ADJUST CASTING TO 7 1/2 MAX BELOW FINISHED GRADE

CONCRETE COLLAR TO ENCASE CASTING AND CONCRETE ADJUSTING RINGS. USE CONCRETE CURB AND GUTTER MIX OR MORTAR MIX (SPEC. 2506.2B) FOR COLLAR SEE DETAIL STM-10A

NEENAH R-1733 (5001 LIGHTWEIGHT) SERIES CASTING, SELF-SEALING SOLID LID WITH 2 CONCEALED PICKHOLES AND RAISED LETTERS READING "STORM SEWER". SEE PLATE NO. STM-10 MIN 1 AND MAX 4 ADJUSTING RINGS. MORTAR BETWEEN CASTING, RINGS AND STRUCTURE

MNDOT TYPE "B" CONE

**O** RING RUBBER GASKET

PRECAST R.C.P WALLS

5' MIN

GROUT DOGHOUSES, PLASTER OUTSIDE WITH 6" MIN. COLLAR, STRIKE INSIDE CLEAN BASES SHALL BE 6" STANDARD PRECAST WITH 2" LEAN GROUT FOR 14' DEEP OR LESS, AND INCREASE 1" THICKNESS FOR EVERY 4' OF DEPTH GREATER THAN 14'

SECTION

GROUT INVERT TO 1/2 PIPE DIAMETER

PLAN

NOTES:
1. ALL MANHOLES MUST BE A MINIMUM OF 4' IN DEPTH.
2. PROVIDE Poured CONCRETE INVERTS AND DOGHOUSES.
3. MARKING POSTS SHALL BE SUPPLIED AND INSTALLED BY THE CONTRACTOR AT ALL MANHOLES LOCATED OUTSIDE OF STREET SECTION.
4. VARY RING THICKNESS TO USE MINIMUM NUMBER OF RINGS.
5. GROUT ALL DOGHOUSES INSIDE AND OUT AND LIFT HOLES TO INSPECTORS APPROVAL.
6. DOGHOUSE OPENING SHALL NOT BE MORE THAN 4" LARGER THAN THE PIPE.
7. RUBBERIZED BITUMASTIC SEALER USED AT ALL JOINTS.
8. NO MANHOLE STEPS ALLOWED.
9. 2", 4" AND 6" ADJUSTING RINGS ARE ACCEPTABLE.
10. BLOCK MANHOLES SHALL NOT BE ALLOWED WITHOUT PRIOR APPROVAL FROM CITY ENGINEER.
CONCRETE COLLAR TO ENCASE CASTING AND CONCRETE ADJUSTING RINGS. USE CONCRETE CURB AND GUTTER MIX OR MORTAR MIX (SPEC. 2506.2B) FOR COLLAR. SEE DETAIL STM-10B

NEENAH R-3057/V OR EQUAL VB GRATES SHALL BE USED AT LOW POINTS

MIN OF 1 AND MAX OF 4 ADJUSTING RINGS MORTAR (DESIGNED FOR UNDERGROUND UTILITY INSTALLATION) BETWEEN CASTING RINGS AND STRUCTURE

SECTION A-A

4' MINIMUM

WALLS MUST BE STANDARD PRECAST

GROUT DOGHouses, PLASTER OUTSIDE WITH 6" MIN. COLLAR AND STRIKE INSIDE CLEAN

SLOPE 1" PER FT

Bases shall be 6" PRECAST WITH 2" LEAN GROUT OR 8" POURED SLAB

SECTION

CENTER OF STRUCTURE

3 HANDLING HOOKS AT 120 DEGREE SPACING

PLAN

NOTES:
1. ALL CATCH BASIN/MANHOLES MUST BE A MINIMUM OF 4' IN DEPTH.
2. PROVIDE Poured CONCRETE INVERTS AND DOGHouses.
3. GROUT ALL DOGHouses AND LIFT HOLES TO INSPECTORS APPROVAL.
4. DOGHouse OPENING SHALL NOT BE MORE THAN 4" LARGER THAN PIPE.
5. NO MANHOLE STEPS ALLOWED.
6. 2", 4" OR 6" ADJUSTING RINGS ARE ACCEPTABLE.
7. CATCH BASIN/MANHOLES WITH FLAT TOP SLABS SHALL HAVE TERMINATING MANHOLE SECTIONS.
8. SPECIFICATIONS FOR CATCH BASIN, MANHOLE SECTIONS, COVER AND SLABS SHALL CONFORM TO MANHOLE DETAIL.
9. BLOCK MANHOLES SHALL NOT BE ALLOWED WITHOUT PRIOR APPROVAL FROM CITY ENGINEER.

Richfield
City of Richfield
Engineering Division
CONCRETE COLLAR TO ENCASE CASTING AND CONCRETE ADJUSTING RINGS. USE CONCRETE CURB AND GUTTER MIX OR MORTAR MIX (SPEC. 2506.2B) FOR COLLAR
SEE DETAIL STM-10A

NEENAH R-3067V OR EQUAL VB GRATERS TO BE USED AT LOW POINTS

MIN OF 1 AND MAX OF 4 ADJUSTING RINGS.
MORTAR (DESIGNED FOR UNDERGROUND UTILITY INSTALLATION) BETWEEN CASTING, RINGS AND STRUCTURE

GROUT DOGHouses, PLASTER OUTSIDE WITH 6" MIN. COLLAR AND STRIKE INSIDE CLEAN

SLOPE 1" PER FT

BASES SHALL BE 6" PRECAST WITH 2" LEAN GROUT OR 8" PCoured SLab

VARIes

NOTES:
1. ALL CATCH BASIN/MANHOLES MUST BE A MINIMUM OF 4' IN DEPTH.
2. PROVIDE Poured CONCRETE INVERTS AND DOGHouses.
3. GROUT ALL DOGHouses AND LIFT HOLES TO INSPECTORS APPROVAL.
4. DOGHouse OPENING SHALL NOT BE MORE THAN 4" LARGER THAN PIPE.
5. NO MANHOLE STEPS ALLOWED.
6. 2", 4" OR 6" ADJUSTING RINGS ARE ACCEPTABLE.
7. CATCH BASIN/MANHOLES WITH FLAT TOP SLABS SHALL HAVE TERMINATING MANHOLE SECTIONS.
8. SPECIFICATIONS FOR CATCH BASIN, MANHOLE SECTIONS, COVER AND SLABS SHALL CONFORM TO MANHOLE DETAIL.
9. BLOCK MANHOLES SHALL NOT BE ALLOWED WITHOUT PRIOR APPROVAL FROM THE CITY ENGINEER.
CONCRETE COLLAR TO ENCASE CASTING AND CONCRETE ADJUSTING RINGS. USE CONCRETE CURB AND GUTTER MIX OR MORTAR MIX (SPEC. 2566.2B) FOR COLLAR. SEE DETAIL STM-10B

NEENAH R-3067V CASTING OR EQUAL VB GRATES TO BE USED IN LOW POINTS

MIN 1 AND MAX 4 ADJUSTING RINGS. MORTAR (DESIGNED FOR UNDERGROUND UTILITY INSTALLATION) BETWEEN CASTING, RINGS AND STRUCTURE

WALLS MUST BE STANDARD PRECAST R.C.P

RUBBERIZED BITUMASTIC SEALER

GROUT DOGHOUSES, PLASTER OUTSIDE WITH 6" MIN. COLLAR, STRIKE INSIDE CLEAN

UTILIZE A FULL PIPE LENGTH ENTERING AND EXITING SUMP MH

DISH FLOOR TO CENTER OF FLAT TOP OPENING

COMPACTED GRANULAR BACKFILL

BASES SHALL BE 6" PRECAST WITH 2" LEAN GROUT OR 8" Poured SLAB

SECTION

NOTES:
1. CATCH BASIN/MANHOLES MUST BE A MINIMUM OF 4' IN DEPTH.
2. CATCH BASIN/MANHOLES WITH FLAT TOP SLABS SHALL HAVE TERMINATING MANHOLE SECTIONS.
3. SPECIFICATIONS FOR CATCH BASIN, COVER AND SLAB AND MANHOLE SECTIONS SHALL CONFORM TO MANHOLE DETAIL.
4. PROVIDE Poured CONCRETE INVERTS AND DOGHOUSES.
5. GROUT ALL DOGHOUSES INSIDE AND OUT AND MANHOLES TO INSPECTORS APPROVAL.
6. DOGHOUSE OPENING SHALL NOT BE MORE THAN 4" LARGER THAN PIPE.
7. NO MANHOLE STEPS ALLOWED.
8. 2", 4" AND 6" ADJUSTING RINGS ARE ACCEPTABLE.
9. BLOCK MANHOLES SHALL NOT BE ALLOWED WITHOUT PRIOR APPROVAL FROM THE CITY ENGINEER.
GROUT ALL DOGHOUSES, PLASTER OUTSIDE WITH 6" MIN. COLLAR, STRIKE INSIDE CLEAN

HIGH WATER LEVEL

SECTION

PRECAST R.C.P. WALL

OUTLET PIPE

NORMAL WATER LEVEL

VARIES

18"

18" MINIMUM OPENING

6" PRECAST BASE WITH 2" LEAN GROUT OR 8" POURED SLAB

OUTLET PIPE

RIP-RAP CLASS 3 MINIMUM 2 CU. YARDS

SEE PLATE NO. STM-05 FOR GRATE DETAIL

PLAN

NOTES: 1. PROVIDE POURED CONCRETE INVERTS. 2. GROUT LIFT HOLES. 3. BLOCK MANHOLES NOT ALLOWED.
NOTES: 1. GRATE TO BE TWO PIECES.
2. ALL METAL TO BE HOT-DIPPED GALVANIZED.
NOTES: 1. CONCRETE COLLAR MUST HAVE POSITIVE FLOW TO CATCHBASIN.
2. CONCRETE COLLAR TO BE USED WITH 27" STRUCTURE.
3. CONCRETE STRUCTURES LARGER THAN 27" SHALL BE APPROVED BY THE CITY ENGINEER.
4. MARKING POSTS SHALL BE SUPPLIED AND INSTALLED BY THE CONTRACTOR.
NOTES: 1. USE TWO TIE BOLT FASTENERS PER JOINT INSTALLED AT 60 DEGREES FROM TOP OF PIPE.
2. LAST THREE JOINTS SHALL BE TIED.
3. TYING AND TRASH GUARD SHALL BE INCLUDED IN THE UNIT PRICE BID FOR APRON SECTION.
4. BARS AND PLATES ARE HOT-ROLLED STEEL.
5. BARS, PLATES, PIPE AND BOLTS ARE GALVANIZED.
6. MARKING POSTS SHALL BE SUPPLIED AND INSTALLED BY THE CONTRACTOR.
"O" RING RUBBER GASKET PER ASTM C443

WELDED EYE BOLT

1" DIA. BOLT

USE WASHERS WITH ALL NUTS
MINIMUM RIPRAP REQUIRED

<table>
<thead>
<tr>
<th>DIA. OF PIPE (IN.)</th>
<th>L (FT.)</th>
<th>QUANTITY (C.Y.)</th>
<th>CLASS</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>8</td>
<td>5</td>
<td>III</td>
</tr>
<tr>
<td>15</td>
<td>8</td>
<td>5</td>
<td>III</td>
</tr>
<tr>
<td>18</td>
<td>10</td>
<td>6</td>
<td>III</td>
</tr>
<tr>
<td>24</td>
<td>12</td>
<td>8</td>
<td>III</td>
</tr>
<tr>
<td>30</td>
<td>14</td>
<td>12</td>
<td>III</td>
</tr>
<tr>
<td>36</td>
<td>16</td>
<td>14</td>
<td>III</td>
</tr>
<tr>
<td>42</td>
<td>18</td>
<td>22</td>
<td>IV</td>
</tr>
<tr>
<td>48</td>
<td>20</td>
<td>26</td>
<td>IV</td>
</tr>
<tr>
<td>&gt;48</td>
<td>22-28</td>
<td>30-40</td>
<td>IV</td>
</tr>
</tbody>
</table>

SECTION B-B

1' (12"-27" DIA. PIPE) 1.5' (30" AND LARGER PIPE)

6" SAND BEDDING (MNDOT 3601.2B)

TYPE IV GEOTEXTILE FABRIC (MNDOT 3733)

TIE THE LAST 3 JOINTS ON INLET AND OUTLET PIPES AND BED IN GRANULAR MATERIAL. ANY COVER LESS THAN 2' OVER TOP OF PIPE SHALL BE GRANULAR MATERIAL.

FLARED END SECTION SHALL BE INSTALLED ON RIP RAP FOR THE LAST 2'.

PLAN

NOT TO SCALE

SECTION A-A

1' (12"-27" DIA. PIPE) 1.5' (30" AND LARGER PIPE)

6" SAND BEDDING (MNDOT 3601.2B)

TYPE IV GEOTEXTILE FABRIC (MNDOT 3733)

SHAPE FOUNDATION

STANDARD DETAIL NO. STM-09

RIPRAP DETAIL FOR FLARED END SECTIONS

APPROVAL 12/6/2017

CITY OF RICHFIELD ENGINEERING DIVISION

CITY ENGINEER
R-1733 SERIES MANHOLE WITH CONCEALED LID (CONE SECTION)

STANDARD DETAIL NO. STM-10A

CONCRETE COLLAR TO ENCASE CASTING AND CONCRETE ADJUSTING RINGS. USE CONCRETE CURB AND GUTTER MIX OR MORTAR MIX (SPEC. 2506.2B) FOR COLLAR

MIN 1 AND MAX 4 ADJUSTING RINGS. MORTAR (DESIGNED FOR UNDERGROUND UTILITY INSTALLATION) BETWEEN CASTING, RINGS AND STRUCTURE

NOTES: 1. MACHINED BEARING SURFACE.
2. LETTERED 2" STORM SEWER W/ 2 CONCEALED PICKHOES.
3. H-20 LOAD OR GREATER.
4. WEIGHT- 122 LBS.

APPROVAL 12/6/2017
CITY ENGINEER
CITY OF RICHFIELD ENGINEERING DIVISION
TYPICAL NEENAH R-3067 CASTING. NEENAH R-3067-VB SHALL BE USED AT ALL LOW POINTS.

SURMOUNTABLE CONCRETE CURB AND GUTTER

2 NO. 4, 10' LONG, EPOXY COATED REBARS SHALL BE INSTALLED ON EACH SIDE OF THE CASTING. REBARS AND EPOXY COATING PER MNDOT SPEC. 3301.

NOTE:
SURMOUNTABLE CURB AND GUTTER TO BE FORMED INTO A B618 TYPE CURB AT CATCH BASIN CASTING

10' MIN. TRANSITION
SURMOUNTABLE CURB AND GUTTER

10' TAPER

23'

10' TAPER
NEENAH R-1733 OR APPROVED EQUAL
SOLID LID W/ RAISED LETTERING READING "STORM SEWER"
SEE DETAIL STM-108

MIN. 2 ADJUSTING RINGS
MORTAR (DESIGNED FOR UNDERGROUND UTILITY INSTALLATION) BETWEEN CASTING, RINGS AND STRUCTURE

PLAN
(NO SCALE)

1. MANHOLE SHALL BE CONSTRUCTED CONSISTENT WITH STANDARD DETAIL STM-03.
2. MARKING POSTS SHALL BE SUPPLIED AND INSTALLED BY THE CONTRACTOR AT ALL MANHOLES LOCATED OUTSIDE OF STREET SECTION.

SECTION
(NO SCALE)

<table>
<thead>
<tr>
<th>D= TREATMENT MH CIA.</th>
<th>6'</th>
<th>8'</th>
<th>10'+</th>
</tr>
</thead>
<tbody>
<tr>
<td>d= INTERNAL PIPE DIA.</td>
<td>18&quot;</td>
<td>24&quot;</td>
<td>24&quot;+</td>
</tr>
<tr>
<td>H= SUMP DEPTH</td>
<td>5'</td>
<td>6'</td>
<td>6'+</td>
</tr>
<tr>
<td>MAX IMPERVIOUS AREA</td>
<td>5 AC</td>
<td>10 AC</td>
<td>&gt;10AC*</td>
</tr>
<tr>
<td>MAX STORM SEWER SIZE</td>
<td>18&quot;</td>
<td>24&quot;</td>
<td>&gt;24&quot;AC</td>
</tr>
</tbody>
</table>

* NOTE: OFFLINE CUSTOM DESIGN REQUIRED
NEENAH R-1733 OR APPROVED EQUAL
SOLID LID W/ RAISED
LETTERING READING "STORM SEWER"
SEE DETAIL STM-10B

MIN. 2 ADJUSTING RINGS,
MORTAR (DESIGNED FOR
UNDERGROUND UTILITY
INSTALLATION) BETWEEN
CASTING, RINGS AND
STRUCTURE

1' MIN. CLEARANCE
3/4" THREADED STAINLESS STEEL
ROD AND SUPPORT BAND

D = TREATMENT MH DIA.
6'  8'  >8'
d = INTERNAL PIPE DIA.
18" 24"  24"+
H = SUMP DEPTH
9'  6'  6'+
MAX IMPERVIOUS AREA
5AC  10AC  >10AC*
MAX STORM SEWER SIZE
18"  24"  >24**

*NOTE: OFFLINE CUSTOM DESIGN REQUIRED

STANDARD DETAIL NO.
STM-13

ENVIRONMENTAL
MANHOLE
(EXISTING STORM SEWER)

APPROVAL 12/6/2017
CITY ENGINEER

CITY OF RICHFIELD
ENGINEERING DIVISION
NOTES: 1. BEDDING SHALL BE CONSIDERED INCIDENTAL TO THE PIPE UNLESS MODIFIED IN THE CONTRACT DOCUMENTS.
2. BEDDING REQUIRED FOR ALL MAINS AND SERVICES.