

PROPOSED
LEGEND

- SANITARY M.H.
- CLEANOUT
- CATCH BASIN
- CATCH BASIN
- STORM M.H.
- HYDRANT
- GATE VALVE & WELL
- SHUT OFF
- STORM
- SANITARY
- WATER MAIN
- PR. ELEVATION
- FG
- FINISH GRADE
- FF
- FINISH FLOOR
- IE
- INVERT ELEVATION
- TC
- TOP OF CURB
- CU
- GUTTER

EXISTING
LEGEND

- BENCHMARK
- TRAVERSE POINT
- MONUMENT
- IRON PIPE
- IRON ROD
- SANITARY M.H.
- CLEANOUT
- CATCH BASIN
- CATCH BASIN
- STORM M.H.
- HYDRANT
- GATE VALVE & WELL
- SHUT OFF
- TELEPHONE MANHOLE
- GAS VALVE
- UTILITY POLE
- GUY ANCHOR
- LIGHT POLE
- SN
- MAILBOX
- DEODOROUS TREE
- CONIFEROUS TREE
- CONIFEROUS BUSH
- DEODOROUS BUSH
- TREE LINE
- CHAINLINK FENCE
- WOOD FENCE
- WALL
- STONE BLOCK
- OVERHEAD UTILITIES
- STORM
- SANITARY
- WATER MAIN
- GAS
- GAS
- 000.00
- SPOT ELEVATION
- FG
- FINISH GRADE
- FF
- FINISH FLOOR
- IE
- INVERT ELEVATION
- TC
- TOP OF CURB
- CU
- GUTTER

LEGAL DESCRIPTION PARCEL "A": A parcel of land being a part of Lot 10, "SUPERVISORS PLAT No. 10", as recorded in Liber 18 of Plats, Page 32, Macomb County Records, said Plat being a part of P.C. S 145 and 147, T3N, R14E, Chesterfield Township, Macomb County, Michigan and described as: Commencing at the Southeastly corner of said Lot 10; thence S. 50° 17' 30" W. 138.04 feet along the line common to Lots 9 and 10 to a point on the Northerly right of way line of 21 Mile Road, said point being on a curve to the right (radius=3719.72 feet, Delta = 01° 18' 59" and whose chord bears N. 84° 29' 59" W. 85.46 feet); thence along the Northerly right of way line of 21 Mile Road and said curve to the right 85.46 feet to the point of beginning of this description; thence continuing along the Northerly right of way line of 21 Mile Road and said curve to the right (radius=3719.72 feet, Delta = 08° 25' 09" and whose chord bears N. 79° 37' 55" W. 546.10 feet) 546.59 feet to the P.T. of said curve; thence N. 75° 25' 21" W. 8.73 feet along the Northerly right of way line of 21 Mile Road to the Southwestly right of way line of Sugarbush Road, said point being on a curve to the right (radius=736.61 feet, Delta = 28° 02' 44" and whose chord bears N. 52° 58' 16" E. 356.97 feet); thence along the Southwestly right of way line of Sugarbush Road and said curve to the right 360.56 feet; thence S. 39° 34' 00" E. 409.20 feet to the point of beginning of this description. Said parcel contains 1.883 acres (82,034.8 square feet), more or less.

LEGAL DESCRIPTION PARCEL "B": A parcel of land being a part of Lot 10, "SUPERVISORS PLAT No. 10", as recorded in Liber 18 of Plats, Page 32, Macomb County Records, said Plat being a part of P.C. S 145 and 147, T3N, R14E, Chesterfield Township, Macomb County, Michigan and described as: Commencing at the Southeastly corner of said Lot 10; thence S. 50° 17' 30" W. 98.40 feet along the line common to Lots 9 and 10 to the point of beginning of this description; thence continuing S. 50° 17' 30" W. 39.64 feet along the line common to Lots 9 and 10 to a point on the Northerly right of way line of 21 Mile Road, said point being on a curve to the right (radius=3719.72 feet, Delta = 01° 18' 59" and whose chord bears N. 84° 29' 59" W. 85.46 feet); thence along the Northerly right of way line of 21 Mile Road and said curve to the right 85.46 feet; thence N. 39° 34' 00" E. 174.65 feet; thence N. 50° 26' 04" E. 100.00 feet; thence S. 39° 34' 00" E. 235.06 feet to the point of beginning of this description. Said parcel contains 0.498 acres (21,701.8 square feet), more or less.

LEGAL DESCRIPTION PARCEL "C": A parcel of land being a part of Lot 10, "SUPERVISORS PLAT No. 10", as recorded in Liber 18 of Plats, Page 32, Macomb County Records, said Plat being a part of P.C. S 145 and 147, T3N, R14E, Chesterfield Township, Macomb County, Michigan and described as: Commencing at the Southeastly corner of said Lot 10; thence S. 50° 17' 30" W. 98.40 feet along the line common to Lots 9 and 10 to the point of beginning of this description; thence continuing S. 50° 17' 30" W. 39.64 feet along the line common to Lots 9 and 10 to a point on the Northerly right of way line of 21 Mile Road, said point being on a curve to the right (radius=3719.72 feet, Delta = 01° 18' 59" and whose chord bears N. 84° 29' 59" W. 85.46 feet); thence along the Northerly right of way line of 21 Mile Road and said curve to the right 85.46 feet; thence N. 39° 34' 00" E. 174.65 feet; thence N. 50° 26' 04" E. 100.00 feet; thence S. 39° 34' 00" E. 235.06 feet to the point of beginning of this description. Said parcel contains 0.498 acres (21,701.8 square feet), more or less.

BOUNDARY SURVEY BY POLARIS SURVEYING, P.L.L.C. - JOB # CHESTERFIELD #50SPLOTS

SANITARY SEWER BASIS OF DESIGN - INITIAL AND ULTIMATE

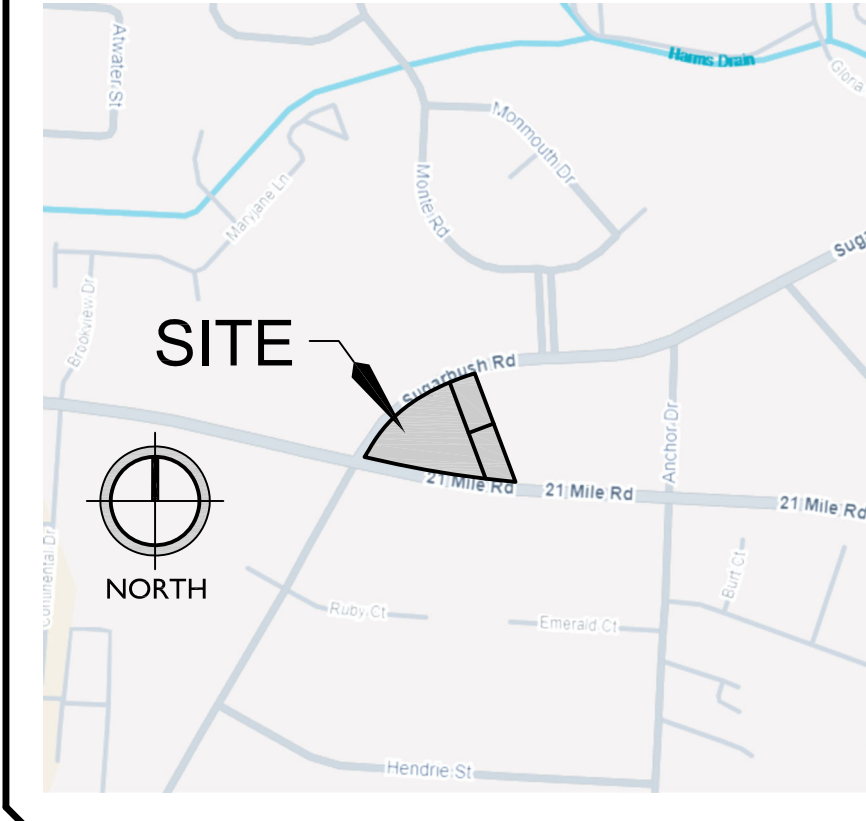
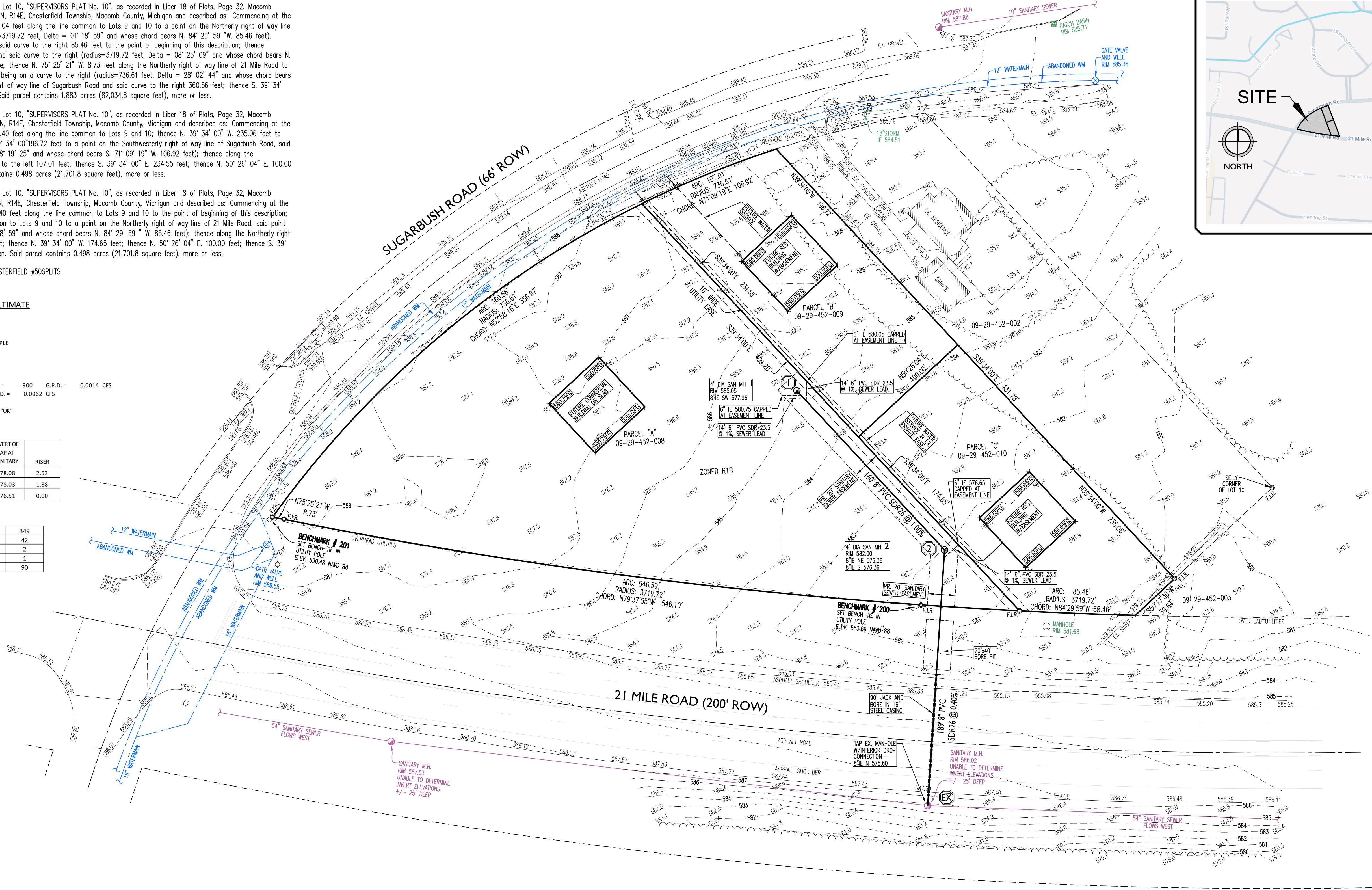
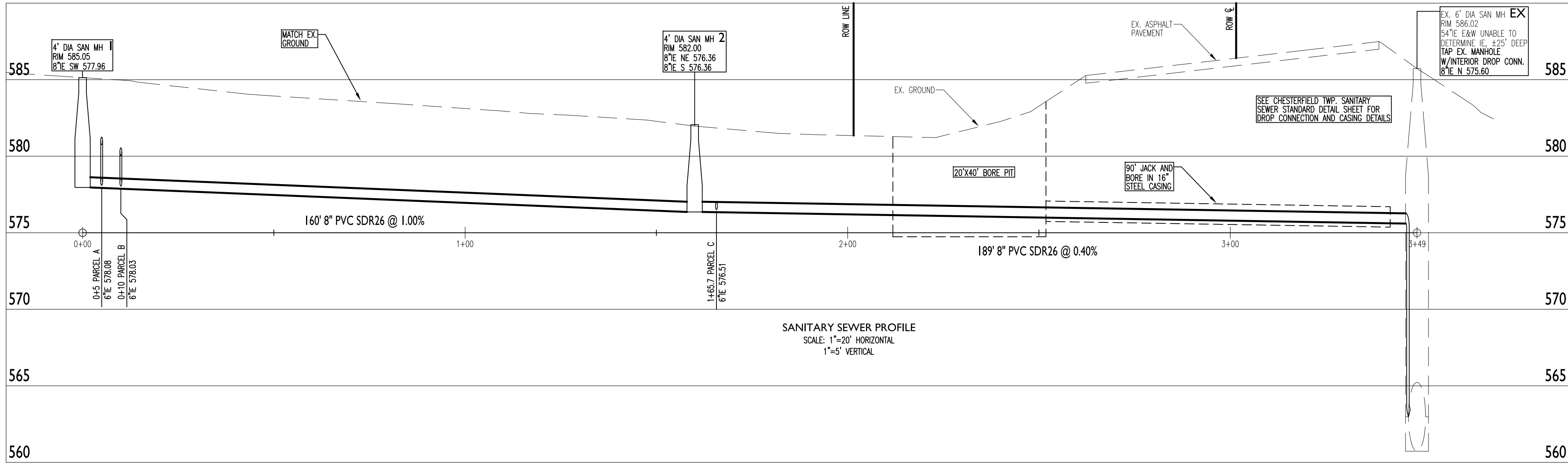
SERVICE AREA 3 LOTS
1 REU PER LOT x 3 LOTS = 3 REUS
POPULATION = 3 REUS x 3 PEOPLE PER REU = 9.0 PEOPLE
PEAKING FACTOR = $\frac{18 + (9.0 / 1000) * 0.5}{4 + (9.0 / 1000) * 0.5} = 4.419$
AVERAGE DAILY FLOW AT 100 G.P.C.P.D. = $\frac{9.0 \times 100}{4.419 \times 900} = 900$ G.P.D. = 0.0014 CFS
PEAK FLOW AT 4.419 x 900 = 3977.022 G.P.D. = 0.0062 CFS
8 INCH PIPE AT 0.40% = 0.77 CFS > 0.01 CFS "OK"

LEAD INFORMATION

LOT NO.	F.G. @ BLDG.	INVERT AT SETBACK	LEAD LENGTH TO SETBACK	INVERT OF LEAD AT SANITARY	INVERT OF TAP AT SANITARY	RISER
A	590.75	580.75	14	580.61	578.08	2.53
B	590.05	580.05	14	579.91	578.03	1.88
C	586.65	576.65	14	576.51	576.51	0.00

APPROX. QUANTITIES

8" PVC SDR26	LF	349
6" PVC SDR23.5	LF	42
4" Dia Sanitary Manhole	EA	2
8" Tap to Ex Manhole with drop connection	EA	1
Jack and Bore w/16" casing	LF	90



DEVELOPER / OWNER
VIPER ENTERPRISES, LLC
DAVE KEENA
39664 RYAN ROAD
STERLING HEIGHTS, MI 48310

PCE
Project Control Engineering, LLC
Engineers Surveyors Consultants
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www.pce-eng.com

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PROJECT CONTROL ENGINEERING, LLC

DRAWING STATUS:
☒ PRELIMINARY CONSTRUCTION
☐ FINAL CONSTRUCTION
☐ RECORD DOCUMENTS

SCALE:

DATE: 12-10-25
REV. DATE:
02-16-26 PER CHESTERFIELD TOWNSHIP

SANITARY SEWER PLAN

SANITARY SEWER EXTENSION

SHEET TITLE: PROJECT:

811 Know what's below
Call before you dig.

JOB NUMBER:
25-159

DRAWN BY:
TMG/EHJ

CHECK BY:
SAD

DRAWING ID:
25-159 Topo Mapping

SCALE:
1" = 40'

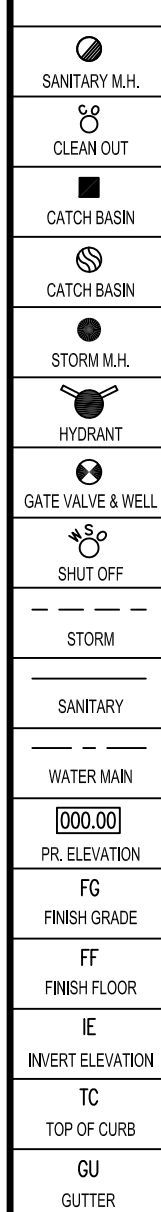
1 of **4**

UTILITY INFORMATION, AS SHOWN, INDICATES APPROXIMATE LOCATIONS AND TYPES OF FACILITIES ONLY, AS DISCLOSED TO THIS FIRM BY THE VARIOUS UTILITY COMPANY'S RECORDS. NO GUARANTEE IS GIVEN OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF.

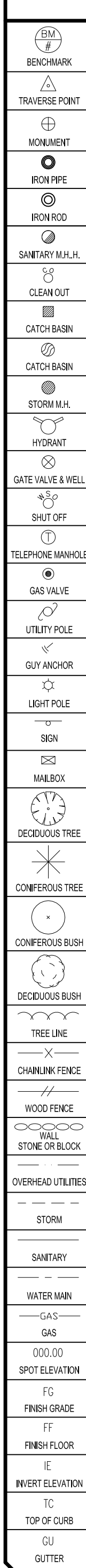
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PROPOSED
LEGEND



EXISTING
LEGEND

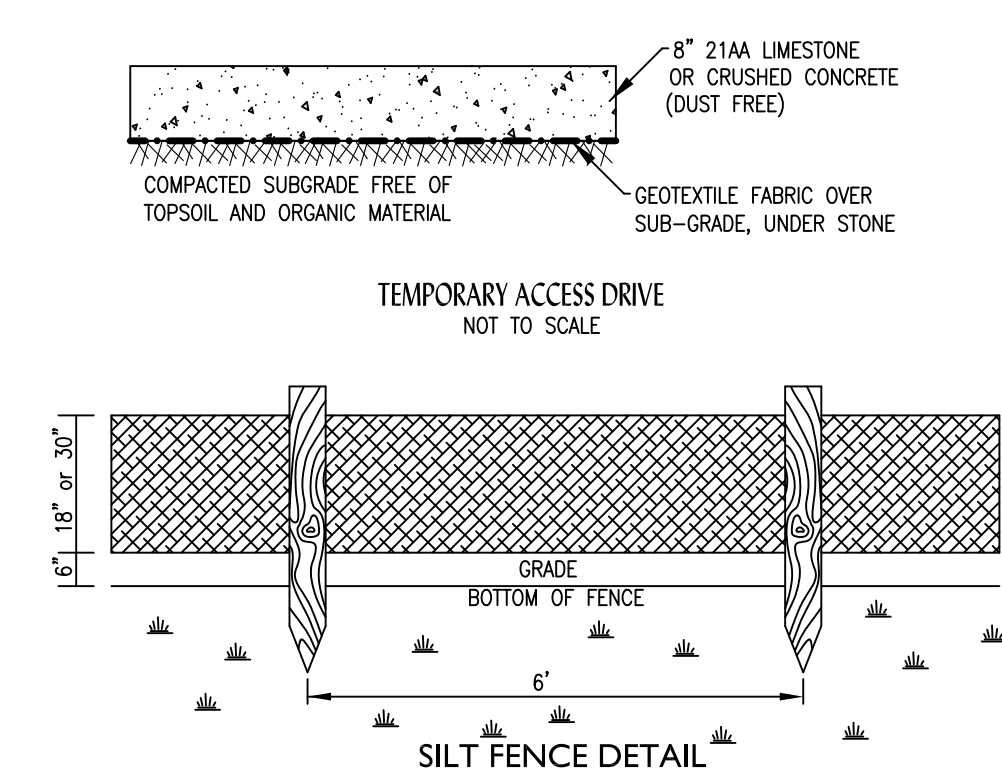


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BOUNDARY SURVEY BY POLARIS SURVEYING, P.L.L.C. - JOB # CHESTERFIELD #50SLPTS



PROPERTY OF FILTER FABRIC	TEST METHOD	2125
GRAB TENSILE	ASTM-D-4632	WARP 110
MULLEN BURST	ASTM 3786	FILL 90
UV RESISTANCE (STRENGTH RETAINED)	ASTM 4355	275
PERMITTIVITY	ASTM 4491	70
A STURDY, LIGHTWEIGHT, SUNLIGHT RESISTANT, WOVEN POLYPROPYLENE.		
SILT FENCE CROSS-SECTION		

TIMING SEQUENCE FOR SOIL EROSION AND SEDIMENTATION CONTROL MEASURES							
ACTIVITY	2026						
	FEB	MAR	APR	MAY	JUNE	JULY	AUG
INSTALL TEMPORARY EROSION CONTROL MEASURES							
ROUGH GRADING & CONSTRUCTION							
COMPLETION OF CONSTRUCTION							
FINAL GRADING							
INSTALLATION OF PERMANENT EROSION CONTROL MEASURES AND SEEDING							
REMOVAL OF TEMPORARY EROSION CONTROL MEASURES							

TOTAL EARTH DISTURBANCE
±0.1 ACRES

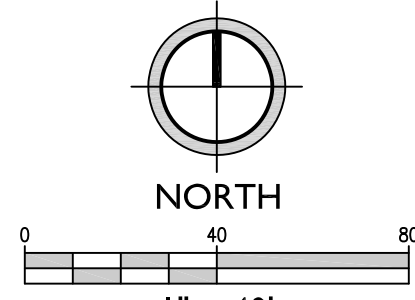
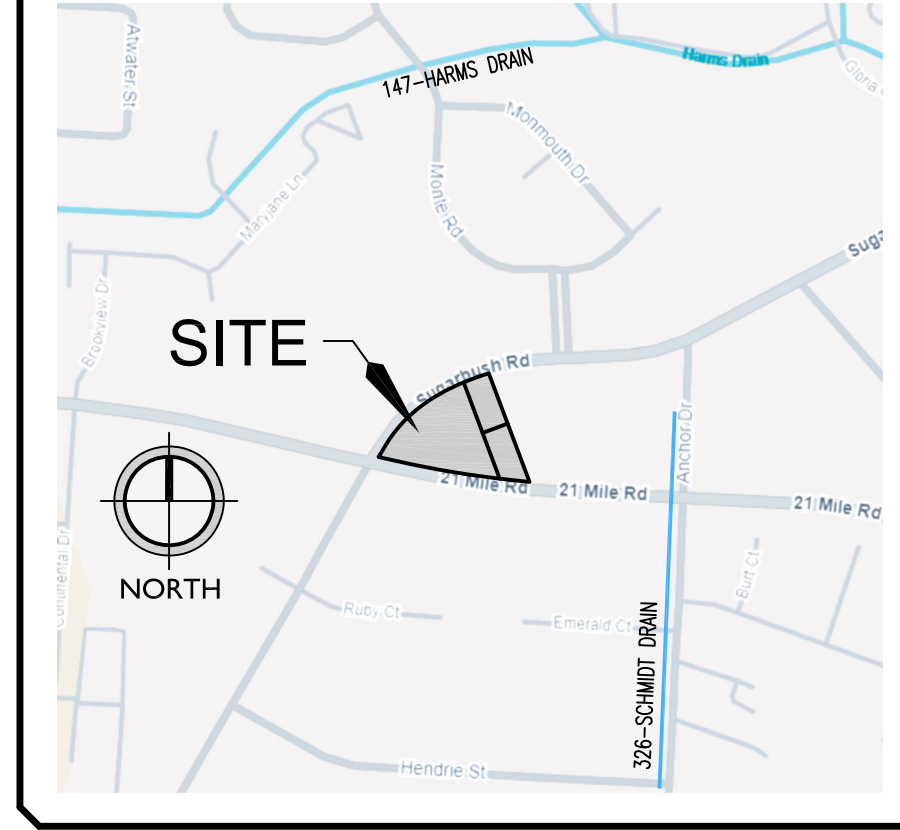
DISTANCE TO CLOSEST WATERCOURSE
SCHMIDT DRAIN ±600' EAST OF CONSTRUCTION ACTIVITY

PARCEL I.D. NUMBERS
09-29-452-008

ON SITE SOIL TYPE
ASB PIPESTONE SAND, ERE-HURON LAKE PLAIN, 0 TO 3 PERCENT SLOPES
BX BREVORT-SELFREDGE COMPLEX
OW GRANLY LOWAY FINE SAND
OKABB OKAWILLE FINE SAND, ERE-HURON LAKE PLAIN, 0 TO 6 PERCENT SLOPES

GENERAL NOTES
NO STOCKPILING IS PROPOSED FOR THIS PROJECT
NO DENATURING IS PROPOSED

ONSITE RESPONSIBLE PARTY
FOR TEMPORARY AND PERMANENT SOIL EROSION CONTROL:
CONTRACTOR TBD



SOIL EROSION AND SEDIMENTATION CONTROL NOTES
AND MAINTENANCE NOTES

- THIS PROJECT SHALL BE CONSTRUCTED IN COMPLIANCE WITH PART 91 OF ACT 451 OF 1994, AS AMENDED, THE SOIL EROSION AND SEDIMENTATION CONTROL ACT AND THE MACOMB COUNTY SOIL EROSION AND SEDIMENTATION CONTROL ORDINANCE.
- ALL EROSION AND SEDIMENTATION CONTROL WORK SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF THE MACOMB COUNTY PUBLIC WORKS OFFICE.
- EROSION AND ANY SEDIMENTATION FROM WORK ON THIS SITE SHALL BE CONTAINED ON THE SITE AND NOT ALLOWED TO COLLECT ON ANY OFF SITE AREAS OR IN WATERWAYS. WATERWAYS INCLUDE BOTH NATURAL AND MAN MADE OPEN DITCHES, STREAMS, STORM DRAINS, LAKES AND Ponds.
- STAGING THE WORK WILL BE DONE BY THE LANDOWNER OR LANDOWNER'S REPRESENTATIVE AS DIRECTED IN THESE PLANS AND AS REQUIRED TO ENSURE PROGRESSIVE STABILIZATION OF DISTURBED EARTH CHANGE.
- THE LANDOWNER OR LANDOWNER'S REPRESENTATIVE SHALL BE RESPONSIBLE FOR INSTALLATION AND MAINTENANCE OF SOIL EROSION AND SEDIMENTATION CONTROL DEVICES.
- THE LANDOWNER OR LANDOWNER'S REPRESENTATIVE SHALL IMPLEMENT AND MAINTAIN THE SOIL EROSION CONTROL MEASURES SHOWN ON THE PLANS BEFORE AND AT ALL TIMES DURING CONSTRUCTION ON THIS PROJECT. ANY MODIFICATIONS OR ADDITIONS TO SOIL EROSION CONTROL MEASURES DUE TO CONSTRUCTION OR CHANGED CONDITIONS SHALL BE COMPLIED WITH AS REQUIRED OR DIRECTED BY THE MACOMB COUNTY PUBLIC WORKS OFFICE.
- IF ANY OF THE SESC MEASURES ON THE SITE ARE DAMAGED OR INEFFECTIVE, THE MACOMB COUNTY PUBLIC WORKS OFFICE SESC DIVISION HAS THE RIGHT TO REQUIRE ADDITIONAL SESC MEASURES AT THE EXPENSE OF THE LANDOWNER.
- INSTALL A CRUSHED CONCRETE ACCESS DRIVE PLACED ON GEOTEXTILE FABRIC AS INDICATED ON THE PLAN. THE ACCESS DRIVE MUST BE A MINIMUM OF 30'X50'.
- INSTALL SILT FENCE AS INDICATED ON THE PLAN AND AT ADDITIONAL AREAS AS NECESSARY.
 - A. SILT FENCE SHALL BE INSTALLED PER DETAIL.
 - B. BUILD UP OF SEDIMENT SHALL BE REMOVED WHEN SEDIMENT ACCUMULATES TO 1/3 TO 1/2 OF THE HEIGHT OF THE SILT FENCE.
 - C. IF SILT FENCE FABRIC DECOMPOSES OR BECOMES INEFFECTIVE PRIOR TO THE END OF EXPECTED USABLE LIFE AND THE BARRIER IS STILL REQUIRED, THE SILT FENCE SHALL BE REPLACED PROMPTLY.
 - D. SILT FENCE SHALL BE INSPECTED WEEKLY UNDER NORMAL CONDITIONS, WITHIN 24 HOURS OF RAINFALL AND DAILY DURING A PROLONGED RAIN EVENT. REQUIRED MAINTENANCE SHALL BE PROVIDED PROMPTLY.
- INSTALL INLET FILTERS ON ALL PAVEMENT CATCH BASINS PER DETAIL.
 - A. INLET FILTERS SHALL BE INSPECTED WEEKLY UNDER NORMAL CONDITIONS, WITHIN 24 HOURS OF A RAINFALL AND DAILY DURING A PROLONGED RAIN EVENT.
 - B. BUILDUP OF SEDIMENT AND DEBRIS SHALL BE REMOVED PROMPTLY.
 - C. IF FABRIC DECOMPOSES OR BECOMES INEFFECTIVE PRIOR TO THE END OF EXPECTED USABLE LIFE AND THE BARRIER IS STILL REQUIRED, THE FABRIC SHALL BE REPLACED PROMPTLY.
- IMMEDIATELY AFTER SEEDING, MULCH ALL SEEDING AREAS WITH UNWEATHERED SMALL GRAIN STRAW, SPREAD UNIFORMY AT THE RATE OF 1 TO 2 TONS PER ACRE OR 100 POUNDS (2-3 BALES) PER 1000 SQUARE FEET. THIS MULCH SHOULD BE ANCHORED AND LOCATED WITHIN 100' OF THE SEEDING AREA. MULCHING TOOL OR OTHER MEANS AS APPROVED BY THE MACOMB COUNTY PUBLIC WORKS OFFICE. MULCH MATING MAY BE USED IN LIEU OF LOOSE MULCH.
- IF ANY DOWNTURNING IS NEEDED, IT SHALL BE DISCHARGED THROUGH A FILTER BAG OVER A WELL-VEGETATED AREA. THE PUMP MUST DISCHARGE AT A NON-EROSIVE VELOCITY. IF NECESSARY, AN APPROVED ENERGY DISSIPATOR MAY BE USED.
- ALL DIRT TRACKED ONTO ANY ROADWAY SHALL BE REMOVED IMMEDIATELY.
- STREETS AND OR PARKING AREAS WILL BE SCOPED ON A DAILY BASIS AND SWEEPED AT A MINIMUM OF ONCE PER WEEK BY THE LANDOWNER OR LANDOWNER'S REPRESENTATIVE.
- DURING DRY PERIODS, ALL DISTURBED AREAS SHALL BE WATERED FOR DUST CONTROL.
- PERMANENT SOIL EROSION CONTROL MEASURES FOR ALL SLOPES, CHANNELS, DITCHES, OR ANY DISTURBED LAND AREA SHALL BE COMPLETED WITHIN 5 CALENDAR DAYS AFTER FINAL GRADING OR THE FINAL EARTH CHANGE HAS BEEN COMPLETED. WHEN IT IS NOT POSSIBLE TO PERMANENTLY STABILIZE A DISTURBED AREA AFTER EARTH CHANGE ACTIVITY CEASES, TEMPORARY SOIL EROSION CONTROL MEASURES SHALL BE IMPLEMENTED IMMEDIATELY. ALL TEMPORARY SOIL EROSION CONTROL SHALL BE MAINTAINED UNTIL PERMANENT SOIL EROSION CONTROL MEASURES ARE IMPLEMENTED. ALL PERMANENT SOIL EROSION CONTROL MEASURES WILL BE IMPLEMENTED AND ESTABLISHED BEFORE A CERTIFICATE OF COMPLIANCE IS ISSUED.
- FINAL GRADE, ESTABLISH VEGETATION AND OR LANDSCAPE ALL DISTURBED AREAS NOT BUILT OR PAVED UPON.
- REMOVE ALL TEMPORARY SOIL EROSION DEVICES AFTER PERMANENT STABILIZATION IS ESTABLISHED.

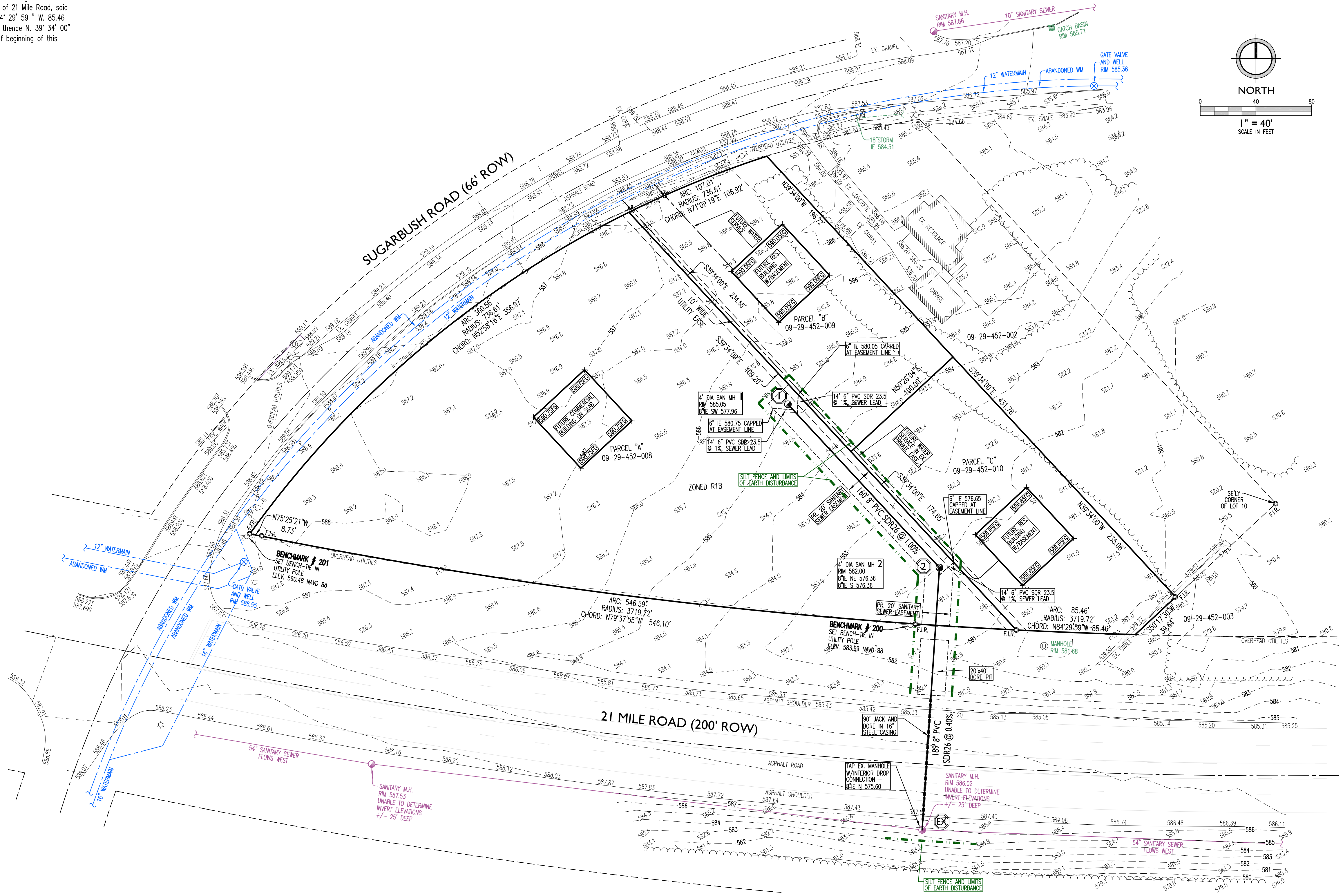
EROSION CONTROL MEASURES
AND SEQUENCE OF CONSTRUCTION

- OWNER WILL OBTAIN A SOIL EROSION PERMIT PRIOR TO START OF CONSTRUCTION.
- INSTALL TEMPORARY SOIL EROSION CONTROL MEASURES AS INDICATED ON PLAN AND AT ADDITIONAL AREAS AS NECESSARY.
- MAINTAIN A 15 FT. BUFFER OF VEGETATION WHERE POSSIBLE AROUND PERIMETER OF SITE.
- INSTALL UTILITIES. INSTALL CATCH-ALL INLET BAGS ON ALL CATCH BASINS AND INLET STRUCTURES.
- INSTALL PAVING.
- FINAL GRADE, SPREAD TOPSOIL, STABILIZE SIDE SLOPES OF DRAIN, ESTABLISH VEGETATION AND/OR LANDSCAPE ALL DISTURBED AREAS NOT BUILT OR PAVED UPON.
- CLEAN PAVEMENT AND REMOVE ALL TEMPORARY EROSION CONTROL MEASURES. REESTABLISH VEGETATION AS NECESSARY.
- ALL DIRT AND MUD TRACKED ONTO PUBLIC ROADS SHALL BE REMOVED IMMEDIATELY.
- STREET CATCH BASINS TO BE PERIODICALLY CLEANED AND FILTER CLOTH CHANGED AND MAINTAINED.
- AFTER COMPLETION OF PAVING, REMOVAL OF FORMS, AND GRADING OF R.O.W., TEMPORARY SEED AND MULCH OF R.O.W. MUST BE COMPLETED.

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DEVELOPER / OWNER

VIPER ENTERPRISES, LLC
DAVE KEENA

39664 RYAN ROAD
STERLING HEIGHTS, MI 48310

PCE

Project Control Engineering, LLC
Engineers Surveyors Consultants

P.O. Box 307
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DATE: 12-10-25
REV. DATE:

SOIL EROSION AND SEDIMENT CONTROL PLAN

SANITARY SEWER EXTENSION

SHEET TITLE: PROJECT:

811 Know what's below
Call before you dig.

JOB NUMBER: 25-159

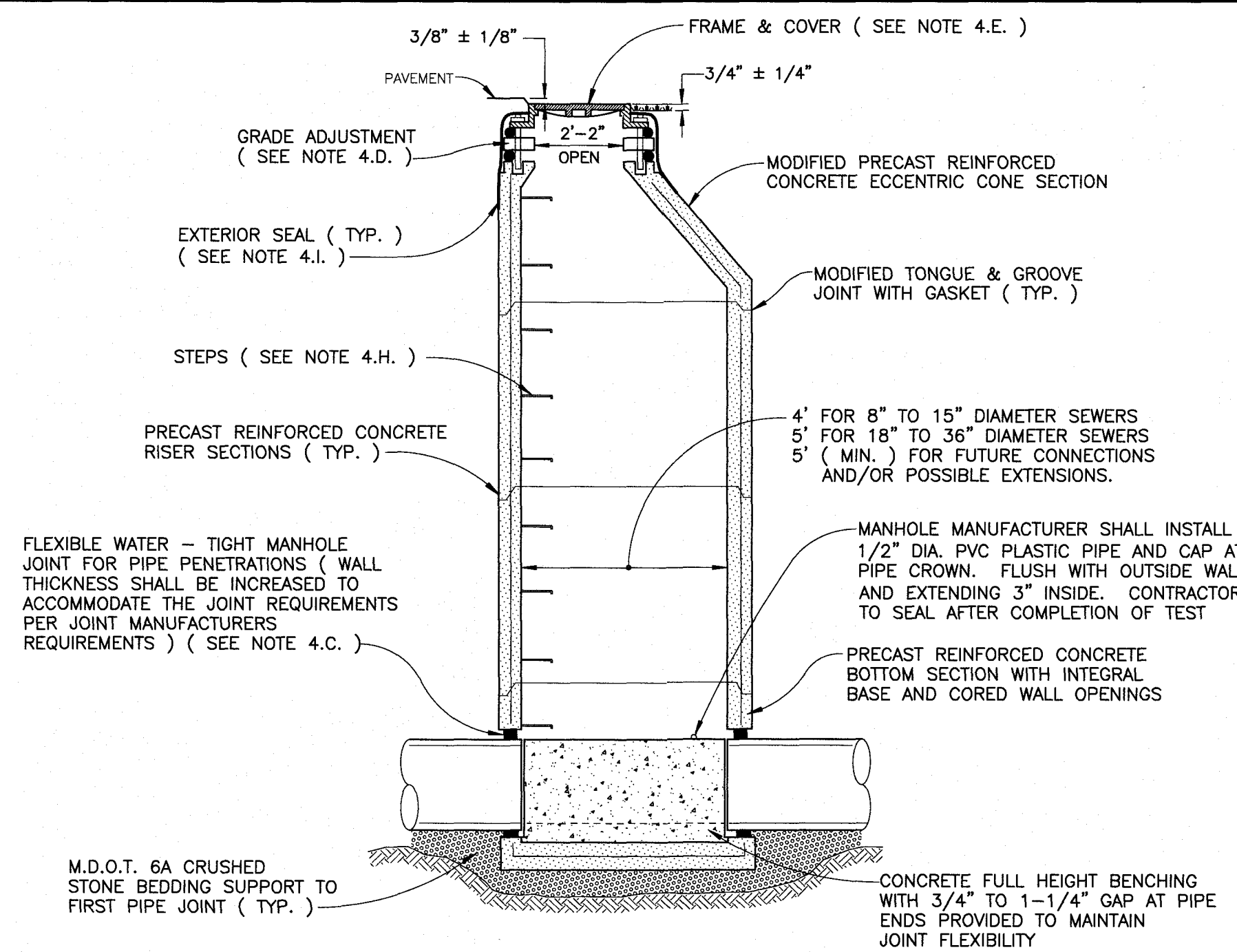
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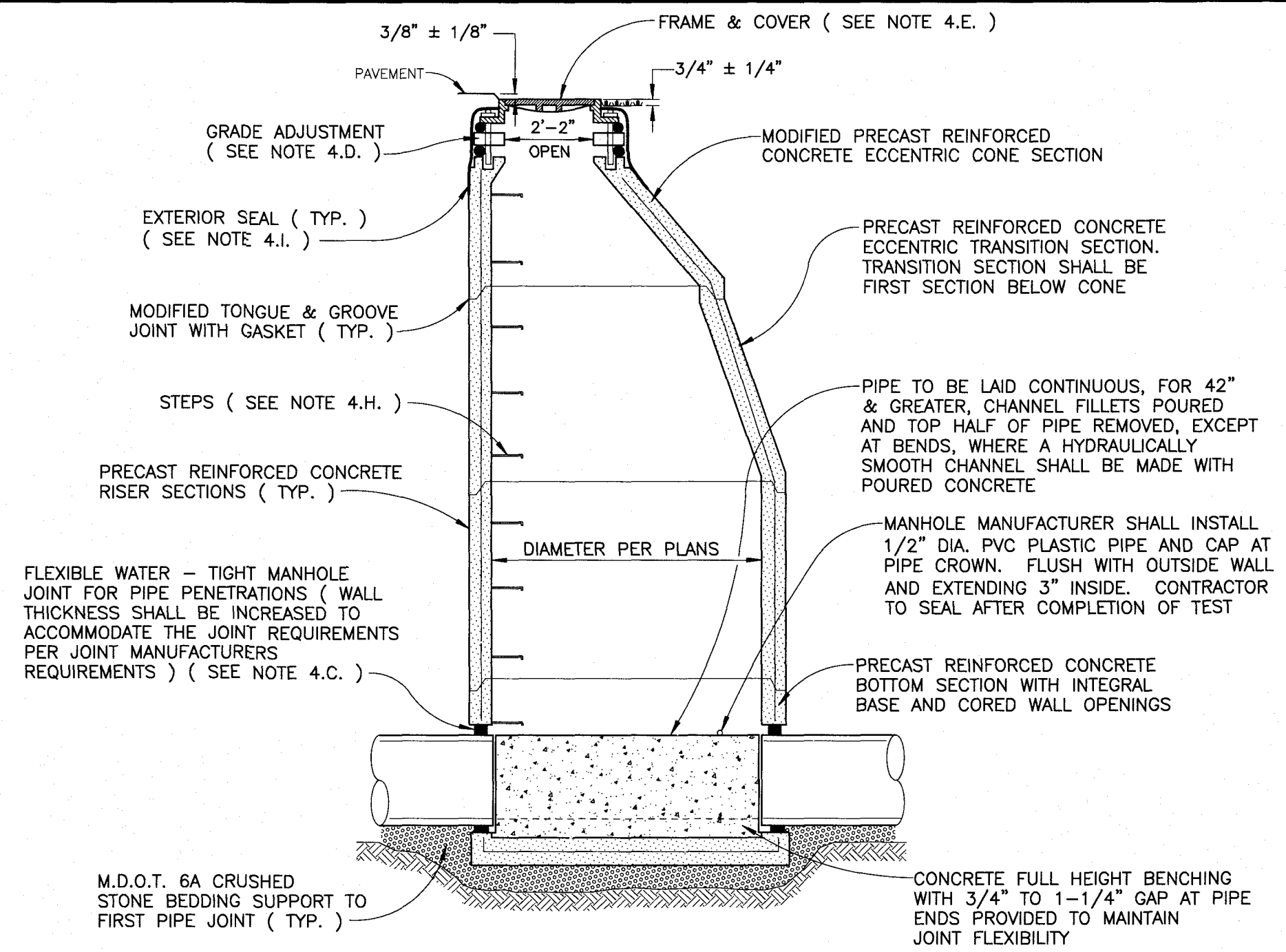
DRAWING ID: 25-159 Topo Mapping

SCALE: 1" = 40'

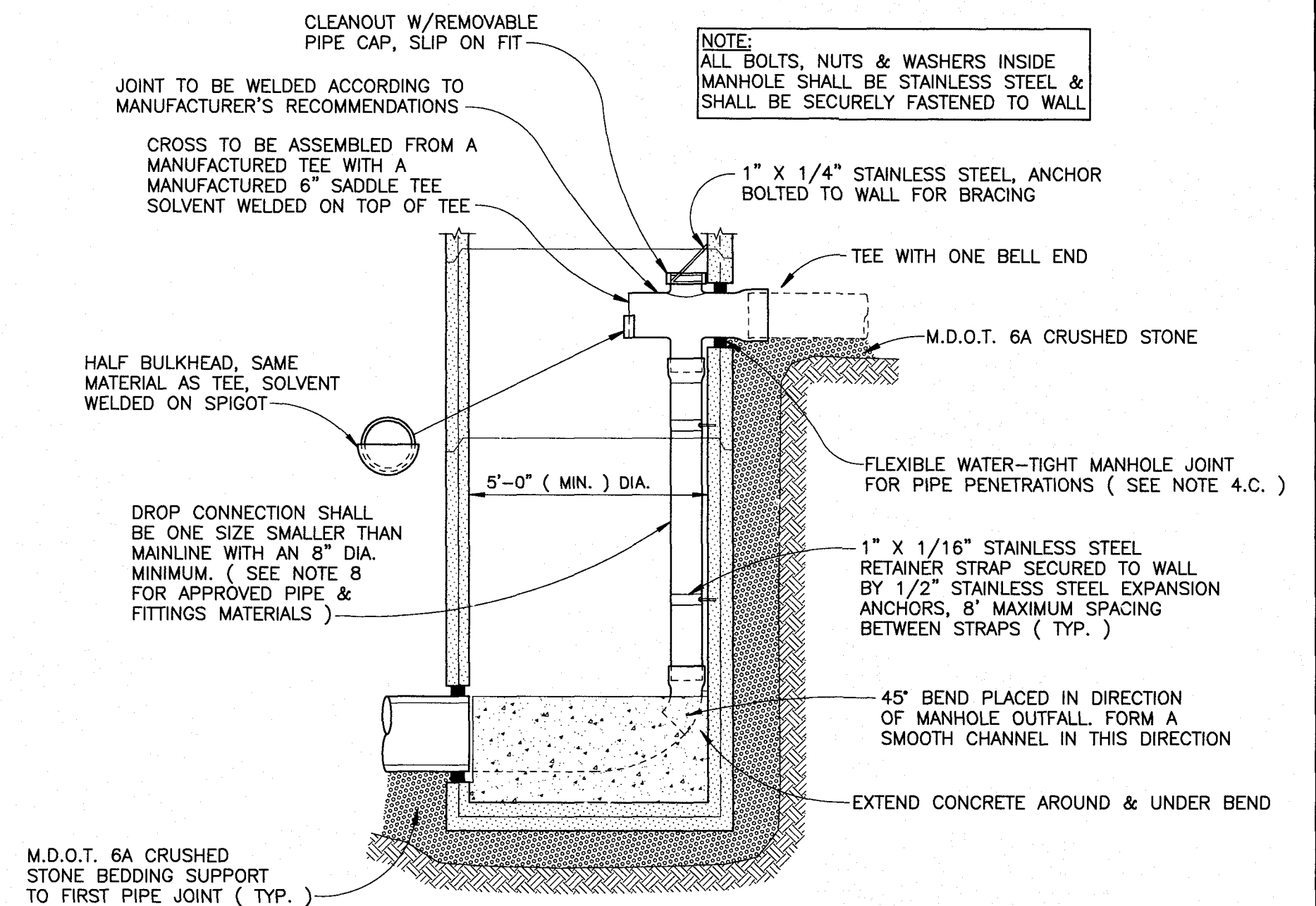
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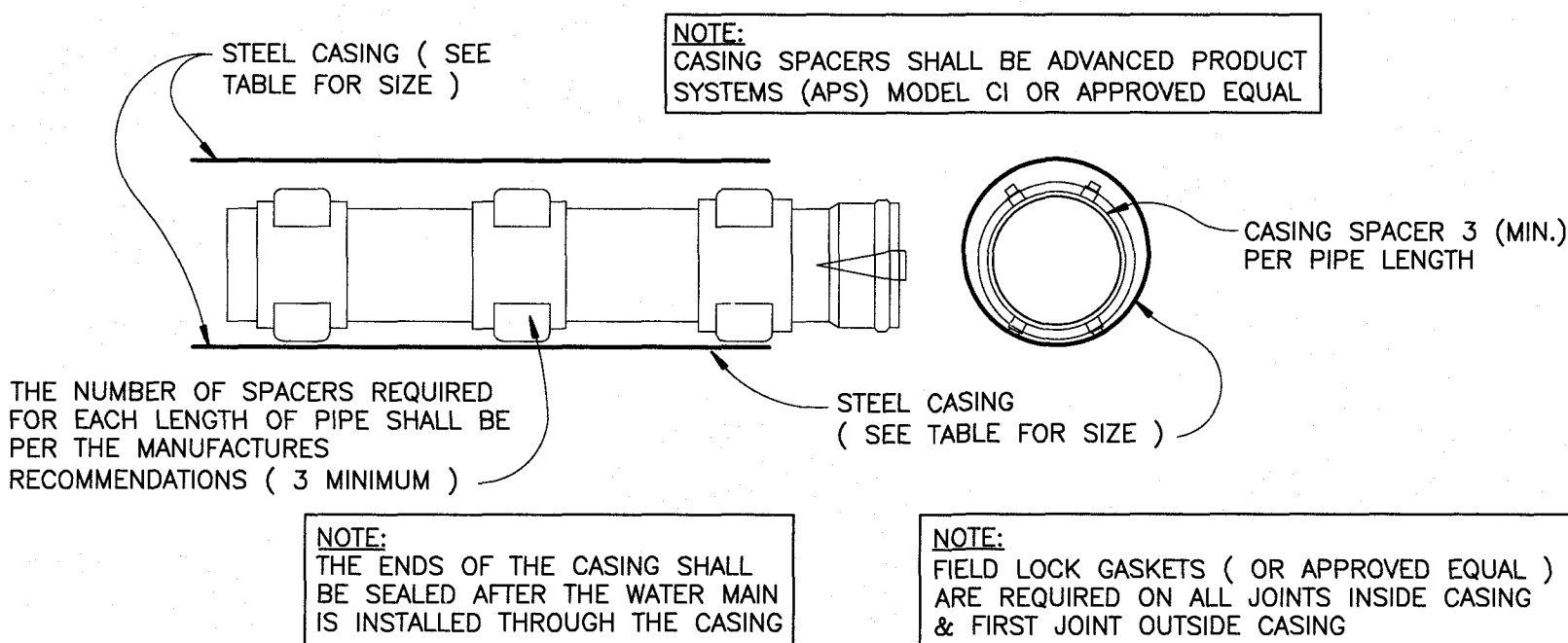
SANITARY SEWER MANHOLE
NOT TO SCALE
(4' AND 5' DIAMETER)



SANITARY SEWER MANHOLE
NOT TO SCALE
(6' DIAMETER AND LARGER)

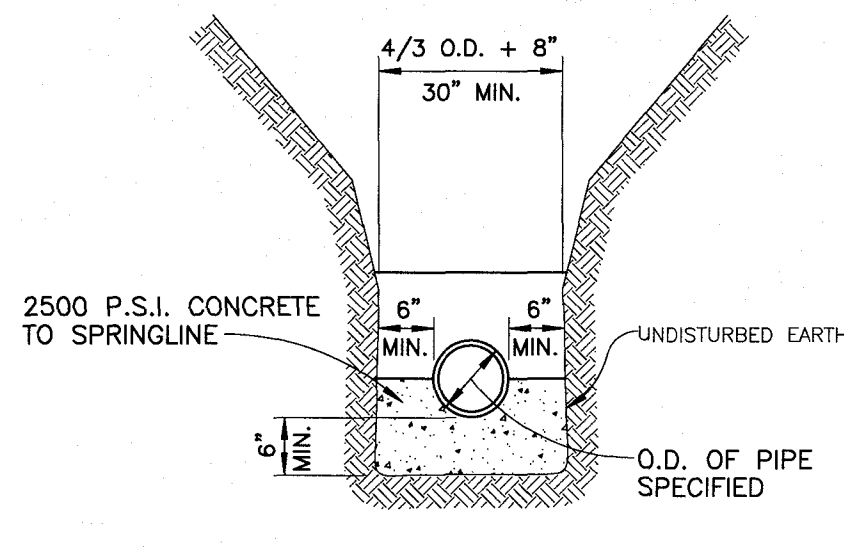


INTERIOR DROP CONNECTION
NOT TO SCALE
(FOR ALL DROP CONNECTIONS)

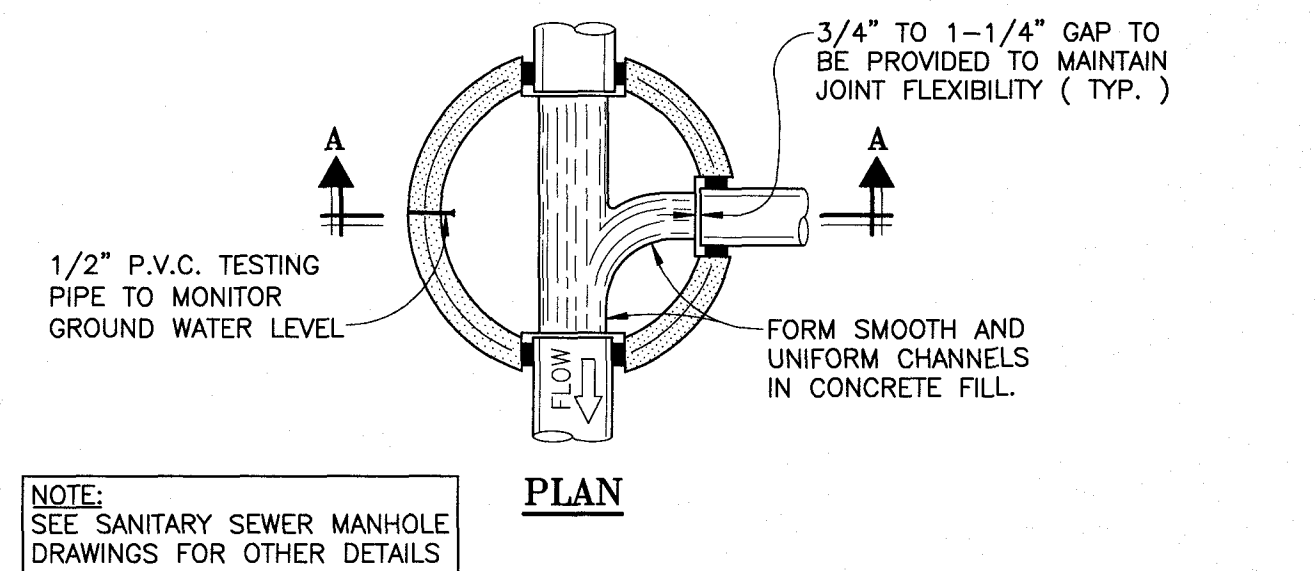


PIPE SIZE	RECOMMENDED MINIMUM CASING DIAMETER (O.D.)	MINIMUM CASING WALL THICKNESS
4"	12.75"	0.375"
6"	14"	0.375"
8"	16"	0.375"
12"	20"	0.375"
16"	24"	0.406"
24"	36"	0.532"

STEEL CASING REQUIREMENTS
NOT TO SCALE

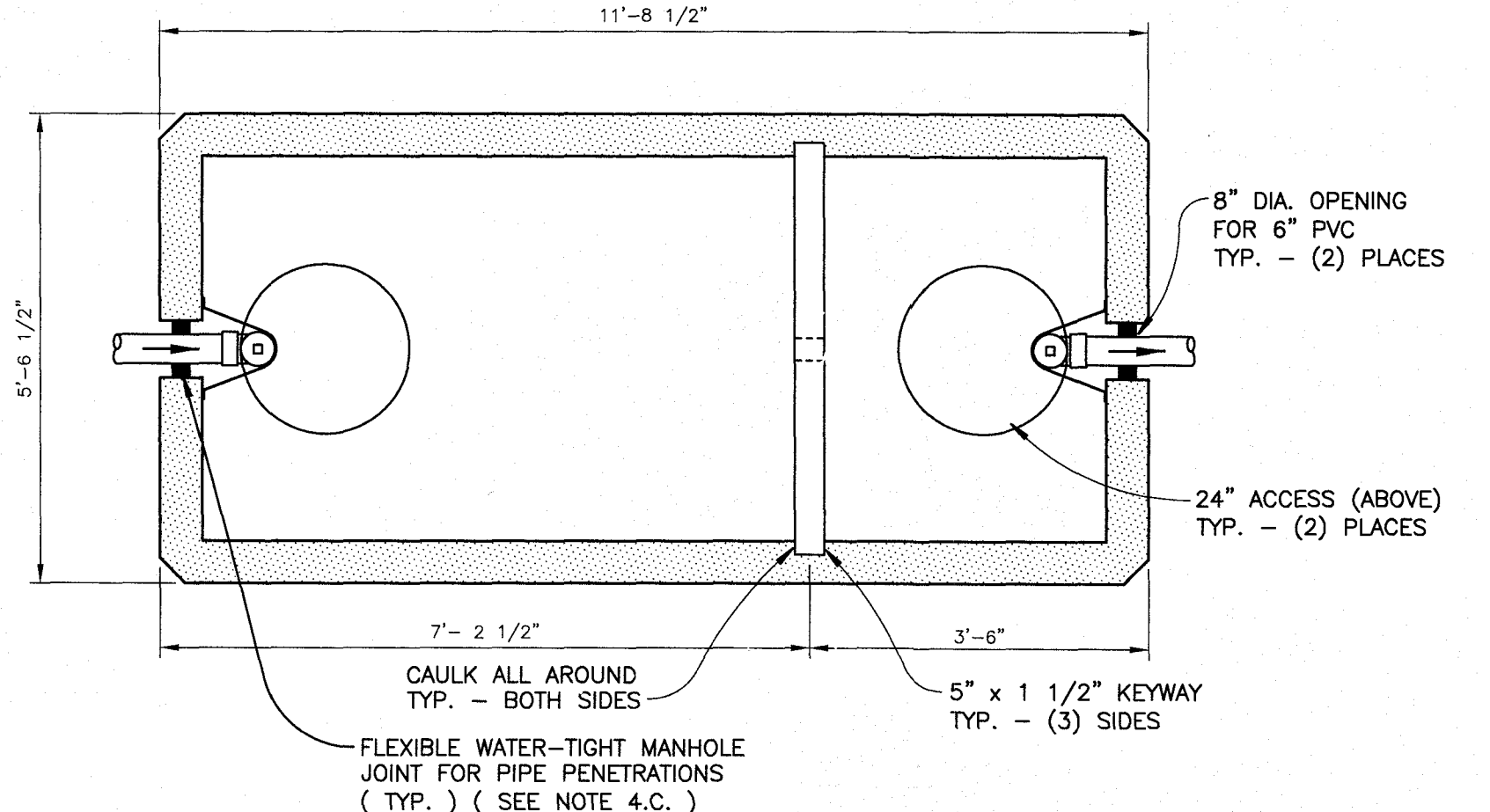


CONCRETE CRADLE
NOT TO SCALE
(ONLY WITH COMMUNITY APPROVAL)

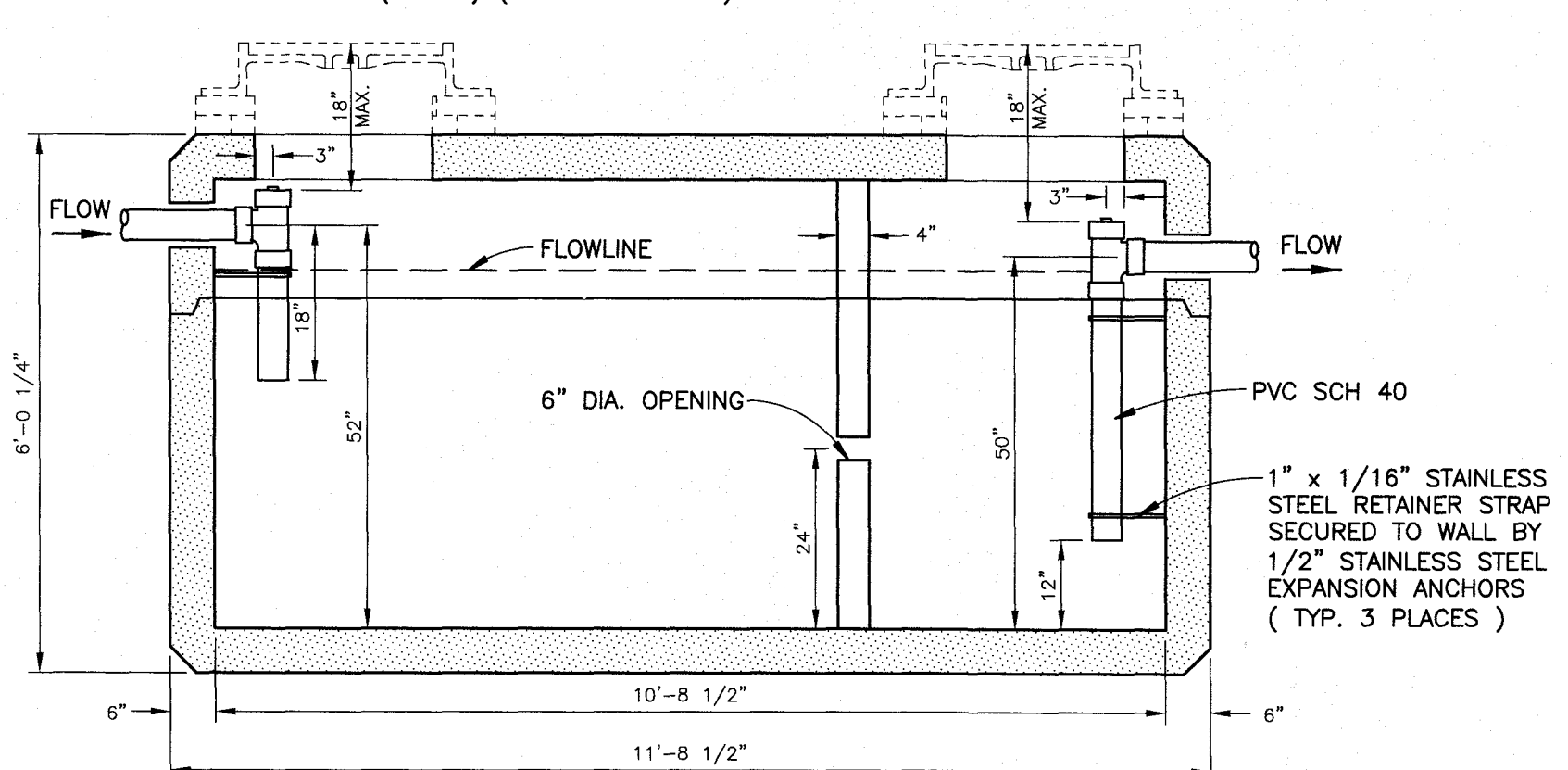


SUMP MANHOLE
NOT TO SCALE
FOR TESTING, CLEANING & DEWATERING

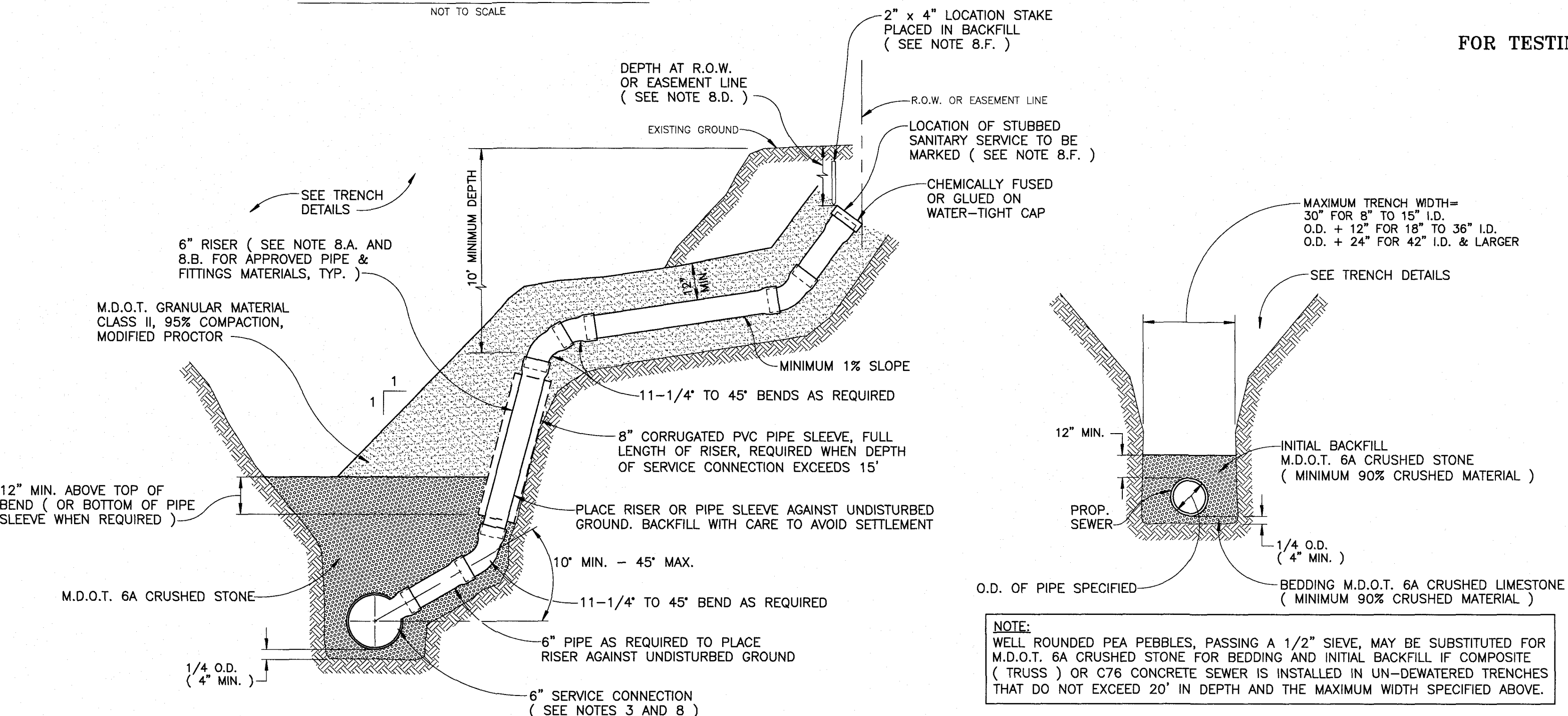
INTERCEPTOR/GREASE TRAP SECTIONS TO BE MANUFACTURED PER AASHTO 17TH EDITION AND ASTM SPECIFICATIONS WITH HS-25 LOADING AND 0.0' TO 3.0' OF EARTH COVER.
CONCRETE: 5000 psi @ 28 DAYS
REINFORCEMENT PER ASTM A-615 & A-496.
COVER TO BE SEALED WITH 1 1/2\"/>



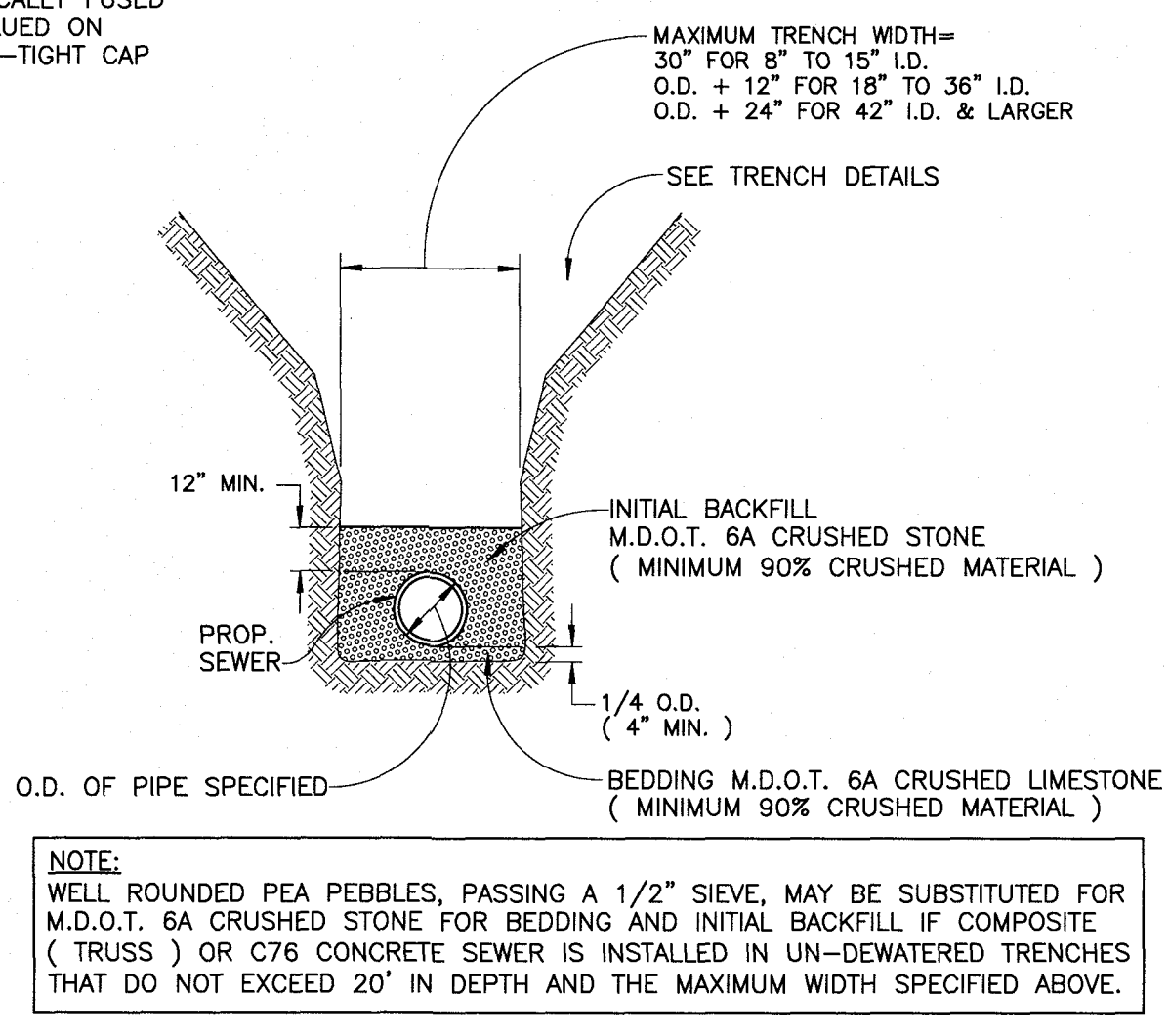
NOTE- CAPACITY 1,500 GALLONS



INTERCEPTOR/GREASE TRAP (EXTERIOR)
NOT TO SCALE



BUILDING LEAD DETAIL
NOT TO SCALE



BEDDING DETAIL
NOT TO SCALE



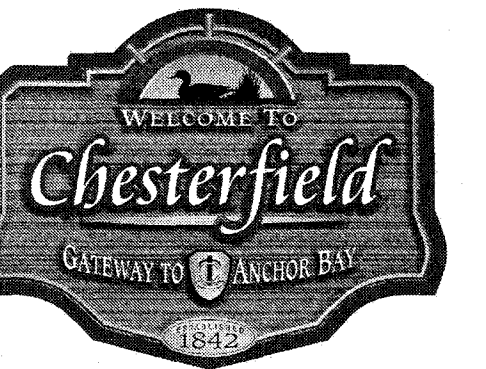
ANDERSON, ECKSTEIN AND WESTRICK, INC.

CIVIL ENGINEERS SURVEYORS ARCHITECTS

51301 Schoenherr Road Phone 586 726 1234
Shelby Township Fax 586 726 8780
Michigan 48315

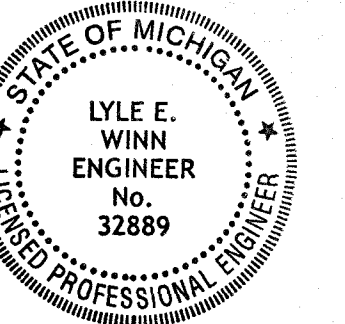
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ENGINEERING STRONG COMMUNITIES



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

M:\COMMUNITIES\CHESTERFIELD\STDDETAILS\CURRENT\SANITARY_1.DWG
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LYLE E. WINN
P.E. NO. 32889

DEPARTMENT OF PUBLIC WORKS

APPROVED BY: DON CODDINGTON, DIRECTOR

DATE: 12/6/13

CHARTER TOWNSHIP OF CHESTERFIELD

STANDARD SANITARY SEWER DETAILS
(1 OF 2)

SHEET NO.

SAN1

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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.

THE CONTRACTOR SHALL ASSUME RESPONSIBILITY FOR THE PROTECTION OF ALL EXISTING UTILITIES DURING CONSTRUCTION. ALL COSTS FOR LOCATING, REMOVING AND REPLACING OR RELOCATING THESE UTILITIES SHALL BE INCLUDED IN THE COST OF CONSTRUCTING THE SANITARY SEWER. ALL UTILITIES DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED WITH LIKE MATERIAL. THE CONTRACTOR SHALL VERIFY THE DEPTH AND HORIZONTAL LOCATION OF ALL EXISTING UTILITIES BEFORE ANY WORK IS STARTED. THE EXACT LOCATION OF EXISTING UTILITIES SHALL BE DETERMINED BY HAND DIGGING.

- E. AT ALL CONNECTIONS TO CHESTERFIELD TOWNSHIP SANITARY SEWERS OR TO EXTENSIONS THERETO, AND BEFORE START OF CONSTRUCTION, THE CONTRACTOR MUST REQUEST AND HAVE IN HIS POSSESSION AN APPROVED CONNECTIONS PERMIT ISSUED BY THE CHESTERFIELD TOWNSHIP DEPARTMENT OF PUBLIC WORKS.
- F. THE CONTRACTOR SHALL MAINTAIN ALL EXISTING SANITARY SEWER, WATER OR STORM SEWER SERVICE CONNECTIONS DURING CONSTRUCTION. ANY ADJUSTMENTS OR REPAIRS TO THESE UTILITIES SHALL BE MADE BY THE CONTRACTOR AND THE COST SHALL BE INCLUDED IN THE COST FOR CONSTRUCTING THE SANITARY SEWER, UNLESS OTHERWISE PROVIDED IN THE CONTRACT.
- G. THE ENTIRE PROJECT AREA OF PUBLICLY FUNDED PROJECTS, AND ALL AREAS NOT UNDER THE OWNERSHIP OF ANY PRIVATE DEVELOPER FOR PRIVATELY FUNDED PROJECTS, SHALL BE DIGITALLY RECORDED IN COLOR PRIOR TO THE START OF CONSTRUCTION. THE VIDEO SHALL BE UTILIZED BY THE TOWNSHIP TO DETERMINE CONSTRUCTION RELATED DAMAGE AND TO ASSURE ADEQUATE RESTORATION. THE VIDEO SHALL BE ON NEW, PREMIUM QUALITY, SINGLE-SIDED DVD(S).

3. PIPE MATERIAL

- A. EIGHT INCH (8") THROUGH FIFTEEN INCH (15") PIPE SHALL BE POLYVINYL CHLORIDE (PVC) COMPOSITE (TRUSS) SEWER PIPE, ASTM D2688, 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.

NOTE: THE MINIMUM ALLOWABLE SIZE OF A SANITARY SEWER IN TEN INCHES (10") IN DIAMETER. AN EIGHT INCH (8") DIAMETER SEWER MAY BE UTILIZED ONLY WITH WRITTEN APPROVAL OF THE DIRECTOR OF THE CHARTER TOWNSHIP OF CHESTERFIELD SEWER DEPARTMENT.

- 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 C76). 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-TREE. 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 BELLTITE. 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 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 SO AS TO INCREASE THE FLEXIBILITY OF THE JOINTS. 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.

- I. ALL MANHOLES SHALL BE REQUIRED TO HAVE EXTERIOR SEAL. EXTERIOR SEAL SHALL BE CANUSA WRAPID SEAL ENCAPSULATION SYSTEM INSTALLED PER MANUFACTURERS SPECIFICATIONS. WRAPID SEAL SHALL BE SIZED TO EXTEND A MINIMUM OF SIX INCHES (6") ONTO THE CONE SECTION. ALL PRECAST STRUCTURES SHALL HAVE CONSEAL CS102 BUTYL RUBBER SEALANT INSTALLED BETWEEN EACH SECTION.

- J. ALL TERMINAL MANHOLES AND ANY INTERMEDIATE MANHOLES WHERE FUTURE DROP CONNECTIONS ARE A POTENTIAL SHALL BE ONE FOOT (1') LARGER IN DIAMETER THAN WOULD OTHERWISE BE REQUIRED. THE MINIMUM DIAMETER SHALL BE FIVE FEET (5').

- K. IN INDUSTRIAL AND COMMERCIAL AREAS, OR ANY OTHER AREAS WHERE DEEMED NECESSARY BY THE CHARTER TOWNSHIP OF CHESTERFIELD SEWER DEPARTMENT, PRIVATE SANITARY SERVICES MUST HAVE AN ACCESSIBLE SAMPLING AND MONITORING MANHOLE INSTALLED PRIOR TO THE CONNECTION AT THE SEWER MAIN. THE MANHOLE SHALL BE LOCATED ON PRIVATE PROPERTY AT A LOCATION APPROVED BY THE CHARTER TOWNSHIP OF CHESTERFIELD SEWER DEPARTMENT.

- L. FOR SANITARY MANHOLES CONSTRUCTED WITHIN REGULATED FLOOD PLAINS OR AREAS SUBJECT TO FLOODING AND WETLANDS, ALL MANHOLE JOINTS SHALL REQUIRE EXTERIOR WRAPID SEAL AND FRAMES SHALL BE SET ABOVE THE FLOOD PLAIN ELEVATION.

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 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 LESTONE. 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 LESTONE. THE MINIMUM DEPTH OF LESTONE 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 PERFORMING REQUIRED TESTS.

- B. ALL SEWERS TWENTY-FOUR INCHES (24") IN DIAMETER AND SMALLER SHALL BE TESTED USING LOW PRESSURE AIR (ASTM C924 OR ASTM F1494) BASED UPON PIPE MATERIAL. IN ACCORDANCE WITH THE CHARTER TOWNSHIP OF CHESTERFIELD SEWER DEPARTMENT SANITARY SEWER 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 WITHER AROUND WATER 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 RETURNED 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.

- G. 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 PACP. 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.

- 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.

- 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 FERNCO 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-TREE 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.

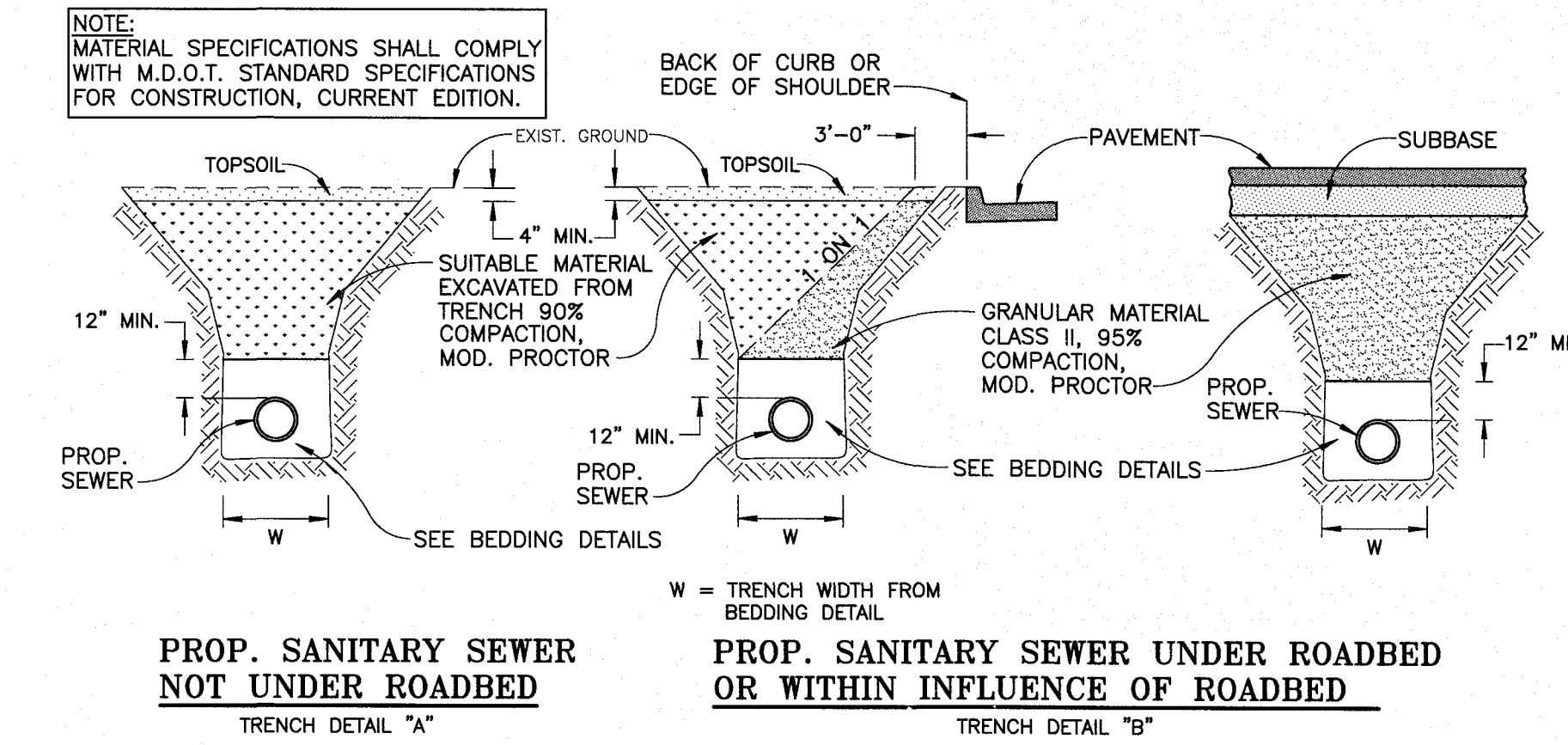
9. GREASE/GRIT INTERCEPTORS

- 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. 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.



TRENCH DETAILS

NOT TO SCALE



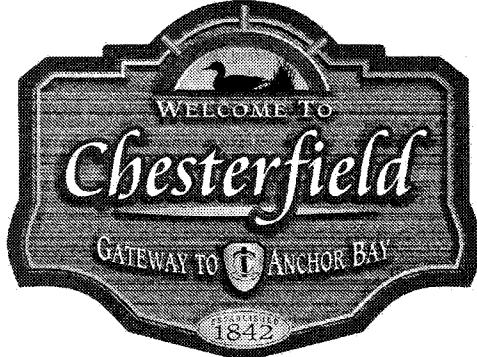
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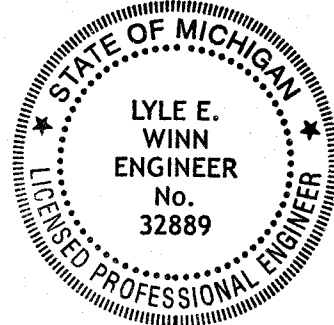
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Lyle E. Winn
Lyle E. Winn P.E. No. 32889

DEPARTMENT OF PUBLIC WORKS

APPROVED BY: Don Codding, DIRECTOR

DATE: 12/6/18

CHARTER TOWNSHIP OF CHESTERFIELD

STANDARD SANITARY SEWER DETAILS (2 OF 2)

SHEET NO.

SAN2

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