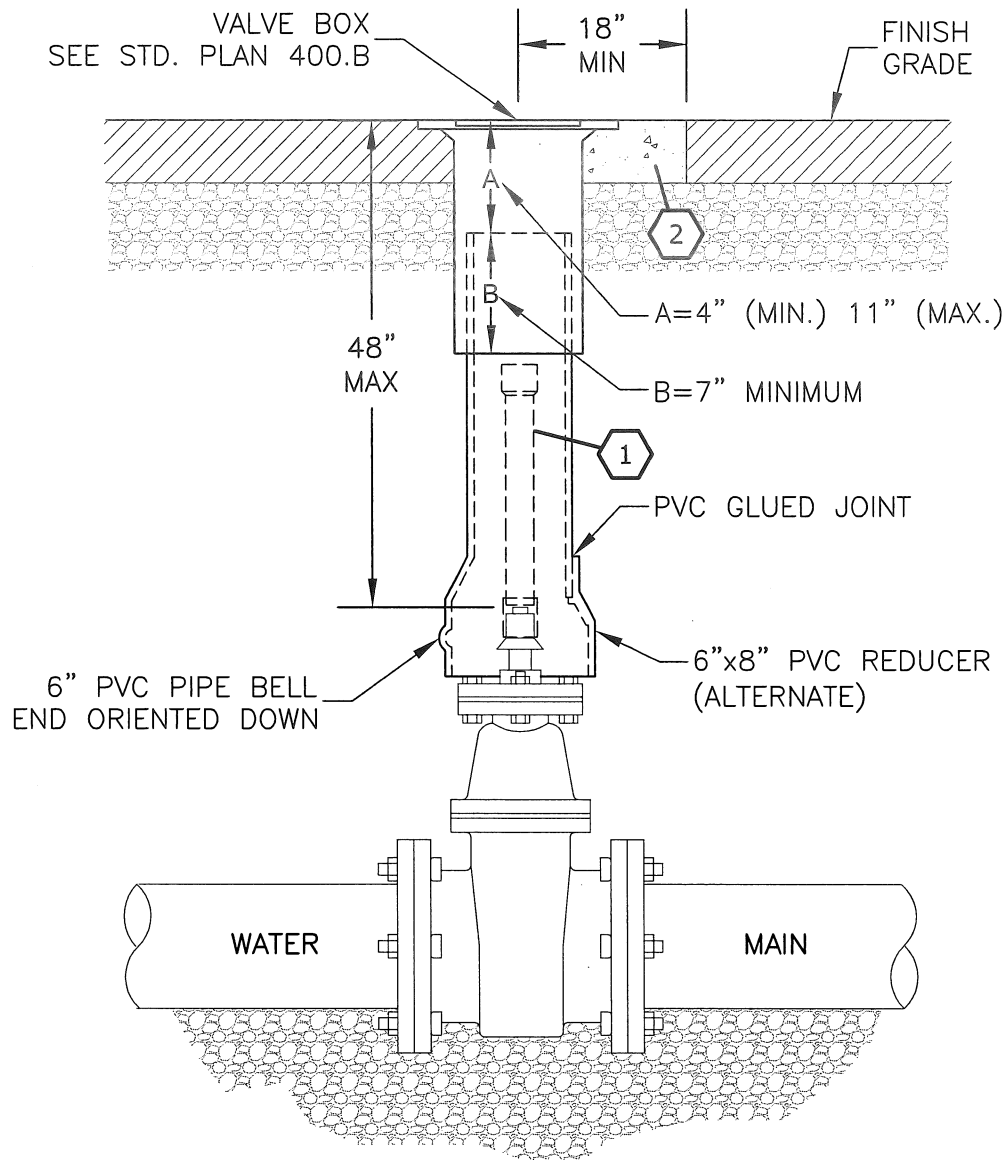


CITY OF SALEM
DEPARTMENT OF PUBLIC WORKS
STANDARD DRAWINGS
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| 900-999 | Erosion Control |

| Plan No. | Title | Date |
|-----------------|---|-------------|
| Water | | |
| 400.A | Water Valve Box Assembly | 03-11-2016 |
| 400.B | Water Valve Box | 03-11-2016 |
| 400.C | Water Valve Operator Extension | 03-11-2016 |
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| 418 | Cathodic Protection Detail | 09-15-1999 |
| 419 | 1½" and 2" Domestic Water Service Installation | 03-01-2002 |
| 420 | 1½" and 2" Irrigation Water Service Installation | 03-01-2002 |
| 421 | Automatic Meter Reader Lid | 05-18-2004 |
| 422 | Domestic Water Service Sleeve | 01-01-2014 |



GENERAL NOTES

- CENTER VALVE BOX ASSEMBLY AND ALIGN VERTICALLY OVER VALVE OPERATING NUT.
- ADJUST VALVE BOX TO FINISH PAVING GRADE.
- PVC PIPE SHALL BE ONE CONTINUOUS PIECE WITH BELL END ORIENTED DOWNWARD, OR ALTERNATIVELY, GLUE PVC REDUCER ON PLAIN END OF PIPE.

KEYNOTES

- 1 PROVIDE VALVE OPERATOR EXTENSION WHEN OPERATING NUT DEPTH EXCEEDS 48-INCHES. SEE STD. PLAN 400.C
- 2 CONSTRUCT 6-INCH THICK P.C.C. COLLAR IF VALVE IS IN UNPAVED AREA SUBJECT TO VEHICULAR TRAFFIC.

CITY OF SALEM DEPARTMENT OF PUBLIC WORKS

STANDARD PLAN

WATER VALVE BOX ASSEMBLY

CHANGES
 1 ADDED PIPE BELL/REDUCER OPTION
 2 REMOVED DETAIL ON VALVE BOX
 3 ADDED WARRANT FOR OPERATOR EXTENSION

APPROVED

[Signature]
CITY ENGINEER

31110

DRAWN BY

JAK

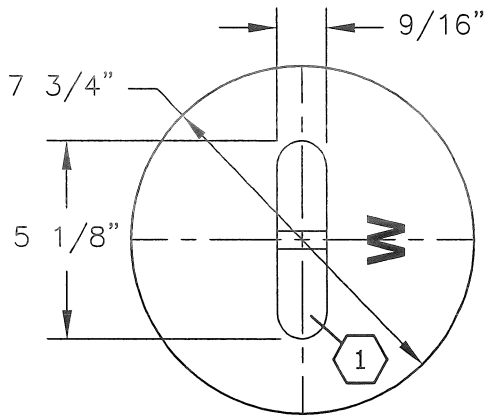
2016

CHECKED BY

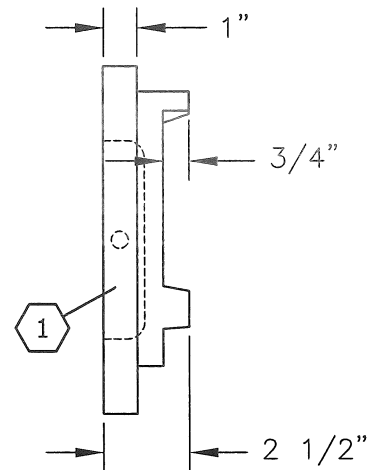
DEW

2016

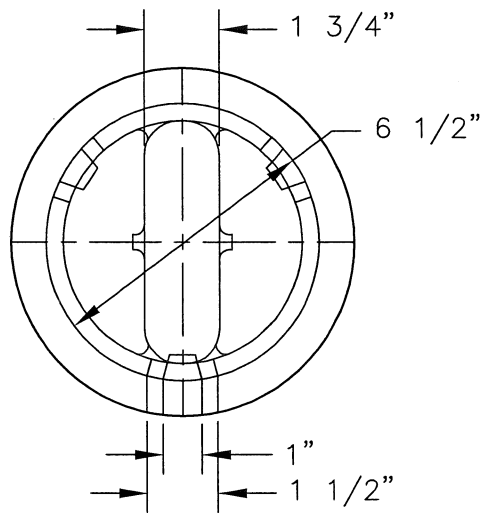
NO.400.A



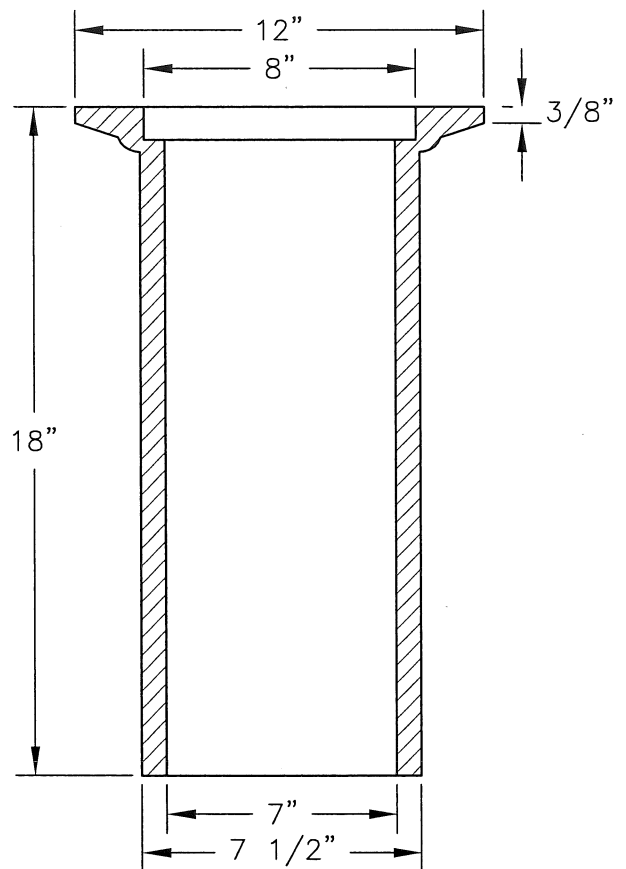
LID TOP



LID SIDE



LID BOTTOM



BOX SECTION

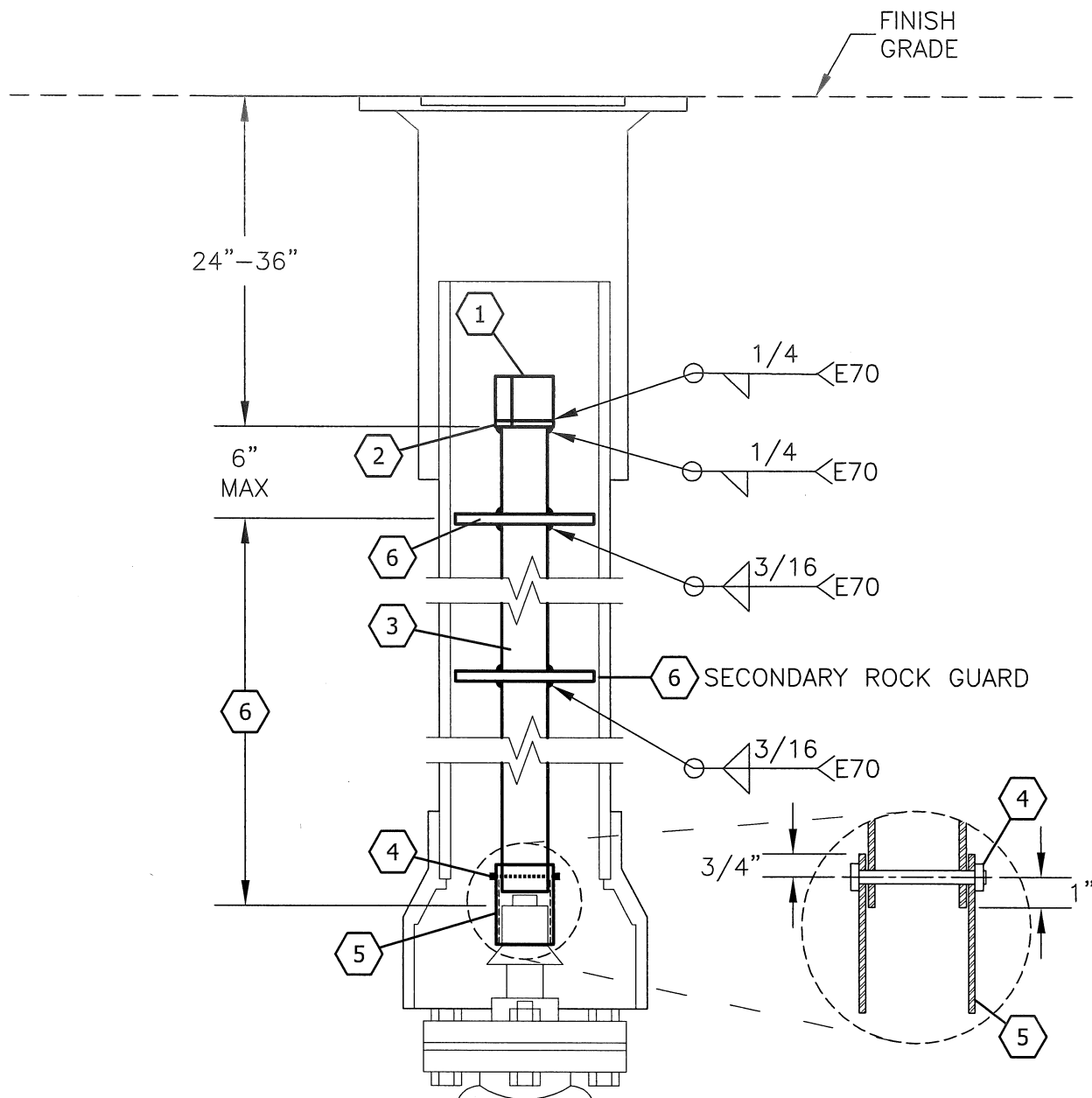
SPECIFICATION:
WATER VALVE BOX MATERIAL SHALL BE CAST IRON
ASTM A48, CL35.

1 LIFT POCKET 1" WIDE x 1 1/4" DEEP.

| | |
|---------|-------------------------------|
| CHANGES | NEW DRAWING |
| | CHANGED TO CLASS 35 CAST IRON |
| | |
| | |

| | | |
|----------|---|---------|
| APPROVED |  | 3-11-16 |
| | CITY ENGINEER | |

| | | | |
|-----------------------------------|-----|------|-----------------|
| CITY OF SALEM | | | |
| DEPARTMENT OF PUBLIC WORKS | | | |
| STANDARD PLAN | | | |
| WATER VALVE BOX | | | |
| DRAWN BY | JAK | 2016 | NO.400.B |
| CHECKED BY | DEW | 2016 | |



KEYNOTES

- ① 2"x2"x1/8"x2" LONG STEEL TUBE.
EXTEND TO 24"-36" FROM FINISH GRADE.
- ② 2"x2"x3/8" STEEL FLAT BAR.
- ③ 1 1/2" SCHEDULE 40 STEEL PIPE
(1.90 OD x .145 WALL).
- ④ 3/8" BOLT WITH LOCK NUT.
- ⑤ 2 1/2"x2 1/2"x3/16"x3 1/2" LONG STEEL TUBE.

- ⑥ ROCK GUARD. 1/8" STEEL PLATE WELDED TO STEEL PIPE. INSTALL 6" MAX BELOW OPERATOR NUT. ROCK GUARD DIAMETER SHALL BE 5 1/2". SECONDARY ROCK GUARD IS REQUIRED IF DISTANCE FROM UPPER ROCK GUARD TO VALVE NUT EXCEEDS 72". INSTALL SECONDARY ROCK GUARD HALFWAY BETWEEN UPPER GUARD AND VALVE NUT.

CITY OF SALEM DEPARTMENT OF PUBLIC WORKS

STANDARD PLAN WATER VALVE OPERATOR EXTENSION

| | |
|---------|-------------|
| CHANGES | NEW DRAWING |
| | |
| | |
| | |

| | | |
|----------|---------------|---------|
| APPROVED | | 3-17-16 |
| | CITY ENGINEER | |

| | | |
|------------|-----|------|
| DRAWN BY | JAK | 2016 |
| CHECKED BY | DEW | 2016 |

NO.400.C

(HORIZONTAL)
BEARING AREA OF THRUST BLOCKS
IN SQUARE FEET

| FITTING SIZE | TEE, WYE, PLUGGED CROSS | STRADDLE BLOCK | 90° BEND PLUGGED CROSS | TEE PLUGGED ON RUN | | 45° BEND | 22-1/2° BEND | 11-1/4° BEND |
|-----------------|----------------------------|-------------------|------------------------------|--------------------------|------|-------------|-----------------|-----------------|
| | | | | A-1 | A-2 | | | |
| 4 | 1.0 | 1.6 | 2.0 | 1.9 | 1.4 | 1.0 | --- | --- |
| 6 | 2.1 | 3.7 | 4.0 | 4.3 | 3.0 | 1.6 | 1.0 | --- |
| 8 | 3.8 | 6.5 | 6.8 | 7.6 | 5.4 | 2.9 | 1.5 | 1.0 |
| 10 | 5.9 | 10.2 | 10.3 | 11.8 | 8.4 | 4.6 | 2.4 | 1.2 |
| 12 | 8.5 | 14.7 | 14.5 | 17.0 | 12.0 | 6.6 | 3.4 | 1.7 |
| 14 | 11.5 | --- | 19.5 | 23.0 | 16.3 | 8.9 | 4.6 | 2.3 |
| 16 | 15.0 | 26.1 | 25.3 | 30.0 | 21.3 | 13.7 | 7.0 | 3.5 |
| 18 | 19.0 | --- | 31.7 | 38.0 | 27.0 | 17.2 | 8.8 | 4.4 |
| 20 | 23.5 | 40.8 | 38.9 | 47.0 | 33.3 | 21.1 | 10.8 | 5.4 |
| 24 | 34.0 | 58.8 | 55.5 | 68.0 | 48.0 | 26.2 | 13.6 | 6.8 |

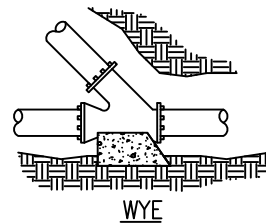
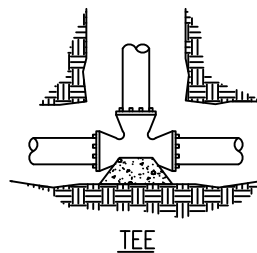
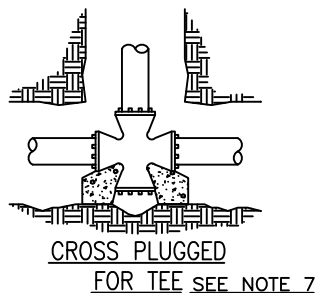
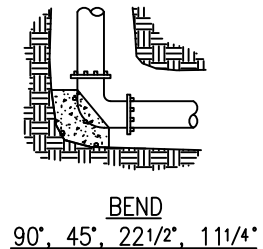
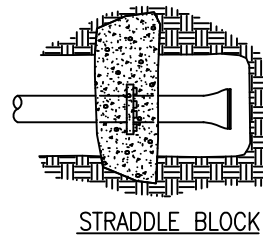
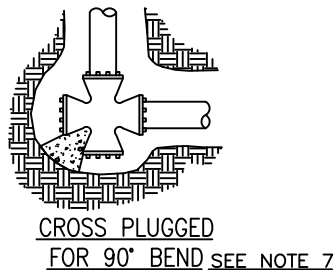
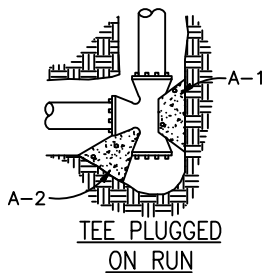
NOTES:

1. ABOVE BEARING AREAS BASED ON TEST PRESSURE OF 150 PSI AND AN ALLOWABLE SOIL BEARING STRESS OF 2000 POUNDS PER SQUARE FOOT. TO COMPUTE BEARING AREAS FOR DIFFERENT TEST PRESSURES AND SOIL BEARING STRESSES, USE THE FOLLOWING EQUATION:

$$\text{BEARING AREA} = (\text{TEST PRESSURE} / 150) \times (2000 / \text{SOIL BEARING STRESS}) \times (\text{TABLE VALUE})$$

2. ABOVE VOLUMES BASED ON TEST PRESSURE OF 150 PSI AND THE WEIGHT OF CONCRETE = 4050 POUNDS PER CUBIC YARD. TO COMPUTE FOR DIFFERENT TEST PRESSURES, USE THE FOLLOWING EQUATION:

$$\text{VOLUME} = (\text{TEST PRESSURE} / 150) \times (\text{TABLE VALUE})$$



NOTES:

1. CONCRETE BLOCKING TO BE POURED AGAINST UNDISTURBED EARTH.
2. ALL CONCRETE TO BE CLASS 2400 MINIMUM.
3. INSTALL ISOLATION MATERIAL BETWEEN PIPE AND/OR FITTINGS BEFORE POURING CONCRETE BLOCKING.
4. CONCRETE SHALL BE KEPT CLEAR OF ALL JOINTS AND ACCESSORIES.
5. SEE STANDARD PLAN NO. 402 FOR VERTICAL BEND ANCHOR BLOCK DETAILS.
6. SEE STANDARD PLAN NO. 403 AND 404 FOR TIED BACK THRUST BLOCK DETAILS.
7. MAY NOT WORK OUT FOR ALL FITTING SIZES – CONFIRM USE OF THIS BLOCKING CONFIGURATION WITH ENGINEER.

Approved Karl O. Schuster
City Engineer

9-15-99
Date

CITY OF SALEM
DEPARTMENT OF PUBLIC WORKS

STANDARD PLAN
HORIZONTAL THRUST BLOCKING

DRAWN BY: I.D.F.

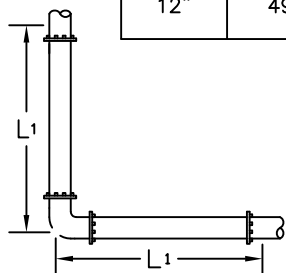
CHECKED BY: R.W.L.

NO. 401

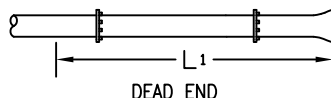
| | | | | |
|-----|------------------------------------|------|-----|------|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| 2. | ADJUST SIZE OF SOME THRUST BLOCKS. | 3/99 | JHC | |
| 1. | CONVERT TO CAD DWG. | | | |
| No. | Description | Date | By | Appr |
| | REVISION | | | |

LENGTH (L₁) OF PIPE REQUIRED FOR RESTRAINT (FEET)

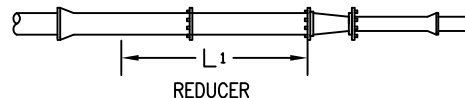
| | Horizontal Bend | | | | Dead End | Reducer (Restrained Length for Large Diameter Side) | | | | |
|----------|-----------------|-----|---------|---------|----------|--|----|----|-----|-----|
| Diameter | 90° | 45° | 22 1/2° | 11 1/4° | | 4" | 6" | 8" | 10" | 12" |
| 4" | 30 | 23 | 20 | 19 | 44 | -- | 37 | 53 | 65 | 77 |
| 6" | 35 | 25 | 21 | 20 | 55 | -- | -- | 38 | 53 | 67 |
| 8" | 40 | 27 | 22 | 20 | 66 | -- | -- | -- | 37 | 54 |
| 10" | 44 | 29 | 23 | 21 | 76 | -- | -- | -- | -- | 51 |
| 12" | 49 | 31 | 24 | 21 | 86 | -- | -- | -- | -- | -- |



BEND
90°, 45°, 22 1/2°, 11 1/4°



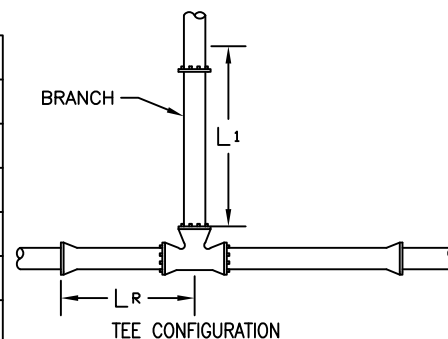
DEAD END



REDUCER

LENGTH (L₁) OF PIPE REQUIRED FOR RESTRAINT WHEN USING TEES (FEET)

| Tee Configurations (Restrained Length for Branch) | | | | | | | | | | |
|---|------|------|------|------|------|-------|-------|-------|-------|-------|
| Branch Pipe Diameter | LR=0 | LR=2 | LR=4 | LR=6 | LR=8 | LR=10 | LR=12 | LR=14 | LR=16 | LR=18 |
| 4" | 44 | 30 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 |
| 6" | 55 | 45 | 36 | 26 | 19 | 19 | 19 | 19 | 19 | 19 |
| 8" | 66 | 59 | 52 | 44 | 37 | 30 | 23 | 19 | 19 | 19 |
| 10" | 76 | 70 | 64 | 58 | 53 | 47 | 41 | 35 | 30 | 24 |
| 12" | 86 | 81 | 76 | 71 | 67 | 62 | 57 | 52 | 47 | 43 |



TEE CONFIGURATION

LR is the minimum length in either direction from tee to nearest adjacent joint

NOTES:

- ALL JOINTS WITHIN THE LENGTH "L₁" FROM THE ABOVE TABLE, SHALL BE RESTRAINED.
- THE JOINT RESTRAINT LENGTHS CALCULATED ARE FOR FITTINGS USED TO CHANGE PIPE HORIZONTAL ALIGNMENT ONLY. FOR APPLICATIONS WHERE FITTINGS ARE USED TO CHANGE THE SLOPE OF THE PIPE, THE DESIGN ENGINEER SHALL INCLUDE THE JOINT RESTRAINT REQUIREMENTS ON THE PROJECT DRAWINGS.
- IF AN UNANTICIPATED NEED FOR JOINT RESTRAINT ARISES TO CHANGE THE SLOPE OF THE PIPE, THE CONTRACTOR SHALL CONTACT THE DESIGN ENGINEER OR UTILIZE ANCHORS IN ACCORDANCE WITH STANDARD DRAWING NO. 402.
- JOINT TYPES NOT COVERED ON ABOVE TABLE MUST BE DESIGNED INDIVIDUALLY IN ORDER TO DETERMINE APPROPRIATE RESTRAINED LENGTH. THIS LENGTH SHALL BE SHOWN ON THE PROJECT DRAWINGS.
- THE SMALL DIAMETER SIDE OF A REDUCER DOES NOT REQUIRE RESTRAINT IF THE LARGE DIAMETER SIDE IS PROPERLY RESTRAINED.
- ABOVE RESTRAINED LENGTHS ARE BASED ON:
 - TEST PRESSURE OF 150 POUNDS PER SQUARE INCH
 - MINIMUM OF 3 FEET COVER
 - CLASS B PIPE ZONE CONDITIONS
 - WHEN ORGANIC OR CLAY TYPE SOILS ARE BEING USED FOR BACKFILL, GRANULAR BACKFILL MUST BE USED FOR BEDDING AND BACKFILL TO A HEIGHT OF 6 INCHES OVER THE TOP OF THE PIPE BEFORE OTHER SOILS ARE PLACED.
 - UNCOATED PIPE, THIS TABLE IS NOT APPLICABLE FOR PIPE ENCASED IN POLYETHYLENE

ANY REDUCTION OF THESE VALUES AS A RESULT OF OTHER CONDITIONS ENCOUNTERED SHALL BE BASED ON THE APPROPRIATE EVALUATION AND RECOMMENDATION BY A QUALIFIED, REGISTERED ENGINEER AND WITH APPROVAL BY THE CITY.

Approved

Karl O. Schuster
City Engineer

2-1-00
Date

CITY OF SALEM
DEPARTMENT OF PUBLIC WORKS

STANDARD PLAN
JOINT RESTRAINT

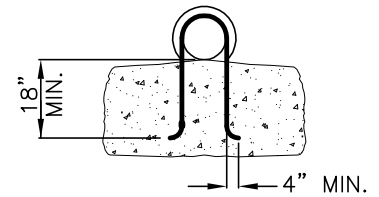
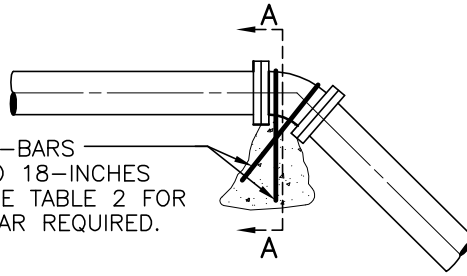
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| | | | | |
| No. | Description | Date | By | Appr |
| REVISION | | | | |

DRAWN BY: TAL

CHECKED BY: KW

NO. 401.5

GALV. OR EPOXY COATED RE-BARS
OVER FITTING AND EMBEDDED 18-INCHES
IN CONCRETE AS SHOWN. SEE TABLE 2 FOR
NUMBER AND SIZE OF RE-BAR REQUIRED.



SECTION A-A

N.T.S.

1. KEEP CONCRETE CLEAR OF JOINT AND JOINT ACCESSORIES.
2. THE REQUIRED ANCHOR BLOCK VOLUMES FOR SPECIAL CONNECTIONS ARE SHOWN EN-CIRCLED ON THE PLAN E.G. ③ INDICATES 3 CUBIC YARDS OF CONCRETE ARE REQUIRED.
3. IF NOT SHOWN ON PLANS, REQUIRED VOLUMES AT FITTINGS SHALL BE AS INDICATED BELOW, ADJUST IF NECESSARY, TO CONFORM TO THE TEST PRESSURE(S) STATED IN THE SPECIAL PROVISIONS.
4. VOLUMES AND SPECIAL BLOCKING DETAILS SHOWN ON PLANS TAKE PRECEDENCE OVER VOLUMES AND BLOCKING DETAIL SHOWN ON THIS STANDARD PLAN.
5. THRUST BLOCKS FOR VERTICAL UP BENDS SHALL BE THE SAME AS FOR HORIZONTAL BENDS.

TABLE 1

| FITTING SIZE | VOLUME OF CONCRETE ANCHOR BLOCK IN CU. YD. | | | |
|-----------------|--|----------|--------------|--------------|
| | 90° BEND | 45° BEND | 22-1/2° BEND | 11-1/4° BEND |
| 4 | 1.0 | 0.5 | 0.3 | N.R |
| 6 | 2.0 | 1.1 | 0.5 | 0.3 |
| 8 | 3.4 | 1.8 | 0.9 | 0.5 |
| 10 | 5.1 | 2.7 | 1.4 | 0.7 |
| 12 | 7.2 | 3.9 | 2.0 | 1.0 |
| 14 | 9.6 | 5.2 | 2.7 | 1.3 |
| 16 | 12.5 | 6.7 | 3.4 | 1.7 |
| 18 | 15.6 | 8.5 | 4.3 | 2.2 |
| 20 | 19.2 | 10.4 | 5.3 | 2.7 |
| 24 | 27.4 | 14.8 | 7.6 | 3.8 |

TABLE 2

| FITTING SIZE | NUMBER & SIZE OF STEEL RE-BAR REQUIRED | | | |
|-----------------|--|----------|--------------|--------------|
| | 90° BEND | 45° BEND | 22-1/2° BEND | 11-1/4° BEND |
| 4 | 2-#5 | 2-#5 | 2-#5 | 2-#5 |
| 6 | 2-#5 | 2-#5 | 2-#5 | 2-#5 |
| 8 | 2-#5 | 2-#5 | 2-#5 | 2-#5 |
| 10 | 3-#5 | 2-#5 | 2-#5 | 2-#5 |
| 12 | 4-#5 | 2-#5 | 2-#5 | 2-#5 |
| 14 | 4-#6 | 3-#5 | 2-#5 | 2-#5 |
| 16 | 4-#7 | 4-#5 | 2-#5 | 2-#5 |
| 18 | 4-#7 | 3-#6 | 3-#5 | 2-#5 |
| 20 | 4-#8 | 4-#6 | 3-#5 | 2-#5 |
| 24 | 6-#8 | 4-#7 | 2-#7 | 2-#5 |

NOTE:

1. THE VOLUMES SHOWN IN TABLE 1 ARE BASED ON TEST PRESSURES OF 150 PSI AND THE WEIGHT OF CONCRETE = 4050 LBS/CU.YD.. TO COMPUTE VOLUME FOR DIFFERENT TEST PRESSURES, USE THE FOLLOWING EQUATION: VOLUME = (TEST PRESSURE/150) X (TABLE VALUE).
2. THE NUMBER AND SIZE OF RE-BAR REQUIRED SHOWN IN TABLE 2 ARE BASED UPON GRADE 40 RE-BAR WITH A TENSILE STRENGTH OF 20,000 PSI AND A FS=1.5.
3. ALTERNATE JOINT RESTRAINT METHODS SUCH AS MEGA-LUG, ETC., WILL BE ACCEPTED BY WRITTEN APPROVAL OF THE ENGINEER.

Approved

Karl O. Schuster
City Engineer

9-15-99
Date

CITY OF SALEM
DEPARTMENT OF PUBLIC WORKS

STANDARD PLAN
VERTICAL BEND ANCHOR BLOCK DETAIL

| | | | | | |
|-----|----------------------|-------|-----|------|--|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | SIGNIFICANT REVISION | | | | |
| 1 | CONVERT TO CAD DWG. | 12/98 | IDF | KDG | |
| No. | Description | Date | By | Appr | |
| | REVISION | | | | |

DRAWN BY SGP

CHECKED BY KDG

NO.402



TABLE 1

BEARING AREA OF THRUST BLOCK

| FITTING SIZE | 1/2 BEARING AREA (SQ. FT.)(EACH SIDE) | | | | |
|-----------------|---|-------------|-------------|-----------------|-----------------|
| | DEAD END WYE OR TEE W/STD THRUST BLOCK | 90° BEND | 45° BEND | 22 1/2° BEND | 11 1/4° BEND |
| 4 | 1.4 | 1.9 | 1.0 | 0.5 | 0.3 |
| 6 | 2.8 | 3.9 | 2.1 | 1.1 | 0.5 |
| 8 | 4.8 | 6.8 | 3.7 | 1.9 | 0.9 |
| 10 | 7.3 | 10.3 | 5.6 | 2.8 | 1.4 |
| 12 | 10.3 | 14.5 | 7.9 | 4.0 | 2.0 |
| 14 | 13.8 | 19.5 | 10.6 | 5.4 | 2.7 |
| 16 | 17.8 | 25.2 | 13.6 | 7.0 | 3.5 |

TABLE 2

NUMBER & SIZE OF STEEL TIE RODS REQ'D

| SIZE | NO. OF FULL DIA. RODS WELDED TO PLATES | | | NO. OF THREADED RODS | | |
|------|---|-----------------------------------|----|----------------------|---------------------|----|
| | 5/8" | 3/4" | 1" | 5/8" | 3/4" | 1" |
| 4 | 2 | WARNING-DUC-LUGS WILL NOT HOLD | | 2 | WARNING-NO DUC-LUGS | |
| 6 | 2 | | | 3 | 2 | 2 |
| 8 | 3 | 2 | 2 | 5 | 3 | 2 |
| 10 | 5 | 3 | 2 | 7 | 5 | 3 |
| 12 | 7 | 5 | 3 | 10 | 7 | 4 |
| 14 | 10 | 7 | 4 | 13 | 9 | 5 |
| 16 | 12 | 9 | 5 | 17 | 11 | 6 |

NOTES:

1. THE AREAS SHOWN IN TABLE 1 ARE BASED ON TEST PRESSURES OF 150 PSI AND AN ALLOWABLE SOIL BEARING STRESS OF 2,000 POUNDS PER SQUARE FOOT. TO COMPUTE BEARING AREAS FOR DIFFERENT TEST PRESSURES AND SOIL BEARING STRESSES, USE THE FOLLOWING EQUATION.
$$\text{BEARING AREA} = (\text{TEST PRESSURE} / 150) \times (2,000 / \text{SOIL BEARING STRESS}).$$
2. THE NUMBER AND SIZE OF TIE RODS REQUIRED SHOWN IN TABLE 2 ARE BASED UPON ASTM A307 STEEL BOLT STOCK WITH A TENSIL STRENGTH OF 20,000 PSI AND A FS=1.5, BASED ON TEST PRESSURE OF 150 P.S.I.
3. MAKE CONNECTIONS AS FOLLOWS:
 - 5/8" RODS – THRU BOLT HOLES, DUCTILE IRON LUGS, STARR TIE BOLTS, STEEL PLATES.
 - 3/4" RODS – THRU BOLT HOLES, STARR TIE BOLTS, STEEL PLATES.
 - 1" RODS – CONNECT TO STEEL PLATE, STRAPS OR "EARS".
4. CONSTRUCT TIED BACK THRUST BLOCK AS PER STANDARD PLAN NO. 404.
5. MULTIPLY THE AREAS LISTED IN TABLE 1 BY 2 IN ORDER TO DETERMINE THE TOTAL BEARING AREA REQUIRED.

Approved

Karl O. Gueber
City Engineer

9-15-99
Date

CITY OF SALEM
DEPARTMENT OF PUBLIC WORKS

STANDARD PLAN

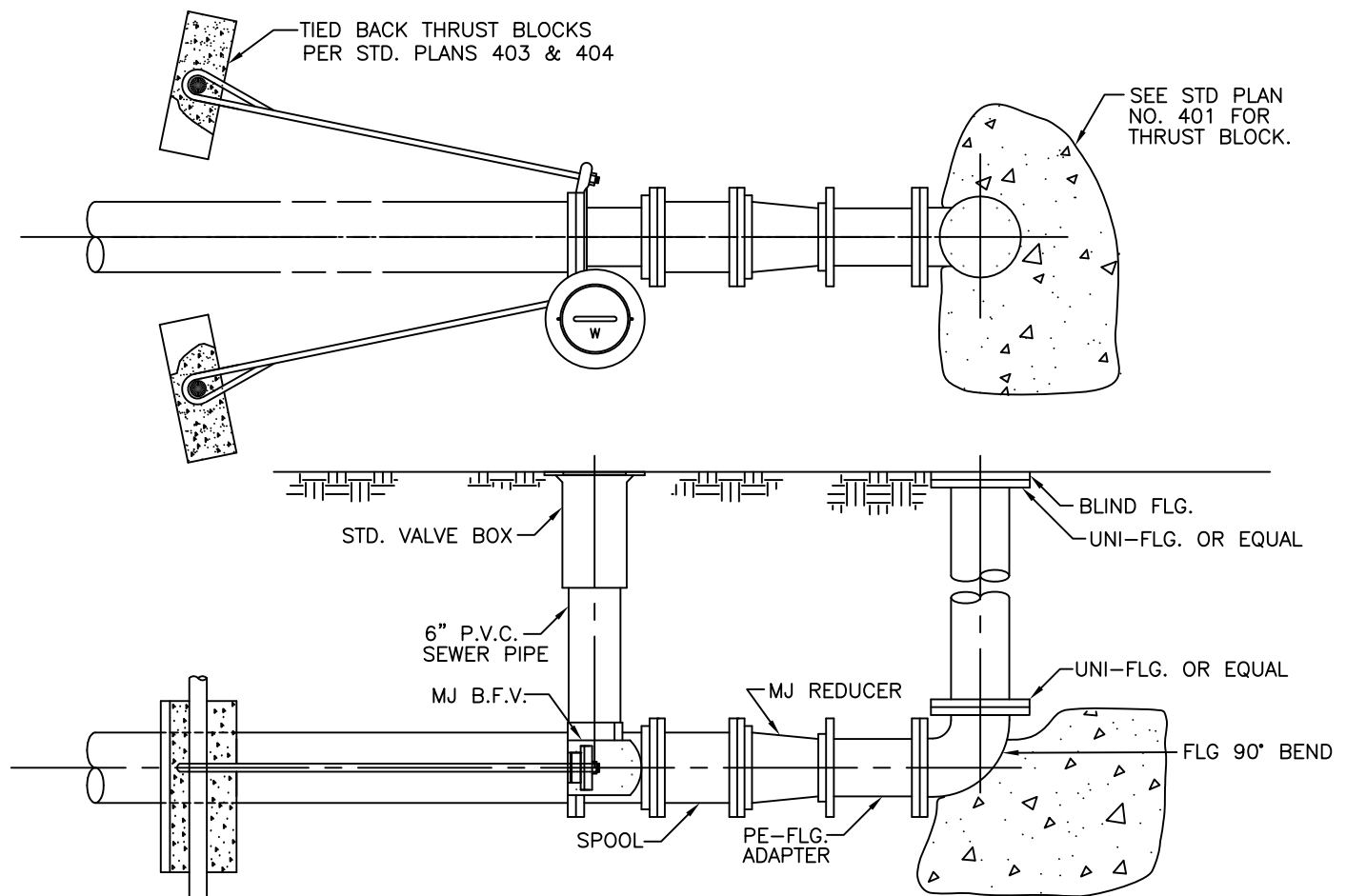
4" TO 16" TIED BACK THRUST BLOCK SCHEMATIC AND DIMENSIONS

| | | | | |
|----------|-----------------------|------|----|------|
| | SIGNIFICANT REVISIONS | | | |
| No. | Description | Date | By | Appr |
| REVISION | | | | |

DRAWN BY IDF

CHECKED BY KDG

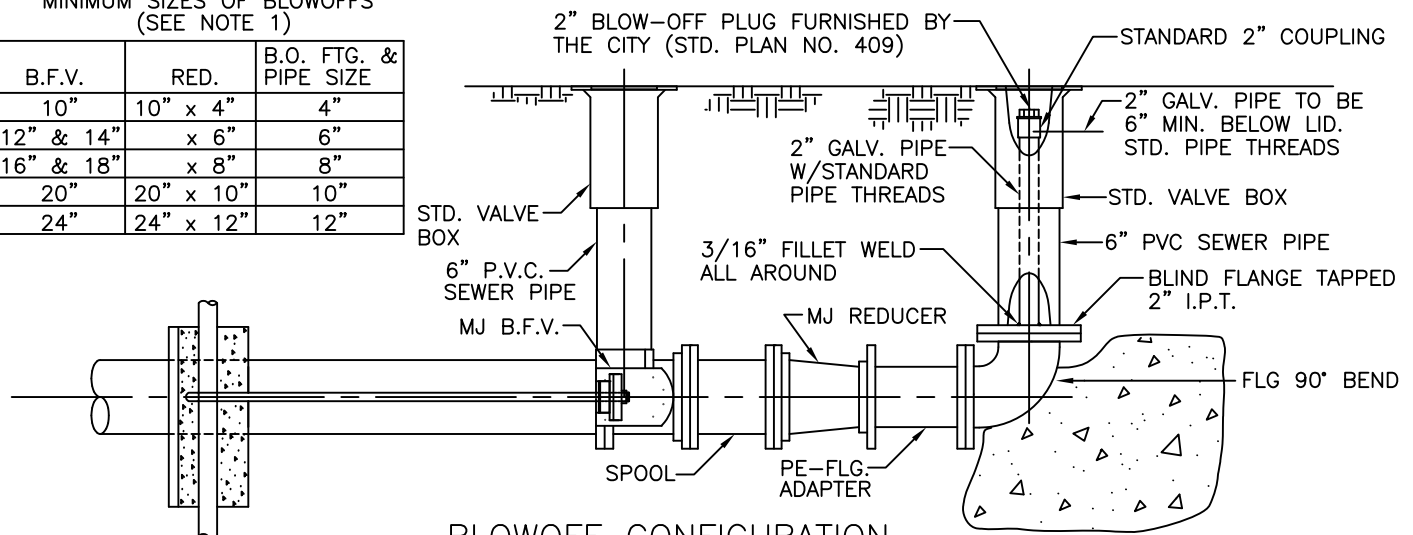
NO.403



BLOWOFF CONFIGURATION BEFORE
FIRST FLUSHING OF MAIN LINE

MINIMUM SIZES OF BLOWOFFS
(SEE NOTE 1)

| B.F.V. | RED. | B.O. FTG. & PIPE SIZE |
|-----------|-----------|--------------------------|
| 10" | 10" x 4" | 4" |
| 12" & 14" | x 6" | 6" |
| 16" & 18" | x 8" | 8" |
| 20" | 20" x 10" | 10" |
| 24" | 24" x 12" | 12" |



BLOWOFF CONFIGURATION
BEFORE CHLORINATION

NOTES:

1. SIZE OF B.O. & VALVE SHALL BE USED IN ABSENCE OF MORE SPECIFIC INFORMATION SHOWN ON PLANS.
2. FITTINGS MAY BE SUBSTITUTED AS APPROVED BY ENGINEER.

Approved *Karl O. Guter* 3-1-02
City Engineer Date

| | | | | |
|----------|--|------|-----|------|
| 1 | SUGGEST ENGINEER DESIGN REDUCER, VALVE & B.O. SIZES TO ACHIEVE REQUIRED FLUSHING VELOCITY. | 5/99 | SP | DW |
| 2 | ADDED BLOW-OFF ASSEMBLY BEFORE AND AFTER FIRST FLUSHING OF MAIN LINE | 4/01 | IDF | |
| No. | Description | Date | By | Appr |
| REVISION | | | | |

CITY OF SALEM
DEPARTMENT OF PUBLIC WORKS

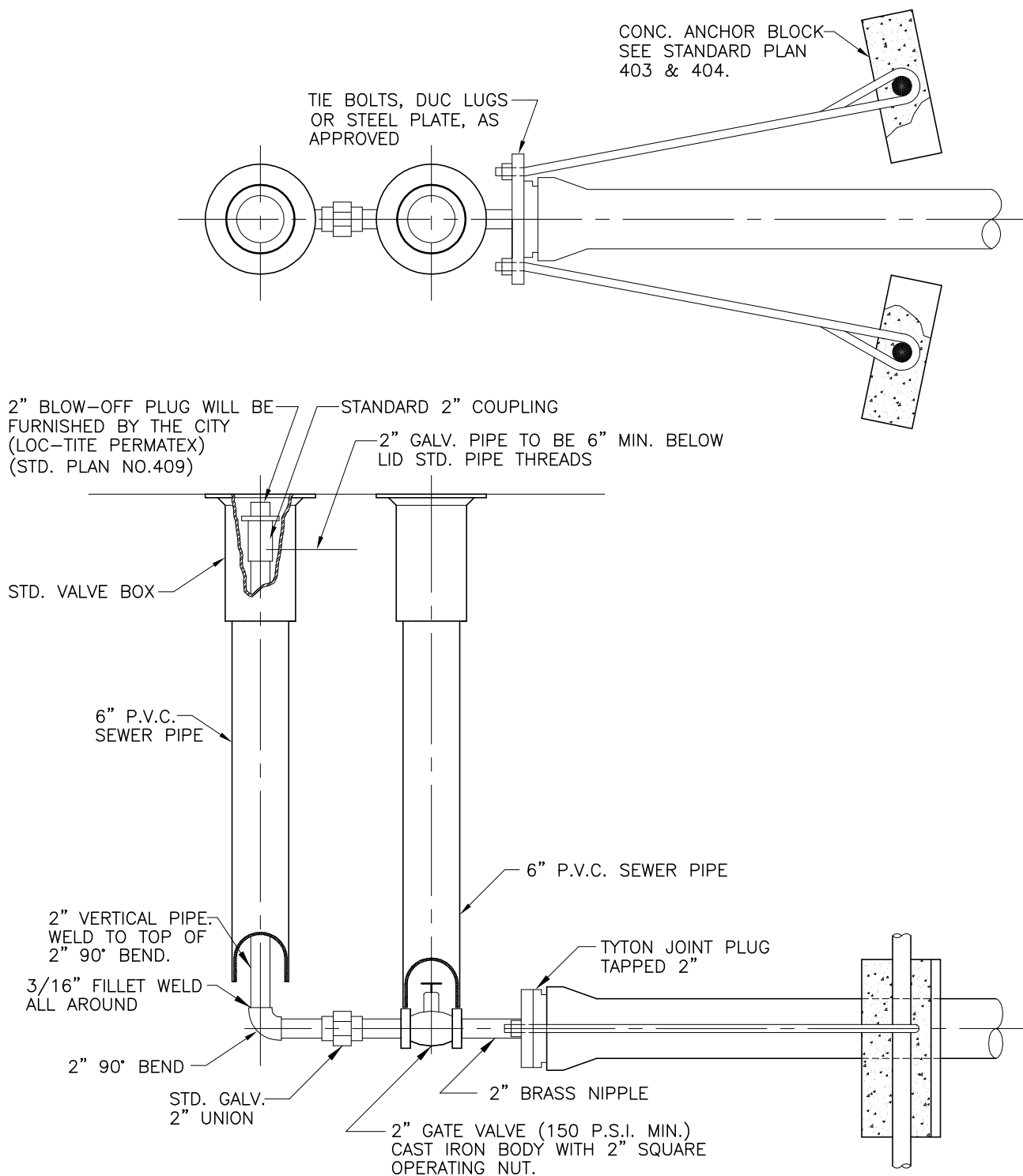
STANDARD PLAN

BLOWOFF WITH IN LINE VALVE
FOR 10" DIA. PIPE & LARGER

DRAWN BY GS, SP

CHECKED BY D.W.

NO. 406



NOTES:

1. 8" MAXIMUM PIPE SIZE FOR 2" BLOW-OFF.

Approved *Karl O. Schuster*
City Engineer

9-15-99
Date

CITY OF SALEM
DEPARTMENT OF PUBLIC WORKS

STANDARD PLAN
BLOWOFF WITH
PLUGGED END

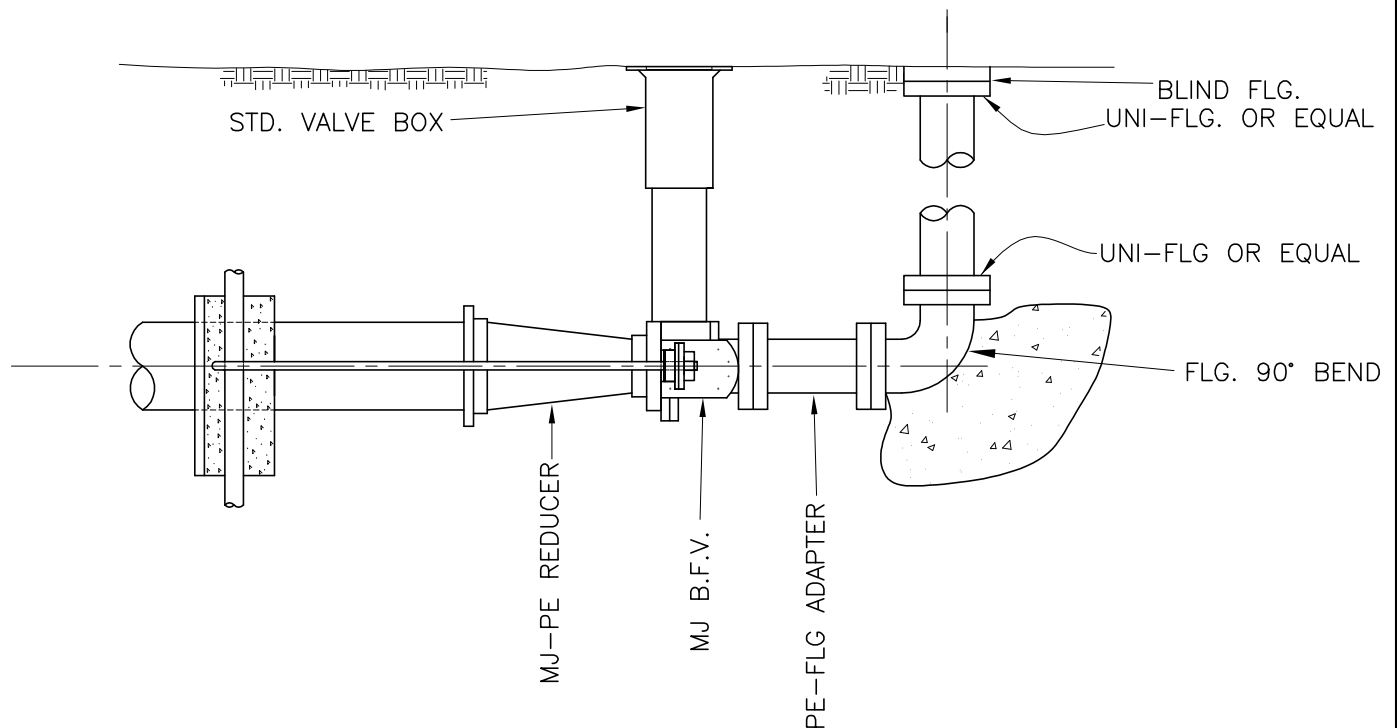
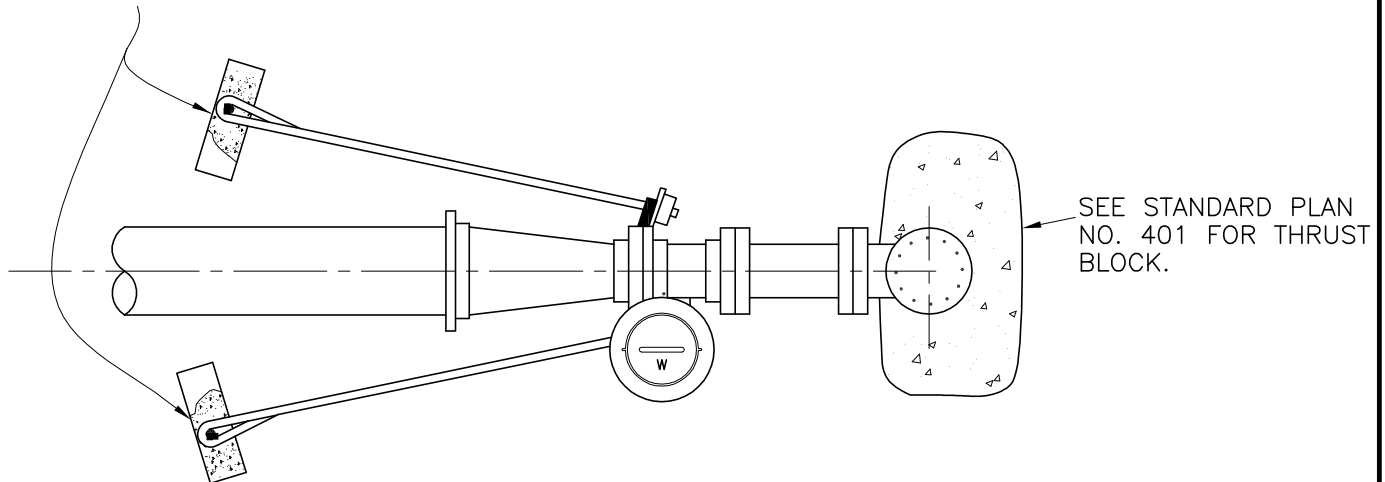
| No. | Description | Date | By | Appr |
|----------|---------------------|-------|-----|------|
| 1 | CONVERT TO CAD DWG. | 12/98 | IDF | KDG |
| REVISION | | | | |

DRAWN BY S.G.P.

CHECKED BY D.W.

NO.407

TIED BACK THRUST BLOCKS PER
STANDARD PLANS 403 & 404.



MINIMUM SIZES OF BLOWOFFS
SEE NOTE 1

| MAIN SIZE | RED. | B.O. FTG. & PIPE SIZE & VALVE, TYPE |
|-----------|---------|---|
| 10" | 10"x4" | 4" G.V. |
| 12" & 14" | x6" | 6" G.V. |
| 16" & 18" | x8" | 8" B.F.V. |
| 20" | 20"x10" | 10" B.F.V. |
| 24" | 24"x12" | 12" B.F.V. |

NOTES:

1. SIZE OF B.O. & VALVE SHALL BE USED IN ABSENCE OF MORE SPECIFIC INFORMATION ON PLANS.
2. FITTINGS MAY BE SUBSTITUTED AS APPROVED BY THE ENGINEER.

Approved Karl O. Guter
City Engineer

9-15-99
Date

| 1 | SUGGEST ENGINEER DESIGN REDUCER, VALVE & B.O. SIZES TO ACHIEVE REQUIRED FLUSHING VELOCITY. | 5/99 | SP | DW |
|-----|---|------|----|------|
| No. | Description | Date | By | Appr |

REVISION

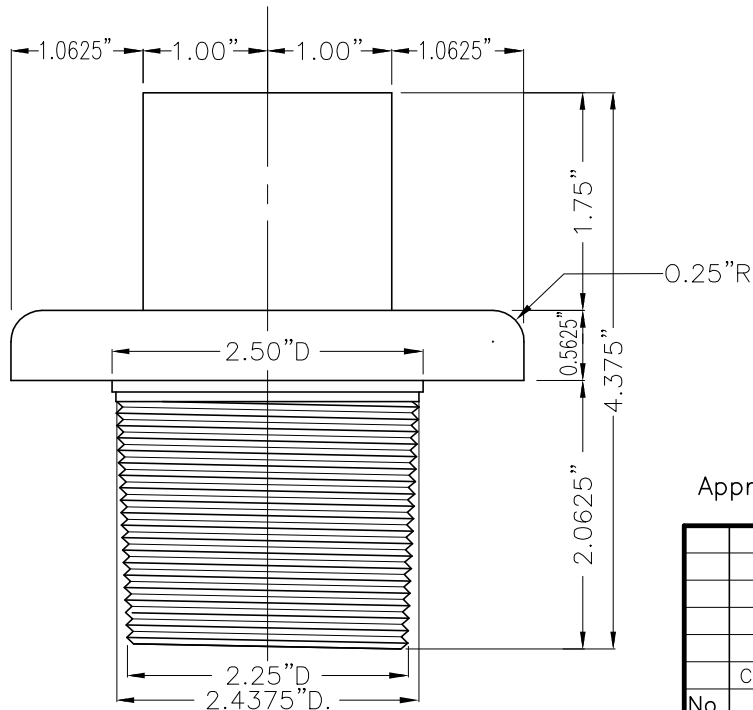
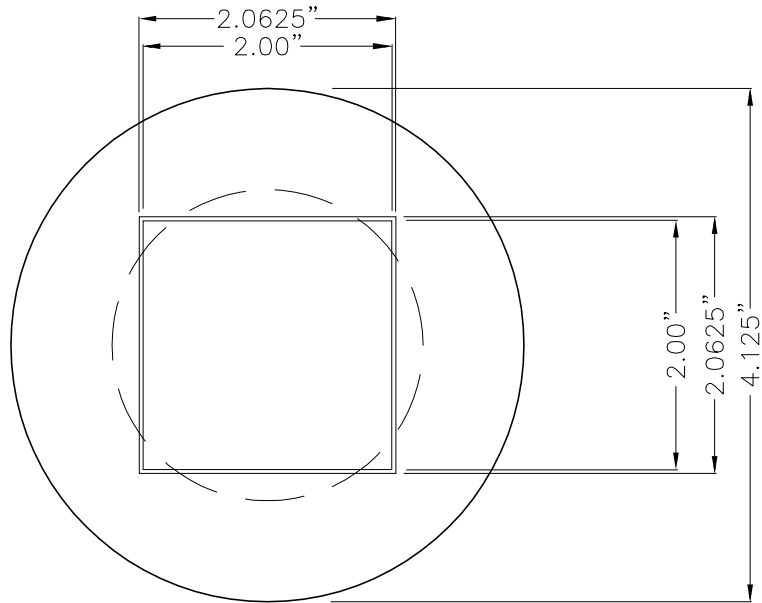
CITY OF SALEM
DEPARTMENT OF PUBLIC WORKS

STANDARD PLAN
BLOWOFF WITH REDUCED SIZE VALVE
FOR 10" DIA. PIPE & LARGER

DRAWN BY GS, SP

CHECKED BY D.W.

NO.408



NOTES:

1. MATERIAL SHALL BE A.S.T.M. A-48 GRAY CAST IRON, CLASS 30.
2. APPROX. WEIGHT 5 LBS 15 OZ.
3. THREADS SHALL BE STANDARD PIPE THREAD TO MATCH 2" I.D. COUPLING.
4. REFER TO STD. DRAWING NOS. 405 AND 407 FOR LOCATION OF PLUG IN BLOW-OFF.

Approved

Karl O. Guter
City Engineer

9-15-99

Date

| No. | Description | Date | By | Appr |
|-----|---------------------|------|----|------|
| | CONVERT TO CAD DWG. | 1/98 | | |
| | REVISION | | | |

CITY OF SALEM
DEPARTMENT OF PUBLIC WORKS

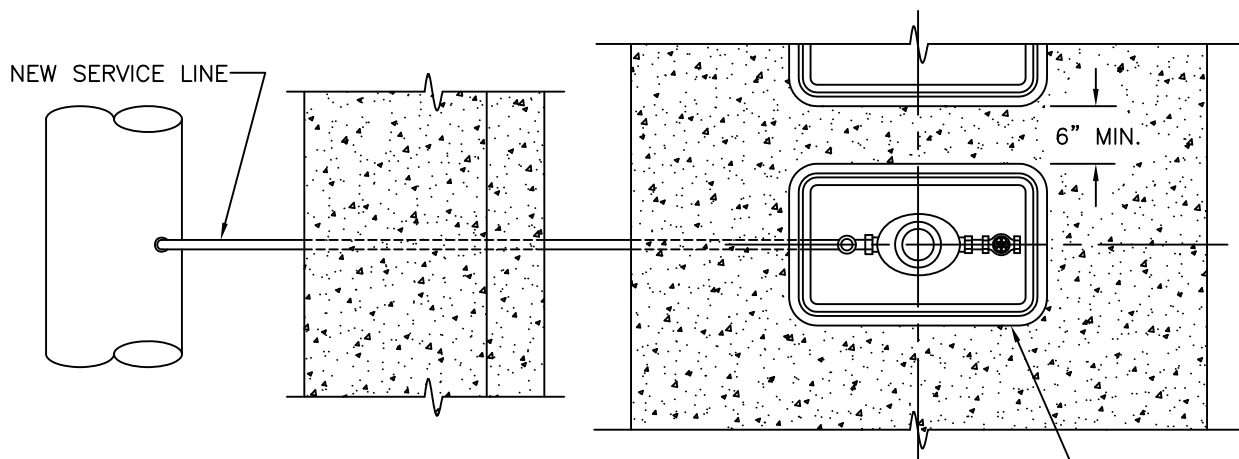
STANDARD PLAN

2" BLOW-OFF PLUG

DRAWN BY GS

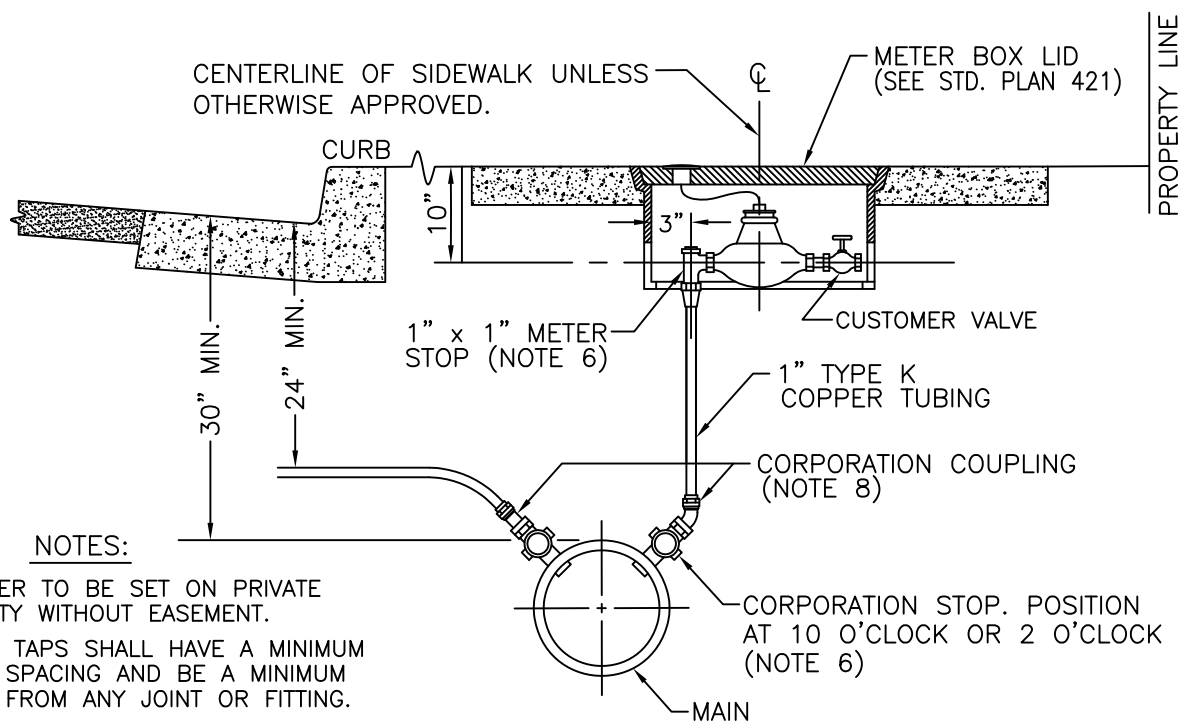
CHECKED BY D.W.

NO.409



13" x 24" x 12" METER BOX CENTERED IN SIDEWALK
UNLESS OTHERWISE APPROVED (NOTE 6 & 7)

PLAN



NOTES:

1. NO METER TO BE SET ON PRIVATE PROPERTY WITHOUT EASEMENT.
2. SERVICE TAPS SHALL HAVE A MINIMUM OF 18" SPACING AND BE A MINIMUM OF 18" FROM ANY JOINT OR FITTING.
3. METER PRV (IF REQUIRED) AND CUSTOMER VALVE TO BE INSTALLED BY CITY FORCES.
4. MAINTAIN MINIMUM 6" SPACING BETWEEN ANY TWO METER BOXES.
5. ALL NEW SERVICE TAPS ON EXISTING MAINS MUST BE DONE BY CITY FORCES.
6. SEE SCS 504 FOR SPECIFICATIONS.
7. WHEN P.R.V. IS SPECIFIED USE 17" x 30" x 12" METER BOX.
8. CORPORATION COUPLING IS A REQUIRED FITTING. USE 0°-90° BEND AS SITUATION REQUIRES. SEE SCS 504 FOR SPECIFICATIONS.

Approved: _____

Karl O. Spitzer
City Engineer

3-1-02

Date

| REVISION | DESCRIPTION |
|----------|------------------------------------|
| 1 | ADDED CORPORATION COUPLING |
| 2 | CHANGED METER BOX SPEC. |
| 3 | 1" METER STOP ONLY. ADD PLAN VIEW. |
| 4 | ADDED CUSTOMER VALVE |

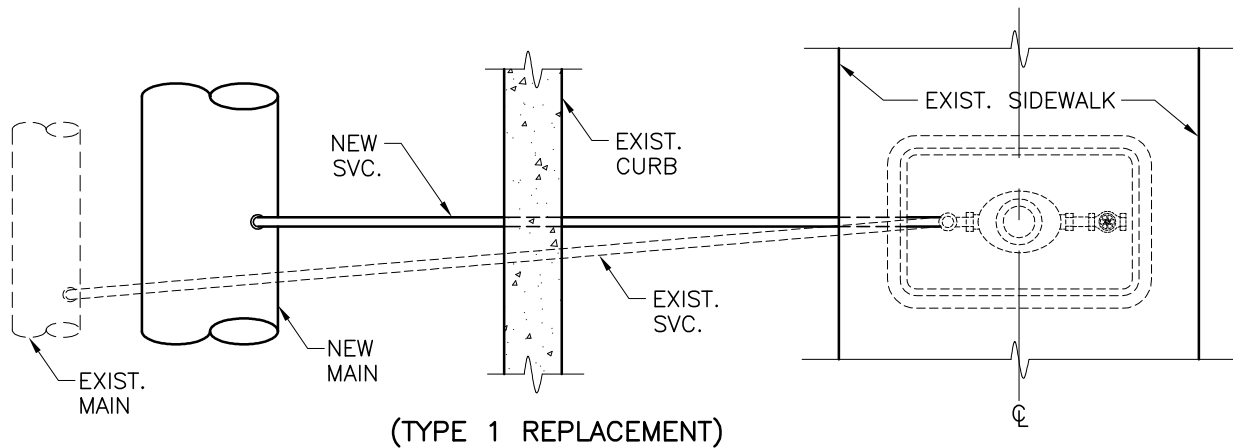
CITY OF SALEM
DEPARTMENT OF PUBLIC WORKS

STANDARD PLAN
1" WATER SERVICE INSTALLATION

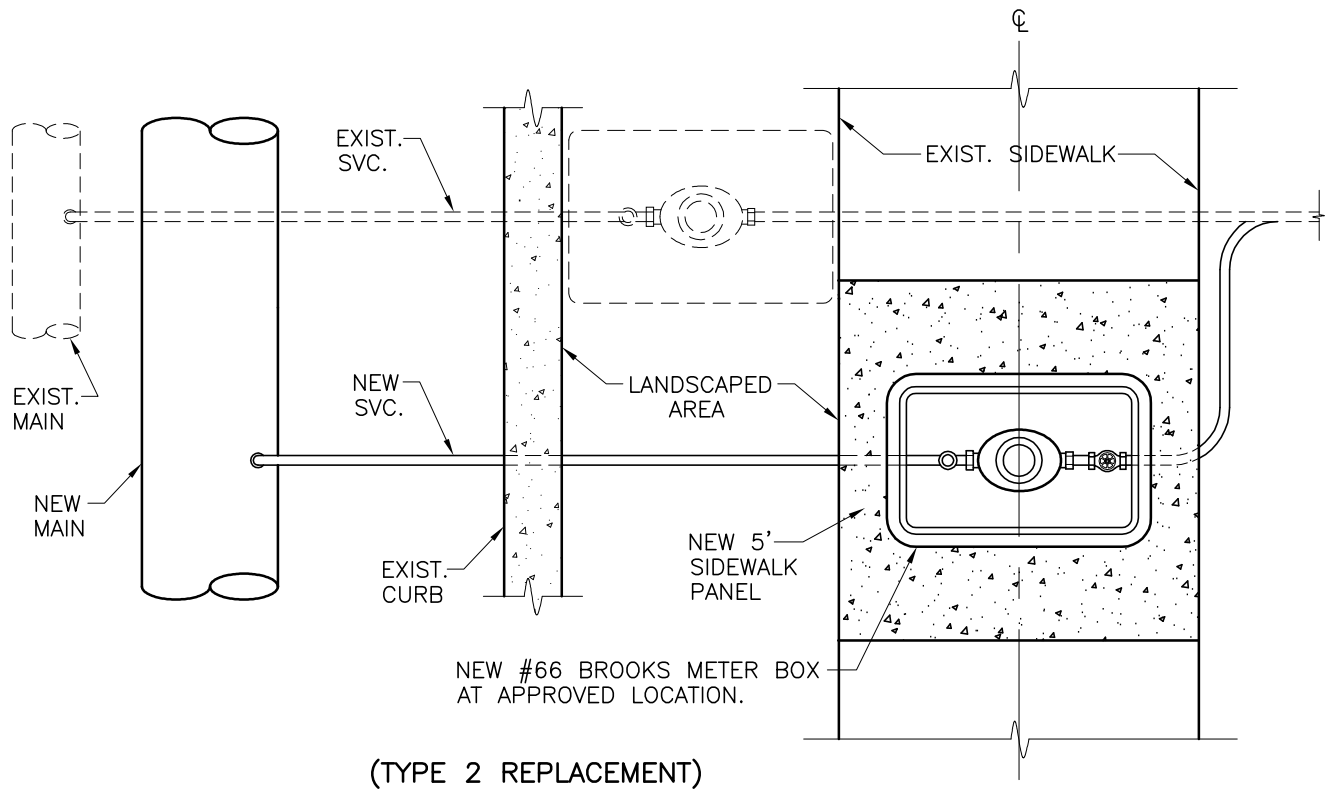
DRAWN BY I.D.F.

CHECKED BY D.W.

NO. 410



- NOTES: 1. USE TYPE 1 WHEN EXISTING METER IS LOCATED WITHIN EXISTING SIDEWALK AND WATER METER/METER BOX IS NOT DESIGNATED TO BE REPLACED.
2. NEW LOCK-WING ANGLE METER STOP SHALL BE SIZED TO MATCH EXIST. METER.
3. NEW SERVICE LINE CONNECTION AT EXISTING METER SHALL BE MADE ONLY BY A LICENSED PLUMBER.
4. SEE STD. PLAN 410 FOR ADDITIONAL INFORMATION AND NOTES.



- NOTES: 1. USE TYPE 2 WHEN EXISTING METER IS NOT LOCATED IN AN EXISTING SIDEWALK WITHIN RIGHT-OF-WAY.
2. NEW METER AND CUSTOMER VALVE TO BE INSTALLED BY CITY FORCES.
3. CONTRACTOR TO REMOVE AND REPLACE SIDEWALK PANEL.
4. REPLUMBING OF SERVICE ON CUSTOMER SIDE OF METER SHALL BE DONE IN ACCORDANCE WITH UNIFORM PLUMBING CODE.
5. SEE STD. PLAN 410 FOR ADDITIONAL INFORMATION AND NOTES.

Approved: Karl O. Gruber
City Engineer

9-15-99
Date

| REVISION | DESCRIPTION |
|----------|-------------|
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CITY OF SALEM
DEPARTMENT OF PUBLIC WORKS

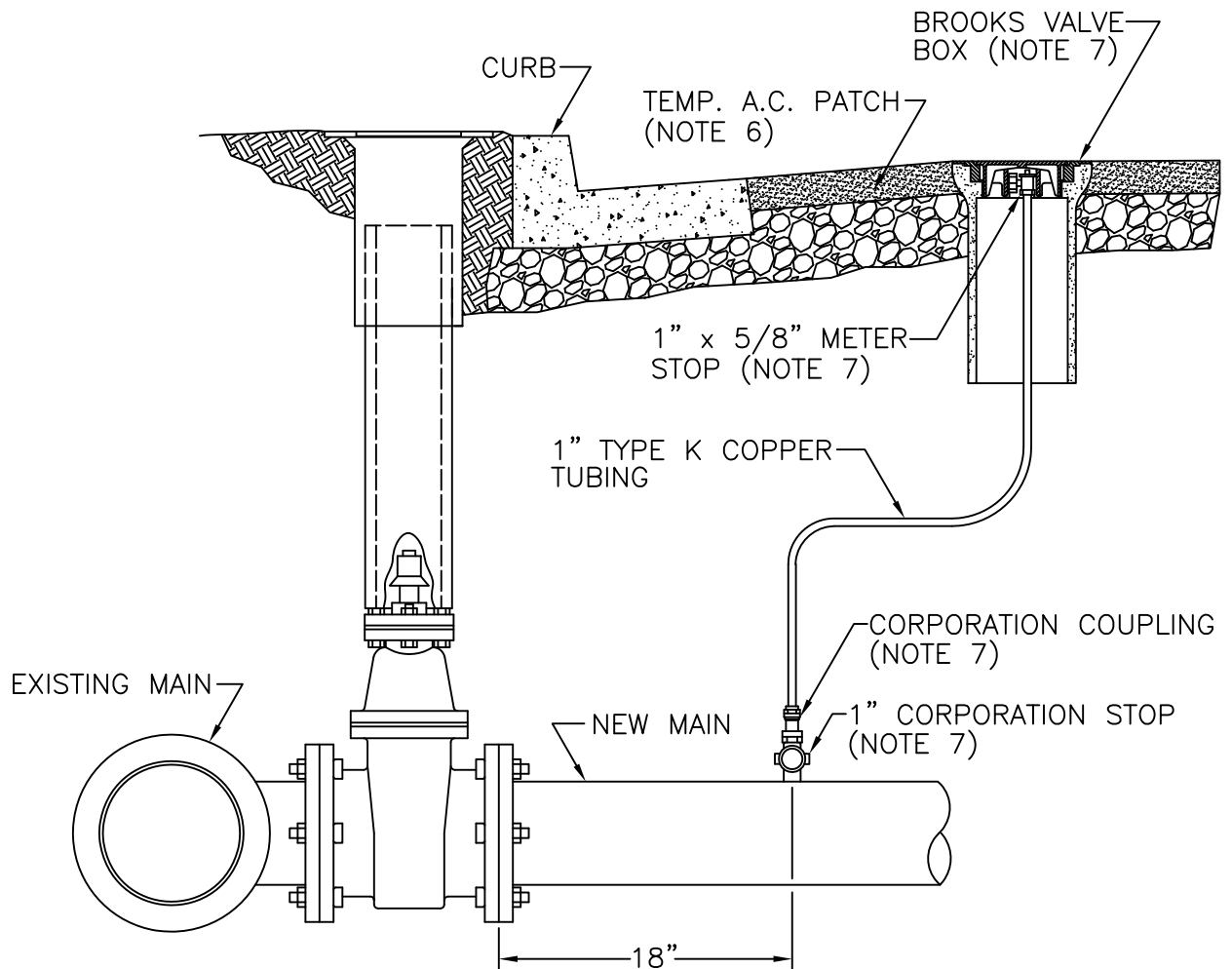
STANDARD PLAN

1" WATER SERVICE REPLACEMENT

DRAWN BY I.D.F.

CHECKED BY D.W.

NO.411



NOTES:

1. VALVE BOX OVER 1" CHLORINE LINE DOES NOT NEED TO BE INSTALLED IF CHLORINE LINE IS BEHIND THE CURB. VALVEBOX IS TO BE INSTALLED ONLY WHEN CHLORINE LINE IS IN AREA COVERED BY TRAFFIC.
2. CHLORINE LINE PLACED IN AN AREA NOT COVERED BY TRAFFIC WILL BE 6" ABOVE NATURAL GROUND LEVEL.
3. DISTANCE FROM GATE VALVE TO CHLORINE TAP WILL BE 18".
4. CHLORINATION PROCESS WILL BE CONDUCTED BY CITY FORCES ONLY, IN ACCORDANCE WITH APPROVED SPECIFICATIONS.
5. CITY WILL REMOVE CHLORINATION ASSEMBLY AFTER RECEIVING NOTICE OF NEGATIVE BACTERIOLOGICAL TEST. CONTRACTOR TO PROVIDE EXCAVATION, BACKFILL, AND FINAL SURFACE RESTORATION.
6. TEMPORARY ASPHALT SURFACE REQUIRED IN AREAS COVERED BY TRAFFIC.
7. SEE SCS DIVISION 5 FOR SPECIFICATIONS.

Approved Karl O. Spitzer 3-1-02
City Engineer Date

CITY OF SALEM
DEPARTMENT OF PUBLIC WORKS

STANDARD PLAN
MAIN LINE CHLORINATION ASSEMBLY

| 6 | TEMPORARY A.C. REQUIRED | 12-14-01 | I.D.F. | |
|-----|--|----------|--------|------|
| 5 | CHANGED TO BROOKS BOX IN PAVED AREA | 4-18-01 | I.D.F. | |
| 4 | REVISED NOTES AND ADDED LABELS | 2-23-01 | I.D.F. | |
| 3 | REMOVED "MIN." FROM 18-INCH DIMENSION | 2-23-01 | I.D.F. | |
| | CHLORINE LINE CHANGED TO 1-INCH FROM 3/4" | | | |
| | DIST. FROM TAP TO VALVE CHANGED TO 18-INCHES | | | |
| No. | Description | Date | By | Appr |
| | REVISION | | | |

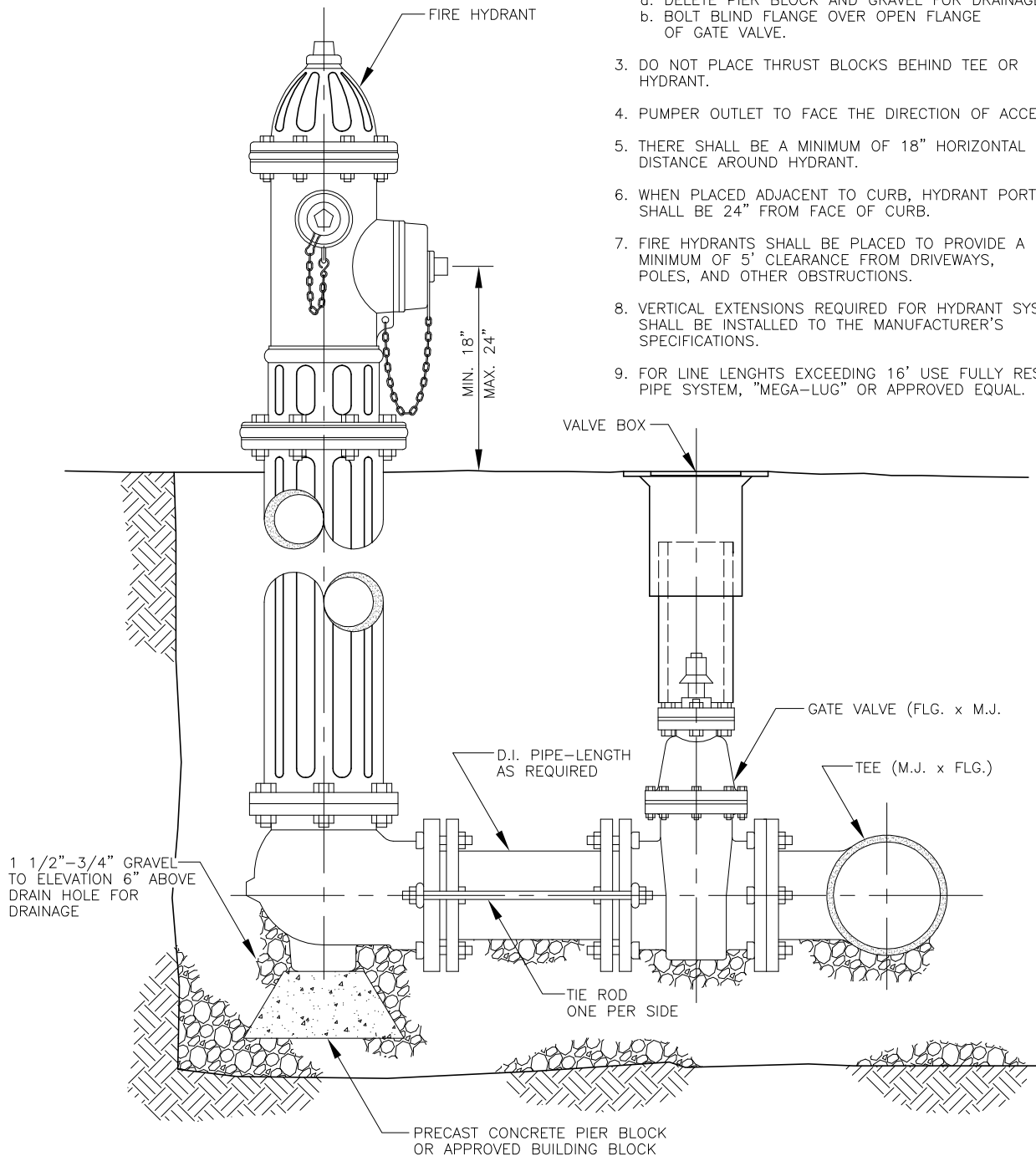
DRAWN BY I.D.F.

CHECKED BY D.W.

NO. 412

NOTES

1. TIE RODS TO BE 5/8" A307 STEEL BOLT STOCK WITH 14,000 PSI TENSILE STRENGTH OR APPROVED EQUAL. ONE TIE ROD PER SIDE.
2. IF HYDRANT IS NOT INSTALLED ON STUB.
 - a. DELETE PIER BLOCK AND GRAVEL FOR DRAINAGE.
 - b. BOLT BLIND FLANGE OVER OPEN FLANGE OF GATE VALVE.
3. DO NOT PLACE THRUST BLOCKS BEHIND TEE OR HYDRANT.
4. PUMPER OUTLET TO FACE THE DIRECTION OF ACCESS.
5. THERE SHALL BE A MINIMUM OF 18" HORIZONTAL DISTANCE AROUND HYDRANT.
6. WHEN PLACED ADJACENT TO CURB, HYDRANT PORT SHALL BE 24" FROM FACE OF CURB.
7. FIRE HYDRANTS SHALL BE PLACED TO PROVIDE A MINIMUM OF 5' CLEARANCE FROM DRIVEWAYS, POLES, AND OTHER OBSTRUCTIONS.
8. VERTICAL EXTENSIONS REQUIRED FOR HYDRANT SYSTEMS SHALL BE INSTALLED TO THE MANUFACTURER'S SPECIFICATIONS.
9. FOR LINE LENGTHS EXCEEDING 16' USE FULLY RESTRAINED PIPE SYSTEM, "MEGA-LUG" OR APPROVED EQUAL.



Approved Karl O. Schuster
City Engineer

1-7-00
Date

CITY OF SALEM
DEPARTMENT OF PUBLIC WORKS

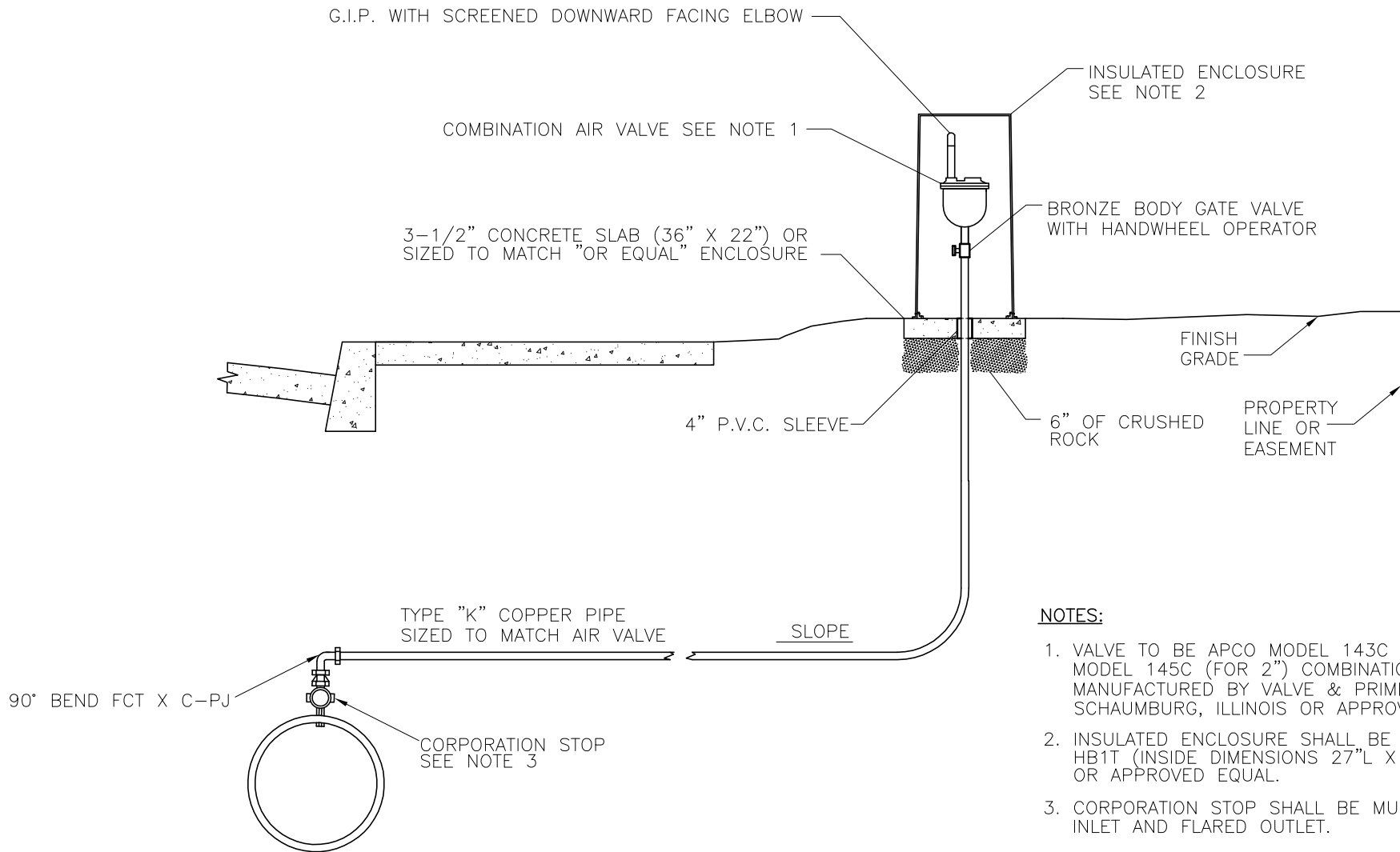
STANDARD PLAN
FIRE HYDRANT INSTALLATION

| No. | Description | Date | By | Appr |
|----------|---------------------|-------|--------|------|
| 2 | REVISE VALVE BOX | 1-00 | I.D.F. | KDG |
| 1 | CONVERT TO CAD DWG. | 12-98 | I.D.F. | KDG |
| REVISION | | | | |

DRAWN BY IDF

CHECKED BY D.W.

NO.413



NOTES:

1. VALVE TO BE APCO MODEL 143C (FOR 1") OR MODEL 145C (FOR 2") COMBINATION AIR VALVE AS MANUFACTURED BY VALVE & PRIMER CORPORATION SCHAUMBURG, ILLINOIS OR APPROVED EQUAL.
2. INSULATED ENCLOSURE SHALL BE HOT BOX MODEL HB1T (INSIDE DIMENSIONS 27"L X 13"W X 35"H) OR APPROVED EQUAL.
3. CORPORATION STOP SHALL BE MUELLER (CC) MALE INLET AND FLARED OUTLET.

Approved Karl O. Schuster 9-15-99
City Engineer Date

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| | | | | |
| No. | ALL NEW DESIGN | Date | By | Appr |
| | REVISION | | | |

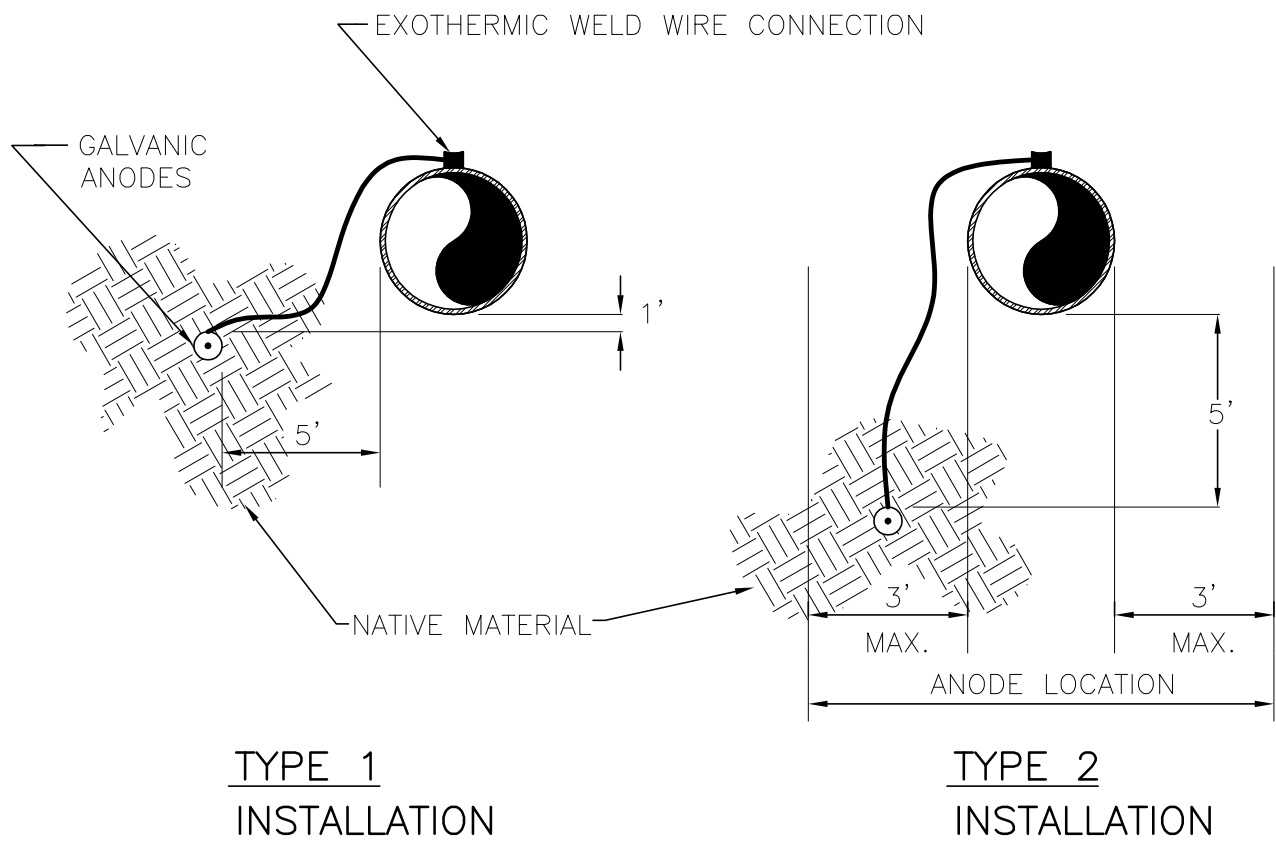
CITY OF SALEM
DEPARTMENT OF PUBLIC WORKS

STANDARD PLAN
COMBINATION AIR-RELEASE AND
VALVE ASSEMBLY 2" AND SMALLER

DRAWN BY S.G.P.

CHECKED BY D.W.

NO.414



NOTES:

1. PLACE GALVANIC ANODE IN CLEAN NATIVE BACKFILL AND COMPACT TO 95% DENSITY TO 1 FT. ABOVE ANODE.
2. FOR ANODES DISTRIBUTED ALONG THE PIPELINE, ALTERNATE PERPENDICULAR OFFSET FROM ONE SIDE OF PIPE TO THE OTHER.
3. ANODES CAN BE PLACED UPRIGHT OR HORIZONTAL. HORIZONTAL SHOWN.
4. INSULATING JOINTS, JOINT BONDS, TEST STATIONS, ETC. WILL BE AS DETAILED BY THE ENGINEER.

Approved Karl O. Gutzler 9-15-99
City Engineer Date

CITY OF SALEM
DEPARTMENT OF PUBLIC WORKS

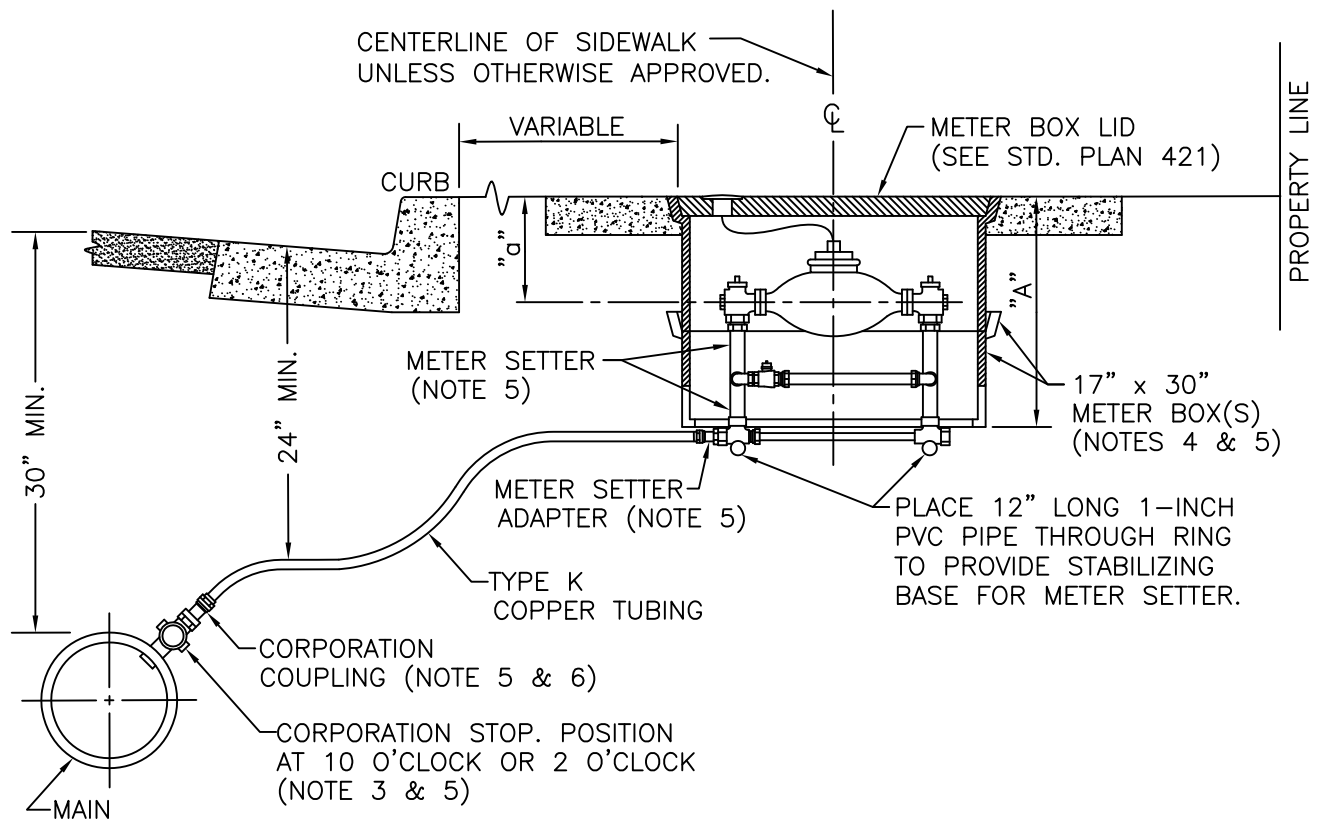
STANDARD PLAN
CATHODIC PROTECTION DETAIL

| | | | | |
|-----|-------------|------|----|------|
| No. | Description | Date | By | Appr |
| | REVISION | | | |
| | | | | |
| | | | | |
| | | | | |

DRAWN BY GS
CHECKED BY D.W.

NO.418

| SVC. SIZE | DIM "a" | DIM "A" |
|-----------|---------|----------|
| 1 1/2" | 10" | 18" |
| 2" | 15" | 24"(MIN) |



NOTES

1. NO METER ON PRIVATE PROPERTY WITHOUT EASEMENT.
2. METER TO BE INSTALLED BY CITY FORCES.
3. SERVICE TAPS TO HAVE A MINIMUM OF 18" SPACING AND BE A MINIMUM OF 18" FROM ANY JOINT OR FITTING.
4. TWO STACKED BOXES ARE ACCEPTABLE. IF TWO BOXES ARE STACKED, THE UPPER BOX SHALL NOT HAVE PIPE ENTRY PORTS CUT OUT.
5. SEE SCS 504 FOR SPECIFICATIONS.
6. CORPORATION COUPLING IS A REQUIRED FITTING. USE 0°-90° BEND AS FIELD CONDITIONS REQUIRE.

Approved

Karl O. Grueter
City Engineer

3-1-02
Date

CITY OF SALEM
DEPARTMENT OF PUBLIC WORKS

STANDARD PLAN
1 1/2" & 2" DOMESTIC
WATER SERVICE INSTALLATION

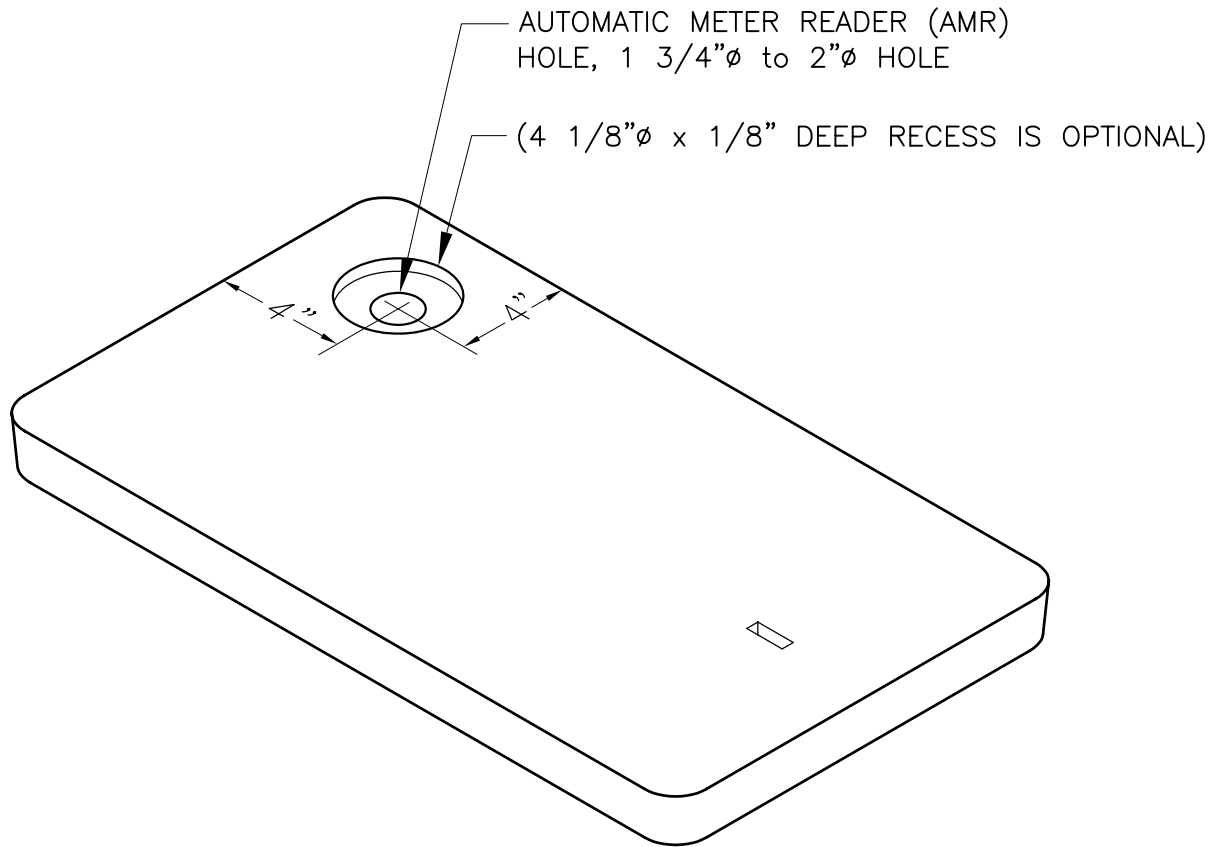
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| | | | | |
| | ADDED CORP. COUPLING & METER SETTER ADAPTER | 1-02 | I.D.F. | |
| | CHANGED METER BOX/LID SPECIFICATION | 1-02 | I.D.F. | |
| No. | Description | Date | By | Appr |
| REVISION | | | | |

DRAWN BY I.D.F.

CHECKED BY D.W.

NO. 419

NO.420



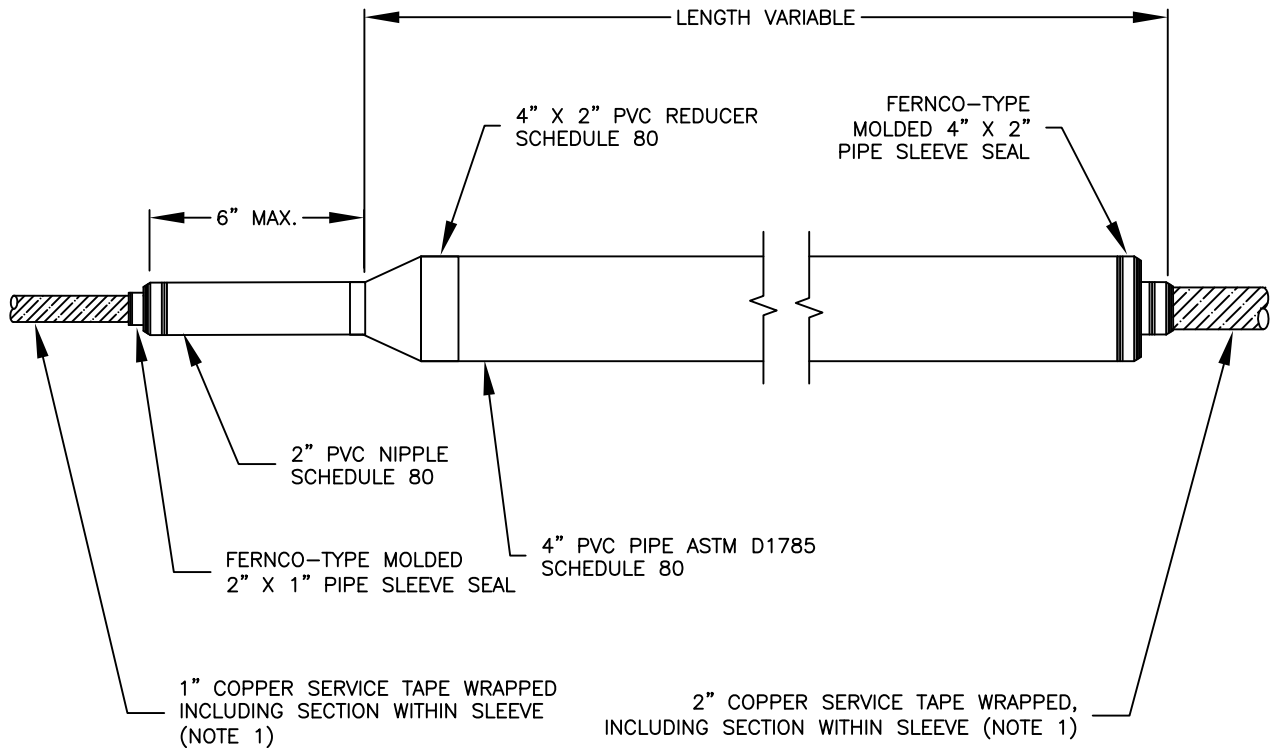
NOTES

1. SEE SCS 504 FOR LID SPECIFICATIONS.

Approved: Karl O. Guehrer 5-18-04
City Engineer Date

| | |
|----------------------|------|
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| | |
| | |
| RECESS MADE OPTIONAL | 5/04 |
| REVISION DESCRIPTION | |

| | |
|---|---------|
| CITY OF SALEM DEPARTMENT OF PUBLIC WORKS | |
| STANDARD PLAN AUTOMATIC METER READER LID | |
| LAST REV. BY: DTN | NO. 421 |
| CHECKED BY: DEW | |



NOTES:

1. COPPER PIPE SHALL BE WRAPPED WITH 20mil. PVC TAPE, 50% OVERLAP, 40 mil. TOTAL, INSIDE AND OUTSIDE PVC SLEEVE
2. SLEEVES SHALL BE DRY AND MOISTURE FREE BEFORE SEALING

**CITY OF SALEM
DEPARTMENT OF PUBLIC WORKS**

**STANDARD PLAN
DOMESTIC WATER SERVICE SLEEVE**

| | | | | | |
|----------|---|---------|------------|-----|---------|
| APPROVED |  | 1/01/14 | DRAWN BY | KAK | 12/2013 |
| | | DATE | CHECKED BY | KR | 12/2013 |

NO. 422