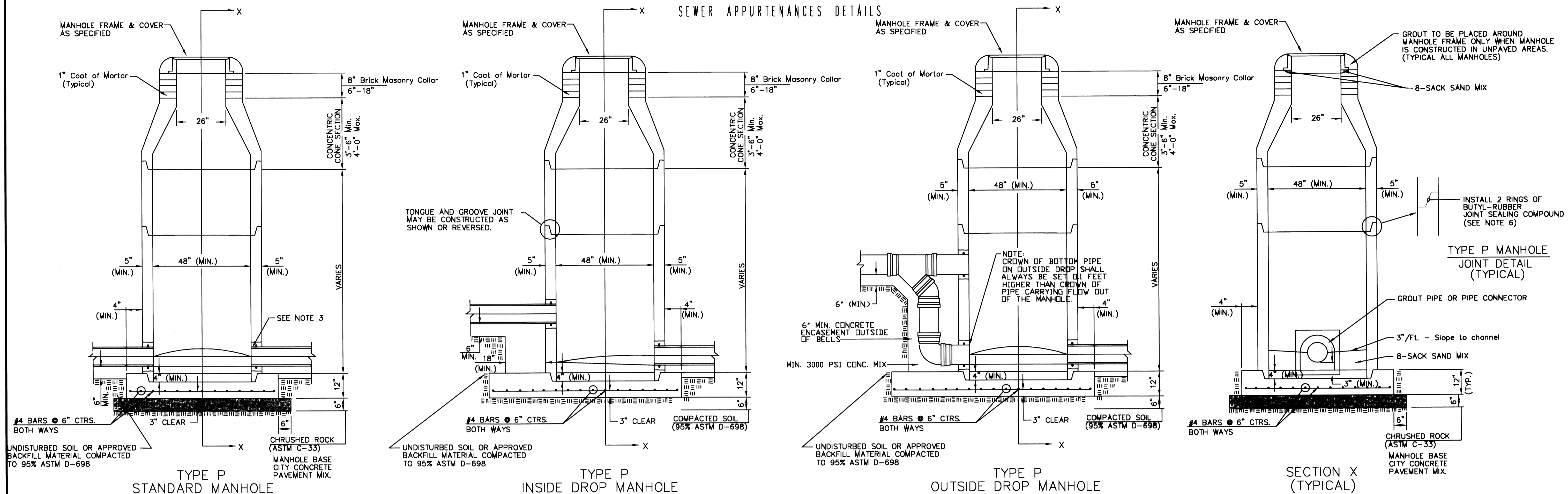


SEWER APPURTENANCES DETAILS

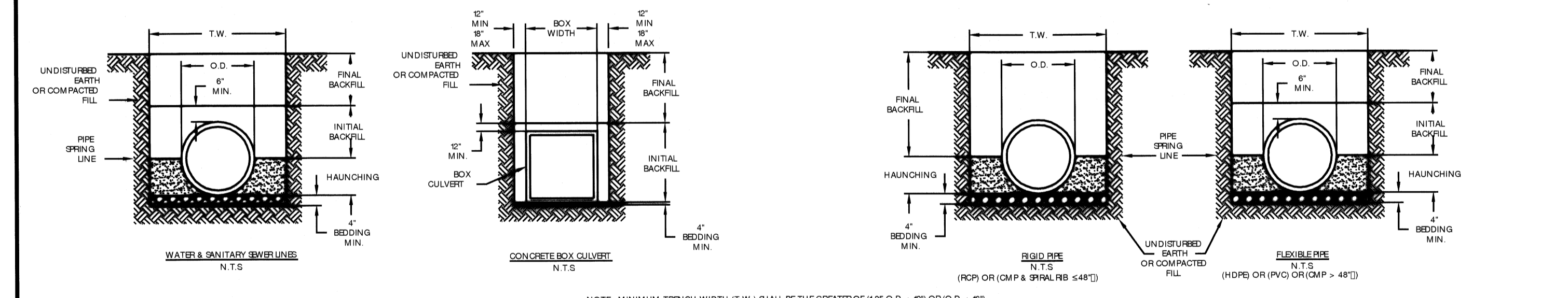


DATE	REV	DESCRIPTION
3-29-07		REVISED PER ASHRAE 90.1-2007 COMMENTS 23-26 OF PROJECT
5-03-07	1	REVISION TO PRIVATE PROJECT
5-17-07	2	REVISED PER SUBMITTAL COMMENTS 1-117
6-11-07	3	REVISED PER SUBMITTAL COMMENTS 1-117



- GENERAL NOTES**
- PRECAST MANHOLE NOTES**
- ALL PRECAST CONCRETE MANHOLE SECTIONS SHALL CONFORM TO THE LATEST REVISIONS OF A.S.T.M. C478 AS MODIFIED BY THE SPECIFICATIONS.
  - NON-SHRINK GROUT SHALL BE NON-METALLIC TYPE.
  - APPROVED FLEXIBLE WATERSTOP GASKETS SHALL BE INSTALLED TO JOIN THE SEWER TO THE MANHOLE WALL WHEN A.B.S. COMPOSITE PIPE OR P.V.C. PIPE IS USED. FOR OTHER TYPES OF PIPE THE SEWER PIPE SHALL BE SUPPORTED WITH CONCRETE ENCASEMENT A MINIMUM OF 3 FEET FROM THE MANHOLE WALL AND TO THE FIRST JOINT FOR V.P.C. SUCH THAT THE JOINT REMAINS FLEXIBLE.
  - ALL INSIDE SURFACES OF THE CONCRETE MANHOLE WHICH WOULD BE EXPOSED TO SEWER GAS SHALL BE COATED WITH 2 COATS OF TNEC SERIES 66 HI-BUILD EPOXYLINE, DRY THICKNESS OF 8 MILS (MIN.).
  - EXTERIOR MANHOLE WALLS SHALL BE COATED WITH 1 COAT MOBILARMA 633 BITUMINOUS COATING.
  - JOINT SEALING COMPOUND SHALL BE KENT SEAL NO. 2 OR APPROVED EQUAL.
  - PRECAST MANHOLES SHALL BE SET AT LEAST 4 INCHES INTO THE MANHOLE BASE.
- TOP OF MANHOLE FLOOR SLAB SHALL BE AT LEAST 3 INCHES BELOW THE FLOW LINE OF THE OUTLET PIPE TO INSURE SUFFICIENT MINIMUM THICKNESS OF SLAB.
  - LIFTING HOLES SHALL BE FILLED WITH NON-SHRINK GROUT AND THE INTERIOR SURFACE COATED AS SPECIFIED.
  - MORTAR USED IN MASONRY CONSTRUCTION SHALL CONTAIN 8 SACKS OF CEMENT PER CUBIC YARD. CONCRETE USED IN MANHOLE BASES SHALL CONFORM TO THE REQUIREMENTS OF CONCRETE FOR CONCRETE PAVING CONSTRUCTION AS SPECIFIED IN THE CITY STANDARD PAVING SPECIFICATIONS USING CITY CONCRETE PAVEMENT MIX WITHOUT AIR ENTRAINING ADMIXTURE. MORTAR SHALL BE PLACED AROUND THE MANHOLE RING AS SHOWN ON THE DRAWINGS WHEN MANHOLES ARE CONSTRUCTED IN UNPAVED AREAS. MANHOLES CONSTRUCTED WHERE PIPE SIZES ARE SMALLER THAN 24" SHALL HAVE AN INSIDE DIAMETER OF 4". MANHOLES CONSTRUCTED WHERE PIPE SIZES ARE 24" OR LARGER SHALL HAVE AN INSIDE DIAMETER OF 6". COMPLETED MANHOLE SHALL BE WITHOUT LEAKS AND WATER TIGHT.
  - REINFORCING STEEL SHALL BE INSTALLED IN THE MANHOLE BASES AND SHALL CONSIST OF NO. 4 BARS PLACED ON 6" CENTERS IN BOTH DIRECTIONS. THE MANHOLE BASE REINFORCEMENT SHALL BE PLACED AT LEAST 3" ABOVE THE BOTTOM OF THE MANHOLE BASE. ALL COSTS FOR FURNISHING AND INSTALLING REINFORCING STEEL SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE MANHOLE.
  - OPENINGS SHALL BE CUT INTO THE MANHOLE WALL WHEN OUTSIDE DROPS ARE CONSTRUCTED ON EXISTING MANHOLES. SUCH OPENINGS CUT INTO EXISTING MANHOLES SHALL BE AS SMALL AS PRACTICAL TO FACILITATE INSTALLING AND GROUTING THE NEW PIPE IN PLACE. WATERSTOP GASKETS SHALL BE USED WITH P.V.C. AND A.B.S. COMPOSITE PIPE. THE NEW PIPE SHALL BE GROUTED INTO THE OPENING USING AN APPROVED NONSHRINK GROUT FOR THE FULL MANHOLE WALL THICKNESS. THE EXTERIOR OF THE COMPLETED CONNECTION SHALL BE SEALED WITH AN APPROVED BITUMINOUS COATING SUCH THAT THE CONNECTION WILL BE WATER TIGHT. FLOOR OF MANHOLE SHALL BE MODIFIED TO FORM NEW FLOW CHANNEL FOR THE NEW CONNECTION AS INDICATED BY THE DRAWING. THIS WORK, INCLUDING MODIFICATION OF MANHOLE FLOOR, SHALL BE PAID FOR AT THE UNIT PRICE BID FOR OUTSIDE DROP STACK CONSTRUCTED ON EXISTING MANHOLE.
  - THE FLOORS OF ALL MANHOLES SHALL BE SHAPED WITH FLOW CHANNELS SUCH THAT THE MANHOLES WILL BE SELF CLEANING AND FREE OF AREAS WHERE SOLIDS COULD BE DEPOSITED AS SEWAGE FLOWS THROUGH THE MANHOLE FROM ALL INLET PIPES TO THE OUTLET PIPE. FLOW CHANNELS SHALL BE FORMED TO MATCH THE BOTTOM HALVES OF THE INFLOWING PIPES AND THE OUTFLOWING PIPE AS SHOWN BY THE DRAWINGS EXCEPT FOR INSIDE DROP MANHOLES. FLOW CHANNELS FOR INSIDE DROP MANHOLES SHALL BE CONSTRUCTED AS INDICATED BY THE DRAWING. MANHOLE FLOORS SHALL HAVE SLOPES OF 3 INCHES PER FOOT IN THE AREAS OUTSIDE OF THE FLOW CHANNELS SLOPED TOWARD THE FLOW CHANNELS. PIPES LAID THROUGH MANHOLES SHALL HAVE THE TOP HALF REMOVED TO NEAT LINES FOR THE FULL INSIDE DIAMETER OF THE MANHOLE. MANHOLE FLOORS SHALL THEN BE SHAPED AROUND THE BOTTOM HALF OF THE PIPE WHICH FORMS THE FLOW CHANNEL.
  - PIPES INSTALLED WITHIN THE EXCAVATION MADE FOR THE MANHOLE SHALL BE CRADLED WITH CONCRETE TO THE LIMITS OF THE MANHOLE EXCAVATION. WHEN CLAY PIPE IS USED, THE CRADLE SHALL EXTEND TO THE FIRST JOINT OUTSIDE THE MANHOLE. THE CRADLE SHALL BE TERMINATED AT THE CLAY PIPE JOINT IN A MANNER WHICH WILL MAINTAIN THE FLEXIBILITY OF THE JOINT. COST OF CRADLE WITHIN MANHOLE EXCAVATION OR TO CLAY PIPE JOINTS ADJACENT TO MANHOLE SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE MANHOLE.
  - MANHOLE COVER CASTINGS AND MANHOLE FRAME CASTINGS SHALL CONFORM TO THE REQUIREMENTS AS INDICATED IN THE STANDARD SPECIFICATIONS AND AS SHOWN IN THE STANDARD DETAIL DRAWING.
  - THE VERTICAL DROP IN INSIDE DROP MANHOLES SHALL NOT EXCEED 2' FOR INFLOWING PIPES SIZED 12" OR SMALLER AND 2' FOR INFLOWING PIPES LARGER THAN 12". THE CROWNS OF INFLOWING PIPES SHALL NEVER BE SET LOWER THAN THE CROWN OF THE OUTFLOWING PIPE.
  - STANDARD MANHOLES AND STANDARD INSIDE DROP MANHOLES SHALL BE BID AS STANDARD MANHOLES FOR THE TYPE AND DIAMETER INDICATED. OUTSIDE DROP MANHOLES SHALL BE BID AS STANDARD OUTSIDE DROP MANHOLES FOR THE TYPE AND DIAMETER INDICATED. ALL MANHOLE DIAMETERS WILL BE 4" UNLESS INDICATED OTHERWISE.
  - A BRICK MASONRY COLLAR SHALL BE INSTALLED BETWEEN THE CAST IRON FRAME AND THE CONCENTRIC CONE. THE COLLAR SHALL HAVE 8" WALLS AND A VERTICAL HEIGHT OF 6" MINIMUM AND 18" MAXIMUM. A COAT OF MORTAR WILL BE PLASTERED ON THE OUTSIDE OF THE COLLAR. THE USE OF PRE-CAST CONCRETE SPACERS FOR MANHOLE TOP ADJUSTMENT IS ALSO ALLOWED.
  - CHURSHED ROCK CONFORMING TO ASTM C-33 WITH A GRADATION OF NO. 67 SHALL BE INSTALLED AT THE BASE OF THE MANHOLE TO A DEPTH OF NO LESS THAN 6", AND SHALL EXTEND NO LESS THAN 6" OUTSIDE THE DIAMETER OF THE CONCRETE FLOOR OF THE MANHOLE.
  - WALL THICKNESS SHALL BE 1" GREATER THAN MANHOLE DIAMETER IN FEET.
  - THE FULL DIAMETER OF THE MANHOLE SHALL EXTEND THE ENTIRE DEPTH OF THE MANHOLE TO THE CONE SECTION. NO REDUCTION IN MANHOLE DIAMETER WILL BE ALLOWED.

**1 STANDARD TYPE 'P' MANHOLES**  
Not To Scale

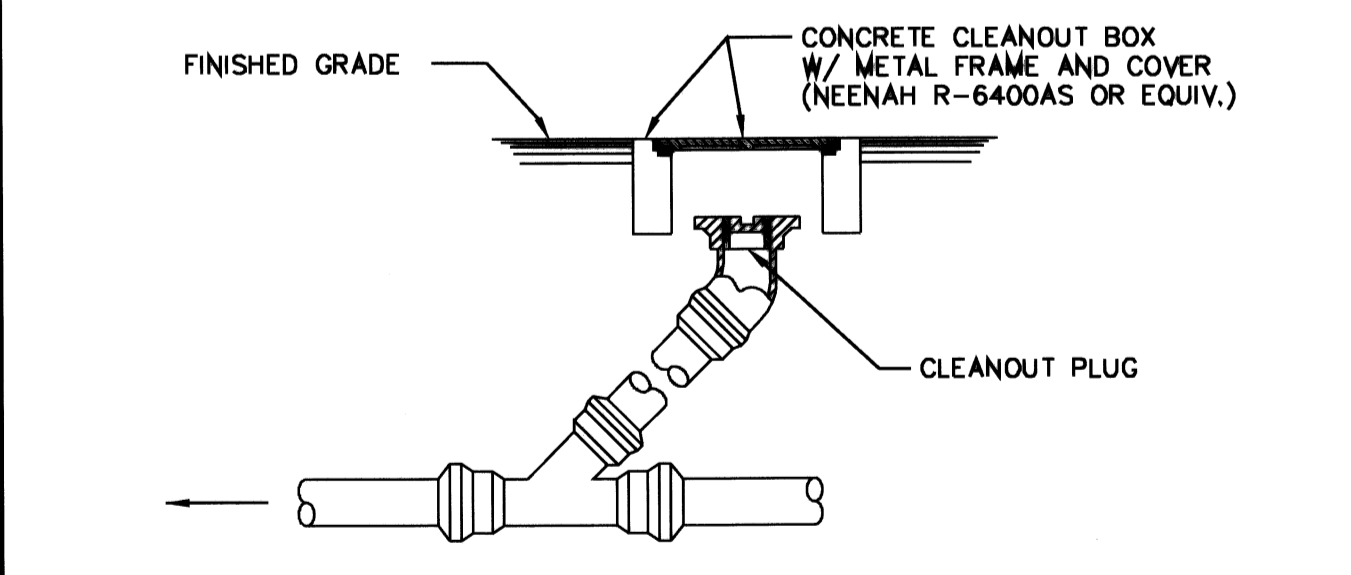


**2 TRENCH AND BEDDING DETAILS**  
Not To Scale

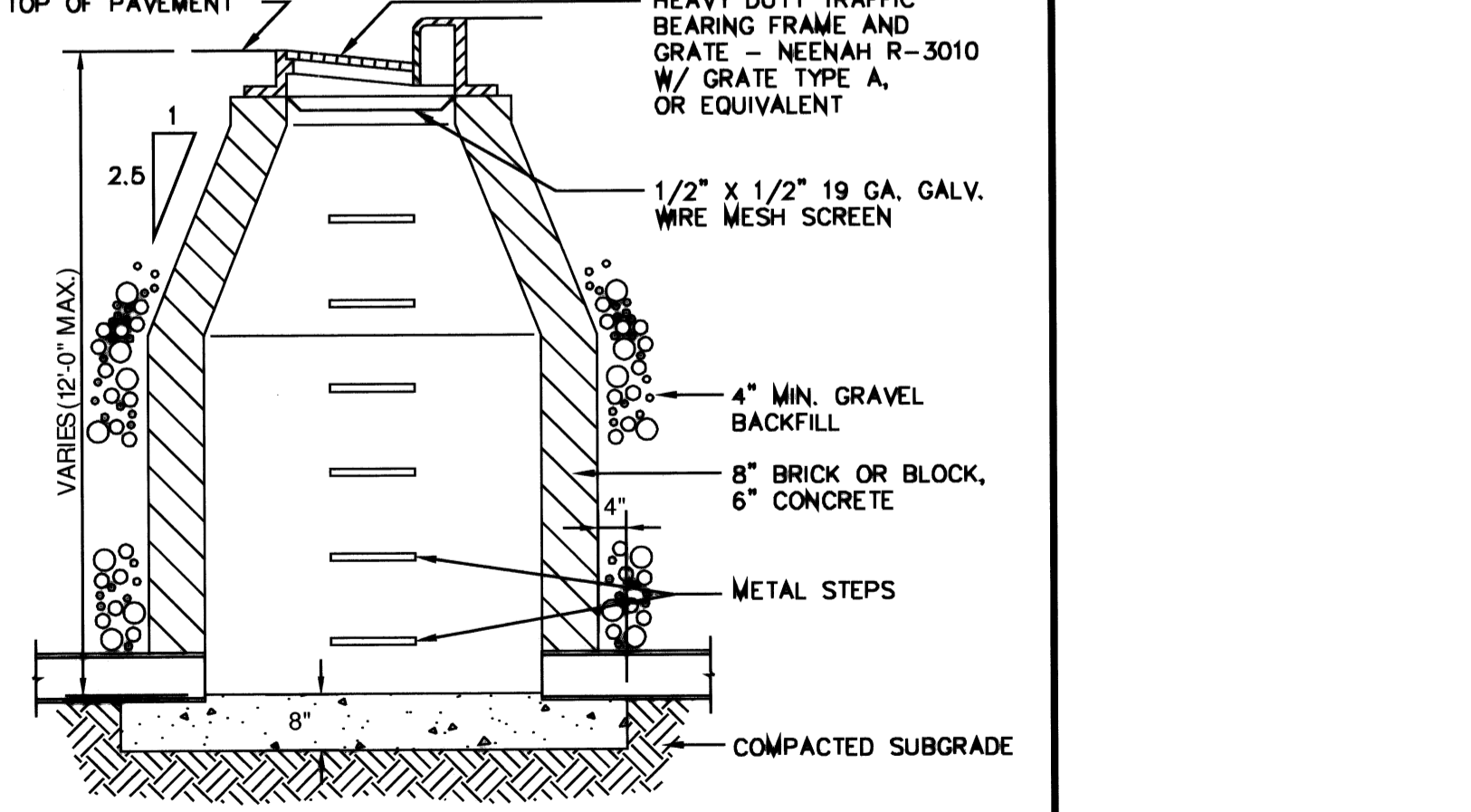
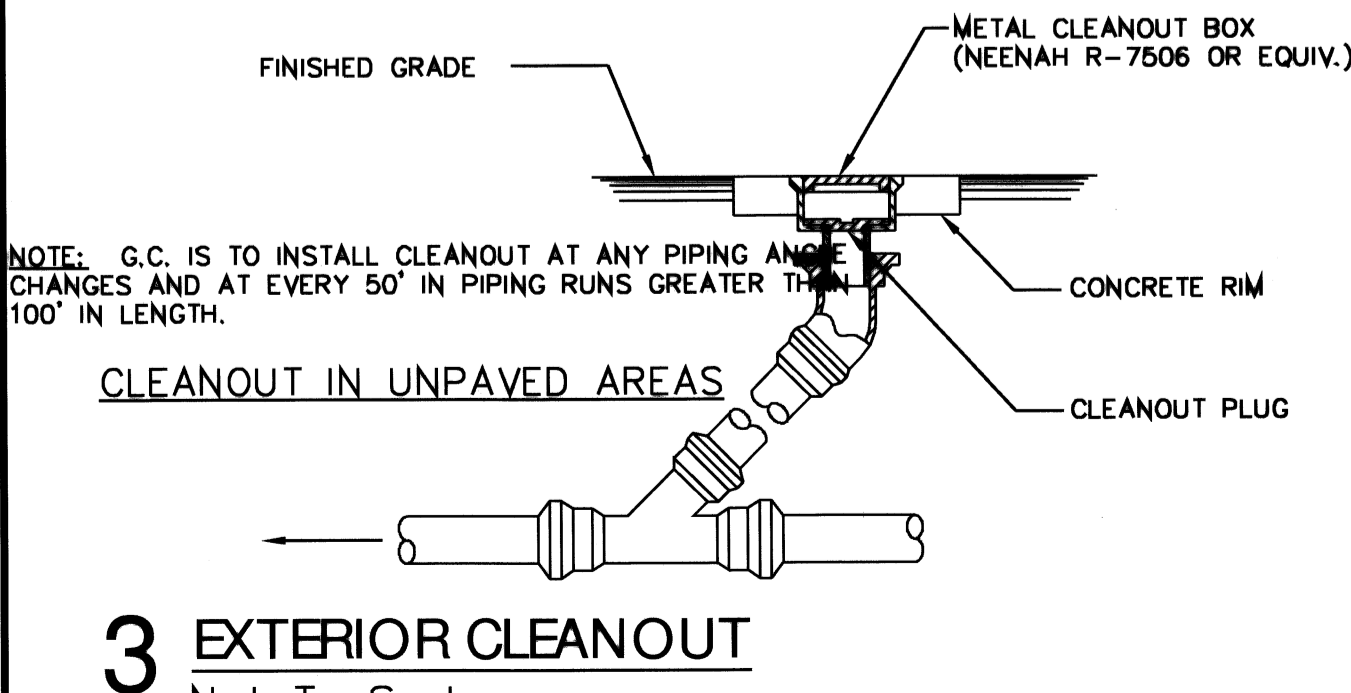
**TABLE 1. CLASSIFICATION OF BEDDING AND BACKFILL MATERIALS**

ASTM D 2321 MATERIAL CLASS	ASTM D 2487 SOIL GROUP	MATERIAL TYPE	% PASSING			ATTEMBERG LIMITS	
			1/2 IN.	NO. 4	NO. 200	LL	PL
IA	NONE	MANUFACTURED OPEN GRADED AGGREGATES	100%	≥ 10%	< 5%		NON PLASTIC
IB	NONE	MANUFACTURED DENSE GRADED AGGREGATES	100%	≥ 50%	< 5%		NON PLASTIC
II	GW	COARSE-GRAINED SOLID CLEAN	100%	< 50% OF "COARSE FRACTION"	< 5%	NON PLASTIC	
	BV						
	GP						
	GM						
III	GC	COARSE-GRAINED SOLIDS/ FINES	100%	< 50% OF "COARSE FRACTION"	15% TO 50%	≤ 4 OR - "A" LINE	
	SM						
	SC						
	ML						
IV-A	CL	FINE-GRAINED SOILS	100%	100%	> 50%	< 50	≤ 4 OR - "A" LINE ≥ 7 OR - "A" LINE

- GENERAL NOTES**
- BEDDING SHALL BE DUMPED CLASSIFIED WORKED BY HAND OR CLASSIFIED COMPACTED TO 95% STANDARD PROCTOR. LOCAL COSE PERMITTING WITH GEOTECHNICAL ENGINEER AND OWNER APPROVAL, NATIVE SOILS MAY BE USED FOR BEDDING PROVIDED IT MEETS THE MINIMUM AND BACKFILL MATERIALS IN TABLE INCLUDING CLASS IV-A.
  - HAUNCHING SHALL BE WORKED AROUND THERE BY HAND TO ELIMINATE VOICINGS AND SHALL BE CLASS I-A OR CLASS II OR CLASS III COMPACTED TO 95% STANDARD PROCTOR. 1/2" GRAVEL SHALL NOT BE USED AS HAUNCHING MATERIAL. CLASS I MATERIAL SHALL BE ALLOWED FOR RIGID PIPE COMPACTED AT 95% STANDARD PROCTOR.
  - INITIAL BACKFILL SHALL BE CLASSIFIED WORKED BY HAND OR CLASSIFIED COMPACTED TO 90% STANDARD PROCTOR OR CLASS III COMPACTED TO 90% STANDARD PROCTOR. CLASS I MATERIAL SHALL BE USED FOR FLEXIBLE PIPE WITH FULL HEIGHTS EXCEED 6'.
  - FINAL BACKFILL SHALL BE CLASSIFIED WORKED BY HAND OR CLASSIFIED COMPACTED TO 90% STANDARD PROCTOR OR CLASS III COMPACTED TO 95% STANDARD PROCTOR.
  - FINAL BACKFILL NOT UNDRIPPED AREA CAN BE CLASSIFIED A COMPACTED TO 95% STANDARD PROCTOR.
  - ALL MATERIALS ARE CLASSIFIED IN ACCORDANCE WITH ASTM D 2321 (SEE TABLE 1).
  - ALL MATERIALS SHALL BE INSTALLED IN MAXIMUM 8" LIFTS UPON ACCORDANCE WITH ASTM D 1586. CLASS II, III, AND IV-A MATERIALS SHALL BE COMPACTED NEAR OPTIMUM MOISTURE CONTENT.
  - FILL OBTAINED FROM EXCAVATION SHALL BE FREE OF COBBLES OR Boulders LARGER THAN 2".
  - ALL TRENCH EXCAVATIONS SHALL BE SHORED, SHORED, SHEDDED, BRACED, OR OTHERWISE SUPPORTED IN COMPLIANCE WITH OSHA REGULATIONS AND LOCAL ORDINANCES.
  - DESIGN ENGINEER SHALL DESIGNATE ON THE PLANS WHERE WATER TIGHT JOINTS ARE TO BE REQUIRED.
  - REPLACE WEIR OR UNUSABLE TABLE EXHAUSTIONARY TO PROVIDE A SUITABLE BASE AS DIRECTED BY GEOTECHNICAL ENGINEER OR OWNER.
  - WHERE GROUND WATER IS PRESENT CLASS I-A MATERIAL SHALL BE WETTED WITH A MINIMUM OF 10% GEOTECHNICAL ENGINEER'S DESIGNATION BETWEEN 4" & 8" THICK.
  - CONTRACTOR SHALL REFER TO GEOTECHNICAL REPORT FOR SOIL TYPE AND CLASSIFICATION FOR THIS PROJECT.
  - CONTRACTOR SHALL REFER TO THE LATEST VERSION OF ASTM STANDARDS PRIOR TO CONSTRUCTION.



**3 EXTERIOR CLEANOUT**  
Not To Scale



**4 CURB DRAINAGE CATCH BASIN**  
Not To Scale

STREET ADDRESS  
1421 N WEST STREET

CITY  
WICHITA

STATE  
KANSAS

COUNTY  
SEDGEWICK

REGIONAL DWG. NO.  
15-0276

DETAIL SHEET

STATUS	DATE	BY
PRELIMINARY	-/-/-	-
PLAN CHECKED	-/-/-	-
ASBUILT	-/-/-	-
PROJECT NO.	06-0716	

**U5**