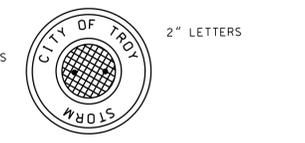


- GENERAL NOTES**
- PRIOR TO CONSTRUCTION, THE CONTRACTOR MUST HAVE IN HIS POSSESSION A COPY OF A VALID PERMIT TO CONSTRUCT A CONNECTION TO, OR AN EXTENSION OF, THE STORM WATER DRAINAGE SYSTEM.
 - PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL ATTEND A PRE-CONSTRUCTION MEETING, AT A TIME AND PLACE AS ARRANGED BY THE ENGINEER DEPT., AT WHICH VARIOUS UTILITY COMPANIES AND GOVERNMENTAL AGENCY REPRESENTATIVES WILL BE PRESENT. THE OWNERS' ENGINEER SHALL SUBMIT APPROVED PLANS TO ALL UTILITY COMPANIES AND GOVERNMENTAL AGENCIES 10 DAYS PRIOR TO THE PRE-CONSTRUCTION MEETING. CONSTRUCTION SHALL START WITHIN 3 WEEKS OF MEETING.
 - AT LEAST FORTY-EIGHT (48) HOURS PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL GIVE NOTIFICATION OF HIS INTENTION TO BEGIN CONSTRUCTION TO THE CITY OF TROY FIELD ENGINEERING DEPARTMENT, 524-3409, TO THE CITY OF DEPARTMENT OF PUBLIC WORKS 524-3392, AND THE COUNTY PUBLIC WORKS COMMISSIONERS OFFICE (858-0958) AND THE COUNTY ROAD COMMISSION (858-4835) IF APPLICABLE.
 - THE CONTRACTOR SHALL SECURE PERMITS FROM THE COUNTY PUBLIC WORKS COMMISSION FOR ALL TAPS AND CROSSINGS OF COUNTY DRAINS AND SHALL PAY THE COST OF SAID PERMITS AND THE COST OF ANY INSPECTION CHARGES BY THAT AGENCY FOR WORK DONE UNDER THE PERMITS.
 - 72 HOURS PRIOR TO ANY CONSTRUCTION, THE CONTRACTOR SHALL TELEPHONE MISS DIG (1-800-482-7171) FOR THE LOCATION OF UNDERGROUND FACILITIES, AND SHALL ALSO NOTIFY REPRESENTATIVES OF ANY OTHER FACILITIES, LOCATED IN THE VICINITY OF THE WORK, WHICH MAY NOT BE HANDLED BY MISS DIG.
 - ALL STORM WATER DRAINAGE SYSTEM CONSTRUCTION SHALL CONFORM TO THE CURRENT STANDARDS AND SPECIFICATIONS OF THE CITY OF TROY, COUNTY ROAD COMMISSION, AND/OR COUNTY DRAIN COMMISSION AS APPLICABLE.
 - STORM SEWER PIPE SHALL BE REINFORCED CONCRETE, ASTM C-76 CLASS III OR HIGHER UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER. THE FOLLOWING STORM SEWER PIPE MATERIALS MAY BE USED ONLY WITH APPROVAL OF THE CITY ENGINEER. ISOILS PH & RESISTIVITY TESTS DEMONSTRATE A PH OF 5.0 TO 9.0 AND AN ELECTRICAL RESISTANCE OF 2000 OHM/CM/CM OR HIGHER, THEN HELICALLY CORRUGATED, FULL WELDED SEAM, AASHTO M-218 STEEL PIPE, GAUGE AS SHOWN, MANUFACTURED ACCORDING TO AASHTO M-36 WITH 2 2/3" X 1/2" OR 125MM X 25MM CORRUGATIONS, ALUMINIZED AT 1.00 OZ PER SQ. FT. PER AASHTO M-274 MAY BE USED. THE C.S.P. DIAMETER MUST HAVE THE SAME HYDRAULIC CAPACITY AS THE CONCRETE PIPE WHEN THE PIPE IS NOT SUBJECT TO CRUSHING FROM CONSTRUCTION OPERATIONS AND PROPERTY MAINTENANCE AND A MIN. 3' OF COVER CAN BE MAINTAINED ABS COMPOSITE (TRUSS) PIPE AND PVC PIPE MAY BE USED OUTSIDE PUBLIC ROAD R.O.W. WITH APPROVAL OF THE CITY ENGINEER.
 - REINFORCED CONCRETE PIPE JOINTS SHALL BE MODIFIED TONGUE & GROOVE WITH RUBBER "O" RING GASKET. CORRUGATED STEEL PIPE SHALL HAVE TWO CIRCUMFERENTIAL CORRUGATIONS ROLLED ON EACH END OF EACH SECTION. STEEL COUPLING BANDS OF THE SAME MATERIAL AS THE PIPE, FITTING THE PIPE CONFIGURATION WITH TWO "O" RING RUBBER GASKETS SHALL PRODUCE A WATERTIGHT JOINT ("HUGGER BANDS"). "PVC & TRUSS" PIPE JOINTS SHALL BE CHEMICALLY FUSED IN ACCORDANCE WITH THE MANUFACTURERS' INSTRUCTIONS.
 - UNLESS OTHERWISE INDICATED ON THE PLANS, ALL STORM SEWER BEDDING SHALL BE STANDARD BEDDING. CRUSHED STONE BEDDING SHALL BE PLACED, IF THE INSPECTOR DEEMS THAT THE INSTALLATION WARRANTS IT.
 - ALL SUMP AND BUILDING SERVICE CONNECTIONS SHALL BE 3" POLY-VINYL CHLORIDE (PVC) SEWER PIPE, SCHEDULE 40 WITH CHEMICALLY FUSED JOINTS AND CONNECT TO A CATCH BASIN OR MANHOLE. NO BLIND TAPS.
 - ALL DRAINAGE STRUCTURES SHALL CONFORM TO THE DETAILS SHOWN. ALL CATCH BASINS SHALL HAVE 2 FT. SUMP.
 - CONNECTIONS TO DRAINAGE STRUCTURES SHALL BE CORED. THE OPENING BETWEEN THE HOLE AND PIPE SHALL BE SEALED WITH A NON-SHRINK GROUT.
 - IF THE WALL OF THE STRUCTURE BEING TAPPED IS DAMAGED, THE CITY SHALL DECIDE IF IT CAN BE REPAIRED AND APPROVE THE METHOD. IF THE STRUCTURE CANNOT BE REPAIRED IT WILL BE REPLACED.
 - UNLESS OTHERWISE NOTED ON THE PLANS, STRUCTURE FRAME AND COVERS SHALL BE AS FOLLOWS:
 MANHOLE E.J.I.W. 1000 WITH TYPE "B" PERFORATED COVER, OR EQUAL.
 CATCH BASIN IN PAVEMENT E.J.I.W. 5080 WITH SINUSOIDAL M2 GRATE, OR EQUAL, IN RESIDENTIAL AREAS.
 CATCH BASIN IN PAVEMENT E.J.I.W. 5105 WITH SINUSOIDAL M2 GRATE, OR EQUAL, IN NON-RESIDENTIAL AREAS.
 CATCH BASIN NOT IN PAVEMENT E.J.I.W. 1000-01 WITH TYPE M, C, OR O1 HEAVY DUTY GRATE, OR EQUAL.
 CATCH BASIN IN LANDSCAPE AREAS OR ROADSIDE DITCH MAY REQUIRE THE USE OF E.J.I.W. OR ONE OF THE FOLLOWING:
 - 1040 TYPE "N" OVAL GRATE OR TYPE O2 BEEHIVE GRATE
 - 1130 TYPE "N" OVAL GRATE OR TYPE O1 BEEHIVE GRATE
 - 2800 TYPE "N" OVAL GRATE OR TYPE O2 BEEHIVE GRATE
 - 6508 OR 6517

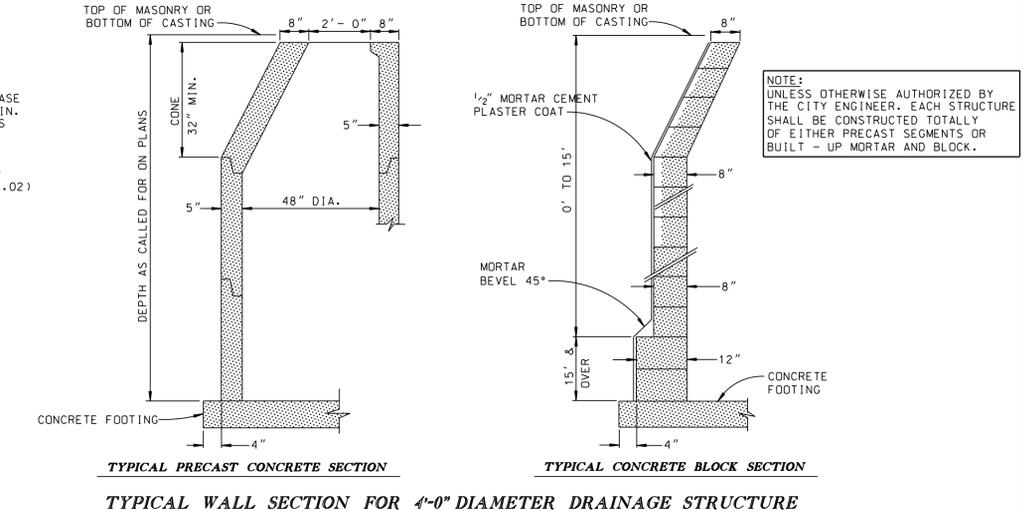


STORM SEWER MANHOLE A

4 FT. DIAMETER CATCH BASIN

UNDERDRAIN DETAIL FOR CATCH BASIN IN CURB FOR PAVEMENT WITHIN THE CITY R.O.W.

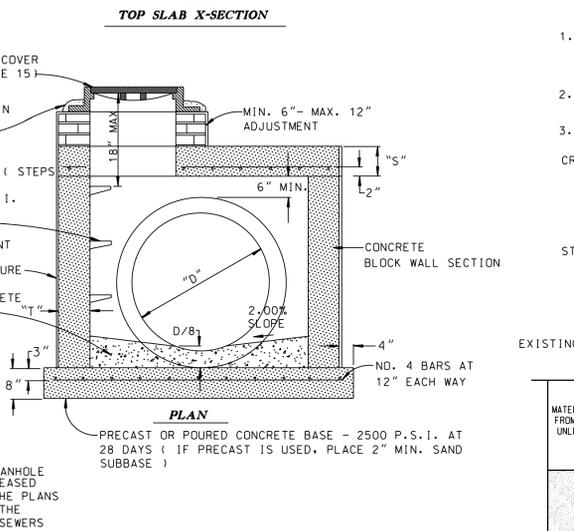
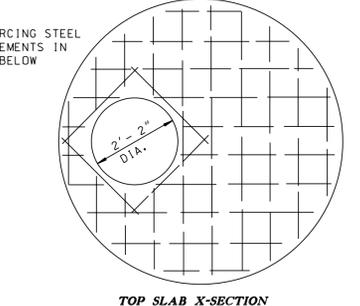
REAR YARD UNDERDRAIN CROSS SECTION



TYPICAL PRECAST CONCRETE SECTION and **TYPICAL CONCRETE BLOCK SECTION**
TYPICAL WALL SECTION FOR 4'-0" DIAMETER DRAINAGE STRUCTURE

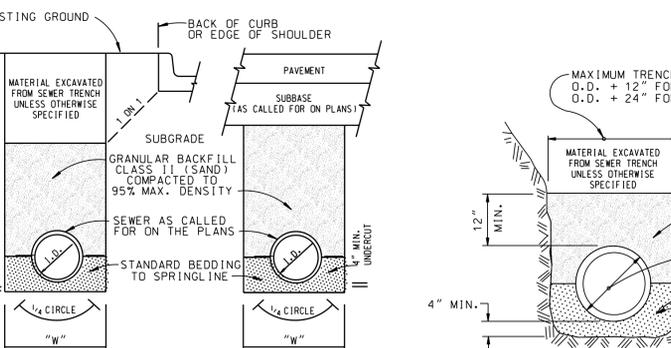
GENERAL PIPE BEDDING & TRENCH NOTES

- THE CONTRACTOR SHALL INSTALL THE PIPE IN ACCORDANCE WITH THE BEDDING DETAIL REQUIRED FOR THE PIPE DEPTH (MEASURED FROM THE TOP OF THE PIPE), AND TRENCH WIDTH (MEASURED ACROSS THE TRENCH AT THE TOP OF THE PIPE) CONSTRUCTED. A CONTRACTOR MAY ALWAYS USE A HIGHER QUALITY BEDDING CLASS THAN REQUIRED. ANY OTHER VARIATIONS MUST BE APPROVED IN WRITING BY THE ENGINEER.
- CRUSHED STONE BEDDING SHALL BE UTILIZED FOR ALL DEWATERED GROUND TRENCHES AND SHALL UTILIZE A TRENCH WIDTH OF 30" (MINIMUM).
- BEDDING & BACKFILL MATERIAL SHALL BE AS FOLLOWS:
 CRUSHED STONE BEDDING: SHALL CONSIST OF WELL GRADED CRUSHED STONE. THE STONE SHALL CONFORM TO ASTM D 448, #67, ASTM D 2487 CLASS 1, OR ALTERNATIVE APPROVED BY THE ENGINEER. ANY MATERIAL INCORPORATED SHALL PROVIDE A MINIMUM OF 90% CRUSHED MATERIAL. MDT COURSE AGGREGATES 6A, 6AA, 9A, 17A & 25 SERIES ARE ALSO APPROVED FOR USE IF THEY ARE MANUFACTURED WITH SUFFICIENT CRUSHED MATERIAL AND NO STONE IS LARGER THAN 1-1/4 INCH IN DIAMETER. SPADING THE HAUNCH AREA IS REQUIRED, FOR DENSITY.
 STANDARD BEDDING: SHALL CONSIST OF WELL GRADED COURSE SANDS AND GRAVEL (1-1/4 INCH MAXIMUM DIAMETER) CONTAINING A SMALL PERCENTAGE OF FINES. THE MATERIAL SHALL CONFORM TO ASTM D 2487 CLASS 11 AND SHALL INCLUDE PEA PEBBLE AND MDT AGGREGATES 20 SERIES, 21 SERIES, 22 SERIES, 23A, 26A, 28 SERIES & 31 SERIES. 90% MINIMUM DENSITY REQUIRED.

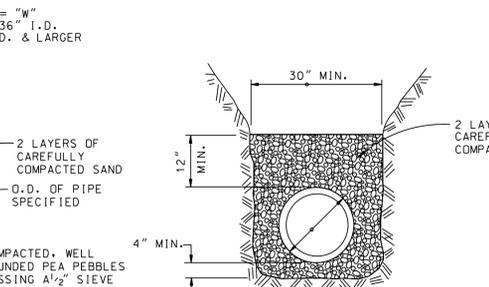


| OUTLET "D" I.D. | M.H. I.D. | TOP SLAB "S" | WALL "T" | REINFORCING STEEL |
|-----------------|-----------|--------------|----------|-------------------|
| 36" OR LESS | 4 | 9" | 12" | 3/4" @ 9" EA. WAY |
| 42" | 5 | 10" | 12" | 3/4" @ 9" EA. WAY |
| 48" - 54" | 6 | 11" | 12" | 7/8" @ 9" EA. WAY |
| | 7 | 12" | 12" | 1" @ 9" EA. WAY |
| | 8 | 12" | 12" | 1" @ 9" EA. WAY |

STORM SEWER MANHOLE A WITH FLAT SLAB



STANDARD BEDDING TRENCH DETAIL 'A'



CRUSHED STONE BEDDING

CITY OF TROY
OAKLAND COUNTY, MICHIGAN
STANDARD STORM SEWER DETAILS

ENGINEERING DEPARTMENT

APPROVED BY: STEVEN J. VANDETTE, CITY ENGINEER DATE: JANUARY 8, 2001

| DATE | REMARKS | PROJECT NO. | SHEET NO. |
|------|---------|-------------|-----------|
| | | | |

DATE: JANUARY 2001
 DRAWN BY: G.S.F. CHECKED BY: W.D.J.

STATE OF MICHIGAN
STEVEN J. VANDETTE
 ENGINEER
 NO. 28197
 PROFESSIONAL ENGINEER

STEVEN J. VANDETTE, P.E. 28197