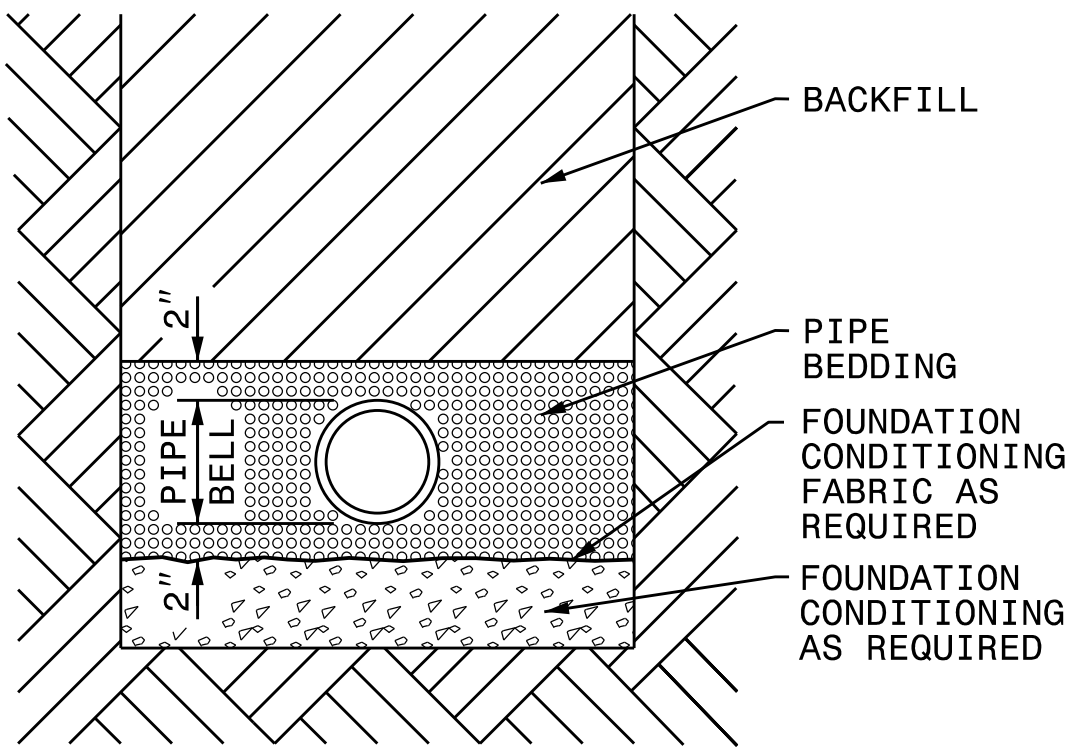


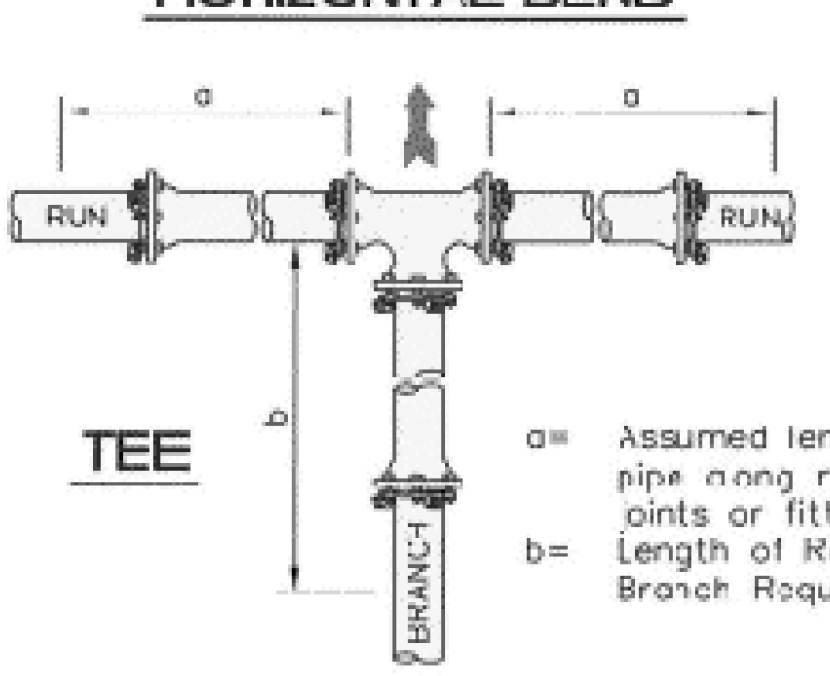
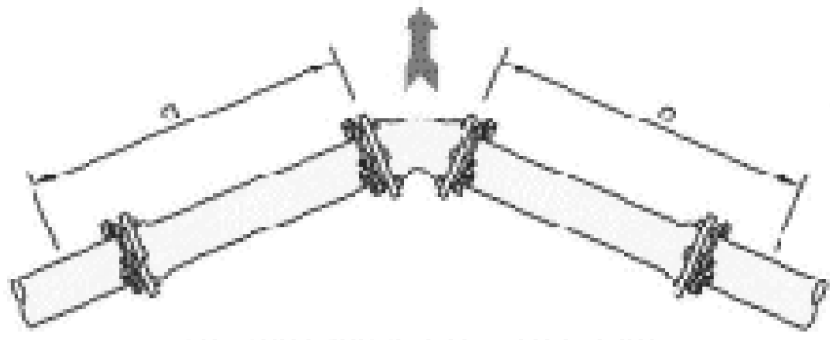
TRENCH DETAIL



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.

UTILITY NOTES HN-0033

| Minimum Restraint Length Chart (for Fittings) <small>See Note 4</small> |     |            |     |     |     |     |                 |         |         |     |         |                   |
|-------------------------------------------------------------------------|-----|------------|-----|-----|-----|-----|-----------------|---------|---------|-----|---------|-------------------|
| Nominal Size                                                            | Tee |            |     |     |     |     | Horizontal Bend |         |         |     | Reducer | Dead End          |
|                                                                         | a   | b (branch) |     |     |     |     | a               | a       |         |     | a       | a                 |
|                                                                         | 4"  | 6"         | 8"  | 12" | 16" | 24" |                 | 11 1/4" | 22 1/2" | 45" | 90"     | Smaller Line Size |
| 6"                                                                      | 9'  | 1'         | 13' | -   | -   | -   | 3'              | 5'      | 10'     | 25' | 4"      | 16'               |
| 8"                                                                      | 9'  | 1'         | 8'  | 23' | -   | -   | 3'              | 6'      | 13'     | 30' | 6"      | 17'               |
| 12"                                                                     | 9'  | 1'         | 1'  | 14' | 40' | -   | 5'              | 9'      | 18'     | 45' | 8"      | 31'               |
| 16"                                                                     | 9'  | 1'         | 1'  | 5'  | 34' | 58' | 6'              | 11'     | 23'     | 55' | 12"     | 33'               |
| 24"                                                                     | 9'  | 1'         | 1'  | 1'  | 20' | 48' | 8'              | 16'     | 33'     | 79' | 16"     | 60'               |



**Table Design Assumptions**

Restrained pipe: DIP

Soil Type: CL

Safety Factor: 1.5:1 (covers most installations)

Trench Bury: Pipe bedding in 4" of loose soil with backfill lightly consolidated to top of pipe.

Bury Depth: 3 ft.

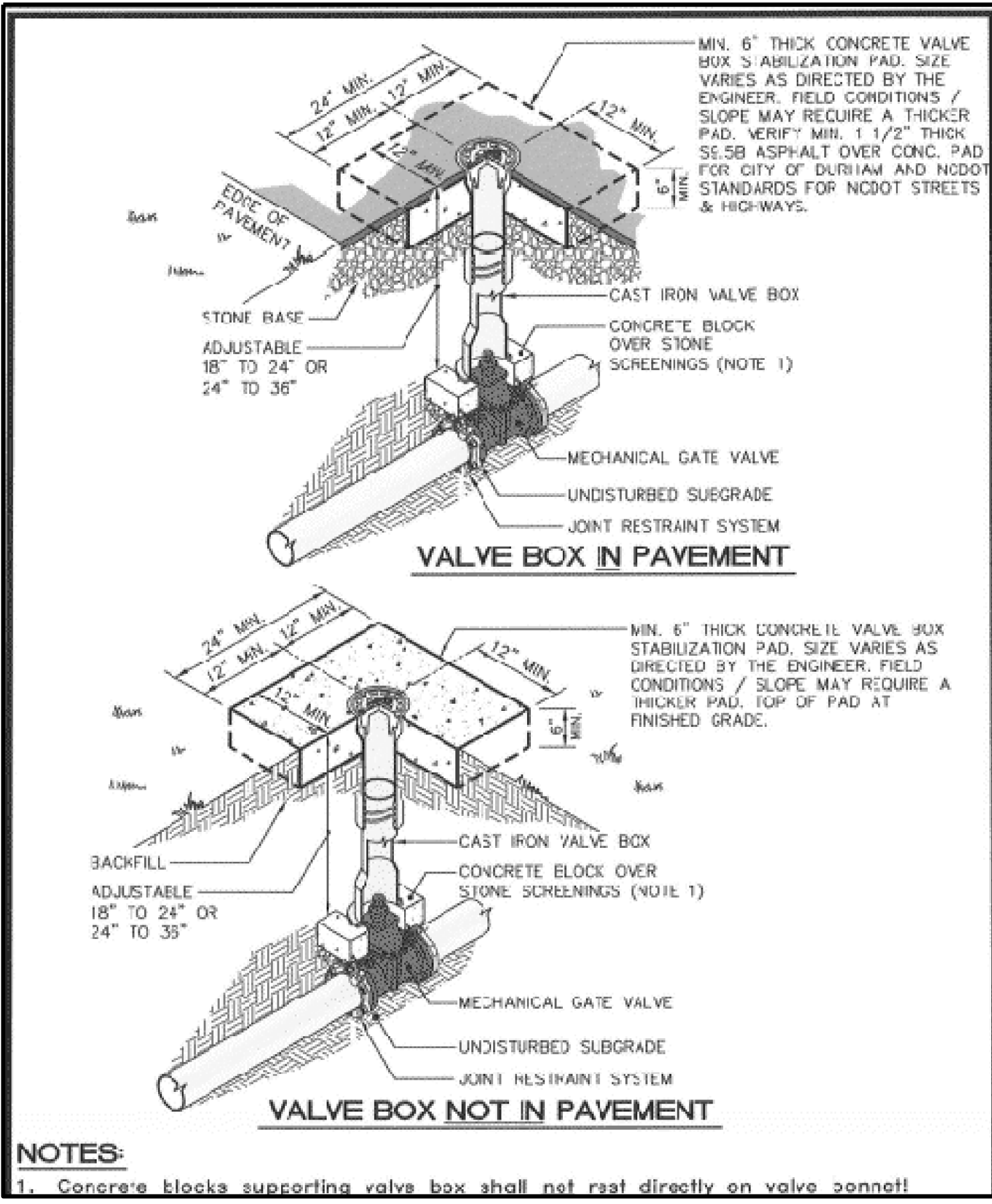
Test Pressure: 200 psi



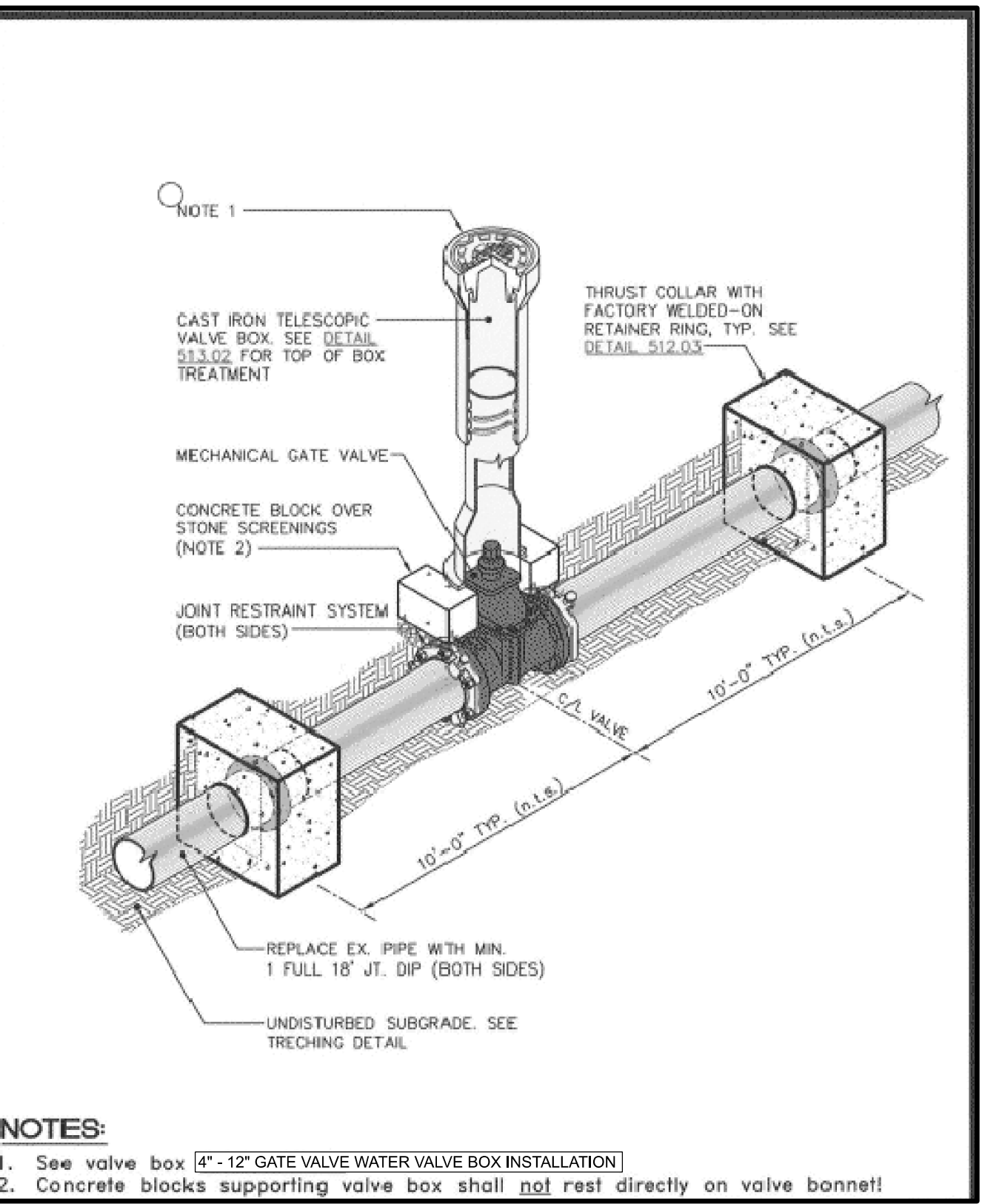
- NOTES:**
- If the length of the solid pipe on either side of the tee or the diameters on any leg of the tee varies, this table does not apply and the restraint length must be calculated.
  - If the diameter of the smaller pipe is anything other than what is shown, restraint length must be calculated.
  - If any of the assumptions vary from what is shown in the table, the restraint length must be calculated.
  - Minimum restraint length to be verified by the design engineer for each project.
  - Thrust restraint data shown in Table is based on DIPRA (Ductile Iron Pipe Research Association) guidelines.

FITTING RESTRAINT LENGTH CHART

| MAXIMUM TRENCH WIDTH AT TOP OF PIPE |                       |                            |                       |
|-------------------------------------|-----------------------|----------------------------|-----------------------|
| NOMINAL PIPE SIZE (INCHES)          | TRENCH WIDTH (INCHES) | NOMINAL PIPE SIZE (INCHES) | TRENCH WIDTH (INCHES) |
| 4                                   | 28                    | 20                         | 44                    |
| 6                                   | 30                    | 24                         | 48                    |
| 8                                   | 32                    | 30                         | 54                    |
| 10                                  | 34                    | 36                         | 60                    |
| 12                                  | 36                    | 42                         | 66                    |
| 14                                  | 38                    | 48                         | 72                    |
| 16                                  | 40                    | 54                         | 78                    |
| 18                                  | 42                    |                            |                       |



4" - 12" GATE VALVE WATER VALVE BOX INSTALLATION



FOR 4" - 12" GATE VALVE ASSEMBLY

HN-0033

UC-3A

UTILITY CONSTRUCTION PLANS ONLY

**PROFESSIONAL SEAL**

046226

DESIGNED BY: EW

DRAWN BY: EW

CHECKED BY: JP

APPROVED BY:

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