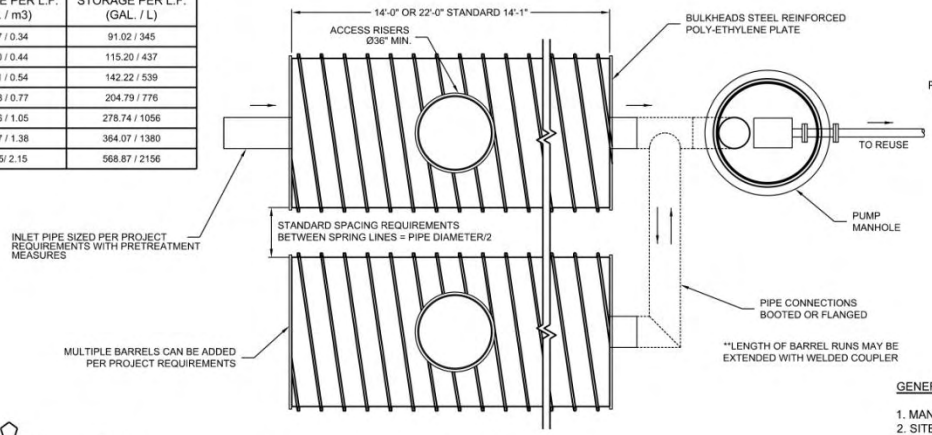
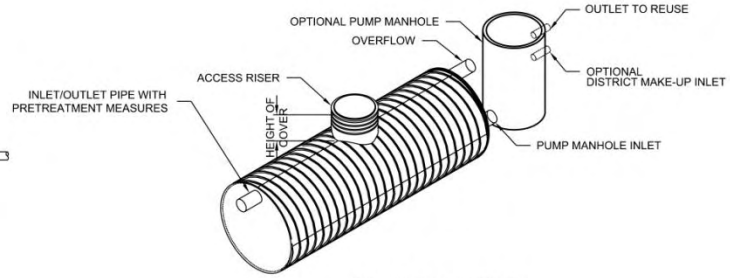
STORAGE AVAILABILITY PER DIAMETER		
DIAMETER (IN / mm)	AVAILABLE STORAGE PER L.F. (C.F. / m3)	AVAILABLE STORAGE PER L.F. (GAL. / L)
48 / 1200	12.17 / 0.34	91.02 / 345
54 / 1350	15.40 / 0.44	115.20 / 437
60 / 1500	19.01 / 0.54	142.22 / 539
72 / 1800	27.38 / 0.77	204.79 / 776
84 / 2100	37.26 / 1.05	278.74 / 1056
96 / 2400	48.67 / 1.38	364.07 / 1380
120 / 3000	76.05/ 2.15	568.87 / 2156

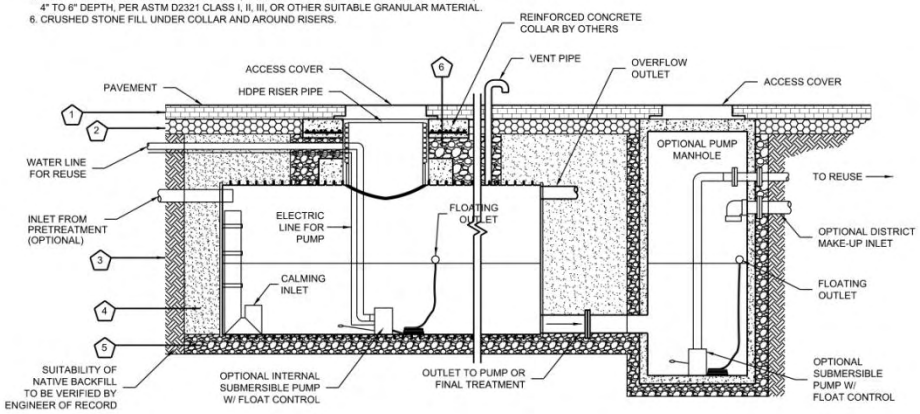


PLAN VIEW



ISOMETRIC VIEW

KEY
1. RIGID OR FLEXIBLE PAVEMENT.
2. GRANULAR COMPACTED ROAD BASE.
3. ANY SUITABLE NATIVE OR GENERAL BACKFILL, SEE ENGINEER PLANS.
4. WELL GRADED GRANULAR FILL. ASTM D2321 CLASS I, II, III, OR EQUIVALENT. COMPACT TO MIN. 90% STANDARD DENSITY PER AASHTO T99. MAY INCLUDE ROAD BASE.
5. RELATIVELY LOOSE GRANULAR BEDDING, ROUGHLY SHAPED TO FIT BOTTOM OF BARREL, 4" TO 6" DEPTH, PER ASTM D2321 CLASS I, II, III, OR OTHER SUITABLE GRANULAR MATERIAL.
6. CRUSHED STONE FILL UNDER COLLAR AND AROUND RISERS.



ELEVATION VIEW

GENERAL NOTES

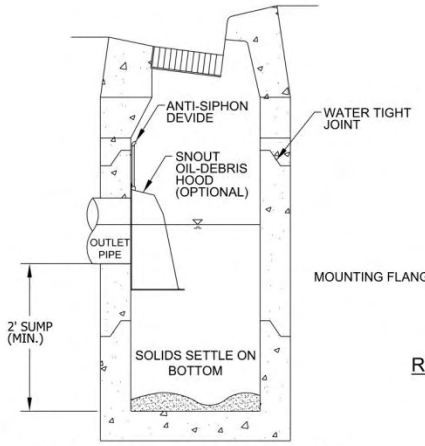
1. MANUFACTURER TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. SITE SPECIFIC DRAWINGS WITH DETAILED STRUCTURE, CAPACITY AND BACKFILL DETAILS, TO BE PROVIDED BY MANUFACTURER.
3. ALL ELEVATIONS, DIMENSIONS AND LOCATIONS OF RISERS AND INLETS SHALL BE VERIFIED BY THE ENGINEER OF RECORD.
4. PRIOR TO INSTALLATION OF THE SYSTEM A PRE-CONSTRUCTION MEETING SHALL BE CONDUCTED. THOSE REQUIRED TO ATTEND ARE THE SUPPLIER OF THE SYSTEM, THE GENERAL CONTRACTOR, SUB-CONTRACTORS AND THE ENGINEER.
5. THE CISTERN IS MANUFACTURED FROM STEEL REINFORCED POLYETHYLENE PLASTIC.
6. SYSTEM TO MEET AASHTO HS20/HS25 LIVE LOADING, PER AASHTO LRFD SECTION 12.
7. ACCESS COVERS TO MEET AASHTO M306 LOAD RATING.
8. MINIMUM COVER IS EQUAL TO PIPE DIAMETER/5 AND NO LESS THAN 12-INCHES FROM TOP OF PIPE TO BOTTOM OF PAVEMENT. Ø72" AND Ø84" PIPE MINIMUM COVER IS 18-INCHES, Ø96" PIPE MINIMUM COVER IS 24-INCHES, Ø120" PIPE MINIMUM COVER IS 36-INCHES.
9. FOLLOW THE REQUIRED PRETREATMENT MEASURES LISTED ON THE VOLUME CONTROL PRETREATMENT MEASURES DETAIL (PAGE 17).

INSTALLATION NOTES

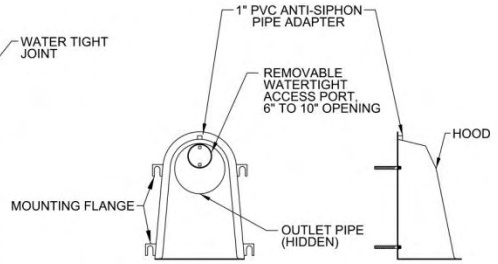
A. INSTALLATION GUIDE TO BE REVIEWED BY CONTRACTOR PRIOR TO INSTALLATION.
B. CONTRACTOR TO PROVIDE, INSTALL AND GROUT ALL INLET AND OUTLET PIPES.
C. CONTRACTOR TO PROVIDE AND INSTALL ALL BEDDING AND BACKFILL MATERIAL.
D. PRIOR TO PLACING BEDDING, THE FOUNDATION MUST BE CONSTRUCTED TO A UNIFORM AND STABLE GRADE. IN THE EVENT THAT UNSUITABLE FOUNDATION MATERIALS ARE ENCOUNTERED DURING EXCAVATION, A GEOGRID SHALL BE UTILIZED OR UNSUITABLE MATERIAL SHALL BE REMOVED AND BROUGHT BACK TO GRADE WITH FILL MATERIAL AS APPROVED BY THE ENGINEER OF RECORD. ONCE THE FOUNDATION PREPARATION IS COMPLETE, THE BEDDING MATERIAL CAN BE PLACED.
E. STONE EMBEDMENT MATERIAL SHALL BE INSTALLED TO 95% STANDARD PROCTOR DENSITY AND PLACED IN 6-INCH TO 8-INCH LIFTS SUCH THAT THERE IS NO MORE THAN A TWO LIFT DIFFERENTIAL BETWEEN ANY OF THE BARRELS AT ANY TIME. GRANULAR BACKFILL MATERIAL SHALL BE COMPACTED TO 90% SPD. BACKFILLING SHALL BE ADVANCED ALONG THE LENGTH OF THE BARRELS AT THE SAME RATE TO AVOID DIFFERENTIAL LOADING AND DISPLACEMENT OF THE BARRELS. THE MINIMUM PIPE SPACING MUST BE MAINTAINED.
F. REFER TO INSTALLATION GUIDE FOR TEMPORARY CONSTRUCTION LOADING GUIDELINES.
G. IT IS ALWAYS THE RESPONSIBILITY OF THE CONTRACTOR TO FOLLOW OSHA GUIDELINES FOR SAFE PRACTICES.
H. GENERAL INSTALLATION METHODS AND MATERIALS TO BE IN ACCORDANCE WITH ASTM D2321.

OPERATION NOTES

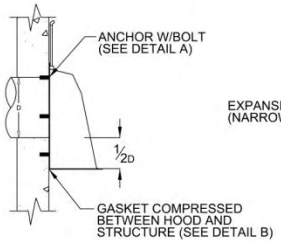
1. PROPERTY OWNER MUST INSPECT AND EXERCISE ANNUALLY.
2. THE STORAGE MUST DEWATER IN 72 HOURS OR 12 HOURS BEFORE STORM EVENT.
3. CISTERN MUST BE PROTECTED FROM FREEZING EFFECTS.



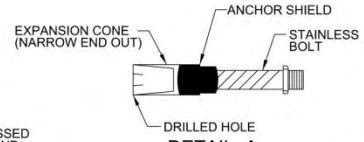
CATCH BASIN WITH OPTIONAL HOOD



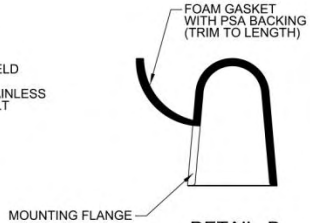
REMOVABLE SNOUT OIL-WATER-DEBRIS SEPARATOR (OPTIONAL)



OUTLET PIPE



DETAIL A



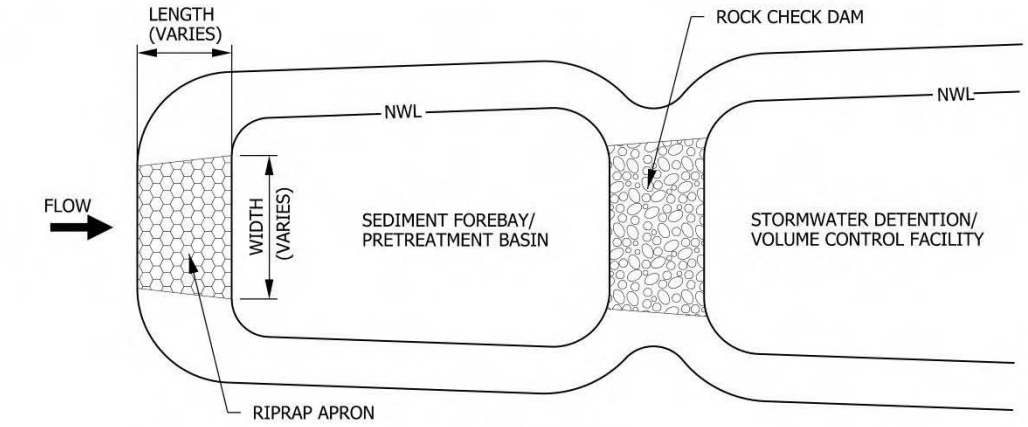
DETAIL B

NOTES:

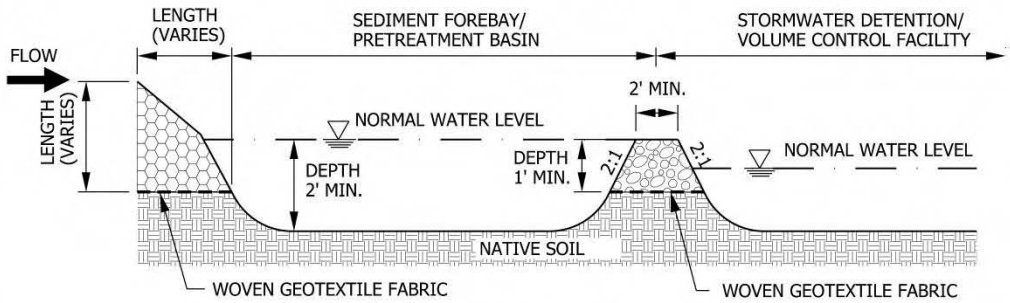
1. ALL HOODS SHALL BE CONSTRUCTED OF A FIBERGLASS REINFORCED RESIN COMPOSITE WITH ISO GEL COAT EXTERIOR FINISH WITH A MINIMUM 0.125" LAMINATE THICKNESS.
2. ALL HOODS SHALL BE EQUIPPED WITH A WATERTIGHT ACCESS PORT, A MOUNTING FLANGE, AND AN ANTI-SIPHON VENT PIPE AND ELBOW AS DRAWN. (SEE CONFIGURATION DETAIL).
3. THE SIZE AND POSITION OF THE HOOD SHALL BE DETERMINED BY OUTLET PIPE SIZE AS PER MANUFACTURER'S RECOMMENDATION (SNOUT SIZE ALWAYS LARGER THAN PIPE SIZE).
4. THE BOTTOM OF THE HOOD SHALL EXTEND DOWNWARD A MINIMUM DISTANCE EQUAL TO ½ THE OUTLET PIPE DIAMETER WITH A MINIMUM DISTANCE OF 6" FOR PIPES < 12" I.D.
5. THE ANTI-SIPHON VENT SHALL EXTEND ABOVE HOOD BY MINIMUM OF 3" AND A MAXIMUM OF 12" ACCORDING TO STRUCTURE CONFIGURATION.
6. THE SURFACE OF THE STRUCTURE WHERE THE HOOD IS MOUNTED SHALL BE FINISHED SMOOTH AND FREE OF LOOSE MATERIAL AND PIPE SHALL BE FINISHED FLUSH TO WALL.
7. THE REMOVABLE HOOD SHALL BE ATTACHED TO THE STRUCTURE WITH THE SLOTTED TABS MOUNTED OVER ⅜" STAINLESS STEEL BOLTS AND OIL-RESISTANT GASKETS.
8. POSITION HOOD SUCH THAT BOTTOM FLANGE IS AT A DISTANCE OF ½" OUTLET PIPE DIAMETER (MIN.) BELOW THE PIPE INVERT. MINIMUM DISTANCE FOR PIPES <12" I.D. IS 6".
9. RESTRICTOR AND SNOUT WHEN PAIRED SHOULD BE INSTALLED IN SUCH A WAY THAT RESTRICTOR AND SNOUT REMAIN INSPECTABLE.
10. RESTRICTOR AND SNOUT HOOD SHALL BE CURVED TO INSIDE RADIUS OF STRUCTURE AND WATERTIGHT.

NOT TO SCALE

	TECHNICAL GUIDANCE MANUAL	7/1/15
	REMOVABLE HOOD BASIN AND WATER QUALITY STRUCTURE DETAIL	STD. DWG. NO.11
		PAGE NO. 12



PLAN VIEW



PROFILE VIEW

NOTES:

1) RIPRAP APRON DIMENSIONS AND GRADATIONS SHALL BE DETERMINED ACCORDING TO IUM PRACTICE STANDARD 910, TABLES 1 AND 2.
2) WOVEN GEOTEXTILE FABRIC SHALL MEET OR EXCEED REQUIREMENTS IN ILLINOIS URBAN MANUAL MATERIAL SPECIFICATION 592, TABLE 1, CLASS I, II, OR III.
3) SEDIMENT FOREBAY/PRETREATMENT BASIN VOLUME SHALL BE A MINIMUM OF 10% OF THE STORMWATER DETENTION/VOLUME CONTROL STORAGE.
4) ROCK CHECK DAM DESIGNED IN ACCORDANCE WITH IUM PRACTICE STANDARD FOR ROCK CHECK DAM (905).
5) CONCRETE OVERFLOW SPILLWAY OR GABION BASKETS MAY BE USED IN PLACE OF ROCK CHECK DAM.
6) DEPTH IN SEDIMENT FOREBAY/PRETREATMENT BASIN SHALL BE A MINIMUM OF 2 FEET AND A MAXIMUM OF 6 FEET.
7) SIDE SLOPES OF OF FACILITY SHALL NOT EXCEED 3:1.

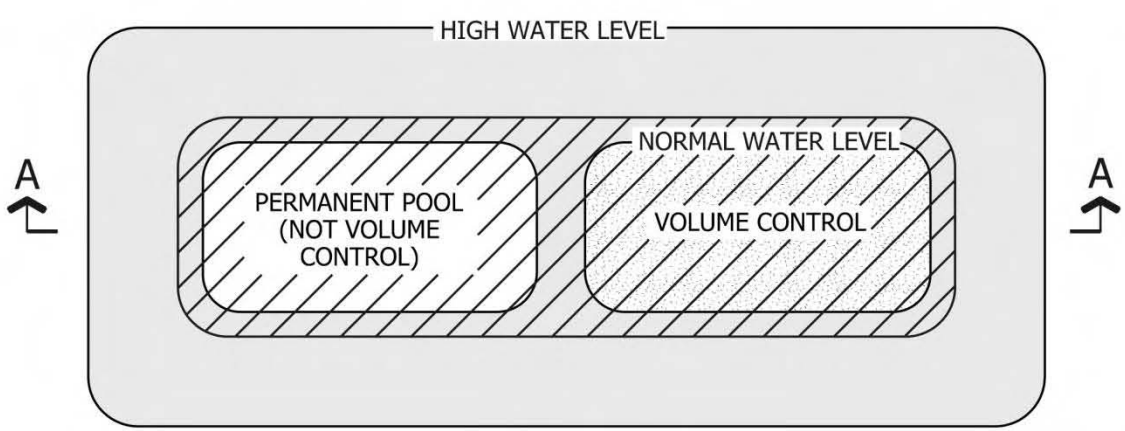
NOT TO SCALE

	TECHNICAL GUIDANCE MANUAL	7/1/15
	SEDIMENT FOREBAY/ PRETREATMENT BASIN TYPICAL DETAIL	STD. DWG. NO.12
		PAGE NO. 13

NOTES:
1. ONE SIGN SHALL BE POSTED PER 40 PARKING SPACES.

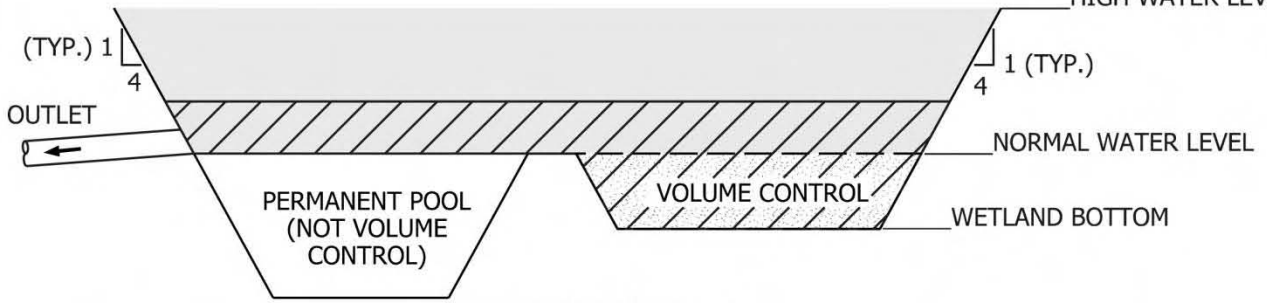
NOT TO SCALE

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO	TECHNICAL GUIDANCE MANUAL	7/1/15
	TYPICAL SIGNAGE FOR PERMEABLE PAVEMENT AREA	STD. DWG. NO.13
		PAGE NO. 14



PLAN VIEW

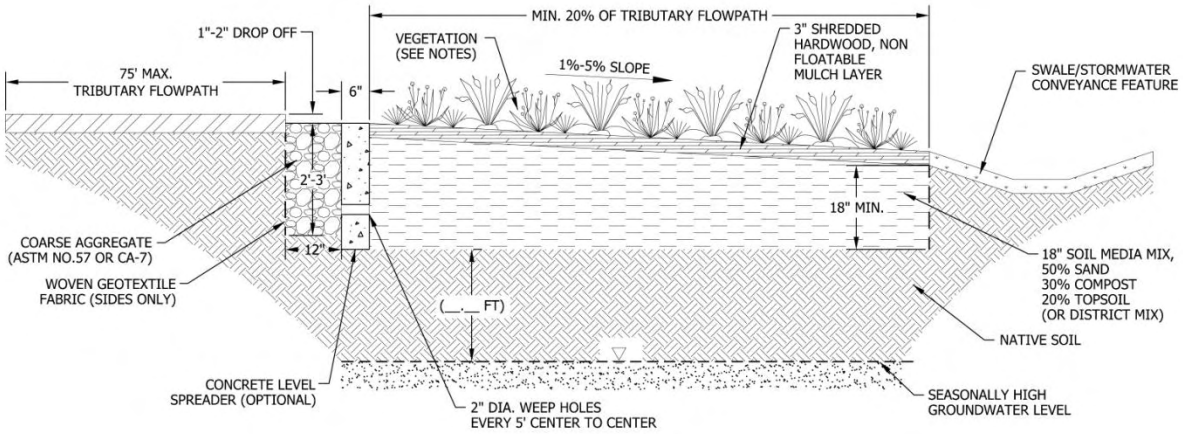
VOLUME TYPE	POROSITY	MEDIA VOLUME	STORAGE VOLUME	VOLUME PROVIDED
SURFACE STORAGE	1.00	V_A	1.00 x V_A	
			TOTAL	



SECTION A - A

NOTES:
1) BOTTOM OF VOLUME CONTROL FACILITY SHALL BE AS FLAT AS POSSIBLE. BOTTOM SLOPES SHALL NOT EXCEED 20:1.
2) DEPTH BELOW OUTLET SHALL NOT EXCEED 12 INCHES.
3) DETENTION BASIN SIDE SLOPES SHALL BE 3:1 MINIMUM.
4) FOLLOW THE REQUIRED PRETREATMENT MEASURES LISTED ON THE VOLUME CONTROL PRETREATMENT MEASURES DETAIL (PAGE 17).

NOT TO SCALE



NOTES:
1. MULCH LAYER SHALL BE HARDWOOD MULCH OR OTHER NON-FLOATING GROUND COVER.
2. AVOID INSTALLATION ON SLOPES GREATER THAN 15 TO 1 AND ABOVE COMPACTED FILL.
3. LONGEST FLOW PATH OF CONTRIBUTING DRAINAGE AREA MUST NOT EXCEED 75 FEET.
4. WOVEN GEOTEXTILE FABRIC SHALL MEET REQUIREMENTS OF IUM MATERIAL SPECIFICATION 592 GEOTEXTILE, TABLE 1, CLASS 1, WITH AN APPARENT OPENING SIZE OF 50.
5. COARSE AGGREGATE OPTIONS ARE CA-7, DISTRICT VULCAN MIX, OR APPROVED ALTERNATE. NO RECYCLED MATERIALS ARE ALLOWED.
6. FOLLOW THE REQUIRED PRETREATMENT MEASURES LISTED ON THE VOLUME CONTROL PRETREATMENT MEASURES DETAIL.

NOT TO SCALE

	TECHNICAL GUIDANCE MANUAL	7/1/15
	VEGETATED FILTER STRIP (FLOW-THROUGH) DETAIL	STD. DWG. NO.15
		PAGE NO. 16

Volume Control Practice	Void Space of Aggregate[1]	Surface Storage[2]	Growing Media[3]
Bioretention Facility	X	X	X
Bioswale[4]	X	X	X
Constructed Wetlands	X	X	X
Drywell	X		
Green Roof	X		X
Infiltration Trench	X		
Permeable Pavement	X		
Storage Below Detention Basin Outlet		X	
Vegetated Filter Strip	X		X
Water Reuse System		X	

[1]A void ratio of 0.36 shall be used to calculate volume in CA-1 or CA-7 gradations, 0.25 for pea gravel or CA-16

[2]Storage calculated using average-end method between surface elevation and elevation of overflow grate/check dam

[3]Porosity of 0.25 shall be used to calculate volume in growing media

[4]Surface storage only if check dams are installed

Volume Control Practice	Pretreatment Measures
Bioretention Facility	• Level spreader must be installed where runoff enters the facility as shallow concentrated flow to distribute the runoff as sheet flow over the entire facility. • Vegetated filter strip, grass-lined channel, or sump must be installed upstream of the facility to filter out settleable particle and floatable materials. • Where inflow velocities are greater than 3 ft/s, a vegetated filter strip or rock outlet protection must be installed to prevent erosion and distribute flows across the facility. • Vegetated portions of the contributing drainage area must be stabilized.
Bioswale	• Level spreader must be installed where runoff enters the facility as shallow concentrated flow to distribute the runoff as sheet flow over the entire facility. • Vegetated portions of the contributing drainage area must be stabilized.
Constructed Wetlands	• Where inflow velocities are greater than 3 ft/s, rock outlet protection should be provided to prevent erosion and distribute the flows into the facility. • Vegetated portions of the contributing drainage area must be stabilized.
Drywell	• Filter screens must be installed on all roof drains directed toward the facility. • For facilities that include inflow pipes, sump shall be installed at manhole immediately upstream of facility.
Green Roof	• No Pretreatment measures required.
Infiltration Trench	• Level spreader must be installed where runoff enters the facility as shallow concentrated flow to distribute the runoff as sheet flow over the entire facility. • Vegetated filter strip, grass-lined channel, or sump must be installed upstream of the trench to filter out settleable particle and floatable materials. • Where inflow velocities are greater than 3 ft/s, a vegetated filter strip or rock outlet protection should be provided to prevent erosion and distribute flows across the facility. • Vegetated portions of the contributing drainage area must be stabilized.
Permeable Pavement	• Vegetated filter strip, grass-lined channel, or sump must be installed upstream of the facility to filter out settleable particle and floatable materials. • Vegetated portions of the contributing drainage area must be stabilized.
Storage Below Detention Basin Outlet	• Where inflow velocities are greater than 3 ft/s, rock outlet protection should be provided to prevent erosion and distribute the flows into the facility. • Vegetated portions of the contributing drainage area must be stabilized.
Vegetated Filter Strip	• Level spreader must be installed where runoff enters the facility as shallow concentrated flow to distribute the runoff as sheet flow over the entire facility. • Vegetated portions of the contributing drainage area must be stabilized.
Water Reuse System	• Filter screens must be installed on all roof drains directed toward the facility. • For facilities that include inflow pipes, sump shall be installed at manhole immediately upstream of facility.

1. A porosity of 0.36 shall be used to calculate volume in CA-1 or or CA-7 gradation, 0.25 for CA-16 (volume above underdrain cre3dited at 50%)
2. Storage calculated using average-end method between surface elevation and elevation of overflow grate/check dam.
3. Porosity of 0.25 shall be used to calculate volume in growing media (volume above underdrain at 50%)
4. Surface storage only if check dams are installed.

A. REFERENCED SPECIFICATIONS

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE APPLICABLE SECTIONS OF THE FOLLOWING, EXCEPT AS MODIFIED HEREIN OR ON THE PLANS:
   * STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION (LATEST EDITION), BY THE ILLINOIS DEPARTMENT OF TRANSPORTATION (IDOT SS) FOR ALL IMPROVEMENTS EXCEPT SANITARY SEWER AND WATER MAIN CONSTRUCTION;
   * STANDARD SPECIFICATIONS FOR WATER AND SEWER MAIN CONSTRUCTION IN ILLINOIS, LATEST EDITION (SSWS) FOR SANITARY SEWER AND WATER MAIN CONSTRUCTION;
   * VILLAGE OF _____ MUNICIPAL CODE;
   * THE METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO (MWRD) WATERSHED MANAGEMENT ORDINANCE AND TECHNICAL GUIDANCE MANUAL;
   * IN CASE OF CONFLICT BETWEEN THE APPLICABLE ORDINANCES NOTED, THE MORE STRINGENT SHALL TAKE PRECEDENCE AND SHALL CONTROL ALL CONSTRUCTION.

B. NOTIFICATIONS

1. THE MWRD LOCAL SEWER SYSTEMS SECTION FIELD OFFICE MUST BE NOTIFIED AT LEAST TWO (2) WORKING DAYS PRIOR TO THE COMMENCEMENT OF ANY WORK (CALL 708-588-4055).

2. THE VILLAGE OF _____ ENGINEERING DEPARTMENT AND PUBLIC MUST BE NOTIFIED AT LEAST 24 HOURS PRIOR TO THE START OF CONSTRUCTION AND PRIOR TO EACH PHASE OF WORK. CONTRACTOR SHALL DETERMINE ITEMS REQUIRING INSPECTION PRIOR TO START OF CONSTRUCTION OR EACH WORK PHASE.

3. THE CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES PRIOR TO BEGINNING CONSTRUCTION FOR THE EXACT LOCATIONS OF UTILITIES AND FOR THEIR PROTECTION DURING CONSTRUCTION. IF EXISTING UTILITIES ARE ENCOUNTERED THAT CONFLICT IN LOCATION WITH NEW CONSTRUCTION, IMMEDIATELY NOTIFY THE ENGINEER SO THAT THE CONFLICT CAN BE RESOLVED. CALL J.U.L.I.E. AT 1-800-892-0123.

C. GENERAL NOTES

1. ALL ELEVATIONS SHOWN ON PLANS REFERENCE THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88). CONVERSION FACTOR IS _____ FT.

2. MWRD, THE MUNICIPALITY AND THE OWNER OR OWNER'S REPRESENTATIVE SHALL HAVE THE AUTHORITY TO INSPECT, APPROVE, AND REJECT THE CONSTRUCTION IMPROVEMENTS.

3. THE CONTRACTOR(S) SHALL INDEMNIFY THE OWNER, ENGINEER, MUNICIPALITY, MWRD, AND THEIR AGENTS, ETC., FROM ALL LIABILITY INVOLVED WITH THE CONSTRUCTION, INSTALLATION, OR TESTING OF THIS WORK ON THE PROJECT.

4. THE PROPOSED IMPROVEMENTS MUST BE CONSTRUCTED IN ACCORDANCE WITH THE ENGINEERING PLANS AS APPROVED BY MWRD AND THE MUNICIPALITY UNLESS CHANGES ARE APPROVED BY MWRD, THE MUNICIPALITY, OR AUTHORIZED AGENT. THE CONSTRUCTION DETAILS, AS PRESENTED ON THE PLANS, MUST BE FOLLOWED. PROPER CONSTRUCTION TECHNIQUES MUST BE FOLLOWED ON THE IMPROVEMENTS INDICATED ON THE PLANS.

5. THE LOCATION OF VARIOUS UNDERGROUND UTILITIES WHICH ARE SHOWN ON THE PLANS ARE FOR INFORMATION ONLY AND REPRESENT THE BEST KNOWLEDGE OF THE ENGINEER. VERIFY LOCATIONS AND ELEVATIONS PRIOR TO BEGINNING THE CONSTRUCTION OPERATIONS.

6. ANY EXISTING PAVEMENT, SIDEWALK, DRIVEWAY, ETC., DAMAGED DURING CONSTRUCTION OPERATIONS AND NOT CALLED FOR TO BE REMOVED SHALL BE REPLACED AT THE EXPENSE OF THE CONTRACTOR.

7. MATERIAL AND COMPACTION TESTING SHALL BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF THE MUNICIPALITY, MWRD, AND OWNER.

8. THE UNDERGROUND CONTRACTOR SHALL MAKE ALL NECESSARY ARRANGEMENTS TO NOTIFY ALL INSPECTION AGENCIES.

9. ALL NEW AND EXISTING UTILITY STRUCTURES ON SITE AND IN AREAS DISTURBED DURING CONSTRUCTION SHALL BE ADJUSTED TO FINISH GRADE PRIOR TO FINAL INSPECTION.

10. RECORD DRAWINGS SHALL BE KEPT BY THE CONTRACTOR AND SUBMITTED TO THE ENGINEER AS SOON AS UNDERGROUND IMPROVEMENTS ARE COMPLETED. FINAL PAYMENTS TO THE CONTRACTOR SHALL BE HELD UNTIL THEY ARE RECEIVED. ANY CHANGES IN LENGTH, LOCATION OR ALIGNMENT SHALL BE SHOWN IN RED. ALL WYES OR BENDS SHALL BE LOCATED FROM THE DOWNSTREAM MANHOLE. ALL VALVES, B-BOXES, TEES OR BENDS SHALL BE TIED TO A FIRE HYDRANT.

D. SANITARY SEWER

1. THE CONTRACTOR SHALL TAKE MEASURES TO PREVENT ANY POLLUTED WATER, SUCH AS GROUND AND SURFACE WATER, FROM ENTERING THE EXISTING SANITARY SEWERS.

2. A WATER-TIGHT PLUG SHALL BE INSTALLED IN THE DOWNSTREAM SEWER PIPE AT THE POINT OF SEWER CONNECTION PRIOR TO COMMENCING ANY SEWER CONSTRUCTION. THE PLUG SHALL REMAIN IN PLACE UNTIL REMOVAL IS AUTHORIZED BY THE MUNICIPALITY AND/OR MWRD AFTER THE SEWERS HAVE BEEN TESTED AND ACCEPTED.

3. DISCHARGING ANY UNPOLLUTED WATER INTO THE SANITARY SEWER SYSTEM FOR THE PURPOSE OF SEWER FLUSHING OF LINES FOR THE DEFLECTION TEST SHALL BE PROHIBITED WITHOUT PRIOR APPROVAL FROM THE MUNICIPALITY OR MWRD.

4. ALL SANITARY SEWER CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR WATER AND SEWER MAIN CONSTRUCTION IN ILLINOIS (LATEST EDITION).

5. ALL FLOOR DRAINS SHALL DISCHARGE TO THE SANITARY SEWER SYSTEM.

6. ALL DOWNSPOUTS AND FOOTING DRAINS SHALL DISCHARGE TO THE STORM SEWER SYSTEM.

7. ALL SANITARY SEWER PIPE MATERIALS AND JOINTS (AND STORM SEWER PIPE MATERIALS AND JOINTS IN A COMBINED SEWER AREA) SHALL CONFORM TO THE FOLLOWING:

PIPE MATERIAL	PIPE SPECIFICATIONS	JOINT SPECIFICATIONS
VITRIFIED CLAY PIPE	ASTM C-700	ASTM C-425
REINFORCED CONCRETE SEWER PIPE	ASTM C-76	ASTM C-443
CAST IRON SOIL PIPE	ASTM A-74	ASTM C-564
DUCTILE IRON PIPE	ANSI A21.51	ANSI A21.11
POLYVINYL CHLORIDE (PVC) PIPE 6-INCH TO 15-INCH DIAMETER SDR 26 18-INCH TO 27-INCH DIAMETER F/DY=46	 ASTM D-3034 ASTM F-679	 ASTM D-2855 OR ASTM D-3212 ASTM D-3212
HIGH DENSITY POLYETHYLENE (HDPE)	ASTM D-3350	ASTM D-3261
WATER MAIN QUALITY PVC 4-INCH TO 36-INCH 4-INCH TO 12-INCH 14-INCH TO 48-INCH	 ASTM D-2241 AWWA C900 AWWA C905	 ASTM D-2672 OR ASTM D-3139 ASTM D-3212 ASTM D-3212

8. ALL SANITARY SEWER CONSTRUCTION (AND STORM SEWER CONSTRUCTION IN COMBINED SEWER AREAS), REQUIRES STONE BEDDING WITH STONE ¼ " TO 1" IN SIZE, WITH MINIMUM BEDDING THICKNESS EQUAL TO ¼ THE OUTSIDE DIAMETER OF THE SEWER PIPE, BUT NOT LESS THAN FOUR (4) INCHES NOR MORE THAN EIGHT (8) INCHES. MATERIAL SHALL BE CA-11 OR CA-13 AND SHALL BE EXTENDED AT LEAST 12" ABOVE THE TOP OF THE PIPE WHEN USING PVC.

9. "BAND SEAL" OR SIMILAR NON-SHEAR FLEXIBLE-TYPE COUPLINGS SHALL BE USED IN THE CONNECTION OF SEWER PIPES OF DISSIMILAR MATERIALS.

10. ALL MANHOLES SHALL BE PROVIDED WITH BOLTED, WATERTIGHT COVERS. SANITARY LIDS SHALL BE CONSTRUCTED WITH A CONCEALED PICKHOLE AND WATERTIGHT GASKET WITH THE WORD "SANITARY" CAST INTO THE LID.

11. WHEN CONNECTING TO AN EXISTING SEWER MAIN BY MEANS OTHER THAN AN EXISTING WYE, TEE, OR AN EXISTING MANHOLE, ONE OF THE FOLLOWING METHODS SHALL BE USED:
    a) A CIRCULAR SAW-CUT OF SEWER MAIN BY PROPER TOOLS ("SHEWER-TAP" MACHINE OR SIMILAR) AND PROPER INSTALLATION OF HUBWYE SADDLE OR HUB-TEE SADDLE.
    b) REMOVE AN ENTIRE SECTION OF PIPE (BREAKING ONLY THE TOP OF ONE BELL) AND REPLACE WITH A WYE OR TEE BRANCH SECTION.
    c) WITH PIPE CUTTER, NEATLY AND ACCURATELY CUT OUT DESIRED LENGTH OF PIPE FOR INSERTION OF PROPER FITTING, USING "BAND SEAL" OR SIMILAR COUPLINGS TO HOLD IT FIRMLY IN PLACE.

12. WHENEVER A SANITARY/COMBINED SEWER CROSSES UNDER A WATERMAIN, THE MINIMUM VERTICAL DISTANCE FROM THE TOP OF THE SEWER TO THE BOTTOM OF THE WATERMAIN SHALL BE 18 INCHES. FURTHERMORE, A MINIMUM HORIZONTAL DISTANCE OF 10 FEET BETWEEN SANITARY/COMBINED SEWERS AND WATERMAINS SHALL BE MAINTAINED UNLESS: THE SEWER IS LAID IN A SEPARATE TRENCH, KEEPING A MINIMUM 18" VERTICAL SEPARATION; OR THE SEWER IS LAID IN THE SAME TRENCH WITH THE WATERMAIN LOCATED AT THE OPPOSITE SIDE ON A BENCH OF UNDISTURBED EARTH, KEEPING A MINIMUM 18" VERTICAL SEPARATION. IF EITHER THE VERTICAL OR HORIZONTAL DISTANCES DESCRIBED ABOVE CANNOT BE MAINTAINED, OR THE SEWER CROSSES ABOVE THE WATERMAIN, THE SEWER SHALL BE CONSTRUCTED TO WATERMAIN STANDARDS.

13. ALL EXISTING SEPTIC SYSTEMS SHALL BE ABANDONED. ABANDONED TANKS SHALL BE FILLED WITH GRANULAR MATERIAL OR REMOVED.

14. ALL SANITARY MANHOLES, (AND STORM MANHOLES IN COMBINED SEWER AREAS), SHALL HAVE A MINIMUM INSIDE DIAMETER OF 48 INCHES, AND SHALL BE CAST IN PLACE OR PRE-CAST REINFORCED CONCRETE.

15. ALL SANITARY MANHOLES, (AND STORM MANHOLES IN COMBINED SEWER AREAS), SHALL HAVE PRECAST "RUBBER BOOTS" THAT CONFORM TO ASTM C-923 FOR ALL PIPE CONNECTIONS. PRECAST SECTIONS SHALL CONSIST OF MODIFIED GROOVE TONGUE AND RUBBER GASKET TYPE JOINTS.

16. ALL ABANDONED SANITARY SEWERS SHALL BE PLUGGED AT BOTH ENDS WITH AT LEAST 2 FEET LONG NON-SHRINK CONCRETE OR MORTAR PLUG.

17. EXCEPT FOR FOUNDATION/FOOTING DRAINS PROVIDED TO PROTECT BUILDINGS, OR PERFORATED PIPES ASSOCIATED WITH VOLUME CONTROL FACILITIES, DRAIN TILES/FIELD TILES/UNDERDRAINS/PERFORATED PIPES ARE NOT ALLOWED TO BE CONNECTED TO OR TRIBUTARY TO COMBINED SEWERS, SANITARY SEWERS, OR STORM SEWERS TRIBUTARY TO COMBINED SEWERS IN COMBINED SEWER AREAS. CONSTRUCTION OF NEW FACILITIES OF THIS TYPE IS PROHIBITED; AND ALL EXISTING DRAIN TILES AND PERFORATED PIPES ENCOUNTERED WITHIN THE PROJECT AREA SHALL BE PLUGGED OR REMOVED, AND SHALL NOT BE CONNECTED TO COMBINED SEWERS, SANITARY SEWERS, OR STORM SEWERS TRIBUTARY TO COMBINED SEWERS.

18. A BACKFLOW PREVENTER IS REQUIRED FOR ALL DETENTION BASINS TRIBUTARY TO COMBINED SEWERS. REQUIRED BACKFLOW PREVENTERS SHALL BE INSPECTED AND EXERCISED ANNUALLY BY THE PROPERTY OWNER TO ENSURE PROPER OPERATION, AND ANY NECESSARY MAINTENANCES SHALL BE PERFORMED TO ENSURE FUNCTIONALITY. IN THE EVENT OF A SEWER SURCHARGE INTO AN OPEN DETENTION BASIN TRIBUTARY TO COMBINED SEWERS, THE PERMITTEE SHALL ENSURE THAT CLEAN UP AND WASH OUT OF SEWAGE TAKES PLACE WITHIN 48 HOURS OF THE STORM EVENT.

E. EROSION AND SEDIMENT CONTROL

1. THE CONTRACTOR SHALL INSTALL THE EROSION AND SEDIMENT CONTROL DEVICES AS SHOWN ON THE APPROVED EROSION AND SEDIMENT CONTROL PLAN.

2. EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE FUNCTIONAL PRIOR TO HYDROLOGIC DISTURBANCE OF THE SITE.

3. ALL DESIGN CRITERIA, SPECIFICATIONS, AND INSTALLATION OF EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE IN ACCORDANCE WITH THE ILLINOIS URBAN MANUAL.

4. A COPY OF THE APPROVED EROSION AND SEDIMENT CONTROL PLAN SHALL BE MAINTAINED ON THE SITE AT ALL TIMES.

5. INSPECTIONS AND DOCUMENTATION SHALL BE PERFORMED, AT A MINIMUM:
    a) UPON COMPLETION OF INITIAL EROSION AND SEDIMENT CONTROL MEASURES, PRIOR TO ANY SOIL DISTURBANCE.
    b) ONCE EVERY SEVEN (7) CALENDAR DAYS AND WITHIN 24 HOURS OF THE END OF A STORM EVENT WITH GREATER THAN 0.5 INCH OF RAINFALL OR LIQUID EQUIVALENT PRECIPITATION.

6. SOIL DISTURBANCE SHALL BE CONDUCTED IN SUCH A MANNER AS TO MINIMIZE EROSION. IF STRIPPING, CLEARING, GRADING, OR LANDSCAPING ARE TO BE DONE IN PHASES, THE CO-PERMITTEE SHALL PLAN FOR APPROPRIATE SOIL EROSION AND SEDIMENT CONTROL MEASURES.

7. A STABILIZED MAT OF CRUSHED STONE MEETING THE STANDARDS OF THE ILLINOIS URBAN MANUAL SHALL BE INSTALLED AT ANY POINT WHERE TRAFFIC WILL BE ENTERING OR LEAVING A CONSTRUCTION SITE. SEDIMENT OR SOIL REACHING AN IMPROVED PUBLIC RIGHT?OF?WAY, STREET, ALLEY OR PARKING AREA SHALL BE REMOVED BY SCRAPING OR STREET CLEANING AS ACCUMULATIONS WARRANT AND TRANSPORTED TO A CONTROLLED SEDIMENT DISPOSAL AREA.

8. CONCRETE WASHOUT FACILITIES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE ILLINOIS URBAN MANUAL AND SHALL BE INSTALLED PRIOR TO ANY ON SITE CONSTRUCTION ACTIVITIES INVOLVING CONCRETE.

9. TEMPORARY DIVERSIONS SHALL BE CONSTRUCTED AS NECESSARY TO DIRECT ALL RUNOFF FROM HYDROLOGICALLY DISTURBED AREAS TO AN APPROPRIATE SEDIMENT TRAP OR BASIN. VOLUME CONTROL FACILITIES SHALL NOT BE USED AS TEMPORARY SEDIMENT BASINS.

10. DISTURBED AREAS OF THE SITE WHERE CONSTRUCTION ACTIVITIES HAVE TEMPORARILY OR PERMANENTLY CEASED SHALL BE STABILIZED WITH TEMPORARY OR PERMANENT MEASURES WITHIN SEVEN (7) DAYS.

11. ALL FLOOD PROTECTION AREAS AND VOLUME CONTROL FACILITIES SHALL, AT A MINIMUM, BE PROTECTED WITH A DOUBLE-ROW OF SILT FENCE (OR EQUIVALENT).

12. VOLUME CONTROL FACILITIES SHALL NOT BE CONSTRUCTED UNTIL ALL OF THE CONTRIBUTING DRAINAGE AREA HAS BEEN STABILIZED.

13. SOIL STOCKPILES SHALL, AT A MINIMUM, BE PROTECTED WITH PERIMETER SEDIMENT CONTROLS. SOIL STOCKPILES SHALL NOT BE PLACED IN FLOOD PROTECTION AREAS OR THEIR BUFFERS.

14. EARTHEN EMBANKMENT SIDE SLOPES SHALL BE STABILIZED WITH APPROPRIATE EROSION CONTROL BLANKET.

15. STORM SEWERS THAT ARE OR WILL BE FUNCTIONING DURING CONSTRUCTION SHALL BE PROTECTED BY APPROPRIATE SEDIMENT CONTROL MEASURES.

16. THE CONTRACTOR SHALL EITHER REMOVE OR REPLACE ANY EXISTING DRAIN TILES AND INCORPORATE THEM INTO THE DRAINAGE PLAN FOR THE DEVELOPMENT. DRAIN TILES CANNOT BE TRIBUTARY TO A SANITARY OR COMBINED SEWER.

17. IF DEWATERING SERVICES ARE USED, ADJOINING PROPERTIES AND DISCHARGE LOCATIONS SHALL BE PROTECTED FROM EROSION AND SEDIMENTATION. DEWATERING SYSTEMS SHOULD BE INSPECTED DAILY DURING OPERATIONAL PERIODS. THE SITE INSPECTOR MUST BE PRESENT AT THE COMMENCEMENT OF DEWATERING ACTIVITIES.

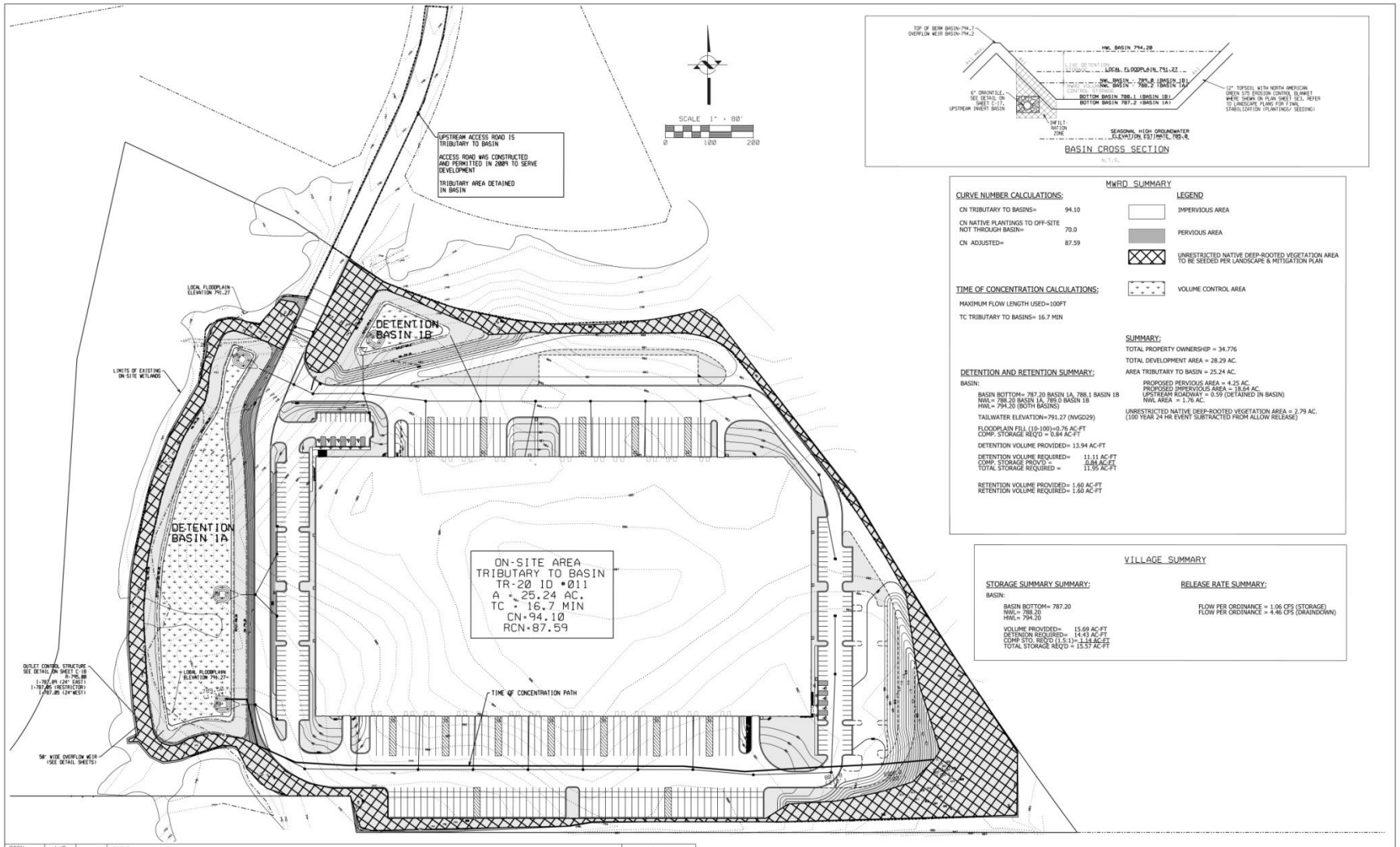
18. THE CONTRCTOR SHALL BE RESPONSIBLE FOR TRENCH DEWATERING AND EXCAVATION FOR THE INSTALLATION OF SANITARY SEWERS, STORM SEWERS, WATERMAINS AS WELL AS THEIR SERVICES AND OTHER APPURTENANCES. ANY TRENCH DEWATERING, WHICH CONTAINS SEDIMENT SHALL PASS THROUGH A SEDIMENT SETTLING POND OR EQUALLY EFFECTIVE SEDIMENT CONTROL DEVICE. ALTERNATIVES MAY INCLUDE DEWATERING INTO A SUMP PIT, FILTER BAG OR EXISTING VEGETATED UPSLOPE AREA. SEDIMENT LADEN WATERS SHALL NOT BE DISCHARGE TO WATERWAYS, FLOOD PROTECTION AREAS OR THE COMBINED SEWER SYSTEM.

19. ALL PERMANENT EROSION CONTROL PRACTICES SHALL BE INITIATED WITHIN SEVEN (7) DAYS FOLLOWING THE COMPLETION OF SOIL DISTURBING ACTIVITIES.

20. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE MAINTAINED AND REPAIRED AS NEEDED ON A YEAR-ROUND BASIS DURING CONSTRUCTION AND ANY PERIODS OF CONSTRUCTION SHUTDOWN UNTIL PERMANENT STABILIZATION IS ACHIEVED.

21. ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE REMOVED WITHIN THIRTY (30) DAYS AFTER PERMANENT SITE STABILIZATION.

22. THE EROSION AND SEDIMENT CONTROL MEASURES SHOWN ON THE PLANS ARE THE MINIMUM REQUIREMENTS. ADDITIONAL MEASURES MAY BE REQUIRED, AS DIRECTED BY THE ENGINEER, SITE INSPECTOR, OR MWRD.



BASIN CROSS SECTION

N.T.S.

MWRD SUMMARY

CURVE NUMBER CALCULATIONS:

CN TRIBUTARY TO BASINS=	94.10
CN NATIVE PLANTINGS TO OFF-SITE NOT THROUGH BASIN=	70.0
CN ADJUSTED=	87.59

TIME OF CONCENTRATION CALCULATIONS:

MAXIMUM FLOW LENGTH USED=100FT

TC TRIBUTARY TO BASINS= 16.7 MIN

LEGEND

- IMPERVIOUS AREA
- PERVIOUS AREA
- UNRESTRICTED NATIVE DEEP-ROOTED VEGETATION AREA TO BE SEEDED PER LANDSCAPE & MITIGATION PLAN
- VOLUME CONTROL AREA

SUMMARY:

TOTAL PROPERTY OWNERSHIP = 34.776

TOTAL DEVELOPMENT AREA = 28.29 AC.

AREA TRIBUTARY TO BASIN = 25.24 AC.

PROPOSED PERVIOUS AREA = 4.25 AC.
PROPOSED IMPERVIOUS AREA = 18.64 AC.
UPSTREAM ROADWAY = 0.59 (DETAINED IN BASIN)
NWL AREA = 1.76 AC.

UNRESTRICTED NATIVE DEEP-ROOTED VEGETATION AREA = 2.79 AC.
(100 YEAR 24 HR EVENT SUBTRACTED FROM ALLOW RELEASE)

DETENTION AND RETENTION SUMMARY:

BASIN:

BASIN BOTTOM= 787.20 BASIN 1A, 788.1 BASIN 1B
NWL= 788.20 BASIN 1A, 789.0 BASIN 1B
HWL= 794.20 (BOTH BASINS)

TAILWATER ELEVATION=791.27 (NVGD29)

FLOODPLAIN FILL (10-100)=0.76 AC-FT
COMP. STORAGE REQ'D = 0.84 AC-FT

DETENTION VOLUME PROVIDED= 13.94 AC-FT

DETENTION VOLUME REQUIRED=	11.11 AC-FT
COMP. STORAGE PROV'D =	0.84 AC-FT
TOTAL STORAGE REQUIRED =	11.95 AC-FT

RETENTION VOLUME PROVIDED= 1.60 AC-FT
RETENTION VOLUME REQUIRED= 1.60 AC-FT

VILLAGE SUMMARY

STORAGE SUMMARY SUMMARY:

BASIN:

BASIN BOTTOM= 787.20
NWL= 788.20
HWL= 794.20

VOLUME PROVIDED=	15.69 AC-FT
DETENTION REQUIRED=	14.43 AC-FT
COMP STO. REQ'D (1.5:1)=	1.14 AC-FT
TOTAL STORAGE REQ'D =	15.57 AC-FT

RELEASE RATE SUMMARY:

FLOW PER ORDINANCE = 1.06 CFS (STORAGE)
FLOW PER ORDINANCE = 4.46 CFS (DRAINDOWN)

DSGN.	LJS
DWN.	EAT
CHKD.	LJS
SCALE:	80'
PLOT DATE:	7/16/2015
CAD USER:	PRAZALAN
FILE:	DRAINAGE EXHIBIT
MODEL:	MODEL

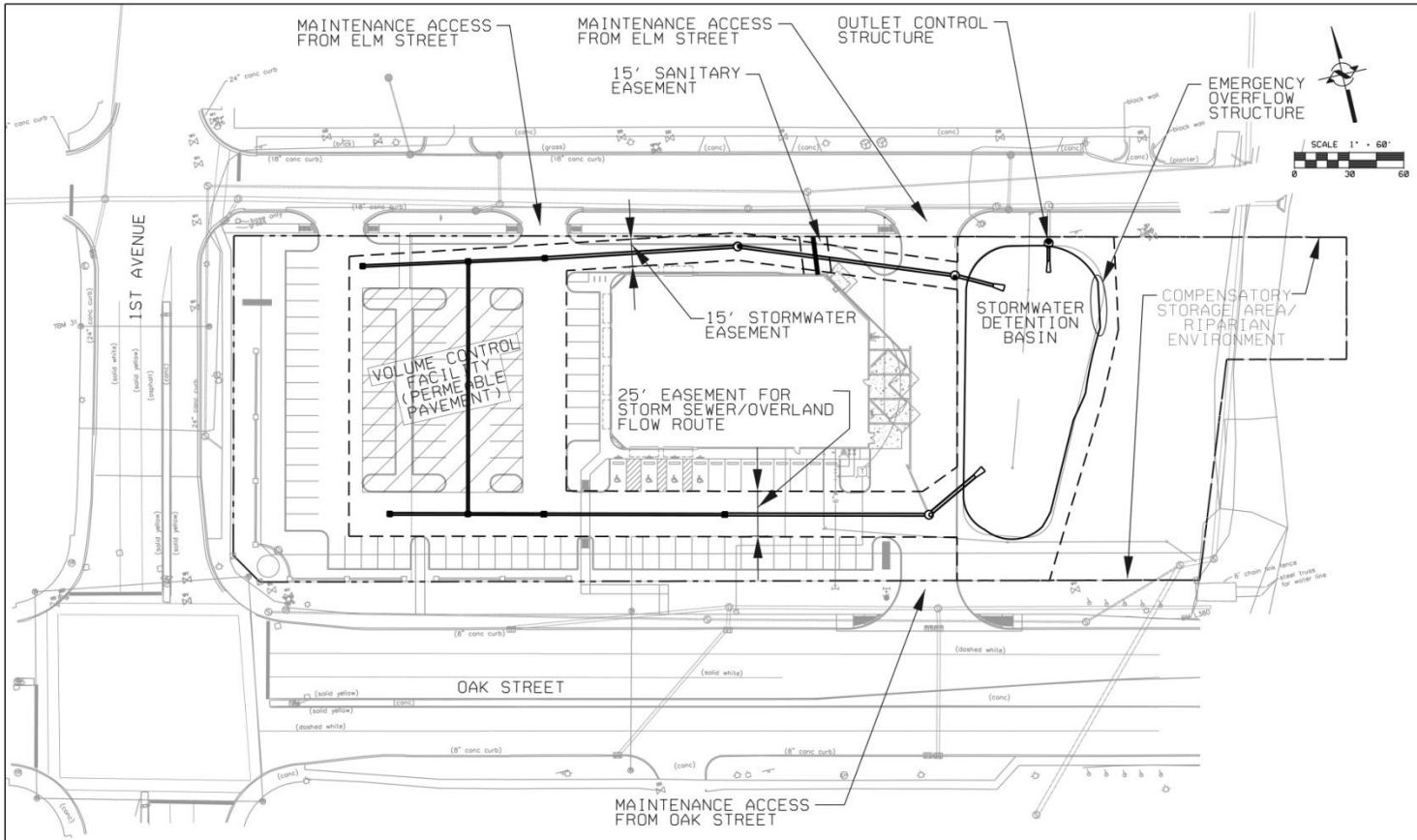
TITLE:

DRAINAGE EXHIBIT
ABC DEVELOPMENT
VILLAGE OF XXXX, COOK COUNTY, IL.

PROJ. NO.	130409
DATE:	7/01/2015
SHEET	OF
DRAWING NO.	19

FILE NAME Z:\MWRDGC\130409\WATER\EXHIBITS\DRAINAGE EXHIBIT.DGN

PAGE 20



LEGEND

- QUALIFIED SEWER CONSTRUCTION
- STORM SEWER
- EASEMENT/DEED RESTRICTED AREA
- PROPERTY LINE

PROJECT SITE SUMMARY

PROPERTY LEGAL DESCRIPTION: SECTION 35, TOWNSHIP 42N, RANGE 10E
PROPERTY ADDRESS: 123 MAPLE STREET, SUNNYSIDE, IL. 60155
PROPERTY INDEX NUMBER(S): XX-XX-XXX-XXX-XXXX
TOTAL CONTIGUOUS OWNERSHIP: 10.55 ACRES
PROJECT AREA: 5.00 ACRES
CONSERVATION AREA/DEED RESTRICTED AREA: 0.45 ACRES

STORMWATER/FLOODPLAIN SUMMARY	REQUIRED (AC-FT)	PROVIDED (AC-FT)
VOLUME CONTROL	0.24	0.24
DETENTION VOLUME	1.15	1.20
COMPENSATORY STORAGE VOLUME (0-10 YEAR)	0.44	0.50
COMPENSATORY STORAGE VOLUME (10-100 YEAR)	0.60	0.75

DSGN.	LJS
DWN.	EAT
CHKD.	LJS
SCALE:	60'
PLOT DATE:	7/1/2015
CAD USER:	ELMOTODA
FILE:	EXHIBIT R
MODEL:	MODEL

TITLE:

EXHIBIT R
XYZ COMMERCIAL DEVELOPMENT
VILLAGE OF XXXX, COOK COUNTY, IL.

PROJ. NO.	13040M
DATE:	7/1/2015
SHEET	OF
DRAWING NO.	20

FILE NAME: Z:\WORDOC\13040M\WATER\EXHIBITS\EXHIBIT R.DGN

EXAMPLE MAINTENANCE PLAN FOR XYZ COMMERCIAL DEVELOPMENT

The Owner of the XYZ Development, with facilities as shown on this exhibit (Exhibit R), shall assume responsibility for the following perpetual maintenance activities:

1. General
Regular inspections and routine maintenance of general areas shall be performed on a monthly or as-needed basis. Specific items of concern include:
- ___ Litter and debris shall be controlled
- ___ Landscaped areas shall be maintained with regular mowing and restored with appropriate seeding/vegetation as necessary
- ___ Accumulated sediment shall be disposed of properly, along with any wastes generated during maintenance operations
- ___ Riprap areas shall be repaired with the addition of new riprap, as necessary, of similar size and shape
- ___ Roads shall be swept, vacuumed and/or washed on a regular basis

2. Stormwater Management Facilities
All components of the stormwater management facilities shall be checked monthly between March and November and maintained as necessary to ensure proper performance. It is critical that all inflows and outflows to the detention facility are clean and performing as designed. In addition, the design volume of the detention facility shall also be maintained. Inspections for the following specific items should be conducted monthly between March and November:

Side Slopes/Embankment/Emergency Overflow Structure
- ___ Inspect embankments for settlement and erosion
- ___ Remove woody growth from the embankment
- ___ Any breaks, hire Registered Professional Engineer for design resolution
- ___ Seed and sod any eroded areas
- ___ Signs of piping (leakage) or seepage, repair
- ___ Stabilize emergency overflow structure if erosion observed
- ___ Remove obstructions blocking emergency overflow spillway

Vegetated Areas
- ___ Regular mowing to control vegetation, no cutting of native vegetation
- ___ Need for planting, reseeding or sodding. Supplement alternative native vegetation if a significant portion has not established (50% of the surface area). Reseed with alternative grass species if original grass cover has not successfully established.
- ___ Evidence of grazing, motorbikes or other vehicles, repair
- ___ Check for invasive vegetation, remove where possible
- ___ All vegetation must be maintained per the approved planting plan

Outlet Control Structure
- ___ Inspect restrictor and remove debris if clogged or discharge reduced
- ___ Remove accumulated sediment at outlet
- ___ Scour and erosion at outlet, repair and reseed
- ___ Any ice damage to outlet of pipe, repair if necessary
- ___ Condition of trash tracks, remove debris
- ___ Outlet channel conditions downstream

Access for Maintenance Equipment
- ___ Remove any obstructions placed in maintenance easements

Safety Features
- ___ Access controls to hazardous areas
- ___ Fences
- ___ Loose or damaged posts
- ___ Loose or broken wires
- ___ Condition of gates
- ___ Signs

Detention Volume
- ___ Inspect all stormwater detention facilities to ensure that the constructed volume for detention is maintained. No sediment, topsoil, or other dumping into the facility shall be allowed. Specific locations in the stormwater management system, designed to accumulate sediment, shall be dredged as necessary to prevent sediment from reaching the invert of any gravity outlet pipe.

3. Volume Control Facility
Routine inspections and maintenance of volume control facilities shall be performed by the Owner on a yearly or as-needed basis. Specific items of concern include:
- ___ Facility shall be inspected yearly using the monitoring well to verify the system is functioning properly.
- ___ Surface of permeable pavement shall be cleaned with low-pressure power washer.
- ___ Accumulated sediment from surface shall be vacuumed out and disposed of properly.
- ___ Appropriate signage shall be repaired if damaged or illegible.

4. Stormwater Collection System
The Owner shall perform monthly inspections of all components of the stormwater collection system. The monthly inspection shall occur between March and November and include the following specific areas of concern:

Storm Inlets/Manholes
- ___ Remove accumulated leaves and other debris from grates
- ___ Reset covers/lids on as-needed basis
- ___ Remove accumulated sediment from manhole bottom when 50% of sump is filled

Storm Sewers/Culverts
- ___ Visually inspect pipes by removing manhole lids, make repairs as necessary
- ___ Storm sewers and culverts shall be checked for siltation deposits at inlets, outlets, and within the conduit, clean out as necessary
- ___ Restore riprap at outfalls if erosion observed
- ___ Restore riprap at outfalls
- ___ Replant and reseed any eroded areas

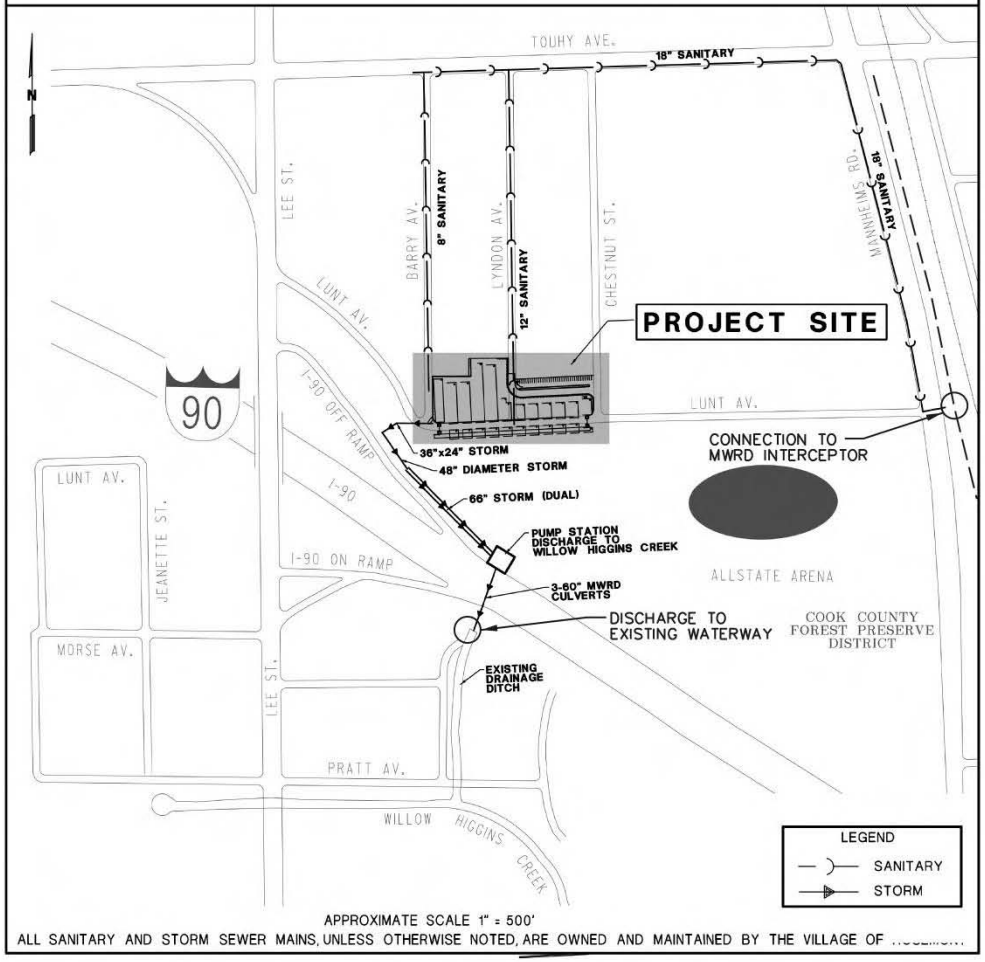
Overland Flow Routes (Ditches/Swales)
- ___ Annual visual inspections shall be performed that verify the design capacity of the overland flow routes is maintained. The slope and cross-sectional area of the ditch/swale shall be verified during this inspection.
- ___ Remove any obstructions that have been placed in the drainage path
- ___ Seed and sod any eroded areas
- ___ Restore riprap as necessary
- ___ Regrade to provide positive drainage as necessary
- ___ Regular mowing to control vegetation

5. Vegetated Areas
- ___ Need for planting, reseeding, or sodding. Supplement alternative native vegetation if a significant portion has not established (50% of the surface area after second growing season). Reseed with alternative native grass species if original grass cover has not successfully established.
- ___ Evidence of grazing, motorbikes, or other vehicles, repair.
- ___ Check for invasive vegetation, remove when possible.
- ___ Regular mowing to control vegetation; it is recommended that native vegetation remain uncut.
- ___ Dead or damaged non-native grassy areas – repair with seeding with fertilization or seeding with mulch.
- ___ Compensatory storage area shall be reseeded with appropriate vegetation according to the approved planting plan.

6. Qualified Sewer Construction
- ___ Perform manhole inspections once every five years, make repairs as necessary.
- ___ Perform sewer inspections once every five years, make repairs as necessary.
- ___ Perform regular cleaning so that each sewer segment is cleaned once every 5 years.
- ___ Remove any obstructions placed in maintenance easements that may impede maintenance equipment access.

PAGE 21

LOCATION MAP



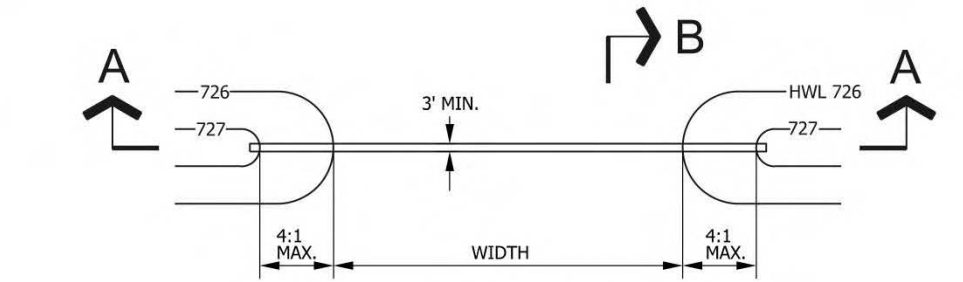
APPROXIMATE SCALE 1" = 500'

ALL SANITARY AND STORM SEWER MAINS, UNLESS OTHERWISE NOTED, ARE OWNED AND MAINTAINED BY THE VILLAGE OF ...

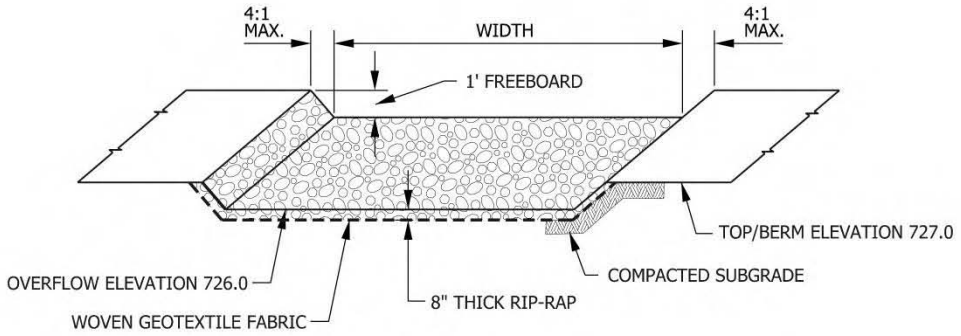
NOTES:

1. ALL STORM, SANITARY, AND COMBINED SEWERS SHALL BE SHOWN WITH OUTLETS TO WATERWAY AND/OR DISTRICT INTERCEPTOR.
2. INDICATE OWNER(S) OF DRAINAGE SYSTEMS.
3. LABEL SIZES OF ALL PIPES SHOWN ON EXHIBIT.
4. ROUTING EXHIBIT SHALL BE PROVIDED ON COVER PAGE OF PLANS.

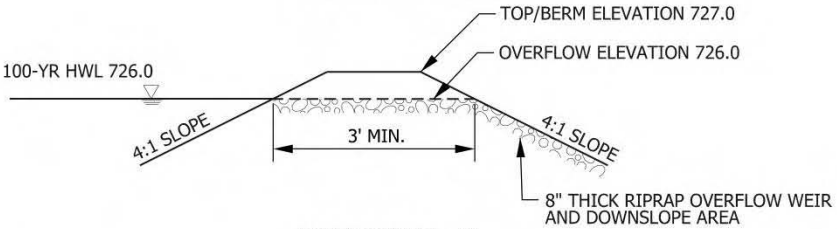
	TECHNICAL GUIDANCE MANUAL	7/1/15
	EXAMPLE ROUTING EXHIBIT	STD. DWG. NO.21
		PAGE NO. 22



PLAN VIEW



SECTION A - A



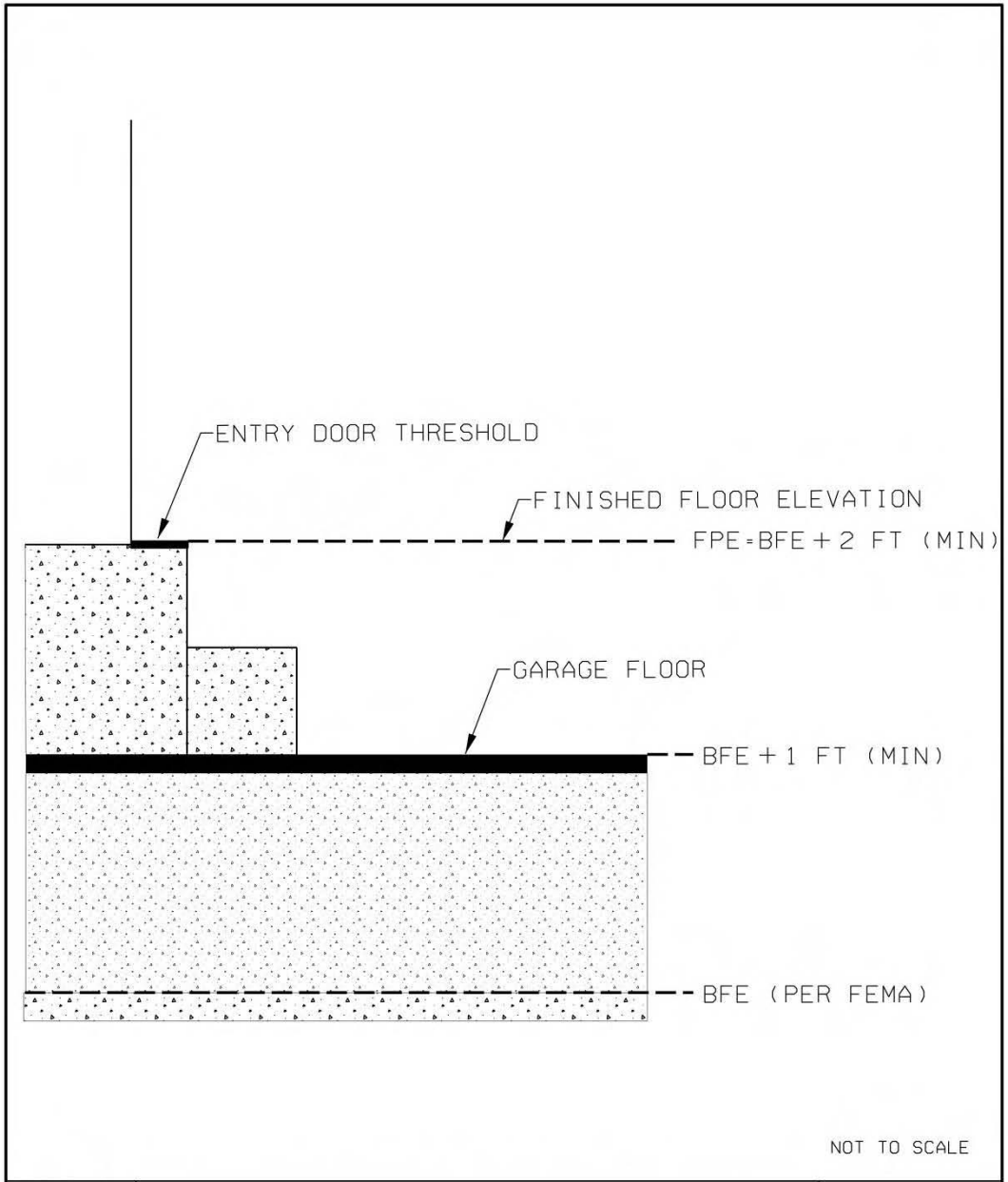
SECTION B - B

NOTES:

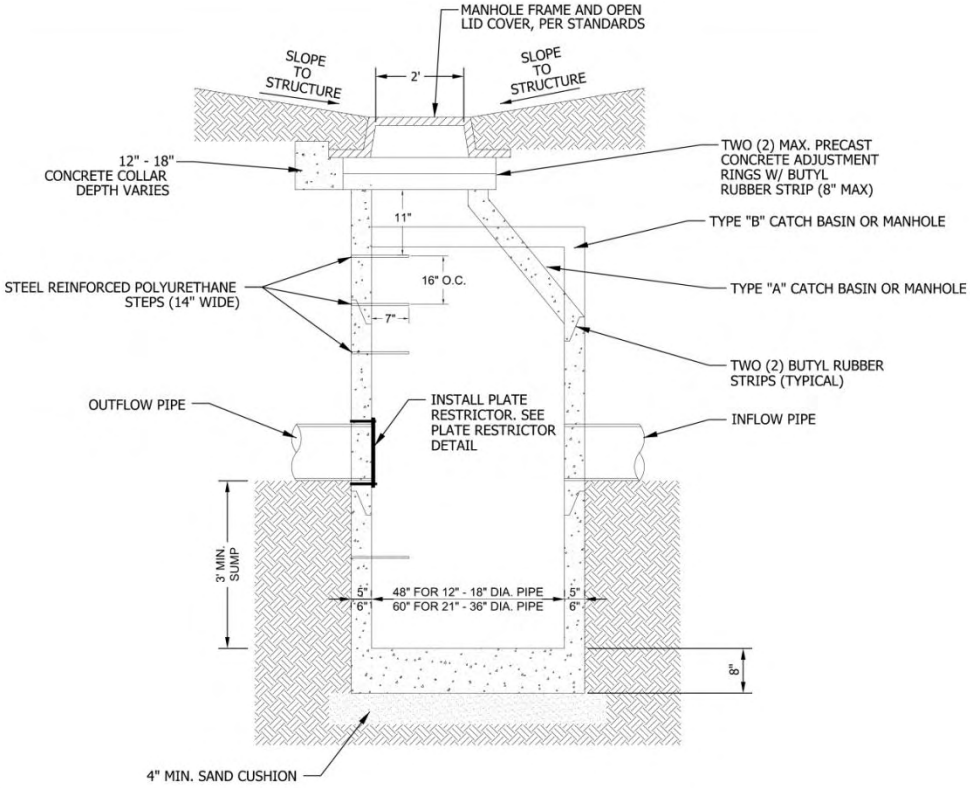
1. FINISHED FLOOR ELEVATIONS OF ADJACENT STRUCTURE SHALL BE ELEVATED AT LEAST ONE FOOT ABOVE PEAK 100-YEAR WATER SURFACE ELEVATION THROUGH OVERFLOW WEIR.
2. WOVEN GEOTEXTILE FABRIC SHALL MEET OR EXCEED STANDARDS OF IUM MATERIAL SPECIFICATION 592, TABLE 1, CLASS I, II, OR III.

NOT TO SCALE

	TECHNICAL GUIDANCE MANUAL	7/1/15
	TYPICAL EMERGENCY OVERFLOW WEIR	STD. DWG. NO.22
		PAGE NO. 23



	TECHNICAL GUIDANCE MANUAL	7/1/15
	FLOODPLAIN GARAGE DETAIL	STD. DWG. NO.23
		PAGE NO.24



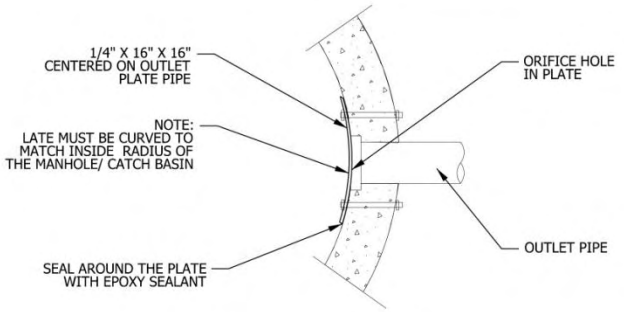


PLATE RESTRICTOR DETAIL: SECTION

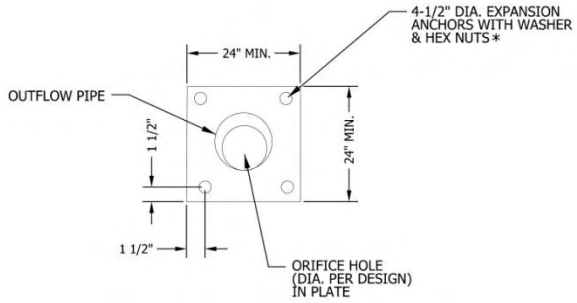


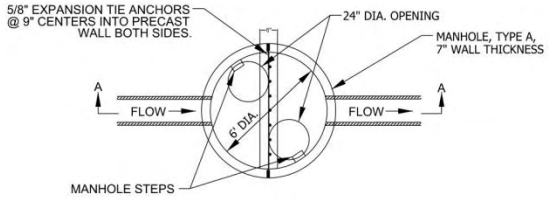
PLATE RESTRICTOR DETAIL: ELEVATION

NOTES:
1. CATCH BASINS MUST CONFORM TO ASTM C-478.
2. CATCH BASIN SECTIONS TO BE TONGUE AND GROOVED.
3. NON-STICK GROUT OR CEMENT TO BE USED ON ALL PENETRATIONS INSIDE AND OUTSIDE OF STRUCTURE.
4. ALL PIPE PENETRATIONS TO BE CORED, RUBBER BOOTED AND INTERIOR GROUTED (NON-STICK) OR CEMENTED, ASTM C923 CONNECTORS IN COMBINED SEWER AREAS.

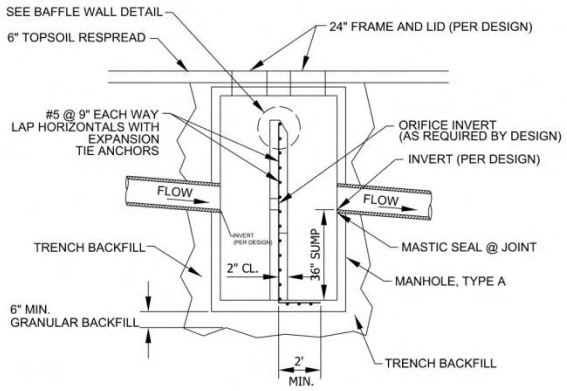
* ANCHORS SHALL BE TACK WELDED TO THE PLATE. ANCHOR EMBEDMENT SHALL BE 3" MIN.

NOT TO SCALE

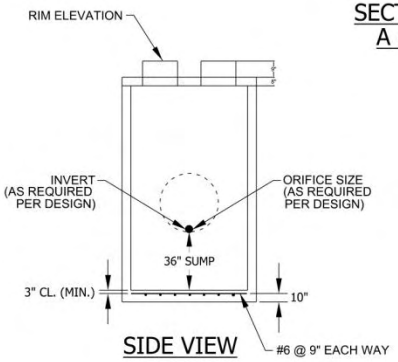
	TECHNICAL GUIDANCE MANUAL	7/1/15
	PLATE RESTRICTOR DETAIL (INSTALLED IN MANHOLE/CATCH BASIN)	STD. DWG. NO.24
		PAGE NO. 25



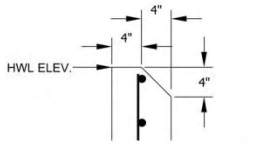
PLAN



SECTION
A - A



SIDE VIEW

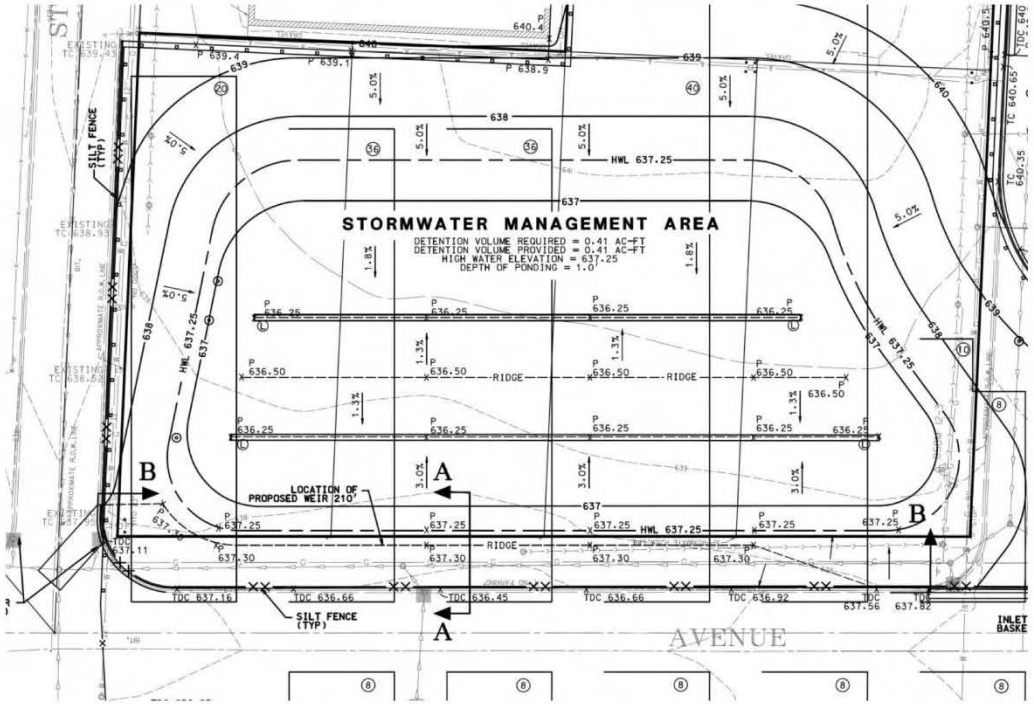


BAFFLE WALL DETAIL

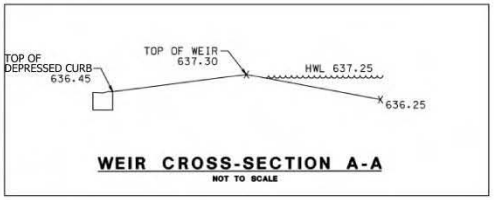
NOTES:
1. STRUCTURE AND BAFFLE WALL FABRICATED USING PORTLAND CEMENT CONCRETE.
2. RESTRICTORS LESS THAN 4" IN DIAMETER MUST USE CITY OF CHICAGO VORTEX RESTRICTOR (SEE DETAIL)
3. BAFFLE WALL PERMANENTLY INSTALLED AS PRECAST OR CAST IN PLACE, (STEEL PLATE ACCEPTABLE IF PERMANENT).
4. PIPE TO STRUCTURE CONNECTIONS SHALL BE ASTM C923 IN COMBINED SEWER AREAS.

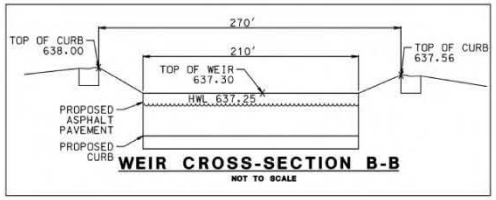
NOT TO SCALE

	TECHNICAL GUIDANCE MANUAL	7/1/15
	TYPICAL OUTLET CONTROL STRUCTURE (WALL) DETAIL	STD. DWG. NO.25 PAGE NO. 26



PLAN VIEW





NOTES:

1. MAXIMUM DEPTH IN PARKING LOT SHALL NOT EXCEED 12 INCHES.
2. MINIMUM SLOPE ON PARKING LOT SHALL BE 1% (TYPICAL).
3. MAXIMUM SLOPE ON PARKING LOT SHALL BE 5% (TYPICAL)
4. APPROPRIATE WARNING SIGNAGE SHALL BE CLEARLY POSTED INDICATING FLOOD RISK (PAGE 28).
5. FINISHED FLOOR ELEVATION OF ADJACENT STRUCTURES SHALL BE AT LEAST ONE FOOT ABOVE PEAK 100-YEAR WATER SURFACE ELEVATION THROUGH OVERFLOW WEIR.

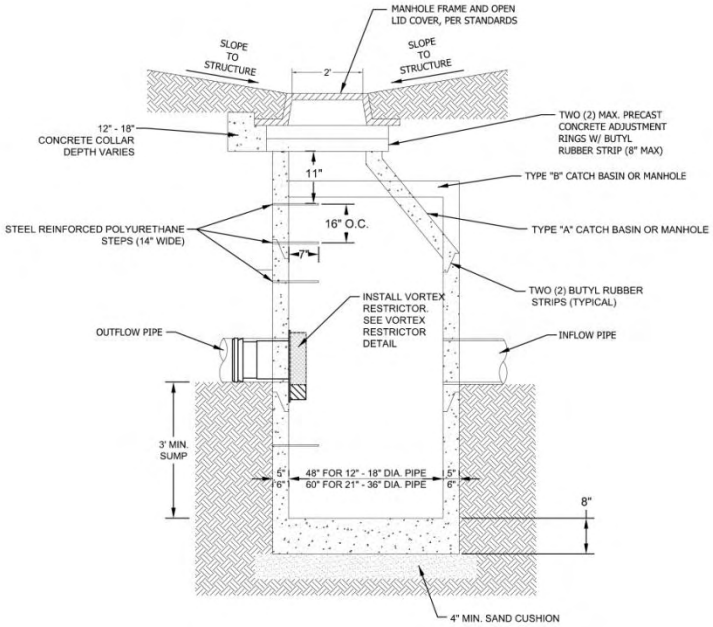
NOT TO SCALE

	TECHNICAL GUIDANCE MANUAL	7/1/15
	TYPICAL PARKING LOT DETENTION	STD. DWG. 26
		PAGE NO. 27

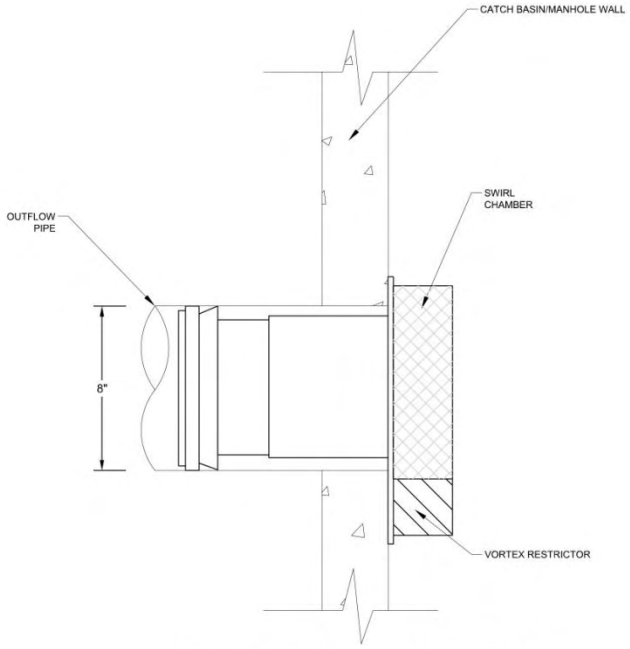
NOTES:
1. ONE SIGN SHALL BE POSTED PER 40 PARKING SPACES.
2. SIGNS SHALL BE POSTED IF PONDING IS GREATER THAN 8 INCHES.

NOT TO SCALE

METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO	TECHNICAL GUIDANCE MANUAL	7/1/15
	TYPICAL SIGNAGE FOR PARKING LOT DETENTION	STD. DWG. NO.27
		PAGE NO. 28



NOTES:
1. CATCH BASINS MUST CONFORM TO ASTM C-478.
2. CATCH BASIN SECTIONS TO BE TONGUE AND GROOVED.
3. NON-STICK GROUT OR CEMENT TO BE USED ON ALL PENETRATIONS INSIDE AND OUTSIDE OF STRUCTURE.
4. ALL PIPE PENETRATIONS TO BE CORED, RUBBER BOOTED AND INTERIOR GROUTED (NON-STICK) OR CEMENTED, ASTM C923 CONNECTORS IN COMBINED SEWER AREAS.

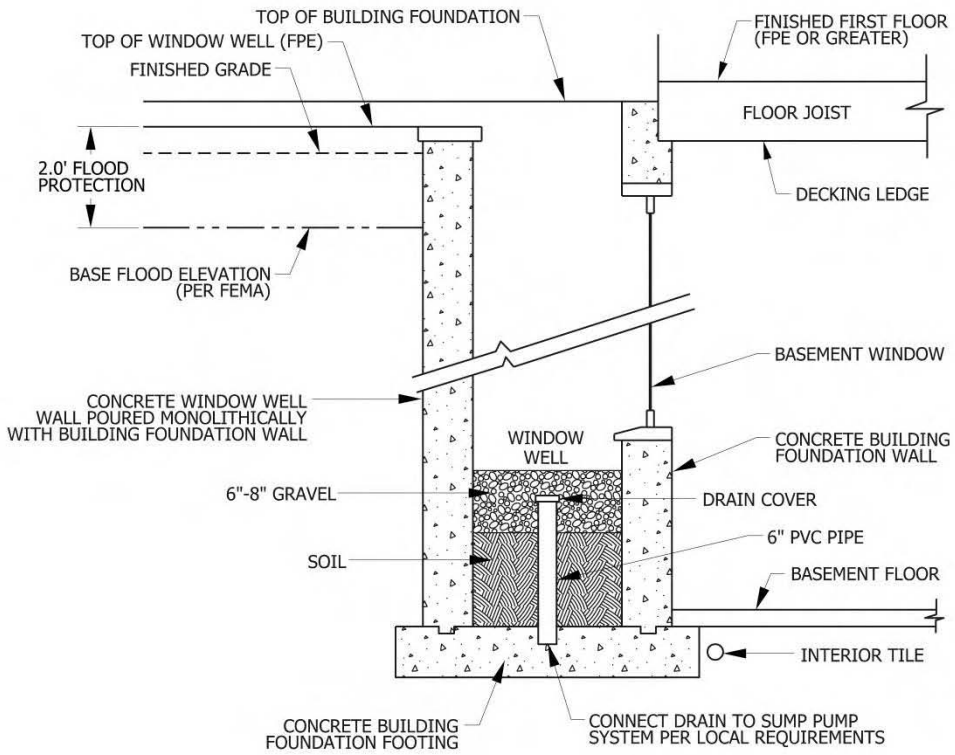


VORTEX RESTRICTOR DETAIL: SECTION

NOTES:
1. TO BE USED IN PLACE OF RESTRICTORS LESS THAN 4 INCHES IN DIAMETER.
2. VORTEX RESTRICTOR DESIGNED TO FIT INTO 8-INCH DIAMETER OUTFLOW PIPE.
3. THE 3" VORTEX RESTRICTOR CAN BE OBTAINED FROM DWM CENTRAL DISTRICT AT 3901 S. ASHLAND AVE. THE CONTRACTOR SHOULD ARRANGE FOR PICK UP BY CONTACTING 312-747-1177 (7AM TO 3PM, M-F).
4. THE VORTEX RESTRICTOR OTHER THAN 3" SIZE CAN BE OBTAINED EITHER FROM CONTECH ENGINEERED SOLUTIONS, LLC AT 1200 HARPER RD, SUITE 707, OAKBROOK, IL. (PH:773-661-9794) OR FROM HYDRO INTERNATIONAL AT 94 HUTCHINS DRIVE, PORTLAND, ME. (PH:207-756-6200) THE CONTRACTOR SHOULD ARRANGE FOR PURCHASE BY CONTACTING EITHER OF THE TWO AFOREMENTIONED AGENCIES.
5. PULL ON RESTRICTOR TO VERIFY THAT A TIGHT FIT IS MADE.
6. INSERT THE RESTRICTOR WITH THE OPENING DOWN. UPON TIGHTENING OF THE 2 BOLTS ON THE FACE OF THE RESTRICTOR, THE RUBBER O-RINGS WILL PROVIDE A WATER- TIGHT SEAL.

NOT TO SCALE

	TECHNICAL GUIDANCE MANUAL	7/1/15
	VORTEX RESTRICTOR DETAIL	STD. DWG. NO.28
		PAGE NO. 29

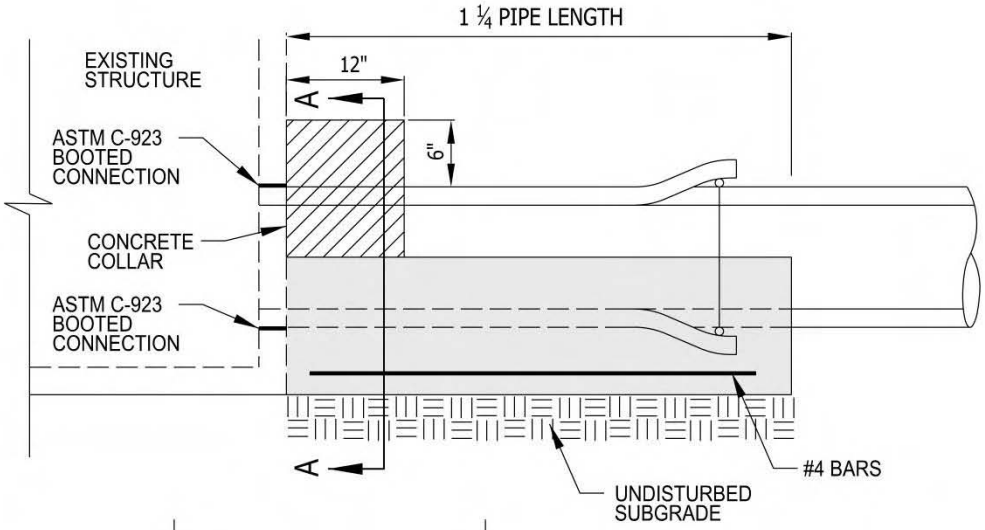


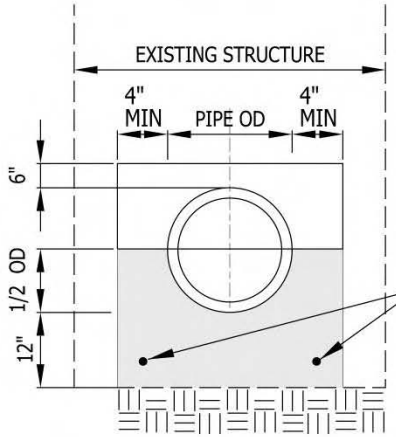
NOTE:

1. FINISHED FIRST FLOOR AND LOW-ENTRY ELEVATIONS MUST BE ELEVATED AT LEAST TWO FEET ABOVE BASE FLOOD ELEVATION (BFE) PER FEMA.
2. LOWEST ADJACENT GRADE TO FOUNDATION MUST BE ELEVATED TO AT LEAST THE BFE AND EXTEND A MINIMUM OF 20 FEET BEYOND OUTSIDE FACE OF BUILDING.
3. CHECK BUILDING/FIRE CODE FOR EGRESS WINDOW REQUIREMENTS.

NOT TO SCALE

	TECHNICAL GUIDANCE MANUAL	7/1/15
	TYPICAL WINDOW WELL DETAIL	STD. DWG. NO.29
		PAGE NO. 30





CONCRETE - 4000 psi @ 28 days

THICKNESS OF CRADLE 1/2 PIPE DIAMETER + 12"

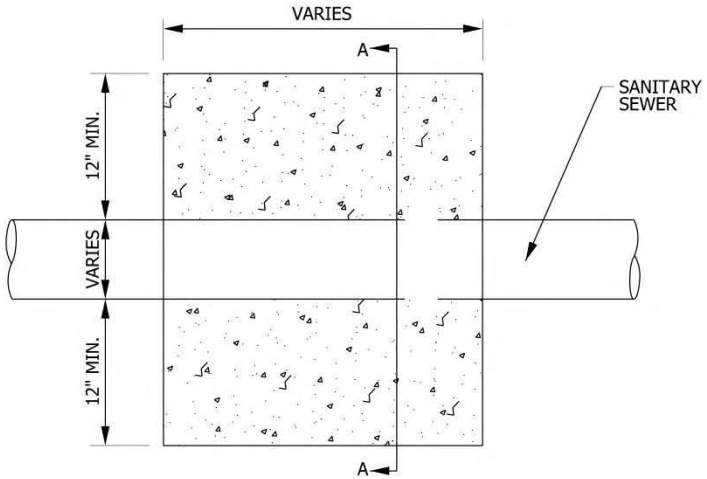
BEAR ON UNDISTURBED SUBGRADE.

* REINFORCEMENT SHALL BE TWO #4 BARS FOR PIPE DIAMETER LESS THAN OR EQUAL TO 8 INCHES, FOUR #4 BARS FOR PIPE DIAMETER GREATER THAN 8 INCHES.

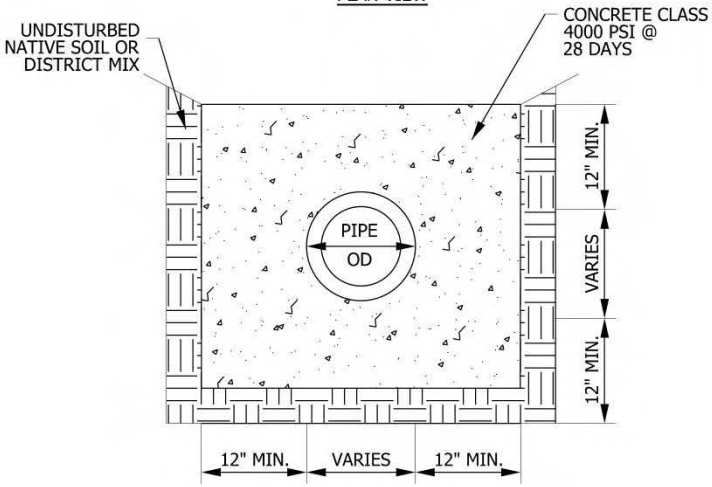
SECTION A-A

NOTE: TO BE USED WHEN CONNECTING TO DISTRICT INTERCEPTOR (SEE PAGE 38).

	TECHNICAL GUIDANCE MANUAL	7/1/15
	CONCRETE CRADLE	STD. DWG. NO. 30
		PAGE NO. 31



PLAN VIEW

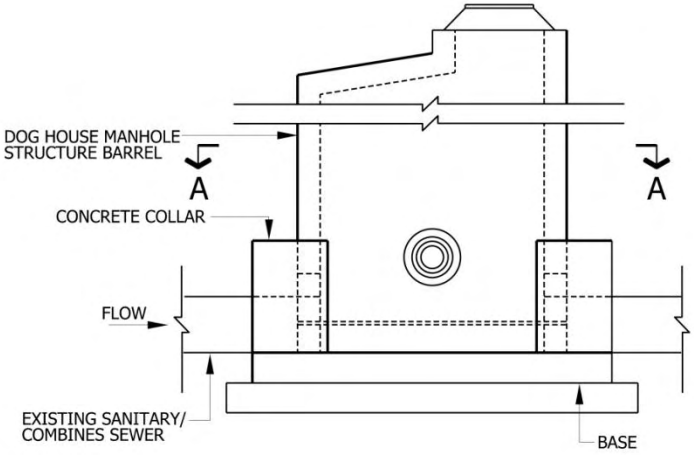


SECTION A - A

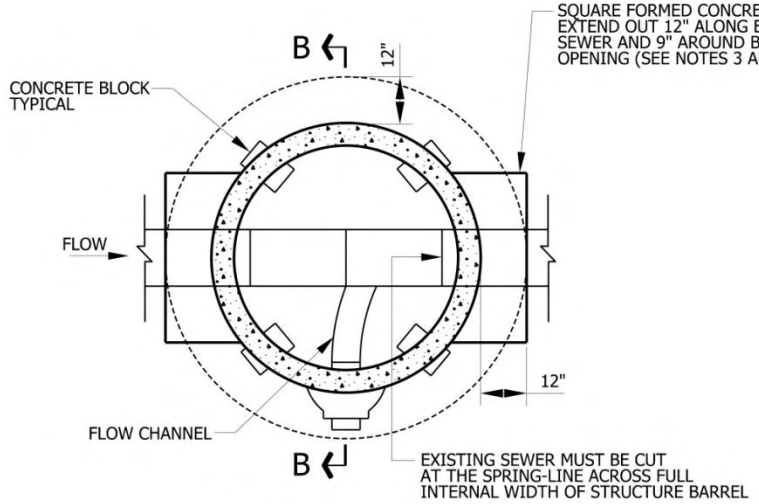
NOTES:
1. CONCRETE ENCASEMENT SHALL BE PROVIDED WHERE SEPARATION REQUIREMENTS CANNOT BE MET.
2. ENCASEMENT PLACED AGAINST UNDISTURBED NATIVE SOIL, OR FILL COMPACTED TO 90% RELATIVE COMPACTION.
3. NOT FOR PIPE TO PIPE CONNECTIONS.

NOT TO SCALE

	TECHNICAL GUIDANCE MANUAL	7/1/15
	CONCRETE ENCASEMENT DETAIL	STD. DWG. NO.31
		PAGE NO. 32

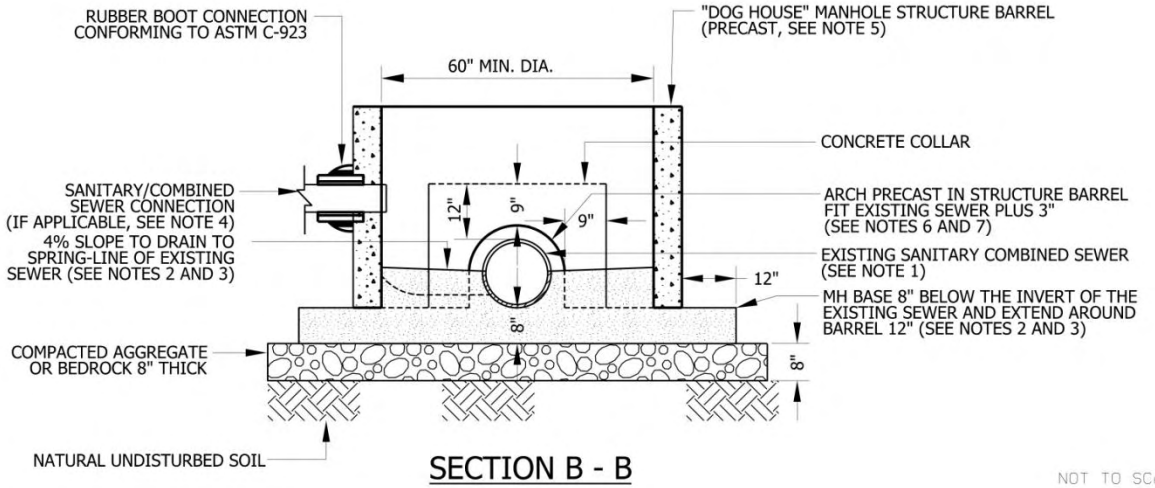


DOG HOUSE MANHOLE PROFILE



SECTION A - A

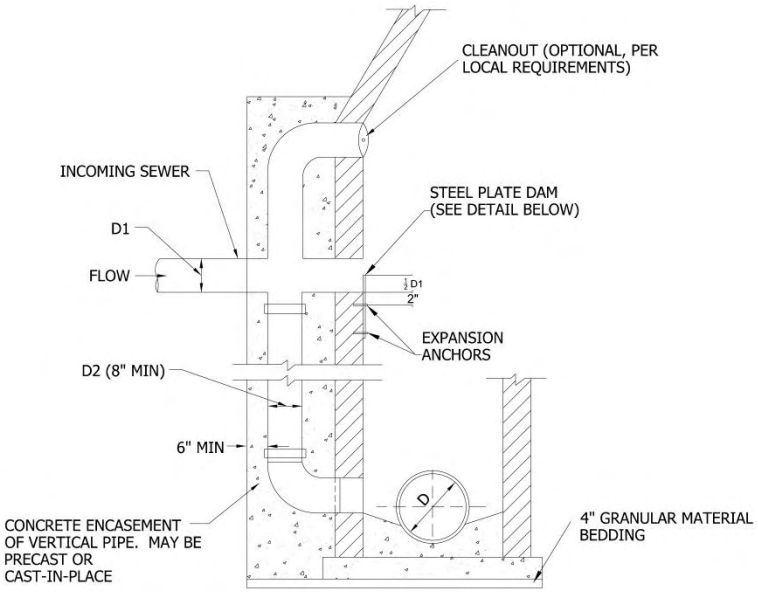
NOTES:
1. EXISTING SANITARY OR COMBINED SEWER MUST BE 15" DIAMETER OR LARGER FOR "DOG HOUSE" MANHOLE USE.
2. INTEGRAL POUR FOR BASE AND BENCH. (NO PRECAST BASE)
3. ALL POURED-IN-PLACE CONCRETE MUST BE 4000 PSI NON-SHRINK MIX.
4. EXTERNAL DROP CONNECTION MUST BE PROVIDED IF INVERT OF CONNECTING SEWER IS 24" OR MORE ABOVE THE INVERT OF OUTLET (SEE SEPARATE MWRD STANDARD DROP DETAIL).
5. MANHOLE DIAMETER MINIMUM 60"-INCREASES BASED ON THE EXISTING SEWER DIAMETER.
6. CONCRETE BONDING AGENT MUST BE APPLIED TO ALL INTERFACES OF PRECAST CONRETE SURFACES WITH POURED-IN-PLACE CONCRETE.
7. A CURVED INTERNAL ARCH FORM MUST BE USED DURING COLLAR CONCRETE FILL. NO BRICK, MORTAR, OR DEBRIS IS TO BE USED IN PLACE OF CONSOLIDATED CONCRETE.
8. DEBRIS MUST NOT BE ALLOWED TO ENTER THE SEWER SYSTEM AT ANY TIME DURING CONSTRUCTION.
9. ALL DIMENSIONS NOTED ARE MINIMUM ALLOWED.
10. THE STRUCTURE MUST NOT BE BACKFILLED FOR A MINIMUM OF 24 HOURS AFTER CONSTRUCTION.



SECTION B - B

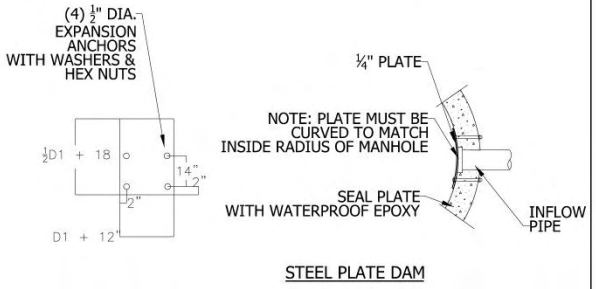
NOT TO SCALE

	TECHNICAL GUIDANCE MANUAL	7/1/15
	DOG HOUSE MANHOLE	STD. DWG. NO.32
		PAGE NO. 33



NOTES:
1. REQUIRED FOR 2FT. OR GREATER DROP TO SANITARY OR COMBINED SEWER.
2. MINIMUM WALL THICKNESS IS 6" FOR CAST IN PLACE CONCRETE STRUCTURES AND 1/12 MANHOLE DIAMETER FOR PRECAST CONCRETE STRUCTURES.
3. CONCRETE FOR ENCASEMENT SHALL BE 4,000 PSI @ 28 DAYS.
4. FORCEMAIN FLOW NOT ALLOWED AS INCOMING SEWER, SEE FORCEMAIN DISCHARGE DETAIL.

DIAMETER (INCHES)	
D1	D2
6	8
8	8
10	8
12	8
15	10
18	12
21	15
24	18

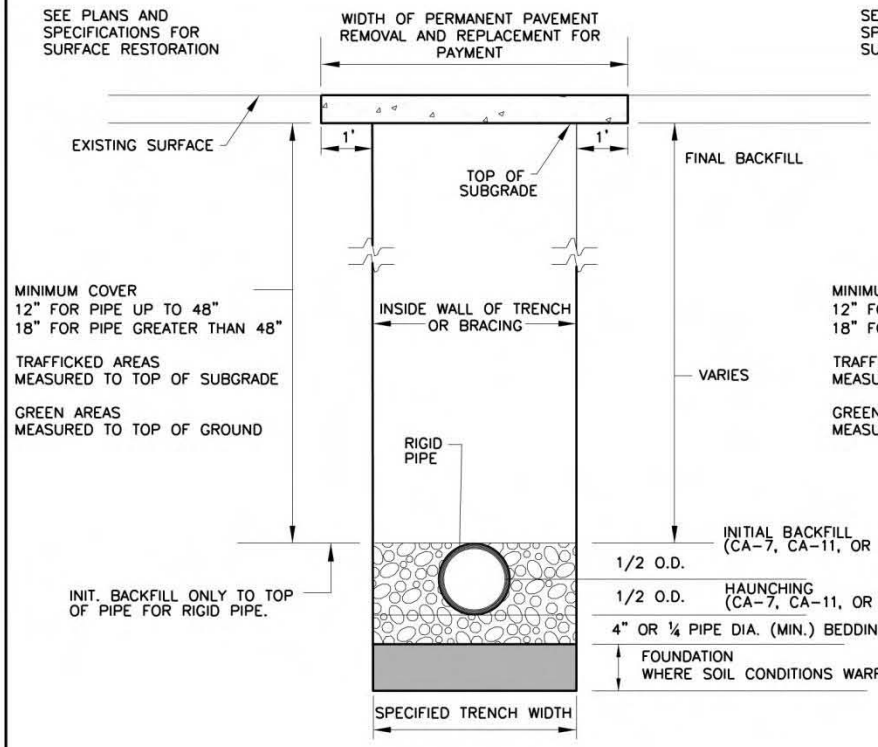


STEEL PLATE DAM

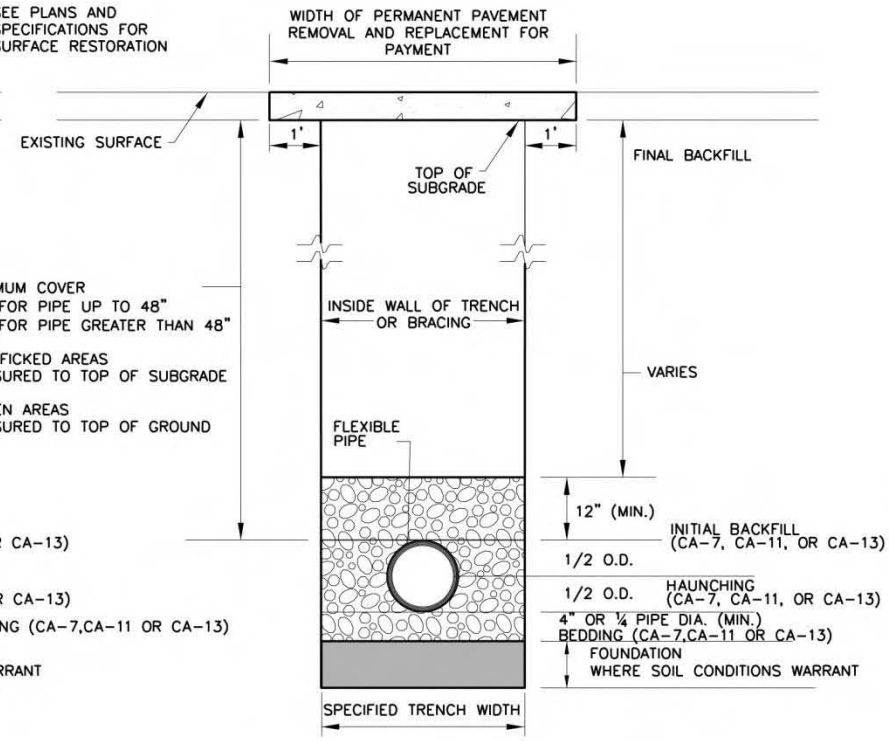
NOTES:
1. PLATE AND FASTENERS MUST BE FABRICATED IN STAINLESS STEEL, DUCTILE IRON, OR EQUIVALENT WATERPROOF/WEATHER PROOF MATERIALS.
2. BOLTS TACK WELDED TO PLATE.
3. ANCHOR EMBEDMENT: 3" MIN.

NOT TO SCALE

	TECHNICAL GUIDANCE MANUAL	7/1/15
	TYPICAL DROP MANHOLE CONNECTION	STD. DWG. NO. 33
		PAGE NO. 34



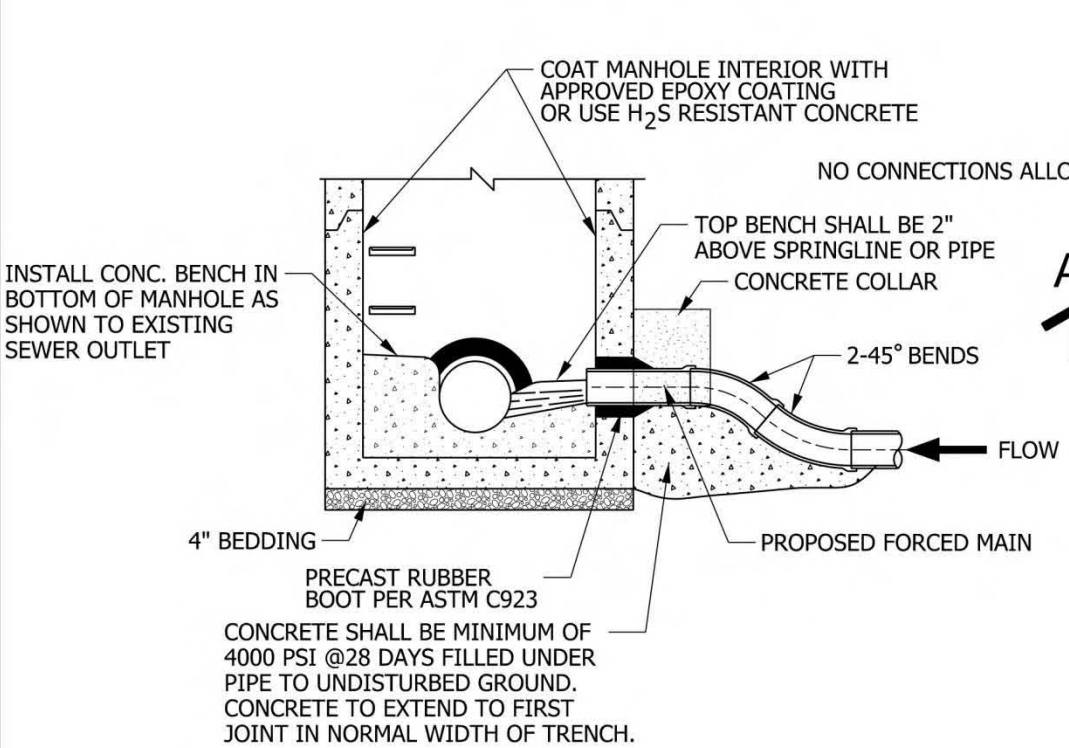
RIGID PIPE INSTALLATION DETAIL



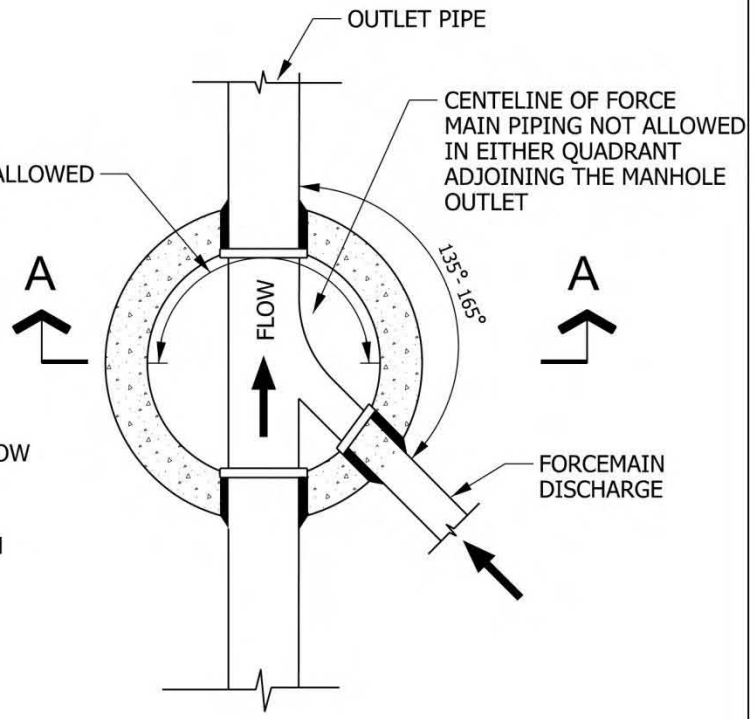
FLEXIBLE PIPE INSTALLATION DETAIL

NOTES:
1. FOR QUALIFIED SEWER CONSTRUCTION ONLY.
2. SHORING, OR EQUIVALENT PROTECTIVE SYSTEM, REQUIRED FOR TRENCHES OF 5' DEPTH OR GREATER, OR AS REQUIRED BY MUNICIPALITY.

NOT TO SCALE



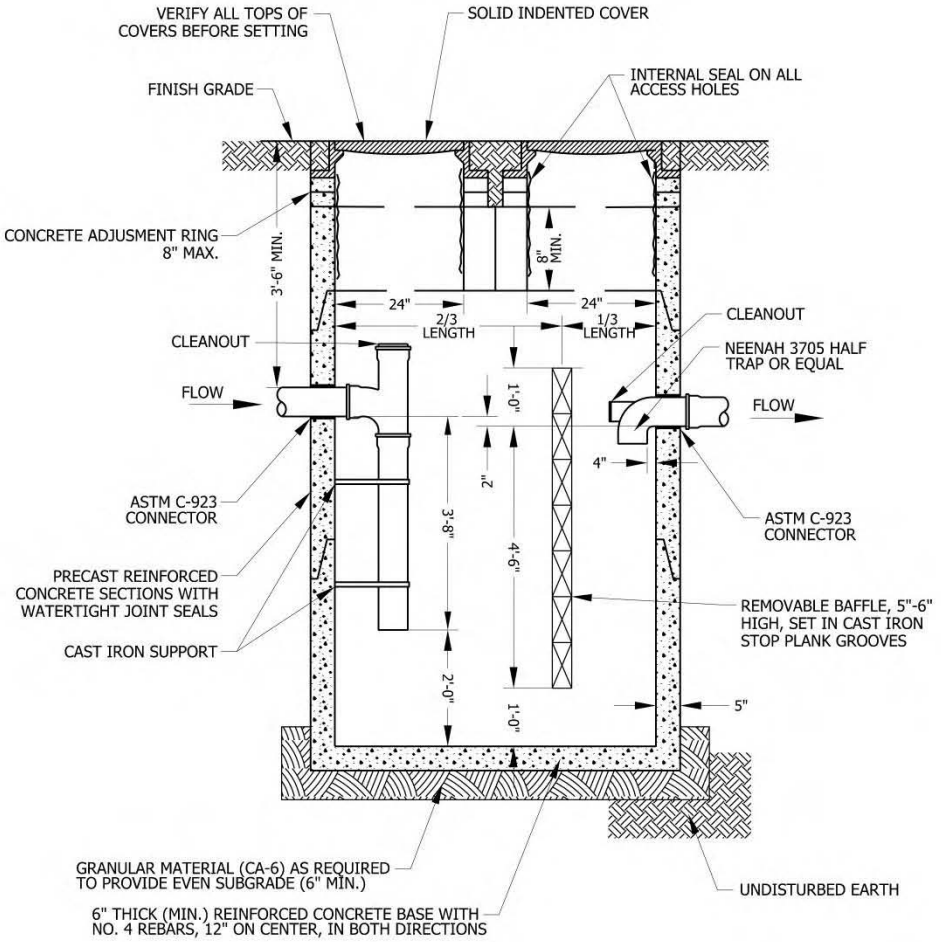
SECTION A - A



PLAN VIEW

NOTES:
1. DROP CONNECTIONS ARE NOT ALLOWED.
2. MAXIMUM OF ONE FORCEMAIN CONNECTION PER MANHOLE; MULTIPLE CONNECTIONS NOT ALLOWED.

NOT TO SCALE



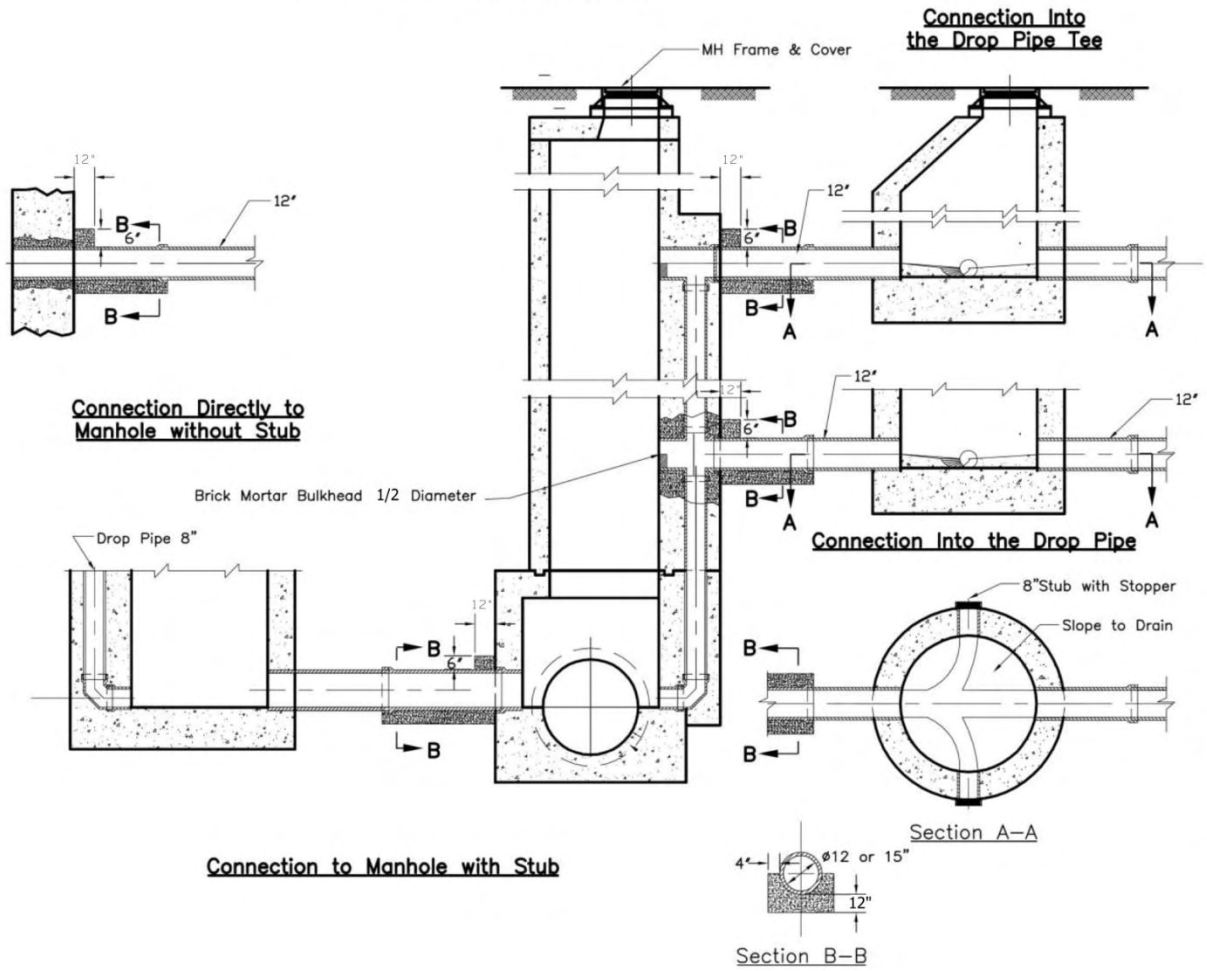
NOTES:

1. IF RIM ELEVATION IS LOWER THAN FLOOD PROTECTION ELEVATION, A WATERTIGHT FRAME WITH BOLTED DOWN LID SHALL BE USED.
2. DISHWASHER DISCHARGE SHALL BYPASS GREASE BASIN.
3. TRIPLE BASINS ARE ALSO ACCEPTABLE.

NOT TO SCALE

	TECHNICAL GUIDANCE MANUAL	7/1/15
	LARGE GREASE BASIN (>500 GALLONS)	STD. DWG. NO. 36
		PAGE NO. 37

Detailed plans drawn to scale with appropriate notes, must be included with the permit application.



NOTES:

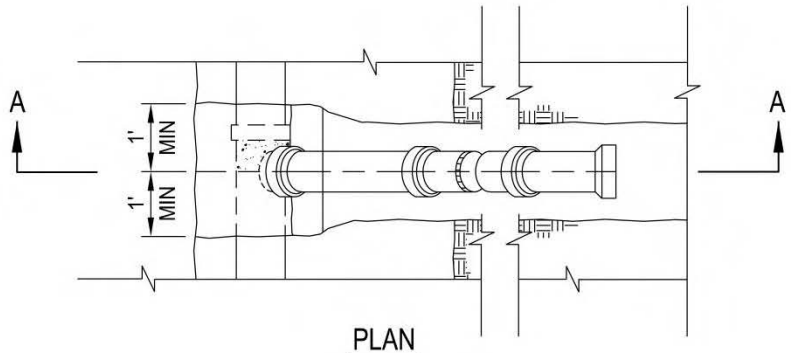
1. A MANHOLE SHALL BE PROVIDED ON THE LOCAL SEWER ADJACENT TO THE DISTRICT MANHOLE AND WITHIN THE ROW PARALLEL TO THE DISTRICT INTERCEPTOR. CLEAR SPACE BETWEEN MANHOLES SHALL NOT BE LESS THAN 3 FEET AND MORE THAN 10 FEET. CONNECTIONS WILL NOT BE PERMITTED AT LOCATIONS WHERE EXISTING DISTRICT MANHOLES ARE NOT PROVIDED. MANHOLE SHALL HAVE A MINIMUM DIAMETER OF 48 INCHES. DROP MANHOLES SHALL BE PROVIDED WHERE NEEDED. TWO BULKHEADED STUBS OF MINIMUM 8- INCH DIAMETER SHALL BE PROVIDED.
2. CONNECTION SEWER SHALL BE EXTRA STRENGTH VITRIFIED CLAY PIPE OF THE SAME SIZE AS EXISTING TEE OR STUB. CONNECTION PIPE SHALL BE PROVIDED WITH CONCRETE COLLAR AT THE DISTRICT MANHOLE, AND A CONCRETE CRADLE FOR AT LEAST 1 ¼ PIPE LENGTH, AS SHOWN. STRUCTURAL GRADE CONCRETE WITH A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 4000 PSI SHALL BE USED.
3. WHEN MAKING A CONNECTION TO A DISTRICT MANHOLE WHERE A STUB IS NOT PROVIDED, A HOLE SHALL BE CORE-DRILLED AT THE SPRINGLINE. HOLE DIAMETER SHALL BE NO MORE THAN ONE INCH LARGER THAN THE OUTSIDE DIAMETER OF CONNECTING PIPE. NON-SHRINK GROUT SHALL BE USED TO FILL ANNULAR SPACE BETWEEN PIPE AND HOLE.
4. FOR CONNECTIONS TO A DISTRICT DROP PIPE BELOW THE STUB, A VITRIFIED CLAY PIPE CROSS SHALL BE USED AND JOINED WITH EXISTING DROP PIPE, WITH PIPE STUBS AND COLLARS, TO FORM A WATERTIGHT JOINT. CONNECTION RUN OF CROSS SHALL BE NO MORE THAN TWO NOMINAL PIPE SIZES LARGER THAN DROP PIPE.
5. ANY DEBRIS ENTERING MANHOLE DURING CONSTRUCTION SHALL BE REMOVED IMMEDIATELY. ANY MANHOLE STEPS THAT ARE DAMAGES SHALL BE REPLACED.
6. ALL ELEVATIONS SHALL BE CLEARLY MARKED. "RECORD" ELEVATIONS OF DISTRICT FACILITIES MAY BE USED BUT FIELD SURVEY IS RECOMMENDED FOR CRITICAL ELEVATIONS.
7. DURING CONSTRUCTION OF PROPOSED CONNECTION, MANHOLE SHALL BE SUPPORTED ACCORDING TO DETAILS PREPARED, SIGNED, AND SEALED BY A LICENSED STRUCTURAL ENGINEER.
8. DOWELS SHALL BE USED TO CONNECT CONCRETE COLLAR AND CRADLE TO THE MANHOLE.
9. THESE CONNECTION DETAILS SHALL BE USED FOR SEWERS UP TO A 15-INCH DIAMETER. CONNECTION DETAILS FOR LARGER SEWERS SHALL BE PREPARED BASED ON SITE CONDITIONS AND CONFIGURATION OF EXISTING MANHOLE/STRUCTURE.

INSTRUCTIONS FOR USE:

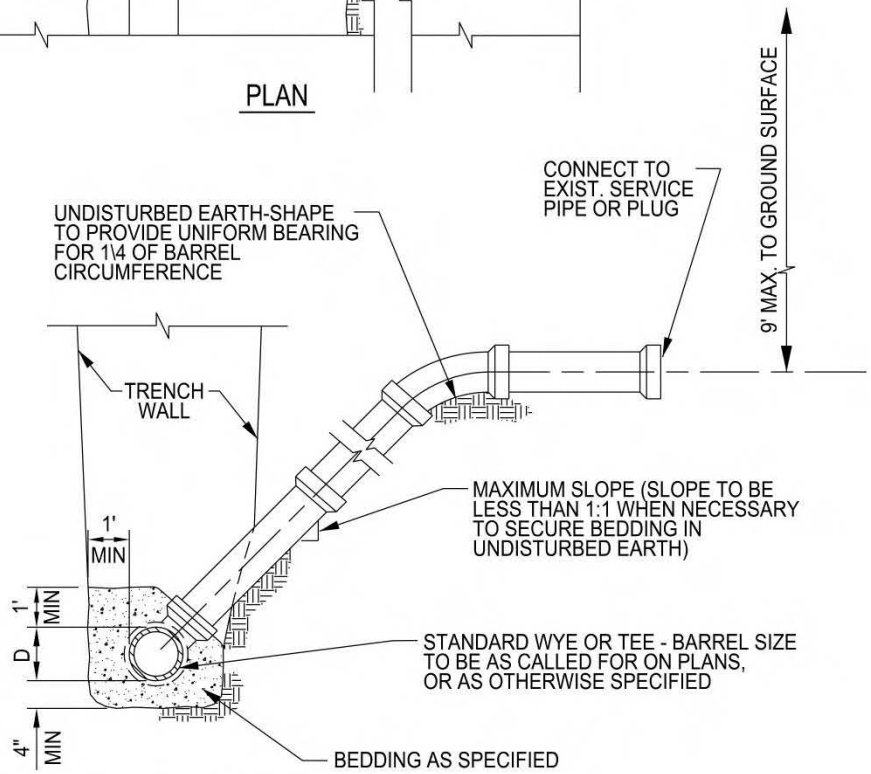
1. SELECT THE METHOD OF CONNECTION.
2. PROVIDE ALL CRITICAL INVERT ELEVATIONS.
3. CROSS OUT ALL CONNECTION TYPES THAT ARE NOT APPLICABLE AND CLEARLY HIGHLIGHT STRUCTURE ON PLANS THAT REFER TO THIS DETAIL.

NOT TO SCALE

	TECHNICAL GUIDANCE MANUAL	7/1/15
	METHODS OF CONNECTING TO MWRD MANHOLES	STD. DWG. NO. 37
		PAGE NO. 38

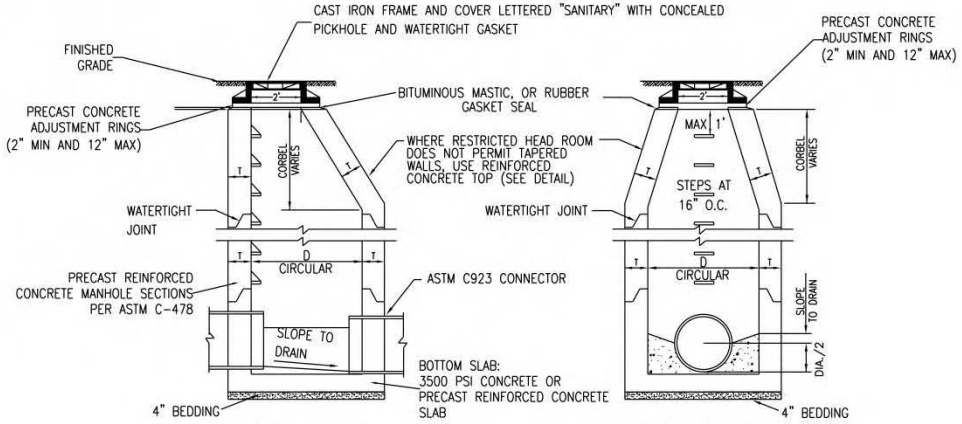


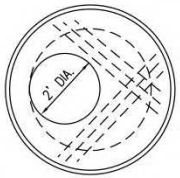
PLAN

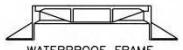


SECTION A-A

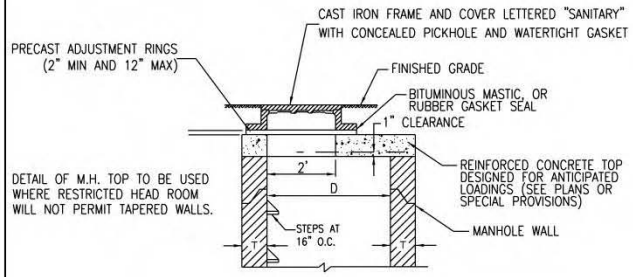
METROPOLITAN WATER RECLAMATION DISTRICT OF GREATER CHICAGO	TECHNICAL GUIDANCE MANUAL	7/1/15
	TYPICAL RISER SANITARY SERVICE LATERAL	STD. DWG. NO.38
		PAGE NO. 39



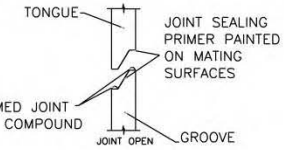


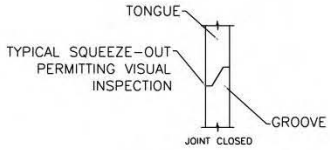


WATERPROOF FRAME AND BOLTED LID (SEE NOTES)



REINFORCED CONCRETE TOP





WATER TIGHT JOINT DETAIL

1. MANHOLES TO HAVE PRECAST "RUBBER BOOTS" CONFORMING TO ASTM C-923 AT ALL PIPE CONNECTIONS.
2. SANITARY MANHOLES SUBJECT TO SATURATION SOIL CONDITIONS OR SURFACE SUBMERGENCE SHALL BE EQUIPPED WITH CHIMNEY SEALS AND WATER TIGHT BOLTED DOWN MANHOLE COVERS.
3. MASTIC SEALANT OR RUBBER GASKET SEAL MUST BE APPLIED BETWEEN CONCRETE & FLANGE OF FRAME BEFORE LID BOLTS ARE TIGHTENED.
4. SAFETY LANDINGS REQUIRED FOR MANHOLES GREATER THAN 28 FEET DEPTH (RIM TO INVERT). MAXIMUM VERTICAL SPACING OF SAFETY LANDING IS 20 FEET.
5. FOR DROP CONNECTIONS, USE DROP CONNECTION MANHOLE DETAIL.
6. FOR ONLINE CONNECTIONS GREATER THAN 15 INCHES, USE DOGHOUSE MANHOLE DETAIL.

ALT MATERIALS FOR WALLS	D	T (MIN.)
PRECAST REINFORCED CONCRETE SECTION	4 FEET 5 FEET 6 FEET	4 IN 5 IN 6 IN
CAST-IN-PLACE CONCRETE	4 FEET 5 FEET 6 FEET	4 IN 5 IN 6 IN

NOT TO SCALE

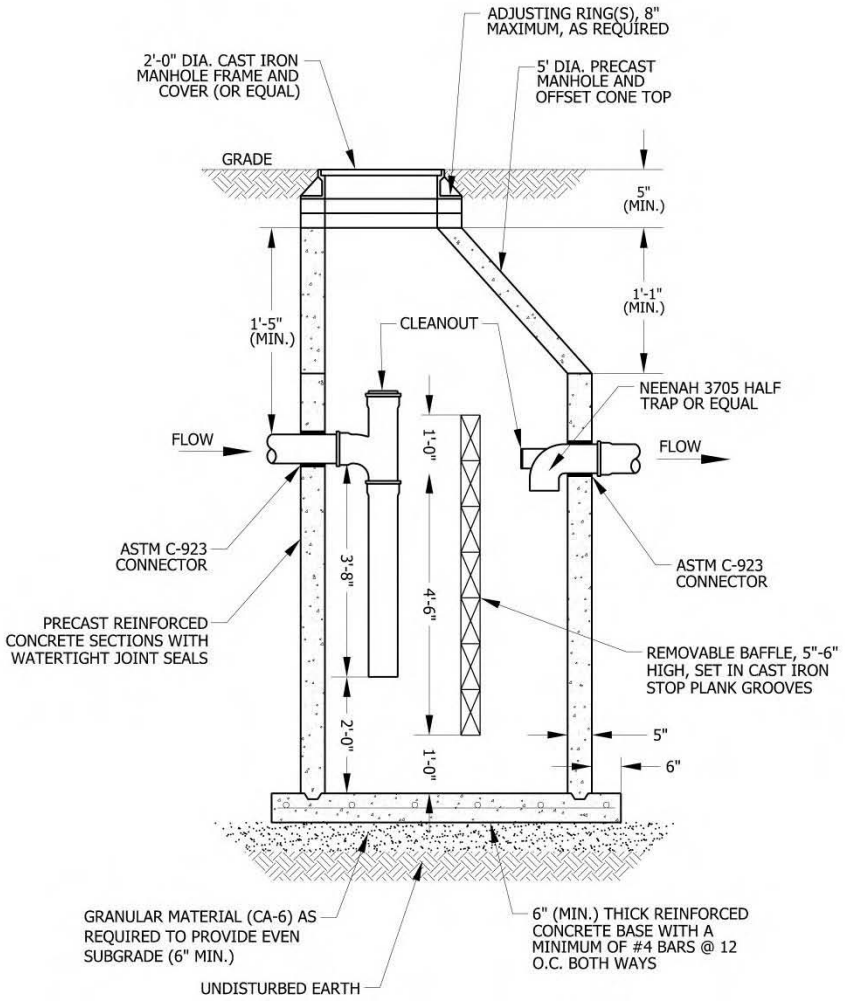
TECHNICAL GUIDANCE MANUAL

7/1/15

TYPICAL SANITARY MANHOLE "A" AND "B" DETAIL

STD. DWG. NO.39

PAGE NO. 40



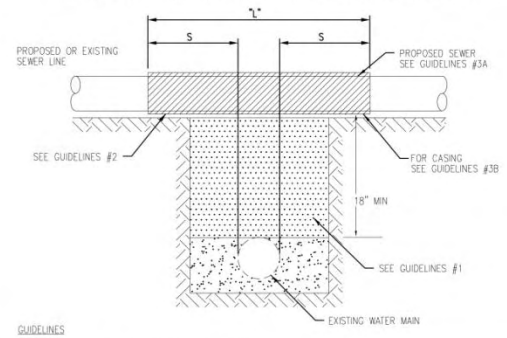
NOTES:

1. IF RIM ELEVATION IS LOWER THAN FLOOD PROTECTION ELEVATION, A WATERTIGHT FRAME WITH BOLTED DOWN LID SHALL BE USED.
2. DISHWASHER DISCHARGE SHALL BYPASS GREASE BASIN.

NOT TO SCALE

	TECHNICAL GUIDANCE MANUAL	7/1/15
	SMALL GREASE BASIN (<500 GALLONS)	STD. DWG. NO. 40
		PAGE NO. 41

PROPOSED SEWER LINE WITH 18" MINIMUM VERTICAL SEPARATION ABOVE EXISTING WATER MAIN



GUIDELINES

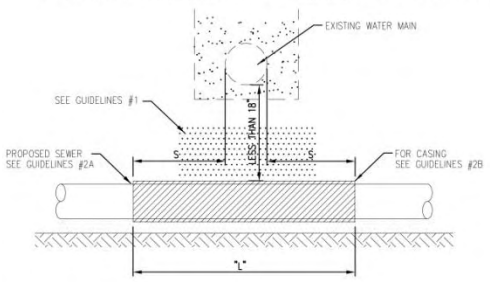
1. IF SELECT GRANULAR BACKFILL EXISTS: REMOVE WITHIN WIDTH OF PROPOSED SEWER TRENCH AND REPLACE WITH SELECT EXCAVATED MATERIAL (CLASS IV) AND COMPACT
2. OMIT SELECT GRANULAR EMBEDMENT AND GRANULAR BACKFILL TO ONE (1) FOOT OVER TOP OF SEWER AND USE SELECT EXCAVATED MATERIAL (CLASS IV) AND COMPACT THE LENGTH OF "L" FEET.
3. A) CONSTRUCT "L" FEET OF PROPOSED SEWER OF WATER MAIN MATERIAL AND PRESSURE TEST, OR;

   B) USE "L" FEET OF WATER MAIN MATERIAL FOR CASING OF PROPOSED SEWER AND SEAL ENDS OF CASING.

NOTE: "S" THE LENGTH NECESSARY TO PROVIDE 10 FEET OF SEPARATION AS MEASURED PERPENDICULAR TO THE EXISTING WATER MAIN

*BASED ON STANDARD SPECIFICATIONS FOR WATER AND SEWER MAIN CONSTRUCTION IN ILLINOIS.

PROPOSED SEWER LINE BELOW EXISTING WATER MAIN WITH LESS THAN 18" MINIMUM VERTICAL SEPARATION



GUIDELINES

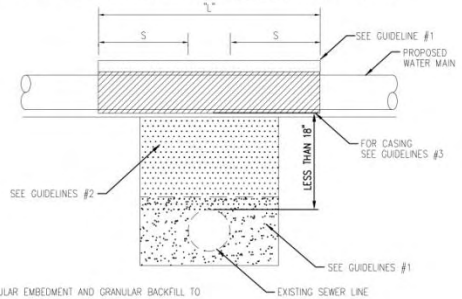
1. OMIT SELECT GRANULAR EMBEDMENT AND GRANULAR BACKFILL TO ONE (1) FOOT OVER TOP OF SEWER AND USE SELECT EXCAVATED MATERIAL (CLASS IV) AND COMPACT FOR "S" FEET ON EACH SIDE OF WATER MAIN.
2. A) CONSTRUCT "L" FEET OF PROPOSED SEWER OF WATER MAIN MATERIAL AND PRESSURE TEST, OR;

   B) USE "L" FEET OF WATER MAIN MATERIAL FOR CASING OF PROPOSED SEWER AND SEAL ENDS OF CASING.
3. PROVIDE ADEQUATE SUPPORT FOR EXISTING WATER MAIN TO PREVENT DAMAGE DUE TO SETTLEMENT OF SEWER TRENCH

NOTE: "S" THE LENGTH NECESSARY TO PROVIDE 10 FEET OF SEPARATION AS MEASURED PERPENDICULAR TO THE EXISTING WATER MAIN

*BASED ON STANDARD SPECIFICATIONS FOR WATER AND SEWER MAIN CONSTRUCTION IN ILLINOIS.

PROPOSED WATER MAIN ABOVE EXISTING SEWER LINE WITH LESS THAN 18" VERTICAL SEPARATION



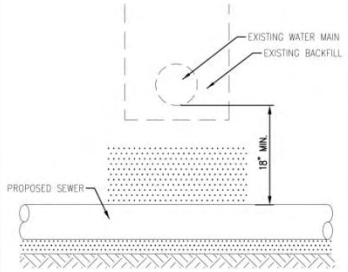
GUIDELINES

1. OMIT SELECT GRANULAR EMBEDMENT AND GRANULAR BACKFILL TO ONE (1) FOOT OVER TOP OF WATER MAIN AND USE SELECT EXCAVATED MATERIAL (CLASS IV) AND COMPACT THE LENGTH OF "L".
2. IF SELECT GRANULAR BACKFILL EXISTS, REMOVE WITHIN WIDTH OF EXISTING SEWER LINE TRENCH AND REPLACE WITH SELECT EXCAVATED MATERIAL (CLASS IV) AND COMPACT.
3. USE "L" FEET OF WATER MAIN MATERIAL FOR CASING OF PROPOSED WATER MAIN AND SEAL ENDS OF CASING.
4. POINT LOADS SHALL NOT BE ALLOWED BETWEEN WATER MAIN CASING AND SEWER

NOTE: "S" THE LENGTH NECESSARY TO PROVIDE 10 FEET OF SEPARATION AS MEASURED PERPENDICULAR TO THE EXISTING SEWER LINE.

*BASED ON STANDARD SPECIFICATIONS FOR WATER AND SEWER MAIN CONSTRUCTION IN ILLINOIS.

PROPOSED SEWER LINE BELOW EXISTING WATER MAIN WITH 18" MINIMUM VERTICAL SEPARATION

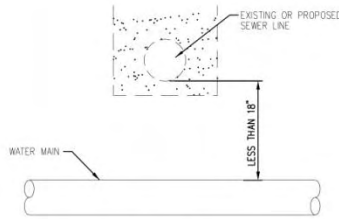


GUIDELINES

1. PROVIDE ADEQUATE SUPPORT FOR EXISTING WATER MAIN TO PREVENT DAMAGE DUE TO SETTLEMENT OF SEWER TRENCH.

*BASED ON STANDARD SPECIFICATIONS FOR WATER AND SEWER MAIN CONSTRUCTION IN ILLINOIS.

PLACEMENT OF WATER MAIN BELOW EXISTING OR PROPOSED SEWER LINE WITH LESS THAN 18" MINIMUM VERTICAL SEPARATION, **NOT ALLOWED.**



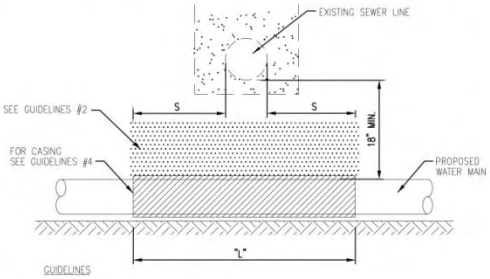
NOT ALLOWED*
MUST MAINTAIN 18" VERTICAL SEPARATION

*BASED ON STANDARD SPECIFICATIONS FOR WATER AND SEWER MAIN CONSTRUCTION IN ILLINOIS.

PROPOSED WATER MAIN BELOW EXISTING SEWER LINE WITH 18" MINIMUM VERTICAL SEPARATION

NOTE: "S" THE LENGTH NECESSARY TO PROVIDE 10 FEET OF SEPARATION AS MEASURED PERPENDICULAR TO THE EXISTING SEWER LINE

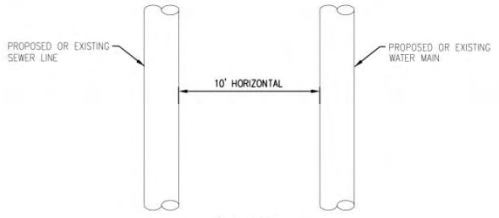
*BASED ON STANDARD SPECIFICATIONS FOR WATER AND SEWER MAIN CONSTRUCTION IN ILLINOIS.



GUIDELINES

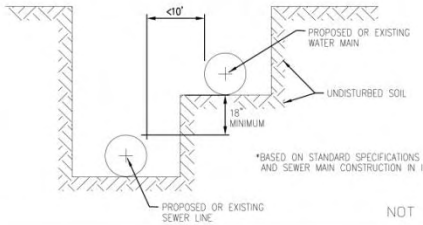
1. OMIT SELECT GRANULAR EMBEDMENT AND GRANULAR BACKFILL TO ONE (1) FOOT OVER TOP OF WATER MAIN AND USE SELECT EXCAVATED MATERIAL (CLASS IV) AND COMPACT THE LENGTH OF "L".
2. IF SELECT GRANULAR BACKFILL EXISTS, REMOVE WITHIN WIDTH OF EXISTING SEWER LINE TRENCH AND REPLACE WITH SELECT EXCAVATED MATERIAL (CLASS IV) AND COMPACT.
3. PROVIDE ADEQUATE SUPPORT FOR EXISTING SEWER LINE TO PREVENT DAMAGE DUE TO SETTLEMENT.
4. USE "L" FEET OF WATER MAIN MATERIAL FOR CASING OF PROPOSED WATER MAIN AND SEAL ENDS OF CASING.

PER IEPA, WHEN **PROPOSED** SEWER (OR WATER) IS LOCATED 10 FEET OR MORE FROM EXISTING WATER (OR SEWER), NO SPECIAL CONSTRUCTION REQUIRED



PLAN VIEW

PER IEPA, WHEN **PROPOSED** SEWER (OR WATER) IS LOCATED **LESS THAN 10 FEET** FROM EXISTING WATER (OR SEWER), DETAILS BELOW SHALL APPLY



*BASED ON STANDARD SPECIFICATIONS FOR WATER AND SEWER MAIN CONSTRUCTION IN ILLINOIS.

NOT TO SCALE

TECHNICAL GUIDANCE MANUAL

7/1/15

WATER AND SEWER SEPARATION REQUIREMENTS (PER IEPA)

STD. DWG. NO. 41

PAGE NO. 42