# SANITARY SEWER STANDARD DETAIL DRAWINGS

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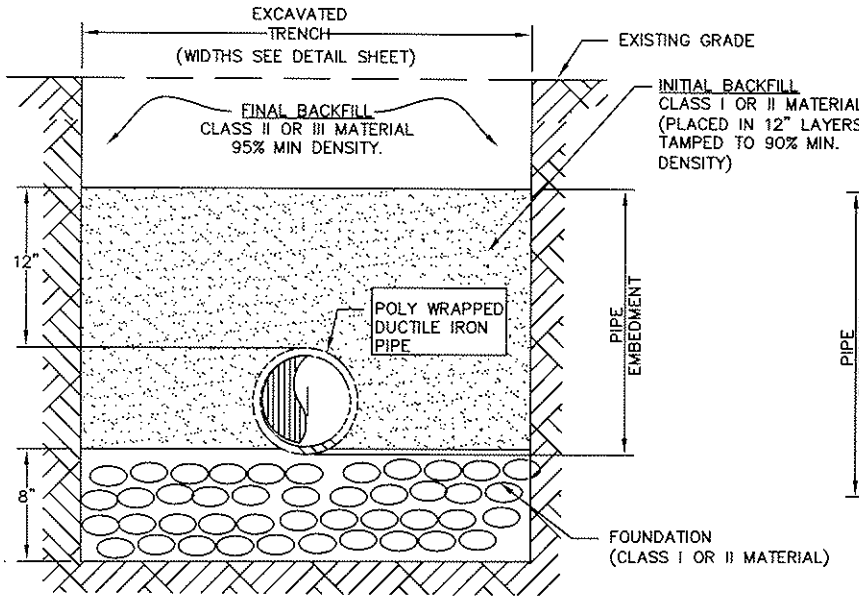
| | | TABLE OF CONTENTS | SCALE: N.T.S. |
| | | | DRAWING NO. INDEX |




EMBEDMENT DETAIL FOR A D.I. GRAVITY SEWER PIPE *

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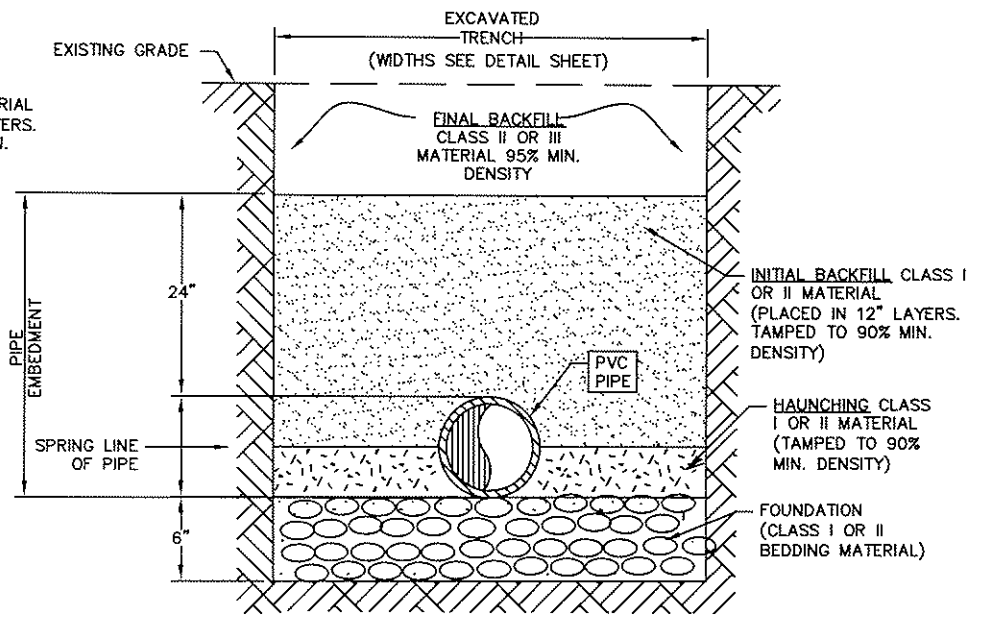


EMBEDMENT DETAIL FOR PVC SEWER PIPE *

N.T.S.

* UNLESS OTHERWISE SPECIFIED BY GEOTECHNICAL REPORT

GENERAL NOTES FOR COMPACTION

1. WHEN USING MECHANICAL COMPACTORS, AVOID CONTACT WITH PIPE. USE SMALL MECHANICAL COMPACTORS WHEN COMPACTING OVER PIPE CROWN AND MAINTAIN 6" MINIMUM COVER ABOVE PIPE. COMPACTION WITH BACK-HOE BUCKET, OR OTHER EQUIPMENT NOT INTENDED FOR COMPACTION USE, IS NOT ALLOWED.
2. MATERIAL SHALL BE INSTALLED AND COMPACTED IN 12" MAXIMUM LAYERS.
3. FINAL GRADE OF BEDDING SHALL BE LEVELED BY HAND.
4. HAUNCHING SHALL BE WORKED IN AROUND PIPE BY HAND & EVENLY TAMPED TO PROVIDE UNIFORM SUPPORT.
5. EMBEDMENT COMPACTION SHALL BE ACHIEVED BY PLACING AND WORKING IN BY HAND TO INSURE ALL EXCAVATED VOIDS AND HAUNCH AREAS ARE FILLED. HAND TAMP WITH VIBRATORY PLATE COMPACTORS. TO MINIMIZE COMPACTION EFFORT OF CLASS III MATERIAL, MOISTURE CONTENT SHALL BE MAINTAINED NEAR OPTIMUM.
6. LOCALIZED LOADINGS/DIFFERENTIAL SETTLEMENT SHALL BE MINIMIZED AT PIPE CROSSINGS.
7. PLACEMENT OF EMBEDMENT MATERIALS SHALL BE BY METHODS THAT WILL NOT DISTURB OR DAMAGE THE PIPE.
8. WORK IN AND TAMP THE HAUNCHING MATERIAL IN THE AREA BETWEEN THE BEDDING AND UNDERSIDE OF THE PIPE BEFORE PLACING AND COMPACTING THE REMAINDER OF THE EMBEDMENT IN THE PIPE ZONE.
9. USE COMPACTION EQUIPMENT AND TECHNIQUES THAT ARE COMPATIBLE WITH MATERIALS USED AND LOCATION IN THE TRENCH. (SEE NOTE 12)
10. HEAVY COMPACTION EQUIPMENT SHALL NOT BE USED FOR COMPACTION PURPOSES WITHIN THE PIPE EMBEDMENT AND FOUNDATION PIPE ZONES .BEFORE USING HEAVY COMPACTION OR CONSTRUCTION EQUIPMENT DIRECTLY OVER THE PIPE, PLACE SUFFICIENT BACKFILL TO PREVENT DAMAGE, EXCESSIVE DEFLECTIONS, OR OTHER DISTURBANCE OF THE PIPE. SUFFICIENT BACKFILL SHALL BE AS DETERMINED BY THE ENGINEER.
11. THE MINIMUM DEPTH OF COVER TO BE ESTABLISHED BY THE ENGINEER. IN THE ABSENCE OF AN ENGINEER REVIEW, THE FOLLOWING "DEFAULT" COVER RECOMMENDATIONS SHALL BE USED. FOR CLASS I, EMBEDMENT MATERIALS INSTALLED TO THE MINIMUM REQUIRED DENSITIES SHALL PROVIDE COVER OF AT LEAST 24" OR ONE PIPE DIAMETER (WHICHEVER IS GREATER). FOR CLASS II AND III, EMBEDMENT MATERIALS INSTALLED TO THE MINIMUM REQUIRED DENSITIES SHALL PROVIDE COVER OF AT LEAST 36" OR ONE PIPE DIAMETER (WHICHEVER IS GREATER). AT LEAST 48" COVER IS REQUIRED BEFORE USING HEAVY COMPACTION EQUIPMENT.
12. COMPACTION METHODS:
    a. COARSE GRAINED, CLEAN MATERIALS, SUCH AS CRUSHED STONE, GRAVELS AND SAND, ARE MORE READILY COMPACTED USING VIBRATORY EQUIPMENT. VIBRATORY PLATE TAMPERS WORK WELL FOR COARSE GRAINED MATERIALS (CLASS I AND CLASS II).
    b. FINE MATERIALS REQUIRE KNEADING AND IMPACT FORCE ALONG WITH CONTROLLED WATER CONTENT TO ACHIEVE ACCEPTABLE DENSITIES. HAND TAMPERS OR AIR DRIVEN HAND-HELD IMPACT RAMMERS ARE SUITABLE FOR THE FINE GRAINED MATERIALS (CLASS III AND CLASS IV).
    c. IN TRENCHES, SMALL HAND-HELD OR WALK BEHIND COMPACTORS ARE REQUIRED TO PRECLUDE DAMAGE TO THE PIPE AND TO INSURE THOROUGH COMPACTION IN THE CONFINED AREAS AROUND THE PIPE AND ALONG THE TRENCH WALL.

EMBEDMENT MATERIAL & CLASS DESCRIPTIONS:
(SEE SPECIFICATIONS FOR SIEVE ANALYSIS)

CLASS I – ANGULAR,GRADED STONE, OR ROCK, DENSE OR OPEN GRADED W/ LITTLE OR NO FINES (¼" INCH TO 1½" INCH IN SIZE) (ALDOT #57 STONE, B-BASE)

CLASS II – CLEAN COARSE GRAINED SANDS & GRAVELS (1½" INCH MAXIMUM SIZE)

CLASS III – COARSE GRAINED MATERIAL W/FINES. GRAVEL OR SAND MUST COMPRISE MORE THAN 50% OF CLASS III MATERIALS. (1½" INCHES MAX. SIZE)

MAWSS
MOBILE AREA WATER & SEWER SYSTEM

BOARD OF WATER AND SEWER COMMISSIONERS OF THE CITY OF MOBILE, ALABAMA

TYPICAL SANITARY SEWER DETAILS

SEWER PIPE EMBEDMENT DETAILS

DATE ISSUED: 01-11-10
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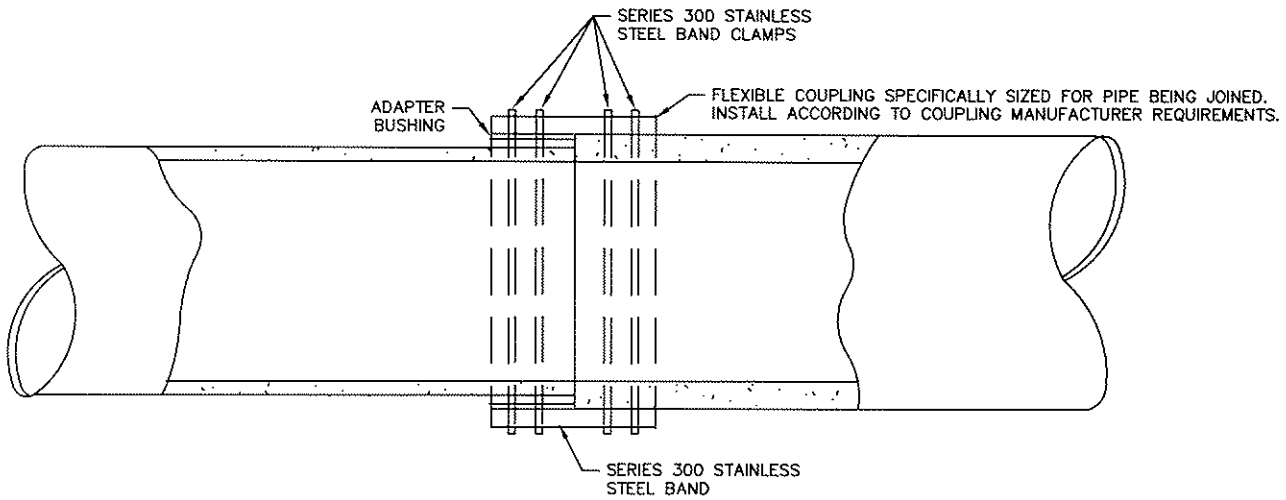
DRAWING NO.: SS-101




JOINT DETAIL FOR COUPLING OF PIPES OF DISSIMILAR O.D. UP TO 16"

N.T.S.

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| | | DISSIMILAR PIPE COUPLINGS DETAIL | SCALE N.T.S. |
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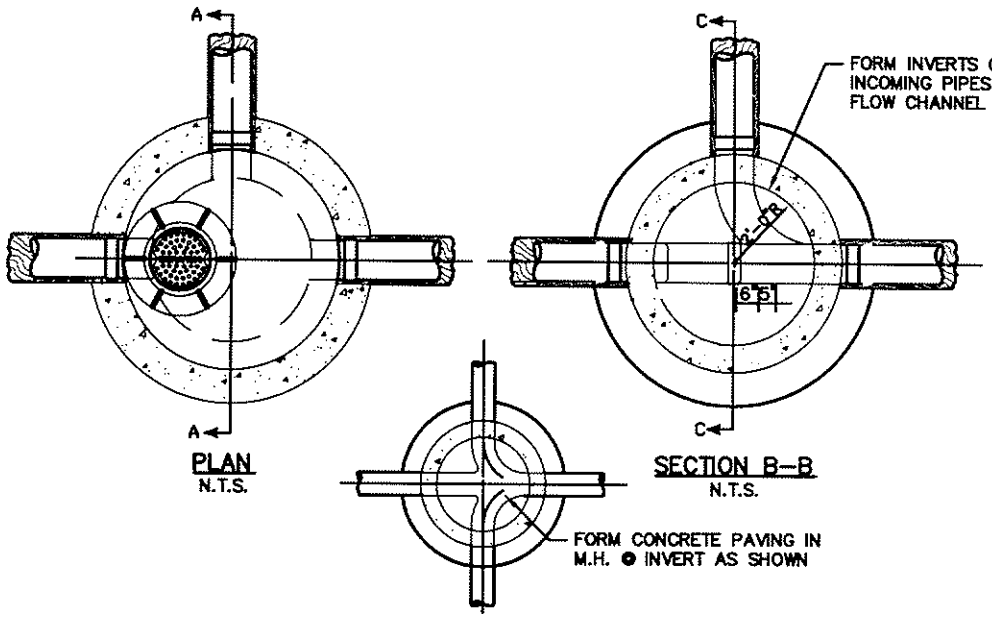
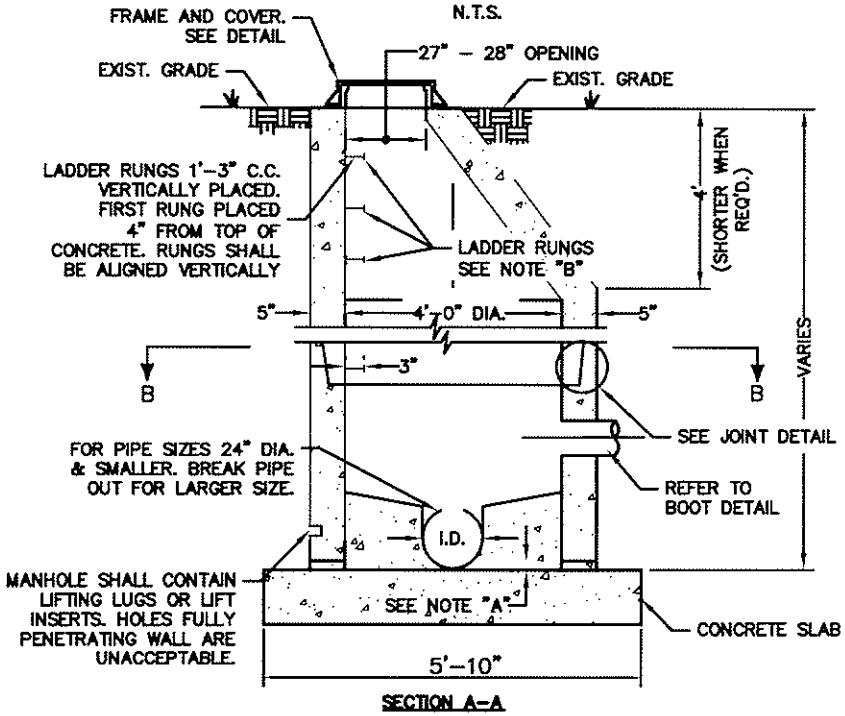
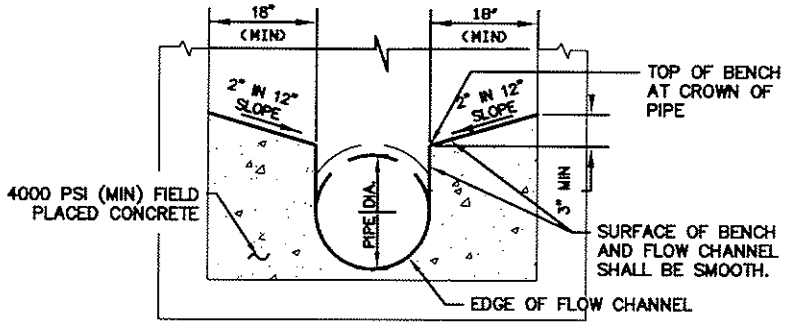



## MANHOLE WITH THREE OR MORE PIPES AT INVERT
N.T.S.




SECTION A–A

## DETAIL OF STANDARD 48" PRECAST MANHOLE FOR PIPE 24" DIA. & SMALLER
N.T.S.




TYPICAL SECTION

## MANHOLE BENCH DETAIL
N.T.S.

NOTE "A"
DISTANCE BETWEEN INVERT OF PIPE AND OUTSIDE OF BELL DETERMINES THE ELEVATION OF TOP OF 8" CONCRETE SLAB.

NOTE "B"
MANHOLE STEPS SHALL BE STEEL RODS ENCASED IN POLYPROPYLENE PLASTIC AND SHALL BE TYPE "PS–1–B" AS MANUFACTURED BY M.A. INDUSTRIES, INC., OR AN APPROVED EQUAL.

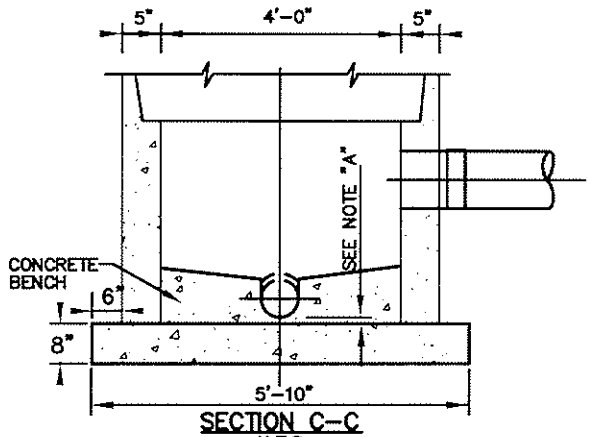
NOTE "C"

ALL PIPES IN OR OUT OF MANHOLE SHALL BE FLUSH WITH INSIDE WALL OF MANHOLE.

NOTE "D"

DEAD END MANHOLE:

FOR DEAD END MANHOLES THE FLOW CHANNEL SHALL EXTEND THE WIDTH OF THE MANHOLE.




## SECTION C–C
N.T.S.

MOBILE AREA WATER & SEWER SYSTEM

BOARD OF WATER AND SEWER COMMISSIONERS OF THE CITY OF MOBILE, ALABAMA

TYPICAL SANITARY SEWER DETAILS

PRECAST MANHOLE DETAILS

DATE ISSUED: 01-11-10
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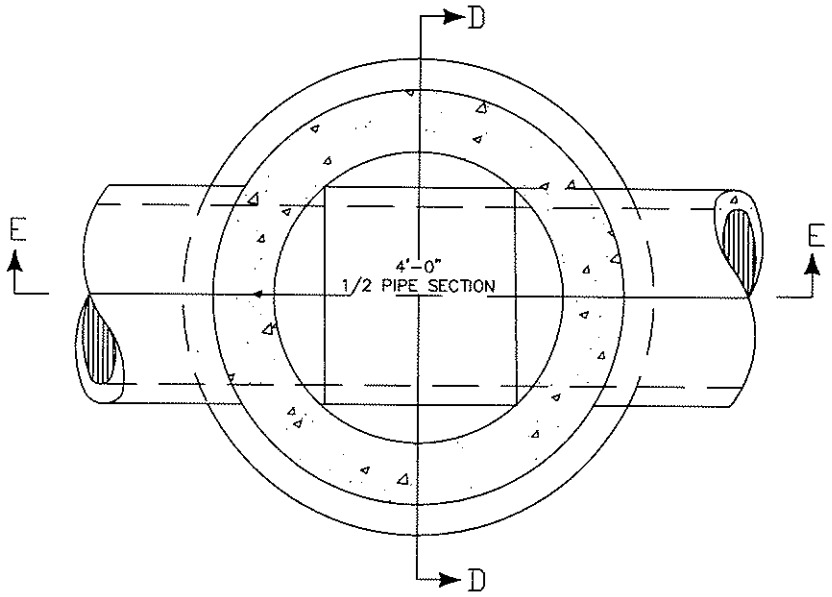
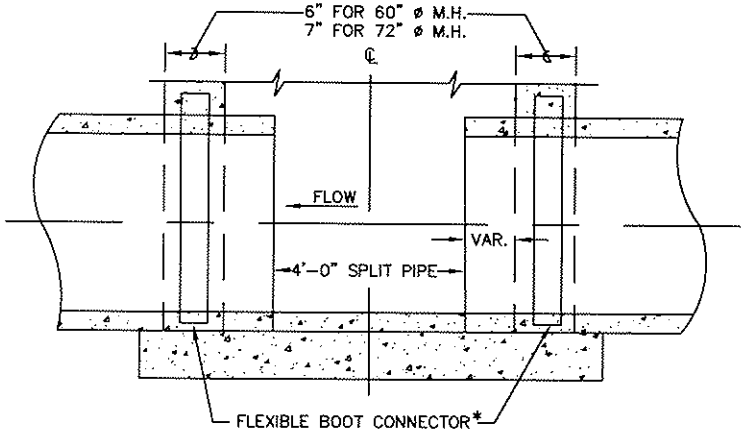
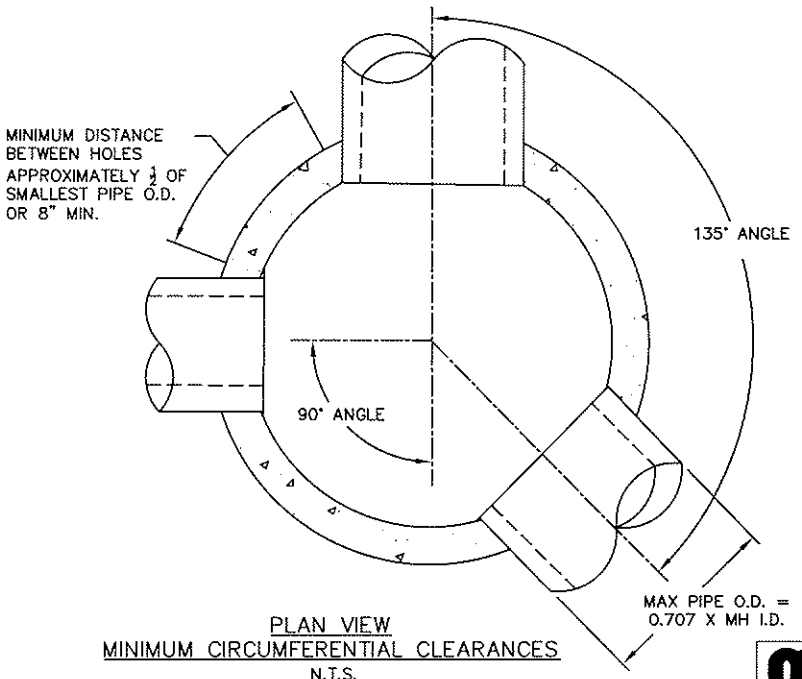



PLAN
N.T.S.

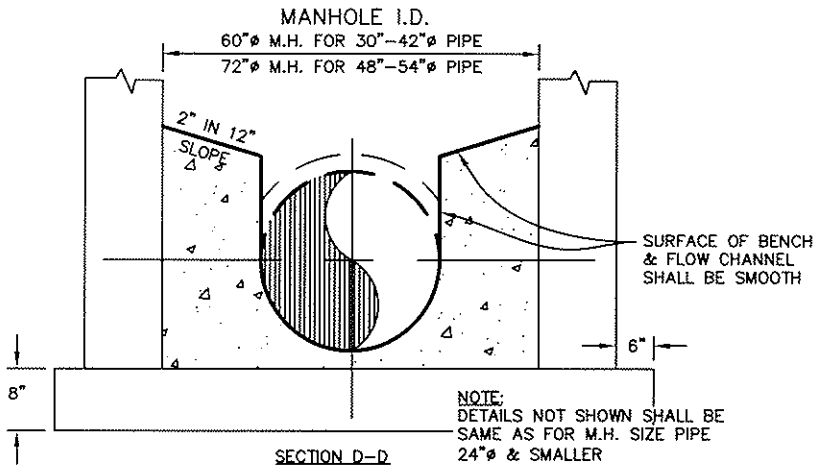



SECTION E-E
N.T.S.

* BOOT MAY BE PRECAST OR FIELD CORED TO MANHOLE.




PLAN VIEW
MINIMUM CIRCUMFERENTIAL CLEARANCES
N.T.S.




DETAIL OF MANHOLE FOR PIPE SIZES LARGER THAN 24" DIA.
N.T.S.

MAWSS
MOBILE AREA WATER & SEWER SYSTEM

BOARD OF WATER AND SEWER COMMISSIONERS OF THE CITY OF MOBILE, ALABAMA

TYPICAL SANITARY SEWER DETAILS

LARGE DIAMETER MANHOLE & MINIMUM CIRCUMFERENTIAL CLEARANCES

DATE ISSUED: 01-11-10
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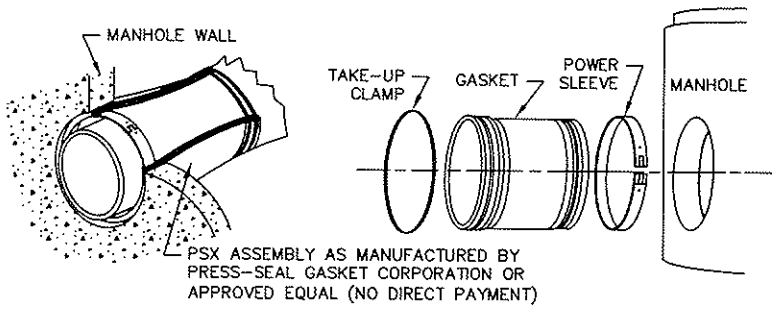
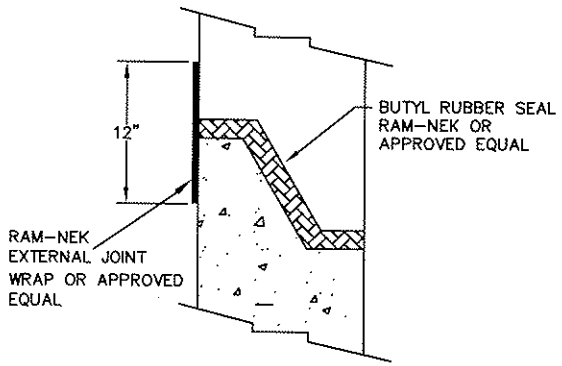
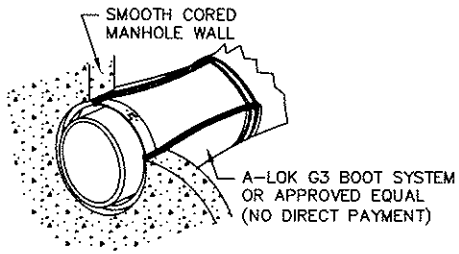



TYPICAL "BOOT" DETAIL
N.T.S.

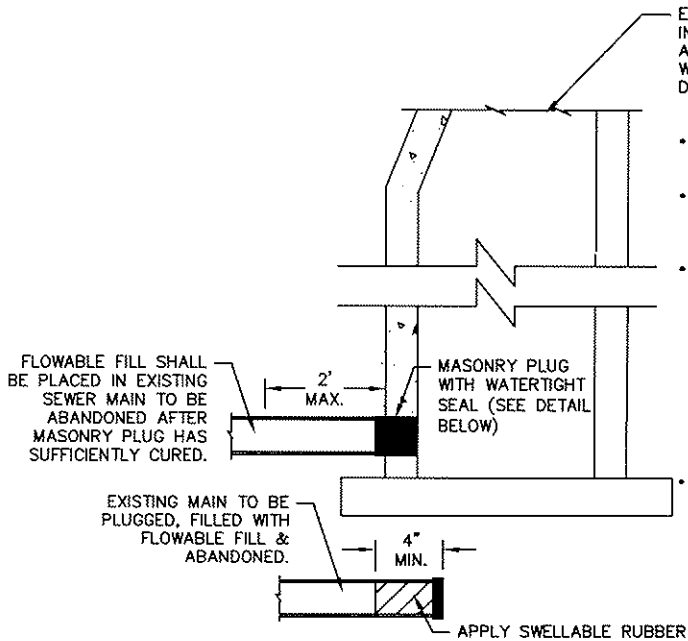



JOINT DETAIL
N.T.S.




TYPICAL "CORE DRILLED" "BOOT" DETAIL
N.T.S.

MANHOLE BOOT MAY BE PRECAST OR FIELD CORED TO MANHOLE




- MINIMUM PLUG WIDTH = 1/2 PIPE SIZE DIAMETER
- SIKASWELL S-2, OR EQUAL, WATERTIGHT SEAL BETWEEN PIPE WALL AND MASONRY PLUG SHALL BE PROVIDED.
- MANHOLES TO BE ABANDONED SHALL BE FILLED WITH FLOWABLE FILL TO THE TOP OF THE MANHOLE CONE AND CASTING SHALL BE REMOVED. AFTER CASTING IS REMOVED AND FLOWABLE FILL OBTAINS ADEQUATE HARDNESS, THE EXCAVATED AREA FROM THE TOP OF THE MANHOLE CONE SECTION TO THE EXISTING SURFACE SHALL BE BACKFILLED AND RESTORED TO MATCH THE EXISTING SURFACE CONDITIONS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
- WHERE THE MANHOLES TO BE ABANDONED ARE LOCATED IN THE ROADWAY, A PERMANENT ASPHALT PATCH SHALL BE INSTALLED, AS SHOWN IN THE PAVING DETAIL SHEETS.

PLUGGING ABANDONED SEWER MAIN AT MANHOLE DETAIL
N.T.S.

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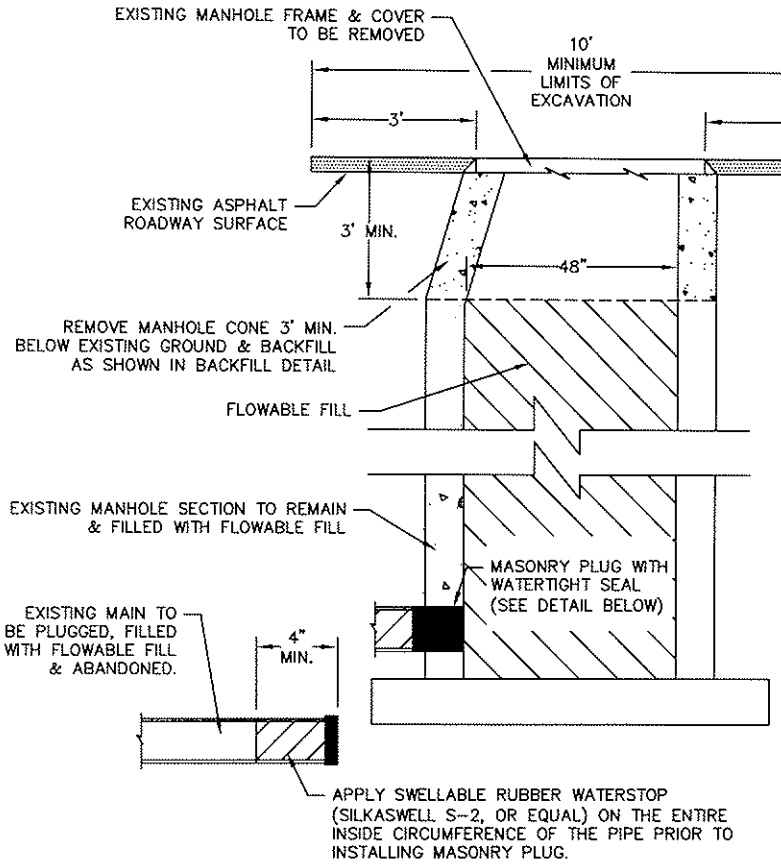
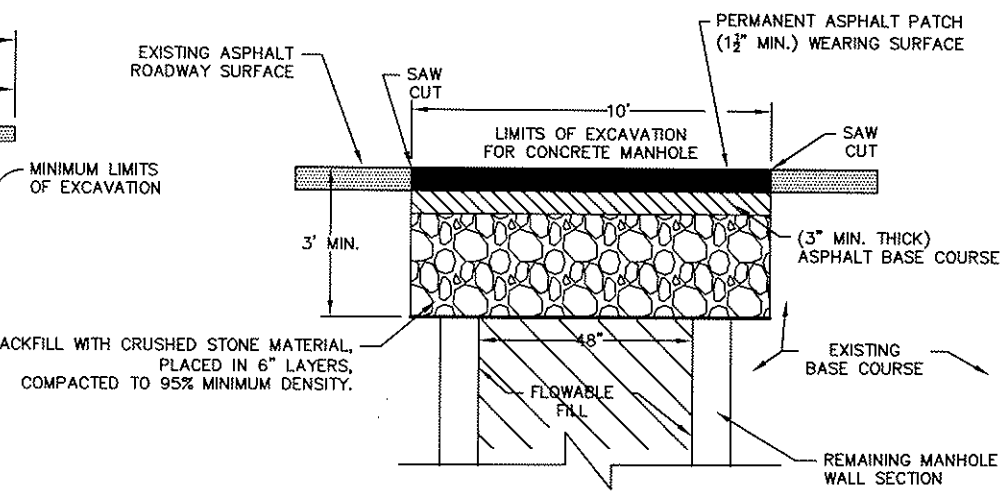
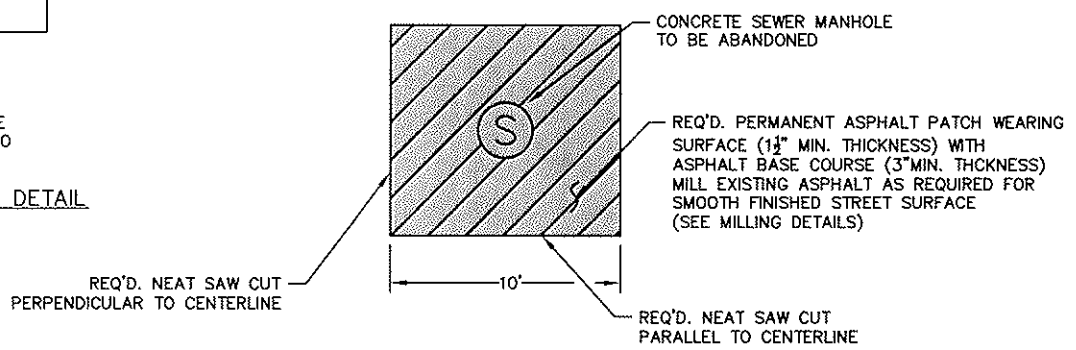
| | | MANHOLE BOOT, MANHOLE JOINT AND PLUGGING ABANDONED SEWER MAIN AT MANHOLE | SCALE N.T.S. |
| | | | DRAWING NO. SS-104A |




PLUG & ABANDON CONCRETE MANHOLE DETAIL
(ASPHALT STREET)
N.T.S.




BACKFILL AT ABANDON CONCRETE MANHOLE DETAIL
N.T.S.




MANHOLE PERMANENT ASPHALT PATCH DETAIL FOR ABANDONED CONCRETE MANHOLE
N.T.S.

- MINIMUM PLUG WIDTH = 1/2 PIPE SIZE DIAMETER
- SIKASWELL S-2, OR EQUAL, WATERTIGHT SEAL BETWEEN PIPE WALL AND MASONRY PLUG SHALL BE PROVIDED.
- THE MANHOLE FRAME, COVER, & TOP 3-FEET OF EXISTING MANHOLE SHALL BE REMOVED. REMAINING MANHOLE SECTION SHALL BE FILLED WITH FLOWABLE FILL.
- AFTER FLOWABLE FILL OBTAINS ADEQUATE HARDNESS, THE EXCAVATED AREA FROM THE TOP OF THE MANHOLE CONE SECTION TO THE EXISTING SURFACE SHALL BE BACKFILLED AND RESTORED TO MATCH THE EXISTING SURFACE CONDITIONS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
- WHERE THE MANHOLES TO BE ABANDONED ARE LOCATED IN THE ROADWAY, A PERMANENT ASPHALT PATCH SHALL BE INSTALLED.

NOTE:

PAVING AND CONSTRUCTION WITHIN THE CITY OF MOBILE RIGHT OF WAY SHALL MEET THE CITY OF MOBILE'S STANDARDS.

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| | | PLUG & ABANDON CONCRETE MANHOLE DETAILS (ASPHALT STREET) | SCALE: N.T.S. |
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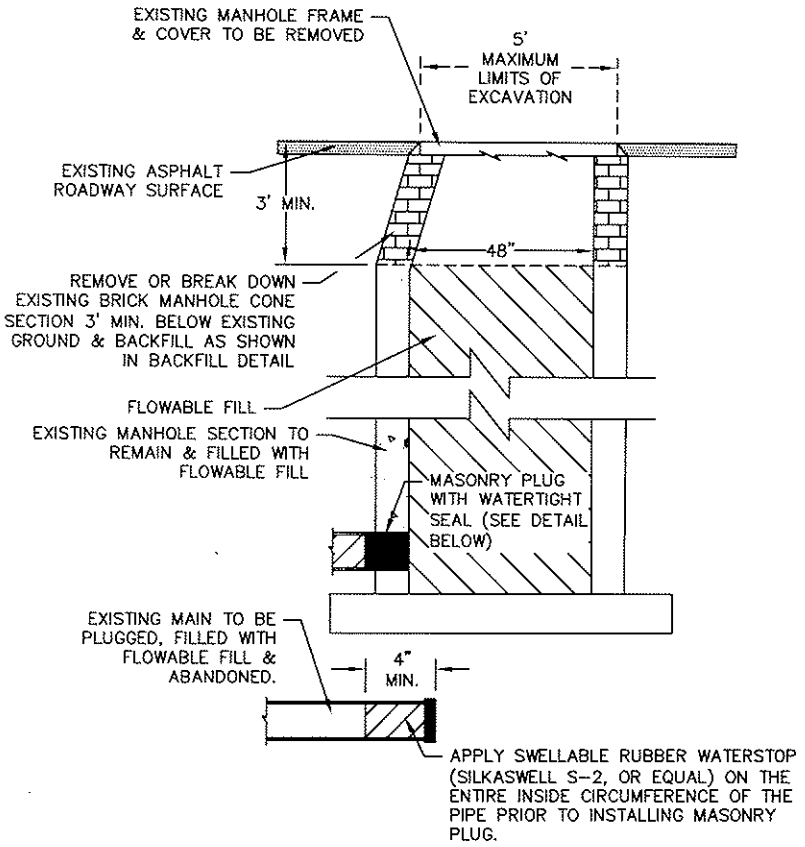
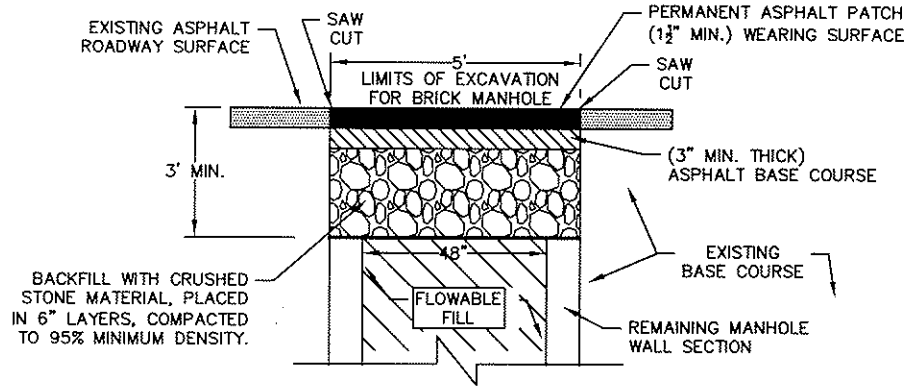



## PLUG & ABANDON BRICK MANHOLE DETAIL (ASPHALT STREET)

N.T.S.

- MINIMUM PLUG WIDTH = 1/2 PIPE SIZE DIAMETER
- SIKASWELL S-2, OR EQUAL, WATERTIGHT SEAL BETWEEN PIPE WALL AND MASONRY PLUG SHALL BE PROVIDED.
- THE MANHOLE FRAME & COVER SHALL BE REMOVED & TOP 3-FEET OF EXISTING BRICK MANHOLE CONNECTION SHALL BE REMOVED, OR BROKEN DOWN. REMAINING MANHOLE SECTION SHALL BE FILLED WITH FLOWABLE FILL.
- AFTER FLOWABLE FILL OBTAINS ADEQUATE HARDNESS, THE EXCAVATED AREA FROM THE TOP OF THE MANHOLE CONE SECTION TO THE EXISTING SURFACE SHALL BE BACKFILLED AND RESTORED TO MATCH THE EXISTING SURFACE CONDITIONS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
- WHERE THE MANHOLES TO BE ABANDONED ARE LOCATED IN THE ROADWAY, A PERMANENT ASPHALT PATCH SHALL BE INSTALLED AS SHOWN.




## BACKFILL AT ABANDON BRICK MANHOLE DETAIL

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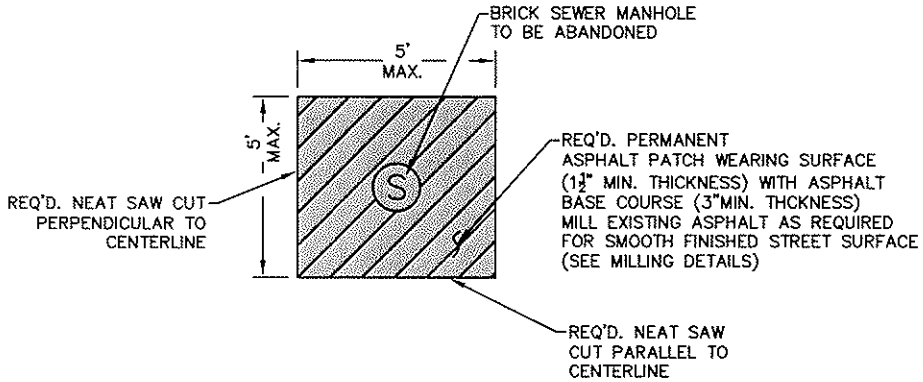


## MANHOLE PERMANENT ASPHALT PATCH DETAIL FOR ABANDONED BRICK MANHOLE

NOTE:

PAVING AND CONSTRUCTION WITHIN THE CITY OF MOBILE RIGHT OF WAY SHALL MEET THE CITY OF MOBILE'S STANDARDS.

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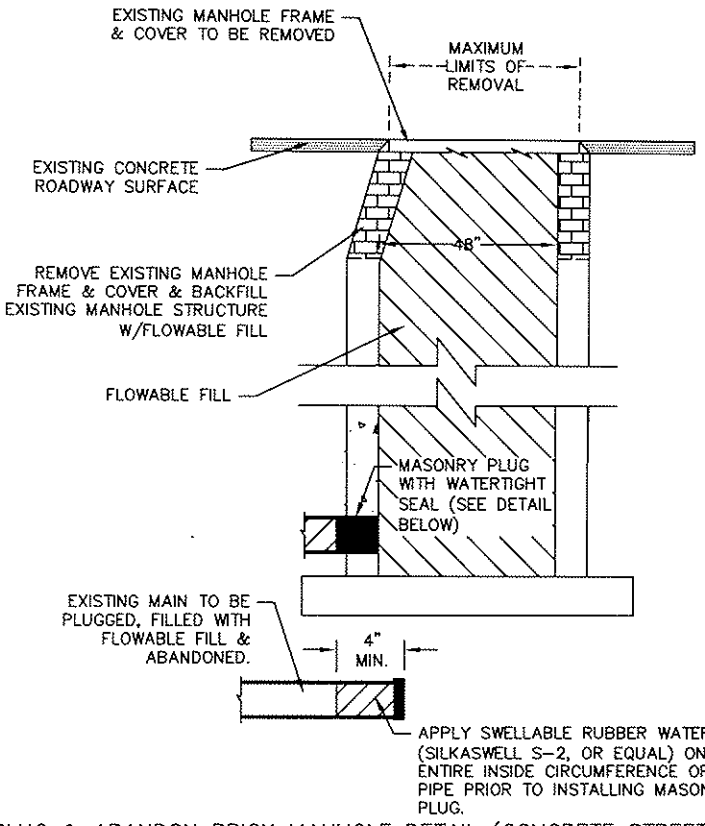
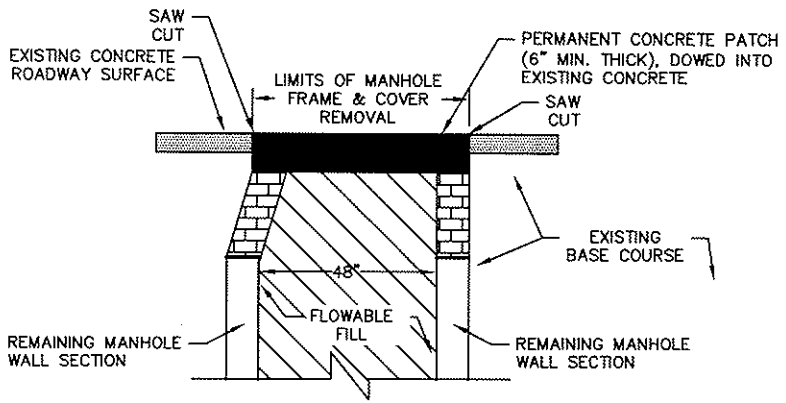
| | | PLUG & ABANDON BRICK MANHOLE DETAILS (ASPHALT STREET) | SCALE: N.T.S. |
| | | | DRAWING NO.: SS-104C |




PLUG & ABANDON BRICK MANHOLE DETAIL (CONCRETE STREET)

N.T.S.

- MINIMUM PLUG WIDTH = 1/2 PIPE SIZE DIAMETER
- SIKASWELL S-2, OR EQUAL, WATERTIGHT SEAL BETWEEN PIPE WALL AND MASONRY PLUG SHALL BE PROVIDED.
- THE MANHOLE FRAME & COVER SHALL BE REMOVED & EXISTING BRICK MANHOLE SHALL BE SHALL BE FILLED WITH FLOWABLE FILL, PRIOR TO PERMANENT CONCRETE PATCH.
- AFTER FLOWABLE FILL OBTAINS ADEQUATE HARDNESS, THE DISTURBED STREET SURFACE SHALL BE RESTORED TO MATCH THE EXISTING SURFACE CONDITIONS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
- WHERE THE MANHOLES TO BE ABANDONED ARE LOCATED IN THE ROADWAY, A PERMANENT CONCRETE PATCH SHALL BE INSTALLED AS SHOWN.




BACKFILL AT ABANDON BRICK MANHOLE DETAIL (CONCRETE STREET)

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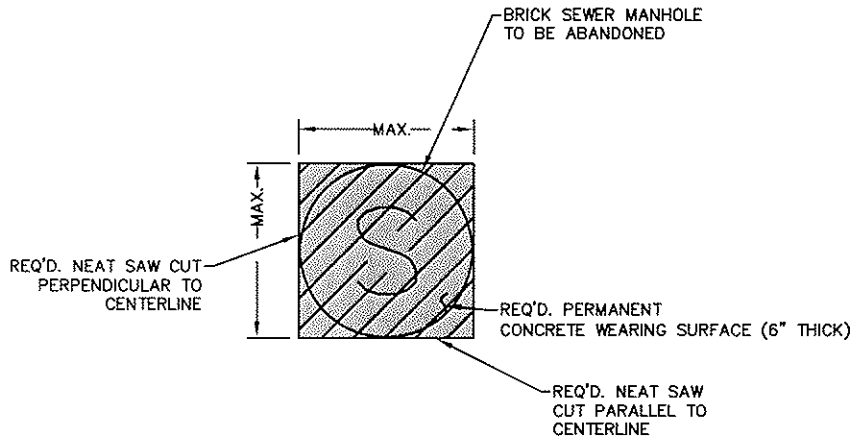



MANHOLE PERMANENT CONCRETE PATCH DETAIL FOR ABANDONED BRICK MANHOLE

N.T.S.

NOTE:

PAVING AND CONSTRUCTION WITHIN THE CITY OF MOBILE RIGHT OF WAY SHALL MEET THE CITY OF MOBILE'S STANDARDS.

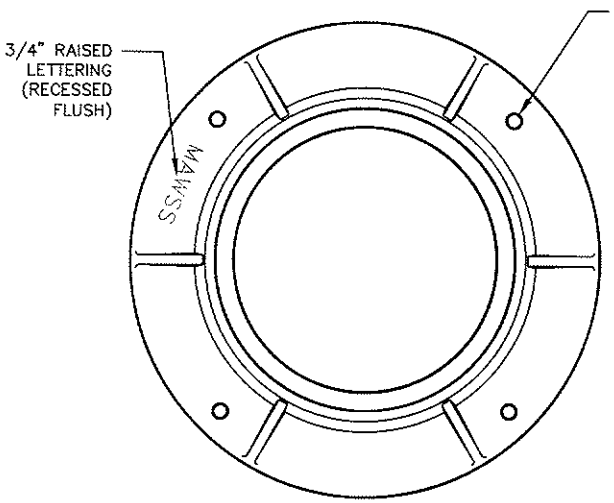
MAWSS
MOBILE AREA WATER & SEWER SYSTEM

BOARD OF WATER AND SEWER COMMISSIONERS OF THE CITY OF MOBILE, ALABAMA

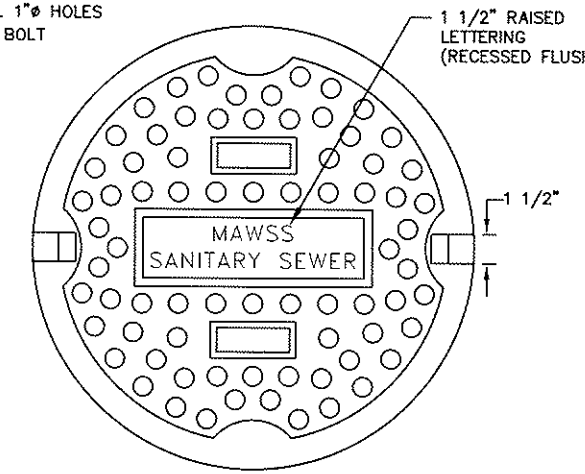
TYPICAL SANITARY SEWER DETAILS

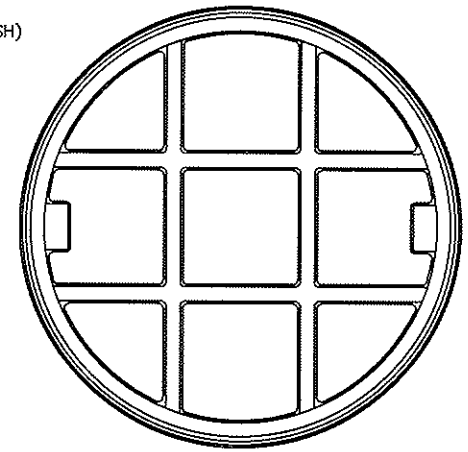
PLUG & ABANDON BRICK MANHOLE DETAILS (CONCRETE STREET)

DATE ISSUED: 01-11-10
SCALE: N.T.S.
DRAWING NO.: SS-104D

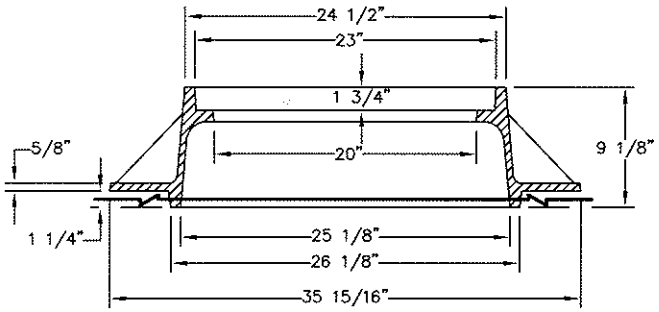



RING TOP VIEW

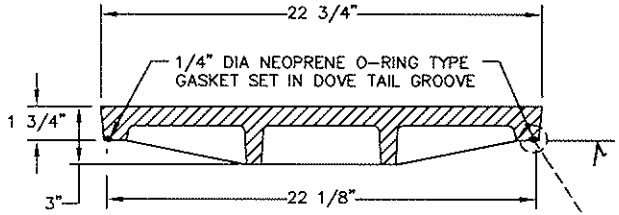


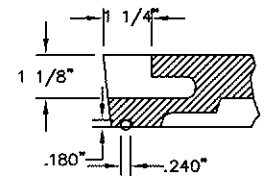
COVER BACK




RING SECTION
N.T.S.




COVER SECTION
N.T.S.




(2) TYPE TWO NON-PENETRATING PICKHOLES

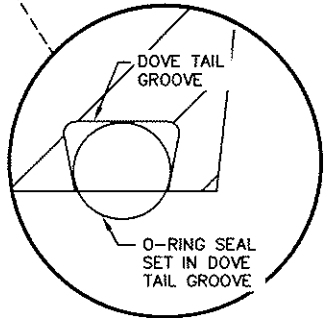
DOVE TAIL GROOVE & PICKHOLE DETAIL
N.T.S.

**STANDARD MANHOLE FRAME & COVER**

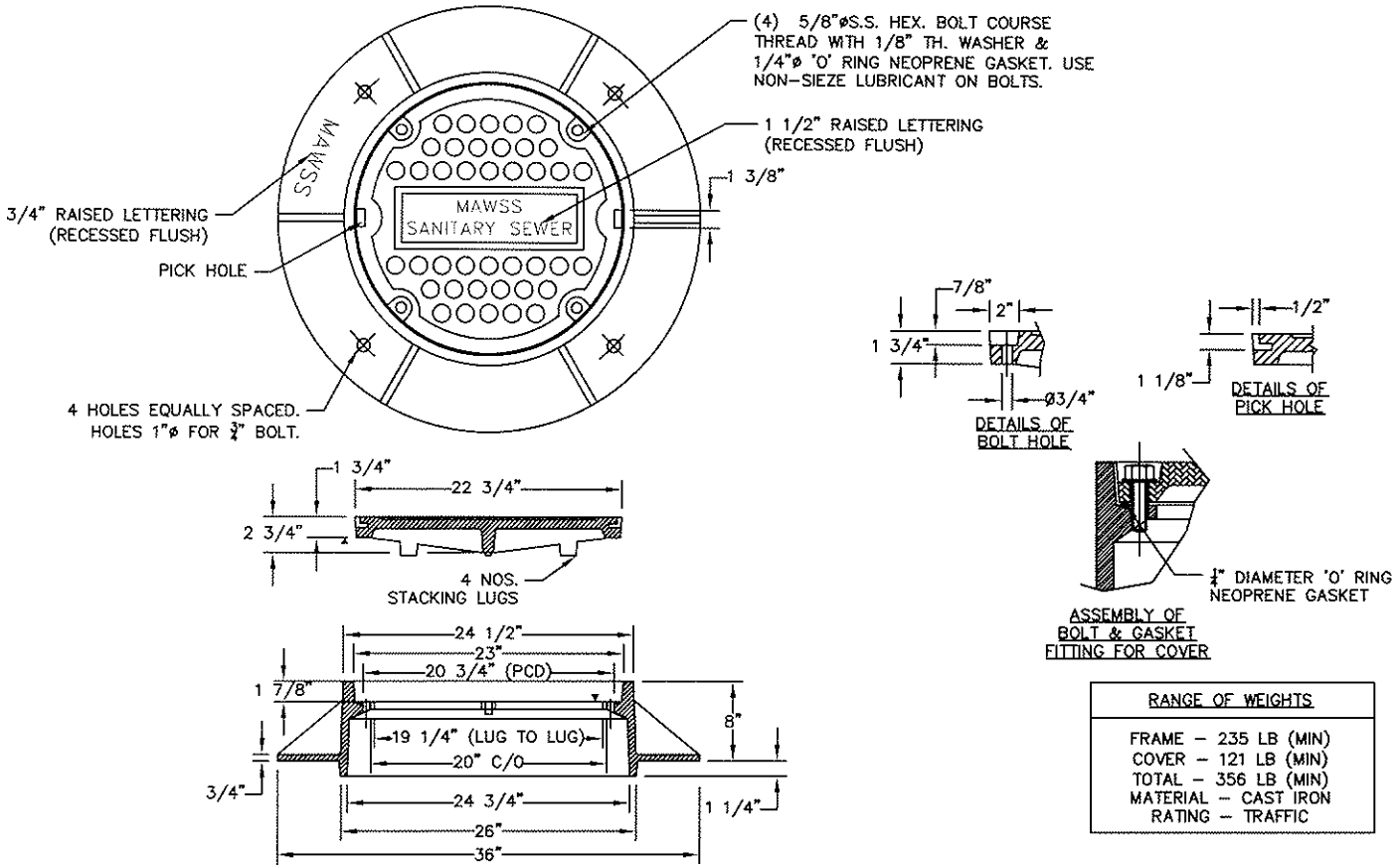
| RANGE OF WEIGHTS |
|---|
| FRAME – 230 LB (MIN)–260 LB (MAX) |
| COVER – 120 LB (MIN)–130 LB (MAX) |
| TOTAL – 350 LB (MIN)–390 LB (MAX) |
| MATERIAL – GREY IRON ASTM A48CL35B |
| RATING – H20 FOR TRAFFIC |

NOTE:

1. MANHOLE FRAME AND COVER SHALL BE EAST JORDAN MODEL# V-1476 OR APPROVED EQUAL
2. COVER SHALL HAVE O-RING SEAL IN DOVE TAIL GROOVE.




| | | | |
|---|---|---|---|
| MAWSS MOBILE AREA WATER & SEWER SYSTEM | BOARD OF WATER AND SEWER COMMISSIONERS OF THE CITY OF MOBILE, ALABAMA | TYPICAL SANITARY SEWER DETAILS | DATE ISSUED 01-11-10 |
| | | STANDARD MANHOLE FRAME & COVER | SCALE: N.T.S. |
| | | | DRAWING NO. SS-105 |



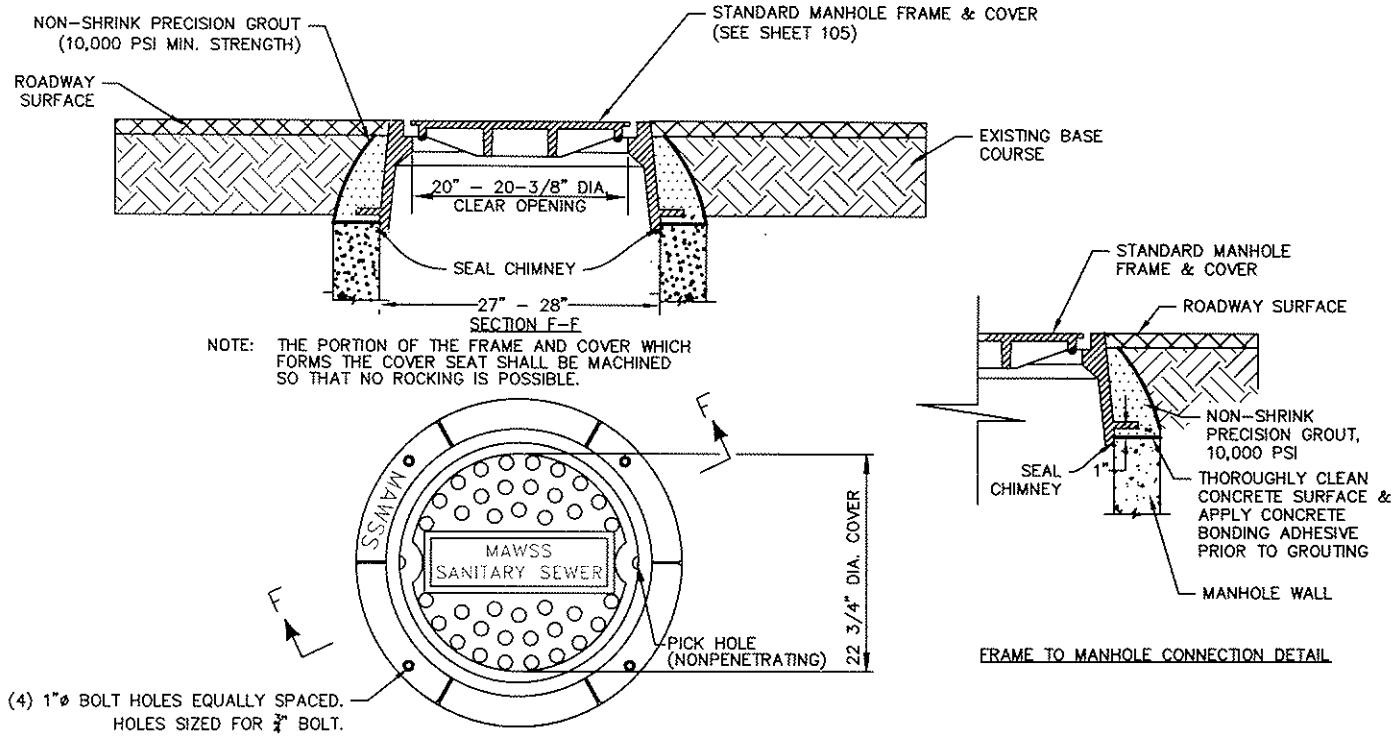

| RANGE OF WEIGHTS |
|---|
| FRAME – 235 LB (MIN) |
| COVER – 121 LB (MIN) |
| TOTAL – 356 LB (MIN) |
| MATERIAL – CAST IRON |
| RATING – TRAFFIC |

WATERTIGHT/BOLTDOWN FRAME & COVER
N.T.S.

NOTE:

1. WATERTIGHT/BOLTDOWN FRAME & COVER SHALL BE EJIW V2480-1, OR APPROVED EQUAL.
2. COVER SHALL BOLT TO FRAME.

| | | | |
|---|---|---|---|
| MAWSS MOBILE AREA WATER & SEWER SYSTEM | BOARD OF WATER AND SEWER COMMISSIONERS OF THE CITY OF MOBILE, ALABAMA | TYPICAL SANITARY SEWER DETAILS | DATE ISSUED 01-11-10 |
| | | WATERTIGHT/BOLTDOWN MANHOLE FRAME & COVER | SCALE N.T.S. |
| | | | DRAWING NO. SS-105A |




## TYPE I A STANDARD MANHOLE FRAME & COVER INSTALLATION IN ROADWAYS

## (FRAME GROUTED TO MANHOLE WALL)

N.T.S.

### MANHOLE FRAME & COVER INSTALLATION TYPES

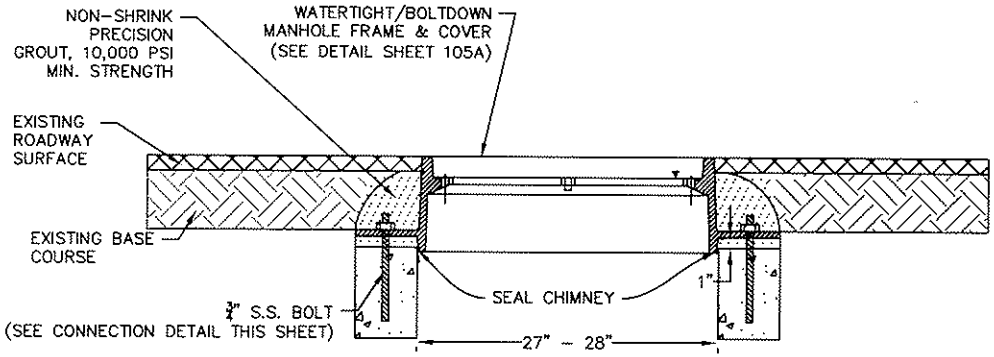
TYPE I—INSTALLATION IN ROADWAYS
- IA: STANDARD FRAME & COVER (FRAME GROUTED TO MANHOLE)
- IB: WATERTIGHT/BOLTDOWN FRAME & COVER (FRAME GROUTED & ANCHORED TO MANHOLE)

TYPE II—INSTALLATION IN EASEMENTS
- IIA— STANDARD FRAME & COVER IN NON-FLOODING EASEMENTS (FRAME GROUTED TO MANHOLE)
- IIB— STANDARD FRAME & COVER (FRAME ANCHORED TO MANHOLE)
- IIC— WATERTIGHT/BOLTDOWN FRAME & COVER (FRAME ANCHORED TO MANHOLE)

MAWSS MOBILE AREA WATER & SEWER SYSTEM

BOARD OF WATER AND SEWER COMMISSIONERS OF THE CITY OF MOBILE, ALABAMA

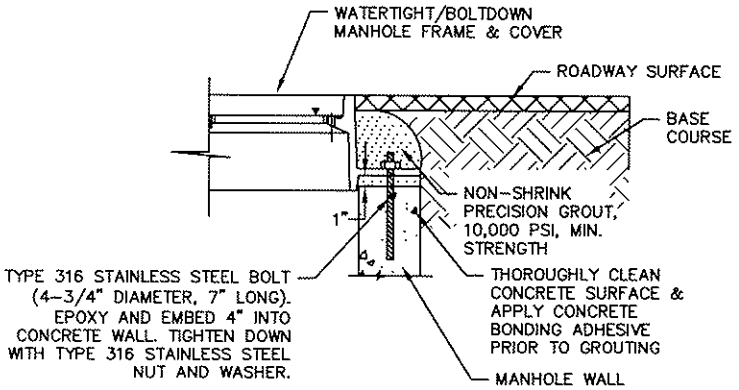
| | |
|---|---|
| TYPICAL SANITARY SEWER DETAILS | DATE ISSUED 01-11-10 |
| TYPE IA STANDARD MANHOLE INSTALLATION IN ROADWAYS | SCALE N.T.S. |
| | DRAWING NO. SS-105B |



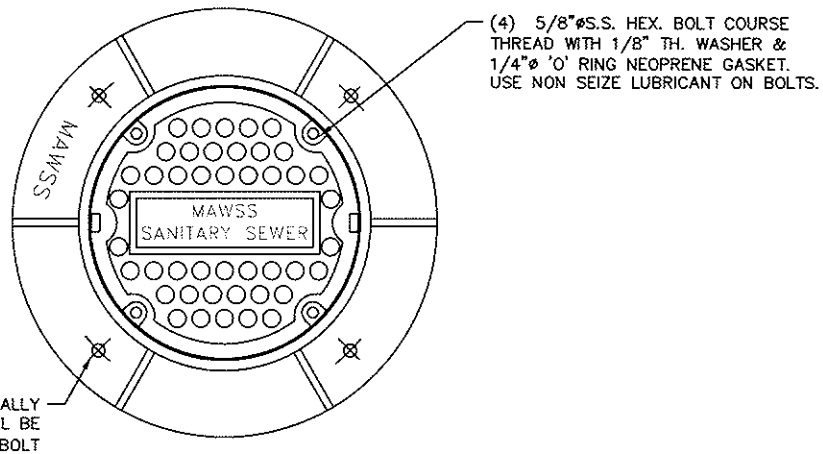

## TYPE I B
## WATERTIGHT/BOLTDOWN FRAME & COVER INSTALLATION IN ROADWAYS

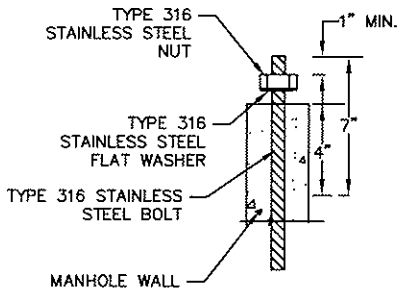
N.T.S.

## (FRAME GROUTED & ANCHORED TO MANHOLE WALL)




FRAME TO MANHOLE CONNECTION DETAIL




DETAIL OF STAINLESS STEEL BOLT ASSEMBLY WITH NUT AND WASHER

### MANHOLE FRAME & COVER INSTALLATION TYPES

TYPE I—INSTALLATION IN ROADWAYS
- IA: STANDARD FRAME & COVER (FRAME GROUTED TO MANHOLE)
- IB: WATERTIGHT/BOLTDOWN FRAME & COVER (FRAME GROUTED & ANCHORED TO MANHOLE)

TYPE II—INSTALLATION IN EASEMENTS
- IIA— STANDARD FRAME & COVER IN NON-FLOODING EASEMENTS (FRAME GROUTED TO MANHOLE)
- IIB— STANDARD FRAME & COVER (FRAME ANCHORED TO MANHOLE)
- IIC— WATERTIGHT/BOLTDOWN FRAME & COVER (FRAME ANCHORED TO MANHOLE)

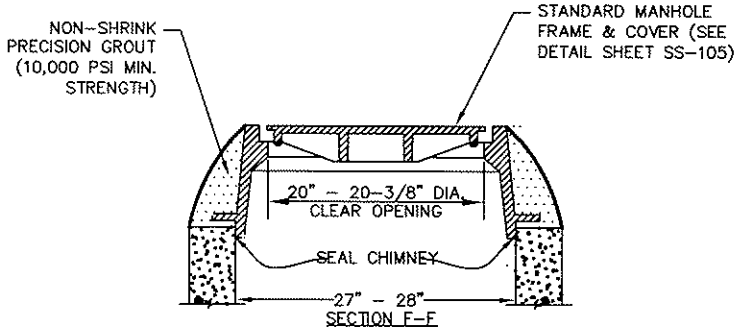
MAWSS MOBILE AREA WATER & SEWER SYSTEM

BOARD OF WATER AND SEWER COMMISSIONERS OF THE CITY OF MOBILE, ALABAMA

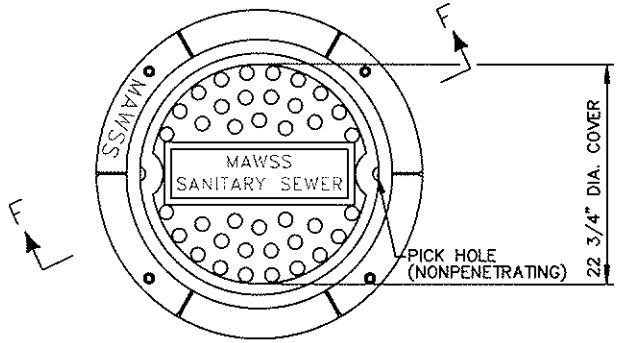
TYPICAL SANITARY SEWER DETAILS

TYPE IB
WATERTIGHT/BOLTDOWN FRAME & COVER INSTALLATION IN ROADWAYS

DATE ISSUED: 01-11-10
SCALE: N.T.S.
DRAWING NO.: SS-105C



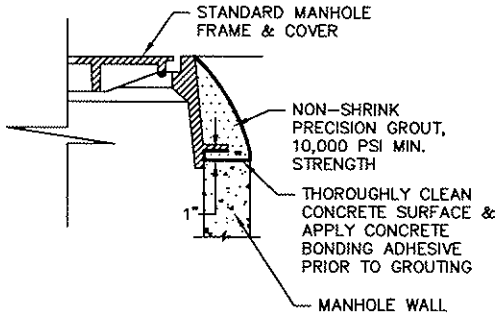

NOTE: THE PORTION OF THE FRAME AND COVER WHICH FORMS THE COVER SEAT SHALL BE MACHINED SO THAT NO ROCKING IS POSSIBLE.




PLAN

## TYPE II A
## INSTALLATION OF STANDARD MANHOLE FRAME & COVER IN NON-FLOODING EASEMENTS (FRAME GROUTED TO MANHOLE WALL)

N.T.S.




FRAME TO MANHOLE CONNECTION DETAIL

NOTES

1. UNLESS DIRECTED OTHERWISE, BOLLARDS SHALL BE REQUIRED FOR PROTECTION OF MANHOLE FRAME & COVERS WITHIN EASEMENTS. (SEE TYP. BOLLARD DETAIL SHEET)
2. RUBBER RISER ADJUSTMENT RINGS ARE ALLOWED FOR HEIGHT ADJUSTMENT OF MANHOLES WITHIN EASEMENTS. (SEE DETAILS SHEET SS-108)

### MANHOLE FRAME & COVER INSTALLATION TYPES

TYPE I—INSTALLATION IN ROADWAYS
- IA: STANDARD FRAME & COVER (FRAME GROUTED TO MANHOLE)
- IB: WATERTIGHT/BOLTDOWN FRAME & COVER (FRAME GROUTED & ANCHORED TO MANHOLE)

TYPE II—INSTALLATION IN EASEMENTS
- IIA- STANDARD FRAME & COVER IN NON-FLOODING EASEMENTS (FRAME GROUTED TO MANHOLE)
- IIB- STANDARD FRAME & COVER (FRAME ANCHORED TO MANHOLE)
- IIC- WATERTIGHT/BOLTDOWN FRAME & COVER (FRAME ANCHORED TO MANHOLE)

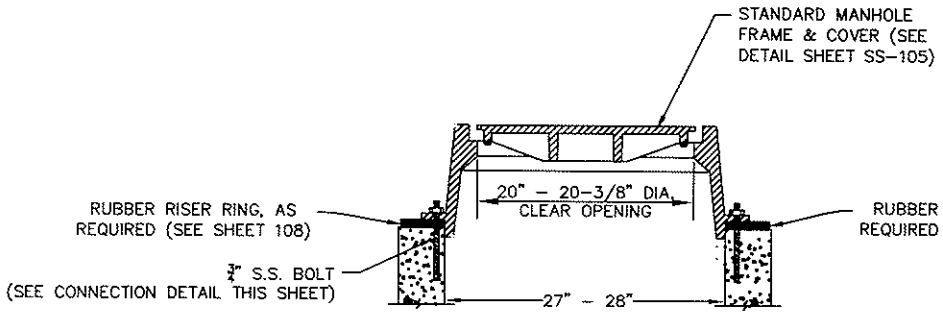
MAWSS MOBILE AREA WATER & SEWER SYSTEM

BOARD OF WATER AND SEWER COMMISSIONERS OF THE CITY OF MOBILE, ALABAMA

TYPICAL SANITARY SEWER DETAILS

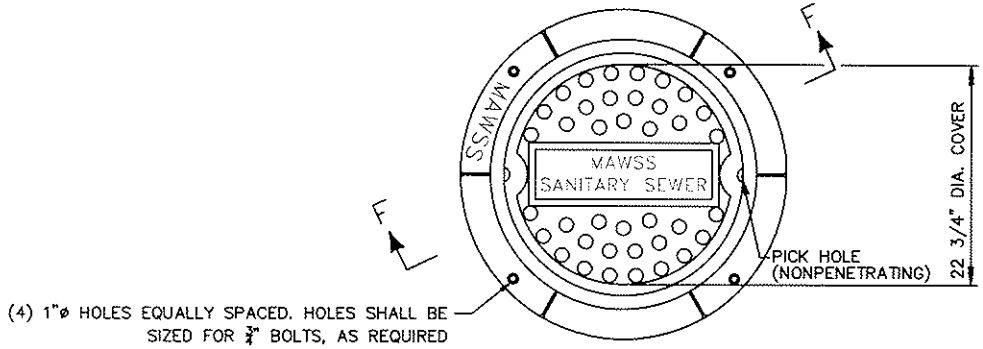
TYPE IIA
STANDARD MANHOLE FRAME & COVER
INSTALLATION IN NON-FLOODING EASEMENTS

DATE ISSUED: 01-11-10
SCALE: N.T.S.
DRAWING NO.: SS-105D




SECTION F-F

NOTE: THE PORTION OF THE FRAME AND COVER WHICH FORMS THE COVER SEAT SHALL BE MACHINED SO THAT NO ROCKING IS POSSIBLE.

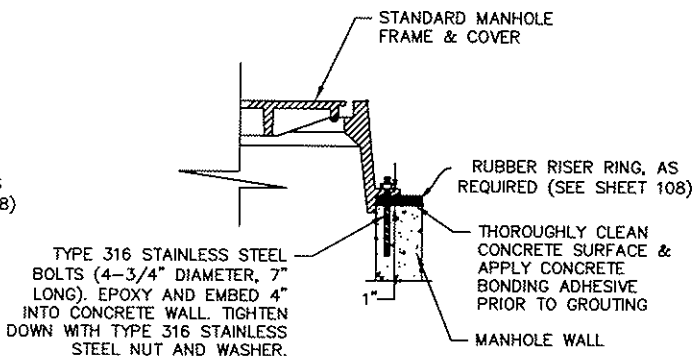



PLAN

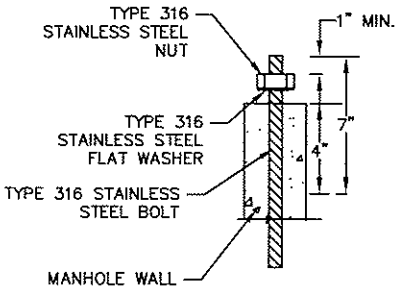
## TYPE II B INSTALLATION OF STANDARD MANHOLE FRAME & COVER IN FLOOD PRONE EASEMENTS

## (FRAME ANCHORED TO MANHOLE WALL)

N.T.S.




FRAME TO MANHOLE CONNECTION DETAIL




DETAIL OF STAINLESS STEEL BOLT ASSEMBLY WITH NUT AND WASHER

**NOTE:**

**CHIMNEY SEAL REQ'D WHEN RUBBER RING ASSEMBLY IS NOT USED.**

### MANHOLE FRAME & COVER INSTALLATION TYPES

TYPE I—INSTALLATION IN ROADWAYS
- IA: STANDARD FRAME & COVER (FRAME GROUTED TO MANHOLE)
- IB: WATERTIGHT/BOLTDOWN FRAME & COVER (FRAME GROUTED & ANCHORED TO MANHOLE)

TYPE II—INSTALLATION IN EASEMENTS
- IIA- STANDARD FRAME & COVER IN NON-FLOODING EASEMENTS (FRAME GROUTED TO MANHOLE)
- IIB- STANDARD FRAME & COVER (FRAME ANCHORED TO MANHOLE)
- IIC- WATERTIGHT/BOLTDOWN FRAME & COVER (FRAME ANCHORED TO MANHOLE)

NOTES

1. UNLESS DIRECTED OTHERWISE, BOLLARDS SHALL BE REQUIRED FOR PROTECTION OF MANHOLE FRAME & COVERS WITHIN EASEMENTS. (SEE TYP. BOLLARD DETAIL SHEET)
2. RUBBER RISER ADJUSTMENT RINGS ARE ALLOWED FOR HEIGHT ADJUSTMENT OF MANHOLES WITHIN EASEMENTS. (SEE DETAILS SHEET SS-108)

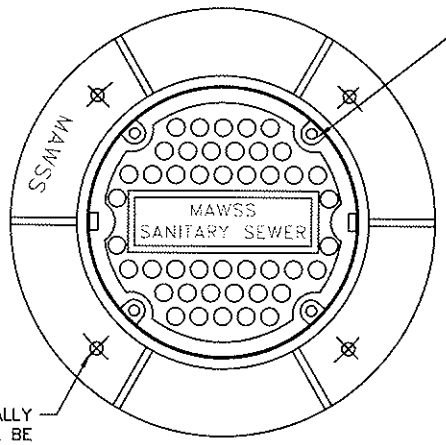
MAWSS MOBILE AREA WATER & SEWER SYSTEM

BOARD OF WATER AND SEWER COMMISSIONERS OF THE CITY OF MOBILE, ALABAMA

TYPICAL SANITARY SEWER DETAILS

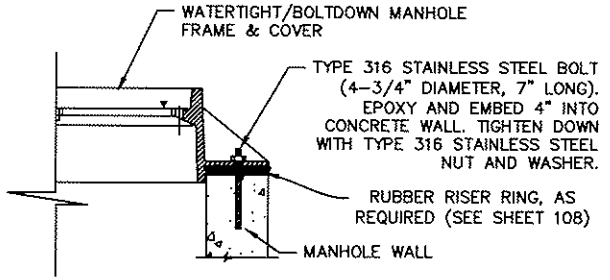
TYPE IIB
STANDARD MANHOLE FRAME & COVER
INSTALLATION IN EASEMENTS PRONE TO FLOODING

DATE ISSUED: 01-11-10
SCALE: N.T.S.
DRAWING NO.: SS-105E

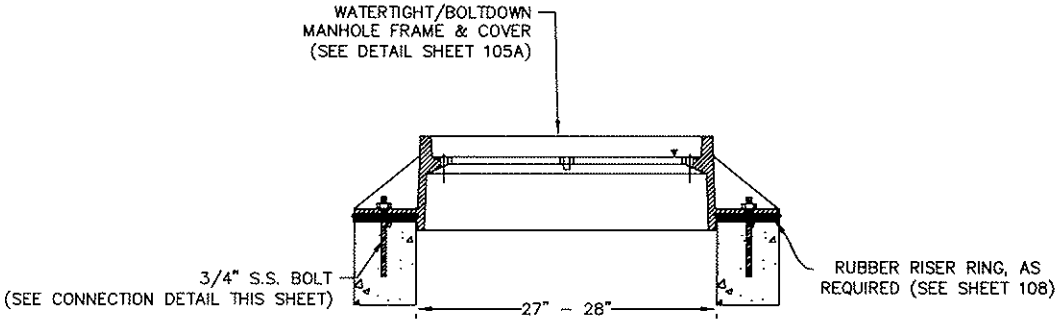



(4) 5/8"øS.S. HEX. BOLT COURSE THREAD WITH 1/8" TH. WASHER & 1/4"ø 'O' RING NEOPRENE GASKET. USE NON SEIZE LUBRICANT ON BOLTS.

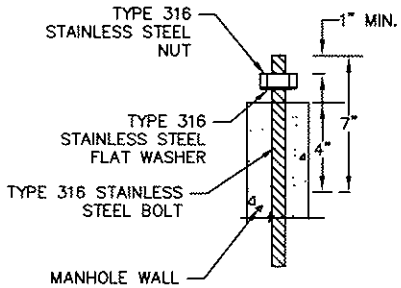
4 1"ø HOLES EQUALLY SPACED. HOLES SHALL BE SIZED FOR ¾" BOLT




FRAME TO MANHOLE CONNECTION DETAIL




**TYPE II C**
**INSTALLATION OF WATERTIGHT/BOLTDOWN FRAME & COVER IN EASEMENTS**
N.T.S.
**(FRAME ANCHORED TO MANHOLE WALL)**




DETAIL OF STAINLESS STEEL BOLT ASSEMBLY WITH NUT AND WASHER

## MANHOLE FRAME & COVER INSTALLATION TYPES

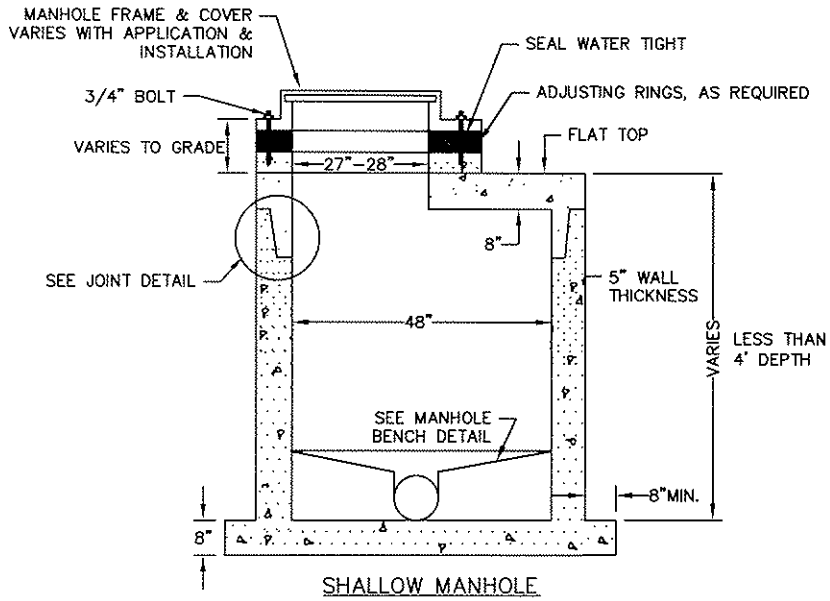
TYPE I–INSTALLATION IN ROADWAYS
- IA: STANDARD FRAME & COVER (FRAME GROUTED TO MANHOLE)
- IB: WATERTIGHT/BOLTDOWN FRAME & COVER (FRAME GROUTED & ANCHORED TO MANHOLE)

TYPE II–INSTALLATION IN EASEMENTS
- IIA– STANDARD FRAME & COVER IN NON–FLOODING EASEMENTS (FRAME GROUTED TO MANHOLE)
- IIB– STANDARD FRAME & COVER (FRAME ANCHORED TO MANHOLE)
- IIC– WATERTIGHT/BOLTDOWN FRAME & COVER (FRAME ANCHORED TO MANHOLE)

NOTES

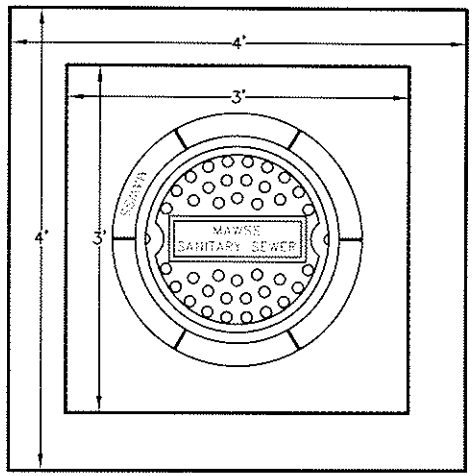
1. UNLESS DIRECTED OTHERWISE, BOLLARDS SHALL BE REQUIRED FOR PROTECTION OF MANHOLE FRAME & COVERS WITHIN EASEMENTS. (SEE TYP. BOLLARD DETAIL SHEET)
2. RUBBER RISER ADJUSTMENT RINGS ARE ALLOWED FOR HEIGHT ADJUSTMENT OF MANHOLES WITHIN EASEMENTS. (SEE DETAILS SHEET SS–108)

| | | | |
|---|---|---|---|
| MAWSS MOBILE AREA WATER & SEWER SYSTEM | BOARD OF WATER AND SEWER COMMISSIONERS OF THE CITY OF MOBILE, ALABAMA | TYPICAL SANITARY SEWER DETAILS<br>TYPE IIC<br>WATERTIGHT/BOLTDOWN FRAME & COVER<br>INSTALLATION IN EASEMENTS | DATE ISSUED 01-11-10<br>SCALE N.T.S.<br>DRAWING NO. SS-105F |

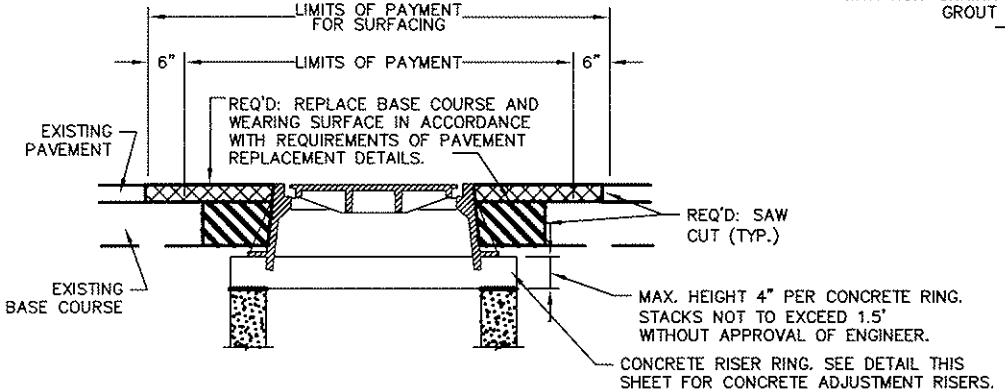



SHALLOW MANHOLE
N.T.S.

| | | | |
|---|---|---|---|
| MAWSS MOBILE AREA WATER & SEWER SYSTEM | BOARD OF WATER AND SEWER COMMISSIONERS OF THE CITY OF MOBILE, ALABAMA | TYPICAL SANITARY SEWER DETAILS | DATE ISSUED 01-11-10 |
| | | SHALLOW MANHOLE | SCALE: N.T.S. |
| | | | DRAWING NO. SS-106 |

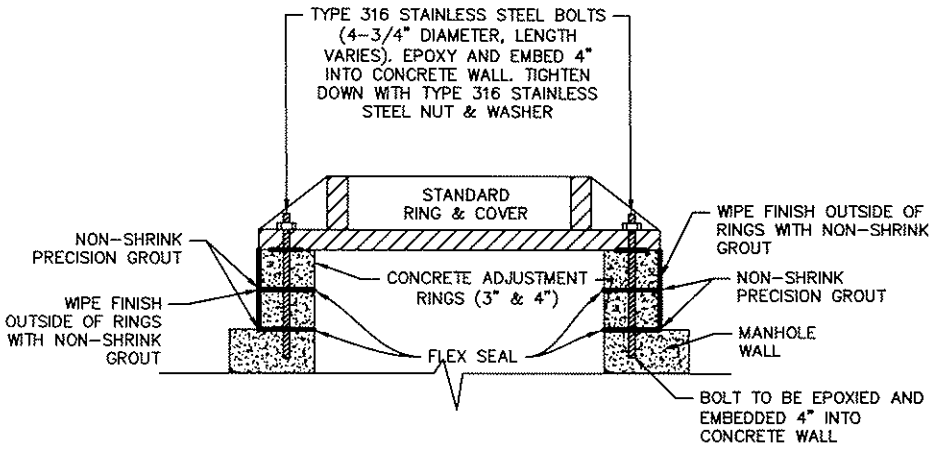



PLAN VIEW
N.T.S.




MANHOLE HEIGHT ADJUSTMENT DETAIL IN ROADWAY
N.T.S.

1. ADJUST MANHOLE COVER TO BE FLUSH WITH EXISTING GRADE, UNLESS OTHERWISE NOTED.
2. ADJUST BY USING PRECAST CONCRETE ADJUSTING RING.
3. IF ONLY 1"–2" ADJUSTMENT IS NECESSARY, A CAST IRON MANHOLE ADJUSTMENT RING FOR USF MODEL NO. 2300 OR APPROVED EQUAL MAY BE USED.
4. STAINLESS STEEL BOLTS WILL NOT BE REQUIRED IN ROADWAY UNLESS NOTED BY ENGINEER OR IN PLANS. (BOLTS PERMISSIBLE FOR USE IN EASEMENT APPLICATIONS ONLY)




CONCRETE ADJUSTMENT RISER RING DETAIL
N.T.S.

NOTES

1. CONCRETE ADJUSTING RING SURFACES SHALL BE CLEANED PRIOR TO APPLYING GROUT.
2. LATEX BASED CONCRETE BONDING ADHESIVE SHALL BE APPLIED TO CONCRETE SURFACES TO BE JOINED WITH GROUT.
3. FRAME SHALL BE SET ON CONCRETE ADJUSTING RING IN A BED OF NON–SHRINK PRECISION GROUT.
4. NON–SHRINK PRECISION GROUT SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 10,000 PSI.
5. CONCRETE RING SHALL BE CONCENTRICALLY PLACED ABOUT THE CENTER OF MANHOLE WITH VERTICAL SIDEWALLS.
6. WIPE FINISH EXTERIOR WALLS WITH NON–SHRINK GROUT.
7. APPLY FLEX SEAL TO INNER RISER RING SURFACE & FRAME.
8. CONTRACTOR SHALL USE THE FEWEST NUMBER OF RISER RINGS AS NECSSARY TO ACHIEVE THE DESIRED HEIGHT.

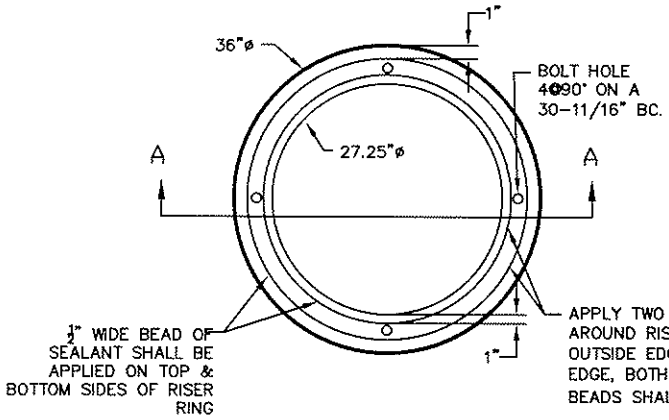
| | | | |
|---|---|---|---|
| MAWSS MOBILE AREA WATER & SEWER SYSTEM | BOARD OF WATER AND SEWER COMMISSIONERS OF THE CITY OF MOBILE, ALABAMA | TYPICAL SANITARY SEWER DETAILS | DATE ISSUED 01-11-10 |
| | | MANHOLE HEIGHT ADJUSTMENT WITH CONCRETE ADJUSTMENT RISER RING | SCALE N.T.S. |
| | | | DRAWING NO. SS-107 |

## INFRA-RISER PRODUCT SPECIFICATIONS:

1. POLYURETHANE PREPOLYMER
2. COLOR: BLACK
3. SHORE HARDNESS 75A +/- 7 POINTS
4. TENSILE STRENGTH MINIMUM 1.0 MPa
5. INITIAL COMPRESSION DEFORMATION 2.9%
6. COMPRESSION SET 1.5%
7. BRITTLENESS AT LOW TEMPERATURE -40 C
8. COEFFICIENT OF THERMAL EXPANSION 12.95 X 10-5

NOTES:

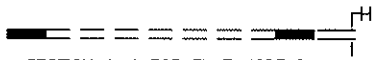
1. MAXIMUM HEIGHT OF RUBBER RINGS IS 3". STACKS SHALL NOT EXCEED TWO RINGS OR 6" IN TOTAL HEIGHT.
2. TWO BEADS OF POLYURETHANE SEALANT (½" WIDE) SHALL BE APPLIED ON BOTH SIDES OF RING WITH EACH BEAD AT A DISTANCE OF 1" FROM INNER & OUTER EDGES.
3. USE OF RUBBER RINGS FOR ADJUSTING MANHOLES IN ROADWAYS IS NOT PERMISSIBLE.



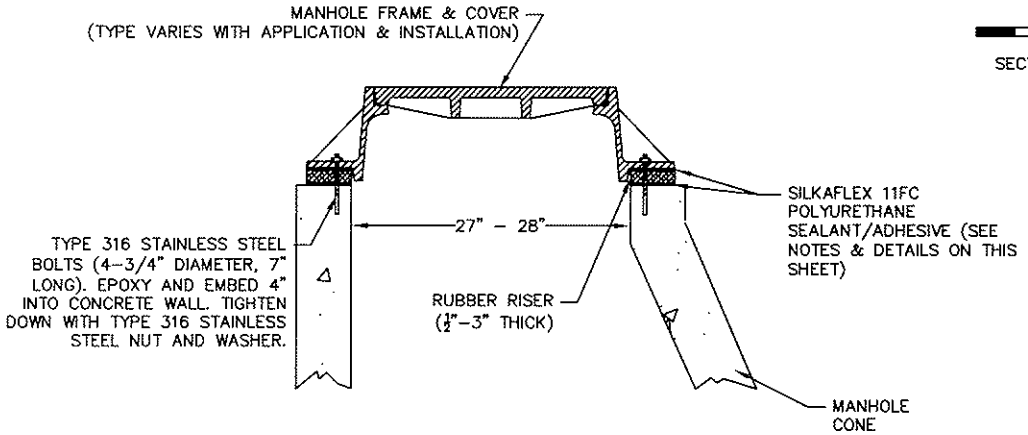

AVAILABLE SIZES:

| DIAMETERS: | ID. | OD. |
|---|---|---|
| | 27.25" | 36.00" |

| FLAT: | THICKNESS |
|---|---|
| | H= .050 |
| | H= 1.00 |
| | H= 1.50 |
| | H= 2.00 |
| | H= 2.50 |
| | H= 3.00 |




SECTION A-A FOR FLAT MODELS




RUBBER COMPOSITE ADJUSTMENT RING ASSEMBLY DETAIL

N.T.S.

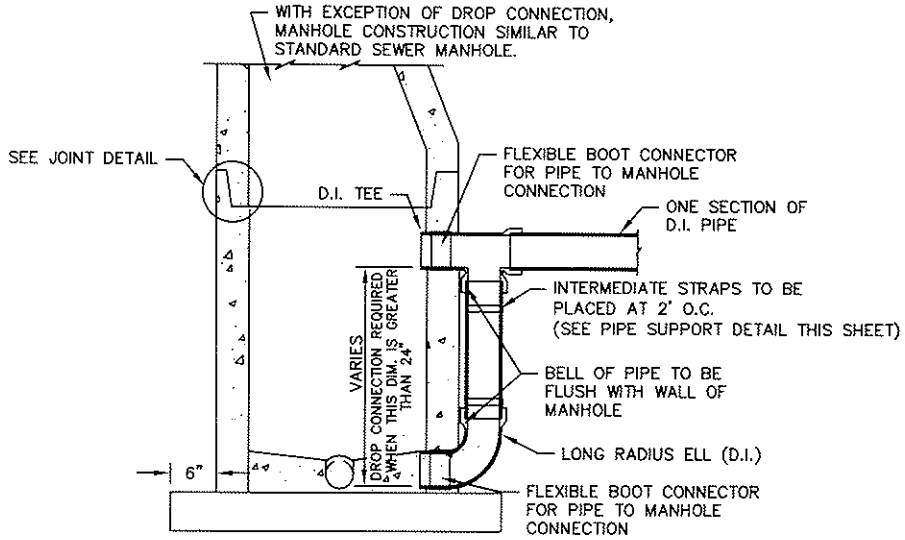
MAWSS
MOBILE AREA WATER & SEWER SYSTEM

BOARD OF WATER AND SEWER COMMISSIONERS OF THE CITY OF MOBILE, ALABAMA

TYPICAL SANITARY SEWER DETAILS

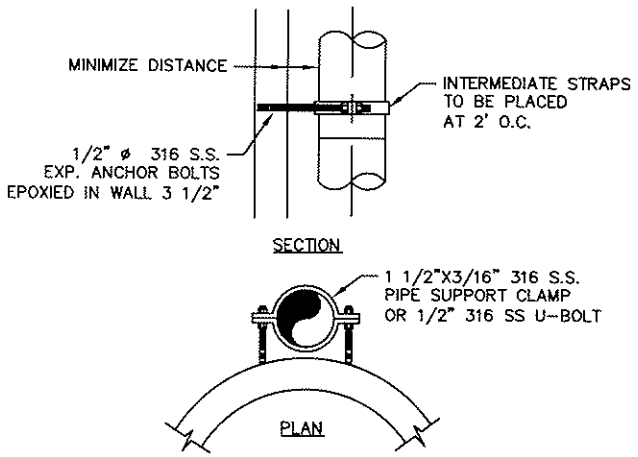
MANHOLE HEIGHT WITH RUBBER ADJUSTMENT RISER RING

DATE ISSUED: 01-11-10
SCALE: N.T.S.
DRAWING NO.: SS-108

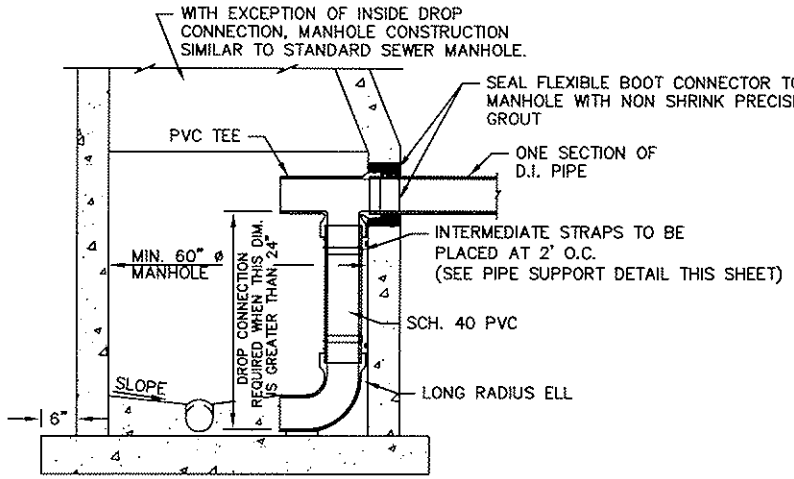



DETAIL OF DROP CONNECTION
OUTSIDE OF MANHOLE

AN ACCEPTABLE ALTERNATE IS A PRE-CAST DROP MANHOLE WITH EXTERNAL DROP COLUMN, MANUFACTURED BY UNIVERSAL PRE-CAST, OR EQUAL
N.T.S.




PIPE SUPPORT DETAILS
N.T.S.




DETAIL OF DROP CONNECTION
INSIDE OF MANHOLE
N.T.S.

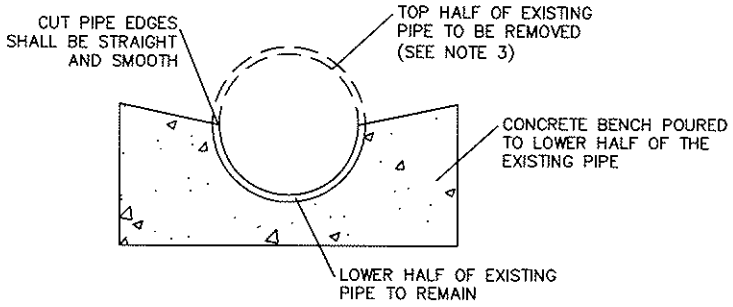
MOBILE AREA WATER & SEWER SYSTEM

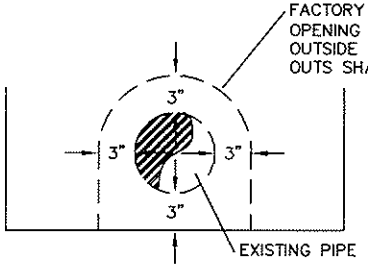
BOARD OF WATER AND SEWER COMMISSIONERS OF THE CITY OF MOBILE, ALABAMA

TYPICAL SANITARY SEWER DETAILS

MANHOLE DROP CONNECTION

DATE ISSUED: 01-11-10
SCALE: N.T.S.
DRAWING NO.: SS-109

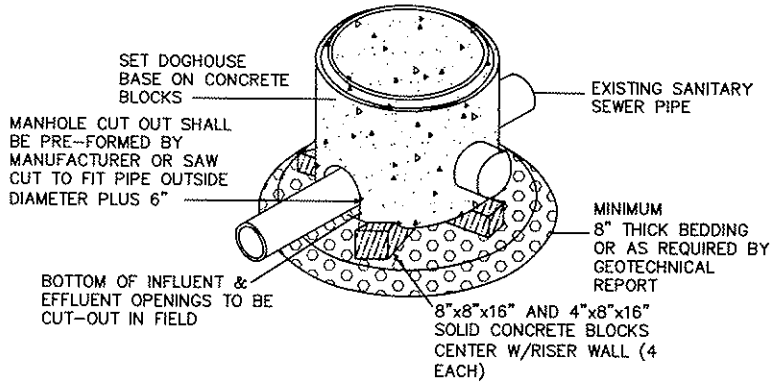



MANHOLE CUT OUT DETAIL

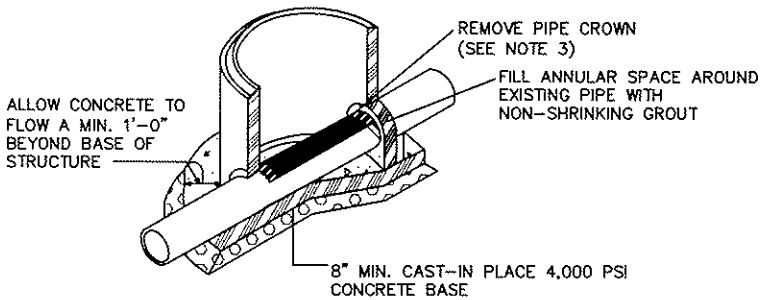
N.T.S.

PRECAST CONCRETE MANHOLE BASES SHALL BE FABRICATED IN ACCORDANCE WITH SECTION 12.04 OF THESE SPECIFICATIONS




DOGHOUSE MANHOLE BASE

N.T.S.




FOUNDATION SECTION VIEW

N.T.S.

NOTES:

1. CONSTRUCT A FORMED INVERT FROM NEW SEWER LINE TO ALLOW FLOW TO THE EXISTING PIPE.
2. POUR A BENCH TO THE LOWER HALF OF THE EXISTING PIPE.
3. CUT AND REMOVE THE TOP HALF OF EXISTING PIPE TO WITHIN 6" OF THE MANHOLE WALLS AFTER THE INVERT AND BENCH HAVE BEEN FORMED AND THE MANHOLE HAS BEEN FULLY TESTED IN ACCORDANCE WITH THESE SPECIFICATIONS. PIPE CUTS AT FLOW CHANNEL SHALL BE STRAIGHT & SMOOTH. ALL JAGGED & IRREGULAR EDGES OF PIPE SHALL BE REMOVED.
4. FINAL INVERT SHALL CONFORM TO MANHOLE BENCH STANDARD DETAIL.
5. UPON COMPLETION OF MANHOLE INSTALLATION, THE INSIDE OF THE MANHOLE SHALL BE COATED WITH A CEMENTIOUS BASE MIX IN ACCORDANCE WITH THE REQUIREMENT OF STANDARD SPECIFICATION SECTION 19, UNLESS OTHERWISE DIRECTED BY THE OWNER OR ENGINEER.

TYPICAL MANHOLE BASE

SHOWING "DOGHOUSE" INSTALLATION

| | | | |
|---|---|---|---|
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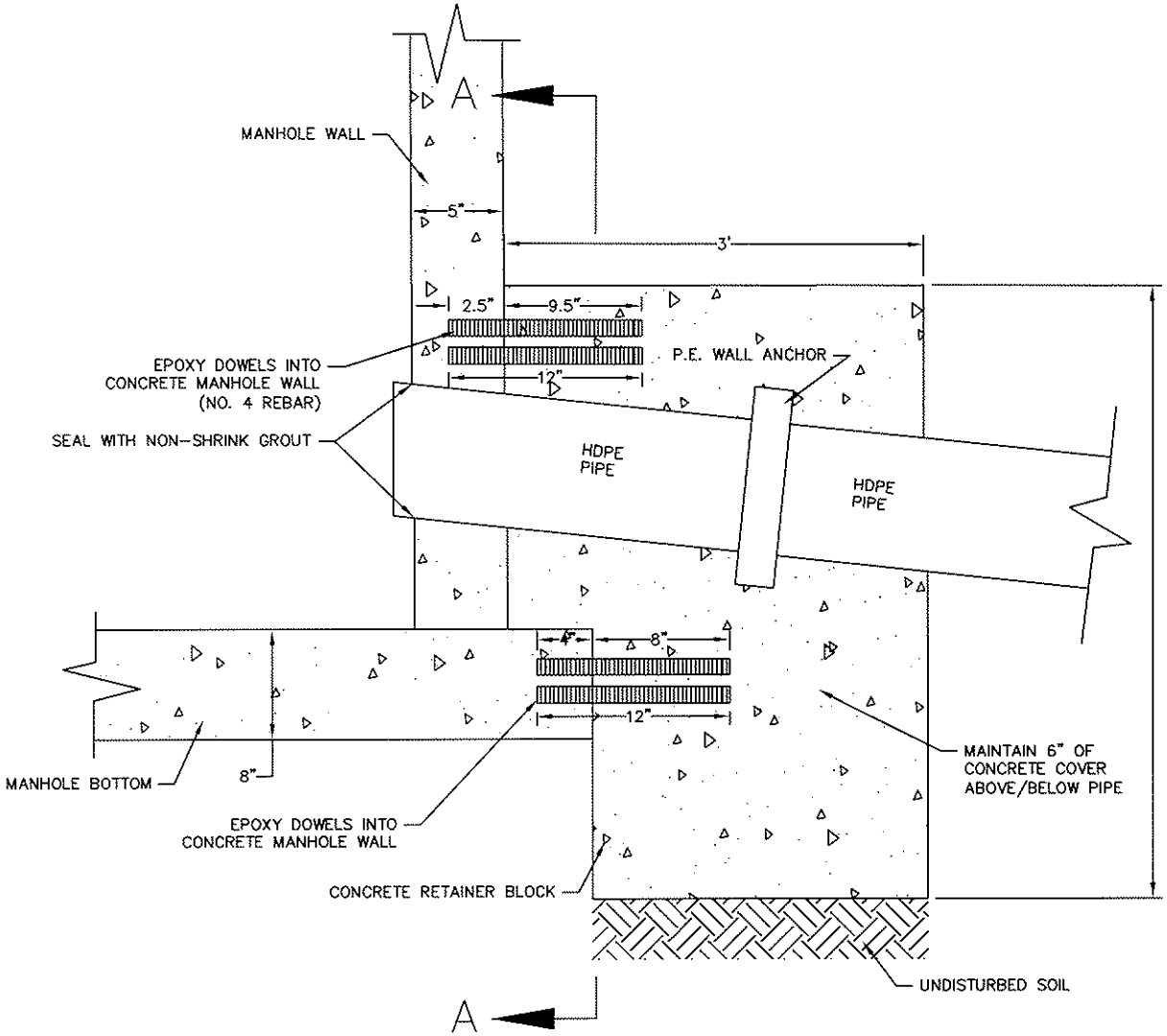
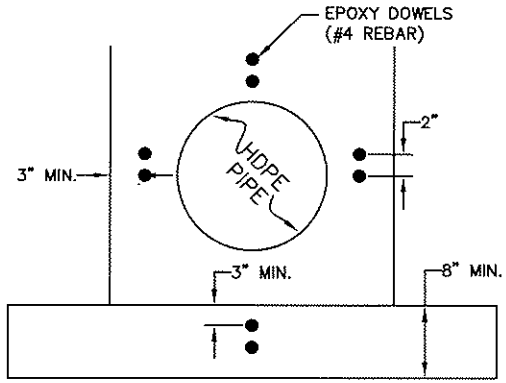
| | | | SCALE: N.T.S. |
| | | DOGHOUSE MANHOLE DETAILS | DRAWING NO. SS-110 |




HDPE TO MANHOLE CONNECTION DETAIL
N.T.S.




SECTION A–A
N.T.S.

MOBILE AREA WATER & SEWER SYSTEM

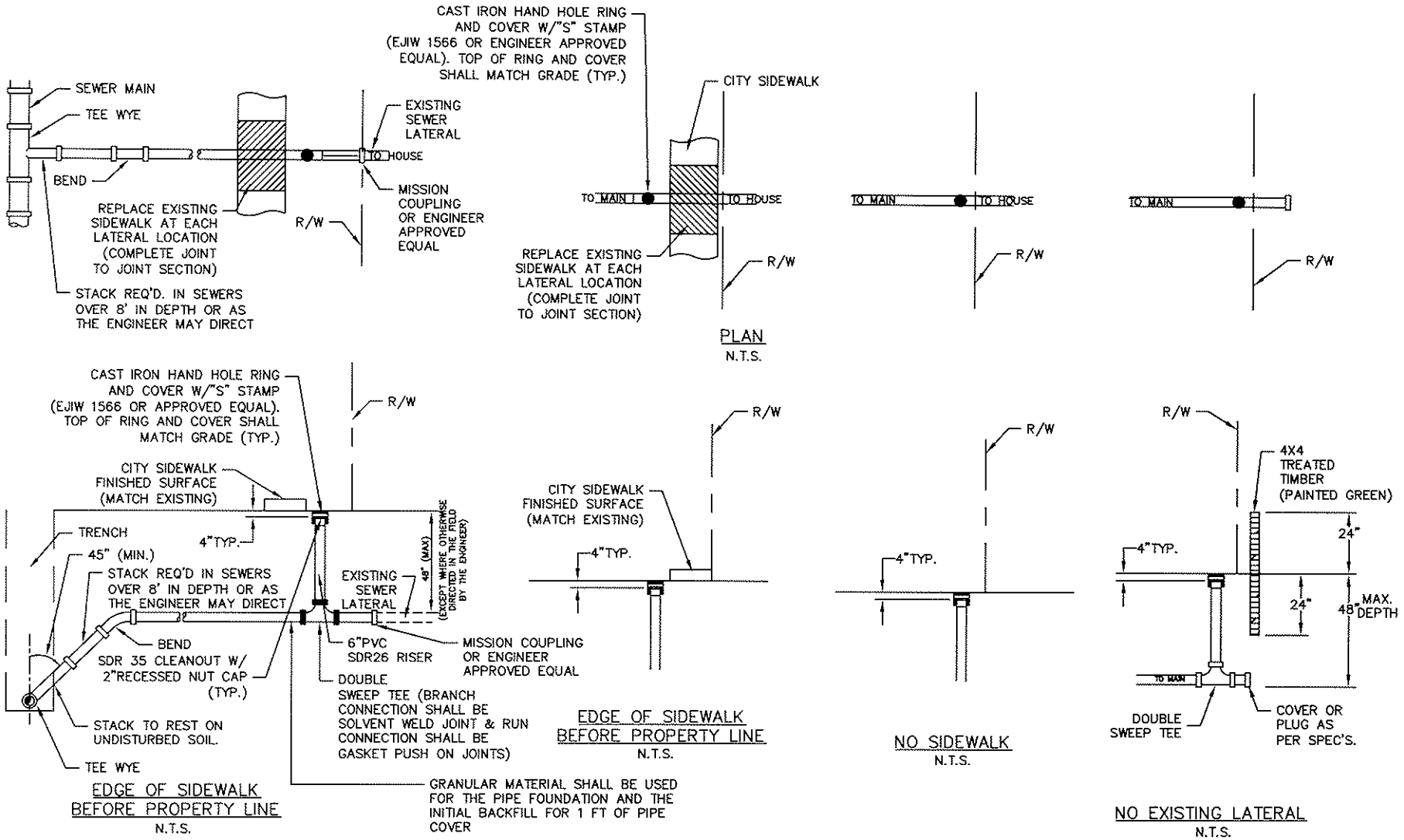
BOARD OF WATER AND SEWER COMMISSIONERS OF THE CITY OF MOBILE, ALABAMA

TYPICAL SANITARY SEWER DETAILS

HDPE TO MANHOLE CONNECTION DETAILS

DATE ISSUED: 01-11-10
SCALE: N.T.S.
DRAWING NO.: SS-111

Drawing name: G:\M5712\2243 section 12 update\New CADD DWGs\8.5_TYP_S.S._DETAILS_2.dwg Plotted on: Mar 26, 2012 - 3:59pm




NOTE:

- GRAVITY LATERALS SHALL BE OF SDR 26 6"PVC PIPE, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
- DOUBLE SWEEP TEE SHALL BE GASKET RUN JOINTS BY SOLVENT WELD BRANCH JOINTS
- NON SEIZE GREASE, SUITABLE FOR USE WITH PVC, SHALL BE APPLIED TO THE THREADS OF THE CLEANOUT CAP.
- CONNECTION OF LATERALS TO EXISTING PIPE SHALL BE PROVIDED BY CUTTING IN TEES/TEE-WYES.
- WHERE SEWER MAIN IS OF HEAVY WALL PVC C900, THE CONNECTION OF LATERALS TO THE EXISTING PIPE SHALL BE WITH GASKETED PVC C900 45° WYE.

ELEVATIONS
TYPICAL TEE & LATERAL INSTALLATION
N.T.S.

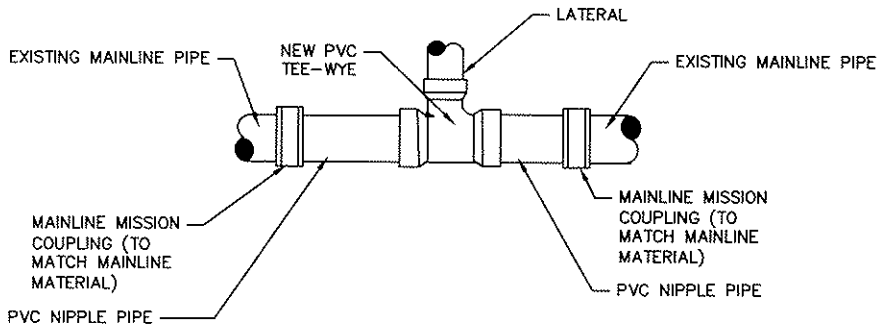
MAWSS
MOBILE AREA WATER & SEWER SYSTEM

BOARD OF WATER AND SEWER COMMISSIONERS OF THE CITY OF MOBILE, ALABAMA

TYPICAL SANITARY SEWER DETAILS

SANITARY SEWER LATERAL CONNECTION DETAILS

DATE ISSUED 01-11-10
SCALE N.T.S.
DRAWING NO. SS-112




CUT – IN TEE

N.T.S.

NOTE:
- LENGTH SHALL VARY TO MEET ACTUAL FIELD CONDITION.

MAWSS
MOBILE AREA WATER & SEWER SYSTEM

BOARD OF WATER AND SEWER COMMISSIONERS OF THE CITY OF MOBILE, ALABAMA

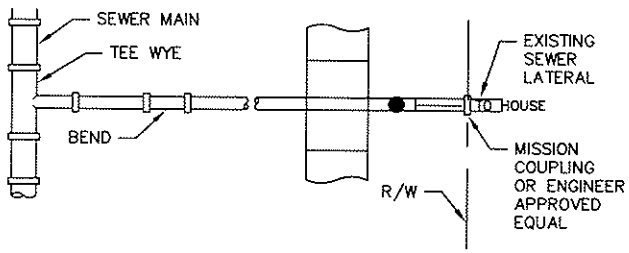
TYPICAL SANITARY SEWER DETAILS

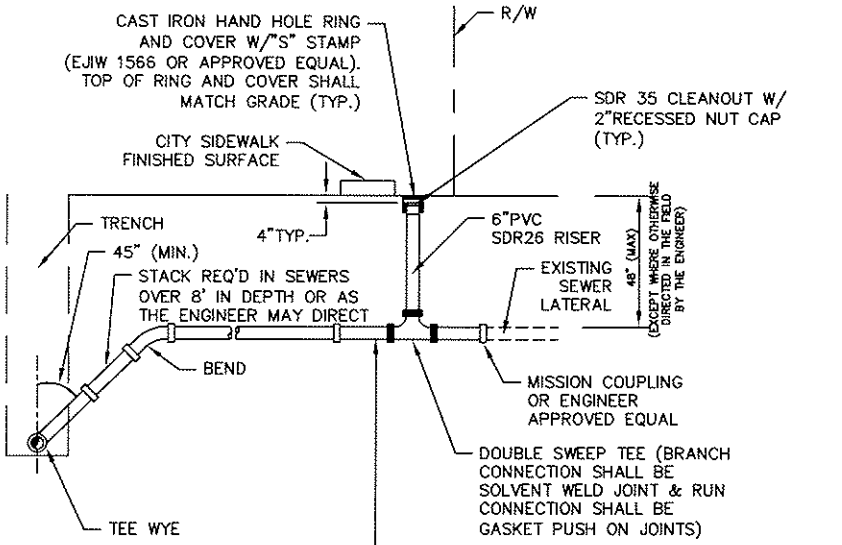
SANITARY SEWER LATERAL CONNECTION DETAILS

DATE ISSUED 01-11-10

SCALE: N.T.S.

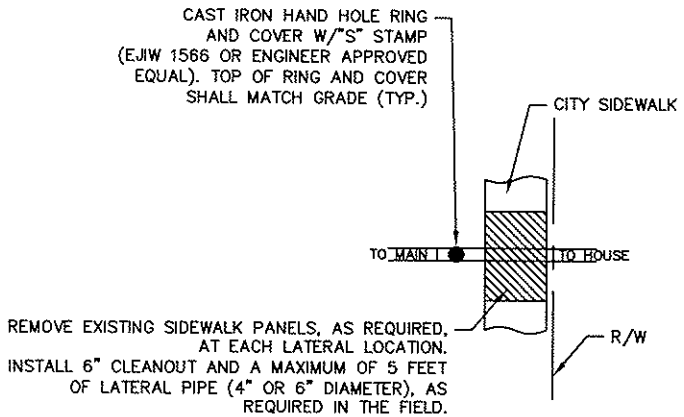
DRAWING NO. SS-112A



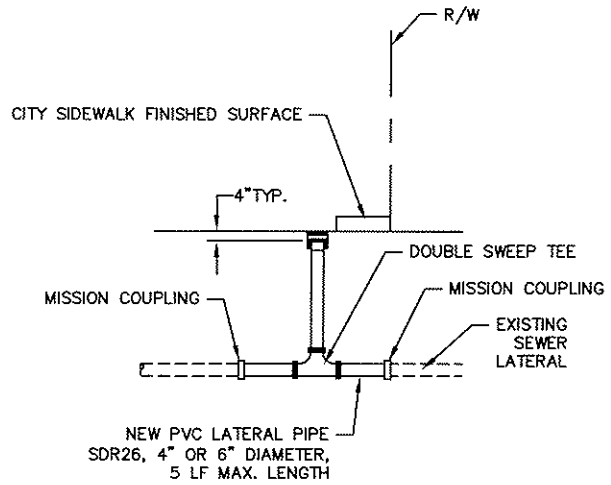




EDGE OF SIDEWALK
INSIDE RIGHT-OF-WAY LINE
N.T.S.

NOTE:
- GRAVITY LATERALS SHALL BE OF SDR 26 6"PVC PIPE, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
- DOUBLE SWEEP TEE SHALL BE GASKET RUN JOINTS BY SOLVENT WELD BRANCH JOINTS
- NON SEIZE GREASE, SUITABLE FOR USE WITH PVC, SHALL BE APPLIED TO THE THREADS OF THE CLEANOUT CAP.
- CONNECTION OF LATERALS TO EXISTING PIPE SHALL BE PROVIDED BY CUTTING IN TEES/TEE-WYES.
- ALL LATERAL PIPE SHALL BE INSTALLED TO THE RIGHT-OF-WAY LINE.




PLAN
N.T.S.




EDGE OF SIDEWALK
ADJACENT TO RIGHT-OF-WAY LINE
N.T.S.

ELEVATIONS
TYPICAL TEE & LATERAL INSTALLATION
N.T.S.

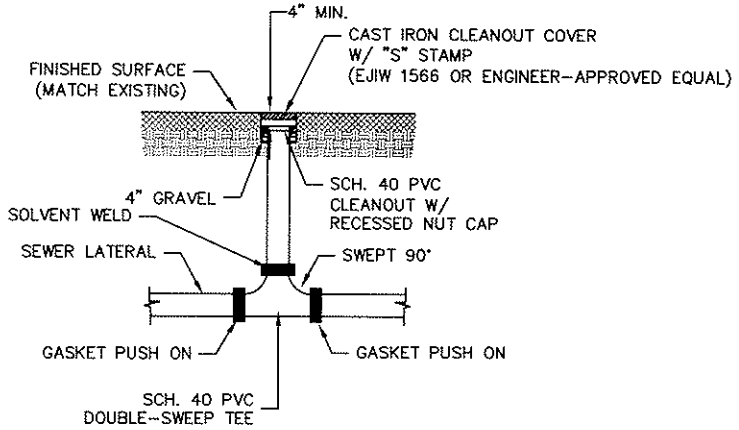
MAWSS
MOBILE AREA WATER & SEWER SYSTEM

BOARD OF WATER AND SEWER COMMISSIONERS OF THE CITY OF MOBILE, ALABAMA

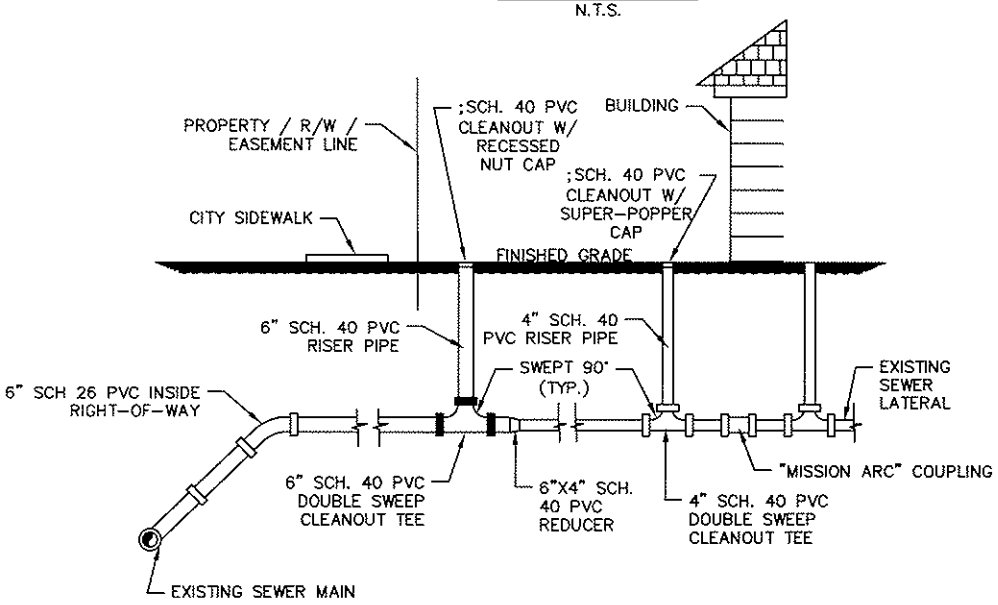
TYPICAL SANITARY SEWER DETAILS

SANITARY SEWER CIPP LATERAL DETAILS

DATE ISSUED: 01-27-12
SCALE: N.T.S.
DRAWING NO.: SS-112B




TRAFFIC-BEARING SURFACE
CLEANOUT DETAIL
N.T.S.




PRIVATE SANITARY SEWER LATERAL DETAIL
N.T.S.

NOTES:

1. A CLEANOUT SHALL BE PLACED AT THE PROPERTY/ RIGHT-OF-WAY / EASEMENT LINE AND WITHIN 2' TO 5' OF BUILDING OR AS APPROVED BY THE ENGINEER. CLEANOUTS PLACED AT THE BUILDINGS SHALL HAVE DOUBLE-SWEEP TEES & SUPER-POPPER CAP PER CITY OF MOBILE PLUMBING CODES.

2. A CAST IRON CLEANOUT COVER AS SHOWN IN DETAIL ABOVE SHALL BE INSTALLED IN DRIVEWAYS AND OTHER TRAFFIC-BEARING SURFACES.

3. DETAILS SHOWN ABOVE ARE TYPICAL FOR AN EXISTING 4" LATERAL. LINE SIZES AND ALL ASSOCIATED ITEMS INCLUDING FITTINGS AND TEES SHALL BE EITHER 4" OR 6", AS APPROPRIATE.

4. DOUBLE SWEEP TEE SHALL BE GASKET RUN JOINTS BY SOLVENT WELD BRANCH JOINTS.

| | | | |
|---|---|---|---|
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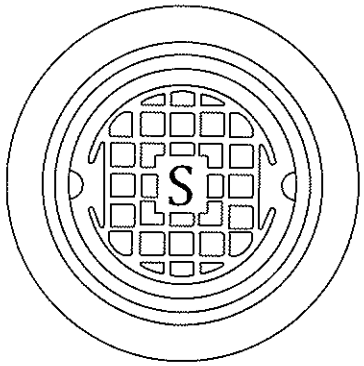
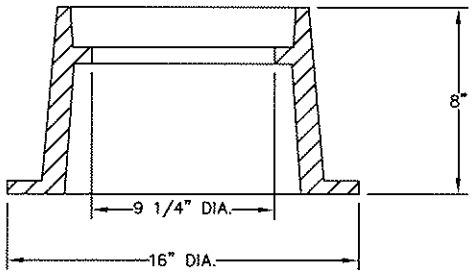
| | | PRIVATE LATERAL CONNECTION DETAILS | SCALE: N.T.S. |
| | | | DRAWING NO. SS-113 |




COVER SECTION
N.T.S.

EAST JORDAN, IRON WORKS 1566, MONUMENT BOX, HANDHOLE RING AND COVER, OR EQUAL




RING SECTION
N.T.S.

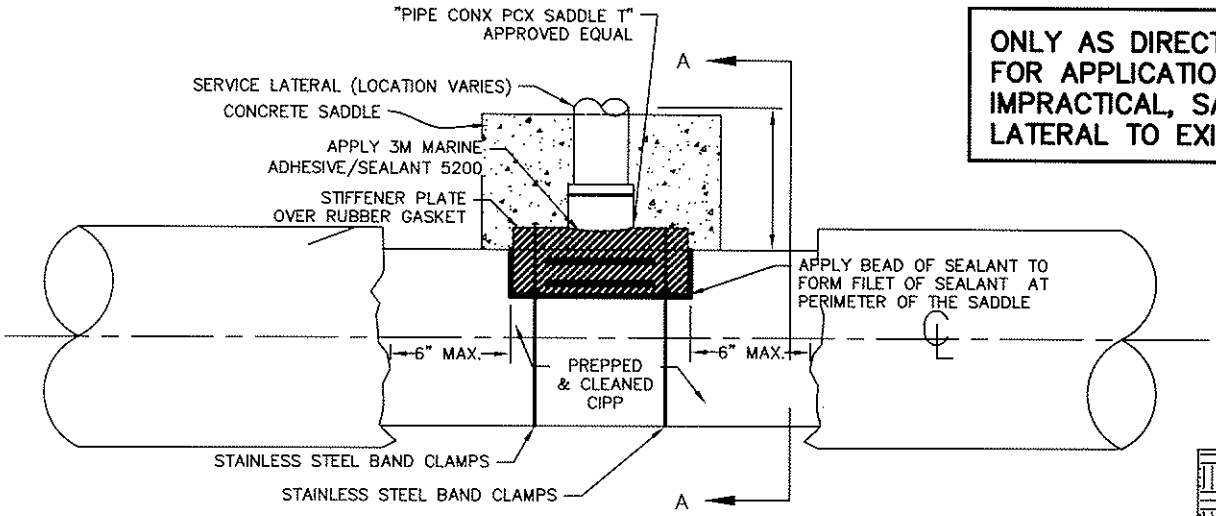
RING–40 LBS.
COVER–25 LBS.

HAND HOLE RING & COVER DETAIL FOR 6" CLEANOUT
N.T.S.

NOTE:

FOR 4" CLEANOUT U.S. FOUNDRY MODEL NO. 7610 OR EQUAL SHALL BE USED.

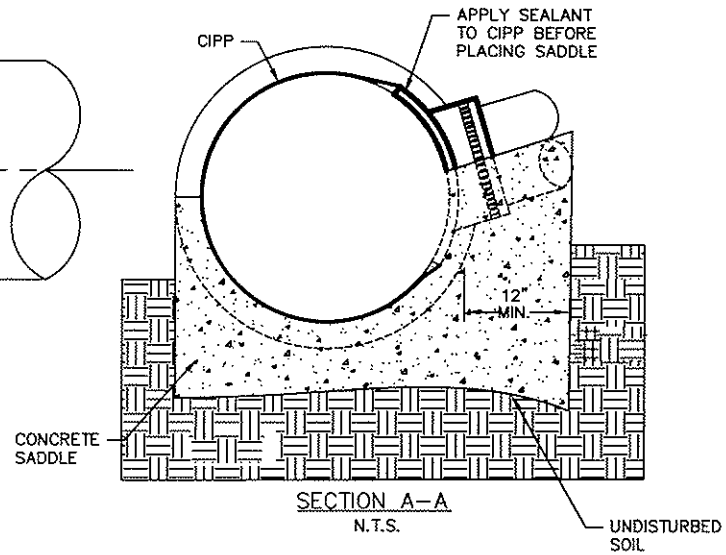
| | | | |
|---|---|---|---|
| MAWSS MOBILE AREA WATER & SEWER SYSTEM | BOARD OF WATER AND SEWER COMMISSIONERS OF THE CITY OF MOBILE, ALABAMA | TYPICAL SANITARY SEWER DETAILS | DATE ISSUED 01-11-10 |
| | | SANITARY SEWER HANDHOLE RING AND COVER DETAILS | SCALE: N.T.S. |
| | | | DRAWING NO. SS-114 |




SERVICE CONNECTION TO CIPP LINED S.S. MAINS

N.T.S.

**ONLY AS DIRECTED/APPROVED BY THE OWNER & FOR APPLICATIONS WHERE THE USE OF TEE-WYE IS IMPRACTICAL, SADDLES MAYBE USED TO CONNECT LATERAL TO EXISTING CIPP MAINLINE.**




SECTION A-A

N.T.S.

SERVICE CONNECTION NOTES:

1. REMOVE HOST PIPE FROM CIPP WITHOUT DAMAGING CIPP LINER.
2. THE LENGTH OF THE REMOVED HOST PIPE SHALL NOT EXCEED 6" BEYOND THE PERIMETER OF THE SADDLE. REMOVAL OF SOIL BENEATH THE PIPE SHALL BE MINIMAL.
3. FOR A NEW SERVICE INSTALLATION, A HOLE SAW OF PROPER DIAMETER FOR THE SADDLE SHALL BE USED TO CUT THE LINER. SEE SADDLE INSTALLATION DIRECTIONS FROM SADDLE MANUFACTURER TO IDENTIFY PROPER HOLE SIZE. IF THE LINER HAS AN EXISTING CUT-OUT BY THE CIPP INSTALLER, MAKE THE CUT-OUT AS CIRCULAR AS POSSIBLE. THE EDGES OF ANY CUT IN THE LINER SHALL NOT BE JAGGED AND SHALL BE SANDED FREE OF BURRS OR ANY OTHER EXTRANEOUS MATERIAL.

   IF THE EXISTING CUT-OUT IN THE CIPP IS FOR A WYE, IS OBLONG OR EXCEEDS 6.5" IN DIAMETER, A FITTING MUST BE CUT INTO THE CIPP FOR THE LATERAL INSTALLATION. DO NOT USE A SADDLE.
4. ALL SOIL, DEBRIS, OILS, LOOSE MATERIAL AND OTHER CONTAMINANTS SHALL BE REMOVED FROM THE CIPP LINER TO ENSURE PROPER ADHESION OF SEALANT. THE CIPP SHALL BE DRY WHEN SEALANT IS APPLIED.
5. PLACE THE SADDLE ON THE CIPP WITH THE SADDLE OPENING PROPERLY POSITIONED OVER THE CUT-OUT IN THE CIPP. ENSURE THE SADDLE IS CLEAN OF SOIL, DEBRIS, OILS, LOOSE MATERIAL, ETC. THE PROTRUDING RIDGE AROUND THE INSIDE OF THE SADDLE HOLE SHALL BE PLACED WITHIN THE CIPP CUT-OUT. THE RIDGE SHALL BE BEARING AGAINST THE BOTTOM OF THE CUT-OUT TO HELP PREVENT THE SADDLE FROM SLIPPING DOWNWARD. ONCE THE SADDLE IS POSITIONED, MARK ON THE CIPP THE OUTER PERIMETER OF THE SADDLE. REMOVE THE SADDLE.
6. APPLY 3M MARINE ADHESIVE/SEALANT 5200 (OR ENGINEER APPROVED EQUAL) TO THE SURFACE OF THE CIPP WITHIN THE MARKED PERIMETER ON THE PIPE. USE A TROWEL OR SOME OTHER TOOL TO COVER THE ENTIRE SURFACE WITHIN THE MARKED PERIMETER WITH ADHESIVE/SEALANT TO A THICKNESS NOT EXCEEDING ¼".
7. PLACE THE SADDLE ON THE CIPP IN THE LOCATION IDENTIFIED BY THE MARKED PERIMETER. INSTALL STIFFENER PLATE AND STAINLESS STEEL STRAPS. ENSURE STAINLESS STEEL STRAPS MEET TORQUE REQUIREMENTS OF SADDLE MANUFACTURER.
8. APPLY A BEAD OF ADHESIVE/SEALANT TO PERIMETER OF SADDLE TO FORM A FILLET AROUND THE PERIMETER OF THE SADDLE.
9. APPLY 3M MARINE ADHESIVE/SEALANT 5200 TO THE OUTSIDE OF THE SPICKET ENT OF THE LATERAL, THEN INSERT THE LATERAL INTO THE BELL OF THE TEE-SADDLE.
10. AFTER LATERAL PIPE IS CONNECTED TO SADDLE AND ON PROPER GRADE, POUR A CONCRETE SADDLE UNDER THE MAIN PIPE AND THE LATERAL CONNECTION AS SHOWN. CONCRETE SHALL BE THOROUGHLY MIXED WITH WATER BEFORE PLACEMENT. POURING DRY MIX INTO EXCAVATION AND WETTING WITH WATER AFTERWARD IS UNACCEPTABLE.
11. ALLOW ADEQUATE TIME, PER MANUFACTURER'S RECOMMENDATIONS, FOR SEALANT TO CURE AND CONCRETE SET BEFORE BACKFILLING EXCAVATION.

| | | | |
|---|---|---|---|
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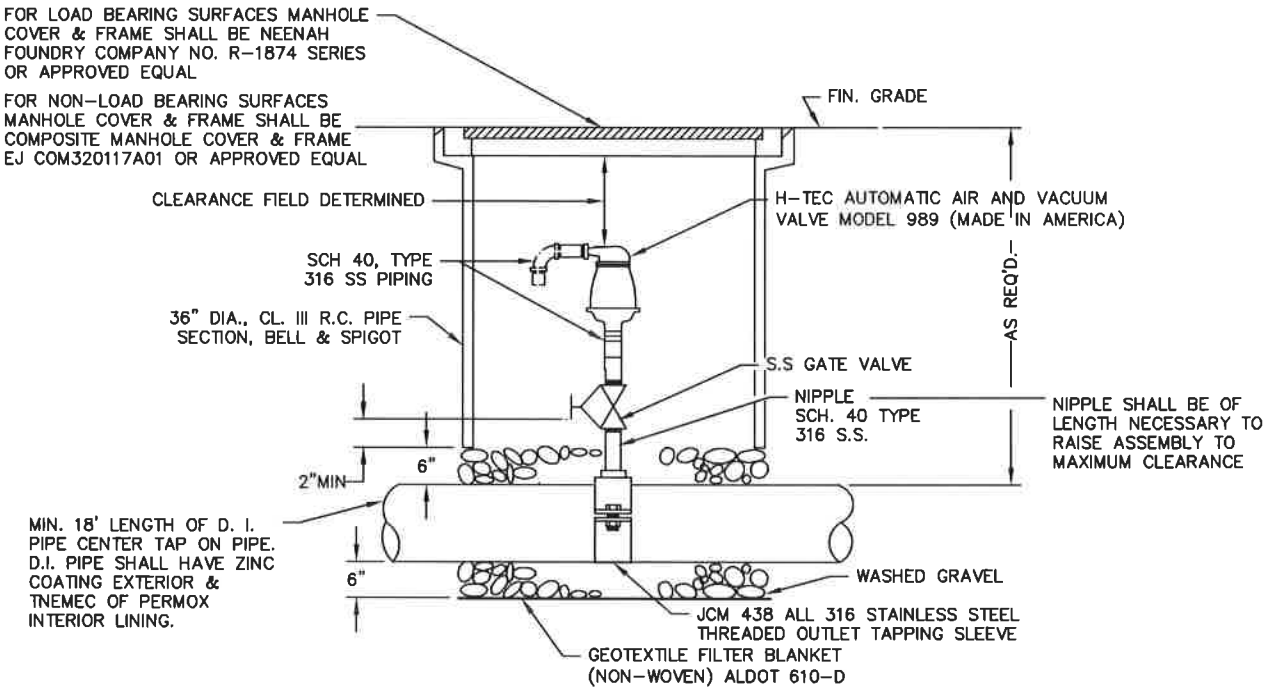
| | | LATERAL CONNECTION TO CIPP SEWER MAIN DETAILS | SCALE N.T.S. |
| | | | DRAWING NO. SS-115 |




AIR AND VACUUM VALVE ASSEMBLY
FOR DUCTILE IRON PIPE FORCEMAIN
N.T.S.

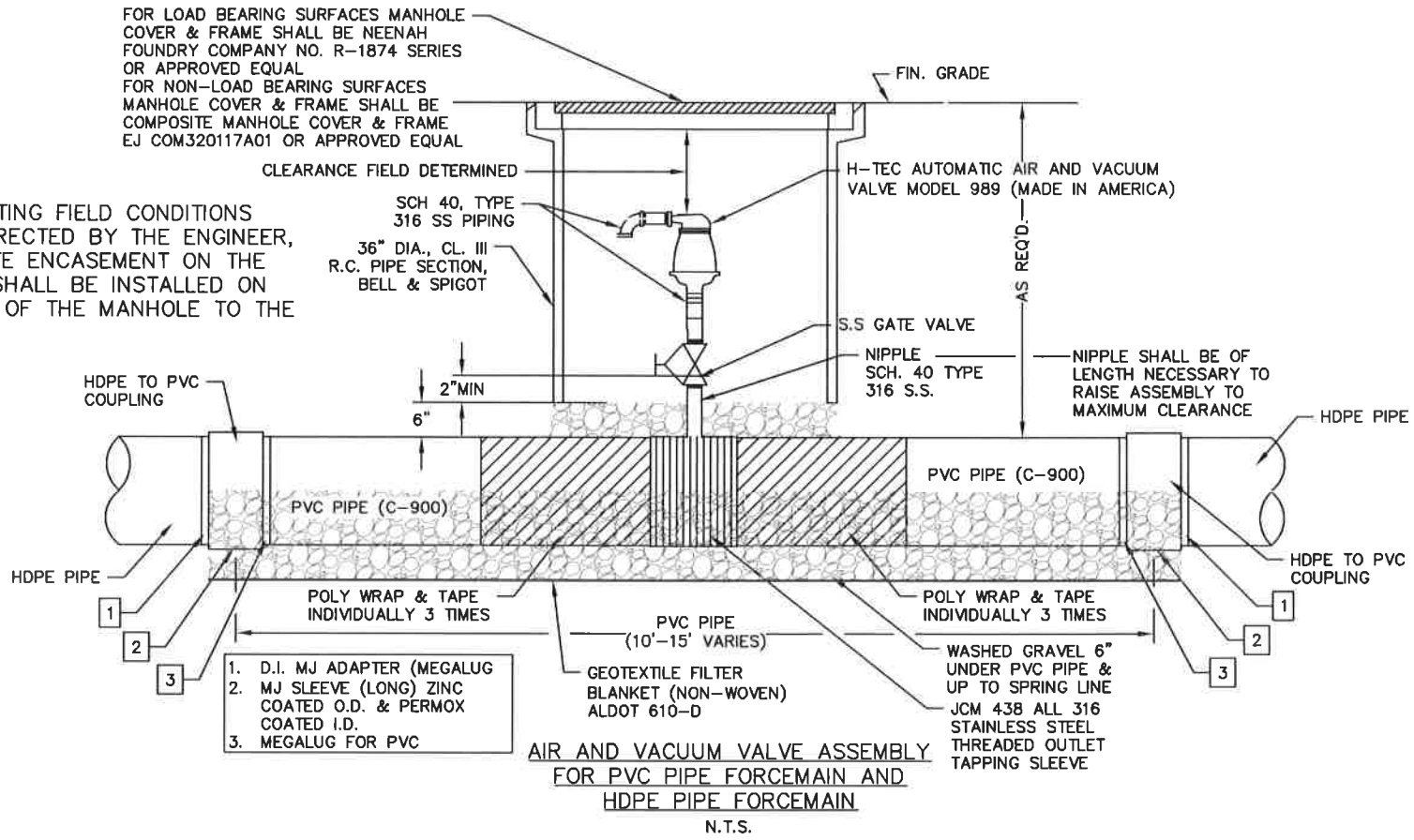
MAWSS
MOBILE AREA WATER & SEWER SYSTEM

BOARD OF WATER AND SEWER COMMISSIONERS OF THE CITY OF MOBILE, ALABAMA

TYPICAL SANITARY SEWER DETAILS

AIR AND VACUUM VALVE ASSEMBLY AND FORCE MAIN CONNECTION TO MANHOLE DETAILS

| | |
|---|---|
| REVISED ON | 07-03-23 |
| DATE ISSUED | 01-11-10 |
| SCALE: | N.T.S |
| DRAWING NO. | SS-116 |




NOTE:
GIVEN EXISTING FIELD CONDITIONS AND AS DIRECTED BY THE ENGINEER, A CONCRETE ENCASEMENT ON THE PVC PIPE SHALL BE INSTALLED ON EACH SIDE OF THE MANHOLE TO THE COUPLINGS.

AIR AND VACUUM VALVE ASSEMBLY FOR PVC PIPE FORCEMAIN AND HDPE PIPE FORCEMAIN

N.T.S.

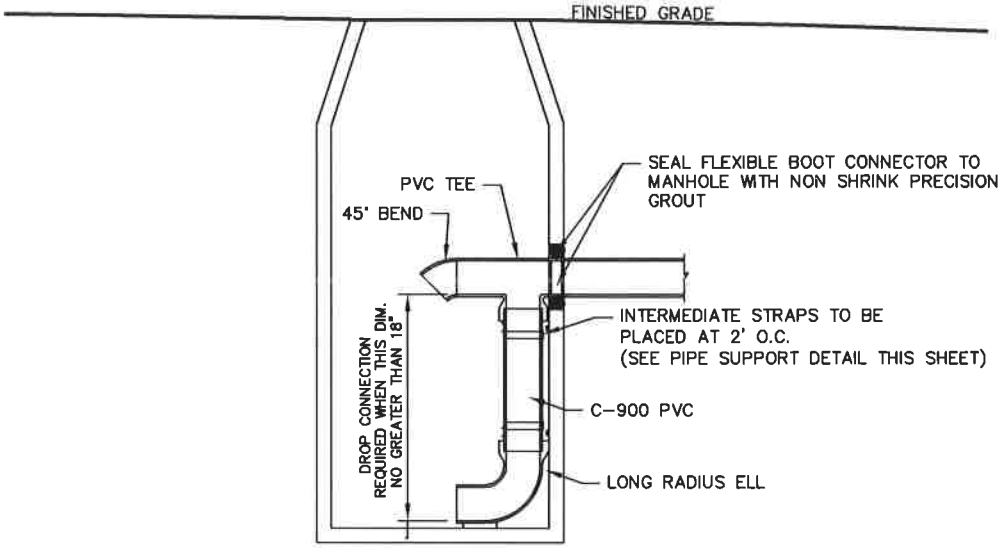
MAWSS
MOBILE AREA WATER & SEWER SYSTEM

BOARD OF WATER AND SEWER COMMISSIONERS OF THE CITY OF MOBILE, ALABAMA

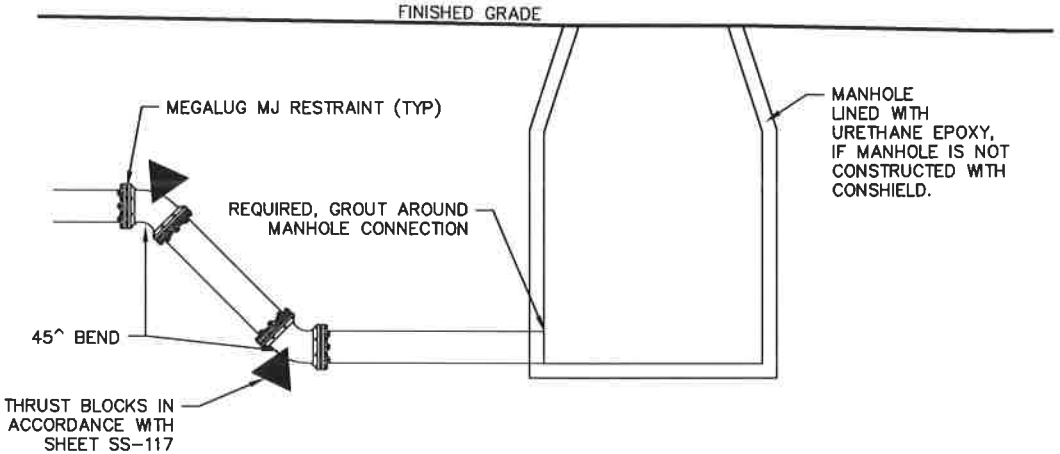
TYPICAL SANITARY SEWER DETAILS

AIR AND VACUUM VALVE ASSEMBLY AND FORCE MAIN CONNECTION TO MANHOLE DETAILS

| | |
|---|---|
| REVISED ON | 07-03-23 |
| DATE ISSUED | 01-11-10 |
| SCALE | N.T.S |
| DRAWING NO. | SS-116A |




FORCE MAIN CONNECTION TO MANHOLE
4' DEEP OR GREATER
N.T.S.




FORCE MAIN CONNECTION TO MANHOLE
4' DEEP OR LESS
N.T.S.

MAWSS
MOBILE AREA WATER & SEWER SYSTEM

BOARD OF WATER AND SEWER COMMISSIONERS OF THE CITY OF MOBILE, ALABAMA

TYPICAL SANITARY SEWER DETAILS

FORCE MAIN CONNECTION TO MANHOLE DETAILS

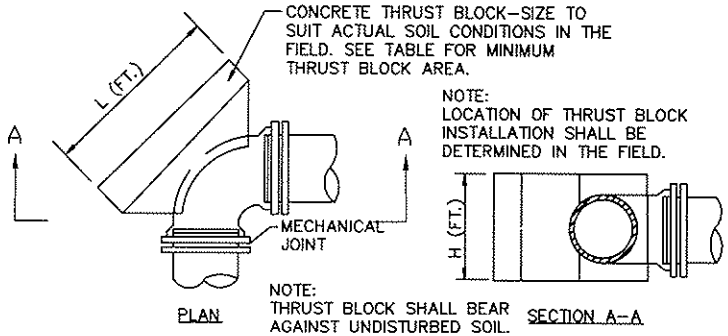
| | |
|---|---|
| REVISED ON | 07-03-23 |
| DATE ISSUED | 01-11-10 |
| SCALE | N.T.S |
| DRAWING NO. | SS-116B |

## TYPICAL THRUST BLOCKS
## MINIMUM THRUST BLOCK AREA SQ. FT. L (FT.) X H (FT.)

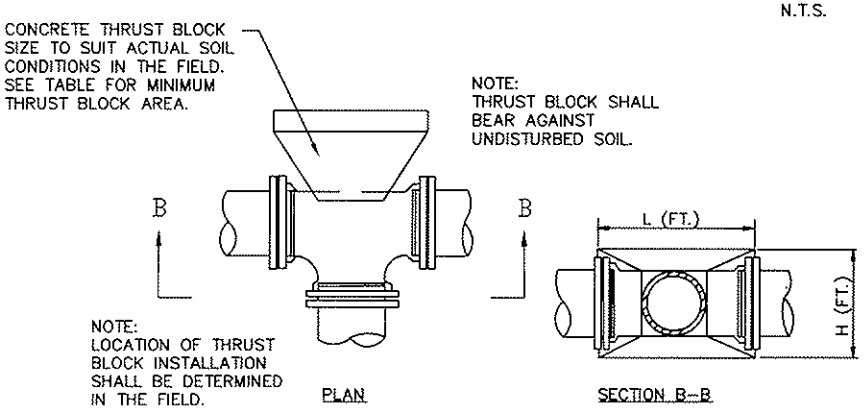
| INSIDE DIA. PIPE LINE IN INCHES | 90° BENDS | TEES, DEAD ENDS, OR 45° BENDS | 22½° BENDS |
|---|---|---|---|
| 6" | 3.0 | 2.2 | 1.0 |
| 8" | 5.5 | 4.0 | 1.5 |
| 10" | 8.5 | 6.0 | 2.5 |
| 12" | 12.0 | 9.0 | 3.5 |
| 16" | 22.0 | 16.0 | 6.0 |
| 18" | 27.0 | 20.0 | 8.0 |
| 20" | 34.0 | 24.0 | 10.0 |
| 24" | 48.0 | 34.0 | 14.0 |
| 30" | 75.0 | 53.0 | 21.0 |

NOTE:

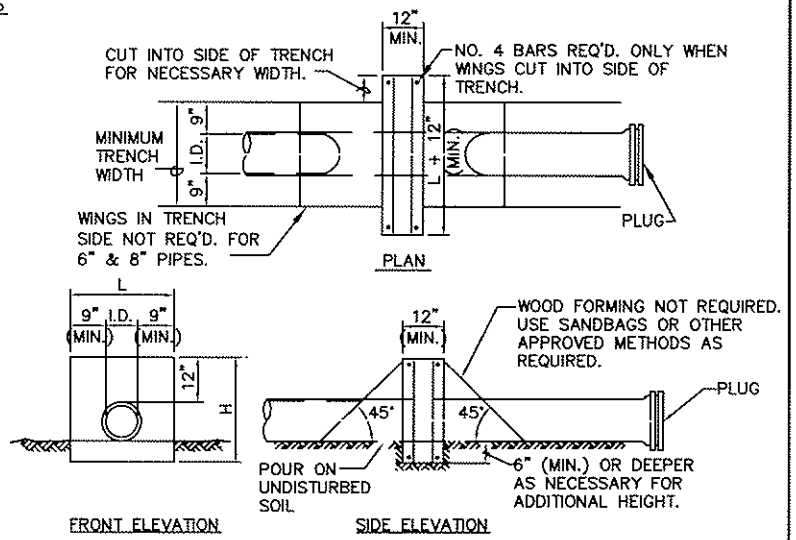
1. CONCRETE SHALL HAVE 28 DAY COMPRESSIVE STRENGTH ≥3000PSI
2. CONCRETE SHALL BE THOROUGHLY MIXED WITH WATER PRIOR TO PLACEMENT
3. CONCRETE SHALL BE POURED AGAINST UNDISTURBED SOIL.




TYPICAL THRUST BLOCK DETAIL FOR BENDS
N.T.S.




TYPICAL THRUST BLOCK DETAIL FOR TEES
N.T.S.




CONCRETE DEAD END ANCHOR BLOCK DETAILS
N.T.S.

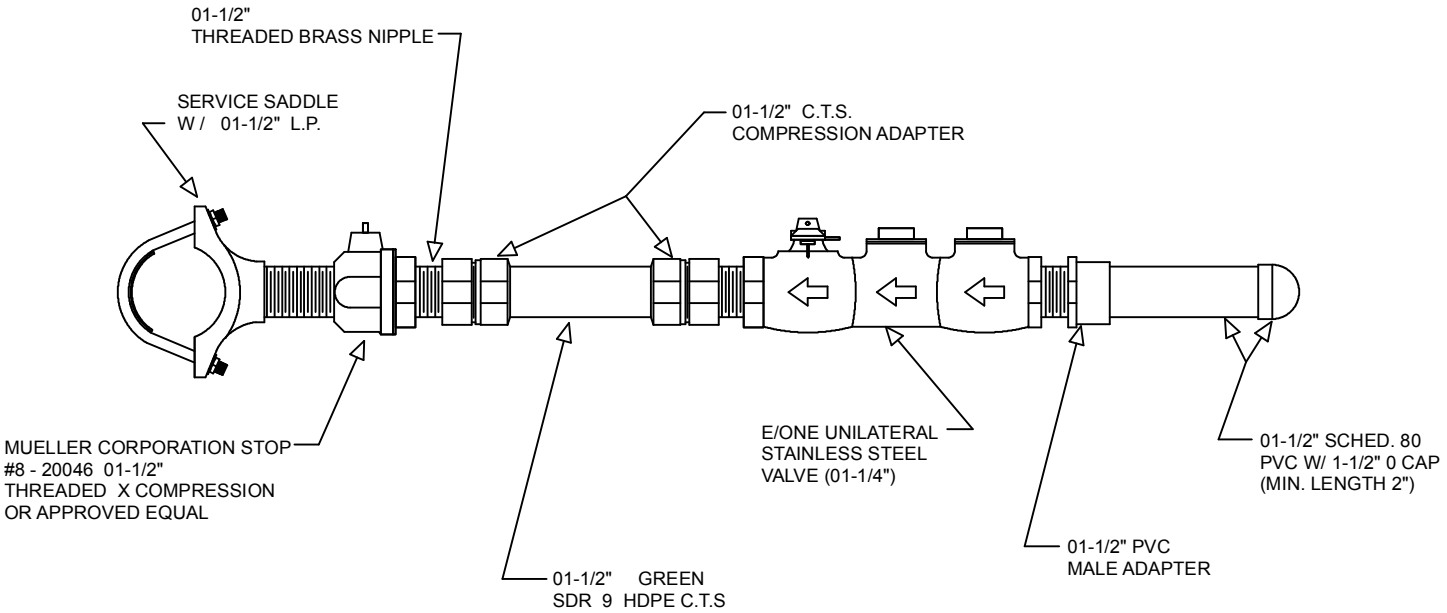
MAWSS
MOBILE AREA WATER & SEWER SYSTEM

BOARD OF WATER AND SEWER COMMISSIONERS OF THE CITY OF MOBILE, ALABAMA

TYPICAL SANITARY SEWER DETAILS

THRUST BLOCK & DEAD END ANCHOR BLOCKS DETAILS

DATE ISSUED: 01-11-10
SCALE: N.T.S.
DRAWING NO: SS-117




LOW PRESSURE FORCEMAIN S.S. LATERAL DETAIL
N.T.S

NOTE:

1. A TRACER WIRE (14 GUAGE COPPER WIRE) SHALL BE INSTALLED AT THE LATERAL LOCATION FROM FORCE MAIN CONNECTION TO TERMINATION AT PROPERTY LINE

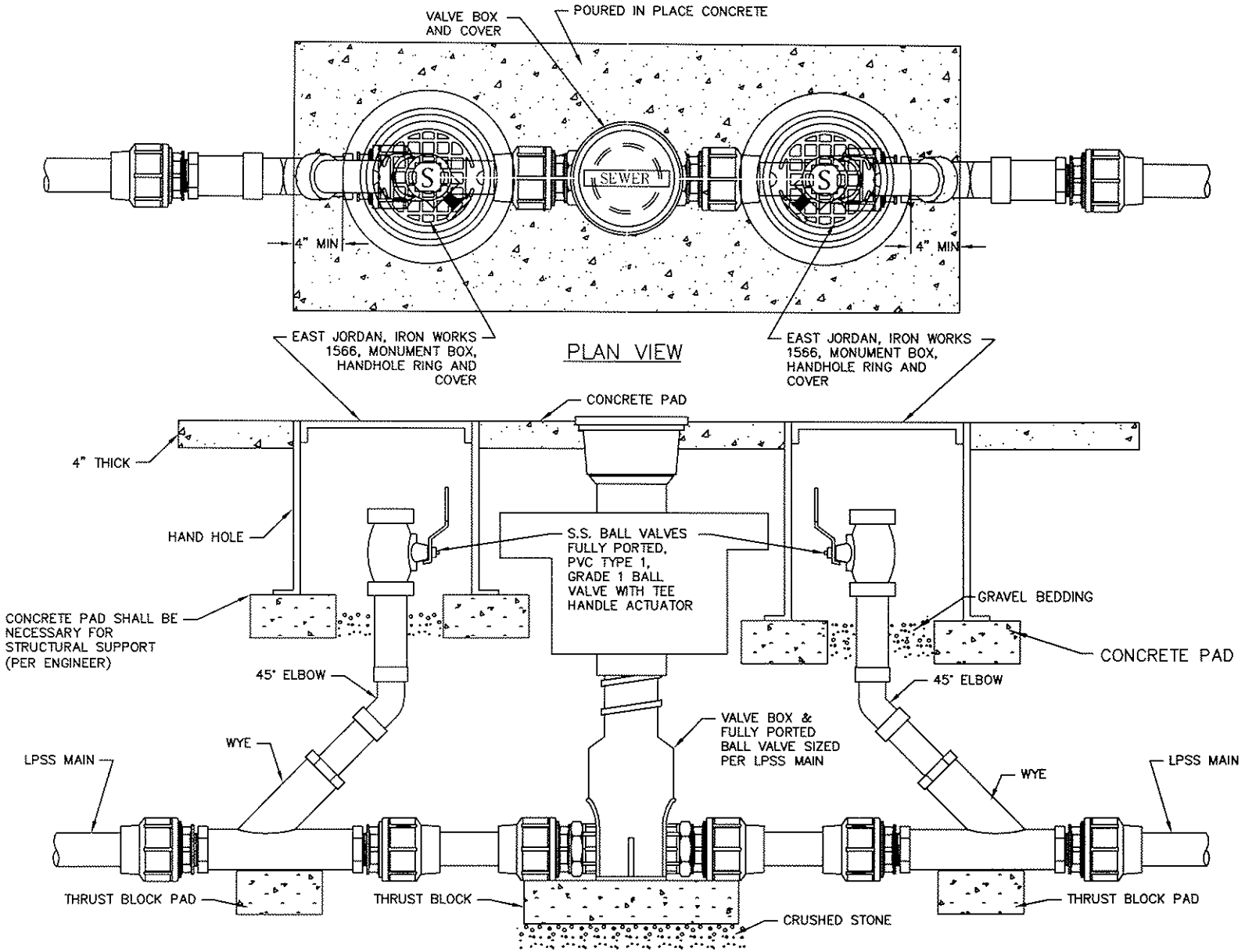
2. WIRE SHALL RUN FROM MAIN TO TERMINATION POINT OF LATERAL

3. FOR NEW DEVELOPMENTS WITH CONCRETE CURBS, A 3" "S" SHALL BE STAMPED ON CURB AT THE LOCATION OF THE SERVICE

4. INSTALL ONE 4"X4"X4" TREATED TIMBER AT THE TERMINATION POINT OF THE LATERAL. TIMBER SHALL BE PAINTED GREEN & BE INSTALLED PLUMB.

REVIISED: 02/10/2021

| | | | |
|---|---|---|---|
| MAWSS MOBILE AREA WATER & SEWER SYSTEM | BOARD OF WATER AND SEWER COMMISSIONERS OF THE CITY OF MOBILE, ALABAMA | TYPICAL SANITARY SEWER DETAILS | DATE ISSUED 01-11-10 |
| | | LOW PRESSURE SEWER FORCE MAIN LATERAL | SCALE: N.T.S |
| | | | DRAWING NO: SS-118 |




NOTE:

AT EACH CLEANOUT LOCATION A VALVE MARKER SHALL BE REQUIRED.

## TYPICAL FLUSHING CONNECTION ON LPSS FORCE MAIN

N.T.S.

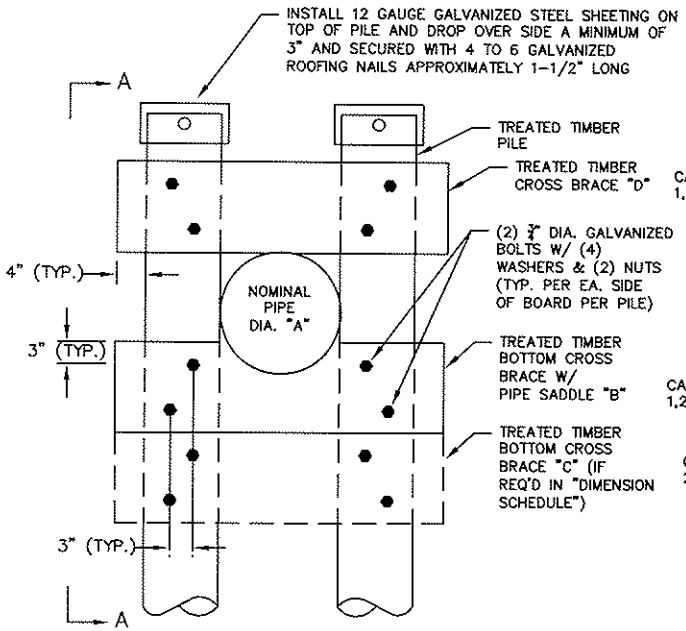
MAWSS
MOBILE AREA WATER & SEWER SYSTEM

BOARD OF WATER AND SEWER COMMISSIONERS OF THE CITY OF MOBILE, ALABAMA

TYPICAL SANITARY SEWER DETAILS

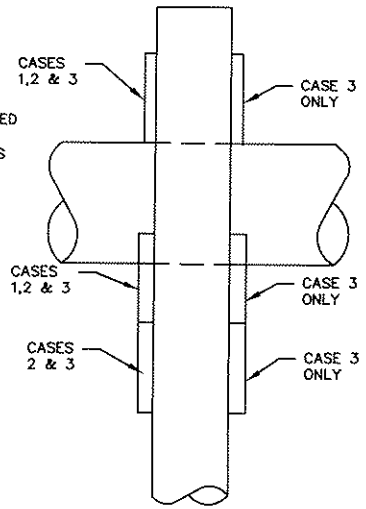
FLUSHING CONNECTION FOR LOW PRESSURE SEWER FORCE MAIN

DATE ISSUED: 01-11-10
SCALE: N.T.S.
DRAWING NO.: SS-119




| DIMENSION SCHEDULE | | | | |
|---|---|---|---|---|
| CASE NO. | "A" | "B" | "C" | "D" |
| CASE 1 | 8"–16" | 1 EA. 3X12 | NOT REQ'D | 1 EA 2X12 |
| CASE 2 | 18"–24" | 1 EA. 3X12 | 1 EA. 3X12 | 1 EA. 2X12 |
| CASE 3 | 30"–36" | 2 EA. 3X12 (1 EACH SIDE OF PILE) | 2 EA. 3X12 (1 EACH SIDE OF PILE) | 2 EA. 2X12 (1 EACH SIDE OF PILE) |

TIMBER PILE SUPPORT DETAIL
N.T.S.




SECTION "A–A"
N.T.S.

NOTES:

1. SUPPORT STRUCTURES SHALL BE PLACED AT EVERY JOINT, 18' TO 20' ON CENTER TYPICAL. DEPENDING ON LAYING LENGTH OF PIPE.

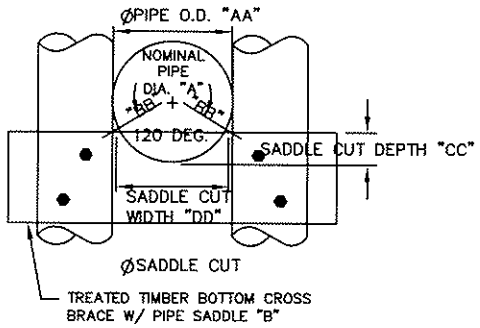
2. SEE STANDARD SPECIFICATIONS FOR MATERIAL SPECIFICATIONS.

3. TREATED TIMBER PILES SHALL HAVE A MINIMUM TIP DIAMETER OF 6" UNLESS DIRECTED OTHERWISE BY OWNER OR ENGINEER.

4. LENGTH OF PILES TO BE DETERMINED BY ENGINEER, OR OWNER AS FIELD-CONDITIONS WARRANT.

5. RESTRAINED JOINTS SHALL BE USED FOR AERIAL CROSSINGS.

TIMBER PILE SUPPORTS FOR D.I. SANITARY SEWER PIPE
N.T.S.




| PIPE SADDLE DIMENSION SCHEDULE | | | | |
|---|---|---|---|---|
| "A" | "AA" | "BB" | "CC" | "DD" |
| 8" | 9.05" | 10.05" | 2.51" | 8.70" |
| 10" | 11.10" | 12.10" | 3.03" | 10.48" |
| 12" | 13.20" | 14.20" | 3.55" | 12.30" |
| 14" | 15.30" | 16.30" | 4.08" | 14.12" |
| 16" | 17.40" | 18.40" | 4.60" | 15.93" |
| 18" | 19.50" | 20.50" | 5.13" | 17.75" |
| 20" | 21.60" | 22.60" | 5.65" | 19.57" |
| 24" | 25.80" | 26.80" | 6.70" | 23.21" |
| 30" | 32.00" | 33.00" | 8.25" | 28.58" |
| 36" | 38.30" | 39.30" | 9.83" | 34.03" |

PIPE SADDLE DETAIL
N.T.S.

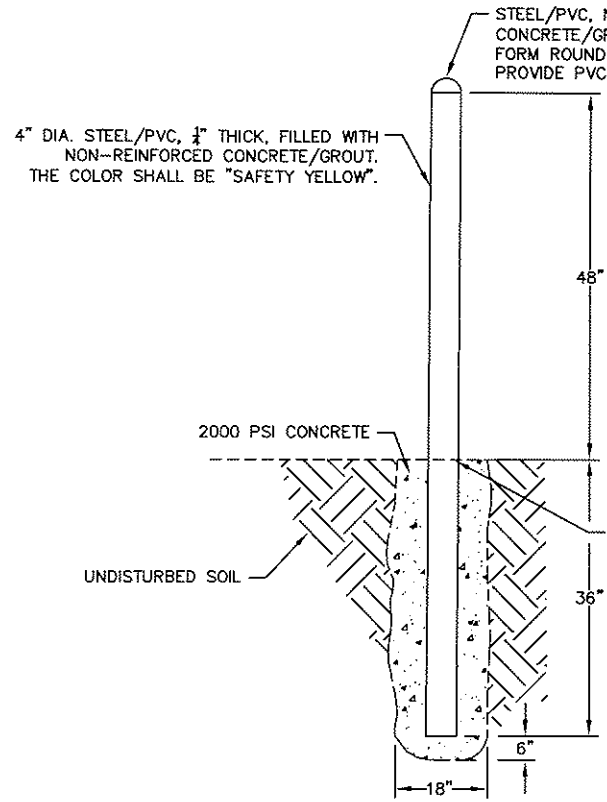
MAWSS
MOBILE AREA WATER & SEWER SYSTEM

BOARD OF WATER AND SEWER COMMISSIONERS OF THE CITY OF MOBILE, ALABAMA

TYPICAL SANITARY SEWER DETAILS

TIMBER PILE SUPPORT DETAILS FOR D.I. SANITARY SEWER PIPES

DATE ISSUED: 01-11-10
SCALE: N.T.S.
DRAWING NO.: SS-120

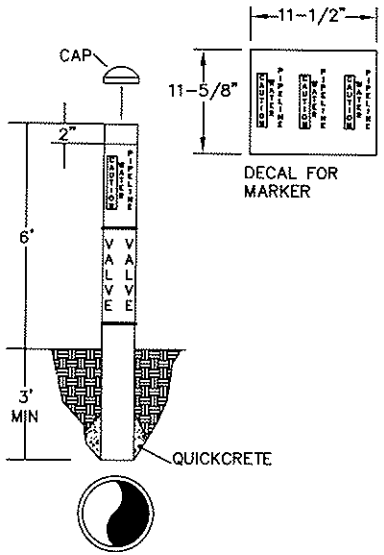



BOLLARD DETAIL
N.T.S.

BOLLARD NOTES:

1. THREE (3) BOLLARDS SHALL BE EVENLY SPACED AT 120° AROUND MANHOLE. INSTALL THE BOLLARD WITHIN 3 FT TO 4 FT OF THE EDGE OF THE MANHOLE RIM.
2. BOLLARDS SHALL BE AT SAME HEIGHT AND SHALL BE PLUMB.
3. BOLLARDS ON PRIVATE PROPERTY OR WITHIN EASEMENTS SHALL BE STEEL PIPE FILLED WITH CONCRETE & PAINTED "SAFETY YELLOW" WITH AN EXTERIOR ENAMEL BASE PAINT.
4. BOLLARDS WITHIN THE RIGHT-OF-WAY SHALL BE PVC AS SHOWN IN THIS DETAIL.

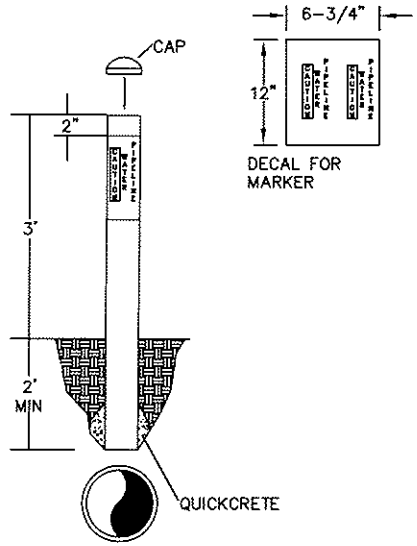
| | | | |
|---|---|---|---|
| MAWSS MOBILE AREA WATER & SEWER SYSTEM | BOARD OF WATER AND SEWER COMMISSIONERS OF THE CITY OF MOBILE, ALABAMA | TYPICAL SANITARY SEWER DETAILS | DATE ISSUED 01-11-10 |
| | | BOLLARD DETAIL | SCALE N.T.S. |
| | | | DRAWING NO. SS-121 |




USE ON WATER & SEWER LINES RUNNING THROUGH NON-RESIDENTIAL AREAS.

- 1 - 40LB BAG OF QUICKCRETE(MIN)
- PLACE MARKER DIRECTLY OVER PIPELINE
- MARKER SHALL BE PLUMB
- FLARE BOTTOM OF HOLE FOR QUICKCRETE

GUIDE FOR INSTALLATION OF 3" PVC WATER & SEWER PIPELINE MARKERS

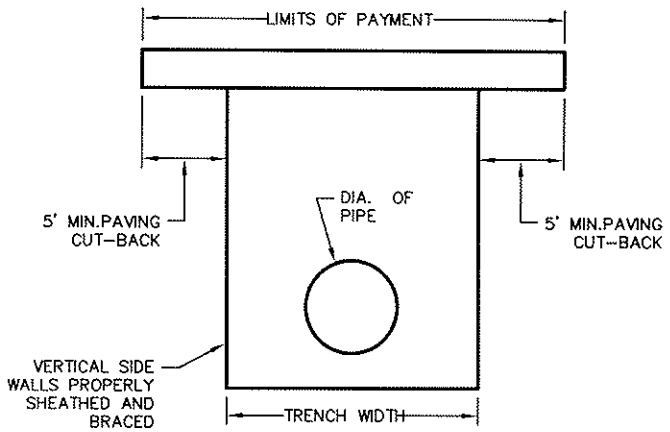



USE ON WATER & SEWER LINES RUNNING THROUGH NON-RESIDENTIAL AREAS.

- ½ - 40LB BAG OF QUICKCRETE(MIN)
- PLACE MARKER DIRECTLY OVER PIPELINE
- MARKER SHALL BE PLUMB
- FLARE BOTTOM OF HOLE FOR QUICKCRETE

GUIDE FOR INSTALLATION OF 1½" PVC WATER & SEWER PIPELINE MARKERS

| | | | |
|---|---|---|---|
| MAWSS MOBILE AREA WATER & SEWER SYSTEM | BOARD OF WATER AND SEWER COMMISSIONERS OF THE CITY OF MOBILE, ALABAMA | TYPICAL SANITARY SEWER DETAILS | DATE ISSUED: 01-11-10 |
| | | PIPE LINE MARKER DETAILS | SCALE: N.T.S. |
| | | | DRAWING NO: SS-122 |




TRENCH WIDTHS & PAVING CUT- BACKS
LIMIT OF PAYMENT
N.T.S.

| NOMINAL PIPE DIAMETER (INCHES) | TRENCH WIDTH (INCHES) |
|---|---|
| 4 | 40 |
| 6 | 42 |
| 8 | 44 |
| 10 | 46 |
| 12 | 48 |
| 14 | 50 |
| 15 | 51 |
| 16 | 52 |
| 18 | 54 |
| 20 | 56 |
| 24 | 60 |
| 30 | 66 |
| 36 | 72 |
| 42 | 78 |
| 48 | 84 |

NOTES:

1. THE LIMITS OF PAYMENT FOR PAVING OVER THE TRENCH SHALL BE THE TRENCH WIDTH SHOWN PLUS THE CUT- BACK ON EITHER SIDE OF THE TRENCH.
2. REPLACEMENT WORK BEYOND TRENCH WIDTH OR LIMITS OF PAYMENT FOR PAVING SHALL BE AT THE CONTRACTOR'S EXPENSE. NO EXTRA COMPENSATION WILL BE ALLOWED.
3. THE LIMITS OF PAYMENT FOR SELECT BACKFILL (ITEM BF- 1) SHALL BE THE APPLICABLE TRENCH WIDTH SHOWN MULTIPLIED BY THE AVERAGE DEPTH OF BACKFILL TO THE TOP OF PIPE.
4. THE JAGGED EDGES OF THE EXISTING PAVEMENT ALONG THE TRENCH CUT SHALL BE SQUARED AND CUT TO A NEAT LINE WITH AN APPROPRIATE SAW ALONG STRAIGHT LINES PARALLEL TO THE CENTER OF THE PAVEMENT CUT.

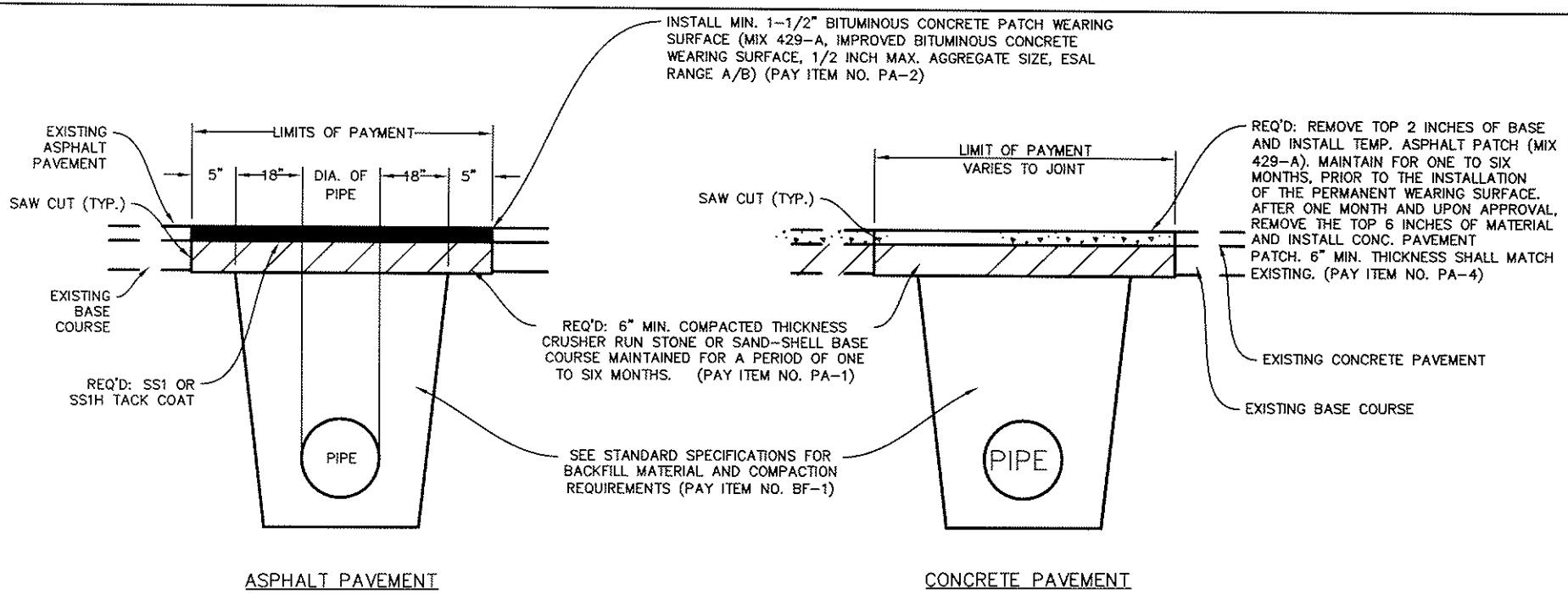
MAWSS
MOBILE AREA WATER & SEWER SYSTEM

BOARD OF WATER AND SEWER COMMISSIONERS OF THE CITY OF MOBILE, ALABAMA

TYPICAL SANITARY SEWER DETAILS

TRENCH WIDTHS AND PAVING CUT BACK

DATE ISSUED: 01-11-10
SCALE: N.T.S.
DRAWING NO.: SS-123



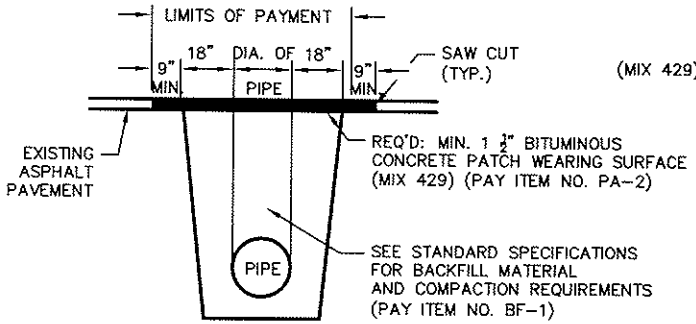

## TEMPORARY ROADWAY PATCH WITHIN CITY OF MOBILE R/W

N.T.S.

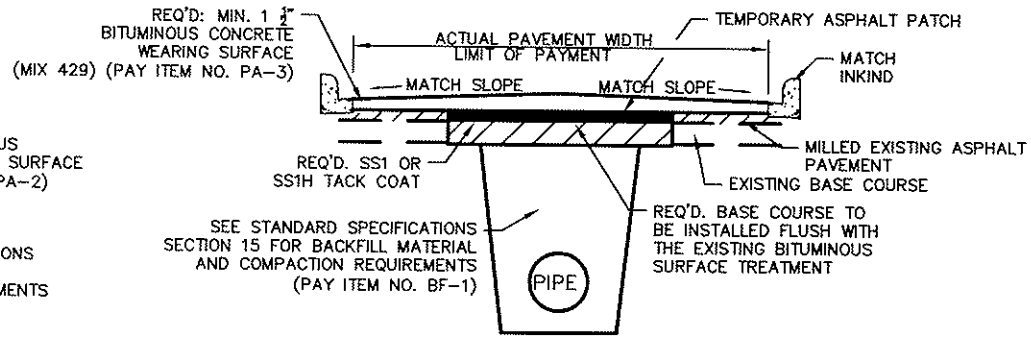
NOTE:

PAVING AND CONSTRUCTION WITHIN THE CITY OF MOBILE RIGHT OF WAY SHALL MEET THE CITY OF MOBILE'S STANDARDS.

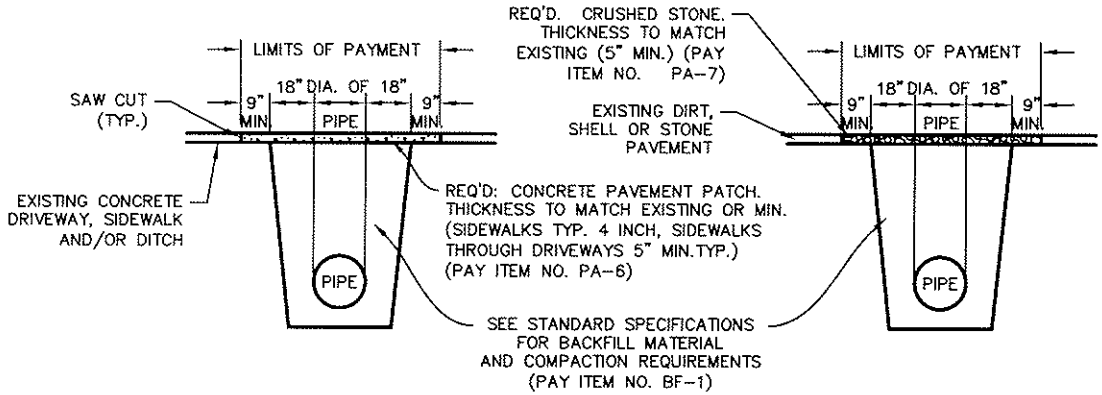
| | | | |
|---|---|---|---|
| MAWSS MOBILE AREA WATER & SEWER SYSTEM | BOARD OF WATER AND SEWER COMMISSIONERS OF THE CITY OF MOBILE, ALABAMA | TYPICAL SANITARY SEWER DETAILS | DATE ISSUED 01-11-10 |
| | | TEMPORARY PAVEMENT DETAILS | SCALE: N.T.S. |
| | | | DRAWING NO. SS-124 |



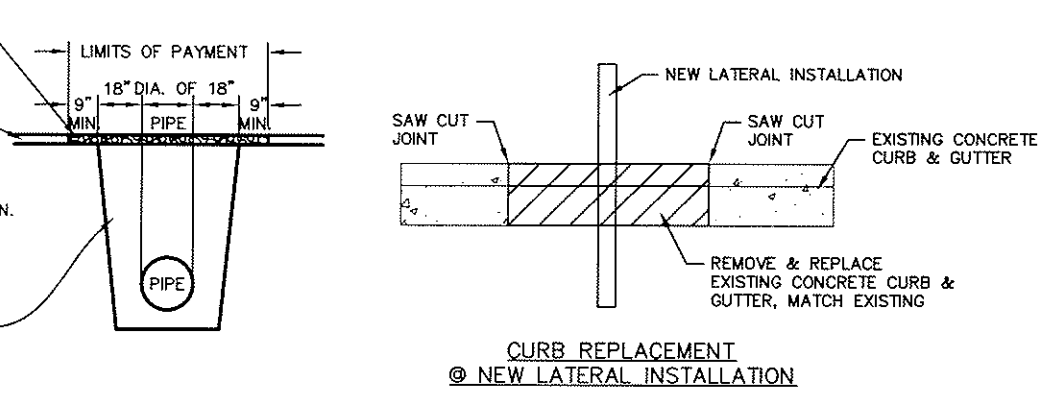

REMOVING & REPLACING ASPHALT DRIVEWAYS
N.T.S.




BITUMINOUS WEARING SURFACE FOR FULL WIDTH STREET SURFACING
N.T.S.




REMOVING & REPLACING CONCRETE DRIVEWAYS, SIDEWALKS & DITCHES
N.T.S.




CRUSHED STONE FOR SURFACING
(OUTSIDE DRIVEWAY APRON & SIDEWALK)
N.T.S.

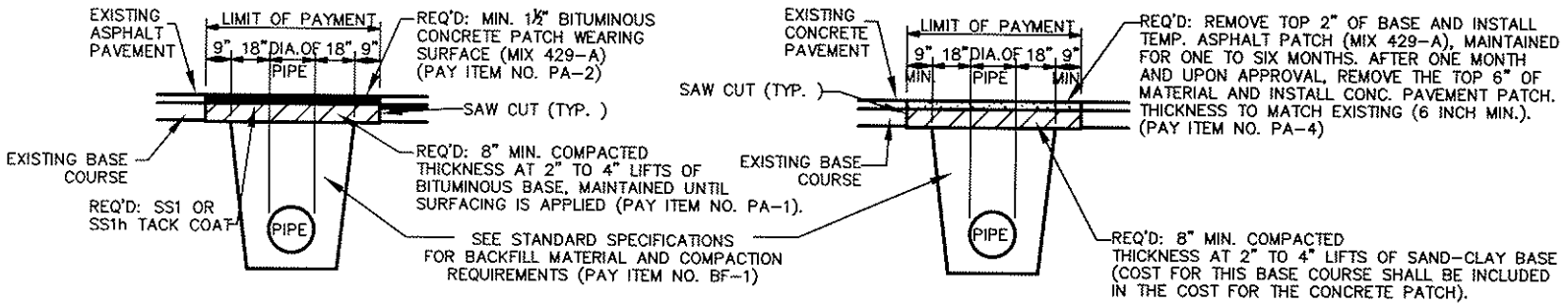



CURB REPLACEMENT
@ NEW LATERAL INSTALLATION
N.T.S.

NOTE:

PAVING AND CONSTRUCTION WITHIN THE CITY OF MOBILE RIGHT OF WAY SHALL MEET THE CITY OF MOBILE'S STANDARDS.

| | | | |
|---|---|---|---|
| MAWSS MOBILE AREA WATER & SEWER SYSTEM | BOARD OF WATER AND SEWER COMMISSIONERS OF THE CITY OF MOBILE, ALABAMA | TYPICAL SANITARY SEWER DETAILS | DATE ISSUED: 01-11-10 |
| | | PAVEMENT REMOVAL & REPLACEMENT DETAILS | SCALE: N.T.S. |
| | | | DRAWING NO.: SS-125 |

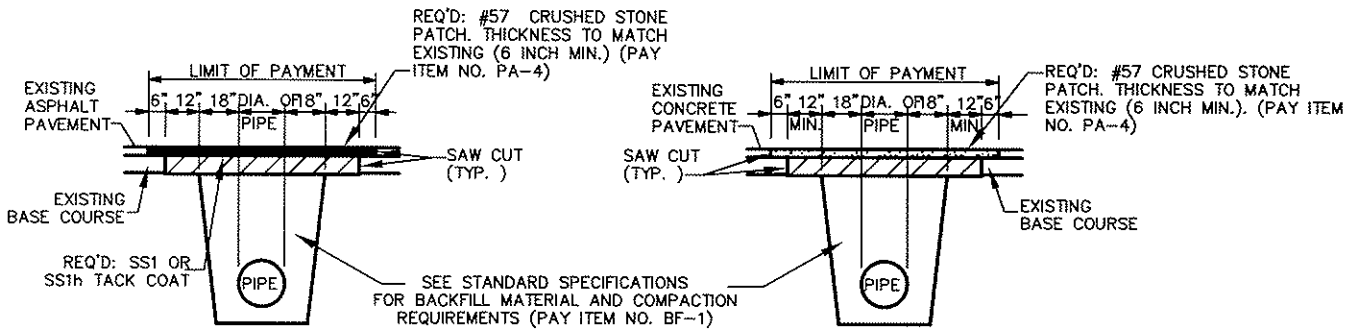



ASPHALT PAVEMENT

CONCRETE PAVEMENT

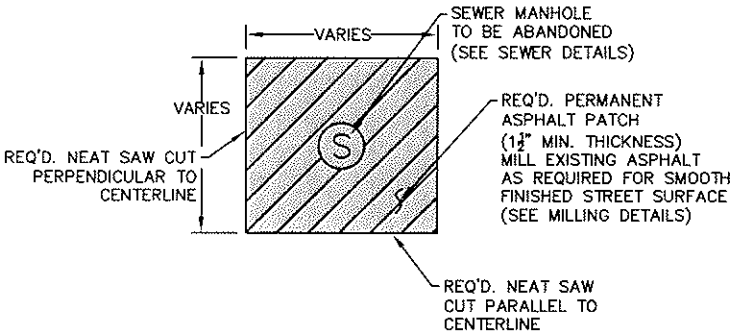
REMOVING & PREPARATION OF PAVEMENT WITHIN MOBILE COUNTY R/W

N.T.S.

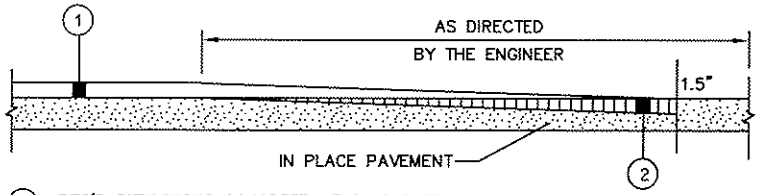



REMOVING & PREPARATION OF PAVEMENT WITHIN STATE OF ALABAMA R/W

N.T.S.




MANHOLE PERMANENT ASPHALT PATCH DETAIL




(1) REQ'D BITUMINOUS CONCRETE WEARING SURFACE LAYER, 1-½" THICK MIX 429-A

(2) MILLING EXISTING PAVEMENT (APPROXIMATELY 1-1/4" THRU 1-3/4" THICK)

PAVEMENT TERMINATION DETAIL

N.T.S.

NOTE:

REMOVE EXISTING PAVEMENT SO AS TO CONSTRUCT A UNIFORM LAYER OF BITUMINOUS CONCRETE WEARING SURFACE. DEPTH OF REMOVAL WILL BE TO THE SATISFACTION OF THE ENGINEER. THE COST ASSOCIATED WITH THE REMOVAL & DISPOSAL OF THE IN PLACE PAVEMENT SHALL BE BID AND PAID FOR UNDER ITEM NO. PA-3A.

NOTE:

PAVING AND CONSTRUCTION WITHIN THE CITY OF MOBILE RIGHT OF WAY SHALL MEET THE CITY OF MOBILE'S STANDARDS.

MAWSS
MOBILE AREA WATER & SEWER SYSTEM

BOARD OF WATER AND SEWER COMMISSIONERS OF THE CITY OF MOBILE, ALABAMA

TYPICAL SANITARY SEWER DETAILS

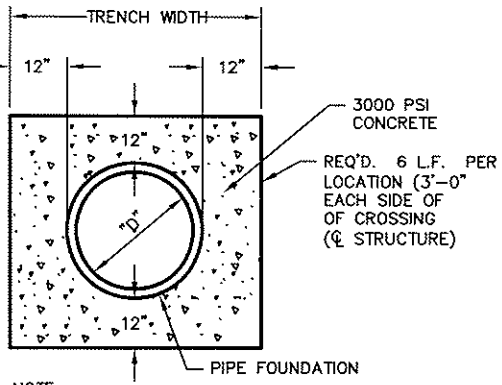
PAVEMENT REMOVE & REPLACEMENT DETAILS

DATE ISSUED 01-11-10

SCALE N.T.S.

DRAWING NO. SS-126

| "D" (INCHES) | CU.YDS. OF CONC. PER LOCATION |
|---|---|
| 10 OR LESS | 0.60 |
| 15 | 0.84 |
| 18 | 1.02 |
| 24 | 1.44 |
| 30 | 1.80 |
| 36 | 2.28 |
| 42 | 2.76 |
| 48 | 3.60 |




NOTE:
CONCRETE COLLAR SHALL BE USED WHEN MIN. VERTICAL CLEARANCE BETWEEN PIPES CANNOT BE MAINTAINED (1' OR LESS).

CONCRETE COLLAR DETAIL
N.T.S.

MAWSS
MOBILE AREA WATER & SEWER SYSTEM

BOARD OF WATER AND SEWER COMMISSIONERS OF THE CITY OF MOBILE, ALABAMA

TYPICAL SANITARY SEWER DETAILS

TYPICAL CONCRETE COLLAR

DATE ISSUED: 01-11-10
SCALE: N.T.S.
DRAWING NO.: SS-127

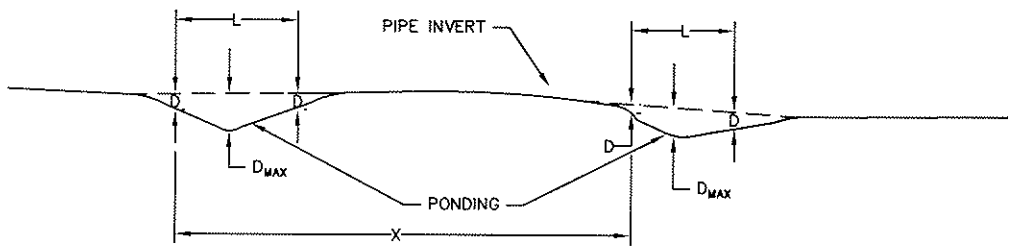
| NOMINAL PIPE DIAMETER (INCHES) | MINIMUM GRADE (%) | ACCEPTABLE SAG DEPTH (D)* IN INCHES OF WATER | | | | ABSOLUTE MAXIMUM DEPTH ($D_{MAX}$) IN INCHES OF WATER | | MAXIMUM SAG LENGTH (L)** | MINIMUM ALLOWABLE DISTANCE BETWEEN SAGS WITH 10% OR GREATER DEPTH (X)*** |
|---|---|---|---|---|---|---|---|---|---|
| | | EQUAL OR LESS THAN MINIMUM GRADE | | GREATER THAN MINIMUM GRADE | | EQUAL OR LESS THAN MINIMUM GRADE | GREATER THAN MINIMUM GRADE | | |
| | | PVC PIPE | D. IRON PIPE | PVC PIPE | D. IRON PIPE | | | | |
| 8 | 0.400 | 0.8" | 0.8" | 1" | 1" | 1.2 | 1.5 | 6 FT | 36 FT |
| 10 | 0.280 | 1" | 1" | 1.1" | 1.1" | 1.5 | 1.65 | 6 FT | 36 FT |
| 12 | 0.220 | 1.1" | 1.1" | 1.2" | 1.2" | 1.65 | 1.8 | 9 FT | 54 FT |
| 15 | 0.150 | 1.5" | 1.5" | 1.5" | 1.5" | 2.25 | 2.25 | 9 FT | 54 FT |
| 16 | 0.140 | | 1.5" | | 1.6" | 2.25 | 2.4 | 9 FT | 54 FT |
| 18 | 0.120 | | 1.5" | | 1.8" | 2.25 | 2.7 | 9 FT | 72 FT |
| 21 | 0.100 | | 1.5" | | 2" | 2.25 | 3.0 | 9 FT | 72 FT |
| 24 | 0.080 | | 1.5" | | 2.4" | 2.25 | 3.6 | 9 FT | 72 FT |
| 27 | 0.067 | | 2" | | 2.7" | 3.0 | 4.0 | 9 FT | 72 FT |
| 30 | 0.058 | | 2" | | 3" | 3.0 | 4.5 | 9 FT | 72 FT |
| 36 | 0.046 | | 2" | | 3" | 3.0 | 4.5 | 9 FT | 72 FT |
| 42 | 0.037 | | 2" | | 3" | 3.0 | 4.5 | 9 FT | 72 FT |

*D = ALLOWABLE SAG DEPTH = ALLOWABLE DEPTH OF POOLED WATER IN PIPE AS MEASURED FROM WATER SURFACE TO INVERT OF PIPE BY USE OF SAG GAUGE.

$D_{MAX}$ = ABSOLUTE MAXIMUM DEPTH. ANY SAG DEPTH GREATER THAN $D_{MAX}$ CONSTITUTES FAILURE

**L = SAG LENGTH = LENGTH OF POOLED WATER SURFACE AS MEASURED FROM UPSTREAM EDGE OF POOLED WATER SURFACE TO DOWNSTREAM EDGE OF POOLED WATER SURFACE. (PROVIDED $D_{MAX}$ IS NOT EXCEEDED.)

***X = DISTANCE BETWEEN SAGS, AS MEASURED FROM UPSTREAM EDGE OF POOLED WATER SURFACES BETWEEN CONSECUTIVE SAGS.




SEE SHEET SS-129 FOR SAG PROOFING DETAIL

MAWSS
MOBILE AREA WATER & SEWER SYSTEM

BOARD OF WATER AND SEWER COMMISSIONERS OF THE CITY OF MOBILE, ALABAMA

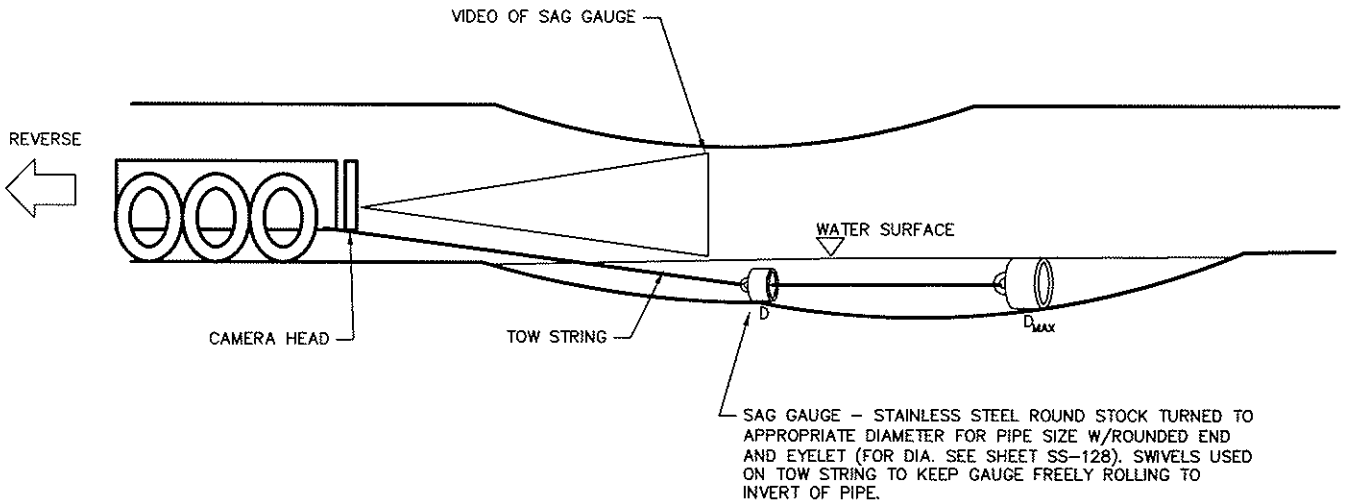
TYPICAL SANITARY SEWER DETAILS

GRADE TOLERANCE/ACCEPTABLE SAG LIMITS

DATE ISSUED: 01-11-10
SCALE: N.T.S.
DRAWING NO.: SS-128

# SAG PROOFING SEWER MAINS

- PIPE IS CLEANED, FLOODED AND ALLOWED TO DRAIN FREELY.
- CAMERA TRAVELS FORWARD TO MANHOLE VIDEO INSPECTING PIPE AS IT MOVES.
- TOW STRINGS AND SAG GAUGE ARE ATTACHED TO CAMERA.
- CAMERA VIDEOS SAG GAUGE AS CAMERA TRAVELS SLOWLY IN REVERSE.
- WHEN GAUGE IS IN SAG, CAMERA STOPS AND ALLOWS WATER TO CALM:
  - IF ANY PORTION OF THE GAUGE IS SEEN ABOVE WATER SURFACE, SAG IS ACCEPTABLE.
  - IF GAUGE IS SUBMERGED, EVEN SLIGHTLY, SAG IS REJECTED AND MUST BE REPAIRED.

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|---|---|---|---|
| MAWSS MOBILE AREA WATER & SEWER SYSTEM | BOARD OF WATER AND SEWER COMMISSIONERS OF THE CITY OF MOBILE, ALABAMA | TYPICAL SANITARY SEWER DETAILS | DATE ISSUED 01-11-10 |
| | | SAG PROOFING SEWER MAINS | SCALE N.T.S. |
| | | | DRAWING NO. SS-129 |