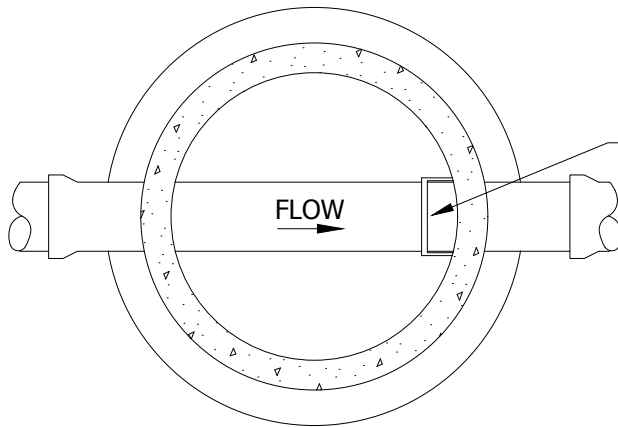


PRECAST INVERT MUST BE 1/2  
DIAMETER OF THE PIPE AND BENCHES  
SLOPED 2" TOWARD THE INVERT.



**PLAN**

MANHOLE STEPS SHALL BE PLACED  
SO THAT OFFSET VERTICAL PORTION  
OF CONE IS FACING DOWNSTREAM.

CASTING AND ADJUSTMENT  
RINGS AS SPECIFIED.

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

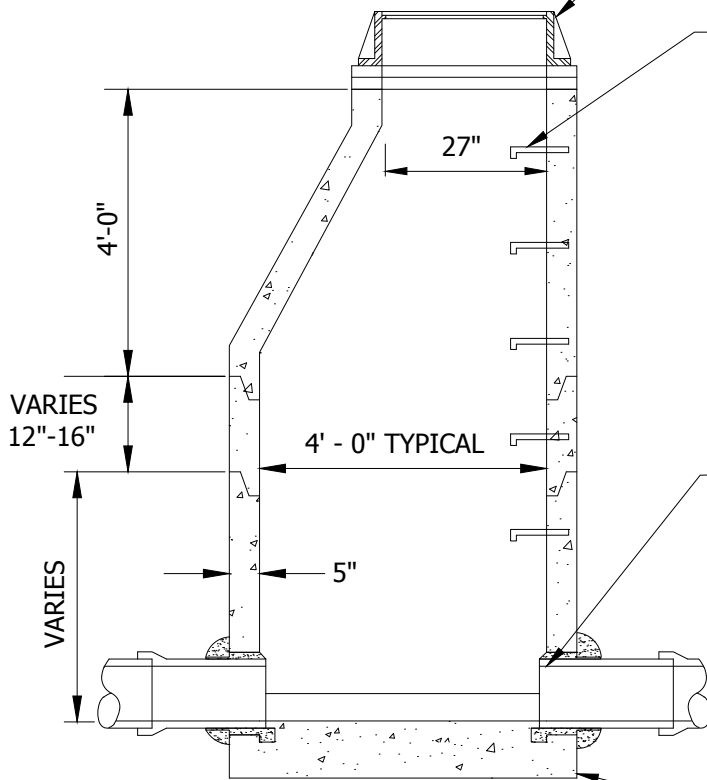
ALL JOINTS IN MANHOLE SHALL  
CONFORMING TO ASTM 443.

WRAP EACH MANHOLE BARREL JOINT  
WITH 12" MASTIC SEAL, OR RING  
JOINTS W/ 3/4" RAM - NEK  
BITUMINOUS ROPE.

PIPE SHALL BE CUT 2" INSIDE FACE  
OF WALL AT MID-POINT OF PIPE AND  
HAVE A WATER TIGHT SEAL.  
NOTE: KOR-N-SEAL OR PSX DIRECT  
DRIVE MANHOLE CONNECTOR  
CONSIDERED ACCEPTABLE ALTERNATES.

ALL DOG HOUSES SHALL BE GROUTED  
ON INSIDE AND OUTSIDE.

MINIMUM THICKNESS OF INTEGRAL  
PRECAST BASE IS 6" FOR 14' DEEP OR  
LESS, AND INCREASES 1" IN THICKNESS  
FOR EVERY 4' OF DEPTH GREATER THAN  
14'.



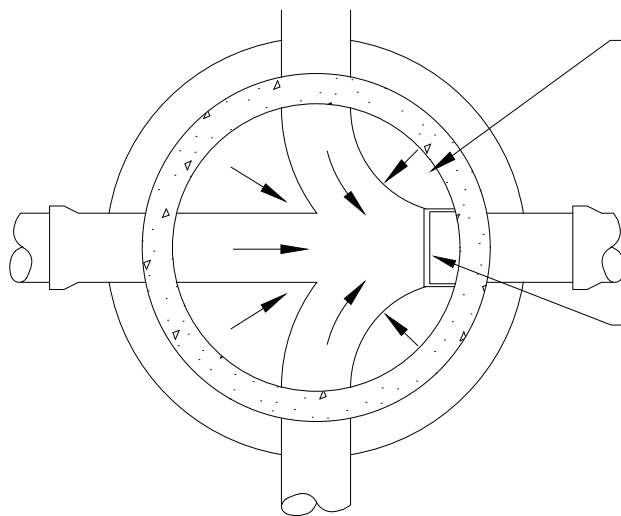
**SECTION**



**STANDARD DETAILS**  
**SANITARY SEWER MANHOLE**

Revised  
1/2019

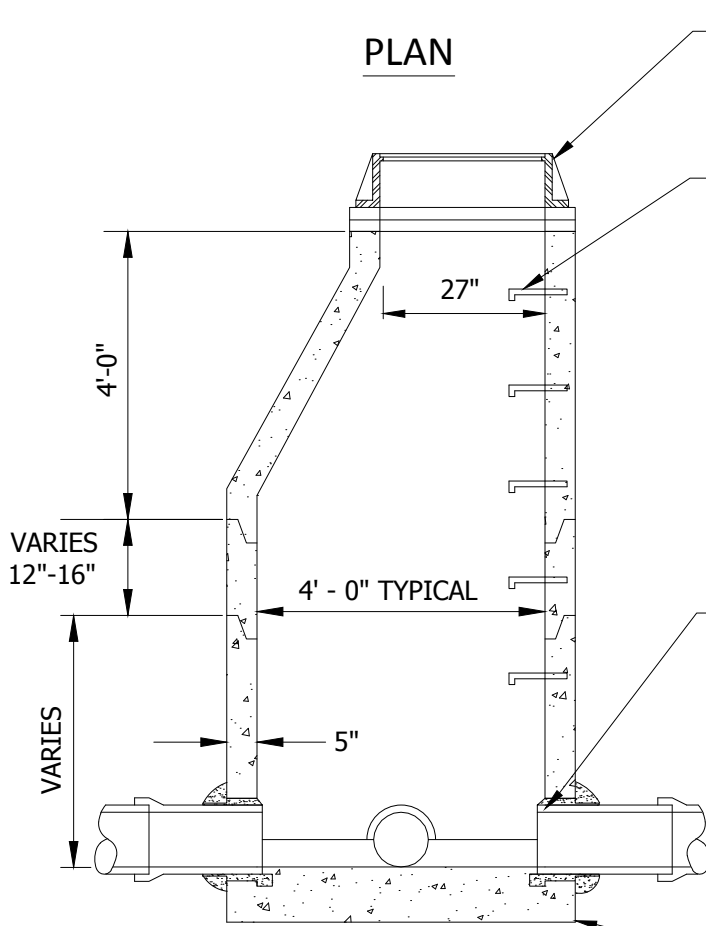
Standard  
Plate No.  
**SAN-1**



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

MANHOLE STEPS SHALL BE PLACED SO THAT OFFSET VERTICAL PORTION OF CONE IS FACING DOWNSTREAM.

**PLAN**



CASTING AND ADJUSTMENT RINGS AS SPECIFIED.

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

ALL JOINTS IN MANHOLE SHALL CONFORM TO ASTM 443.

WRAP EACH MANHOLE BARREL JOINT WITH 12" MASTIC SEAL, OR RING JOINTS W/ 3/4" RAM - NEK BITUMINOUS ROPE.

PIPE SHALL BE CUT 2" INSIDE FACE OF WALL AT MID-POINT OF PIPE AND HAVE A WATER TIGHT SEAL.. NOTE: KOR-N-SEAL OR PSX DIRECT DRIVE MANHOLE CONNECTOR CONSIDERED ACCEPTABLE ALTERNATES.

ALL DOG HOUSES SHALL BE GROUTED ON INSIDE AND OUTSIDE.

MINIMUM THICKNESS OF INTEGRAL PRECAST BASE IS 6" FOR 14' DEEP OR LESS, AND INCREASES 1" IN THICKNESS FOR EVERY 4' OF DEPTH GREATER THAN 14'.

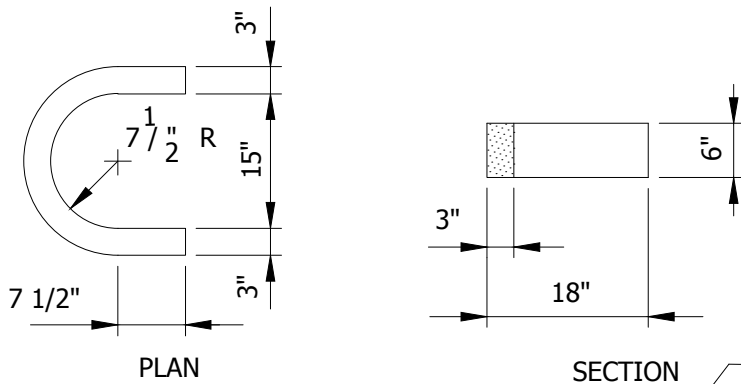
**SECTION**



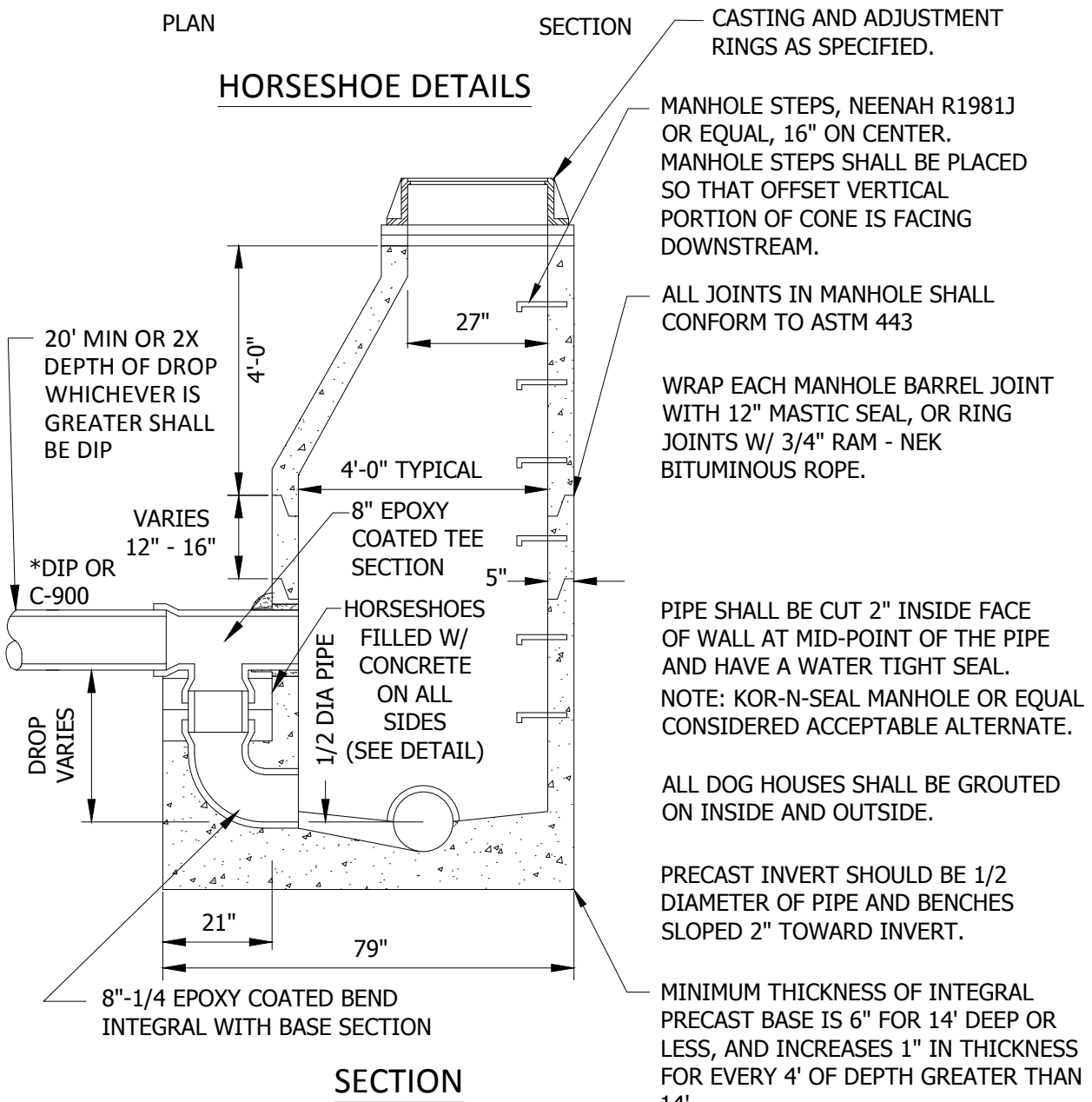
**STANDARD DETAILS**  
**SANITARY SEWER JUNCTION**  
**MANHOLE**

Revised  
 1/2019

Standard  
 Plate No.  
**SAN-2**



**HORSESHOE DETAILS**



CASTING AND ADJUSTMENT RINGS AS SPECIFIED.

MANHOLE STEPS, NEENAH R1981J OR EQUAL, 16" ON CENTER. MANHOLE STEPS SHALL BE PLACED SO THAT OFFSET VERTICAL PORTION OF CONE IS FACING DOWNSTREAM.

ALL JOINTS IN MANHOLE SHALL CONFORM TO ASTM 443

WRAP EACH MANHOLE BARREL JOINT WITH 12" MASTIC SEAL, OR RING JOINTS W/ 3/4" RAM - NEK BITUMINOUS ROPE.

PIPE SHALL BE CUT 2" INSIDE FACE OF WALL AT MID-POINT OF THE PIPE AND HAVE A WATER TIGHT SEAL. NOTE: KOR-N-SEAL MANHOLE OR EQUAL CONSIDERED ACCEPTABLE ALTERNATE.

ALL DOG HOUSES SHALL BE GROUTED ON INSIDE AND OUTSIDE.

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

MINIMUM THICKNESS OF INTEGRAL PRECAST BASE IS 6" FOR 14' DEEP OR LESS, AND INCREASES 1" IN THICKNESS FOR EVERY 4' OF DEPTH GREATER THAN 14'.

20' MIN OR 2X DEPTH OF DROP WHICHEVER IS GREATER SHALL BE DIP

VARIES 12" - 16"

\*DIP OR C-900

DROP VARIES

8"-1/4 EPOXY COATED BEND INTEGRAL WITH BASE SECTION

**SECTION**

\* DIP MUST BE POLYETHYLENE, POLYURETHANE, OR EPOXY LINED

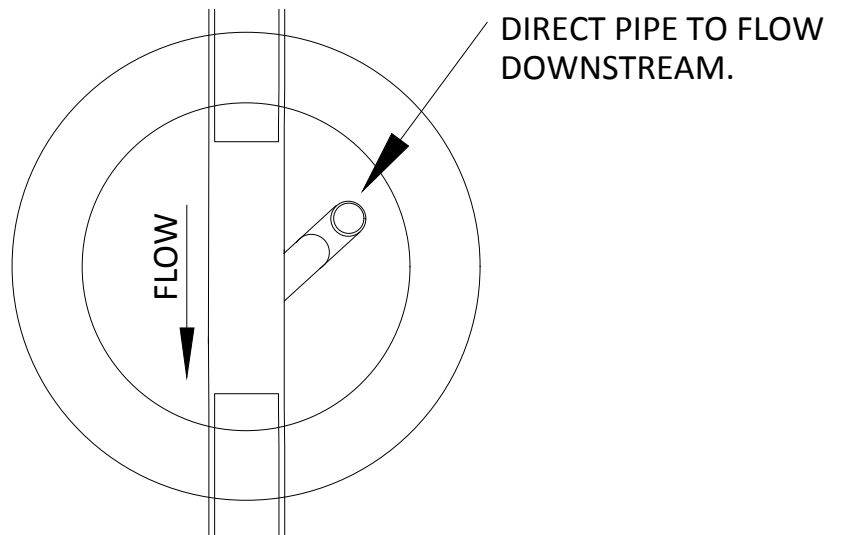
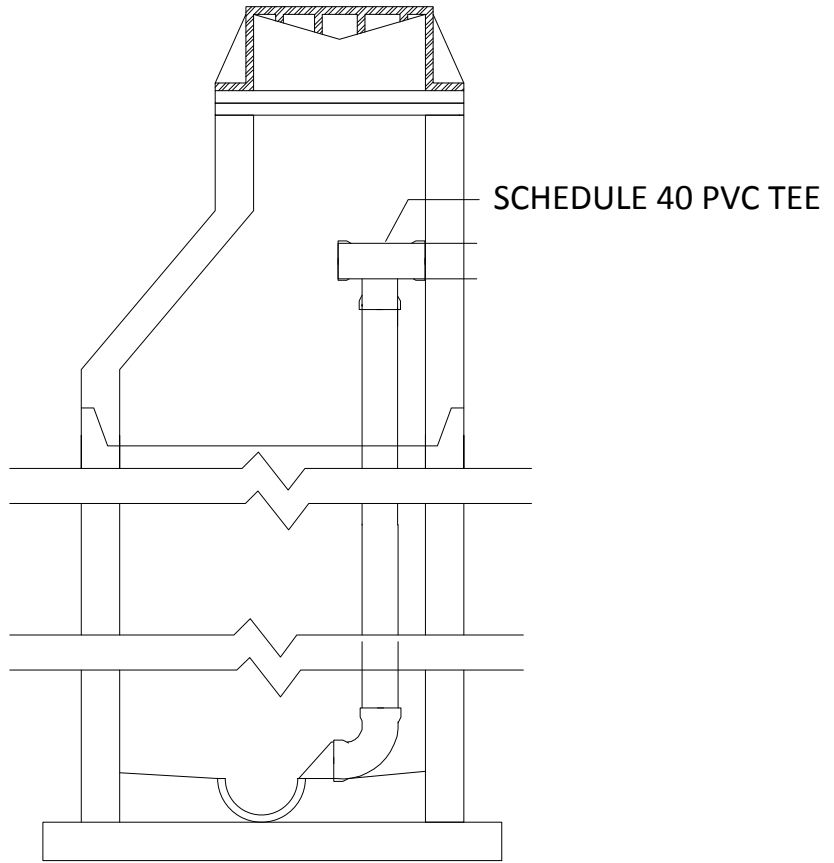


**STANDARD DETAILS**  
**SANITARY SEWER**  
**DROP INLET MANHOLE**

Revised  
1/2019

Standard Plate No.  
**SAN-3**

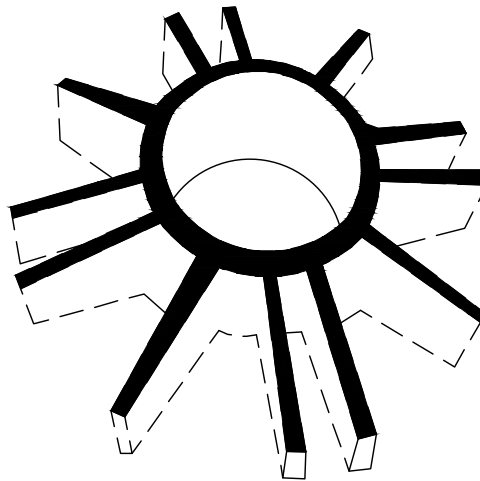
NOTE:  
INSIDE DROP SHALL BE  
INTRAFLOW LOW PROFILE DROP  
AS MANUFACTURED BY ROYAL  
ENTERPRISES OR AN APPROVED  
EQUAL.



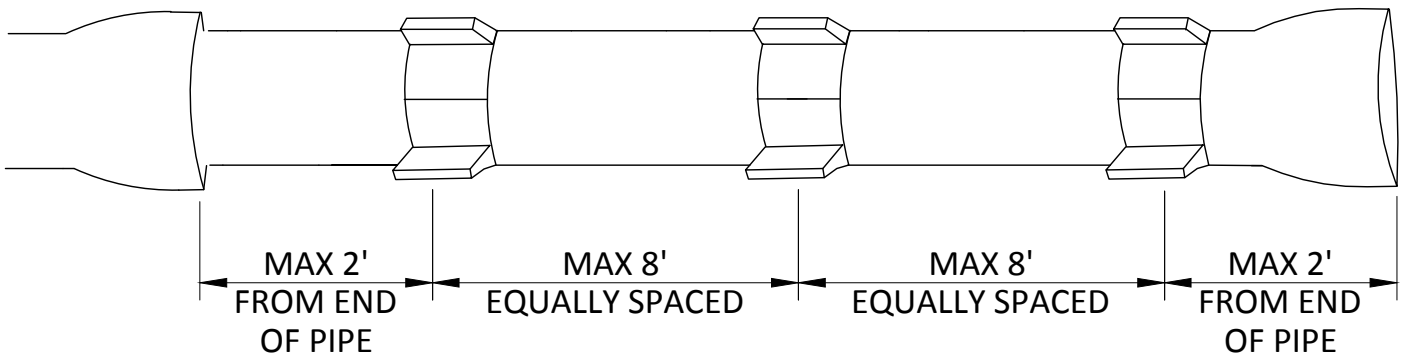
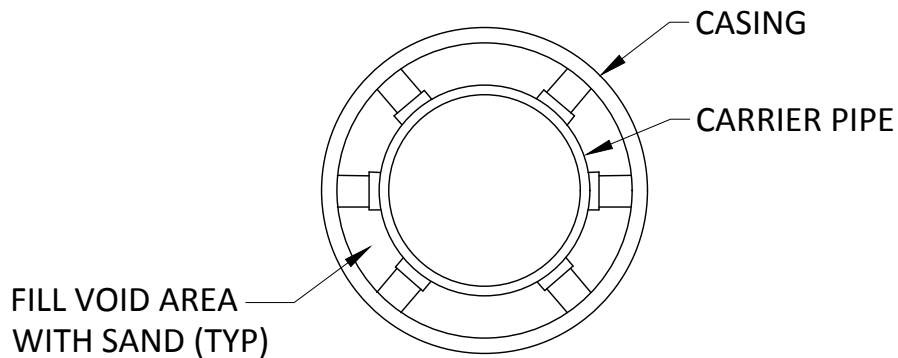
**STANDARD DETAILS**  
**SANITARY SEWER**  
**INSIDE DROP MANHOLE**

Revised  
1/2019

Standard  
Plate No.  
**SAN-4**



PHOENIX PLASTIC CASING SPACER  
OR APPROVED EQUAL



**SANITARY SEWER OR WATER MAIN PIPE SUPPORT  
IN CASING, PLASTIC SPACERS**

NOT TO SCALE



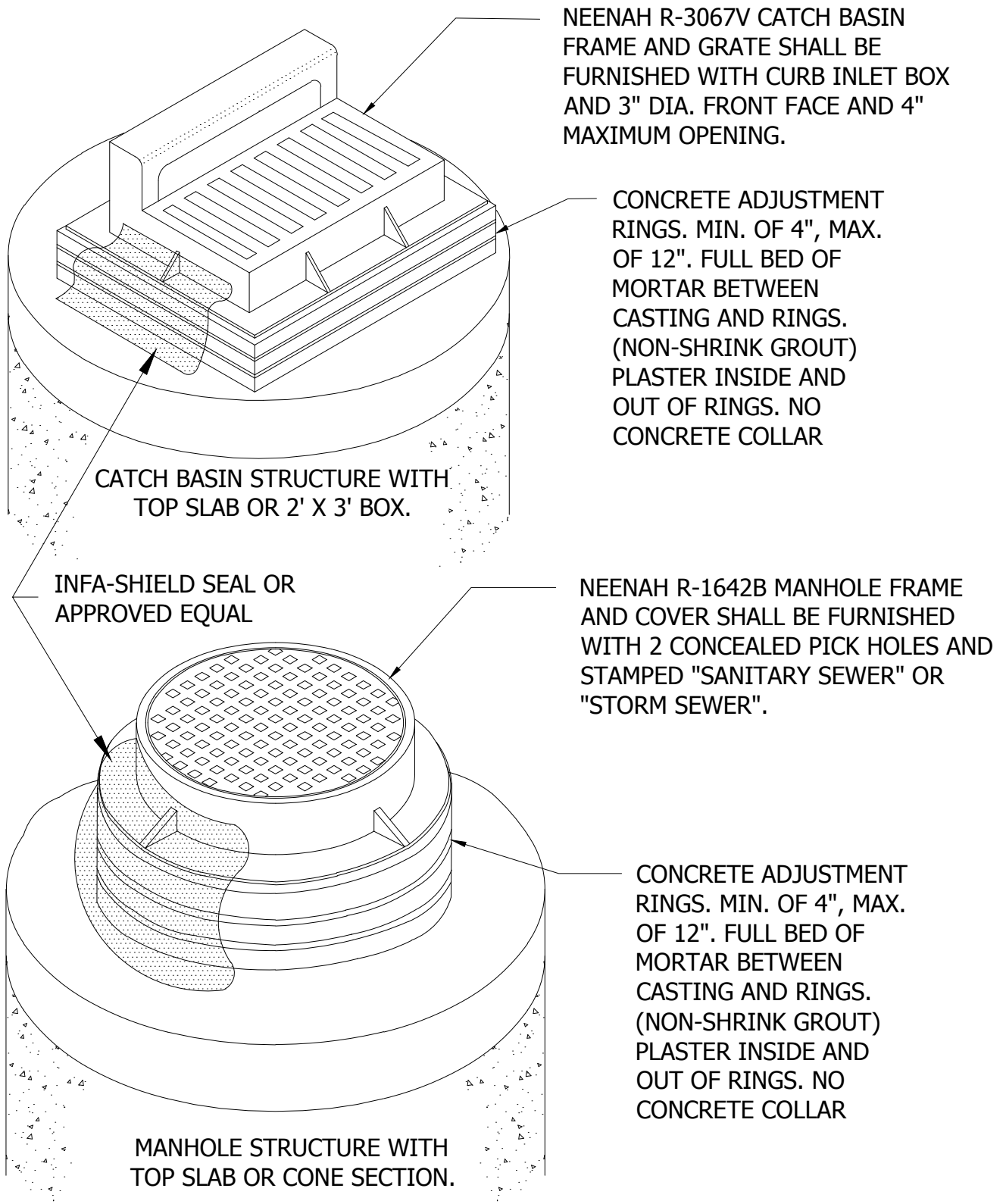
**STANDARD DETAILS**  
PIPE CASING  
TYPICAL INSTALLATION

Revised

1/2019

Standard  
Plate No.

**SAN-5**



**NOTES:**

1. NO SHIMS TO BE USED OTHER THAN MORTAR OR BRICK WHEN ADJUSTING RINGS AND CASTING.



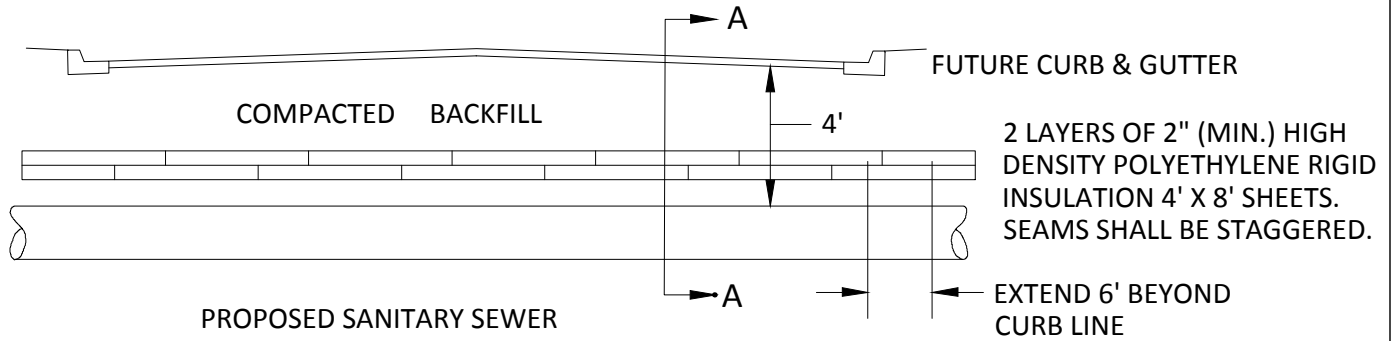
**STANDARD DETAILS**  
**MANHOLE ADJUSTMENT**  
**CONCRETE RINGS**

Revised

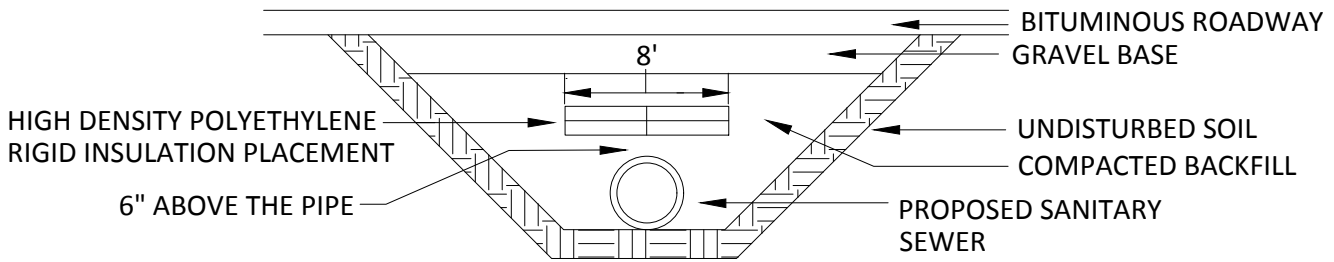
1/2019

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Plate No.

**SAN-6**



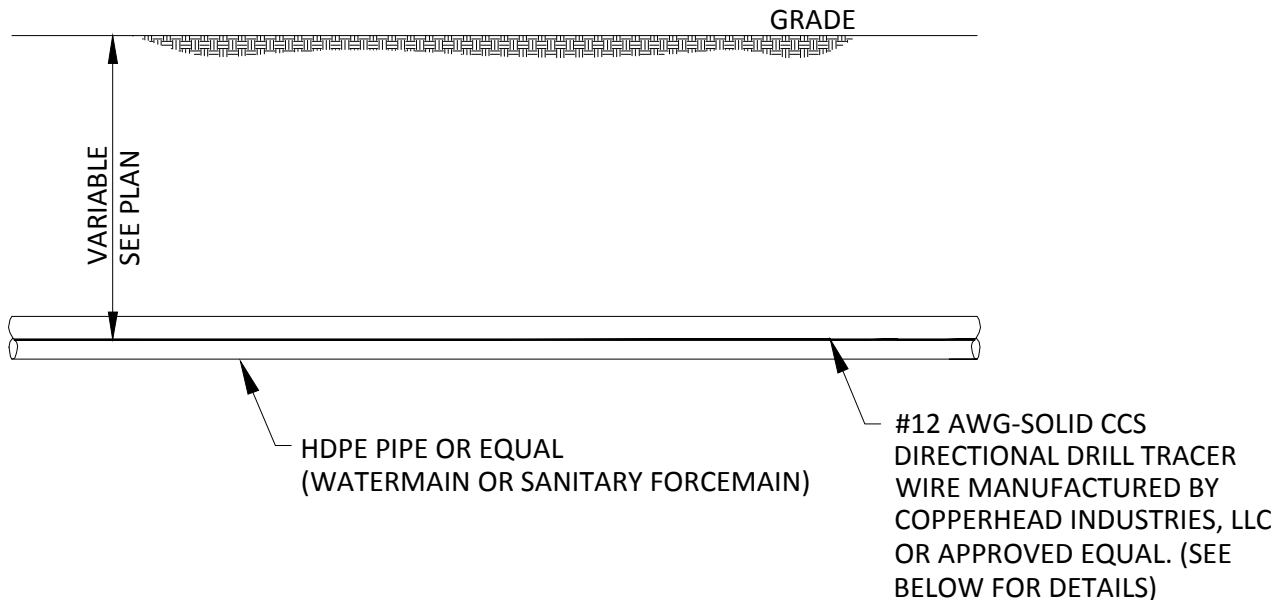
SECTION A-A



**STANDARD DETAILS**  
**SANITARY SEWER**  
**INSULATION REQUIREMENTS**

Revised  
 1/2019

Standard  
 Plate No.  
**SAN-7**



**NOTES:**

1. HDPE PIPE SHALL BE DUCTILE IRON PIPE SIZES (DIPS).
2. CONTRACTOR SHALL PROVIDE AND INSTALL #12 AWG SOLID (0.0808" DIAMETER) CCS EXTRA HIGH STRENGTH HARD DRAWN HORIZONTAL DRILL TRACER WIRE MANUFACTURED BY COPPERHEAD INDUSTRIES, LLC OR APPROVED EQUAL.
3. TRACER WIRE SHALL HAVE A MINIMUM 45 MIL HDPE, 30 VOLT MINIMUM RATING, AND A 1150 POUND MINIMUM AVERAGE BREAK STRENGTH.
4. TRACER WIRE SHALL BE BLUE FOR WATERMAIN AND GREEN FOR SANITARY SEWER.
5. ATTACH TRACER WIRE TO PIPE IN A MANNER THAT ENSURES IT REMAINS INTACT THOUGHOUT THE ENTIRE INSTALLATION PROCESS.
6. TRACER WIRE TO BE BROUGHT TO SURFACE AT GATE VALVE AND/OR HYDRANT LOCATIONS AND AIR RELEASE MANHOLES.
7. TRACER WIRE BROUGHT TO THE SURFACE SHALL BE MARKED AND IDENTIFIED WITH A TRI-VIEW FLEX TEST STATION CONTAINING TWO INTERNAL TERMINALS MANUFACTURED BY RHINO MARKING AND PROTECTION SYSTEMS OR APPROVED EQUAL. TEST STATION FOR WATER SHALL BE BLUE WITH RHINO PART #TVTI72BB2 OR APPROVED EQUAL AND CONTAIN ONE DECAL ON EACH SIDE OF TEST STATION WITH RHINO PART #GD8-1332K OR APPROVED EQUAL. TEST STATIONS FOR SEWER SHALL BE GREEN WITH RHINO PART 3TVTI72GB2 OR APPROVED EQUAL AND CONTAIN ONE DECAL ON EACH SIDE OF THE TEST STATION WITH RHINO PART #GD8-1316K OR APPROVED EQUAL.
8. TRANSITION FROM HDPE TO DIP SHALL BE MADE AT THE EXTREMITIES OF HYDRANT CONNECTIONS, WATERMAIN CROSSINGS AND SERVICES.
9. HDPE TO DUCTILE IRON FITTING CONNECTIONS SHALL BE MADE WITH ONE OF THE FOLLOWING, UNLESS APPROVED BY THE CITY ENGINEER:
  - MJ ADAPTORS (FUSED TO HDPE PIPE) APPROVED BY THE CITY
  - MEGALUGS AND STAINLESS STEEL PIPE STIFFENERS SHALL BE MODEL CPS AS MANUFACTURED BY CASCADE WATERWORKS MFG. OR APPROVED EQUAL.



**STANDARD DETAILS**  
**HDPE PIPE**  
**WATERMAIN OR SANITARY FORCEMAIN**

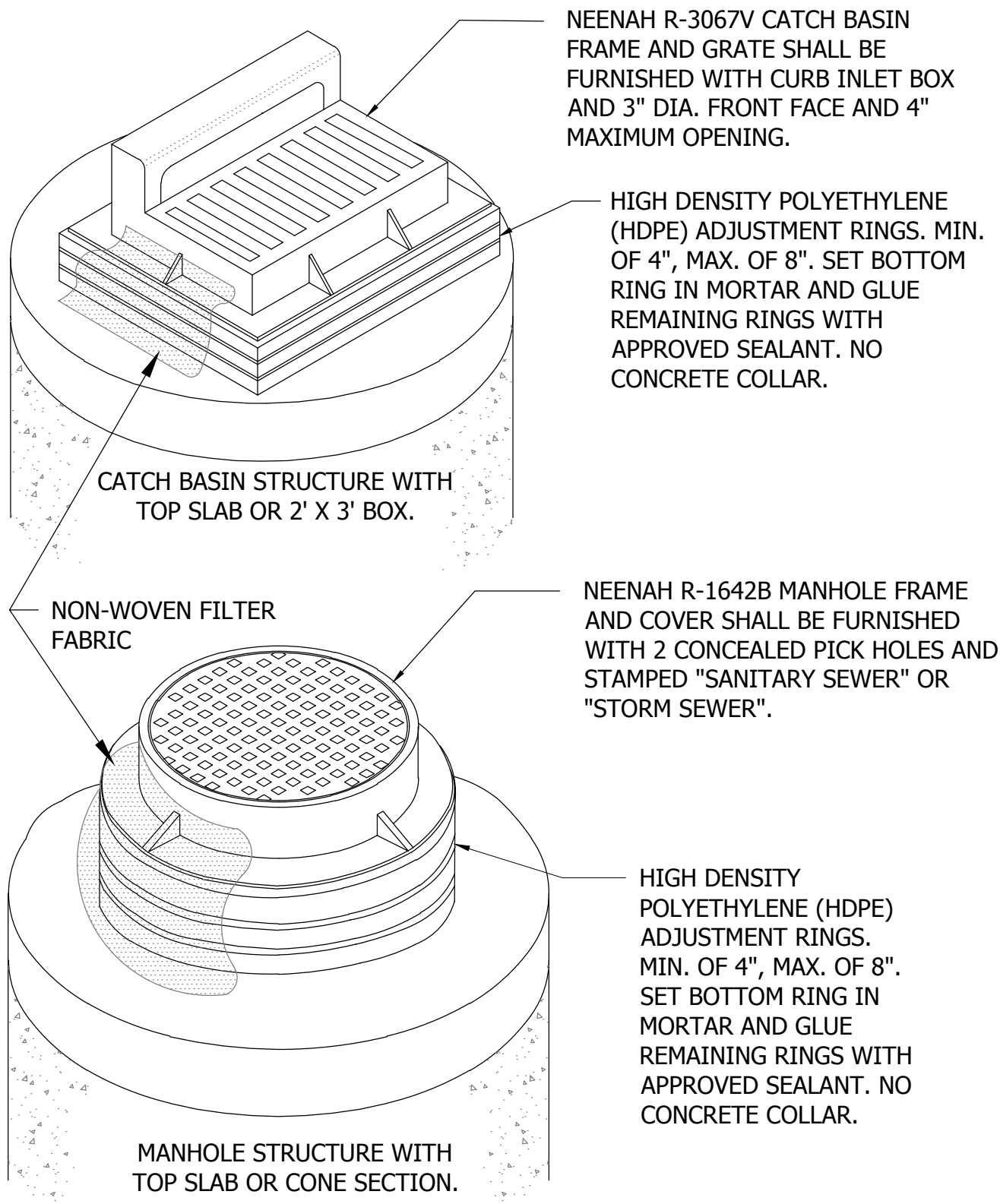
Revised

1/2019

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Plate No.

**SAN-8**





**STANDARD DETAILS**  
**MANHOLE ADJUSTMENT**  
**HDPE RINGS**

Revised  
 1/2019

Standard  
 Plate No.  
**SAN-9**