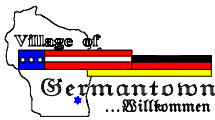


**DESIGN, DRAFTING & CONSTRUCTION STANDARDS & SPECIFICATIONS  
SECTION 4.0: STORM WATER CONVEYANCE SYSTEM REQUIREMENTS**

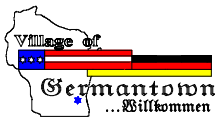
<b>TABLE 1.0: GOVERNING AGENCIES AND APPLICABLE CODES/GUIDELINES/REGULATIONS</b> (Most stringent shall apply)	
Wisconsin State Statutes & Administrative Code	<ul style="list-style-type: none"> <li>Chapter DSPTS 382 (formerly Comm 82)</li> </ul>
Milwaukee Metropolitan Sewerage District (MMSD)	<ul style="list-style-type: none"> <li>MMSD Rules, including Chapter 13</li> </ul>
State of Wisconsin Department of Transportation (WisDOT)	<ul style="list-style-type: none"> <li>WisDOT Standard Specifications for Highway and Structure Construction (WisDOT Standard Specifications)</li> <li>WisDOT Facility Development Manual (FDM)</li> <li>WisDOT Approved Product List</li> </ul>
State of Wisconsin Department of Natural Resources (WDNR)	<ul style="list-style-type: none"> <li>Technical Standards (a.k.a., Conservation Practice Standards)</li> </ul>
Village of Germantown	<ul style="list-style-type: none"> <li>Municipal Code</li> <li>Stormwater Management Requirements</li> <li>Design, Drafting &amp; Construction Standards &amp; Specifications (Sec. 1-9)</li> <li>Village Board and Committee actions</li> <li>DPW Director, Village Engineer, Utility Superintendent discretion</li> </ul>
Other	<ul style="list-style-type: none"> <li>Standard Specifications for Sewer &amp; Water Construction in Wisconsin (Standard Specifications)</li> <li>American Association of State Highway and Transportation Officials (AASHTO)</li> <li>Southeast Wisconsin Regional Planning Commission (SEWRPC)</li> <li>Manufacturer specifications</li> </ul>
Private Storm Sewers, Ditches and Swales	<ul style="list-style-type: none"> <li>Man-made exterior sewer and surface runoff management systems intended to directly drain runoff from privately-owned buildings, driveways, parking lots, lawns, etc. These systems are typically created by site plans associated with subdivision plats of survey, certified survey maps, or individual lot plats of survey.</li> <li>Private easements shall overlay all private storm sewers, ditches, and swales. All private drainage easements shall be labeled as “Private Drainage Easements” on plats of survey, site plans, and as-built drawings.</li> <li>Private property owner(s), or homeowners or neighborhood associations, shall maintain private storm sewers, ditches and swales. In event private storm sewers, ditches and swales are overlain by public easements, maintenance remains responsibility of the private property owner(s) or association.</li> </ul>
Public Storm Sewers, Ditches and Swales	<ul style="list-style-type: none"> <li>Man-made exterior sewer and surface runoff management systems intended to directly drain runoff from Village-owned buildings, streets, parks, lawns, etc. These systems are typically situated on Village-owned buildings and grounds, Village-owned outlots, and Village-owned rights-of-way.</li> <li>Public easements shall overlay all public storm sewers, ditches, and swales not situated in Village-owned right-of-way. All public drainage easements shall be labeled as “Public Drainage Easements” on plats of survey, site plans, and as-built drawings.</li> <li>The Department of Public Works shall maintain public storm sewers, ditches and swales.</li> </ul>



**DESIGN, DRAFTING & CONSTRUCTION STANDARDS & SPECIFICATIONS**  
**SECTION 4.0: STORM WATER CONVEYANCE SYSTEM REQUIREMENTS**

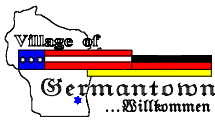
<b>TABLE 2.0: DESIGN CRITERIA</b>															
General	<ul style="list-style-type: none"> <li>• Mainline Dia. = 15" min.; Lateral Dia. = 6" min.</li> <li>• Live loading = AASHTO H-25 min.</li> <li>• Underground laterals for roof drains &amp; sump pumps are required for ea. newly created lot</li> <li>• Alignment:               <ul style="list-style-type: none"> <li>○ Situate manholes at 10' min offset from sanitary sewer alignment (or roadway centerline when sanitary sewer absent)</li> <li>○ Alignments under concrete curb &amp; gutter are prohibited</li> </ul> </li> <li>• Cover above mainline crown = 3-1/2' depth min.</li> <li>• Insulation: Depths &lt; 3-1/2' require polystyrene board insulation; Conform to Standard Specifications 8.50.2</li> <li>• Manhole/Catch Basin/Inlet Spacing = 300' max.</li> <li>• Manholes shall connect 2 pipes having differing dia.</li> <li>• Pipe connections shall be crown-to-crown when the following constraint can be satisfied:               <ul style="list-style-type: none"> <li>○ Δ I.E. between influent and effluent pipes = 0.1' min. and 2.0' max.</li> <li>○ Otherwise, outside drop required when Δ I.E. &gt; 2.0'</li> </ul> </li> <li>• Double Catch Basins/Inlets required in Roadway Sags not having safe overland relief conveyance of 100-year rainfall event</li> <li>• Private Facilities: The last private structure tributary to public sewer shall be a catch basin</li> <li>• Pipe with cover depths &gt; 20' shall have the pipe material approved by the Engineer and shall be designed conforming to Standard Specifications Ch. 5.3.12 and Table 12</li> </ul>														
Capacity	<ul style="list-style-type: none"> <li>• Min. capacities as determined by TR-55 or Rational Method:               <ul style="list-style-type: none"> <li>○ 10-year rainfall event capacity in areas having safe overland conveyance of 100-year rainfall event</li> <li>○ 100-year rainfall event capacity in areas not having safe overland conveyance of 100-year rainfall event</li> </ul> </li> </ul>														
Slopes	<ul style="list-style-type: none"> <li>• Storm Sewer: Min. slopes for mainlines shall conform to NR 110.13, Table 1 as follows:               <table style="margin-left: 20px; border: none;"> <tr><td>8-inch</td><td>0.40 (ft/100 ft)</td></tr> <tr><td>10-inch</td><td>0.28 (ft/100 ft)</td></tr> <tr><td>12-inch</td><td>0.22 (ft/100 ft)</td></tr> <tr><td>15-inch</td><td>0.15 (ft/100 ft)</td></tr> <tr><td>18-inch</td><td>0.12 (ft/100 ft)</td></tr> <tr><td>21-inch</td><td>0.10 (ft/100 ft)</td></tr> <tr><td>24-inch</td><td>0.08 (ft/100 ft)</td></tr> </table> </li> <li>• Swales &amp; Ditches:               <ul style="list-style-type: none"> <li>○ Longitudinal slope = 1% min.; 10% max.</li> <li>○ Cross-slope = 4H:1V preferred (3H:1V max.)</li> </ul> </li> </ul>	8-inch	0.40 (ft/100 ft)	10-inch	0.28 (ft/100 ft)	12-inch	0.22 (ft/100 ft)	15-inch	0.15 (ft/100 ft)	18-inch	0.12 (ft/100 ft)	21-inch	0.10 (ft/100 ft)	24-inch	0.08 (ft/100 ft)
8-inch	0.40 (ft/100 ft)														
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21-inch	0.10 (ft/100 ft)														
24-inch	0.08 (ft/100 ft)														
Rainfall Depths & Distribution	<ul style="list-style-type: none"> <li>• NOAA Atlas 14, <i>Precipitation-Frequency Atlas of the United States, Volume 8, Version 2.0: Midwestern States (Colorado, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Oklahoma, South Dakota, Wisconsin)</i></li> <li>• SCS Type II Distribution</li> </ul>														

<b>TABLE 3.0: MAINLINE PIPE, APPURTENANCES, &amp; OTHER MATERIALS</b>	
Reinforced Concrete Pipe (RCP)	<ul style="list-style-type: none"> <li>• Class III min. w/ rubber gaskets; Conform to Standard Specifications Ch. 8.6.0 and 8.41.2</li> <li>• Circular and arch or elliptical equivalents are acceptable</li> </ul>
Polyvinyl Chloride (PVC)	<ul style="list-style-type: none"> <li>• SDR-35 min. w/ rubber gaskets required; Conform to Standard Specifications Ch. 8.10.0 and 8.41.4</li> </ul>
High Density Polyethylene (HDPE)	<ul style="list-style-type: none"> <li>• Manufacturer: ADS N-12 ST IB (soil-tight) pipe (or Engineer approved equal)</li> <li>• Prohibited in areas with high seasonal groundwater (unless buoyancy is mitigated)</li> <li>• Trench shall be completely dewatered before laying HDPE pipe</li> </ul>
Corrugated Steel Pipe	<ul style="list-style-type: none"> <li>• Only permissible for private driveway culverts; Conform to WisDOT Standard Specifications Sec. 521.2.2</li> </ul>



**DESIGN, DRAFTING & CONSTRUCTION STANDARDS & SPECIFICATIONS**  
**SECTION 4.0: STORM WATER CONVEYANCE SYSTEM REQUIREMENTS**

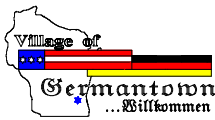
<b>TABLE 4.0: PIPE BEDDING, COVER &amp; BACKFILL</b>	
Bedding	<ul style="list-style-type: none"> <li>• RCP: Class “C” conforming to Standard Specifications Ch. 3.2.6(a) and File No. 3</li> <li>• HDPE or PVC: Class “B” conforming to Standard Specifications Ch. 3.2.6(b) and File No. 4</li> <li>• &lt;18” Dia.: 3/8” crushed stone chips; Conform to Standard Specifications Ch. 8.43.2, Table 32</li> <li>• &gt;18” Dia.: ¾” crushed stone chips; Conform to Standard Specifications Ch. 8.43.2, Table 33</li> <li>• Prohibited: Sand; gravel</li> </ul>
Cover	<ul style="list-style-type: none"> <li>• RCP: Class “C” conforming to Standard Specifications Ch. 3.2.6(a) and File No. 3</li> <li>• HDPE or PVC: Class “B” conforming to Standard Specifications Ch. 3.2.6(b) and File No. 4</li> <li>• &lt;18” Dia.: 3/8” crushed stone chips conforming to Standard Specifications Ch. 8.43.2, Table 32</li> <li>• &gt;18” Dia.: ¾” crushed stone chips conforming to Standard Specifications Ch. 8.43.2, Table 33</li> <li>• Prohibited: Sand; gravel</li> </ul>
Backfill	<ul style="list-style-type: none"> <li>• Aggregate slurry under Village-owned pavements: Required at top 3’ depth. Conform to Standard Specification Ch. 8.43.8.</li> <li>• Granular where specified: Crushed gravel. Conform to Standard Specification Ch. 8.43.4, Table 39 Graded Aggregates, 1½” Graded Crushed Stone.</li> <li>• Spoil not under pavements: Spoil material. Conform to Standard Specifications Ch. 8.43.5</li> <li>• Consolidation: Mechanical compaction. Conform to Standard Specification Ch. 2.6.14(b). Conform to 95% Standard Proctor Density tested at Contractor’s expense.</li> <li>• Initial Lift = Max. 2 ft; Subsequent Lifts = Max. 1½ ft</li> <li>• Prohibited: Debris; frozen material; large clods or stones; organic material; blast rock; stones larger than 6”; sand. Contractor shall haul away and dispose of these materials at Contractor’s expense.</li> </ul>



**DESIGN, DRAFTING & CONSTRUCTION STANDARDS & SPECIFICATIONS**  
**SECTION 4.0: STORM WATER CONVEYANCE SYSTEM REQUIREMENTS**

**TABLE 5.0: MANHOLES**

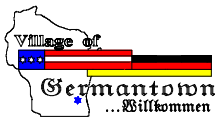
<p>Characteristics</p>	<ul style="list-style-type: none"> <li>• Precast Required: Conform to Standard Specifications Ch. 3.5.3(b), 8.39.0 and File No. 12</li> <li>• Block MHs are prohibited</li> <li>• MH Dia. and Wall Thickness: <table border="1" data-bbox="526 352 1060 541" style="margin-left: 20px;"> <thead> <tr> <th>Pipe Dia.</th> <th>MH Dia. (min.)</th> <th>Wall Thickness (min.)</th> </tr> </thead> <tbody> <tr> <td>8" to 30"</td> <td>48"</td> <td>5"</td> </tr> <tr> <td>&gt; 30" to 36"</td> <td>60"</td> <td>6"</td> </tr> <tr> <td>&gt; 36" to 42"</td> <td>72"</td> <td>7"</td> </tr> </tbody> </table> </li> <li>• Manhole Spacing = 300' max.</li> <li>• Pipe connections shall be crown-to-crown when the following constraint can be satisfied: <ul style="list-style-type: none"> <li>○ Δ I.E. between influent and effluent pipes = 0.1' min. and 2.0' max.</li> <li>○ Otherwise, outside drop required when Δ I.E. &gt; 2.0'</li> </ul> </li> <li>• Cone sections = Eccentric (concentric cones are prohibited)</li> <li>• Lift holes: Exterior lift holes only (interior lift holes are prohibited)</li> <li>• Benches: Conform to Standard Specifications File No. 13</li> </ul>	Pipe Dia.	MH Dia. (min.)	Wall Thickness (min.)	8" to 30"	48"	5"	> 30" to 36"	60"	6"	> 36" to 42"	72"	7"
Pipe Dia.	MH Dia. (min.)	Wall Thickness (min.)											
8" to 30"	48"	5"											
> 30" to 36"	60"	6"											
> 36" to 42"	72"	7"											
<p>Outside Drop</p>	<ul style="list-style-type: none"> <li>• Conform to Standard Specifications Ch. 3.5.8(d) and File No. 19/20</li> <li>• 1 full-length of pipe shall precede the tee connecting the manhole and the drop segment</li> </ul>												
<p>Joint Seals</p>	<ul style="list-style-type: none"> <li>• Kentseal butyl rubber sealant (or Engineer approved equal)</li> <li>• External for MH w/ Precast Outside Drop: EZ-Wrap by Press Seal Gasket Corp primed with EZ-Stick No. 4 primer <ul style="list-style-type: none"> <li>○ Extruded butyl adhesive tape bonded to the concrete</li> </ul> </li> </ul>												
<p>Chimneys</p>	<ul style="list-style-type: none"> <li>• Depth: Min. = 2", Max. = 16" (measured bottom of frame to top of cone)</li> <li>• Precast Rings: Precast conforming to ASTM C-478. 26" dia. 2" or 4" thickness</li> <li>• Mortar: Quikrete Fast-Set repair mortar min. ¼" thick applied full width and struck off inside/out</li> <li>• Prohibited: Cracked rings; all forms of wedges; diluting/reconstituting mortar; back-plastering; corbelling</li> </ul>												
<p>Frames &amp; Covers</p>	<ul style="list-style-type: none"> <li>• Neenah R-1661 w/ Neenah R-1660-0003 rocking cover w/ 2 pick holes and 8 vent holes</li> <li>• Elevations: Top of frame = binder grade</li> <li>• Paving Ring: Neenah R-1979 Series Ref. No. 1661-7156</li> </ul>												
<p>Connections</p>	<ul style="list-style-type: none"> <li>• Connections shall be cored. Cutting or breaking is prohibited.</li> <li>• Bulkheads for future connections: Conform to Standard Specifications Ch. 3.2.25 and File #13A; Timber is prohibited</li> <li>• Connections w/o boots shall be filled with brick and Quikrete Fast-Set repair mortar</li> <li>• Connections shall be perpendicular to manholes</li> <li>• Piping shall be trimmed so flush with interior manhole wall</li> </ul>												
<p>Steps</p>	<ul style="list-style-type: none"> <li>• Conform to Standard Specifications Ch. 3.5.4(g) and 8.40.0, and File No. 12 and 15</li> <li>• Align with entrance</li> <li>• Prohibited: Steps in chimneys</li> </ul>												
<p>Grout</p>	<ul style="list-style-type: none"> <li>• If approved by Village Engineer and Utility Superintendent, Contractor may use acrylamide or polyurethane grout for manhole repair/rehabilitation</li> </ul>												



**DESIGN, DRAFTING & CONSTRUCTION STANDARDS & SPECIFICATIONS**  
**SECTION 4.0: STORM WATER CONVEYANCE SYSTEM REQUIREMENTS**

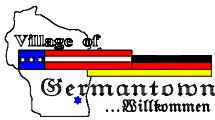
**TABLE 6.0: CATCH BASINS & INLETS**

<p>Characteristics</p>	<ul style="list-style-type: none"> <li>• Catch Basins: Precast Required; Conform to Standard Specifications Ch. 3.6.1 and File No. 25</li> <li>• Inlets: Precast Required; Conform to Standard Specifications Ch. 3.6.3 and File No. 28</li> <li>• Wall Thickness = 5" min.</li> <li>• Block Catch Basins and Inlets are prohibited</li> <li>• Catch Basin/Inlet Spacing = 300' max.</li> <li>• Pipe connections shall be crown-to-crown when the following constraint can be satisfied:             <ul style="list-style-type: none"> <li>○ Δ I.E. between influent and effluent pipes = 0.1' min. and 2.0' max.</li> <li>○ Otherwise, outside drop required when Δ I.E. &gt; 2.0'</li> </ul> </li> <li>• Drain Socks in Roadway Sags: Install by coring two 4" dia. HDPE perforated underdrain pipe with sock (18-36" long) situated 3" above downstream pipe I.E.</li> <li>• Lift holes: Exterior lift holes only (interior lift holes are prohibited)</li> <li>• Private Facilities: The last private structure tributary to public sewer shall be a catch basin</li> </ul>
<p>Chimneys</p>	<ul style="list-style-type: none"> <li>• Depth: Min. = 2", Max. = 16" (measured bottom of frame to top of precast structure)</li> <li>• Precast Rings: Precast conforming to ASTM C-478. 2" or 4" thickness</li> <li>• Mortar: Quikrete Fast-Set repair mortar min. 1/4" thick applied full width and struck off inside/out</li> <li>• Prohibited: Cracked rings; all forms of wedges; diluting/reconstituting mortar; back-plastering; corbelling</li> </ul>
<p>Frames &amp; Covers</p>	<ul style="list-style-type: none"> <li>• 30" Mountable Curb: Neenah R-3501-R</li> <li>• Vertical Face Curb: Neenah R-3067</li> </ul>
<p>Connections</p>	<ul style="list-style-type: none"> <li>• Connections shall be cored. Cutting or breaking is prohibited.</li> <li>• Bulkheads for future connections: Conform to Standard Specifications Ch. 3.2.25 and File #13A; Timber is prohibited</li> <li>• Connections w/o boots shall be filled with brick and Quikrete Fast-Set repair mortar</li> <li>• Connections shall be perpendicular to catch basins/inlets</li> <li>• Piping shall be trimmed so flush with interior catch basin/inlet wall</li> </ul>
<p>Steps</p>	<ul style="list-style-type: none"> <li>• Conform to Standard Specifications Ch. 3.5.4(g) and 8.40.0, and File No. 12 and 15</li> <li>• Align with entrance</li> <li>• Prohibited: Steps in chimneys</li> </ul>
<p>Grout</p>	<ul style="list-style-type: none"> <li>• If approved by Village Engineer and Highway Superintendent, Contractor may use acrylamide or polyurethane grout for manhole repair/rehabilitation</li> </ul>
<p>Interim CB/Inlet</p>	<ul style="list-style-type: none"> <li>• Required in sags until surface lift paved</li> <li>• Install interim asphalt curb-and-gutter in CC&amp;G gap</li> <li>• Tie Bars: Upon conversion to permanent catch basins/inlets, install three #5 x 12" epoxy-coated tie bars drilled into ea. existing CC&amp;G section and set into new CC&amp;GT section</li> </ul>



**DESIGN, DRAFTING & CONSTRUCTION STANDARDS & SPECIFICATIONS**  
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<b>TABLE 7.0: LATERALS, SUMP PUMP COLLECTORS &amp; DRAIN TILE</b>	
Pipe	<ul style="list-style-type: none"> <li>• PVC: SDR-35 min. w/ rubber gaskets required; Conform to Standard Specifications Ch. 8.10.0 and 8.41.4</li> <li>• HDPE: ADS N-12 ST IB (soiltight) pipe (or Engineer approved equal)</li> <li>• Dia. = 6" min.</li> </ul>
Drainage Patterns	<ul style="list-style-type: none"> <li>• Residential with roadway curb &amp; gutter: Front ½ of roof and front yard can surface discharge to roadway. Back ½ of roof, backyard and sump pump must surface discharge to backyard swales. If not achievable, connection to storm sewer with check valve in home plumbing system is required.</li> <li>• Non-Residential with roadway curb &amp; gutter: Surface discharge to roadway is prohibited.</li> </ul>
Clean Outs	<ul style="list-style-type: none"> <li>• Clean Out Spacing = 100' max.</li> </ul>
Connections	<ul style="list-style-type: none"> <li>• Wye for New Sewer = Prefabricated</li> <li>• 8"x6" Wye for Exist Sewer = 8"x6" factory wye with 2 repair couplings</li> <li>• &gt; 8"x6" Wye for Exist Sewer = Inserta-Tee conforming to Standard Specifications Ch. 5.3.2 and Table 10 cored in the upper pipe quadrant (30°) with 45° bend</li> <li>• Existing Lateral: Use Fernco. If reducer needed, install at right-of-way boundary. Gaps shall be &lt; 1/8"</li> <li>• Connections to Manholes/Catch Basins/Inlets: Core-drilled w/ installation of Kor-N-Seal boot (or Engineer approved equal), set perpendicular to structure, and trimmed so flush with interior manhole/catch basin/inlet wall</li> <li>• Prohibited: Ferncos on clay or concrete pipe.</li> </ul>
Tracer Wire	<ul style="list-style-type: none"> <li>• Required for all mainlines and laterals</li> <li>• Insulated solid copper #8 wire</li> <li>• Place parallel to and above the mainlines and laterals</li> <li>• GPS survey of lateral locations can substitute for the tracer wire.</li> <li>• Spacing of tape = 10' intervals</li> <li>• Splicing = spliced, soldered, and wrapped with Plyflex low voltage splice kit, manufactured by Plymouth Rubber Co. (or Engineer approved equal)</li> <li>• Continuity testing: Provide a temporary above-ground wire between adjacent location boxes. Connect ohm meter in a series loop with detector wire and above-ground wire. Circuit resistance shall not exceed 5 ohms.</li> </ul>
General	<ul style="list-style-type: none"> <li>• Installation: Conform to Standard Specifications Ch. 5.3.0, 5.3.5 and File No. 50</li> <li>• Laterals to lots: <ul style="list-style-type: none"> <li>○ Extend to right-of-way.</li> <li>○ Cap at right-of-way. Water-proof, leak-proof.</li> <li>○ Marker board = 2"x4". Length from bottom of pipe to 3' above proposed final ground surface. Top 1' painted orange.</li> </ul> </li> </ul>

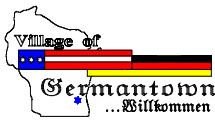


**DESIGN, DRAFTING & CONSTRUCTION STANDARDS & SPECIFICATIONS**  
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<b>TABLE 8.0: CULVERTS</b>	
Pipe	<ul style="list-style-type: none"> <li>• Under Village-owned Pavements: RCP Class III min. w/ rubber gaskets; Conform to WisDOT Standard Specifications Sec. 522.2.2 or 523.2.2</li> <li>• Under Private Driveways: Corrugated Steel Pipe; Conform to WisDOT Standard Specifications Sec. 521.2.2</li> </ul>
Apron Endwalls	<ul style="list-style-type: none"> <li>• RCP: Conform to WisDOT Standard Specifications Sec. 522.2.4 and 523.2.4</li> <li>• Corrugated Steel Pipe: Conform to WisDOT Standard Specifications Sec. 521.2.4</li> <li>• Endwall Grates:               <ul style="list-style-type: none"> <li>○ Upstream Entry: Vertical grate</li> <li>○ Downstream Exit: Horizontal grate</li> </ul> </li> </ul>
Rip-Rap	<ul style="list-style-type: none"> <li>• Required when slope &gt; 5% or flow &gt; 10 cfs</li> <li>• Medium Rip-Rap w/ Type R Geotextile Fabric: Conform to WisDOT Standard Specifications Sec. 606 and 645.2.6</li> </ul>
General	<ul style="list-style-type: none"> <li>• Installation: Conform to WisDOT Standard Specifications Sec. 520</li> </ul>

<b>TABLE 9.0: DITCHES &amp; SWALES</b>	
Capacity	<ul style="list-style-type: none"> <li>• 100-year rainfall event capacity min. as determined by TR-55 or Rational Method</li> </ul>
Slopes	<ul style="list-style-type: none"> <li>• Longitudinal slope = 1% min.; 10% max.</li> <li>• Cross-slope = 4H:1V preferred (3H:1V max.)</li> </ul>
Erosion Mat	<ul style="list-style-type: none"> <li>• Conform to WDNR Technical Standard #1053</li> <li>• Low Flow w/ 4H:1V to 3H:1V Side Slopes = North American Green DS75 (or equal)</li> <li>• Moderate Flow w/ 3H:1V to 2H:1V Side Slopes = North American Green DS150 (or equal)</li> </ul>
Roadway Ditches	<ul style="list-style-type: none"> <li>• 2' min. depth below outside edge of pavement (intended to adequately drain roadway's underlying crushed aggregate base course)</li> </ul>
Alignments	<ul style="list-style-type: none"> <li>• Centerline along shared parcel boundaries preferred</li> <li>• Dissecting parcels should be avoided</li> </ul>

<b>TABLE 10.0: INSPECTION &amp; TESTING</b>	
Scheduling	<ul style="list-style-type: none"> <li>• Contact Engineering Dept. (262) 250-4721 two business days before construction to schedule inspection(s)</li> </ul>
Testing	<ul style="list-style-type: none"> <li>• Deflection, Alignment and Bore:               <ul style="list-style-type: none"> <li>○ RCP: Visible beam lamping to verify conformance to Standard Specifications Ch. 3.2.4</li> <li>○ PVC or HDPE Dia. &gt;27": Visible beam lamping to verify conformance to Standard Specifications Ch. 3.2.4</li> <li>○ PVC or HDPE Dia. &lt;27": Conform to Standard Specifications Ch. 3.2.6(i)(4) and File No. 30 for 5% deflection limit.</li> </ul> </li> <li>• Catch Basin/Inlet Location: String line alignment with proposed CC&amp;G</li> <li>• Contractor shall repair mainlines failing tests until acceptable to Village Engineer and Utility Superintendent at Contractor's expense</li> </ul>



**DESIGN, DRAFTING & CONSTRUCTION STANDARDS & SPECIFICATIONS**  
**SECTION 4.0: STORM WATER CONVEYANCE SYSTEM REQUIREMENTS**

<b>TABLE 11.0: SUBMITTAL REQUIREMENTS</b>	
Construction Drawings & As-Builts	<ul style="list-style-type: none"> <li>Plan and Profile on D-sized paper prepared, sealed and signed by Wisconsin P.E.</li> <li>Drawings shall graphically delineate and quantify areas tributary to each inlet structure</li> <li>Storm sewer and inlet grate capacity computations are required on drawings</li> <li>Datum: Local NVGD 1929 datum required</li> <li>Submit both paper and electronic copies to Village Engineer</li> <li>Preparation and submittal of construction drawings and as-built drawings shall be at the Engineering Consultant's expense.</li> </ul>
Easements	<ul style="list-style-type: none"> <li>Public: 20' min. width centered over centerline alignment</li> <li>Private: Required when conveyance for multiple properties</li> <li>Submit both paper and electronic copies to Village Engineer</li> <li>Preparation and submittal of easements shall be at the Engineering Consultant's expense</li> </ul>
Plan Review	<ul style="list-style-type: none"> <li>Engineering Consultant shall prepare the entire MMSD Sewer Plan Review Tool Kit</li> <li>If applicable, Engineering Consultant shall prepare the entire Dept. of Safety &amp; Professional Services (formerly Commerce) Plumbing Plan Review package for "private" sanitary services</li> <li>Submit two (2) original paper and 1 electronic copy of all documents to the Village Engineer for review</li> <li>Village Engineer submit the entire package to the MMSD</li> <li>If applicable, Engineering Consultant shall submit the entire Dept. of Safety &amp; Professional Services (formerly Commerce) Plumbing Plan Review package for "private" sanitary services with the Owner Letter</li> <li>Preparation and submittal of plan review packages shall be at the Engineering Consultant's expense.</li> </ul>
Street Excavation in ROW Permit	<ul style="list-style-type: none"> <li>Contractor to prepare and submit with fee to Village Engineering Dept.</li> </ul>
Erosion Control Permit	<ul style="list-style-type: none"> <li>Contractor to prepare and submit with fee to Village Inspection Services (Building Inspection) Dept.</li> </ul>
Building Permit	<ul style="list-style-type: none"> <li>Plans, reports and permits shall be reviewed and accepted by the MMSD, Dept. of Safety &amp; Professional Services (formerly Commerce), and Village Engineer before the Village will issue a building permit</li> </ul>
Occupancy Permit	<ul style="list-style-type: none"> <li>As-built drawings shall be reviewed and accepted by the Village Engineer before the Village will issue an occupancy permit</li> </ul>

<b>TABLE 12.0: LIST OF VILLAGE STANDARD DETAILS</b>	
	<ul style="list-style-type: none"> <li>Under Development</li> </ul>

<b>TABLE 13.0: OTHER REQUIREMENTS</b>	
	<ul style="list-style-type: none"> <li>Contractor shall be responsible for Digger's Hotline locates, site safety, resident access, traffic control, erosion &amp; sediment control, and protection of existing facilities, features and structures at all times</li> <li>At end of each day, open excavations shall not exceed 25 ft. in length.</li> <li>All lateral trenches shall be backfilled at end of day.</li> <li>At end of each day, contractor shall erect barricades with flashers and snow fencing surrounding excavations.</li> <li>Mainline Installation: Conform to Standard Specifications Ch. 3.2.0</li> <li>Sawcut Exist Pavements: Wheel mounting saw required. Sawcut full-depth.</li> <li>Inlet Protection: Conform to Wisconsin DNR Technical Standard #1060</li> <li>Dewatering: Conform to Wisconsin DNR Technical Standard #1061</li> </ul>