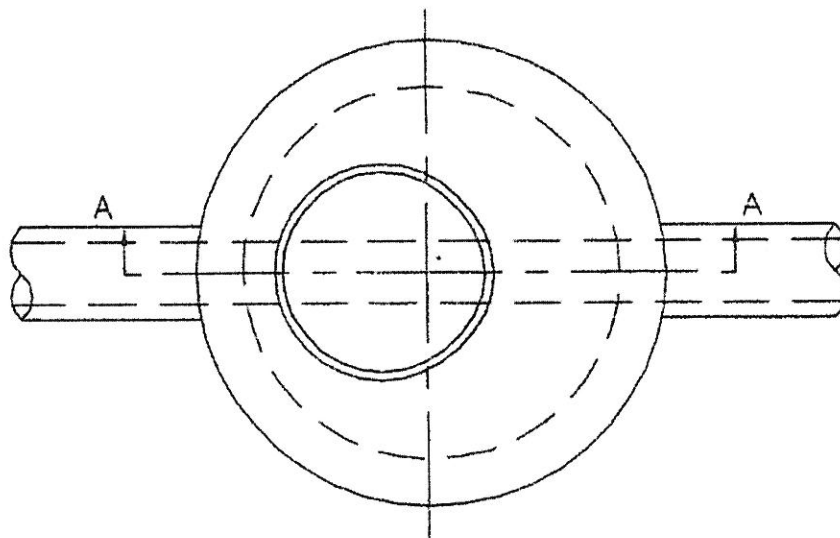
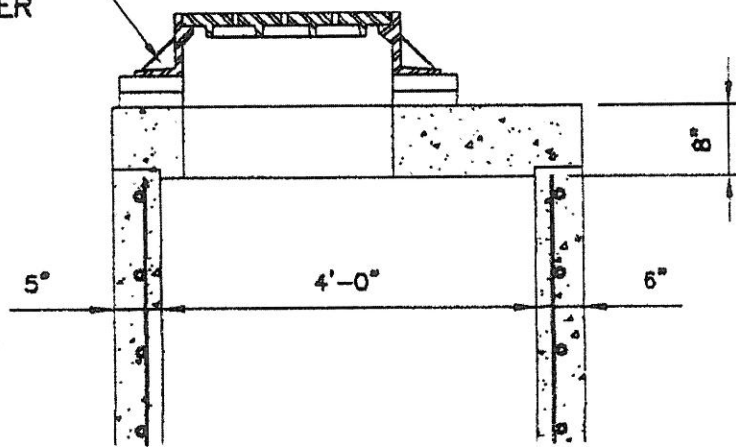


NOTES:

1. Unless Otherwise Specified, Only Precast Manholes Shall Be Used For Sanitary Sewers.
2. Barrel Block Used In Manhole Construction Shall Be Six inches Wide And Six Or Eight Inches In Height. Batter Block Shall Be Eight Inches In Height. Only Three Courses Of Batter Block Shall Be Used, Giving An Opening Of 30 Inches On The Top Of The Manhole.
3. Outside Walls Of Manhole Shall Be Plastered With A One-Half Inch Thick Coat Of 1:2 Cement - Sand Mortar, Troweled To A Smooth Finish.



STANDARD MANHOLE
FRAME AND COVER
(SEE DETAIL)



NOTE: OFFSET M.H. COVERS SHALL BE POSITIONED ABOVE THE CENTER LINE OF THE MAIN

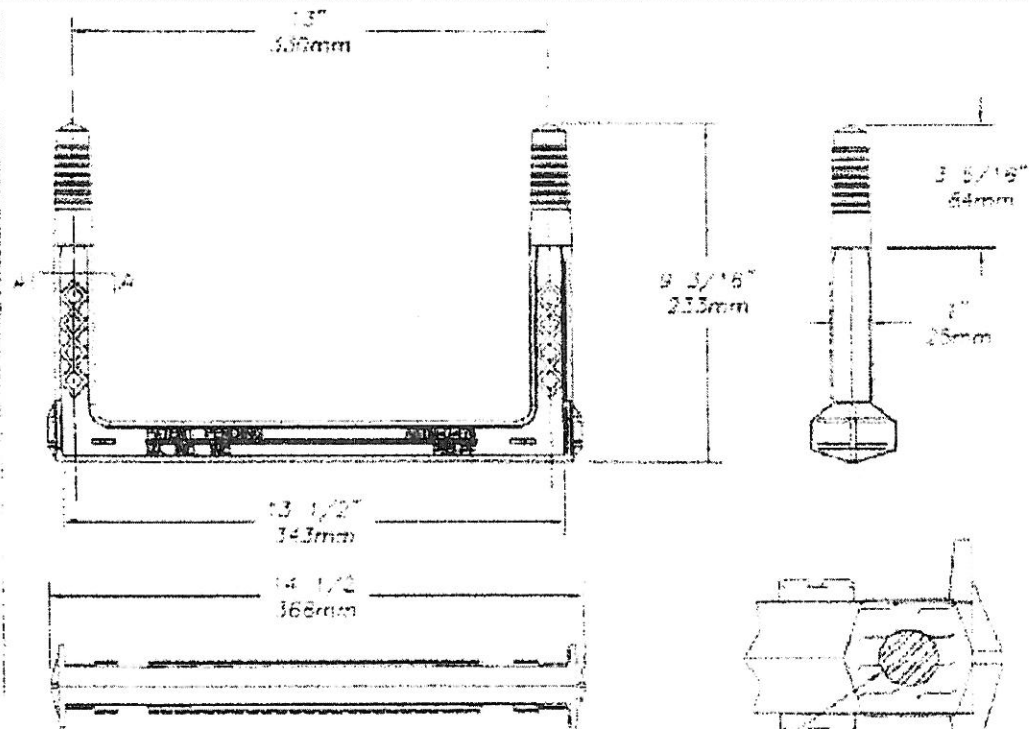
REV. 1 - JANUARY, 2003

| | | | |
|--|--|----------------------|---------------|
| Jacobs Environmental, Inc. Piscataway, New Jersey | Ewing-Lawrence Sewerage Authority Standard Details | SANITARY Slab Top | 3 of 34 |
| August 1996 | | | |

PS2-PF-DF

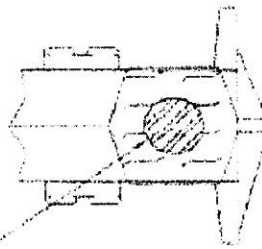
004-510-DF

Manhole Step

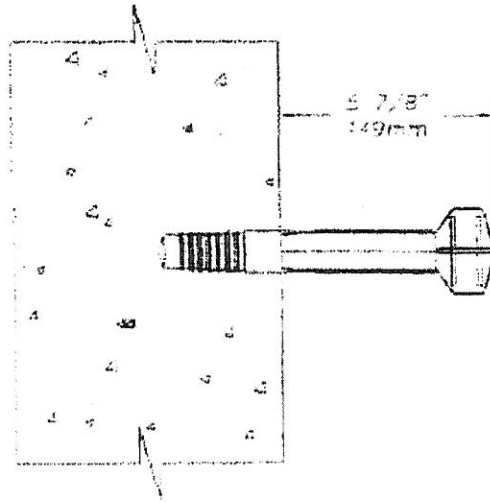


Copolymer Polypropylene Plastic

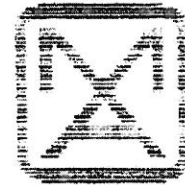
1.3mm
1/2" GRADE 60 STEEL REINFORCEMENT



SECTION-A



MEETS: ASTM C-478
ASTM D-4101
ASTM A-615
AASHTO M-199



M. A. INDUSTRIES, INC.

3 G. Box 2322, 562 Boulevard Dr. - Rochester City, NY 14624 - Drawn: 7701 437 7164 - Working Paper: 7701 437 1482 - Corporate: 7701 931 4672

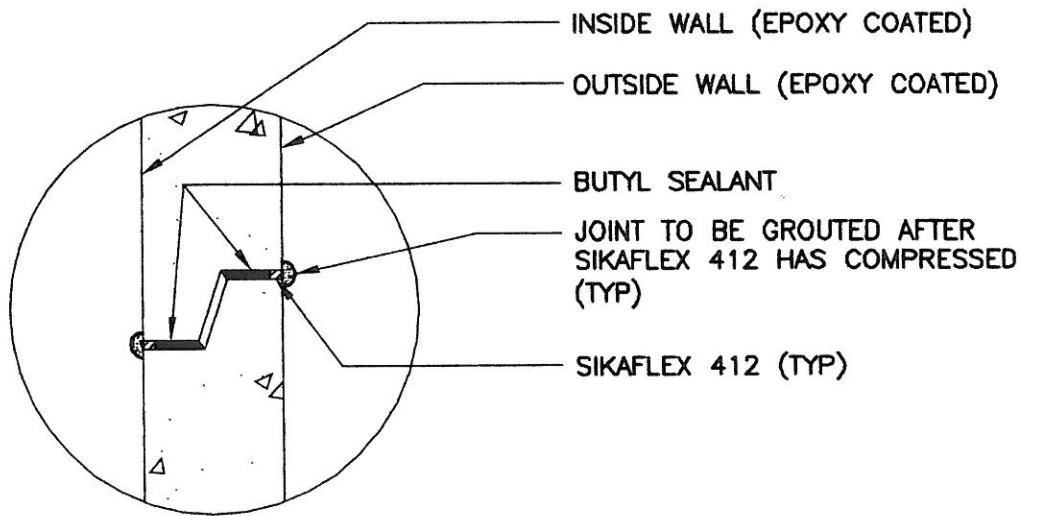
REV. 2 - MAY, 2012
REV. 1 - JANUARY, 2003

Jacobs Environmental, Inc.
Piscataway, New Jersey
August 1996

Ewing-Lawrence
Sewerage Authority
Standard Details

SANITARY
Manhole Step

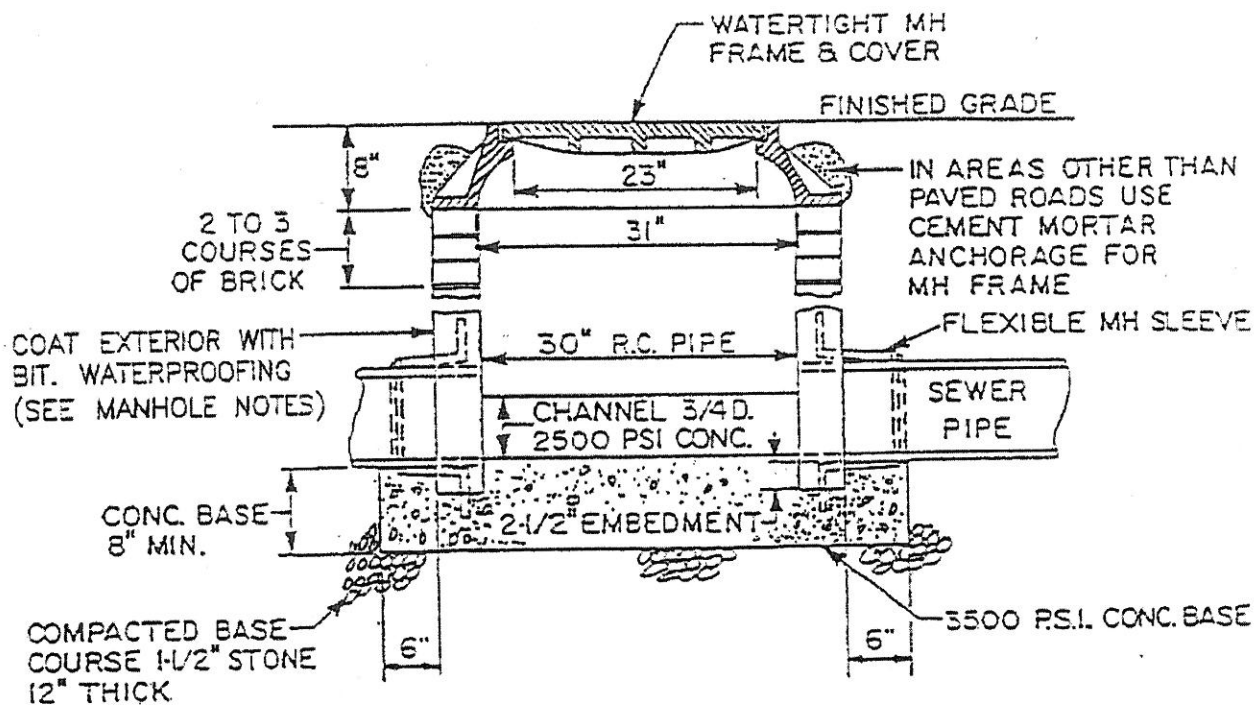
4
of
34



REV. 2 - MAY, 2012

REV. 1 - JANUARY, 2003

| | | | |
|--|---|--|-------------------------------|
| <p>Jacobs Environmental, Inc. Piscataway, New Jersey</p> | <p>Ewing-Lawrence Sewerage Authority Standard Details</p> | <p>SANITARY Manhole Joint</p> | <p>5 of 34</p> |
| <p>AUGUST 1996</p> | | | |

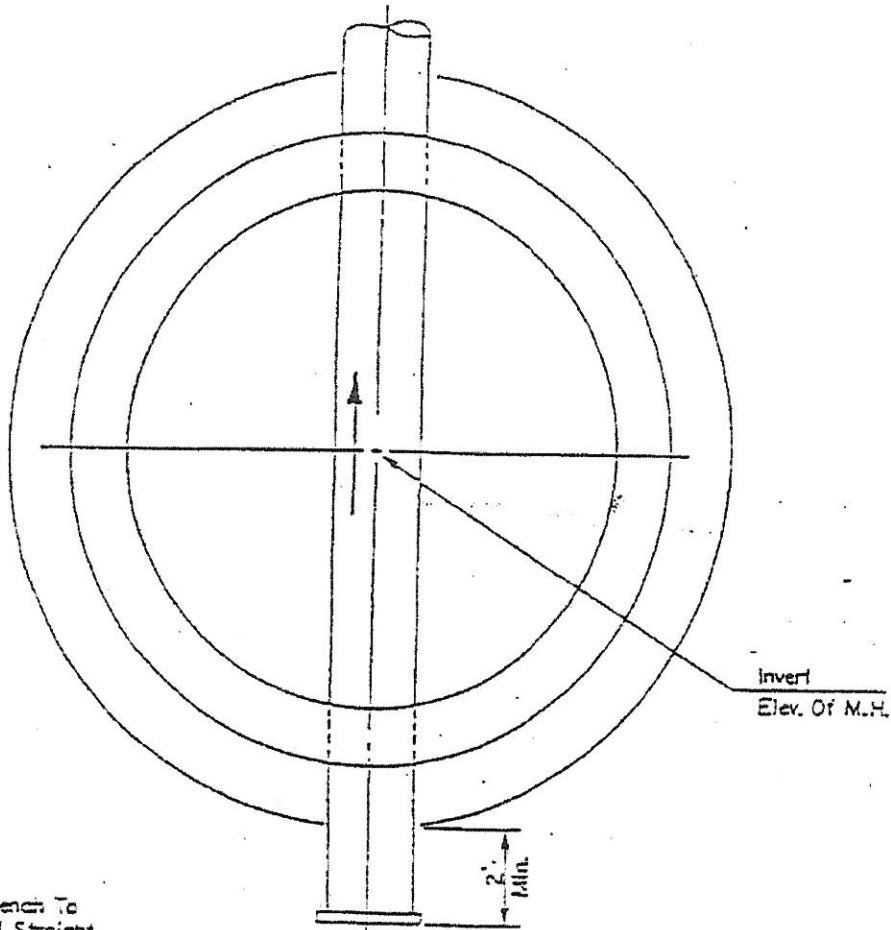


NOTES

1. SHALLOW MH (CIRCULAR) TO BE USED AT LOCATIONS WHERE DISTANCE FROM FINISHED GRADE TO PIPE INVERT IS 3'-0" OR LESS.
2. FOR DEPTHS 3'-0" AND LESS, MEASURED FROM THE TOP OF THE PIPE, CONTRACTOR SHALL INSTALL DUCTILE IRON PIPE, CLASS 54 UNDER TRAFFIC AREAS.

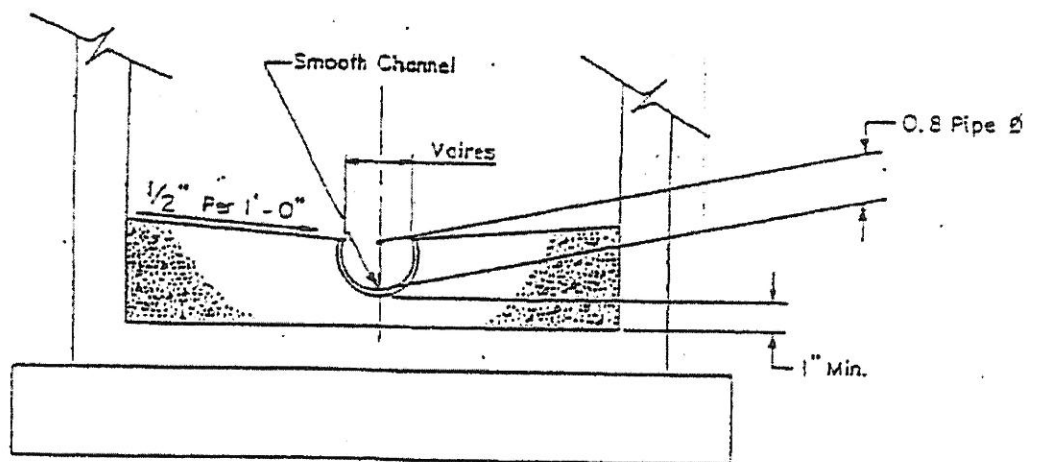
REV. 1 - JANUARY, 2003

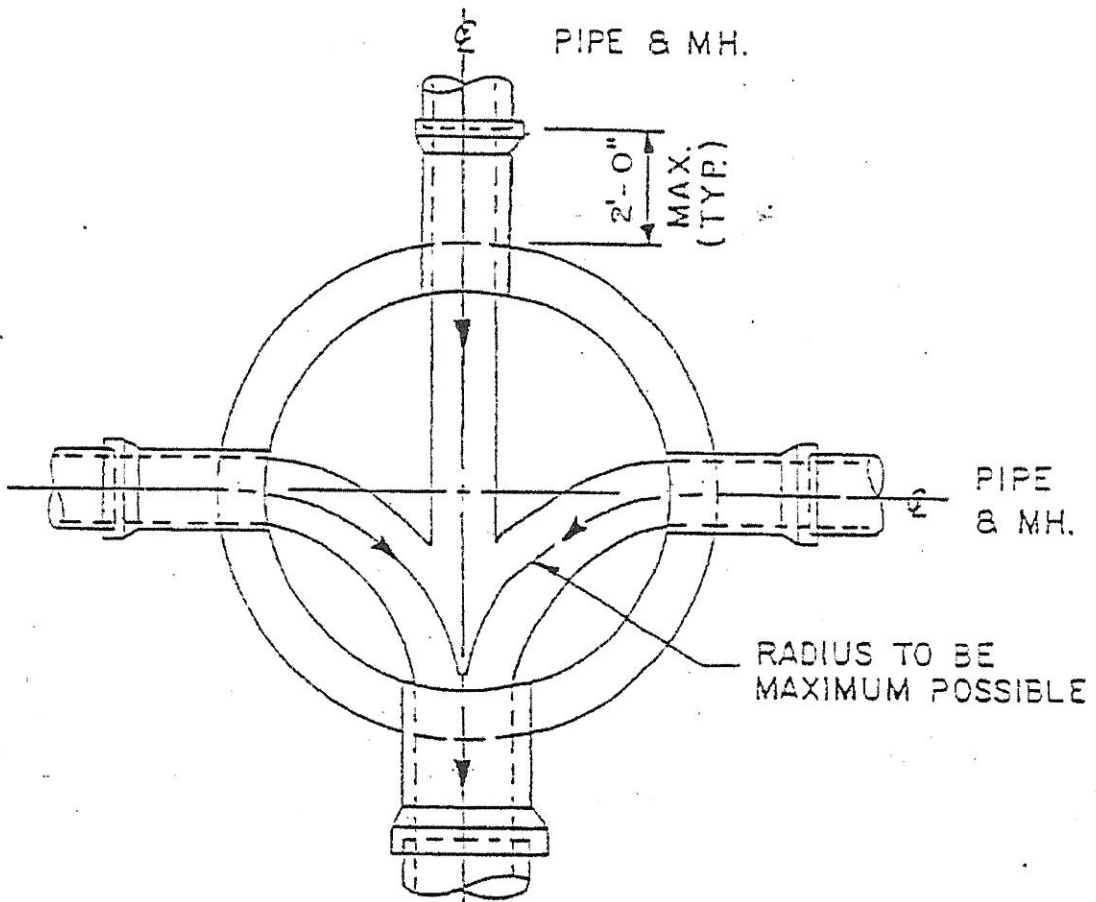
| | | |
|--|--|-----------------------------|
| Jacobs Environmental, Inc. Piscataway, New Jersey | Ewing-Lawrence Sewerage Authority Standard Details | SANITARY Shallow Manhole |
| AUGUST 1996 | | |

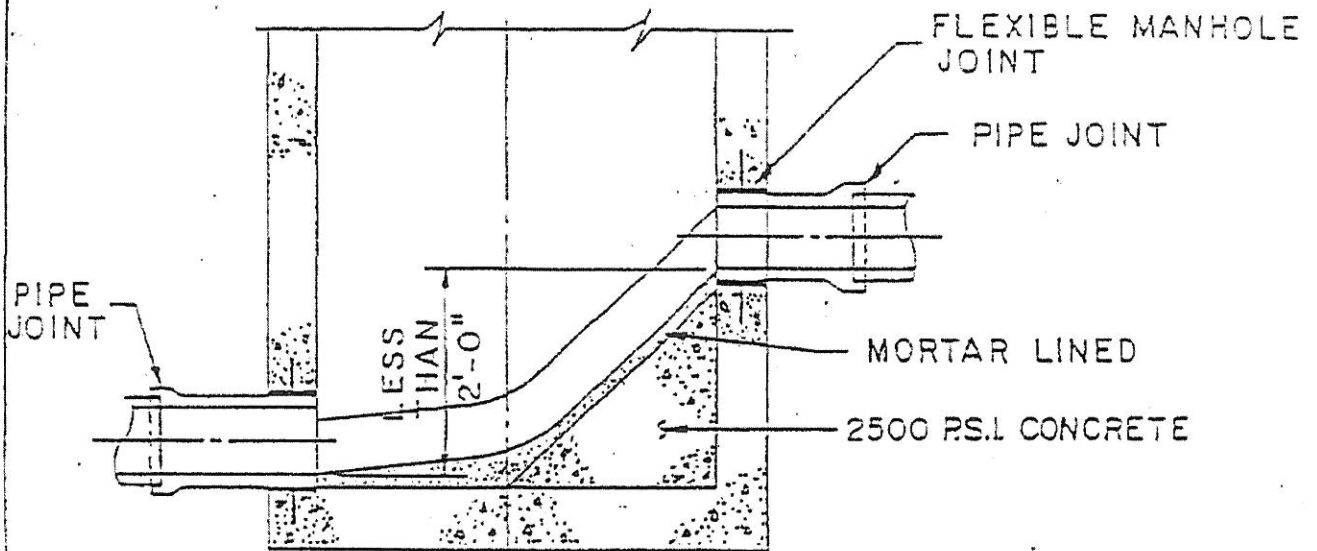


NOTE:

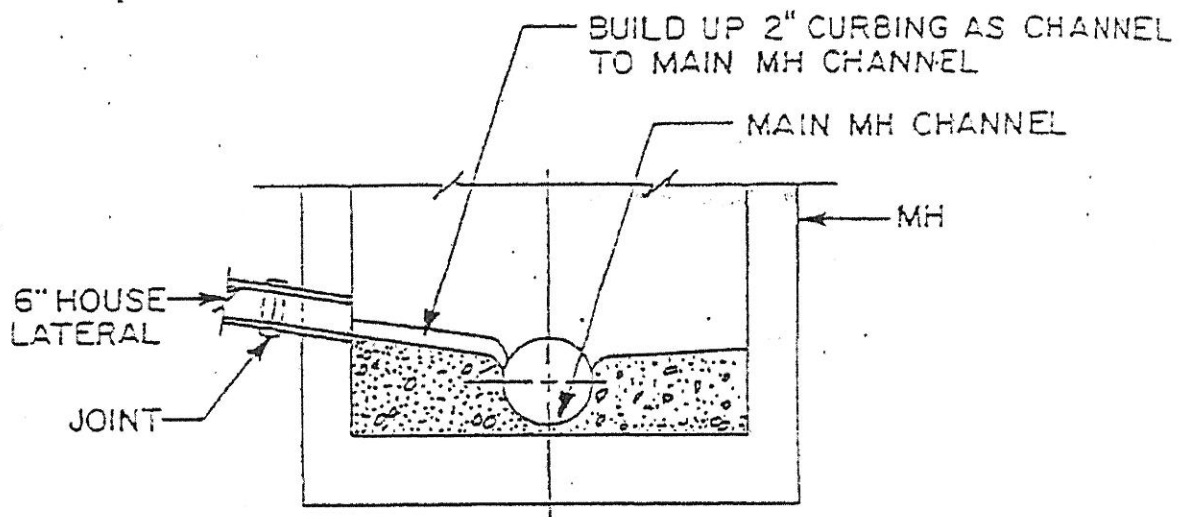
Pipe Invert And Bench To Be Provided At All Straight Through Manholes.





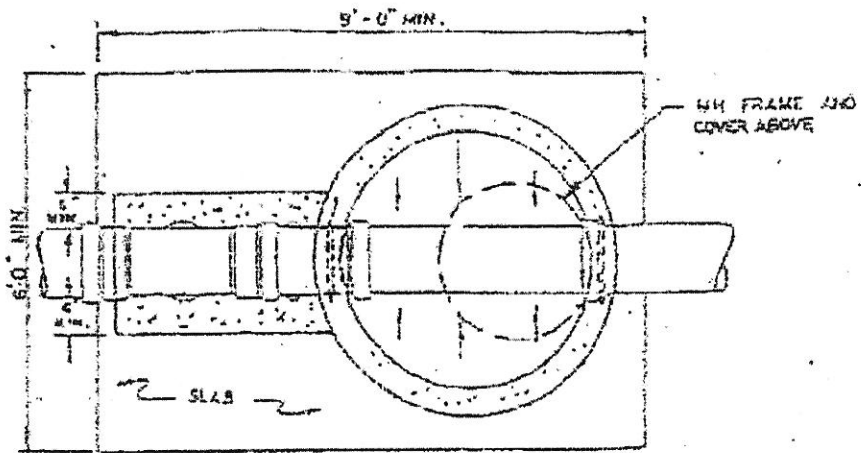


NOTE: MANHOLE CHUTE IS TO BE USED WHERE DIFFERENCE IN INVERT ELEVATIONS BETWEEN INCOMING PIPE AND OUTGOING PIPE IS LESS THAN 2'-0". IF THE DIFFERENCE IS 2'-0" OR GREATER, THEN DROP CONNECTION SHALL BE MADE AS SHOWN IN DETAIL ON THIS SHEET. CHANNELING SHALL BE DONE AS SHOWN IN DETAIL ON THIS SHEET.

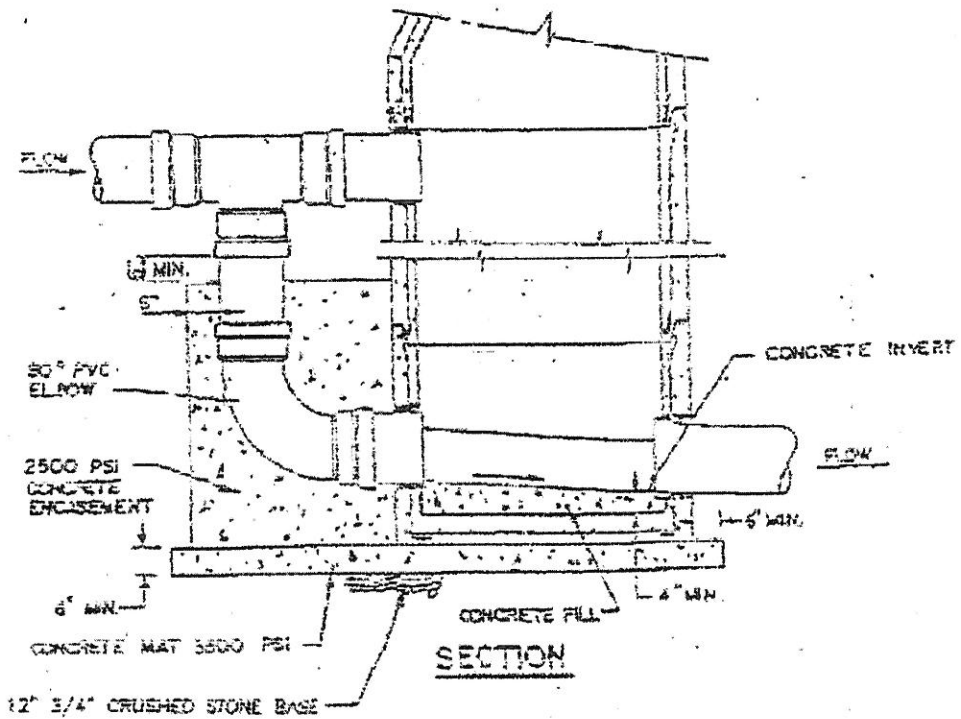


NOTES

1. SHALLOW MH (CIRCULAR) TO BE USED AT LOCATIONS WHERE DISTANCE FROM FINISHED GRADE TO PIPE INVERT IS 3'-0" OR LESS.
2. FOR DEPTHS 3'-0" AND LESS, MEASURED FROM THE TOP OF THE PIPE, CONTRACTOR SHALL INSTALL DUCTILE IRON PIPE, CLASS 54 UNDER TRAFFIC AREAS.



PLAN



SECTION

REV. 2 - JULY, 2015

REV. 1 - JANUARY, 2003

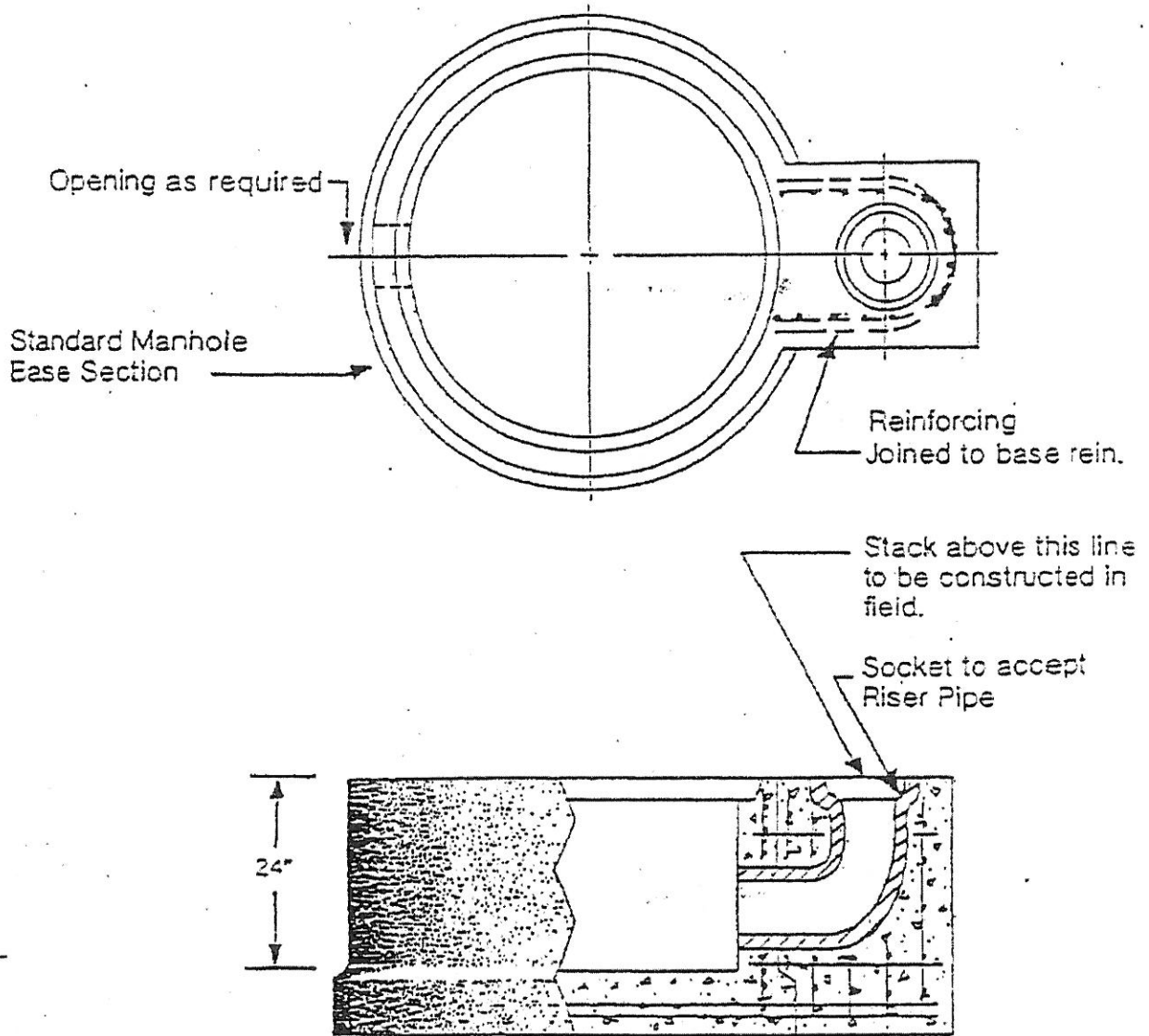
Jacobs Environmental, Inc.
Piscataway, New Jersey

August 1986

Ewing-Lawrence
Sewerage Authority
Standard Details

SANITARY
Drop Manhole

11
of
34



MANHOLE NOTES:

GENERAL

1. SHORTS SHALL BE USED AT MANHOLES
2. EXTERIOR SURFACES SHALL BE COATED WITH (2) COATS OF BITUMASTIC WATERPROOFING MATERIAL. INTERIOR SHALL BE PAINTED WITH (2) COATS OF WHITE EPOXY WATERPROOFING.
3. ALL CONSTRUCTION SHALL MEET STANDARD SPECIFICATIONS; LATEST REVISIONS.
4. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST G.S.H.A. STANDARD WHERE POSSIBLE

PRECAST CONCRETE MANHOLE (ASTM C-478)

1. WHERE 5' AND 6' I.D. BASES ARE USED, A TAPER SECTION CONNECTING BASE AND RISER SHALL BE REQUIRED AND SHALL HAVE A THICKNESS AS SHOWN. THE BASE SECTION AND RISER TO ALLOW FOR AT LEAST 6" MINIMUM VERTICAL CLEARANCE WHERE POSSIBLE.
2. BASES TO BE AS SHOWN IN THE SCHEDULE.

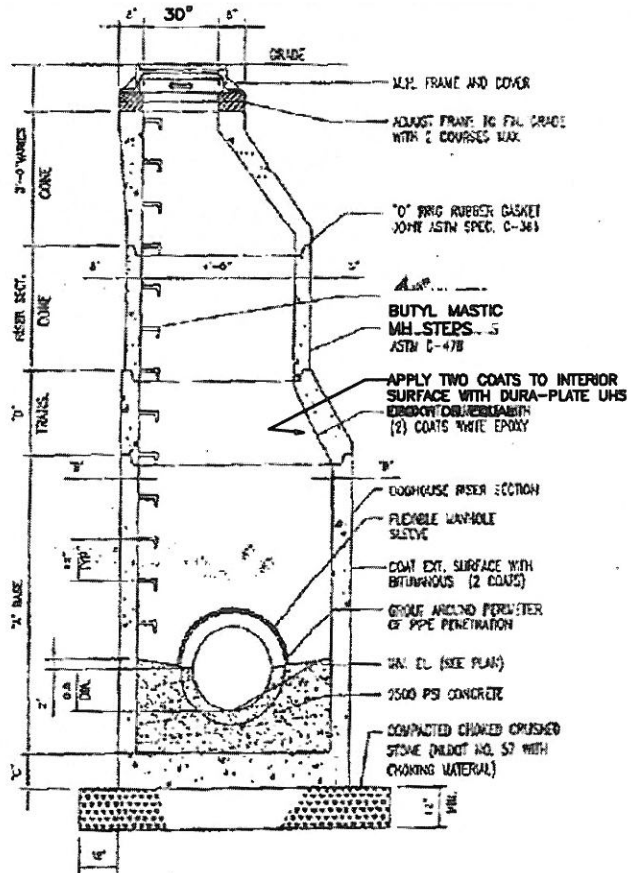
BRICK OR CONCRETE BLOCK MANHOLES (NOT SHOWN)

1. BRICK OR CONCRETE BLOCK MANHOLES MUST BE APPROVED BY THE AUTHORITY.
2. SHOP DRAWINGS MUST BE SUBMITTED FOR ALL DETAILS.

WORK AT EXISTING MANHOLES

1. THE CONTRACTOR SHALL CUT INTO THE MAN-HOLE AND COMPLETE A CONNECTION USING A SUITABLE ADAPTOR AS REQUIRED AND APPROVED BY THE AUTHORITY.
2. THE CONTRACTOR SHALL NOT INTERFERE WITH EXISTING SEWERAGE SERVICE DURING THE PERIOD OF CONSTRUCTION AND SHALL TAKE ALL NECESSARY PRECAUTIONS TO KEEP DEBRIS OUT OF MANHOLE.

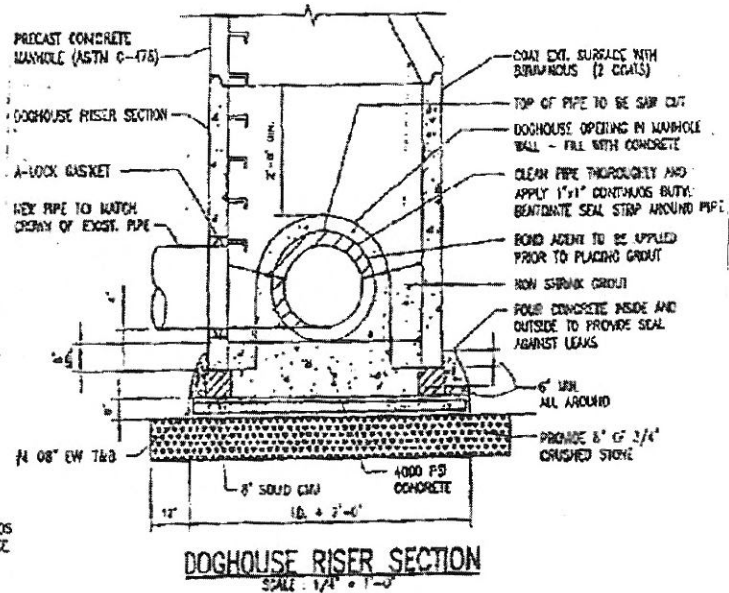
| PIPE DIA. | DIMENSIONS | | | |
|------------|------------|-----|-----|-------|
| | "A" | "B" | "C" | "D" |
| 6" TO 24" | 4'-0" | 5" | 6" | - |
| 27" TO 36" | 5'-0" | 6" | 8" | 2'-0" |
| 42" TO 48" | 6'-0" | 7" | 8" | 3'-0" |



TYP. PRE CAST MANHOLE
SCALE: 1/4" = 1'-0"

CONSTRUCTION SEQUENCE FOR DOGHOUSE MANHOLE

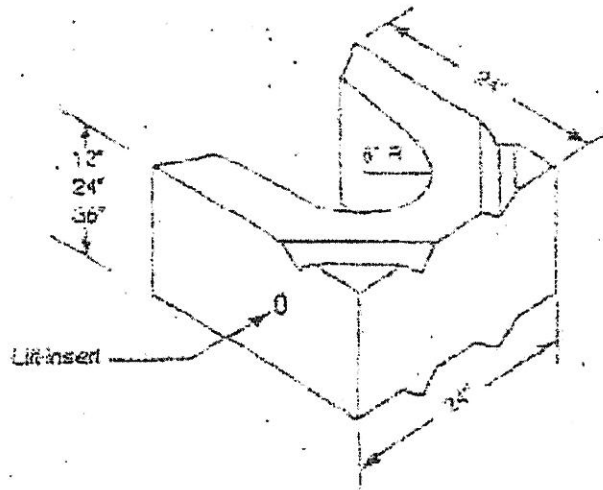
1. EXCAVATE TO PIPE AND PREPARE SUB GRADE WITH STONE BASE. TEMPORARILY SUPPORT PIPE AS REQUIRED. THOROUGHLY CLEAN EXPOSED PIPE.
2. SET CHU SUPPORT (4-8" CHU) FOR SUPPORT OF BASE DOGHOUSE PRECAST SECTION. SET REBAR AND FORMS.
3. PLACE DOGHOUSE PRECAST SECTION ON CHU AND LEVEL.
4. PLACE CONCRETE TO 4" BELOW PIPE INVERT. ALLOW TO CURE 48 HOURS BEFORE ANY ADDITIONAL WORK IS PERFORMED.
5. APPLY BOND COMPOUND TO DOGHOUSE AREA. WRAP PIPE WITH 1.5" CONTINUOUS BUTYL BENTONITE SEAL STRIP AT CENTER OF WALL OF PRECAST SECTION. PLACE NON SHRINK GROUT TO SEAL OPENINGS.



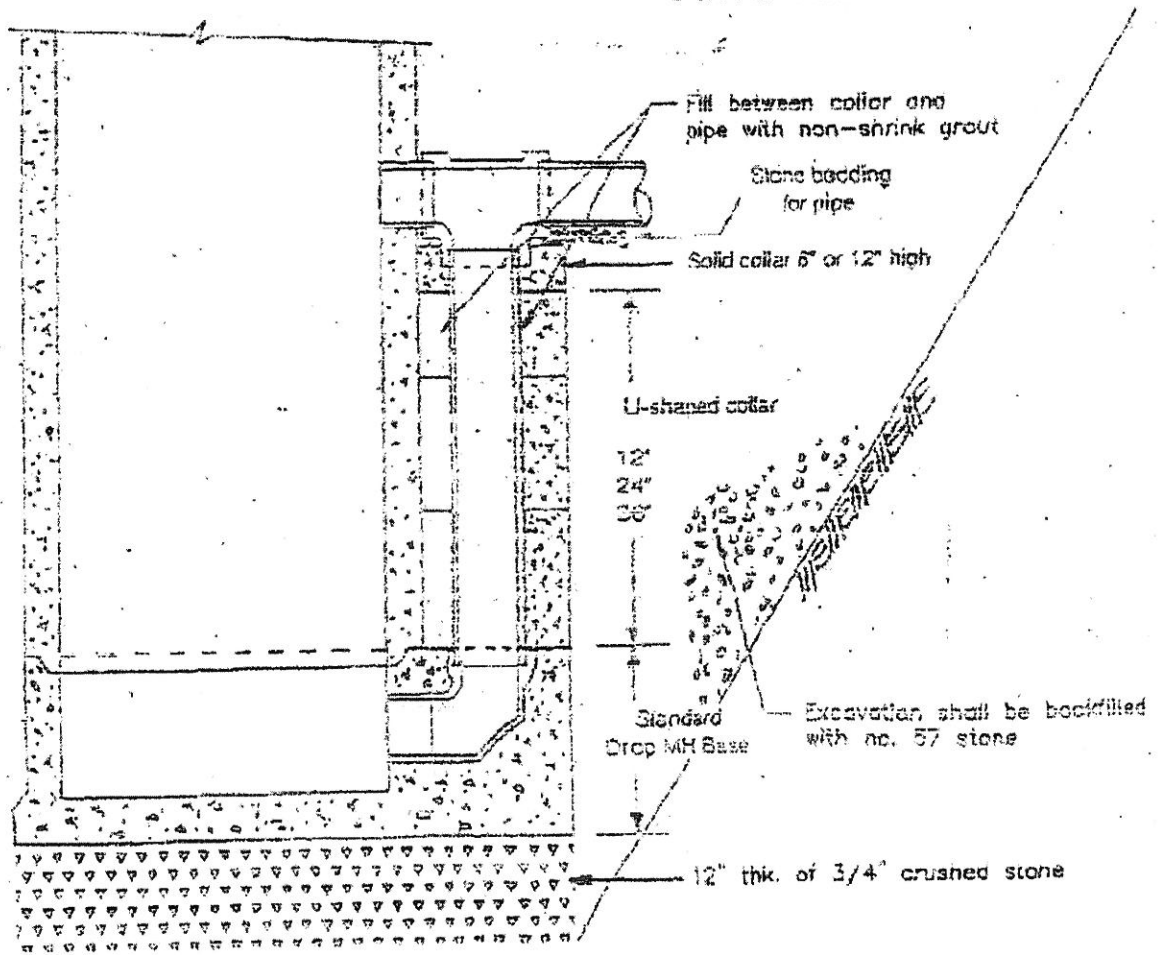
DOGHOUSE RISER SECTION
SCALE: 1/4" = 1'-0"

REV. 2 - JUNE 23, 2018 (Jacobs Environmental, LLC)

REV. 1 - JULY, 2015



U-SHAPED COLLAR



REV. 2 - JULY, 2015

REV. 1 - JANUARY, 2003

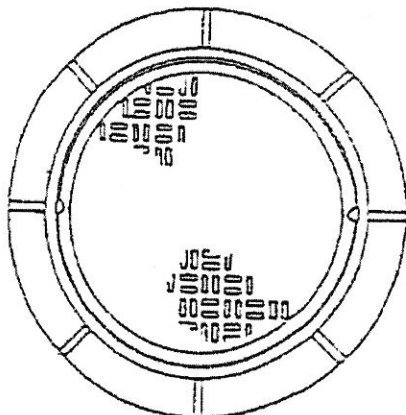
Jacobs Environmental, Inc.
Piscataway, New Jersey

Ewing-Lawrence
Sewerage Authority
Standard Details

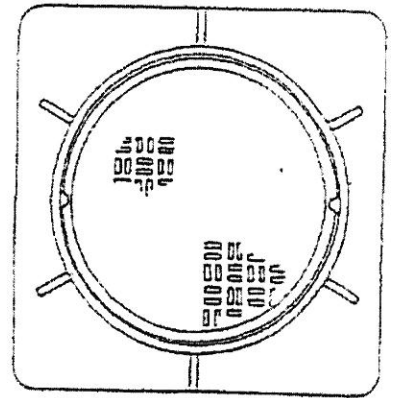
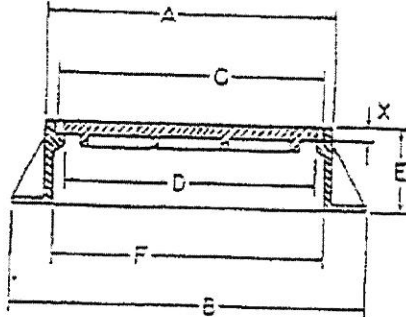
SANITARY
Precast Drop Risers

August 1996

13
of
34



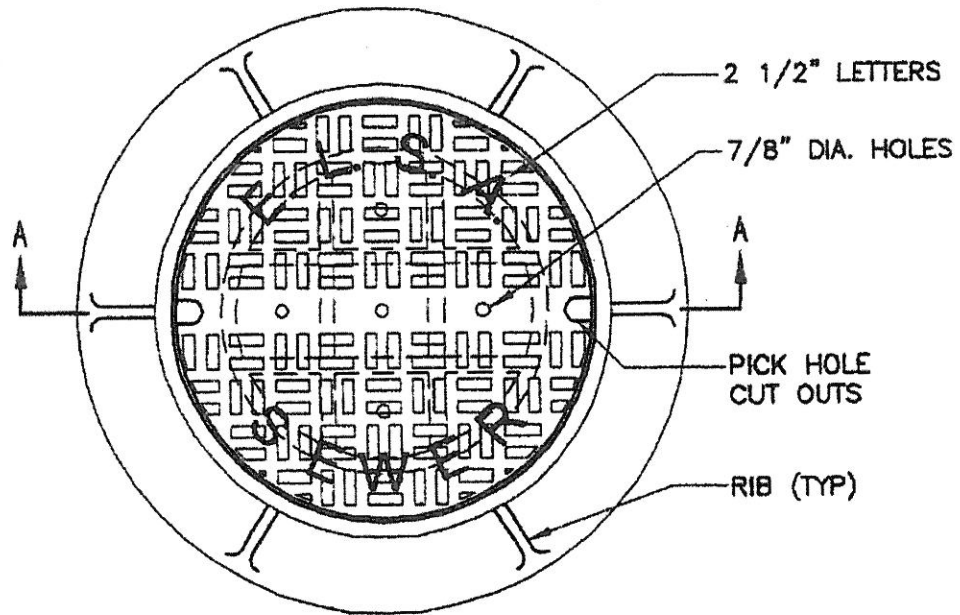
ROUND FLANGE



SQUARE FLANGE

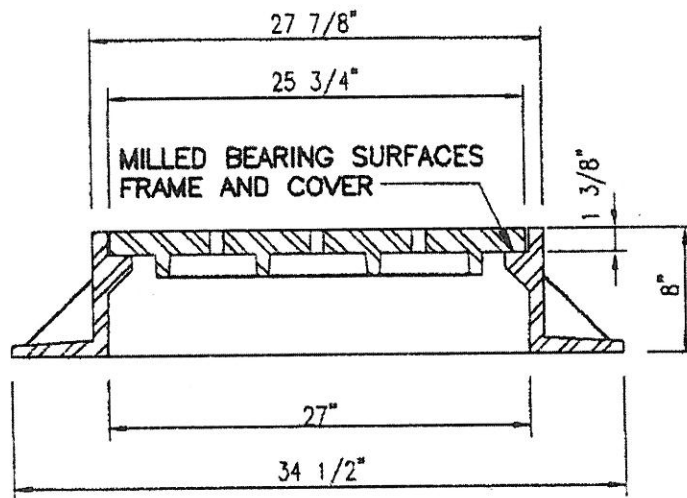
| PATTERN NUMBER | | DIMENSIONS IN INCHES | | | | | | |
|----------------|---------------|----------------------|-----|-----|-----|----|-----|----|
| ROUND FLANGE | SQUARE FLANGE | A | B | C | D | E | F | X |
| 1000 | 1050 | 13% | 18 | 11% | 10% | 8 | 12% | 1 |
| 1001 | 1051 | 19% | 26 | 18 | 16% | 8 | 18 | 1% |
| 1002 | 1052 | 24% | 37 | 21% | 19% | 9% | 25% | 1% |
| 1003 | 1053 | 26 | 40 | 22% | 21 | 10 | 25% | 1% |
| 1004A | . | 25 | 34 | 22% | 21 | 9 | 24 | 1% |
| 1004B | 1054B | 25 | 36 | 22% | 21 | 9 | 23 | 1% |
| 1005 | 1055 | 25% | 37 | 23 | 21% | 9 | 24 | 1% |
| 1006 | 1056 | 27 | 38% | 24 | 21% | 11 | 25% | 1% |
| 1007A | 1057A | 25% | 31% | 24 | 22% | 3 | 22% | 1% |
| 1007B | 1057B | 25% | 32 | 24 | 22% | 4 | 22% | 1% |
| 1007C | 1057C | 25% | 34 | 24 | 22% | 6 | 24 | 1% |
| 1007D | 1057D | 25% | 34 | 24 | 21% | 8 | 24% | 1% |
| 1007E | . | 25% | 29% | 24 | 22% | 3 | 22% | 1% |
| 1008 | 1058 | 25% | 34 | 24 | 22% | 10 | 26 | 1% |
| 1010 | 1060 | 28% | 38% | 26% | 24 | 8 | 26% | 1% |
| 1011A | 1061A | 32 | 39 | 30 | 28 | 6% | 31 | 1% |
| 1011B | 1061B | 32% | 42 | 30 | 28 | 8 | 31 | 1% |
| 1011D | 1061D | 31% | 36 | 30 | 28 | 4 | 29 | 1% |
| 1012A | 1062A | 34 | 43 | 31% | 30 | 5% | 32 | 1% |
| 1012B | 1062B | 34 | 43 | 31% | 30 | 8 | 32 | 1% |
| 1012C | 1062C | 34 | 43 | 31% | 30 | 10 | 32 | 1% |
| 1012D | 1062D | 34 | 38% | 31% | 30% | 4 | 30% | 1% |
| 1013 | 1063 | 38% | 44% | 36 | 34 | 8 | 37% | 1% |
| 1014A | 1064A | 43% | 48% | 42 | 40% | 3 | 40% | 2 |
| 1014B | 1064B | 44% | 52% | 42 | 39% | 8 | 43% | 2 |
| 1015 | 1065 | 50% | 60 | 48% | 46% | 8 | 48 | 2% |
| 1020 | . | 26 | 36 | 24 | 21% | 9 | 24% | 2% |
| 1021 | . | 41% | 53% | 38% | 35% | 12 | 39% | 2% |
| 1022 | . | 26% | 40% | 24 | 22% | 11 | 24% | 1% |
| 1023A | . | 24% | 34 | 22% | 20 | 6 | 24 | 1% |

| PATTERN NUMBER | | DIMENSIONS IN INCHES | | | | | | |
|----------------|---------------|----------------------|-----|-----|-----|----|-----|----|
| ROUND FLANGE | SQUARE FLANGE | A | B | C | D | E | F | X |
| 1023B | . | 24% | 34 | 22% | 20 | 9% | 24 | 1% |
| 1024 | . | 38% | 43% | 36 | 34% | 4 | 36% | 1% |
| 1025 | . | 35 | 34 | 22% | 20 | 10 | 24% | 1% |
| 1026 | . | 28% | 39 | 25% | 24 | 7 | 27 | 2 |
| 1027A | . | 25% | 34 | 23% | 21% | 4 | 24% | 1% |
| 1027B | . | 25% | 36 | 23% | 22% | 7 | 25% | 1% |
| 1027C | . | 25% | 36 | 23% | 22% | 8 | 25% | 1% |
| 1027D | . | 26 | 34% | 23% | 22% | 9 | 25% | 1% |
| 1028 | . | 25% | 41 | 24 | 22 | 9 | 25 | 1% |
| 1029 | . | 29% | 39 | 28 | 26 | 10 | 28 | 1% |
| 1030 | 1080 | 28 | 34 | 25% | 24 | 6 | 26% | 1% |
| 1031 | . | 25% | 34% | 23% | 20% | 7 | 25 | 2 |
| 1032 | . | 25% | 34 | 24 | 22% | 7 | 24% | 1% |
| 1033 | . | 29% | 36 | 27% | 25% | 7 | 28 | 2 |
| 1036 | . | 25% | 33% | 23% | 22 | 7% | 24 | 1 |
| 1037 | . | 25% | 34 | 24% | 23 | 8 | 26% | 1% |
| 1038 | . | 28 | 38 | 23% | 22% | 6 | 24% | 1% |
| 1039 | . | 25% | 35% | 23% | 21% | 9 | 24% | 3 |
| 1040 | . | 25% | 34% | 23% | 20% | 8% | 23% | 1% |
| 1041A | 1091A | 29 | 39 | 25% | 24 | 4 | 27 | 1% |
| 1041B | 1051B | 29 | 38 | 26% | 24 | 8 | 27 | 1% |
| 1042 | . | 25% | 34 | 24 | 22% | 7 | 24% | 1% |
| 1043 | . | 25 | 34 | 22% | 20% | 7% | 25 | 1% |
| 1044 | . | 26 | 33 | 23% | 21% | 8 | 25 | 1% |
| 1045 | . | 31 | 37% | 26% | 26% | 7 | 29% | 1% |
| 1046 | . | 26 | 33 | 24 | 22% | 6 | 24 | 1% |
| 1047 | . | 27% | 36 | 26 | 24 | 8% | 27 | 1% |
| 1048 | . | 25% | 39 | 23 | 20% | 7 | 23% | 1% |
| 1048A | . | 26 | 34 | 23% | 22 | 4 | 24% | 1% |
| 1049E | . | 26 | 35 | 23% | 22 | 9 | 24 | 1% |



PLAN VIEW OF FRAME & COVER

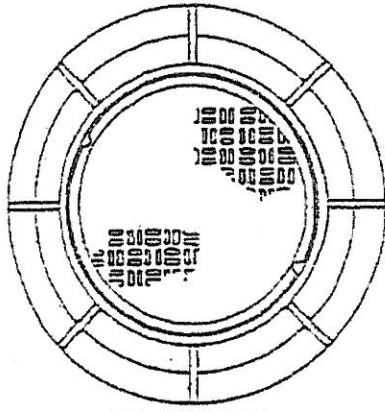
MANHOLE FRAME AND COVER SHOWN ARE CIRCULAR AS MANUFACTURED BY CAMPBELL FOUNDRY CAT. No. 1009 SEE FIG. 14 THRU 17 OF 34 FOR MANHOLE SELECTION



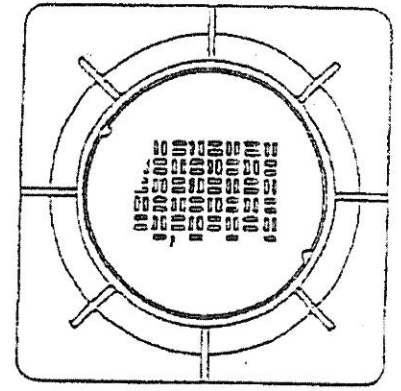
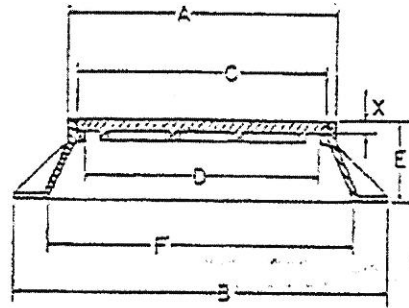
SECTION "A - A"
(FRAME AND COVER)

STANDARD CAST IRON MANHOLE FRAME AND COVER

NOTE: PRIVATE SEWERS SHALL NOT HAVE THE NAME "ELSA" ON THE COVER

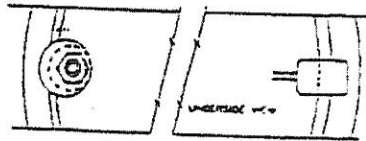
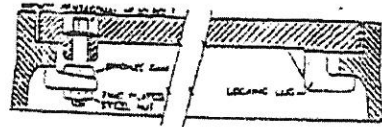


ROUND FLANGE



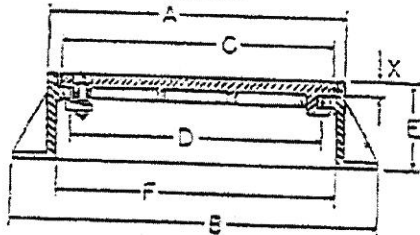
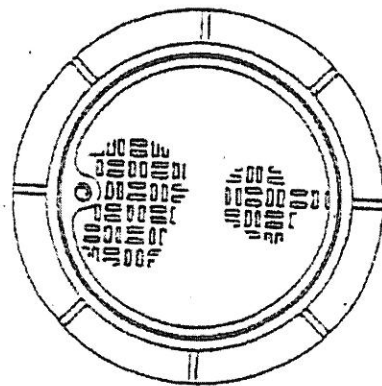
SQUARE FLANGE

| PATTERN NUMBER | | DIMENSIONS IN INCHES | | | | | | |
|----------------|---------------|----------------------|--------|--------|-----|----|--------|-------|
| ROUND FLANGE | SQUARE FLANGE | A | B | C | D | E | F | X |
| 1200 | 1225 | 24% | 38 1/2 | 22% | 20% | 8 | 25 1/2 | 1 1/2 |
| 1201 | 1226 | 25% | 40 | 22% | 20% | 10 | 30 | 1% |
| 1202A | 1227A | 27% | 39 | 25% | 23 | 4 | 23 | 2 |
| 1202B | 1227B | 27% | 39 | 25% | 23 | 8 | 31 | 2 |
| 1203A | 1228A | 27% | 39 | 25% | 24 | 4 | 24 | 1% |
| 1203B | 1228B | 27% | 39 | 25% | 24 | 8 | 31 | 2 |
| 1204 | 1229 | 28 | 43 | 25% | 24 | 10 | 35 | 1% |
| 1205 | 1230 | 31 | 44 | 28% | 27 | 10 | 38 | 1% |
| 1206 | 1231 | 34 | 49 | 31% | 30 | 10 | 41 | 1% |
| 1207 | 1232 | 40 | 53 | 37% | 36 | 10 | 46 | 1 1/2 |
| 1210 | 1225 | 31% | 45 | 28% | 27 | 8 | 33 | 1% |
| 1211 | . | 41 | 50 1/2 | 37% | 35% | 6% | 38 1/2 | 1% |
| 1217 | . | 34% | 43 1/2 | 31% | 30 | 7 | 36 1/2 | 1 1/2 |
| 1218 | . | 28 1/2 | 43 | 26% | 25 | 8 | 29 | 1% |
| 1219 | . | 24 | 34 | 22 | 20 | 8 | 24 | 1 |
| 1220 | . | 27 1/2 | 39 | 25% | 24 | 8 | 31 | 2 |
| 1221 | . | 26 | 48 | 20% | 21% | 8 | 36 | 1% |
| 1222 | 1247 | 28% | 43 | 26 | 24 | 10 | 35 | 1% |
| 1223 | . | 34% | 49 | 32 | 30 | 5% | 37 | 1% |
| 1224 | . | 40% | 50 | 38 | 36 | 10 | 40 | 1% |
| . | 1233 | 34 | 41 | 31 1/2 | 30 | 7 | 34 | 1% |
| . | 1234 | 33 | 41 | 30 1/2 | 28 | 8% | 33 | 1 |



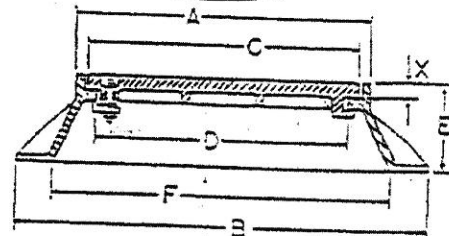
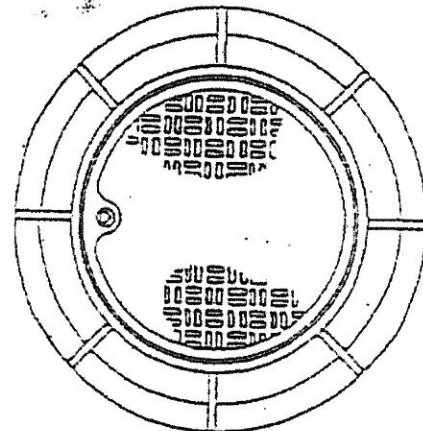
TYPE A CAM LOCK

STRAIGHT TYPE FRAME



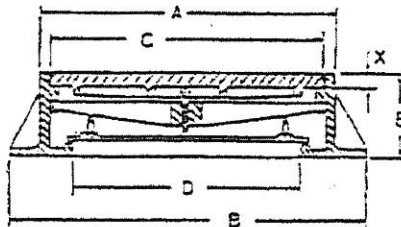
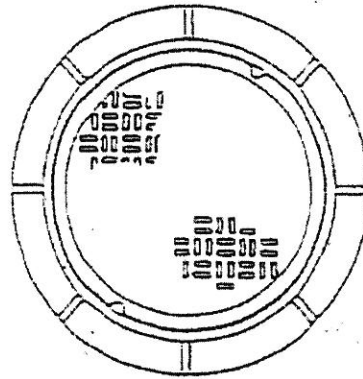
| PATTERN NUMBER | DIMENSIONS IN INCHES | | | | | | |
|----------------|----------------------|-----|-----|-----|----|-----|----|
| | A | B | C | D | E | F | X |
| 1450 | 19% | 25 | 18 | 16% | 8 | 19 | 1% |
| 1451 | 25 | 36 | 22% | 21 | 9 | 23 | 1% |
| 1452A | 25% | 31% | 24 | 22% | 3 | 22% | 1% |
| 1452B | 25% | 32 | 24 | 22% | 4 | 22% | 1% |
| 1452C | 25% | 34 | 24 | 22% | 6 | 2% | 1% |
| 1452D | 25% | 34 | 24 | 21% | 8 | 24% | 1% |
| 1454A | 32 | 38 | 30 | 28 | 5% | 31 | 1% |
| 1454B | 32% | 42 | 30 | 28 | 8 | 31 | 1% |
| 1454D | 31% | 36 | 30 | 28 | 4 | 28 | 1% |
| 1455A | 38% | 43% | 36 | 34% | 4 | 36% | 1% |
| 1455B | 38% | 44% | 36 | 34 | 8 | 37% | 1% |
| 1460A | 34 | 43 | 31% | 30 | 6% | 32 | 1% |
| 1460B | 34 | 43 | 31% | 30 | 8 | 32 | 1% |
| 1460C | 34 | 43 | 31% | 30 | 10 | 32 | 1% |
| 1461 | 25% | 37 | 23 | 21% | 9 | 24 | 1% |
| 1462 | 26% | 34 | 24 | 22 | 10 | 26 | 1% |

FLARED TYPE FRAME

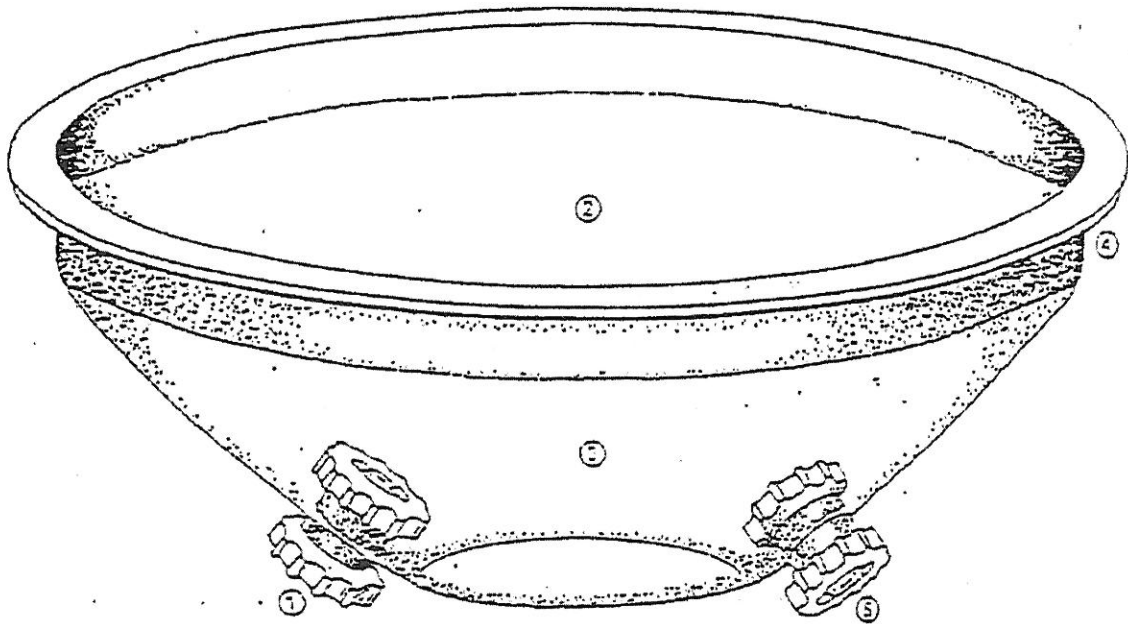


| PATTERN NUMBER | DIMENSIONS IN INCHES | | | | | | |
|----------------|----------------------|-----|-----|-----|----|-----|----|
| | A | B | C | D | E | F | X |
| 1485 | 24% | 38% | 22% | 20% | 8 | 26% | 1% |
| 1486 | 27% | 39 | 25% | 23 | 8 | 31 | 2 |
| 1486 | 28 | 43 | 25% | 24 | 10 | 35 | 1% |
| 1489 | 31 | 44 | 26% | 27 | 10 | 35 | 1% |
| 1490 | 34 | 48 | 31% | 30 | 10 | 41 | 1% |

STRAIGHT TYPE FRAME



| PATTERN NUMBER | DIMENSIONS IN INCHES | | | | | |
|----------------|----------------------|-----|-----|-----|----|----|
| | A | B | C | D | E | X |
| 6502 | 28½ | 38½ | 26½ | 21 | 8 | 1½ |
| 6536 | 25½ | 34 | 24 | 18 | 7 | 1½ |
| 6539 | 26½ | 34 | 25½ | 21 | 5½ | 1½ |
| 6540 | 26½ | 34 | 25½ | 21 | 8 | 1½ |
| 6541 | 29½ | 35½ | 27½ | 23½ | 7 | 2½ |
| 6542 | 31 | 38 | 28½ | 21 | 7 | 1½ |
| 6544 | 32 | 39 | 30 | 24 | 6½ | 1½ |
| 6547 | 34 | 43 | 31½ | 24 | 8 | 1½ |
| 6548 | 32½ | 44½ | 36 | 30 | 8 | 1½ |
| 6549 | 41 | 48 | 37½ | 33 | 8 | 1½ |
| 6550 | 44½ | 52½ | 42 | 36 | 8 | 2 |
| 6551 | 50½ | 56 | 48½ | 42 | 8 | 2 |
| 6552 | 34 | 43 | 31½ | 27 | 8 | 1½ |
| 6553 | 34 | 43 | 31½ | 27 | 6½ | 1½ |



1. The spring-loaded Gas Relief Valve is designed to relieve the gas pressure build-up. The valve is automatically activated when the gas pressure differential in the manhole reaches approximately $\frac{1}{2}$ psi. This prevents dangerous accumulation of sewer gases by venting them through the water, sand and debris collected in the insert.

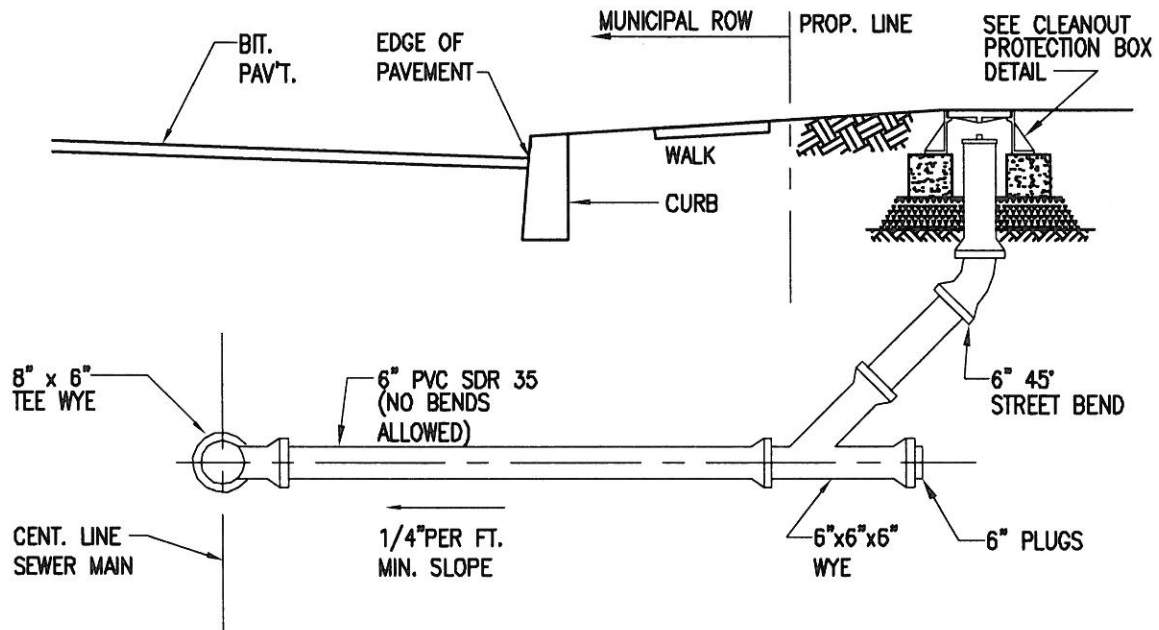
2. SEWER GUARD'S bowl shape is specially designed to protect the insert valves when the manhole cover is removed. In addition, the shape also traps and holds dirt and debris.

3. Made of specially formulated plastic polymers, the insert will not corrode, and cannot be damaged by sewer gases or road oils.

4. The closed-cell crosslinked polyethylene gasket, heat-welded under the lip, conforms to irregularities in the frame, and forms a tight, virtually leakproof seal.

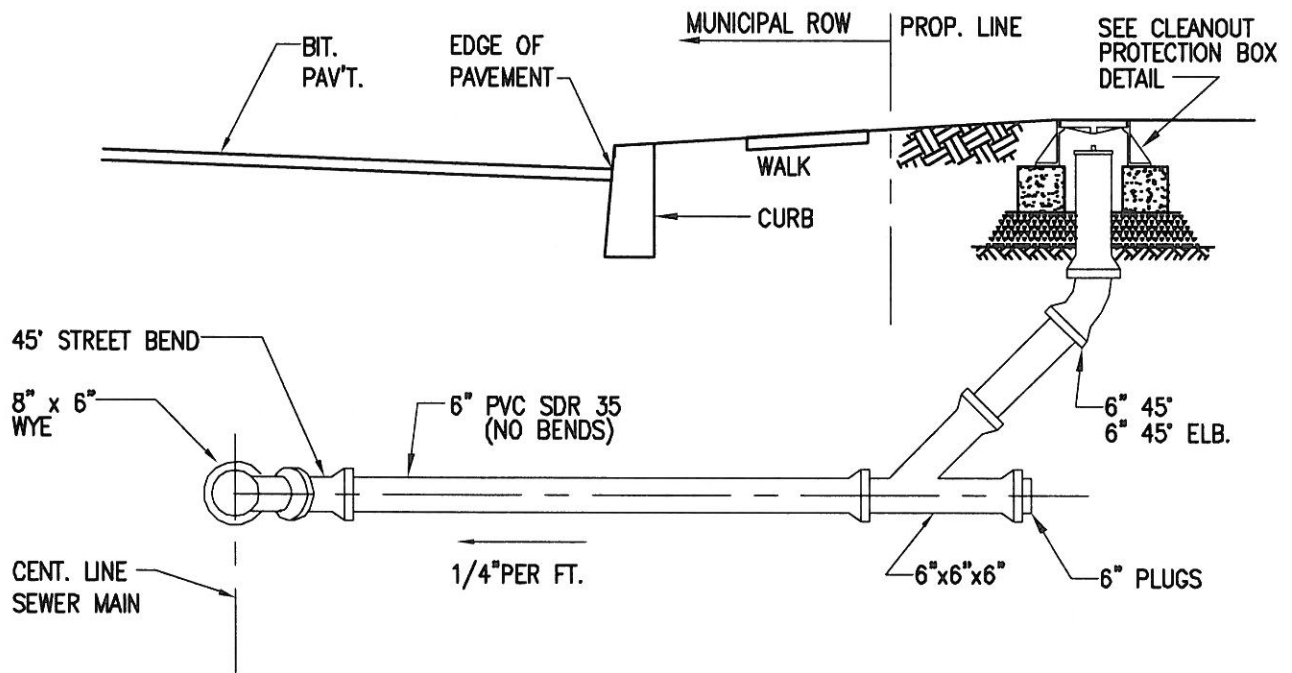
5. The spring-loaded Vacuum Relief Valve relieves vacuum pressure build-up. This valve is activated when the vacuum pressure differential reaches approximately 2.25 psi.

Both valves (1 and 5) are self-cleaning, and are made of non-corrodible material. They are also intended to be used as handles for removing the insert.



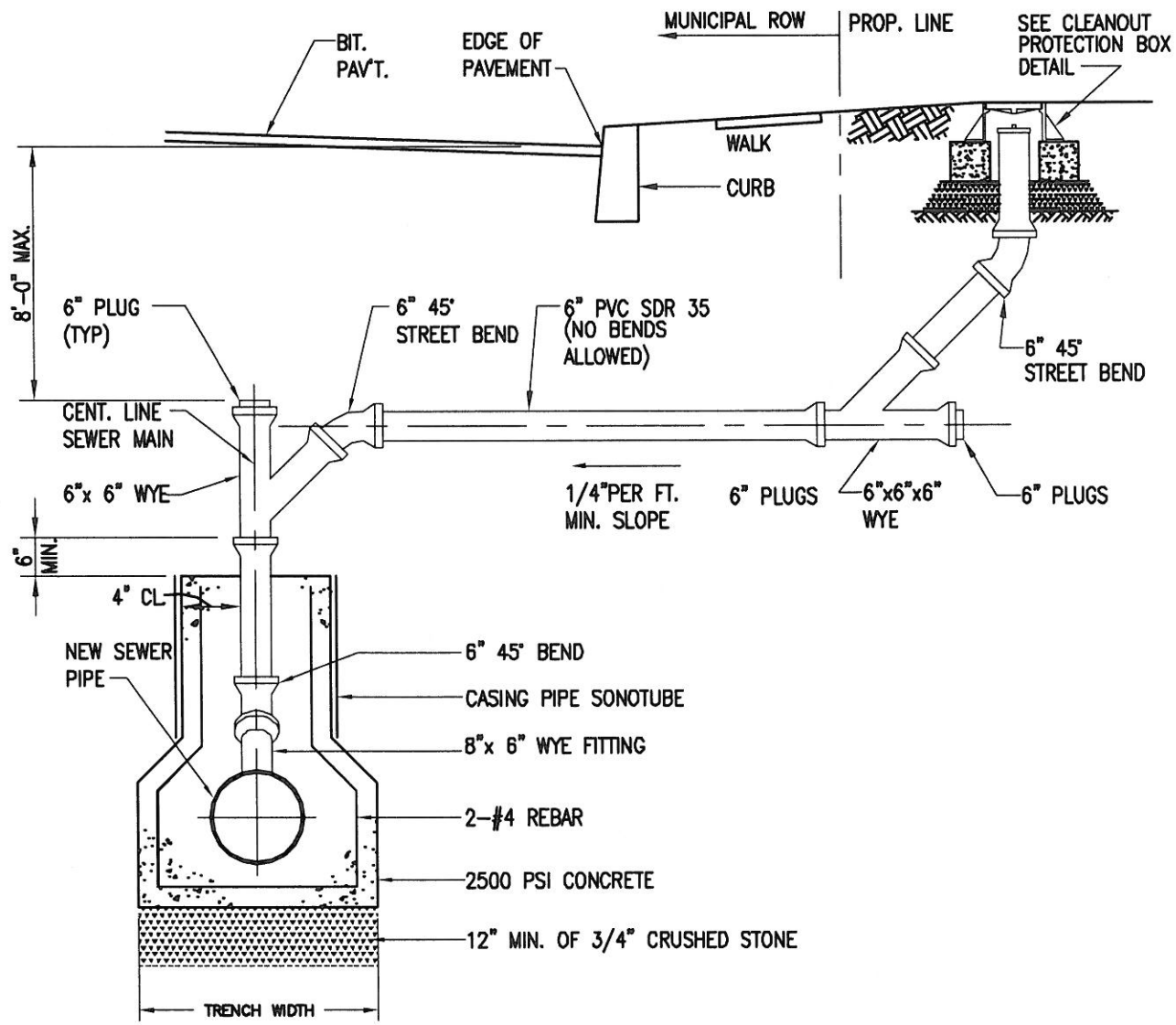
REV. 3 - JUNE 23, 2018 (Jacobs Environmental, LLC)
 REV. 2 - MAY, 2012
 REV. 1 - JANUARY, 2003

| | | | |
|---|--|--|----------------|
| Jacobs Environmental, Inc. Piscataway, New Jersey | Ewing-Lawrence Sewerage Authority Standard Details | SANITARY Lateral Type I - Tee Wye | 19 of 34 |
| AUGUST 1996 | | | |



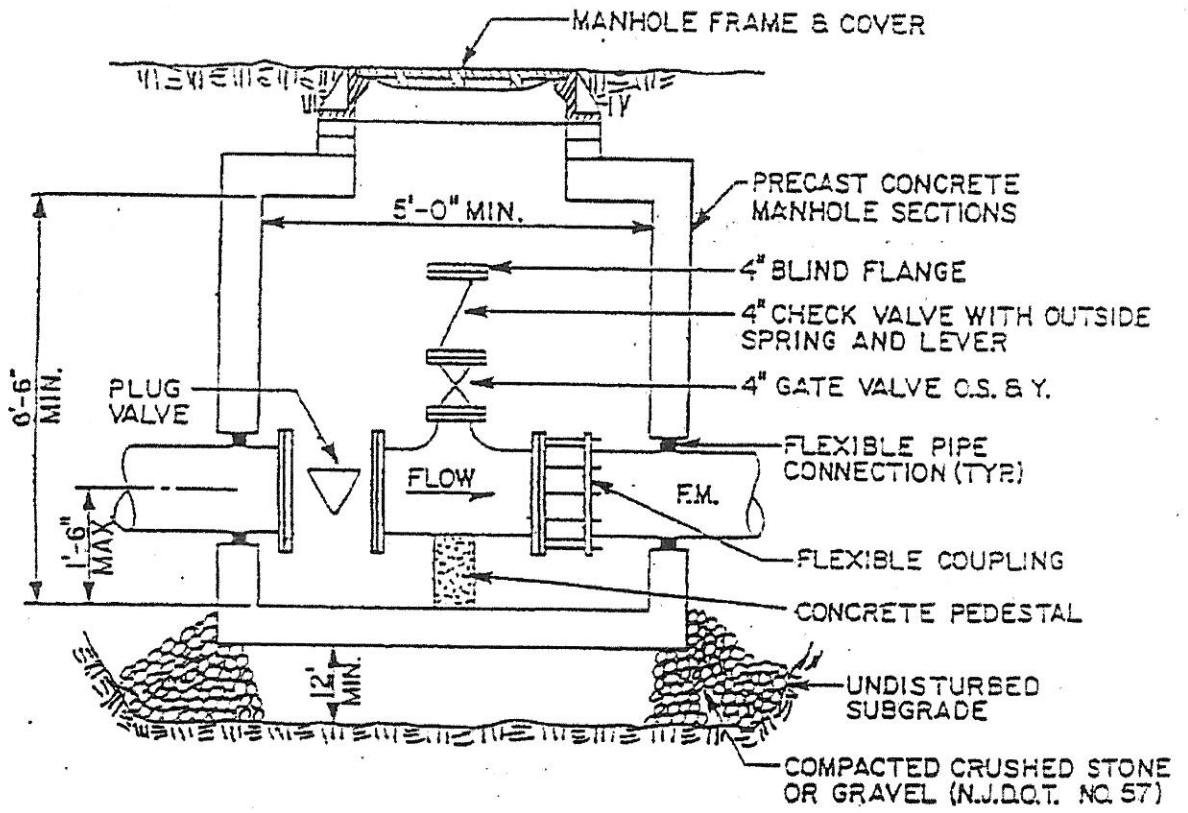
REV. 3 - JUNE 23, 2018 (Jacobs Environmental, LLC)
 REV. 2 - MAY, 2012
 REV. 1 - JANUARY, 2003

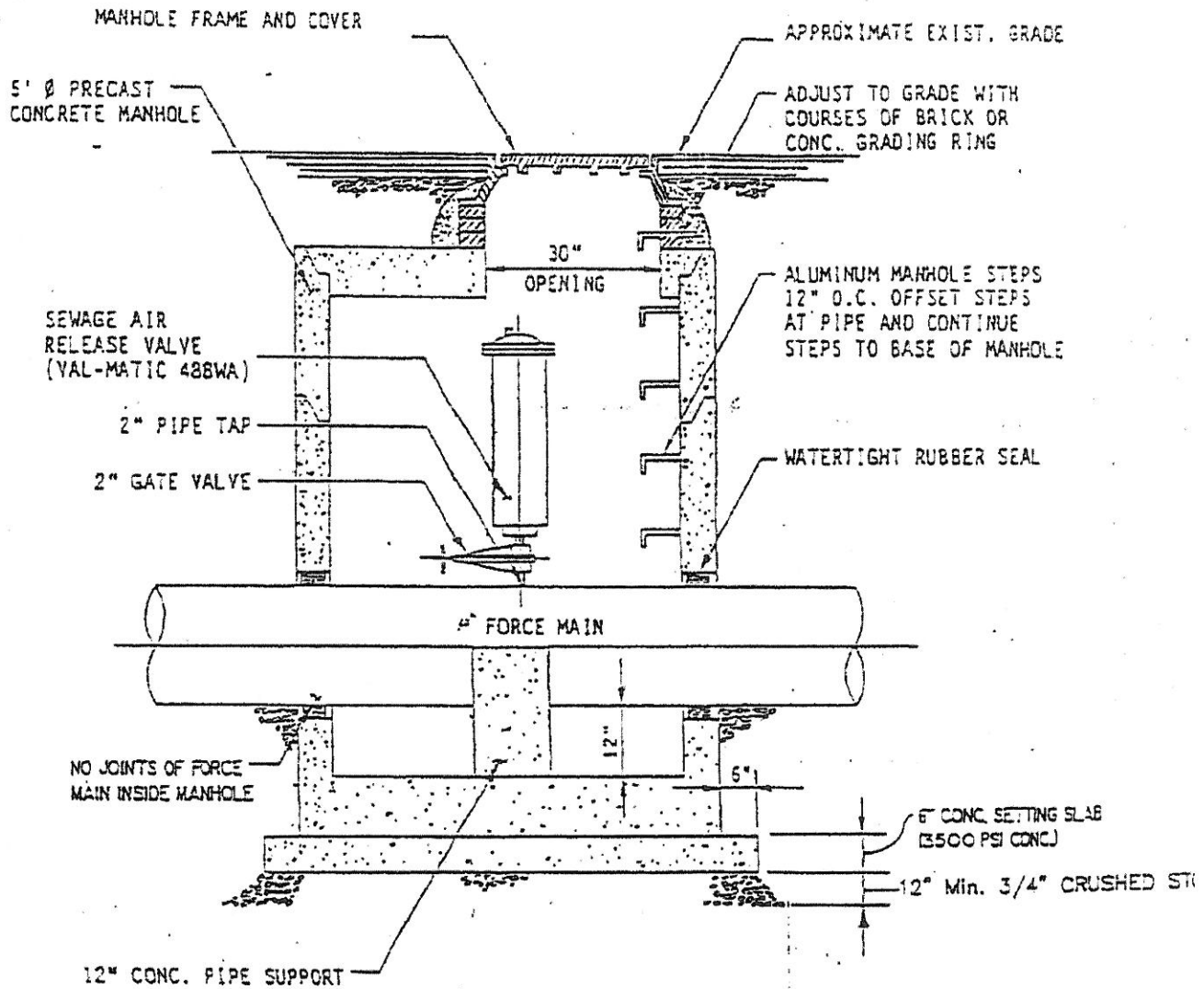
| | | | |
|--|--|-----------------------------------|----------------|
| Jacobs Environmental, Inc. Piscataway, New Jersey | Ewing-Lawrence Sewerage Authority Standard Details | SANITARY Lateral Type II - Wye | 20 of 34 |
| AUGUST 1996 | | | |



REV. 2 - JUNE 23, 2018 (Jacobs Environmental, LLC)
 REV. 1 - JANUARY, 2003

| | | | |
|---|---|---|----------------|
| Jacobs Environmental, Inc. Piscataway, New Jersey | Ewing-Lawrence Sewerage Authority Standard Details | SANITARY Lateral Type III - Chimney | 21 of 34 |
| AUGUST 1996 | | | |





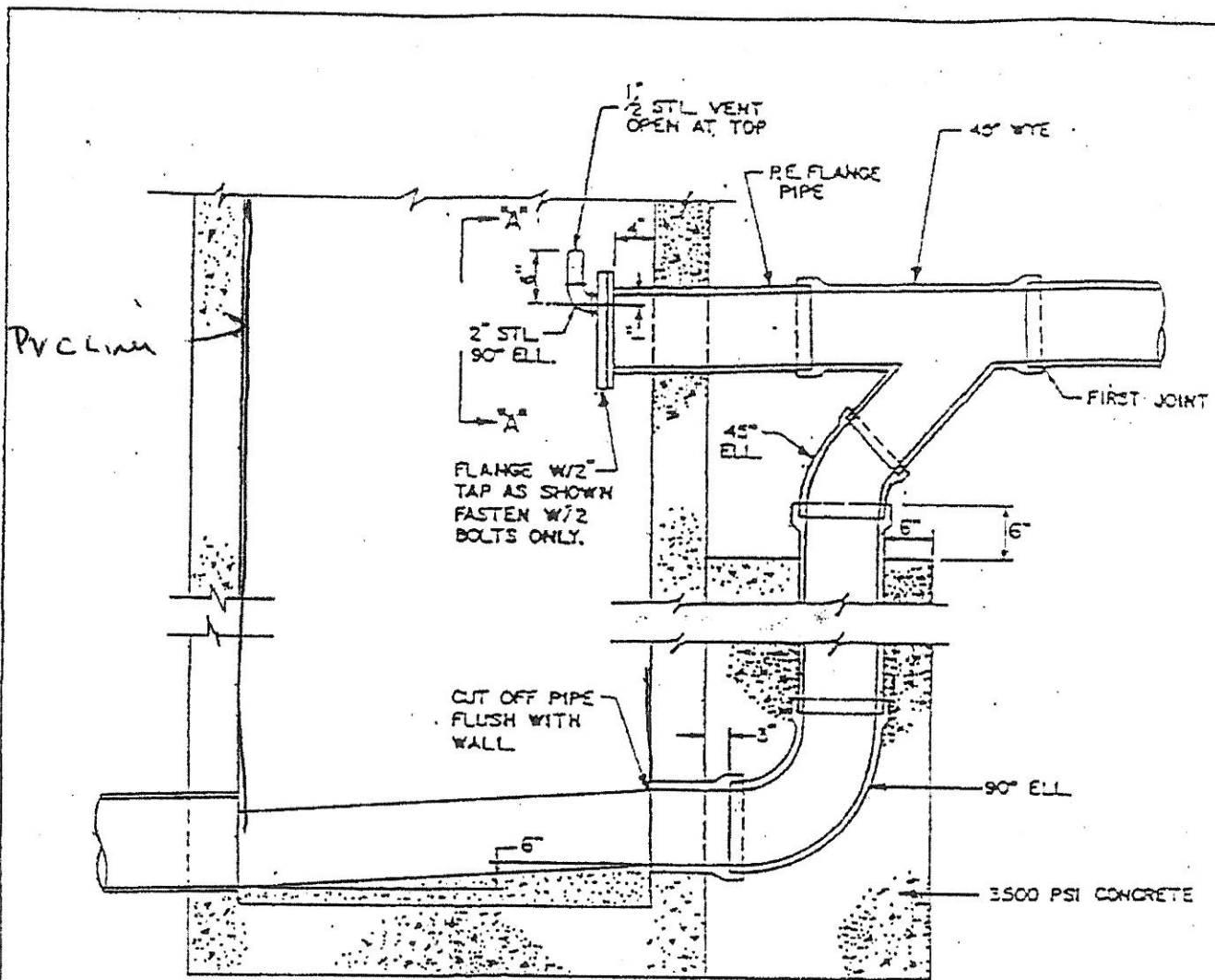
REV. 1 - JANUARY, 2003

Jacobs Environmental, Inc.
Piscataway, New Jersey

Ewing-Lawrence
Sewerage Authority
Standard Details

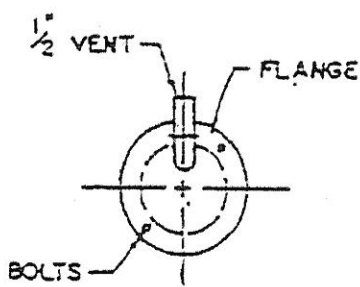
SANITARY
Air/Vacuum Valve

ATTACHED TO QOR



FLANGE W/2" TAP AS SHOWN FASTEN W/2 BOLTS ONLY.

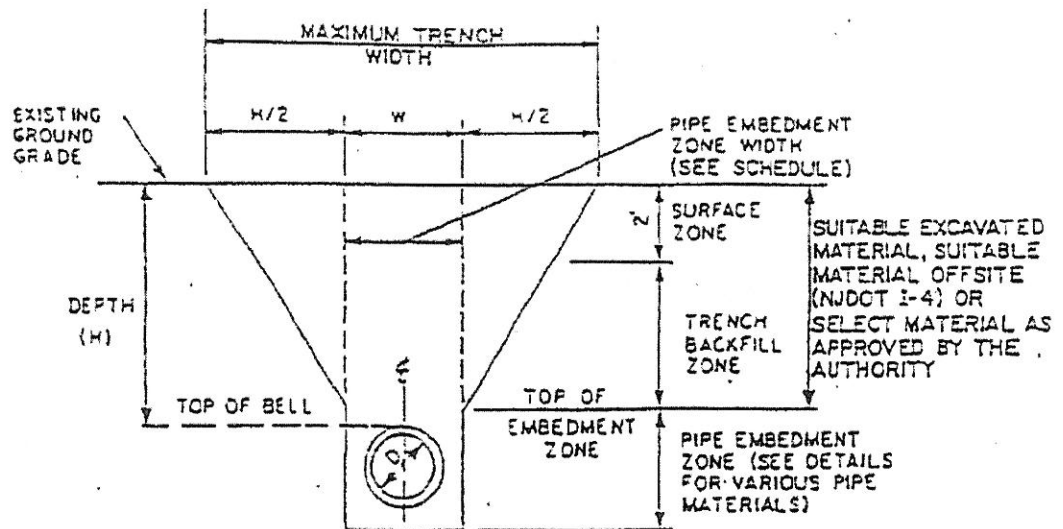
CUT OFF PIPE FLUSH WITH WALL



ELEVATION "A-A"

FORCE MAIN NOTES

1. PROVIDE MECHANICAL THRUST RESTRAINTS AT ALL BENDS.
2. AIR RELEASE VALVE TO BE INSTALLED AT ALL HIGH POINTS OF FORCE MAIN.
3. MINIMUM COVER IN ROADWAY & SIDEWALK AREAS TO BE 4 FEET.
4. MINIMUM RADIUS OF CURVATURE OF PIPE SHALL BE THAT RECOMMENDED BY THE PIPE MANUFACTURER.
5. ALL MATERIAL FOR F.M. DROP CONN. SHALL BE CAST OR DUCTILE IRON.
6. ALL PIPES & FITTINGS SHALL BE SAME DIA. AS FORCE MAIN DIA.



**PIPE EMBEDMENT ZONE WIDTH
SCHEDULE**

| | | | | | | |
|--------------------------|----------------------|-------|-------|-------|-------|-------|
| INSIDE DIA. OF PIPE (D) | 4", 5", 8", 10", 12" | 15" | 16" | 21" | 24" | 27" |
| EMBEDMENT ZONE WIDTH (W) | 3'-0" | 3'-6" | 3'-6" | 4'-0" | 4'-0" | 4'-6" |

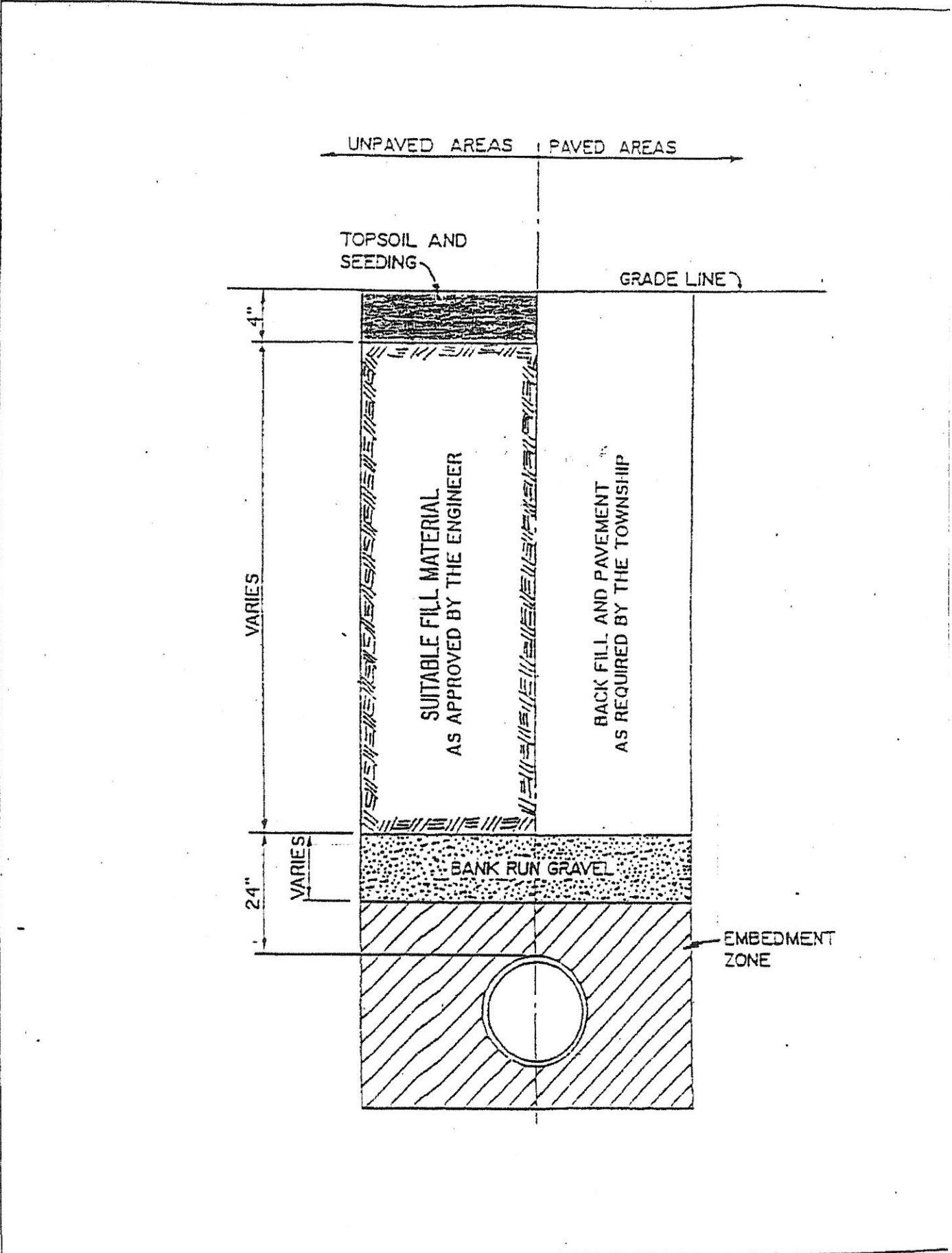
TRENCH EXCAVATION AND BACKFILL NOTES

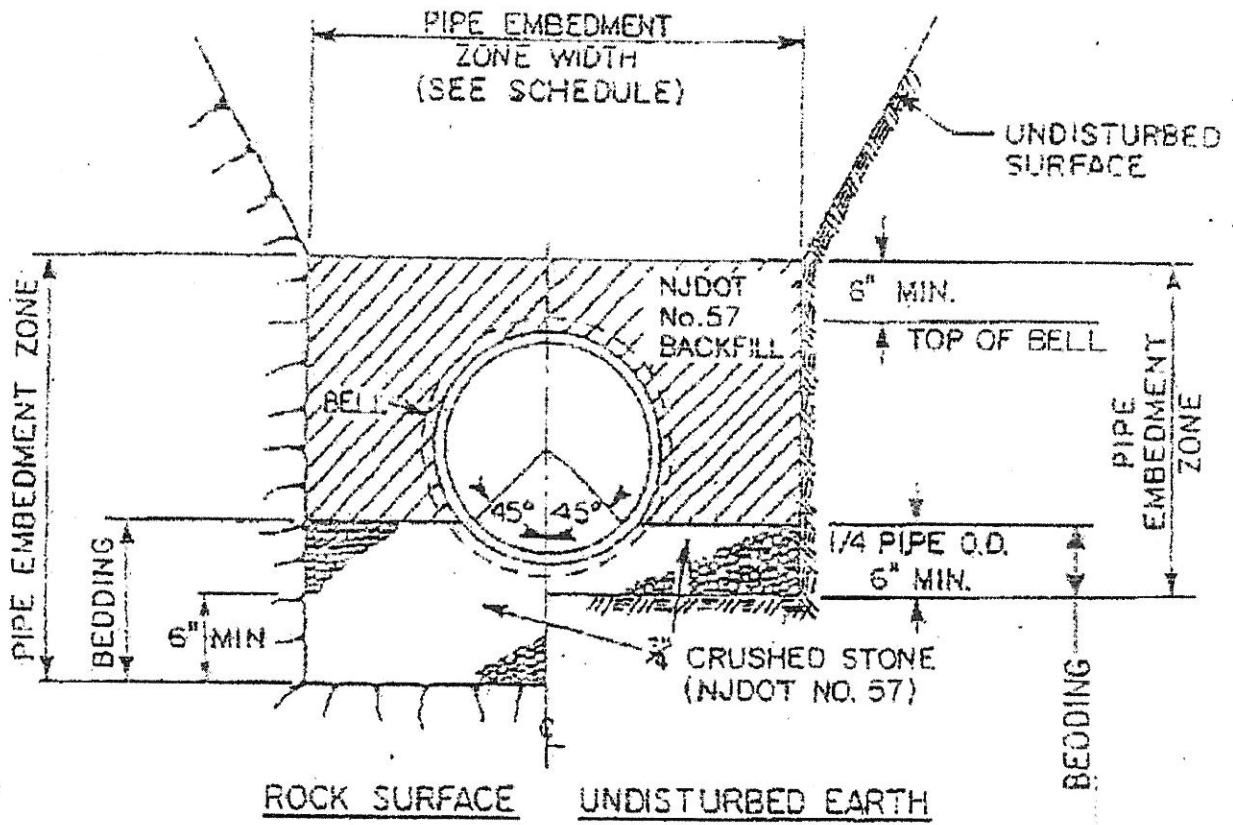
1. THE MAXIMUM DRY DENSITIES SHALL BE DETERMINED IN ACCORDANCE WITH ASTM DESIGNATION D1557. THE MINIMUM PERCENTAGE OF COMPACTION TO BE ACHIEVED BY THE CONTRACTOR IN THE VARIOUS ZONES IS AS FOLLOWS:

| | PIPE MATERIAL | LOCATION | INITIAL COMPACTION |
|-----------------------|---------------|----------|--------------------|
| SURFACE ZONE: | ALL | ALL | 95% |
| TRENCH BACKFILL ZONE: | | | 90% |
| PIPE EMBEDMENT ZONE: | | | 95% |

THE MINIMUM COMPACTION IN EMBANKMENTS SHALL BE 90%.

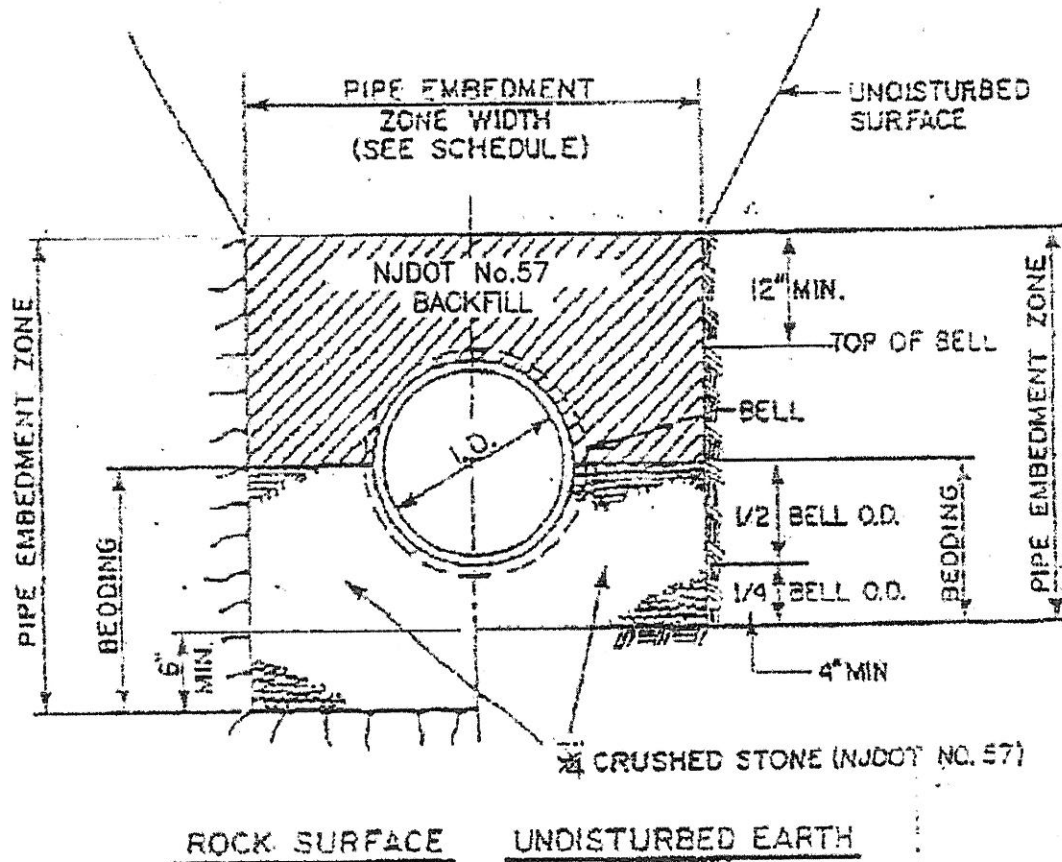
2. THE PIPE EMBEDMENT ZONE WIDTH AND THE MAXIMUM TRENCH WIDTH SHALL NOT EXCEED THE PERMISSIBLE WIDTHS SHOWN. IF THE PERMISSIBLE WIDTH IS EXCEEDED, THE PIPE SHALL BE INSTALLED IN A HIGHER CLASS BEDDING THAN SHOWN ON THE DRAWINGS OR THE SPECIFIED PIPE SHALL BE REPLACED WITH PIPE OF GREATER CRUSHING STRENGTH OR BOTH, TO ACHIEVE SUITABLE CONDITIONS.
3. SUITABLE MATERIAL FROM EXCAVATIONS SHALL BE FREE FROM OBJECTIONABLE QUANTITIES OF ORGANIC MATTER, CLAYS, TREES, STUMPS, FROZEN MATERIAL, RUBBLE, REFUSE, CINDERS, ROCK AND OTHER MATERIALS CONSIDERED DELETERIOUS BY THE AUTHORITY AND SHALL NOT HAVE FINES IN EXCESS OF 10 PERCENT PASSING THE NO. 200 SIEVE NOR STONE OR GRAVEL LARGER THAN 2 INCHES.
4. FOR PIPE MATERIALS OTHER THAN PVC, PIPE EMBEDMENT ZONE MAY BE INCREASED BY 6 INCHES.





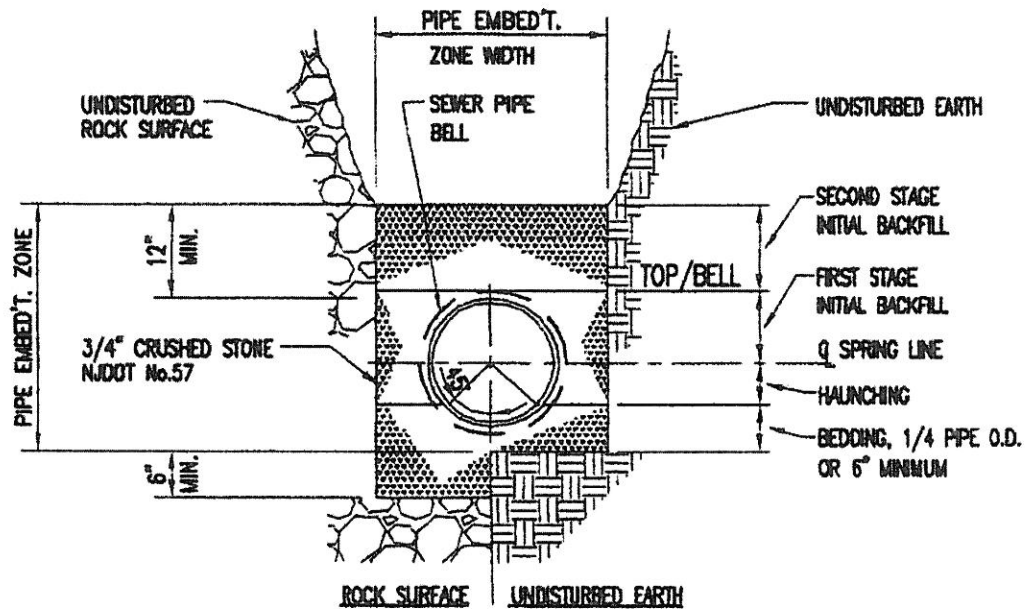
REV. 1 - JULY, 2015

| | | | |
|--|---|---------------------------------|-------------------------|
| <p>Jacobs Environmental, Inc. Piscataway, New Jersey</p> | <p>Ewing-Lawrence Sewerage Authority Standard Details</p> | <p>SANITARY DIP Bedding</p> | <p>27 of 34</p> |
| <p>August 1996</p> | | | |



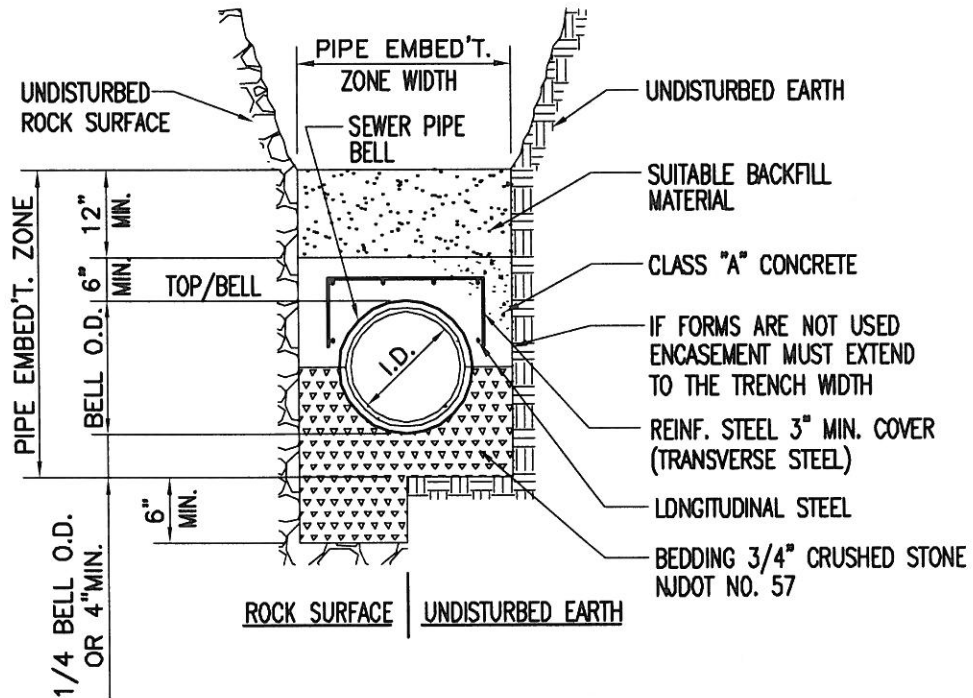
REV. 1 - JULY, 2015

| | | | |
|--|--|-------------------------|----------------|
| Jacobs Environmental, Inc. Piscataway, New Jersey | Ewing-Lawrence Sewerage Authority Standard Details | SANITARY RCP Bedding | 28 of 34 |
| August 1996 | | | |



REV. 1 - JANUARY, 2003

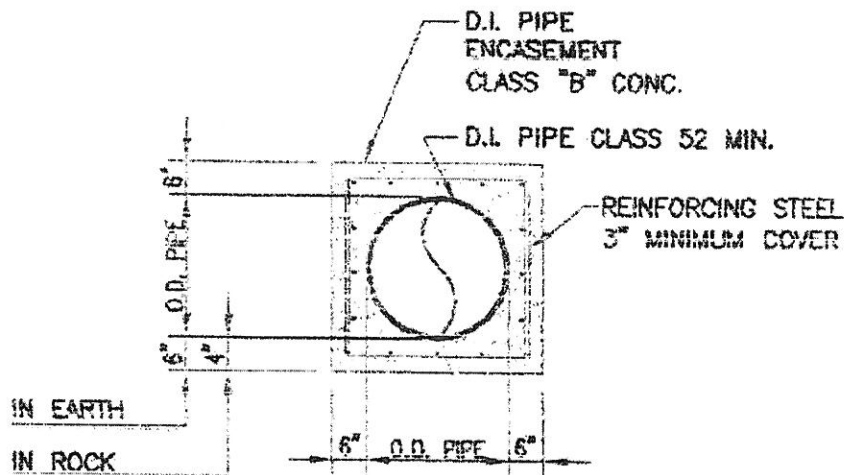
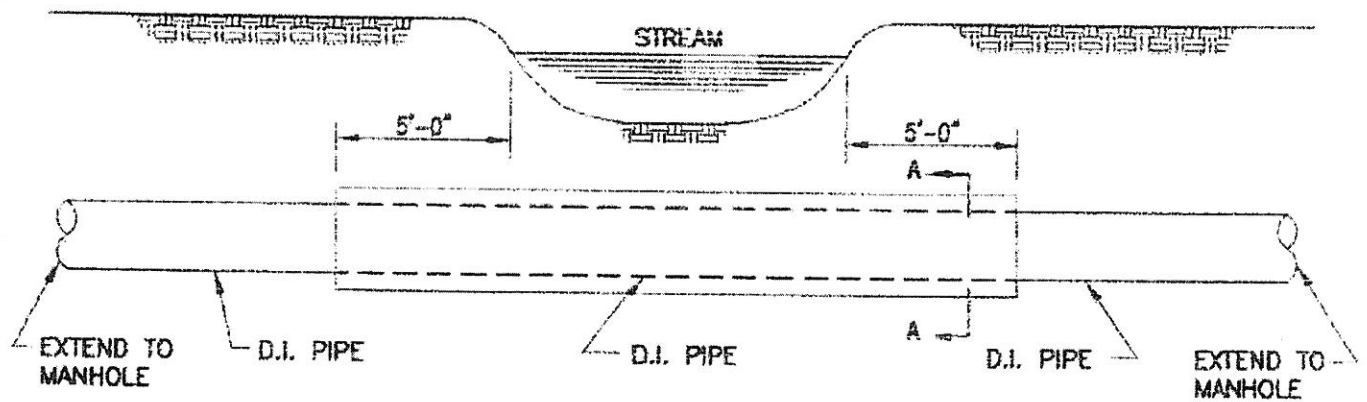
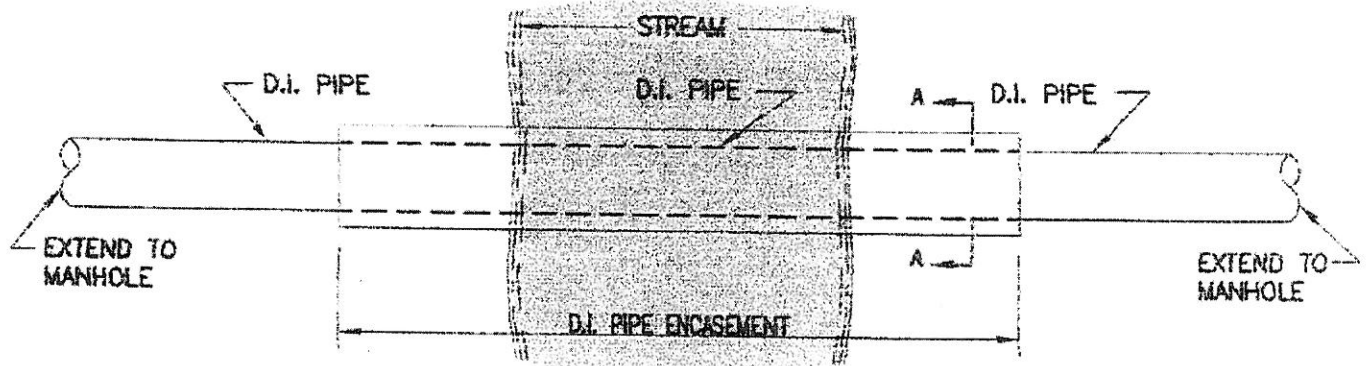
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|--|---|---------------------------------|-------------------------|
| <p>Jacobs Environmental, Inc. Piscataway, New Jersey</p> | <p>Ewing-Lawrence Sewerage Authority Standard Details</p> | <p>SANITARY PVC Bedding</p> | <p>29 of 34</p> |
| <p>August 1996</p> | | | |



1. TO BE USED WHERE DIRECTED OR WHERE SEWER IS LESS THAN 18" BELOW UTILITY
2. ALL REINFORCING STEEL SHALL BE #4 AT 12" O.C. EACH WAY

REV. 4 – JUNE 23, 2018 (Jacobs Environmental, LLC)
 REV. 3 – JULY, 2015
 REV. 2 – MAY, 2012
 REV. 1 – JANUARY, 2003

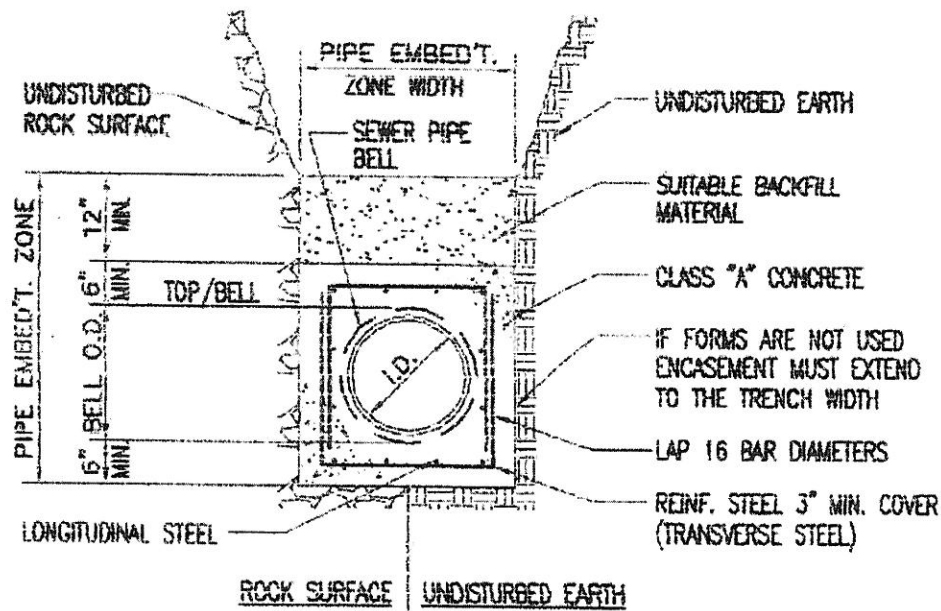
| | | | |
|--|--|-----------------------------|----------------|
| Jacobs Environmental, Inc. Piscataway, New Jersey | Ewing-Lawrence Sewerage Authority Standard Details | SANITARY Half Encasement | 30 of 34 |
| AUGUST 1996 | | | |



NOTE: 1. ALL REINFORCING STEEL SHALL BE #4 AT 12" O.C. EACH WAY

REV. 2 - JULY, 2015
 REV. 1 - JANUARY, 2003

| | | | |
|---|--|-----------------------------|-----------------|
| Jacobs Environmental, inc. Piscataway, New Jersey November 2000 | Ewing-Lawrence Sewerage Authority Standard Details | SANITARY Stream Crossing | 30A of 34 |
|---|--|-----------------------------|-----------------|



1. TO BE USED WHERE DIRECTED OR WHERE SEWER IS LESS THAN 18" ABOVE UTILITY
2. ALL REINFORCING STEEL SHALL BE #4 AT 12" O.C. EACH WAY

REV. 3 - JULY, 2015

REV. 2 - MAY, 2012

REV. 1 - JANUARY, 2003

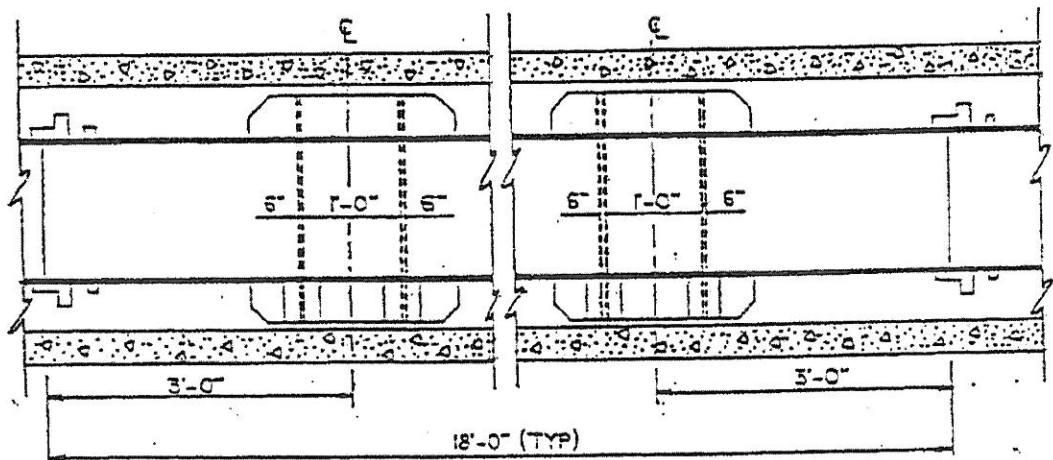
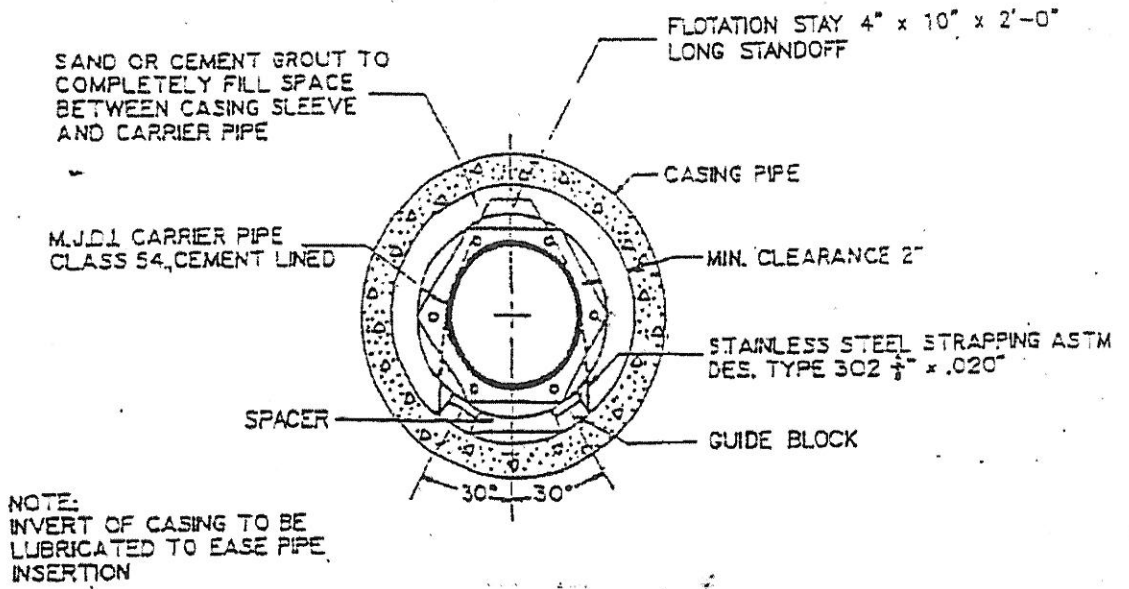
Jacobs Environmental, Inc.
Piscataway, New Jersey

August 1996

Ewing-Lawrence
Sewerage Authority
Standard Details

SANITARY
Full Encasement

31
of
34



1. 8 IN. CEMENT BULKHEAD TO BE CONSTRUCTED AT BOTH ENDS OF THE CASING. RANDOM VERTICAL JOINTS TO BE LEFT UNMORTARED FOR SEEPAGE. ASPHALT IMPREGNATED FELT WITH MIN. THICKNESS OF 1" TO BE PLACED AROUND THE CARRIER PIPE WHERE BRICK MASONRY IS PLACED.

REV. 1 - JANUARY, 2003

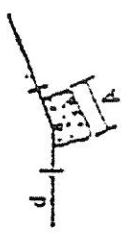

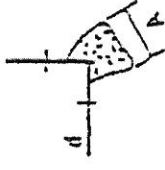
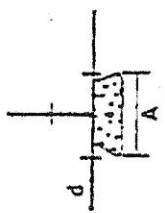
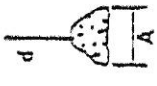
Jacobs Environmental, Inc.
Piscataway, New Jersey

Ewing-Lawrence
Sewerage Authority
Standard Details

SANITARY
Casing

Handwritten initials and signature

A : CONTACT BEARING AREA OF BLOCK WITH EARTH, SQUARE FEET

| DIAMETER (d) OF PIPE | 22 1/2° ELBOW | 45° ELBOW | 90° ELBOW | TEE CONNECTION | PLUG |
|----------------------|---|---|--|---|---|
| 6" |  A 0.5 |  A 1.1 |  A 2.0 |  A 1.4 |  A 1.4 |
| 8" | 1.0 | 1.9 | 3.6 | 2.7 | 2.7 |
| 10" | 1.5 | 3.0 | 6.5 | 4.2 | 4.2 |
| 12" | 2.2 | 4.3 | 8.0 | 5.7 | 5.7 |
| 16" | 4.5 | 7.7 | 14.2 | 10.0 | 10.0 |
| 20" | 6.1 | 12.0 | 22.3 | 15.7 | 15.7 |
| 24" | 8.8 | 17.2 | 32.0 | 22.7 | 22.7 |

1. BEARING AREAS ARE BASED ON UNDISTURBED SOIL WITH A BEARING CAPACITY OF .2 TONS PER SQ. FT. FOR A LESSER SOIL BEARING CAPACITY THESE AREAS SHALL BE INCREASED ACCORDINGLY.

2. ALL CONCRETE THRUST BLOCKS SHALL BE 2500 PSI

3. THRUST BLOCKS SHALL BE POURED AGAINST UNDISTURBED EARTH.

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