## SANITARY SEWER DETAILS

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAN-1</td>
<td>SANITARY CASTING DETAIL</td>
</tr>
<tr>
<td>SAN-2</td>
<td>TYPICAL SEWER SERVICE CONNECTION</td>
</tr>
<tr>
<td>SAN-2A</td>
<td>SEWER SERVICE CONNECTION FOR CIPP LINED SEWER MAIN</td>
</tr>
<tr>
<td>SAN-3</td>
<td>SANITARY MANHOLE NON-PAVED AREAS</td>
</tr>
<tr>
<td>SAN-3A</td>
<td>CONCRETE ENCASED CASTING COLLAR FOR SANITARY MH IN ROADWAY, WALKS, &amp; DRIVES</td>
</tr>
<tr>
<td>SAN-4</td>
<td>CONSTRUCT INSIDE DROP STRUCTURE</td>
</tr>
<tr>
<td>SAN-5</td>
<td>HDPE SANITARY SEWER PRESSURE LATERAL CONNECTION</td>
</tr>
<tr>
<td>SAN-6</td>
<td>HDPE FORCEMAIN TO GRAVITY MAIN MANHOLE</td>
</tr>
<tr>
<td>SAN-7</td>
<td>AIR-RELEASE MANHOLE</td>
</tr>
<tr>
<td>SAN-8</td>
<td>CLEANOUT MANHOLE</td>
</tr>
<tr>
<td>SAN-8A</td>
<td>DEAD END CLEAN OUT HANDHOLE</td>
</tr>
<tr>
<td>SAN-9</td>
<td>POLYETHYLENE MH ADJUSTING RING - FLAT</td>
</tr>
<tr>
<td>SAN-10</td>
<td>POLYETHYLENE MH ADJUSTING RING - WEDGE</td>
</tr>
<tr>
<td>SAN-11</td>
<td>PRECAST MECHANICAL JOINT SEWER MANHOLE</td>
</tr>
</tbody>
</table>
SANITARY CASTING DETAIL

NOTE: T/Cast shall be .03' below finished pavement surface.

(2) Concealed pick hole
See pick hole detail

2" Raised letters flush w/ lid surface design

NOTE: Suitable for HS25 wheel loads
NOTES
1. BID ITEM FOR PVC WYE INCLUDES FURNISHING AND INSTALLING WYE IN SEWER MAIN.
2. CONNECT SEWER SERVICE INCLUDES 6" PVC SEWER SERVICE PIPE (TO 4" FROM C/L) AND ALL FITTINGS
3. 6" PVC SEWER SERVICE PIPE IS INTENDED FOR THE RECONSTRUCTION OF SEWER SERVICES (WHEN FOUND TO BE IN NEED BY THE ENGINEER) COMPLETE IN PLACE FROM 4.0' BEYOND THE C/L OF THE SEWER MAIN TO A POINT DESIGNATED BY THE ENGINEER
4. FOR NEW SERVICES, PIPE TO STOP AT RIGHT OF WAY
5. #12 GAUGE GREEN INSULATED COPPER TRACER WIRE SHALL BE INSTALLED WITH SANITARY SEWER MAINS AND SERVICES. TRACER WIRE TERMINAL BOXES SHALL BE INSTALLED DIRECTLY ABOVE THE SEWER SERVICE OR AS DETERMINED BY THE ENGINEER
6. FOR SERVICES, TRACER WIRE SHALL RUN FROM THE WYE AND TERMINATE IN A FLUSH MOUNTED TRACER BOX WITH A GREEN CAST IRON LOCKABLE TOP
7. THE TRACER WIRE SHALL REMAIN CONTINUOUS TO THE GREATEST EXTENT POSSIBLE. SPLICES IN THE TRACER WIRE SHOULD BE MADE WITH SPLIT BOLT CONNECTORS. WIRE NUTS SHALL NOT BE USED. A WATER-PROOF CONNECTION IS NECESSARY TO PREVENT CORROSION.

TYPICAL SEWER SERVICE CONNECTION

REvised/appROvEd 02/19/2015
CITY OF DULUTH STANDARD DETAIL
DEPT. OF PUBLIC WORKS AND UTILITIES

NO SCALE
CONTRACTOR SUPPLIED MAGNETIZED TRACER BOX WITH GREEN TOP. WIRE CONNECTED TO TRACER BOX TERMINAL

LEAVE SLACK IN WIRE

CONNECT TO EXISTING SANITARY SEWER 4’ TRACER WIRE

6” PVC SEWER SERVICE PIPE Varies

2% MINIMUM SLOPE

EXISTING SERVICE PIPE

COARSE FILTER AGGREGATE SPEC. 3149.2H

ANGLE VARIES TO MATCH EXISTING SERVICE PIPE

NEOPRENE SLEEVE WITH STAINLESS STEEL BANDS ADAPT TO EXISTING PIPE MATERIAL (INCIDENTAL)

MAGNESIUM ANODE (1 LB MIN.) REQUIRED WHERE NO TRACER IS INSTALLED ON MAIN

EXISTING CLAY HOST PIPE

CIPP LINED MAIN

CONNECT SEWER TAP SADDLE WITH TWO-PART EPOXY TO LINER

1” MIN. BEYOND SLEEVE

NOTES

1. REMOVE PORTION OF EXISTING HOST PIPE TO EXPOSE CIPP LINER. CUT CIRCULAR HOLE IN CIPP LINER WHERE THE EXISTING OPENING OF THE CIPP LINER EXCEEDS THE SIZE FOR A NEW SEWER TAP SADDLE. CONSTRUCT EPOXY LINER PATCH, AND CUT CIRCULAR HOLE IN CURED PATCH.

2. PROVIDE NEW PVC SEWER TAP SADDLE ON IN-PLACE SEWER MAIN LINER CONNECTED BY TWO-PART EPOXY GLUED JOINT FORMING A WATER-TIGHT CONNECTION TO CIPP LINER.

3. CONNECT SEWER SERVICE INCLUDES SEWER TAP SADDLE, 6” PVC SEWER SERVICE PIPE (TO 4” FROM C/L) AND ALL FITTINGS.

4. 6” PVC SEWER SERVICE PIPE INTENDED FOR THE RECONSTRUCTION OF SEWER SERVICES (WHEN FOUND TO BE IN NEED BY THE ENGINEER) COMPLETE IN PLACE FROM 4.0’ BEYOND THE C/L OF THE SEWER MAIN TO A POINT DESIGNATED BY THE ENGINEER.

5. FOR NEW SERVICES PIPE TO STOP AT THE RIGHT OF WAY.

6. #12 GAUGE GREEN INSULATED SOLID COPPER WIRE SHALL BE INSTALLED WITH SANITARY SEWER MAINS AND SERVICES. TRACER WIRE TERMINAL BOXES SHALL BE INSTALLED DIRECTLY ABOVE THE SEWER SERVICE OR AS DIRECTED BY ENGINEER.

7. FOR SERVICES, TRACER WIRE SHALL RUN FROM A 1 POUND MAGNESIUM ANODE PLACE ADJACENT TO THE SADDLE TAP CONNECTION AT THE MAIN AND TERMINATE IN A FLUSH MOUNTED TRACER BOX.

8. THE TRACER WIRE SHALL REMAIN CONTINUOUS TO THE GREATEST EXTENT POSSIBLE. SPLICES IN TRACER WIRE SHALL BE WITH SPLIT BOLT CONNECTORS. WIRE NUTS ARE NOT ACCEPTABLE. A WATER-PROOF CONNECTION IS NECESSARY TO PREVENT CORROSION.

SEWER SERVICE CONNECTION FOR CIPP LINED SEWER MAIN

REVISED/APPROVED 04/05/2019

CITY OF DULUTH STANDARD DETAIL

DEPT. OF PUBLIC WORKS AND UTILITIES

SAN-2A

NO SCALE
**SANITARY MANHOLE NON–PAVED AREAS**

**NOTE:**
1. All seals shall extend from the casting to the cone.
2. Tracer wire required on all sanitary sewer mains.

**SAN–3**

REVISED/APPROVED 04/05/2019
CITY OF DULUTH STANDARD DETAIL
DEPT. OF PUBLIC WORKS AND UTILITIES
NO SCALE
NOT TO SCALE

CONCRETE ENCASED CASTING COLLAR FOR SANITARY MH IN ROADWAY, WALKS, & DRIVES

REMARKS:
1. CONCRETE (MIX NO. 3052) COLLAR TO ENCASE CASTING AND ADJUSTMENT RING.
2. TRACER WIRE REQUIRED ON ALL SANITARY SEWER MAINS.
3. CONCRETE COLLAR SHALL BE CIRCULAR LAYOUT. PAVEMENT AND BASE SHALL BE CUT OUT WITH ROTATING CUTTING DEVICE.
4. FINISH CONCRETE EDGE WITH 1/4" RADIUS. SEAL JOINT BETWEEN PAVEMENT AND COLLAR.
5. MAINTAIN 3.5" COVER ON REINFORCEMENT.

CITY OF DULUTH STANDARD DETAIL
DEPT. OF PUBLIC WORKS AND UTILITIES
TOP OF CASTING = XXXXX

NOTE: T/CAST SHALL BE .03' BELOW FINISHED GRADE.

SEE DETAIL SAN-3 AND SAN 3-A

TRACER WIRE

STAINLESS STEEL STRAP 4' O.C.
3/4" MINIMUM WIDTH (TYP)

MH WALL (48" DIAMETER)

8" PVC

8" PVC

8" X 1-1/2" STAINLESS STEEL EXPANSION BOLT (TYP)

CUT OFF "TEE" AS SHOWN AND REMOVE

PVC TEE = 8" 8" 8"

F/L = XXXXX

STAINLESS STEEL STRAP 4"
O.C. 3/4" MINIMUM WIDTH (TYP)

A

A

8" PVC, LENGTH AS REQUIRED

45° PVC BEND

F/L IN = XXXXX

F/L OUT = XXXXX

6" MIN. BEDDING MATERIAL

INTEGRAL BASE

SECTION A-A

NOTES: REFER TO PLAN/PROFILES FOR ELEVATIONS

CONSTRUCT INSIDE DROP STRUCTURE

SAN-4

REVISED/APPROVED 04/05/2019

CITY OF DULUTH STANDARD DETAIL
DEPT. OF PUBLIC WORKS AND UTILITIES

NO SCALE
NOTES:
1. #12 GAUGE GREEN INSULATED COPPER TRACER WIRE SHALL BE INSTALLED WITH THE NON-CONDUCTIVE SERVICE PIPE. TRACER WIRE INSTALLATION REQUIRES ACCESS POINTS AT LEAST EVERY 300 FEET.
2. THE TRACER WIRE SHALL REMAIN CONTINUOUS TO THE GREATEST EXTENT POSSIBLE. SPLICES IN THE TRACER WIRE SHOULD BE MADE WITH SPLIT BOLT CONNECTORS. WIRE NUTS SHALL NOT BE USED. A WATER-PROOF CONNECTION IS NECESSARY TO PREVENT CORROSION.
3. TRACER WIRE SHALL RUN FROM THE WYE AND TERMINATE IN A FLUSH MOUNTED TRACER BOX WITH A GREEN CAST IRON TOP.
NOTE:
ALL CONCRETE SURFACES INSIDE OF MANHOLES TO BE COATED WITH SHERWIN-WILLIAMS TAR-GUARD COAL TAR EPOXY OR EQUAL IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS.

TAPER INVERT FROM FORCEMAIN DIAMETER TO GRAVITY SEWER DIAMETER. 6" TO 2' DROP ALLOWABLE. REFER TO PLAN/PROFILE FOR ELEVATION.

SEE DETAIL SAN-3 AND SAN-3A

ALL POURED IN PLACE CONCRETE SHALL BE MIX NUMBER 3943

TAPER INVERT FROM FORCEMAIN DIAMETER TO GRAVITY SEWER DIAMETER. 6" TO 2' DROP ALLOWABLE. REFER TO PLAN/PROFILE FOR ELEVATION.
1 1/2" x 1 1/2" S.S. SUPPORT BRACKETS WITH S.S. BAND OR APPROVED EQUAL (ALL PARTS AND HARDWARE TO BE STAINLESS STEEL)

AIR VACUUM RELEASE VALVE

FORCE MAIN

NOTE: TOP OF CASTING SHALL BE .03" BELOW FINISHED GRADE

SEE DETAIL SAN-3 AND SAN-3A

MAGNETIZED TRACER WIRE BOX

6" POLYSTYRENE INSULATION BOARD (DOW STYROFOAM HI 40, CERTIFOAM 40, OR EQUIVALENT)

3/4" TREATED PLYWOOD SUPPORTED BY 1" S.S. ANGLE IRON W/ STAINLESS LAG BOLTS

INCIDENTAL TO MH CONSTRUCTION

MAGNETIZED TRACER WIRE BOX

ALL Poured IN PLACE CONCRETE SHALL BE MIX NUMBER 3Y43

8" x 8" x 3"
POLYSTYRENE INSULATION

3" X 12" X 4"
INSULATION STRIPS

1 1/2" x 1 1/2" S.S. SUPPORT BRACKET WITH S.S. BAND OR APPROVED EQUAL

TRACER WIRE

ELECTROFUSION SERVICE SADDLE WITH 2" BRASS INSERT

CORE DRILL AND INSTALL MODULAR RUBBER SEAL

AIR VACUUM RELEASE VALVE
APCO MODEL 443, VAL-MATIC 801WA, OR APPROVED EQUAL

2" GALVANIZED IRON PIPE

1/2" PE FULLY PORTED THREADED BALL VALVE

CONCRETE SUPPORT, MIN. 8" HIGH

INTEGRAL BASE

NOTE: MANHOLE TO MEET ALL REQUIREMENTS OF SAN-11

AIR-RELEASE MANHOLE

SAN-7

REVISED/APPROVED 01/08/2019

CITY OF DULUTH STANDARD DETAIL
DEPT. OF PUBLIC WORKS AND UTILITIES

NO SCALE
DIMENSION SCHEDULE

<table>
<thead>
<tr>
<th>CONE SIZE</th>
<th>DIMENSION A</th>
<th>DIMENSION B</th>
<th>DIMENSION C</th>
<th>DIMENSION D</th>
<th>DIMENSION H1</th>
</tr>
</thead>
<tbody>
<tr>
<td>27.00</td>
<td>26.75</td>
<td>36.50</td>
<td>5.00</td>
<td>26.25</td>
<td>1.20, 1.50, 2.00, 4.00</td>
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</tbody>
</table>

DESCRIPTION
1. PLASTIC INJECTION MOLDED ADJUSTMENT RING
2. MOLDED FROM HIGH DENSITY POLYETHYLENE AS DEFINED IN ASTM SPECIFICATION D1248
3. ACTUAL RESIN PROPERTIES WILL VARY ALLOWING FOR THE UTILIZATION OF A MAXIMUM PERCENT OF RECYCLED MATERIAL
4. THE PERCENT OF POST CONSUMER WASTE TO INDUSTRIAL WASTE WILL VARY WITH AVAILABILITY AND PROPERTY RETENTION NEEDS
5. COLOR, SHADE AND UNIFORMITY WILL VARY WITH THE MIX OF THE POST CONSUMER AND INDUSTRIAL WASTE MATERIALS
6. DIMENSIONS SHOWN ARE NOMINAL – ACTUAL SIZE WILL VARY WITHIN ALLOWABLE TOLERANCE AND REQUIRED FIT

POLYETHYLENE MH ADJUSTING RING – FLAT

REVISED/APPROVED 02/01/2013
CITY OF DULUTH STANDARD DETAIL
DEPT. OF PUBLIC WORKS AND UTILITIES
NO SCALE
**DIMENSION SCHEDULE**

<table>
<thead>
<tr>
<th>CONE SIZE</th>
<th>DIMENSION A</th>
<th>DIMENSION B</th>
<th>DIMENSION C</th>
<th>DIMENSION D</th>
<th>DIMENSION H1-H2</th>
</tr>
</thead>
<tbody>
<tr>
<td>27.00</td>
<td>26.75</td>
<td>36.50</td>
<td>5.00</td>
<td>26.25</td>
<td>0.75 – 1.50</td>
</tr>
</tbody>
</table>

**DESCRIPTION**

1. PLASTIC INJECTION MOLDED ADJUSTMENT RING
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6. DIMENSIONS SHOWN ARE NOMINAL – ACTUAL SIZE WILL VARY WITHIN ALLOWABLE TOLERANCE AND REQUIRED FIT

**POLYETHYLENE MH ADJUSTING RING – WEDGE**

**SAN-10**

**REVISED/APPROVED 02/01/2013**

**CITY OF DULUTH STANDARD DETAIL**

**DEPT. OF PUBLIC WORKS AND UTILITIES**

**NO SCALE**
**Notes:**

1. Sanitary manholes shall not have steps.
2. All sanitary manholes shall be vacuum tested.
3. All sanitary manholes shall be watertight. Any observable water seepage through the end of the warranty period shall be cause to reject manholes.
4. An inside drop is required per detail SAN-4 anytime the drop is greater than 2.0'.

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**Pipe Sleeve Details:**

1. All pipe sleeves must be water tight.

**EXISTING MANHOLE DETAILS:**

- Gasket (MNDOT Spec. 3726 Type B) or approved equal.
- Reinforcing shall be a minimum of a single line wire fabric having an area of not less than 0.12 sq. in. per ft. of height.
- 3" slope from trough to wall.
- Stainless steel strap with draw bolts and nuts or worm drive screw.
- Internal expanding locking band (non-magnetic corrosion resistant steel).

**Construction Details:**

- Tracer wire to be continuous.
- 6" maximum adjustment allowed.
- 4'0" concentric cone unless otherwise noted.
- Variable as required bottom rise with integral base.
- Integral pipe invert.
- Formed concrete trough to match integral base.

**Precast Mechanical Joint Sewer Manhole**

**SAN-11**

**Revised/Approved 01/08/2016**

**City of Duluth Standard Detail**

**Dept. of Public Works and Utilities**

**No Scale**