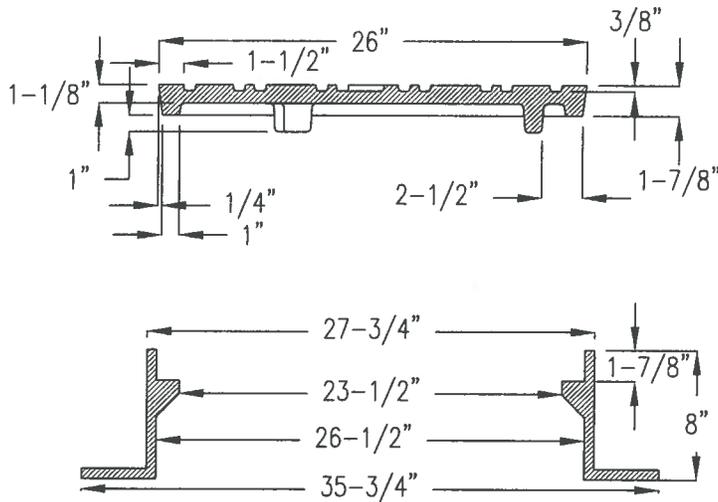
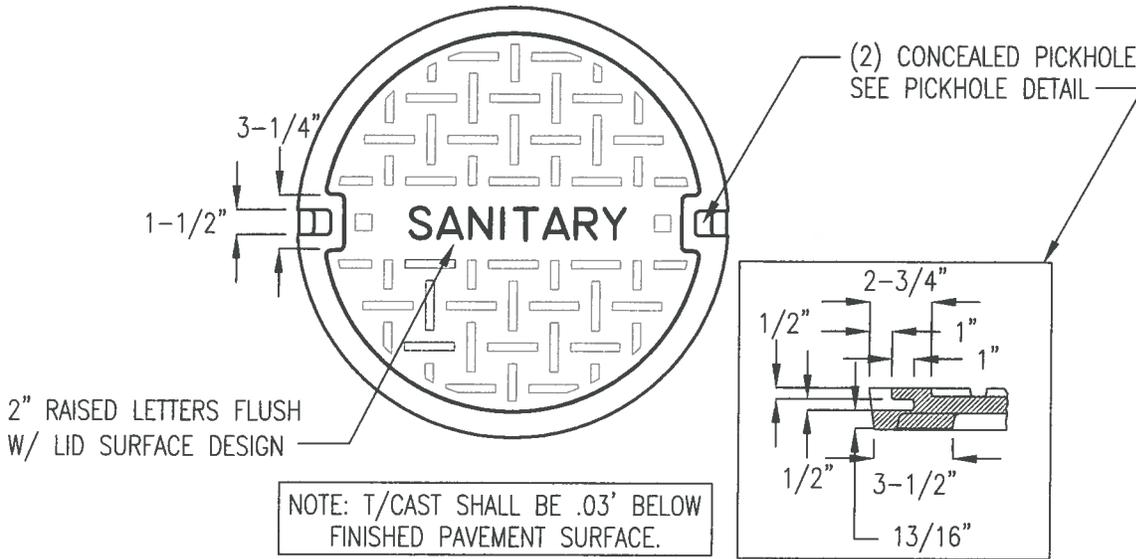


SANITARY SEWER DETAILS

- SAN-1 SANITARY CASTING DETAIL
- SAN-2 TYPICAL SEWER SERVICE CONNECTION
- SAN-3 SANITARY MANHOLE NON-PAVED AREAS
- SAN-3A CONCRETE ENCASED CASTING COLLAR FOR SANITARY MH IN ROADWAY,
WALKS, & DRIVES
- SAN-4 CONSTRUCT INSIDE DROP STRUCTURE
- SAN-5 HDPE SANITARY SEWER PRESSURE LATERAL CONNECTION
- SAN-6 HDPE FORCEMAIN TO GRAVITY MAIN MANHOLE
- SAN-7 AIR-RELEASE MANHOLE
- SAN-8 CLEANOUT MANHOLE
- SAN-9 POLYETHYLENE MH ADJUSTING RING - FLAT
- SAN-10 POLYETHYLENE MH ADJUSTING RING - WEDGE
- SAN-11 PRECAST MECHANICAL JOINT SEWER MANHOLE

WGT. 298 LBS		MATERIAL: GRAY IRON CLASS 35B
WGT. 122 LBS	TOTAL WEIGHT 420 LBS.	SPEC.: ASTM A-48-74

NOTE: SUITABLE FOR HS25 WHEEL LOADS



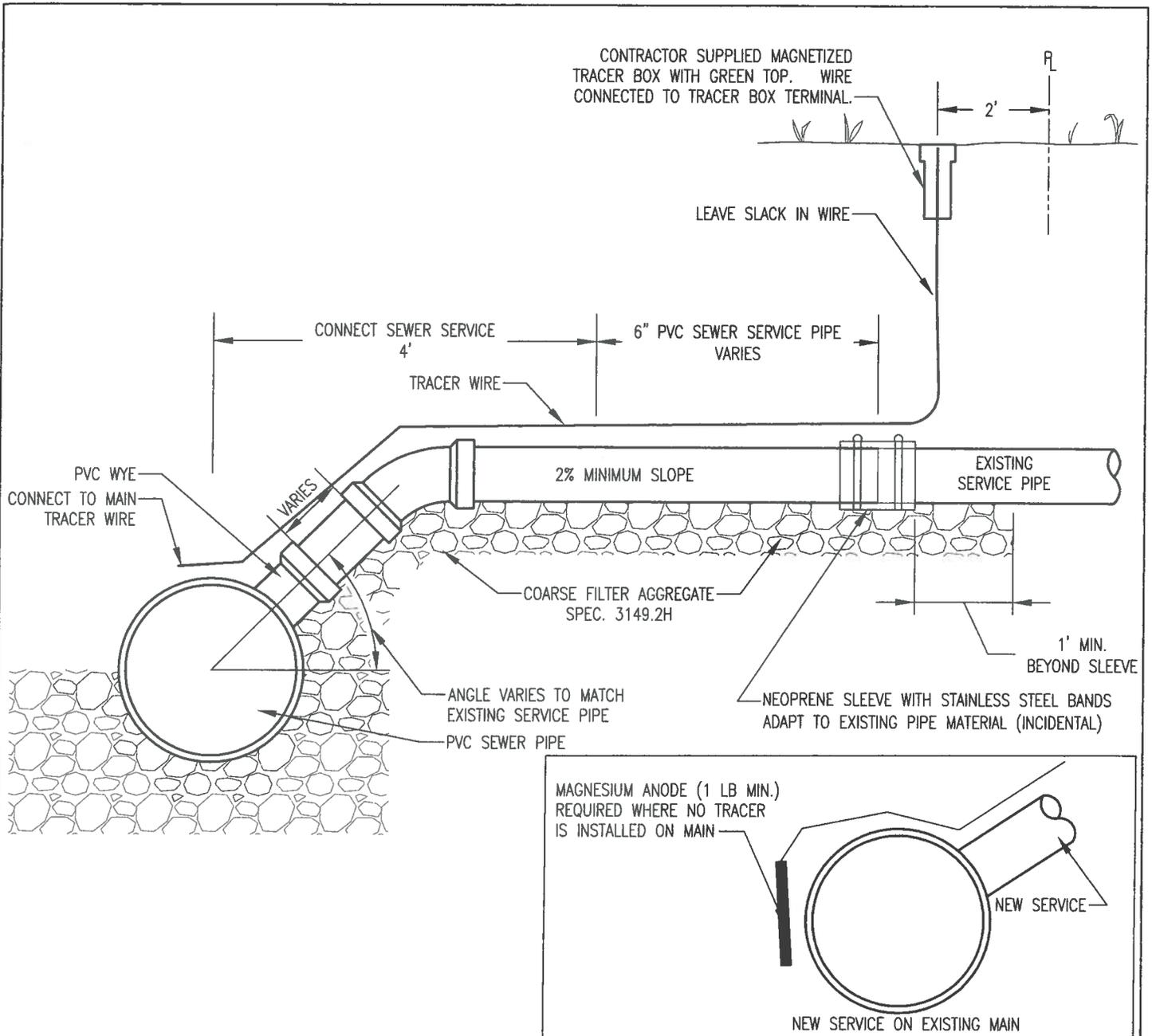
SANITARY CASTING DETAIL

SAN-1

REVISED/APPROVED 2/01/2013

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

NO SCALE



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.

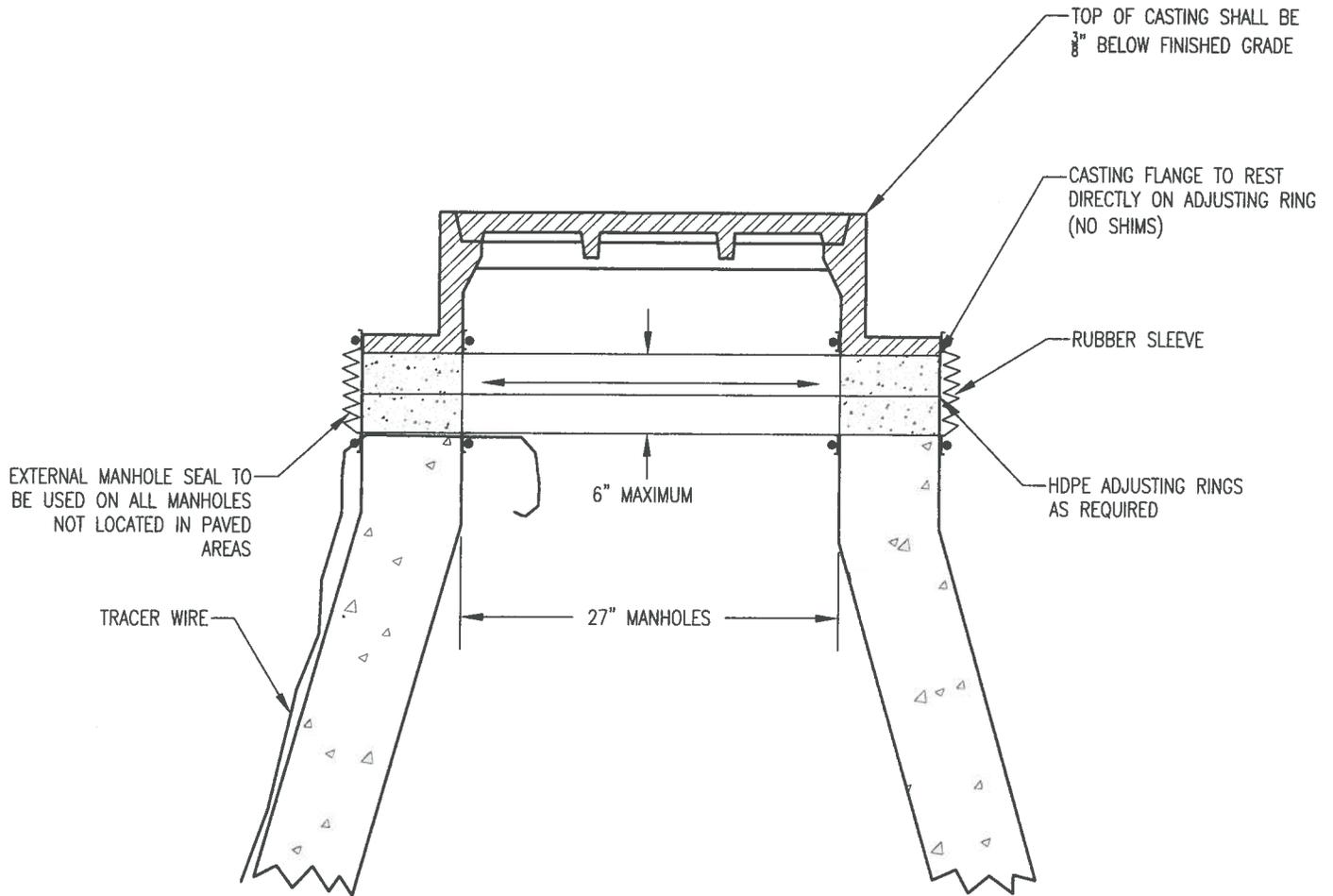
TYPICAL SEWER SERVICE CONNECTION

SAN-2

REVISED/APPROVED 02/19/2015

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

NO SCALE



NOTE:

1. ALL SEALS SHALL EXTEND FROM THE CASTING TO THE CONE
2. TRACER WIRE REQUIRED ON ALL SANITARY SEWER MAINS

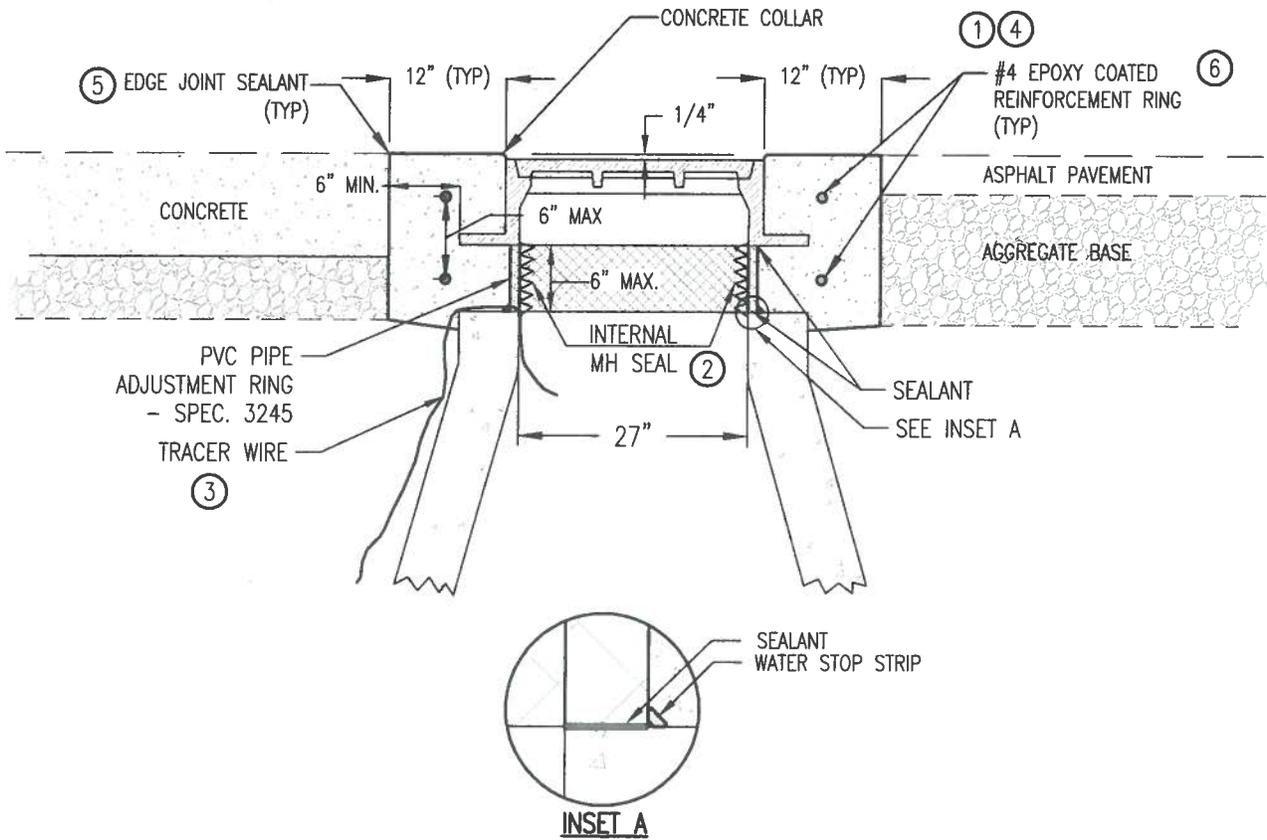
SANITARY MANHOLE NON-PAVED AREAS

SAN-3

REVISED/APPROVED 02/19/2015

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

NO SCALE



NOTES:

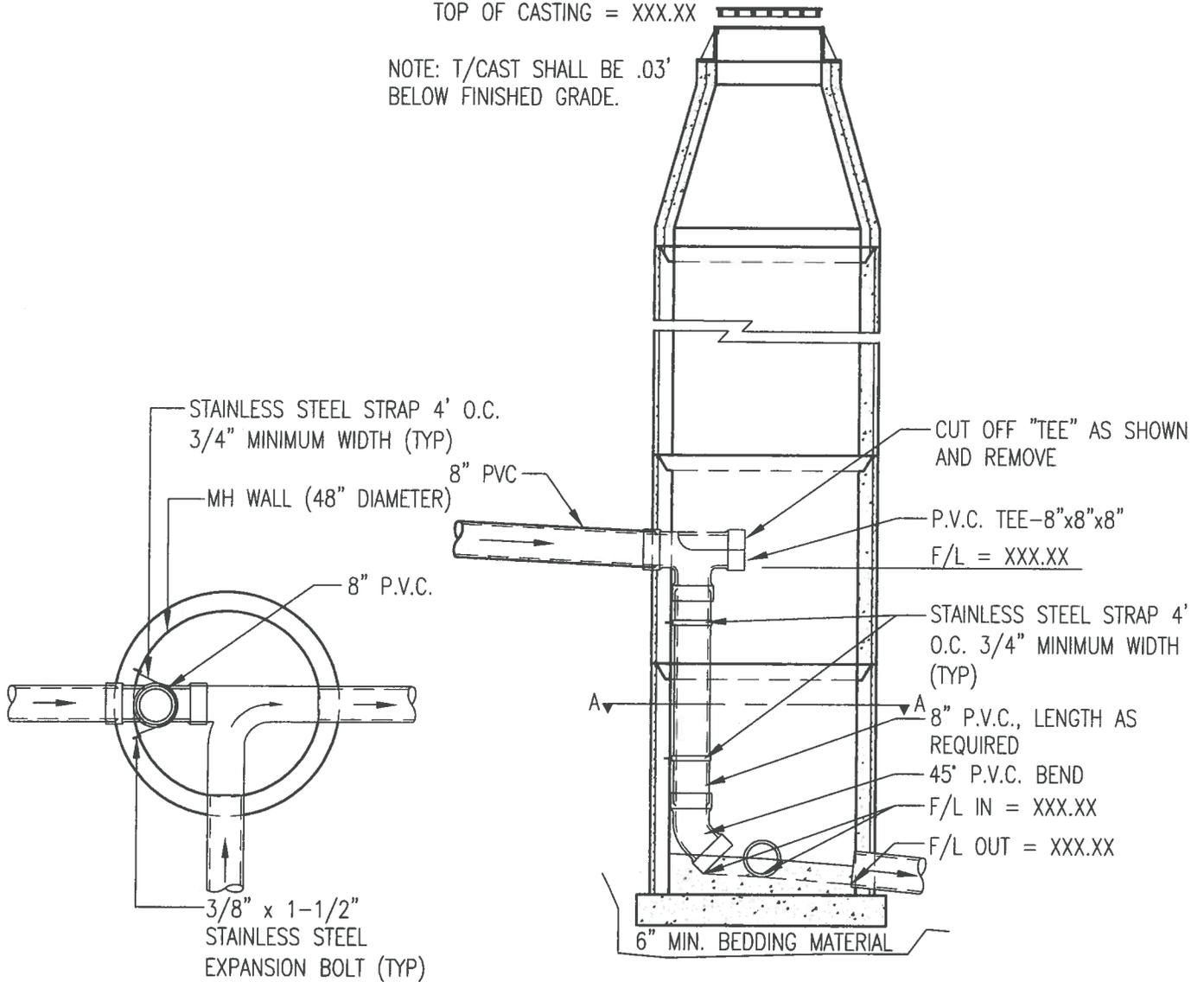
1. CONCRETE (MIX NO. 3Y43) COLLAR TO ENCASE CASTING AND ADJUSTMENT RING.
2. ALL SANITARY MANHOLE'S SHALL HAVE AN INTERNAL MANHOLE FRAME SEAL 2506 INSTALLED. ALL SEALS TO EXTEND FROM THE CASTING TO STRUCTURE CONE.
3. TRACER WIRE REQUIRED ON ALL SANITARY SEWER MAINS.
4. CONCRETE COLLAR SHALL BE CIRCULAR LAYOUT. PAVEMENT AND BASE SHALL BE CUT OUT WITH ROTATING CUTTING DEVICE
5. FINISH CONCRETE EDGE WITH 1/4" RADIUS. SEAL JOINT BETWEEN PAVEMENT AND COLLAR.
6. MAINTAIN 3.5" COVER ON REINFORCEMENT.

NOT TO SCALE

CONCRETE ENCASED CASTING COLLAR FOR SANITARY MH IN ROADWAY, WALKS, & DRIVES		SAN-3A
REVISED/APPROVED 02/19/2015	CITY OF DULUTH STANDARD DETAIL DEPT. OF PUBLIC WORKS AND UTILITIES	NO SCALE

TOP OF CASTING = XXX.XX

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



SECTION AA

NOTES: REFER TO PLAN/PROFILES FOR ELEVATIONS

CONSTRUCT INSIDE DROP STRUCTURE

SAN-4

REVISED/APPROVED 2/01/2013

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

NO SCALE

CONTRACTOR SUPPLIED MAGNETIZED
TRACER BOX WITH GREEN TOP OVER
1-1/2" I.D. BLK IRON PIPE. WIRE
CONNECTED TO TRACER BOX TERMINAL.

2" I.D. BLK IRON PIPE BOTTOM SECTION SCREWED
ONTO 2" X 1 1/2" I.D. REDUCING BUSHING
SUPPLIED BY CITY AT GARFIELD SHOP AND
INSTALLED BY CONTRACTOR. (INCIDENTAL)

BUTT FUSE REDUCER AS NECESSARY
TO MATCH LATERAL DIAMETER

BUTT FUSE WYE

TRACER
WIRE

HDPE FORCE MAIN

HDPE LATERAL SERVICE

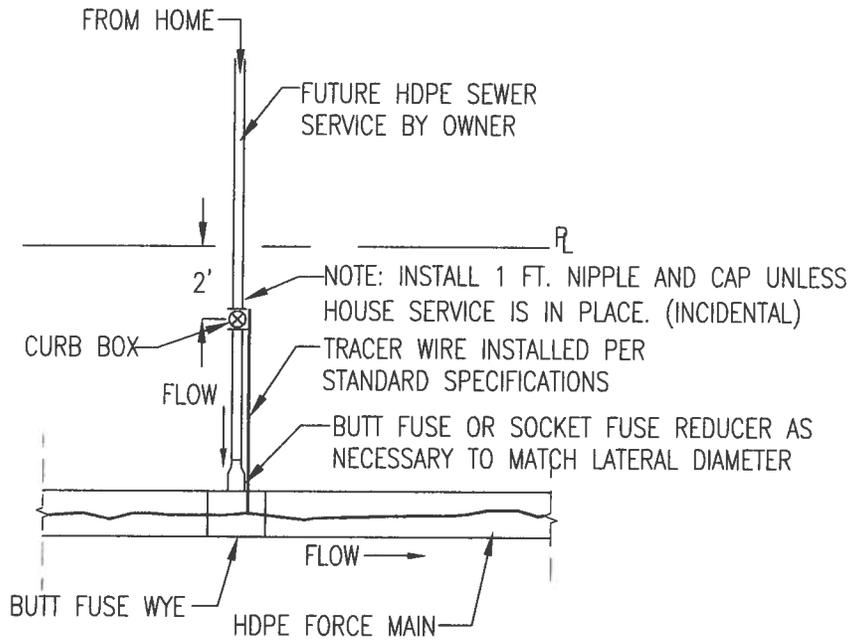
SPEC. NO. 3149.2H
COARSE FILTER AGGREGATE

CONCRETE BLOCK

7' MINIMUM COVER

TRACER WIRE RUN ALONG
OUTSIDE OF STANDPIPE

LEAVE SLACK IN WIRE



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.

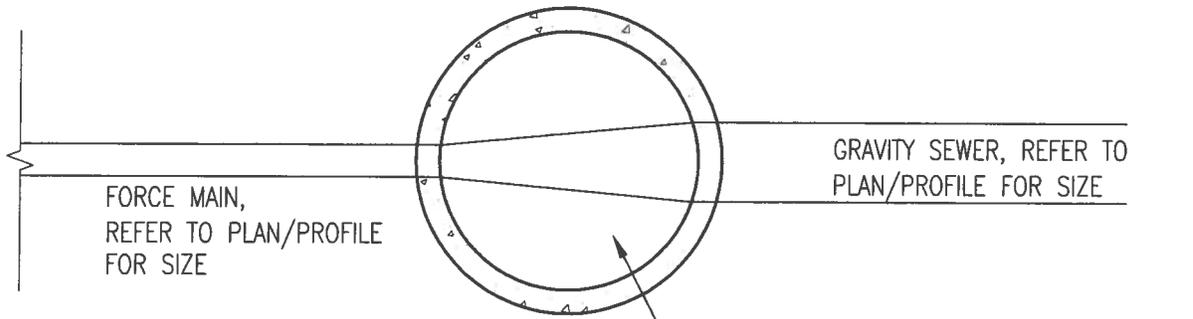
HDPE SANITARY SEWER PRESSURE LATERAL CONNECTION

SAN-5

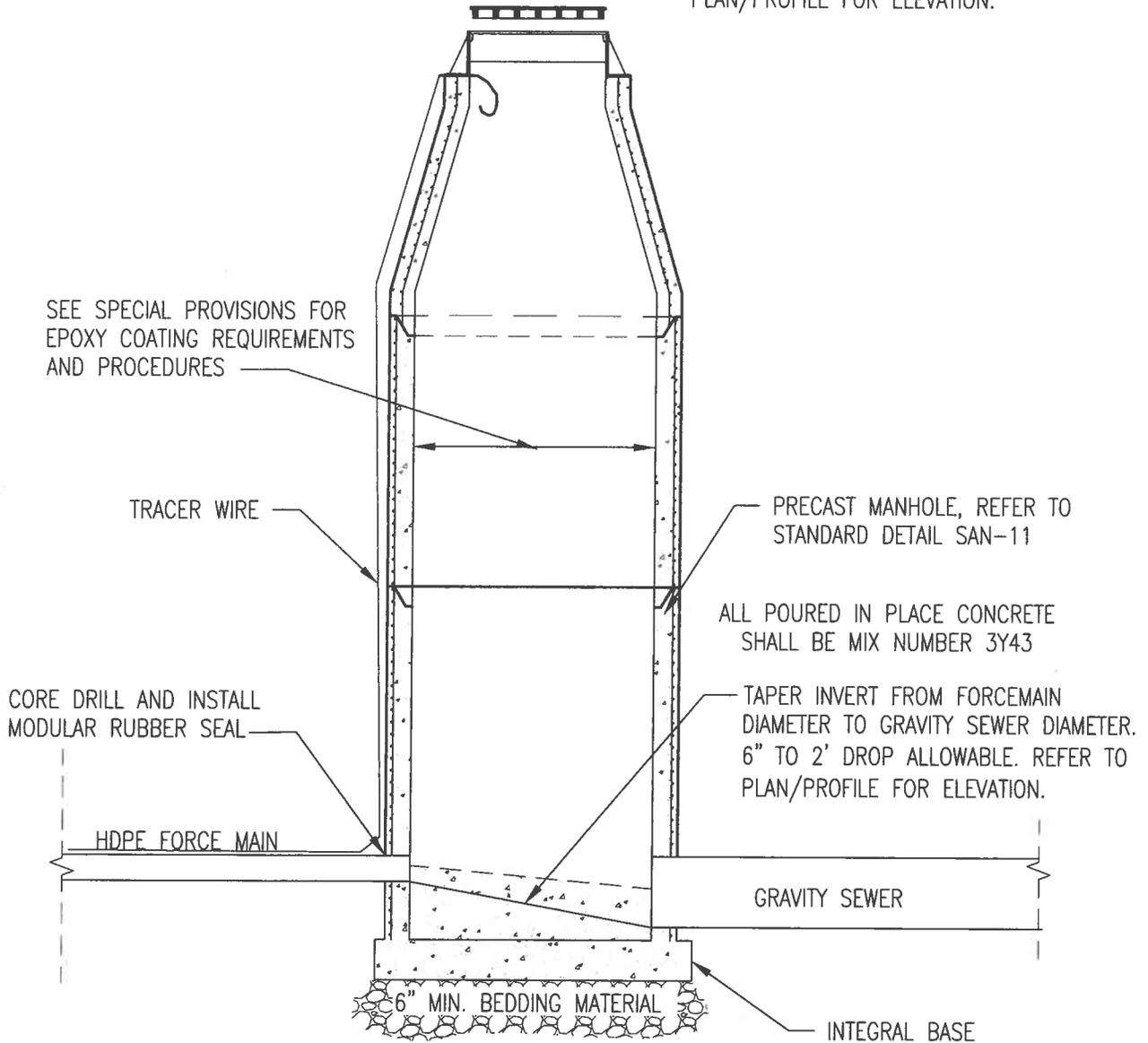
REVISED/APPROVED 06/01/2014

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

NO SCALE



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



HDPE FORCEMAIN TO GRAVITY MAIN MANHOLE

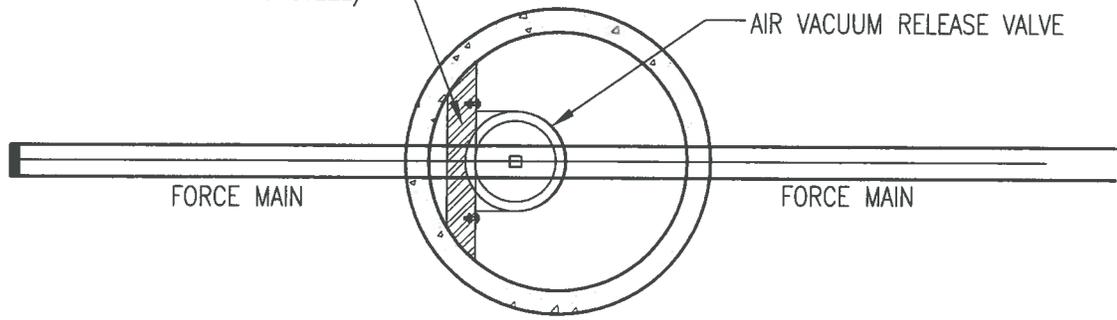
SAN-6

REVISED/APPROVED 2/01/2013

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

NO SCALE

1-1/2"x1-1/2" S.S. SUPPORT BRACKET WITH S.S. BAND OR APPROVED EQUAL (ALL PARTS AND HARDWARE TO BE STAINLESS STEEL)



NOTE: T/CASTING SHALL BE .03' BELOW FINISHED GRADE.
SEE STANDARD DETAIL FOR CHIMNEY SEAL INSTALLATION

ALL POURED IN PLACE CONCRETE SHALL BE MIX NUMBER 3Y43

1 1/2"x1 1/2" S.S. AIR RELEASE SUPPORT BRACKET WITH S.S. BAND OR APPROVED EQUAL

TRACER WIRE

CORE DRILL AND INSTALL MODULAR RUBBER SEAL

HDPE FORCE MAIN

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

1/2" TREATED PLYWOOD SUPPORTED BY 1" S.S. ANGLE IRON W/ STAINLESS LAG BOLTS.

INCIDENTAL TO MH CONSTRUCTION

PRECAST MANHOLE, REFER TO STANDARD DETAIL SAN-11

TRACER WIRE

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

2" GALV. IRON PIPE

2" P.E. FULLY PORTED BALL VALVE

HDPE FORCE MAIN

CONCRETE SUPPORT, MIN. 8" HIGH

6" MIN. BEDDING MATERIAL

INTEGRAL BASE

AIR-RELEASE MANHOLE

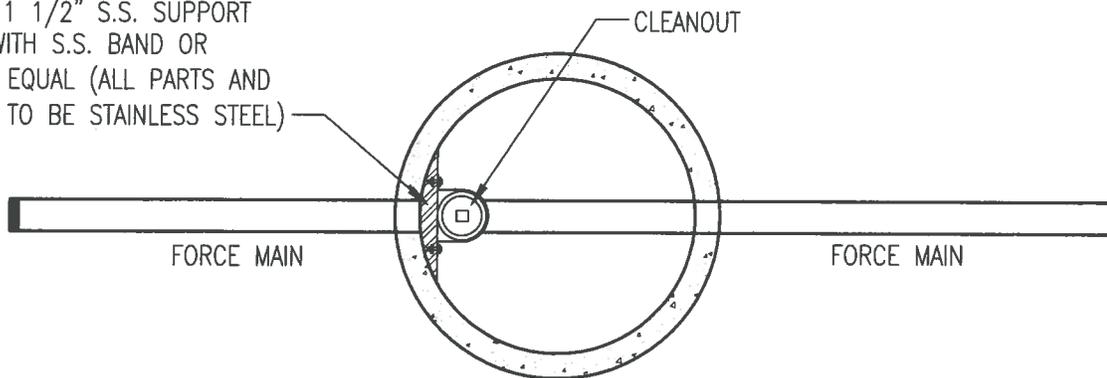
SAN-7

REVISED/APPROVED 02/01/2011

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

NO SCALE

1 1/2" X 1 1/2" S.S. SUPPORT BRACKET WITH S.S. BAND OR APPROVED EQUAL (ALL PARTS AND HARDWARE TO BE STAINLESS STEEL)



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

SEE STANDARD DETAIL FOR CHIMNEY SEAL INSTALLATION

2" CAMLOCK COUPLER
3" BELOW PLYWOOD

2" P.E. FULLY PORTED BALL VALVE

1 1/2" X 1 1/2" S.S. SUPPORT BRACKET WITH S.S. BAND OR APPROVED EQUAL BELOW VALVE AND EVERY 4 FT. (ALL PARTS AND HARDWARE TO BE STAINLESS STEEL)
TRACER WIRE

CORE DRILL AND INSTALL MODULAR RUBBER SEAL

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

1/2" TREATED PLYWOOD SUPPORTED BY 1" S.S. ANGLE IRON W/ STAINLESS LAG BOLTS.

INCIDENTAL TO MH CONSTRUCTION

TRACER WIRE

ALL POURED IN PLACE CONCRETE SHALL BE MIX NUMBER 3Y43

PRECAST MANHOLE, REFER TO STANDARD DETAIL SAN-11

P.E. 45 BEND

P.E. WYE

HDPE FORCE MAIN

HDPE FORCE MAIN

CONCRETE SUPPORT, MIN. 8" HIGH

6" MIN. BEDDING MATERIAL

INTEGRAL BASE

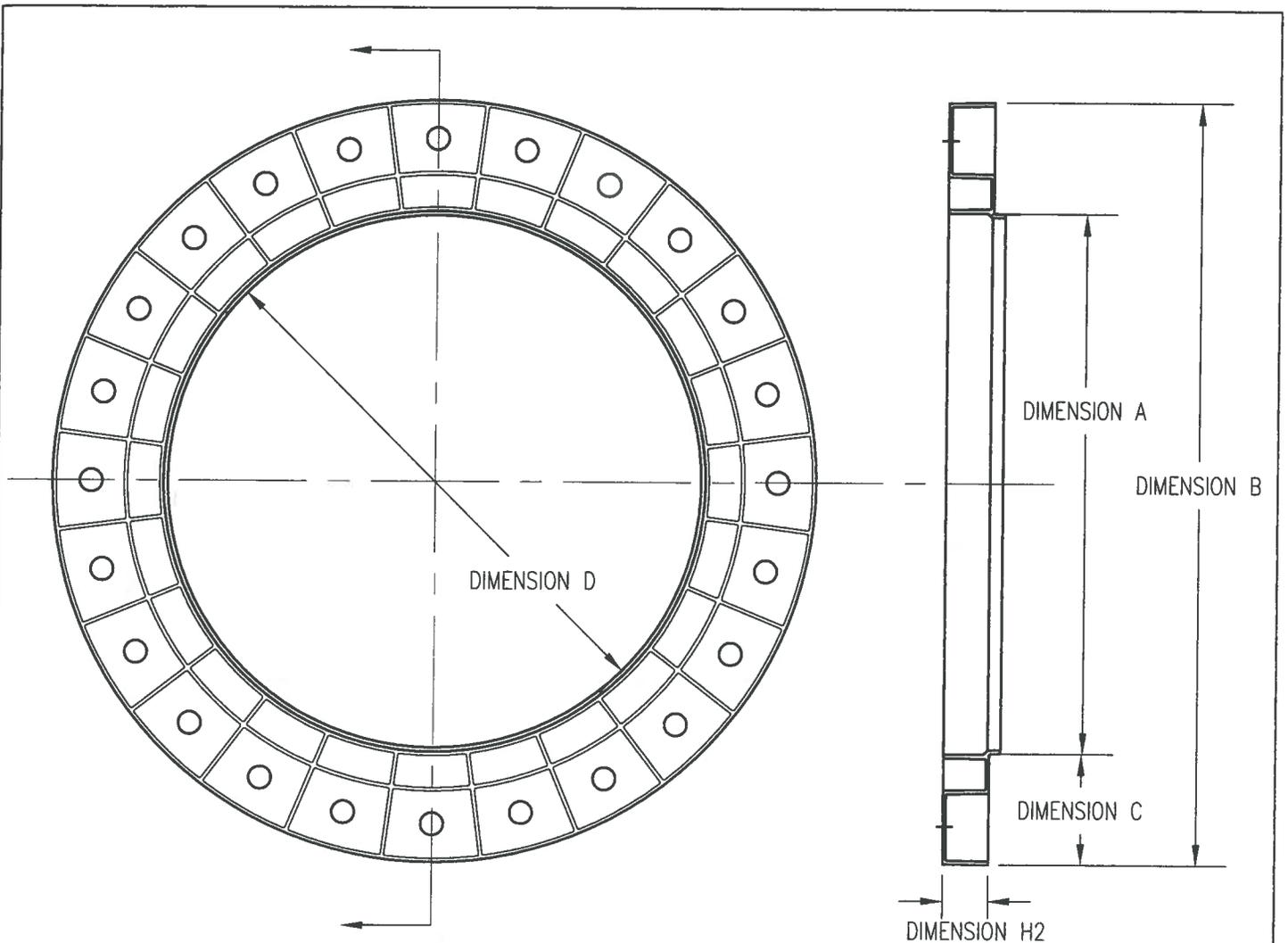
CLEANOUT MANHOLE

SAN-8

REVISED/APPROVED 2/01/2013

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

NO SCALE



DIMENSION SCHEDULE

CONE SIZE	DIMENSION A	DIMENSION B	DIMENSION C	DIMENSION D	DIMENSION H1
27.00	26.75	36.50	5.00	26.25	1.20, 1.50, 2.00, 4.00

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

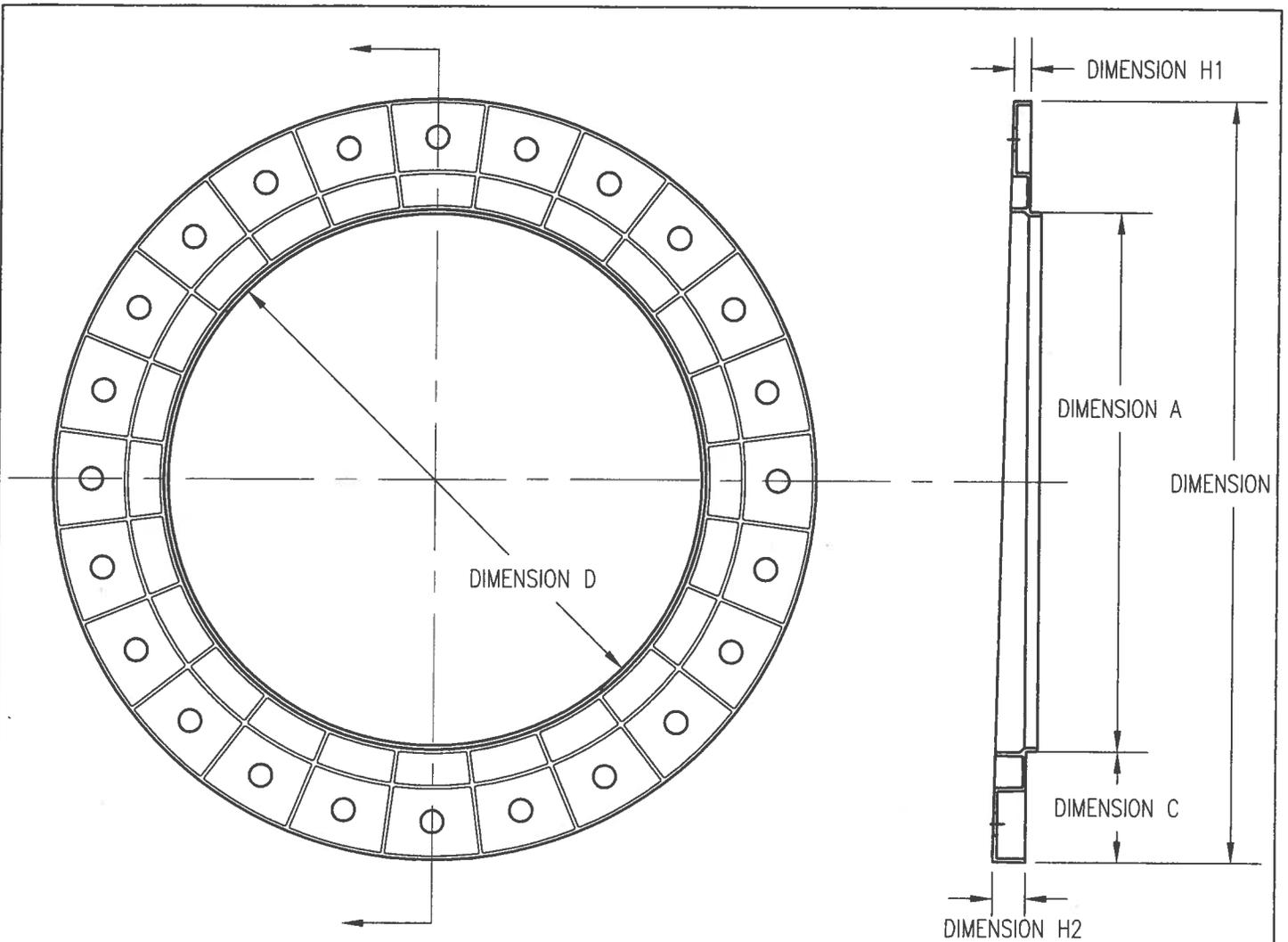
POLYETHYLENE MH ADJUSTING RING – FLAT

SAN-9

REVISED/APPROVED 2/01/2013

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

NO SCALE



DIMENSION SCHEDULE

CONE SIZE	DIMENSION A	DIMENSION B	DIMENSION C	DIMENSION D	DIMENSION H1-H2
27.00	26.75	36.50	5.00	26.25	0.75 - 1.50

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

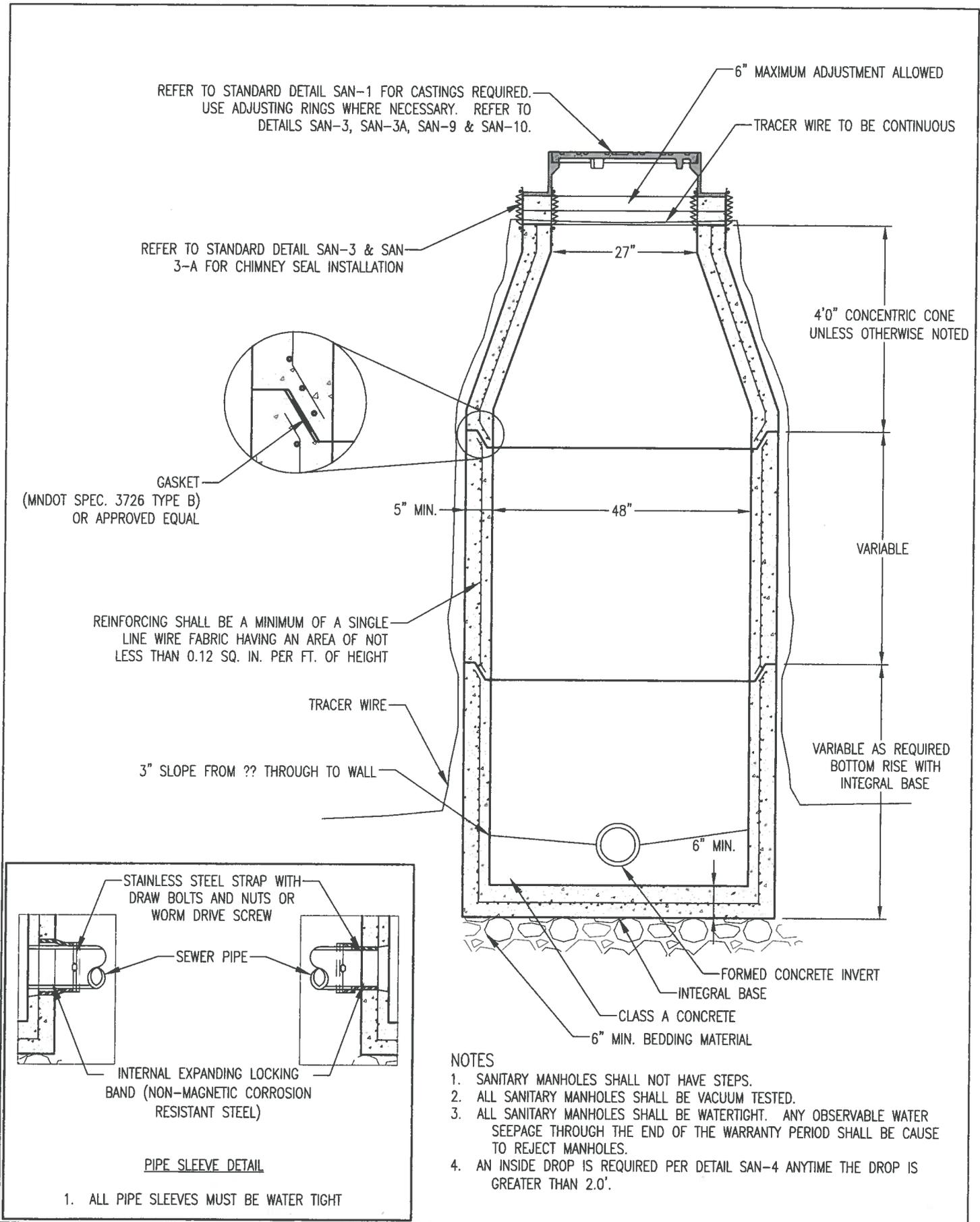
POLYETHYLENE MH ADJUSTING RING - WEDGE

SAN-10

REVISED/APPROVED 2/01/2013

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

NO SCALE



PRECAST MECHANICAL JOINT SEWER MANHOLE

SAN-11

REVISED/APPROVED 02/19/2015

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

NO SCALE