24" OR 30" RING AND COVER WITH WESTMINSTER SANITARY SEWER LETTERING ON COVER (SEE DETAILS SS11 AND SS12).

FIELD INSTALLATION PAVED AREAS

ROAD SURFACE 1/4" ABOVE RING AND COVER

18" MIN

18" MAX

12"-18"

CONCRETE COLLAR (NOT APPLICABLE IN ASPHALT STREET)

PRECAST ECCENTRIC CONE SECTION OR FLAT TOP LID AS REQUIRED.

PRECAST BARREL SECTION

CONCRETE BENCH TO BE PLACED AFTER PIPES ARE INSTALLED. BENCH SHALL EXTEND 2" (MIN.) ABOVE PIPE CROWN.

6" MIN. BEDDING MATERIAL CONFORMING TO AASHTO M6 GRADATION

UNDISTURBED SOIL OR COMPACTED BACKFILL

NOTES:
1. PRECAST CONCRETE MANHOLES SHALL BE MANUFACTURED IN ACCORDANCE WITH ASTM C478 AND AASHTO H-20 LIVELOADS.
2. TYPICAL VERTICAL DROP OF PIPE INVERTS SHALL BE 0.2' FOR PIPES WITH DIRECTION CHANGE AND 0.1' OTHERWISE.
3. A LARGER MANHOLE OR VAULT MAY BE REQUIRED DEPENDING ON NUMBER OF PIPES CONVERGING AND HORIZONTAL PIPE ANGLES.
4. MANHOLE INTERIORS WITH SEWER MAINS 15" AND LARGER SHALL BE COATED IN ACCORDANCE WITH THESE STANDARDS, INCLUDING ALL ADJUSTMENT RINGS, CONES, BARREL SECTIONS AND BASES. COATINGS APPLIED TO BENCHES SHALL CONTAIN SILICA SAND TO PREVENT SLIPPING.
5. PIPES SHALL STUB THROUGH GASKETED BOOTS PRECAST INTO THE CONCRETE (A-LOK Z-LOK OR APPROVED EQUAL) OR GASKETED BOOTS INSTALLED IN CORE-DRILLED PENETRATIONS (A-LOK G-3 OR APPROVED EQUAL). NON-SHRINK GROUT SHALL BE APPLIED AROUND PIPE STUBS AND FILL PENETRATIONS.
6. STUB-OUT PIPES FOR FUTURE CONNECTIONS SHALL USE WATER-TIGHT GASKETED PLUGS.
7. MANHOLE JOINTS (INCLUDING ADJUSTMENT RINGS AND COVER RING) SHALL BE SET USING A FLEXIBLE BITUMASTIC MATERIAL (RAM-NEK) OR EQUAL. INTERIOR JOINTS SHALL BE PLASTERED WITH MORTAR AND EXTEND 4" EACH SIDE OF JOINT. EXTERIOR BARREL SECTION JOINTS SHALL BE WRAPPED WITH JOINT TAPE (CONWRAP OR EQUAL).

<table>
<thead>
<tr>
<th>MINIMUM MANHOLE ID (NOTE 3)</th>
<th>PIPE SIZE</th>
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</thead>
<tbody>
<tr>
<td>48&quot;</td>
<td>8&quot;-15&quot;</td>
</tr>
<tr>
<td>60&quot;</td>
<td>18&quot;-21&quot;</td>
</tr>
<tr>
<td>72&quot;</td>
<td>24&quot;-30&quot;</td>
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</tbody>
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CITY of WESTMINSTER
4800 WEST 92ND AVENUE
WESTMINSTER, COLO. 80031

STANDARD PRE-CAST MANHOLE

DATE: JUNE 2019
SHEET SS1
NOTES:

1. MANHOLE JOINTS (INCLUDING ADJUSTMENT RINGS AND COVER RING) SHALL BE SET USING A FLEXIBLE BITUMASTIC MATERIAL (RAM–NEK) OR EQUAL. INTERIOR JOINTS SHALL BE PLASTERED WITH MORTAR AND EXTEND 4" EACH SIDE OF JOINT. BARREL SECTION EXTERIOR JOINTS SHALL BE WRAPPED WITH JOINT TAPE (CONWRAP OR EQUAL).

2. MINIMUM BASE REINFORCEMENT SHALL CONSIST OF A GRID PATTERN OF TIED NO. 4 BARS, 12" ON CENTER WITH 3" MINIMUM COVER. REINFORCEMENT SHALL BE INSPECTED BY THE CITY. SQUARE BASES ARE ACCEPTABLE.

3. A LARGER MANHOLE OR VAULT MAY BE REQUIRED DEPENDING ON NUMBER OF PIPES COVERING AND HORIZONTAL PIPE ANGLES.

4. TYPICAL VERTICAL DROP OF PIPE INVERTS ACROSS MANHOLE SHALL BE 0.2' FOR PIPES WITH DIRECTION CHANGE AND 0.1' OTHERWISE.

5. MANHOLE INTERIORS WITH SEWER MAINS 15" AND LARGER SHALL BE COATED IN ACCORDANCE WITH CHAPTER 4 OF THE CITY STANDARDS, INCLUDING ALL ADJUSTMENT RINGS, CONES, BARREL SECTIONS AND BASES. COATINGS APPLIED TO BENCHES SHALL CONTAIN SILICA SAND TO PREVENT SLIPPING.
1. DROP CONNECTIONS FOR 12” AND SMALLER FEED PIPES THAT HAVE A DROP HEIGHT OF 24” AND GREATER SHALL USE AN INSIDE DROP BOWL AND DROP PIPE MANUFACTURED BY RELINER-DURAN, INC. OR APPROVED EQUAL. FOR LARGER DIAMETER SEWER MAINS REFER TO DETAIL SS4.

2. PENETRATIONS IN MANHOLE WALLS SHALL HAVE GASKETED BOOTS PRECAST INTO THE CONCRETE (A-LOK Z-LOK OR APPROVED EQUAL) OR GASKETED BOOTS INSTALLED IN CORE-DRILLED PENETRATIONS (A-LOK G-3 OR APPROVED EQUAL).

3. DROP BOWL AND DROP PIPE SHALL MATCH THE INCOMING PIPE DIAMETER.

4. A FORCE LINE HOOD SHALL BE PROVIDED WHEN THE INCOMING LINE IS DOWNSTREAM OF A FORCE MAIN OR PIPE WITH SLOPE OF 3% OR GREATER.

5. SECURE DROP BOWL AND DROP PIPE TO MANHOLE WALL WITH STAINLESS STEEL ADJUSTABLE CLAMPING BRACKETS AND 4” X 3/8” STAINLESS STEEL BOLTS WITH LEAD TAMP-IN ANCHORS AS REQUIRED.

6. SEWER SERVICES ARE NOT ALLOWED TO CONNECT WITH AN INSIDE DROP. SERVICES 6” AND LARGER SHALL USE AN OUTSIDE DROP MANHOLE AND 4” SERVICES SHALL CONNECT TO THE SEWER MAIN.
NOTES:

1. DROP CONNECTIONS FOR 15" AND LARGER FEED PIPES SHALL USE AN OUTSIDE DROP PIPE ASSEMBLY. MINIMUM INVERT DROP OF 24" IS ALLOWED FOR 15" FEED PIPES. LARGER FEED PIPES WILL REQUIRE A GREATER INVERT DROP TO ACCOMMODATE DROP PIPE FITTINGS. DESIGN DRAWINGS SHALL BE PROVIDED FOR REVIEW AND APPROVAL BY THE CITY.

2. MANHOLE BASE AND BARREL SECTION DIMENSIONS AND REINFORCEMENT SHALL BE DESIGNED BY A STRUCTURAL ENGINEER.

3. ALL PIPE AND FITTINGS SHALL BE PVC AND HAVE A MINIMUM SDR OF 35 WITH WATER TIGHT GASKETS.

4. DIAMETER OF THE DROP PIPE AND UPPER AND LOWER INVERT PIPES SHALL NOT BE LESS THAN THE FEED PIPE DIAMETER.

5. CONCRETE ENCASEMENT SHALL BE A MINIMUM OF 6" THICK ALL AROUND THE LOWER INVERT PIPE ASSEMBLY AND UP TO THE LIMITS OF THE 45° DROP ELBOW FITTING SHOWN.

6. PENETRATIONS IN MANHOLE WALLS SHALL HAVE GASKETED BOOTS PRECAST INTO THE CONCRETE (A-LOK Z-LOK OR APPROVED EQUAL) OR GASKETED BOOTS INSTALLED IN CORE-DRILLED PENETRATIONS (A-LOK G-3 OR APPROVED EQUAL).

7. A LARGER MANHOLE OR VAULT MAY BE REQUIRED DEPENDING ON NUMBER OFPIPES CONVERGING AND HORIZONTAL PIPE ANGLES.
NOTES:

1. TRENCHES 5 FT DEEP OR GREATER REQUIRE A "PROTECTIVE SYSTEM" AS DEFINED BY OSHA. TRENCHES 20 FT DEEP OR GREATER REQUIRE THAT THE PROTECTIVE SYSTEM BE DESIGNED BY A REGISTERED PROFESSIONAL ENGINEER.

2. MINIMUM COVER OVER PIPE TO BE BELOW APPROVED FINAL GRADE.

3. FOR ASPHALT PATCH DEPTH REQUIREMENTS REFER TO CHAPTER 9 OF THE STANDARDS AND SPECIFICATIONS.

4. FOR BACKFILL, COMPACTION AND MATERIAL SPECIFICATION REQUIREMENTS REFER TO CHAPTER 9 OF THE STANDARDS AND SPECIFICATIONS.

5. PIPE BEDDING SHALL BE PLACED AGAINST UNDISTURBED SOIL IN THE TRENCH BOTTOM. WHERE ADVERSE SOIL IS ENCOUNTERED IN THE TRENCH BOTTOM, SOIL SHALL BE REMOVED AND TRENCH STABILIZATION MATERIAL SHALL BE PLACED IN ACCORDANCE WITH THE RECOMMENDATIONS OF A GEOTECHNICAL ENGINEER.
CONNECT 4" SERVICES TO MAIN WITH A MANHOLE WHEN MAIN SIZE IS 15" OR LARGER. 6" SERVICES SHALL CONNECT TO ANY SIZE MAIN WITH A MANHOLE.

MARKED CURB WITH "X" TO DENOTE SEWER SERVICE LOCATION
NOTES:

1. CONCRETE ENCASEMENT OR FLOWABLE FILL AROUND SEWER PIPE TO BE CAST AGAINST UNDISTURBED SOIL OR SHORING AND SHALL EXTEND AT LEAST 10-FEET EACH SIDE OF WATER MAIN CROSSING.

2. SEWER PIPE CASING BELOW A WATER MAIN SHALL CONSIST OF A SINGLE SECTION OF STEEL, DUCTILE IRON OR PVC PIPE AND EXTEND AT LEAST 9-FEET EACH SIDE OF THE WATER MAIN CROSSING. SUITABLE CASING SPACERS AND END SEALS SHALL BE PROVIDED.

3. SEWER PIPE CASING ABOVE A WATER MAIN SHALL CONSIST OF A SINGLE SECTION OF STEEL OR DUCTILE IRON PIPE AND EXTEND AT LEAST 9-FEET EACH SIDE OF THE WATER MAIN CROSSING. SUITABLE CASING SPACERS AND END SEALS SHALL BE PROVIDED.
CASING SPACER SHALL BE SPACED IN ACCORDANCE WITH MANUFACTURER’S REQUIREMENTS OR 8 FEET MAX.

DOUBLE CASING SPACERS SHALL BE SPACED A MAXIMUM OF ONE FOOT FROM EACH END OF CASING

1’ MAX

8’ MAX

CASING PIPE

CARRIER PIPE

NOTE 6

END SEAL WITH STAINLESS STEEL BANDS, TYP (NOTE 3)

TYPICAL CASING SPACER CONFIGURATION

CARRIER PIPE

CASING SPACER

NOTE 1

RUNNER (NOTE 2)

CASING PIPE

NOTE 4

TYPICAL END VIEW

NOTES:

1. CASING SPACER WIDTH SHALL BE 8 INCH FOR PIPES UP TO 24 INCHES AND 12 INCH FOR PIPES 27 INCHES AND LARGER. CASING SPACERS SHALL BE STAINLESS STEEL AND MANUFACTURED BY CCI MODEL CSS, APS MODEL SSI OR APPROVED EQUAL.

2. CASING SPACER RUNNER AND RISER HEIGHTS SHALL BE ADJUSTED ALONG THE CASING PROFILE TO MAINTAIN THE DESIGN SLOPE OF THE CARRIER PIPE. MAXIMUM VOID BETWEEN RISER AND CASING SHALL BE 2 INCHES. QUANTITY OF RUNNERS/RISERS SHALL BE IN ACCORDANCE WITH THE MANUFACTURER’S RECOMMENDATIONS.

3. END SEALS SHALL BE 1/8 INCH MINIMUM THICK RUBBER WITH STAINLESS STEEL STRAPS AND MANUFACTURED BY ADS, INC. OR APPROVED EQUAL.

4. CASING PIPE SHALL BE NEW AND HAVE A MINIMUM WALL THICKNESS OF 0.375 INCHES FOR CARRIER PIPES LESS THAN 30 INCHES AND THICKNESS OF 0.500 INCHES FOR CARRIER PIPES 30 INCHES AND LARGER.

5. CATHODIC PROTECTION OF CASING PIPE SHALL BE PROVIDED FOR ALL ROADWAY AND RAILROAD CROSSINGS.

6. JOINT RESTRAINT OF THE CARRIER PIPE SHALL BE REQUIRED INSIDE THE CASING.
1. STANDARD 23–7/8" COVERS SHALL BE USED WITH 21" AND SMALLER SEWER MAINS.

   STANDARD 30" COVERS SHALL BE USED WITH 24" AND LARGER SEWER MAINS.

2. STANDARD (NON-HINGED) COVERS SHALL BE REQUIRED IN ALL PAVED AREAS.

3. CASTINGS SHALL BE GRAY IRON AND CONFORM TO THE REQUIREMENTS OF ASTM A48 CL35B AND HAVE AASHTO H–20 LOAD RATING.
1. LOCKING AND HINGED 24" NOMINAL DIAMETER RING AND COVERS SHALL BE USED WITH 21" AND SMALLER SEWER MAINS.

LOCKING AND HINGED 32" NOMINAL DIAMETER RING AND COVERS SHALL BE USED WITH 24" AND LARGER SEWER MAINS.

2. LOCKING AND HINGED RING AND COVERS SHALL BE REQUIRED IN ALL FIELD INSTALLATIONS (NON-PAVED AREAS).

3. CASTINGS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M105 AND M306 AND ASTM A536.

4. HINGED COVERS SHALL LOCK IN THE 90° POSITION AND REST IN THE 120° POSITION AND SHALL BE REMOVABLE FROM THE RING AS NEEDED.

5. STAINLESS STEEL CAM LOCK SHAFT SHALL BE COMPATIBLE WITH THE CITY’S CURRENT KEY CONFIGURATION.

6. FOR STABILITY, RINGS SHALL BE BOLTED TO MANHOLE TOP SECTIONS PRIOR TO POURING CONCRETE COLLARS.

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LOCKING HINGED SANITARY SEWER COVER IN NON-PAVED AREAS

DATE: JUNE 2019

SHEET SS12
1. Excavations within paved areas shall be backfilled with flowable fill or flowable flyash material. Refer to Chapter 9 of the City Standards and Specifications for Trench Backfill and Compaction Requirements.
NOTE:

1. REFER TO CHAPTER 9 OF THE CITY STANDARDS AND SPECIFICATIONS FOR LOW PERMEABILITY BARRIER MATERIAL REQUIREMENTS.
NOTE:
1. FOR SHALLOW SERVICE PIPES, ADJUST ANGLES ON WYE AND RISER ASSEMBLY TO MAINTAIN EXISTING SERVICE PIPE SLOPES.