
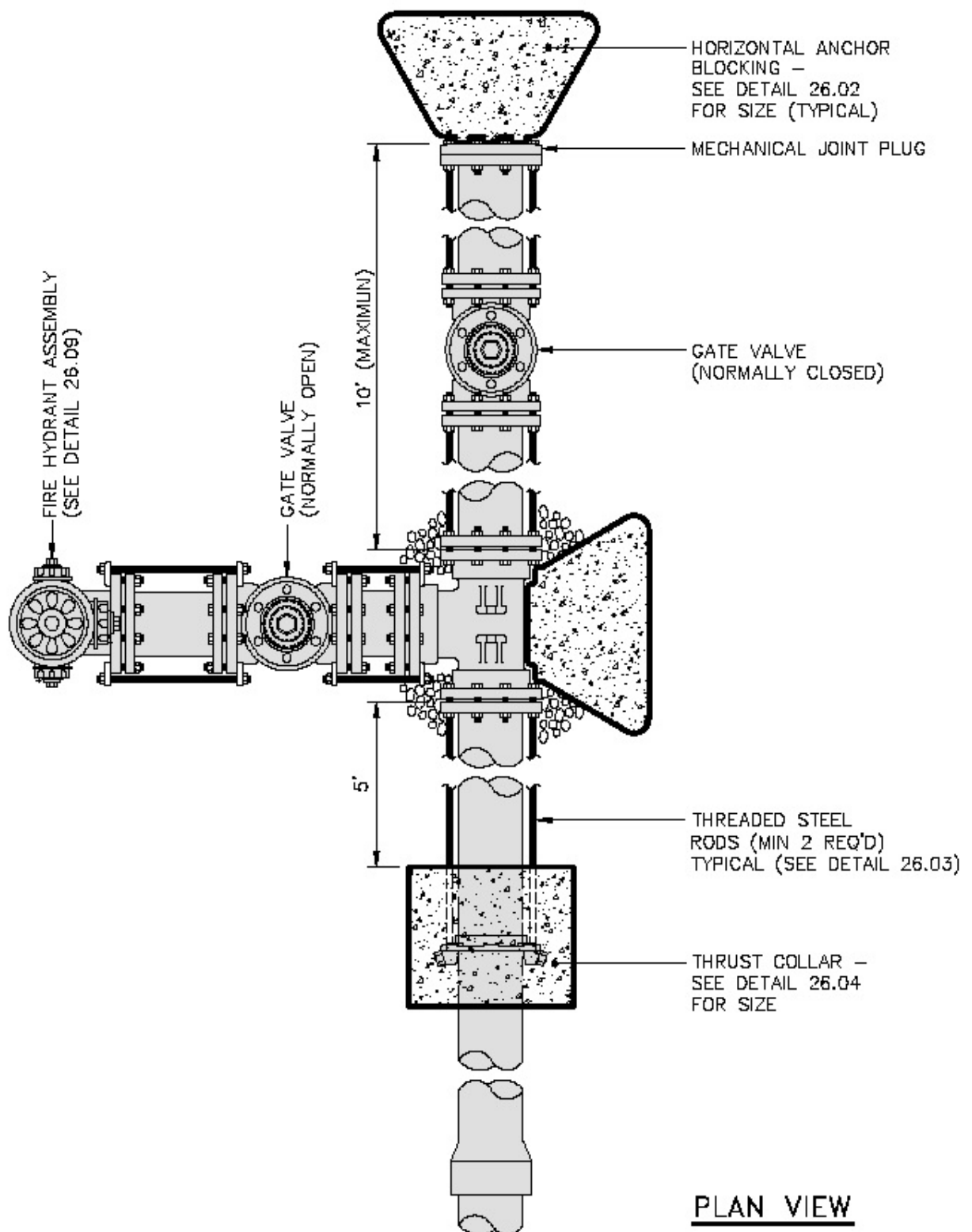



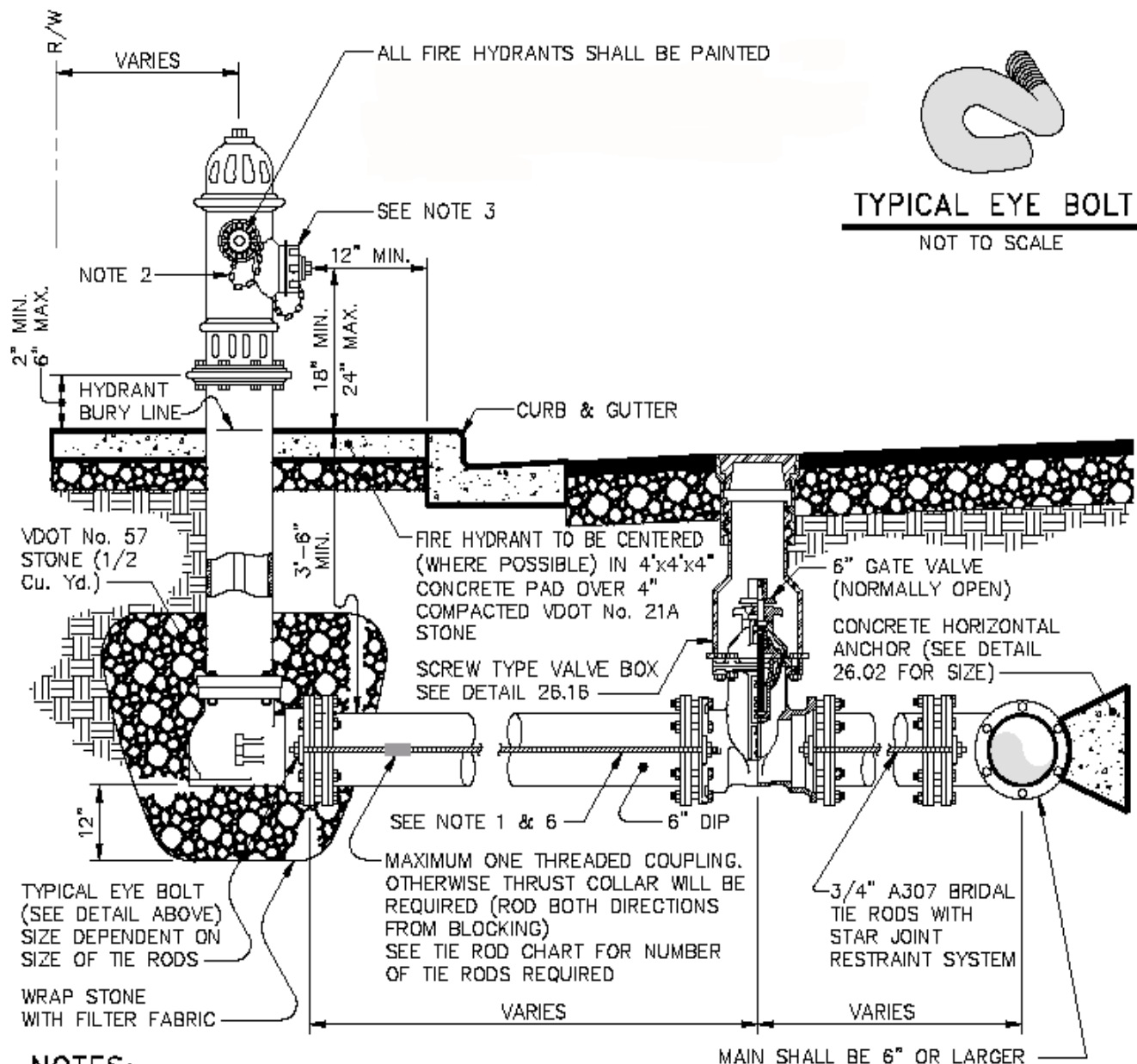
#### NOTES:

1. BEDDING SHALL BE REQUIRED FOR WATER LINES 16" IN DIAMETER AND LARGER OR IF ROCK IS ENCOUNTERED.
2. EXTRA DEPTH EXCAVATION SHALL BE PAID FOR AS ANYTHING BEYOND 4' OF COVER TO TOP OF PIPE.
3. ANY EXCAVATION BEYOND TRENCH LIMITS SHOWN ON DETAIL SHALL BE AT THE CONTRACTOR'S EXPENSE.

|   |                                 |                                  |
|---|---------------------------------|----------------------------------|
| Operations Division   | <b>WATER LINE TRENCH DETAIL</b> |                                  |
|  | Adopted : 01/13/2008            | Approved:                        |
|   | Revised:                        | Detail Number: <b>WATER - 01</b> |




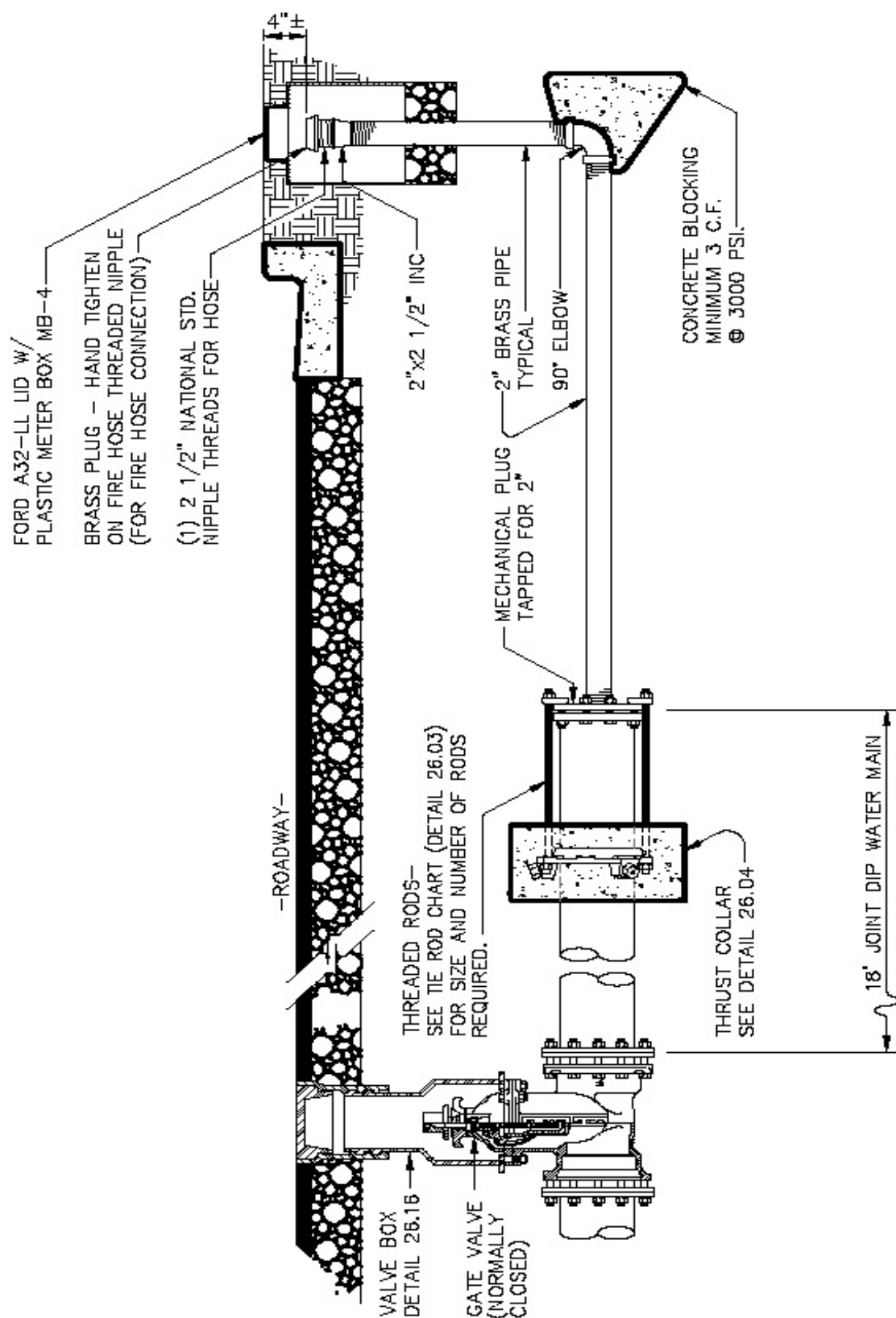
|   |  |                                  |
|---|--|----------------------------------|
| Operations Division   | <b>END OF LINE FOR FUTURE EXPANSION DETAIL</b> |                                  |
|  | Adopted : 01/13/2008                           | Approved:                        |
|   | Revised:                                       | Detail Number: <b>WATER - 10</b> |



### NOTES:

1. MEG-A-LUGS MAY BE SUBSTITUTED FOR TIE RODS UPON APPROVAL BY THE CITY ENGINEER.
2. CHAINS ON FIRE HYDRANTS TO BE REMOVED.
3. HYDRANTS TO BE PLACED WITH PUMPER NOZZLE FACING THE STREET OR AS OTHERWISE DIRECTED.
4. WHEN VALVE BOX IS PLACED OUTSIDE OF PAVEMENT, PROVIDE PRECAST SHOULDER SLAB. (DETAIL 26.18)
5. WHEN FIRE HYDRANTS ARE INSTALLED WHERE ROADWAY HAS A DRAINAGE DITCH AND NO CURB & GUTTER, MINIMUM COVER SHALL BE 24" FROM THE BOTTOM OF DITCH.
6. SEE TIE ROD CHART (DETAIL 26.03) FOR NUMBER OF RODS REQUIRED.
7. WHERE HYDRANT IS SET BEHIND GUARDRAIL, CENTERLINE OF PUMPER NOZZLE TO BE A MINIMUM OF 12" AND A MAXIMUM OF 18" ABOVE TOP OF GUARDRAIL.

|   |   |                                  |
|---|---|----------------------------------|
| Operations Division   | <b>TYPICAL FIRE HYDRANT CONNECTION DETAIL</b> |                                  |
| <br>Halifax County Service Authority | Adopted : 01/13/2008                          | Approved:                        |
|   | Revised:                                      | Detail Number: <b>WATER - 11</b> |



Operations Division

### BLOW-OFF ASSEMBLY DETAIL

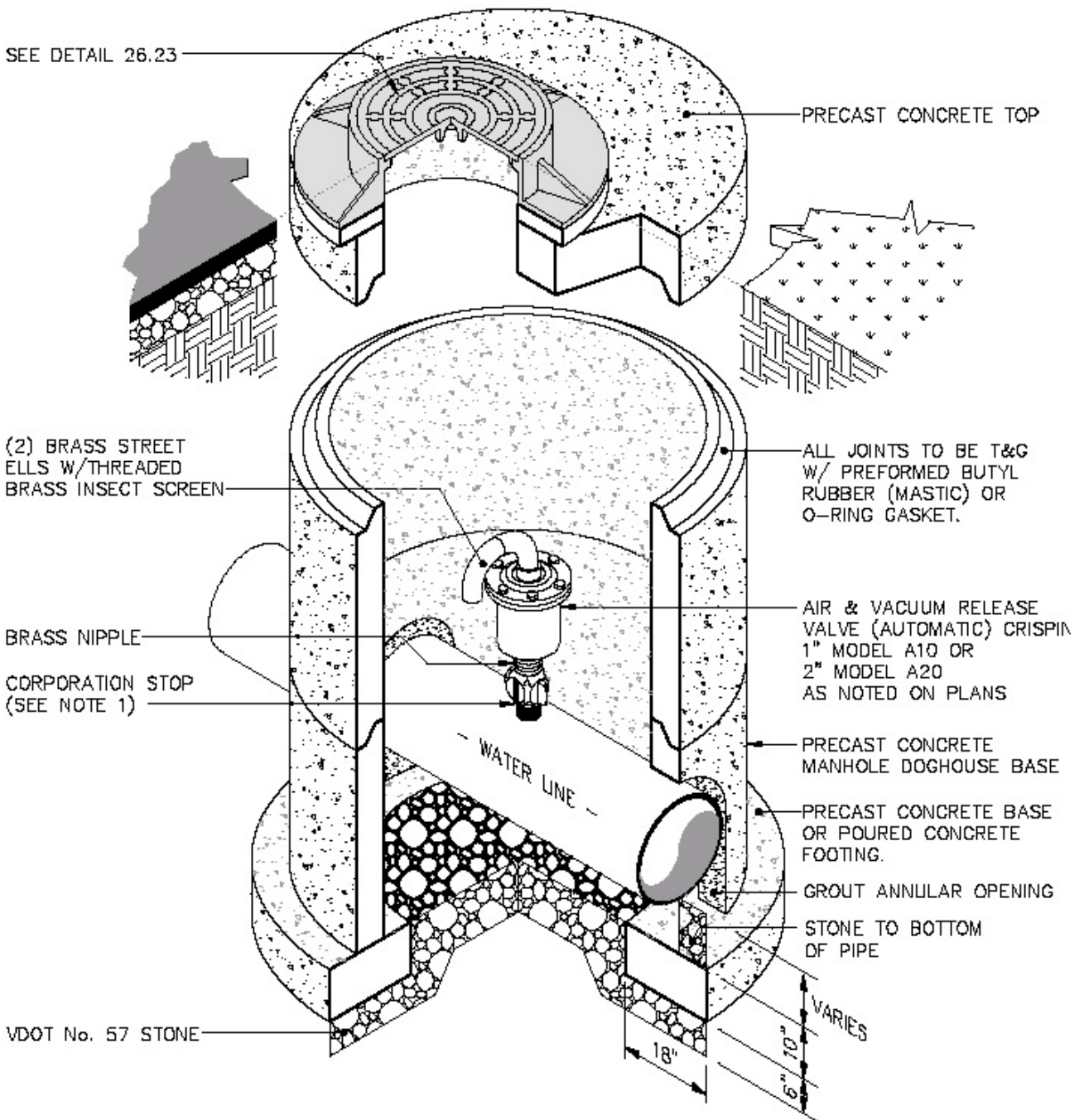


Adopted : 01/13/2008

Approved:


Revised:

Detail Number: **WATER - 12**



#### NOTES:

1. DO NOT EXCEED ALLOWABLE DIRECT TAP ALLOWED BY PIPE MANUFACTURER. OTHERWISE, USE DOUBLE STRAP SERVICE SADDLE FOR 2" AIR RELEASE.
2. CONE SECTION MAY BE SUBSTITUTED FOR FLAT TOP ACCORDING TO DEPTH.

|   |   |                                  |
|---|---|----------------------------------|
| Operations Division   | <b>AIR &amp; VACUUM RELIEF VALVE IN PRECAST MANHOLE</b> |                                  |
|  | Adopted : 01/13/2008                                    | Approved:                        |
|   | Revised:  | Detail Number: <b>WATER - 13</b> |

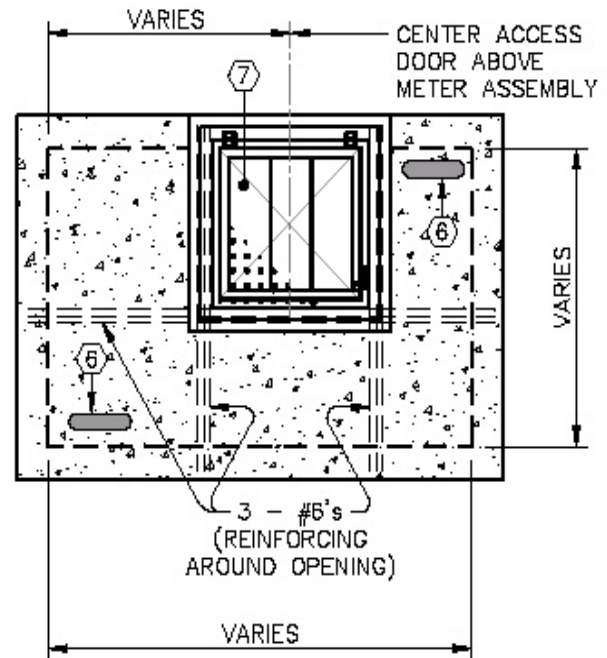


Detail Number: **WATER - 14**




## LEGEND

- ① TURBO METER ASSEMBLY AND BY-PASS METER. METER TO READ IN CUBIC FEET.
- ② DUCTILE IRON FLANGED ADAPTER (DRESSER #127 OR APPROVED EQUAL).
- ③ WALL SLEEVE WITH LINK SEAL OR APPROVED EQUAL.
- ④ ANCHOR BLOCKING - SEE STANDARD DETAIL 26.02.
- ⑤ TIE ROD ANCHORS - SEE STANDARD DETAIL 26.03.
- ⑥ 4" DIAMETER STEEL VENT PIPE WITH BRASS INSECT SCREEN OVER OUTSIDE END. (STYLE EITHER 180° BEND OR MUSHROOM) (2 REQUIRED)
- ⑦ 36" X 36" ALUMINUM ACCESS HATCH - BILCO MODEL "J-4AL" OR APPROVED EQUAL.
- ⑧ CONCRETE SUPPORTS
- ⑨ AWWA C-509 RESILIENT WEDGE GATE VALVE.
- ⑩ 2" TEST PLUG.

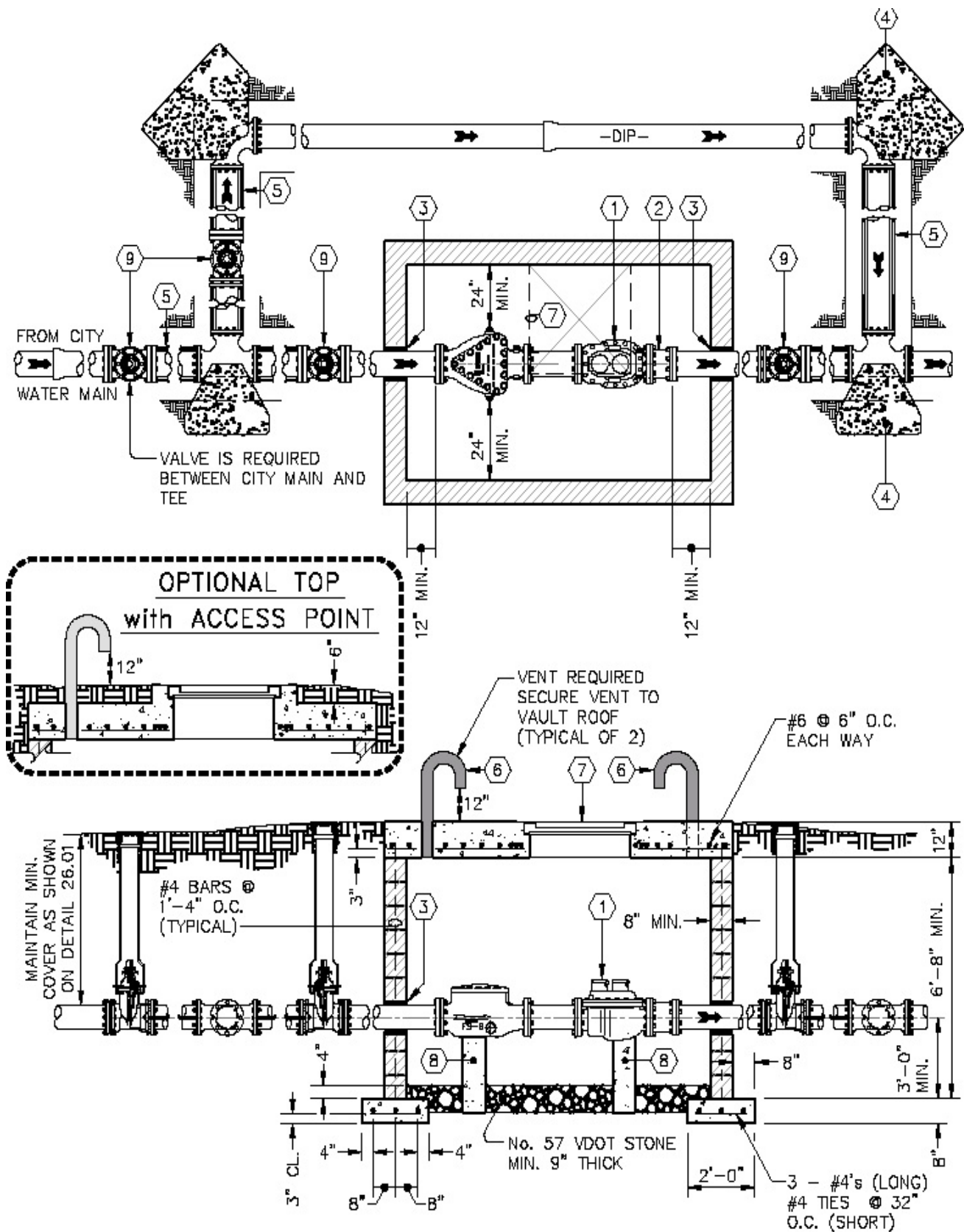


## NOTES:


1. THESE DRAWINGS ARE APPROVED STANDARDS FOR THE INSTALLATION OF LARGE WATER METERS AND THE CONSTRUCTION OF C.M.U. VAULTS. ANY DEVIATIONS FROM THESE STANDARDS SHALL BE REVIEWED AND APPROVED BY THE CITY ENGINEER. NOTE MINIMUM CLEARANCE DIMENSIONS.
2. ALL PIPE AND FITTINGS USED INSIDE THE VAULT SHALL BE FLANGED DUCTILE IRON.
3. CONCRETE FOR SUPPORTS AND ANCHORS SHALL BE 3000 P.S.I.
4. ALL NON-FLANGED FITTINGS SHALL BE TIED WITH THREADED ROD TO ADJACENT FITTINGS AS GENERALLY SHOWN ON THIS SHEET. MEGALUG OR APPROVED EQUAL MAY BE SUBSTITUTED FOR TIE RODS AT MECHANICAL JOINTS.
5. TURBO METER ASSEMBLY SHALL BE ADEQUATELY SUPPORTED BY TWO POURED CONCRETE SUPPORTS SET ON UNDISTURBED EARTH.
6. ALL DIMENSIONS SHALL BE VERIFIED BY CONTRACTOR.
7. WALL SLEEVES SHALL BE SUFFICIENT IN SIZE TO ACCOMMODATE PIPE AND PENETRATION SEAL. SEAL SHALL BE LINK SEAL OR APPROVED EQUAL.
8. VAULT IS NOT DESIGNED TO SUPPORT VEHICULAR TRAFFIC. IF VEHICULAR TRAFFIC MUST PASS OVER VAULT, THE VAULT SHALL BE DESIGNED FOR TRAFFIC LOADING BY A LICENSED ENGINEER.
9. WALLS ARE TO BE CONSTRUCTED OF CONCRETE MASONRY UNITS (C.M.U.) MEETING REQUIREMENTS OF ASTM C-139. MORTAR JOINTS ON INTERIOR TO BE FINISHED FLUSH AND MAY BE LEFT EXTRUDED ON EXTERIOR FACES TO BE UNDERGROUND. C.M.U. TO BE COMPLETELY FILLED WITH GROUT AFTER WALLS ARE COMPLETED AND ALL REINFORCING STEEL IS IN PLACE. GROUT SHALL CONSIST OF ONE PART PORTLAND CEMENT FOR 3 PARTS SAND, THOROUGHLY MIXED WITH WATER TO PRODUCE GROUT HAVING A THICK CREAMY CONSISTENCY.
10. THE CONTRACTOR MAY SUBSTITUTE A PRE CAST OR CAST-IN-PLACE VAULT. BASIC REQUIREMENTS WOULD BE THAT IT MEET THE MINIMUM DIMENSIONS AS SHOWN ON THE DRAWING.
11. DEFORMED REINFORCING BARS SHALL CONFORM TO ASTM A-615 GRADE 60. ALL REINFORCING BAR DIMENSIONS ON THIS DRAWING ARE TO CENTER OF BARS.
12. AS AN OPTION, THE FLOOR OF VAULT CAN BE POURED WITH 4" MIN. OF 3000 PSI CONCRETE WITH FLOOR DRAIN INSTALLED TO DAYLIGHT.
13. ONE ACCESS DOOR KEY SHALL BE SUBMITTED TO THE UTILITIES METER SUPERVISOR.

|   |                                 |                                  |
|---|---------------------------------|----------------------------------|
| Operations Division   | <b>TURBO METER VAULT DETAIL</b> |                                  |
|  | Adopted : 01/13/2008            | Approved:                        |
|   | Revised:                        | Detail Number: <b>WATER - 16</b> |





**Additional OS&Y Shut-off valves will be required to isolate the water meter.**

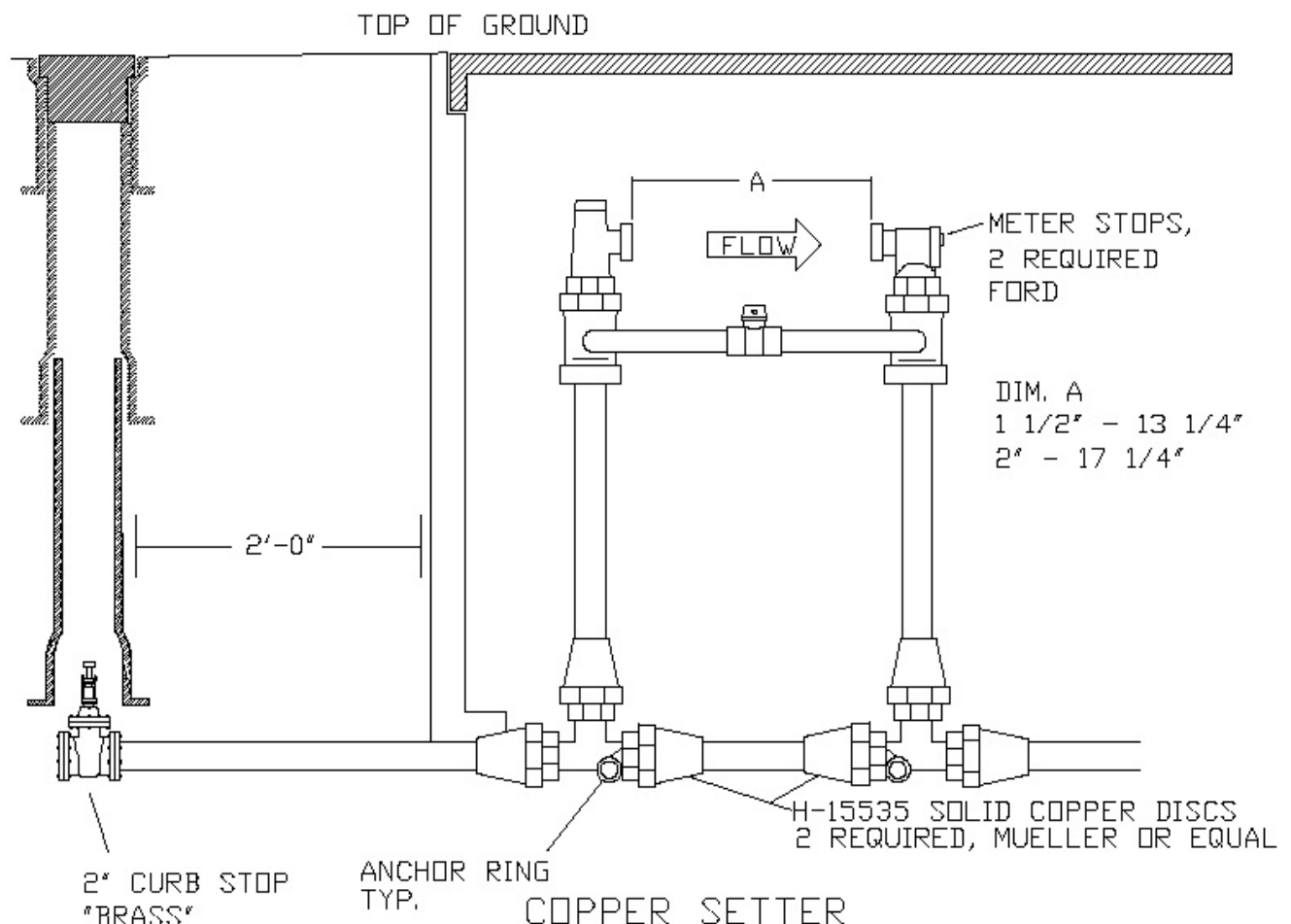
|   |                                    |                                  |
|---|------------------------------------|----------------------------------|
| Operations Division   | <b>COMPOUND METER VAULT DETAIL</b> |                                  |
|  | Adopted : 01/13/2008               | Approved:                        |
|   | Revised:                           | Detail Number: <b>WATER - 17</b> |




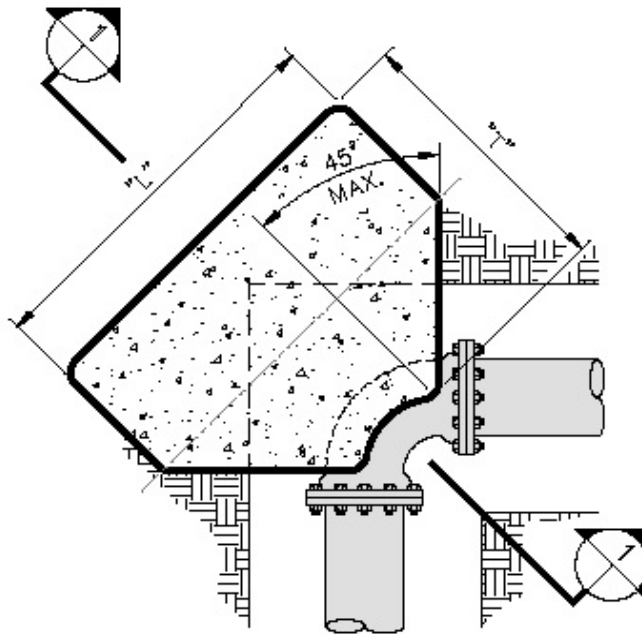
5. FOR STANDARD METER BOX SEE W-22

# NOTES:

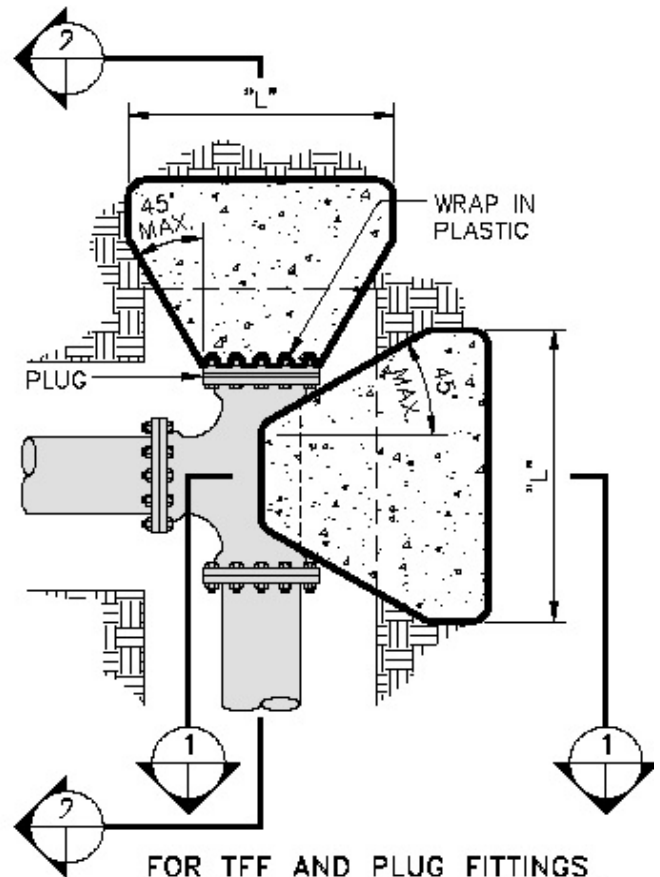
1. METER AS MANUFACTURED BY SENSUS OR SCHLUMBERGER.
2. TEES SHALL BE MALLEABLE BRASS, FLARED FITTINGS.
3. BACKFILL TAMPED IN 6" LIFTS.
4. 4" MIN. AND 12" MAX. VERTICAL CLEARANCE FROM TOP OF METER TO BOTTOM OF METER BOX COVER 4" OF 67 STONE IN BOTTOM OF METER BOX.
5. FOR 1 1/2" AND 2" WATER METER BOX INSTALLATIONS, USE CB-SO-4 FRAME AND COVER.
6. OPENING SIZES: 1 1/2" TO HAVE 13 1/4" FLANGE, 2" SERVICE TO HAVE 17 1/4" FLANGE.
7. COMPARABLE YOKES WITH HIGH RISE BYPASS AS MANUFACTURED BY FORD, MUELLER, AND A.Y. MCDONALD MUST BE USED.
8. METER BOX FOR 1 1/2" AND 2" METER TO BE CBS05 FRAME AND LID.



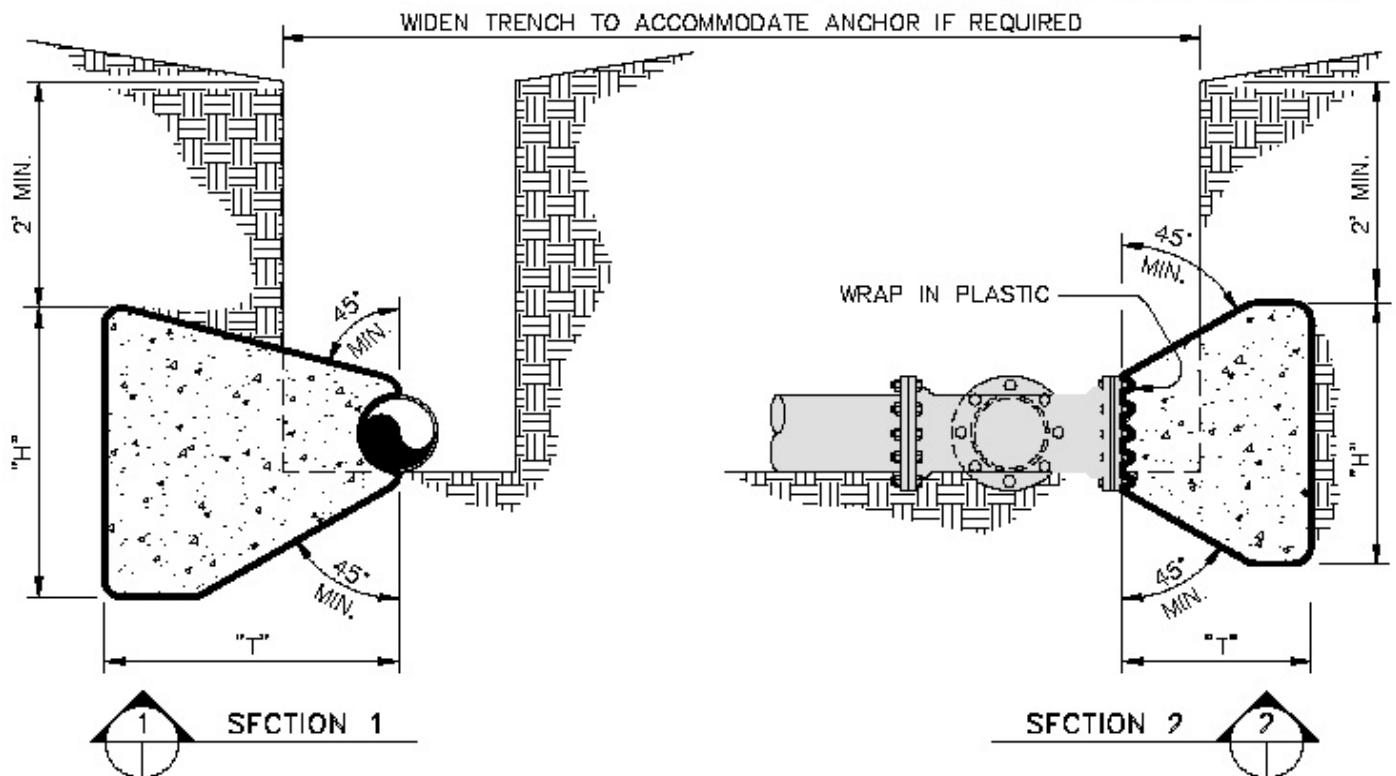
|   |   |                                  |
|---|---|----------------------------------|
| Operations Division   | <b>1 1/2" THRU 2" WATER SERVICE INSTALLATION DETAIL</b> |                                  |
|  | Adopted : 01/13/2008                                    | Approved:                        |
|   | Revised:  | Detail Number: <b>WATER - 19</b> |



FOR ALL BENDS



FOR TFF AND PLUG FITTINGS



SECTION 1

SECTION 2

Operations Division

**TYPE "F" HORIZONTAL BLOCKING ANCHOR DETAIL**



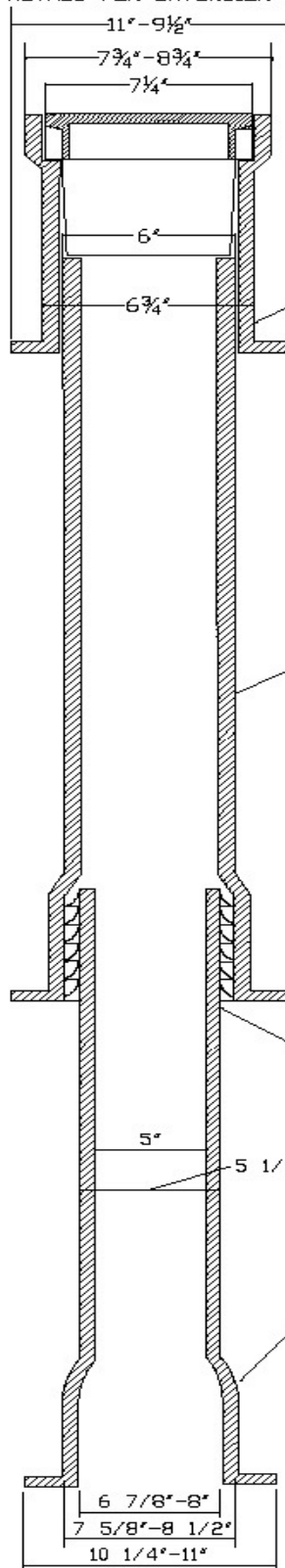
Adopted : 01/13/2008

Approved:

Revised:

Detail Number: **WATER - 02**

APPROVED METHOD FOR EXTENSION OF VALVE BOX



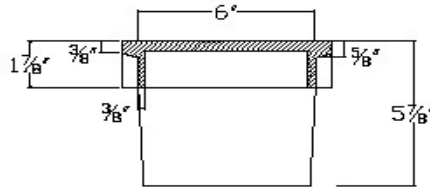
STANDARD VALVE BOX  
TOP SECTION TO BE  
80 LBS. HEAVY WEIGHT

USE 5" DUCTILE IRON  
PIPE FOR EXTENSIONS

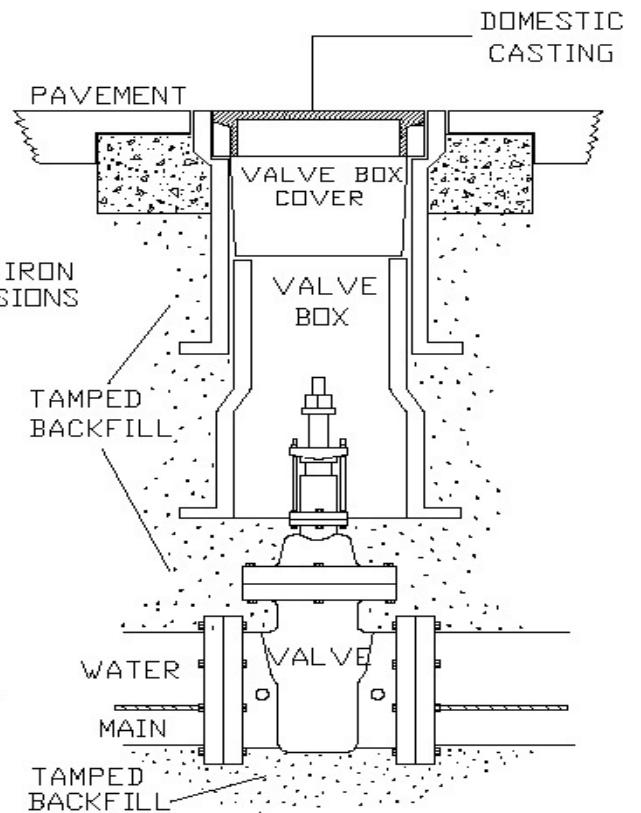
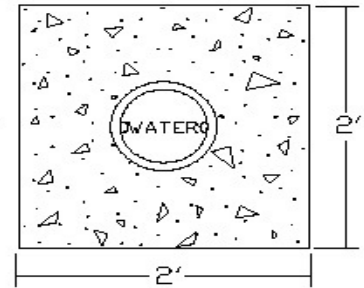
STAB-IN C.I. OR  
D.I. PIPE GASKET

STANDARD VALVE BOX  
BOTTOM SECTION

COVER



NOTE: 2'x 2'x 6" CONCRETE  
PAD REQUIRED ON ALL VALVES.  
NO PRECAST CONCRETE DOUGHNUT ALLOWED.



NOTE: VALVE BOX NOT TO  
CONTACT WATER MAIN  
NOR VALVE.  
ALL TRAFFIC CASTINGS MUST  
BE CLASS 35 OR GREATER.

Operations Division

**VALVE BOX INSTALLATION AND EXTENSION DETAIL**



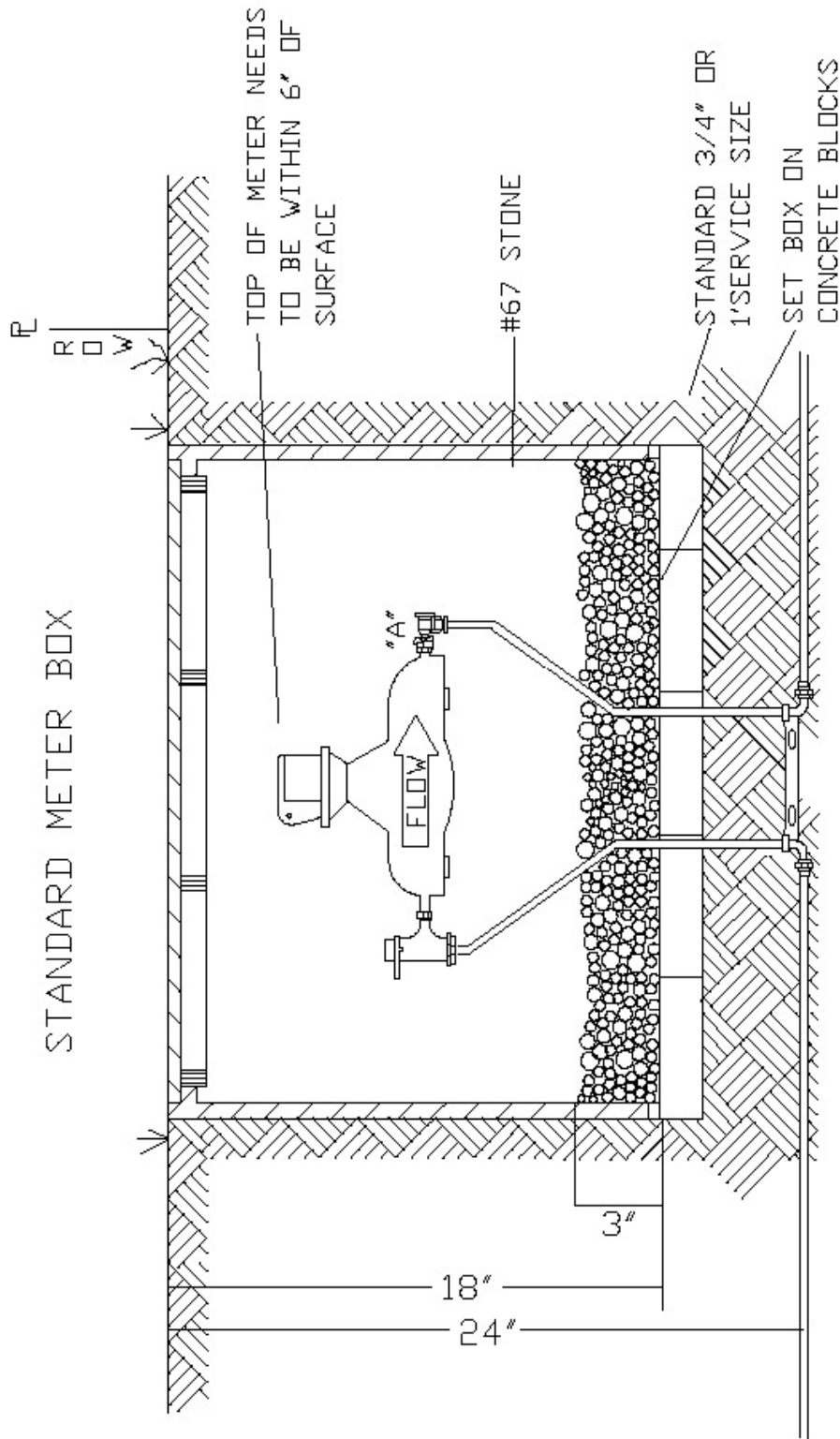
Adopted : 01/13/2008

Approved:

Revised:


Detail Number: **WATER - 20**

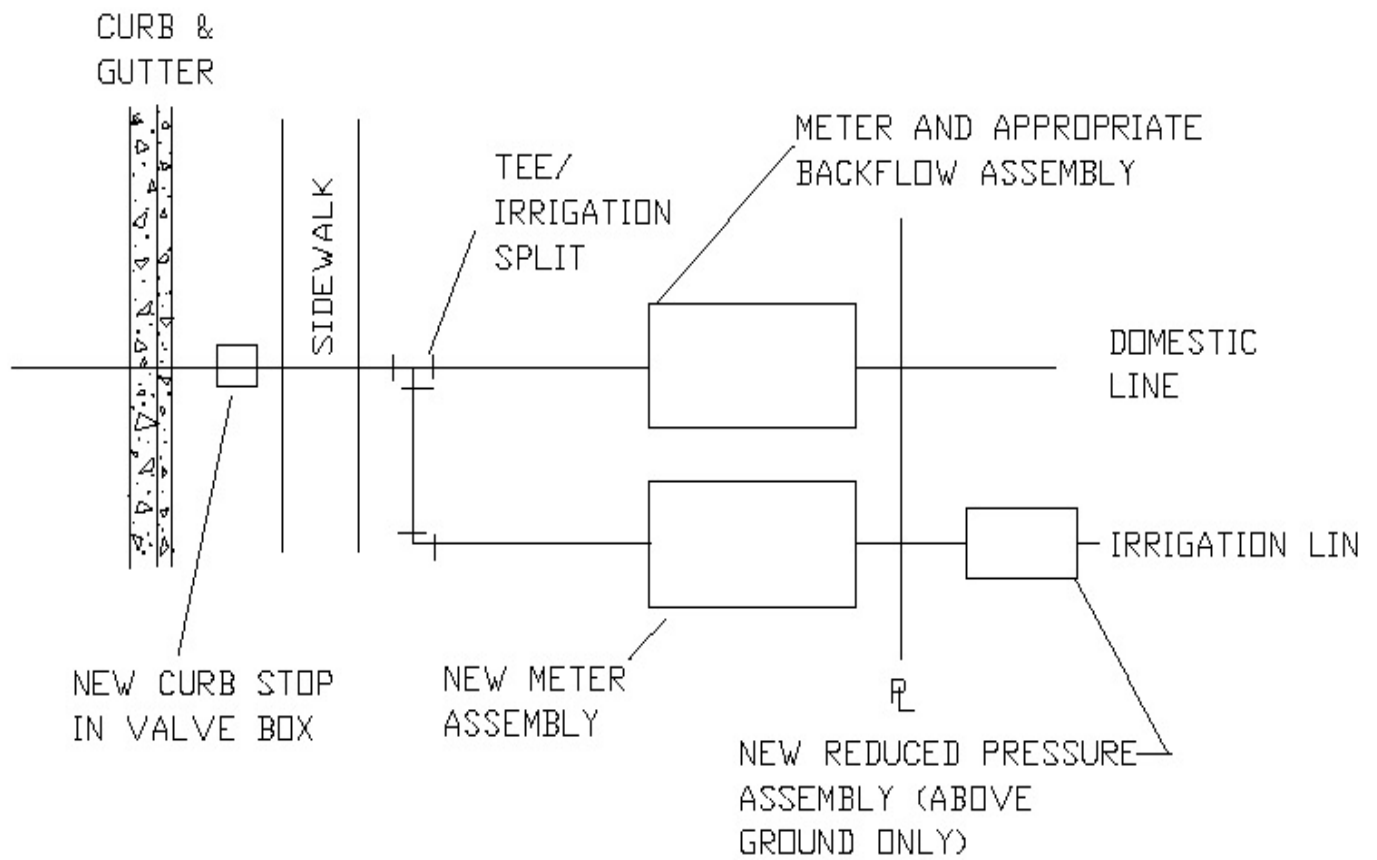





THE BACKFLOW PREVENTER LOCATION IS  
DEPENDENT ON THE TYPE DEVICE  
PROPOSED FOR USE AS FOLLOWS:

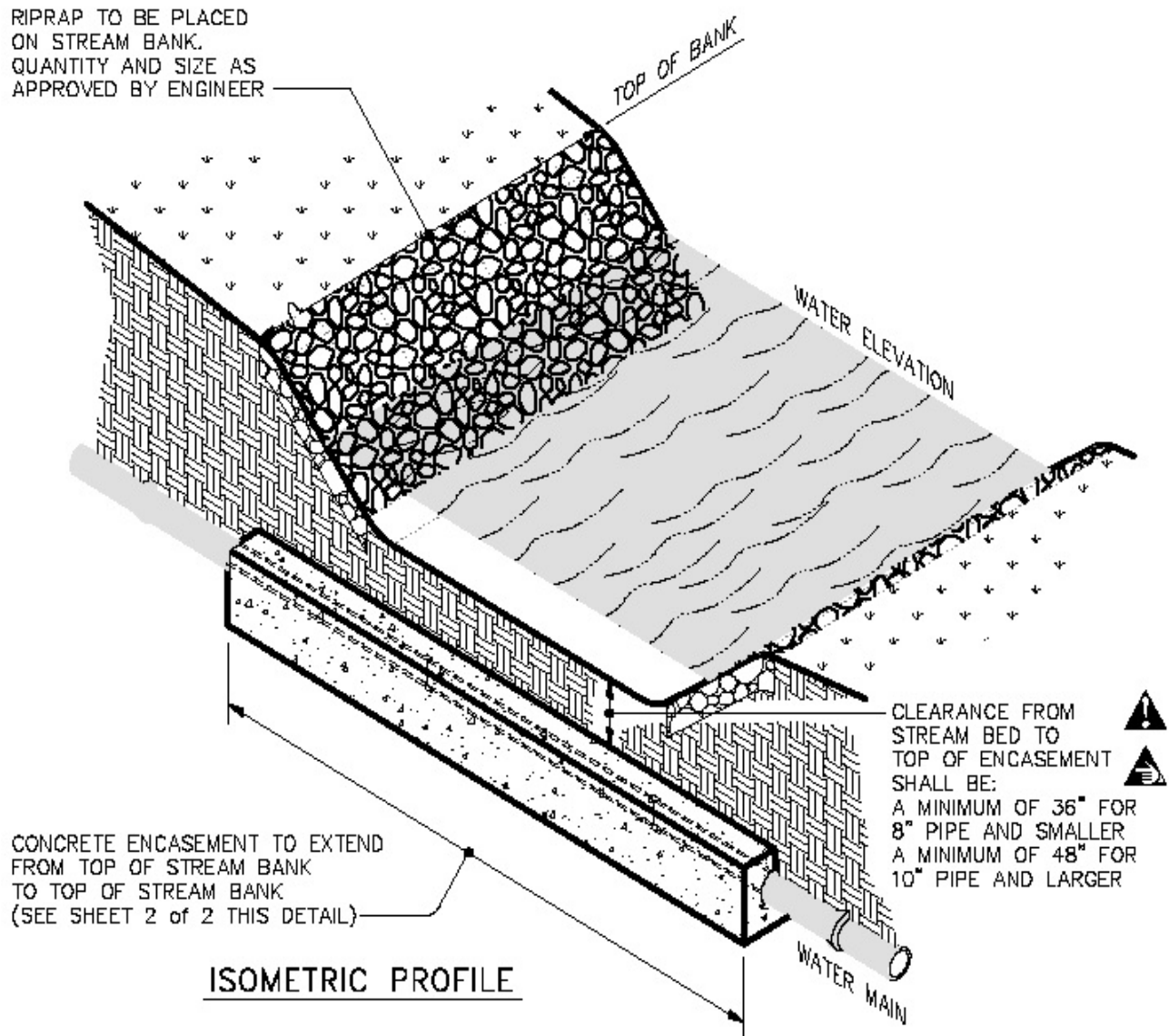
| LOCATION  | DEVICE   |
|---|--|
| "A"   | FORD ANGLE CHECK<br>(VHH-71-12W FOR 3/4")<br>(VHH-74-12W FOR 1") |
| NOTE:<br>MAY NEED ADDITIONAL BACKFLOW PREVENTION<br>DEVICES IF USED ON MORE THAN TWO RESIDENTIAL UNITS. |  |

|   |   |                                  |
|---|---|----------------------------------|
| Operations Division   | <b>RESIDENTIAL NEW CONSTRUCTION METER BOX</b> |                                  |
|  | Adopted : 01/13/2001                          | Approved:                        |
|   | Revised:                                      | Detail Number: <b>WATER - 21</b> |




|   |   |                                  |
|---|---|----------------------------------|
| Operations Division   | <b>IRRIGATION TAP EXISTING SERVICE DETAIL</b> |                                  |
|  | Adopted : 01/13/2008                          | Approved:                        |
|   | Revised:                                      | Detail Number: <b>WATER - 22</b> |

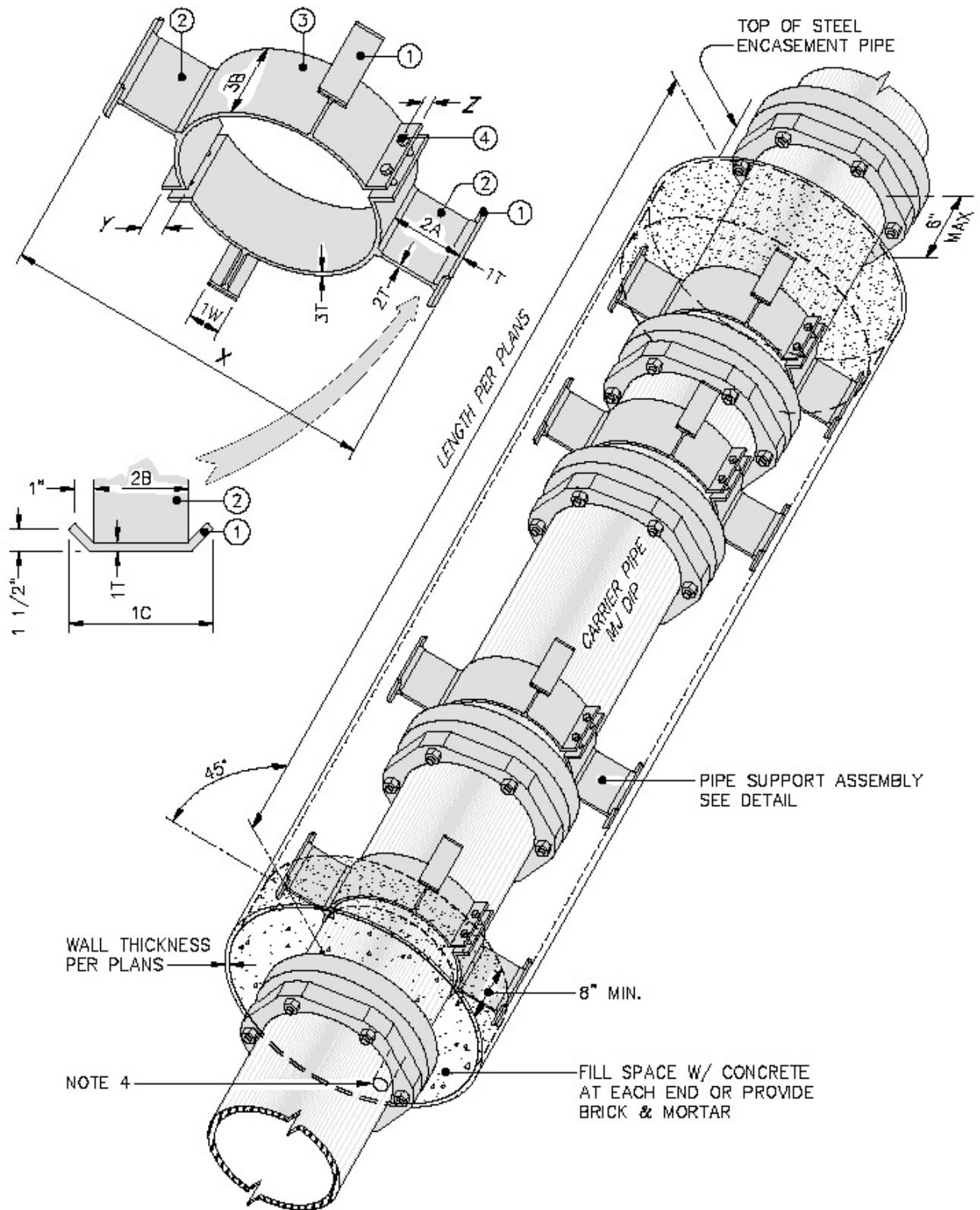
RIPRAP TO BE PLACED  
ON STREAM BANK.  
QUANTITY AND SIZE AS  
APPROVED BY ENGINEER




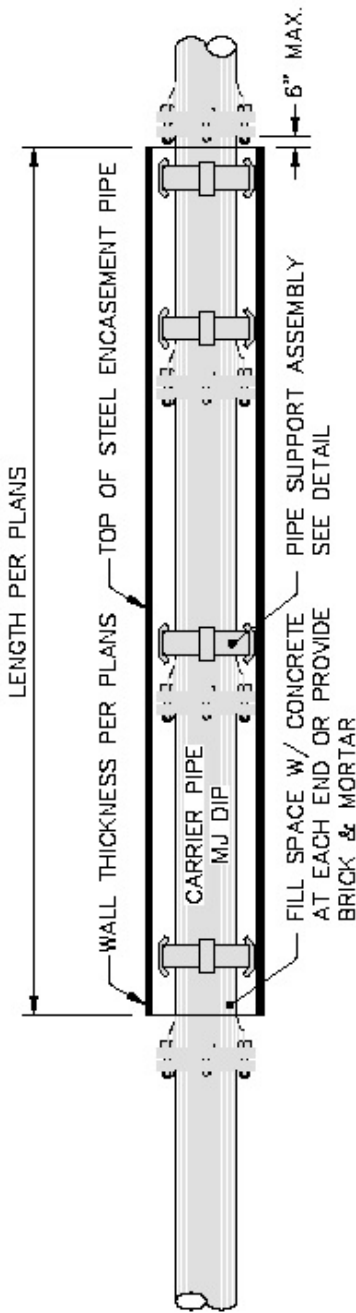
#### NOTES:

1. CONCRITT TO BE 3000 PSI.
2. ENCASEMENT TO BE USED ONLY WHERE SPECIFIED ON PLANS.
3. PIPE SHALL BE DUCTILE IRON PIPE.
4. FILTER FABRIC TO BE PLACED UNDER RIP-RAP AND KEYED INTO EMBANKMENT.

|   |   |                                  |
|---|---|----------------------------------|
| Operations Division   | <b>WATER LINE CROSSING BENEATH STREAM BED</b> |                                  |
| <br>Halifax County Service Authority | Adopted : 01/13/2003                          | Approved:                        |
|   | Revised:                                      | Detail Number: <b>WATER - 23</b> |



|   |                                     |                                  |
|---|-------------------------------------|----------------------------------|
| Operations Division   | <b>STEEL ENCASEMENT PIPE DETAIL</b> |                                  |
|  | Adopted : 01/13/2008                | Approved:                        |
|   | Revised:                            | Detail Number: <b>WATER - 24</b> |



### ENCASEMENT PIPE DETAIL

| CARRIER PIPE    |        | CASING PIPE |         | PIPE SUPPORT ASSEMBLY MARK NUMBER |       |     |    |      |     |        |      |     |      | DIMENSIONS          |        |        |        |
|-----------------|--------|-------------|---------|-----------------------------------|-------|-----|----|------|-----|--------|------|-----|------|---------------------|--------|--------|--------|
|                 |        | RAILROAD    | HIGHWAY |                                   |       |     |    |      |     |        |      |     |      |                     |        |        |        |
| NOMINAL<br>DIA. | O.D.   | O.D.        | WALL    | O.D.                              | WALL  | ①   |    |      | ②   |        |      | ③   |      |                     | X      | Y      | Z      |
|                 |        |             |         |                                   |       | C   | W  | T    | B   | A      | T    | B   | T    |                     |        |        |        |
| 6"              | 6.90"  | 12"         | .251"   | 12"                               | .188" | 5"  | 2" | 3/8" | 3"  | 1"     | 3/8" | 3"  | 3/8" | 1 1/2" DIA. 1 REQ'D | 10.40" | 1 7/8" | 3/4"   |
| 8"              | 9.05"  | 16"         | .282"   | 16"                               | .188" | 6"  | 2" | 3/8" | 4"  | 1 3/4" | 3/8" | 3"  | 3/8" | 1 1/2" DIA. 1 REQ'D | 14.05" | 1 7/8" | 3/4"   |
| 10"             | 11.10" | 24"         | .407"   | 24"                               | .188" | 6"  | 2" | 3/8" | 4"  | 4 3/4" | 3/8" | 4"  | 3/8" | 1 1/2" DIA. 1 REQ'D | 22.10" | 3"     | 1 3/8" |
| 12"             | 13.20" | 24"         | .407"   | 24"                               | .188" | 6"  | 2" | 3/8" | 4"  | 3 3/4" | 3/8" | 4"  | 3/8" | 1 1/2" DIA. 1 REQ'D | 22.20" | 3"     | 1 3/8" |
| 14"             | 15.30" | 24"         | .407"   | 24"                               | .250" | 6"  | 2" | 3/8" | 4"  | 2 3/4" | 3/8" | 4"  | 3/8" | 1 1/2" DIA. 1 REQ'D | 22.30" | 3"     | 1 3/8" |
| 16"             | 17.40" | 30"         | .469"   | 30"                               | .250" | 8"  | 3" | 3/8" | 6"  | 4 1/4" | 3/8" | 6"  | 3/8" | 3/4" DIA. 1 REQ'D   | 27.40" | 3"     | 1 3/8" |
| 18"             | 19.50" | 30"         | .469"   | 30"                               | .250" | 8"  | 3" | 3/8" | 6"  | 3 1/4" | 3/8" | 6"  | 3/8" | 3/4" DIA. 1 REQ'D   | 27.50" | 3"     | 1 3/8" |
| 24"             | 25.80" | 42"         | .563"   | 42"                               | .312" | 12" | 4" | 1/2" | 10" | 5 3/4" | 1/2" | 10" | 1/2" | 1 1/2" DIA. 2 REQ'D | 39.30" | 3"     | 1 3/8" |
| 30"             | 32.00" | 42"         | .563"   | 42"                               | .312" | 12" | 4" | 1/2" | 10" | 2 1/2" | 1/2" | 10" | 1/2" | 1 1/2" DIA. 2 REQ'D | 39.00" | 3"     | 1 3/8" |

\* DIMENSIONS ARE WITHOUT COATINGS

### NOTES:

1. GREASE ENCASEMENT PIPE AS REQUIRED FOR EASE OF INSTALLATION.
2. INSTALLATION BY DRY BORE & JACKING.
3. STEEL PIPE TO BE 35,000 PSI MIN. YIELD STRENGTH.
4. PROVIDE A 2" DRAIN PIPE FROM CASING PIPE AT DOWNSTREAM INVERT OF CASING PIPE. DRAIN TO DAYLIGHT OR FRENCH DRAIN.

Operations Division



### STEEL ENCASEMENT PIPE DETAIL

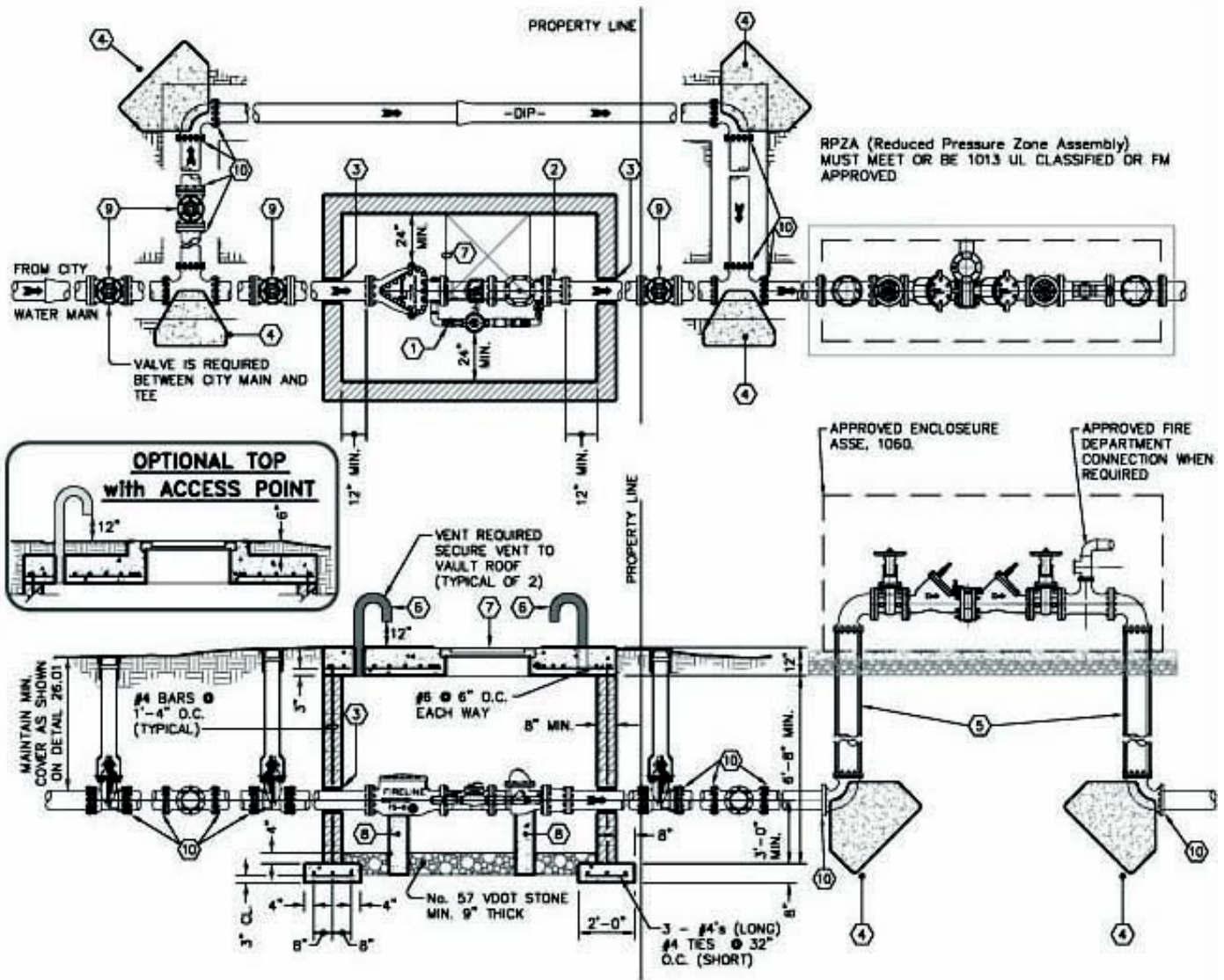
Adopted : 01/13/2008

Revised:

Approved:

Detail Number: **WATER - 25**





Operations Division

## TURBO METER VALVE WITH FIRE LINE RPZA




Adopted : 01/13/2008

Approved:


Revised:

Detail Number: **WATER - 26**

| TYPE "F" HORIZONTAL ANCHOR BLOCK DATUM   |                  |                  |      |      |                      |
|--|------------------|------------------|------|------|----------------------|
| TYPE FITTING                             | PIPE SIZE INCHES | DIMENSIONS (Ft.) |      |      | VOL. CONC. CU. YARDS |
|  |                  | "L"              | "H"  | "T"  |                      |
| TEST PRESSURE = 150 P.S.I. & BELOW       |                  |                  |      |      |                      |
| 11 1/4"                                  | 6                | 1.5              | 2    | 2.5  | 0.19                 |
| 22 1/2"                                  | 6                | 1.5              | 2    | 2.52 | 0.19                 |
| 45°                                      | 6                | 2                | 2.25 | 2.6  | 0.26                 |
| 90°                                      | 6                | 2.5              | 2.5  | 3.01 | 0.40                 |
| TEE                                      | 6                | 2                | 2.25 | 2.5  | 0.25                 |
| PLUG                                     | 6                | 2                | 2.25 | 2.5  | 0.25                 |
| 11 1/4"                                  | 8                | 1.66             | 2.16 | 2.67 | 0.23                 |
| 22 1/2"                                  | 8                | 1.66             | 2.16 | 2.69 | 0.23                 |
| 45°                                      | 8                | 2.66             | 2.66 | 2.77 | 0.41                 |
| 90°                                      | 8                | 3.66             | 3.16 | 3.21 | 0.75                 |
| TEE                                      | 8                | 3.16             | 2.91 | 2.66 | 0.50                 |
| PLUG                                     | 8                | 3.16             | 2.91 | 2.66 | 0.50                 |
| 11 1/4"                                  | 12               | 2                | 2.5  | 3    | 0.33                 |
| 22 1/2"                                  | 12               | 2.5              | 2.75 | 3.02 | 0.44                 |
| 45°                                      | 12               | 4                | 3.5  | 3.12 | 0.87                 |
| 90°                                      | 12               | 5.5              | 4.25 | 3.62 | 1.63                 |
| TEE                                      | 12               | 4.5              | 3.75 | 3    | 0.99                 |
| PLUG                                     | 12               | 4.5              | 3.75 | 3    | 0.99                 |
| TEST PRESSURE = 151 P.S.I. to 200 P.S.I. |                  |                  |      |      |                      |
| 11 1/4"                                  | 6                | 1.5              | 2    | 2.5  | 0.19                 |
| 22 1/2"                                  | 6                | 1.5              | 2    | 2.52 | 0.19                 |
| 45°                                      | 6                | 2                | 2.55 | 2.6  | 0.29                 |
| 90°                                      | 6                | 3                | 2.75 | 3.01 | 0.52                 |
| TEE                                      | 6                | 2.5              | 2.5  | 2.5  | 0.34                 |
| PLUG                                     | 6                | 2.5              | 2.5  | 2.5  | 0.34                 |
| 11 1/4"                                  | 8                | 1.66             | 2.16 | 2.67 | 0.23                 |
| 22 1/2"                                  | 8                | 2.16             | 2.41 | 2.69 | 0.31                 |
| 45°                                      | 8                | 3.16             | 2.91 | 2.77 | 0.52                 |
| 90°                                      | 8                | 4.16             | 3.41 | 3.21 | 0.90                 |
| TEE                                      | 8                | 3.66             | 3.16 | 2.66 | 0.62                 |
| PLUG                                     | 8                | 3.66             | 3.16 | 2.66 | 0.62                 |
| 11 1/4"                                  | 12               | 2                | 2.5  | 3    | 0.33                 |
| 22 1/2"                                  | 12               | 3                | 3    | 3.02 | 0.56                 |
| 45°                                      | 12               | 4.5              | 3.75 | 3.12 | 1.03                 |
| 90°                                      | 12               | 6.5              | 4.75 | 3.62 | 2.14                 |
| TEE                                      | 12               | 5.5              | 4.25 | 3    | 1.35                 |
| PLUG                                     | 12               | 5.5              | 4.25 | 3    | 1.35                 |
| TEST PRESSURE = 201 P.S.I. to 250 P.S.I. |                  |                  |      |      |                      |
| 11 1/4"                                  | 6                | 1.5              | 2    | 2.5  | 0.19                 |
| 22 1/2"                                  | 6                | 1.5              | 2    | 2.52 | 0.19                 |
| 45°                                      | 6                | 2.5              | 2.5  | 2.6  | 0.35                 |
| 90°                                      | 6                | 3.5              | 3    | 3.01 | 0.64                 |
| TEE                                      | 6                | 3                | 2.75 | 2.5  | 0.43                 |
| PLUG                                     | 6                | 3                | 2.75 | 2.5  | 0.43                 |
| 11 1/4"                                  | 8                | 1.66             | 2.16 | 2.67 | 0.23                 |
| 22 1/2"                                  | 8                | 2.16             | 2.41 | 2.69 | 0.31                 |
| 45°                                      | 8                | 3.66             | 3.16 | 2.77 | 0.64                 |
| 90°                                      | 8                | 4.66             | 3.66 | 3.21 | 1.07                 |
| TEE                                      | 8                | 4.16             | 3.41 | 2.66 | 0.75                 |
| PLUG                                     | 8                | 4.16             | 3.41 | 2.66 | 0.75                 |
| 11 1/4"                                  | 12               | 2.5              | 2.75 | 3    | 0.44                 |
| 22 1/2"                                  | 12               | 3.5              | 3.25 | 3.02 | 0.69                 |
| 45°                                      | 12               | 5.5              | 4.25 | 3.12 | 1.41                 |
| 90°                                      | 12               | 7.5              | 5.25 | 3.62 | 2.71                 |
| TEE                                      | 12               | 6                | 4.5  | 3    | 1.56                 |
| PLUG                                     | 12               | 6                | 4.5  | 3    | 1.56                 |


|   |                                     |                                  |
|---|-------------------------------------|----------------------------------|
| Operations Division   | TYPE "F" HORIZONTAL ANCHOR BLOCKING |                                  |
|  | Adopted : 01/13/2008                | Approved:                        |
|   | Revised:                            | Detail Number: <b>WATER - 03</b> |

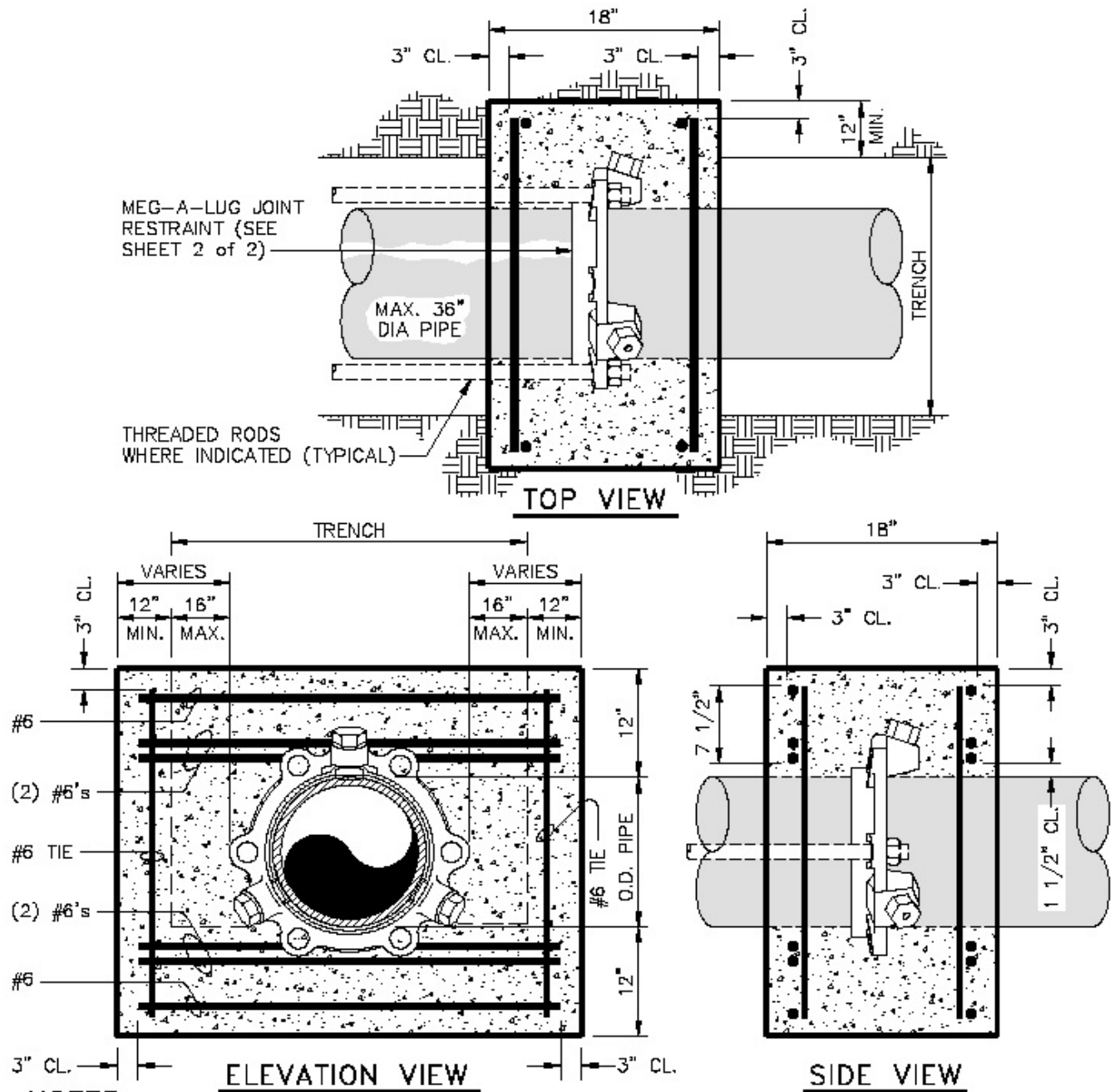
| TYPE "F" HORIZONTAL ANCHOR BLOCK DATUM   |                  |                  |      |      |                      |
|--|------------------|------------------|------|------|----------------------|
| TYPE FITTING                             | PIPE SIZE INCHES | DIMENSIONS (Ft.) |      |      | VOL. CONC. CU. YARDS |
|  |                  | "L"              | "H"  | "T"  |                      |
| TEST PRESSURE = 150 P.S.I. & BELOW       |                  |                  |      |      |                      |
| 11 1/4"                                  | 16               | 3                | 2    | 3    | 0.48                 |
| 22 1/2"                                  | 16               | 4                | 3    | 3    | 0.93                 |
| 45°                                      | 16               | 6                | 4    | 3    | 1.81                 |
| 90°                                      | 16               | 8                | 5.5  | 3.75 | 3.92                 |
| TEE                                      | 16               | 8                | 5.5  | 2.67 | 3.02                 |
| PLUG                                     | 16               | 8                | 5.5  | 2.67 | 3.02                 |
| 11 1/4"                                  | 24               | 4.5              | 3    | 4    | 1.31                 |
| 22 1/2"                                  | 24               | 6                | 4.5  | 4    | 2.56                 |
| 45°                                      | 24               | 8.5              | 6.25 | 4    | 4.97                 |
| 90°                                      | 24               | 12               | 8    | 4.5  | 9.84                 |
| TEE                                      | 24               | 12               | 8    | 4    | 8.94                 |
| PLUG                                     | 24               | 12               | 8    | 4    | 8.94                 |
| TEST PRESSURE = 151 P.S.I. to 200 P.S.I. |                  |                  |      |      |                      |
| 11 1/4"                                  | 16               | 3                | 2.67 | 3    | 0.63                 |
| 22 1/2"                                  | 16               | 4.5              | 3.5  | 3    | 1.20                 |
| 45°                                      | 16               | 7.5              | 4.25 | 3    | 2.40                 |
| 90°                                      | 16               | 10               | 5.75 | 3.75 | 5.11                 |
| TEE                                      | 16               | 10               | 5.75 | 5    | 6.46                 |
| PLUG                                     | 16               | 10               | 5.75 | 5    | 6.46                 |
| 11 1/4"                                  | 24               | 5                | 3.5  | 4    | 1.68                 |
| 22 1/2"                                  | 24               | 7                | 5    | 4    | 3.30                 |
| 45°                                      | 24               | 10               | 7    | 4    | 6.54                 |
| 90°                                      | 24               | 13               | 10   | 4.5  | 13.31                |
| TEE                                      | 24               | 13               | 10   | 4.5  | 13.31                |
| PLUG                                     | 24               | 13               | 10   | 4.5  | 13.31                |
| TEST PRESSURE = 201 P.S.I. to 250 P.S.I. |                  |                  |      |      |                      |
| 11 1/4"                                  | 16               | 3.5              | 3    | 3    | 0.81                 |
| 22 1/2"                                  | 16               | 5.5              | 3.67 | 3    | 1.53                 |
| 45°                                      | 16               | 7.5              | 5.25 | 3    | 2.95                 |
| 90°                                      | 16               | 12               | 6    | 3.75 | 6.38                 |
| TEE                                      | 16               | 12               | 6    | 4    | 6.72                 |
| PLUG                                     | 16               | 12               | 6    | 4    | 6.72                 |
| 11 1/4"                                  | 24               | 6                | 3.75 | 4    | 2.14                 |
| 22 1/2"                                  | 24               | 8                | 5.5  | 4    | 4.13                 |
| 45°                                      | 24               | 12               | 7.25 | 4    | 8.11                 |
| 90°                                      | 24               | 14               | 11.5 | 4.75 | 17.21                |
| TEE                                      | 24               | 14               | 11.5 | 4.75 | 17.21                |
| PLUG                                     | 24               | 14               | 11.5 | 4.75 | 17.21                |

|   |  |                                  |
|---|--|----------------------------------|
| Operations Division   | TYPE "F" HORIZONTAL ANCHOR BLOCKING DETAIL |                                  |
|  | Adopted : 01/13/2008                       | Approved:                        |
|   | Revised:                                   | Detail Number: <b>WATER - 04</b> |

| TIE ROD ANCHORS DATUM                    |                             |                                    |
|--|-----------------------------|------------------------------------|
| PIPE<br>SIZE<br>(INCHES)                 | ROD<br>DIAMETER<br>(INCHES) | NUMBER OF<br>A307 RODS<br>REQUIRED |
| TEST PRESSURE = 150 P.S.I. & BFLOW       |                             |                                    |
| 6  | 3/4                         | 2                                  |
| 8  | 3/4                         | 2                                  |
| 10                                       | 3/4                         | 2                                  |
| 12                                       | 3/4                         | 4                                  |
| 16                                       | 3/4                         | 6                                  |
| 20                                       | 3/4                         | 8                                  |
| 24                                       | 1                           | 8                                  |
| 30                                       | 1                           | 10                                 |
| TEST PRESSURE = 151 P.S.I. to 200 PSI    |                             |                                    |
| 6  | 3/4                         | 2                                  |
| 8  | 3/4                         | 2                                  |
| 10                                       | 3/4                         | 4                                  |
| 12                                       | 3/4                         | 6                                  |
| 16                                       | 3/4                         | 8                                  |
| 20                                       | 3/4                         | 12                                 |
| 24                                       | 1                           | 10                                 |
| 30                                       | 1                           | 14                                 |
| TEST PRESSURE = 201 P.S.I. to 250 P.S.I. |                             |                                    |
| 6  | 3/4                         | 4                                  |
| 8  | 3/4                         | 4                                  |
| 10                                       | 3/4                         | 4                                  |
| 12                                       | 3/4                         | 6                                  |
| 16                                       | 3/4                         | 12                                 |
| 20                                       | 3/4                         | 14                                 |
| 24                                       | 1                           | 16                                 |
| 30                                       | 1                           | 20                                 |

TIE RODS SHALL BE A307 CADMIUM COATED TIE RODS.


|   |                              |                                  |
|---|------------------------------|----------------------------------|
| Operations Division   | TIE ROD ANCHORS DATUM DETAIL |                                  |
|  | Adopted : 01/13/2008         | Approved:                        |
|   | Revised:                     | Detail Number: <b>WATER - 05</b> |



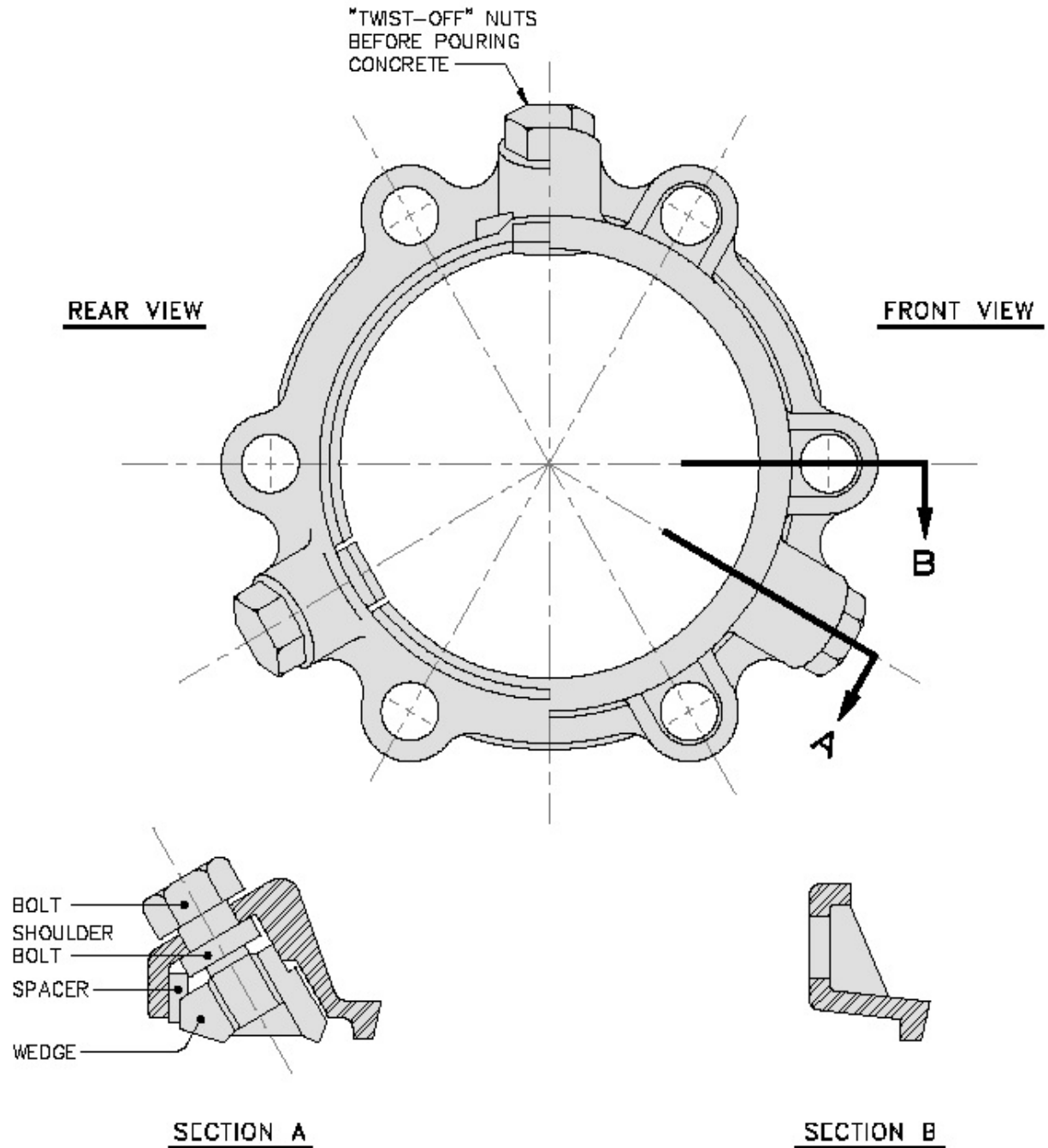
**NOTES:**

1. CONCRETE SHALL BE 3000 P.S.I.
2. REINFORCING BARS SHALL BE DEFORMED, AND TIED TOGETHER.
3. TRENCH BOTTOM WIDTH IN VICINITY OF THRUST BLOCK(S) INSTALLATION SHALL BE THE MINIMUM WIDTH.
4. BACKFILL AND COMPACT IN 6" LAYERS.
5. PLACE THRUST COLLAR ON ONE FULL JOINT OF PIPE.
6. LAST JOINT OF PIPE WITH THRUST COLLAR TO BE MECHANICAL JOINT PIPE.
7. PLACE MEG-A-LUG 4' FROM PLUG END OF PIPE.


**\* GRIP-RINGS will be used on AWWA C900, and not be used on AWWA C909-02 (molecular oriented PVC) pipe applications.**

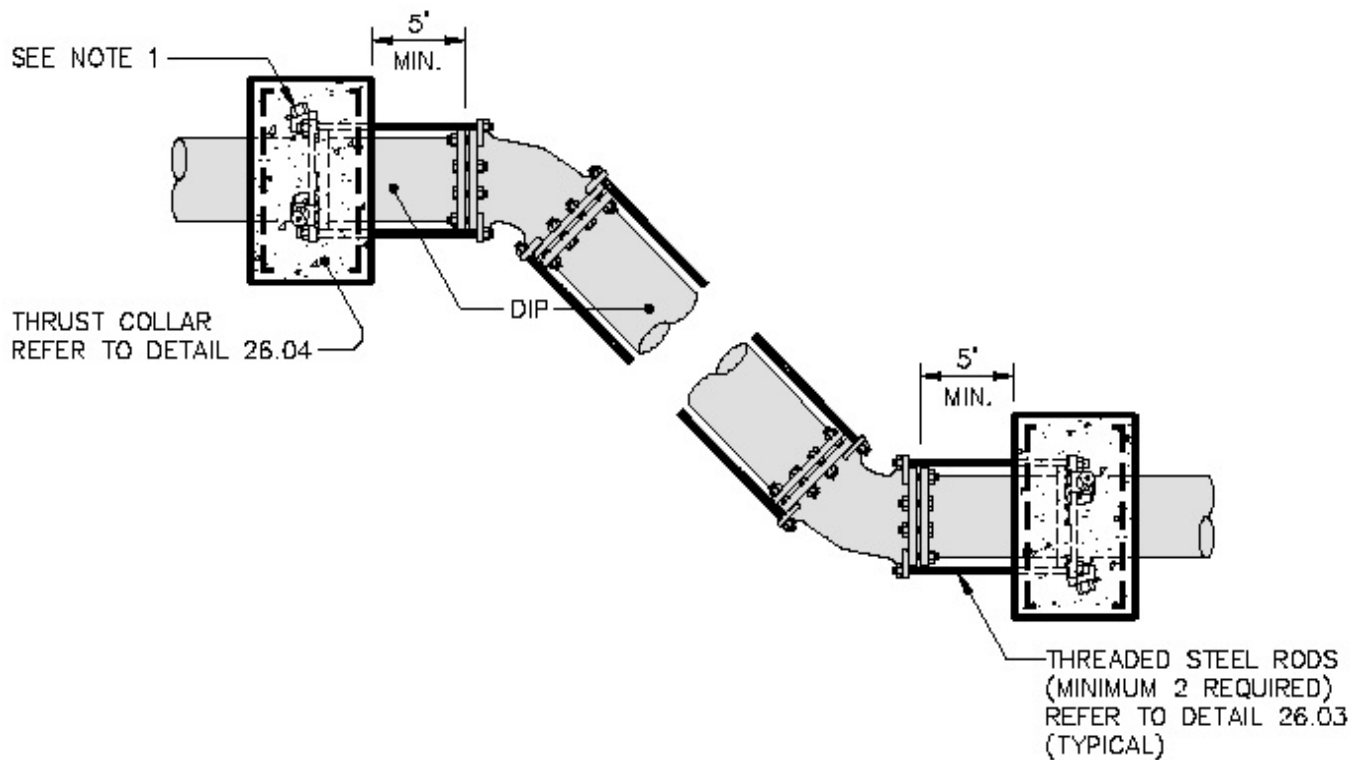
|   |                                 |                                  |
|---|---------------------------------|----------------------------------|
| Operations Division   | THRUST COLLAR & BLOCKING DETAIL |                                  |
|  | Adopted : 01/13/2008            | Approved:                        |
|   | Revised:                        | Detail Number: <b>WATER - 06</b> |






**⚠ A "MEGALUG" SERIES 1100 MECHANICAL JOINT RESTRAINT SHALL BE PLACED ON DIP. CONCRETE & REINFORCEMENT STEEL SHALL ALSO BE AS SHEET 1 of 2.**

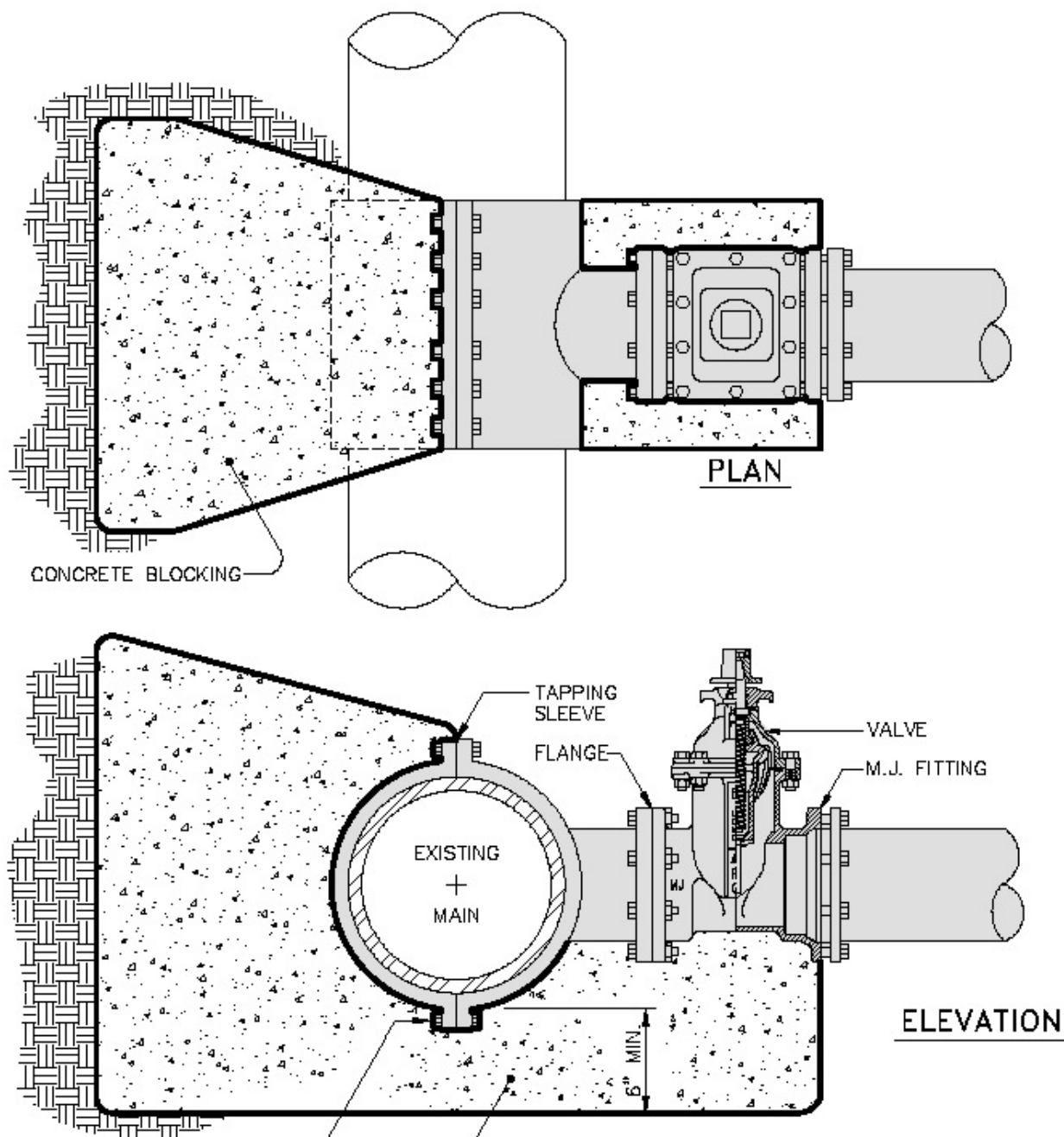
|   |                                     |                                  |
|---|-------------------------------------|----------------------------------|
| Operations Division   | <b>MEG-A-LUG THRUST RING DETAIL</b> |                                  |
| <br>Halifax County Service Authority | Adopted : 01/13/2008                | Approved:                        |
|   | Revised:                            | Detail Number: <b>WATER - 07</b> |



### NOTES:

1. MFG-A-LUG JOINT RESTRAINT SHALL BE USED.

|   |   |                                  |
|---|---|----------------------------------|
| Operations Division   | <b>VERTICAL BEND IN WATER LINE DETAIL</b> |                                  |
|  | Adopted : 01/13/2008                      | Approved:                        |
|   | Revised:                                  | Detail Number: <b>WATER - 08</b> |



SEE NOTE 1

POUR 3000 PSI CONCRETE  
BLOCKING AND FOOTING  
UNDER ASSEMBLY AS SHOWN

### NOTES

1. CONCRETE SHALL NOT CONTACT BOLTS OR ENDS OF MECHANICAL JOINT FITTINGS. (WRAP IN PLASTIC)
2. SEE TYPE "F" (HORIZONTAL) ANCHOR BLOCK DETAIL 26.02 FOR AREA OF CONCRETE REQUIRED.
3. TAPPING SLEEVE SHALL BE A MINIMUM OF 4' FROM NEAREST PIPE JOINT.

Operations Division

### TAPPING SLEEVE AND VALVE DETAIL



Adopted : 01/13/2009

Approved:

Revised:

Detail Number: **WATER - 09**