

CITY OF FARMINGTON
Checklist for Detailed Engineering Plans

Note to Design Engineers:

The following checklist is intended to serve as a guide for designers to review prior to submitting plans to the City for review. While this checklist covers all major areas that will be reviewed by the City's Engineer, this list is not all-inclusive and the City Engineer may comment on items not listed herein.

General Requirements

- ┌ Submittal shall be on 24" x 36" white paper having blue or black lines with a minimum horizontal scale of 1" = 50' and vertical scale of 1" = 5'. Other acceptable scales are 1" = 20'; 1" = 30' and 1" = 40'.
- ┌ A general plan at a scale 1" = 100' or 1" = 200' shall be provided when the size of site prohibits a single plan sheet. Show street names, units, utilities, pavement, site dimensions, phase lines, lot lines, and lot numbers.
- ┌ A location map showing section number(s) and major thoroughfares in the project area shall be provided on the cover sheet of the plans.
- ┌ Lot number, parcel dimensions, and adjoining right-of-ways (ROW) shall be shown.
- ┌ City Standard Notes and Details must be attached to the plans. The Standard Notes and Details are included in the Digital Appendix.
- ┌ The plans must be signed and sealed by a professional engineer registered in the State of Michigan. All correspondence concerning the design of the site will be directed to the engineer whose seal appears on the plan.
- ┌ The name, address, and phone number of both the applicant and the design engineer must be shown on the plans.
- ┌ A legal description of property must be provided on the plans.
- ┌ Both existing and proposed utilities must be a minimum of 10' from existing or proposed buildings.
- ┌ A north arrow, scale, and MISS DIG notice must be shown on the plans.
- ┌ The storm sewer, sanitary sewer, and water main shall be shown on the same plan view. The landscaping plan shall be overlaid in light scale in for reference; plantings must not interfere with utilities.
- ┌ When more than three (3) plan sheets are in a set, a cover sheet with an index shall be provided and each plan sheet shall include a title block providing a summary of the information presented on that particular sheet.
- ┌ Adequate space must be provided to allow for turning movements of vehicles, including trucks and fire engines per AASHTO guidelines.

Topography

- ┌ A complete topographical survey is required for all proposed projects. A metes and bounds legal description of the project site shall be provided on the plans. Property lines shall be indicated by bearing and distance in the plan view. All existing easements shall also be shown on the plan view of the existing conditions.
- ┌ A minimum of two (2) benchmarks are required. All benchmark elevations shall be referenced to North American Vertical Datum of 1988 (NAVD '88). All benchmarks shall be clearly indicated on the plans.
- ┌ Existing offsite elevations must be given at a minimum of 50 feet and 100 feet abutting the entire perimeter of the site. Grades will be indicated at all property corners and along all property lines.

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- Onsite, intermittent elevations, and/or defined contours (minimum contour interval of two (2) feet) are required to establish the existing site drainage.
- Existing features shall be located and shown within 100 feet of the project. Existing features to be shown shall include, but may not necessarily be limited to, the following items:
 - Ditches.
 - Culverts.
 - Water supply system, stormwater management, and/or sanitary sewer facilities, including inverts and casting elevations at all structures.
 - Gas, telephone, electric, and cable television lines, including manholes and/or utility poles.
 - Pedestrian facilities.
 - Trees and other landmark vegetation.
 - All streams, lakes, and/or county drains with names shown.
 - Existing buildings and permanent structures.

 - Existing adjacent roads and existing right-of-way or easement lines shall be shown on the plans and shall extend across the entire site with grades shown on both sides of the road for:
 - Right-of-way or easement line.
 - Ditch centerline.
 - Top of bank.
 - Edge of shoulder.
 - Edge of pavement or top of curb.
 - Crown or centerline.

Water Supply System

- Water distribution system improvements shall be designed in accordance with the requirements of the Michigan Safe Drinking Water Act, Act 399 of the Public Acts of 1976, as amended; as well as the latest revisions of the standards prescribed by the American Water Works Association (AWWA), the Great Lakes Water Authority (GLWA), and as specified herein.
- Water infrastructure improvements specified in the City of Farmington Water Reliability Study may be required as part of the project. The applicant shall contact the City Engineer to determine if any improvements called for in the City of Farmington Water Reliability Study will be necessary.
- Plan and profile views shall be provided for all proposed water main, including all fire hydrant leads. The plan and profile shall be presented on the same plan sheet and shall be vertically oriented.
 - A water main quantity list shall be provided on the cover sheet of the detailed engineering plans. The quantity list shall be delineated by existing or proposed road right-of-way or easement.
 - The following information must be shown in the plan view of the proposed water supply system improvements:
 - Type, class, and size of pipe.

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- Length between fittings and/or appurtenances.
- Water service locations and sizes.
- Where required, a dedicated water main easement must be shown on the plans. The easement width shall be the greater of the following: Twice the depth of bury plus the pipe diameter plus 2 feet (rounded to the next largest full foot), or 15 feet, whichever is greater. Where water main is adjacent to and parallel to the right-of-way, a water main easement must be extended across the entire frontage of the property.

- The following information must be shown in the profile view of the proposed water supply system improvements:
 - Type, class, and size of pipe.
 - Length between fittings and/or appurtenances.
 - Top of casting elevation on valve wells and/or boxes, as well as the finished grade for fire hydrants.
 - Crossing of all existing and proposed utilities, including leads.
 - Granular backfill, trench details, special bedding, bores, and/or other special construction methods.
 - Existing and proposed ground elevations.

- Where public water main construction is proposed, the City Standard Water Main Detail Sheets must accompany the plans. The Standard Details are included in the Digital Appendix.

- Water Main
 - The minimum size water main allowed for use in the distribution system shall be 8" diameter. Other allowable sizes for use in the distribution system are 12" and 16". A 12" water main may be considered as minimum for internal transmission on industrial sites, major streets, collector streets, and elsewhere as design dictates. Water mains larger than 16" in diameter are considered transmission mains.
 - Water supply systems shall be designed to provide service from a double source of supply ("looped main") or to provide service by a double source of supply in the future when adjacent properties are developed with the approval of the City Engineer.
 - Terminal dead end water mains with domestic service connections are discouraged, and will not be permitted without the written approval of the City Engineer. Where terminal dead end water mains are permitted, a gate valve and fire hydrant shall be provided at the terminus of the main. The following are the maximum allowable lengths for terminal dead end water mains:
 - 40 feet for 6" fire hydrant lead.
 - 600 feet for 8" water distribution mains (residential areas only).
 - 1,000 feet for 12" and larger water distribution mains.

- Water main shall be designed and constructed with a minimum 5½' depth of cover over the top

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of pipe as measured from the proposed final grade. A minimum 18" vertical clearance shall be maintained between water mains and other underground utilities. Where the vertical alignment of the water main must be deflected in order to achieve the required vertical clearance, the length of the deeper main shall be kept to a minimum and standard 45° bends shall be used to affect the necessary deflection.

- A minimum of ten (10) feet horizontal separation shall be maintained between water main and sanitary sewers and/or storm sewers. A minimum of 5 feet horizontal separation shall be provided between water mains and other underground utilities and/or structures.
- Valves
 - Water supply system improvements shall be designed to include adequate valves to properly isolate sections of water main without adversely impacting significant portions of the system. Valves on water mains 16" and smaller shall be gate valves and valves on water mains larger than 16" shall be butterfly valves.
 - The connection of proposed water mains to existing water mains shall be accomplished by means of a tapping sleeve and valve unless the connection can be made without interrupting service on the existing water main or if the existing water main is 16" diameter or larger.
 - Valves shall be located so that:
 - Three (3) valves can be closed to isolate any section of water main, four (4) maximum.
 - No more than 800 feet of water main out of service for 8" water mains; not more than ¼ mile of water main out of service for mains 12" and larger.
 - No more than two (2) fire hydrants out of service.
 - No more than 24 single-family units or 30 multiple-family units out of service.
 - Valves shall generally be located such that they will not be in street pavements, sidewalks, or driveways.
 - All valves shall be installed in a three-piece, adjustable valve box with the following exceptions: Valves will be installed in gate wells where the valve will be located within existing or proposed pavement, or the valve is located on a water main larger than 16" in diameter, or the valve is part of a tapping valve connecting to a concrete water main requiring the use of a saddle sleeve.
- Fire Hydrants
 - Generally, fire hydrants shall be spaced such that not more than 250' of fire hose would be required to reach the farthest corner of any proposed building. The spacing of hydrants around multiple, commercial or manufacturing establishments shall be considered on an individual basis and shall be determined by consultation with the City Engineer and the City Fire Marshal.
- Domestic Service Connections
 - No service connections shall be permitted from 6" fire hydrant leads or transmission mains.

Sanitary Sewer

- Sanitary sewer infrastructure improvements specified by the City of Farmington shall be designed in

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accordance with the requirements of Part 41 of Act 451 of the Public Acts of 1994, as amended; the most recent revision of the Recommended Standards for Sewage Works by the Great Lakes-Upper Mississippi River Board of State Sanitary Engineers (commonly known as the “Ten States Standards”); and as prescribed herein.

- Public sanitary sewers shall be provided where multiple lots or parcels will be served either presently or in the future. Public sanitary sewer system extensions will require the review and approval of the City Engineer, the City and the MDEQ. Public sanitary sewers are required when two or more connections are made to the same sewer. In most instances, including multiple unit developments, the sewer may have to be public even though the project has one owner. City approval will be required for private services serving more than one building. The extension of the sanitary sewers will generally be required across the entire frontage of the site.
- Sanitary sewer improvements specified in the City of Farmington SRF Project Plan may be required as part of the project. The applicant shall contact the City Engineer to determine if any improvements called for in the City SRF Project Plan will be necessary.
- Plan and profile views shall be provided for all proposed sanitary sewer system improvements, including force mains. The plan and profile shall be presented on the same plan sheet and shall be vertically oriented.
- Sanitary sewer design flow computations, sanitary sewer district map and sanitary sewer quantity list shall be provided on the cover sheet of the detailed engineering plans. The design flow computations and sanitary sewer district map shall include both current and future service populations and areas. The quantity list shall be delineated by existing or proposed road right-of-way or easement.
- The following information must be shown in the plan view of the proposed sanitary sewer system improvements:
 - Size, material, and type of pipe.
 - Length between structures.
 - Slope of sewer between structures.
 - Where required, a dedicated sanitary sewer easement must be shown on the plans. The sanitary sewer easement width shall be either twice the depth of the pipe plus the diameter of the pipe plus 2 feet (rounded up to the nearest whole foot), or 25', whichever is greater.
 - Top of casting and invert elevations at each structure.
 - Progressive numbering system on structures.
- The following information must be shown in the profile view of the proposed sanitary sewer system improvements:
 - Existing and proposed ground elevations.
 - Length, type, class, size, and slope of pipe between structures.
 - Top of casting and all sewer inverts at all structures.
 - All utility crossings.
 - Special backfill areas, (i.e. sand).
 - Provisions for infiltration testing.