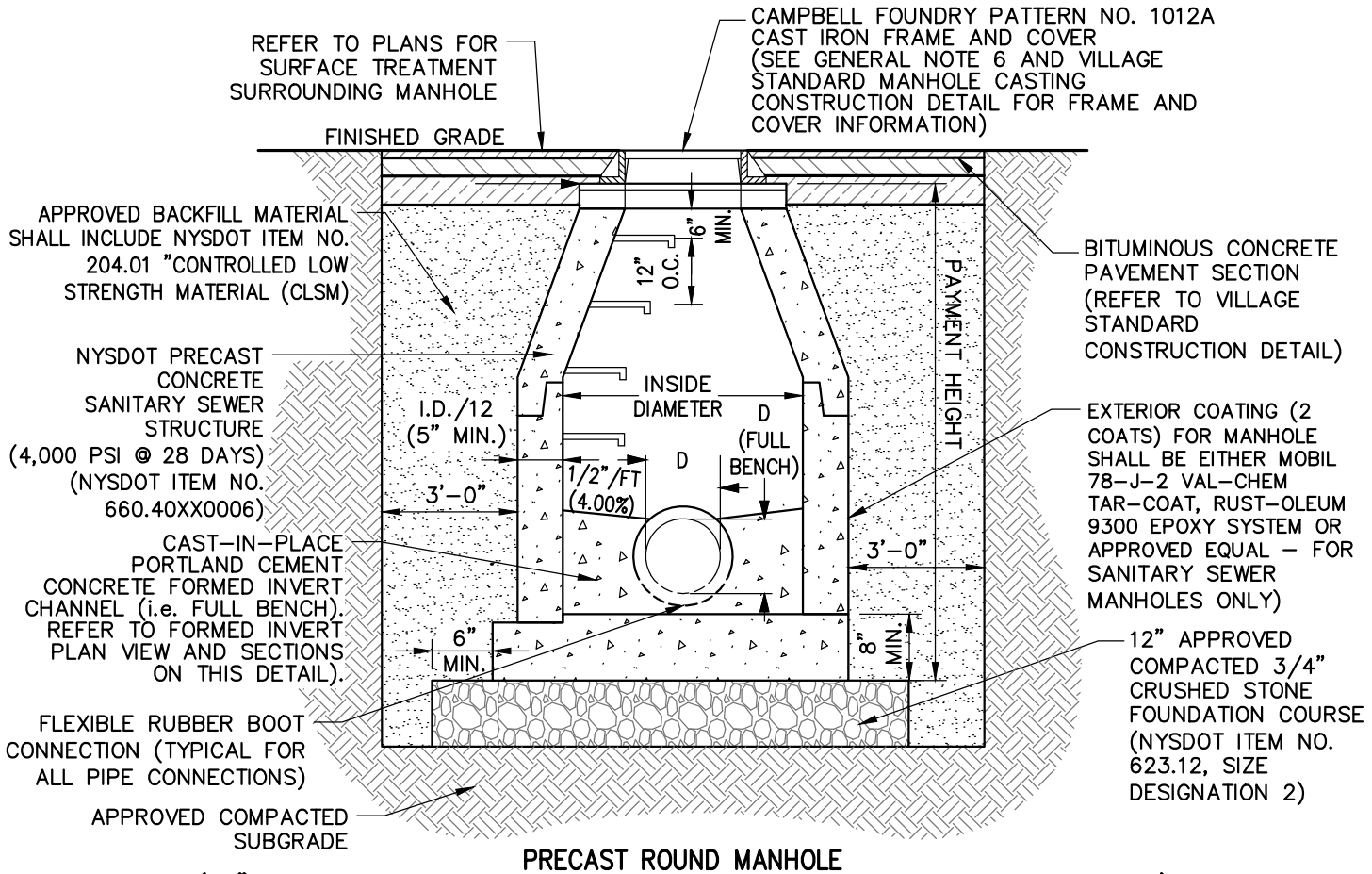
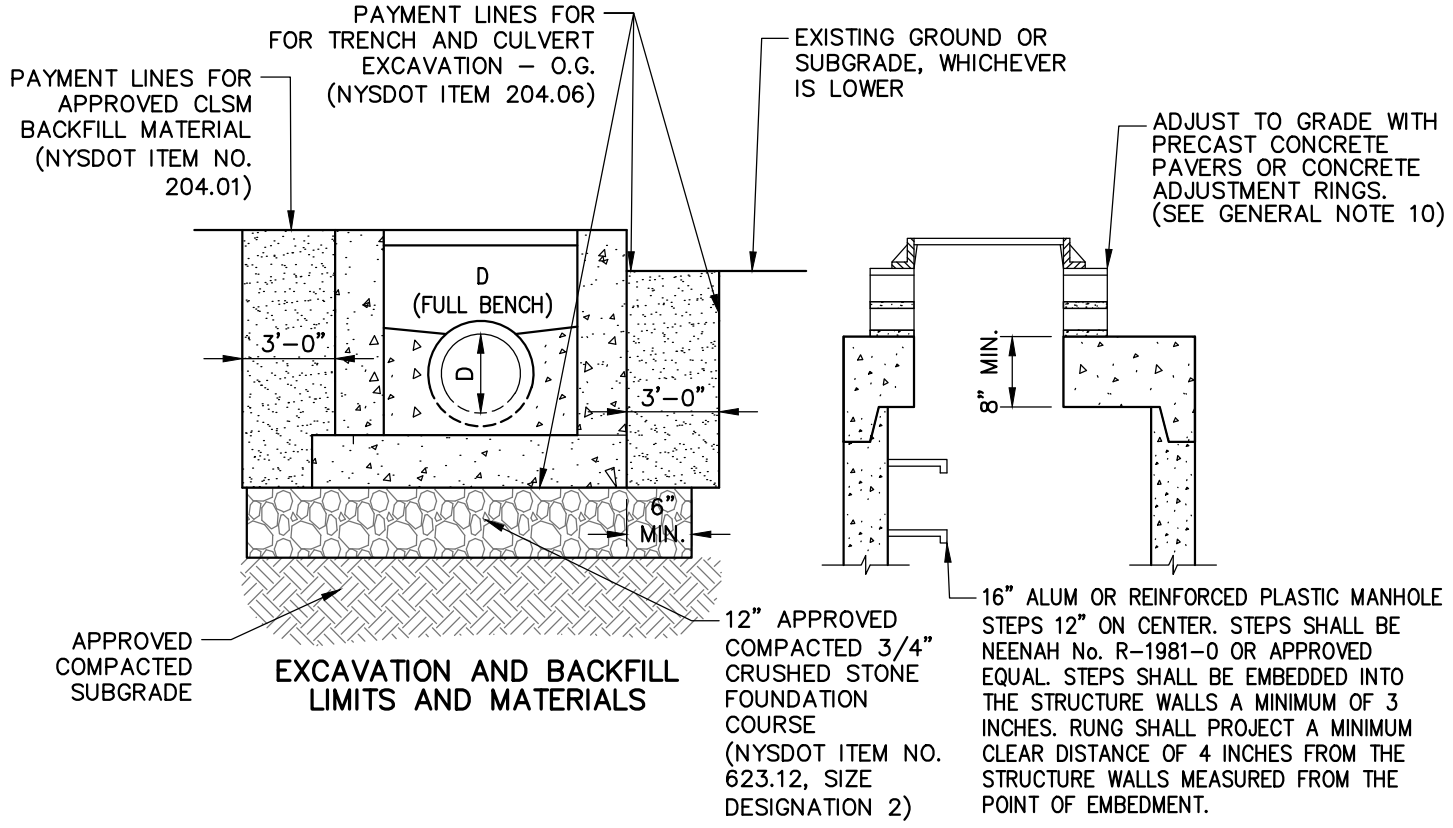


PRECAST ROUND MANHOLE
(48" INSIDE DIAMETER UNLESS OTHERWISE SPECIFIED BY THE VILLAGE ENGINEER)



EXCAVATION AND BACKFILL LIMITS AND MATERIALS

VILLAGE OF CROTON-ON-HUDSON STANDARD CONSTRUCTION DETAILS

PREPARED IN THE OFFICE OF THE COMMISSIONER OF PUBLIC WORKS

PRECAST CONCRETE SANITARY SEWER MANHOLE (NYSDOT ROUND STRUCTURE)

DESIGNED BY: ARC, PE | CHECKED BY: ARC, PE
DRAWN BY: ARC, PE | VOCOH SD-4A_Precast Sanitary YSDOT).dwg

VILLAGE OF CROTON-ON-HUDSON
STANLEY H. KELLERHOUSE MUNICIPAL BUILDING
1 VAN WYCK STREET (2ND FLOOR)
WESTCHESTER COUNTY
VILLAGE OF CROTON-ON-HUDSON, NY 10520
PHONE: (914) 271-3775
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PROJECT: DETAILS
SCALE:NOT TO SCALE
DATE: 04/10/2015

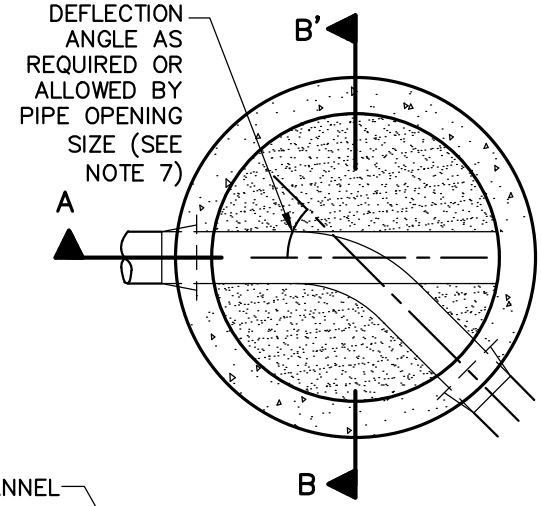
SD-4A

SELECTION TABLES FOR ALTERNATE ROUND SANITARY SEWER STRUCTURES

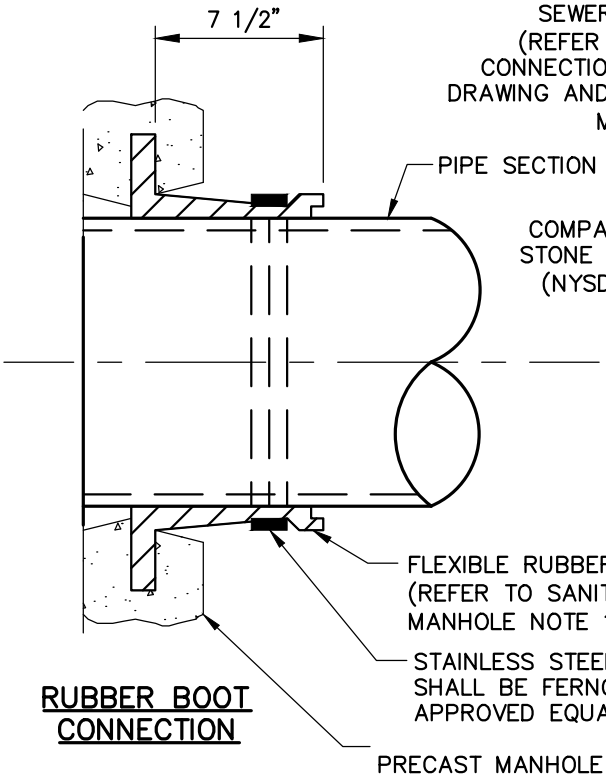
CONCRETE, POLYETHYLENE, PVC, DIP, CIP AND VCP PIPES		STRUCTURE INTERNAL DIAMETER 48"	60"	72"	84"	96"
RCP H.E. RISE X SPAN	ROUND INTERNAL DIAMETER	MINIMUM ANGLE BETWEEN PIPE ENTRIES (NOTE 5)				
	12"	84	63	50	41	35
	15"	94	70	56	46	39
	18"	104	78	62	51	43
	21"	115	85	68	56	48
	24"	127	93	74	61	52
	27"	141	102	81	67	57
	30"	157	111	87	72	61
19" X 30"		157	112	88	73	62
	34"		121	95	78	66
22" X 34"			125	97	80	68
	36"		133	102	84	71
24" X 38"			140	106	87	74
27" X 42"			156	115	94	79
	42"		164	119	96	81
29" X 45"				130	104	87
	48"			140	110	92
32" X 49"				145	113	94
34" X 53"				166	123	101
	54"			175	126	104
	60"				147	117

PRECAST ROUND MANHOLES

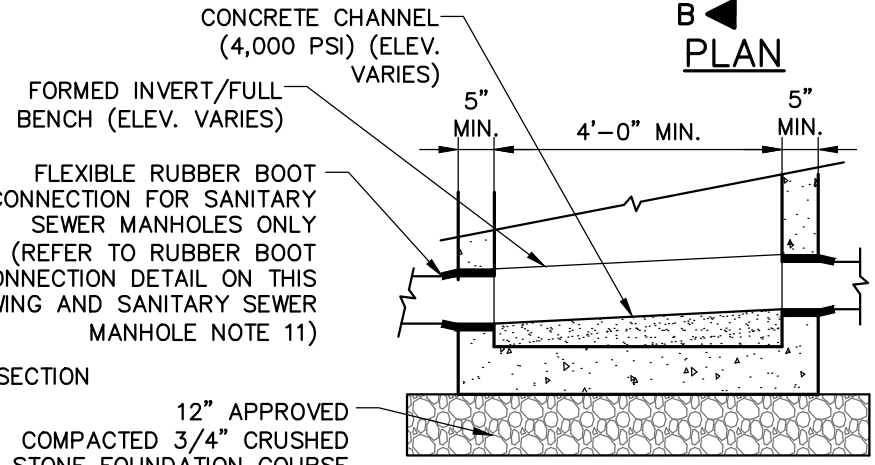
NYSDOT ITEM NO.	TYPE	CIRCUMFERENTIAL STEEL – SQUARE INCHES PER VERTICAL FOOT	INSIDE DIAMETER
660.40480006	48	0.12	48
660.40600006	60	0.15	60
660.40720006	72	0.18	72
660.40840006	84	0.21	84
660.40960006	96	0.24	96



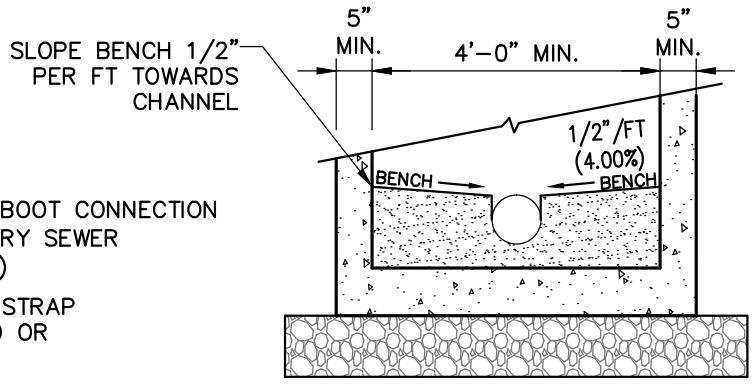
PLAN



RUBBER BOOT CONNECTION



SECTION A–A'



SECTION B–B'

VILLAGE OF CROTON–ON–HUDSON STANDARD CONSTRUCTION DETAILS

PREPARED IN THE OFFICE OF THE COMMISSIONER OF PUBLIC WORKS

PRECAST CONCRETE SANITARY SEWER MANHOLE (NYSDOT ROUND STRUCTURE)

DESIGNED BY: ARC, PE CHECKED BY: ARC, PE
DRAWN BY: ARC, PE VOCOH SD–4A_Precast Sanitary (NYSDOT).dwg

VILLAGE OF CROTON–ON–HUDSON
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PROJECT: DETAILS
SCALE: NOT TO SCALE
DATE: 04/10/2015

SD-4A

GENERAL NOTES:

1. UNLESS OTHERWISE APPROVED BY THE VILLAGE ENGINEER, SANITARY SEWER STRUCTURES SHALL BE PRECAST CONCRETE UNITS. THE CONTRACTOR SHALL SUBMIT WORKING DRAWINGS FOR REVIEW AND APPROVAL OF ANY CHANGES TO THE STRUCTURES SHOWN ON THIS DETAIL OR CONTRACT PLANS, OTHER THAN MINOR CHANGES APPROVED BY THE ENGINEER. USE OF FLAT SLAB TOPS ON ROUND PRECAST UNITS SHALL REQUIRE SUBMISSION OF WORKING DRAWINGS.

2. SEE PLANS FOR ELEVATIONS AND SANITARY SEWER STRUCTURE LOCATIONS.

3. RECTANGULAR STRUCTURES (ONLY WHERE DIRECTED AND AS APPROVED BY THE VILLAGE ENGINEER):
REINFORCEMENT FOR RECTANGULAR SANITARY SEWER UNITS (ONLY WHEN REQUIRED FOR CONSTRUCTABILITY AND LARGER PIPE DIAMETERS) BAR REINFORCEMENT INDICATED FOR RECTANGULAR TOP SLABS, RISERS AND BASES SHALL BE GRADE 60. WIRE FABRIC FOR CONCRETE REINFORCEMENT SHALL MEET THE REQUIREMENTS OF §709–02. RISER REINFORCEMENT SHALL BE PLACED SO IT WILL HAVE A MINIMUM COVER OF 2" BUT NO MORE THAN 4" FROM THE INSIDE FACE. THE REINFORCEMENT SHALL EXTEND COMPLETELY AROUND THE SANITARY SEWER STRUCTURE RISER AND SHALL BE LAPPED AND TIED. BASE REINFORCEMENT SHALL BE PLACED ABOVE THE MIDPOINT OF SLAB AND SHALL HAVE A MINIMUM CONCRETE COVER OF 2".

4. ROUND STRUCTURES:
THE RISER, TOP SLAB, AND BOTTOM SLAB FOR THE ROUND ALTERNATE SHALL BE MANUFACTURED IN ACCORDANCE WITH THE PROVISIONS OF §706–04 OF THE STANDARD SPECIFICATIONS. WORKING DRAWINGS FOR THE ROUND ALTERNATES SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL, UNLESS THE ROUND ALTERNATE PROPOSED HAS BEEN PREVIOUSLY APPROVED. FOR PREVIOUSLY APPROVED ROUND UNITS THE CONTRACTOR SHALL SUBMIT A COPY OF THE APPROVED DRAWINGS TO THE ENGINEER.

5. FORMED INVERTS:
FORMED INVERTS SHALL BE PROVIDED AND INCLUDED IN THE PRICES BID FOR SANITARY SEWER STRUCTURES CALLED FOR IN THE CONTRACT DOCUMENTS. WHEN NON–CIRCULARPIPES ARE USED, THE FORMED INVERT SHALL BE MODIFIED TO FIT THE INVERTS.

6. COVERS:
CASTINGS SHALL BE CAST IRON AND HAVE THE WORD "SANITARY" CAST ON THE COVER. THE COVER SHALL NOT HAVE VENT HOLES. REFER TO THE VILLAGE STANDARD MANHOLE CASTING CONSTRUCTION DETAIL FOR ADDITIONAL INFORMATION.

7. WALL OPENINGS:
RECTANGULAR STRUCTURES SHOULD NEVER HAVE CORNER PIPE ENTRIES. IF PIPE ALIGNMENT WOULD REQUIRE A CORNER ENTRY, USE A ROUND SANITARY SEWER STRUCTURE OR USE A SPECIAL SANITARY SEWER STRUCTURE. ALL WALL OPENINGS SHALL BE FORMED COMPLETELY THROUGH THE WALL SECTION. CIRCULAR WALL OPENINGS SHALL BE FORMED FOR EACH CIRCULAR PIPE ENTERING PERPENDICULAR TO THE WALL. WHEN NON–CIRCULAR PIPES ARE SPECIFIED, OR ROUND PIPE ENTRIES ARE SKEWED, RECTANGULAR OPENINGS MAY BE USED. THE CLEARANCE BETWEEN THE OUTSIDE OF THE PIPE AND THE OPENING SHALL BE AT LEAST 2" BUT NO MORE THAN 3". THIS CLEARANCE SHALL BE MEASURED BETWEEN THE OUTSIDE OF THE PIPE AND NEAREST POINT ON THE RECTANGULAR OPENING. IF A CORNER HAS PIPE ENTRIES ON BOTH SIDES, AND THERE IS LESS THAN 2" BETWEEN EITHER OPENING AND THE CORNER THEN THAT SECTION OF THE SANITARY SEWER STRUCTURE MUST HAVE 8" THICK WALLS.

8. MONOLITHIC AND INTEGRAL BASES MAY HAVE A MAXIMUM VERTICAL DRAFT OF ½" ON ALL INTERIOR DIMENSIONS, TO FACILITATE FORM REMOVAL. FOR WALL OPENINGS THAT EXTEND THE FULL WIDTH OR LENGTH OF THE STRUCTURE, THE MINIMUM CLEARANCE BETWEEN THE OUTSIDE OF THE PIPE AND THE WALL OPENING SHALL BE 1½".

9. FINISHING PIPE ENTRIES:
THE BELLS OF CONCRETE PIPE SHALL BE CUT OFF AT EVERY PIPE ENTRY WHERE THE BELL ENTERS A STRUCTURE. CONNECTIONS BETWEEN THE STRUCTURE AND PIPE SHALL BE MADE BY USING A RESILIENT CONNECTOR (i.e. RUBBER BOOT CONNECTION). PLEASE REFER TO SANITARY SEWER MANHOLE NOTE 11.

10. TOP SLAB AND OR FRAME AND GRATE ADJUSTMENT:
A MINIMUM OF ½" OF BEDDING SHALL BE PLACED BETWEEN RISER AND PRECAST TOP SLABS. GRADE ADJUSTMENT FOR TOP SLABS AND/OR FRAME AND GRATE OF UP TO 2½" SHALL BE MADE WITH BEDDING MATERIAL MEETING THE REQUIREMENTS OF MORTAR FOR CONCRETE MASONRY, CONCRETE GROUTING MATERIALS OR CONCRETE REPAIR MATERIAL. GRADE ADJUSTMENT FOR TOP SLABS AND/OR FRAME AND GRATES OF UP TO 6" SHALL BE MADE WITH COMBINATION OF PRECAST CONCRETE PAVERS AND BEDDING MATERIALS. GRADE ADJUSTMENT FOR TOP SLABS AND/OR FRAME AND GRATES OF UP TO 1'–0" SHALL BE MADE WITH CAST–IN–PLACE CONCRETE OR A COMBINATION OF PRECAST CONCRETE ADJUSTMENT ELEMENTS AND BEDDING MATERIALS. ALTERNATELY, GRADE ADJUSTMENTS FOR FRAMES AND GRATES OF UP TO 2" MAY BE MADE WITH RECYCLED RUBBER ELEMENTS OR UP TO 3" WITH HDPE ELEMENTS. RECYCLED RUBBER AND HDPE ELEMENTS SHALL BE PRODUCTS APPROVED BY THE MATERIALS BUREAU AND SHALL BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS. THE CONTRACTOR MAY USE ALTERNATE METHODS OF GRADE ADJUSTMENT, CONTINGENT UPON SATISFACTORY RESULTS BEING OBTAINED.

11. MANHOLE STEPS SHALL BE REQUIRED IN ALL SANITARY SEWER STRUCTURES DEEPER THAN 4'–0".

12. CORBELED OR CONICAL RISER SECTIONS AND FLAT SLAB REDUCERS.
ROUND PRECAST SANITARY SEWER STRUCTURES OR MANHOLES (WHEN ALLOWED OR SPECIFIED) MAY BE FITTED WITH CONCENTRIC OR ECCENTRIC CONICAL SECTIONS TO REDUCE THEIR DIAMETERS. PROVIDED THE USE OF SUCH DEVICES IS COMPATIBLE WITH THE DRAINAGE SYSTEM DESIGN. THE CONTRACTOR SHALL SUBMIT WORKING DRAWINGS FOR REVIEW AND APPROVAL OF FLAT SLAB REDUCERS FOR ROUND OR RECTANGULAR STRUCTURES. A WALL SECTION WITH A HEIGHT LESS THAN 6" BETWEEN THE TOP OF THE HIGHEST PIPE ENTRY AND THE BOTTOM OF A CONICAL SECTION OR FLAT SLAB REDUCER SHALL NOT BE PERMITTED.

VILLAGE OF CROTON–ON–HUDSON STANDARD CONSTRUCTION DETAILS PREPARED IN THE OFFICE OF THE COMMISSIONER OF PUBLIC WORKS	**PRECAST CONCRETE SANITARY SEWER MANHOLE (NYSDOT ROUND STRUCTURE)** DESIGNED BY: ARC, PE CHECKED BY: ARC, PE DRAWN BY: ARC, PE VOCOH SD–4A_Precast Sanitary YSDOT).dwg	**VILLAGE OF CROTON–ON–HUDSON** STANLEY H. KELLERHOUSE MUNICIPAL BUILDING 1 VAN WYCK STREET (2ND FLOOR) WESTCHESTER COUNTY VILLAGE OF CROTON–ON–HUDSON, NY 10520 PHONE: (914) 271–3775 FAX: (914) 271–2856	PROJECT: DETAILS SCALE:NOT TO SCALE DATE: 04/10/2015 SD-4A

GENERAL NOTES (CONT'D):

13. WHEN PIPE LOCATIONS PROVIDE FOR LESS THAN 8" BETWEEN THE TOP OF THE UPPERMOST PIPE AND THE TOP OF THE RISER AND THE STRUCTURE MAY BE SUBJECTED TO HIGHWAY LOADS, CONTACT THE VILLAGE ENGINEER FOR A SPECIAL DESIGN.

14. WHEN SITE CONDITIONS REQUIRE A SANITARY SEWER STRUCTURE TO BE INSTALLED TO A DEPTH GREATER THAN THAT SHOWN IN THE CONTRACT DOCUMENTS, AN INSTALLATION TOLERANCE OF 8" IS PERMITTED WITHOUT REQUIRING AN INCREASE IN WALL THICKNESS OR REINFORCING STEEL AS REQUIRED BY VILLAGE STANDARD CONSTRUCTION DETAIL SD-3A "DRAINAGE STRUCTURE REINFORCEMENT" TABLE.

SANITARY SEWER MANHOLE NOTES:

1. UNLESS OTHERWISE NOTED, SANITARY SEWER STRUCTURES SHALL MEET THE SPECIFICATIONS OUTLINED IN SECTION 604, 664, 706-04 AND OTHER APPLICABLE SECTIONS OF THE NEW YORK STATE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS, DATED MAY 7, 2015 WITH LATEST REVISIONS.

2. PRECAST ROUND MANHOLE SHALL BE TYPE 48, NYSDOT ITEM NO. 664.40480006 (OR LARGER AS REQUIRED TO ACCOMMODATE SANITARY SEWER PIPE) AND SHALL INCLUDE A MANHOLE FRAME AND COVER, MONOLITHICALLY POURED FLOOR SLABS AND PRECAST OR CAST-IN-PLACE CONCRETE FORMED BENCH AND FULL INVERT.

3. THE ABOVE VALUES ARE BASED ON THE CENTERLINE OF ALL PIPES INTERSECTING AT THE CENTER OF THE ROUND MANHOLE.

4. THE ANGLE BETWEEN ADJACENT PIPE ENTRIES SHALL NOT BE LESS THAN THE MINIMUM SHOWN IN THE TABLE ABOVE. WHEN THE ADJACENT PIPES HAVE DIFFERENT SIZES, THE MINIMUM ANGLE SHALL BE THE VALUE FOR THE LARGER OF THE TWO PIPES.

5. THE SUM OF THE MINIMUM ANGLES BETWEEN PIPES AT THE SAME LEVEL SHALL NOT BE MORE THAN 360 DEGREES. THEY SHALL BE REGARDED AS BEING AT THE SAME LEVEL IF THEIR RISES OVERLAP.5. A BLANK (NO ENTRY) IN TABLE INDICATES THAT THE STRUCTURE IS TOO SMALL FOR PIPE OF THAT SIZE.

6. SLOPE CHANNEL (i.e. BENCH, INVERT, ETC.) DOWN 0.10 FEET FROM INLET TO OUTLET.

7. MAKE CHANGES IN FLOW DIRECTION BY CIRCULAR CHANNEL CONSTRUCTION WITH MAXIMUM RADIUS POSSIBLE.

8. FOR DEAD-END MANHOLES, BUILD CHANNEL AS DIRECTED BY THE COMMISSIONER OF PUBLIC WORK AND/OR ENGINEER.

9. EXTERIOR COATING FOR MANHOLE SHALL BE EITHER MOBIL 78-J-2 VAL-CHEM TAR-COAT, RUST-OLEUM 9300 EPOXY SYSTEM OR APPROVED EQUAL.

10. PRECAST REINFORCED CONCRETE TOP SLAB AND/OR PRECAST LANDING IF REQUIRED SHALL BE MANUFACTURED IN ACCORDANCE WITH THE DETAIL SHOWN ON THE CONTRACT PLANS. THE CONCRETE USED IN THE MANUFACTURING OF THESE SLABS SHALL BE MINIMUM 4000 PSI CONCRETE AS SPECIFIED UNDER SECTION 706-04, "PRECAST CONCRETE DRAINAGE UNITS" OF THE NYSDOT STANDARD SPECIFICATIONS.

11. PIPE CONNECTIONS INTO THE SANITARY SEWER MANHOLES SHALL BE AS FOLLOWS:

a. THE PRECAST REINFORCED CONCRETE MANHOLE BASE SHALL BE PROVIDED WITH CIRCULAR OPENINGS AT THE LOCATIONS AND ELEVATIONS FOR THE PROPER CONNECTION OF PIPES. THE PIPE CONNECTIONS SHALL BE SEALED WITH FLEXIBLE MANHOLE SEAL ASSEMBLIES.

b. THE FLEXIBLE MANHOLE SEAL ASSEMBLIES SHALL BE INSTALLED IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE SEAL ASSEMBLY MANUFACTURER AND SHALL CONFORM TO ASTM C923-02.

c. FLEXIBLE MANHOLE SEAL ASSEMBLIES SHALL PERMIT AT LEAST AN EIGHT (8) DEGREE DEFLECTION FROM THE CENTERLINE OF THE OPENING IN ANY DIRECTION WHILE MAINTAINING A WATERTIGHT CONNECTION.

d. THE FLEXIBLE MANHOLE SEAL ASSEMBLIES SHALL BE AS MANUFACTURED BY INTERPACE CORP. (LOCK JOINT FLEXIBLE MANHOLE SLEEVE), NATIONAL POLLUTION CONTROL SYSTEMS, INC. (KOR-N-SEAL) OR PRESS-SEAL GASKET CORP. OR APPROVED EQUAL.

12. A CAST-IN-PLACE CONCRETE INVERT SHALL BE FORMED WITHIN THE PRECAST CONCRETE MANHOLE BASE AS SHOWN ON THE CONTRACT DRAWINGS WITH CLASS A CONCRETE.

13. MANHOLE BASES
FOR PRECAST MANHOLE BASES, THE AREA UNDERNEATH THE MANHOLE BASE SHALL BE EXCAVATED TO THE REQUIRED ELEVATION. THE SOIL BELOW THE BASE SHALL NOT BE DISTURBED. THE MANHOLE BASE SHALL THEN BE LOWERED INTO THE TRENCH AND CHECKED FOR PROPER BEARING ON THE SUBGRADE, PROPER ELEVATION AND ORIENTATION TO RECEIVE THE INCOMING AND OUTGOING SEWERS AT THE DESIGNATED INVERT ELEVATION. IF THE INVERT ELEVATION VARIES BY MORE THAN PLUS OR MINUS ½ INCH FROM THE DESIGNATED INVERT ELEVATION, THE BASE SHALL BE REMOVED AND RESET.

14. CAST IN PLACE INVERTS
THE CONCRETE INVERT FILL SHALL BE INSTALLED FOLLOWING THE CONNECTION OF ALL SEWER PIPES TO THE MANHOLE. THE INVERT FILL SHALL BE TRUE TO THE SEWER PIPE INVERT ELEVATIONS, WITH SMOOTH CHANNELS OF UNIFORM CROSS SECTION AND SLOPE, EITHER STRAIGHT OR WITH A CONTINUOUS CURVE BETWEEN INLET AND OUTLET OF PIPES. THE CONCRETE INVERT FILL SHALL BE PLACED IN ACCORDANCE WITH DIMENSIONS AND DETAILS SHOWN ON THE CONTRACT PLANS. TO ELIMINATE FREE FALL CONDITIONS IN A MANHOLE RESULTING FROM INVERT ELEVATION DIFFERENTIALS BETWEEN INCOMING AND OUTGOING PIPES, THE CONTRACTOR SHALL FORM AND CONSTRUCT SUITABLE CHANNELS IN THE BOTTOM OF THE MANHOLE CONNECTING THE INVERTS. THE COMPLETE EXTERIOR, FLOW CHANNEL, AND BENCH SHALL RECEIVE A PRIME AND FINISH COAT OF THE SPECIFIED COATING. APPLICATION SHALL BE IN STRICT CONFORMANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

15. MASONRY COLLAR
THE PRECAST CONCRETE PAVERS OR PRECAST CONCRETE COLLAR BE CONSTRUCTED ON THE PRECAST CONCRETE TOP SLAB TO BRING THE MANHOLE FRAME AND COVER TO THE PROPER GRADE IN ACCORDANCE WITH THE DETAIL ON THE CONTRACT PLANS. THE MINIMUM HEIGHT SHALL BE 4 INCHES AND THE MAXIMUM HEIGHT SHALL NOT EXCEED 16 INCHES. FOLLOWING THE PLACEMENT OF THE PAVERS A ½ INCH LAYER OF MASONRY MORTAR SHALL BE APPLIED TO THE EXTERIOR SURFACE OF BRICK AND TROWELLED TO A SMOOTH FINISH.

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