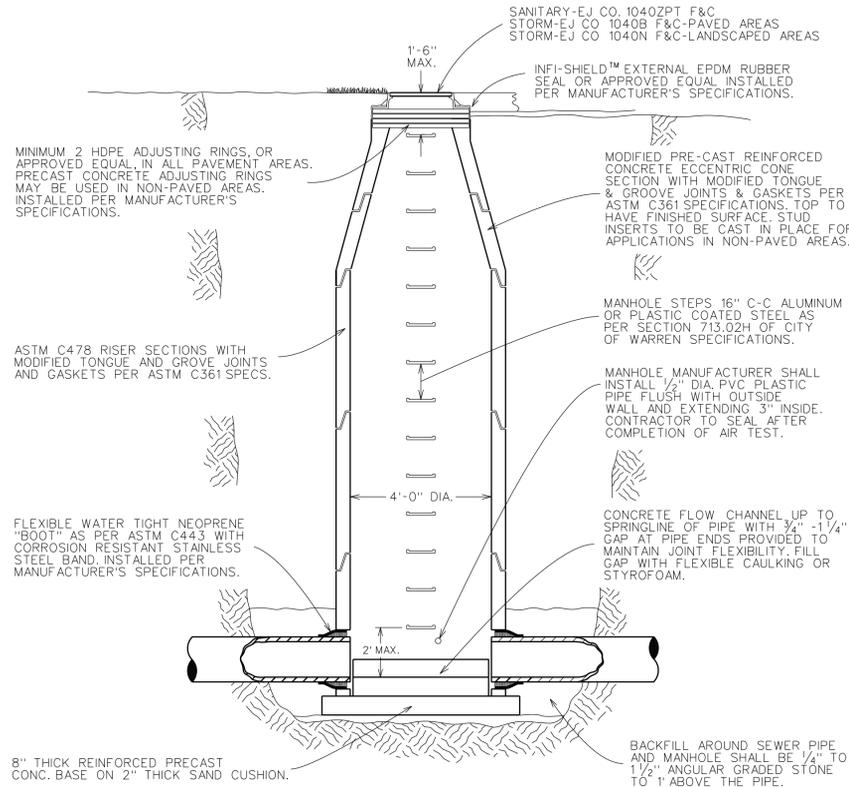


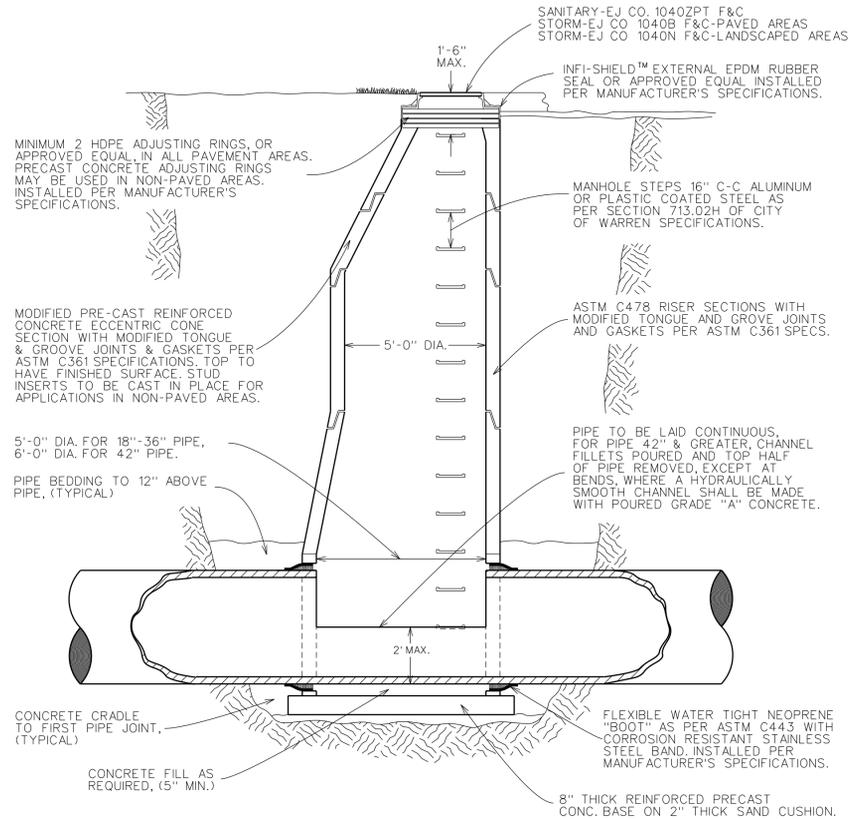
NOTES:
PRECAST BASE SECTIONS OF APPROVED DESIGN MAY BE USED FOR BOTTOM SECTION OF MANHOLE. ALL PRECAST MANHOLES & SLAB BASES SHALL BE MANUFACTURED WITH TYPE III/II OR IIIA CEMENT. ALL CONCRETE FOR CHANNELIZATION SHALL BE MADE WITH THE SAME AS ABOVE.



STANDARD MANHOLE WITH 8"-15" DIAMETER SEWER

SCALE: 1" = 3'

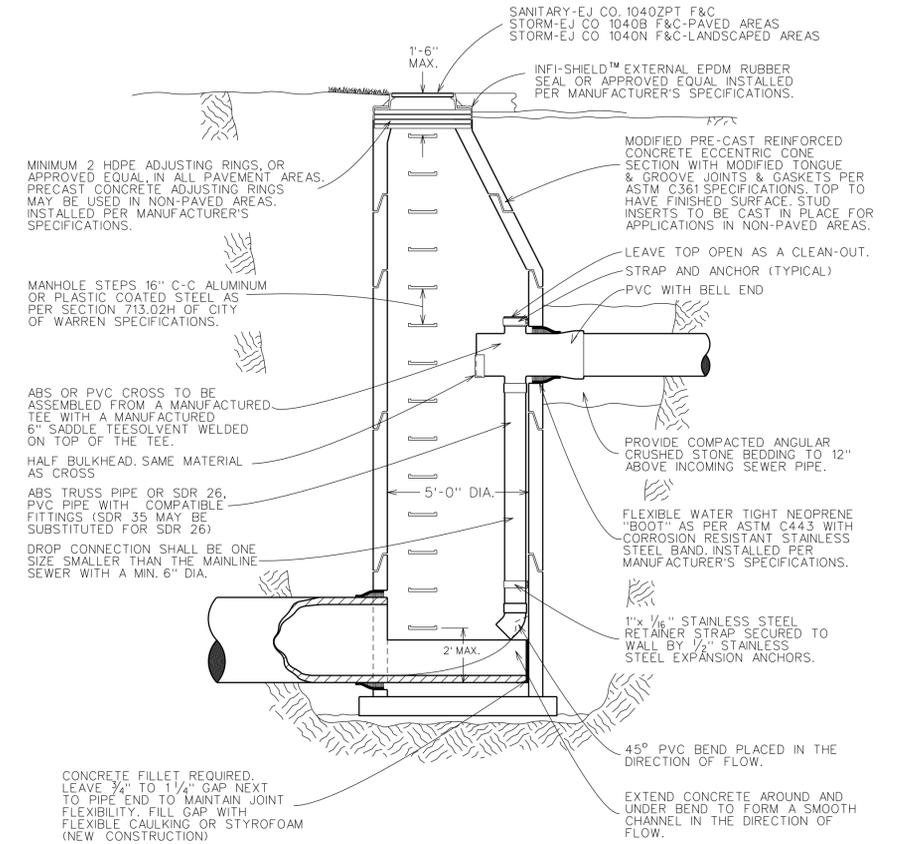
NOTES:
PRECAST BASE SECTIONS OF APPROVED DESIGN MAY BE USED FOR BOTTOM SECTION OF MANHOLE. ALL PRECAST MANHOLES & SLAB BASES SHALL BE MANUFACTURED WITH TYPE III/II OR IIIA CEMENT. ALL CONCRETE FOR CHANNELIZATION SHALL BE MADE WITH THE SAME AS ABOVE.



STANDARD MANHOLE FOR 18" THROUGH 42" DIA. SEWER

SCALE: 1" = 3'

NOTES:
1) DROP CONNECTION REQUIRED WHENEVER THE INVERT BETWEEN INLET & OUTLET IS 24" INCHES OR GREATER.
2) MANHOLE CONSTRUCTION TO CONFORM TO REQUIREMENTS SPECIFIED ELSEWHERE ON THIS SHEET.
3) ABS OR PVC JOINTS TO BE WELDED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.
4) ALL BOLTS INSIDE MANHOLE SHALL BE BRASS OR STAINLESS STEEL AND SECURELY FASTENED TO THE WALL.

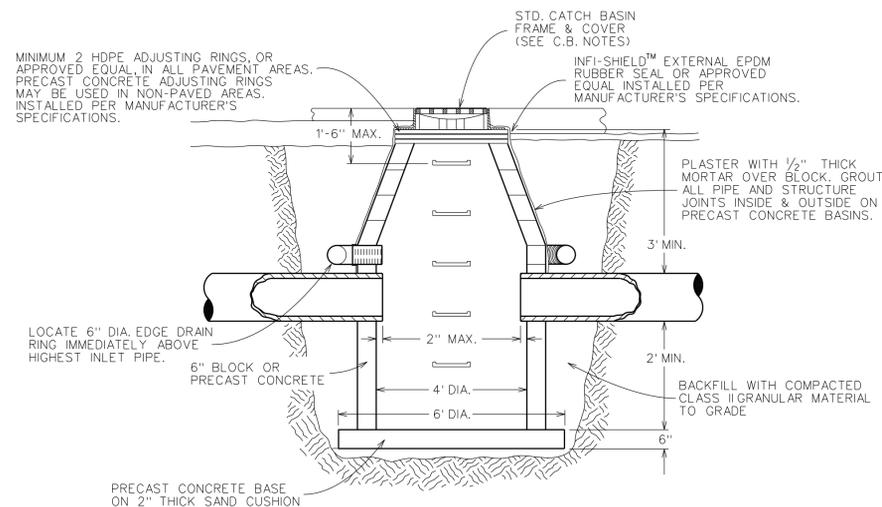


STANDARD MANHOLE WITH DROP CONNECTION

SCALE: 1" = 3'

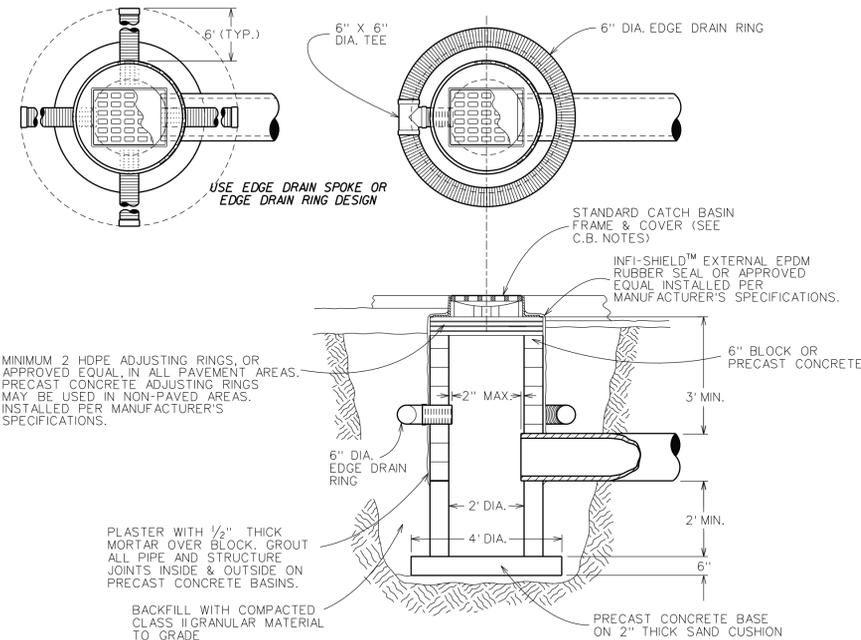
CATCH BASIN NOTES:

1. TYPE "A" CATCH BASINS SHALL BE USED ON ALL STREET PAVING PROJECTS. ALL REAR YARD DRAINAGE STRUCTURES SHALL BE TYPE "A" EXCEPT WHERE ONLY ONE PIPE ENTERS THE CATCH BASIN.
2. STANDARD CATCH BASIN COVERS TO BE USED ON STREET PAVING PROJECT SHALL BE EQUAL TO EJ CO. 5080 TYPE M1 OR NEENAH R-3448-C. TOTAL WEIGHT SHALL NOT BE LESS THAN 285 LBS.
3. STANDARD GRATES TO BE USED ON REAR YARD DRAINAGE STRUCTURES SHALL BE EQUAL TO EJ CO. 1040N OR APPROVED EQUAL. TOTAL WEIGHT SHALL NOT BE LESS THAN 200 LBS.
4. STEPS AT 16" C-C SHALL BE INSTALLED IN ALL TYPE "A" CATCH BASINS.
5. EDGE DRAIN RING NOT REQUIRED AT CATCH BASINS CONNECTED TO PAVEMENT EDGE DRAIN.



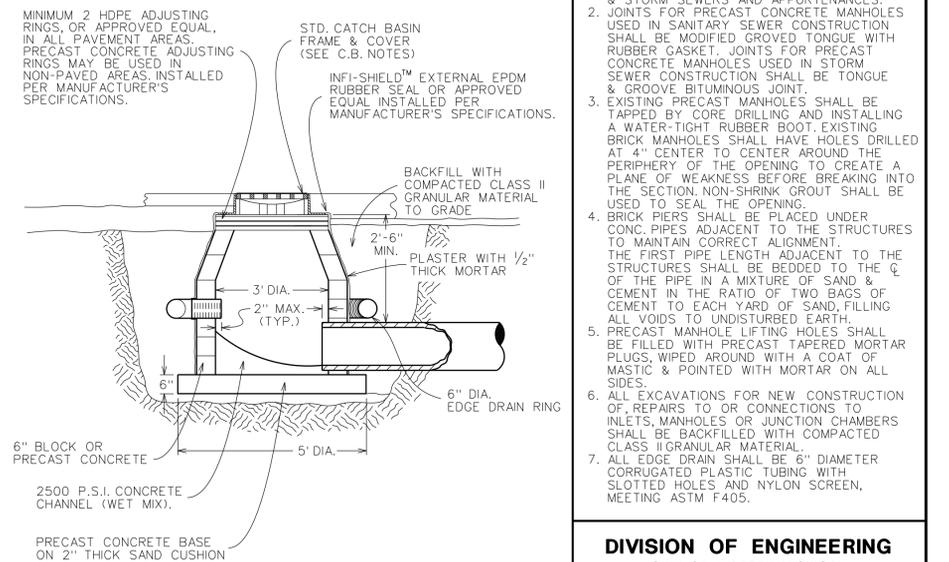
STANDARD CATCH BASIN TYPE "A"

SCALE: N.T.S.



STANDARD CATCH BASIN TYPE "B"

SCALE: N.T.S.



STANDARD INLET TO BE USED IN INACCESSIBLE AREAS

SCALE: N.T.S.

GENERAL NOTES

1. ALL CONSTRUCTION SHALL CONFORM TO SECTIONS 700 OF THE CITY OF WARREN STANDARD SPECIFICATIONS FOR SANITARY & STORM SEWERS AND APPURTENANCES.
2. JOINTS FOR PRECAST CONCRETE MANHOLES USED IN SANITARY SEWER CONSTRUCTION SHALL BE MODIFIED TONGUE WITH RUBBER GASKET JOINTS FOR PRECAST CONCRETE MANHOLES USED IN STORM SEWER CONSTRUCTION SHALL BE TONGUE & GROOVE BITUMINOUS JOINT.
3. EXISTING PRECAST MANHOLES SHALL BE TAPPED BY CORE DRILLING AND INSTALLING A WATER-TIGHT RUBBER BOOT. EXISTING BRICK MANHOLES SHALL HAVE HOLES DRILLED AT 4" CENTER TO CENTER AROUND THE PERIPHERY OF THE OPENING TO CREATE A PLANE OF WEAKNESS BEFORE BREAKING INTO THE SECTION. NON-SHRINK GROUT SHALL BE USED TO SEAL THE OPENING.
4. BRICK PIERS SHALL BE PLACED UNDER CONC. PIPES ADJACENT TO THE STRUCTURES TO MAINTAIN CORRECT ALIGNMENT. THE FIRST PIPE LENGTH ADJACENT TO THE STRUCTURES SHALL BE BEDDED TO THE C OF THE PIPE IN A MIXTURE OF SAND & CEMENT IN THE RATIO OF TWO BAGS OF CEMENT TO EACH YARD OF SAND, FILLING ALL VOIDS TO UNDISTURBED EARTH.
5. PRECAST MANHOLE LIFTING HOLES SHALL BE FILLED WITH PRECAST TAPERED MORTAR PLUGS, WIPED AROUND WITH A COAT OF MASTIC & POINTED WITH MORTAR ON ALL SIDES.
6. ALL EXCAVATIONS FOR NEW CONSTRUCTION OF INLETS, MANHOLES OR JUNCTION CHAMBERS SHALL BE BACKFILLED WITH COMPACTED CLASS II GRANULAR MATERIAL.
7. ALL EDGE DRAIN SHALL BE 6" DIAMETER CORRUGATED PLASTIC TUBING WITH SLOTTED HOLES AND NYLON SCREEN, MEETING ASTM F405.

**DIVISION OF ENGINEERING
CITY OF WARREN, MICHIGAN**

MANHOLE & CATCH BASIN DETAILS

REVISED CMK 02/14
REVISED RMA 8/13
REVISED D.D.Z 2/98

DS-2a