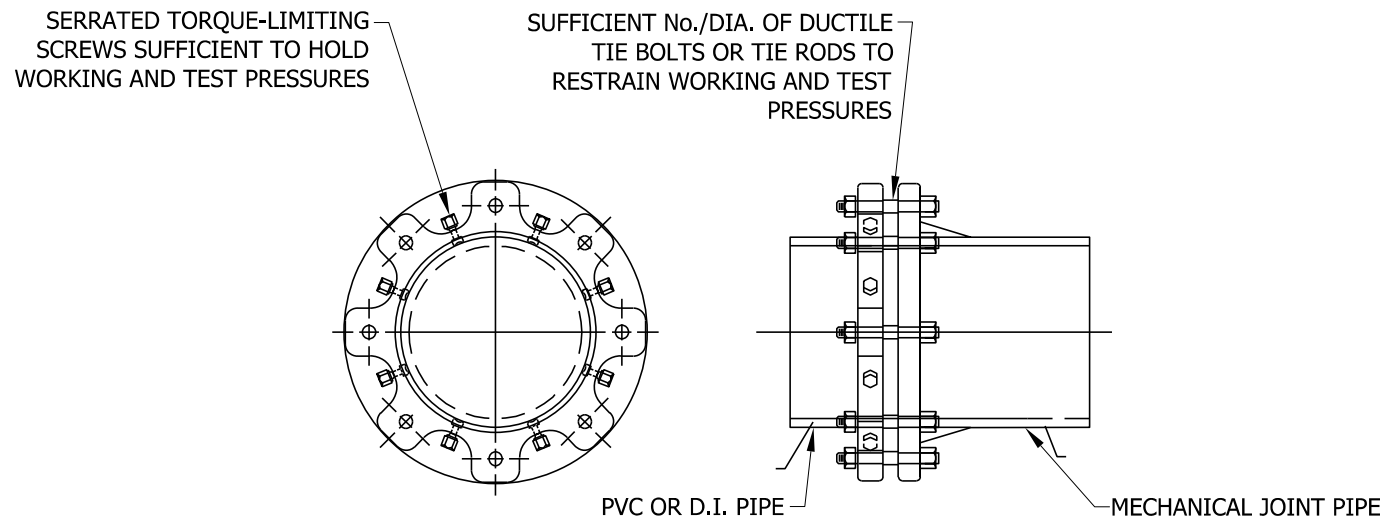


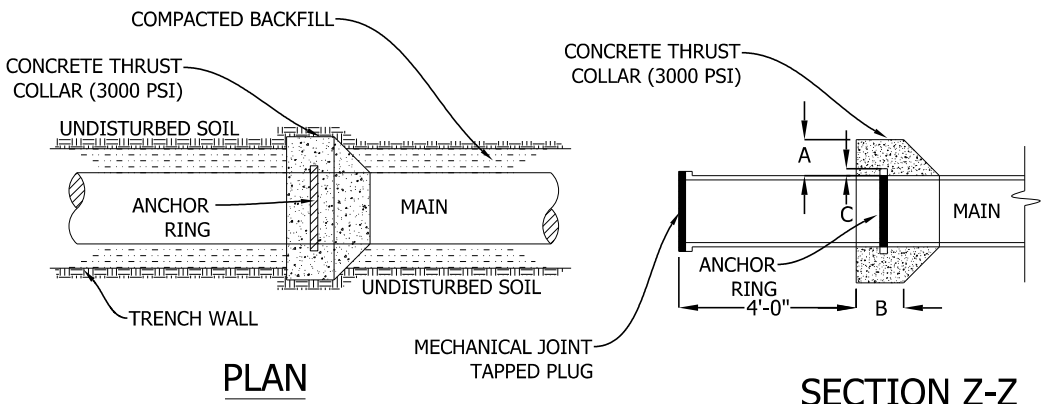
5/14/99



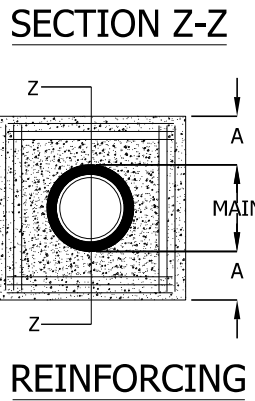
RESTRAINED JOINTS ON MECHANICAL JOINT PIPE & FITTINGS

| MINIMUM FOOTAGE OF RESTRAINED PIPE FOR VARIOUS DIAMETERS & DEGREES CAST & DUCTILE IRON ELBOWS | | | | | | | | |
|---|-----------------|-------|-----|-----|---------------------|-----------------|---------------|---------------------------|
| COVER DIA. MAIN | DEGREE OF ELBOW | | | | VERTICAL OFFSET 45° | | BRANCH OF TEE | REDUCER (LARGE SIDE ONLY) |
| | 11.25° | 22.5° | 45° | 90° | UPPER BEND (3') | LOWER BEND (3') | | |
| | 3' | 3' | 3' | 3' | 3' | 3' | | |
| 6" | 2' | 5' | 10' | 25' | 15' | 10' | 15' | 20' |
| 8" | 4' | 6' | 14' | 33' | 25' | 15' | 30' | 40' |
| 10" | 5' | 8' | 18' | 42' | 27' | 18' | 40' | 40' |
| 12" | 5' | 10' | 20' | 50' | 30' | 20' | 55' | 45' |
| 16" | 7' | 13' | 28' | 67' | 45' | 30' | 80' | 45' |
| 20" | 8' | 17' | 35' | 84' | 55' | 35' | 105' | 45' |

RESTRAINED JOINT DETAIL

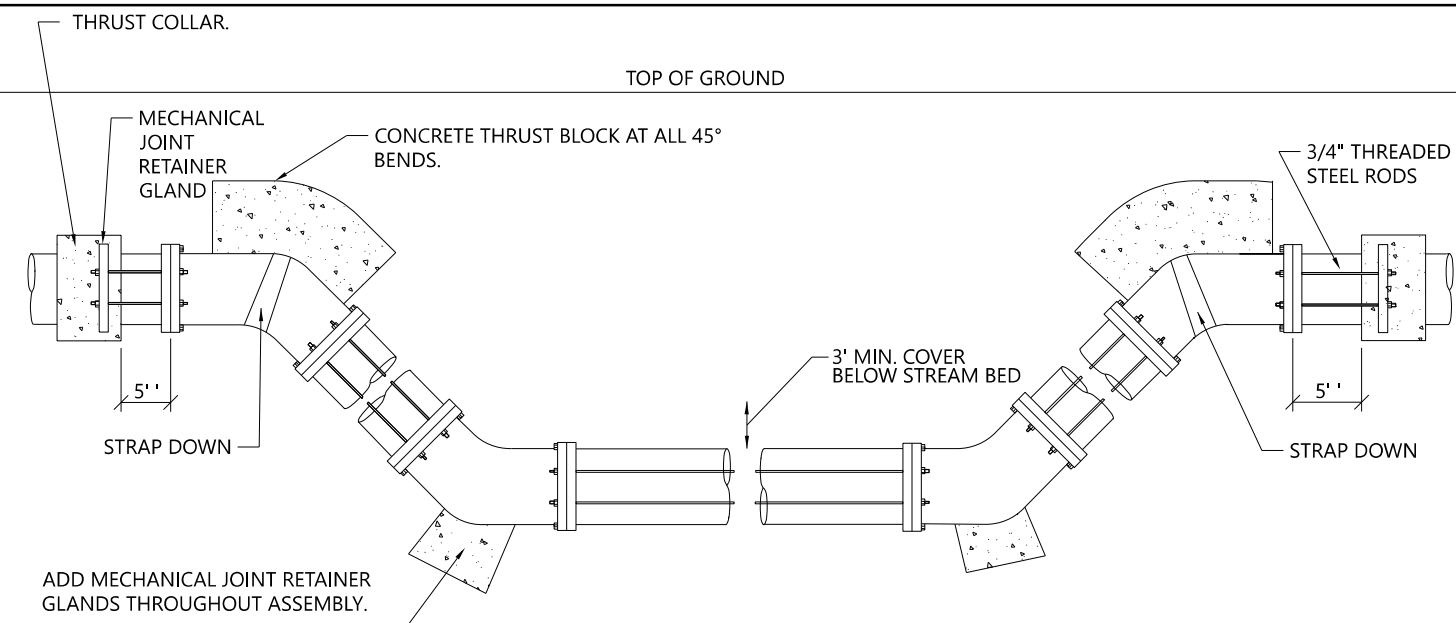


| PIPE DIAMETER | CONCRETE THRUST COLLAR | | ANCHOR RING | RINGS REQUIRED |
|------------------|---------------------------|-------|----------------|-------------------|
| | A | B | C | |
| 6" - 12" | 1'-0" | 1'-0" | 2" | ONE |
| 16" | 1'-4" | 1'-0" | 2" | ONE |
| 20" | 1'-4" | 1'-0" | 3" | ONE |
| 24" | 1'-4" | 1'-0" | 3" | TWO |
| 30" | 1'-4" | 1'-2" | 4" | TWO |
| 36" | 1'-4" | 1'-4" | 4" | TWO |



NOTE:
6" TO 16" MAINS--12 NO. 7 BARS
20" TO 36" MAINS--12 NO. 8 BARS
* BARS PLACED AS SHOWN

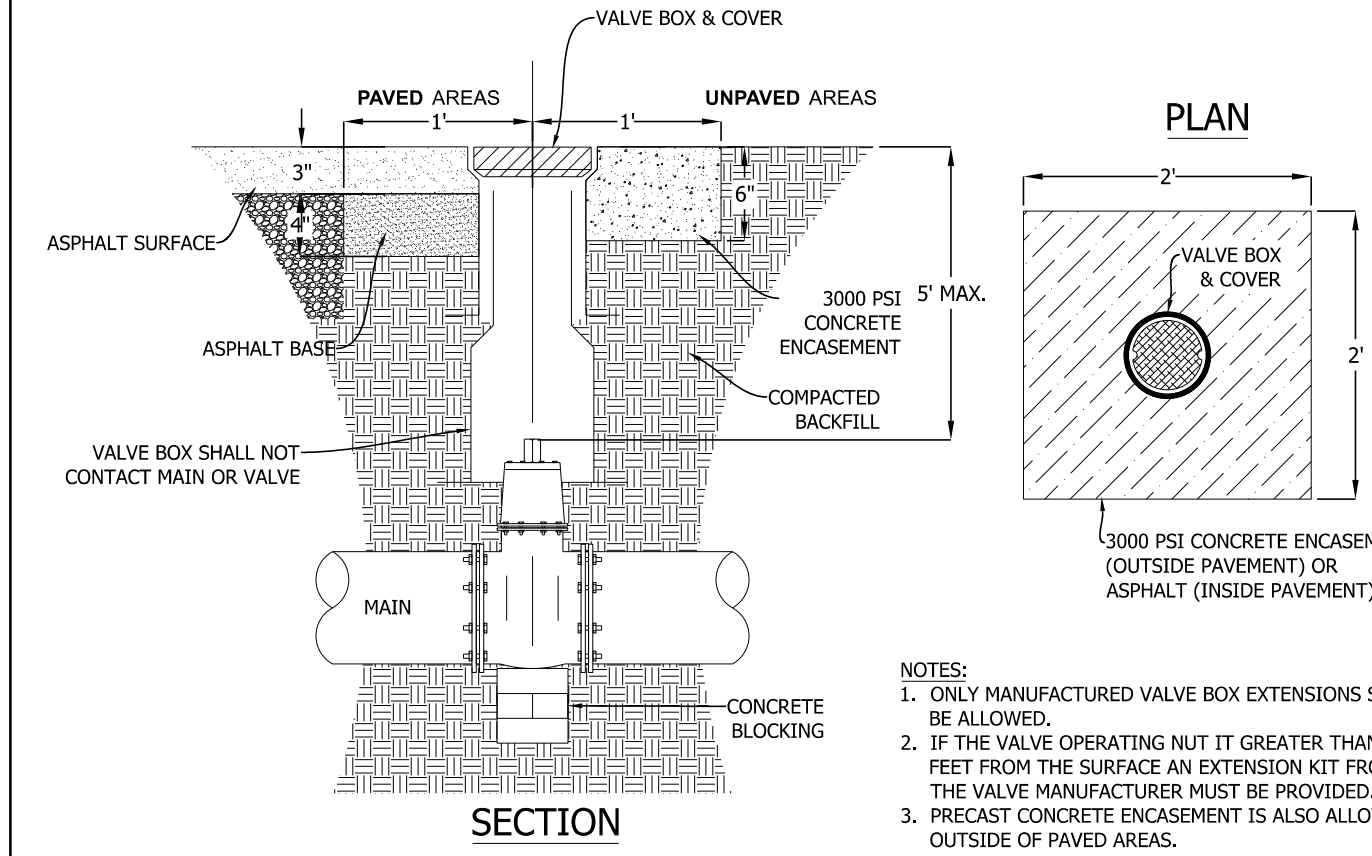
THRUST COLLAR INSTALLATION



| ROD REQUIREMENTS | | |
|------------------|-------------------------|----------------------|
| SIZE OF 45 BEND | STATIC THRUST IN POUNDS | NO. OF RODS REQUIRED |
| 6" | 4,328 | 2 |
| 8" | 7,694 | 4 |
| 12" | 17,312 | 4 |
| 16" | 30,779 | 8 |
| 24" | 69,252 | 8 |

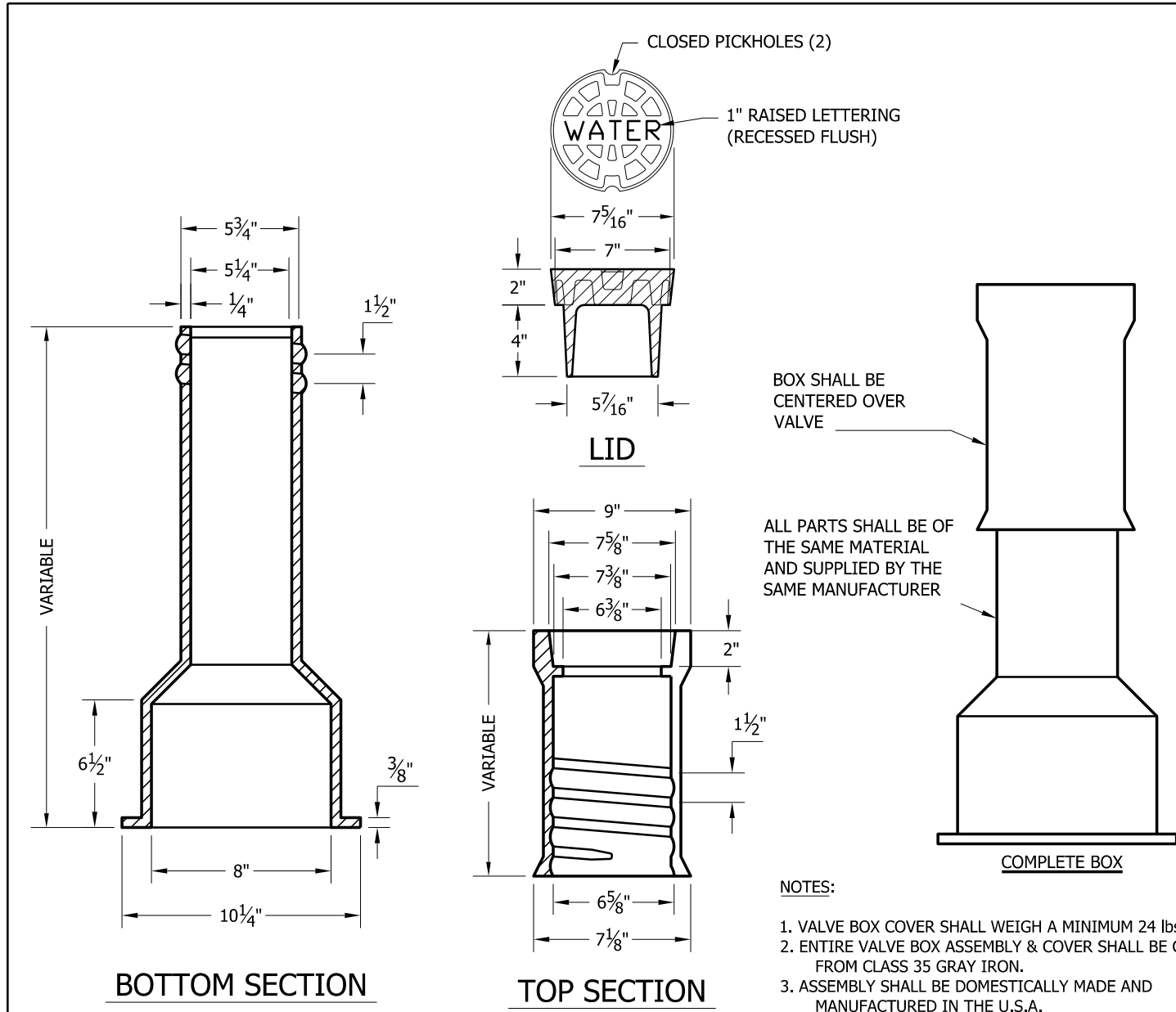
- GENERAL NOTES:
1. STEEL RODS AND BOLTS SHALL BE 3/4" HOT DIPPED GALVANIZED.
2. CONCRETE SHALL NOT CONTACT BOLTS OR ENDS OF MECHANICAL JOINT BENDS.
3. RESTRAINED MECHANICAL GLANDS TO BE USED AT ALL FITTINGS.
4. MUST USE DUCTILE IRON EYE BOLTS WHERE NECESSARY.
5. 3" MINIMUM COVER MUST BE MAINTAINED ON ALL WATER MAINS

STANDARD VERTICAL BEND



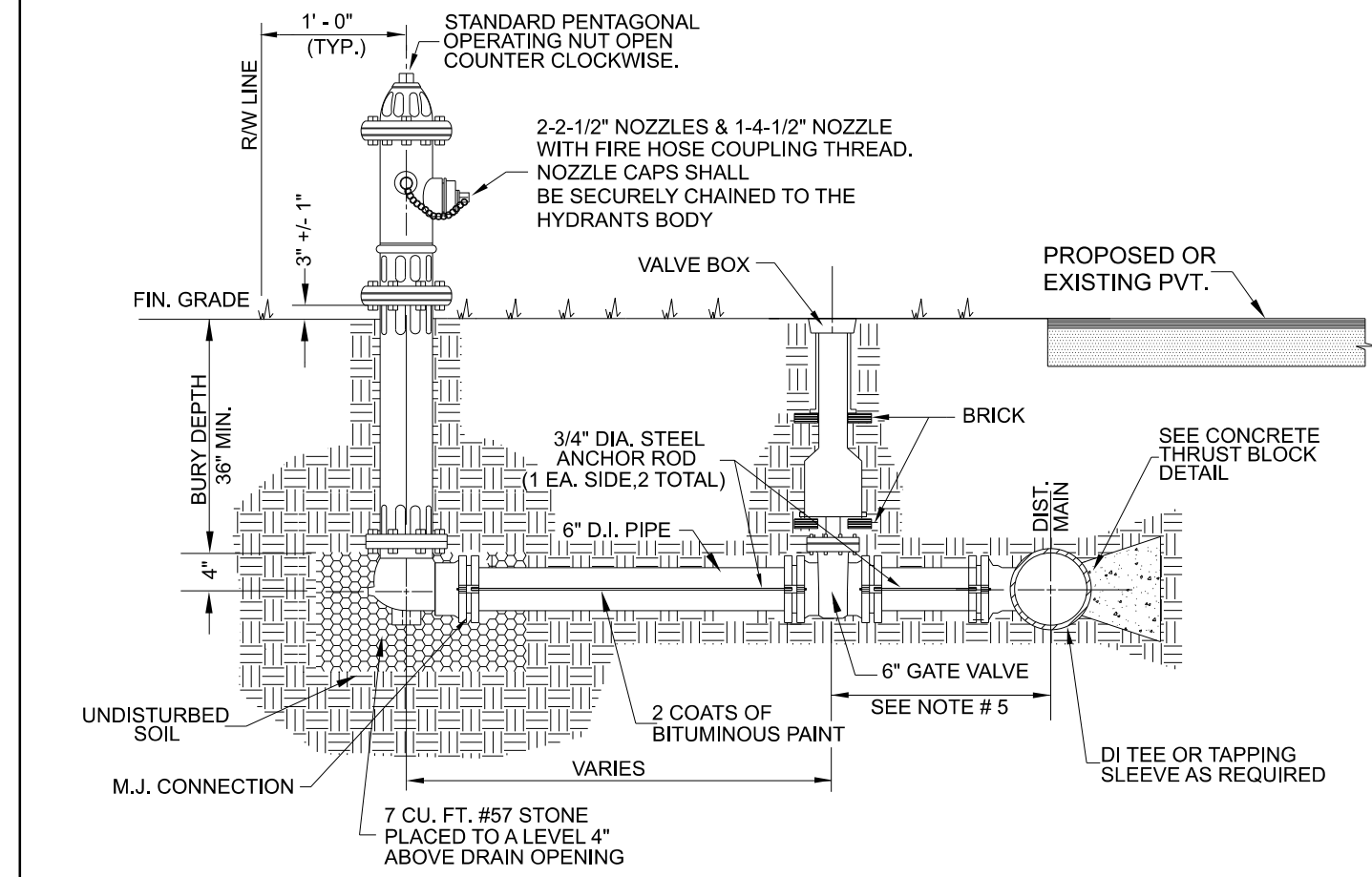
- NOTES:
1. ONLY MANUFACTURED VALVE BOX EXTENSIONS SHALL BE ALLOWED.
2. IF THE VALVE OPERATING NUT IS GREATER THAN 6 FEET FROM THE SURFACE AN EXTENSION KIT FROM THE VALVE MANUFACTURER MUST BE PROVIDED.
3. PRECAST CONCRETE ENCASEMENT IS ALSO ALLOWED OUTSIDE OF PAVED AREAS.

VALVE BOX INSTALLATION




VALVE BOX INSTALLATION

- NOTES:
1. ALL VALVES AND HYDRANTS SHALL HAVE M.J. CONNECTIONS WITH IRON RETAINING GLAND M.J. RESTRAINT OR ANCHOR LUGS AND 3/4" DIA. STEEL ANCHOR RODS.
2. 3/4" DIA. STEEL RODS AND ALL BURIED SURFACES SHALL BE PAINTED WITH 2 COATS OF BITUMINOUS PAINT. MARKED OR SCRATCHED SURFACES SHALL BE REPAINTED. PAINT SHALL CURE PRIOR TO BACK FILLING TRENCH.
3. FIRE HYDRANTS SHALL BE PLACED AS DIRECTED BY THE ENGINEER.
4. HYDRANT BRANCH SHALL NOT BE BACK FILLED UNTIL INSPECTED AND APPROVED BY ENGINEER.
5. HYDRANT EXTENSIONS SHALL BE APPROVED BY ENGINEER.



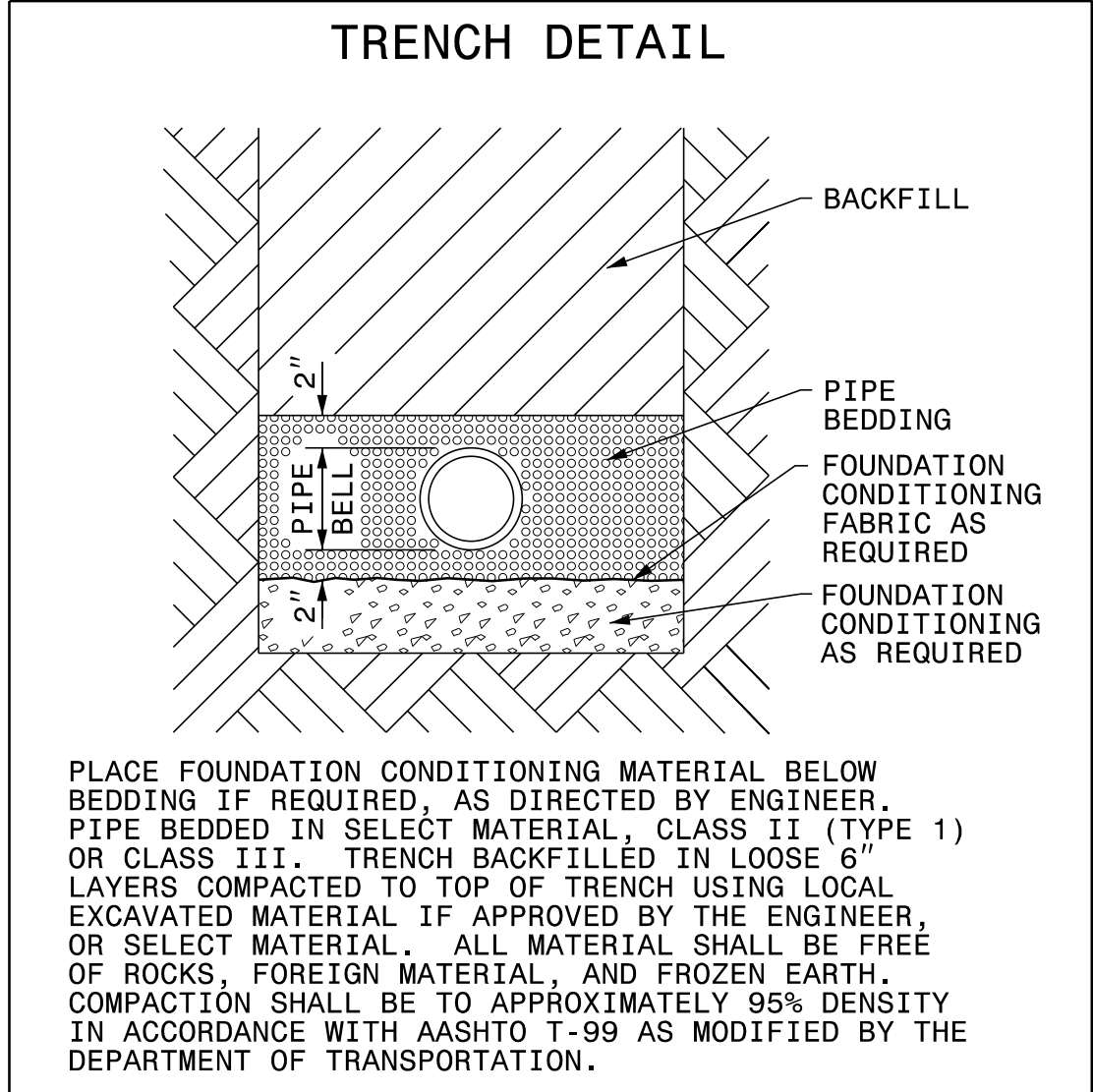
HYDRANT DETAIL

PROJECT DETAILS

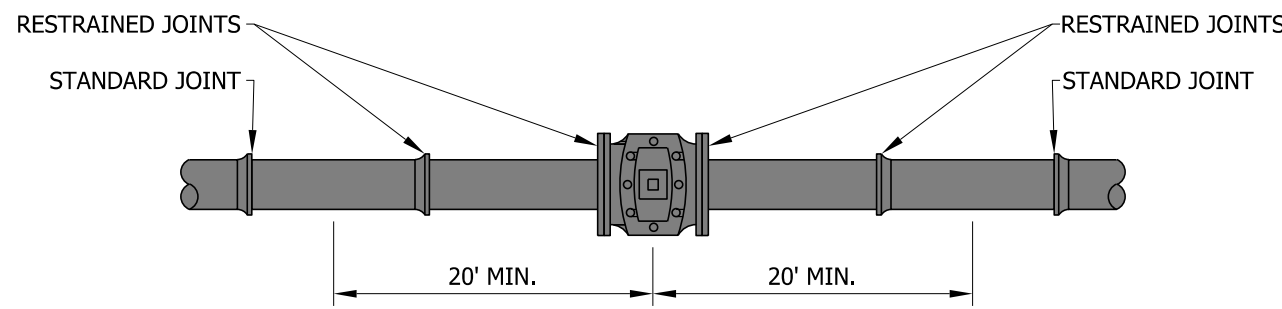
| PROJECT REFERENCE NO. | SHEET NO. |
|--|---|
| DF18314.2044188 | UC - 3A |
| DESIGNED BY: JMK | 2/27/2022 |
| DRAWN BY: JMK |  |
| CHECKED BY: BTB | |
| APPROVED BY: JMK | |
| REVISED: | |
| NORTH CAROLINA DEPARTMENT OF TRANSPORTATION | |
| UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151 | UTILITY CONSTRUCTION PLANS ONLY |

UTILITY CONSTRUCTION

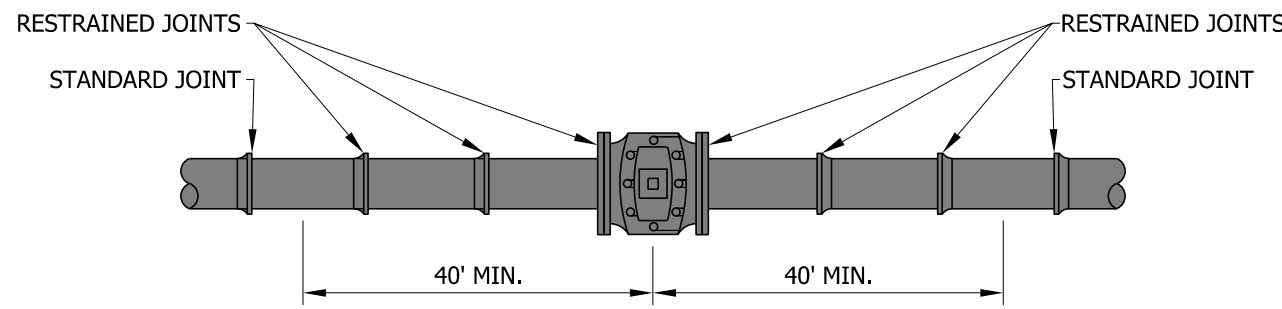
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



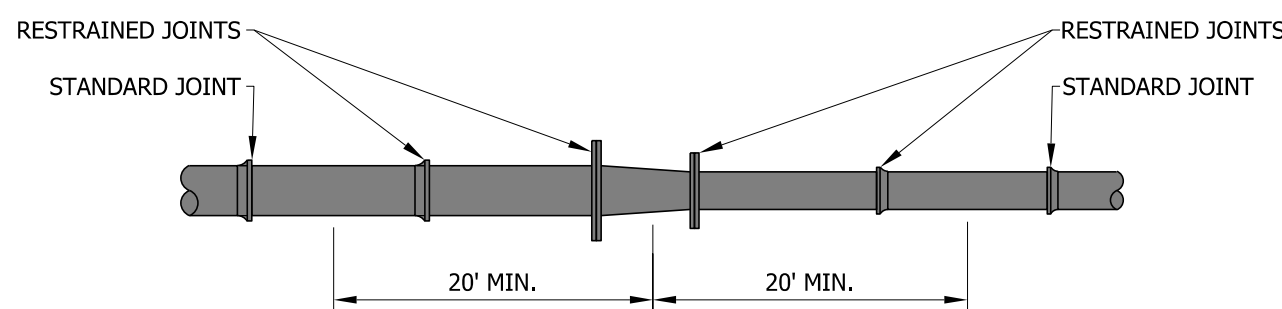
PLACE FOUNDATION CONDITIONING MATERIAL BELOW BEDDING IF REQUIRED, AS DIRECTED BY ENGINEER. PIPE BEDDED IN SELECT MATERIAL, CLASS II (TYPE 1) OR CLASS III. TRENCH BACKFILLED IN LOOSE 6" LAYERS COMPACTED TO TOP OF TRENCH USING LOCAL EXCAVATED MATERIAL IF APPROVED BY THE ENGINEER, OR SELECT MATERIAL. ALL MATERIAL SHALL BE FREE OF ROCKS, FOREIGN MATERIAL, AND FROZEN EARTH. COMPACTION SHALL BE TO APPROXIMATELY 95% DENSITY IN ACCORDANCE WITH AASHTO T-99 AS MODIFIED BY THE DEPARTMENT OF TRANSPORTATION.



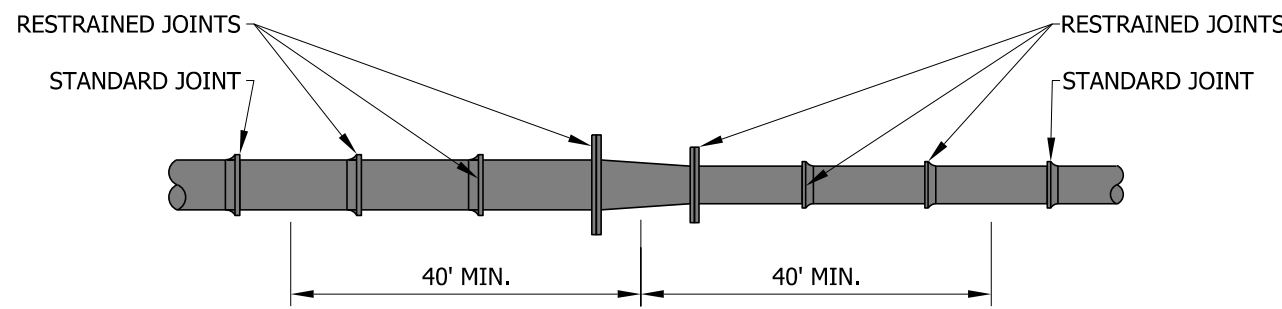
VALVES (NON-DEAD END) 8" AND SMALLER



VALVES (NON-DEAD END) 12" AND LARGER



REDUCERS - LARGER PIPE DIAMETER IS 8" OR SMALLER



REDUCERS - LARGER PIPE DIAMETER IS 12" OR LARGER

TYP. RESTRAINING FOR VALVES AND REDUCERS