## Sanitary Sewer Standard Details

<table>
<thead>
<tr>
<th>PLATE #</th>
<th>TITLE</th>
<th>SIGNATURE DATE</th>
<th>STD. SPECS.</th>
<th>COMMODITY CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>S-1</td>
<td>Manhole</td>
<td>3/10/2005</td>
<td>1008</td>
<td>870000</td>
</tr>
<tr>
<td>S-2</td>
<td>Shallow Manhole</td>
<td>3/10/2005</td>
<td>1008</td>
<td>872190</td>
</tr>
<tr>
<td>S-3</td>
<td>Twin House Conn. Layout</td>
<td>3/18/2002</td>
<td>1007</td>
<td>-</td>
</tr>
<tr>
<td>S-4</td>
<td>Precast 48&quot; San.MH</td>
<td>1/2/2007</td>
<td>1008</td>
<td>875000</td>
</tr>
<tr>
<td>S-5</td>
<td>60&quot;, 72&quot; Precast San. MH</td>
<td>1/2/2007</td>
<td>1008</td>
<td>875000</td>
</tr>
<tr>
<td>S-6</td>
<td>Drop MH - Type A &amp; B</td>
<td>3/18/2002</td>
<td>1008</td>
<td>880000, 881000</td>
</tr>
<tr>
<td>S-6A</td>
<td>Precast San.Drop MH</td>
<td>12/4/2001</td>
<td>1008</td>
<td>880000, 881000</td>
</tr>
<tr>
<td>S-7</td>
<td>Bedding/Gravity PVC Pipe</td>
<td>1/31/2007</td>
<td>1001</td>
<td>-</td>
</tr>
<tr>
<td>S-8</td>
<td>Heavy Traffic MH Fr.&amp;Cvr</td>
<td>10/23/1997</td>
<td>1008</td>
<td>877000</td>
</tr>
<tr>
<td>S-8B</td>
<td>Sanitary MH Platen Cover - 1</td>
<td>9/12/2000</td>
<td>1008</td>
<td>877000</td>
</tr>
<tr>
<td>S-8C</td>
<td>Sanitary MH Platen Cover - 2</td>
<td>9/12/2000</td>
<td>1008</td>
<td>877000</td>
</tr>
<tr>
<td>S-12</td>
<td>Stack House Connections</td>
<td>10/23/1997</td>
<td>1007</td>
<td>-</td>
</tr>
<tr>
<td>S-12A</td>
<td>House Conn.@ Prop.Line</td>
<td>1/10/2007</td>
<td>1007</td>
<td>-</td>
</tr>
<tr>
<td>S-12B</td>
<td>Grinder Pump Conn@ Hse.Conn.</td>
<td>1/2/2007</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>S-13</td>
<td>Watertight MH Fr.&amp;Cvr</td>
<td>10/23/1997</td>
<td>1008</td>
<td>877000</td>
</tr>
<tr>
<td>S-14</td>
<td>Air Relief Valve Vault</td>
<td>3/18/2002</td>
<td>Special Provision</td>
<td>886000</td>
</tr>
<tr>
<td>S-15</td>
<td>Precast Doghouse Riser</td>
<td>5/15/2002</td>
<td>1008</td>
<td>-</td>
</tr>
</tbody>
</table>
SECTION A–A

NOTES:

1. WALLS AND BOTTOM MUST BE BRICK OR PRECAST CONCRETE (SEE DETAILS S–4, S–5). INVERT AND BENCH MUST BE BRICK LAID ON EDGE.

2. WHERE COVER OVER PIPE IS LESS THAN 5', USE SHALLOW MANHOLE (SEE PLATE S–2).

3. THICKNESS OF WALLS TO BE INCREASED TO 12", 12'–0" BELOW UNDERSIDE OF FRAME.

4. IN LOW, WET GROUND, WALLS MUST BE 12" THICK THROUGHOUT AS DIRECTED.

5. DROP ACROSS MANHOLE ALONG FLOW LINE SHALL BE 0.1 FOOT MINIMUM.


7. SEE DETAIL S–4 FOR PRECAST ALTERNATIVE MANHOLE.

8. OFFSET MANHOLES – PROVIDE DETAIL ON PLANS.

9. FOR TERMINAL MANHOLE, OMIT BENCH. PROVIDE BRICK INVERT. DROP TO OUTLET MUST NOT EXCEED 0.3 FOOT.

BRICK SHALL BE ASTM C32 GRADE SS LAID ON EDGE.

CEMENT MORTAR

PRECAST GRADE ADJUSTMENT RING (STD. DETAIL G–3) OR BRICK MASONRY (16 IN. MAX., 2 COURSES MINIMUM)

1/2" CEMENT MORTAR (BRICK MANHOLE ONLY)

STANDARD SANITARY SEWER FRAME & COVER
(SEE DETAIL S–8 OR S–13)

CENTER MH STEPS ON C OF MH.

BATTER
4'-0" MAXIMUM
3'-0" MINIMUM

TOP OF BENCH
2'-0"

8" MINIMUM

DEPARTMENT OF PUBLIC WORKS
SANITARY SEWER DETAILS
MANHOLE
(FOR PIPE 6" THRU 36"
HORIZONTAL DIAMETER)

ISSUED: OCTOBER 1977
REVISED: JULY, 1985
REVISED: JANUARY 2005
PLATE S–1
#7 @ 6" c/c
EACH WAY.

STANDARD MH STEPS
ON E OF MH.
SEE DETAIL G-4.

NOTES:

1. WALLS AND BOTTOM MUST BE
BRICK OR PRECAST CONCRETE

2. INVERT AND BENCH MUST BE
BRICK LAID ON EDGE.

3. BENCH FULL HEIGHT OF PIPE AS
SHOWN FOR LINE MANHOLE.

4. DROP ACROSS MANHOLE ALONG
FLOW LINE SHALL BE 0.1 FOOT
MINIMUM.

5. FOR PIPE 42" AND LARGER IN
HORIZONTAL DIAMETER, USE
STORM DRAIN TYPE C MANHOLE
- PLATE D-3.04. WHERE CENTER
LINE OF HORIZONTAL CURVATURE
EXCEEDS 4 FEET, USE BEND
STRUCTURE - PLATE D-4.02.

6. SEE DETAIL S-4 FOR PRECAST
ALTERNATIVE MANHOLE.

7. IN LOW, WET GROUND, WALLS MUST
BE 12" THICK THROUGHOUT, AS
DIRECTED.

8. REINFORCEMENT SHALL BE 2 LAYERS
(1 LAYER IN BOTTOM SLAB) OF 4x4
W40 x W40 WELDED WIRE FABRIC.
REINFORCEMENT COVER =
1 1/2" IN PRECAST STRUCTURE
2" IN CAST IN PLACE STRUCTURE
3" AGAINST EARTH IN CIP STRUCTURE.

9. WALL THICKNESS =
6" IN PRECAST STRUCTURE;
8" IN CIP STRUCTURE.

10. FOR TERMINAL MANHOLE, OMIT BENCH.
PROVIDE BRICK INVERT. DROP TO OUTLET
MUST NOT EXCEED 0.3 FEET.
CLEAN-OUT STANDPIPE (TYP.) SEE DETAIL S-12A

SEE DETAIL S-12A

R/W LINE

45° BEND

6" X 6" WYE

45° BEND

SEE DETAIL S-12 FOR STACK HOUSE CONNECTION ALTERNATE.

FLOW

MAIN LINE SEWER

WYE
1. UNLESS OTHERWISE NOTED, MANHOLE TAPERS, RISERS AND BASES SHALL BE FURNISHED IN STRICT ACCORDANCE WITH A.S.T.M. DESIGNATION C-478 (LATEST) FOR "PRECAST REINFORCED CONCRETE MANHOLE SECTIONS".

2. ALL CONCRETE SHALL BE 4,500 PSI COMPRESSIVE STRENGTH.


4. SEE STANDARD DETAIL PLATE G-4 FOR MANHOLE STEP SPECIFICATIONS, SPACING AND PLACEMENT. STEP LOCATION SHOWN IS FOR ILLUSTRATION ONLY. LOCATE STEPS 90° FROM MAIN FLOW CHANNEL WITHIN MANHOLE.

5. A PRECAST MANHOLE SECTION MAY BE PLACED OVER EXISTING PIPE. SEE DETAIL FOR PRECAST MANHOLE "DOGHOUSE" RISER, STANDARD DETAIL PLATE S-15.

6. MINIMUM CIRCUMFERENTIAL REINFORCEMENT PER A.S.T.M. C76 TABLE III WALL B FOR PIPE DIAMETERS GREATER THAN 18".

7. USE A MINIMUM OF 1 MANHOLE STEP IN BASE UNIT.

8. PRECAST MANHOLE RISER JOINTS: THE MANUFACTURER SHALL FORM MALE AND FEMALE ENDS OF JOINTS USING THEIR OWN DESIGN. THE JOINTS SHALL BE SEALED BY THE CONTRACTOR & MADE WATER-TIGHT USING THE MANUFACTURER'S RECOMMENDED ASTM OR AASHO-APPROVED SEALANT.

9. SEE STANDARD DETAIL PLATE G-3 FOR SPECIFICATIONS AND PLACEMENT OF PRECAST CONCRETE GRADE RINGS.

10. USE LARGEST APPLICABLE RISER UNIT LENGTHS. USE A MAXIMUM OF ONE - 1' LENGTH RISER UNIT PER STRUCTURE, TO BE PLACED IMMEDIATELY BELOW ECCENTRIC CONE SECTION.

11. FOR PIPE OF DIAMETER LARGER THAN 48", USE BRICK BEND (DETAIL D-4.01 & D-4.02) OR A SPECIAL DESIGN MANHOLE.

NOTES:

* USE 72" DIAMETER MANHOLE.

* ADD 2' TO INDICATED DIMENSION FOR TRANSITION UNIT, INDICATED DIMENSIONS APPLY ONLY TO SLAB REDUCER.

DEPARTMENT OF PUBLIC WORKS
SANITARY SEWER DETAILS
60" & 72" PRECAST SANITARY
A-2 & A-3 MANHOLINES
(FORE PIPE 27" THRU 48" HORIZ. DIAMETER)
PRECAST GRADE ADJUSTMENT RING (SEE STD. DETAIL G-3) OR BRICK MASONRY (16 IN. MAXIMUM, 2 COURSES MINIMUM)

<table>
<thead>
<tr>
<th>SIZE OF SEWER</th>
<th>TYPE A MAX. DROP</th>
<th>MIN. DROP</th>
<th>TYPE B MAX. DROP</th>
<th>MIN. DROP</th>
</tr>
</thead>
<tbody>
<tr>
<td>6&quot;</td>
<td>3'-9&quot;</td>
<td>2'-0&quot;</td>
<td>3'-9&quot;</td>
<td></td>
</tr>
<tr>
<td>8&quot;</td>
<td>3'-9&quot;</td>
<td>2'-0&quot;</td>
<td>3'-9&quot;</td>
<td></td>
</tr>
<tr>
<td>10&quot;</td>
<td>4'-0&quot;</td>
<td>2'-0&quot;</td>
<td>4'-0&quot;</td>
<td></td>
</tr>
<tr>
<td>12&quot;</td>
<td>6'-0&quot;</td>
<td>2'-6&quot;</td>
<td>6'-0&quot;</td>
<td></td>
</tr>
<tr>
<td>15&quot;</td>
<td>6'-0&quot;</td>
<td>2'-6&quot;</td>
<td>6'-0&quot;</td>
<td></td>
</tr>
</tbody>
</table>

STANDARD SANITARY FRAME AND COVER. (SEE DETAIL S-8 & S-13)

CEMENT MORTAR

NOTES:
1. FOR 15" SEWERS WITH DROP CONNECTIONS USE SPECIAL "Y" WITH 12" BRANCH.
2. WALLS SHALL BE 12" THICK THROUGHOUT WHERE DIRECTED.
3. WALLS AND BOTTOM SHALL BE BRICK OR MIX #3 CONCRETE Poured IN PLACE. INVERT SHALL BE Laid BRICK ON EDGE.
4. STANDARD MANHOLE STEPS SHALL BE PLACED 90° FROM MAIN FLOW CHANNEL. SEE DETAIL G-4.
5. DIP OR PVC PIPE SHALL BE USED FOR DROP CONNECTION. A FERNO BANDED REPAIR COUPLING (OR EQUIV.) SHALL BE USED FOR CONNECTION OF PVC DROP CONNECTION TO NON-PVC PIPE.

TYPE "B" DROP

1/8 BEND

MIX NO. 1 CONCRETE TO UNDISTURBED EARTH.

TYPE "A" DROP

1/2" CEMENT MORTAR (BRICK MANHOLES ONLY)

SECTION OF PIPE TO BE USED BETWEEN "Y" AND 1/8 BEND IF REQUIRED.

MIX NO. 1 CONCRETE TO UNDISTURBED EARTH.

1/8 BEND

BRICK SHALL BE ASTM C32 GRADE SS Laid ON EDGE.

DEPARTMENT OF PUBLIC WORKS
SANITARY SEWER DETAILS
DROP CONNECTIONS AT MANHOLE, TYPE A AND B

ISSUED: OCTOBER, 1977
REVISED: AUGUST, 1997
REVISED: FEBRUARY, 2002

PLATE S-6
NOTES.
1. UNLESS OTHERWISE NOTED, MANHOLE BASE SHALL BE FURNISHED IN STRICT ACCORDANCE WITH ASTM DESIGNATION C478 (LATEST) FOR "PRECAST REINFORCED CONCRETE MANHOLE SECTIONS."
2. MANHOLE BASE SHALL BE OF 4,500 PSI PRECAST CONCRETE.
3. MANHOLE RISERS AND TAPERS SHALL CONFORM TO SANITARY SEWER DETAIL PLATE S-4. MINIMUM CIRCUMFERENTIAL REINFORCEMENT PER A.S.T.M. C478, UNLESS OTHERWISE NOTED.
4. MINIMUM DROP IS 2.5' FROM INVERT TO INVERT.
5. STEPS TO BE LOCATED 90° FROM MAIN FLOW CHANNEL. SEE STD. DETAIL G-4.
6. PIPE SHALL BE POLYVINYL CHLORIDE OR D.I.P.
7. BENCH REQUIRED FOR ALL MANHOLES.

48" STANDARD PRECAST DROP MANHOLE BASE

REINFORCING AREA = 0.12 IN./VERTICAL FT. JOINED TO BASE REINFORCEMENT.

BACKFILL VOID WITH COARSE AGGREGATE PORTLAND CEMENT CONCRETE (57 OR PER ENGINEER) OR FINE AGGREGATE PORTLAND CEMENT CONCRETE (BANK RUN SAND ONLY) OR NON-SHRINK GROUT

NOTE 7
8" MINIMUM BRICK SHALL BE ASTM C32 GRADE SS LAID ON EDGE.

MIN. SLAB REINFORCING AS = 0.39 SQ. IN./FT. E.W.
6" OF #57 STONE UNDER PRE-CAST STRUCTURE

48" STANDARD PRECAST DROP MANHOLE BASE

DEPARTMENT OF PUBLIC WORKS
SANITARY SEWER DETAILS

PRECAST SANITARY DROP MANHOLE
(FOR PIPE 6", 8" & 10" HORIZONTAL DIA.)

ISSUED: SEPTEMBER 10, 1994
REVISED: OCTOBER 2001

PLATE S-6A
BEDDING DETAIL

FOR GRAVITY PVC PIPE 8" & LARGER

TRENCH WIDTH AS PER STANDARD SPECIFICATIONS

GENERAL BACKFILL (SEE SPECIAL PROVISIONS)

2' OVER PIPE INITIAL BACKFILL, AS PER STD. SPECIFICATIONS.

#6 AGGREGATE BEDDING (COST FOR BEDDING TO BE INCLUDED IN THE PRICE BID FOR PIPE.)

CLASS 3 EXCAVATION & BACKFILL, AS DIRECTED BY THE ENGINEER IN THE FIELD.
NOTE:

MATERIAL USED SHALL CONFORM TO ASTM SPECIFICATION A-48, CLASS 30B CAST IRON, PER SECTION 909.04, SPECIFICATIONS.

CASTING MUST BE MACHINED ON BEARING SURFACES.

- USE OF 30" FRAME & COVER SHALL BE LIMITED TO AREAS ACCESSIBLE BY VEHICLE.
- USE IN OTHER AREAS WILL BE APPROVED ON A CASE-BY-CASE BASIS BY THE DEPARTMENT OF PUBLIC WORKS. 30" FRAMES AND COVERS SHALL BE CERTIFIED AS MEETING H-25 DESIGN LOAD STANDARDS.

WHERE FRAME & COVER IS USED OUTSIDE OF BALTIMORE COUNTY R/W OR EASEMENTS, SUBSTITUTE THE WORDS "PRIVATE SANITARY SEWER" FOR "BALTIMORE COUNTY SANITARY SEWER" ON THE COVER.

<table>
<thead>
<tr>
<th></th>
<th>24&quot; DIAMETER</th>
<th>30&quot; DIAMETER</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOMINAL WEIGHT</td>
<td>250 Lbs.</td>
<td>310 Lbs.</td>
</tr>
<tr>
<td>OF FRAME</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NOMINAL WEIGHT</td>
<td>150 Lbs.</td>
<td>215 Lbs.</td>
</tr>
<tr>
<td>OF COVER</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NOMINAL TOTAL</td>
<td>400 Lbs.</td>
<td>525 Lbs.</td>
</tr>
<tr>
<td>WEIGHT</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

DEPARTMENT OF PUBLIC WORKS
SANITARY SEWER DETAILS
HEAVY TRAFFIC MANHOLE FRAME AND COVER
NOTE: ALL DIMENSIONS SHOWN ARE IN ENGLISH AND [METRIC]
MEETS OR EXCEEDS H2O LOADING
MATERIAL: CAST GRAY IRON ASTM A-48, CLASS 35B
FINISH: NO PAINT
WEIGHT: 177#
FRAME: SEE DETAIL G-14

DEPARTMENT OF PUBLIC WORKS
SANITARY SEWER DETAILS
SANITARY SEWER PLATEN COVER
FOR USE WITH STRAIGHT WALL MH FRAME

PLATE
S-8B
SANITARY SEWER PLATEN COVER
FOR USE WITH STRAIGHT WALL MH FRAME

DEPARTMENT OF PUBLIC WORKS
SANITARY SEWER DETAILS

SEE DETAIL "A"

1" TYP. [22mm]

3 3/16" [13mm]

1/2" TYP. [13mm]

5/8" TYP. [16mm]

2 1/8" TYP. [54mm]

8 7/8" [225mm]

1/2" TYP. [13mm]

2 1/8" TYP. [54mm]

FEBRUARY, 2000

PLATE S-8C
**NOTE:**

1. Use all ductile iron fittings including sewer wye.
2. Encase riser in mix #1 concrete utilizing braced 14" diameter sonotube or approved equal.
3. Main line to be ductile iron pipe.
4. Trench width payment shall be paid from center line of main line to end of house connection. See detail G-6 for trench width.
PROPOSED 6" HOUSE CONNECTION

PROPERTY LINES, ULTIMATE R/W LINES AND/OR -UTILITY EASEMENT LINES.

TOP VIEW

EXISTING GROUND

2"x6" BOARD TO BE PLACED AS MARKER & TO EXTEND 4' ABOVE GRADE.

PLAN

EXISTING OR PROPOSED SEWER

5'

FLOW

6"x6"x4" WYE AND 4"-45° ELBOW ENCASED IN CONCRETE.

5'

5'

6" MAX

PROPOSED 6" H.C.

6" PVC

EXISTING OR PROPOSED SEWER

6"x6"x4" PVC WYE FULLY ENCASED IN CONCRETE.

ENCASEMENT ONLY WHEN DEEPER THAN 18 FEET

SECTION A-A

6" ASTM C-1173 6xHWS SP. ADAPTOR; FERNCO BANDED REPAIR COUPLING (OR EQUIVALENT) AS APPROVED BY ENGINEER FOR CONNECTION TO EXISTING NON-PVC HOUSE CONNECTION.

4"-45° PVC ELBOW FULLY ENCASED IN CONCRETE

VERTICAL FEET OF 4" PVC

(2) OPTIONAL LIFT LOOPS (#5 REBAR)

VARES

6"

4"-45° PVC RISER

PROPOSED 4" PVC

PLUG

LIMIT OF PAYMENT

NOTES

THE PROPOSED 6" HOUSE CONNECTION SHALL CONSIST OF PVC PIPE OR DUCTILE IRON PIPE, SCHEDULE 52, MATCH TYPE OF H.C. PIPE TO TYPE USED IN SEWER, WHERE POSSIBLE.

CONCRETE TO BE MIX #1.

DEPARTMENT OF PUBLIC WORKS
SANITARY SEWER DETAILS
SANITARY SEWER
HOUSE CONNECTION
AT PROPERTY LINE

LEONARD
DIRECTOR
B рем. OF ENGINEERING/CONSTRUCTION
1-10-07
DATE

ISSUED: SEPTEMBER 1991
REVISED: AUGUST 1997
REVISED: JANUARY 2007

PLATE S-12A
NOTES

WITH THE APPROVAL OF THE ENGINEER, THE CONTRACTOR MAY ELECT TO MODIFY THIS DETAIL TO REDUCE DOWN FROM 4" PVC TO 1 1/2" PRESSURE SEWER.

ALL COST TO BE INCLUDED AS PART OF OTHER ITEMS BID.
WHERE FRAME & COVER IS USED OUTSIDE OF BALTIMORE COUNTY R/W OR EASEMENTS, SUBSTITUTE THE WORDS "PRIVATE SANITARY SEWER" FOR "BALTIMORE COUNTY SANITARY SEWER" ON THE COVER.

CASTING MUST BE MACHINED ON BEARING SURFACES.

1/2" R

1/2"

7/8"

RUBBER GASKET

SECTION A-A

WATERTIGHT MANHOLE FOR HEAVY TRAFFIC

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>WEIGHT</th>
</tr>
</thead>
<tbody>
<tr>
<td>29 7/8&quot;</td>
<td>27 7/8&quot;</td>
<td>24&quot;</td>
<td>36&quot;</td>
<td>2 1/2&quot;</td>
<td>9&quot;</td>
<td>575 Lbs.</td>
</tr>
</tbody>
</table>

NOTE: MATERIAL USED WILL CONFORM TO A.S.T.M. SPECIFICATION A-48, CLASS 30B CAST IRON.

DEPARTMENT OF PUBLIC WORKS
SANITARY SEWER DETAILS
WATERTIGHT MANHOLE FRAME AND COVER

PLATE S-13
24" HEAVY TRAFFIC MANHOLE FRAME AND COVER

PRECAST GRADE ADJUSTMENT RING (SEE STD. DETAIL C-3) OR BRICK MASONRY (16 IN. MAXIMUM, 2 COURSES MINIMUM)

STD. BRICK OR PRECAST MANHOLE - SEE DETAILS S-1, S-2 OR S-4

D.I. PIPE SHALL BE BOSSED AND TAPPED FOR 2" N.P.T.

CONCRETE PAD

STREET SURFACE OR FINISHED GROUND

CEMENT MORTAR

FRONT ELEVATION

NOTES:
ALL VALVES SHALL BE SOLID WEDGE 125 LBS. GATE VALVES.
WHERE VACUUM RELIEF IS REQUIRED, RELIEF VALVES SHALL BE MANIFOLDED AS RECOMMENDED BY THE MANUFACTURER.
6" TO 12" DIAMETER FORCE MAINS STANDARD, SPECIAL DETAIL REQUIRED FOR 16" AND LARGER FORCE MAIN.
R.S.G.V. = RISING STEM GATE VALVE

SIDE ELEVATION

DEPARTMENT OF PUBLIC WORKS
SANITARY SEWER DETAILS

AIR RELIEF VALVE VAULT

ISSUED: OCTOBER 1977
REvised: AUGUST 1997
REvised: FEBRUARY, 2002
PLATE S-14
**NOTES**

1. UNLESS OTHERWISE NOTED, MANHOLE TAPERS AND RISERS SHALL BE FURNISHED IN STRICT ACCORDANCE WITH ASTM DESIGNATION C-478 (LATEST) FOR "PRECAST REINFORCED CONCRETE MANHOLE SECTIONS".

2. CONCRETE:
   - BASE SLAB - MIX #3, Poured-in-place doghouse riser - 4500 psi precast.

3. PROVIDE 12" MINIMUM CLEARANCE FROM PROPOSED PIPE AND FROM DOGHOUSE OPENING TOP(S) TO UPPER RISER JOINT.

4. PROVIDE 6" MINIMUM CLEARANCE FROM INCOMING LATERAL PIPE OPENING TO BOTTOM OF DOGHOUSE RISER.

5. MINIMUM 1" CLEARANCE SHALL BE MAINTAINED BETWEEN PIPES AND PRECAST DOGHOUSE PIPE OPENINGS. OPENINGS SHALL BE GROUTED WITH NON-SHRINK GROUT JOINT FILLER.

6. IN ALL CASES, A MINIMUM 12" WIDE SECTION OF MANHOLE WALL SHALL BE MAINTAINED BETWEEN PIPE OPENINGS IN DOGHOUSE RISER.

7. ALL REINFORCING STEEL SHALL CONFORM TO ASTM A-615, GRADE 60.

8. SEE STANDARD PLATE S-4 OR S-5 FOR 48" OR 60" DIA. SANITARY MANHOLE DETAILS RESPECTIVELY FOR USE WITH DOGHOUSE RISER SHOWN HERE.

9. MAXIMUM MANHOLE HEIGHT SHALL BE 30 FT. WHEN USING PRECAST DOGHOUSE RISER.

10. PRECAST MANHOLE RISER JOINTS: THE MANUFACTURER SHALL FORM MALE AND FEMALE ENDS OF JOINTS USING THEIR OWN DESIGN. THE JOINTS SHALL BE SEALED BY THE CONTRACTOR AND MADE WATER TIGHT USING THE MANUFACTURER'S RECOMMENDED ASTM OR AASHTO APPROVED SEALANT.

11. MINIMUM CIRCULAR REINFORCEMENT PER ASTM C77: TABLE 9 WALL B FOR PIPE DIAMETERS GREATER THAN 18 INCHES.

12. BREAK OUT ADDITIONAL PIPE AS REQUIRED TO PROVIDE POSITIVE FLOW FROM INCOMING LATERAL PIPE TO CENTER MANHOLE CHANNEL.

13. SEE STANDARD DETAIL PLATE G-4 FOR MANHOLE STEP SPECIFICATIONS, SPACING & PLACEMENT. USE A MINIMUM OF ONE MANHOLE STEP IN "DOGHOUSE" RISER UNIT.

14. BRICK SHALL BE ASTM C32 CLASS SS.

**SECTION A-A**

- *Based on lateral pipe at 90° to existing pipe. Other angles may be used if positive flow is maintained within manhole and twelve inches of reinforced "doghouse" wall is maintained between pipe openings.*