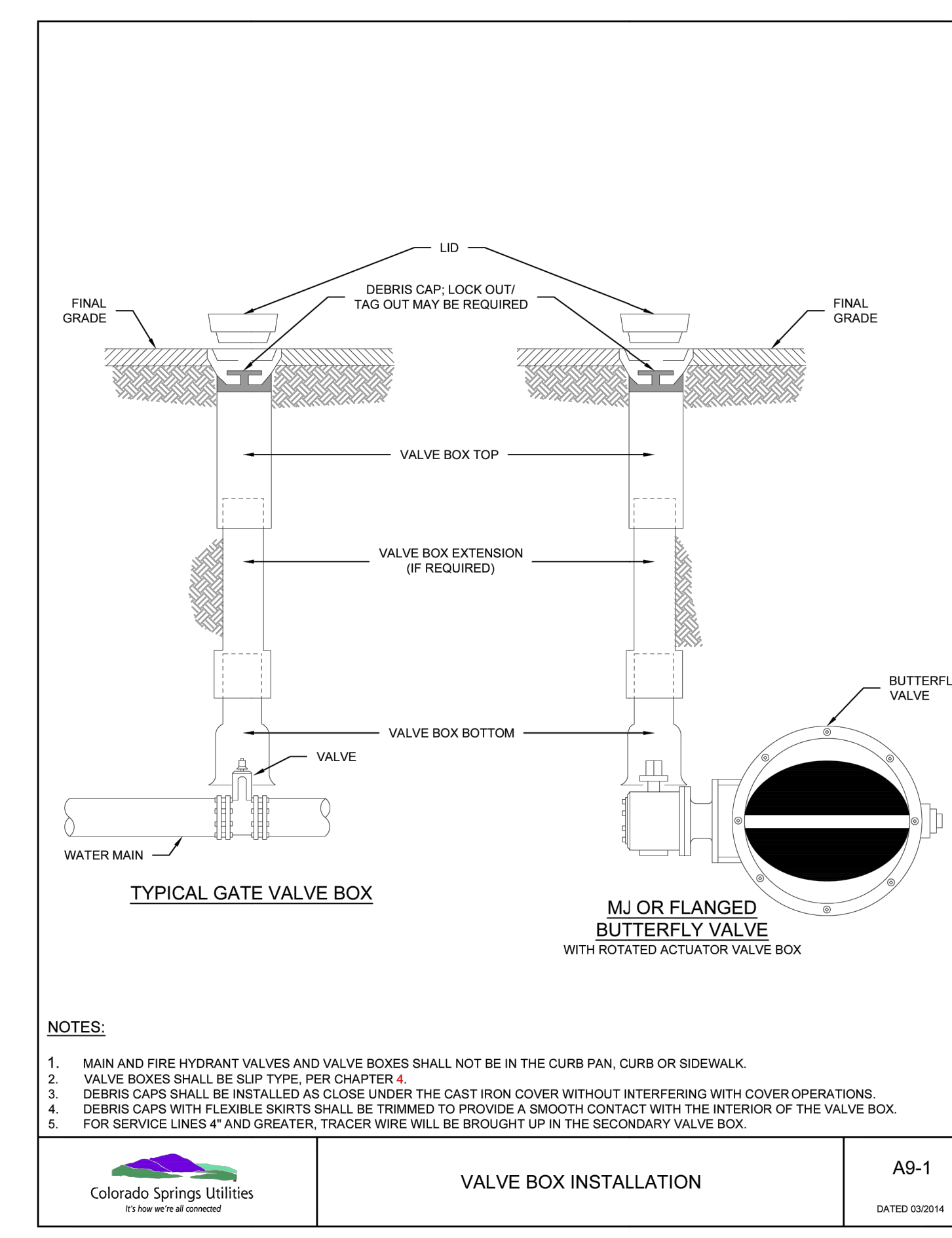
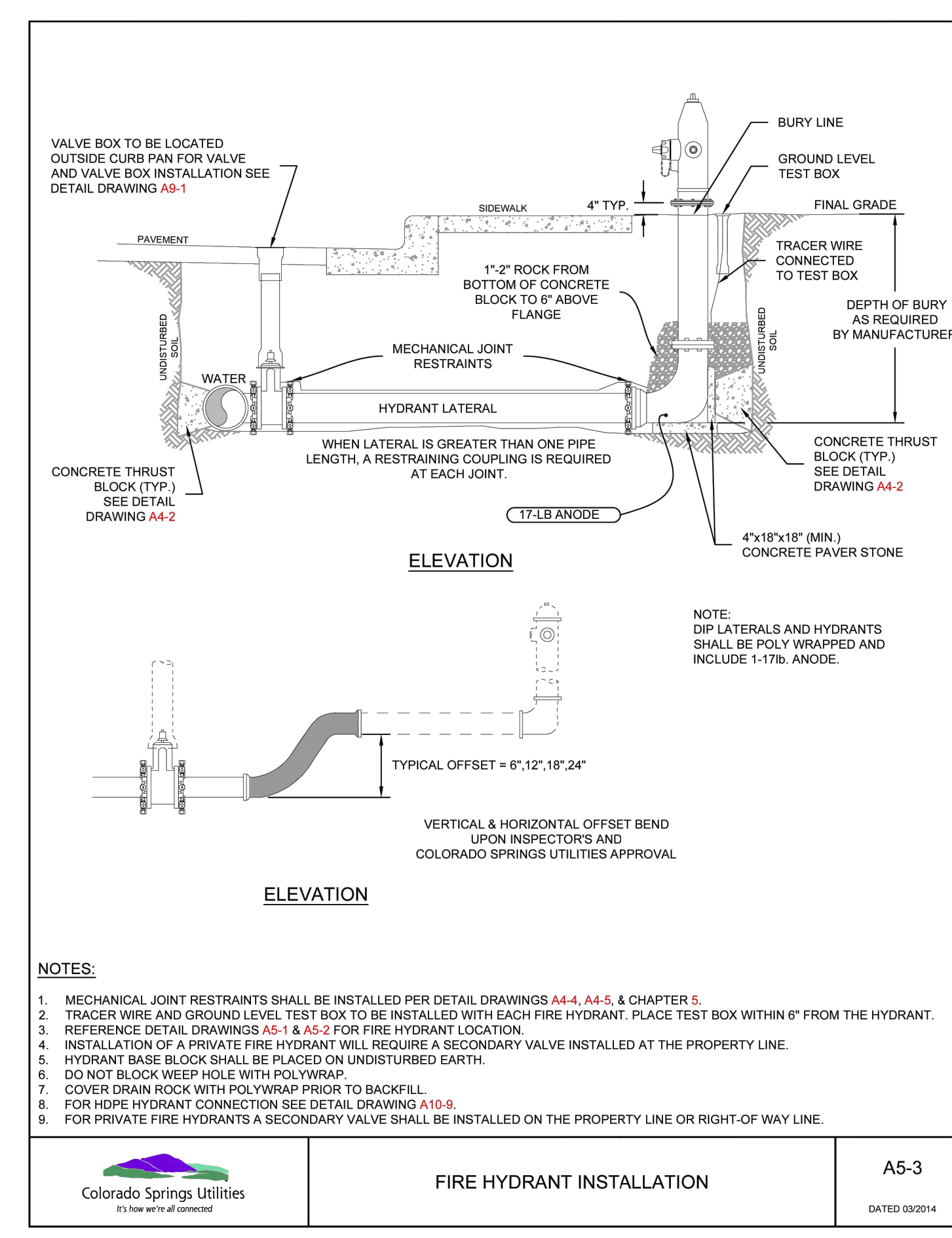
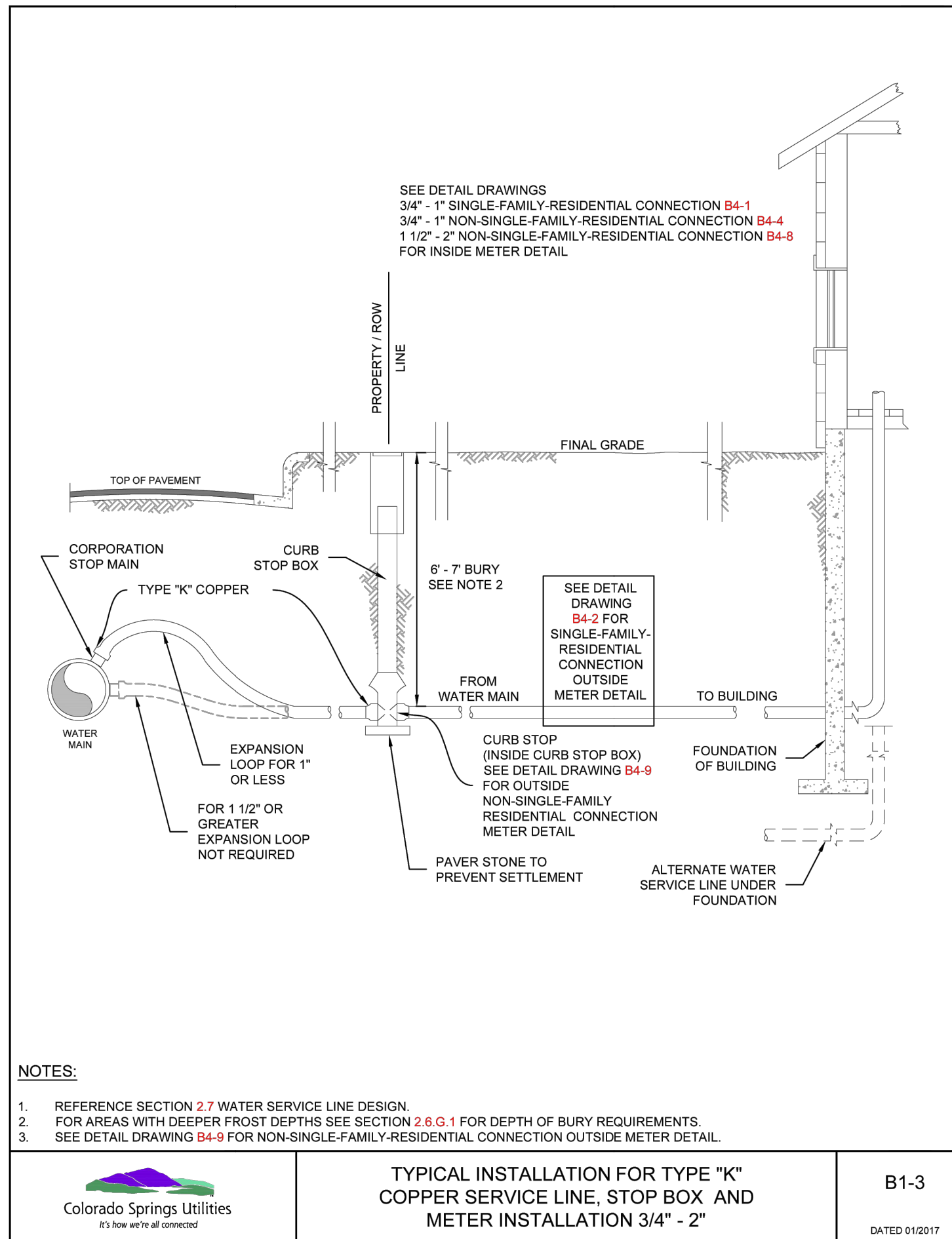
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CHECKED BY: N/A

DATE: 10/09/23

SHEET 8 OF 9

JOB NO. 25188.11





UNTIL SUCH TIME AS THESE DRAWINGS ARE APPROVED BY THE APPROPRIATE REVIEWING AGENCIES, JR ENGINEERING APPROVES THEIR USE. THESE DRAWINGS ARE DESIGNATED BY WRITTEN AUTHORIZATION.

PREPARED FOR  
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No.	REVISION	BY		DATE	
		BY	DATE	BY	DATE
N/A	N/A				
N/A	N/A				
10/09/23					
N/A	N/A				
N/A	N/A				

**STERLING RANCH FILING 4**

**WATER DETAILS**

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**ENGINEER'S STATEMENT**  
STANDARD DETAILS SHOWN WERE REVIEWED ONLY AS TO THEIR APPLICATION ON THIS PROJECT

*Mike Bramlett*  
MIKE A. BRAMLETT, P.E.  
COLORADO P.E. 32314  
FOR AND ON BEHALF OF JR ENGINEERING, A LOCAL ENGINEERING FIRM

DATE: 10/10/23

SHEET 9 OF 9  
JOB NO. 25188.11