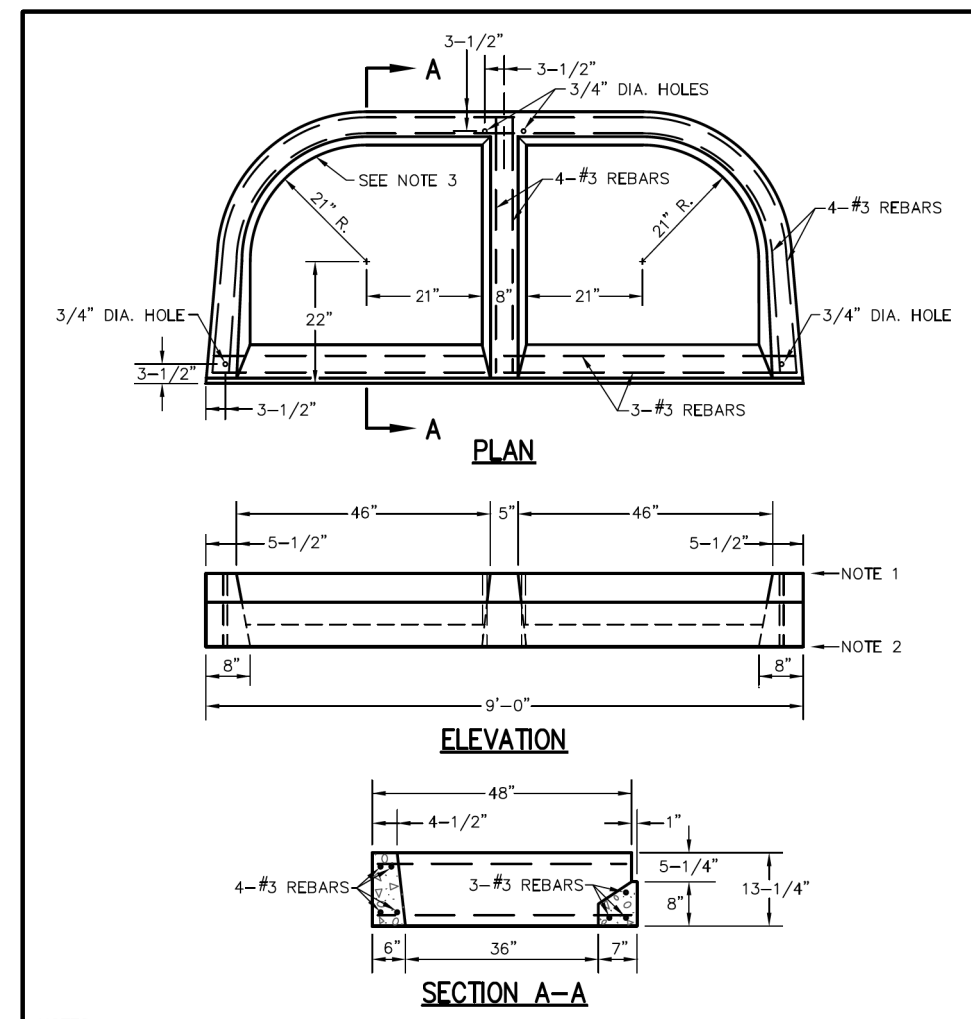


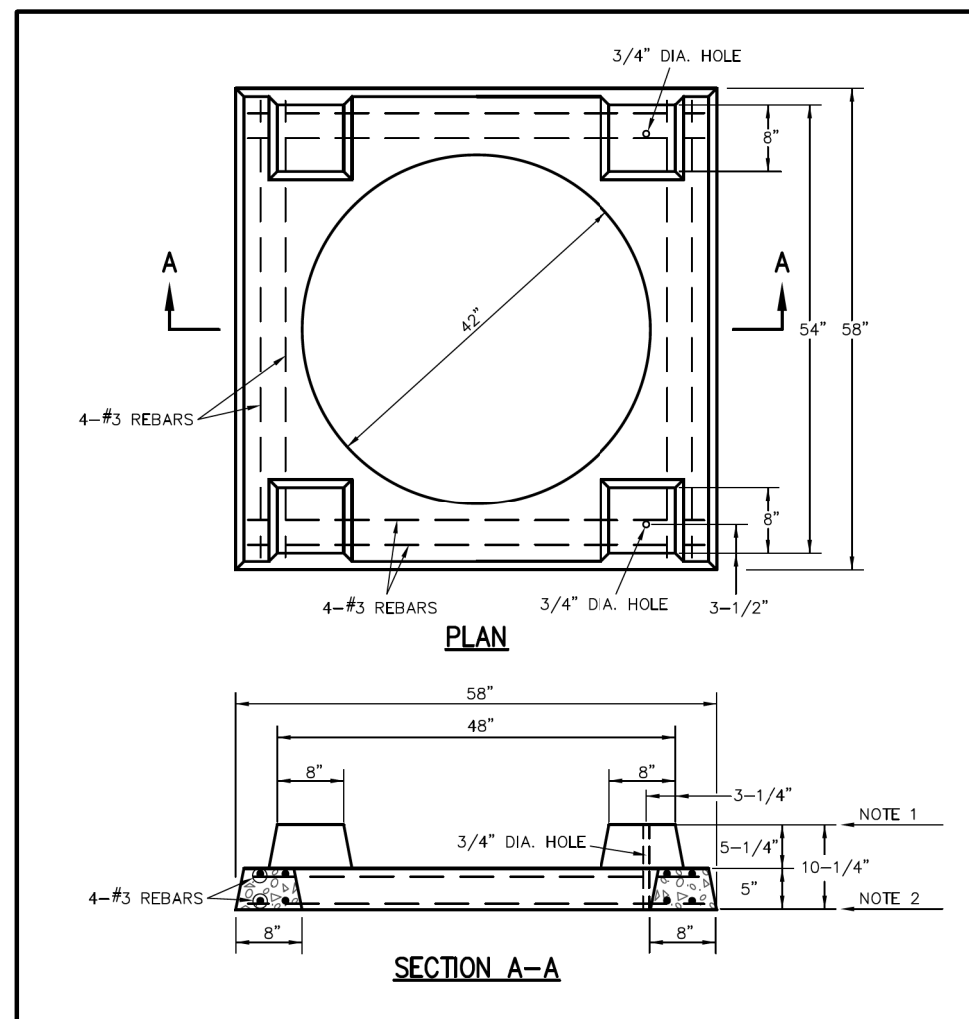
NOTES:
 1) SET TWO (2) STANDARD INLET STONES IN 3/4" MORTAR BED AND DOWEL WITH 5/8" DIA. 1'-0" LONG PINS AND GROUT.
 2) RAISE TO FINAL GRADE WITH COURSES OF BRICK AND SET THE UNIT TO BASE WITH 3/4" MORTAR BED.
 3) THIS UNIT IS TO BE USED WITH POURED-IN-PLACE CONCRETE BASE.
 4) 5000 P.S.I. CONCRETE REQUIRED.
 5) 1 INCH CLEARANCE, ALL REINFORCEMENT.

PRECAST CONCRETE UNIT "A" FOR STREET DOUBLE INLET
 METROPOLITAN ST. LOUIS SEWER DISTRICT
 Standard Details of Sewer Construction
 Dr. RGV/SAM Ch. J.C.K. 2009 SHEET 42



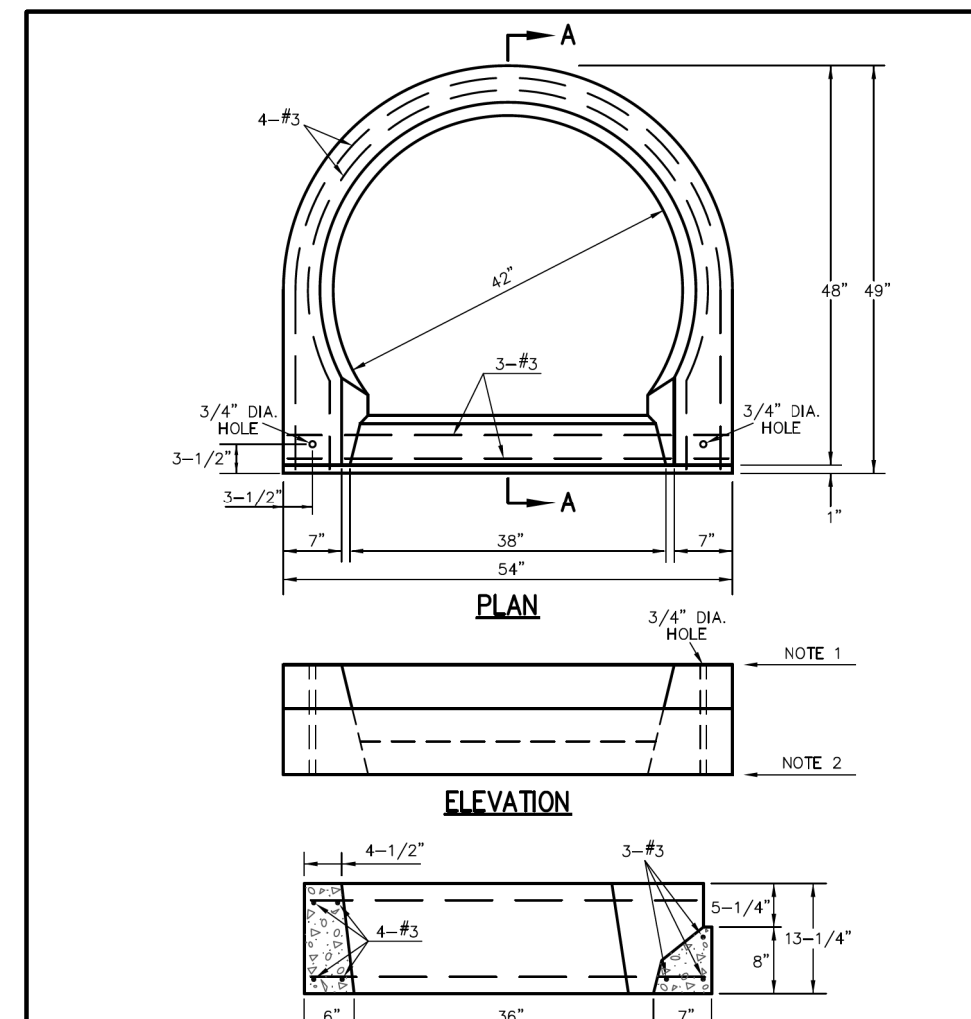
NOTES:
 1) SET TWO (2) STANDARD INLET STONES IN 3/4" MORTAR BED AND DOWEL WITH 5/8" DIA. 1'-0" LONG PINS AND GROUT.
 2) SET THE UNIT TO BASE WITH 3/4" MORTAR BED.
 3) THIS UNIT TO BE USED WITH PRECAST BASE OR BRICK BASE HAVING 8 INCH THICK WALLS AND INSIDE DIMENSIONS CONFORMING TO THE INSIDE DIMENSIONS OF THE UNIT AS INDICATED.
 4) 5000 P.S.I. CONCRETE REQUIRED.
 5) 1 INCH CLEARANCE, ALL REINFORCEMENT.

PRECAST CONCRETE UNIT "B" FOR STREET DOUBLE INLET
 METROPOLITAN ST. LOUIS SEWER DISTRICT
 Standard Details of Sewer Construction
 Dr. RGV/SAM Ch. J.C.K. 2009 SHEET 43



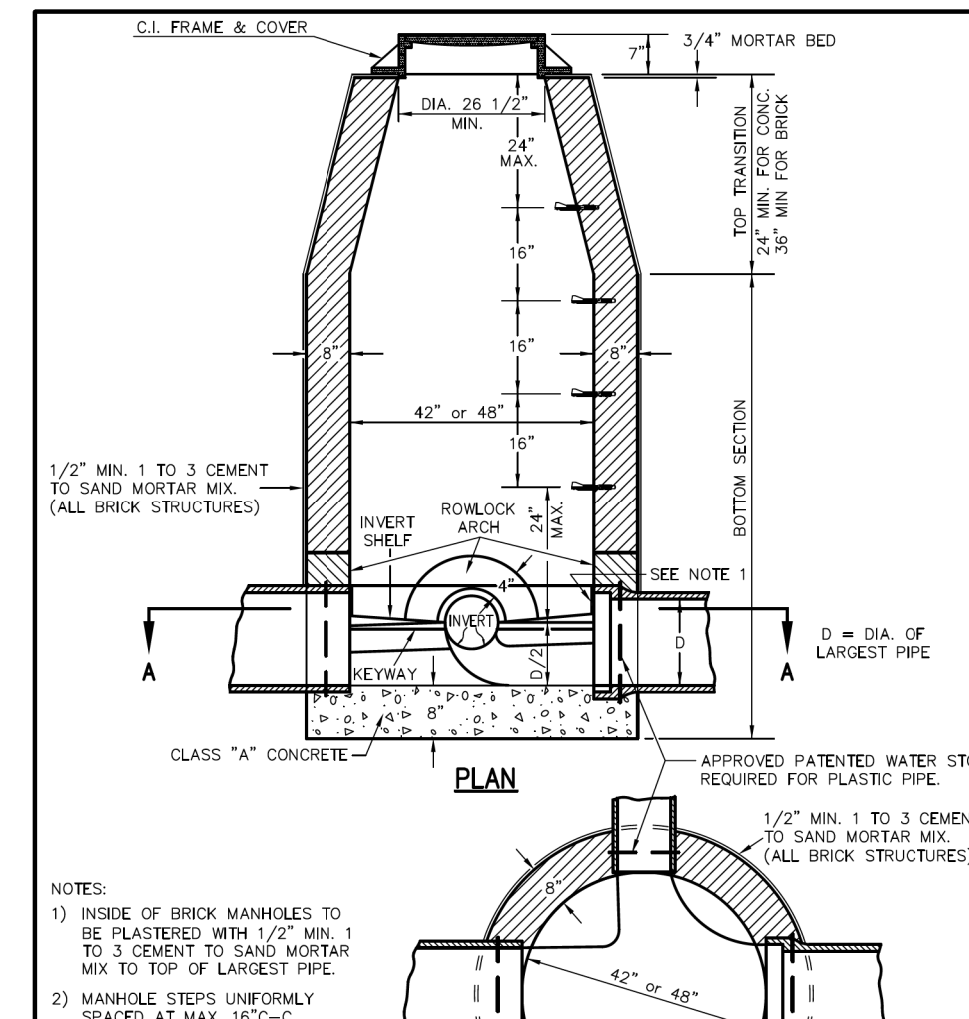
NOTES:
 1) SET STANDARD INLET STONE IN 3/4" MORTAR BED AND DOWEL WITH 5/8" DIA. 1'-0" LONG PINS AND GROUT.
 2) RAISE TO FINAL GRADE WITH COURSES OF BRICK AND SET THE UNIT TO BASE WITH 3/4" MORTAR BED.
 3) THIS UNIT IS TO BE USED WITH 42 INCH I.D. BASE.
 4) 5000 P.S.I. CONCRETE IS REQUIRED.

PRECAST CONCRETE UNIT FOR 4 WAY AREA INLET
 METROPOLITAN ST. LOUIS SEWER DISTRICT
 Standard Details of Sewer Construction
 Dr. RGV/SAM Ch. J.C.K. 2009 SHEET 40



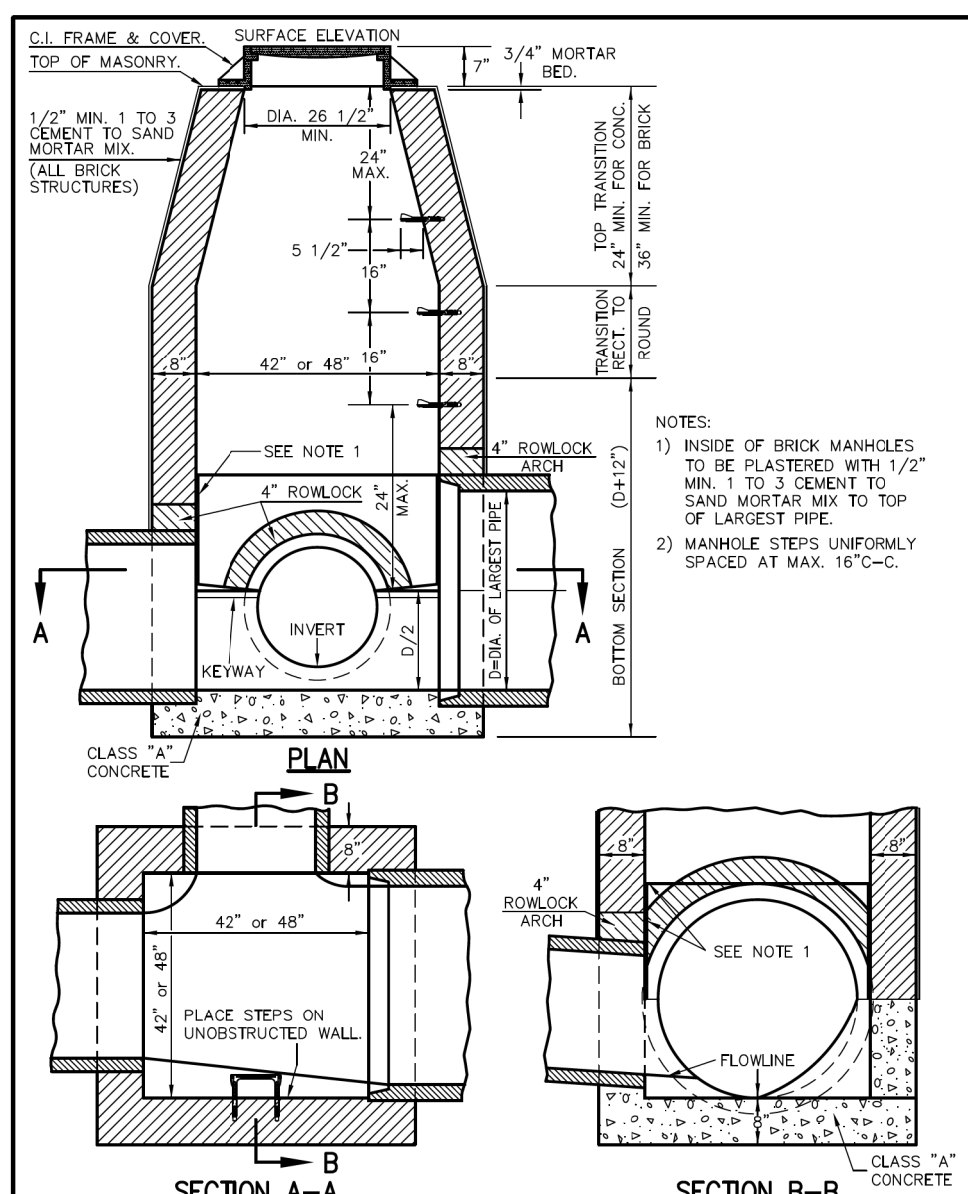
NOTES:
 1) SET STANDARD INLET STONE IN 3/4" MORTAR BED AND DOWEL WITH 5/8" DIA. 1'-0" LONG PINS AND GROUT.
 2) RAISE TO FINAL GRADE WITH COURSES OF BRICK AND SET THE UNIT TO BASE WITH 3/4" MORTAR BED.
 3) THIS UNIT IS TO BE USED WITH 42 INCH I.D. POURED-IN-PLACE CONCRETE OR BRICK BASE.
 4) 5000 P.S.I. CONCRETE IS REQUIRED.

PRECAST CONCRETE UNIT FOR SINGLE STREET INLET
 METROPOLITAN ST. LOUIS SEWER DISTRICT
 Standard Details of Sewer Construction
 Dr. WSH/SAM Ch. J.C.K. 2009 SHEET 39



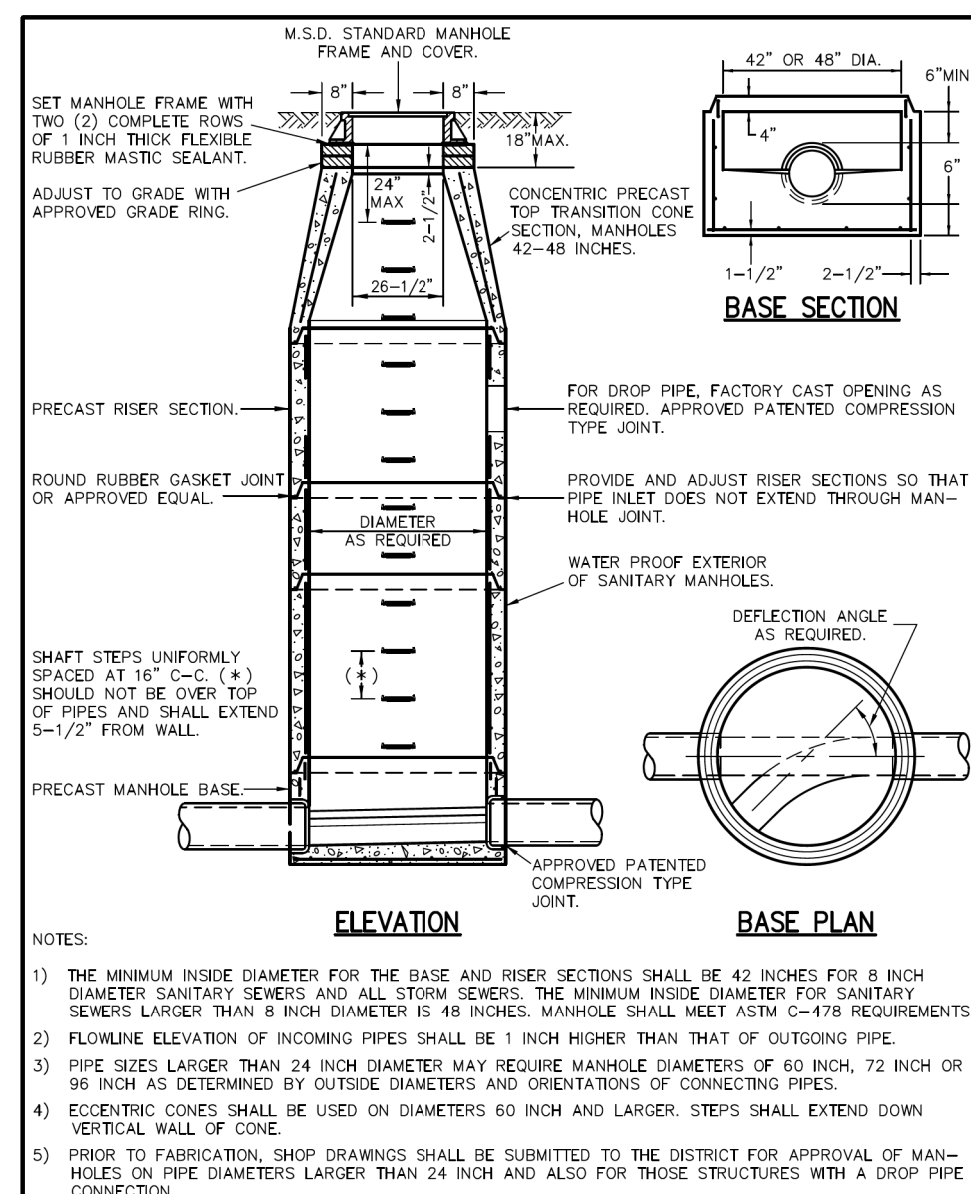
NOTES:
 1) INSIDE OF BRICK MANHOLES TO BE PLASTERED WITH 1/2" MIN. 1 TO 3 CEMENT TO SAND MORTAR MIX TO TOP OF LARGEST PIPE.
 2) MANHOLE STEPS UNIFORMLY SPACED AT MAX. 15" O.C.
 3) GRANULAR BEDDING REQUIRED AROUND PIPE AT MANHOLES.
 4) THE MINIMUM INSIDE DIAMETER FOR THE BASE AND RISER SECTIONS SHALL BE 42" FOR 8" DIAMETER SANITARY SEWERS AND ALL OTHER SEWERS, THE MINIMUM INSIDE DIAMETER FOR INSIDE DROPPING MANHOLES AND SANITARY SEWERS LARGER THAN 8" DIAMETER IS 48 INCHES.

LINE MANHOLE FOR PIPE SEWERS 8"-24" DIA.
 METROPOLITAN ST. LOUIS SEWER DISTRICT
 Standard Details of Sewer Construction
 Dr. WSH/SAM Ch. J.C.K. 2009 SHEET 10 (REV)



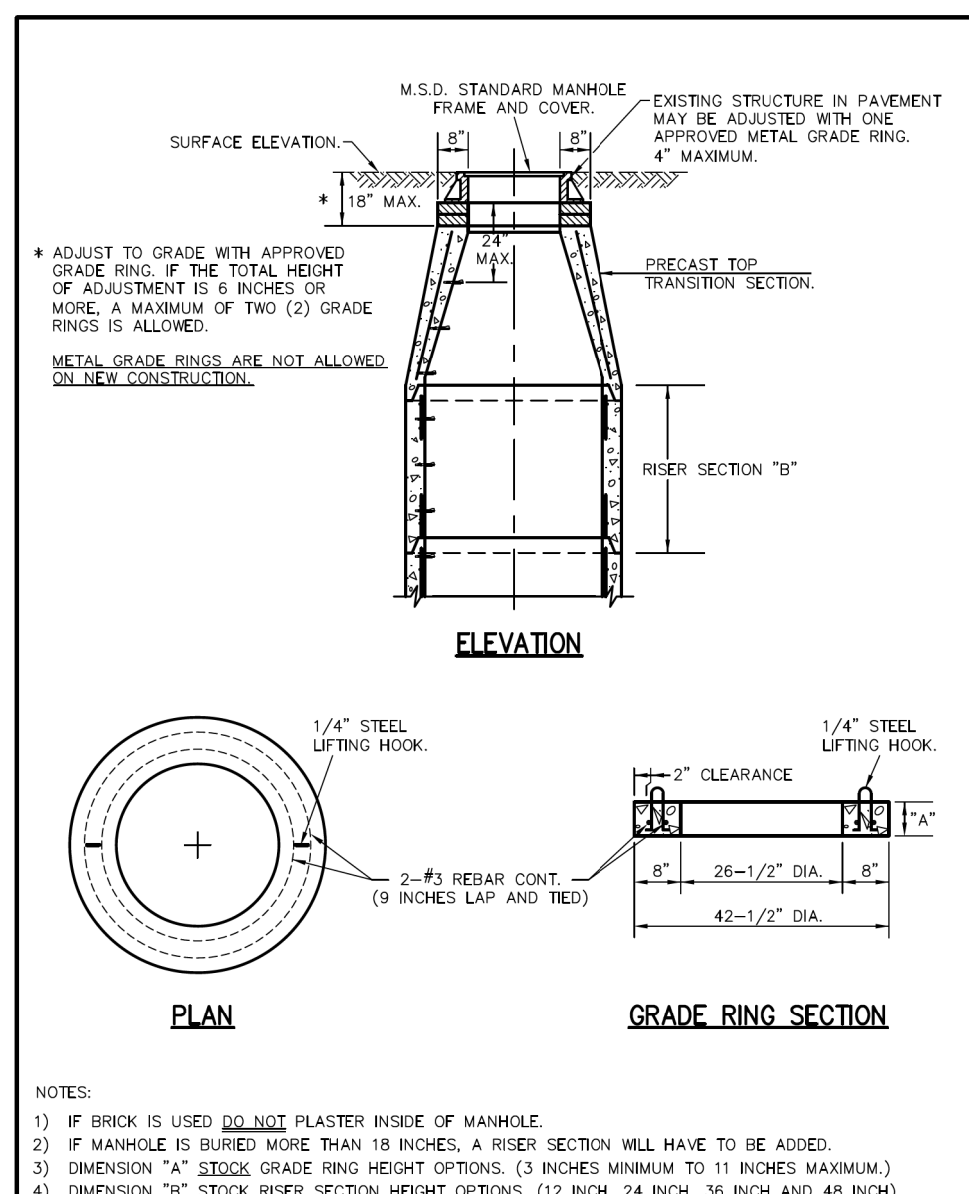
NOTES:
 1) INSIDE OF BRICK MANHOLES TO BE PLASTERED WITH 1/2" MIN. 1 TO 3 CEMENT TO SAND MORTAR MIX TO TOP OF LARGEST PIPE.
 2) MANHOLE STEPS UNIFORMLY SPACED AT MAX. 15" O.C.

TYPICAL LINE MANHOLE ON PIPE SEWER 27" THRU 42" IN DIAMETER
 METROPOLITAN ST. LOUIS SEWER DISTRICT
 Standard Details of Sewer Construction
 Dr. WSH/SAM Ch. J.C.K. 2009 SHEET 11 (REV)



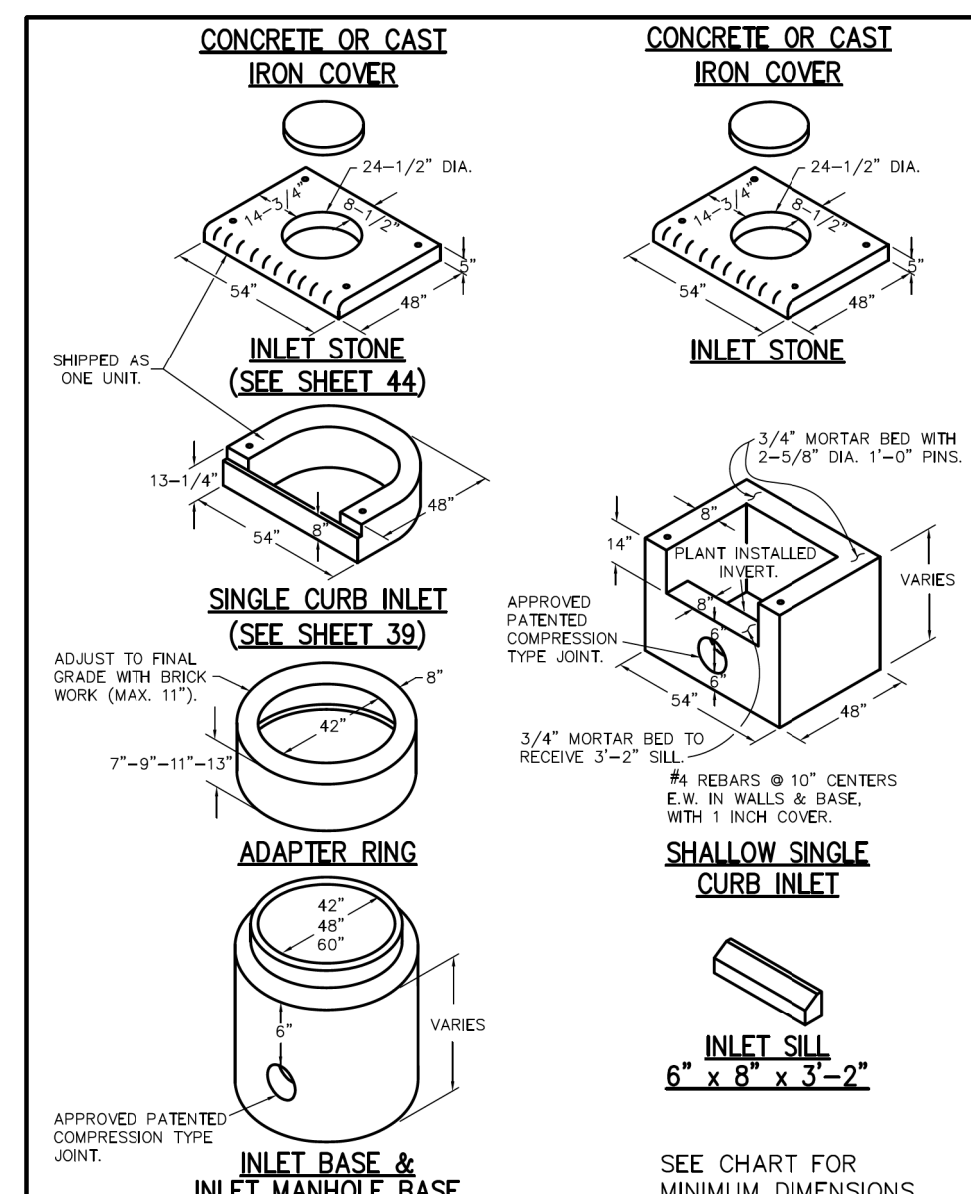
NOTES:
 1) THE MINIMUM INSIDE DIAMETER FOR THE BASE AND RISER SECTIONS SHALL BE 42 INCHES FOR 8 INCH DIAMETER SANITARY SEWERS AND ALL OTHER SEWERS, THE MINIMUM INSIDE DIAMETER FOR SANITARY SEWERS LARGER THAN 8 INCH DIAMETER IS 48 INCHES. MANHOLE SHALL MEET ASTM C-478 REQUIREMENTS.
 2) FLOWLINE ELEVATION OF INCOMING PIPES SHALL BE 1 INCH HIGHER THAN THAT OF OUTGOING PIPE.
 3) PIPE SIZES LARGER THAN 24 INCH DIAMETER MAY REQUIRE MANHOLE DIAMETERS OF 60 INCH, 72 INCH OR 96 INCH AS DETERMINED BY OUTSIDE DIAMETERS AND ORIENTATIONS OF CONNECTING PIPES.
 4) ECCENTRIC CONES SHALL BE USED ON DIAMETERS 60 INCH AND LARGER, SECTIONS SHALL EXTEND DOWN VERTICAL WALL OF CONE.
 5) PRIOR TO FABRICATION, SHOP DRAWINGS SHALL BE SUBMITTED TO THE DISTRICT FOR APPROVAL OF MANHOLE ON PIPE DIAMETERS LARGER THAN 24 INCH AND ALSO FOR THOSE STRUCTURES WITH A DROP PIPE CONNECTION.

PRECAST CONCRETE MANHOLE
 METROPOLITAN ST. LOUIS SEWER DISTRICT
 Standard Details of Sewer Construction
 Dr. S.A.M. Ch. P.W.S. 2009 SHEET 21 (REV)



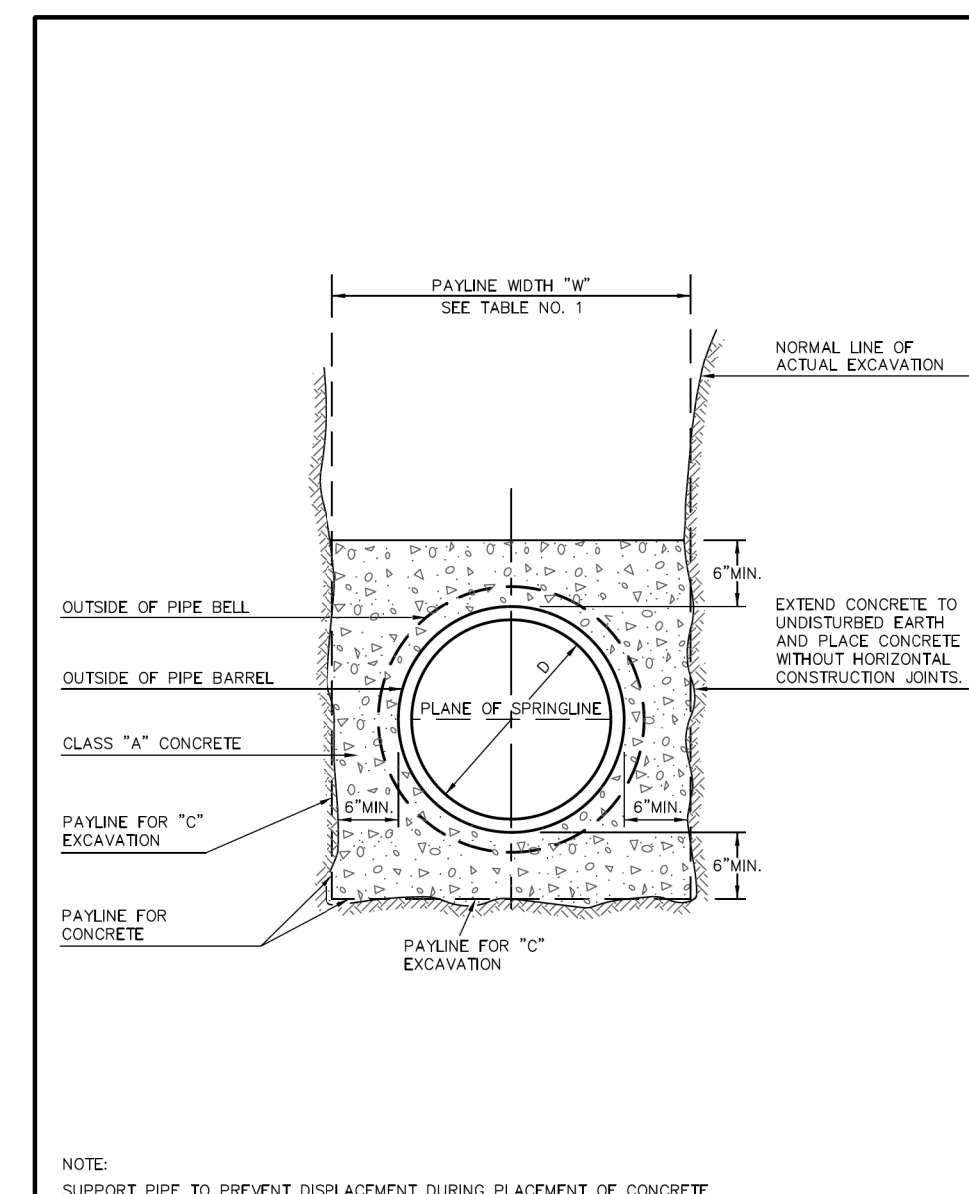
NOTES:
 1) IF BRICK IS USED DO NOT PLASTER INSIDE OF MANHOLE.
 2) IF MANHOLE IS BUILT MORE THAN 18 INCHES, A RISER SECTION WILL HAVE TO BE ADDED.
 3) DIMENSION "A" STOCK GRADE RING HEIGHT OPTIONS: (3 INCHES MINIMUM TO 11 INCHES MAXIMUM.)
 4) DIMENSION "B" STOCK RISER SECTION HEIGHT OPTIONS: (12 INCH, 24 INCH, 36 INCH AND 48 INCH)

ADJUST TO GRADE
 METROPOLITAN ST. LOUIS SEWER DISTRICT
 Standard Details of Sewer Construction
 Dr. S.A.M. Ch. P.W.S. 2009 SHEET 23 (REV)



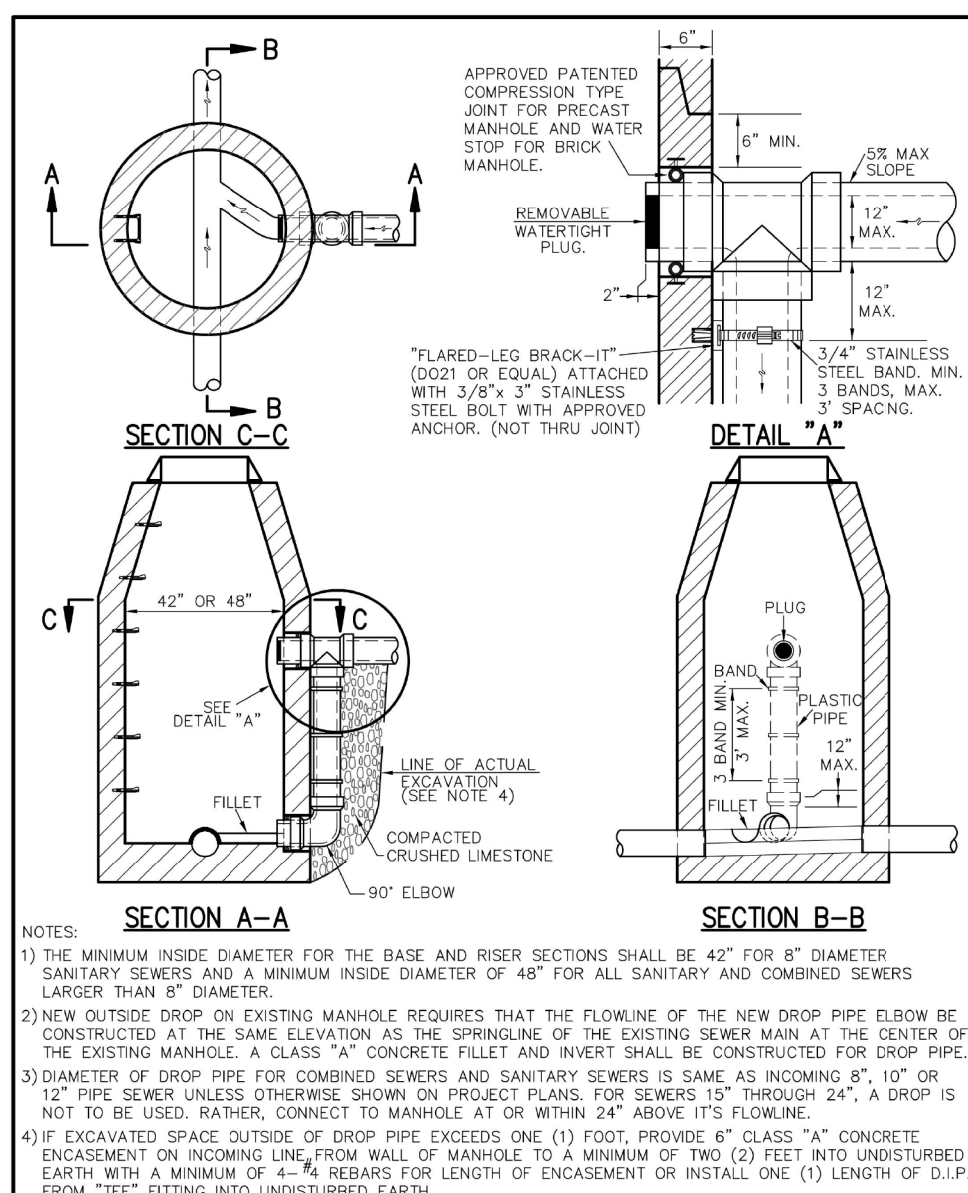
NOTES:
 1) IF BRICK IS USED DO NOT PLASTER INSIDE OF MANHOLE.
 2) IF MANHOLE IS BUILT MORE THAN 18 INCHES, A RISER SECTION WILL HAVE TO BE ADDED.
 3) DIMENSION "A" STOCK GRADE RING HEIGHT OPTIONS: (3 INCHES MINIMUM TO 11 INCHES MAXIMUM.)
 4) DIMENSION "B" STOCK RISER SECTION HEIGHT OPTIONS: (12 INCH, 24 INCH, 36 INCH AND 48 INCH)

CONCRETE OR CAST IRON COVER
 METROPOLITAN ST. LOUIS SEWER DISTRICT
 Standard Details of Sewer Construction
 Dr. JLG/SAM Ch. J.C.K. 2009 SHEET 36



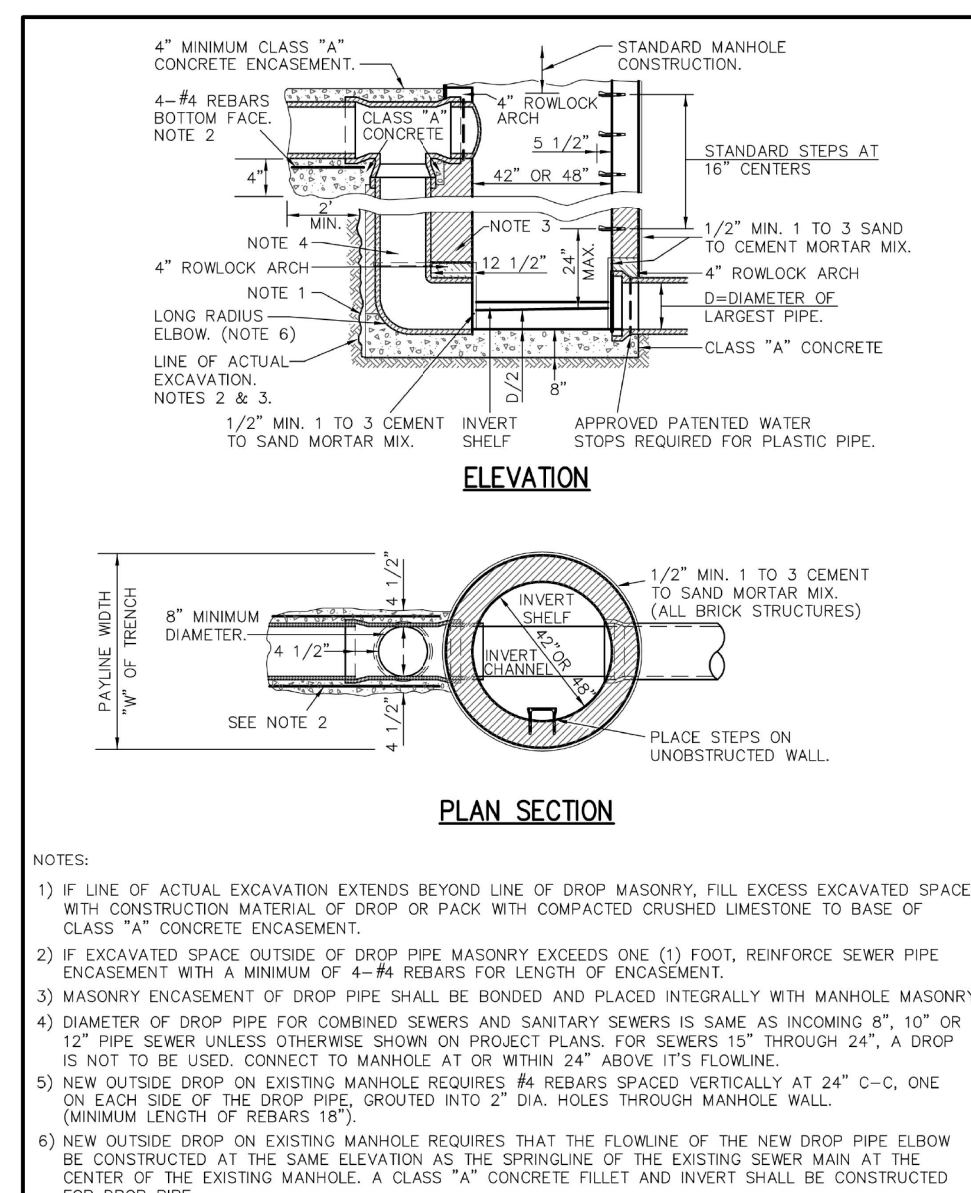
NOTE:
 SUPPORT PIPE TO PREVENT DISPLACEMENT DURING PLACEMENT OF CONCRETE.

CONCRETE ENCASUREMENT
 METROPOLITAN ST. LOUIS SEWER DISTRICT
 Standard Details of Sewer Construction
 Dr. WSH/SAM Ch. J.C.K. 2009 SHEET 8



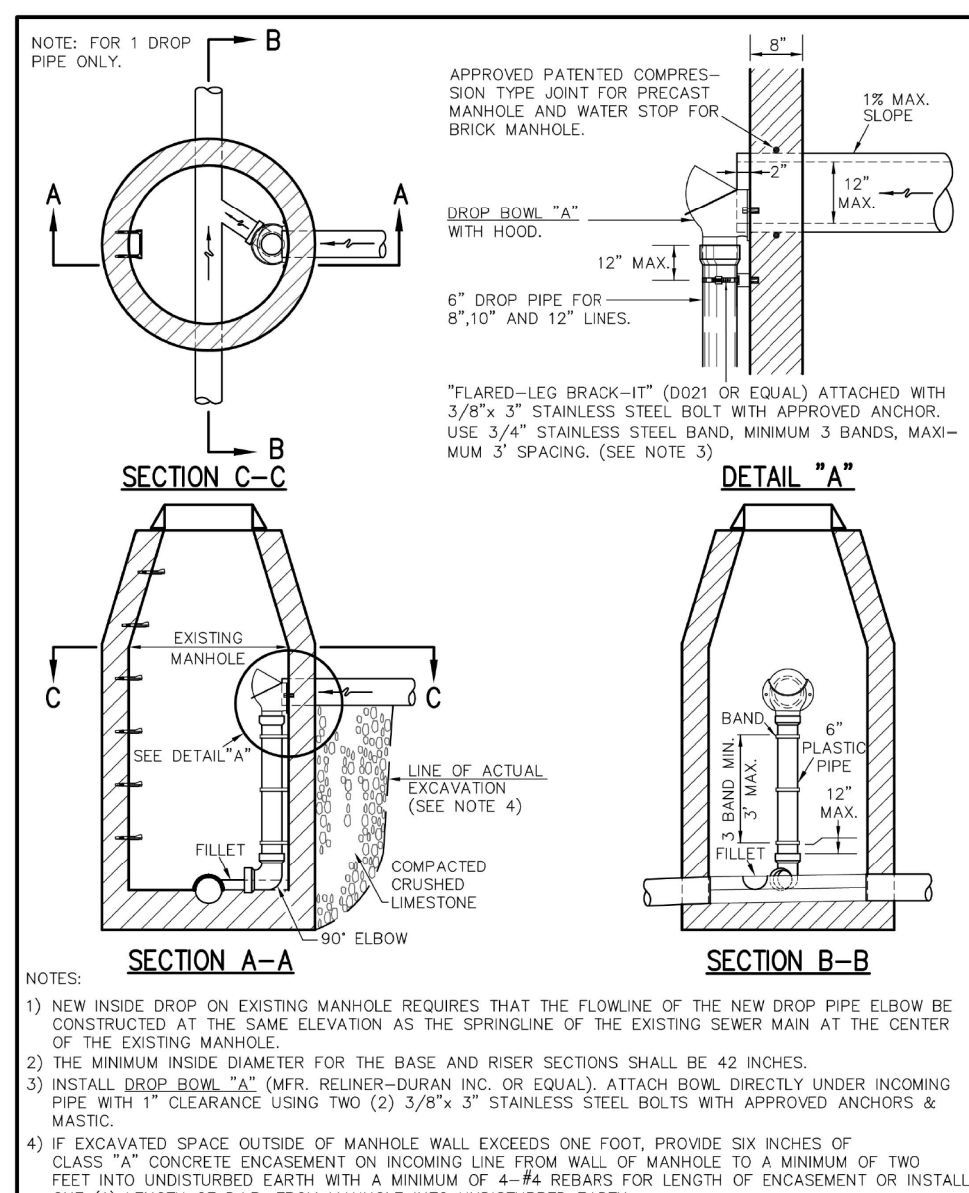
NOTES:
 1) THE MINIMUM INSIDE DIAMETER FOR THE BASE AND RISER SECTIONS SHALL BE 42" FOR 8" DIAMETER SANITARY SEWERS AND A MINIMUM INSIDE DIAMETER OF 48" FOR ALL SANITARY AND COMBINED SEWERS LARGER THAN 8" DIAMETER.
 2) NEW OUTSIDE DROP ON EXISTING MANHOLE REQUIRES THAT THE FLOWLINE OF THE NEW DROP PIPE ELBOW BE CONSTRUCTED AT THE SAME ELEVATION AS THE SPRINGLINE OF THE EXISTING SEWER MAIN AT THE CENTER OF THE EXISTING MANHOLE. A CLASS "A" CONCRETE FILLET AND INVERT SHALL BE CONSTRUCTED FOR DROP PIPE THE EXISTING MANHOLE.
 3) DIAMETER OF DROP PIPE FOR COMBINED SEWERS AND SANITARY SEWERS IS SAME AS INCOMING 8", 10" OR 12" PIPE UNLESS OTHERWISE SHOWN ON PROJECT PLANS. FOR SEWERS 12" THROUGH 24" A DROP IS NOT TO BE USED, RATHER, CONNECT TO MANHOLE AT OR WITHIN 24" ABOVE ITS FLOWLINE.
 4) EXCAVATED SPACE OUTSIDE OF DROP PIPE EXCEEDS ONE (1) FOOT, PROVIDE 6" CLASS "A" CONCRETE ENCASUREMENT ON INCOMING LINE FROM WALL OF MANHOLE TO A MINIMUM OF TWO (2) FEET INTO UNDISTURBED EARTH WITH 4 #3 REBAR FOR LENGTH OF ENCASUREMENT OR INSTALL ONE (1) LENGTH OF D.I.P. FROM "TEE" FITTING INTO UNDISTURBED EARTH.

OUTSIDE FOULWATER DROP MANHOLE
 METROPOLITAN ST. LOUIS SEWER DISTRICT
 Standard Details of Sewer Construction
 Dr. S.A.M. Ch. P.W.S. 2009 SHEET 16



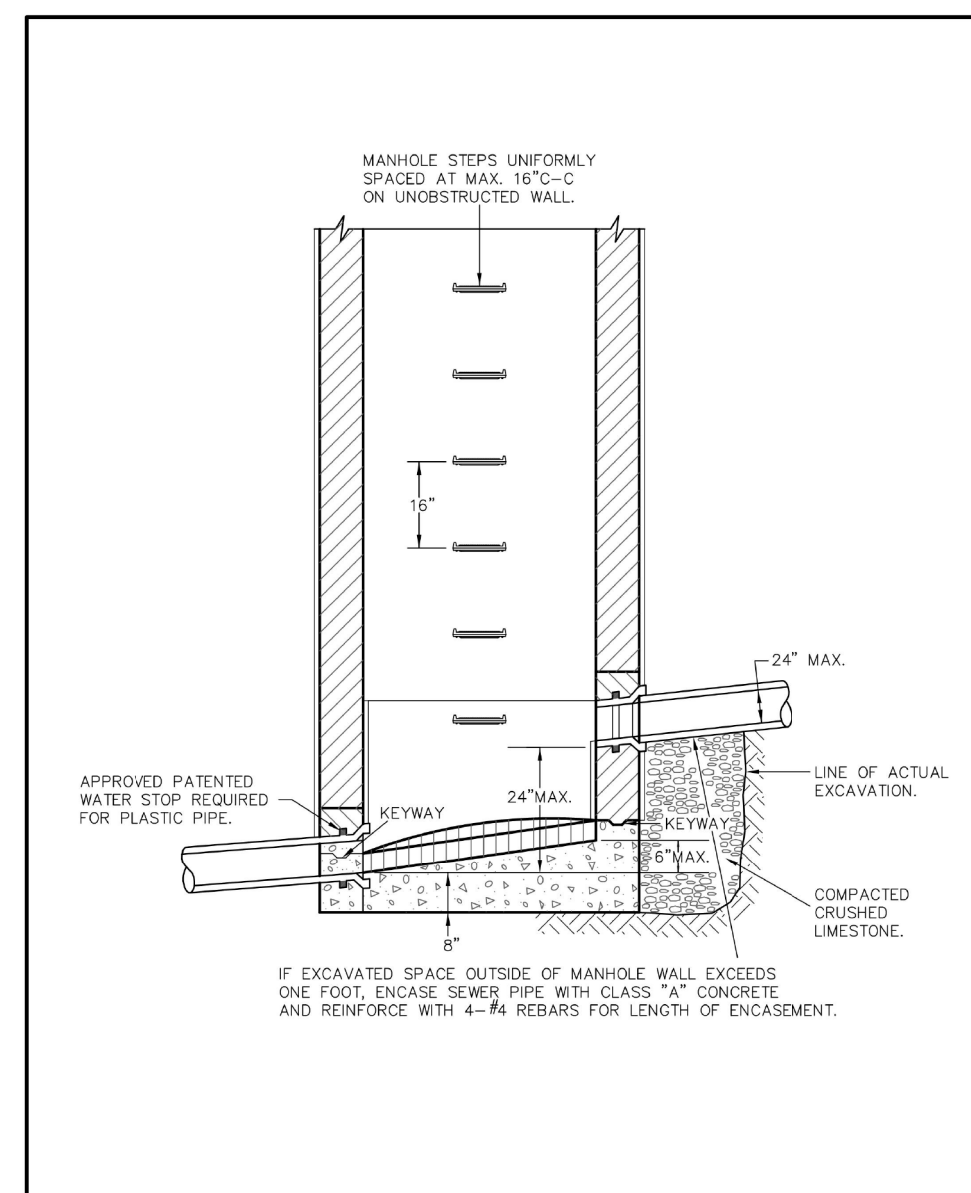
NOTES:
 1) IF LINE OF ACTUAL EXCAVATION EXTENDS BEYOND LINE OF DROP MANHOLE, FILL EXCAVATED SPACE WITH COMPACTED MATERIAL OF DROP OR PACK WITH COMPACTED CRUSHED LIMESTONE TO BASE OF CLASS "A" CONCRETE ENCASUREMENT.
 2) IF EXCAVATED SPACE OUTSIDE OF DROP PIPE MANHOLE EXCEEDS ONE (1) FOOT, REINFORCE WITH MANHOLE PIPE ENCASUREMENT WITH A MINIMUM OF 4 #3 REBAR FOR LENGTH OF ENCASUREMENT.
 3) MASONRY ENCASUREMENT OF DROP PIPE SHALL BE BONDING AND PLACED INTERIORLY WITH MASONRY OF THE EXISTING MANHOLE. A CLASS "A" CONCRETE FILLET AND INVERT SHALL BE CONSTRUCTED FOR DROP PIPE THE EXISTING MANHOLE.
 4) DIAMETER OF DROP PIPE FOR COMBINED SEWERS AND SANITARY SEWERS IS SAME AS INCOMING 8", 10" OR 12" PIPE UNLESS OTHERWISE SHOWN ON PROJECT PLANS. FOR SEWERS 12" THROUGH 24" A DROP IS NOT TO BE USED, RATHER, CONNECT TO MANHOLE AT OR WITHIN 24" ABOVE ITS FLOWLINE.
 5) NEW OUTSIDE DROP ON EXISTING MANHOLE REQUIRES 4 #3 REBAR SPACED VERTICALLY AT 24" O.C., ONE ON EACH SIDE OF THE DROP PIPE, SPOCIED INTO 2" DIA. HOLES THROUGH MANHOLE WALL (MINIMUM LENGTH OF REBAR IS 18").
 6) NEW OUTSIDE DROP ON EXISTING MANHOLE REQUIRES THAT THE FLOWLINE OF THE NEW DROP PIPE ELBOW BE CONSTRUCTED AT THE SAME ELEVATION AS THE SPRINGLINE OF THE EXISTING SEWER MAIN AT THE CENTER OF THE EXISTING MANHOLE. A CLASS "A" CONCRETE FILLET AND INVERT SHALL BE CONSTRUCTED FOR DROP PIPE THE EXISTING MANHOLE.

OUTSIDE FOULWATER DROP MANHOLE (ALTERNATE)
 METROPOLITAN ST. LOUIS SEWER DISTRICT
 Standard Details of Sewer Construction
 Dr. RGV/SAM Ch. J.C.K. 2009 SHEET 17



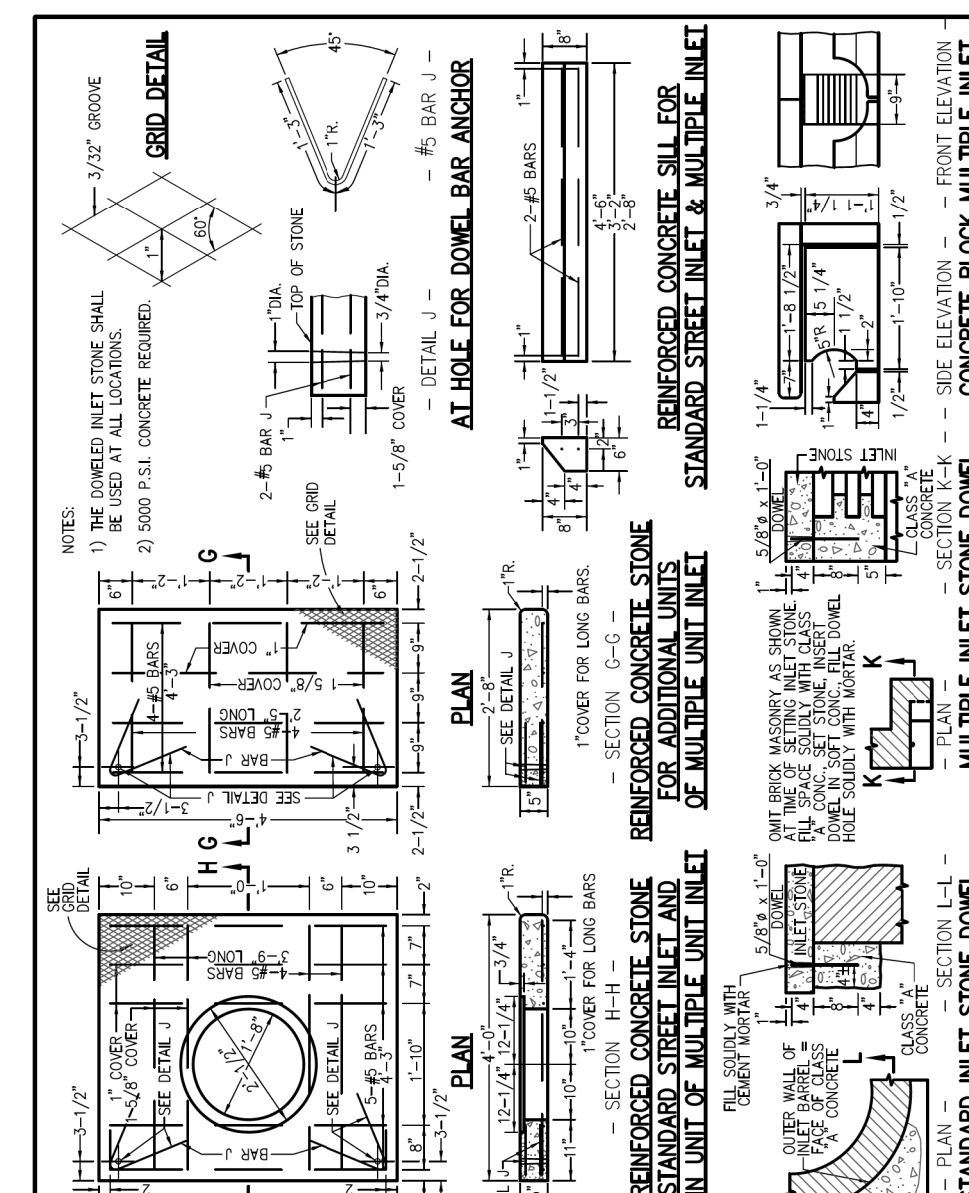
NOTES:
 1) NEW INSIDE DROP ON EXISTING MANHOLE REQUIRES THAT THE FLOWLINE OF THE NEW DROP PIPE ELBOW BE CONSTRUCTED AT THE SAME ELEVATION AS THE SPRINGLINE OF THE EXISTING SEWER MAIN AT THE CENTER OF THE EXISTING MANHOLE.
 2) THE MANHOLE INSIDE DIAMETER FOR THE BASE AND RISER SECTIONS SHALL BE 42 INCHES.
 3) INSTALL DROP BOW "A" (MFR. RELIANT-DURAN INC. OR EQUAL), ATTACH BOW DIRECTLY UNDER INCOMING PIPE WITH "T" CLEARANCE USING TWO (2) 3/8" X 3" STAINLESS STEEL BOLTS WITH APPROVED ANCHORS & MASTIC.
 4) IF EXCAVATED SPACE OUTSIDE OF MANHOLE WALL EXCEEDS ONE FOOT, PROVIDE SIX INCHES OF CLASS "A" CONCRETE ENCASUREMENT ON INCOMING LINE FROM WALL OF MANHOLE TO A MINIMUM OF TWO FEET INTO UNDISTURBED EARTH WITH A MINIMUM OF 4 #3 REBAR FOR LENGTH OF ENCASUREMENT OR INSTALL ONE (1) LENGTH OF D.I.P. FROM MANHOLE INTO UNDISTURBED EARTH.

NEW INSIDE DROP ON EXISTING MANHOLE
 METROPOLITAN ST. LOUIS SEWER DISTRICT
 Standard Details of Sewer Construction
 Dr. RGV/SAM Ch. J.C.K. 2009 SHEET 18



NOTES:
 1) IF EXCAVATED SPACE OUTSIDE OF MANHOLE WALL EXCEEDS ONE FOOT, PROVIDE SIX INCHES OF CLASS "A" CONCRETE ENCASUREMENT ON INCOMING LINE FROM WALL OF MANHOLE TO A MINIMUM OF TWO FEET INTO UNDISTURBED EARTH WITH A MINIMUM OF 4 #3 REBAR FOR LENGTH OF ENCASUREMENT OR INSTALL ONE (1) LENGTH OF D.I.P. FROM MANHOLE INTO UNDISTURBED EARTH.

INSIDE FOULWATER MANHOLE (FOR FREE-FALL)
 METROPOLITAN ST. LOUIS SEWER DISTRICT
 Standard Details of Sewer Construction
 Dr. WSH/SAM Ch. J.C.K. 2009 SHEET 19



NOTES:
 1) THE DOWNED INLET STONE SHALL BE USED AT ALL LOCATIONS.
 2) 5000 P.S.I. CONCRETE REQUIRED.

STANDARD - INLET STONES, BLOCKS & DESIGN DETAILS
 METROPOLITAN ST. LOUIS SEWER DISTRICT
 Standard Details of Sewer Construction
 Dr. WSH/SAM Ch. J.C.K. 2009 SHEET 44