STANDARD DETAILS

STORM SEWER JUNCTION MANHOLE
W/ REINFORCED TOP SLAB

PRECAST INVERT SHOULD BE 1/2 DIAMETER OF PIPE AND BENCHES SLOPED 2" TOWARD INVERT.

MANHOLE STEPS SHALL BE PLACED SO THAT OFFSET HOLE IN TOP SLAB IS FACING DOWNSTREAM.

CASTING AND ADJUSTMENT RINGS AS SPECIFIED.

PRECAST REINFORCED CONCRETE MANHOLE AND SLAB SHALL CONFORM TO ASTM C478 AND C497

TOP OF BARREL SECTION BELOW TOP SLAB TO HAVE FLAT TOP EDGE SEALED WITH 2 BEADS OF RAMNEK OR EQUAL.

MANHOLE STEPS, NEENAH R1981J OR EQUAL, 16" ON CENTER.

ALL JOINTS IN MANHOLE SHALL CONFORM TO ASTM 443

DOGHOUSES MUST BE GROUTED BOTH INSIDE AND OUTSIDE.

PIPE SHALL BE CUT 2" INSIDE OF FACE OF WALL AT MID-POINT OF PIPE.

BASE SLAB SHALL CONFORM TO ASTM C478 AND C497

NO BLOCK STRUCTURES OR PRECAST INVERTS ARE ALLOWED.
PRECAST INVERT SHOULD BE 1/2 DIAMETER OF PIPE AND BENCHES SLOPED 2" TOWARD INVERT.

MANHOLE STEPS SHALL BE PLACED SO THAT OFFSET HOLE IN TOP SLAB IS FACING DOWNSTREAM.

CASTING AND ADJUSTMENT RINGS AS SPECIFIED.

PRECAST REINFORCED CONCRETE MANHOLE AND SLAB SHALL CONFORM TO ASTM C478 AND C497

TOP OF BARREL SECTION BELOW TOP SLAB TO HAVE FLAT TOP EDGE SEALED WITH 2 BEADS OF RAMNEK OR EQUAL.

MANHOLE STEPS, NEENAH R1981J OR EQUAL, 16" ON CENTER.

ALL JOINTS IN MANHOLE SHALL CONFORM TO ASTM 443

DOGHOUSES MUST BE GROUTED BOTH INSIDE AND OUTSIDE.

PIPE SHALL BE CUT 2" INSIDE OF FACE OF WALL AT MID-POINT OF PIPE.

BASE SLAB SHALL CONFORM TO ASTM C478 AND C497

NO BLOCK STRUCTURES OR PRECAST INVERTS ARE ALLOWED.
24"X36" SLAB OPENING FOR NEENAH R3067V OR ESS. BROS. 330 HIGH CAPACITY OR EQUAL. INSTALL R3501-TB FOR DRIVEWAYS AND R3290-A FOR VALLEY GUTTERS. (VANE GRATE SHOWN) DIMENSION FROM BACK OF CURB TO CENTER OF PIPE.

4' DIA. MH - 9" IN FROM BACK OF CURB
5' DIA. MH - 3" IN FROM BACK OF CURB
6' DIA. MH - 3" BEHIND BACK OF CURB
7' DIA. MH - 9" BEHIND BACK OF CURB
8' DIA. MH - 15" BEHIND BACK OF CURB

CASTING AND ADJUSTMENT RINGS AS SPECIFIED.

PRECAST REINFORCED CONCRETE MANHOLE AND SLAB SHALL CONFORM TO ASTM C478 AND C497

TOP OF BARREL SECTION BELOW TOP SLAB TO HAVE FLAT TOP EDGE SEALED WITH 2 BEADS OF RAMNEK OR EQUAL.

ALL JOINTS IN MANHOLE CONFORM TO ASTM 443.

NO BLOCK STRUCTURES OR PRECAST INVERTS ARE ALLOWED.

MANHOLE STEPS, NEENAH R1981J OR EQUAL, 16" ON CENTER. PLACED BELOW THE DOWNSTREAM CORNER OF THE OPENING NEAREST THE STREET.

DOGHOUSES MUST BE GROUTED BOTH INSIDE AND OUTSIDE.

BASE SLAB SHALL CONFORM TO ASTM C478 AND C497

GROUT BOTTOM
**STANDARD DETAILS**

**CATCH BASIN MANHOLE WITH SUMP**

*Revised 1/2019  Standard Plate No. STO-4*

---

- **24"x36" SLAB OPENING FOR CASTING AS SPECIFIED.**

- **DIMENSION FROM BACK OF CURB TO CENTER OF PIPE.**
  - 4' DIA. MH - 9" IN FROM BACK OF CURB
  - 5' DIA. MH - 3" IN FROM BACK OF CURB
  - 6' DIA. MH - 3" BEHIND BACK OF CURB
  - 7' DIA. MH - 9" BEHIND BACK OF CURB
  - 8' DIA. MH - 15" BEHIND BACK OF CURB

- **CASTING AND ADJUSTMENT RINGS AS SPECIFIED.**

- **PRECAST REINFORCED CONCRETE MANHOLE AND SLAB SHALL CONFORM TO ASTM C478 AND C497**

- **TOP OF BARREL SECTION BELOW TOP SLAB TO HAVE FLAT TOP EDGE SEALED WITH 2 BEADS OF RAMNEK OR EQUAL.**

- **ALL JOINTS IN MANHOLE SHALL CONFORM TO ASTM 443.**

- **NO BLOCK STRUCTURES OR PRECAST INVERTS ARE ALLOWED.**

- **MANHOLE STEPS, NEENAH R1981J OR EQUAL, 16" ON CENTER.**

- **DOGHOUSES MUST BE GROUTED BOTH INSIDE AND OUTSIDE.**

- **BASE SLAB SHALL CONFORM TO ASTM C478 AND C497**

---

**PLAN**

**SECTION**

**PIPE DIA.**

**VARIES**

**VARIETIES 12"-16"**

**MIN. 4'-0""**

**5"**

**6"**

**NO DRAIN HOLES**
NOTE: VANE GRATE SHOWN

DIRECTION OF FLOW

PLAN

CASTING AND ADJUSTMENT RINGS AS SPECIFIED.

GRATE TO BE 2" BELOW GUTTER GRADE. 10' TRANSITION EACH SIDE OF CATCH BASIN.

MIN. 4" AND MAX. 12" IN HEIGHT FOR CONCRETE ADJUSTMENT RINGS. FULL BED OF MORTAR BETWEEN CASTING AND RINGS. (NO-SHRINKING GROUT REQUIRED) 1" MAX. MORTAR THICKNESS WHEN USED FOR CASTING ADJUSTMENT. SEE DETAIL SHEET STO-13

GROUTED INVERT

DOGHOUSES SHALL BE GROUTED ON BOTH THE INSIDE AND OUTSIDE.

NO DRAIN HOLES

SECTION

NO BLOCK STRUCTURES ARE ALLOWED.

STANDARD DETAILS

CATCH BASIN WITH SUMP

Revised 1/2019

STO-5
CASTING AND ADJUSTMENT RINGS AS SPECIFIED.

GRATE TO BE 2" BELOW GUTTER GRADE. 10' TRANSITION EACH SIDE OF CATCH BASIN.

DOGHOUSES SHALL BE GROUTED ON BOTH THE INSIDE AND OUTSIDE.

NO DRAIN HOLES

24" X 36" PRECAST

SECTION

DIRECTION OF FLOW

PLAN

2'x3' CATCH BASIN WITHOUT SUMP

STANDARD DETAILS

Revised 1/2019

Standard Plate No. STO-6
SEE CITY PLATE NO. STO-8 FOR RIPRAPH PLACEMENT.

ANCHOR CLIP

24" MAX
6"

TIE LAST 3 PIPE JOINTS. USE 2 TIE BOLT FASTENERS PER JOINT. INSTALL AT 60° FROM TOP OR BOTTOM OF PIPE.

H

ANCHOR BOTH SIDES.

PROVIDE 3 ANCHOR CLIPS TO FASTEN TRASH GUARD TO FLARED END SECTION. HOT DIP GALVANIZE AFTER FABRICATION.

ISOMETRIC

*TRASH GUARD SIZING

<table>
<thead>
<tr>
<th>PIPE SIZE</th>
<th>BARS</th>
<th>'H'</th>
<th>BOLTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>24&quot; - 42&quot;</td>
<td>1&quot;φ</td>
<td>6&quot;</td>
<td>3/4&quot;</td>
</tr>
<tr>
<td>48&quot; - 72&quot;</td>
<td>1 1/4&quot;φ</td>
<td>12&quot;</td>
<td>1&quot;</td>
</tr>
</tbody>
</table>

*PROVIDE TRASH GUARDS ON FLARED ENDS 24" AND GREATER
RIPRAP REQUIREMENTS

<table>
<thead>
<tr>
<th>Size</th>
<th>CY</th>
<th>Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>12&quot; TO 24&quot;</td>
<td>8 TO 12</td>
<td>CL.3</td>
</tr>
<tr>
<td>27&quot; TO 33&quot;</td>
<td>14 TO 20</td>
<td>CL.3</td>
</tr>
<tr>
<td>36&quot; TO 48&quot;</td>
<td>23 TO 38</td>
<td>CL.3</td>
</tr>
<tr>
<td>54&quot; AND UP</td>
<td>62 AND UP</td>
<td>CL.4</td>
</tr>
</tbody>
</table>

(ONE CUBIC YARD IS APPROXIMATELY 2,800 LBS.)

SECTION A-A
GEOTEXTILE FILTER FABRIC
TYPE IV OR V

SECTION B-B
GEOTEXTILE FILTER FABRIC
TYPE IV OR V

EXTEND FABRIC AND RIPRAP UNDER FLARED END SECTION

RIP RAP AT OUTLETS

STANDARD DETAILS

CHISAGO CITY
Gateway to the Lakes

STANDARD DETAILS
RIP RAP AT OUTLETS

STO-8
4" PERFORATED HDPE WITH GEOTEXTILE WRAP MIRAFI 140s FILTER SOCK OR EQUAL.

CURB AS SPECIFIED

AGGREGATE BASE

SELECT GRANULAR

4" PERFORATED HDPE WITH GEOTEXTILE WRAP MIRAFI 140s FILTER SOCK OR EQUAL.

GEOTEXTILE FABRIC, TYPE V, NON-WOVEN

TRENCH DETAIL

1/4" 0/HOLE (HYP.)

90°

160°

4" PERFORATED HDPE WITH GEOTEXTILE WRAP MIRAFI 140s FILTER SOCK OR EQUAL.

PIPE DETAIL

STANDARD DETAILS

4" HDPE PERFORATED DRAINTILE WITH FILTER ROCK

Revised: 1/2019

Standard Plate No.: STO-9
BEEHIVE CASTING AS SPECIFIED

PRECAST CONCRETE STRUCTURE. PIPE NOT ALLOWED.

DOGHOUSE SHALL BE GROUTED ON BOTH THE INSIDE AND OUTSIDE.

REINFORCED CONCRETE PIPE

40" DIA. x 5" THICK PRECAST REINFORCED CONCRETE BASE SLAB.

STANDARD DETAILS

PRECAST 27" SHALLOW DEPTH BEEHIVE

1/2019

STO-10
Hole for xx" Dia. outlet pipe.

5' Dia. (Typ.) Manhole

Elev.=xxx.x

Varies

6" aggregate backfill (MnDOT Spec. 3149H Mod.)

See Grate Detail

xx" dia. hole in 8" baffle wall.
Baffle wall optional (project specific)

When feasible, set invert for outlet pipe below NWL to improve pipe cover and minimize slope around skimmer.

NOTE:
When baffle wall height is greater than 3' above NWL the following shall be required:
1. Steps
2. 6' Diameter MH
NOTE:
DESIGNER TO ACCOUNT FOR OVERTURNING FORCES IN DESIGN

PROPERTY/OUTLOT LINE AT HWL

MAINTENANCE BENCH

SKIMMER

OUTLET PIPE

NOTE:
DESIGNER TO ACCOUNT FOR OVERTURNING FORCES IN DESIGN

TYPICAL BENCH DETAIL WITHIN 10' OF SKIMMER OUTLET

PROPERTY/OUTLOT LINE AT HWL

MAINTENANCE BENCH

SAFETY/AQUATIC VEGETATION BENCH

SIDE SLOPE PROFILE WITHIN 10' OF SKIMMER

TYPICAL BENCH DETAIL

POND BOTTOM

POND NWL

OUTLET PIPE

4:1 MAX

10:1

3:1 MAX

2'

10'

8'

10'

10:1

4:1

3:1 MAX

POND NWL

POND BOTTOM

STANDARD DETAILS

TYPICAL BENCH DETAIL

Revised 1/2019

Standard Plate No. STO-12
NOTES:
1. THE CATCH BASIN CASTING SHALL LINE UP WITH THE CONCRETE STRUCTURE SO IT CAN BE PROPERLY MAINTAINED.
2. NO SHIMS TO BE USED OTHER THAT MORTAR OR BRICK WHEN ADJUSTING RINGS OR CASTINGS.
3. PLACE NO. 4 REBAR (TO EXTEND 10' BEYOND EACH SIDE OF THE CASTING) EMBEDDED IN CONCRETE COLLAR AND CURB.