Note 1. Multiply average daily flow by peak flow factor to obtain max. flow for design purposes.
NOTE:
1. Multiply average daily sewage flow by peak flow factor to obtain max. flow for design purposes.
2. Peak flow factor is 2.5 for all flows greater than 10 MGD.
NOTES:

2. All reinforcing steel to meet current requirements of ASTM Spec. A-615.
3. Concrete to be Class A-4.
4. Tapered joint with O-ring gasket, or single offset joint with rubber gasket, to meet current requirements of ASTM Spec. C-443.
5. Pioneer 301 Mastic or approved equal on exterior side of Joint (Typical all Precast manholes).
6. Grout inverts must consist of a Portland Cement concrete mix to VDOT Spec. for Class B-2 or containing 1 part cement, 2 parts mortar sand and 3 1/2 parts aggregate. The surface must be hand troweled smooth with no coarse aggregate exposed and the benches are to have a light broom finish.
7. Flexible joint required on all pipe connections to manholes. Flexible Joint pipe to manhole sleeve may be Kor—N—Seal, Interspace, Presswedge or approved equal. Installation must be in accordance with manufacturer's instructions. Where field conditions will not permit the use of a sleeve, a maximum 24” stub may be used. (See Section 10.0102.5G.)
8. Joint configuration may be cast bell-up or spigot-up.
9. Manufacturer's name to be cast in steps or on inside face of cone and is to be clearly visible without entering the structure.

See detail of this plate for installation of strapping device as shown where manhole is subject to water velocities. Individual manholes to be strapped and details to number & location of straps to be shown on plans.

Base section to provide min. 6” clearance between top of pipe and bottom of bell and spigot joint.

In fill areas, base section footing must be spread a min. 8” or more as detailed on the plans.

Min. 4” compacted gravel

Galvanized steel strapping device 3” X 3/8”

Pioneer 301 Mastic or approved equal on exterior side of Joint (Typical all Precast manholes).

0-ring gasket or single offset gasket, ASTM C-443

1” X 3” lag bolt (typ.)

For frame anchorage detail see Plate 10-10

Steps to be set in line

Manhole Step Cast in place (See Plate 13-10)

Notch for 0-ring or single offset gasket (see detail above)

Base

Risers – 1”0” min. to max. Lifting hole (Optional)

Optional – Max. 3” tapered lift hole, plugged with rubber plug. Mortar or mastic outside only.

Slope bench 1” to 2” per ft. midpoint of pipe.

GROUT

Min. 4” compacted gravel

4” min. 11” Min.

8”

24”

8” max.

4” max.

12” or 16” typ.

12” max. adj. rings

Ref. Sec. 10-0102.5D(7), Plate 4-10

Rev. 1-00, 2011 Reprint, 4-15, 2018 Reprint

TYPICAL 4’-0” ID PRECAST CONCRETE MANHOLE

PLATE NO. STD. NO.

3-10 DPW-15
FAIRFAX COUNTY PUBLIC FACILITIES MANUAL

MH DIMENSIONS

<table>
<thead>
<tr>
<th>MH DIA. IN FT.</th>
<th>DIMENSIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>A 6&quot; 6'0&quot;</td>
<td></td>
</tr>
<tr>
<td>B 8&quot; 7'2&quot;</td>
<td></td>
</tr>
<tr>
<td>C 6&quot; 7'2&quot;</td>
<td></td>
</tr>
<tr>
<td>D 8&quot; 8'0&quot; min. min.</td>
<td></td>
</tr>
</tbody>
</table>

NOTES:

1. Concrete to be Class A-4.
2. Pipe connections to conform to Note 7, Plate 3-10.
3. All reinforcing steel to meet current requirements of ASTM Spec. A-615.
4. Manufacturer's name to be cast in steps or on inside face of cone and is to be clearly visible without entering the structure.
6. Compacted gravel under base sections must conform to Plate 3-10.
7. Joint configuration may be cast bell-up or spigot-up.
8. Pioneer 301 Mastic or approved equal must be used in addition to the joint specified. (See Plate 3-10)

Ref. Sec. 10-0102.5D(7)
Rev. 1-00, 2011 Reprint, 4-13, 2018 Reprint

TYPICAL 5’-0” & 6’-0” DIAMETER PRECAST CONCRETE MANHOLE WITH 4’-0” STACK

PLATE NO. 4-10
STD. NO. DPW-16
NOTES:
1. Concrete to be Class A-4.
2. All reinforcing steel to meet the current requirements of ASTM Spec. A-615.
4. Tapered joint with O-Ring Gasket, or single offset joint with rubber gasket, to meet current requirements of ASTM Spec. C-443.
5. Doghouse opening may only be used when placing a new MH over an existing line; otherwise, the opening must be cast. Size, location & angle of entry must be as required by the plans.
6. MH section to be cast in the base a min. of 2".
7. Joint configuration may be cast bell-up or spigot-up.
8. Holes in precast units are to be 4" min. 8" max. larger than the outside dia. of the proposed pipe.
9. Base section to provide min. 8" clearance between top of pipe opening and bottom of bell and spigot joint.

CHART "A"

<table>
<thead>
<tr>
<th>MIN. DIMENSIONS (in.)</th>
<th>MH 4'-0&quot;</th>
<th>5'-0&quot;</th>
<th>6'-0&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>48&quot;</td>
<td>60&quot;</td>
<td>72&quot;</td>
</tr>
<tr>
<td>B</td>
<td>58&quot;</td>
<td>72&quot;</td>
<td>86&quot;</td>
</tr>
<tr>
<td>C</td>
<td>5&quot;</td>
<td>6&quot;</td>
<td>7&quot;</td>
</tr>
<tr>
<td>D</td>
<td>6&quot;</td>
<td>8&quot;</td>
<td>10&quot;</td>
</tr>
</tbody>
</table>

Dimensions of D must be taken from bottom of key (see drawing below)

Notch for O-Ring or single offset gasket, ASTM C-443

PRECAST CONCRETE MANHOLE DOGHOUSE BASE

Ref. Sec. 10-0102.5D(7)

Rev. 1-00, 4-13, 2018
Reprint

PLATE NO. 5-10
STD. NO. DPW-17
NOTES:
1. Concrete to be Class A–4.

2. All reinforcing steel to meet current requirements of ASTM Spec. A–615.


4. Flat tops must be used only when specifically required on the plans, or where there is a height or invert conflict, as determined by the contractor or the precast manufacturer, and approved by the inspector.

5. Joint configuration may be cast bell-up or spigot-up.

6. A max. adjustment of 12" on a manhole flat top is allowed.

MANHOLE SIZE (in.)

<table>
<thead>
<tr>
<th></th>
<th>4'-0&quot;</th>
<th>5'-0&quot;</th>
<th>6'-0&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>48&quot;</td>
<td>60&quot;</td>
<td>72&quot;</td>
</tr>
<tr>
<td>B</td>
<td>55&quot;</td>
<td>72&quot;</td>
<td>88&quot;</td>
</tr>
<tr>
<td>C</td>
<td>5&quot;</td>
<td>6&quot;</td>
<td>7&quot;</td>
</tr>
<tr>
<td>D</td>
<td>6&quot;</td>
<td>8&quot;</td>
<td>8&quot;</td>
</tr>
</tbody>
</table>
Note: For detail of MH frame and cover anchorage see Plate 10-10.
Material:
Gray iron

PLAN VIEW

SECTION A–A

STANDARD ROADWAY FRAME

Ref. Sec. 10–0102.5D(7), Plate 4–10

Rev. 1–00

PLATE NO. STD. NO.
8–10 DPW–21
Material: Gray iron

PLAN VIEW

SECTION A–A

STANDARD ROADWAY MANHOLE COVER

Ref. Sec. 10–0102.5D(7), Plate 4–10

Rev. 1–00
Material: Gray iron

Tap for 5/8” Stainless Steel bolt (typ. of 2)

1 1/2” dia. hole in flange for 1” dia. anchor bolts (typ. of 4)

PLAN VIEW

SECTION A–A

NOTE:
3/4” dia. threaded anchor bolt or 3/4” dia. variable length allthread with 2” dia. washer locked between 2 nuts at embedded end, or 3/4” dia. variable length allthread with 3” long 1/2” (min.) dia. "T" welded on the embedded end. Anchor bolt to be embedded in nonshrink or expansive Portland Cement grout.

ANCHOR BOLT DETAIL (SEE NOTE)

Ram–Nek, Pioneer 301 Mastic or approved equal, must be used except in paved areas as noted in Section 10–0104.2L et seq.

WATERTIGHT/Locking MANHOLE FRAME

Ref. Sec. 10–0102.5D(7), Plates 3–10, 4–10, 6–10, 7–10
Rev. 1–00, 2011 Reprint, 2018 Reprint
Material:
Gray iron

PLAN VIEW

SECTION A–A

DETAIL 'A'

Gasket

5/8” stainless steel bolt with 15/16” hex head.

Ref. Sec. 10-0102.5D(7).
Plate 4-10

WATERTIGHT MANHOLE COVER

PLATE NO. 11-10

STD. NO. DPW-23

Rev. 1-00, 2011 Reprint
Material
Gray Iron

PLAN VIEW
28 3/4" dia.

SECTION A–A
Approved MH step manufacturers:
M. A. Industries, Inc. — "Plastic Step" or Delta, Oliver Tire and Rubber Company Wedge–Lok Safety Step, or approved equal.

Steps must be steel with plastic or rubber coating unless otherwise specified for caustic service.
Notes:

1. Concrete to be Class A-4

2. All reinforcing steel to meet current requirements of ASTM Spec. A-615

3. Manhole sections to meet current requirements of ASTM Spec. C-478

4. Joint configuration may be cast Bell-up or Spigot-up

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>5'-4'</th>
<th>6'-4'</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>60&quot;</td>
<td>72&quot;</td>
</tr>
<tr>
<td>B</td>
<td>72&quot;</td>
<td>85&quot;</td>
</tr>
<tr>
<td>C</td>
<td>6&quot;</td>
<td>7&quot;</td>
</tr>
<tr>
<td>D</td>
<td>8&quot;</td>
<td>8&quot;</td>
</tr>
</tbody>
</table>

Section A–A
Inside drop connection to be used under special circumstances such as:

- Bad soils / rock
- High water table
- Utility conflicts
- Excessive depths

Special notes
See Section 10-0102.5E et seq.
### TYPICAL TRENCH CONSTRUCTION PIPE BEDDING – ALTERNATE "A" (CONTRACTOR'S OPTION)

<table>
<thead>
<tr>
<th>PLATE NO.</th>
<th>STD. NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td>15-10</td>
<td>DPW-6</td>
</tr>
</tbody>
</table>

- Backfill and compaction requirements in accordance with Section 10-0104.2L(13).
- Select backfill – hand packed to 95% compaction in accordance with VDOT specs Sections 523.03, 302 and 303.10, max granular size 1".
- Crushed stone VDOT size 57, 68, or 78 in accordance with VDOT specs Section 203 Table II-5

### TYPICAL TRENCH CONSTRUCTION PIPE BEDDING – ALTERNATE "B" (CONTRACTOR’S OPTION)

<table>
<thead>
<tr>
<th>PLATE NO.</th>
<th>STD. NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td>16-10</td>
<td>DPW-6</td>
</tr>
</tbody>
</table>

- Backfill and compaction requirements in accordance with Section 10-0104.2L(13)
- Crushed stone VDOT size 57, 68, or 78 in accordance with VDOT specs Section 203 Table II-5

**NOTE 1:** The width of the trench is to be as specified by the Engineer on the plans or as set forth in the specs. Max. trench width and depth must be as specified in Tables 10.4 and 10.5. Trenching methods must be in compliance with the Va. Department of Labor and Industry (VDHI) requirements.

**NOTE 2:** The pipe must be bedded in carefully compacted granular material placed on a flat trench bottom. The granular material must be crushed stone VDOT size 57, 68, or 78, in accordance with VDOT Spec. Section 203. The granular bedding must have a min. thickness of 1/4 the outside pipe dia. (4" min.) and must extend vertically in accordance with alternatives A or B. If the max. width of the trench at the top of the pipe exceeds those specified, granular bedding material will be brought to the top of the pipe for the full width of the trench. The remainder of the side fills and a min. depth of 12" over the top of the pipe must be filled with carefully compacted material. Should the contractor elect to use larger stone to carry the water, the larger stone is to be placed beneath the specified amount of granular material. The larger stone is not in any way to affect the amount of granular material to be used.
For details of backfill above springline of pipe see DPW-6, Plates 15-10 and 16-10.

4” min.

See Note 1

Bc

1/2 Bc min.

1/4 Bc (4” min.)

In case of blasting overbreak, see Note 2.

NOTES:

1. The compacted crushed stone is to be as described in Plates 15-10 and 16-10 of the specs.

2. Blasting overbreak to be removed and replaced with compacted crushed stone.
5" dia. laterals must connect to 8" dia. sewer mains by way of a manufactured "T" or "Y". 6" dia. laterals must connect to collector sewers in sizes from 8" to 15" by way of a manufactured "Y" only with prior approval from the Department of Public Works and Environmental Services. Lateral connections to sewers greater than 15" in diameter must be made at manholes. Approved saddles may be used for 5" dia. connections for 8" dia. rigid pipe sewer mains.

*Not applicable to Planned Development Districts

**Hand mixing allowed per VDOT specifications
TO AVOID CONFLICTS WITH OTHER UNDERGROUND SERVICE UTILITIES, THE MINIMUM LATERAL EXTENSION DISTANCE (D)* MUST BE:

<table>
<thead>
<tr>
<th>Type</th>
<th>Distance Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single-Family Detached</td>
<td>20 ft beyond the property line or within 5 ft of the minimum yard requirement, whichever distance is less.</td>
</tr>
<tr>
<td>Single-Family Townhouse</td>
<td>5 ft beyond the property line or sanitary sewer easement, whichever distance is greater.</td>
</tr>
</tbody>
</table>

NOTES:
1. Gravel bedding beyond the concrete cradle must conform to Note 2 of Plate 16–10.
2. Lateral pipe material must be as specified in Section 10–0103.8 or in the International Plumbing Code.
3. CI Saddles must be as made by Richmond Foundry, Pioneer Foundry, or approved equal.
4. A long sweep, 90-degree bend may be used as an alternate to two 45-degree bends.

FOR PLAN VIEW, SEE PLATE 18–10.

*Not applicable to Planned Development Districts
**Hand mixing allowed per VDOT specifications

HOUSE LATERAL CONSTRUCTION DETAIL

<table>
<thead>
<tr>
<th>PLATE NO.</th>
<th>STD. NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td>19–10</td>
<td>DPW–11</td>
</tr>
</tbody>
</table>
Note 1:
Damage exceeding 3” must be repaired as stated under replacement of pipe – see Section 10–0104.7C et seq. 6”–min. dimension from extremity of damaged area to end of sleeve.
FAIRFAX COUNTY PUBLIC FACILITIES MANUAL

HOLE IN PIPE BELOW SPRING LINE

Ref. Sec. 10–0104.7E(2)
Rev. 1–00, 2018 Reprint

PLATE NO. 21–10
STD. NO. RG–2

PIPE WITH CRACK OR SHEAR

Ref. Sec. 10–0104.7E(3)
Rev. 1–00, 2018 Reprint

PLATE NO. 22–10
STD. NO. RG–2
CRUSHED SECTION OR SECTIONS OF PIPE

AREA OF CUT

Hairline fracture
Crushed area
Cut line

12" Extremity of 12"
min. damaged area min.
Min. distance from
extremity of damaged
area, which must include
hairline fractures.
(Appplies to each end of
damaged area)

Min. length of section to
be cut and replaced

Note 1 - Cuts will be made on a vertical plane with
an approved cutting tool. After the cut has
been made, a visual inspection will be made
to check for hairline fractures on the inside
of pipe; additional pipe will be cut out if
this condition is found.

Existing pipe
Existing pipe

Replacement pipe

Repair clamp
Repair clamp

SLIPPED OR LEAKING JOINTS

CRUSHED SECTION OF PIPE
AND SLIPPED OR LEAKING JOINT

Plate No. 23–10
Std. No. RG–3
Sewer test plug

3" x 1/2" reducer
The jack chocks with 1" deep grooves must have dimensions of 4" x 6" x 18" and be placed 6' O.C. 1" metal bands are to be bound and bolted in chock grooved areas.

All tunnel ends to be closed with brick and mortar construction.

Grout Specifications
One part cement and four parts concrete sand to which has been added "Passolite" or fly ash in the amount of 1/2 pound per bag of cement.

Casing pipe size varies, 8 gauge galvanized asphalt, coated corrugated metal culvert pipe AASHTO STD. M36 or black seamless steel welded (AWWA C-200) pipe minimum thickness 3/8".

<table>
<thead>
<tr>
<th>CASING PIPE SIZES</th>
<th>SEWER MAIN PIPE SIZE (INCHES)</th>
<th>CASING PIPE SIZE (INCHES)</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>24</td>
<td></td>
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<tr>
<td>14</td>
<td>30</td>
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<td>18</td>
<td>36</td>
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<td>20</td>
<td>36</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>36</td>
<td></td>
</tr>
</tbody>
</table>

HIGHWAY CROSSING
JACKING AND BORING/TUNNEL DETAILS

PLATE NO. STD. NO.
25-10 DWP-12
Maximum clearance = 1/2"

1/4" steel channel 8" long, center at each collar size as required

2" x 3/8" steel collars 2 per length

Sleeve or casing pipe with a minimum thickness of 3/8".

Fill annular space with grout

DIP Carrier pipe

1/2" Bolts

variable

Dolley wheels or approved skids

Ends to be closed with brick and mortar construction

<table>
<thead>
<tr>
<th>CASING PIPE SIZES</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEWER MAIN PIPE SIZE (INCHES)</td>
</tr>
<tr>
<td>8</td>
</tr>
<tr>
<td>10</td>
</tr>
<tr>
<td>12</td>
</tr>
<tr>
<td>14</td>
</tr>
<tr>
<td>16</td>
</tr>
</tbody>
</table>

Grout Specifications
One part cement and four parts concrete sand to which has been added "Passolite" or fly ash in the amount of 1/2 pound per bag of cement.

HIGHWAY CROSSING

JACKING AND BORING/TUNNEL DETAILS

PLATE NO. | STD. NO.
26-10     | DPW-13
NOTES:

1. Casing pipe must be smooth wall carbon steel pipe, joints must be squared and continuously welded. Wall thickness: 42" ID and greater = .5"  
   36" ID and less = 0.375"
2. Carrier pipe must be ductile iron.
3. Casing spacers must be carbon steel with polyvinyl chloride coating as manufactured by PSI or stainless steel as manufactured by Cascade Waterworks Inc. or approved equal. Runner width must be a minimum of 2".
4. End closures: Casing end seals must be pull-on type molded from synthetic rubber or approved equal. Seals must be attached to casing pipe by band clamps. Band clamps must be type 304 stainless steel. Seals must have molded seats for proper location of bands.
BOLLARDS (6) TYPICAL –
6" MIN. DIAM. – SCH. 40
STEEL PIPE CONCRETE FILLED

6" REINFORCED CONCRETE
SLAB

1.5' MIN.
(TYP)

4.9'

4.9'

10.0'

5.3' X 6.2'

5.3' X 6.2'

1.0' MIN.

1.0' MIN.

19.0' CLEAR OPENING
TRUCK ACCESS (TYP.)

1.5' MIN.

22.0'