

MINIMUM CONSTRUCTION PLAN STANDARDS

FOR

DESIGN OF PUBLIC SANITARY SEWER & WATER SUPPLY

FOR

GENESEE COUNTY, MICHIGAN



6th EDITION

FORWARD

In an effort to expedite the processing of construction plans, the following minimum standards have been formulated by the Genesee County Drain Commissioner Division of Water and Waste Services (GCDC-WWS). Please read and follow these carefully, as there have been significant changes in the standards. PLEASE NOTE: GCDC-WWS approvals are valid for one year. After one year, the project will be subject to start the review process from the beginning.

A. PLAN SUBMISSION

The submission to GCDC-WWS shall include the following items:

- a. Completed Construction Plan Checklist
- b. One set of 24" x 36" Construction Plans, signed and sealed by a professional engineer licensed in the State of Michigan.
- c. A completed Act 451 Part 41 Permit Application with basis of design (if applicable).
- d. A completed Act 399 Permit Application (if applicable).
- e. All easements properly signed and recorded at the Genesee County Register of Deeds. The easement should be returned to this office once it has been recorded at the Register of Deeds. These easements and any conditions on shall appear on the plans.
- f. Project specifications (if differing from GCDC-WWS 6th Edition).
- g. Detailed shop drawings shall be supplied for any special structure, pump station, etc.
- h. Copies of any other permit applications necessary for the project (wetlands, floodplain, etc.)
- i. Letter from a licensed professional engineer certifying the capacity (for sanitary sewer only).
- j. A Letter of Authorization to review from the local municipality.
- k. Plans are reviewed with two (2) weeks of being received if the application is complete.

B. GENERAL

The basic format for construction plans must include:

- a. Cover Sheet.
- b. Note Sheet(s).
- c. Construction Plan Sheet(s).
- d. Construction Profile Sheet(s).
- e. Sanitary Sewer and/or Watermain Standard Details.
- f. General Notes Sheet.
- g. Soil Erosion/ Sedimentation Control Details.
- h. Pump Station and Forcemain Detail Sheets.
- i. Meter Pit Note Sheets.
- j. Paving and Storm Sewer Details.

- Please make sure ALL UTILITIES are shown in both plan and profile. All plans must have, as a minimum, one sheet showing the utilities master plan for the project.
- Plans shall be submitted on a standard 24" x 36" format. The minimum scale for the detailed construction drawings shall be 1"=50' horizontal and 1"=10' vertical.
- All plans shall be submitted to all utility companies, any affected municipality, etc.

C. COVER SHEET

A cover sheet shall be supplied for all public utility projects. The cover sheet shall, at a minimum, contain the following basic information:

- Project Name along with the Municipality, County name, and section number clearly shown.
- Location map with layout sketch of project. (Larger projects may require a separate layout sheet).
- Engineer's Seal, signed & dated.
- Developer's name, address, and phone number.
- Sheet index.
- Legal property description.
- Legend.
- Listing of Plan Distribution with contact person and date plans submitted to utility
- Total Disturbed Area and statement whether NPDES storm water permit is or is not required.
- Miss Dig 811 Alert
- Easement Statement - All public sanitary sewers and public watermains shall have an easement granted to GCDC-WWS and/or local municipality for maintenance, repair and/or replacement. For condominiums, the easement shall be recorded on the master deed document and for a subdivision, the easement shall be noted on the final recorded plat. All others shall be recorded on the NEW standard GCDC-WWS easement form.
- (Place **BOLDLY** on the cover sheet). **Note: This project has been designed implementing the latest GCDC-WWS Design Specifications. Carefully review the notes, details, and design prior to submitting a bid. Full compliance with the new standards will be required.**
- A statement whether or not existing utilities were exposed for verification of location and elevations.

D. NOTE SHEET

The second sheet of any set of construction plans shall be a general information sheet for contractors regarding this project. The following items shall be on this page:

- General Construction Notes
- Watermain Notes
- Sanitary Sewer Notes
- Bid Notes

- e. Special Project Notes
- f. Forcemain & Pump Station Notes
- g. Storm Sewer & Pavement Notes

E. MINIMUM ITEMS TO BE INCLUDED ON THE PLANS:

The plan shall include but will not necessarily be limited to the following items:

- a. All geographical and topographical features.
- b. Location of proposed utility.
- c. All property lines shown on the plans.
- d. All phase lines shown on the plans.
- e. All existing underground utilities shown in plan and in profile.
- f. All 6" service risers are to be shown on the plan to their termination point. Riser locations are to be determined in the field by project engineer or county inspector.
- g. A riser schedule showing the station and invert elevation for each house riser. It shall be the contractor's responsibility to install the service leads at a sufficient depth to service house basements if the main line sewer is sufficiently deep. Where feasible the service risers shall be installed at a minimum depth of 8' to 10' at the property line.
- h. All existing buildings and properties shall be provided with a sanitary service riser. This includes boring a road to serve buildings and properties on the opposite side of the road where the sanitary sewer is being installed.
- i. Where possible, the North Arrow shall be located to the top or to the right of the sheet.
- j. All easements and easement conditions shall be shown on the plan view.
- k. All utilities shall be centered within the easement, where applicable.
- l. All vacant lots shall be numbered.
- m. All proposed buildings shall be numbered.
- n. Roadways, ROW size, lot numbers, future building numbers, parcel ID numbers, street address for site, street address for surrounding buildings, and lot configuration.
- o. The location of all physical features that may be affected by the construction shall be shown on the plan view. The feature shown shall be listed and the distance left or right of the road centerline shall be shown. Physical features to be listed shall include trees, poles, headwalls, culverts, watermain valves or hydrants, driveways and type of surface, signs, mailboxes, shrubbery, gas markers, telephone markers, stumps, etc.
- p. Size, grade, length, bedding, and material of pipe between manholes or structures.
- q. First floor elevations shall be shown where critical to the design.
- r. Stationing along the utility centerline.
- s. **All compacted sand backfill shall be noted on both plan and profile view.**
- t. A benchmark referenced the USGS or NGV vertical datum. Benchmark locations shall be identified on the plan view. All benchmarks shall be listed with a description, elevation and location.

- u. For the crossing of any stream or county drain, the direction of flow, low water elevation, high water elevation, flood plain limits, wetlands, and low point of channel bottom at crossing, shall be listed by elevation.
- v. Meters shall be placed on the utility crosses a municipal boundary or connects to a county owned utility.

F. GENERAL NOTES TO BE INCLUDED:

Utility Warning - Underground utility locations as shown on the plans were obtained from utility owners, and were not field located. A minimum of three (3) working days prior to beginning construction, the contractor shall notify "MISS DIG" (811) and have all underground utilities staked before any work may begin. The contractor shall be responsible for the protection and/ or relocation of all utilities that may interfere with construction. Three (3) Working Days Before You DIG - Call MISS DIG (811).

G. PRIOR TO SUBMITTAL TO THE STATE OF MICHIGAN:

Prior to submittal to the State of Michigan Department of Environmental Quality the following items shall be submitted to GCDC-WWS:

- a. Approval from GCDC-WWS and/or the local community.
- b. Construction plans submitted in PDF form and on clear, 4 mil mylar reproducible.
- c. The appropriate number of plans to be sent to State of Michigan.
- d. Notice of Coverage for the NPDES permit, if 5 acres or more are disturbed. The Engineer shall prepare the Notice of Coverage and submit it, along with a check for \$400.00 payment to the State of Michigan, along with the completed Soil Erosion and Sedimentation Control application, to GCDC-WWS.
- e. Payment shall be made for all inspection and water usage fees. GCDC-WWS Inspection fees are detailed in the current fee schedule, attached

H. SANITARY SEWER DESIGN

In general, all sanitary sewers shall be designed in accordance with the current edition of the Recommended Standards For Wastewater Facilities (10 State Standards) and the GCDC-WWS Standard Specifications and Details.

1. DESIGN BASIS

Average sewage flow: 1 unit = 3.5 people at 90 gpd = 315 gallons/day. The engineer may be required to submit the basis of design to GCDC-WWS.

2. DESIGN CRITERIA

All construction and material shall conform to the latest GCDC-WWS Standard Specifications and Standard Details. All public systems shall have a minimum pipe size of 8". All public systems shall be extended to the furthest limits of the property and properly sized according to GCDC-WWS determination.

3. PLAN REQUIREMENTS

- a. Generally no lateral sewer shall be constructed with less than 8' of cover below the crown of the existing or proposed road grade. Where shallow sewers are anticipated, the basement elevation of all affected buildings (proposed and existing) shall be shown on the plan. Where the cover over the crown of the sanitary sewer is less than 48", the design engineer shall specify a minimum thickness of an approved insulation cover above the top of the sewer and extending one foot either side.
- b. The minimum size of a public sewer shall be 8" in internal diameter.
- c. All public systems shall be **extended** to the furthest limits of the property, including corner lots, properly sized according to GCDC-WWS determination.
- d. Proposed inverts and surface elevations of each manhole shall be shown.
- e. In the profile view, show the proposed ground elevation, existing ground elevations, existing ditch centerline elevations, and the centerline of road elevation.
- f. A numbering sequence for manholes, valves, hydrants, etc.
- g. All sanitary sewers shall be designed and constructed so as to discharge a minimum velocity of 2' per second when flowing full. Velocities greater than 12' per second should be avoided where possible.
- h. Manhole spacing shall not exceed 400' for sewers under 15" and not exceed 600' for sewers larger than 18".
- i. Core drill all existing manholes and install an approved flexible rubber boot.
- j. Internal drop connections will not be allowed on public sanitary sewers. Connections within 30" from the invert of the outlet sewer are acceptable without an external drop connection.
- k. Show all external drops for sewer connection exceeding 30" from the existing invert and reference the sanitary sewer standard detail.
- l. A horizontal separation of 10' shall be maintained between sanitary sewer and public water supply.
- m. Show method of connection referenced to Standard Details including the method of connection.
- n. Plan or profile note: "Contractor shall not connect to the existing outlet sewer until the proposed sanitary system is tested and approved by GCDC-WWS." The ENGINEER shall indicate the connection method to be used.
- o. For mainline bores, in plan **and** profile view, show length, size and thickness of the casing pipe with a reference to the appropriate standard detail.
- p. Show approved bedding requirements for all pipes to be used.
- q. Show length, grade, and pipe material between manholes.
- r. 6" service risers shall be shown and referenced to a standard detail. Design shall incorporate one lead per parcel on both sides of the road with the exact location to be determined in the field. Indicate a typical length for main side and bore and include material and length. For bores, show casing size, thickness, material and length. All 6" service risers are to be bedded pursuant to PVC bedding detail. Show invert elevation for all service leads.

- s. All saddle taps shall be made by GCDC-WWS. The developer shall submit required fee per tap. There shall be NO 6" saddle taps made on interceptor sewers, unless approved by the Division Director.
- t. All public sanitary sewer shall be televised by a reputable company whose approval is determined by GCDC-WWS and submitted to GCDC-WWS prior to final acceptance. Reference Note: All public sanitary sewer 8" or larger shall be internally televised by the contractor, and the TV reports, including the tapes, shall be given to GCDC-WWS prior to the request for final acceptance. The contractor shall be responsible for cleaning the line and assuring all dirt and debris has been removed prior to televising. The TV report shall list the distance a house lead is located from a manhole, all shear breaks in the main or service riser, all longitudinal cracks, broken pipe, dips in the line, pin holes, etc. For PVC public sanitary sewers, these defects shall be repaired by the contractor by excavating, or if applicable & approved, grouting. A leaking joint is defined as having sufficient infiltration to wet the interior of the joint. GCDC-WWS shall be notified when the line is to be televised to be present to inspect repairs. The sanitary sewer shall be televised in an upstream mode, so as to correlate measurements of tees to inspector's field measurements.

I. WATERMAIN DESIGN

In general, all watermains shall be designed in accordance with the current edition of the Recommended Standards For Water Works (10 State Standards) and the GCDC-WWS Standard Specifications and Details.

1. DESIGN BASIS

Water supply systems shall be designed to furnish an average daily flow of 100 gallons per capita per day and a maximum of 200 gallons per capita per day. The water supply system shall be designed to provide a minimum of 1500 gpm at 30 psi residual pressure. When the fire protection is to be provided, system design should be such that fire flows and facilities are in accordance with the requirements of the State Insurance Services Office. The engineer may be required to submit the basis of design to GCDC-WWS.

2. DESIGN CRITERIA

All construction and material shall conform to the latest GCDC-WWS Standard Specifications and Standard Details. All public systems shall have a minimum pipe size of 8" and be designed to loop all watermain and eliminate dead end lines. All public systems shall be extended to the furthest limits of the property and properly sized according to GCDC-WWS determination.

3. PLAN REQUIREMENTS

- a. Place a note on plan or profile regarding testing procedures used.
- b. If the contractor is pressure testing against an existing valve, then a note shall be placed on the construction plans regarding procedures.

- c. Notes for temporary corporations for chlorinating and proper testing procedures.
- d. Remove corporations after satisfactory testing, and cap with copper threaded plugs.
- e. Show depth of cover, bedding, length and material in profile view.
- f. Show typical water service connection size in plan view, and reference standard detail.
- g. In profile view, show the proposed and existing ground elevation.
- h. For hydrant assemblies in plan, note the tee, hydrant, valve, box, approved restraints & standard detail.
- i. Show PROPER size manholes on ALL pressure taps and cut in valves.
- j. Place fire hydrants (temporary or permanent) at the end of ALL lines.
- k. Watermains shall have at least 10' of horizontal separation from any Sanitary Sewer or Storm Sewer.
- l. Hydrants shall be installed at a minimum of every 500 feet.
- m. The minimum watermain size shall be 8" in diameter. A maximum of 300 lineal feet of 6" may be allowed in cul-de-sacs, etc., if this size meets with the allowable design basis.
- n. Gate valves at the end of lines shall have one pipe length added prior to any reducer and end with a fire hydrant, then with a restrained plug.
- o. All public systems shall be extended to the furthest limits of the property, including corner lots, properly sized according to GCDC-WWS determination.

J. FORCEMAIN CONSTRUCTION NOTES

In general, all watermains shall be designed in accordance with the current edition of the Recommended Standards For Wastewater Facilities (10 State Standards) and the GCDC-WWS Standard Specifications and Details.

1. PLAN REQUIREMENTS

- a. All material and construction procedures for forcemain shall conform to GCDC-WWS standard details and specifications. All forcemain shall be Ductile Iron when forcemains are 4" in diameter or greater. All piping within any submersible stations shall be supported in an approved method.
- b. Minimum cover over the top of the forcemain shall be 5' from final grade. The forcemain may be lowered during construction to avoid underground problems.
- c. The connection shall not be made to the outlet gravity sewer until approval has been granted by GCDC-WWS.
- d. Contractor shall place approved thrust restraints at all horizontal and vertical bends. Restraints shall be in accordance with manufacturer's recommendations for pressure generated by the pumping system and in accordance with the GCDC-WWS standard details and specifications.
- e. All constructed elevations at point of beginning, at stream or drain crossings, if any, and at point of ending shall be field determined by the contractor using proper surveying equipment and the information incorporated into the record drawings.

- f. All forcemain shall be pressure tested in accordance with the GCDC-WWS standard details and specifications. All testing is to be done by the Contractor under the observation and supervision of a representative of GCDC-WWS.
- g. The entire project shall be restored to as near as original condition as feasible and in accordance with standard specifications. Restoration shall include repair and replacement of sidewalks and drives, gravel restoration, and re-surfacing of any hard surfaced areas disturbed during construction. Culverts, mailboxes, shrubs, etc. shall be replaced prior to placement of 4" of clean topsoil. The contractor is responsible for seeding, fertilizing and mulching the entire length of the project.

K. PUBLIC PUMP STATIONS

In general, all pump stations shall be designed in accordance with the current edition of the Recommended Standards For Wastewater Facilities (10 State Standards) and the GCDC-WWS Standard Specifications and Details.

1. PUMP STATION DATA

The following information shall be provided to GCDC-WWS for review and approval:

- a. Basis of design
- b. Station type: wetwell/submersible or wetwell/drywell.
- c. Proposed pumping units to be served by this project & future
- d. Average sewage flow: 1 unit = 3.5 people @ 90 gpd = 315 gallons/day
- e. Must be able to pump existing and projected sewage with largest pump out of service.
- f. Pump curve, as a minimum, will show: Total Dynamic Head, GPM, RPM, impeller size, HP, motor eff., NPSHR, NPSHA, design peak flow.
- g. Wetwell diameter, working volume, drawdown time, fill time.
- h. Auxiliary equipment: as a minimum, in conformance with standard detail for control panels.
- i. Pump controls - mercury float switches.
- j. Size, material, length, and velocity of forcemain
- k. Buoyancy calculations
- l. Any needed air release valves.
- m. Spare parts: (alt., lights, etc.)

2. PLAN REQUIREMENTS

- a. All components and construction of the proposed pump station shall be in accordance with GCDC-WWS standard details and specifications.
- b. Contractor shall submit sufficient copies of shop drawings for approval by the design engineer and by GCDC-WWS.
- c. The contractor shall order and pay for all costs associated with supplying power to the pump station. The power supply shall be 3 Phase. The supply of power shall include, but is not limited to, any required 3 Phase power extension, power poles, transformers, power drop, meter, etc.

- d. All electrical work and material shall be in accordance with NEC, local, state codes, and any other applicable codes.
- e. Design engineer shall show all pump station data, design, and buoyancy calculations on the plan sheet.
- f. The wetwell shall be sized according to service area, proposed and future flows, and pump sizes. The wetwell shall conform to GCDC-WWS standard details and specification. A basis of design shall be submitted to GCDC-WWS for review and approval.
- g. The valve vault shall be separate from the wet well with valves, emergency connection, etc. and approved through the shop drawing submittal process.
- h. Contractor shall be responsible for all installations and start-up work and shall furnish and install all materials to deliver a functional pumping station.
- i. O&M manuals shall be supplied to GCDC-WWS and approved prior to final acceptance.
- j. The contractor shall install 6AA crushed limestone (A1) under the wetwell and valve vault. 6AA crushed limestone (A1) shall extend from the bottom of the excavated area to the top of the forcemain and any inlet gravity lines. Compacted sand backfill shall be placed around the rest of the wetwell and valve vault.

Genesee County Drain Commissioner's Office
Division of Water and Waste Services
Construction Plan Submittal Check List 7th Edition

Project Name: _____

Parcel and or Parcel #'s _____

**The following information shall be included with, or
appear on all, construction plans submitted to this office:**

Please note that if any of the following information is not applicable to the development being submitted, so state with reason.

GENERAL

- \$250 construction plan review fee. Checks payable to "The Genesee County Drain Commissioner".
- A copy of this Construction Plan Submittal Checklist, signed and dated.
- Transmittal sheet indicating if this is a first time submission or if the plans are being resubmitted.
- Letter signed and sealed from a professional engineer stating there is adequate sanitary sewer capability for this development, which shall include all calculations and flow maps. This shall include the entire route from the proposed site to the interceptor.
- Site plan approval letter from the local municipality.
- Tax map of area with appropriate property highlighted. Tax map shall also show the surrounding area, including both sides of the road and can be obtained from the Genesee County Dept. of Equalization.
- Sheet size of 24" x 36". (If a different sheet size is proposed, this office must be contacted prior to submitting plans.)
- Legend.
- GCDC-WWS Demolition Notes, if applicable.
- Minimum scale shall be 1" = 50'.
- All parcels have been serviced with sanitary and watermain adjacent to this property.
- IPP Permit Application for all non-residential buildings if applicable.
- Copies or applications for all EGLE permits as applicable to the development.
- Soil Erosion & Sedimentation Control Plan (SESC) or copy of SESC Permit.
- All existing (water, sanitary sewer, and storm water) utilities shown on the plans and labeled with their size (rims, invert), elevation, and material. Please also label any utilities in other areas where conflicts may arise.

- Recorded easements for the proposed public utility extensions. Minimum width for easements shall be Sanitary Sewer = 20' and Watermain = 15'. The utility shall be centered in the easement.
- Benchmarks shall be shown and labeled in either USGS or NGV datum.
- Utilities shall be extended to the furthest limits of the property.
- Location of the 100-year flood plain elevations and wetlands.
- Roadways, ROW size, lot numbers, future building numbers, parcel ID numbers, street address for site, street address for surrounding buildings, and lot configuration.
- GCDC-WWS' most current detail sheets and general construction notes as applicable which can be found on the website.
- Plans have been submitted to GCDC-SWM (Surface Water Management) for Storm and/or Surface Water review (if applicable).

COVER SHEET

The cover sheet shall, at a minimum, contain the following basic information:

- Project name, address, scale, and north arrow
- Location map with layout sketch of project
- County, municipality, and section number below project name
- Plans signed and sealed by a professional engineer, surveyor, or an architect
- Developer's name, address, and phone number
- Sheet index
- Legal description
- Plan distribution list including contact names and dates submitted to utility/agency
- Total disturbed area and a statement clarifying whether an NPDES permit is or is not required.
- 811 "Call Before You Dig" Alert
- GCDC-WWS Contractor Alert Statement and Easement Statement
- A statement clarifying whether or not existing utilities were exposed for verification of location and elevations.
- Verification that there are no franchising agreements, no community boundary crossing restrictions, no municipal agreements restricting connections.

APPLICATIONS

The following applications shall be submitted with the construction plans:

- IPP Permit Application for all non-residential buildings (includes churches, schools, etc.). Applications can be downloaded from www.gdcwws.com.
- SESC Permit Application, Plans, and appropriate fees.

I hereby certify that the abovementioned items have been provided with the submitted plans.

Name of Party Preparing Checklist: _____

E-mail address of Party Preparing Checklist: _____

Signature: _____ **Date:** _____

OFFICE USE ONLY

This application review packet will be reviewed for completeness within 5 business days of being received. If the application review packet is found to be incomplete it will be returned in its entirety to the entity that made the submission.

Dated Received: _____

Is this application complete? YES NO

Dated Verified: _____

Project Engineer Detailed Review:

Sign: _____ **Date:** _____

Note: It is necessary to submit only one set of construction plans for review and approval of sanitary sewer and watermain and only one set of plans for SESC review and permitting.

REVIEWER COMMENTS: