

Municipal Standards

City of Ionia

Project No. 221589

October 4, 2023

City of Ionia

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CHAPTER 1 – GENERAL INFORMATION2

- Introduction.....2
- Acronyms & Definitions.....3
- Regulatory Requirements4
- Land Division Act4
- Inland Lakes and Streams Act4
- Wetland Protection Act.....4
- Floodplain Regulatory Authority.....5
- Soil Erosion and Sedimentation Control Act.....5
- State and Local Building Codes5
- Underground Utilities Act, Public Act 53 of 1974.....5
- City Codes and Ordinances5
- Sanitary Sewer and Water Main Permits.....6
- Utility Locations within Street Rights-of-Way.....7
- Easements and Rights-of-Way7
- Transfer of Ownership7
- Administrative Procedures and Fees8
 - General8
 - Fees8

CHAPTER 2 – GENERAL CONSTRUCTION REQUIREMENTS10

- General Construction Specifications.....10
 - Insurance.....10
 - Bonds and Other Surety Guarantees.....10
 - Hold Harmless Agreement.....10
 - Sundays and Night Work11
 - Compliance with Law11
 - Oral Agreements11
 - Superintendence.....12
 - Drawings and Specifications12
 - Shop Drawings12
 - Safety13
 - Use of Job Site13

Protection of Work13

Construction Observation.....13

Boundary Marker Replacement14

Release of Lien14

CHAPTER 3 – STANDARDS FOR UTILITY CONSTRUCTION WITHIN EXISTING STREET RIGHTS-OF-WAY.....16

 General16

 Construction Operations16

 Pavement Crossings.....17

 Pavement Replacement.....17

 Sidewalk and Driveway Approaches.....17

CHAPTER 4 – DIGITAL DATA SUBMISSION STANDARDS19

 Scope19

 Objective.....19

 Coordinate System.....19

 Data Format19

 Data Layering20

CHAPTER 5 – STANDARDS OF DESIGN – STREETS AND MUNICIPAL UTILITIES22

 Standards of Design – Streets22

 Scope22

 Drawings and Specifications.....22

 Subsurface Soil Conditions23

 Rights-of-Way23

 Utility Locations within Street Rights-of-Way23

 Sidewalk23

 Driveway Approaches23

 Development Access Requirements, Dead End Streets, and Cul De Sacs.....24

 Roundabouts.....24

 Street Design Criteria.....24

 Restoration Adjacent to Streets25

 Street Signing and Striping25

 Street Lighting.....26

Standards of Design – Sanitary Sewers26

 Scope26

 Drawings and Specifications26

 Illegal Connections27

 Inverted Siphons27

 Location27

 Subsurface Soil Conditions27

 Trench Backfill and Loading Design28

 Sanitary Sewer Design28

 Minimum Diameter28

 Manholes28

 Service Laterals29

 Sediment/Grease Trap29

 Lift Stations30

 Force Main30

Standards of Design – Storm Sewers31

 Scope31

 Drawings and Specifications31

 Location32

 Best Management Practices32

 Storm Water Detention/Retention/Storm Water Quality32

 Trench Backfill and Loading Design32

 Storm Sewer Design32

 Manhole33

 Catch Basins33

 Storm Sewer Leads34

Standards of Design – Water Distribution Systems34

 Scope34

 Drawings and Specifications34

 Location35

 Minimum Size35

 Valves36

Valve Boxes and Manholes36

Water Mains.....36

Hydrants36

Service Connections.....37

Water Meters.....38

Backflow Preventers38

Temporary Water Service During Construction.....39

Water Main Testing.....39

Standards of Design – Site Development and Grading.....41

 Scope41

 Drawings and Specifications41

Standards for Design – Grading41

Landscaping and Open Areas.....42

Table of Standard Materials.....43

CHAPTER 6 – TECHNICAL SPECIFICATIONS46

 Technical Specifications Index46

 SPECIAL PROVISIONS46

CHAPTER 7 - VARIANCE PROCEDURE81

APPENDIX 182

Attachments

- City of Ionia – Site Plan Review Process
- City of Ionia – Zoning Site Plan Review Application
- City of Ionia – Public Infrastructure Permit Application

CHAPTER 1

GENERAL INFORMATION

CHAPTER 1 – GENERAL INFORMATION

Introduction

The design and construction standards for land development contained in this publication are intended as guidelines to be used by the developer in the preparation of drawings and specifications for all proposed developments in the City of Ionia (City or Municipality.) These developments include, but are not limited to, residential plats, site condominiums, apartments, condominiums, commercial development, and industrial development. The City of Ionia Municipal Standards (Municipal Standards) are to be used in conjunction with local zoning and subdivision ordinances, the State of Michigan Land Division Act, and other applicable state and local regulations to produce residential, commercial, and industrial developments that conform to the City's requirements.

Where reference is made to specifications and standards, it is understood to mean the latest revision. Whenever reference is made to specifications other than those contained herein, said specifications will apply and be binding as if fully stated in this document.

Acronyms & Definitions

AWWA – American Waterworks Association

BOCA – Building Officials and Code Administration

City – City of Ionia, Michigan

Contractor – The person, firm, or corporation engaged by the developer for construction services in conjunction with the proposed land development.

Design Engineer – The engineer engaged by the developer to prepare drawings and specifications for the proposed development.

Engineer or City Engineer – The person, firm, or corporation empowered by the City to provide the required engineering review and inspection services.

Owner or Developer – A natural person, firm, corporation, association, partnership, or other entity who proposes subdivision or other land development and/or municipal improvements, and who either has an ownership interest therein or is authorized to act as an agent on behalf of an entity having such ownership interest.

EGLÉ – Michigan Department of Environment, Great Lakes, and Energy

MDOT – Michigan Department of Transportation

Municipality – City of Ionia, Michigan

NAVD 88 – North American Vertical Datum of 1988
NEC - National Electrical Code.

Standards – “Municipal Standards” hereafter, the minimum standards for design and construction of subdivisions and land development projects.

RPZ – Reduced Pressure Zone

SESC – Soil Erosion and Sedimentation Control

State – State of Michigan

Regulatory Requirements

The developer is responsible to secure all permits required to construct the proposed project. This includes completing permit applications and payment of all related fees. The City will be required to issue certain permits and in these instances, will review the permit for conformance with permit requirements prior to issuing the permit.

The following is a discussion of some of the common regulatory requirements and permits that a developer may be required to satisfy prior to construction. It is the developer's responsibility to identify and comply with any additional regulatory requirements that may exist.

Land Division Act

The Michigan Legislature enacted the Land Division Act that gives local units of government in Michigan the authority required to ensure that new subdivisions conform to sound subdivision practices, retain their beauty and value, and remain an asset to the community.

A manual of instructions for implementing the Land Division Act is available from the State Department of Consumer and Industry Services Corporation, Securities and Land Development Bureau. The manual of instructions includes step by step regulations for preparation of the preliminary and final plats, as well as the rules and regulations of the Michigan Department of Treasury and EGLE.

Inland Lakes and Streams Act

The Inland Lakes and Streams Act controls construction operations in and adjacent to lakes and streams. A construction permit may be required and can be obtained from EGLE. All EGLE permits for submerged stream crossings and culvert and bridge construction will also be obtained by the developer.

Wetland Protection Act

In 1979, the Michigan Legislature passed the Geomare-Anderson Wetlands Protection Act, 1979 PA 203, which is now Part 303, Wetlands Protection, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NRPA). EGLE has adopted administrative rules that provide clarification and guidance on interpreting Part 303. As applicable, the developer will be required to obtain permits, as applicable, under Part 303 for any, and all work involving wetlands.

Floodplain Regulatory Authority

The State of Michigan's Floodplain Regulatory Authority, found in Part 31, Water Resources Protection, of the Natural Resources and Environmental Protection (NREPA), 1994, PA 451, as amended, requires that a permit be obtained prior to any alteration or occupation of the 100-year floodplain of a river, stream or drain. The developer will be required to obtain permits, as applicable, for work or construction in floodplain areas.

Soil Erosion and Sedimentation Control Act

Part 91, Soil Erosion and Sedimentation Control, of the Natural Resources and Environment Protection Act (NREPA) provides for the control of soil erosion and protects adjacent properties and the waters of the state from sedimentation. A permit is generally required for any earth change activity that disturbs one or more acres of land, or that is within 500 feet of a lake or stream. The developer must obtain a construction permit from the county enforcing agency. The County Enforcing Agent (CEA) for SESC permits is the Ionia County Building Department .

State and Local Building Codes

The administration and enforcement of the building, electrical, mechanical, and plumbing codes are through Ionia County. It is the developer's responsibility to consult the Ionia County Building Department for code requirements.

Underground Utilities Act, Public Act 53 of 1974

The MISS DIG Underground Facility Damage Prevention and Safety Act, Act 174 of 2013 was enacted to require notification of local public, quasi-public, and private utilities of excavation in the area of their facilities, so they can be marked prior to excavation.

City Codes and Ordinances

In addition to these Municipal Standards, the City has a comprehensive zoning and planning ordinance that outlines permitted land uses, design requirements, review fees, and penalties for violation of the ordinance. Developers are encouraged to review the requirements of the applicable ordinance(s) at the outset of their planning and design work.

Developers will complete City of Ionia application forms and provide payment in the appropriate amount to the City for site plan and to have the municipal utility drawings review. **If an application form and payment are not provided, the reviews and approvals for the project will not be performed.** To request municipal utility drawing

review, the developer will complete the City of Ionia Utility Site Plan Review, Municipal Utility Extensions, and Streets Application. See examples in the attachments after Appendix 1. For a site plan review, the developer will complete the City of Ionia Site Plan Review Application/Checklist also in the attachments following Appendix 1. included on the following pages.

Sanitary Sewer and Water Main Permits

Upon receipt of approved drawings and specifications from the developer, the developer will then prepare the EGLE Permit Applications for Water Supply and/or Wastewater Systems, as applicable. The developer will provide the City with a minimum of four (4) sets of drawings stamped by a registered engineer and an electronic PDF version for submittal with the permit application. The City will review the permit application, and if acceptable, sign it and forward the application and drawings to EGLE, for a water main and/or sanitary sewer construction permit.

Utility Locations within Street Rights-of-Way

The utilities listed below will be constructed in the designated location within street rights-of-way for new construction unless existing utility locations preclude conformance to the standard locations.

- Sanitary Sewers – centerline of the street.
- Storm Sewers – 10 to 13 feet from the centerline of the right-of-way, but not in the vehicular wheel path.
- Water Mains – 23 feet from the centerline of the right-of-way.
- Gas Mains – in dedicated frontage easement.
- Other Utilities – as approved by the Municipality.

Easements and Rights-of-Way

The developer normally will provide the City with onsite and/or offsite easements and rights-of-way. If the developer desires municipal utility service and the City is to operate and maintain the proposed municipal utilities, then easements, and/or appropriately sized rights-of-way must have to be provided to the City.

Where offsite easements are required, it is the responsibility of the developer to secure all easements for streets and utilities in the name of the Municipality. All easements required within the development will be granted by the developer. The developer will prepare the legal description, easement drawing, and written easement language for review and approval by the City. Upon securing the easements, the developer will also provide a deed of grant, conveying all ownership interest in the public improvements to the City. Easements and deeds of grant will be transferred to the Municipality prior to acceptance of the project.

Transfer of Ownership

The developer owns, is responsible and liable for the municipal utilities constructed on their site until ownership is transferred to the City. This includes times when temporary service is being provided to the site. The developer is responsible for MISS DIG staking until ownership is transferred.

At a minimum, the following must be provided to the City prior to transfer of ownership:

1. Municipal utilities and streets constructed per these standards. Any exceptions must be explicitly approved by the City.
2. Record drawings acceptable to the City.
3. Release of lien from contractor and subcontractor.
4. Easements signed and recorded with the county.

The developer is responsible for the costs associated with these items. Upon their completion, ownership will be transferred to the City through a deed of grant.

Administrative Procedures and Fees

General

All correspondence, verbal requests, submission of drawings, and related information exchanges will be directed to the City Manager or his/her designee at City Hall during normal business hours or by U.S Mail /email.

Appropriate distribution of information to staff members, drawings, etc., will be made by the City. This applies to information received from developers for the City engineer and information from the City engineer for the developer. The intent of this section is to make the City the point of contact with the developer and to maintain, in the City offices, a copy of all correspondence and related information for City use.

Fees

The developer is directed to reference the "Zoning Ordinance Fee Schedule." Developers will complete the applicable forms for the City of Ionia and provide payment in the appropriate amount to the City for municipal utility drawings or site plan review. If an application form and payment are not provided, the reviews and approvals for the project will not be performed. The City may require the developer to enter into a Development Agreement, or other agreement to accommodate the proposed development.

The City requires the developer to reimburse it for legal, engineering, and other professional fees associated with a development. Upon request by the developer, the City will provide an estimate of construction engineering and inspection charges at the time of street and utility plan approval. Please note that these charges are often directly related to the time required for the developer's contractor to perform construction. The estimated cost will be deposited with the City by the developer prior to construction. The City may request the developer to increase the amount deposited during construction if issues occur that increase the amount of construction engineering and inspection required to complete the development.

The developer is also responsible to cover the cost of independent testing associated with the development so the City may verify that proper construction techniques and materials are used. The City engineer may coordinate the testing and request reimbursement if the developer does not coordinate the testing. Either way, the cost of the testing will be borne by the developer.

CHAPTER 2

GENERAL CONSTRUCTION REQUIREMENTS

CHAPTER 2 – GENERAL CONSTRUCTION REQUIREMENTS

General Construction Specifications

Insurance

The developer will furnish a Municipality's Protective Policy for the City affording limits of not less than \$1,000,000 per occurrence for personal injury liability and property liability with an aggregate of \$2,000,000 or those minimum limits as required by the City, whichever is greater. In addition, the developer will provide XCU coverage against loss due to perils of explosion, collapse, and underground hazards. These limits are minimum values, and increased insurance coverage may be requested depending upon the nature of the development.

In the policies to be issued, the named insured will include the City and the City engineer. The original policy will be given to the City with a certificate copy to be given to the City engineer. The policy will also provide that it will not be cancelled unless the City and the City engineer have been given 30 days advance written notice of cancellation.

The developer will not commence work or allow any contractor or subcontractor to commence work under this contract until the insurance requirement referenced above has been satisfied and approved by the City.

Bonds and Other Surety Guarantees

The developer will post a performance bond equal to the value of all materials and municipality for all work to be completed in the development. Other bonds may be requested by the City depending on the nature of the development and how the construction contracts are being administered. All bonds, surety guarantees, escrow accounts, etc., will be in effect for a period of one year after final acceptance of all construction by the City.

Hold Harmless Agreement

The developer will indemnify and hold harmless the City, its officers, agents, and employees, and all additional named insured's, for and from all claims, demands, payments, suits, actions, recoveries, and judgments of every kind and description brought or recovered against any or all of them for, or on account of, any injuries to or debt of any person, or any other loss or damage to persons or property by reason of the performance of the work of the project, and for any liability or obligation imposed directly or indirectly upon the City or any of the additional named insured's by reason of any law of the State or of the United States now existing or which will hereafter be enacted, imposing any liability or obligation or providing for compensation to any person or persons on account of, or arising from the death or injuries, to any municipal employee or employee of the developer, or any of its agents, contractors, or subcontractors.

The developer will pay, settle, compromise, and procure the discharge of any and all such claims, and all such losses, damages, expenses, liabilities, and obligations, and will defend at its own cost and expense, any and all claims, demands, suits, and actions made or brought against the City, its officers, agents, or employees, and all additional named insured's for or upon any such claim. In case the developer will fail, neglect, or refuse to comply with any of the provisions of this paragraph, the City, its officers, agents, or employees, or any additional named insured may at its option, but without obligation to do so, in order to protect itself and any additional named insured from liability, defend such claim, demand, suits or actions, and pay, settle, compromise, or procure the discharge thereof, in which case the developer will repay the City including the attorney's fees paid, suffered or incurred by the City, its officers, agents, or employees, or such additional named insured. Nothing in this paragraph will be construed to apply whenever the damages arising out of bodily injury to persons or damage to property are caused by or resulted from sole negligence of any promisee or indemnity hereunder, its agents, or employees.

Sundays and Night Work

The contractor may prosecute work during the hours of daylight, defined as 7 a.m. through 6 p.m. No work will be permitted at night, on Sundays, or on holidays unless specifically authorized or directed by the City or City engineer.

Compliance with Law

The developer will give all notices required by, and comply with all applicable laws, ordinances, and codes of the local, state, and federal governments. All disconnections and demolition will comply with all applicable ordinances and codes, including all written waivers. Before beginning the work, the contractor will examine the drawings and technical specifications for compliance with applicable ordinances and codes and will immediately report any discrepancy to the City. Should the contractor fail to observe the foregoing provisions and do work at variance with any applicable ordinances or codes including any written waivers (notwithstanding the fact that such methods are in compliance with the technical specifications), the contractor will correct the methods of doing such work without cost to the City.

Oral Agreements

No oral order, objection, claim, or notice by any party will affect or modify any of the requirements of the Municipal Standards or other related ordinances and regulations.

Superintendence

The developer will give personal superintendence to the work, or assign a competent superintendent, satisfactory to the City engineer and the City, on the work site at all times.

Drawings and Specifications

The contractor will keep a copy of the drawings and specifications at the worksite.

Shop Drawings

After checking and verifying all field measurements, the developer will submit to the City engineer, for approval, one reproducible, electronic copy in PDF format of all shop drawings, which will have been reviewed and approved by the developer. The developer will be responsible for their submission at the proper time so as to prevent delays and delivery of materials. A minimum of ten workdays will be allowed for reviewing and processing shop drawings.

The data indicated on the shop drawings will be complete with respect to the dimensions, design criteria, materials of construction, and the like, to enable the City engineer to review the information as required. All details will clearly indicate the relations of the various parts to the main members and lines of the structure and where correct fabrication of the work depends upon field measurements, such measurements will be made and noted on the drawings before submission for approval.

All submissions will be referenced properly to clearly indicate the locations, service, and function of each particular item. At the time of each submission, the developer will, in writing on such drawings, call the City engineer's attention to any deviation that the shop drawing may have from the requirements of the contract documents and Municipal Standards. The City engineer will review such shop drawings with reasonable promptness, but this reviewing and approval will be only for conformance with the design concept of the project and for compliance with the information given in the contract documents and Municipal Standards.

The approval of shop drawings will indicate that the general method of construction and detailing is satisfactory and does not relieve the developer of the responsibility for any error that may exist. The developer will be responsible for the dimensions and design of adequate connections and details, and satisfactory construction. The developer will make any corrections required by the City engineer and return the required number of corrected copies of shop drawings. The approval of a separate item, as such, will not indicate approval of the assembly in which the item functions.

No work requiring a shop drawing will proceed until the submission has been approved by the City engineer. The City engineer's approval of shop drawings will not relieve the developer from its responsibility for any deviation from the requirements of the contract documents and Municipal Standards, unless the developer has, in writing on such drawings, called the City engineer's attention to such deviation at the time of submission and the City engineer has given written approval to the specific deviation, nor will it relieve the developer from errors or omissions in the shop drawings.

Safety

The developer and contractor will comply with, and be responsible for, knowledge of all current, applicable requirements of all Federal and State of Michigan Occupational Health and Safety regulations during construction of the proposed development.

Use of Job Site

The contractor will confine equipment, apparatus, the storage of materials, and worker's operations to limits indicated by law, ordinances, permits or directions of the City.

Protection of Work

The contractor will continuously maintain adequate protection of all work from damage and will protect the City's and adjacent properties from damage and/or injury arising in connection with construction and the developer will be responsible for all damage and/or injury caused by or arising out of the operations.

Construction Observation

The City and its representative will have access to observe the work wherever it is in preparation or progress at all times. The developer will provide proper facilities for access and observation. Such observation will not relieve the developer from any obligation to furnish materials and perform the work strictly in accordance with the approved specifications. The City will have the right to reject materials and workmanship that are defective or require correction. Rejected workmanship will be satisfactorily corrected and rejected materials will be removed from the premises without charge to the City. Should it be considered necessary or advisable by the City at any time before final acceptance of the entire work to make an examination of work already completed by removing or tearing out same, the developer will, on request, promptly furnish all necessary facilities, labor, and materials. If the work is found to be defective in any material respect, due to the fault of the developer or its contractors, the developer will pay all costs associated with the examination and satisfactory reconstruction. The developer will cooperate with the City and furnish assistance as may be required to facilitate inspection and/or laying out

principal reference lines or points. Any work that, during its progress and before its final acceptance becomes damaged from any cause, will be removed and replaced by satisfactory work at the developer's expense.

Boundary Marker Replacement

The developer will hire a professional surveyor, at the developer's expense to replace, all section corners, property corners, or boundary markers of any type or material that may have been damaged or destroyed during construction of the development.

Release of Lien

The developer will provide a Release of Lien from the contractor upon completion of each phase of construction prior to the City accepting the municipal utilities or streets. The release of lien will state that the contractor and all subcontractors have been paid and will not lien the project for payment of services performed. It is the developer's responsibility to provide the release of lien to the City in a timely manner.

CHAPTER 3
STANDARDS FOR UTILITY CONSTRUCTION
WITHIN EXISTING STREET RIGHTS-OF-WAY

CHAPTER 3 – STANDARDS FOR UTILITY CONSTRUCTION WITHIN EXISTING STREET RIGHTS-OF-WAY

General

This utility standard covers all water main, sanitary sewer, storm sewer, natural gas, telephone, cable television, fiber optic lines or other utilities public or private, constructed by private persons or corporations in an existing municipal street right-of-way. No work will be performed in City streets without notifying the City. The City will provide information on who has jurisdiction over the street(s) where the construction is proposed. The City reserves the right to request that performance bonds be posted to cover the cost of restoring all surfaces to their original condition. Unless otherwise specified, all work will conform to applicable provisions of the MDOT 2020 Standard Specifications for Construction or the latest version thereof.

All work will be carried on in a neat and satisfactory manner and interference with flow of traffic (i.e. City of Ionia, Michigan Department of Transportation, etc.) will be kept to a minimum. No street may be closed without prior permission from the authority having jurisdiction. The contractor is responsible for providing, installing, and maintaining traffic control signs, lights, and barricades as required by the current version of the Michigan Manual of Uniform Traffic Control Devices. If determined necessary by the authority having jurisdiction, a detour plan with appropriate control devices and signing plan will be provided. When given permission to close a street, the contractor is responsible to contact Ionia County Central Dispatch at (616) 527 0400 to provide notification.

The contractor will notify the City, Ionia County Central Dispatch, and MISS DIG (800 482 7171) at least 72 hours prior to commencing construction operations, unless the situation warrants immediate action.

Where applicable, construction drawings will be submitted to the City for approval at least 30 days in advance of the proposed construction operations. When projects include water main extensions or sanitary sewer line extensions, construction will not begin until EGLE permits are obtained. A preconstruction meeting will be held approximately 10 days prior to the start of construction.

Construction Operations

In general, construction operations will be in accordance with the applicable sections of these Municipal Standards. Upon completion of construction operations, paved surfaces (bituminous or concrete) and the ground surface will be restored in a manner similar to its original condition. The City will determine the adequacy of the restoration in its sole judgement. It is recommended that pavement restoration be discussed with the City prior to performing construction to avoid misunderstandings.

For projects on existing streets where water main construction is not included in the scope of the work, the contractor will expose existing water services and coordinate with the City to have all non-copper water services replaced.

Pavement Crossings

Unless otherwise specified, where a utility line crosses the entire width of permanent pavement, the contractor will be required to bore, bore and jack, or tunnel in accordance with the requirements of MDOT. If open cutting of the permanent pavement is allowed by the City or MDOT (depending on jurisdiction) the pavement will be saw cut prior to excavation, backfilled, and compacted in accordance with the requirements of MDOT and these standards.

Pavement Replacement

Pavement will be replaced upon completion of construction operations, weather permitting. Pavement replacement materials will be of the same material and thickness as the existing pavement. At a minimum, 4-inches (two lifts of 2-inches) of HMA, MDOT 13A mix will be placed unless directed otherwise by the City. When replacing existing pavement with a bituminous curb, the new bituminous curb will be placed integrally with the top course of pavement. During freezing weather, cold patch will be used until permanent pavement can be replaced. The utility, private persons or corporations will be responsible for maintaining the cold patch until the permanent pavement can be replaced.

Sidewalk and Driveway Approaches

Damage to sidewalks and driveway approaches will be repaired or replaced with materials of similar quality and thickness. Repairs or replacement will be done to the satisfaction of the City.

CHAPTER 4

DIGITAL DATA SUBMISSION STANDARDS

CHAPTER 4 – DIGITAL DATA SUBMISSION STANDARDS

Scope

These standards establish the requirements for the submission of digital design drawings to the City.

Objective

The City maintains digital mapping in a Geographic Information System (GIS) using Esri ArcGIS software. In an effort to incorporate record drawings into the existing City mapping system, the following criteria are required in the submission of digital data.

Coordinate System

The City mapping system is in the Michigan State Plane Coordinate System - South Zone, North American Datum 1983, International Feet. The vertical datum is North American Vertical Datum 1988. This is the preferred system in which to provide digital drawings.

If it is not possible to meet this standard, all plats and site plans must reference at least two section corners to allow for geo-referencing transformation of the data.

Digital data must be mapped to scale.

Data Format

In addition to submittal materials otherwise stated in the Municipal Standards, digital mapping files must be delivered via flash drive, Microsoft OneDrive, or File Transfer Protocol (FTP) site.

The following formats are acceptable:

1. AutoCAD drawing file (.dwg).
2. GIS Esri geodatabase (.gdb)
3. Adobe® image file (.pdf) of complete project drawings must be provided in addition to one of the above formats.

AutoCAD drawing files submittals – Individual layers must exist for the following features included in the drawings:

1. Site boundary
2. Parcel lot lines
3. Section corners – note if the point is surveyed or collected with Global Positioning System (GPS)
4. Parcel dimensions

5. Attached condominium footprints
6. Apartment, commercial, and industrial building footprints
7. Road right-of-way
8. Road names
9. Utility pipes – individual layer for each utility type (water main, sanitary sewer, storm sewer, etc.) and diameter
10. Utility labels – individual layer for each utility size and material
11. Utility structures – individual layer for each utility type and structure type
12. Detention ponds

GIS Esri Geodatabase submittals:

1. Use Esri ArcGIS Solutions for database schema.
 - a. <https://www.arcgis.com/apps/solutions/index.html?gallery=true&industry=Utilities&sortField=relevance&sortOrder=desc#home>
2. Unique feature classes for each asset type (water, sewer, stormwater, reference data, etc.) within the geodatabase.
3. Appropriate attribute data populated completely.

Data Layering

A complete list of drawing layer name descriptions must be delivered with the digital files. The metadata may be provided as an ASCII text file (.txt), a Microsoft Word document (.doc), or in World Wide Web Consortium (.xml) documents. For GIS data, metadata must include summary, description, and credits.

CHAPTER 5
STANDARDS OF DESIGN
STREETS AND MUNICIPAL UTILITIES

CHAPTER 5 – STANDARDS OF DESIGN – STREETS AND MUNICIPAL UTILITIES

Standards of Design – Streets

Scope

These standards establish the minimum requirements for the design of both public and private streets and roadways in the City.

Drawings and Specifications

1. Drawings and specifications will be prepared by a registered professional engineer.
2. Drawings will consist of a cover sheet indicating a location map and site drawing of the proposed project, drawing and profile sheets covering all the proposed street and roadway construction, and a standard detail sheet. Drawing sheet size will be 22 inches by 34 inches. Minimum drawing scale will be 1 inch = 40 feet horizontally and 1 inch = 4 feet vertically. Where a different scale is proposed, the vertical scale will be exaggerated 10 times the horizontal scale.
3. Drawings will be developed using AutoCAD® software; exceptions may be granted by the City.
4. Elevations will be based upon NAVD 88 datum. Elevations based upon assumed datum will not be approved.
5. Drawing profiles will indicate existing and proposed ground levels, NAVD 88 datum, and stationing.
6. Four sets of drawings and specifications and one set of reproducible .pdf drawings will be submitted by the developer to the City for preliminary approval. All drawings and specifications submitted for approval will be sealed by the registered engineer in charge of design. Modifications required to meet the municipal standards, if any, will be noted on two sets with one such set returned to the developer for final corrections within 30 days of receipt.
7. Six sets of final drawings and specifications will be submitted by the developer to the City for approval. All drawings and specifications submitted for approval will be sealed by the registered engineer in charge of design.
8. The developer will be responsible for securing all State and local construction permits required for street and roadway construction. The City will review and approve permit applications that satisfy all requirements. Permits will be obtained prior to beginning construction.
9. Six sets of reproducible record drawings and one disk in current AutoCAD® format will be submitted to the City upon completion of the construction.

Subsurface Soil Conditions

The developer will provide sufficient soil borings, at a minimum of one every 500 feet, and other information to accurately describe the prevailing soil conditions under proposed streets and roadways. The minimum soil boring depth will be 10 feet below the plan road grade or 5 feet below the lowest proposed utility, whichever is lower. If unstable soil conditions are encountered, the boring depth will be extended until stable soil is encountered.

Rights-of-Way

The minimum width of street rights-of-way will be 66 feet for local streets and 80 feet for arterial or section line streets. Cul de sacs will have 120-foot diameter rights-of-way. The rights-of-way for roundabouts will depend on the size of the roundabout, and will require City approval, and must be large enough to facilitate truck and emergency vehicle turning movements.

Utility Locations within Street Rights-of-Way

Utility locations will conform to the requirements outlined in Chapter 1 of these standards.

Sidewalk

Concrete sidewalks will be 5 feet wide and will be located 1 foot inside of the right-of-way line on both sides of the street, if applicable. All sidewalks within developments are required to be completed at the time of road construction. At all intersections of sidewalks and curb and gutter, appropriate pedestrian ramps will be constructed in accordance with current ADA guidelines.

The maximum allowable sidewalk grade will be 7% and the minimum allowable grade will be 0.50%. Sidewalks will project 1 inch above finished grade. In cut sections, the maximum sidewalk elevation will be 1 foot above the street centerline elevation. In fill sections, the sidewalk elevation will be no lower than 0.5 feet below the street centerline elevation. Sidewalk will have a cross slope of 1/4 inch per foot toward the street in cut sections and toward the property line in fill sections. Sidewalks will be 4 inches thick except across residential driveways, which will be 6 inches thick, and across commercial driveways, which will be 8 inches thick unless otherwise approved by the City engineer.

Driveway Approaches

All driveway approaches for new construction projects between the curb and gutter and sidewalk will be paved with concrete. Concrete driveway approaches for residential sections will be 6 inches thick and 8 inches for commercial approaches. The maximum grade on driveway approaches for new construction will be 10%. The width of the driveway curb cut will conform to the standard detailed in Appendix 1 - Typical Curb Breaks.

Maximum grade on driveway approaches in areas under reconstruction may exceed 10% if the existing driveway approach exceeds 10%.

Development Access Requirements, Dead End Streets, and Cul De Sacs

Developments with over 75 living units will have a minimum of two streets that connect into the City's street system. Large developments may be required to have additional access points as determined by the City.

Dead end streets will not exceed 800 feet in length. Cul de sacs will be provided on dead end streets to allow turning movements for trucks, emergency vehicles, and snow removal. Cul de sacs will have an outer curb radius of 50 feet. Cul de sacs will normally have a center with a concrete roll curb. The center island may be landscaped but will not be vegetated with plantings that require maintenance.

Temporary cul de sacs must be provided on all dead-end streets created by a phased development. Temporary cul de sacs must be paved, and drainage provided in an acceptable manner to the City unless maintenance is to be performed by a neighborhood or homeowner's association.

Roundabouts

Roundabouts may be permitted by the City in intersections where three or more streets converge. Roundabouts will be of sufficient size to allow truck turning movements to occur without having rear tires top or go over the curb. Roundabouts will be designed to a standard acceptable to the City and City engineer.

Street Design Criteria

All streets and roadways will include concrete curb and gutter; bituminous curb will not be allowed on new road construction. On local streets, the minimum street width will be 31 feet back-to-back of curb. Concrete curb and gutter width on major streets will conform to the "Uniform Criteria for Major Streets" as adopted by MDOT and the City's Master Plan. At all intersections, the minimum curb radius will be 25 feet, unless otherwise approved. Concrete curb and gutter will conform to MDOT F 4 with longitudinal bars or to a roll curb section approved by the City.

The minimum longitudinal grade on any street with curb and gutter will be 0.50 foot per 100 feet (0.5%). The maximum longitudinal grade on any street will be 5 feet per 100 feet (5%) unless City approval is provided. In general, the length of a vertical curve will be determined by the design speed, per American Association of State Highway and Transportation Officials' (AASHTO's), "A Policy on Geometric Design of Highways and Roads," 2018 edition, unless otherwise dictated by site topography. In general, all intersections of streets or roadways will be

made perpendicular to each other. However, intersections ranging from 75 degrees to 90 degrees from perpendicular may be approved.

Streets will normally be constructed with a crown in the center of the street. Transverse grades will normally be 2% from the centerline of the street to the edge of the curb pan. Inverted crowns are not allowed on City streets. Additional information concerning street geometrics, rights-of-way widths, block lengths, and other relevant requirements are available from the City.

Underdrains will be required on all streets unless waived by the City based on soil conditions. Underdrains will normally be placed along the curb lines and connected to the storm sewer prior to the catch basins.

Subbase for all local and major streets will consist of 12 inches of MDOT Class II sand.

Pavement design for local streets will consist of 8 inches of compacted MDOT 21AA – Modified Aggregate Base and 440 pounds per square yard of MDOT 13A or approved equal bituminous material constructed in 2 lifts: 2 1/2 inches or 275 pounds (lbs)/square yard (syd) leveling course and 1 1/2 inches or 165 lbs/syd top course.

Pavement design for major streets will reflect the increased traffic volume and higher axle loads and will be subject to approval by the City.

Bituminous material will be delivered in quad axle trucks. Large flowboys are prohibited on City streets. Any damage to City streets from delivery of bituminous materials will be repaired to the City's satisfaction by the contractor.

Restoration Adjacent to Streets

A mulch blanket will be utilized from the back of curb to a minimum distance of 4 feet from the curb. Mulch blankets may also be required adjacent to driveways, on slopes or in other areas required by the City. All other areas within the rights-of-way may be restored with seed and mulch per MDOT requirements for roadside seeding. Blown Straw is not permissible.

Street Signing and Striping

All street projects within the City will include new street name and traffic signing. Street signing will be consistent with signing throughout the City. Traffic signing will be in accordance with the current version of the Michigan Manual of Uniform Traffic Control Devices. If street parking is prohibited, no parking signs will be placed as approved by the City.

All streets will be striped with cross walks and stop bars when required by the City. Striping for centerlines and parking will be required on major streets and other streets as requested by the City.

Street Lighting

Streetlights may be required as determined by the City and will be consistent with street lighting throughout the City. When street lighting is required, provide light emitting diode (LED) luminaires with a candlepower distribution designed to a standard acceptable to the City and City engineer. Lamp posts and luminaires will be as manufactured by Spring City Electrical Manufacturing Company, Hall and Main Streets, P.O. Box 19, Spring City, PA, 19475 or approved equal. Lamp posts will be placed a minimum of 3 feet behind the back of curb or edge of pavement.

Foundations for lamp posts will be cast in place with integrally cast anchor bolts. Precast bases or screw-in foundations are not permissible.

Standards of Design – Sanitary Sewers

Scope

These standards establish the minimum requirements for the design of sanitary sewers in the City.

Drawings and Specifications

1. The drawings and specifications will be prepared by a registered professional engineer.
2. Drawings will consist of a cover sheet indicating a location map and site plan of the proposed project, drawing and profile sheets covering all the proposed sanitary sewer construction, and a standard detail sheet. Drawing sheet size will be 22 inches by 34 inches. Minimum drawing scale will be 1 inch = 40 feet horizontally and 1 inch = 4 feet vertically. Where a different scale is proposed, the vertical scale will be exaggerated 10 times the horizontal scale.
3. Drawings will be developed using AutoCAD® software; exceptions may be granted by the City.
4. Elevations will be based upon NAVD 88 datum. Elevations based upon an assumed datum will not be approved.
5. Drawing profiles will indicate existing and proposed ground levels, NAVD 88 elevations, and stationing.
6. Four sets of drawings, plus a PDF, and specifications will be submitted by the developer to the City for preliminary review and approval. All drawings and specifications submitted for approval will be sealed by the registered engineer in charge of design. Modifications required to meet the municipal standards, if any, will be noted on two sets, with one such set returned to the developer for final corrections within 30 days of receipt. Preliminary drawings may have to be resubmitted if numerous corrections are noted.

7. Six sets of final drawings, plus a PDF, and specifications will be submitted by the developer to the City for obtaining permits and construction after they are approved. All drawings and specifications submitted for approval will be sealed by the registered engineer in charge of design and will include a completed EGLE Part 41, Act 451 Permit Application.
8. The City will secure the sanitary sewer construction permit from the EGLE. The developer will be responsible for securing all other permits required for the sanitary sewer construction and prior to being provided sanitary sewer service. All permits must be obtained before construction begins.
9. Six sets of reproducible record drawings and one disk in AutoCAD® format will be submitted to the City upon completion of the utility construction. The location of all tees, manholes, and the intersection of the service lateral and the respective property line will be witnessed from at least two permanent topographic features.
10. The developer is the owner and, responsible and liable for the sanitary sewer until it is accepted by the City. The City will not accept the sanitary sewer until all grants of deeds, easements, and record drawings are provided to the City. The developer must coordinate all MISS DIG and other requests for locating the sanitary sewer, until it is accepted by the City.

Illegal Connections

The connections of footing drains, roof drains, sump pump discharge, or yard drains to the sanitary sewer are strictly prohibited.

Inverted Siphons

The use of inverted siphons will not be approved unless specific conditions warrant their use.

Location

The location of the sanitary sewer within the street rights-of-way will be on the centerline of the street.

Subsurface Soil Conditions

The developer will provide sufficient soil borings along the sanitary sewer route to accurately describe the prevailing soil conditions. The borings will be completed to a depth of 5 feet below the proposed invert elevation of the sanitary sewer.

Trench Backfill and Loading Design

Sanitary sewer construction will be backfilled with MDOT Class II sand or equal as approved by the City. All sanitary sewers will be designed so as to resist all trench backfill and construction load or anticipated superimposed loadings utilizing a factor of safety of 2.0 of the pipe's resistance to failure.

Sanitary Sewer Design

The City sanitary sewers are normally designed using polyvinyl chloride (PVC) pipe (see specifications). Other materials may be approved if their use is warranted.

Sanitary sewers will be designed to maintain a minimum velocity of 2 feet per second; maximum velocity will not exceed 10 feet per second. Suggested minimum grades for various size sanitary sewers are listed below:

Lateral Size	Minimum Grade
6-inch	1.00%
8-inch	0.40%
10-inch	0.28%
12-inch	0.22%
15-inch	0.15%
18-inch	0.12%
24-inch	0.10%

Minimum Diameter

The minimum diameter of collection sewers will be 8 inches; the minimum diameter of the service lateral will be 6 inches. The sanitary sewer size will be determined by the area to be served. The City may desire to increase the size of certain sewers, in which case the City may pay for the difference in sewer pipe and manhole material costs over and above the size required for the service area.

Manholes

Sanitary sewer manholes will be constructed at all changes in grade, size, and alignment of the sanitary sewer. The maximum run between manholes will be 400 feet. Manholes will be precast concrete with rubber "O" ring at joints; block or brick sanitary manholes will not be approved. Pipe openings will be cast in the precast section or cored and booted in the finished wall. Manhole pipe connections will be furnished with an integrally cast seal system, Kor-N-Seal or equal. Bituminous waterproofing will be applied to the outside of the manhole structure in accordance with ASTM D449.

Sanitary manholes will have an integral concrete manhole bottom. A drop pipe will be constructed for all sewers entering a manhole at a height of 24 inches or greater above the proposed manhole outlet invert as shown in

Appendix 5. The minimum inside diameter of a sanitary sewer manhole for sewers less than 24 inches in diameter will be 48 inches. For sanitary sewers 24 inches to 36 inches in diameter, the minimum inside diameter of the sanitary manholes will be 60 inches. Depending on the number of pipes, the size of the pipes, and the elevation of the pipes, larger manholes may be required by the City. A minimum of three rows and a maximum of six rows of concrete adjusting bricks or concrete rings will be constructed on top of the precast cone section. The interior and exterior of the adjusting bricks or rings will receive a 0.50-inch coat of plaster. Manholes will be provided with approved manhole steps. See Appendix 4 for Standard Sanitary Manhole detail.

The standard sanitary manhole casting will have a 24-inch clear opening. Refer to Table of Standard Materials (pages 47 and 48) for the standard manhole casting.

Service Laterals

Service laterals will be a minimum of 6-inch diameter and connected to the collection sewer with a wye or other City-approved connection. Where sanitary sewers are deeper than 12 feet, 6-inch diameter risers will be constructed such that the service lateral is 11 feet below finished grade at the property line. In addition, the developer will be required to furnish a map to the City indicating the precise location of all sanitary sewer laterals at the property line intersection. The location should be witnessed from two recoverable reference points. The service lateral will be constructed to the property line of all lots and marked in accordance with the sanitary sewer standard of construction included herein. Each residential unit will have a separate sanitary sewer service lateral whenever there is separate ownership or rental of the living unit. See Appendix 6 and 7 for sanitary service lead and connection details.

For commercial or industrial connections, a minimum 4-foot diameter sampling manhole will be constructed at the property line on the service lateral. Drawings submitted for approval will note the elevation of the service lateral at the building foundation line, as well as the invert elevation of the lateral at the collection sewer. Minimum cover over the service lateral will be 4 feet. For service laterals of extended length, manholes will be constructed approximately 5 feet outside the building structure and at all changes in direction, materials, or pipe size. As an alternative, cleanouts may be constructed at 50-foot intervals, however, their use is discouraged and will not be allowed on service laterals over 150 feet in length.

Sediment/Grease Trap

All commercial and industrial facilities (including, but not limited to, restaurants, strip malls, car washes, auto dealers, auto repair, correction facilities, etc.), that could discharge sediment or grease will provide an external sediment/grease trap when deemed appropriate by the City. The sediment/grease trap will be sized to handle peak flows and installed with a surface access for maintenance. A schematic diagram of an example grease trap is

provided in Appendix 9. A sampling manhole will normally still be required on the service lead downstream of the sediment/grease trap.

Lift Stations

The City requires that all areas that can be served by gravity sanitary sewers be provided this service. The use of sanitary sewage lift stations is discouraged due to the ongoing operation and maintenance cost associated with stations.

When necessary, sanitary sewage lift stations will be a wet pit dry pit arrangement with centrifugal pumps. The lift station structures will be either reinforced concrete section, or reinforced fiberglass structures, approved by the City.

The lift station should, to the extent possible, be of the same type of pumping equipment and manufacturer as existing municipal lift stations. The lift stations will be equipped with duplex pumps. All lift stations will be equipped with a generator (emergency power), ventilation fan, sump pump, and fire extinguisher in addition to the pumps, compressors, valves, ejectors, and other associated components. Lift stations will be equipped with a flow meter on the discharge with a recording chart. Lift stations will be equipped with high- and low-level alarms, including visual (red light) and autodialed systems. The flow meter and alarm system will be capable of communicating control information to the Ionia Wastewater Treatment Facility in a manner consistent with the City's Supervisory Control and Data Acquisition (SCADA) system. Lift station design will conform to the guidelines contained in the Recommended Standards for Sewage Works, Great Lakes Upper Mississippi River Board of State Sanitary Engineers (Ten States Standards) unless otherwise noted or approved.

The lift station to the extent possible should be compatible with the surrounding development. This will be achieved by providing appropriate structures for the emergency generator and landscaping. A paved driveway will be included in the site design. Fencing will normally be required.

Lift station design will be performed in conjunction with the City engineer and subject to the approval of the City.

Force Main

Design calculations for a proposed sanitary force main size will be submitted with the pump station design. Force main will be constructed with 6 feet of cover. Sanitary force mains will be constructed of ductile iron or high-density polyethylene (HDPE) pipe, as approved by the City. Electrical continuity and polyethylene encasement will be provided when required by the City. Green warning tape indicating "Caution Buried Sewer Line Below" will be placed between 1 and 2 feet above the crown of the force main during backfill. Piping for

sanitary force main will be restrained at all locations necessary to eliminate pipe movement stresses. Where restrained joint pipe is not feasible, thrust blocks may be used if approved by the City.

Air release and/or vacuum valves will be provided at high points and other locations approved by the City. All air release valves will be constructed in manholes. Refer to Appendix 8 for an Air Release Manhole Detail.

Upon completion of construction, all sanitary force main will undergo pressure leakage tests, and deflection testing as necessary.

Standards of Design – Storm Sewers

Scope

These standards establish the minimum requirements for the design of storm sewers in the City.

Drawings and Specifications

1. The drawings and specifications will be prepared by a professional engineer registered in the State.
2. Drawings will consist of a cover sheet indicating a location map and a site plan of the proposed project, drawing and profile sheets covering all the proposed storm sewer construction, and a standard detail sheet. Drawing sheet size will be 22 inches by 34 inches. Minimum drawing scale will be 1 inch = 40 feet horizontally and 1 inch = 4 feet vertically. Where a different scale is proposed, the vertical scale will be exaggerated 10 times the horizontal scale.
3. Drawings will be developed using AutoCAD® software; exceptions may be granted by the City.
4. Elevations will be based upon NAVD 88 datum. Elevations based upon an assumed datum will not be approved.
5. Drawing profiles will indicate existing and proposed ground levels, NAVD 88 elevations, and stationing.
6. Six sets of drawings, plus a PDF, and specifications will be submitted by the developer to the City for preliminary approval. All drawings and specifications submitted for approval will be sealed by the registered engineer in charge of design. Modifications required to meet the municipal standards, if any, will be noted on two sets, with one such set returned to the developer for final corrections within 30 days of receipt.
7. Six sets of final drawings, plus a PDF, and specifications will be submitted by the developer to the City for approval. All drawings and specifications submitted for approval will be sealed by the registered engineer in charge of design.

8. The developer will be responsible for securing all State and local construction permits for storm sewer construction.
9. Six sets of reproducible record drawings and one disk in AutoCAD® format will be submitted to the City upon completion of the utility construction. The location of all tees, manholes, and catch basins, will be witnessed from at least two permanent topographic features.

Location

The location of the storm sewer will be within the street right-of-way 10 to 13 feet from the centerline of the right-of-way and not in the vehicle wheel path.

Best Management Practices

The City requires the use of best management practices to control storm water runoff and soil erosion during construction and for the design of storm water facilities. Development drawings will be reviewed looking to incorporate best management practices whenever possible, and the developer will be required to revise the drawings accordingly.

Storm Water Detention/Retention/Storm Water Quality

The City may require the construction of storm water detention/retention or water quality facilities. If required, the facilities will meet the current requirements of the standards of the Ionia County Drain Commissioner (ICDC).

Trench Backfill and Loading Design

Storm sewers will be backfilled with MDOT Class II sand or City approved equal. All storm sewers will be designed so as to resist all trench backfill and construction load or anticipated superimposed loadings utilizing a factor of safety of 2 of the pipe's resistance to failure.

Storm Sewer Design

All main line storm sewers and catch basin leads constructed in the City rights-of-way or when requested by the City will be reinforced concrete pipe (RCP). Main line storm sewers and catch basin leads outside of the City rights-of-way may be constructed with MDOT approved plastic storm sewer pipe, if approved by the City.

Storm sewers will normally be designed per the requirements of the ICDC. Storm sewers that discharge to a county drain will meet the requirements of the ICDC. All storm sewers will be designed to provide a minimum velocity of 3 feet per second and a maximum velocity of 10 feet per second when the pipe is flowing full.

The minimum diameter for all storm sewers, including catch basin leads, will be 12 inches. The City may desire to increase the size of certain sewers, in which case, the City may pay for the difference in sewer pipe and manhole structure material costs over and above the size required for the service area.

Where applicable, the 100-year floodplain limits and floodplain elevation will be noted on the drawings.

Manhole

Storm sewer manholes will be constructed at all changes in grade, size, and alignment of the storm sewer. The maximum run between storm sewer manholes will be 400 feet or 100 pipe diameters for sewers over 36 inches in diameter. Manholes will be precast concrete and will have integral concrete manhole bottoms, whenever possible. The minimum inside manhole diameter for storm sewers through 21 inches in diameter will be 48 inches. For storm sewers from 24 inches to 36 inches in diameter, the minimum storm manhole diameter will be 60 inches. For storm sewers 42 inches and larger, the "tee" manhole riser sections will be used. Should a change in grade, size, or alignment of the pipe occur in a manhole where one or more of the sewers are 42 inches in diameter or larger, the manhole section will have a minimum inside diameter of the largest pipe diameter plus 2 feet. Depending on the number of pipes, the size of the pipes, and the elevation of the pipes, larger manholes or vaults may be required by the City. A minimum of three rows and a maximum of six rows of concrete adjusting bricks or concrete rings will be constructed on top of the precast cone section. Manholes will be provided with approved manhole steps. See Appendix 2 for standard storm manhole details.

The standard storm manhole casting is provided in the Table of Standard Materials (page 44).

Catch Basins

Storm sewer catch basins will have a minimum inside diameter of 48 inches and will provide a minimum sump depth of 36 inches below the lowest pipe invert elevation. Catch basins will be precast concrete and will have integral concrete bottom, whenever possible. A minimum of three rows and a maximum of six rows of concrete adjusting bricks or concrete rings will be constructed on top of the precast cone section. Catch basins will be constructed at all low points in the curb and gutter and will also be located so as to limit storm water travel in the gutter section to a maximum distance of 250 feet. If necessary, multiple catch basins will be required in the low points to maximize inlet capacity and to allow adequate drainage. Catch basins will not be located in driveway approaches. See Appendix 3 for Standard Catch basin detail.

Storm Sewer Leads

Storm sewer leads will be installed for each lot or parcel, extending from the main line storm sewer to the property line. Leads will be 6-inch SDR 26 pipe, connected to the main line storm sewer via a cored hole and Kor-N-Seal, or equivalent, boot. Storm sewer leads will not be connected directly to a manhole.

Standards of Design – Water Distribution Systems

Scope

These standards establish the minimum requirements for the design of water distribution systems in the City.

Drawings and Specifications

1. The drawings and specifications will be prepared by a registered professional engineer.
2. Drawings will consist of a cover sheet indicating a location map and site plan of the proposed project, drawing and profile sheets covering all the proposed water main construction, and a standard detail sheet. Drawing sheet size will be 22 inches by 34 inches. Minimum drawing scale will be 1 inch = 40 feet horizontally and 1 inch = 4 feet vertically. Where a different scale is proposed, the vertical scale will be exaggerated 10 times the horizontal scale.
3. Drawings will be developed using AutoCAD® software; exceptions may be granted by the City.
4. Elevations will be based upon NAVD 88 datum. Elevations based upon an assumed datum will not be approved.
5. Drawing profiles will indicate existing and proposed ground levels, NAVD 88 elevations, and stationing.
6. Four sets of drawings, plus a PDF, and specifications will be submitted by the developer to the City for preliminary approval. All drawings and specifications submitted for approval will be sealed by the registered engineer in charge of design. Modifications required to meet the municipal standards, if any, will be noted on two sets, with one such set returned to the developer for final corrections within 30 days of receipt.
7. Six sets of final drawings plus a PDF, and specifications will be submitted by the developer to the City for approval. All drawings and specifications submitted for approval will be sealed by the registered engineer in charge of design.
8. The City will secure the water main construction permit from EGLE. The developer will be responsible for securing all other permits required for the water distribution system construction.

9. When a contractor's work is near or associated with the City's water supply system (wells, storage tanks, booster pump stations, etc.), the contractor will provide the following information for all individuals working on the project: Full name, driver's license number, vehicle description, vehicle license plate number, and vehicle identification number. This information will be provided to the City one week prior to beginning construction operations.
10. Six sets of reproducible record drawings and one disk in AutoCAD® format will be submitted to the City upon completion of the utility construction and prior to being provided water service. The location of all valves and curb shutoffs will be witnessed from at least two permanent topographic features.
11. The developer is the owner and is responsible and liable for all water main until it is accepted by the City. The City will not accept the water main until all grants of deed, easements, and record drawings are provided to the City. The developer must coordinate all MISS DIG and other requests for locating the water main until it is accepted by the City.

Location

The location of the water main within the street right-of-way will be 23 feet from the centerline of the right-of-way whenever possible. The location of water main through a commercial or industrial development will be approved by the City. A water main placed in front of a commercial or industrial property will extend across the full width (or length) of the property being developed along the road right-of-way. The location of the water main will be chosen to allow for looping of the water distribution system. The water main location should provide the City with an easement width of 30 feet for operation and maintenance.

In no case will a water main be constructed within 10 feet (measured horizontally) from the outside edge of a sanitary sewer or storm sewer. Water main will also be located with an 18-inch vertical separation from sanitary sewers and storm sewers.

Fire hydrants will be located a minimum of 3 feet behind a curb, whenever possible; exceptions must be approved by the City. See Appendix 10 for Ionia Standard Hydrant Assembly detail.

Water mains will be constructed along the entire street frontage of commercial, industrial, and institutional developments to facilitate future extension of the distribution system. In residential developments, rights-of-way and/or easements will be provided to allow future extension of the water distribution system.

Minimum Size

The minimum size of water main will be 8 inches in diameter. Water mains will be sized within a development to meet maximum demand and meet fire flow requirements consistent with the Insurance Service Offices

recommendations when the system has the capabilities to meet these requirements. The City may desire to increase the size of certain mains, in which case, the City may pay for the difference in water main and valve material costs over and above the size required for fire flow.

Valves

American Waterworks Association (AWWA) approved, and NSF/ANSI Standard 61 certified, resilient wedge gate or butterfly valves will be placed throughout the distribution system in accordance with the following regulations:

1. On straight runs, valves will be spaced at maximum intervals of 500 feet.
2. At tees, a minimum of three valves are required.
3. At crosses, a minimum of four valves are required.
4. At the end of a dead end main, a valve and a minimum of two full lengths of water main, and a hydrant will be constructed to facilitate future connections.
5. A valve will be installed at the intersection of water mains and easement lines; the City intends to maintain water main within legal easements.

Valve Boxes and Manholes

Valves will be provided with adjustable screw type valve boxes (no deeper than 6 feet) for all valves up to 12 inches. For valves on water mains 12 inches and larger, valve manholes may be required in state highway rights-of-way, paved surfaces, berms, sidewalks, and any other location where re excavation may be difficult as determined by the City. Refer to the Table of Standard Materials and Appendix 12 for details.

Water Mains

Water mains will be constructed of NSF/ANSI Standard 61 certified, Class 52, ductile iron with a minimum cover of 6 feet. In general, water mains will be designed in a network with sufficient looping to eliminate "dead end" runs. Continuity wedges will be installed at each joint.

Hydrants

The minimum size for fire hydrants will be 5 inches in diameter and the hydrant will have connections and special construction as noted in the Table of Standard Materials. Hydrants will be spaced along the water main network such that all residential, commercial, and industrial establishments are within 300 feet of a hydrant (measured along the street right-of-way). The pumper connection will face the street. Hydrants will normally be placed a minimum of 3 feet behind the curb or edge of pavement. Hydrants will be constructed at all dead-end mains to allow for flushing.

Hydrants will be constructed from the main by use of a standard tee and gate valve; the use of Lucas tees will not be permitted. Hydrants will be provided to maintain 6 feet of cover over the water main and permit the breakaway flange to be installed 3 inches above grade or at a height per the manufacturer's recommendations. This will normally require a 6-foot hydrant length. Hydrant extensions, if required, will be provided at no additional cost to the City. Hydrant and valve will be restrained using Meg-a-Lugs whenever possible as indicated in the Ionia Standard Hydrant Assembly (Appendix 10). In special situations, a concrete thrust block of sufficient area may be constructed to resist the thrust when necessary and only when approved by the City. At the City's discretion, hydrants will have plugged drains.

Threads on the connections will be the City fire department standard which is a 4.5" fine diameter thread, also known as "Grand Rapids" thread. All hydrants will be furnished with a 5-inch diameter Harrington Integral Hydrant Storz, compatible with the fire hydrant.

Hydrants will be placed in service whenever possible including during a construction project. When hydrants are not in service, red "out of service" tags will be placed on the hydrant to warn public safety personnel of this condition.

Service Connections

The size of water service connection will be approved by the City. The City requires that compression fittings be utilized on service connections; refer to the Table of Standard Materials for the specific components the City allows on service connections. Flared or other fittings will not be allowed. Service connections and curb boxes will not be allowed in driveways, drive approaches, or sidewalks unless previously approved by the City for special circumstances.

For single family residential units where separate ownership exists (including condominiums), each living unit will have its own service lead. Connection to the water main will be made with a corporation stop with a minimum diameter of 1 inch. The service lead will be type K annealed seamless copper water tubing with compression type fittings. The service lead will be constructed to within 6 inches of the property line and will be terminated with a curb valve and adjustable curb box no more than 6 feet deep. The open end will be capped and protected during backfill operations. Each service connection will be provided with a minimum 6 feet of cover. Refer to the Table of Standard Materials for acceptable manufacturers and model numbers and Appendix 11 for details. For multi-family residential (apartments), commercial, and industrial buildings, the developer will be responsible to provide separate leads for fire protection and domestic service. The size of the leads will be determined by the developer based on their specific demand conditions, as well as applicable local and state codes. It is the developer's responsibility to determine the water system's flow and pressure at the desired location on the

system. The developer must coordinate with the City when performing flow tests to evaluate the pressure and flow for the development.

Due to the elevation change in the City, certain areas will have high water pressure. When water pressures exceed 75 pounds per square inch, or when desired by the property owner, a pressure reducing valve will be placed on the service lead. The type of pressure reducing valve must be approved by the City but is the owner's responsibility to maintain. Pressure reducing valves will be installed prior to the water meter.

Water Meters

All water use associated with the City's water system will be metered. Each metered residential unit will have its own service connection and shutoff valve and will be equipped with a shutoff before and after the yoke at owner's expense. Such shutoffs will be within reasonable distance of the yoke to permit maintenance and repair of the meter. The City standard 0.625 inch by 0.75 inch meter and yoke is available through the City for an individual residential service. Larger meter types and sizes will be approved by the City and the developer or business is responsible for installation and meter costs. Water meters must be installed in a horizontal position. All water meters installed must be compatible with the City's "radio read" system to record water consumption information. The meter and appurtenances will remain the property of the City and will be maintained by the City in accordance with City Ordinances.

Residential developments (manufactured housing, subdivision, site condominiums, planned unit developments, etc.) will provide "radio read" equipment with the water meter that is compatible with the City's water meters and meter reading system. The developer is responsible for the cost of meters and "radio read" equipment.

Multi-family residential, commercial, and industrial developments must have metering systems approved by the City. The developer will install the meter and provide sufficient space for the City to access the meter for maintenance, removing and replacing the meter in the future. Based on the daily variation in water use at these types of developments, compound meters will normally be required. The City will purchase a meter(s) for the development that is compatible with the City's metering system and will be reimbursed by the developer for the initial cost of the metering equipment. The City will own and be responsible for maintaining the meter after the initial installation.

Backflow Preventers

Service connections to the City water system, if required, must install approved backflow preventers, per International Plumbing Code, Michigan Plumbing Code, and EGLE cross connection requirements. Water service

will not be activated until the backflow preventer installation has been certified by a licensed plumber and proper documentation is on file with the City's Department of Public Utilities.

Applications where a reduced pressure zone (RPZ) backflow prevention device will be required on the service lead after the meter, include, but are not limited to, the following:

1. Yard irrigation system at supply to irrigation system (not an RPZ in this case, but an atmospheric vacuum breaker).
2. Fire protection sprinkler system downstream of Siamese fire connection.
3. Service to industrial or correctional facilities.
4. Fire protection systems, wet or chemical.
5. Boiler for generating hot water or steam that is chemically treated for corrosion protection.

All backflow prevention devices connected to the City's water system will be tested and certified as working properly (refer to example certification on following page). A copy of the test certification will be provided to the City prior to receiving continual water service.

Backflow preventers in high hazard locations must be tested annually. All other backflow preventers must be tested every three to five years.

Temporary Water Service During Construction

Developers and/or their contractors frequently request temporary water service during construction. After appropriate pressure and bacteriological testing has occurred, the City may allow temporary use of water for the ongoing development. The developer must contact the City Department of Public Utilities to make arrangements for the temporary connection, meter, and payment. A deposit will be required for the temporary service based on meter size.

Valves will be operated by City personnel only.

Water Main Testing

The City's testing procedures are outlined in the water main specifications in the next section of the Municipal Standards. The City's required water main testing procedures exceed the minimum standards outlined by AWWA. Since the City's water main testing requirements are slightly different than the minimum standards, contractors are encouraged to review the City's testing procedures. City personnel are available to review the procedure with the contractor, if necessary.

CROSS CONNECTION CONTROL BACKFLOW PREVENTION DEVICES

Owner:			Telephone:		
Address:		City:	Zip:		
RPBP Location:					
Make:	Model:	Size:	Serial No.		
Testers State Certification No.:					
Company Name:					
	Check Value No. 1	Check Value No. 2	Pressure Differential Across No. 1 Check	Differential Pressure Relief Valve	
Test Before Repair	Leaked () Closed Tight ()	Leaked () Closed Tight ()	() p.s.i.	Opened at () p.s.i. Reduced Pressure	Date:
Describe Repairs					Date:
Materials Used					
Final Test	Closed Tight ()	Closed Tight ()	() p.s.i.	Opened at () p.s.i. Reduced Pressure	Date:
Comments:					
Pass: _____ Fail: _____					
Testers Signature:				Date:	

Standards of Design – Site Development and Grading

Scope

These standards establish the minimum requirements for the design of site grading.

Drawings and Specifications

1. The drawings and specifications will be prepared by a registered professional engineer.
2. Drawings will consist of a cover sheet indicating a location map and site plan of the proposed project, a drawing sheet indicating the street and lot drainage, and a standard detail sheet. Drawing sheet size will be 22 inches by 34 inches. Minimum drawing scale for residential developments will be 1 inch = 40 feet horizontally and 1 inch = 4 feet vertically. Commercial and industrial developments may use a reasonable scale not greater than 1 inch = 100 feet unless approved by the City. Where a different scale is proposed, the vertical scale will be exaggerated 10 times the horizontal scale.
3. Drawings will be developed using AutoCAD® software; exceptions may be granted by the City.
4. Elevations will be based upon NAVD 88 datum. Elevations based upon an assumed datum will not be approved.
5. The site drawing for street and lot layout will indicate both existing and proposed contours at a 1 foot contour interval. Individual lot drainage patterns will be indicated on the drawing.
6. Four sets of drawings and specifications plus PDF will be submitted by the developer to the City for preliminary approval. All drawings and specifications submitted for approval will be sealed by the registered engineer in charge of design. Modifications required to meet the municipal standards, if any, will be noted on two sets, with one such set returned to the developer for final corrections within 30 days of receipt.
7. Six sets of final drawings and specifications plus PDF will be submitted by the developer to the City for approval. All drawings and specifications submitted for approval will be sealed by the registered engineer in charge of design.

Standards for Design – Grading

Site grading will be designed to allow for drainage of storm water away from residential or commercial buildings. Grades will be such as to minimize earth settlement problems, avoid concentrating runoff onto adjacent properties, prevent creation of water pockets or pools of standing water, and to minimize erosion. The grading design will incorporate natural drainage courses where possible.

In areas where natural drainage is not present, surface (ditches) or subsurface (storm sewers) drainage will be provided for collection and disposal of storm runoff. It is the intent of these regulations that the grading design minimizes the need for banks, retaining walls, or terracing.

Minimum grade away from structures will be 2%. The maximum allowable slope will be 4 horizontal to 1 vertical or as approved by the City. On slopes approved to be 3.5 horizontal to 1 vertical or steeper, sod with pegs must be provided to minimize erosion. Site grading will conform to the applicable sections of the SESC plan. Where mulch is required, a mulch adhesive will be used.

Grading drawings for parking lot and sidewalk construction will conform to the requirements of the Americans with Disabilities Act and the Michigan Barrier Free codes.

Landscaping and Open Areas

The developer is required to provide landscaping and open areas per the requirements of the City's Master Plan and ordinances. The developer should submit a separate landscaping plan for the City's review and approval.

The developer is also required to identify ownership of open areas as part of the development. In the event that the ownership will be through a property owners association, the City will be provided with the legal basis for the ownership and have input relative to the Master Deed or other document relative to the maintenance and upkeep of the open area.

Table of Standard Materials

Sanitary/Storm Sewer System

Sanitary Manhole Castings	EJIW 1040A
Storm Manhole Castings	EJIW 1040B
Storm Catch Basin Castings	
Curb Type	EJIW 7045
Ditch Type	EJIW 6508
Gutter Type	EJIW 7065
Alleys	EJIW 5105
Parking Lots	EJIW 1460, Type M

Water Distribution System

Valves	
Gate	Resilient wedge ductile iron, open left, as manufactured by Clow or East Jordan Iron Works (EJIW)
Valve Box	Tyler type, three piece (D) 5 1/4 inch
Tapping Valve	Clow or EJIW, Stainless steel saddle w/cast flange residual valve

Services

Service Lead	Type K annealed seamless copper
Corporation Stop	A.Y. McDonald 4701Q (3/4 inch – 2 inch), Mueller H15008 (3/4 or 1 inch), Mueller H15013 (1-1/2 inch – 2 inch). (AWWA x Q CTS Comp)
	Corporation sizes exceeding the maximum for three full threads will use a service clamp
Service Clamp (Saddles)	Romac 202 NU, Mueller DR2A (AWWA taper thread [cc])
Curb Valve or Stop	A.Y. McDonald 6I00Q, Mueller B25209 (Q CTS Comp x Q CTS Comp)
Curb Box	Tyler 6500 95E (w/enlarged base 144809 for 2-inch services)
Union	A.Y. McDonald 4758Q 3/4 inch – 2 inch
Pressure Reducing Valves	Contact plumber to determine need for pressure reducing valve. If a pressure reducing valve is required, the valve will be owned by the homeowner and will be installed prior to the meter.
Service Lead	Type K annealed seamless copper

Valve Manhole Castings

6-, 8-, and 10-inch Valves	EJIW 1040 A, marked "Water"
12-inch Valve and Larger	EJIW 1330, solid cover marked "Water"

Fire Hydrants

Type	EJIW 5-BR 250, yellow
Hose Connection	Two – 2-1/2-inch hose connections, National Standard
Pumper Connection	4-inch Pumper Connection, C 1/2 Thread
	5-inch Harrington Integral Hydrant Storz (HIHS)
Nuts	1-1/2-inch Point OT Flat
	National Standard, 1-1/2-inch Pentagon
Open	Left
Hydrant Storz	Harrington Integral

CHAPTER 6

TECHNICAL SPECIFICATIONS

CHAPTER 6 – TECHNICAL SPECIFICATIONS

Technical Specifications Index

Land development projects will be constructed in accordance with the MDOT 2020 Standard Specifications for Construction and the following Special Provisions, as included herein.

SPECIAL PROVISIONS

Environmental Protection	47
Removing Pavement - Modified.....	49
Subgrade Undercutting, Special.....	50
Concrete Driveway, Non-reinforced	53
Concrete Sidewalk	54
Bituminous Application Estimate	55
Slope Restoration.	56
Sanitary Sewer	57
Storm Sewer	64
Water Mains	66
Maintenance Gravel	73
Concrete Utility Manholes	74
Imported Granular Embankment.....	77
Street Lighting	78

**SPECIAL PROVISION
FOR
ENVIRONMENTAL PROTECTION**

1 of 2

It is the responsibility of the contractor to take such measures as may be necessary and to comply with all federal, state, and local laws and regulations for the protection of the public health, safety, welfare, and environment in the performance of its work. The cost of such compliance represents a cost of doing business to be borne by the contractor.

The following are specific requirements regarding environmental protection matters:

1. Control of Air Pollution/Dust Control: During the construction of any project, adequate dust control measures will be maintained by the contractor so as not to cause detriment to the safety, health, welfare, or comfort of any person or cause damage to any property, residence, or business. If not shown as a pay item, dust control will be at the contractor's expense.
2. Control of Water Pollution and Siltation: Construction operations will be conducted in such a manner as to prevent damaging sedimentation of watercourses, streams, lakes, or wetlands, and in accordance with the Soil Erosion and Sedimentation Control Permit issued for this Project.
3. Control of Hazardous Materials: All hazardous materials, hazardous waste, toxic materials, or polluting materials will be used, stored, and disposed of according to applicable federal, state, and local laws and regulations.
4. Noise Pollution: The contractor will exercise judgment in the conduct of operations that by nature result in excessive noise. All such operations will take place during reasonable daylight period, which are defined as 7 a.m. through 6 p.m. unless otherwise stated in the governing municipal ordinance or authorized by the City.
5. Construction Debris: All construction debris will be removed from the construction site(s) at regular intervals and disposed of at sanitary landfill(s) licensed by the EGLE.
6. Housekeeping: The project work area will be maintained in a neat and clean condition and all debris and waste materials will be removed from work areas on a daily basis.

2 of 2

7. Hauling on Local Roads and Streets: The contractor is advised that the hauling of construction materials over local roads and streets must be with the approval of the respective county and municipal authorities having jurisdiction over the proposed hauling routes. All loads will be within legal limits established by the local governing authorities. The contractor is responsible for preventing the tracking of material onto local roads and streets. If any material is tracked onto local roads or streets, it will be removed. It will be the contractor's responsibility to make arrangements with local authorities for hauling routes.

**SPECIAL PROVISION
FOR
REMOVING PAVEMENT – MODIFIED**

1 of 1

- A. Description: The Work of Removing Pavement – Modified will consist of removing existing pavement in accordance with Section 204 of the MDOT 2020 Standard Specifications for Construction of the Michigan Department of Transportation. The existing pavement varies in thickness.
- B. Methods of Construction: The existing pavement will be removed to sawed joints at abutting streets as indicated on the drawings. Existing utilities will be protected during removal operations.

**SPECIAL PROVISION
FOR
SUBGRADE UNDERCUTTING, SPECIAL**

1 of 3

A. Description

This work consists of subgrade undercutting, including backfilling. This work will be performed to replace material susceptible to frost heaving or differential frost action and unstable soil conditions, as determined by the City engineer. The backfill will consist of a Road Grade Biaxial Geogrid (Section 910) with 12 inches of 21AA dense graded aggregate (Section 902). This work will be performed in accordance with Section 205 of the MDOT 2020 Standard Specifications for Construction, except as modified herein.

1. Definitions

The following defines terms used herein:

Road Grade Biaxial Geogrid – A structural geogrid formed by regular network of integrally connected tensile elements with apertures of sufficient size to allow interlocking with surrounding soil, rock, earth, and function as reinforcement.

2. Reference Documents

Geosynthetic Research Institute

GG1 87 Standard Test Method for Geogrid Rib Tensile Strength

GG2 87 Standard Test Method for Geogrid Junction Strength

B. Materials

1. Road Grade Biaxial Geogrid

Road Grade Biaxial Geogrid conforming to section 910.06 of the MDOT 2020 Standard Specifications for Construction.

2. Backfill

Dense graded aggregate conforming to Class 21AA specification, MDOT 2020 Standard Specifications for Construction, Section 902.

2 of 3

C. Methods of Construction

After the subgrade has been excavated to the approximate grade, the City engineer will promptly inspect the grade to determine if any subgrade undercutting is required and determine the limits of such undercutting. Subgrade undercutting will be performed within the limits established by the City engineer, and the excavated material will become the property of the contractor.

The subgrade will be undercut a uniform 12 inches. The contractor will backfill the undercut by placing a dense graded aggregate, 21AA on top of the structural geogrid.

1. Geogrid Installation

The geogrid reinforcement will be laid horizontally on the prepared subgrade. The geogrid will be pulled taut and anchored prior to backfill placement on the geogrid.

The geogrid reinforcement will be overlapped a minimum of 12 inches at the longitudinal and transverse edges.

2. Material Storage and Protection:

Geogrids will be stored above – 20 Degrees F (29 Degrees C).

Prevent excessive mud, wet cement, epoxy, and like materials from coming into contact with, and affixing to, the geogrid material.

Rolled geogrid material may be laid flat or stood on end for storage.

3. Reinforced Backfill Placement

Backfill will be placed, spread, and compacted in such a manner that minimizes the development of slack in the geogrid.

Backfill will be placed and compacted in accordance with Section 301 and 302 of MDOT 2020 Standard Specifications for Construction.

3 of 3

4. General

Track construction equipment will not be operated directly upon the geogrid reinforcement. A minimum fill thickness of 6 inches is required prior to operation of tracked vehicles over the geogrid. Tracked vehicles turning should be kept to a minimum to prevent tracks from displacing the fill and damaging the geogrid.

Rubber tire equipment may pass over the geogrid reinforcement at slow speeds, less than 10 MPH. Sudden braking and sharp turning will be avoided.

**SPECIAL PROVISION
FOR
CONCRETE DRIVEWAY, NON-REINFORCED**

1 of 1

A. Description

The work of Concrete Driveway, non-reinforced will consist of constructing concrete driveways and drive approaches, of the thickness specified in the drawings, in accordance with Sections 205 and 801 of the Michigan Department of Transportation 2020 Standard Specifications for Construction, except as modified herein.

B. Methods of Construction

The work will consist of placing concrete on a 4-inch thick compacted MDOT granular material Class II subbase, consolidating the concrete, and providing a broom or burlap finish. Water will not be added to the concrete surface as an aid in finishing except when approved by the City engineer.

**SPECIAL PROVISION
FOR
CONCRETE SIDEWALK**

1 of 1

A. Description

This work will consist of constructing Portland cement concrete sidewalks on prepared base at locations shown on the drawings, in accordance with Section 803 of the MDOT 2020 Standard Specifications for Construction, except as modified herein.

B. Construction Methods

Excavation will be made to the required depth and width that will permit forming. A 4-inch thick compacted MDOT granular material class II subbase will be placed under the concrete sidewalk. Sand subbase layer will be included with the concrete sidewalk.

**SPECIAL PROVISION
FOR
BITUMINOUS APPLICATION ESTIMATE
LOCAL STREETS**

1 of 1

A. Description

1. The bituminous mixture (top course) 13A will have a yield of 165 pounds per square yard. Estimated thickness is 1 1/2 inches.
2. The bituminous mixture (leveling course) 13A will have a yield of 275 pounds per square yard. Estimated thickness is 2 1/2 inches.
3. The asphalt cement - mixture will be performance grade 58 28 for bituminous mixes 13A.
4. The bituminous bond coat material will be per the Michigan Department of Transportation 2020 Standard Specifications for Construction.

**SPECIAL PROVISION
FOR
SLOPE RESTORATION**

1 of 1

A. Description

This work will consist of grading, top soiling, seeding, Class A fertilizing, and mulching as shown on the typical cross section in accordance with Section 816 of the MDOT 2020 Standard Specifications for Construction and as directed by the City engineer.

B. Materials

All materials will meet the requirements specified in Section 816 of the MDOT 2020 Standard Specifications for Construction.

C. Construction Method

The contractor will restore all areas as described in Subsections 816 of the MDOT 2020 Standard Specifications for Construction. Materials will be placed at rates described therein, or as directed by the City engineer.

**SPECIAL PROVISION
FOR
SANITARY SEWER**

1 of 7

A. Description

The work will consist of furnishing all plant, labor, equipment, and materials in connection with installation of Sanitary Sewers.

B. Materials

1. Certification of Materials: When requested, the contractor will furnish certification that all materials meet the requirements set forth in the drawings and specifications. The source of the certification will be determined by the City engineer.
2. Pipe and Joints: All materials will be new. Manufacturers' recommendations for storage, handling, and installation will be strictly adhered to. Materials will be of the type as listed herein meeting the specifications noted.
 - a. Pipe
 - 1) Polyvinyl Chloride (PVC):
 - a) For 6-inch through 15-inch diameter sanitary sewer, PVC pipe will conform to ASTM D3034. Minimum pipe wall thickness will be SDR 26. All pipes will have a "home" mark. Joints will be of the elastomeric gasket push on type conforming to ASTM D3212.
 - b. Fittings: All pipe connections and pipe size and/or direction changes will be made with standard manufactured fittings conforming to the following.
 - 1) Polyvinyl Chloride (PVC) Fittings:
 - a) For 6-inch through 15-inch diameter sanitary sewer, PVC fittings will be full fittings conforming to ASTM 3034 for pipe wall thickness of SDR 26.
 - c. Connections of Dissimilar Pipe Materials: Connections will be made utilizing one of the following methods:
 - 1) Standard Adapters: Will be a manufacturer's standard adapter with joints conforming to the above specifications.

2 of 7

- 2) Couplings: Will be an elastomeric coupling complete with 300 series stainless steel tension bands conforming to ASTM C425. Couplings will be Clow Band Seal Couplings, Fernco Flexible Couplings, or equal.
 - d. Changes in Pipe Sizes: Will be made using standard smooth flow increasers or reducers.
 - e. Lubricants: All lubricants for the making of pipe joints will strictly conform to the recommendations of the pipe manufacturer.
3. Sanitary Sewer Manholes: Sanitary sewer manholes will be precast concrete conforming to Appendix 4 and the details on the drawings. Joints between the pipe and the manhole will be as indicated on the drawings. Manholes will be coated with bituminous waterproofing.
 4. Chemical Grout: Chemical grout for sealing minor joint leaks will be an U.S. Environmental Protection Agency approved type.
 5. Marking: All pipe, fittings, and appurtenant items furnished to the job site will be marked in accordance with the applicable specification. Any unmarked materials are subject to rejection by the City engineer.
 6. Pipe Bedding and Backfill Materials: Will conform to the MDOT Standard Plan R 83 series.
- C. Methods of Construction
- 1) General: Handling, storage, installation, and the making of joints will strictly follow the manufacturer's recommendations. Plastic and rubber materials affected by ultraviolet rays including all PVC products will be protected from direct sunlight. Material handling during cold weather will take into account increased brittleness of plastic materials. Pipe which is warped or bowed due to temperature variations such that the deviation from straightness is greater than 1 inch will not be installed.
 - 2) Grade and Alignment: All sewers will be laid utilizing an "in line" laser for vertical and horizontal control. Vertical and horizontal alignment of the invert will, at any point, be within plus or minus 0.04 feet (1/2 inch) of plan elevation and line.
 - 3) Cutting of Pipe: Full lengths of pipe will be used whenever feasible. Cutting of pipe where required will be done only using methods as recommended by the manufacturer, utilizing tools, and equipment as required to provide a neat, perpendicular cut without damage to the pipe or

3 of 7

coatings. All burrs will be removed. Spigot ends of cut pipe will be beveled similar to factory beveling. If field cutting or coring of pipes exposes any bare metal surface, the surface will be covered with an epoxy coating.

- 4) Laying of Sewer: Each pipe will be inspected for possible defects before being placed in the trench. Joint surfaces will be free of earth or frozen matter. All pipes will be laid with bell ends upgrade to line and grade as called for on the drawings and each pipe as laid will be checked by the contractor. Pipe will be laid from the low end of sewer upgrade. The use of brick, lumps of clay, wood, etc., to bring the pipe to grade will not be permitted.
 - a) Joints: Will be made in strict accordance with the manufacturer's recommendations utilizing the recommended lubricant. Wood blocks or other approved materials will be used to protect the pipe and fitting ends from pry bars, chains, etc. with particular care taken with plastic materials. Pipe will be pushed closed to the "home" position and if joints do not remain tightly closed, the pipes will be replaced.
 - b) Final Line and Grade: After the pipe is laid, care in backfilling and other operations will be taken so as not to disturb its line, grade, or joint. Misalignment will be cause for rejection of the sewer.
- 5) Connections to Live Sewers: When connections are made with sewers carrying sewage or water, special care must be taken that no part of the work is built underwater; a flume or dam must be installed and pumping maintained, if necessary, and the new work kept dry until completed and any concrete or grout has set.
- 6) Service Laterals: Will be installed in accordance with Appendix 6 and 7 to the property line or length as indicated on the construction drawings. The location of the service lateral will be as indicated, or when serving an existing building, to the location designated by the building owner. Where an existing service lead is to be connected, the contractor will locate the lead.
 - a) Marking: The contractor will mark the end of each service lateral with a 4 by 4-inch post of sufficient length to extend from the service lateral to 3 inches below grade, unless otherwise indicated on the drawings. The top of each 4 by 4-inch post will have four 16 penny common nails driven into it for subsequent location with a magnetic locator.

4 of 7

- b) Record of Locations: The contractor will record and submit to the City and the City engineer, a location sketch of the service lateral fitting measured upstream from the nearest manhole and will record the location of the terminus of the service lateral with a minimum of two witness measurements to permanent physical features, building corners, etc. Any services not readily located within one year after the date of the final payment due to inaccurate record drawing measurements will be field-located by the contractor at no expense to the City.
 - c) Risers: Where sanitary sewers are constructed deeper than 12 feet, service risers will be constructed as shown in Appendix 7. Risers will be constructed such that the service lateral is 11 feet deep at the property line. When main sanitary sewers are less than 12 feet deep, no riser is required and the lateral will be constructed at a slope such that the service lead is 11 feet deep at the property line, if feasible. The 6-inch service laterals will be constructed at a minimum slope of 0.60%. Lateral fittings will be installed with the branch connection tilted up 45 degrees.
 - d) Service Lateral Inspection: All service lateral pipes will be left with at least the top of the pipe exposed until inspected by the City or their representative and authorization for backfill given.
- 7) Removal of Unsuitable Material: Whenever any pipe section, fitting, or appurtenance is found to be unsuitable for installation due to specification nonconformance, poor workmanship, damage, or any other reason, it will be removed from the construction site during that working day by the contractor. Any material not so removed will be painted or otherwise marked by the City engineer to prevent its subsequent use.
- 8) Sanitary Sewer Testing: In general, the sanitary sewers will be tested by applying an air pressure test described in the following paragraphs. Methods of testing and measurement other than specified herein will be approved by the City engineer. The contractor will be responsible for furnishing all equipment and labor for the air testing at no additional cost to the City. All testing will be performed in the presence of the City engineer.
- a) Air Testing: Is required to be performed on all sanitary sewers. The following described test procedure will be used.

5 of 7

- i) Equipment Required: Portable air compressor, standard air hose and connections, minimum of 50 feet of single and triple air hose, one single and one triple connection pneumatic sewer plug, one hand air pump, stopwatch, and one air gauge, range 0 to 30 psig graduated in tenths from 0 to 10 psig.
- ii) Preliminary Requirements: After all sewer, lateral, and manhole construction and backfilling operations have been completed, the sewer will be cleaned by the contractor as follows:
 - Inflatable Balls: The contractor will furnish an inflatable rubber ball of a size that will inflate to fit snugly into the pipe to be tested. The ball may, at the option of the contractor be used without a tag line or a rope may be fastened to the ball to enable the contractor to know and control its position at all times. The ball will pass through the pipe with only the force of the water impelling it. All debris flushed out ahead of the ball will be removed at the first manhole. In the event cemented or wedged debris or damaged pipe will stop the ball, the contractor will remove the obstruction.
 - Pneumatic Plug Test: The pneumatic plugs will pass the following qualifying test in the presence of the City engineer and contractor prior to the line testing. One length of sewer pipe will be laid on the ground and sealed at both ends with the pneumatic plugs to be checked; air will be introduced into the pipe until the pipe pressure reaches 15 psig. The pneumatic plugs being checked will hold against this pressure without bracing being needed, and without movement of the plugs out of the pipe. All pneumatic plugs will pass the aforementioned qualifications before being used to test the actual installation.
- iii) Test Procedures: Immediately following the pipe cleaning described, low pressure air will be introduced into the sealed line until the internal air pressure reaches 4 psig greater than the average back pressure of any groundwater pressure, as determined by the City engineer, which may be over the pipe. At least two minutes will be allowed for the air pressure to stabilize.

- Acceptance: The portion of the line being tested will be accepted if the portion under the test meets or exceeds the requirements of ASTM F1417 for plastic pipe. This requirement will be accomplished by performing the test as follows: The time required in minutes for the pressure to decrease from 3.5 to 2.5 psig greater than the average back pressure of any groundwater that may be over the pipe will not be less than the time shown for the given diameters in the table following this paragraph. If the system does not meet the foregoing requirements, the contractor will be required to locate and repair the leaks at no extra cost to the City and repeat the tests until the allowable leakage is obtained.

Air Test Table				
ASTM F1417 – Minimum Test Times for Various Pipe Sizes				
Nominal Pipe Sizes (inches)	Time - Minutes:Seconds			
	Minimum	250 Feet	300 Feet	400 Feet
6	5:40	5:40	5:40	5:42
8	7:34	7:34	7:36	10:08
10	9:26	9:53	11:52	15:49
12	11:20	14:15	17:05	22:47
15	14:10	22:15	26:42	35:36
18	17:00	32:03	38:27	51:16
21	19:50	43:37	52:21	69:48
24	22:40	56:58	68:22	91:10

NOTE: If the section of line to be tested includes more than one pipe size (i.e., lateral connections), calculate the test time for each size, and add the test times to arrive at the total test time for the section.

- b) PVC Deflection Tests: The completed installation of PVC sewers will at no point have out-of-round pipe deflections greater than 5%. Deflectometer or go/no-go gauging tests will be performed prior to acceptance of sewers. The test will be conducted after the final backfill has been in place at least 30 days.
- c) TV Inspection: The City or its representative will have the option of performing a TV inspection of any section of sewer for signs of structural damage, joint leaks, or infiltration. The costs of the inspection will be paid by the City unless the inspection reveals faulty construction or materials wherein the costs will be paid by the contractor.

7 of 7

- d) **Correction of Defective Work:** Whenever any of the above tests or inspections indicate defective material or installation, the contractor will repair and retest the section to the satisfaction of the City engineer at no cost to the City. The use of chemical grouts will be limited to the repair of minor joint leaks and will not be used without the specific written approval of the City engineer. Any pipe or fitting having structural damage will be removed and replaced. Any PVC sewer with deflection in excess of the 5% limitation will be re-excavated, inspected for structural damage, and then rebedded and backfilled, and retested.
- 9) **Sewers Placed Inside Steel Casing Pipe:** Sewers placed inside a steel casing pipe will conform to alignment, grade, and inverts as indicated on the construction drawings to tolerances stated in this special provision. To facilitate placement and proper alignment of the sewer, the contractor will install skids as detailed on the construction drawings. The height of the skids will be varied as required to meet the proposed inverts and grade. The skids will be spaced such that grout will freely flow beneath the inserted sewer pipe. Hold down devices will be installed to prevent “floating” of the sewer during grouting operations. The contractor may propose an alternate method to place, align, and hold down the sewer, subject to the approval of the City engineer. After placement of the sewer, the annular space between the casing pipe and the inserted sewer will be filled with grout. Prior to grouting of the annular space, the sewer must pass all acceptance testing and be approved by the City engineer. Grouting equipment will be capable of placing grout at all locations required by the construction drawings. Bulkheads will be constructed in the annular space to retain the grout and the grouting will begin at the farthest downstream point and proceed upstream.

**SPECIAL PROVISION
FOR
STORM SEWER**

1 of 2

A. Description

This work will consist of installing concrete storm sewer pipe and drainage structures of the required type and diameter and will include excavation and backfilling. This work will be in accordance with Sections 402 and 403 of the MDOT 2020 Standard Specifications for Construction with the following modifications:

B. Materials

1. Concrete Pipe: Concrete sewer pipe will be ASTM C76 and will conform to the class designation indicated on the drawings or in the proposal. In the absence of class designation, Class III will be required.
2. Joint Sealer: All concrete pipe joints will be plain joint tongue and groove and will be wrapped with a non-woven geofabric.
3. Storm Sewer Manholes: Storm sewer manholes will be precast concrete conforming to Appendix 2 and the details on the drawings. Joints between the pipe and the manhole will be as indicated on the drawings.
4. Catch Basins: Catch basins will be precast concrete conforming to Appendix 3 and the details on the drawings. Joints between the pipe and the catch basin will be as detailed on the drawings.
5. Concrete Lead Encasement: Concrete Grade 3500 or 4000.
6. Storm Lead: Unless otherwise indicated on drawings, all storm leads will be 6 inch SDR 23.5 PVC pipe conforming to requirements of ASTM D3034. Connect to mainline storm sewer with Kor-N-Tee flexible connector manufactured by NPC.
7. Non-woven Geofabric: Used in wrapping storm joints will weigh at least 3 ounces per square yard and be a minimum of 3 feet in width.

2 of 2

C. Methods of Construction

Construction will conform to MDOT 2020 Standard Specifications for Construction Sections 402 and 403 with the following modifications:

1. Connecting to Existing Pipe: When the joint of the pipe connecting to existing sewer or drainage structure lead does not match the existing pipe, the connecting joint will be constructed in accordance with the MDOT 2020 Standards Specifications for Construction Section 401.03 requirements for extending concrete culverts.
2. Backfilling: Backfill for sewers will be MDOT Granular Material Class II or with onsite granular material approved by the City engineer.
3. Surplus Earth Removal: Disposal of excavated materials will be the responsibility of the contractor.
4. Concrete Lead Encasement: Concrete encasement for drainage structure leads will be installed at various locations as directed by the City engineer.
5. Storm Sewer Lead: Core a hole in pipe consistent with Kor-N-Tee connector and storm service lateral diameter. Insert Kor-N-Tee assembly into pipe and expand into place. Insert service lateral into Kor-N-Tee until it “bottoms” into a positive stop in Kor-N -Tee. Tighten pipe clamp around service lateral to 60-inch pounds.

SPECIAL PROVISIONS FOR WATER MAINS

1 of 7

A. Description

The work covered by this section of the specifications consists of furnishing all labor, equipment, and materials in connection with installation of water mains.

B. Materials

1. Detailed material lists and specifications for all materials furnished under this section of the specifications will be submitted to the City engineer for review.
2. Water main pipe will be new and of the type as specified herein.

a. General Requirements

- 1) Material Selection: Unless specifically shown on the drawings or listed in the proposal to be a specific material, the contractor will utilize ductile iron pipe material.
- 2) Single Material Requirement: Unless otherwise approved by the City engineer, a single material will be used for all water mains in the Contract. If multiple pipe materials are permitted, the change in materials will be accomplished at normal junctions such as valves or fittings.
- 3) Pipe Markings: All pipes delivered to the job site will bear the marks required by the ANSI/AWWA specification.

b. Ductile Iron (D.I.): Will conform to ANSI/AWWA C151/A21.51, NSF/ANSI Standard 61, and the following:

- 1) Class and Size: Unless otherwise indicated on the drawings, pipe wall thickness will be a minimum pressure Class 52. Ductile iron may be used for 3 inch and larger diameter pipe.
- 2) Exterior Coating: Bituminous, 1 mil thick.
- 3) Lining: Standard thickness cement mortar conforming to ANSI/AWWA C104/A21.4.
- 4) Polyethylene Encasement: ANSI/AWWA C105/A21.5.

2 of 7

- 5) Mechanical Joints and Push on Joints: ANSI/AWWA C111/A21.11, bolts and nuts will be high strength corrosion resistant alloy with hex head nuts.
 - 6) Fittings: Will conform to ANSI/AWWA C153/A21.53 88. Will accommodate connections to water main of differing materials.
 - 7) Electrical Continuity: Bronze wedges or continuity straps.
3. Valves
- a. General Requirements
 - 1) Working Pressure: 150pounds per square inch (psi) minimum.
 - 2) Joints: Unless otherwise indicated on the drawings or valve schedule, mechanical joint conforming to ANSI/AWWA C111/A21.11. End flanges, if specified, will be ANSI B16.1 Class 125.
 - 3) Direction of Opening: Left.
 - b. Resilient Seated Gate Valves: Will conform to ANSI/AWWA C515 and the following:
 - 1) Body Construction: ASTM A126 Class B, cast iron.
 - 2) Operator: Square nut, unless otherwise indicated on the drawings or the valve schedule.
 - 3) Manufacturer: Refer to Table of Standard Materials.
4. Valve Boxes: Cast iron, Tyler type, three piece; cover will be furnished marked "Water."
5. Hydrants: Will conform to ANSI/AWWA C502 and the following:
- a. Type and Size: Breakaway traffic flange; 6-inch main valve seat.
 - b. Connections: Two - 2 1/2-inch hose nozzles, National Standard and a 4-inch pumper connection; C 1/2 threads.
 - c. Direction of Opening: Left.
 - d. Operating Nut - 1 1/2 pentagon.
 - e. Quick Connect: Provide 5-inch Harrington Intergrel Hydrant Storz quick connect for pumper nozzle.
 - f. Manufacturer: Refer to Table of Standard Materials.

3 of 7

6. Service Lead, Corporation Stop, Curb Valve, Curb Box

- a. Service Lead Pipe: ASTM B88 type K annealed seamless copper water tube of the size indicated on the drawings. Fittings will be compression type.
- b. Corporation Stop: Refer to Table of Standard Materials.
- c. Curb Valves: Refer to Table of Standard Materials.
- d. Curb Box: Refer to Table of Standard Materials.
- e. Union: Refer to Table of Standard Materials.

C. Methods of Construction

1. Water Main Installation:

- a. General: Installation will be in accordance with ANSI/AWWA C600 for ductile iron pipe.
- b. Laying Pipe: Pipe will be laid with the bell ends facing the direction of laying, unless otherwise directed or allowed by the City engineer.
- c. Location: As indicated on the drawings. Maintain at least a 10-foot separation from any sewer, unless specifically indicated on the drawings.
- d. Grade and Alignment: Provide cover of 6 feet, unless otherwise indicated on the drawings.
- e. Wet Trench Laying: When the trench contains water, open ends of the pipe will be closed by a watertight plug. This provision will apply during at all times when construction is not in process (noon and overnight).
- f. Pipe Bedding and Backfill: Will be in accordance with the Trench Details indicated on MDOT Standard Plan R 83 Series, Utility Trenches.
- g. Pipe Encasement: Ductile iron pipe, bedded in an area of aggressive soil such as peat, will be encased in a polyethylene encasement.
- h. Electrical Continuity: Unless otherwise noted on the drawings, electrical continuity will be provided for ductile iron pipe.
- i. Locating Provisions: A suitable means for magnetically locating PVC water main will be provided and approved by the City engineer in writing prior to construction.

4 of 7

- j. Thrust Restraint: Will be placed at all bends, dead ends, tees, reducers, hydrants, and valves, as required, using mechanical restraints, Meg-a-Lugs, or approved equal whenever possible. In special cases, when approved by the City, a thrust block consisting of MDOT grade 3500, poured in place concrete may be used in lieu of the mechanical restraint. Thrust blocks will be designed according to the current edition of the Ductile Iron Pipe Research Association Thrust Restraint Design for Ductile Iron Pipe.
2. Valve Installation:
 - a. AWWA approved resilient wedge gate or butterfly valves will be placed throughout the distribution system in accordance with the details on the drawings.
 - b. Valves will be provided with adjustable, Tyler type valve boxes for all valves up to 12 inch. For valves on water mains 12 inches or larger, valve manholes, if required, will be placed in accordance with Appendix 12.
 3. Hydrant Installation: In accordance with Appendix 10
 - a. Hydrant Base: Hydrants will be placed upon a poured in place or precast concrete base (MDOT grade 3500, 4 inches thick) of at least 2 square feet, or as indicated on the drawings. Suitable solid stone or salvage slab may be used for the concrete base as approved by the City engineer. A pocket of crushed stone will be placed around the bottom 18 inches of the hydrant barrel depth.
 - b. Depth of Bury: Hydrant leads will have 6 feet minimum cover, including crossings through ditch sections.
 - c. Hydrant Drain Ports: Will remain plugged unless otherwise indicated on the drawings.
 - d. Hydrant Height: Install break off flange 3" above finish grade or as specified by manufacturer.
 - e. Hydrant Thrust Restraint: Will conform to paragraph c.1.J. of this specification.
 4. Service Lead Installation: In accordance with Appendix 11:
 - a. General: Open cutting of existing hard surfaced pavement will not be allowed. Service leads may be bored, drilled, or jacked; jetting of water or air will not be allowed. Under normal conditions, casings will not be required except where probable damage to the roadbed or the service lead exists. Service leads will be installed to provide a depth of cover of 6 feet.

5 of 7

- b. Installation without Casing: In stable soils, the diameter of the auger head will not exceed the diameter of the service lead by more than 1 inch. Service lead pipe will be pushed or pulled through after the hole has been augured. Pipe ends will be examined after installation for damage. If damaged, the service pipe will be replaced.
- c. Installation with Casing: In unstable soils, as determined by the City, the combination of boring and jacking simultaneously will be utilized providing the cutting edge of the auger does not advance ahead of the casing. Casing diameter will not exceed the diameter of the service lead by more than 1 inch. Casing pipe may be removed at the contractor's option.
- d. Boring Installation: Will conform to the requirement of the local agency/utility.
- e. Connection to Existing Services: Connections to existing water services with like material will be made with standard couplings; connections of dissimilar materials will be made with appropriate couplings complete with Nylon dielectric bushings.

D. Water Main Testing

1. Hydrostatic Testing Requirements:

- a. General: Upon completion of installation of the water main and appurtenances, the contractor will furnish all apparatus, materials, labor, and water required to perform the pressure tests in accordance with Section 4 - Hydrostatic Testing, ANSI/AWWA C600, and the following:
- b. Pre-Test Procedures: contractor will open all valves, including hydrant auxiliary valves, and then completely fill the line with water with a special emphasis upon removing all air from the pipe, valves, or hydrants. If necessary, the contractor will install additional corporation stops at high points to allow the air to be expelled.
- c. Preliminary Test: A preliminary pressure test by the contractor will be accomplished. Any leaks encountered will be corrected and the test will be rerun until results are satisfactory.
- d. Final Pressure and Leakage Test: Will conform to ANSI/AWWA C600 - Hydrostatic Testing, in the presence of the City engineer, who will receive 24 hours' notice prior to testing. If it is necessary for the City engineer to observe more than one test on any section of mainline, the contractor will be liable for the additional cost involved for observation of subsequent tests.

6 of 7

- e. Leak Repair: The contractor will provide all labor and materials, etc. as required to repair leaks, or otherwise required to meet these tests. Any leakage over the allowable design calculations in AWWA C600 will be repaired. Water damage resulting from flushing or testing procedures will be the responsibility of the contractor.

2. Disinfection Requirements

- a. General: Procedures will conform to ANSI/AWWA C651, NSF/ANSI Standard 60, and the following:
- b. Preliminary Flushing: After the pressure test and before disinfection, the contractor will flush out the new pipelines until the water runs clear. Each valved section of the newly laid pipe will be flushed separately with potable water from the public supply. City requires approved backflow prevention device to be used when connected to City water supply. City will be notified when using water and location for water draw must be preapproved by the City.
- c. Disinfection: The contractor will disinfect the new mains by flushing with NSF/ANSI Standard 60 certified drinking water treatment chemicals in approximate 1,000-foot intervals, at a minimum velocity of 2.5 feet per second until water runs clear. Sufficient chlorine should be applied for a 25-ppm chlorine residual and allowed to remain in the water main for 24 hours. Samples will be taken from corporation stops only or location approved by the City. Sampling from hydrants is not recommended. If mains dead end at hydrants with no adjacent valve, the contractor will install an additional corporation stop for sampling. Water with chlorine residuals greater than 1 ppm must be disposed of in the sanitary sewer in a manner acceptable to the City.
- d. Bacteriological Water Samples: The contractor will test chlorine residuals prior to each bacteriological sample and the chlorine residual must be at the normal level of chlorine in the system to allow bacteriological test to be performed. The contractor must wait a minimum of 24 hours after the chlorine is flushed before collecting the first bacteriological test sample. The contractor will collect the water sample(s) on which bacteriological tests will be performed in the presence of the City engineer or authorized City employee and in conformance with ANSI/AWWA C651. The City will perform the bacteriological tests at their certified National Sanitation Foundation laboratory (No. 3370). If the contractor elects to have an independent certified laboratory perform the bacteriological tests, a duplicate set of samples will be provided to the City. Two successive safe tests taken 24 hours apart are required; analysis will be made by a State approved laboratory.

7 of 7

- e. Failing Tests: In the event of a failing test, flushing, disinfection, and testing as described above will be repeated. In the event of two failing tests, contractor will flush and pig water main prior to repeating the above procedure. The contractor will be responsible for the tests and will be liable for any costs associated with testing.

**SPECIAL PROVISION
FOR
MAINTENANCE GRAVEL (LM)**

1 of 1

1. Description: This work consists of constructing an aggregate surface on a prepared grade, where directed by the City engineer, to maintain traffic during construction. Removal and disposal of the aggregate when no longer needed, is also included in this item of work. This work will be completed in accordance with Section 306 of the MDOT 2020 Standard Specifications for Construction except as modified by this special provision.
2. Materials: Maintenance gravel will be dense graded aggregate Class 22A or 23A. When approved by the City engineer, salvaged aggregate or bituminous material may be used in place of Class 22A or 23A. Salvaged material must come from this project and must be 2 inches or less in diameter.
3. Construction: Maintenance gravel is to be placed at locations indicated on the drawings or indicated by the City engineer, to provide a flush transition to shoulders, driveways, and other areas where traffic is to be maintained.

The aggregate surface will be maintained in a smooth and firm condition until no longer needed for maintaining traffic. When construction operations progress to the point that the maintenance gravel is no longer needed, removal of maintenance gravel is to occur in the same workday as paving or aggregate surfacing of the removal area.

Maintenance gravel may be incorporated into the construction of shoulders or approaches at the direction of the City engineer. Otherwise, the contractor is responsible for removal and disposal of the material in accordance with the MDOT 2020 Standard Specifications for Construction.

**SPECIAL PROVISION
FOR
CONCRETE UTILITY MANHOLES**

1 of 3

A. Scope

The work covered by this section of the specifications consists of furnishing all plant, labor, equipment, and materials in connection with concrete utility manholes.

B. General

1. Requirements: All concrete utility manholes, including valve vaults, will be installed in accordance with the details indicated on the drawings and these specifications.
2. Material Lists: The contractor will submit detailed material lists to the City engineer for approval of all materials furnished under this specification.

C. Materials

1. Precast Sections:
 - a. Integral Base: Manholes will consist of integral cast base and riser sections conforming to ASTM C478.
 - b. Pipe Connections: Pipes will generally be flush with the interior manhole wall but protruding no more than 2 inches. Manhole section joints will be as noted in the appendices for the manhole type. All pipe openings will be cast in the precast section or cored in the finished wall. Broken and patched connections will not be accepted.
 - c. Manhole Adjusting Rings: Will be standard precast reinforced concrete rings with a minimum of 3 rows and a maximum of 6 rows. For all new projects, the manhole castings will be set at the road base surface, with the final adjustment to be made at the time of construction of the final course of bituminous surfacing.
 - d. Manhole Steps: Will be Co Polymer Polypropylene Plastic manhole steps reinforced with 3/8 inch deformed reinforced bar. Manhole steps will be of the press fit type with serrated type tread and lugs. Steps will not be cast in wall. Steps will be spaced at 16 inches on center in a true vertical alignment unless indicated otherwise on the drawings.

2 of 3

- e. Cast Iron Frames and Covers: Will conform to the castings noted on the Table of Standard Materials.
- f. Mortar and Grout: At the discretion of the City, the mortar and grout may be required to be hydrogen sulfide resistant.
- g. Concrete: Concrete will meet the requirements of MDOT grade 4000.

D. Installation

Utility manholes will be constructed of precast concrete sections including risers, grade rings, and precast tops of eccentric cone, or flat slab.

1. Utility Manhole: Precast bases will be set on uniform bedding of 8 inches of compacted sand or existing granular material. When water is encountered in the trench, bases will be set on a minimum of 12 inches of stone fill meeting MDOT 6A.
2. Precast Concrete Risers: Will be set plumb and where manhole steps are provided, the risers will be aligned to form a continuous ladder. Joints between manhole sections will utilize rubber O rings. Top sections will be eccentric unless otherwise indicated on the drawings.
3. Castings: Will be installed as specified below:
 - a. Storm Sewer Manholes and Catch Basins: Castings will be set on precast concrete adjusting rings with a minimum of adjustment of 3 grade rings and a maximum of 6 grade rings. Casting and rings will be set in mortar.
 - b. Casting Elevations: Where castings are to be flush with permanent pavements, the contractor will adjust the frame to the proper grade. Where castings are on flat slab tops in non paved areas, they will extend approximately 1 inch above finish earth grade unless shown otherwise.
 - c. Inside Finish: The inside surface of adjustment rings or bricks will be tooled to give a smooth finish coat of mortar.
4. Flow Channels: Will be constructed in manhole bottoms with mechanically mixed MDOT grade 3500 concrete. Prior to placement of concrete, a bonding compound, Sealtight INTRALOK, Sika SIKABOND, ACRYL 60, or equal, herein will be applied per manufacturers' recommendations to the manhole base. Flow channel depth will not exceed half of the pipe diameter and concrete thickness will be a minimum of 4 inches measured from the top of the base to the bottom of the flow channel. A minimum 0.1 foot

3 of 3

drop between inlet and outlet pipe invert elevations will be provided. Where the grade of sewer is continuous through the manhole, the contractor may lay the pipe through the manhole, fill around the pipe with concrete, and carefully break out or cut out the top of the sewer pipe.

**SPECIAL PROVISION
FOR
IMPORTED GRANULAR EMBANKMENT**

1 of 1

A. Description

This work will consist of importing granular material for embankment construction. This work will be performed to construct the site grading to the proposed line and grades, in the event sufficient material is not available onsite.

B. Materials

Will conform to MDOT Granular Material Class III.

C. Methods of Construction

Construction of embankment will be performed in accordance with Section 205 of the MDOT 2020 Standard Specifications for construction except as modified herein.

1. Material will be placed and compacted in accordance with the controlled density method.
2. Importing granular material for embankment construction will be approved in writing by the City engineer prior to transporting of material to the site.

**SPECIAL PROVISION
FOR
STREET LIGHTING**

1 of 2

A. Description

This work will include furnishing and installing a complete operating street lighting system and generally consists of lamp posts, luminaires, conduits, direct burial cable, foundations, wire, handholes, excavation, backfilling, and restoration of the disturbed area. This work will be in accordance with Section 819 of the MDOT 2020 Standard Specifications for Construction with the following modifications:

B. Materials

1. All materials will meet the requirements specified in Section 819 of the MDOT 2020 Standard Specifications for Construction with the following modifications:
2. Lamp Post
 - a. Style: Edgewater, with modified base flange, as supplied by Spring City Electrical Manufacturing Company, Hall and Main Streets, P.O. Box 19, Spring City, PA, 19475. Phone (610) 948-4000.
 - b. Height: 11'-0"
 - c. Light Center: 12'-3"
 - d. Base: 18" Octagonal (Flat to Flat)
 - e. Material: 1 Piece, heavy wall cast iron per ASTM A48-83 Class 30
 - f. Finish: Prime paint, Sherwin Williams 2-part recoatable epoxy primer (B67H5 Part G and B67V5 – Part H)
 - g. Access Door: Located in base secured with tamper proof hex socket security machine screws and will include "City of Ionia" logo.
 - h. Ground Stud Provisions: Drill and tap inside wall of base opposite access door to accommodate a 1/4"-20 ground stud (stud supplied by others)
 - i. Anchor Bolts: (4) 3/4" dia. x 24" long + 3" hook (fully galvanized with 1 galvanized nut and 1 galvanized washer per bolt)

2 of 2

- j. Bolt Projection: 3" required
- k. Tenon: 7" dia. x ¾" high (to accept luminaire)

3. Luminaire

- a. Style: Villa casing – 118 globe with finial as supplied by Spring City Electrical Mfg. Co., Hall and Main Streets, P.O. Box 19, Spring City, PA, 19475, Phone (610) 948-4000.
- b. Height: 32 ¾"
- c. Width: 16 ½" dia.
- d. Material: Cast aluminum alloy ANSI 356 per ASTM B26-95
- e. Globe: Stippled Polycarbonate
- f. Finish: Prime paint, Sherwin Williams 2-part recoatable epoxy primer (B67H5 - Part G and B67V5 – Part H)
- g. Lamping: Light Emitting Diode (LED)
- h. Voltage: Quad wired at 240 Volts
- i. Refractor: Internal Type II – Asymmetric distribution
- j. Socket: Mogul base

- 4. Concrete Base: Concrete base will be pre-cast or cast-in-place reinforced concrete conforming to Appendix 13 and the details on the drawings.

C. Methods of Construction

The contractor will construct the street lighting and electrical system as described in Subsections 819 of the MDOT 2020 Standard Specifications for Construction.

CHAPTER 7

VARIANCE PROCEDURE

CHAPTER 7 - VARIANCE PROCEDURE

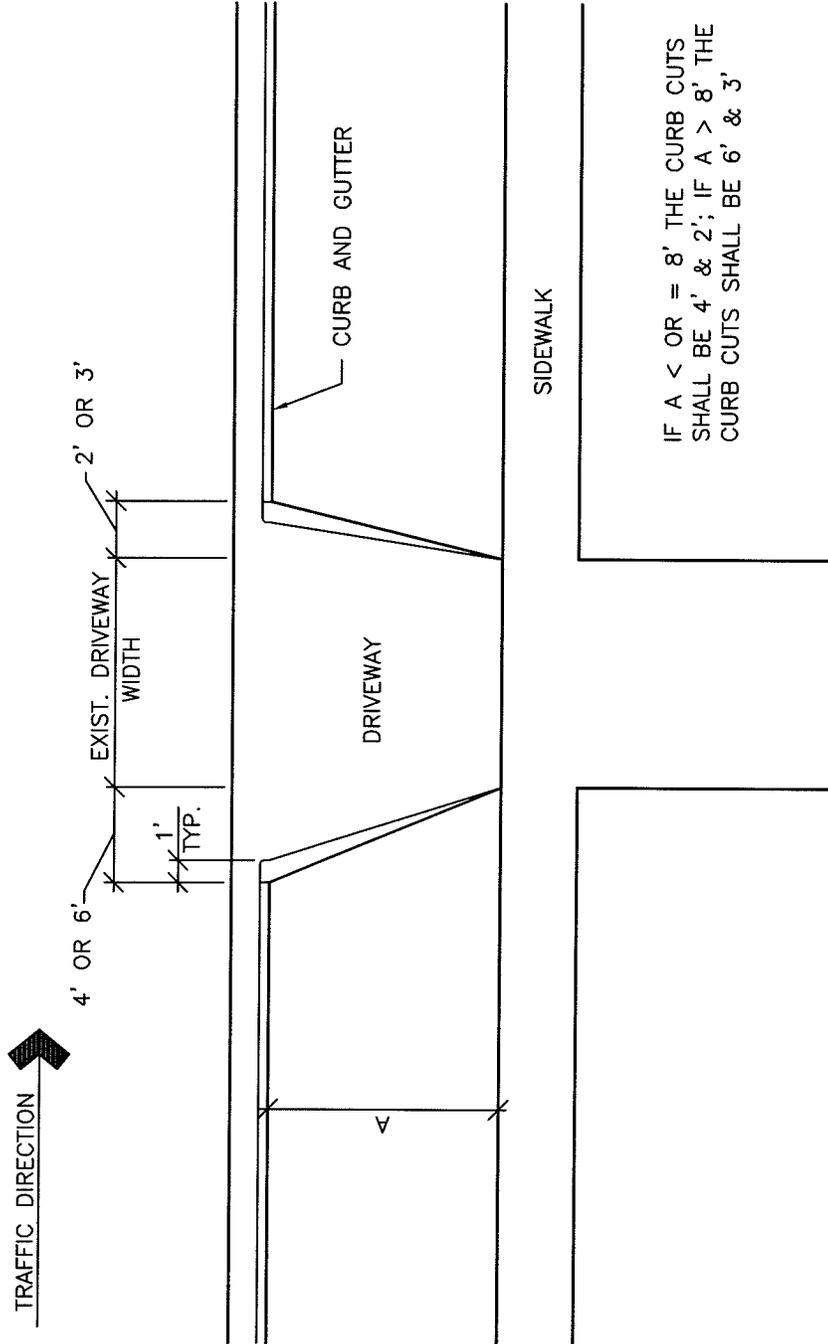
The City of Ionia Municipal Standards provides documentation of the City's expectations for developers, contractors, businesses, and utility companies performing work in the City of Ionia. The City has tried to clarify common development and utility issues with these Municipal Standards. Every effort should be made to comply with these standards.

The City and City engineer review project plans for general conformance to these Municipal Standards and acceptable development practices. If the City identifies deviations from the Municipal Standards when project drawings are submitted for review, the City will require that the design be modified to comply with the standards. If the City discovers that the standards are not being complied with during construction and the variance procedure described below was not followed, the work not in compliance will be reconstructed to meet the standards, regardless of whether the drawings were previously approved by the City.

The City understands that some projects may have special circumstances that do not fit the framework outlined in the standards and a variance may be appropriate. If a special circumstance exists where compliance with one or more of the standards is not practical, a written request for a variance from the Municipal Standards may be made. To request a variance from the Municipal Standards, the developer, contractor, business, or utility company will provide the City with an explanation of the special circumstance and details and supporting documentation required to verify the necessity of the variance. Once the written request and complete supporting documentation are received by the City, the City will review and approve or deny the request within 30 days. If the submitted materials are found to be incomplete, the City may request that additional information be submitted. The 30-day review period will not begin until the City has all the documentation required to determine the necessity of the variance.

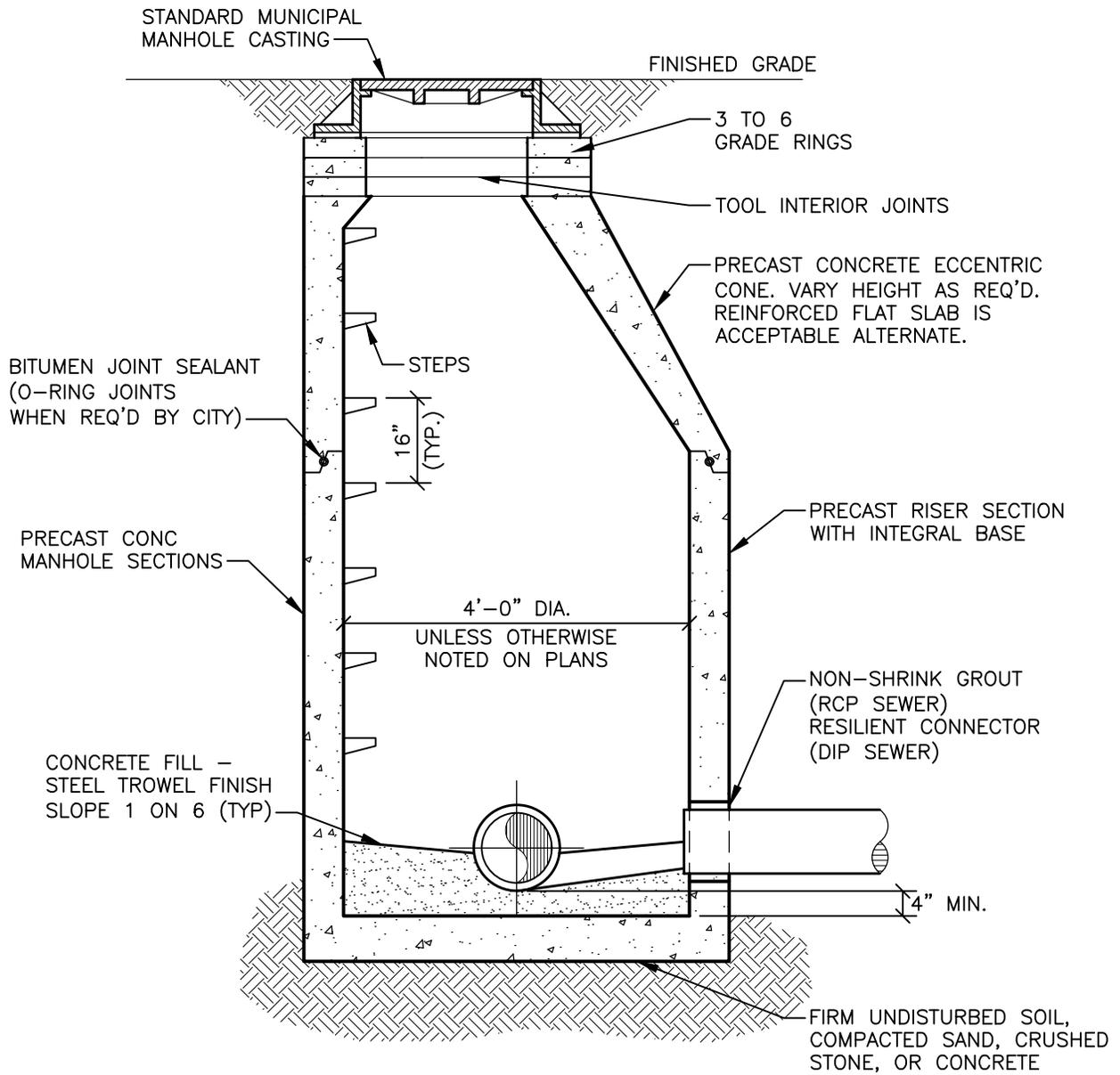
**MUNICIPAL STANDARDS
FOR THE
CITY OF IONIA
IONIA COUNTY, MICHIGAN**

**APPENDIX 1
STANDARD CONSTRUCTION DETAILS**



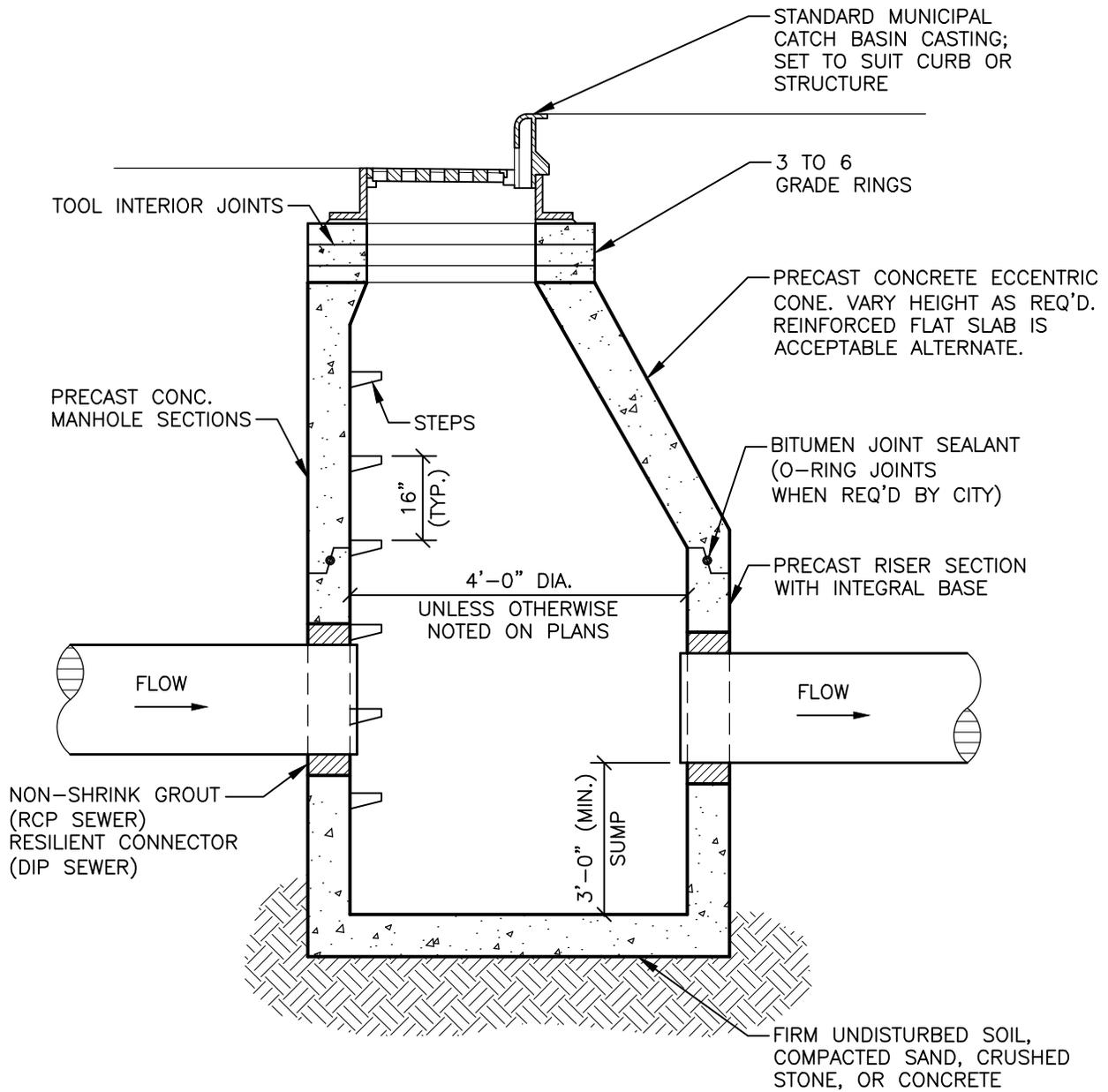
IF A < OR = 8' THE CURB CUTS SHALL BE 4' & 2'; IF A > 8' THE CURB CUTS SHALL BE 6' & 3'

TYPICAL CURB BREAKS
NO SCALE



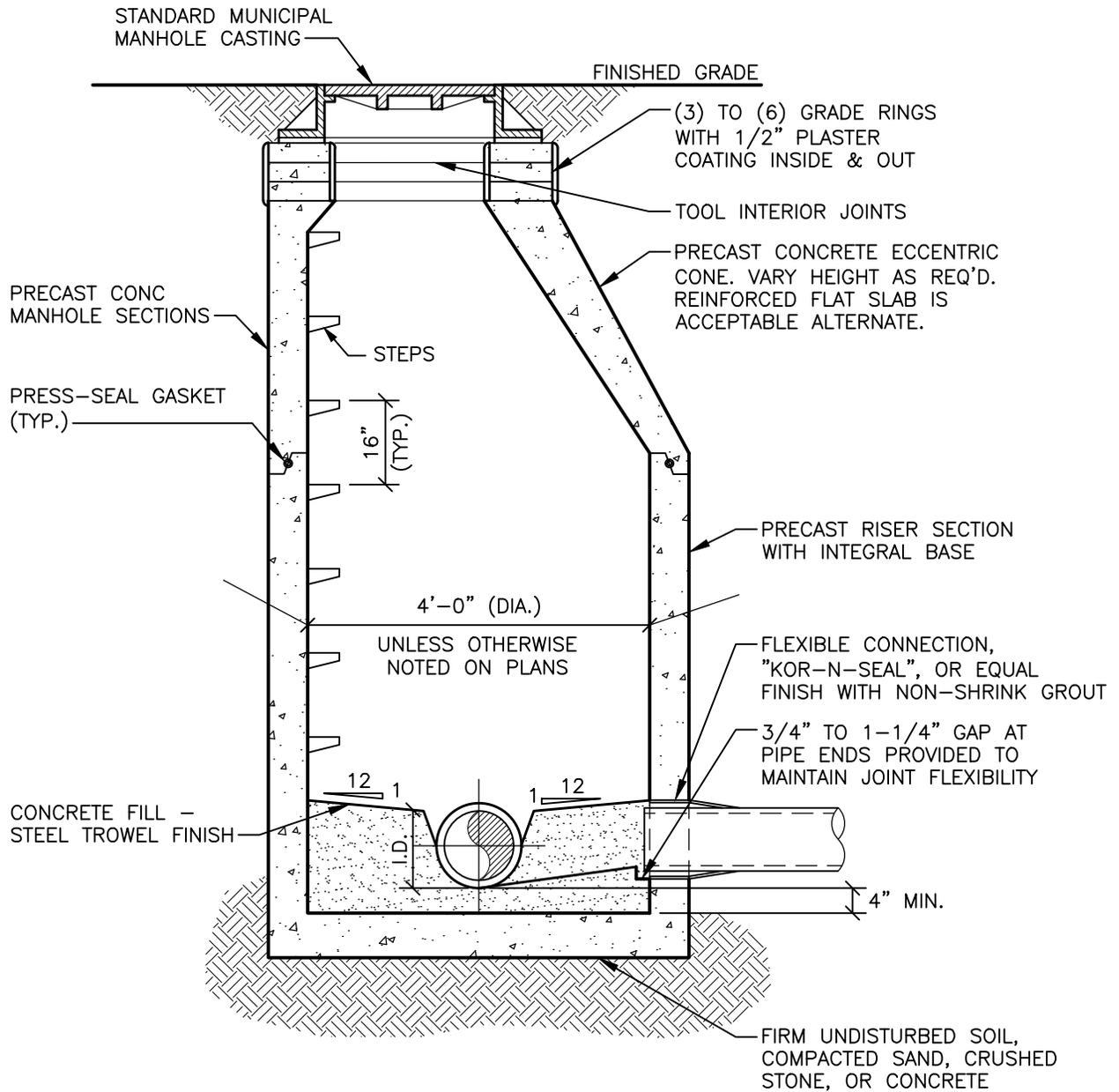
STANDARD STORM MANHOLE
 NO SCALE IT-005

Appendix 2



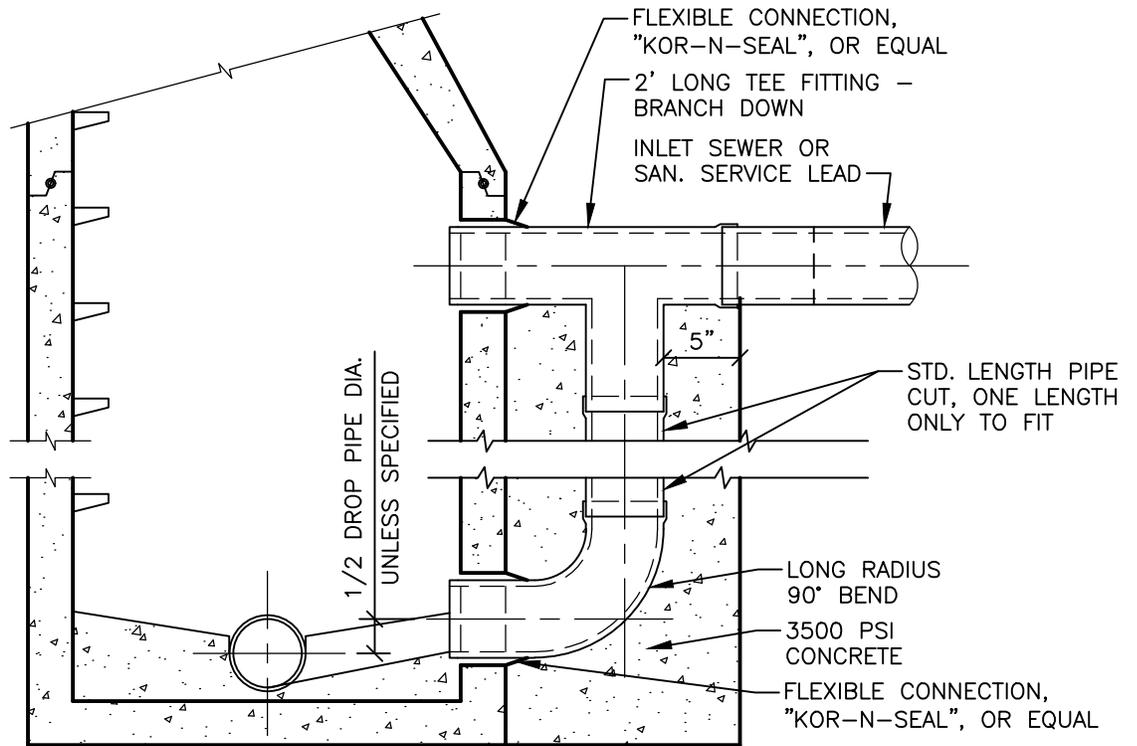
STANDARD CATCH BASIN
 NO SCALE IT-006

Appendix 3



STANDARD SANITARY MANHOLE
 NO SCALE IS-005

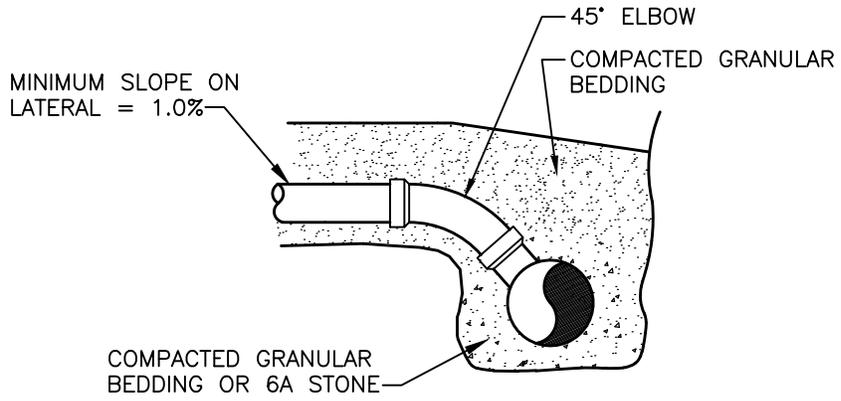
Appendix 4



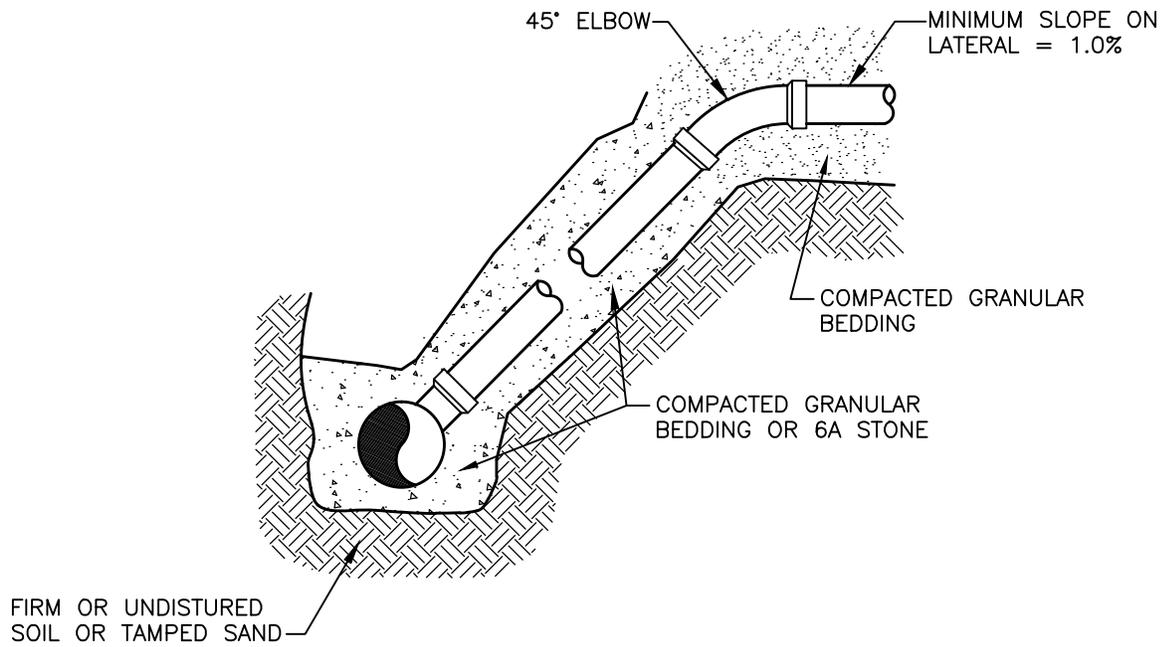
NOTE:
 FOR 8" DIA. SEWERS WITH DROP CONNECTION, THE DROP PIPE SHALL BE 8" DIA. FOR SEWERS 10" AND LARGER, THE DROP PIPE SHALL BE ONE SIZE SMALLER THAN THE MAIN LINE.

STANDARD DROP PIPE DETAIL
 NO SCALE IS-006

Appendix 5



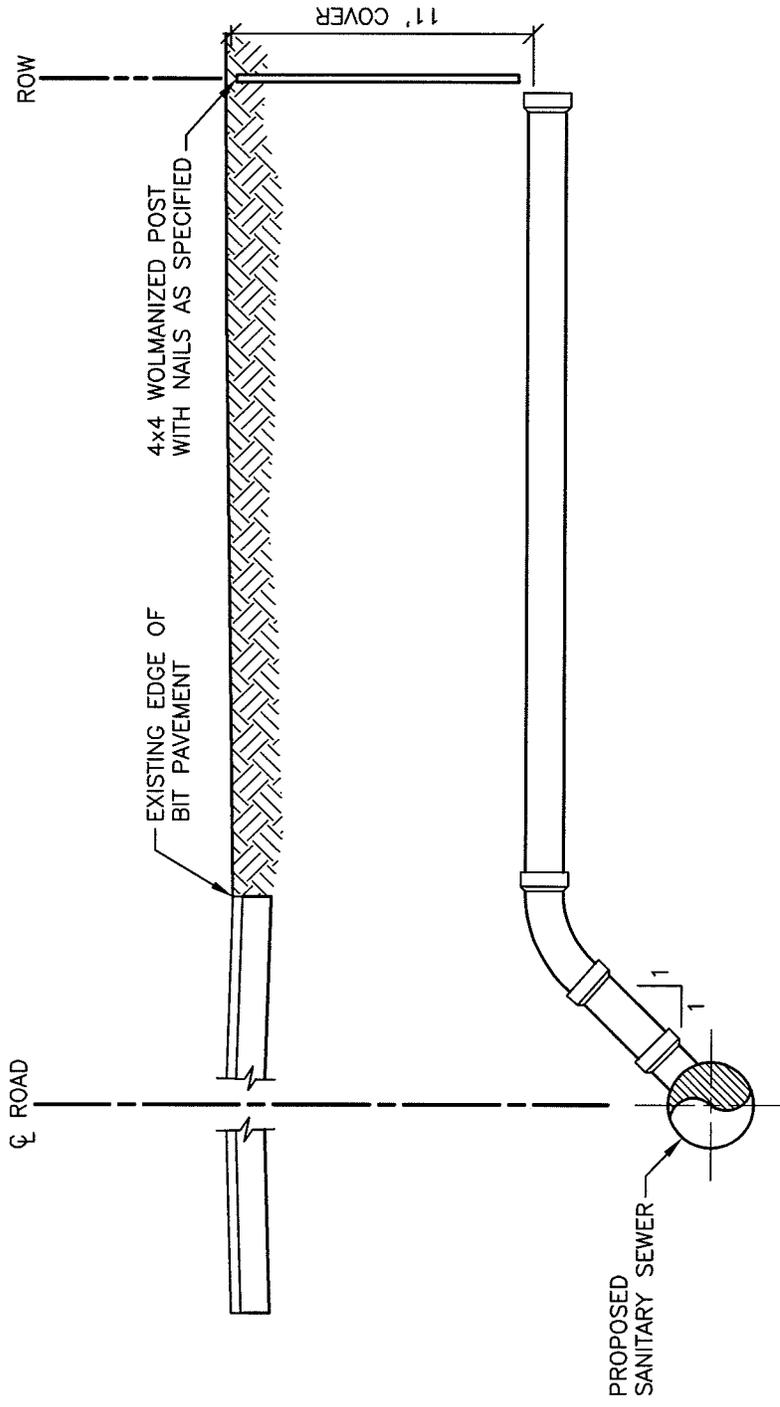
HORIZONTAL CONNECTION



VERTICAL RISER

SANITARY SERVICE CONNECTIONS
NO SCALE

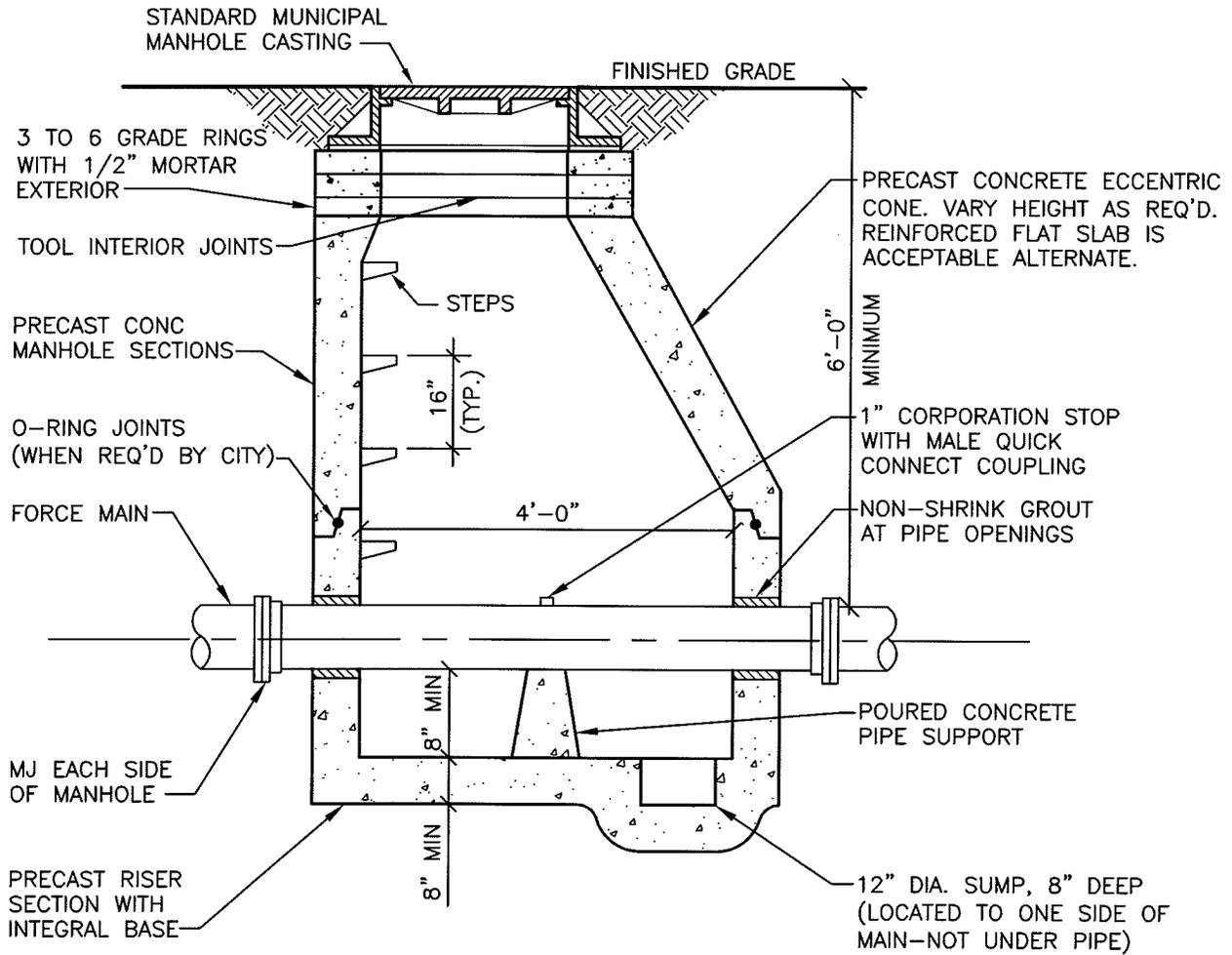
Appendix 6



SANITARY SEWER SERVICE LEAD DETAIL
NO SCALE

Appendix 7

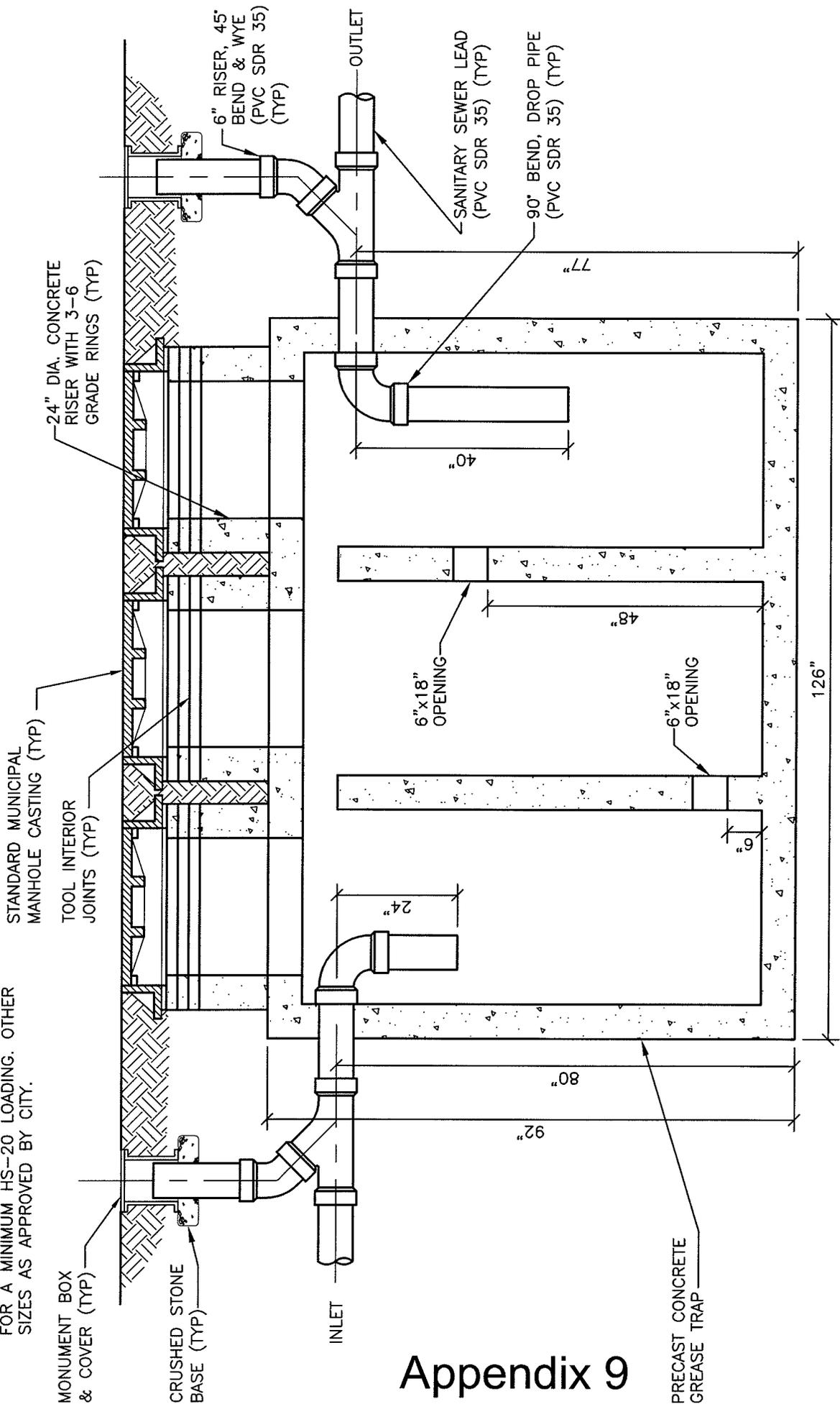
NOTE:
 THE CONTRACTOR SHALL FURNISH TO THE CITY (1) 25 FOOT, 3/4" I.D. DOUBLE LAYER REINFORCED RUBBER HOSE, WITH FEMALE QUICK CONNECTOR COUPLINGS ON BOTH ENDS.



AIR RELEASE MANHOLE DETAIL
 NO SCALE

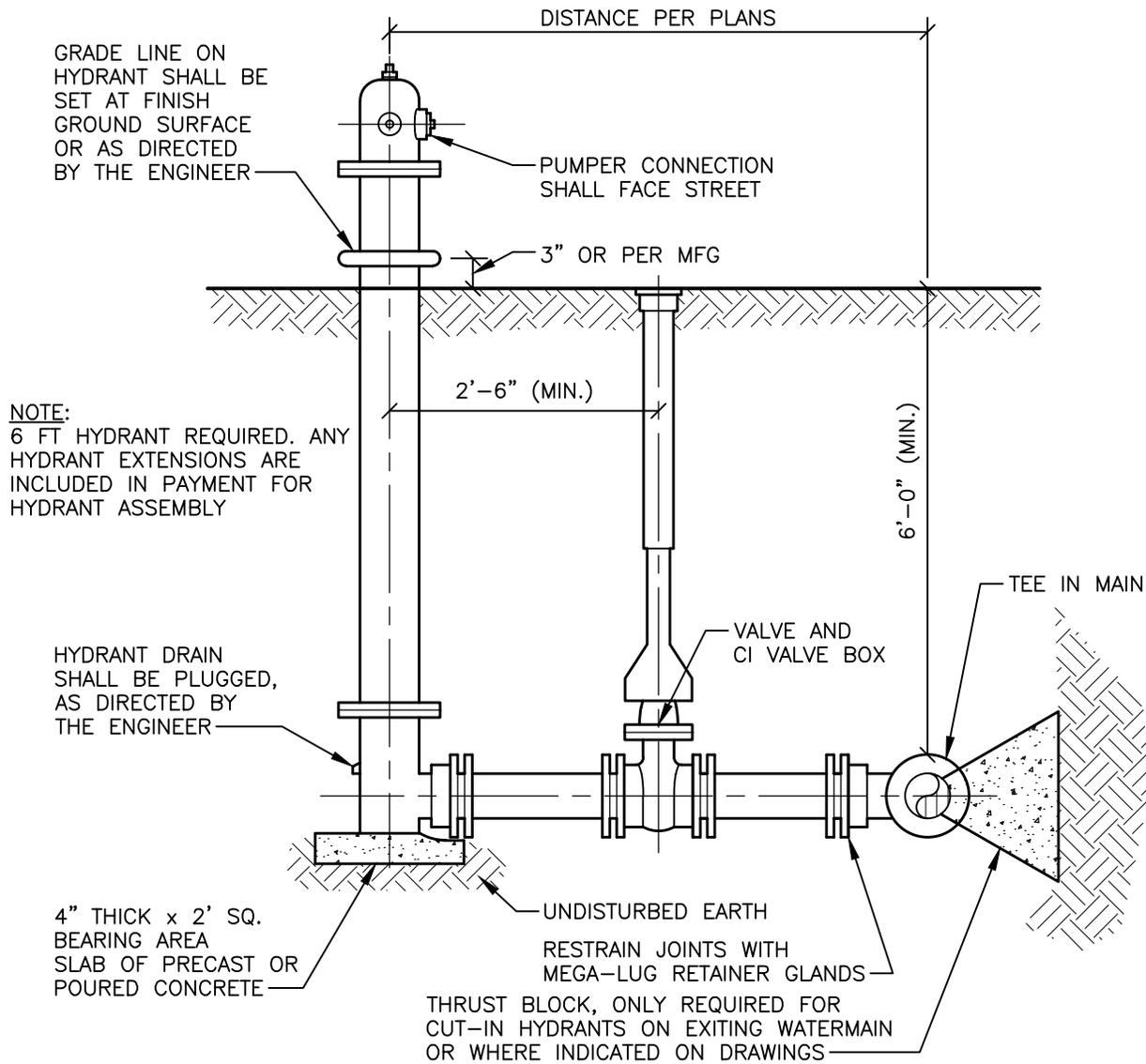
Appendix 8

NOTE:
 2000 GALLON GREASE TRAP FOR
 NON-TRAFFIC AREA SHOWN. IN TRAFFIC
 AREAS, GREASE TRAP SHALL BE DESIGNED
 FOR A MINIMUM HS-20 LOADING. OTHER
 SIZES AS APPROVED BY CITY.



Appendix 9

GREASE TRAP DETAIL
 NO SCALE

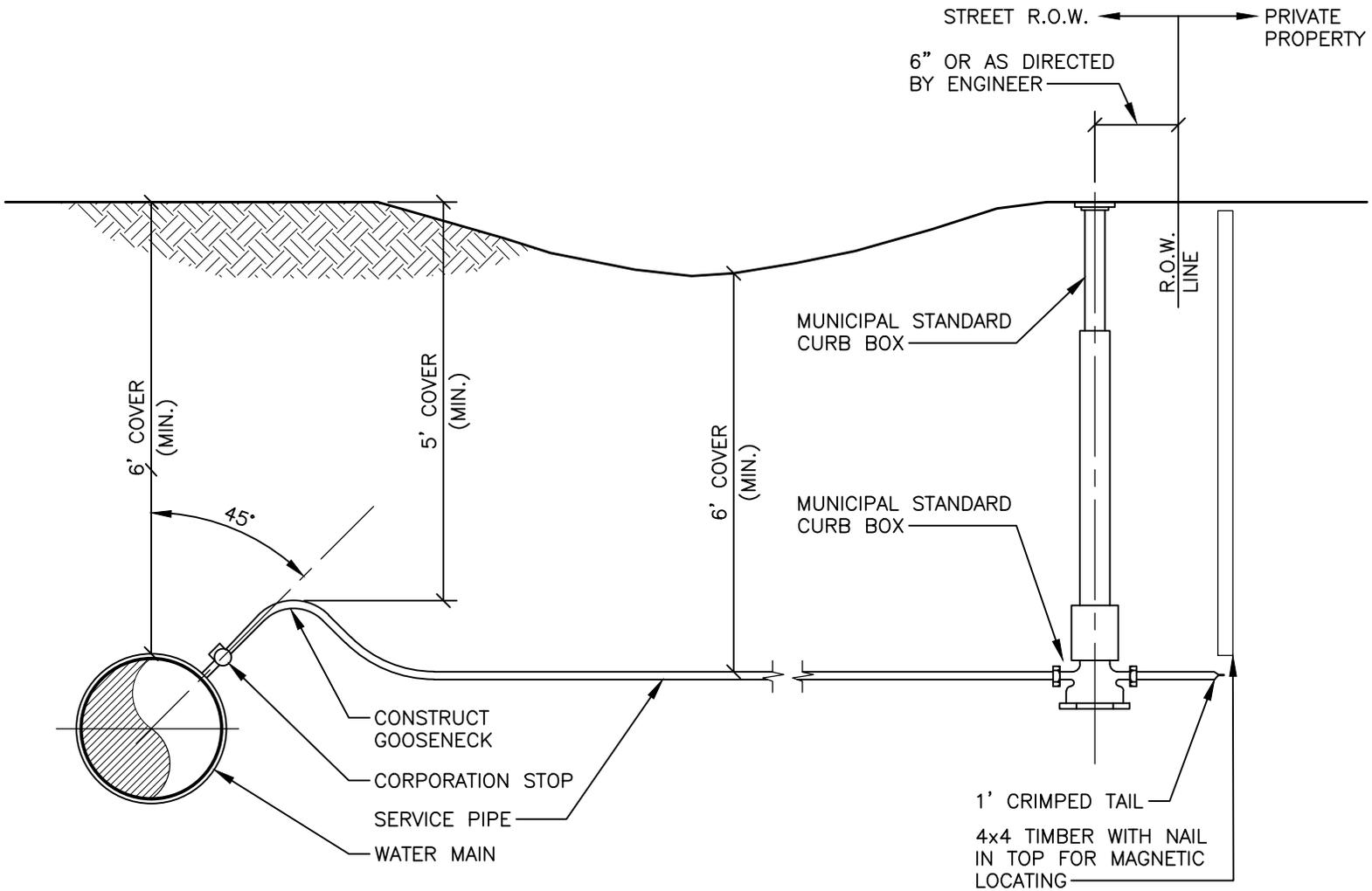


IONIA STANDARD HYDRANT ASSEMBLY

NO SCALE

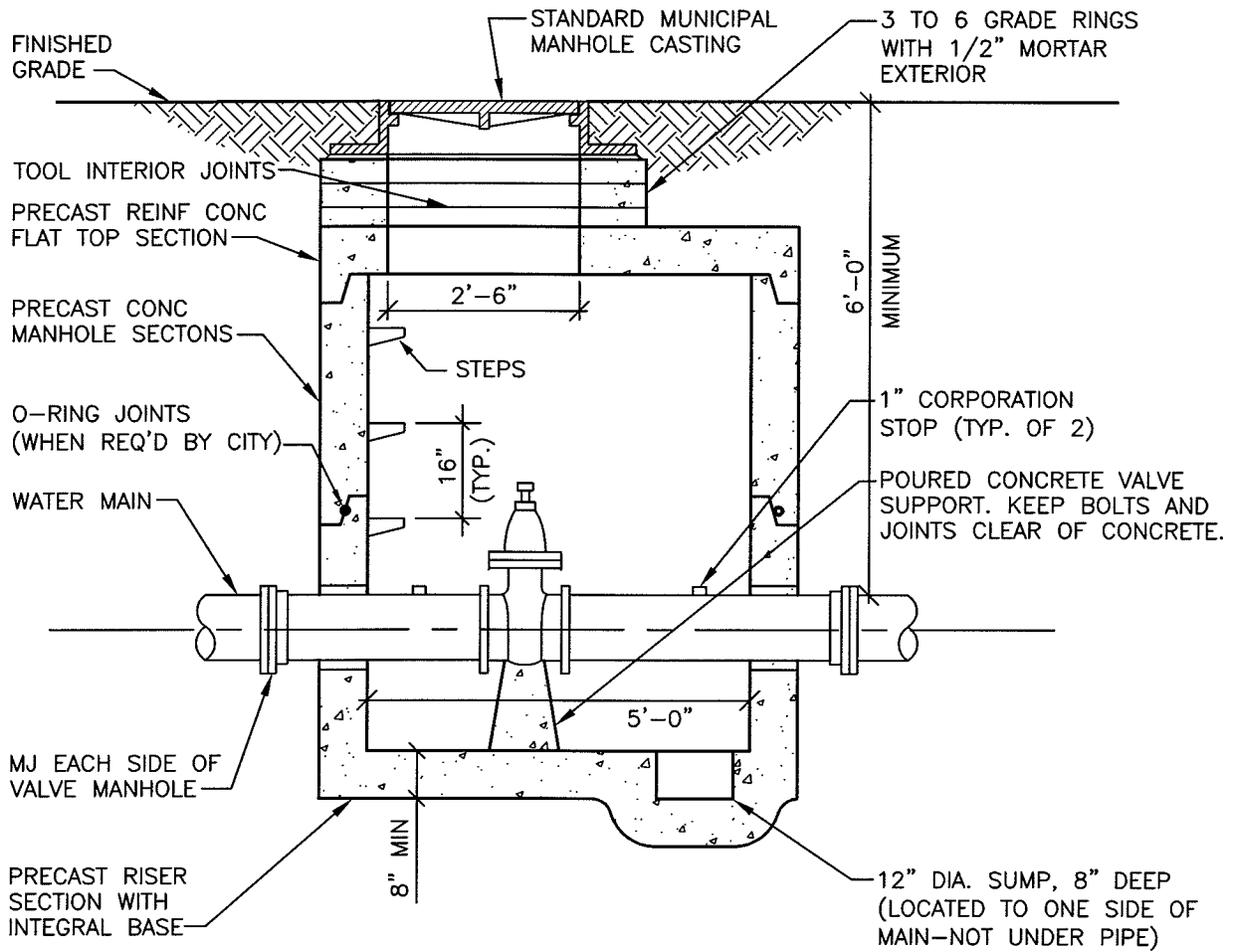
IW-003

Appendix 10



WATER SERVICE CONNECTION DETAIL
 NO SCALE IW-002

Appendix 11



VALVE MANHOLE DETAIL
 NO SCALE

Appendix 12

PROVIDE FUSE(S) IN CIRCUIT TO BALLAST; FUSES SHALL BE BUSSMAN "LIMITRON" TYPE KTK, EQUAL BY LITTELFUSE OR APPROVED EQUAL; FUSE HOLDERS SHALL BE WATERPROOF, BUSSMAN "TRON" TYPE HEB, EQUAL BY LITTELFUSE OR APPROVED EQUAL; SIZE OF FUSE SHALL BE AS REQUIRED BY LUMINAIRE MANUFACTURER

CONNECT GROUND WIRE TO POLE BASE GROUND STUD

BASE COVER

BUSH CONDUITS

1" CHAMFER

#12 THHN

HAND HOLE (4"x6" NOMINAL)

PROJECT ANCHOR BOLTS ABOVE TOP OF BASE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATION; PROVIDE DOUBLE GALVANIZED NUTS AND GALVANIZED WASHERS FOR LEVELING UNIT (ONE ABOVE AND BELOW BASE FLANGE)

3"

GRADE

EDGE OF CURB OR PAVEMENT AREA

TRANSITION TO 24" DIAMETER

24" SQUARE TO 12" BELOW GRADE

3'-0"

2' LONG, 3/4" DIA ANCHOR BOLTS; PROVIDED BY CONTRACTOR

SPARE CONDUIT; SEE PLANS FOR SIZE OF CONDUIT(S)

3/4" RNM FOR GROUND WIRE

#8 BARE GROUND WIRE

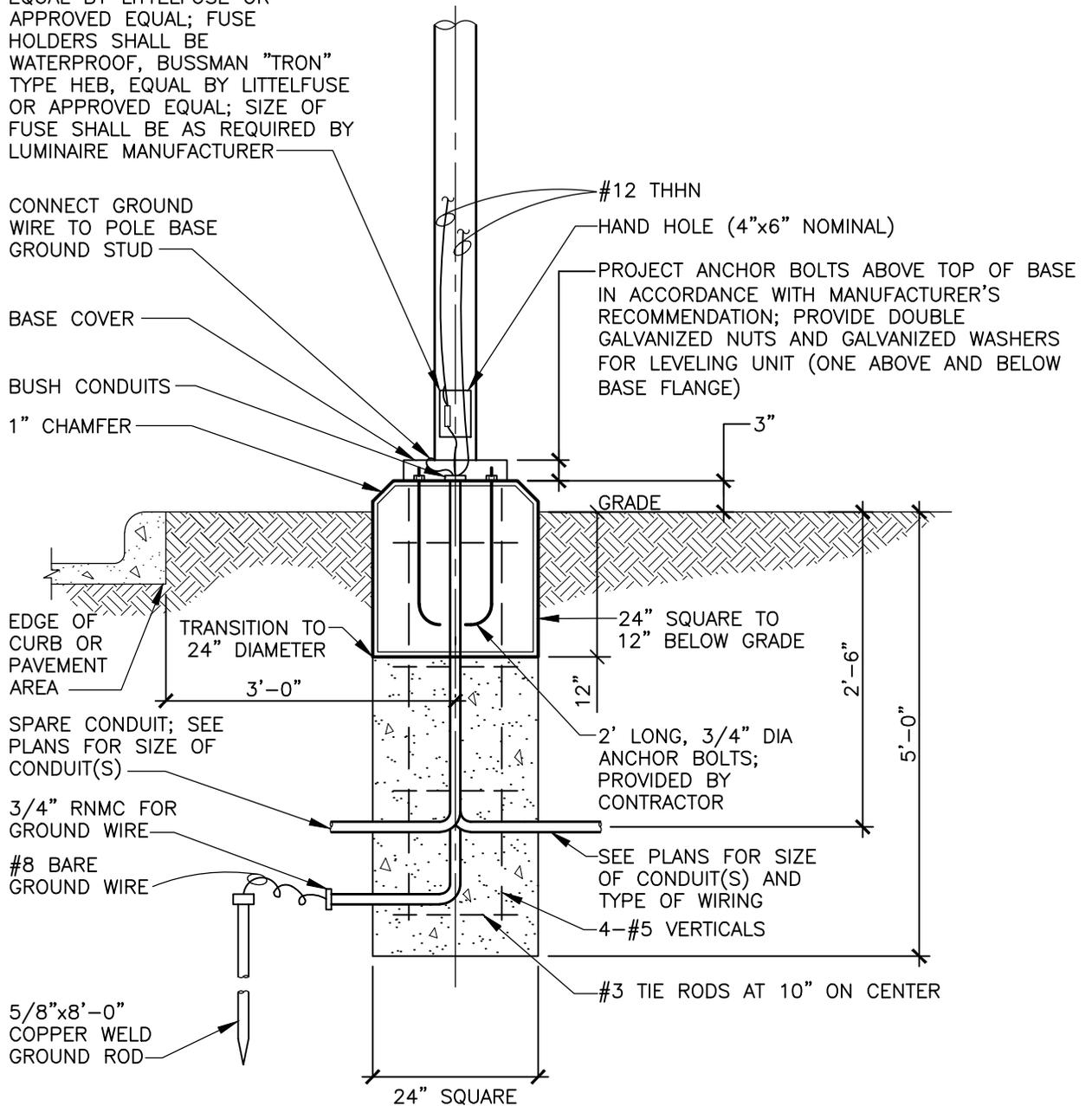
SEE PLANS FOR SIZE OF CONDUIT(S) AND TYPE OF WIRING

4-#5 VERTICALS

5/8"x8'-0" COPPER WELD GROUND ROD

#3 TIE RODS AT 10" ON CENTER

24" SQUARE



OUTDOOR LIGHTING STANDARD CONCRETE BASE DETAIL
NO SCALE

Appendix 13

Attachment



Pre-Construction Meetings

Prior to beginning any development process in the City of Ionia, applicants are encouraged to meet on an informal basis with the City Manager to discuss the proposed project and review the site plan submittal requirements. This meeting can help facilitate the approval process once a formal application is submitted. In order to request a conceptual review meeting, please contact the City Manager by phone at (616) 527-5776 or by email at pgarland@ci.ionia.mi.us

In order to make the best use of time, the following should be known / available:

- Location of site
- Existing land use
- Intended development (residential, office, retail, manufacturing, etc.)
- Preliminary sketches (hand drawn are sufficient)
- Surrounding land uses
- Any other additional information such as flood zone status, expected parking, etc. are helpful but not required.

At the meeting, staff will cover the following:

- Review the proposed use for general conformance with existing zoning
- Provide initial feedback on design (if applicable)
- Identify the correct process (site plan review, special land use, variance, etc.) and walk the applicant through what to expect, identify timelines
- Identify other possible agencies to engage such as MDOT, Ionia County, etc.
- Answer any additional questions you may have pertaining to development in the City.



City of Ionia Site Plan Review Process

I. Site Plan Required

A site plan shall be submitted for review and approval prior to the issuance of a building permit as follows:

- (a) Planning Commission Level. The Planning Commission shall review the following site plans:
 - (i) Any new principal commercial, office, industrial, business or institutional use or a residential use having more than two dwellings.
 - (ii) Special land uses and planned unit developments.
 - (iii) Existing commercial, industrial, business or institutional uses and buildings or residential uses having more than two dwellings proposed to be increased in size fifty percent or more of the existing building or use. The existing size shall be determined by the gross square footage of an existing building, or if the principal use is primarily out of doors, then the land area occupied by the use shall be used to determine the existing size.
 - (iv) Accessory buildings that are more than 50% of the size of the largest principal building on site.
- (b) Staff Level. The Zoning Administrator shall review the following site plans or may refer such plans to the Planning Commission.
 - (i) Expansion of an existing use or building which comprises less than 50% of a building or less than 50% of the land area occupied by a use which is principally outdoors.
 - (ii) A building which is accessory to the principal building if such accessory building is no more than one half of the size of the largest principal building on site.
 - (iii) A change in the use of a property which results in the need for more parking spaces.

II.

Items to be Submitted

The following materials must be submitted to the City of Ionia Zoning Administrator in applying for review of a site plan by the Planning Commission.

_____ 4 physical copies of the site plan

_____ 1 electronic copy of site plan

_____ Application

_____ Fee

The site plan must contain the information required by Section 1276.05 of the City Zoning Ordinance. A site plan checklist is attached which notes the information required.

III.

Meeting Dates

The City Planning Commission meets on the second Wednesday of every month at 4:30 PM, in the City Council Chambers located at City Hall, 114 N. Kidd Street.

IV.

Processing Period

An application for site plan review to the Planning Commission usually takes about 30-45 days to process.

Applications must be submitted at least four weeks before a Planning Commission meeting in order to be placed on the agenda.

A site plan reviewed only by the Zoning Administrator can be processed in a week.

V.

Application Procedures

Whenever an application is filed for a site plan review, the following steps are taken:

Step 1

An application for a site plan is submitted to the Zoning Administrator along with the required fee.

Step 2

The Zoning Administrator in conjunction with the chair of the Planning Commission, sets a public hearing date.

Step 3

The Zoning Administrator mails notices of the hearing to all land owners within 300 feet of the site.

Step 4

The notices are mailed at least 15 days before the hearing.

Step 5

The Zoning Administrator forwards copies of the application and site plan to the Planning Commission, Fire Chief, and Department of Public Works.

Step 6

Reports from the Fire Chief, and Department of Public Works are prepared and sent to the Planning Commission.

Step 7

The Planning Commission at the public hearing reviews the site plan and staff reports. The Commission reviews the plan in accordance with the standards contained in Section 1276.05 of the Zoning Ordinance. The Commission may approve, modify or deny the site plan or approve it subject to revisions being made.

Step 8

The Commission may require the revised plan to be brought back to the Commission for final approval or allow the Zoning Administrator to review and approve the revised plan according to the changes required by the Commission.

Step 9

Once final approval is given and the site plan contains all required corrections, the Zoning Administrator signs two copies of the plan, one for City records and one for the applicant. **Following this step, the applicant may apply for a building permit with Ionia County.**

Step 10

An approved site plan must be under construction within one year of the date of final site plan approval or the site plan becomes invalid. A one-year extension may be granted by the Planning Commission provided the applicant presents reasonable evidence that the development has had unforeseen difficulties but is now ready to proceed.

A Site Plan Review Checklist may be helpful for applicants to ensure that all requirements of the Site Plan have been included. The Site Plan Checklist is attached to this procedural document and the application.

Review Standards

All site plans reviewed by the Planning Commission shall be approved, approved with conditions, or denied based on the purposes, objectives, and requirements of this ordinance, and specifically, the following considerations when applicable. Please review the following standards to ensure that the proposed site plan will satisfy these requirements. Additional comments and information are encouraged.

Relationship of Request to Surrounding Area

- The relationship of uses proposed will not adversely affect the public health, safety or welfare.
- Proposed uses and structures take into account topography, size of property, the uses adjoining property and relationship and size of buildings to the site.
- The site is developed so as not to impede the normal and orderly development or improvement of surrounding property for uses permitted in the ordinance.

Drives, Parking, and Circulation

- Safe, convenient, uncongested, and well-defined vehicular and pedestrian circulation is provided for ingress / egress points within the site.
- Drives, streets and other circulation routes are designed to promote safe and efficient traffic operations within the site and at ingress / egress points.
- The arrangement of public or private vehicular and pedestrian connections to existing or planned streets in the area are planned to provide a safe and efficient circulation system for traffic within the City of Ionia.

Natural Features

- Removal or alteration of significant natural features is restricted to those areas that are reasonably necessary to develop the site in accordance with the requirements of this ordinance.
- Landscaping, buffers, and / or greenbelts are preserved and / or provided to ensure that proposed uses will be adequately buffered from one another and from surrounding public and private property.

General

- Satisfactory assurance is provided that the requirements of all other applicable ordinances, codes and requirements of the City of Ionia will be met.
- The general purposes and spirit of this ordinance and the City of Ionia Master Plan are maintained.

Date: _____

Zoning Permit or Site Plan Review Survey



In an effort to improve our procedures and processes, we are requesting feedback from those who have experienced the Site Plan Review process. This survey will assist City personnel in approving the efficiency and effectiveness of the existing Site Plan Review process and update as needed. Thank you for your participation.

Please indicate the category to which you belong:

Resident Contractor Commercial property owner
 Business owner Other: _____

Did you find the Site Plan Review process to be well organized and easy to navigate?

Yes No, please explain: _____

How did you find the pace of the Site Plan Review process?

Too fast; difficult to keep up Quick and efficient
 Medium Slower than most communities
 No action. Requiring my constant intervention to move the process along.

Do you feel the Planning Commission was thorough understanding your concerns and addressing all of the important and relevant items?

Yes No, please explain: _____

How did you find the pace of the Permit and Inspection Review process?

Too fast; difficult to keep up Quick and efficient
 Medium Slower than most communities
 No action. Requiring my constant intervention to move the process along.

How did you find the permitting and inspection process?

Easy to follow Required assistance from City

If additional assistance was necessary, how can we improve the process? _____

Do you feel the Planning Commission was thorough understanding your concerns and addressing all of the important and relevant items?

Yes No, please explain: _____

Were the City staff and / or the Planning Commission responsive to your questions, comments, and concerns?

Yes

They tried but lacked sufficient knowledge or skills to address my issue.

No

Do you feel that the final decision was consistent with the governing guidelines of the Site Plan Review process?

Yes No, please explain: _____

Please return this survey to:

City of Ionia
P.O. Box 496
Ionia, MI 48846

Description or Explanation of Fee/Charge/Rate	Fee Determination	Planning-Zoning	Adopted
Accessory Structure Permit	\$25.00	Sec 214.06 of City Code	6-7-2022
Fence Permit	\$25.00	Sec 214.06 of City Code	6-7-2022
Home Construction/ Home Addition Permit	\$25.00	Sec 214.06 of City Code	6-7-2022
Land Division	$\begin{array}{r} \text{Split } \$75.00 + \\ \text{\$15.00/new lot} \\ \hline \text{Lot Combination} \\ \text{\$75.00} \\ \hline \text{Lot Line Relocation} \\ \text{\$75.00} \end{array}$	Sec 214.06 of City Code	3-6-2001
Marihuana Facility Operators	\$5,000.00	Sec 214.06 of City Code	6-7-2022
Open Space Neighborhood	\$750.00	Sec 214.06 of City Code	6-7-2022
Planned Unit Development	\$750.00	Sec 214.06 of City Code	6-7-2022
Rezoning	\$750.00	Sec 214.06 of City Code	6-7-2022
Signs - Temporary/Portable - Permanent	\$25.00 \$50.00	Sec 214.06 of City Code	6-7-2022
Site Condominium	\$750.00	Sec 214.06 of City Code	6-7-2022
Site Plan Review - Staff Review - PC Review	\$100.00 \$500.00	Sec 214.06 of City Code	6-7-2022
Special Land Use	\$500.00	Sec 214.06 Of City Code	6-7-2022
Street Vacating	\$750.00	Sec 214.06 Of City Code	6-7-2022
Subdivision Plat	\$750.00	Sec 214.06 of City Code	6-7-2022
Zoning Variance	\$500.00	Sec 214.06 of City Code	6-7-2022



Site Plan Review Application

Submit Applications to City Hall

Street Address: 114 North Kidd Street Ionia, MI 48846

Mailing Address: P.O. Box 496 Ionia, MI 48846

Ph: (616) 527-4170 Website: www.ci.ionia.mi.us

Date of Application: _____

Permit Fee: Staff Review \$100
PC Review \$500

There are two levels of site plan review. The first is conducted at the Planning Commission level and the second at the staff level. If a site plan requires action by the Planning Commission it must be submitted four weeks prior to the meeting in which it will be heard.

All site plan applications must be submitted with a completed site plan checklist. Approved site plans are valid for one year unless extended. If actual construction of a substantial portion of the improvements included in the approved site plan has not commenced and proceeded meaningfully toward completion during that period, the approval of the final site plan shall be voided.

Applicant Information

Applicant's Name: _____ Interest in Property: _____

Address: _____ City, State, Zip: _____

Phone: _____ Email: _____

Owner's Name (If different from above): _____

Project Information

1. Request (check all that apply):

Site Condominium Special Land Use Plat PUD

Site Plan Review Rezoning Other: _____

2. Address of Property: _____

3. Parcel Number: _____

4. Legal Description: _____

5. Project Description: _____

6. Current Zoning: _____ Proposed Zoning: _____

7. Size of Parcel: _____

Signatures

Applicant's Signature: _____ Date: _____

Property Owner's Signature: _____ Date: _____

OFFICE USE ONLY	Application #: _____
___ Fees Paid: _____	
Date Advertised: _____	Date of Meeting: _____
Action Taken: _____	
Comments: _____	

Signature: _____	Date: _____

Site Plan Review Process

I. Site Plan Required

A site plan shall be submitted for review and approval prior to the issuance of a building permit as follows:

- a) Planning Commission Level. The Planning Commission shall review the following site plans:
 - 1. Any new principal commercial, office, industrial, business or institutional use or a residential use having more than two dwellings.
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 - 3. Existing commercial, industrial, business or institutional uses and buildings or residential uses having more than two dwellings proposed to be increased in size fifty percent or more of the existing building or use. The existing size shall be determined by the gross square footage of an existing building, or if the principal use is primarily out of doors, then the land area occupied by the use shall be used to determine the existing size.
 - 4. Accessory buildings which are more than 50% of the size of the largest principal building on site.
- b) Staff Level. The Zoning Administrator shall review the following site plans or may refer such plans to the Planning Commission.
 - 1. Expansion of an existing use or building which comprises less than 50% of a building or less than 50% of the land area occupied by a use which is principally outdoors.
 - 2. A building which is accessory to the principal building if such accessory building is no more than one half of the size of the largest principal building on site.
 - 3. A change in the use of a property which results in the need for more parking spaces.

II. Items to be Submitted

The following material must be submitted to the City Zoning Administrator in applying for review of a site plan by the Planning Commission.

- ___ Application
- ___ Fee
- ___ 4 Copies of a Preliminary Site Plan
- ___ 1 Electronic Copy of a Preliminary Site Plan
- ___ Site Plan Review Checklist

The site plan must contain the information required by Section 1276.05 of the City Zoning Ordinance. The site plan checklist notes the information required.

III. Meeting Dates

The City Planning Commission meets on the second Wednesday of each month at 4:30 P.M. in the city council chambers at the City Hall.

IV. Processing Period.

An application for site plan review to the Planning Commission usually takes about 30 to 45 days to process.

Applications must be submitted at least four weeks before a Planning Commission meeting in order to be placed on the agenda.

A site plan reviewed only by the Zoning Administrator can be processed in a week.

V. Application Procedures

Whenever an application is filed for a site plan review, the following steps are taken:

1. An application for a site plan is submitted to the Zoning Administrator along with the required fee.
2. The Zoning Administrator in conjunction with the chair of the Planning Commission, sets a public hearing date.
3. The Zoning Administrator mails notices of the hearing to all land owners within 300 feet of the site.
4. The notices are mailed at least 15 days before the hearing.
5. The Zoning Administrator forwards copies of the application and site plan to the Planning Commission, Director of Public Safety, and Department of Public Works.
6. Reports from the Director of Public Safety, and Department of Public Works are prepared and sent to the Planning Commission.
7. The Planning Commission at the public hearing reviews the site plan and staff reports. The Commission reviews the plan in accordance with the standards contained in Section 1276.05 of the Zoning Ordinance. The Commission may approve, modify or deny the site plan or approve it subject to revisions being made.

The Commission may require the revised plan to be brought back to the Commission for final approval or allow the Zoning Administrator to review and approve the revised plan according to the changes required by the Commission.

8. Once final approval is given and the site plan contains all required corrections, the Zoning Administrator signs two copies of the plan, one for the City Building Inspector and one for the applicant. Following this step, the applicant may apply for a building permit.
9. An approved site plan must be under construction within one year of the date of final site plan approval or the site plan becomes invalid. A one-year extension may be granted by the Planning Commission provided the applicant presents reasonable evidence that the development has had unforeseen difficulties but is now ready to proceed.

Site Plan Review Standards

All site plans reviewed by the Planning Commission shall be approved, approved with conditions, or denied based on the purposes, objectives, and requirements of this ordinance, and specifically, the following considerations when applicable. Please review the following standards to ensure that the proposed site plan will satisfy these requirements. Additional comments and information are encouraged.

Relationship of Request to Surrounding Area

- ❑ The relationship of uses proposed will not adversely affect the public health, safety, or welfare.
- ❑ Proposed uses and structures take into account topography, size of the property, the uses on adjoining property and relationship and size of buildings to the site.
- ❑ The site is developed so as not to impede the normal and orderly development or improvement of surrounding property for uses permitted in the ordinance.

Drives, Parking, and Circulation

- ❑ Safe, convenient, uncongested, and well-defined vehicular and pedestrian circulation is provided for ingress/egress points and within the site.
- ❑ Drives, streets and other circulation routes are designed to promote safe and efficient traffic operations within the site and at ingress/egress points.
- ❑ The arrangement of public or private vehicular and pedestrian connections to existing or planned streets in the area are planned to provide a safe and efficient circulation system for traffic within the City of Ionia.

Natural Features

- ❑ Removal or alteration of significant natural features is restricted to those areas that are reasonably necessary to develop the site in accordance with the requirements of this ordinance.
- ❑ Landscaping, buffers, and/or greenbelts are preserved and/or provided to ensure that proposed uses will be adequately buffered from one another and from surrounding public and private property.

General

- ❑ Satisfactory assurance is provided that the requirements of all other applicable ordinances, codes, and requirements of the City of Ionia will be met.
- ❑ The general purposes and spirit of this ordinance and the City of Ionia Master Plan are maintained.

Site Plan Review Checklist

A site plan submitted for review by the City of Ionia Planning Commission must contain the following items unless the Commission determines such items are not needed on the plan. This list is taken from Section 1276.05 (c)-(e) of the City of Ionia Zoning Ordinance.

- | | |
|--|---|
| <input type="checkbox"/> Scale (not more than 1" – 100 ft.). | <input type="checkbox"/> Existing & proposed topographic elevations at two-foot intervals on the site & to a distance of 50 ft. outside the boundaries. |
| <input type="checkbox"/> A vicinity map. | <input type="checkbox"/> Identify all slopes 20% or more. |
| <input type="checkbox"/> Date site plan was prepared. | <input type="checkbox"/> Direction of storm water drainage & how storm water runoff will be handled. |
| <input type="checkbox"/> Name, address & seal of preparer. | <input type="checkbox"/> Location of existing buildings. |
| <input type="checkbox"/> North arrow. | <input type="checkbox"/> Location of proposed buildings. |
| <input type="checkbox"/> Legal description. | <input type="checkbox"/> Intended use of proposed buildings. |
| <input type="checkbox"/> Property lines and dimensions. | <input type="checkbox"/> Length & width of proposed buildings. |
| <input type="checkbox"/> Building setback distances. | <input type="checkbox"/> Height of proposed buildings. |
| <input type="checkbox"/> All structures, lot lines & wetlands within 100 feet of the site. | <input type="checkbox"/> Square footage of proposed buildings. |
| <input type="checkbox"/> Location of septic tanks and drain fields. | <input type="checkbox"/> First floor elevation of each building. |
| <input type="checkbox"/> Location of utility easements. | <input type="checkbox"/> Location of abutting streets. |
| <input type="checkbox"/> Location of all sidewalks. | <input type="checkbox"/> Location of rights-of -way. |
| <input type="checkbox"/> Location of all bike paths or walkways. | <input type="checkbox"/> Location of service drives. Location of curb cuts. |
| <input type="checkbox"/> Location and size of any walls, fences or other screening provisions. | <input type="checkbox"/> Location of access easements serving the site. |
| <input type="checkbox"/> Location of all proposed landscape including size and type of planting. | <input type="checkbox"/> Location of driveways opposite the site. |
| <input type="checkbox"/> Location of all proposed accessory structures. | <input type="checkbox"/> Location of driveways within 100 feet on either side of the site. |
| <input type="checkbox"/> Location of all light poles or fixtures including type. | |
| <input type="checkbox"/> Location of all flagpoles. | |

- ___ Driveway width, curb radii and deceleration lane.
- ___ Location and size of all water lines.
- ___ Location and size of sanitary sewer lines.
- ___ Location of all storage sheds.
- ___ Location of all transformers.
- ___ Location of all dumpsters or trash removal areas or devices. Dumpsters must be screened.
- ___ Location of all signs.
- ___ Location of all existing and proposed utility poles.
- ___ Location of proposed parking areas & access drives.
- ___ Number of parking spaces & aisles.
- ___ Dimensions of spaces & aisles.
- ___ Location of parking blocks, landscape, timbers, etc.
- ___ Location of loading areas.
- ___ Location of parking islands.
- ___ Location of handicapped spaces & access ramps.
- ___ Type of parking lot surface.
- ___ Location of curbs.
- ___ Location & type of significant existing vegetation.
- ___ Location & type of significant existing water courses.
- ___ Location & type of significant existing water bodies.
- ___ Location & type of significant existing county or city drains & manmade surface drainage ways.
- ___ Location of 100-year floodplains.
- ___ Location of existing wetlands.
- ___ Location and size of storm drainage lines.
- ___ Location of fire hydrants.
- ___ Location of catch basins.
- ___ Vegetation which is to be retained on the site must be illustrated.
- ___ Zoning on adjacent properties.
- ___ Location & specifications for any existing or proposed above or below ground storage facilities for any chemicals, salts, flammable materials, or hazardous materials.



Public Infrastructure Permit Application

Submit Applications to City Hall

Street Address: 114 North Kidd Street Ionia, MI 48846

Mailing Address: P.O. Box 496 Ionia, MI 48846

Ph: (616) 527-4170 Website: www.ci.ionia.mi.us

Date of Application: _____

Permit Fee: See Below

____ New Construction

____ Existing Construction

Property Address: _____ Parcel Number: _____

Applicant Information

Owner's Name: _____

Address: _____ City, State, Zip: _____

Phone: _____ Email: _____

Contractor: _____ License Number: _____

Address: _____ City, State, Zip: _____

Phone: _____ Email: _____

Applicant's Name: _____ Interest in Property: _____

Address: _____ City, State, Zip: _____

Phone: _____ Email: _____

Project Information

Please check all that apply to the proposed project.

- | | | | |
|-------------------------------|--|-------------|----------------------------|
| ____ Commercial Water Tap-In | Outside City Limit: Fee = Bldg. Sq. Ft. X \$2.37 | | |
| ____ Residential Water Tap-In | \$1,000* | ____ 1" Tap | ____ 2" Tap |
| ____ Sewer Tap In | \$1,500* | ____ City | ____ Easton/Ionia Township |

* If cost for roadcuts, taps, meters, labor, etc. are above specified rate, an additional fee will be charged.

- | | |
|--|--------------------------------|
| ____ Inspection Fee | \$40 Berlin Township Only |
| ____ Sidewalk (New or Restoration) | Fee Waived with Permit |
| ____ Curb Cut (New or Restoration) | No Fee |
| ____ Drive Approach (New or Restoration) | \$25 Plus Insurance Coverage |
| ____ Storm Sewer Tap-In Permit | \$500 Up to 11,000 Sq. Ft. Lot |
| ____ Drainage Permit | \$50 |
| ____ Water Meter on Site | |
| ____ Other _____ | |

