

SANITARY SEWER CONSTRUCTION NOTES

1. STANDARDS AND SPECIFICATIONS

- A. ALL SANITARY SEWER AND SANITARY SYSTEM CONSTRUCTION SHALL CONFORM TO THE CURRENT STANDARDS AND SPECIFICATIONS OF THE CHARTER TOWNSHIP OF CHESTERFIELD SEWER DEPARTMENT AND THE CURRENT EDITION OF THE RECOMMENDED STANDARDS FOR WASTEWATER FACILITIES (COMMONLY REFERRED TO AS THE TEN STATES STANDARDS). CONSTRUCTION AND MATERIALS SHALL ALSO CONFORM TO THE APPLICABLE CURRENT ASTM STANDARD SPECIFICATION OR PRACTICE, WHEN REFERENCED. DETAILED WRITTEN SPECIFICATIONS ARE AVAILABLE UPON REQUEST.
- B. ANY MATERIALS OTHER THAN THOSE LISTED ON THE STANDARD DETAIL SHEETS MUST BE APPROVED IN WRITING BY THE CHARTER TOWNSHIP OF CHESTERFIELD SEWER DEPARTMENT. CONTRACTOR MUST SUBMIT THREE (3) COPIES OF SHOP DRAWINGS AND SPECIFICATIONS FOR PROPOSED ALTERNATE MATERIAL TO THE CHARTER TOWNSHIP OF CHESTERFIELD SEWER DEPARTMENT FOR REVIEW AS AN APPROVED EQUAL. DETERMINATION OF ACCEPTANCE BY THE CHARTER TOWNSHIP OF CHESTERFIELD SEWER DEPARTMENT SHALL BE CONSIDERED FINAL. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH REVIEW OF THE PROPOSED ALTERNATE MATERIAL AS AN APPROVED EQUAL.

2. PRECONSTRUCTION REQUIREMENTS

- A. THE DEVELOPER SHALL PROVIDE A BREAKDOWN OF CONSTRUCTION COST TO THE CHARTER TOWNSHIP OF CHESTERFIELD SANITARY DEPARTMENT AND PAY ALL REQUIRED FEES PRIOR TO SCHEDULING A PRECONSTRUCTION MEETING.
- B. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL ATTEND A PRECONSTRUCTION MEETING AT A TIME AND PLACE AS ARRANGED BY THE TOWNSHIP ENGINEER. THE TOWNSHIP ENGINEER SHALL NOTIFY AFFECTED UTILITY COMPANIES AND GOVERNMENTAL AGENCIES, AS IDENTIFIED BY THE OWNER'S ENGINEER, A MINIMUM OF TEN (10) DAYS PRIOR TO THE PRECONSTRUCTION MEETING. THE OWNER'S ENGINEER SHALL SUBMIT APPROVED PLANS TO ALL UTILITY COMPANIES AND GOVERNMENTAL AGENCIES A MINIMUM OF TEN (10) DAYS PRIOR TO PRECONSTRUCTION MEETING. CONSTRUCTION SHALL START WITHIN TWO (2) WEEKS OF MEETING UNLESS WAIVED BY THE CHARTER TOWNSHIP OF CHESTERFIELD SEWER DEPARTMENT.
- C. IT IS THE CONTRACTOR'S RESPONSIBILITY TO SECURE ALL REQUIRED PERMITS PRIOR TO CONSTRUCTION, OR INSURE THAT ALL REQUIRED PERMITS HAVE BEEN OBTAINED PRIOR TO CONSTRUCTION.
- D. THE CONTRACTOR SHALL NOTIFY MISS DIG AT (800) 482-7171, THE CHARTER TOWNSHIP OF CHESTERFIELD SEWER DEPARTMENT AT (586) 949-0400 EXT. 3, THE INSPECTION SECTION OF DETROIT WATER AND SEWERAGE DEPARTMENT AT (313) 833-8649 AND ANDERSON, ECKSTEIN AND WESTRICK, INC. AT (586) 726-1234 SEVENTY TWO (72) HOURS PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL ALSO NOTIFY REPRESENTATIVES OF ANY OTHER FACILITIES, LOCATED IN THE VICINITY OF THE WORK, WHICH ARE NOT PARTICIPANTS OF THE MISS DIG SYSTEM. THE CONTRACTOR SHALL NOTIFY THE MACOMB COUNTY OFFICE OF PUBLIC WORKS AT (586) 469-5325 TWO (2) WORKING DAYS PRIOR TO CONSTRUCTION.

3. PIPE MATERIAL

- A. EIGHT INCH (8") THROUGH FIFTEEN INCH (15") PIPE SHALL BE POLYVINYL CHLORIDE (PVC) COMPOSITE (TRUSS) SEWER PIPE WITH GASKETED JOINTS (ASTM D3212). SANITARY SERVICE CONNECTIONS FOR NEW PVC COMPOSITE SEWER PIPE SHALL BE MADE BY INSTALLING FACTORY FABRICATED (NOT EXTRUDED), SIX INCH (6") WYES OF THE SAME MATERIAL AS THE MAIN LINE SANITARY SEWER.
- B. EIGHTEEN INCH (18") AND LARGER PIPE SHALL BE REINFORCED CONCRETE CIRCULAR SEWER PIPE, MANUFACTURED WITH TYPE II CEMENT, IN COMBINATION WITH 30 PERCENT REPLACEMENT OF THE TOTAL CEMENTITIOUS WEIGHT WITH GROUND GRANULATED BLAST-FURNACE SLAG WITH MINIMUM GRADE OF 100 AND 3 PERCENT XYPEX ADMIXTURE BY WEIGHT OF CEMENTITIOUS WEIGHT MATERIAL AND WALL THICKNESS C (ASTM C78). SIZE AND CLASS OF PIPE SHALL BE AS INDICATED ON THE PLANS. ALL REINFORCED CONCRETE SEWER PIPE SHALL BE CAST WITH REINFORCING STEEL EXTENDING INTO THE BELL. ALL JOINTS SHALL BE MODIFIED TONGUE AND GROOVE WITH GASKET (ASTM C361). GASKETS SHALL BE SYNTHETIC RUBBER. NATURAL RUBBER GASKETS ARE NOT ACCEPTABLE. SANITARY SERVICE CONNECTIONS FOR NEW REINFORCED CONCRETE SEWER PIPE SHALL BE MADE BY CORE DRILLING A PORT IN THE SEWER WALL AND INSTALLING A LATERAL CONNECTOR FOR CONCRETE PIPE. LATERAL CONNECTOR SHALL BE NPC KOR-N-TEE. ALL CONCRETE SANITARY SEWER THIRTY-SIX INCH (36") OR LARGER SHALL HAVE POINTED JOINTS WITH A NON-SHRINK TYPE MORTAR COMPOSED OF TYPE IIA CEMENT. NON-SHRINK TYPE MORTAR SHALL BE PRECO OR SEKA SET. NO LIME SHALL BE USED IN THE MORTAR.
- C. DUCTILE IRON PIPE WITH EXTERIOR ASPHALTIC MATERIAL COATING SHALL MEET THE REQUIREMENTS OF ANSI A21.51 CURRENT SPECIFICATIONS. DUCTILE IRON PIPE SHALL BE SPECIAL THICKNESS CLASS 54 FOR PUSH-ON-JOINT DUCTILE-IRON PIPE. DUCTILE IRON PIPE SHALL BE DOUBLE CEMENT LINED WITH ASPHALTIC MATERIAL SEAL COATING MEETING THE REQUIREMENTS OF ANSI A21.4 CURRENT SPECIFICATIONS. PUSH-ON JOINTS SHALL MEET THE REQUIREMENTS OF ANSI A21.11 CURRENT SPECIFICATIONS. PUSH ON JOINTS SHALL BE TYTON OR SUPER BELLITE. SANITARY SERVICE CONNECTIONS FOR NEW DUCTILE IRON SEWER PIPE SHALL ONLY BE MADE WITH THE WRITTEN AUTHORIZATION OF THE CHARTER TOWNSHIP OF CHESTERFIELD SEWER DEPARTMENT.

NOTE: DUCTILE IRON PIPE SHALL BE USED FOR THE SANITARY SEWER AT ALL WATER MAIN AND SANITARY SEWER CROSSINGS WITH LESS THAN TWENTY-FOUR INCHES (24") OF VERTICAL CLEARANCE AND WHERE THE WATER MAIN CROSSES BELOW THE SEWER, REGARDLESS OF VERTICAL CLEARANCE DISTANCE, UNLESS OTHERWISE APPROVED BY THE CHARTER TOWNSHIP OF CHESTERFIELD SEWER DEPARTMENT OR THE TOWNSHIP ENGINEER. THE DUCTILE IRON PIPE INSIDE DIAMETER SHALL BE OF EQUAL SIZE (OR LARGER) AS THE PROPOSED SEWER AND SHALL EXTEND FROM MANHOLE TO MANHOLE.

4. MANHOLES

- A. ALL NEW MANHOLES SHALL BE PRECAST REINFORCED CONCRETE (MANUFACTURED WITH TYPE II CEMENT IN COMBINATION WITH 30 PERCENT REPLACEMENT OF THE TOTAL CEMENTITIOUS WEIGHT WITH GROUND GRANULATED BLAST-FURNACE SLAG WITH MINIMUM GRADE OF 100 AND 3 PERCENT XYPEX ADMIXTURE BY WEIGHT OF CEMENTITIOUS WEIGHT MATERIAL), FLEXIBLE-JOINT TYPE (ASTM C478). THE TOP SECTION SHALL BE A MODIFIED ECCENTRIC CONE SECTION WITH STUD INSERTS CAST IN PLACE AND A SMOOTH TROWEL-FINISHED TOP SURFACE. THE BASE SECTION SHALL BE A PRECAST RISER SECTION WITH AN INTEGRAL BASE. JOINTS AND GASKETS SHALL BE MODIFIED TONGUE AND GROOVE (ASTM C443). ALL LIFTING HOLES SHALL BE FILLED WITH A NON-SHRINK TYPE MORTAR COMPOSED OF TYPE IIA CEMENT. NON-SHRINK TYPE MORTAR SHALL BE PRECO OR SEKA SET. NO LIME SHALL BE USED IN THE MORTAR.
- B. PIPE PENETRATION JOINTS FOR NEW PRECAST REINFORCED MANHOLES SHALL BE A FLEXIBLE WATER-TIGHT JOINT. "KOR-N-SEAL" FOR SEWERS SIX INCH (6") THROUGH THIRTY INCH (30") IN DIAMETER AND "A-LOK" FOR SEWERS THIRTY-SIX INCH (36") IN DIAMETER AND LARGER. HOLES FOR PIPES SHALL BE CAST IN THE RISER SECTION SO AS TO PROVIDE A MINIMUM CLEARANCE OF TWO INCHES (2") BETWEEN THE INSIDE BOTTOM OF THE BASE SECTION AND THE OUTSIDE WALL OF THE PIPE. PIPE SHALL NOT EXTEND INTO A MANHOLE BEYOND THE INTERIOR FACE OF THE MANHOLE WALL.
- C. EXISTING PRECAST MANHOLES SHALL BE TAPPED WITH THE "KOR-N-SEAL" METHOD, WITH A WATER-TIGHT RUBBER BOOT FOR SEWERS SIX INCH (6") THROUGH FIFTEEN INCH (15") IN DIAMETER. EXISTING BRICK MANHOLES, AND TAPS FOR SEWERS EIGHTEEN INCH (18") IN DIAMETER AND LARGER, SHALL HAVE HOLES DRILLED AT FOUR INCHES (4") CENTER TO CENTER AROUND THE PERIPHERY OF THE OPENING TO CREATE A PLANE OF WEAKNESS BEFORE BREAKING OUT THE SECTION. NON-SHRINK GROUT, PRECO OR SEKA SET, SHALL BE USED TO SEAL THE OPENING. A CONCRETE COLLAR SHALL BE POURED TWELVE INCHES (12") AROUND THE PIPE AND EXTEND TWELVE INCHES (12") EXTERIOR TO THE MANHOLE.
- D. MINIMUM ADJUSTMENT SHALL BE SIX (6") AND MAXIMUM ADJUSTMENT SHALL BE TWELVE INCHES (12"). ADJUSTMENT RINGS SHALL BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS. NO BRICK OR BLOCK SHALL BE ALLOWED FOR ADJUSTMENT COURSES UNLESS APPROVED IN WRITING BY THE CHARTER TOWNSHIP OF CHESTERFIELD SEWER DEPARTMENT. ADJUSTMENT RINGS SHALL NOT OVERHANG BEYOND THE TOP OF THE RISER OR BASE OF THE COVER. ALL PRECAST ADJUSTMENT SHALL HAVE AN EXTERNAL SEAL APPLIED. SEE NOTE 4.I. FOR EXTERNAL SEAL REQUIREMENTS.

NEW (TAPPING) MANHOLES BUILT OVER ANY EXISTING SANITARY SEWERS SHALL HAVE MONOLITHIC POURED BOTTOMS WITH A DIAMETER SUITABLE FOR THE INSTALLATION.

- E. ALL MANHOLES SHALL BE PROVIDED WITH BOLTED, WATER-TIGHT COVERS. MANHOLE FRAMES AND COVERS SHALL BE EAST JORDAN 1040ZPT WITH PRESSURE TIGHT COVER WITH FOUR (4) ONE INCH (1") ANCHOR BASE FLANGE HOLES. COVERS SHALL BE SUPPLIED WITH "CHESTERFIELD TOWNSHIP SANITARY" IN RAISED LETTERS.

- F. ALL CONCRETE FOR CHANNELIZATION, BENCHES, COLLARS, AND BULKHEADS SHALL BE MADE WITH TYPE II CEMENT IN COMBINATION WITH 30 PERCENT REPLACEMENT OF THE TOTAL CEMENTITIOUS WEIGHT WITH GROUND GRANULATED BLAST-FURNACE SLAG WITH MINIMUM GRADE OF 100 AND 3 PERCENT XYPEX ADMIXTURE BY WEIGHT OF CEMENTITIOUS WEIGHT MATERIAL. CONCRETE PLACED INSIDE NEW MANHOLES TO FORM THE CHANNEL SHALL NOT BE PLACED BETWEEN THE PIPE AND THE OPENING IN THE MANHOLE BASE SECTION AS TO INTERFERE IN ANY WAY WITH THE FLEXIBILITY OF THE JOINT. PRECAST MANHOLE CHANNELS MAY BE USED WITH THE WRITTEN APPROVAL OF THE CHARTER TOWNSHIP OF CHESTERFIELD SEWER DEPARTMENT.
- G. AT ALL CONNECTIONS TO MANHOLES, SEWERS OR EXTENSIONS THERETO, DROP CONNECTIONS SHALL BE REQUIRED WHEN THE DIFFERENCE IN INVERT ELEVATIONS EXCEEDS EIGHTEEN INCHES (18"). ALL DROP CONNECTIONS SHALL BE INTERIOR DROP CONNECTION ASSEMBLIES.
- H. STEPS SHALL BE M.A. INDUSTRIES P.S.I. POLYPROPYLENE OR MSU #360 ALU POLY MANHOLE STEPS AND INSTALLED BY THE MANHOLE MANUFACTURER AT SIXTEEN INCHES (16") CENTER TO CENTER SPACING. STEPS SHALL HAVE FOOT RECESS AND BE SUITABLY SCORED TO PROVIDE A NONSLIP SURFACE. BOTTOM STEP SHALL BE EIGHTEEN INCHES (18") MAXIMUM ABOVE FLOOR. TOP STEP SHALL BE TWENTY FOUR INCHES (24") MAXIMUM BELOW RIM. STEPS SHALL NORMALLY BE PROVIDED ON A BACK WALL OF THE MANHOLE FURTHEST FROM TRAFFIC. IF A MANHOLE IS INSTALLED AT A LOCATION WITHIN EXISTING TRAFFIC FLOW, STEPS SHALL BE PROVIDED SUCH THAT PERSONNEL WILL FACE ON-COMING TRAFFIC.

5. CONSTRUCTION

- A. NO GROUND WATER, STORM WATER, CONSTRUCTION WATER, DOWNSPOUT DRAINAGE OR WEEP TILE DRAINAGE SHALL BE ALLOWED TO ENTER ANY SANITARY SEWER INSTALLATION.
- B. A HORIZONTAL SEPARATION OF TEN FEET (10') (MINIMUM) MUST BE MAINTAINED BETWEEN THE SANITARY SEWER AND THE WATER MAIN.
- C. A MINIMUM VERTICAL CLEARANCE OF ONE AND ONE-HALF FEET (1-1/2') MUST BE MAINTAINED BETWEEN THE SANITARY SEWER AND ANY UTILITIES. A VERTICAL CLEARANCE OF FIVE FEET (5') (MINIMUM) MUST BE MAINTAINED BELOW THE MASTER PLAN DEPTH OF DITCHES, DRAINS AND OPEN WATER COURSES.
- D. VERTICAL TOLERANCES FOR MANHOLE RIM GRADES SHALL BE:
MANHOLE NOT IN R.O.W.: [-0.00] TO + [0.25] FEET
MANHOLE IN R.O.W.: [-0.00] TO + [0.25] FEET
- E. ALL SEWER PIPE SHALL BE LAID USING A LASER TO MAINTAIN GRADE AND ALIGNMENT.
- F. ALL SEWER PIPE AND APPURTENANCES SHALL BE STAKED FOR LINE AND GRADE EVERY FIFTY FEET (50'). CUT SHEETS SHALL BE PROVIDED TO THE TOWNSHIP ENGINEER AND THE CHARTER TOWNSHIP OF CHESTERFIELD SEWER DEPARTMENT. NO SEWER SHALL BE LAID WITHOUT STAKES.
- G. THE CONTRACTOR SHALL ABIDE BY ALL THE REQUIREMENTS OF THE ROAD RIGHT-OF-WAY OWNER REGARDING CONSTRUCTION OF WATER AND SEWER MAINS, MAINTAINING TRAFFIC, BARRICADING, BORING, BACKFILL AND RESTORATION. THERE WILL BE NO ADDITIONAL COMPENSATION DUE TO THE CONTRACTOR FOR COMPLYING WITH THESE REQUIREMENTS.
- H. NO WASTE EXCAVATION MATERIAL SHALL BE DISPOSED OF BY PLACING IT IN ANY FLOODPLAIN OR WETLAND OF THE STATE UNLESS APPROPRIATE PERMITS HAVE BEEN ISSUED. THE CONTRACTOR OR PROPERTY OWNER MUST OBTAIN LOCAL FILL PERMITS FOR ANY MATERIALS DEPOSITED UPON LANDS WITHIN ANY CITY, VILLAGE OR TOWNSHIP.
- I. COMPACTED SAND BACKFILL IS TO BE USED EXCLUSIVELY AT ALL ROAD CROSSINGS, DRIVEWAYS AND SIDEWALKS THROUGHOUT THE COURSE OF THE PROJECT. IN ROADWAYS AND DRIVEWAYS, THE TOP 12 INCHES OF THE EXCAVATION SHALL BE FILLED WITH 21AA LIMESTONE. EXCEPT AS PROVIDED IN THE SPECIFICATIONS, THERE WILL BE NO ADDITIONAL COMPENSATION FOR COMPLYING WITH THIS REQUIREMENT.
- J. THE CONTRACTOR SHALL BE REQUIRED TO COMPLETE ALL WORK IN AN EXPEDITIOUS MANNER AND SHALL NOT STOP CONSTRUCTION EXCEPT FOR REASONS BEYOND HIS CONTROL SUCH AS, BUT NOT LIMITED TO, STRIKES, WEATHER AND UNAVAILABILITY OF MATERIALS.
- K. THE CONTRACTOR SHALL REPLACE THE DISTURBED GRAVEL ROAD SECTION WITH 21AA LIMESTONE. THE MINIMUM DEPTH OF LIMESTONE SHALL BE TWELVE INCHES (12") OR SHALL MATCH THE EXISTING ROAD SECTION, WHICHEVER IS GREATER.

6. TESTING AND ACCEPTANCE

- A. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY MATERIALS, EQUIPMENT AND PERSONNEL TO CONDUCT REQUIRED TESTING. THE CHARTER TOWNSHIP OF CHESTERFIELD SEWER DEPARTMENT SHALL WITNESS ALL TESTS. ALL SEWER INSTALLATIONS SHALL BE COMPLETE, INCLUDING SANITARY SERVICE LEADS WITH CHEMICALLY WELDED OR GLUED WATER-TIGHT CAPS, PRIOR TO PERFORMANCE REQUIRED TESTS.
- B. ALL SEWERS TWENTY-FOUR INCHES (24") IN DIAMETER AND SMALLER SHALL BE TESTED USING LOW PRESSURE AIR (ASTM C924 OR ASTM F1417 BASED UPON PIPE MATERIAL) IN ACCORDANCE WITH THE CHARTER TOWNSHIP OF CHESTERFIELD SEWER DEPARTMENT SANITARY SERVICE SPECIFICATIONS. TABLES FOR MINIMUM HOLDING TIME ARE AVAILABLE AT THE SANITARY SEWER DEPARTMENT UPON REQUEST. INFILTRATION TESTING WILL BE PERFORMED IF GROUND WATER PROHIBITS LOW PRESSURE AIR TESTING AS DETERMINED BY THE CHARTER TOWNSHIP OF CHESTERFIELD ENGINEER.
- C. ALL SEWERS TWENTY-SEVEN INCHES (27") IN DIAMETER AND LARGER, AND SEWERS TWENTY-FOUR INCHES (24") AND SMALLER WHERE GROUND WATER PROHIBITS LOW PRESSURE AIR TESTING, SHALL BE INFILTRATION TESTED IN ACCORDANCE WITH THE CHARTER TOWNSHIP OF CHESTERFIELD SANITARY SEWER SPECIFICATIONS. INFILTRATION SHALL BE TESTED BY THE OWNER UTILIZING CALIBRATED WEIRS OR FLUMES INSERTED IN THE PIPE FLOWLINE AT A MANHOLE. TEST SECTIONS SHALL GENERALLY BE LIMITED TO A MAXIMUM LENGTH OF ONE HALF MILE. THE OWNER RESERVES THE RIGHT TO TEST SHORTER PIPE LENGTH SEGMENTS IF HE DEEMS IT NECESSARY TO ASSURE THAT NO SEGMENT EXCEEDS THE INFILTRATION LIMITS. INFILTRATION TESTING SHALL BE CONDUCTED WITH THE DEWATERING SYSTEM TURNED OFF AND AFTER THE GROUND WATER HAS ACCORDING TO ITS NORMAL LEVEL. NO SEWER INSTALLATION SHALL HAVE AN INFILTRATION EXCEEDING FIFTY (50) GALLONS PER INCH OF DIAMETER PER MILE OF PIPE PER TWENTY-FOUR (24) HOUR PERIOD. IF THERE IS NOT SUFFICIENT GROUND WATER FOR INFILTRATION TESTING, AS DETERMINED BY THE CHARTER TOWNSHIP OF CHESTERFIELD ENGINEER, INFILTRATION TESTING SHALL BE WAIVED.
- D. THE CONTRACTOR SHALL PROVIDE FOR CLOSED CIRCUIT TELEVISION (CCTV) INSPECTION OF ALL SANITARY SEWER INSTALLED. ALL SANITARY SEWER INSTALLED SHALL BE CLEANED, BY AND AT THE CONTRACTOR'S EXPENSE, IMMEDIATELY PRIOR TO CCTV INSPECTION TO ENSURE THE SEWERS ARE FREE OF DEBRIS. THE INSPECTION SHALL BE PERFORMED IN ACCORDANCE WITH THE CURRENT GUIDELINES OF THE NATIONAL ASSOCIATION OF SEWER SERVICE COMPANIES (NASSCO) ALL CCTV INSPECTION SHALL BE WITNESSED BY THE CHARTER TOWNSHIP OF CHESTERFIELD SEWER DEPARTMENT REPRESENTATIVE AND THE CONTRACTOR. ANY CCTV INSPECTION PERFORMED IN THE ABSENCE OF THE CHARTER TOWNSHIP OF CHESTERFIELD SEWER DEPARTMENT REPRESENTATIVE WILL BE REJECTED.
- E. THE COLOR CCTV CAMERA USED FOR THE INSPECTION SHALL BE ONE SPECIFICALLY DESIGNED AND CONSTRUCTED FOR SUCH INSPECTION. THE CAMERA, PAN AND TILT, SHALL BE OPERATIVE IN 100% HUMIDITY CONDITIONS, AND HAVE A HIGH RESOLUTION LENS CAPABLE OF SCANNING 360-DEGREES CIRCUMFERENCE AND 270-DEGREES ON A HORIZONTAL AXIS TO TELEWISE SEWERS AND SERVICE CONNECTIONS. LIGHTING FOR THE CAMERA SHALL BE SUITABLE TO ALLOW A CLEAR PICTURE OF THE ENTIRE PERIPHERY OF THE PIPE. THE CAMERA, TELEVISION MONITOR, AND OTHER COMPONENTS OF THE VIDEO SYSTEM SHALL BE CAPABLE OF PRODUCING PICTURE QUALITY TO THE SATISFACTION OF THE OWNER.
- F. ALL CCTV INSPECTION SHALL BE RECORDED ON NEW, PREMIUM QUALITY, SINGLE-SIDED DVD(S) ON WHICH SOUND AND COLORED VIDEO INFORMATION SHALL BE RECORDED AND TURNED OVER TO THE OWNER. DVD SHALL BE OF AN "AUTHORED" FORMAT CAPABLE OF BEING VIEWED IN A STANDARD DVD PLAYER COMMONLY AVAILABLE (DVD-R, MPEG-2). DISPLAY FRAME RATE SHALL BE 30 IN NTSC FORMAT. EACH MANHOLE TO MANHOLE SECTION SHALL BE ON A SEPARATE TRACK. THE DVD SHALL INCLUDE A MENU LISTING SECTION NUMBER, STREET NAME, MANHOLE NUMBERS, DIRECTION OF FLOW AND TOTAL FOOTAGE. SELECTION OF AN INDIVIDUAL INSPECTION SECTION SHALL OCCUR THROUGH THIS MENU THE DVD SHALL NOT CONTAIN ANY COPY PROTECTION. THE OWNER SHALL BE ABLE TO MAKE COPIES OF THE FOOTAGE TO ADDITIONAL VHS TAPE, DVD, OR VIDEO-CD. ALL DVD'S SHALL BE CORRECTLY LABELED AND TITLED WITH THE PROJECT NAME AND NUMBER, AND REFERENCE DVD NUMBER. A DVD LOG SHALL CONTAIN A TABLE OF CONTENTS WITH THE PROJECT NAME, NUMBER AND REFERENCE TO THE CONTENTS OF EACH DVD.
- H. THE PROJECT NAME, DATE, TIME, FOOTAGE COUNTER AND STRUCTURE TO STRUCTURE SECTION SHALL BE DISPLAYED CONTINUOUSLY. THE CAMERA SHALL BE MOVED THROUGH THE SEWER AT A RATE OF SPEED NOT TO EXCEED THIRTY FEET (30') PER MINUTE, STOPPING WHEN NECESSARY TO PERMIT PROPER AUDIO AND VIDEO DOCUMENTATION OF THE SEWER'S CONDITION. THE CAMERA SHALL BE STOPPED IMMEDIATELY ADJACENT TO ALL JOINTS, POINTS OF INFILTRATION, CRACKED OR BROKEN PIPE, MISALIGNMENT IN LINE OR GRADE AND LOCATION OF SERVICE CONNECTIONS. THE CAMERA SHALL BE ROTATED TO ALLOW VIEWING OF THE PROBLEM AREA OR INTO THE SERVICE CONNECTION. A REPORT DETAILING ALL NOTES, WYE LOCATIONS, AND OTHER PERTINENT INFORMATION SHALL BE MADE AS A PART OF THE CCTV INSPECTION IN ACCORDANCE WITH NASSCO'S CAPC. THE REPORT SHALL BE PRODUCED USING CCTV INSPECTION SOFTWARE PROVIDED BY A NASSCO PACP CERTIFIED VENDOR. ALL CCTV REPORTS SHALL BE DOWNLOADED OR RECORDED ON BOARD THE CCTV VEHICLE. FORMATTING AND LAYOUT, I.E. OBSERVATIONS AND DEFECT CODES SHALL BE NASSCO PACP STANDARD.

- J. ANY DEFECTS NOTED DURING TESTING AND/OR CCTV INSPECTION SHALL BE SATISFACTORILY REPAIRED OR REPLACED, BY AND AT THE CONTRACTORS EXPENSE, AND WITNESSED BY THE CHARTER TOWNSHIP OF CHESTERFIELD SEWER DEPARTMENT. DEFECTS SHALL INCLUDE, BUT NOT BE LIMITED TO FAILING LOW PRESSURE AIR TESTING, EXCEEDING INFILTRATION LIMITS, CRACKED OR BROKEN PIPE, DEFECTIVE JOINTS, MISALIGNMENT IN LINE OR GRADE, AND VISIBLE LEAKS OR INFILTRATION. ADDITIONAL TESTING AND CCTV INSPECTION SHALL BE PERFORMED AT EACH AFFECTED SEGMENT, FROM MANHOLE TO MANHOLE, SUBSEQUENT TO REPAIR AND/OR REPLACEMENT.
- K. BEFORE ACCEPTANCE A FINAL REVIEW MUST BE MADE BY THE CHARTER TOWNSHIP OF CHESTERFIELD SEWER DEPARTMENT. RECORD PLANS SEP1A MYLARS, AUTOCAD DIGITAL FILE AND TWO SETS OF PRINTS SHALL BE SUBMITTED TO THE CHARTER TOWNSHIP OF CHESTERFIELD SEWER DEPARTMENT.

7. PROJECT BONDS, INSURANCE, AND REGISTRATION

- A. PRIOR TO THE START OF CONSTRUCTION THE CONTRACTOR SHALL BE REGISTERED AT THE SEWER DEPARTMENT FOR THE YEAR THAT THE WORK IS BEING PERFORMED.
- B. PRIOR TO THE PRE-CONSTRUCTION MEETING, THE CONTRACTOR SHALL PROVIDE CONTRACTUAL LIABILITY INSURANCE TO THE CHARTER TOWNSHIP OF CHESTERFIELD SEWER DEPARTMENT. THE INSURANCE SHALL BE MAINTAINED THROUGHOUT THE TERM OF THE PROJECT.
- C. A PERFORMANCE BOND MUST BE PROVIDED TO THE CHARTER TOWNSHIP OF CHESTERFIELD SEWER DEPARTMENT PRIOR TO THE PRE-CONSTRUCTION MEETING. THE BOND AMOUNT SHALL BE ONE HUNDRED PERCENT (100%) OF THE PROPOSED IMPROVEMENTS THAT THE TOWNSHIP INSPECTS.
- D. THE CONTRACTOR SHALL PROVIDE A TWO (2) YEAR MAINTENANCE AND GUARANTEE BOND TO THE CHARTER TOWNSHIP OF CHESTERFIELD FROM A SURETY LICENSED IN THE STATE OF MICHIGAN, DATED FROM THE TIME OF ACCEPTANCE BY THE CHARTER TOWNSHIP OF CHESTERFIELD SEWER DEPARTMENT, FOR 100% OF THE CONSTRUCTION COSTS.

8. SANITARY SERVICES

- A. ALL PIPE AND FITTINGS FOR SANITARY SERVICES SHALL BE PVC SOLID PLASTIC PIPE AND FITTINGS, SDR 23.5 (ASTM D3034), SIX INCH (6") DIAMETER, WITH SLEEVE COUPLING TYPE "SC" WELDED JOINTS (ASTM D2855), OR PVC SOLID PLASTIC PIPE AND FITTINGS, SCHEDULE 40 (ASTM D1785 AND ASTM D2466), SIX INCH (6") DIAMETER, WITH SLEEVE COUPLING TYPE "SC" WELDED JOINTS (ASTM D2672). ALL SANITARY SERVICE PIPE AND FITTINGS FOR CONNECTION TO PVC SANITARY SEWER MAINS SHALL BE OF THE SAME MATERIAL AS THE MAIN LINE SEWER. CONNECTION TO EXISTING SEWERS WITH DISSIMILAR PIPE MATERIAL SHALL BE MADE WITH A FERROCO STRONGBACK FITTING.
- B. SIX INCH (6") DIAMETER SANITARY SERVICE RISERS SHALL BE INSTALLED WITH AN EIGHT INCH (8") DIAMETER PIPE SLEEVE, FULL LENGTH OF THE RISER, WHEN THE SERVICE CONNECTION DEPTH EXCEEDS FIFTEEN FEET (15') FROM FINISH GRADE. EIGHT INCH (8") DIAMETER PIPE SLEEVES, WHEN REQUIRED, SHALL BE CORRUGATED PVC SEWER PIPE WITH A SMOOTH INTERIOR SURFACE (ASTM F949).
- C. SANITARY SERVICE CONNECTIONS TO EXISTING SEWER PIPE SHALL BE MADE BY CORE DRILLING A PORT IN THE SEWER WALL AND INSTALLING THE APPROVED FITTING, BASED UPON THE TYPE OF EXISTING SEWER.

PVC COMPOSITE PIPE: FACTORY FABRICATED (NOT EXTRUDED), SIX INCH (6") PVC SADDLE WYES. SADDLE WYES SHALL BE FUSED TO THE EXISTING SEWER WITH A TYPE "SC" WELDED JOINT (ASTM D2680) AND STRAPPED.

CONCRETE PIPE: SIX INCH (6") NPC KOR-N-TEE FLEXIBLE WATER-TIGHT BOOT, INSTALLED PER MANUFACTURERS SPECIFICATIONS.

- D. SANITARY SERVICES SHALL BE CONSTRUCTED TO A DEPTH OF MINIMUM DEPTH OF TEN FEET (10') BELOW FINISHED GRADE FOR BASEMENT SERVICES AND A MINIMUM DEPTH OF SIX FEET (6') BELOW FINISHED GRADE FOR NON-BASEMENT SERVICES AT THE RIGHT-OF-WAY OR UTILITY EASEMENT LINE. SANITARY SERVICES SHALL BE CONSTRUCTED WITH A MINIMUM SLOPE OF ONE PERCENT (1%).

- E. THE SANITARY SERVICES SHALL BE CONSTRUCTED FROM THE SEWER MAIN TO THE RIGHT-OF-WAY OR EASEMENT LINE. THE END OF THE SANITARY SERVICE LEAD SHALL BE CONSTRUCTED TO A DEPTH AS SPECIFIED IN THESE STANDARDS. ALL SANITARY SERVICE LEADS SHALL BE CLOSED WITH WATER-TIGHT, SOLVENT WELDED CAPS, COMPATIBLE WITH THE PIPE USED. CAPS SHALL BE SECURED IN PLACE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND ABLE TO WITHSTAND AIR TESTING PRESSURES.

- F. ALL STUBBED SANITARY SERVICES SHALL BE MARKED WITH A TWO INCH (2") BY FOUR INCH (4") OR LARGER WOOD MARKER BURIED TWO FEET (2') BELOW FINISH GRADE APPROXIMATELY ONE FOOT (1') ABOVE THE END OF THE SANITARY SERVICE.

- G. INDIVIDUAL SANITARY SEWER LEADS SHALL BE REQUIRED FOR EACH SEPARATE UNIT WITHIN PROPOSED COMMERCIAL, INDUSTRIAL AND/OR MULTIPLE FAMILY RESIDENTIAL BUILDINGS.

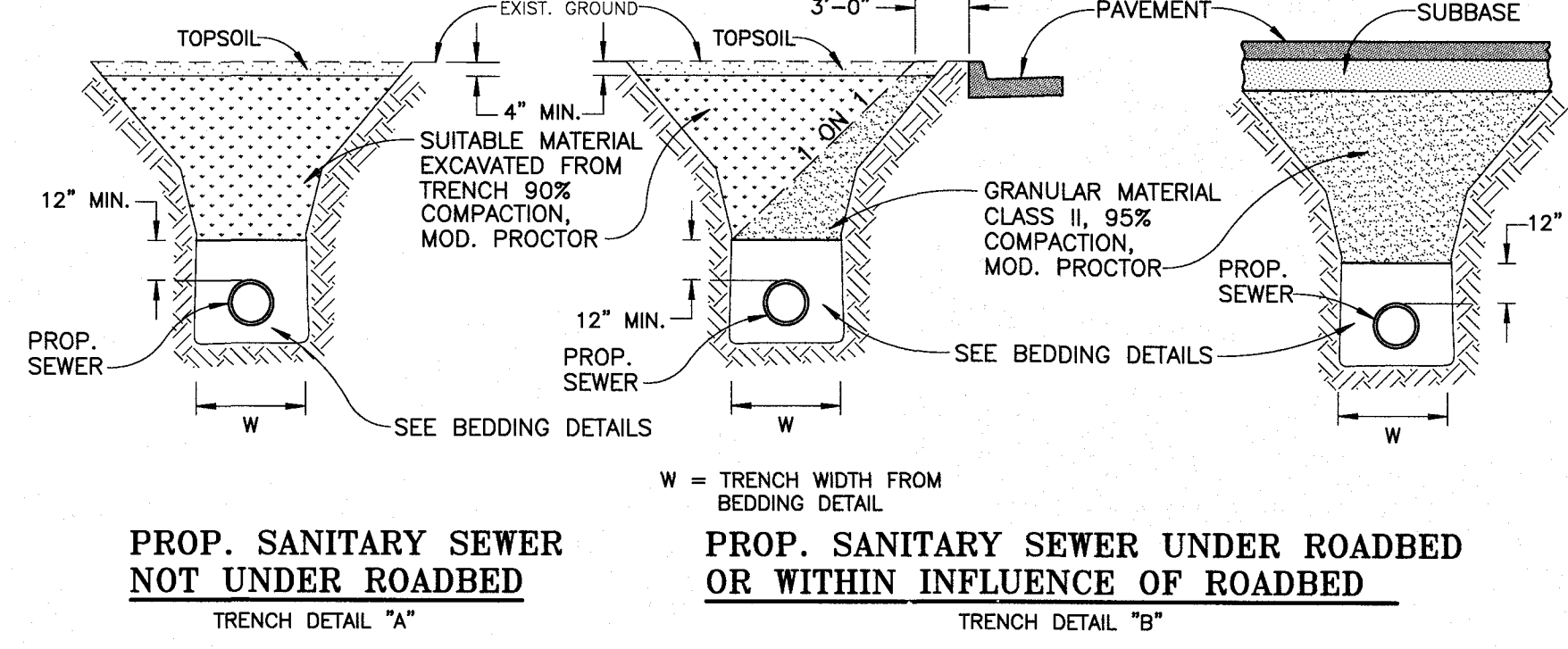
- H. SANITARY SERVICES SHALL BE EXTENDED UNDER PROPOSED BUILDING FOOTINGS OR BASEMENT FOOTINGS PRIOR TO CONSTRUCTION OF SAID FOOTING. A RISER SHALL BE INSTALLED THREE FEET (3') MINIMUM ABOVE PROPOSED FLOOR AND CAPPED UNTIL INTERNAL PLUMBING IS CONNECTED.

- I. WITHIN A FLOODPLAIN, ALL LEADS FROM THE HOUSE MUST HAVE POSITIVE MEANS OF BACKFLOW PREVENTION.

9. GREASE/GRIT INTERCEPTORS

- A. GREASE, OIL AND SAND INTERCEPTORS SHALL BE INSTALLED BY THE USER WHEN THE CHARTER TOWNSHIP OF CHESTERFIELD SEWER DEPARTMENT DETERMINES THEY ARE NECESSARY FOR THE PROPER HANDLING OF LIQUID WASTES. ALL INTERCEPTORS SHALL BE OF A TYPE AND CAPACITY APPROVED BY CHARTER TOWNSHIP OF CHESTERFIELD SEWER DEPARTMENT.
- B. PRIOR TO THE INSTALLATION OF GREASE, OIL AND SAND INTERCEPTORS THE OWNER SHALL OBTAIN A PERMIT AND COMPLY WITH REQUIREMENTS OF THE CHESTERFIELD SANITARY SEWER DEPARTMENT.
- C. ALL INTERCEPTORS SHALL BE LOCATED SO AS TO BE RAPIDLY AND EASILY ACCESSIBLE FOR CLEANING AND INSPECTION, AND SHALL BE CONTINUOUSLY MAINTAINED BY THE USER IN AN OPERATING CONDITION TO ACCOMPLISH THE REQUIRED RESULT.
- D. ALL RESTAURANTS OR ESTABLISHMENTS INVOLVED IN THE PREPARATION OF FOOD SHALL INSTALL A GREASE INTERCEPTOR. ALL GREASE INTERCEPTORS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE MINIMUM REQUIREMENTS DETAILED IN THESE STANDARDS AND SHALL HAVE A MINIMUM CAPACITY OF 1500 GALLONS. THE DETAIL SHOWN IN THESE STANDARDS IS NOT DESIGNED TO WITHSTAND TRAFFIC LOADS.

NOTE: MATERIAL SPECIFICATIONS SHALL COMPLY WITH M.D.O.T. STANDARD SPECIFICATIONS FOR CONSTRUCTION, CURRENT EDITION.

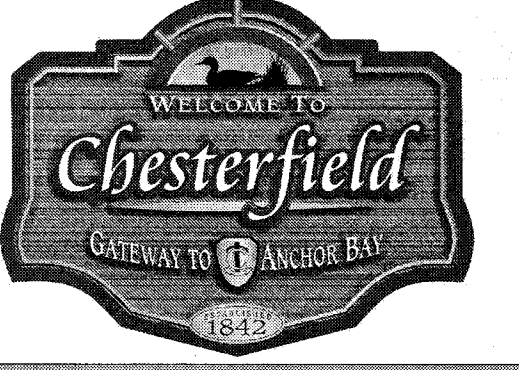


PROP. SANITARY SEWER NOT UNDER ROADBED TRENCH DETAIL "A"
PROP. SANITARY SEWER UNDER ROADBED OR WITHIN INFLUENCE OF ROADBED TRENCH DETAIL "B"

TRENCH DETAILS
NOT TO SCALE

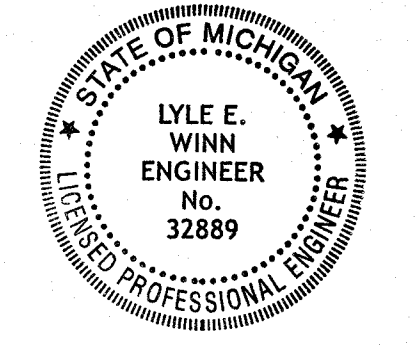
- I. CONTRACTOR SHALL SUBMIT TWO (2) COPIES OF ALL DVD'S ALONG WITH ONE (1) DIGITAL COPY AND TWO (2) COLOR COPIES OF INSPECTION REPORTS, WITH TABLE OF CONTENTS, IN TABBED, THREE (3) HOLE PUNCHED BINDERS, TO THE CHARTER TOWNSHIP OF CHESTERFIELD SEWER DEPARTMENT UPON COMPLETION OF THE CCTV INSPECTION.

ANDERSON, ECKSTEIN AND WESTRICK, INC.
CIVIL ENGINEERS SURVEYORS ARCHITECTS
51301 Schoenherr Road Phone 586 726 1234
Shelby Township Fax 586 726 8780
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ENGINEERING STRONG COMMUNITIES



DATE	SUBMITTALS/REVISIONS
DRAWN BY: MSJ	CHECKED BY: AAP DATE: SEPTEMBER 2010

M:\COMMUNITIES\CHESTERFIELD\STANDARD\CURRENT\SANITARY_2.DWG
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Lyle E. Winn
LYLE E. WINN P.E. NO. 32889

DEPARTMENT OF PUBLIC WORKS

APPROVED BY: *[Signature]*
DON CODDINGTON, DIRECTOR

DATE: 12/6/18

CHARTER TOWNSHIP OF CHESTERFIELD

STANDARD SANITARY SEWER DETAILS (2 OF 2)

SHEET NO. **SAN2**