DESIGN AND CONSTRUCTION STANDARDS

VILLAGE OF LAKE ORION
OAKLAND COUNTY, MICHIGAN

ADOPTED : May 2025

LAKE ORION VILLAGE COUNCIL

PREPARED BY
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The following design Standards are intended to provide a basis upon which all commercial, industrial and residential sites within the Village of Lake Orion are to be designed. The review of the submitted plans will be completed by the Village Engineer, as indicated herein, or his designee. By no means are these Standards intended as a substitute for sound professional engineering judgment. It is recommended that the applicant refer to the Ordinances of the Village of Lake Orion to supplement these Standards.

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DESIGN AND CONSTRUCTION STANDARDS
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Adopted:
Design and Construction Standards

SUBMITTAL REQUIREMENTS AND REVIEW PROCEDURES

SECTION A-1 INTRODUCTION

The following Design and Construction Standards are intended to be used in conjunction with the Zoning Ordinance in order to provide a sound, reasonable basis for the design and preparation of construction plans upon which all site improvements on all commercial and residential parcels within the Village of Lake Orion are to be designed. The Standards herein are required to be used for the preparation of construction plans, which must be completed and approved prior to the issuance of a permit to construct (Zoning Compliance Permit). These plans outline the site improvements including sanitary sewers, storm sewers, water mains, detention/retention basins, stormwater quality control, grading and rear yard drainage, paving, sidewalks, soil erosion and sedimentation control, and alteration of grade plans which must be completed prior to the issuance of a permit to construct or a building permit.

1. Deviation from the Standards should be for valid reasons only and a written request justifying the deviation(s) shall be submitted to the Village Engineer for review and approval. The Village Manager may permit the proposed deviation if the Village Engineer believes that the proposed deviation would benefit the health, safety and welfare of the public or result in a more effective operation of the final constructed improvement, minimization of potential negative impacts on one or more other parcels, and/or a more efficient operation of the review process set forth in these Standards.

2. These Standards are not intended as a substitute for sound professional engineering judgment. These Design and Construction Standards incorporate the Village of Lake Orion Code of Ordinances, specifically Chapters 51, 52, 53, 92, 151, 157. It is suggested that the applicant refer to the Village of Lake Orion Code of Ordinances to supplement these Standards. The Standards are incorporated into each relevant Chapter by reference. The Standards may not apply to all conditions, and alternate solutions may be permitted as recommended by the Village.

3. Extraordinary situations will arise that are not clearly defined by the Standards. The Standards contained in this document may be inappropriate when applied to a particular situation. When such circumstances occur, the decision of the Village Manager shall govern, based on the Village Engineer's appraisal of the feasibility or safety of the proposed improvement, the effectiveness of the final constructed improvement, and/or the potential negative impacts on one or more other parcels.

4. Where standard codes, acts, and details are referenced in this document to the extent so referenced, they are adopted by reference.

5. Proposed improvement plans are not solely for review and construction but are also used to keep records of utilities for maintenance and future construction.

6. The Village Manager upon recommendation of the Village Engineer reserves the right to revise the Design and Construction Standards and Standard Details and Specifications, and fees as deemed necessary from time to time, and to require that such revised Standards be incorporated into the design plan, construction plan, and work at any time prior to final design approval.

SECTION A-2 SUBMITTAL AND APPROVAL PROCEDURES

1. All improvements to vacant land, expansions and/or modifications to existing developed parcels, redevelopment of improved parcels, and improvements or extensions to water main systems, sanitary sewers, stormwater management systems, mass grading and paving require the review and approval of detailed engineering design plans prior to the issuance of permits and start of construction. These Standards are intended to address substantial site improvements and are not intended to regulate minor individual lot improvements such as the construction of decks, sheds, home landscaping, and similar related items so long as they do not significantly impact the property on which the improvements are to occur and/or the property of adjacent owners.

2. The items found in this section contain the general requirements for the submittal of Engineering Construction Plans to the Village of Lake Orion for review, comment and approval. In addition, specific requirements pertaining to grading, soil erosion control, stormwater management, storm sewers, streets and paving, water mains, sanitary sewers, and franchise utilities follow this section and apply as stated within their respective content, in conjunction with Village General and Zoning Ordinances.

SECTION A-3 FEES AND DEPOSITS

Fees and deposits will be in accordance with the most recently adopted Village of Lake Orion Municipal Fee Schedule. Fees required may include, but are not limited to:

1. Application Fee
2. Engineering Plan Review Fee
3. Construction Observation Deposit
4. As Built (Record) Plan Review Fee
5. Addressing Fees

SECTION A-4 SUBMITTALS FOR ENGINEERING / CONSTRUCTION PLANS

All applicable materials shall be submitted to the Village Planning and Development Department for distribution. Section B – Construction Plan Requirements of these Design and Construction Standards provides more specific engineering plan requirements.

Complete improvement plans bearing the seal of a Professional Engineer licensed in the State of Michigan shall be submitted for review and approval of any development or portion thereof. Construction will not be permitted prior to Village approval and receipt of all required permits.

The following items are common for all projects being submitted for engineering review:

1. One complete set of plans in electronic (pdf) format emailed to zoning@lakeorion.org and the required application and review fees must be submitted to the Village of Lake Orion, 21 E. Church St., Lake Orion, MI 48359. All plans must be prepared, sealed and signed by a Registered Professional.

2. Engineering cost estimate for the entire project.

3. Fees as outlined in the most recently adopted Village of Lake Orion Municipal Fee Schedule.

SECTION A-5 ENGINEERING REVIEW PROCEDURE

1. Upon receipt of all required materials from the applicant, the Village shall provide an electronic plan set, a site development cost estimate, and any other applicable submitted materials, to the Village Engineer and all appropriate Departments for review and/or approval. The Village of Lake Orion Standard Detail sheets for Sanitary Sewer, Water Main, Storm Sewer, and Paving need not be submitted at this time.

2. The Village Engineer shall review the plans and related material for conformity to the Standards set forth herein, the Village Ordinances, the overall utility plans of the Village, and sound engineering practice. Following review, one (1) set of plans with the appropriate comments will be returned electronically to the applicant or applicant's agent with a letter summarizing the comments. Unless otherwise requested, all correspondence concerning the design of the site will be directed to the engineer or architect whose seal appears on the plan. A copy of the letter is sent to the Village Department of Public Works, Department of Planning and Development, Fire Marshal and Emergency Response personnel, and the Building Official.

3. Direction will be given at that time as to how plans must be resubmitted.

SECTION A-6 OTHER AGENCY REVIEWS

1. With the exception of public water main and sanitary sewer plans, the applicant or their designee shall be responsible for submitting plans to any public or private utility provider and any State or County agency with existing or proposed facilities or rights-of-way that may be affected by or that has jurisdiction over the proposed construction. Permits for such construction if required, shall be the responsibility of the developer.

2. For projects where the water main will become part of the public system, the Village Engineer shall notify the applicant to provide a water main permit set signed and sealed by a Michigan Registered Professional Engineer for processing, including current standard detail sheets, a completed Act 399 of 1976 permit application, and all documentation required for electronic submittal to the Michigan Department of Environment, Great Lakes and Energy (EGLE) for review and eventual issuance of a construction permit for water main systems.

3. For projects where the sanitary sewer will become part of the public system, the Village Engineer shall notify the applicant to provide a sanitary sewer permit set signed and sealed by a Michigan Registered Professional Engineer for processing, including current standard detail sheets and a completed Part 41 of Act 451 of 1994 permit application, and all documentation required for electronic submittal to Oakland County, GLWA, and the Michigan Department of Environment, Great Lakes and Energy (EGLE) for review and eventual issuance of a construction permit for sanitary sewer systems.

4. Applicant is responsible for submitting the changes requested by any State, regional or County agency back to the Village Engineer for approval.

SECTION A-7 PERMIT REQUIREMENTS

No construction may commence until permits, as applicable to the project, are secured from the appropriate agencies. Such permits include, but are not limited to the following:

1. *Village of Lake Orion:* Following the approved construction plans, a pre-construction meeting, and the remittance of all fees and deposits, a Zoning Compliance permit will be issued.

2. *Michigan Department of Environment, Great Lakes and Energy (EGLE) Water Main (Act 399):* All water main requires a construction permit from the EGLE. The Village will directly request approval from EGLE during the course of construction plan approval.

3. *Michigan Department of Environment, Great Lakes and Energy (EGLE) Sanitary Sewer (Part 41):* All sanitary sewer mains require a construction Permit from the EGLE. The Village will directly request approval Oakland County Water Resources, Great Lakes Water Authority (GLWA) and from EGLE during the course of construction plan approval.

4. *Oakland County Water Resources Commissioner:* All stormwater discharge and/or taps to County-controlled Drainage facilities require permit from the Oakland County Water Resources Commissioner. Applicant or Design Engineer is responsible for submittal to OCWRC.

5. *Oakland County Water Resources Commissioner (Soil Erosion):* A permit is required for any disturbance of soil greater than one acre and/or within 500 feet of a water of the state. Applicant or Design Engineer is responsible for submittal to OCWRC.

a. Sites less than one acre or that lie more than 500 feet from a watercourse or body of water will require Village review and approval of soil erosion control measures.

6. *Road Commission for Oakland County:* All work within existing or proposed road right of way under the jurisdiction of the Road Commission for Oakland County (RCOC), including discharges from stormwater management system to county road drainage facilities, approach work and/or utility work requires a permit. This includes any work within Heights Road or Orion Road. Applicant or Design Engineer is responsible for submittal to RCOC.

7. *National Pollutant Discharge Elimination System (NPDES) Notice of Coverage from Michigan Department of Environmental Quality:* A notice of Coverage is required for all areas disturbed greater than five (5) acres. This Notice requires inspection, restoration and record keeping requirements. Reports from the Certified Stormwater Operator shall be made available to the Village.

8. *Michigan Department of Environment, Great Lakes and Energy (EGLE) (Part 301, Part 303, and Part 31):* A permit is required for any work within a regulated wetland or flood plain, including stormwater discharge. All areas that are considered to be "wetland" as defined by EGLE shall be indicated on the plans. No improvements will be allowed in wetlands unless EGLE issues a permit or a letter of "No Authority" for such improvements. Applicant or Design Engineer is responsible for submittals.

9. *Michigan Department of Transportation:* A permit is required for all work within State-regulated road right of way, including discharges from stormwater management system to State road drainage facilities, approach work and/or utility work. This includes any work within North Park, South Park, or South Broadway (M-24). Applicant or Design Engineer is responsible for submittal to MDOT.

All permits and payment of associated fees required to perform the work shall be the responsibility of the Applicant and/or his Designee.

SECTION A-8 EASEMENTS

1. Easements dedicated to the Village of Lake Orion shall be required for all public sanitary sewer and water main.

2. Easements for storm sewer accepting drainage from other properties must be provided. Said easements shall be to property owners, and not to the Village of Lake Orion.

3. Where necessary, temporary construction easements from adjacent property owners and/or permanent easements for off-site facilities shall be obtained by the Applicant. Copies shall be submitted to the Village Engineer for review prior to recording. Recorded copies shall be submitted to the Village prior to construction plan approval.

4. All easements must be prepared with appropriate sketches, legal descriptions, and conveyance documents, and provided to the Village Engineer for review and approval prior to recording.

5. Documents shall be in a form acceptable to the Village Engineer and the Village Attorney. Standard utility easement forms are available in Appendix A.

6. Easements must be prepared and approved in draft form prior to the issuance of a building permit.

SECTION A-9 FINAL ENGINEERING / CONSTRUCTION APPROVALS / CONSTRUCTION

1. Partial approvals will not be given.

2. Applicant must submit copies of the documentation from other agencies (as applicable to the project) to the Village Engineer indicating that the plans have received approval for work within, and/or modifications to their facilities prior to the Village Engineer granting engineering construction plan approval.

3. After the plans are approved by the Village and prior to any construction, two (2) complete sets, including the Village of Lake Orion Standard Details for Sanitary Sewer, Water Main, Storm Sewer, and Paving as applicable for the project, shall be submitted to the Village Engineer for construction observation. The plans shall be stamped and signed on the cover sheet by the Licensed Engineer responsible for their preparation. All updated revisions from outside agencies shall be included on the plans. These approved plans and an identical electronic copy thereof shall be the only ones used during construction.

4. Upon engineering approval, notification will be given to the Building Official that the construction plans are approved.

5. When all approvals have been obtained and prior to starting construction, the applicant shall contact the Village Engineer to arrange a pre-construction meeting. A pre-construction meeting will not be scheduled until all of the required items listed in the Engineering Approval letter are received by the Village. In some circumstances, and at the DPW and Village Engineer discretion, a pre-construction meeting may be held prior to the receipt of all necessary permits. When such circumstances occur, the decision will be evaluated on a case-by-case basis.

6. Construction may not commence until all necessary permits are obtained, a pre-construction meeting is held, and all required fees, insurance, guarantees, and inspection escrow accounts have been deposited.

7. For quality purposes, and to satisfy the Village's MS4 permit, construction observation is required during construction. Full-time construction observation will be required during the installation of water mains, storm sewer systems including detention/retention areas, sanitary sewers, paving and any other site improvements that the Village Manager requests to insure installation and materials are in accordance with Village Standards and Specifications. This service shall be performed by the Village Engineer or other governing agency.

8. A minimum of 48 hours of notice is required to ensure the presence of an inspector when work commences.

9. All public improvements must be field staked under the supervision of the Registered Professional who prepared the plans. Staking must be in accordance with the approved plans. Cut sheets must be provided to the onsite inspector.

10. All construction must conform to the current OSHA / MIOSHA safety standards.

11. At the time of final inspection for all public improvements, the owner or his contractor shall provide all necessary labor and equipment to allow the Department of Public Works to inspect the system.

12. Generally, one inspector will be assigned to a particular project and will be responsible for that project until its completion. The contractor and the inspector may make arrangements for day-to-day inspection. Any interruption or moratorium on the flow of work may result in a re-assignment of that inspector to another project and require the normal 48-hour notice before work is resumed.

13. The applicant and/or his designee is responsible for coordination and costs of construction observation services during the entire construction process. Should the escrow account become deficient, the applicant shall be responsible to bring the account current. If the applicant does not act within two weeks the project shall be delayed, all approvals shall be suspended, and further work will not be permitted until the accounts are brought current.

SECTION A-10 INSURANCE REQUIREMENTS AND GUARANTEES

1. A Performance Guarantee shall be submitted in the amount of 100 percent of the construction cost for all underground utilities (storm sewer, sanitary sewer, and water main). An example form is included in Appendix C.

2. For all work within the Village limits, Applicant shall provide proof of insurance as quoted herein. All monetary amounts may be revised at the discretion of the Village at any time and without notice.
   a. Contractor's comprehensive general liability insurance.
      1. The contractor shall procure and shall maintain during the life of his or her contract, contractor's personal injury insurance in an amount not less than $2,000,000 for

injuries, including accidental death, to each person, in an amount not less than $1,000,000 on account of each occurrence; and contractor's property damage insurance in an amount not less than $1,000,000 each occurrence; and $2,000,000 aggregate including completed operations and contractual liability coverage.

2. This comprehensive general liability insurance shall include coverage for explosion, collapse, underground hazards, and flooding and coverage assumed in the indemnification clause of this section of the work.

b. Owner's protective public liability insurance. The contractor shall procure and maintain during the life of his or her contract owner's protective public liability insurance in the name of the village and Village Engineer in an amount not less than $1,000,000 for injuries, including accidental death to each person, and in an amount not less than $1,000,000 on account of each occurrence; and property damage in an amount not less than $1,000,000 each occurrence, and $2,000,000 aggregate.

c. Contractor's automobile bodily injury and property damage insurance.
   1. The contractor shall procure and shall maintain during the life of his or her contract automobile bodily injury insurance in an amount not less than $1,000,000 for injuries, including accidental death, to each person, and in an amount not less than $1,000,000 for each occurrence; and property damage in an amount not less than $ 1,000,000 for each occurrence.
   2. The contractor shall procure and shall maintain during the life of his or her contract hired and non-ownership automobile bodily injury and protection damage insurance in an amount not less than $1,000,000 for injuries, including accidental death, to each person; and in an amount not less than $1,000,000 for each occurrence; and property damage in an amount not less than $1,000,000 for each occurrence.

d. Umbrella or excess liability. The contractor is granted the option of arranging under a single policy for the full limit required for general liability and/or automobile liability or by a combination of underlying policies with the balance provided by an excess or umbrella liability policy equal to the total limit(s) requested. The umbrella or excess liability shall be in an amount not less than $2,000,000 per occurrence and $2,000,000 aggregate.

e. Worker's compensation insurance. If requested by the project owner, the contractor shall procure and shall maintain during the life of his or her contract, worker's compensation insurance, including employer's liability, in an amount not less than $500,000 for employer's liability and a statutory rate for compensation.

f. Indemnification clause. The contractor shall indemnify, defend, and save harmless the village and the Engineer, their elected officials, officers, owners, consultants, agents, and employees, from and against all loss or expense (including costs and attorney fees) by reason of liability imposed by law upon the village and the Engineer, their elected officials, officers, owners, consultants, agents, and employees for damages because of bodily injury; including death at any time resulting therefrom, sustained by any person or persons or on account of damage to property, including loss of use thereof, arising out of or in consequence of the performance of this work, whether such injuries to persons or damage to property is due, or claimed to be due, to the negligence of the contractor, his or her subcontractors, the village, the Engineer, and their elected officials, officers, owners, consultants, agents, and employees, except only as such

injury or damage shall have been occasioned by the sole negligence of the village, or their elected officials, officers, owners, agents, employees, or consultants.

g. Proof of coverage of insurance. The contractor shall provide the village certificates of insurance for the required coverage. A guarantee that 30 days notice to the village prior to cancellation or non-renewal of or change in any such insurance shall be endorsed on each policy and certificate of insurance.
h. Additional insured. All insurance policies with the exception of Worker's Compensation, are to include the following additional insured:
    1. Village of Lake Orion: all elected officials, officers, owners, consultants, agents, and employees.
    2. The Village Engineer: their owners, officers, consultants, owners, agents, and employees.
i. Sample forms may be obtained from the village or Village Engineer.
j. The village to be listed as the certificate holder.

3. After construction, and prior to final acceptance of public improvements by the Village, a Maintenance Guarantee shall be submitted for all public site improvements in the amount of 100 percent of the construction cost of the sanitary sewer, water main, public storm sewer, and public streets / parking. Developer shall submit a copy of the signed contract detailing these items for review and acceptance of adequacy, or a signed and sealed cost opinion by the design engineer. An example form is included in Appendix B.

SECTION A-11 RECORD DRAWINGS

1. Record drawings are prepared by the Developer's Engineer. Following the completion of the construction, the engineer may begin surveying for Record Plans. Inspector's daily reports (IDR's) will be furnished to the developer's engineer upon request for preparation of accurate record plans.

2. Record drawings are to be submitted to the Village Engineer for review and approval.

3. A punch list of items to be repaired by the contractor will be provided by the Village Engineer.

4. Record drawings shall contain a certification by the licensed professional who prepared the plans affirming that the information shown accurately represents the as-built site conditions, and the plan must bear the professional's seal and signature.

5. After approval of the record drawings, one set of drawings in electronic form in both AutoCAD compatible and PDF format must be submitted to the Village Engineer for input to the Village Asset Management system.

SECTION A-12 ACCEPTANCE OF IMPROVEMENTS

1. Final acceptance requirements for project improvements are outlined in each individual section of the Standards.

2. Owner / Contractor is to request a site inspection to determine what site improvements remain to be completed and the remaining Performance Guarantee amounts required prior to issuance of Building Permits.

3. Temporary Certificates of Occupancy (C of O) will not be issued prior to final acceptance of the site utilities. At the discretion of the Village Manager, temporary C of O may be issued if Performance Guarantee amount necessary to cover the cost of installing any remaining improvements and prepare record drawings is provided.

4. Owner / Contractor is to request a final site inspection for Final Site Plan / Zoning Compliance prior to project closeout.

5. Following acceptance of the Record Drawings by the Village Engineer, receipt of the Maintenance Guarantee as outlined in Section A-10, and completion of all required items on the Village Construction Project Closeout list, the Village Engineer will recommend acceptance of the public improvements, the Village will provide a letter of acceptance, and any remaining Performance Guarantee for public improvements may be released. Final Certificates of Occupancy may then be issued.

CONSTRUCTION PLAN REQUIREMENTS

SECTION B-1 INTRODUCTION

The following establishes the minimum requirements for engineering plans for submittal to the Village. Prior to starting any design, the Design Engineer is encouraged to make use of maps and information available at the Village and County offices. It shall be the responsibility of the Design Engineer to verify utility locations provided by the Village, Oakland County, or other agencies.

Proposed improvements must conform to the various master utility plans of the Village. Copies of these plans may be reviewed at the Department of Public Works or requested from the Village Engineer.

The plans and specifications shall be prepared by or under the supervision of a licensed professional registered in the State of Michigan and the plans shall bear the original signature and seal of that engineer. Electronic seals and signatures may be accepted at the discretion of the Village.

Construction Plans shall include the following sheets (when applicable) and the order shall generally be maintained as indicated:

(a) Cover Sheet
(b) Site Plan / General Plan
(c) General Notes
(d) Existing Conditions (Topographic and Boundary Survey)
(e) Soil Erosion and Sediment Control Plans
(f) Demolition Plans
(g) Overall Grading Plans
(h) Detailed Grading Plans
(i) Sanitary Sewer and Water Main Plan and Profile Sheets (including basis of design)
(j) Road and Storm Sewer Plan and Profile Sheets
(k) Detention Area Plan and Sections with Calculations
(l) Drainage Area Map and Storm Sewer Calculations
(m) Traffic Staging / Signing
(n) Soil Boring Data Sheets
(o) Detail and Note Sheets (Project Specific)
(p) Landscape Plans and Details
(q) Village Standard Details

SECTION B-2 GENERAL REQUIREMENTS

1. All construction plans shall contain the latest version of the applicable Village of Lake Orion Standard Detail Sheets.

2. Plans submitted shall be twenty-four (24") inch by thirty-six (36") inch prints, and shall be neatly and accurately prepared. Judgment should be exercised in the design, layout, and presentation of the proposed improvements. Acceptable horizontal scales shall be: 1" = 20'; 1" = 30'; 1" = 40'; 1" = 50', according to the size of the site. The scale shall not be less than 1" = 20' for sites less than three acres in area and at least 1" = 50' for sites of three acres or more. Vertical scale shall be consistent with horizontal scale exaggerated by ten (10) times. For example, plans with a horizontal scale of 1" = 50' shall have a vertical scale of 1" = 5'.

3. Vertical controls shall be on NAVD 88 datum. Horizontal controls shall be in accordance with State Plane Coordinates. A note shall be added to the plans that a permanent benchmark shall be established prior to beginning grading operations.

4. 100-year flood boundary and contour elevations from the Federal Emergency Management Agency (FEMA) maps shall be indicated on the plans. If the surveyed flood plain contour differs from the FEMA mapped line, it shall be also shown and labeled.

5. Any areas that are considered to be wetlands as defined by the Michigan Department of Environment Great Lakes and Energy (EGLE) shall be indicated on the plans. No improvements will be allowed in wetlands unless EGLE issues a permit, or a letter of "No Authority", for such improvements.

6. Street names shall be approved by the Fire Marshal.

7. For proposed design plans, underlying existing information, topography, utilities, etc., shall be shown in gray or lighter line weight, while proposed improvements shall be shown in dark and heavy black lines. The legend shall clearly refer to all line symbols used.

8. Where a project lies within an area or system under jurisdiction of the County, the State or the Federal Government, the standards and requirements of the respective agencies are generally adopted by the Village. Where conflict arises, the higher standard applies, subject to interpretation by the Village Engineer.

9. The Village reserves the right to require revision or correction of any plans, that have been "approved for construction", due to errors, omissions or for unforeseen field conditions and to require that such revisions and corrections be incorporated into the work at any time prior to final acceptance of the work.

SECTION B-3 COVER SHEET

A cover sheet, or the first sheet of a set of plans, shall show the following:

1. Project Title.
2. Name, address, and phone number of property Owner.
3. Name, address and phone number of Design Engineer.
4. The seal and signature of the Registered Professional responsible for the project.
5. Location map drawn to an appropriate graphic scale, generally not greater than 1" = 100' nor smaller than 1" – 2000', with North indicator, showing location of project area with respect to the surrounding area.
6. Legal description of the property including property identification number, site address if existing, and site area in square feet and acres, gross and net.
7. Listing of submittal dates and revision submittal dates.
8. Permit Schedule listing all applicable permits with permit number and date of issue.
9. Sheet Index.

SECTION B-4 SITE PLAN / GENERAL PLAN

The plan shall comply with the requirements of the Zoning Ordinance and at a minimum show the following:

1. North arrow
2. A location map showing the approximate location of the site relative to major thoroughfares.
3. Street names and street widths, both existing and proposed
4. Lot numbers and dimensions
5. Dimensions of parking areas, drive aisles, setbacks, buildings and sidewalks
6. Subdivision or Condominium names, and permanent parcel numbers and dimensions for all unplatted parcels for the site and adjacent properties
7. All proposed and existing utilities and easements
8. Zoning classification of Applicant's parcel and all abutting parcels

9. Abutting right of way, with proposed and existing right of way width

10. For projects or subdivisions of size prohibiting the entire site from being shown on a single plan, a General Plan having a scale of one 1" = 100' or 1" = 200' shall be provided showing the overall project or subdivision showing all proposed utilities with structure labels.

SECTION B-5 TOPOGRAPHIC SURVEY / EXISTING CONDITIONS

A complete topographic survey is required for all sites, showing all existing conditions on and within 100' outside of the site. The following information shall be provided:

1. Existing off-site elevations must be given at a minimum of 50'and 100' abutting the entire perimeter of the site. Grades shall be indicated at all property corners and along all property lines. On site, elevations on a minimum fifty foot grid are required to establish the existing site drainage. Contours may be required for clarity at the discretion of the Village Engineer.

2. All existing conditions shall be indicated. Locations and elevations must be given on the following:
   a. existing drainage courses
   b. upstream and downstream culverts
   c. all utilities, including sanitary, water main, gas, telephone, electrical, and similar. Inverts and finish grades are required where applicable.
   d. sidewalks
   e. finished grades of all adjacent buildings
   f. all easements with width, purpose, and liber and page citations

3. Topography of existing roads shall extend across the entire site with grades shown on both sides of the street for:
   a. Property / right-of-way line
   b. ditch center line, if any
   c. top of bank, if any
   d. edge of shoulder, if any
   e. edge of pavement or top of curb
   f. crown or center line

4. Existing rights-of-way of adjacent roads must be indicated and width labeled.

5. Reference benchmarks, established at intervals not greater than 1,200 feet and on North American Vertical Datum of 1988 (NAVD 88), convenient to the proposed construction. Each benchmark shall be noted with number, location, description and established elevation. A minimum of two benchmarks shall be provided.

6. A minimum of two permanent project Benchmarks (NAVD 88) must be indicated on the plans. A note shall be added to the plans that a permanent benchmark shall be established

prior to beginning grading operations. These benchmarks may be the same as the reference benchmarks.

7. Property lines must be indicated by distances and bearings where applicable.

8. The Parcel Identification number and gross and net acreage of the property.

9. A legal description of the property if not shown on the Cover Sheet.

SECTION B-6 SOIL EROSION AND SEDIMENTATION CONTROL PLAN(S)

See Design and Construction Standards for Soil Erosion Control Section 2-3, Plan Requirements.

SECTION B-7 GRADING PLAN(S)

See Design and Construction Standards for Clearing, Grading and Surface Drainage Section 1-3, Plan Requirements.

SECTION B-8 PLAN AND PROFILE SHEET(S)

Plan and Profile sheets shall be prepared according the requirements outlined in the individual utility and paving sections. See Section 4-3 (storm sewer), Section 6-3 (paving), Section 7-3 (water main), and Section 8-3 (sanitary sewer). Where the site is of such size that utilities cannot each be shown on a single plan/profile sheet, a General Plan shall be provided.

SECTION B-9 DETENTION AND STORMWATER MANAGEMENT PLAN(S)

See Design and Construction Standards for Stormwater Management Systems Section 3-3, Plan Requirements.

SECTION B-10 DETAIL SHEETS

1. The Sanitary Sewer, Water Main, Storm Sewer, and Paving Detail sheets as adopted by the Village of Lake Orion shall be included with plan submittals as applicable and are considered a part of the Design and Construction Standards. An electronic copy of these details may be obtained from the Village Engineer or the Village website.

2. Any additional detail sheets shall include complete details for all water, sewer, or storm appurtenances and structures to be included with the plans.

3. Scales for special details shall be selected to clearly portray intended construction and component or equipment arrangement and shall utilize standard engineering plan scales. Scales used shall be clearly identified.

DESIGN AND CONTRUCTION STANDARDS
FOR CLEARING, GRADING AND SURFACE DRAINAGE

SECTION 1-1 GENERAL

All new subdivisions, condominiums, commercial development, or any improvement which requires site plan approval by the Village, will require a clearing, grading and drainage plan. Improvements to residential parcels that require a building permit and some sites requiring a Zoning Compliance permit, including proposed building additions, retaining walls (construction or replacement), and accessory structures will require a grading plan ("plot plan") as determined by the Planning and Zoning Coordinator. Plans which minimize, to the extent possible, clearing and grading as well as utilize open drainage facilities are strongly encouraged and where these factors can preserve natural features the Village may require such provisions.

SECTION 1-2 DESIGN REQUIREMENTS

1. CLEARING & TREE REMOVAL

    a. Plans will generally not be approved for sites which are to be clear cut and re-landscaped. It is the intent of the Village to maintain as much of the natural landscaping and features as possible.

    b. The Village reserves the right to require trees be preserved and/or protected which they feel enhance the natural characteristics of the property to be developed. These trees may be of unique size, shape, species, location, etc.

    c. All stumps and other tree parts, litter, brush, weeds, scrap construction materials or other debris shall be removed from the site and disposed of in accordance with State and Federal law. Vegetative material may be chipped on site. Trees to be preserved or removed must be clearly identified on the plan. The method to be used for disposal of vegetative material must be shown on the plan. If trees or limbs are reduced to chips, they may be used in landscaping applications. No burning on site is permitted.

2. SITE LAYOUT

    a. Generally, a building shall not be set below the crown of the road on which it fronts, unless it is positioned far enough back from the road to insure positive drainage away from the building.

    b. Each site shall be graded to drain away from structures or units into swales. Swales shall discharge to a storm sewer, roadway gutter, ditch, stormwater management facility, or other approved drainage course.

3. GRADING

   a. Grading design and land balancing shall ensure that:
      1. No existing upstream drainage is restricted;
      2. Drainage is adequately discharged offsite with proper stormwater management controls according to section 3;
      3. The site generally drains without creating standing water;
      4. Paving slopes are in compliance with the Standards outlined in section 6;
      5. Unpaved surfaces have a maximum slope of one (1') foot vertical on four feet (4') horizontal. Slopes steeper than this require installation of a retaining wall.
      6. Sight lines are not obstructed at intersections with streets, sidewalks and paths.

   b. The grading plan shall be designed to ensure that stormwater will drain away from all building structures.
      1. The slopes shall be uniform and shall be such that the elevation of the surface of the ground at a point ten feet from the base of the building is a minimum of six inches (0.5') lower than the ground elevation at the base of the building wall.
      2. Where local setback, side yard, or rear yard requirements would result in the building being located less than ten feet from the property line, then the surface of the ground shall slope away from the building wall at a uniform minimum slope of five (5%) percent and in a manner approved by the Village.

   c. Proposed grading shall meet abutting property line elevations. Easements from adjacent property owners will be required for any offsite grading.

   d. Grading plans shall take into account desirable natural features such as trees, wetlands, steep slopes, and the character of the land which must be preserved where possible.

   e. No filling, dredging, grading, or other alteration will be allowed in any areas of land which lie either wholly or in part within the floodplain of a river, stream, creek, lake or regulated wetlands unless under the terms of a permit granted by the Michigan Department of Environment, Great Lakes and Energy (EGLE) or other governmental agency having jurisdiction, including FEMA.

   f. Topsoil stripped during construction shall be stockpiled on site. Stockpiled topsoil shall be contained by appropriate soil erosion measures to prevent the migration of soils (i.e., erosion). Stockpile locations are to be shown on the plans.

4. DRAINAGE

   a. All stormwater runoff from developed or disturbed areas of the site shall be intercepted within the boundaries of the site, collected, and conducted through a stormwater system to an approved point of discharge. At no time shall stormwater discharge from a developed site exceed the restricted rate or volume as set forth in these Standards.

b. All development shall provide for unimpeded flow of stormwater from adjacent properties where the existing offsite land slopes to the site. The amount of runoff to be provided for from offsite lands shall be at least equal to the volume and rate of runoff from the land in the undeveloped state.

c. All surface drainage facilities must be designed to ensure that, should a failure occur in the system, stormwater will drain away in a manner which will not impact existing or proposed structures onsite or offsite, or cause erosion.

d. For open ditch stormwater conveyance systems, channel slopes shall be set at grades which will not cause erosion. The Design Engineer shall be responsible to provide calculations based on Manning's formula, which demonstrate the velocity and capacity of all open drainage courses based on a ten (10) year design flow in accordance with the methods as outlined in section 4 for enclosed storm sewers. The minimum longitudinal ditch grade shall be one percent (1%).

e. Side slopes of all drainage courses shall be designed in accordance with the proposed slope maintenance. For example, grass slopes to be mowed shall be no steeper than one on four (1:4), or armored banks such as riprap or gabion lining shall be no steeper than one on two (1:2) side slopes.

f. Stormwater runoff in excess of the rate and volume generated by the pre-developed property shall be managed in accordance with the stormwater management Standards detailed in section 3.

5. RETAINING WALLS

a. Design details and computations sealed by a professional engineer registered in the State of Michigan shall be submitted and approved for all retaining walls greater than four (4') feet in height.

b. Any face of a retaining wall must be a minimum of five feet (5') from the property line to provide adequate space for construction, maintenance and drainage as necessary unless appropriate off-site easements are provided.

c. An easement over the adjacent property shall be required for any retaining wall footing which encroaches on that parcel, or where excavation (1:1 slope) for construction of footing will require encroachment.

d. Utilities are discouraged under retaining walls. Where deemed necessary, utility shall be placed in casing pipe.

e. Retaining wall construction requires a building permit, Zoning Compliance Permit, and, for individual home sites, submittal of a plot plan for review and approval.

SECTION 1-3 PLAN REQUIREMENTS

All clearing, grading and surface drainage plans shall be submitted to the Village for approval as part of the construction plan review, or plot plan review when required by the Planning and Zoning Coordinator for a Zoning Compliance Permit, and shall show at least, but not limited to, the following information:

1. Existing and proposed topography and ground elevation contours, with a maximum 2-foot contour interval tied together to clearly show cuts and fills. Benchmarks must be indicated on the plan, defined on the NAVD88 Datum.

2. The limits of clearing and limits of disturbance.

3. All proposed and existing storm drainage facilities, such as swales, ditches, stormwater management facilities, storm sewers, manholes, catch basins, and inlets including rim and end section finish grades, as well as inverts.

4. Stationing of centerline of street pavements where applicable, and pavement elevations at 50-foot intervals. Indicate all high and low points.

5. Top of curb or shoulder elevation opposite each front lot (unit) corner (and side lot corner for corner lots) to hundredths (0.01') of a foot.

6. Finished grade shall be indicated at the corners of all buildings and for all utility structures. Lowest floor elevation, including basement, shall be shown on the plans. Finished building grades shall be compatible with the grades of surrounding existing structures, yards, and with the existing ground at the proposed structure. The building elevation should fit into the natural topography of the individual property (lot) to the extent practical given any site constraints such as drainage or access.

7. Proposed ground elevation at each lot corner (front and rear), and side lot elevations to hundredths (0.01) of a foot, where individual lots are being developed concurrently with site improvements for which plan approval is being sought.

8. Whenever swales for lot drainage are called for on the plan, swale elevations at the high point adjacent to any buildings, even with the back, and even with the front shall be provided. General flow direction of swales shall be shown with arrows.

9. Drainage flow arrows shall be shown to indicate the direction of surface water flows.

10. Proposed elevations shall be provided for pavement, sidewalks, top of curbs, parking islands, and additional locations as required by the Village Engineer.

11. Cross sections for all proposed open conveyance facilities, including width from top of bank to top of bank, side slope grades, easement width, restoration, slope protection measures,

and other as required by the Village Engineer.

12. For open conveyance systems, drainage district delineation and area plus calculations based on Manning's equations with all assumptions or values used for the variables shown. Calculations are to include design velocity and capacity.

13. Any proposed grade separation that necessitates the provision of a retaining wall must be clearly indicated on the grading plan.
    a. Retaining wall design and supporting calculations for any retaining wall greater than four (4') feet in height must be submitted to the Village at the time of plot plan or construction plan submittal.
    b. The retaining wall design and supporting calculations must bear the seal and signature of a licensed professional engineer, registered to practice in the State of Michigan.

14. Retaining Walls:
    a. Clearly indicate in plan view.
    b. Indicate top of wall and bottom of wall elevation at minimum intervals of 25' along wall, as well as each end.
    c. Indicate any protective guardrail or fencing, appropriate for the wall site conditions. Vehicle and/or pedestrian safety barrier is required for any wall with greater than thirty (30") inches of grade differential.
    d. Indicate the proposed drainage system for the wall, as well as the ultimate discharge point.
    e. A cross section must be provided indicating the following:
        1. Minimum and maximum height of wall.
        2. Material type.
        3. All structural dimensions including wall thickness and depth, width, and thickness of footing.
        4. Geo-grid (if applicable) with embedment length.
        5. Fence / guardrail (if applicable)

15. Standard Notes to be shown on the Grading Plan, including any plot plan:
    a. At all times grading operations shall be conducted in a timely and orderly fashion, acceptable to the Village.
    b. Grading shall be accomplished in a manner that shall adhere to required soil erosion and sedimentation control devices and sequences and shall not alter or in any way affect offsite and adjacent natural drainage.
    c. Natural drainage flow passing through any construction site shall be accommodated at all times.
    d. Any earth excavations and/or embankment, and any ditches or swales, shall be constructed in strict accordance with the approved plans.
    e. Construction fencing shall be placed to delineate the limits of the clearing where appropriate to preserve natural features. Individual trees to be protected shall have protective fencing installed at the dripline of the tree. Construction fencing to be a minimum of four (4') feet high, orange or green in color, and with steel posts spaced

every ten (10') feet.

f. All disturbed areas shall be stabilized or finished, and vegetation established as soon as possible after grading operations have been completed in the affected area.
g. Prior to final approval by the Village, any accumulated sediment shall be removed, and flow channel(s) restored.
h. Bank and channel armorment is to be constructed per the approved plans or per the manufacturer's suggested installation procedures for proprietary products.

SECTION 1-4 CONSTRUCTION REQUIREMENTS

1. All required soil erosion control measures and protective fencing shall be installed prior to commencement of clearing and grading activities.

2. Clearing and grading shall be accomplished in a manner that shall adhere to required soil erosion and sedimentation control devices and sequences, and in compliance with the approved clearing and grading or construction plan.

SECTION 1-5 EASEMENT REQUIREMENTS

1. Easements for drainage facilities shall be of a width adequate to provide proper access for maintenance, centered upon the facilities. Applicant shall be responsible for preparation of easement and legal conveyance documents meeting Village requirements to be reviewed by the Village Engineer and Village Attorney.

2. Such easements shall be deeded or dedicated to the Subdivision Association, Condominium Association, property owner, or entity responsible for the maintenance of the drainage facilities, with restrictions against use or occupation of easements by the property owners and/or by other utilities in any manner which would restrict maintenance or repair operations.

3. Whenever a constructed drainage facility is required to cross an adjacent property, an easement for this purpose must be provided on the adjacent property.

DESIGN AND CONSTRUCTION STANDARDS FOR SOIL EROSION AND SEDIMENTATION CONTROL

SECTION 2-1 GENERAL

This Standard establishes the minimum requirements for the design and construction of soil erosion and sedimentation control (SESC) features within the Village.

Construction and earth change activities within the Village shall be accomplished with proper safeguards to prevent soil erosion and sedimentation, consistent with Act 451 of the Public Acts of 1994 of Michigan, the Natural Resources and Environmental Protection Act, and corresponding general rules for design and construction standards.

Any site, including single family residential sites, within the Village not subject to SESC permitting through the Oakland County Water Resources Commissioner (OCWRC) by virtue of the site size or location shall be required to comply with said OCWRC Standards as most recently adopted by Oakland County.

The Village will review soil erosion control plans for conformance to the Standards cited herein and reserves the right to require control measures above and beyond those required by OCWRC.

SECTION 2-2 DESIGN CONSIDERATIONS

1. Minimize Clearing — Portions of a site near sensitive and critical areas should not be disturbed. Only the areas needed to build structures and provide access should be cleared. Limits of disturbance are to be included in the plans or on a separate Soil Erosion and Sedimentation Control (SESC) plan, if provided.

2. Perimeter Controls — Maintain sediment control practices to prevent soils from leaving the site. Common options are properly installed, located, and maintained silt fence, hydroseeded dikes, and diversions.

3. Drainage Way Stabilization — Special controls such as check dams, silt fence, vegetated buffer strips, erosion control blankets, and riprap are to be applied to the drainage way depending on their slope and length, and the disturbed areas that contribute drainage. Any temporary or permanent facility designed and constructed for the conveyance of water around, though, or from the earth change area shall be designed to limit the water flow to a non-erosive velocity.

4. Construction Phasing — Exposure to the smallest practical area for the shortest time by properly scheduling and staging project activities is preferred. Disturb only first phase areas and stabilize before beginning subsequent phases. The phases should be planned so that

earthwork is balanced within a phase; i.e., the cut from one area matches the fill requirement elsewhere. Earthmoving should occur only when it is absolutely needed. The construction sequence indicated on the plans must outline the specific order of construction that the contractor is to follow to complete a single phase.

5. Slope Protection — Clearing and grading of existing steep slopes should be avoided. Special techniques are to be used to prevent upland runoff from flowing down a slope and causing erosion. The use of silt fence at the toe of steep slopes should be carefully selected because flow velocities and sediment can quickly overload a silt fence. Additional practices may be required, such as scarification, erosion control blankets, multiple rows of silt fence, check dams, and increased mulch application rates with mulch binders and so noted on the plans.

6. Employ Advanced Settling Devices — For critical sites, some form of sediment trap, or sediment basin is required for all basin drainage accumulation points.

7. Adjust Soil Erosion and Sedimentation Control Plan for Field Conditions — The SESC measures may need to be modified during various construction phases due to discrepancies between planned and as-built grades, weather conditions, altered drainage, and unforeseen circumstances. The need for maintenance repairs or additional, specialized controls may become evident after storm events. Proposed modifications should be submitted to the Village for review and concurrence.

SECTION 2-3 PLAN REQUIREMENTS

Plans submitted to the Village shall contain the following Soil Erosion and Sedimentation Control information:

1. Site development plan showing all proposed Soil Erosion and Sedimentation Control measures.

2. Information as to how excavated material will be handled and stored to prevent erosion.

3. Proposed location of material storage and stockpiles properly protected.

4. Detail Sheet showing all proposed Soil Erosion and Sedimentation Control measures. Include the most recent OCWRC soil erosion control standard details.

5. Sequence of Construction, Operations, and Restoration.

6. Schedule for installation, maintenance, and removal of all proposed Soil Erosion and Sedimentation Control measures.

7. Limits of dewatering necessary and proposed discharge location.

8. Permanent stabilization provisions.

9. The following notes must also be included on the plans:

    a. All erosion and sediment control work shall conform to the current Standards and Specifications of Oakland County Water Resources Commissioner and the Village of Lake Orion.

    b. All Soil Erosion and Sedimentation Control measures shall be installed prior to the start of work on site including mobilization onto the site and until the soils on site are stabilized.

    c. lt is the responsibility of the Contractor to maintain the Soil Erosion and Sedimentation Control measures throughout the duration of the project, supplement ineffective measures, and remove all such measures at the time of established restoration and project completion.

    d. Contractor shall make daily inspections for the effectiveness of erosion and sedimentation control measures, and any necessary repairs shall be performed without delay.

    e. Sediment or eroded materials generated on this site shall be contained on the site and not allowed to collect on any offsite areas or in waterways, including both natural and man-made open ditches, streams, storm drains, lakes and ponds.

    f. Staging the work will be completed by the Contractor as directed in these plans and as required to ensure progressive stabilization of disturbed areas.

    g. Soil erosion control practices will be established in early stages of construction by the Contractor. Sediment control practices will be applied as a perimeter defense against any transporting of sediment off the site.

SECTION 2-4 CONSTRUCTION REQUIREMENTS

1. lt is the responsibility of the Contractor to maintain the Soil Erosion and Sedimentation Control measures throughout the duration of the project, supplement ineffective measures, and remove all such measures at the time of established restoration and project completion.

2. Pumping or draining from trench excavation shall not be permitted into the waters of the state. It shall be the Contractor's responsibility to secure the necessary approval of owners of private land and the Village before discharging water from the trench excavation onto the private lands. Water shall be discharged in such a manner as to not cause any pollution or erosion problems. Under no circumstances may the Contractor discharge sanitary sewage onto the ground surface.

3. The Contractor shall dewater to existing storm system sewers wherever possible. Method of disposal shall be approved by the Village. All discharge from dewatering wells shall utilize properly installed filtration bags or approved sediment collection structure prior to entering any enclosed or open drainage system. Any silt or solids retained by these structures shall be removed prior to the removal of the structure. At no time will silt or similar materials be permitted to filter into a lake or natural watercourse.

4. For sites not subject to OCWRC permitting, inspections by the Village or their appointed agent will be made periodically throughout construction on the maintenance and effectiveness of the Soil Erosion and Sedimentation Control measures. Follow-up inspections may be warranted should failures be noted or additional measures needed.

5. The costs of these Village inspections will be charged against the inspection/construction observation escrow account. If inspection reveals that the controls are not being implemented or maintained, a stop work order on all site construction may be issued until the concern is addressed.

DESIGN AND CONSTRUCTION STANDARDS FOR STORMWATER MANAGEMENT SYSTEMS

PURPOSE: The purpose of this section is to establish design and construction practices that provide for the health, safety, and general welfare of the citizens of the Village by implementing the following goals:

1. Controlling the introduction of pollutants via stormwater and non-stormwater discharges to the storm drainage system and surface waters in the Village;
2. Reducing artificially induced flood damage;
3. Minimizing increased stormwater runoff rates and volumes from identified new land development and redevelopment;
4. Reducing stormwater runoff rates and volumes, soil erosion, and nonpoint source pollution, wherever practicable, from lands that were developed without stormwater management controls meeting the purposes of this section;
5. Minimizing the deterioration of existing watercourses, culverts and bridges, and other structures;
6. Encouraging water recharge into the ground where geologically favorable conditions exist;
7. Maintaining the integrity of stream channels for their biological functions, as well as for drainage and other purposes;
8. Minimizing the impact of development upon stream bank and streambed stability;
9. Reducing erosion from development or construction projects;
10. Reducing the adverse impact of changing land use on water bodies.

Where feasible, Applicants are encouraged to combine stormwater management facilities with adjacent developments. This approach is intended to reduce the number of small individual facilities and promote preservation of natural features.

The proposed drainage and stormwater management plan shall, in every way feasible, respect and conform to the natural drainage patterns within the site and the watershed in which it is located.

SECTION 3-1 GENERAL

This Standard establishes the minimum requirements for the design and construction of stormwater management systems within the Village and applies to all construction activity where stormwater runoff generated on the site will outlet to the Village's municipal separate storm sewer system (MS4) or any surface waters.

All stormwater management systems shall be designed to the current Standards of the Village of Lake Orion, the Oakland County Water Resources Commissioner, the Road Commission for Oakland County, the Michigan Department of Transportation, and other agencies having jurisdiction over the receiving storm drainage system.

SECTION 3-2 DESIGN REQUIREMENTS

To achieve the goals and purposes of this section, the performance standard is to preserve the natural condition of water bodies included in and adjacent to the Village, in whole or in part. Unless otherwise approved, stormwater runoff shall be conveyed via natural drainage systems such as swales and vegetated buffer strips. When site conditions permit, infiltration of stormwater runoff is strongly encouraged. Stormwater managed in this way provides greater protection for surface water quality, and also assists in augmenting stream base flow, reduction of flash storm flows and prevention of stream bank erosion.

Owners and their engineers are encouraged to explore approaches to site design and construction that address and treat both stormwater quality and quantity of runoff from the site. This approach requires the consideration and use of Best Management Practices (BMPs) that function together as a system to ensure that the volume, rate, timing and pollutant load of runoff remain similar to or improve upon that which occurred under predevelopment conditions. This can be achieved through a coordinated network of structural and nonstructural methods, designed to provide both source and site control. These alternate approaches might include, but are not limited to, the following partial list of BMPs:

(a) Green roofs;
(b) Bioretention Systems/Bioswales;
(c) Leaching Basins;
(d) Water Reuse
(e) Porous pavement;
(f) Native landscaping
(g) Vegetated Filter Strips.

Stormwater management must be provided for all onsite acreage unless otherwise determined by the Village. Offsite acreage originally draining across the proposed development must either be intercepted and routed through the project's storm drainage system or otherwise accommodated in a manner satisfactory to the Village.

In order to control the volume and rate of stormwater runoff at predevelopment levels, the following design criteria must be implemented:

1. CHANNEL PROTECTION VOLUME CONTROL

   a. Channel Protection Volume Control (CPVC) is required to protect watercourses from increased erosion and sedimentation, promote groundwater recharge, stabilize flow rates, and address water quality control by decreasing the Total Suspended Solids (TSS) in stormwater runoff.

   b. Channel Protection Volume Control (CPVC) shall be implemented to the Maximum Extent Practicable (MEP) in accordance with the current OCWRC Stormwater Engineering Design Standards for calculating required CPVC volume V_{CP-R}.

2. CHANNEL PROTECTION RATE CONTROL: EXTENDED DETENTION

    a. Channel Protection Rate Control (CPRC) is required to protect watercourses from increased erosion and sedimentation resulting from increased imperviousness and runoff rates.

    b. Channel Protection Rate Control (CPRC) shall be implemented to the Maximum Extent Practicable (MEP) in accordance with the current OCWRC Stormwater Engineering Design Standards for calculating required Extended Detention volume V_{ED}.

3. WATER QUALITY CONTROL

    a. Water Quality Control (WQC) is required to limit the Total Suspended Solids (TSS) in post-development stormwater runoff.

    b. Water Quality Control shall be implemented in accordance with the current OCWRC Stormwater Engineering Design Standards.

4. DETENTION AND FLOOD CONTROL

    a. Detention and Flood Control shall be implemented to manage the 100-year peak runoff rate.

    b. The required 100-year detention volume V_{100D} shall be calculated as required by the current OCWRC Stormwater Engineering Design Standards.

5. ON-SITE CONVEYANCE / FLOOD PROTECTION

    a. The “Conveyance” storm event is used to design standard levels of flood protection for streets, sidewalks, structures and properties within the development. This is typically accommodated by a combination of conveyance systems including open channels and culverts, street and roadway gutters, inlets and drains, and storm sewer systems. Other stormwater controls may affect the design of these systems.

    b. The design storms used to size the various on-site conveyance systems will be no less than a 10-year 24-hour storm event, but they may vary depending upon their location and function.
        1. Open channels, culverts, and street rights-of-way may be designed for larger events (25-to-100-year storm events) at the discretion of the Village Engineer or other governing authority.
        2. Once the initial set of controls for the 10-year or 25-year storm event are selected during the site plan design, the full build-out 100-year 24-hour storm should be routed through the on-site conveyance system and stormwater controls to determine the effects on the on-site system, adjacent property, and downstream areas.
        3. Overall the site shall be designed appropriately to safely pass the resulting flows

from the full build-out 100-year storm event with no flood waters entering habitable structures.

6. DETENTION BASINS

   a. Basin side slopes shall generally not exceed one (1') foot vertical to four (4') feet horizontal. Slopes steeper than one foot (1 ') vertical to four (4') feet horizontal, will be permitted only with the installation of a four (4') foot high locked perimeter fence (or other structure approved by Village Administration). In such cases where perimeter fencing is required, a twelve (12') foot wide access gate shall be provided.

   b. The detention volume for a gravity outflow detention basin is defined as the volume of detention provided above the invert of the lowest outflow pipe, and above the existing groundwater elevation as determined by geotechnical investigation. Stormwater management systems incorporating pumps shall generally not be permitted, unless specific site circumstances necessitate same as verified by the Village Engineer.

   c. A minimum of one (1') foot of freeboard will be required for all detention basins, above the high-water elevation.

   d. All basins will have provisions for a defined emergency spillway, routed such that it can be picked up by the main outflow channel while not discharging directly over the outlet pipe. The emergency spillway will be set at an elevation six (6") inches below the design freeboard elevation and be able to discharge flow from a 100-year design storm event.

   e. Adequate maintenance access from public or private rights-of-way to the basin will be provided. The access will be on a slope of ten percent (10%) or less, stabilized to withstand the passage of heavy equipment, and will provide direct access to the forebay, if present, and the outlet structure.

   f. The placement of retention/detention basins within a floodplain of a stream, creek, or lake is strictly prohibited.

7. UNDERGROUND DETENTION

   a. Oversized pipes for underground detention shall be comprised of materials conforming to the current Village of Lake Orion Standard Details or alternate systems as administratively approved by the Village.

   b. Means for accessing the storage system for cleaning and inspection shall be provided. Multiple access points meeting OSHA Standards shall be required.

   c. The system must be designed and located so that, should the design event be exceeded, the system overflows toward a positive outlet.

8. OUTLET CONTROL STRUCTURE

   a. Outlet control structures shall generally be designed in accordance with OCWRC Standard Details, including sediment filter if any, or other BMPs as approved by the Village Engineer.

   b. All outlets will be designed to discharge at an elevation within close proximity to the normal high water of the receiving waters. Discharging at the crest of slopes or submerged outlets will not generally be permitted.

   c. If the outlet structure is of the perforated standpipe type, the riser shall be placed near the pond embankment to provide maintenance access.

   d. Orifice plates or caps over pipes are discouraged. Where an orifice plate or cap is to be used in a standpipe to control discharge, it will have a minimum diameter of three (3") inches as specified by OCWRC Design Standards and may only be used in situations where this orifice size provides the required rate of outlet control.

   e. The use of an outlet structure with internal overflow weir wall and orifices through the wall to accommodate staged detention is encouraged.

9. PARKING LOT DETENTION

   a. Commercial parking lot detention of stormwater is strongly discouraged. It may be permitted only when no reasonable alternative exists and provided it does not adversely affect the functioning of the facility or business which it serves, adjacent property, or create a public nuisance. Parking lot detention shall not be allowed on residential sites and will be limited to sites less than 0.5 acres in size.

   b. The maximum storage depth shall not exceed six (6”) inches.

   c. The discharge from the parking lot may be controlled by means of restricted inlets.

   d. Commercial sites must be equipped with structural and/or non-structural BMPs for stormwater quality enhancement, including pollutant and TSS removal.

   e. The parking lot detention area must be designed and located so that, should the design event be exceeded, the system overflows toward a positive outlet.

10. PERMANENT RETENTION BASINS

   a. Permanent retention basins shall only be permissible when there is no other available positive outlet for stormwater runoff. Retention basins will be capable of storing two consecutive 100-year storms over a period of 48 hours from the entire tributary area, contingent upon the following:

1. An overflow assessment will be required showing the elevations of downstream buildings and other features that would be impacted by a basin overflow. The overflow route from the retention basin may not endanger existing structures or features. Downstream drainage easements will be required.
2. The Applicant must submit a minimum of one (1) soil boring log taken within the basin bottom area to a depth of ten (10') feet (or alternate depth as permitted by the Village) below the proposed basin bottom elevation. The boring must be done by a licensed geotechnical engineer or scientist, unless otherwise permitted by the Village. Accompanying infiltration calculations must also be included with the boring information to demonstrate that the underlying soils will be sufficient for basin dewatering over 72 hours.
3. Retention basin volume calculations shall not include volumes below the existing groundwater table.
4. The freeboard of retention basins shall be a minimum of two (2') feet.

b. Basin side slopes shall generally not exceed one (1') foot vertical to four (4') feet horizontal. Slopes steeper than one foot (1 ') vertical to four (4') feet horizontal, will be permitted only with the installation of a six (6') foot high locked perimeter fence (or other structure approved by Village Administration). In such cases where perimeter fencing is required, a twelve (12') foot wide access gate shall be provided.

c. Adequate maintenance access from public or private rights-of-way to the basin will be provided. The access will be on a slope of ten (10%) percent or less, stabilized to withstand the passage of heavy equipment, and will provide direct access to the forebay, if present.

d. The placement of retention/detention basins within a floodplain of a stream, creek, or lake is strictly prohibited.

SECTION 3-3 PLAN REQUIREMENTS

All stormwater management plans shall be submitted to the Village for engineering review and approval and shall contain, but not be limited to, the following information:

1. Any natural water courses that traverse or abut the development.

2. Any water course passing through the development with the area, flow calculations, etc., shown on the plan.

3. Description of proposed management facility and outlet conditions.

4. Required volume calculations.

5. Proposed system volume calculations.

6. Outlet and restrictor calculations.

7. Existing conditions summary, including “C” factors, outlet constraints, existing zoning master plan use, etc.

8. Site Stormwater Management (SWM) summary chart, including:
   a. Change in impervious area
   b. Pervious area by cover type
   c. Total area of the site
   d. CPVC volume provided at the site
   e. Difference between required and provided CPVC volume
   f. Percent of each Hydrologic Soil Group on site (Type A, B, C, D)
   g. CPRC volume provided at the site
   h. Difference between required and provided CPRC volume

9. Proposed grading contours for the system, including forebay, storage area, embankment, and buffer area.

10. Location of emergency overflow, maintenance access, sediment removal area, control structures, etc.

11. Planting schedule, including plant types, size, location, timing, maintenance, etc.

12. Outlet design in plan and profile view.

13. Animal guards shall be placed on all inlet and outlet pipes with a diameter of eighteen (18”) inches or greater.

14. Cross section shall be provided for all open basins; underground detention shall be shown with the storm sewer profiles.

SECTION 3-4 STORMWATER MAINTENANCE AGREEMENT

1. Subdivisions and Condominiums: The Applicant must provide for continued maintenance of on-site conveyance, sedimentation facilities, detention basins, and other system components. If the maintenance is to be assumed by a Subdivision Association or Condominium Association, the covenants of the plat or Master Deed of the condominium must incorporate a procedure to provide for this continued maintenance.

2. Commercial, Industrial, Multi-Family, and Office Sites: The proprietor shall maintain the stormwater facilities in proper working order at all times.

3. All developments: The Applicant shall enter into a long-term maintenance agreement with the Village in compliance with Ordinance 23.29 and the OCWRC current Stormwater Engineering Design Standards. An example is found at Appendix F.

DESIGN AND CONSTRUCTION STANDARDS FOR STORM SEWERS

SECTION 4-1 GENERAL

This Standard establishes the minimum requirements for the design and construction of enclosed storm sewer systems within the Village.

All storm sewers outside of public road rights-of-way are to remain private within subdivisions, condominiums, and commercial sites. Any storm sewers within the public right-of-way of a Road Commission for Oakland County (RCOC) or Michigan Department of Transportation (MDOT) jurisdictional road shall be under their jurisdiction, respectively.

SECTION 4-2 DESIGN REQUIREMENTS

1. LOCATION AND DEPTH

    a. Sewers shall preferably be constructed outside of paved parking areas, streets and drives, and not closer than ten (10') feet to any building.

    b. The horizontal alignment of sewers which are not proposed to generally follow street, drive, or parking area pavements shall generally parallel property lines or building lines, with clearance distances sufficient to accommodate the full width of the proposed easement.

    c. In residential developments, storm sewer shall generally be located on the opposite side of streets from water mains. Storm sewers shall be located ten feet from the right-of-way line in the public right-of-way where the right-of-way is at least sixty (60') feet wide.

    d. Unless otherwise approved by the Village, all storm sewer shall have a minimum of three (3') feet of cover. Minimum cover must meet or exceed pipe manufacturer's requirements.

2. CAPACITY

    a. Tributary Area: Sewers shall be designed to serve all natural tributary areas with due consideration given to topography, established zoning, and the capacity of the stormwater outlet proposed to be used.

    b. The outlet must be in accordance with the existing natural drainage courses in the area. Discharge must not be diverted onto abutting properties without necessary easements.

    c. Provisions for stormwater management must be included in the storm drainage system

as described in section 3 of these Standards.

d. Storm sewers shall be designed at a minimum for a ten-year storm. To determine the stormwater runoff, the Rational Method shall be used (Q=CIA). Where:

Q = peak rate of run-off in cubic feet per second
C = runoff coefficient for drainage area
I = rainfall intensity in inches per hour
A = area in acres

1. Rational Method runoff coefficients, C =

Forested	0.30
Asphalt, Concrete, Roof Areas, Brick	0.90
Gravel	0.55
Lawns and Meadows	
Up to 2% slope	0.15-0.18
2% to 7% slope	0.18-0.22
Over 7% slope	0.25-0.35
Open Water / Detention	1.00

Coefficients proposed for a project are subject to review and approval by the Village Engineer.

2. Rainfall intensity (I) shall be determined by using the formula:

I = 175/(T+25), where T is the time of concentration in minutes.

For single-family residential areas, the initial T shall usually be 20 minutes; for commercial and office areas, the initial T shall be 15 minutes or less. Sites less than 5 acres shall have an initial T of 10 minutes.

e. Manning's formula shall be used for hydraulic calculations.

1. The roughness coefficient n = 0.013 shall be used for concrete or plastic pipe.

2. Minimum design velocity shall be 2.5 feet per second and maximum design velocity shall be 10 feet per second, with the pipe flowing full.

Allowable Pipe Slopes

Pipe Diameter (Inches)	Minimum Slope (Feet per 100 Feet)	Maximum Slope (Feet per 100 Feet)
8	0.54	8.30
12	0.32	4.88
15	0.23	3.60
18	0.18	2.80
21	0.14	2.30
24	0.12	1.90
27	0.10	1.60
30	0.09	1.40
36	0.07	1.10
42	0.06	0.90
48	0.05	0.75
54	0.04	0.65
60	0.04	0.56

3. The minimum pipe size for public storm sewer shall be 12 inches diameter.

4. In single-family developments, rear yard under drain system may be minimum eight (8”) inch perforated plastic pipe. Six (6”) inch diameter yard drains may be considered for very small tributary areas, typically in higher density multi-family developments.

5. The hydraulic gradient shall generally be maintained by matching the 0.80 diameter depth above invert for pipe size increases.

6. Provide a drop of 0.10 feet in the downstream sewer invert for direction changes in excess of thirty (30°) degrees to compensate for the hydraulic head losses.

7. Surcharging under design conditions is permitted provided the surcharged hydraulic grade line (HGL) is maintained lower than one (1’) foot below the rim elevations of all upstream structures.

8. Differences in invert elevations at structures exceeding two (2’) feet shall be provided with a two (2’) foot deep sump for energy dissipation.

3. STRUCTURES

a. Manholes shall be located at

1. Points where the sewer changes direction.
2. Points where the slope of the sewer changes.
3. The junction of sewer lines.
4. Street intersections or other points where catch basins or inlets are to be connected.
5. The end of the sewer line.

b. Maximum distance between manholes shall be as follows:

Diameter of Sewer	**Maximum Manhole Spacing**
8” – 15”	350’
18” – 30”	400’
36” – 48”	450’
54” – 60”	500’

c. In general, Catch Basins and Inlets shall be located at

1. At all low points in streets, swales and ditches.
2. At the radius returns of street intersections. A maximum distance of 150 feet from a high point or relief basin is allowed when drainage is required to go around a corner to reach the catch basin.
3. At maximum intervals of 600 feet along a continuous slope.
4. At a location to provide a maximum of 800 feet of drainage from two directions.
5. So that the flows to be accommodated do not exceed the intake capacity of the cover. The intake capacity of the cover is assumed to be 0.011 cubic feet per second (cfs) per square inch of opening. To meet this standard, double catch basins may be required at low points where two (2) or more relief basins exist in advance of the low point.
6. Inlets will only be allowed in pavement areas as a high-end structure when followed by a catch basin within 150 feet of inlet.
7. Rear yard basins shall be located within three (3’) feet of lot corners. A minimum twelve (12’) foot side yard easement to the street shall be included at all rear yard basins.
8. All catch basins and inlets located at low points in poor draining soils or within paved areas shall have a minimum of two ten (10’) foot runs of six (6”) inches perforated pipe with open graded bedding and backfill. Other trench collecting underdrains may be required, as determined by the Village.

d. Leaching / Infiltration Basins

1. Leaching basins are encouraged where native soils are permeable and conducive to such installation, provided the maintenance provisions for such basins are approved by the Village.
2. Leaching basins shall be located following the same standards as catch basins or inlets.

e. Pipe end treatment

1. End section or headwall shall be placed at all culverts and pipe inlets or outlets.
2. A prefabricated bar screen shall be used on all storm sewer opening eighteen (18”) inches in diameter and larger.
3. Natural rock or crushed limestone riprap, or other approved energy dissipating measure, is required at all pipe outlet points. The minimum width of the riprap shall be twice the outside diameter of the pipe. The riprap shall extend from the bottom of slope to the pipe invert.

f. Footing Drains/Sump Pump Discharge

1. Generally, sump pump or footing drain discharges shall outlet to an approved storm sewer system. Where no approved storm sewer system exists, sump pump discharge may surface outlet onto splash blocks. These discharges shall not be directed toward adjacent units. Wyes and leads shall be provided to accommodate the connection of the sump pump discharge piping to the storm sewer.

g. Special Structures and Appurtenances

1. Special structures and appurtenances for drainage collection require written approval of the Village.
2. Preliminary plans for special structures and appurtenances required for storm sewer systems shall be submitted to the Village Engineer for review and comment prior to their inclusion in proposed construction drawings.

SECTION 4-3 PLAN REQUIREMENTS

All plans shall be submitted to the Village for storm sewer review and approval and shall contain, but not be limited to, the following information:

1. Storm sewer and pavement shall generally be shown on the same sheets.

2. Overall layout of the sewer system with structure numbers. Drainage structure numbers shall be assigned consecutively and increasing in direction opposite to direction of flow in each sewer.

3. A drainage plan delineating the area tributary to each structure. The drainage area map shall be superimposed on the proposed grading plan for the development.

4. Hydraulic design calculations.

5. Locations of all structures and other sewer appurtenances and special structures.

6. Building leads or wye branches to be constructed or installed concurrently with sewer construction with locations at easement and/or property lines. Length, size, end of lead invert elevations, and amount of riser shall be shown on the plan for each building lead.

7. Dimensions to sewers from property lines, right-of-way lines or buildings. Dimensions between parallel utility lines.

8. Size, slope, length, pipe type and class, and controlling invert elevations for each section of proposed sewer between structures in both plan and profile view.

9. Limits of special backfill requirements.

10. Profile, over centerline of proposed sewer, of existing and finished ground and pavement surfaces. Existing profile shall be obtained from actual field survey data. The HGL must be shown on the profile view if outside the pipe.

11. Location of existing or proposed crossings in the profile view, with vertical separation noted.

12. Location, by station, of every proposed structure, with structure number, invert elevation of all inlet or outlet pipes, rim elevation, cover type, and structure type in the profile view.

13. Location, by station, of all building leads or wye branches to be constructed or installed concurrently with proposed sewer construction in profile view.

14. Sump lead invert elevation at easement line (typical for residential) or upstream end of lead 5’ outside of building (typical for commercial, multi-family).

15. Each plan and profile sheet shall include a tabulated list of quantities appearing on that sheet.

16. Detail Sheets

    a. Plans must include the current Village of Lake Orion Storm Sewer Standard Detail sheets.

    b. Plans may include the standard detail sheets and notes as provided by the Oakland County Water Resources Commissioner or the Road Commission for Oakland County for construction under these agencies’ jurisdiction.

c. Where special structures or appurtenances are proposed, plans shall include specific and complete details describing special or unusual sewer or allied construction requirements. Scales utilized for special details shall be selected to clearly portray intended construction and component or equipment arrangement. Scales used shall be clearly identified.

SECTION 4-4 CONSTRUCTION REQUIREMENTS

1. All materials shall conform to the current Village of Lake Orion Storm Sewer Standard Details.

SECTION 4-5 EASEMENT REQUIREMENTS

1. Applicant shall be responsible for preparation of easement and legal conveyance documents for public storm sewer meeting Village requirements to be reviewed by the Village Engineer and Village Attorney. An example is attached in Appendix A.

2. Easements for storm sewers shall be of a width adequate to provide proper access for maintenance, centered upon the sewer, generally twice the width of the sewer depth, with a minimum width of twelve (12') feet. Such easements shall be deeded or dedicated to the Subdivision Association, Condominium Association, property owner, or entity responsible for the maintenance of the storm sewer.

3. The easement descriptions shall extend a minimum of ten (10') feet beyond the upstream manhole.

4. New public storm sewer shall not be accepted by the Village until any required easements have been secured in accordance with Village requirements.

DESIGN AND CONSTRUCTION STANDARDS FOR IMPACTS TO FLOODPLAINS

SECTION 5-1 INTENT

It is the purpose of this section to provide Design and Construction Standards, which are intended to significantly reduce hazards to persons and damage to property as a result of flood conditions in the Village and to preserve the ability of floodplains and floodways to carry and discharge a base flood.

SECTION 5-2 DISCLAIMER

The degree of flood protection required by this section is considered reasonable for plan review purposes and is based upon engineering and scientific methods of study. Larger floods may occur on rare occasions. Flood heights may be increased by man-made or natural causes, such as ice jams and bridge openings restricted by debris. Approval of the use of land under this section shall not be considered a guarantee or warranty of safety from flood damage. This section does not imply that areas outside the floodplain or floodway area will be free from flood damage. This section does not create liability on the part of the Village or any officer or employee thereof for any flood damages that result from reliance on this section, or any administrative decision lawfully made thereunder, nor shall the Village be responsible for any damages sustained or suffered by the owner or developer for use of land in any floodplain.

SECTION 5-3 PROVISIONS

1. No activity shall be permitted within a floodplain or floodway area without full compliance with the terms of this section and other applicable regulations.

2. No permanent structures shall be placed in a floodplain.

3. The floodplain limits shall be indicated on site plan drawings for improvements adjacent to the floodplain. The boundaries of the floodplain shall be as determined by the Federal Emergency Management Agency (FEMA) and/or other jurisdictional authority. Within the floodplain a regulatory floodway may be designated as determined by FEMA and/or other jurisdictional authority and must be indicated on the plan. Where floodplain by survey differs from the FEMA mapped floodplain, both shall be shown and labeled on the plans.

SECTION 5-4 AGENCY APPROVAL

Encroachments, including fill, new construction, substantial improvements and other development in a riverine floodplain shall be prohibited. Exception to this Standard shall only be made through the granting of a permit by the State or Federal agency having jurisdiction.

SECTION 5-5 SUBMISSION OF BASE FLOOD ELEVATION BY REGISTERED PROFESSIONAL ENGINEER

EGLE may provide flow data on all jurisdictional watercourses. The Applicant's Engineer shall be responsible for computing the flood stage elevations across the site using this data. The calculations, hydraulic model results, or other means of calculating the floodplain sections used must be submitted for review. The Village reserves the right to require hydraulic modeling or other means of calculating the floodplain elevations where specific concerns of potential flooding impacts exist.

SECTION 5-6 PLAN REQUIREMENTS

The following shall be shown on all plans:

1. A site plan, showing all existing and proposed structures, topographical features, utilities, and all proposed changes. The site plan shall include existing and proposed elevation contours (1-foot intervals). The base flood elevation contour shall be clearly delineated on the site plan.

2. The elevation on NAVD 88 datum of each floor, including basement, for all structures proposed by the Applicant adjacent to the floodplain.

3. Pursuant to criteria established in this section for protection of the floodplain, any proposed development necessitates certification by a registered professional that no cumulative impact on the base flood elevation will result. A cumulative impact is defined as an increase in elevation exceeding one-tenth foot.

4. A description of the extent to which any watercourse will be altered or relocated as a result of the proposed development. Specifically, the impact on flow velocities and other flood carrying characteristics of the regulatory floodway should be addressed. Approvals from State or Federal agencies with jurisdiction must be obtained and submitted to the Village.

5. All utilities and facilities shall be designed, constructed, and located to minimize or eliminate flood damage.

6. Adequate drainage shall be provided to reduce exposure to flood damage.

7. The flood carrying capacity of any altered or relocated watercourse not subject to state or federal regulations designed to ensure flood carrying capacity shall be maintained.

8. Available floodplain data from federal, state or other sources shall be reasonably utilized in meeting the Standards of this section. Data furnished by FEMA shall take precedence over data from other sources.

9. All new construction and substantial improvements of structures adjacent to the floodplain shall have the lowest floor, including basement, at least two (2') feet above the base flood elevation.

SECTION 5-7 CONSTRUCTION PROVISIONS

1. All floodplain impacts are to be constructed in accordance with the approved plans and EGLE Part 31 permit.

2. All soil erosion control measures or protective fencing shall be installed around the perimeter of the floodplain.

3. Construction shall be sequenced so that the minimum amount of time possible is required for the work within the floodplain.

4. Restoration shall be completed immediately.

5. Storage of equipment, material, and similar items is strictly prohibited within the floodplain.

DESIGN AND CONSTRUCTION STANDARDS
FOR STREETS, DRIVEWAYS, PEDESTRIAN FACILITIES AND PAVING

SECTION 6-1 GENERAL

This section establishes the minimum requirements for the design and construction of streets, driveways, pedestrian facilities and all other public or private paved surfaces such as parking lots.

Any work proposed within the existing rights of way of the Village, Road Commission for Oakland County (RCOC) or the Michigan Department of Transportation (MDOT) is to be reviewed and approved by the respective agency that has jurisdiction over the subject right of way.

SECTION 6-2 DESIGN REQUIREMENTS

It is the intent of the Village to encourage paving layouts and street designs that preserve natural features by minimizing the clearing and mass grading required to construct streets, parking lots, pedestrian facilities and non-motorized paths.

While RCOC and MDOT will issue construction permits for work within their respective rights of way and their standards will dictate design improvements within their respective jurisdictions, the Village reserves the right to require additional plan provisions or paving requirements above those required by the governmental agency having jurisdiction.

1. SPECIFICATIONS

   a. All roads or drive aisles for motor vehicle access shall meet the width, length, slope and turnaround requirements of the International Fire Code (IFC) as most recently adopted by the Village.

   b. Private roads, where permitted by the Village, shall be designed and constructed in accordance with sound engineering principles, taking into consideration public health, safety, and welfare, as well as preservation of natural resources.

   c. Off-street parking shall be designed in accordance with the current Village Zoning Ordinance and these Standards.

   d. Sidewalks shall be designed and constructed in accordance with the Americans with Disabilities Act (ADA) barrier free specifications.

   e. Pedestrian or non-motorized paths such as safety paths, bike paths, shared use paths, paved nature trails, and similar shall be designed and constructed to current AASHTO

"Guide for the Development of Bicycle Facilities" and ADA "Outdoor Recreational Trails" standards except where modified herein. The stricter interpretation between these Standards, AASHTO and ADA shall apply.

2. STREETS

a. Layout

1. Street layout shall provide for the continuation of existing major or collector streets in surrounding areas or conform to the development plan approved by the Village.

2. Certain streets, public or private, as designated by the Village, shall be extended to the limits of the property to be developed to provide future connection with adjoining undeveloped land.

3. Proposed streets shall be designed in accordance with the existing topography, preserve natural features by minimizing clearing and mass grading, and meet the slope requirements of this section.

4. Emergency access only drives may be permitted to provide a secondary means of access, provided it is acceptable to the Fire Marshal and that appropriate signage limiting usage shall be established as required by the Village.

5. Street jogs with centerline offsets of less than 150 feet shall be approved by the Village only upon an adequate demonstration that there are no reasonably feasible alternatives.

6. Alleys and half-streets are prohibited except where absolutely essential to the reasonable development of the property in conformance to these Standards and the Zoning Ordinance and as reviewed and approved by the Village on a case-by-case basis.

b. Right of Way / Easement Requirements

1. New public road rights of way to be dedicated to the Village shall be 60' wide for local streets, increasing to 100' for boulevard sections, unless otherwise approved by the Village, based on recommendation of the Village Engineer. Rights of way for County-owned roads shall meet RCOC requirements.

2. Private roads, where permitted, shall be contained within a dedicated easement for ingress and egress and utilities. The easement widths shall be as necessary to accommodate paving and drainage improvements based on recommendation of the Village Engineer.

3. Where roadway extensions are required by the Village for future connection to adjacent parcels, whether for public roads, private roads, or cross-access drive

aisles, such extensions shall be shown within a dedicated right-of-way or easement, and shall be constructed to the property line of the adjacent parcel concurrent with the Applicant's proposed development.

c. Geometrics

1. Existing public roads or roads intended to be publicly dedicated shall meet the width standards outlined below.

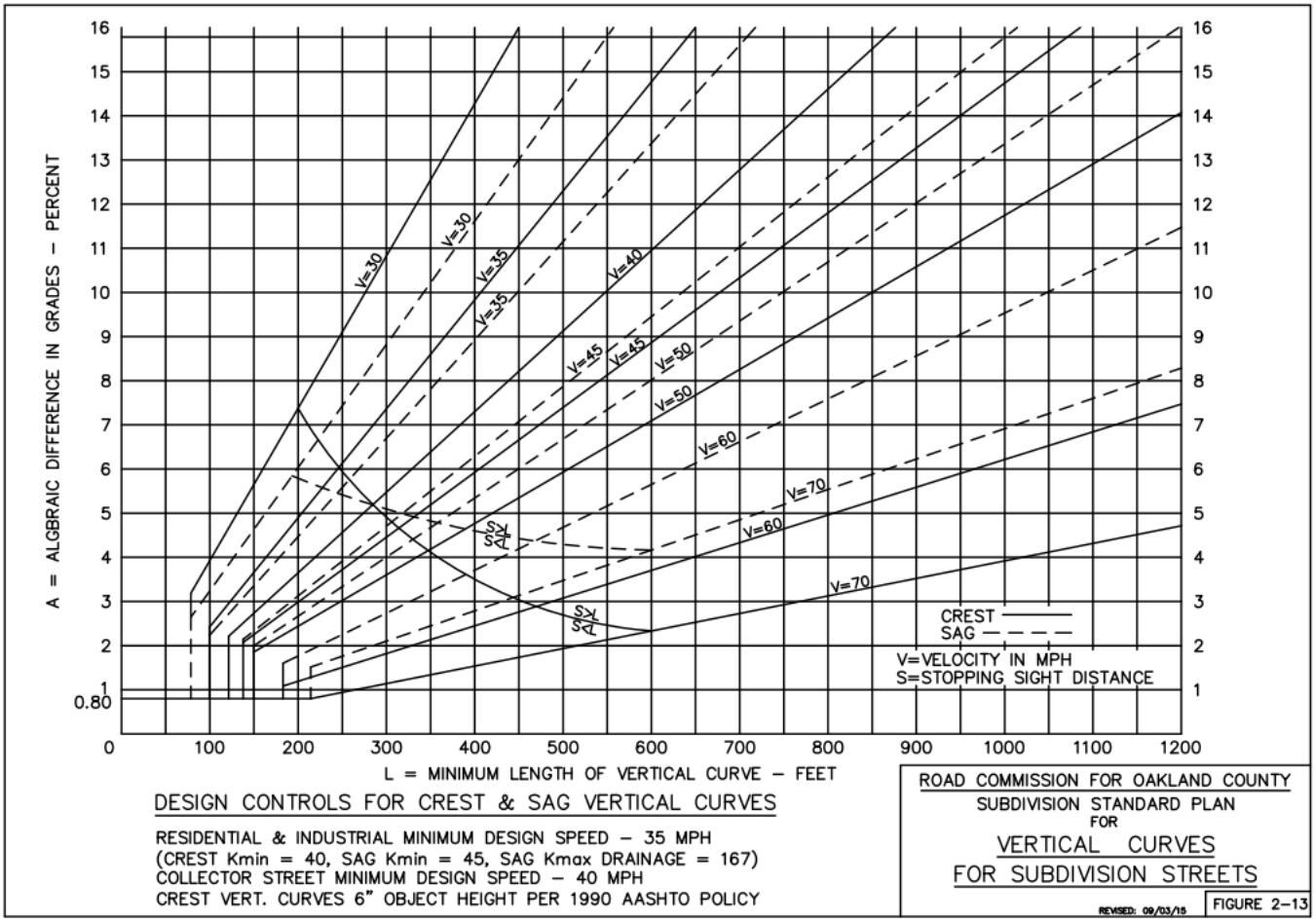
   i. Standard road width with curb and gutter and off-street parking shall be twenty seven (27') feet wide measured between the back of curbs, or twenty four (24') feet wide measured between the edges of the pavement for uncurbed streets with ditches. In no case shall the paved surface of new public roads be less than 20' in width, which will only be allowed where existing, previously unimproved rights of way are less than 50' wide.
   ii. Maximum longitudinal slope shall not exceed 6% without approval by the Village DPW and Fire Marshal.
   iii. The grade shall not exceed three (3%) percent for a minimum distance of fifty (50') feet from the edge of pavement of the intersecting public road, unless otherwise approved by the Village based on limiting topographic conditions.
   iv. Minimum slope shall be one (1.0%) percent on asphalt, one-half (0.5%) percent on concrete.

2. The paved surface width of private roads shall be as necessary to accommodate vehicle access, planned on-street parking, and safe vehicular maneuverability, based on recommendation of the Village Engineer.

   i. In no case shall new private roads be less than 20' in width.
   ii. Longitudinal slope shall be typically eight (8%) percent or less. Where essential to maintain natural features, grades exceeding eight (8%) percent but no greater than ten (10%) percent may be permitted.
   iii. The grade shall not exceed three (3%) percent for a minimum distance of twenty-five (25') feet from the edge of all existing public road rights of way, unless otherwise approved by the Village based on limiting topographic conditions.

3. Pavement widths for each side of a boulevard shall, at a minimum, accommodate 1-way traffic with a minimum paved width of 15'. Island widths shall typically be ten (10') to sixteen (16') feet. The nose of the island shall generally be eight (8') feet from the edge of pavement of the intersecting street.

4. Vertical curves shall be required for all grade changes in excess of two (2%) percent and shall meet AASHTO standards, for both public and private roads. See attached RCOC figure 2-13. For residential streets, minimum vertical curve length shall be 75'.



5. Sight distance for vertical curves shall at a minimum meet the current AASHTO standards for stopping sight distance. Refer to AASHTO table 5-3.

Table 5-3. Design Controls for Stopping Sight Distance and for Crest and Sag Vertical Curves

U.S. Customary				Metric			
Initial Speed (mph)	Design Stopping Sight Distance (ft)	Rate of Vertical Curvature, K^a (ft/%)		Initial Speed (km/h)	Design Stopping Sight Distance (m)	Rate of Vertical Curvature, K^a (m/%)	
		Crest	Sag			Crest	Sag
15	80	3	10	20	20	1	3
20	115	7	17	30	35	2	6
25	155	12	26	40	50	4	9
30	200	19	37	50	65	7	13
35	250	29	49	60	85	11	18
40	305	44	64	70	105	17	23
45	360	61	79	80	130	26	30
50	425	84	96	90	160	39	38
55	495	114	115	100	185	52	45
60	570	151	136				
65	645	193	157				

[a] Rate of vertical curvature, K, is the length of curve per percent algebraic difference in the intersecting grades (i.e., $K = L/A$). (See Sections 3.2.2 and 3.4.6 for details.)

6. For new roads, road centerlines that deflect more than ten (10) degrees, but less than ninety (90) degrees shall generally be connected with a horizontal curve with a minimum radius of two hundred thirty (230') feet. Actual radii, subject to the above minimum, shall be designed for the posted speed of the road and in accordance with AASHTO standards.

7. Streets intersecting major thoroughfares shall do so at approximately ninety (90) degrees.

8. Cul-de-sac lengths shall not exceed 600 feet, or the maximum allowed under IFC requirements for dead-end fire apparatus access roads. Turnarounds shall be provided as required by the most current Village-adopted IFC.

9. Acceleration, deceleration and passing lanes for approaches to existing roads shall be required as determined by the Village with recommendations provided by the Village Engineer. Where required, acceleration, deceleration and passing lanes shall be constructed to AASHTO standards.

10. Streets shall generally be crowned with 2 percent transverse slopes provided from the centerline to the edge of the road.

11. The proposed street cross section shall include curb and gutter with an enclosed

storm sewer system, or shoulders with open ditch drainage under special circumstances where allowed by the Village. Roads with longitudinal slopes exceeding three (3%) percent shall be required to provide curb and gutter.

3. DRIVEWAYS

   a. Unless otherwise determined by the Village, property shall be developed to minimize the number of ingress/egress points from an existing or proposed road.

   b. Driveway permits are required for any connection to public roadways from the agency with jurisdiction, either Village of Lake Orion, RCOC, or MDOT. Village driveway permit application is attached at Appendix G.

   c. Use of shared or common driveways for all developments, including between two businesses, is encouraged and may be required by the Village. Where vehicle access is required by the Village for future connection to adjacent parcels, whether for public roads, private roads, or cross-access drive aisles, such access shall be shown within a dedicated right-of-way or easement, and shall be constructed to the property line of the adjacent parcel concurrent with the Applicant's proposed development.

   d. Maximum driveway grades shall not exceed ten (10%) percent. Wherever reasonably feasible, driveway slopes should not exceed six (6%) percent.

   e. Driveways and approaches shall be paved, with material type and thickness within the right of way to match the existing road section at a minimum. The use of pervious pavement is encouraged for residential driveways.

   f. Driveways to commercial, industrial, multifamily, institutional, and similar developments as determined by the Village shall be designed in accordance with the requirements herein specified for Streets.

4. PEDESTRIAN FACILITIES

   a. General

      1. Pedestrian facilities are to be installed as required by the Village Zoning Ordinance.

      2. Where topography, vegetation, natural features, utilities, poles, signs or similar obstructions dictate, the pedestrian facilities shall be meandered around these features.

      3. Barrier free ramps shall be installed in accordance with ADA barrier free requirements and MDOT specifications at all intersections with driveways, roads, and parking lots.

      4. Pedestrian facilities installed outside of the right of way will require an easement

dedicating the facility for use by the public.

b. Sidewalks

1. The sidewalk shall be sloped to provide for positive drainage of stormwater off of and away from the path. Transverse slope shall not exceed two (2%) percent. Longitudinal slope shall meet the standards of the current ADA with intermediate level landings as required.

2. Sidewalks shall be no less than five (5') feet wide. Where sidewalks abut perpendicular parking, the minimum sidewalk width shall be seven (7') feet.

c. Shared Use, Bicycle, Safety Paths or Nature Trails (referred to herein as paths)

1. Paths shall be sloped to provide for positive drainage of stormwater off of and away from the path. Transverse slope of paths shall not exceed two (2%) percent. Longitudinal slope shall meet the standards of the current ADA with intermediate level landings as required.

2. Paths shall generally be no less than eight (8') feet wide unless otherwise approved by the Village.

5. PARKING LOTS

a. Parking lots shall be of the size and configuration as required in the Village Zoning Ordinance.

b. Maximum parking lot grades shall not exceed six (6%) percent. Exceptions for drive aisles without adjacent parking spaces may be permitted subject to driveway maximum slope criteria.

c. Accessible parking spaces and aisles shall meet ADA requirements, with slope in any direction not exceeding two (2.0%) percent.

d. Parking lots shall be designed with concrete curb and gutter at edge of exterior parking and drive aisles unless otherwise approved by the Village.

SECTION 6-3 PLAN REQUIREMENTS

All construction plans shall be submitted to the Village for street and paving approval and shall contain, but not be limited to, the following information:

1. PLAN VIEW

a. Road and right-of-way width must be shown on the plans. A plan view with centerline stationing shown is necessary for all road paving.

b. Cross sections of all pavement sections shall be provided, including surface, base, subgrade, curb and gutter section, and for roads with open drainage a shoulder and ditch profile. If using standard Village pavement sections, refer to Paving Standard Detail sheet(s).

c. All parking lots, loading spaces, and driveway layouts, along with typical dimensions and layouts of parking spaces shall be shown. A striping plan for the parking areas must be indicated in accordance with the Zoning Ordinance requirements.

d. Entrance, intersection, and cul-de-sac details must be shown.

e. Existing grade elevations at the center of the proposed roadway in fifty (50') foot intervals or as needed to accurately demonstrate proposed plan.

f. The location of any proposed or existing utilities and structures within the proposed right of way.

g. Any proposed culverts (driveway or cross) including size, type and invert elevations.

h. Proposed and existing parking lot and driveway grades.

i. Location and extent of different types and sections of pavement (i.e. standard asphalt, heavy duty, concrete) must be shown. Shading or hatching is recommended.

j. Sight distances must be provided for all street designs as required by the Village upon recommendation by the Village Engineer. Such recommendation shall be based on existing and proposed site topography.

2. PROFILE VIEW OF STREETS

a. Elevations at top of curb or centerline if not curbed in fifty (50') foot intervals or as need to accurately demonstrate proposed plan. Along vertical curves, the elevation interval shall be twenty-five (25') feet.

b. Existing grade elevations at the center of the proposed roadway in fifty (50') foot intervals or as needed to accurately demonstrate proposed plan.

c. Station and elevations of all high and low points, grade breaks, curb returns, intersecting property lines and vertical curve information.

d. The station and elevation of the rim grade of all drainage structures.

3. DETAIL SHEETS

a. Plans must include the current Village of Lake Orion Paving Standard Details.

SECTION 6-4 CONSTRUCTION REQUIREMENTS

1. All materials shall conform to the current Village of Lake Orion Paving Standard Details.

SECTION 6-5 RIGHT OF WAY / EASEMENT REQUIREMENTS

1. Legal descriptions for the road right of way for public roads and ingress-egress easements for private roads must be provided for review and approval prior to recording.

2. Applicant shall be responsible for preparation of easement and legal conveyance documents meeting Village requirements to be reviewed by the Village Engineer and Village Attorney.

3. Easements for roadway extensions or cross-access shall be provided to the property lines at locations designated by the Village.

4. New roadway extensions shall not be accepted by the Village until any required easements or rights of way have been secured and legal conveyance documents finalized in accordance with Village Administration requirements.

DESIGN AND CONSTRUCTION STANDARDS FOR WATER MAINS

SECTION 7-1 GENERAL

The Village of Lake Orion owns and operates the Lake Orion Water Distribution System. The Village obtains its water supply from Orion Township, which is a customer of the Great Lakes Water Authority (GLWA). The Standards herein apply to the design and construction of water distribution system extensions or replacements under Village jurisdiction.

SECTION 7-2 DESIGN REQUIREMENTS

1. SIZES AND DISTRIBUTION

   a. The minimum size water main in the Village shall be eight (8") inch diameter. Twelve (12") inch diameter water main shall be required for industrial developments and other areas as determined by the Village DPW. Six (6") mains may only be used for single hydrant leads having a maximum length of fifty (50') feet. No service leads are allowed from six (6") main.

   b. The distribution system in all developments requiring more than 400 feet of water main shall be looped to have a minimum of two (2) connections to a source of supply.

   c. The water main design must provide for the average daily flow rate plus a fire demand of 1,500 GPM with a residual pressure of 20 psi at the most remote hydrant. Applicant may be required to provide calculations.

   d. Generally, water mains shall be installed on the opposite side of the road from the sanitary sewer where present. A barrel-to-barrel horizontal separation of ten (10') feet shall be maintained between water main and all sewers, including structures, per Ten States Standards of GLUMRB.

   e. Water mains shall preferably be constructed outside of paved parking areas, streets and drives, not closer than ten (10') feet to any building.

   f. In new developments, water mains shall be installed from boundary to boundary in abutting roads and interior streets, and at other locations as required by the Village for future extensions.

   g. All water mains and hydrants shall be accessible to Village DPW and Fire Department personnel at all times.

2. VALVES

   a. A tapping sleeve, valve, and well shall be provided at every connection to existing mains. All such connections shall be provided so as not to disrupt the water supply to existing customers.

   b. In general, valves on cross connecting mains shall be arranged so that no single line failure will require more than 800 feet of main to be out of service. Valves shall be so arranged that any section can be isolated by closing not more than three (3) valves with a maximum of thirty (30) residential units or two (2) hydrants being out of service.

   c. A valve shall be provided at every dead end of a watermain to allow for future extension.

   d. A gate well shall be provided for all valves except for valves for hydrants and service leads under six (6”) inches in diameter.

   e. Valves shall be located outside of pavement where possible.

   f. Pressure Reducing Valves

      1. In systems where two or more pressure districts, as verified by the Village Engineer, are to be connected for a looped supply, the plans shall include a pressure reducing valve near the point of connection to the higher-pressure district to balance pressures across the new water system.

      2. A line gate valve shall be installed both upstream and downstream of each pressure reducing valve to permit isolation of the pressure reducing valve for maintenance or repair. If an alternate service loop to the water system is not available to permit repair on the pressure reducing valve without a complete shutdown of the system, then a bypass line of equivalent size pipe as the water main and an additional bypass gate valve and well shall be provided.

3. FIRE HYDRANTS

   a. Hydrants shall be located for double coverage wherever possible, but shall generally be located no closer than twenty-five (25’) feet from a single-family residence or fifty (50’) feet from other structures.

   b. Hydrant locations shall meet the requirements of the Fire Marshall and Village Engineer and shall be located such that the furthest portion of any building is within a 250’ hose lay.

   c. Fire hydrants shall be located at street intersections where feasible.

   d. A hydrant shall be installed at the end of every dead end main. A one (1”) inch

corporation stop with ten (10') feet of copper or PVC service pipe attached shall be provided adjacent to the hydrant for the purpose of obtaining water samples when the nearest gate well is more than one pipe length away.

e. Hydrants should be placed at high spots along the main for air release and at low spots along the main for sediment blowoff.

f. In general, hydrants shall be located in the road right-of-way not more than ten (10') feet from back of curb or edge of pavement.

4. SPECIAL CROSSINGS

a. Lake, Stream or Regulated Wetland Crossing: Ball and socket joint river pipe shall be used unless otherwise approved by the Village. A valve shall be installed on each side of the crossing. Minimum depth to the top of pipe shall be five (5') feet from centerline of the watercourse.

5. WATER SERVICES

a. The basis of design for size shall be considered using a flow rate of 20 gpm per residential dwelling unit. The basis of size other than for residential use shall be determined by the Developer's Engineer and submitted for approval by the Village prior to submittal of final site plans. Minimum size of service shall be one (1") inch, as provided in Chapter 53 of the Village of Lake Orion Code of Ordinances.

b. Water leads shall be less than 100 feet in length. For multiple-family uses the following minimum sizes shall apply, unless otherwise authorized by Village DPW:

Number of Units Per Building	Water Service Size (Inches)
4	1-1/2
12	1-1/2
16	2
24	2
32	3

6. BACKFLOW PREVENTION

a. All lawn sprinkler and irrigation systems shall be equipped with a suitable backflow prevention device.

b. Special requirements for Automatic Sprinkler Fire Protection Systems: Sprinkler systems directly connected to the community water supply mains shall have double check valve assemblies and/or reduced pressure backflow preventers installed in strict accordance with Village DPW and Fire Department requirements.

SECTION 7-3 PLAN REQUIREMENTS

All construction plans shall be submitted to the Village for water main approval and shall contain, but not be limited to, the following information:

1. Water main and sanitary sewer shall generally be shown on the same plan sheet. Plan and profile views are required for all water mains. Village may require profile views of water main to be separate from sanitary sewer profiles for clarity.

2. Dimensions to property lines, right-of-way lines, and buildings from the water mains and service leads.

3. Service line location and diameter shall be shown to all buildings other than single-family detached dwellings, including location of curb stop box.

4. Finish grades of all fire hydrants, gate well rims, hydrant valve boxes, and all other water structures.

5. Water main eight (8") inches and larger in diameter shall be shown in profile. The Village may also require profiles be shown where multiple utility crossings provide the potential for conflicts.

6. In the plan and profile views, all crossings of utilities must be shown with elevations of invert and top of pipe. Minimum vertical clearance between utilities shall be one and one half (1.5) feet. Compacted granular backfill is required between utilities.

7. Plan and profile views shall indicate location and degree of vertical and horizontal bends; the size, material type and class of pipe; class of bedding; length between structures, tees or bends; and the existing and proposed ground elevations above the route of the water main.

8. Location, by station, of every proposed structure, tee and bend, with rim elevation structure number in profile view.

9. The elevation at the top of mains at all points of potential conflict with other utilities (for all water main regardless of size) must be shown.

10. Water Main Basis of Design.

11. Each Plan and Profile Sheet shall include a tabulated list of quantities appearing on that sheet.

12. Detail Sheets: Plans must include the current Village of Lake Orion Water Main Standard Details.

SECTION 7-4 CONSTRUCTION REQUIREMENTS

1. All materials shall conform to the current Village of Lake Orion Water Main Standard Details.

2. No water main construction shall commence without a valid EGLE Act 399 permit.

3. No building permits will be issued above the foundation for any development prior to the active service of the community mains and hydrants and adequate firefighting equipment. No occupancy shall be allowed in any instance without the required mains, hydrants, and sprinklers being in active service.

SECTION 7-5 EASEMENT REQUIREMENTS

1. Easements for publicly dedicated water mains not within the road right-of-way shall be provided. Utilities shall typically be centered within easements. Applicant shall be responsible for preparation of easement and legal conveyance documents meeting Village requirements to be reviewed by the Village Engineer and Village Attorney. Example attached at Appendix A.

2. Easements for possible extensions shall be provided to the property lines at locations designated by the Village. Within unplatted projects, water mains shall be installed parallel to the property lines, or building lines, with clearance distances to accommodate the full width of the proposed easement.

3. All water main easements shall be a minimum of twelve (12') feet wide and shall be dedicated to the Village of Lake Orion. Where the water main is more than seven (7') feet below the finished grade, the easement width shall be increased as required by the Village DPW.

4. The easement descriptions shall include hydrant leads and shall extend a minimum of ten (10') feet beyond the hydrant, or no less than six (6') feet where approved by the Village DPW. The easement documents shall contain a provision prohibiting the construction or locating of any underground utilities, aboveground structures or landscape trees within the limits of such easements.

5. New water main extensions shall not be accepted by the Village until any required easements have been secured and legal conveyance documents finalized in accordance with Village Administration requirements.

DESIGN AND CONSTRUCTION STANDARDS FOR SANITARY SEWER COLLECTION SYSTEMS

SECTION 8-1 GENERAL

This section establishes the minimum requirements for the design and construction of sanitary sewer replacement or extensions to the Village of Lake Orion Sewer System, owned by the Village and operated and maintained by the Oakland County Water Resources Commissioner (OCWRC). The Standards herein apply to the collection of sanitary sewage via local Village-owned sanitary sewers for transportation to the Clinton Oakland Sewage Disposal System (COSDS) with ultimate transport to the Great Lakes Water Authority (GLWA) Wastewater Treatment Plant.

SECTION 8-2 DESIGN REQUIREMENTS

1. LOCATION AND DEPTH

    a. Sanitary sewers shall generally be located on the opposite side of the street from any proposed water mains and within the road right-of-way.

    b. Sewers shall preferably be constructed outside of paved parking areas, streets, and drives.

    c. Ten (10') feet of horizontal separation must be maintained between sanitary sewers, water mains, and storm sewers, measured from the outer edge. The minimum vertical separation between all utilities shall be eighteen (18") inches.

    d. Unless specifically approved by the Village, no sanitary sewer shall have less than five (5') feet of cover. In general, sanitary sewers shall have a minimum of eight (8') feet of cover below the finished road surface grade.

    e. Unless otherwise approved by the Village, the top of any sanitary sewer shall be at least nine (9') feet below finished grade elevation at the building setback line of each fronting property which the sewer is designed to serve.

2. SEWER CAPACITY

    a. Sanitary sewers shall be designed to serve all areas within the defined service area as determined by the Village, anticipating full development of such areas, with due consideration given to topography, existing natural features, established zoning, and any other documents published by the Village in this regard.

    b. The number of Residential Equivalent Units (REU or unit) to be assigned to any

particular premises shall be determined by the Lake Orion Village Code of Ordinances or the Village Administration and its decision shall be final. Village Administration, if the circumstances justify, may assign more than one REU to a single-family dwelling. No less than one REU shall be assigned to each premises for the purpose of computing the capital charge and the lateral benefit fee set forth; units in excess of one may be computed and assigned to the nearest 1/10 of a unit.

c. Population per REU shall be calculated as not less than 2.44 people per REU, or as specified in the most recent Oakland County Water Resource Commissioner "Residential Equivalent Unit Study Report" for areas tributary to the Clinton-Oakland Interceptor.

d. For service areas with design populations of 500 or less, peak design flow Q shall be 400 gallons per capita per day.

   For service areas with design populations greater than 500, but less than 28,400, peak design flow per capita shall be based on the following formula:

$$Q = 100 \times \frac{18 + \sqrt{P}}{4 + \sqrt{P}}$$

   Where Q = Peak flow in gallons per capita per day
   P = Design population expressed in thousands

e. The sewage system outlet must be investigated to determine if adequate capacity is available. The Village Engineer, and/or the Oakland County Water Resources Commissioner's office may be able to assist the Applicant's Engineer in identifying the service area and available capacity in the downstream system.

f. The minimum pipe size for sanitary sewers shall be eight (8") inches nominal internal diameter or as required by Village DPW.

g. Hydraulic calculations shall be based on Manning's formulas, with n = 0.013. Minimum design velocity shall be two (2') feet per second, and maximum design velocity shall be ten (10') feet per second, with pipe flowing full. The slope of the sewer between the last two manholes at the upper end of any lateral shall be increased to 1.00 percent or greater to obtain cleaning velocities.

Allowable Pipe Slopes

Pipe Diameter (Inches)	Minimum Slope (Feet per 100 Feet)	Maximum Slope (Feet per 100 Feet)
8	0.40	8.30
10	0.30	6.20
12	0.22	4.88
15	0.15	3.60
18	0.12	2.80
21	0.10	2.30

1. Maximum flow velocity for full pipe flow shall be maintained by continuity of the 0.80 diameter depth above invert for pipe size increases and also with intersecting sewer grade raised to compensate for head loss due to direction change.

2. Provide a drop of 0.10 feet in the downstream sewer invert for direction changes in excess of 30 degrees to compensate for velocity head loss of the incoming flow.

3. BUILDING LEADS

a. Sanitary sewer extensions to serve a single development shall provide building leads to the easement or property line for each single family residence, or to five (5') feet outside the building envelope for each proposed building on the site, as part of sanitary sewer design and construction.

b. Where sanitary sewer extensions cross multiple properties, construction of building leads from the public sewer to the easement and/or property line for each fronting parcel which the sewer is designed to serve shall be included with the construction of each sanitary sewer unless otherwise approved by the Village.

c. Where the construction of building leads to the property line is not required concurrently with the sanitary sewer construction, a wye branch with riser is required. Said wye and riser shall be provided with a watertight stopper or plug with type of joint used for the sewer pipe and shall be installed for every lot or building site which the sewer extension is designed to serve.

d. Where depth of sewer from top of pipe to finished surface exceeds ten (10') feet, risers shall be installed from wyes and tees to an elevation ten (10') feet below finished surface.

e. Minimum size for gravity building leads shall be six (6") inch nominal internal diameter. Maximum length of building lead without a cleanout shall be one hundred (100') feet.

f. Minimum slope for gravity building leads shall be one (1%) percent.

4. MANHOLES

a. Manholes shall be constructed at every change in sewer grade, alignment, and pipe size, and at the end of each sewer line. Maximum distance between manholes shall be 350 feet for sewers thirty-six (36”) inches and smaller in nominal diameter.

b. Where future connections to a manhole are anticipated, stubs or blind drop connections with watertight plugs shall be provided.

c. At all connections to manholes, sewers or extensions thereto, drop connections per the Village of Lake Orion Sanitary Sewer Standard Details shall be required when the difference in invert elevations exceeds eighteen inches (18").

5. SPECIAL STRUCTURES AND APPURTENANCES

Special structures and appurtenances for sewage collection require written approval of the Village. Preliminary plans for special structures and appurtenances required for sanitary sewer systems shall be submitted to the Village Engineer for review and comment prior to their inclusion in proposed construction drawings.

a. Inverted Siphons will not generally be allowed.

b. Grease, oil and sand interceptors shall be installed by the user when the Village Department of Public Works determines they are necessary for the proper handling of liquid wastes. All restaurants or establishments involved in the preparation of food shall install a grease interceptor.

c. Sewage pumping stations shall have at least two pumps or ejectors, each sized to handle maximum design flow. For three or more pumps or ejectors, sizing of units shall be such that design flows can be accommodated with the largest unit out of service. Design features shall conform to the Ten States Standards of GLUMRB. When all pumps are operating, the pumping station shall not discharge flows which exceed the capacity of any downstream sewers.

d. Pipe for force mains shall be designed to withstand both internal pressures and external trench and live loads. Design computations shall be submitted by the Developer’s engineer for review and recommendation by the Village Engineer and approval by Village DPW.

e. Force main pipe materials shall be ductile iron, HDPE pressure pipe, or PVC pressure pipe. Ductile iron pipe shall be cement lined. Force mains shall be pressure tested for water tightness to a test pressure equal to twice the total system head but no less than 150 psi held for a minimum 2-hour period, maximum 6-hour. Zero leakage allowed.

SECTION 8-3 PLAN REQUIREMENTS

All construction plans shall be submitted to the Village for sanitary sewer approval and shall contain, but not be limited to, the following information:

1. Sanitary sewer and water main shall generally be shown on the same sheet. Plan and profile views are required for all sanitary sewers and water mains. Profile views shall be located below the plan view where possible, with as close an alignment as possible.

2. Overall layout of the sewer system with manhole numbers. Manhole numbers shall be assigned consecutively and increasing in direction opposite to direction of flow in each sewer.

3. District limits of service area, population, and basis of design calculations for all sewer main construction.

4. Locations of all manholes and other sewer appurtenances and special structures.

5. Building leads or wye branches to be constructed or installed concurrently with sewer construction, with locations at easement and/or property lines. Length, size, end of lead invert elevations, and amount of riser shall be shown on the plan for each building lead.

6. Dimensions to sewers from property lines, right-of-way lines or buildings. Dimensions between parallel utility lines.

7. Size, slope, length, type and class of pipe, and controlling invert elevations for each section of proposed sewer between manholes in profile view.

8. Limits of special backfill requirements.

9. Profile over centerline of proposed sewer, of existing and finished ground, and pavement surfaces. Existing profile shall be obtained from actual field survey data.

10. In the plan and profile views, all crossings of utilities must be shown with elevations of invert and top of pipe. Minimum vertical clearance between utilities shall be one and one half (1.5) feet. Compacted granular backfill is required between utilities.

11. Profiles of sewers shall indicate the size, material type and class of pipe, class of bedding, length between structures, slope of pipe, and shall indicate the existing and proposed ground elevations above the route of sewer.

12. Location, by station, of every proposed manhole, with manhole number, invert elevation of all inlet or outlet pipes, and rim elevation in profile view. Where manhole inner diameter is greater than the standard four (4') feet, identify inner diameter.

13. Location, by station, of all building leads or wye branches to be constructed or installed concurrently with proposed sewer construction in profile view.

14. Required risers.

15. Invert elevation at property line (typical residential) or upstream end of lead 5' outside of building (commercial, multi-family).

16. Each Plan and Profile Sheet shall include a tabulated list of quantities appearing on that sheet.

17. Detail Sheets:

    a. Plans must include the current Village of Lake Orion Sanitary Sewer Standard Detail sheets.

    b. Where special structures or appurtenances are proposed, plans shall include specific and complete details describing special or unusual sewer or allied construction requirements. Scales utilized for special details shall be selected to clearly portray intended construction and component or equipment arrangement. Scales used shall be clearly identified.

SECTION 8-4 CONSTRUCTION REQUIREMENTS

1. All materials shall conform to the current Village of Lake Orion Standard Details.

2. No sanitary sewer construction shall commence without a valid EGLE Part 41 permit.

3. No building permits will be issued above the foundation for any development prior to the active service of the sanitary sewer. No occupancy shall be allowed in any instance without the required sewage collection system being in active service.

SECTION 8-5 EASEMENT REQUIREMENTS

1. Easements for publicly dedicated sanitary sewers not within the public road right-of-way shall be provided. Utilities shall typically be centered within easements. Applicant shall be responsible for preparation of easement and legal conveyance documents meeting Village requirements to be reviewed by the Village Engineer and Village Attorney. Example attached at Appendix A.

2. Easements for possible extensions shall be provided to the property lines at locations designated by the Village. Within unplatted projects, sewers shall be installed parallel to the property lines, or building lines, with clearance distances to accommodate the full width of the proposed easement.

3. All sanitary sewer easements shall be a minimum of twenty (20') feet wide and shall be dedicated to the Village of Lake Orion. Where the sanitary sewer is more than ten (10') feet below the finished grade, the easement width shall be increased as required by the Village DPW, or not less than one additional foot of width per each additional foot of depth.

4. The easement descriptions shall extend a minimum of ten (10') feet beyond the upstream manhole. The easement documents shall contain a provision prohibiting the construction or locating of any underground utilities, aboveground structures or landscape trees within the limits of such easements.

5. New sanitary sewer extensions shall not be accepted by the Village until any required easements have been secured and legal conveyance documents finalized in accordance with Village Administration requirements.

FRANCHISED UTILITIES
(Electric, Telephone, Gas, TV)

SECTION 9-1 GENERAL

The intent of this Standard is to supplement the requirements of private utility construction within developments required to submit final site plans to the Village.

The Developer is advised to submit development plans to the utility companies for their review and approval prior to the start of construction.

SECTION 9-2 DESIGN REQUIREMENTS

1. All procedures, design, and construction of utilities shall be in conformance with the requirements of the supplying utility company.

2. Franchise utility providers shall make every effort to install all proposed utilities underground for their full length. Specific approval by the Village Administration or its authorized representative shall be required for the placement of above ground utilities and shall be based on a showing of substantial hardship or practical difficulty with underground installation. Existing overhead utilities on site shall be relocated underground.

3. Surface equipment shall be located so as not to interfere with traffic flow, parking, building access, or access to fire hydrants.

4. Surface transformers, pedestals and similar equipment shall be screened from view in compliance with Zoning Ordinance requirements, and the screening shall be shown on the Developer's landscape plans.

5. Electrical, telephone, gas and cable lines, and similar utilities may not share a common trench with sanitary sewer, water mains, or storm sewer and shall maintain a minimum of ten (10') feet of horizontal and eighteen (18") inches of vertical separation from them.

SECTION 9-3 PLAN REQUIREMENTS

Plans of all proposed utilities, whether or not in public rights-of-way, shall be submitted by the utility company to the Village for review and approval prior to starting construction. Plans shall contain, but not be limited to, the following information:

1. All existing and proposed franchise utility information, including lines, poles, and surface equipment shall be shown superimposed on the existing or proposed development with property lines, proposed and existing underground utilities, road rights-of-way, and Village utility easements.

SECTION 9-4 CONSTRUCTION REQUIREMENTS

1. If the utility company installs their utility after final grading has been completed, the utility company shall be responsible for restoring the area disturbed by their work to its original condition.

2. If the utility company fails to restore the disturbed area, it shall be the responsibility of the Developer to complete the restoration.

SECTION 9-5 EASEMENT REQUIREMENTS

1. Easements for franchise utilities not within the public road right-of-way shall be provided. Utilities shall typically be centered within easements.

2. Easement widths shall generally be ten (10') feet, or as necessary to accommodate all franchise utilities to be co-located within the easement. Franchise utility easements shall generally not be allowed to overlap Village easements for sanitary sewer or water main.

ABBREVIATIONS AND DEFINITIONS

SECTION 10-1 ABBREVIATIONS

AASHTO — American Association of State Highway and Transportation Officials

ADA — Americans with Disabilities Act of 1990, As Amended

ANSI — American National Standards Institute

ASTM — American Society of Testing and Materials

AWWA — American Water Works Association

BMP – Best Management Practices

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

FEMA – Federal Emergency Management Agency

GLUMRB — Great Lakes-Upper Mississippi River Board

IFC – International Fire Code

MDOT — Michigan Department of Transportation.

MIOSHA or OSHA — Michigan Occupational Safety and Health Administration

MS4 – Municipal Separate Storm Sewer System

NPDES — National Pollutant Discharge Elimination System

OCWRC — Oakland County Water Resources Commissioner

RCOC — Road Commission for Oakland County

SECTION 10-2 DEFINITIONS

Administrative policy is the administrative guidelines to the Ordinance.

Aggregate (1) is a rock, stone, or other granular material, (2) means inert material that is mixed with Portland cement and water to produce concrete.

Applicant shall be the party or the parties who are submitting development or improvement plans for review and approval by the Village.

Aquatic vegetation shall mean plants and plant life forms which naturally occur in, at, near, or predominantly near water.

As-builts or Record Plans shall be revised plans showing the as-constructed conditions of the

site, including utilities, grading, detention, and the like.

Association for a condominium development shall have the same meaning as “Association of Co-Owners” found in Act 59, Michigan Public Acts of 1978, as amended. For a subdivision or other development it shall mean an association of homeowners or property owners, sometimes referred to as a Homeowners Association or HOA, organized pursuant to deed restrictions and/or restrictive covenants in a particular development.

Base course: The bottom portion of a pavement where the top and bottom portions are not of the same composition.

Base flood (100-year flood) shall mean the flood having a one (1%) percent chance of being equaled or exceeded in any given year, or of a magnitude that may be equaled or exceeded once in any 100-year period.

Base shall mean a layer of selected, processed or treated aggregate material of planned thickness and quality placed immediately below the pavement and above the subbase or subgrade soil.

Berm means a landscaped earthen undulation which gently blends into surrounding terrain.

Best Management Practices (BMP) means structural, vegetative, or managerial measures, activities, which help to achieve soil erosion and sedimentation control objectives or enhance stormwater quality and/or quantity.

Bottom land shall mean the land area of a lake, stream, or watercourse which lies below the ordinary high-water mark, and which may or may not be covered by water.

Buffer strips (1) are landscaped areas composed of living plant material, a wall or berm, or a combination thereof for the purpose of visual screening and/or noise reduction between conflicting land uses and/or between a thoroughfare and an existing land use. (2) are vegetative areas left in a native state or planted adjacent to water courses or stormwater facilities which provide a transition between developed areas and these environmentally sensitive areas typically provided to provide soil erosion and sedimentation control (SESC) protection and enhance water quality.

Building drain is that part of the lowest piping of the wastewater drainage system of a building which receives the sanitary sewage from waste pipes, and other drainage pipes inside the perimeter walls of the building and conveys it to the building sewer or sanitary service leads, which begins approximately five (5’) feet outside the building wall.

Building sewer (or *sanitary sewer lead* or *building lead*) is that part of the exterior sewer piping of a drainage system which continues from a building drain (approximately 5 feet outside the building wall) and carries the flow emanating from the building drain to the sanitary sewer.

Channel shall mean the geographical area within the natural or artificial banks of a watercourse required to convey continuously or intermittently flowing water under normal or average flow conditions.

Check dam means an earthen, stone, or manufactured structure placed perpendicular in a swale or channel or ditch which reduces water velocities. The design must follow very specific criteria.

Cleanout is a pipe through which cleaning equipment can be pushed to unplug a sewer.

Clear cut shall mean the removal of all existing trees and/or vegetation on a site.

Clearing means any activity which removes the vegetative surface cover including tree removal, stripping, grubbing, and storage or removal of topsoil.

Commercial Developments are businesses or other such developments that are not intended for residential use.

Compaction is the densification of soil by mechanical means involving the expulsion of excess air.

Concrete is a mixture of Portland cement, fine aggregate, coarse aggregate, and water, with or without admixtures.

Condominium or Condominium Project shall mean a development consisting of not less than two condominium units established in conformance with the Condominium Act, Michigan Public Act 59 of 1978, as amended.

Contractor means any person(s) under written contract with the owner, developer, or applicant to perform the described work.

Conveyance system or conveyance facility is a storm drain, pipe, swale, or channel.

County agency is an officer, board, commission, department, or other entity of county government.

County drain refers to drains established and/or constructed pursuant to the Michigan Drain Code, Act 40 of the Public Acts of 1956, as amended.

County refers to County of Oakland, State of Michigan.

Deposit in terms of construction activity shall mean to fill, place, or dump.

Designated Agent, Agent, or Designee is a person who has written authorization from the owner, developer, or applicant to sign the application and secure a permit in the owner's name.

Detention Ponds shall mean a facility designed for holding or detaining stormwater runoff for a relatively short period of time and then releasing it at a controlled rate to a downstream storm sewer system or the natural water course where it returns to the hydrologic cycle. The objective of a detention facility is to regulate the runoff from a given rainfall event and to reduce the impact on downstream drainage systems, natural or man-made.

Developer means a person or other legal entity who creates or develops any parcel of land for any use other than agricultural.

Developer/Owner's Engineer or Design Engineer shall mean the licensed engineer who has prepared the construction plans for review and approval.

Development documents shall mean: (a) for a condominium project, the master deed, Exhibit B Drawings, and bylaws provided by Act 59, Public Acts of 1978, as amended; and (b) with regard to subdivisions or other developments, deed restrictions and/or restrictive covenants.

Development (1) shall include a subdivision as defined by Act 288, Public Acts of 1967, as amended, a condominium pursuant to the provisions of Act 59, Public Acts of 1978, as amended, or any group of dwellings or structures which are proposed. (2) Shall mean any man-made change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation, or drilling operations.

Disturbed area means an area of land subject to erosion due to the removal of vegetative cover and/or earth moving activities, including filling.

Diversion means a ridge graded to divert water to a specific location. It is normally used to reduce the length of slope water runs over, thus reducing the erosive speed of the runoff.

Drain Commissioner's Office is the Oakland County Water Resources Commissioners Office.

Drain is either a County Drain or a private storm drain.

Drainage course shall mean the location of existing surface water such as a lake, pond, river, stream, creek, wetland, or similar feature.

Drainage way means surface or subsurface drains that remove excess surface water or ground water from land.

Driveway approach or apron shall be that portion of a driveway located between the road right-of-way line and the traveled portion of roadway or between the driveway radii returns and the traveled portion of the roadway, whichever is greater in size.

Driveway shall mean any area or portion of a premises, lot, parcel, or yard used or proposed to be used to provide a means of ingress, egress, access and circulation of vehicles and traffic

to, from, and between any public or private street or road, principal or accessory building, use or structure, loading spaces, or parking spaces.

Dwelling shall mean a structure primarily designated or used for residential purposes.

Earth Change is a human-made change in the natural cover or topography of land, including cut and fill activities, which may result in or contribute to soil erosion or sedimentation of the waters of the state.

Easement is the legal document executed to provide the right to use or control the property of another for designated purposes.

Encroachment shall mean (1) any impact to a wetland or other natural feature, or (2) any unauthorized use, trespass, or alteration of areas designated on the plans for preservation, protection or not intended for such activities.

Erosion control permit means a permit issued by the Oakland County Water Resources Commissioners Office.

Excavation shall mean any breaking of ground.

Existing Grade means the vertical location of the existing ground surface or structure prior to excavating or filling.

Expansion shall mean any activity whereby additional structures or users shall be added to an existing system.

Filling means the depositing or dumping of any matter onto or into the ground.

Final Site Plan shall be a plan showing all features of a proposed development, as required under the provisions of the Village Zoning Ordinance, including all engineering required on the development construction plans such as paving, grading, utilities, detention, and the like.

Finished grade means the final grade or elevation of the ground surface conforming to the proposed design.

Flood hazard area means land which, on the basis of available floodplain information, is subject to a one percent or greater chance of flooding in any given year.

Flood or flooding means a general and temporary condition of partial or complete inundation of normally dry land areas from: (1) the overflow of inland or tidal waters; (2) the unusual and rapid accumulation or runoff of surface waters from any source; (3) the collapse or subsidence of land along the shores of a lake or other body of water as a result of undermining cause by waves or currents of water exceeding anticipated cyclical levels, or suddenly caused by an unusually high water level in a natural body of water, accompanied by severe storm, or by an

unanticipated force of nature, such as a flash flood or an abnormal tidal surge, or by some similarly unusual and unforeseen event which results in flooding.

Floodplain (flood hazard area) shall mean land which, on the basis of available information, would be subject to inundation during a base flood event.

Floodway shall mean the channel of a river or other watercourse and the adjacent land areas which must be reserved in order to discharge the base flood.

Franchised Utilities shall mean utilities, such as electric, cable, gas, and telephone, which are not maintained by the Village or the County.

Freeboard is (1) the vertical distance between the high-water surface elevation and the crest of a dam, top of a channel side or the lowest elevation of a detention/retention pond embankment. (2) The distance the water surface can rise before it overflows.

GLUMRB is the Recommended Standards for Water Works (2022) or Recommended Standards for Wastewater Facilities (2014) (often referred to as Ten States Standards, as amended and updated from time to time), prepared by the “Standards Committee” of the Great Lakes-Upper Mississippi River Board of State Sanitary Engineers.

Grading Plan is a sealed drawing or plan and accompanying text prepared by a registered engineer or landscape architect which shows alterations of topography, alterations of watercourses, flow directions of stormwater runoff, and proposed stormwater management and measures, having as its purpose to ensure that the objectives of these Standards are met.

Headwall is the entrance to a culvert or sluiceway.

Impervious Surface is the surface that does not allow stormwater runoff to slowly percolate into the ground.

Infiltration is the movement of water downward from the ground surface through the upper soil.

Lake refers to the Great Lakes, and all natural and artificial inland lakes or impoundments that have definite banks, a bed, visible evidence of a continued occurrence of water, and a surface area of water that is equal to, or greater than, one acre, including any navigable tributaries. Lake does not include sediment basins and basins constructed for the sole purpose of stormwater management, retention, cooling water, or treating polluted water.

Loading space shall mean a facility or space which permits the standing, loading or unloading of trucks, and other vehicles other than on or directly from a public right-of-way.

Looped Connection shall mean a system that has more than one (1) connection to an existing system of streets, sewers, water mains, etc.

Material shall mean soil, sand, gravel, clay, peat, debris and refuse, or any other substance, organic or inorganic.

New construction shall mean structures for which the start of construction commenced on or after the effective date of this section.

Non-point source pollution means pollution that is washed off the surface of land and impervious surfaces.

Open Drainage Facilities are means of stormwater conveyance, such as ditches and swales that are above ground.

Operation shall mean the making of additions or deposits, performing any construction or excavation activity, removing, improving and/or developing land in any manner, or any combination thereof.

Ordinary high-water mark shall mean the line between upland and bottom land which persists through successive changes in water levels, below which the presence and action of the water is so common or recurrent that the character of the land is markedly distinct from the upland and is apparent in the soil itself, the configuration of the surface of the soil and the vegetation. On an inland lake which has a level established by law, it means the high established level. Where water returns to its natural level as a result of a permanent removal or abandonment of a dam, it means the natural ordinary high-water mark.

Owner shall mean any person who has dominion over, control of, title to and/or any other proprietary interest in real estate or real property, or who is engaged in construction in a public right-of-way in accordance with Sections 13, 14, 15, and 16 of Act No. 368 of the Public Acts of 1925, as amended.

Parking space shall be a permanently surfaced area of land adequate to carry out the off-street parking regulations of the Village of Lake Orion Zoning Ordinance and an area for each motor vehicle complying with the Zoning Ordinance, exclusive of drives, aisles, and entrances giving access thereto, and fully accessible for the storage and parking of permitted vehicles.

Parking lot shall be a facility other than for single or two-family dwellings providing vehicular parking spaces along with adequate drives and aisles for maneuvering, so as to provide access for entrance and exit for the parking of more than three vehicles.

Peak Rate of Discharge is the maximum rate of stormwater flow at a particular location following a storm event, as measured at a given point and time in cubic feet per second (CFS).

Pedestrian Facilities shall be sidewalks, safety paths, and nature trails designed and constructed for non-motorized uses.

Plot Plan shall mean a plan for an individual single-family home site prepared at a standard

engineering scale on either 8 ½" x 11", 8 ½" x 14", or 24" x 36" size document showing all information required for a building permit, existing and proposed site elevations, and dimensional ties between proposed and existing structures and the property line(s).

Potable water is water that is suitable for human consumption.

Private Roads are those which are to be maintained and operated by the Owner, Association, or adjacent property owners.

Public Roads shall be those which have been or are to be dedicated to the Village of Lake Orion, or other governmental agency.

Registered professional or licensed professional shall be a registered professional engineer (P.E.), surveyor (P.S.), architect (R.A), or landscape architect (R.L.A.) who is registered in the State of Michigan and whose license is in good standing.

Retention Ponds shall mean a facility without the ability for gravity drainage whereby water is held for a considerable length of time for aesthetic, agricultural, consumptive, holding of storm runoff, or other uses. The water may never be discharged to a natural water course, but it is intended to be dissipated by plants, evaporation, or infiltration into the ground.

Right of Way (R.O.W.) is the strip of land occupied or intended to be occupied by a street, railroad, electric transmission line, oil or gas pipeline, water main, sanitary or storm sewer, or other special use.

Runoff shall mean the surface discharge of precipitation to a watercourse or low area.

Sanitary sewage or wastewater shall mean wastewater discharged from homes, commercial establishments, and other structures, designated as sanitary flow because it is composed of used or spent water resulting from human use in so-called sanitary conveniences.

Sanitary sewer shall mean a pipe or conduit, with appurtenances, that carries liquid and/or water- carried wastes from residences, commercial buildings, industrial plants, and institutions, together with minor quantities of storm, surface, and groundwaters that are not admitted intentionally.

Sanitary sewer system shall mean a facility for the transportation, collection, processing, or treatment of sanitary sewage.

Sediment basin is a naturally occurring or constructed depression used for the sole purpose of capturing sediment during or after an earth change activity.

Sediment is the solid particulate matter, mineral or organic, that has been deposited in water, is in suspension in water, is being transported, or has been removed from its site of origin by the process of soil erosion.

Site improvements shall mean any grading, street surfacing, curb and gutter, sidewalks, crosswalks, water mains and lines, sanitary sewers, culverts, bridges, utilities, and other additions to the natural state of the land which increases its value, utility, or habitability.

Soil erosion is the wearing away of land by the action of wind, water, gravity, or any combination thereof.

Soil erosion and sedimentation control measures means control measures which are installed or constructed to control soil erosion or sedimentation until permanent stabilization is established.

Soil Boring is a geotechnical investigation and analysis of soil conditions taken from digging, auguring, or other means of extracting soil from its place of origin.

Stabilization is the establishment of vegetation or the proper placement, grading, or covering of soil to ensure its resistance to soil erosion, sliding, or other earth movement.

Steep slope as it relates to the provisions of Section 1 and Section 2 means a slope over 15% grade, which is characterized by increased runoff, erosion, and sediment hazards.

Storm drain is a conduit, pipe, natural channel, or human-made structure which serves to transport stormwater runoff.

Stormwater Management Plan means drawings and written information prepared by a registered engineer, registered landscape architect, or registered surveyor which describe the way in which accelerated soil erosion and/or stormwater flows are proposed to be controlled, both during and after construction, having as its purpose to ensure that the objectives of these Standards are met.

Stream is a river, creek, or other surface watercourse which may or may not be serving as a drain as defined in Act No. 40 of the Public Acts of 1956, as amended, and which has defined banks, a bed, and visible evidence of the continued flow or continued occurrence of water.

Structure shall mean any walled and roofed building, a gas or liquid storage tank, or any facility that is principally above ground. In the context of underground utilities, it shall mean any manhole, catch basin, vault, hydrant, well, or the like.

Subbase is the layer of aggregate placed on the existing soil as a foundation for the base.

Subdivision shall mean the partitioning or dividing of a parcel or tract of land by the proprietor thereof or by his heirs, executors, administrators, legal representatives, successors or assigns for the purpose of sale or lease for more than one year, or building development, where the act of division creates five (5) or more parcels of land, each of which is ten (10) acres or less in area; or five or more parcels of land, each of which are ten (10) acres or less, are created

by successive divisions within a period of ten (10) years.

Subdivision Association shall mean an association of owners organized pursuant to deed restrictions and/or restrictive covenants in a particular development.

Subgrade is the portion of a roadbed surface that has been prepared as specified, upon which a subbase, base, base course, or pavement is to be constructed.

Surface Drainage refers to all water flow across the surface of land.

Surface water is any water including ponds, lakes, streams, rivers, drains, and wetlands.

Swale: (a) a low-lying portion of land, below the general elevation of the surroundings; (b) a natural ditch or long, shallow depression through which accumulated water from adjacent watersheds drains to lower areas.

Time of concentration is the time required for water to flow from the most distant point on a runoff area to the measurement or collection point.

Village Attorney is the professional legal firm employed by the Village.

Village Council is the Village Council of Lake Orion.

Village Engineer is the professional engineering firm employed by the Village.

Village Planner is the professional planning firm employed by the Village.

Village shall mean the Village of Lake Orion, Oakland County, Michigan, acting through its duly elected Village Council.

Upland shall mean the land area adjoining a lake, stream, or watercourse, above the ordinary high- water mark, uses for which are essentially non-aquatic.

Utility shall mean water main, sanitary sewer, storm sewer, natural gas, electricity, telecommunications, cable or other services of a similar nature, whether provided by public agencies or private companies.

Vegetative cover means grasses, shrubs, trees, and other vegetation which hold and stabilize soils.

Watercourse or waterway shall mean any waterway or other of water having well defined banks, including rivers, streams, creeks, and brooks, whether continually or intermittently flowing, and lakes and ponds, or as otherwise shown on an official watercourse and/or wetland map.

Water main shall mean a facility for the transportation and distribution of potable water.

Watershed is an area in which there is a common outlet into which stormwater utility flows, otherwise known as a drainage area.

Wetlands shall mean land characterized by the presence of water or a frequency and duration sufficient to support and that under normal circumstances does support wetland vegetation or aquatic life and is commonly referred to as a bog, swamp, or marsh. A wetland may be regulated by EGLE in compliance with Part 303 of Public Act 451 of 1994, as amended.

Zoning Ordinance shall mean the Village of Lake Orion Zoning Ordinance.

APPENDICES

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EASEMENT FOR MUNICIPAL UTILITIES
VILLAGE OF LAKE ORION

PROJECT #

NAME OF PROJECT:

SECTION:

_____, a Michigan _____(“Grantor”), whose address is _____, grants conveys, and releases to the Village of Lake Orion, a Michigan municipal corporation (“Grantee”), whose address is 21 East Church Street, Lake Orion, MI, 48362 for the sum of One Dollar ($1.00) ("Consideration"), the receipt and sufficiency of which are hereby acknowledged, a perpetual easement ("Easement") for the construction, use, operation, installation, inspection, repair, maintenance, reconstruction, replacement and public use of Grantee-Owned Public Utilities (as defined below), over, under and across the following described parcel of land ("Real Property"):

SEE REAL PROPERTY LEGALLY DESCRIBED IN ATTACHED EXHIBIT "A"

Commonly known as: _____

Parcel Number: _____

The Easement shall be a perpetual easement on those portions of the Real Property described as follows ("Easement Areas"):

SEE ATTACHED EXHIBIT "B" DRAWINGS

The perpetual easement granted herein shall be used for the purpose of the operation, maintenance, repair or replacement of the public water/sewer system constructed in accordance with the plans and specifications approved by the Grantee.

Grantor hereby grants and conveys to Grantee all of Grantor's right, title and interest, if any, in all municipal utilities (such as, but not limited to, water mains, sanitary sewers and public storm sewers), and all equipment, piping, appurtenances and related facilities incidental to such utilities, which may now or subsequently be located in the Easement Areas and which have been inspected and accepted by Grantee (collectively referred to in this Easement as "Grantee-Owned Public Utilities").

Grantee, its agents, employees and contractors shall have the right of ingress and egress to and from the Easement Areas across the Real Property for the purpose of constructing, operating, installing, inspecting, repairing, maintaining, reconstructing and/or replacing the Grantee-Owned Public Utilities which are at any time located in the Easement Areas. Grantor, its successors and assigns shall reimburse Grantee for any and all expenses incurred by Grantee to repair any damages to the Grantee-Owned Public Utilities caused by the Grantor, its agents, employees, contractors, licensees, invitees, successors or assigns.

Grantor, its successors and assigns shall be responsible for all maintenance of the Easement Areas, excluding the repair, maintenance, reconstruction, and replacement of the Grantee-Owned Public Utilities or damage to the Easement Areas caused by the Grantee its agents, employees or contractors pertaining to the construction, operation, installation, inspection, repair, maintenance, reconstruction, or replacement of Grantee-Owned Public Utilities.

Grantor, its successors and assigns shall not grant any other easements in the Easement Areas to any individual, person or entity without the prior written consent of Grantee.

Grantor, its successors and assigns hereby agree to indemnify and hold Grantee harmless from any and all claims, debts, causes of action or judgments for any damage to property and/or injury to any person which may arise on the Real Property, unless such damage or injury was caused by (i) the activities of Grantee, its agents, employees or contractors pertaining to the construction, operation, installation, inspection, repair, maintenance, reconstruction, or replacement of Grantee-Owned Public Utilities within the Easement Areas, or (ii) a defect or condition relating to the Grantee-Owned Public Utilities which did not arise from the intentional acts of Grantor, its agents, employees, contractors, licensees, invitees, guests, successors or assigns.

No landscaping (other than sod or grass), trees or shrubs, buildings or other structures shall be placed or maintained in the Easement Areas or within such proximity to them so as to interfere with the construction, operation, installation, inspection, repair, maintenance, reconstruction and/or replacement of the Grantee Owned Public Utilities located within the Easement Areas. Temporary non-use or limited use of the Easement by Grantee shall not prevent Grantee from making use of the Easement to the fullest

extent authorized by law.

The area of the Real Property disturbed by construction or maintenance activities of Grantee, its agents, employees or contractors under this Easement shall be restored by Grantee, its agents, employees or contractors to substantially the same condition as existed immediately prior to the construction or maintenance activities of Grantee, its agents, employees or contractors.

Grantee may assign its rights under this Easement to any federal, state or county agency or to any other municipality.

This Easement is irrevocable and shall run with the Real Property and shall be binding upon the heirs, personal representatives, successors, and assigns of Grantor.

This instrument contains the entire agreement between the Parties relating to the rights herein granted and the obligations herein assumed. Any oral representations or modifications concerning this instrument shall be of no force and effect. Any modification of this Easement must be in writing and must be signed by the Parties to be changed.

This Easement is made and entered into in the State of Michigan and shall in all respects be interpreted, enforced and governed under the laws of the State of Michigan. The language of all parts of this Easement is intended to and, in all cases, shall be construed as a whole according to its fair meaning, and not construed strictly for or against any party.

It is further understood and agreed between the Parties that the terms and conditions herein are contractual and are not a mere recital and that there are no other agreements, understandings, contracts or representations between Grantor and Grantee in any way related to the subject matter hereof, except as expressly stated herein.

If any provision of this Easement or its application to any person or circumstance shall to any extent be invalid or unenforceable, the remainder of this Easement shall not be affected and shall remain valid and enforceable to the fullest extent permitted by law.

The individuals executing this Agreement warrant that they are duly authorized and fully empowered to execute this Agreement on behalf of their respective Parties.

This Easement shall be recorded in the Oakland County Register of Deeds by the Grantee or Grantee's agent.

This Easement is exempt from transfer taxes under MCL §207.505(a) and MCL §207.526(a).

This Easement is executed this _____day of _____, 20__.

GRANTOR:

By:_____

Its:_____

STATE OF MICHIGAN)
) ss:
COUNTY OF OAKLAND)

On this _____day of _____, 20__, before me personally appeared _____, who acknowledged that with authority on behalf of _____ to do so he/she signed this Agreement.

_____
Notary Public
_____County, Michigan
Acting in _____ County, Michigan
My commission expires: _____

Drafted by:

Beier Howlett, P.C.
By: Mary M. Kucharek
3001 W. Big Beaver Rd., Ste. #600
Troy, MI 48084

After recording, return to:

Village of Lake Orion
Village Clerk
21 East Church Street
Lake Orion, MI 48362

MAINTENANCE AND GUARANTEE BOND

(for Private Site Development)

KNOW ALL MEN BY THESE PRESENTS, That we, the developer _____ _____ hereinafter called Principal, and _____, hereinafter called Surety, a corporation organized under the laws of the State of Michigan and authorized as a surety business in the State of Michigan, are held and firmly bound unto the municipal / public agency known as the Village of Lake Orion, Michigan as Obligee, in the fair and just sum of: _____ ($) good and lawful money of the United States of America, for which payment well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, and each and every one of them jointly and severally, firmly by these presents.

WHEREAS, the above named principal has constructed or caused to have constructed the following described public improvements in a public easement and/or right of way in the Village of Lake Orion:

(Check all applicable items)

___Water Main System
___Sanitary Sewer System
___Storm Sewer System
___Roadway
___Sidewalk or Pathway
___Other: _____

Which have been or are about to be accepted by the Obligee for the project known as _____ , located in the _____ ¼ of Section____.

AND WHEREAS, it is required that the Principal should guarantee the project from defects caused by faulty materials or workmanship for a period of ____ year(s) from and after the date of acceptance of same by the Obligee.

The Obligee shall notify the Principal in writing of any defect for which the Principal is responsible and shall specify in said notice a reasonable period of time within which the Principal shall have to correct said defect. If the Principal fails to correct such defect within the time specified in said notice, then the Surety shall have sixty (60) days thereafter within which to take such action as it deems necessary to insure performance of the Principal's obligation. If such defect is not corrected after the expiration of such sixty-day period, then the Obligee shall have the right to correct such defect and the Principal and Surety, jointly and severally, shall pay all costs and expenses incurred by Obligee in correcting such defect; including but not limited to, the engineering, legal, administrative and other costs, together with any damages either direct or consequential, which the Obligee may sustain on account of the Principal's failure to correct such defect. In addition, the Obligee shall have the right to contract for the correction of such defect and, upon acceptance of the lowest responsible bid, the Principal and Surety shall become immediately liable for the amount of the said bid.

If any repair is necessary to be made at once to protect life and property, then and in that case, the Obligee make take immediate steps to repair or barricade such defects without notice to the Principal or Surety. In such accounting, the Obligee shall not be held to obtain he lowest figures for the doing of the work, or any part thereof, but all sums actually paid therefore shall be charged to the Principal or Surety.

In this instance, the judgement of the Obligee is final and conclusive.

The Principal shall fully indemnify, defend and save harmless the Obligee, and its agents, consultants, employees and officers from all suits and actions for damages of every name and description brough or claimed against them for, or on account of, any injury of damage to person or property received or sustained by any party or parties, by or from any of the acts or omissions or through the negligence of said Principal, and its servants, agents or employees, in the prosecution of the work, and from any and all claims arising under the Workman's Compensation Act, so-called, in the State of Michigan.

NOW, THEREFORE, if the above named Principal shall for a period of two (2) years from and after the acceptance of the completed project by the Obligee replace any and all defects arising in said work whether resulting from defective materials or defective workmanship, then the above obligation shall be null and void; otherwise to remain in full force and effect for two (2) years from the date of acceptance by the Obligee.

IN WITNESS WHEREOF, the parties hereto have caused this instrument to be executed by their respective authorized officers this _____ day of _____, 20_____.

WITNESS:

_____

_____
Name

PRINCIPAL

_____
By

_____
Name

Title: _____

Address: _____

_____

Phone: _____

SURETY

_____
By

_____
Name

Title: _____

Address: _____

_____

Phone: _____

Return to TOC

BOND FOR FAITHFUL PERFORMANCE

KNOW ALL MEN BY THESE PRESENTS, That_____

_____ as principal, and

_____

_____, as surety, are held and firmly bound unto the Village of Lake Orion, Michigan, a Municipal Corporation, in the sum of:

_____

_____

good and lawful money of the United States of America, to be paid to said Village of Lake Orion, its legal representatives and assigns, for which payment well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns, and each and every one of them, jointly and severally, firmly by these presents.

Sealed with our Seals and dated this _____ day of _____ A.D. 20 .

WHEREAS, the above named principal has entered into a certain written contract with the Village of Lake Orion, dated this _____ day of _____ A.D. 20 , wherein the said principal covenanted and agreed as follows, to-wit:

TO COMMENCE AND COMPLETE the:

___

_____

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS such that if the above named principal or their legal representatives or successors, shall in all things well and truly keep and perform the covenants, conditions, and agreements in the manner and form and at the time agreed upon to be kept and performed as provided by said contract, and plans, drawings, and specifications, referred to in said contract, and as may be required by the changes, alterations, and modifications thereof, as provided in said contract, then the above obligation shall be void; otherwise to remain in full force and effect.

This bond is given upon the express condition that any changes, alterations, or modifications that may be hereafter ordered or made in the construction and complete installation of the work herein referred to, or the placing of an inspector or superintendent thereon by the Village of Lake Orion shall not operate to discharge or release the surety or sureties thereon.

IN WITNESS WHEREOF, the parties hereto have caused this instrument to be executed by their respective authorized officers this _____ day of _____ A.D. 20 ____.

Signed, Sealed and Delivered in the Presence of:

_____ _____(L.S.)

_____ _____(L.S.)

_____ _____(L.S.)

MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY
DRINKING WATER AND ENVIRONMENTAL HEALTH DIVISION

PERMIT APPLICATION
FOR COMMUNITY WATER SUPPLY SYSTEMS

(CONSTRUCTION – ALTERATION – ADDITION OR IMPROVEMENT)
AS DESCRIBED HEREIN
Required under the Authority of 1976 PA 399, as amended (Act 399).

This application form is not an Act 399 Permit. A permit will be generated and issued by authorized Michigan Department of Environment, Great Lakes, and Energy staff. See EGLE - Instructions and Explanation for Permit Application for Water Supply Systems (Michigan.gov) (EQP5877a) for additional information to complete and submit this application.

Water Supply Details

This application is for the following Type I Public Water Supply System.

Public Water Supply ID (PWSID): 3740
Public Water Supply (PWS) Name: Village of Lake Orion

Water Supply Representative

Please provide the following details about the Water Supply Representative to serve as the primary contact for the PWS.

Contact Name: Wesley Sanchez
Title: DPW Director
Email Address: wsanchez@lakeorion.org Phone Number: 248-693-8391

Design Engineer Details (Primary Project Designer)

Please provide the following details about the person that is primarily responsible for design of the project.

Is the Design Engineer preparing this application? ■ Yes ☐ No
Design Engineer Name: _____
Design Engineer License Number: _____
Engineering Firm Name: _____
Email Address: _____ Phone Number: _____

Project Construction Inspection

Indicate who will provide project construction inspection.

☐ Water Supply
☐ Design Engineer
■ Other – Name/Email/Phone/Address: Nowak & Fraus Engineers
46777 Woodward Ave., Pontiac, MI 48342
248-332-7931

Project Details

Provide details about the project.

Project Name: _____
(*Provide phase number if project is segmented.*)
Purpose: ☐ Alteration ☐ New Development ☐ Replacement
Location (city, village, township): Lake Orion
County (location of project): Oakland

Facilities Summary: Provide a brief narrative of the proposed project, limited to 1,000 characters. Details of each individual facility will be required in the Facility Details section below. Applications without adequate facilities descriptions will be denied.

Proposed Facilities

Check all Facility Types that apply:

☐ Main(s) ☐ Well(s) ☐ Storage Tank(s) ☐ Pump(s) ☐ Treatment Process ☐ Other

Facility Details

For each Facility Type selected, provide at least the relevant information described in the corresponding table. Expected responses are provided as a footnote to each table. Use additional sheets if needed. Applications without adequate Facilities Details will be denied.

Main Facility

Length (ft.)	Size (in.)	Material	Construction Type	Segment Description

***Material*:** Concrete, Cured-in-Place Pipe (CIPP), Ductile Iron (DI), High Density Polyethylene (HDPE), Molecularly-Oriented PVC (PVCO), Other, Polyvinyl Chloride (PVC), Steel.

***Construction Type*:** Water Main Expansion, Replacement or Rehabilitation, Minor Repair(s), New Appurtenance(s).

***Segment Description*:** Identify this stretch of water main. Roads and intersections are commonly used. EXAMPLE – Installed along Lake Street from 1st Avenue to 5th Avenue.

Well Facility

Diameter (in.)	Depth (ft.)	Capacity (GPM)	Well Pump Type	Construction Type	Comments – Include Well ID

***Well Pump Type*:** Submersible, Vertical Turbine.

***Construction Type*:** Replacement or Rehabilitation, Minor Repair(s), New Appurtenance(s), New Well(s).

***Comments – Include Well ID*:** Briefly describe the work being done and the associated well. Include a Well ID, if applicable. Well ID to be sequential with existing and abandoned wells.
EXAMPLE – Pump upgrade and water level device install to East Well (WL004).

Tank Facility

Volume (gal.)	Tank Type	Construction Type	Comments – Include Storage ID and Number of Tanks

***Tank Type*:** Below Ground Storage, Elevated, Ground, Hydropneumatic, Other.

***Construction Type*:** Replacement or Rehabilitation, Minor Repair(s), New Appurtenance(s), New Tank(s).

***Comments*:** Briefly describe the work being done and the associated tank(s). Include a Storage ID and number of tanks, if applicable.
EXAMPLE – Install mixing system and vent replacement to Hill Road Tower (ST301).

Pump Facility

TDH (ft.)	Capacity at Stated TDH (GPM)	Pump Type	Number of Pumps	Construction Type	Comments – Include Pump Facility ID

***Pump Type*:** Horizontal Centrifugal, Other, Submersible, Vertical Turbine.

***Construction Type*:** Replacement or Rehabilitation, Minor Repair(s), New Appurtenance(s), New Pump(s).

***Comments – Include Pump ID*:** Briefly describe the work being done and the associated pump(s). Include a Pump Facility ID, if applicable.
EXAMPLE – Additional pump installed at Booster Station 3 (PF003).

Treatment

Construction Type	Related Treatment	Comments – Include Treatment Plant/Facility ID

***Construction Type*:** Replacement or Rehabilitation, Minor Repair(s), New Appurtenance(s), New Treatment Process or Component.

***Related Treatment*:** Corrosion Control, Disinfection, Filtration, Fluoridation, Other, Prefilter.

***Comments*:** Briefly describe the work being done at the associated treatment site. Include a Treatment Facility ID, if applicable.
EXAMPLE – Media replacement at Hill Road facility (TP103); new IRP at South Street well facility (TP101).

Other

Type	Description

***Type*:** Identify the facility type.
Examples – intake, PRV, etc.

***Description*:** Briefly describe the work being done and the associated facility location.

Is a basis of design needed for any of these Facility Types?
■ YES ☐ NO
If YES, remember to include a Basis of Design document as described in the permit instructions. For water main, complete the Basis of Design (EQP5877b) template.
If NO, explain why a basis of design is not needed.

1. Is the Water Supply a customer, wholesale purchaser, or bulk purchaser?
   ☐ YES ■ NO
   If YES, please provide the following details about the Seller Public Water Supply.
   Seller PWS Name: GLWA
   Seller PWSID: 2838

   Does the water service contract require water producer/seller to review and approve customer/wholesale/bulk purchaser water system construction plans?
   ☐ YES ■ NO
   If YES, please ensure that an approval letter from the water producer/seller is attached to the Permit Application to ensure faster processing of your request.

2. Are sealed and signed engineering plans attached? Please restrict engineering plans to drinking water utilities. Relevant product information should be included as applicable.
   ■ YES ☐ NO
   If NO, explain why engineering plans are not needed.

3. Are sealed and signed construction specifications attached? Specifications should be up-to-date and reflect current industry standards.
   ■ YES ☐ NO
   If NO, explain why construction specifications are not needed. Standard specifications need to be on file at EGLE. Provide the name and date of the specifications.

4. Was an evaluation of the project area for sites of contamination conducted? Please reference the Contaminated Site Evaluation Checklist (EQP5877c) for resources and guidance.
   ■ YES ☐ NO
   If NO, explain why no evaluation was required.

5. Is the project in or adjacent to a site of suspected or known soil or groundwater contamination? Please reference the Contaminated Site Evaluation Checklist (EQP5877c) for resources and guidance.
   ☐ YES ☐ NO
   If YES, estimated contaminant location(s) must be shown and labeled on the plans and a summary of the contaminant nature and extent and other relevant information provided. The water system design must mitigate potential risks from the contamination. Areas of contamination should be avoided to the maximum extent possible. Part 201 and Part 213 of Act 451 requirements must be met, and any contaminated soil and groundwater must be appropriately managed if encountered.

6. Were Recommended Standards for Water Works, Suggested Practice for Water Works, American Water Works Association (AWWA) guidelines, and the requirements of Act 399 and its administration rules followed? If any standards cannot be met, "NO" must be checked.
   ☐ YES ☐ NO
   If NO, explain which deviations were made and why, as described in the permit instructions.
   _____

7. Are all coatings, chemical additives, and construction materials ANSI/NSF or other adequate third-party approved?
   ■ YES ☐ NO
   If NO, describe what coatings, additives, or materials did not meet the applicable standard and why. _____

8. Are all water system facilities being installed in the public right-of-way or a dedicated utility easement?
   ■ YES ☐ NO
   If NO, demonstrate how access and control is available for future utility maintenance and repair.
   _____
   For projects not located in the public right-of-way, include utility easements on the plans and provide adequate maintenance agreements outlining maintenance, repair, and operational responsibilities.

9. Is the project construction activity within a wetland (as defined by Section 324.30301(d) of Part 303, Act 451)?
   ☐ YES ☐ NO
   If YES, a wetland permit has been or will be obtained.

10. Is the project construction activity within a 100-year floodplain (as defined by R 323.1311(e) of Part 31, Act 451, administrative rules)?
    ☐ YES ☐ NO
    If YES, a floodplain permit has been or will be obtained.

11. Is the project construction activity within 500 feet of a lake, reservoir, or stream?
    ☐ YES ☐ NO
    If YES, a Soil and Erosion Control Permit has been or will be obtained or indicate if the owner of the water supply is an Authorized Public Agency (APA) (Section 10 of Part 91, Act 451).
    ☐ Owner is APA

12. Will the proposed construction activity be part of a project involving the disturbance of five (5) or more acres of land?
☐ YES ☐ NO
If YES, is this activity regulated by the National Pollutant Discharge Elimination System (NPDES) storm water regulations?
☐ YES: NPDES Authorization to discharge storm water from construction activities has been or will be obtained.
☐ NO: Describe why activity is not regulated.
_____

13. **OWNER'S CERTIFICATION:** The owner of the proposed facilities or the owner's authorized representative shall complete the owner's certification. It is anticipated that the owner will either be a governmental agency (city, village, township, county, etc.) or a private owner (individual, company, association, etc.) of a Type I public water supply.

I, Wesley Sanchez, acting as the
(Owner's Name)

DPW Director for
(Title/Position)

Village of Lake Orion,
(Entity owning proposed facilities)

certify that this project has been reviewed and approved as detailed by the Plans and Specification submitted under this application, and is in compliance with the requirements of 1976 PA 399, as amended, and its administrative rules.

_____
Signature
(Certified electronic signature only)

Phone Number: 248-693-8391

Please Note:
a. Applicant must comply with requirements of the MISS DIG Underground Facility Damage Prevention and Safety Act, 2013 PA 174, as amended.
b. All earth changing activities must be conducted in accordance with the requirements of Soil Erosion and Sedimentation Control, Part 91, Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (Act 451).
c. All construction activity impacting wetlands must be conducted in accordance with Wetlands Protection, Part 303, Act 451.
d. Intentionally providing false information in this application constitutes fraud which is punishable by fine and/or imprisonment.
e. Where applicable for water withdrawals, the issuance of this permit indicates compliance with the requirements of Great Lakes Preservation, Part 327, Act 451.

If you need this information in an alternate format, contact EGLE-Accessibility@Michigan.gov or call 800-662-9278.

EGLE does not discriminate on the basis of race, sex, religion, age, national origin, color, marital status, disability, political beliefs, height, weight, genetic information, or sexual orientation in the administration of any of its programs or activities, and prohibits intimidation and retaliation, as required by applicable laws and regulations. Questions or concerns should be directed to the Nondiscrimination Compliance Coordinator at EGLE-NondiscriminationCC@Michigan.gov or 517-249-0906.

This form and its contents are subject to the Freedom of Information Act and may be released to the public.

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
WATER RESOURCES DIVISION

PERMIT APPLICATION FOR WASTEWATER SYSTEMS

Construction - Alteration - Addition or Improvement as Described Herein
Required under the Authority of Part 41, Sewerage Systems, of 1994 PA 451, as amended (Act 451)

This application becomes a Part 41 Construction Permit only when signed and issued by authorized DEQ staff.

INSTRUCTIONS: Complete items 1 through 32 on this form and complete the Project Basis of Design (attached form EQP-4600A) or provide same information. Print or type all information except for signatures. Complete the Streamlined Checklist (EQP5937) for sewer projects that qualify; checklist available at www.michigan.gov/deq (select Water; then select Wastewater Construction). Complete the Non-Governmental Ownership Checklist (attached form EQP-4600C) for non-governmentally owned projects. Deliver complete application, plans and specifications, and attachments to the DEQ district office having jurisdiction for the project.

PROCESSING TIME FRAME: Part 13, Permits, of Act 451 allows 150 days for processing of an administratively complete Part 41 permit application, with extensions available when requested by the applicant. However, permits are generally processed within 45 days or less for routine projects. For information regarding recent permit processing time frames, refer to the WRD Metrics Web page (refer to metric B-9). For a fee, an expedited permit review process is available for applicants seeking quicker review time frames; information about this process is available at www.michigan.gov/deq (select Water; then select Wastewater Construction) or click here.

REQUIRED NOTIFICATIONS: The permittee shall provide Startup Notification (just prior to excavation) including permit number and date of issuance and Completion Notification (upon completion of the project) including permit number and date of issuance to the DEQ district office having jurisdiction for the project (attached form EQP-4600B).

PERMIT NUMBER (DEQ USE ONLY)	**DATE OF ISSUANCE** (DEQ USE ONLY)

1. **Municipality or Organization Name and Address** that will own the wastewater facilities to be constructed. This permit is to be issued to: Village of Lake Orion 21 E Church St Lake Orion, MI 48362	Permit Stamp Area (DEQ use only)	
2. **Owner's Contact Person** (provide name for questions) Contact: Wesley Sanchez, DPW Director Phone: 248-693-8391 x 106		
3. **Project Name** (Provide phase number if project is segmented)	4. **Project Location** Village of Lake Orion	5. **County** (location of project) Oakland

ISSUED UNDER THE AUTHORITY OF THE DIRECTOR OF THE DEPARTMENT OF ENVIRONMENTAL QUALITY

cc: Carol Thurber, PE
Nowak & Fraus Engineers
48680 Van Dyke Ave., Unit 200
Shelby Twp., MI 48317

Issued by: _____

Reviewed by: _____

☐ **If this box is marked see special conditions attached to this permit.**

GENERAL PERMIT CONDITIONS

a. This **PERMIT** only authorizes the construction, alteration, addition, or improvement of the wastewater system as described herein and is issued solely under the authority of Part 41 of Act 451.
b. Issuance of this **PERMIT** does not authorize any violation of federal, state, or local laws or regulations, nor does it obviate the need to obtain other permits or approvals from the DEQ or other units of government as may be required by law.
c. This **PERMIT** expires two (2) years after the above date of issuance unless construction starts prior to the expiration date in accordance with R 299.2939(2) of the Part 41 Administrative Rules.
d. Any portion of the herein described facilities constructed prior to the date of issuance is not authorized by this **PERMIT** and is a violation of Act 451.
e. No sewer shall be placed into service unless and until the outlet sewer has been constructed, tested, and placed into service.
f. Failure to meet any condition of this **PERMIT** or any requirement of Act 451 constitutes a violation of Act 451.
g. The applicant must provide notice of impending construction to public utilities and comply with the requirements of the Protection of Underground Facilities Act, 1974 PA 53, as amended (MISS DIG).
h. All earth changing activities must be conducted in accordance with Part 91, Soil Erosion and Sedimentation Control, of Act 451.
i. All construction activity impacting wetlands shall be conducted in accordance with Part 303, Wetlands Protection, of Act 451.
j. Intentionally providing false information in this application constitutes a violation of Section 249 of the Michigan Penal Code, 1931 PA 328, as amended.

6. **Facilities Description** In the space below, provide a detailed description of the proposed project in the format shown in the examples at the bottom of this page. Applications with inadequate facilities descriptions **will be returned**. Use additional sheets if needed.

EXAMPLES OF FACILITIES DESCRIPTIONS	
Sanitary Sewers and/or Force Mains	250 feet of 10" sanitary sewer in Mark Avenue between John and Lincoln Streets. **OR** 250' of 10" sewer in an easement from the intersection of Mark Avenue and John Street to the north.
Pumping Stations	A wetwell/drywell, suction lift, submersible, etc. pumping station rated for 250 gpm at a TDH of 34' located at the northeast corner of Mark Avenue and Lincoln Street, and equipped with two pumps, backup power, pump around capability, and all other equipment as required for proper operation.
Wastewater Treatment Facilities	A 10 million gpd (avg. flow) facility located at the north end of Ronald Street including a 2.0 million gallon equalization basin, six 0.5 million gallon primary clarifiers, four 0.75 million gallon aeration basins with fine bubble aerators, four 0.8 million gallon circular secondary clarifiers, ultraviolet disinfection, and all necessary appurtenances and piping as shown on the plans and described in the specifications for the proper operation of the treatment facility to provide a discharge quality in compliance with the facility's discharge permit.

GENERAL PROJECT INFORMATION – Complete All Boxes Below

7. Design engineer's name, engineering firm, address, phone no., and e-mail address:

8. Indicate who will prepare "as-built" plans for this project:
☐ Design Engineer in Box 7
☒ Other - name, organization, address, and phone no.:
Nowak and Fraus Engineers
43279 Schoenherr Road, Shelby Township, MI 48313
(586) 739-0939

9. Indicate who will provide project construction inspection:
☐ Engineering firm listed in Box 7
☒ Other - name, organization, address, and phone no.:
Nowak and Fraus Engineers
48680 Van Dyke, Unit 200
Shelby Twp, MI 48317
(586) 739-0939

10. Is groundwater dewatering expected for this project?
☐ YES ☒ NO
If YES, provide dewatering specifications.
If YES, will water wells or water bodies be impacted?
☐ YES ☐ NO
NOTE: If groundwater dewatering is expected, and especially if it may result in a large quantity withdrawal (greater than 70 gallons per minute), registration with the DEQ is required and a permit may be necessary. For more information, please contact the Water Use Program staff. If a Part 327 permit is required, it may cause delay in issuance of a Part 41 permit, and/or result in project design revisions.

11. To which wastewater collection system will the project connect? COSDS

12. To which wastewater treatment system will the project connect? GLWA
Final discharge is to: ☐ Groundwater ☒ Surface Water

13. Will this project be within 50 ft. of a private water well?
☐ YES ☐ NO If YES, locate on plans.

14. Will this project be within 200 ft. of a public water well?
☐ YES ☐ NO If YES, locate on plans.

15. Is the project construction activity within a wetland (as defined by Section 30301(p) of Part 303 of Act 451)?
☐ YES ☐ NO
If YES, has application been made for a wetland permit?
☐ YES ☐ NO

16. Is the project construction activity within a 100-year floodplain (as defined by Section 3101 of Part 31, Water Resources Protection, of Act 451, and the associated Administrative Rules)?
☐ YES ☐ NO
If YES, has application been made for a floodplain permit?
☐ YES ☐ NO

17. Is the project construction activity below the ordinary high water mark of an inland lake or stream (as defined by Section 30101(f) of Part 301 of Act 451)?
☐ YES ☐ NO
If YES, has application been made for an inland lakes and streams permit? ☐ YES ☐ NO

18. Is the project construction activity within 500 ft. of a lake, reservoir, or stream? ☐ YES ☐ NO
If YES, has application been made for a Soil Erosion and Sedimentation Control Permit? ☐ YES ☐ NO
Is owner listed in box 2 of this application an Authorized Public Agency (Section 9110 of Part 91 of Act 451)?
☐ YES ☒ NO

19. Will the proposed construction activity be part of a project involving the disturbance of five (5) or more acres of land?
☐ YES ☐ NO Please contact 517-284-5592 with questions regarding the storm water regulations.
If YES, is project regulated by the National Pollutant Discharge Elimination System (NPDES) storm water regulations?
☐ YES: Attach copy of application or NPDES authorization to discharge storm water from construction activities.
☐ NO: Describe why activity is not regulated:

20. Is the project in or adjacent to a site of known soil or groundwater contamination? ☐ YES ☐ NO
If YES, attach a copy of a plan acceptable to the DEQ for handling contaminated soils and/or groundwater disturbed during construction. Contact the local DEQ office for listings of Michigan sites of environmental contamination.

SEWER SYSTEM CAPACITY

21. Are there any known capacity concerns in the collection system downstream of the proposed project? ☐ YES ☐ NO If YES, **include a full explanation with the application**.		Flow Rate	Units
22. Proposed project peak design flow rate:			CFS
23. Total capacity of the existing outlet sewer:			CFS
24. Current peak hour flow into the existing outlet sewer:			CFS
25. Design capacity of nearest downstream pumping station (largest pump out of service):	N.A. ☐		
26. Current peak hour flow into nearest downstream pump station:	N.A. ☐		

OVERFLOWS AND BASEMENT FLOODING – For Proposed Sewer Projects, Mark All Boxes That Apply

27. Has the downstream collection system overflowed or flooded basements in the past five years? ☐ YES ☐ NO
If YES, attach a listing of events in the past five years including date, location, cause, and corrective action.

28. Has the downstream collection system owner entered into an agreement satisfactory to the DEQ to address sanitary sewer overflows and flooding of basements? ☐ YES ☒ NO
If YES, enter agreement name and number: .

29. **TREATED WASTEWATER DISCHARGE AUTHORIZATION** – Mark Boxes As Appropriate

A. Does project include a new treatment facility or expansion, a change in discharge method, or a new discharge location?
☐ YES – Complete B below ☒ NO – skip to item 30

B. If A is marked YES, indicate discharge authorization and provide the requested information:
1. NPDES or Groundwater Discharge Permit No: _____ Permit Authorized Flow Rate: _____ Units: _____
2. Local health department approval. **Include a copy of the approval with this application.**

30. **OWNERSHIP –** Mark A or B as Appropriate Below

☒ A. Ownership will be by a governmental entity **before the sewer is placed in service**.

☐ B. Ownership will be by a non-governmental entity, and a **completed Non-Governmental Ownership Checklist is included with this application.**

Note: A completed **Non-Governmental Ownership Checklist** (EQP-4600C) must be included with the application for **non-governmentally owned projects**. The checklist is attached to this application and the supporting information is available at www.michigan.gov/deq (select Water; then select Wastewater Construction).

31. **COMPLETE APPLICATION CHECKLIST –** Please confirm that this application is complete by using this checklist. Mark the box if the condition is met. This will help reduce DEQ review time and speed permit issuance.

☒ A. Items 1 to 30 of the application are completed.	☒ E. Owner's certification signed and complete (item 32).
☐ B. A contamination management plan is included for sites with known contamination (item 20). ☐ N.A.	☒ F. A detailed basis of design is included with the application. Form EQP-4600A (attached) or similar form is completed providing information required by Rule 35(3) of the Part 41 Administrative Rules of Act 451.
☐ C. For projects with local health department discharge authorization, a copy of the health department authorization is included (item 29). ☒ N.A.	
☐ D. For non-governmentally owned projects, provide the Non-Governmental Ownership Checklist and all documents required by the checklist (item 30). ☒ N.A.	☒ G. Final plans and specifications sealed and signed by a Michigan licensed professional engineer are provided.

32. **OWNER'S CERTIFICATION –** The owner of the proposed facilities or the owner's authorized representative shall complete the following owner's certification:

I, Wesley Sanchez (name), acting as the DPW DIRECTOR (title/position) for Village of Lake Orion (entity owning proposed facilities) certify that the information provided in and with this application Is true and accurate to the best of my knowledge, and I certify that the plans and specifications and other documents submitted to the DEQ with the Part 41 Permit Application accurately represent what I intend to construct under the terms of the Part 41 Permit, once issued. Also, I certify that this proposed project as detailed in the plans and specifications submitted under this application is in compliance with the requirement of Rule 41(a) of the Part 41 Administrative Rules of Act 451, which states that "Proper devices are or will be available and are in satisfactory operation for the collection, transportation and treatment before discharge into any public watercourse, lake, drain, ditch or groundwater, of the sewage or wastes collected or conveyed by such systems, or a definite program or agreement satisfactory to the department leading to the construction and operation of such collection, transportation or treatment devices shall have been officially adopted by the applicant for such permit and filed in the offices of the department." Further, I hereby acknowledge the requirement to provide Startup Notification (just prior to excavation) with the permit number and date of issuance and Completion Notification (upon completion of the project) with the permit number and date of issuance to the DEQ district office having jurisdiction for the project.

SIGNATURE:_____ DATE: _____

NAME (TYPED): WESLEY SANCHEZ PHONE: 248-693-8391 X 106

PROJECT BASIS OF DESIGN

PROJECT NAME: Preston Corners Enclaves

For this PROJECT the following information must be provided per Rule 35(3) of the Part 41 Administrative Rules of Act 451. Attach additional sheets as necessary.

A. A general map of the initial and ultimate service areas
__ Included on engineering plans _____ Attached separately

B. The design service area in acres Initial ____ Ultimate _____

C. The design population densities per acre Initial ____ Ultimate _____

D. 1. The ultimate design population _____ or total Residential Equivalent Units (REU) _____

2. The design per capita sewage contribution _____(gpd) or design contribution per REU _____(gpd)

E. The design commercial and industrial flow Initial _____

Ultimate _____

☐ Mark this box if any commercial or industrial user(s) served by this project are subject to the federal categorical pretreatment standards or may discharge substances with the potential to interfere with the operation of the wastewater collection and/or treatment system.

F. Wastewater flow rates for proposed project

1. Initial design average flow _____ Units CFS

2. Initial design peak flow _____ Units CFS

3. Ultimate design average flow _____ Units CFS

4. Ultimate design maximum flow (peak hour) _____ Units CFS

G. An analysis, including calculations and/or flow monitoring, of the effect of the proposed additional flows on the receiving collection system. _____

H. For proposed pump stations and treatment facilities, attach a detailed explanation of steps to be taken in case of power failure or equipment breakdown, including a description of special reserve units available for emergency treatment, storage, and/or transportation of the wastewater.

Michigan Department of Environmental Quality
Water Resources Division
Permit Application for Wastewater Systems (Continued)

REQUIRED NOTIFICATIONS

Sample Notification Form

Part 41, Sewerage Systems, of 1994 PA 451, as amended

NOT To Be Submitted With Application

(For Construction Notifications)

The **permittee** shall provide Startup Notification just prior to excavation and Completion Notification upon completion of the project to the Part 41 Engineer in the local DEQ district office, Water Resources Division, by telephone, e-mail, or first class mail. This form or other format may be used as long as the permit number, date of issuance, project name, and type of notification (startup or completion) are provided.

Permit No: _____

Issuance Date: _____

Project Name: _____

Mark box to identify type of notification and enter date.

☐ **Startup Notification**: Excavation will begin on or about _____ (date)

☐ **Completion Notification**: Project was completed on _____ (date)

Signature: _____

Name: _____

Title: _____

Date: _____ Phone: _____

STORMWATER MANAGEMENT OPERATIONS AND MAINTENANCE AGREEMENT

THIS STORMWATER MANAGEMENT OPERATIONS AND MAINTENANCE AGREEMENT (this "Agreement") is made on_____, 20___, by and between the Village of Lake Orion (hereinafter "Community"), whose address is 21 East Church Street, Lake Orion, Michigan 48362 and _____ (hereinafter "Owner"), whose address is _____. The Community (or Village) and Owner agree as follows:

Article I. Subject Property.

1.1 The Owner owns the property located at and commonly known as _____[address or general description]_____ (hereinafter the "Subject Property" or "Property"). The legal description of the Subject Property is set forth in ***Exhibit A***.

Article II. Stormwater System.

2.1 The Owner, in accordance with Oakland County Stormwater Standards and State Municipal Separate Storm Sewer System permit requirements, agrees to install and maintain a Stormwater System on the Subject Property in accordance with approved plans and conditions. The Stormwater System is set forth in ***Exhibit B***.

2.2 After construction has been verified and accepted by the Community for the Stormwater System, the Owner shall file with the Community the "as-built" documents showing the design and construction details and shall reference this Agreement.

2.3 The Stormwater System will be governed by the terms and conditions in this Agreement.

Article III. Stormwater O&M Plan.

3.1 The Owner shall be solely responsible for the installation, maintenance, and repair of the Stormwater System, drainage easements, and associated landscaping identified in ***Exhibit B*** in accordance with the Stormwater Management Operations and Maintenance Plan, hereinafter the "Stormwater O&M Plan" set forth at ***Exhibit C*** to this Agreement.

3.2 The Stormwater O&M plan is subject to approval by the Community and its engineer.

3.3 The Owner agrees that the Stormwater O&M Plan is intended to and will serve the Subject Property in perpetuity.

3.4 The Owner, at its sole expense, shall secure from any affected owners of land all easements and releases of right-of-way necessary for the implementation of the Stormwater O&M Plan and shall record them with the Oakland County Register of Deeds. These easements and releases of rights-of-way shall not be altered, amended, vacated, released, or abandoned without prior written approval of the Community and its engineer.

3.5 No alterations or changes to the Stormwater O&M Plan shall be permitted unless they are deemed to comply with this Agreement and are approved in writing by the Community.

3.6 The Owner shall retain the services of a qualified inspector as described in ***Exhibit C — Maintenance Requirement*** to operate and ensure the maintenance of the Stormwater O&M Plan.

3.7 The Owner shall annually, by December 30th, provide to the Community records (logs,

invoices, reports, data, etc.) of inspections, maintenance, and repair of the Stormwater System in compliance with the Stormwater O&M Plan.

3.8 The Community agrees to enforce compliance with the annual inspection, maintenance, and repair records as set forth in 3.7 above, and such enforcement may require compliance with a Village ordinance; provided, however, such compliance will be consistent with the terms under which the system was approved.

Article IV. Access and Enforcement.

4.1 The Community or its designee is authorized to access the property as necessary to conduct inspections of the Stormwater System, implementation of the Stormwater O&M Plan, or drainage easements to ascertain compliance with the intent of this Agreement during daylight hours.

Upon written notification by the Community or their designee of required maintenance or repairs, the Owner shall complete the specified maintenance or repairs within a reasonable time frame determined by the Community which shall not be less than ninety (90) days. The Owner shall be liable for the failure to undertake any maintenance or repairs so that the public health, safety, and welfare shall not be endangered nor the road improvement damaged.

If the Village must undertake any maintenance or repairs for the public health, safety, or welfare, or for any emergency actions, the Owner will reimburse the Village for any and all costs associated with such actions, which costs shall be consistent with market rates at the time the work is performed.

4.2 If the Owner does not keep the Stormwater System in reasonable order and condition, or complete maintenance activities in accordance with the Stormwater O&M Plan, or the reporting required in 3.7 above, the Community is authorized, but not required, to perform the specified inspections, maintenance or repairs in order to preserve the intended functions of the Stormwater System and prevent the Stormwater System from becoming a threat to public health, safety, general welfare or the environment and will be done at Owner's sole expense.

4.3 In the case of an emergency, as determined by the Community, no notice shall be required prior to the Community performing emergency maintenance or repairs. The Community may levy the costs and expenses of such inspections, maintenance, or repairs against the Owner.

The Community, at the time of entering upon said Stormwater System for the purpose of maintenance or repair, may file a notice of lien in the office of the Register of Deeds of Oakland County upon the property affected by the lien. If said costs and expenses are not paid by the Owner, the Community may pursue the collection of same through appropriate court actions, and in such a case, the Owner shall pay in addition to said costs and expenses all costs of litigation, including attorney fees.

4.4 The Owner hereby conveys to the Community an easement over, on, and in the property described in ***Exhibit A*** for the purpose of access to the Stormwater System for the inspection, maintenance, and repair thereof, should the Owner fail to properly inspect, maintain, and repair the Stormwater System.

Article V. Term and Covenants.

5.1 The Owner agrees that this Agreement shall bind all current and future owners of the property. The Owner agrees in the event that the Subject Property is sold, transferred, or leased to provide information to the new owner, operator, or lessee regarding proper

inspection, maintenance, and repair of the Stormwater System and Stormwater O&M Plan. The information shall accompany the first deed transfer and include ***Exhibits B and C*** and this Agreement. The transfer of this information shall also be required with any subsequent sale, transfer, or lease of the Subject Property.

5.2 The Owner agrees that the rights, obligations, and responsibilities hereunder shall commence upon execution of the Agreement.

Article VI. Claims and Authority.

6.1 The Owner, its agents, representatives, successors, and assigns shall defend, indemnify, and hold harmless the Community and its employees, volunteers, appointees, and/or elected officials from and against any claims, demands, actions, damages, injuries, costs or expenses of any nature whatsoever, hereinafter "Claims", fixed or contingent, known, or unknown, arising out of or in any way connected with the design, construction, use, maintenance, repair or operation (or omissions in such regard) of the Stormwater System, appurtenances, connections, and attachments thereto which are the subject of this Agreement. This indemnity and hold harmless shall include any costs, expenses, and reasonable attorney fees incurred by Community in connection with such Claims or the enforcement of this Agreement; provided, however, the Owner shall not indemnify or hold harmless the Community or its agents from Claims arising from their gross negligence or intentional acts.

[OWNER'S SIGNATURE PAGE]

IN WITNESS WHEREOF, the Owner and Community have executed this Agreement on the day and year first above written.

OWNER:

By: _____

Its: _____

STATE OF MICHIGAN)
)ss.
COUNTY OF OAKLAND)

The foregoing instrument was acknowledged before me on this _____day of _____ 20__, by _____, the _____ of _____, on behalf of said company.

_____
Notary Public

[COMMUNITY SIGNATURE PAGE]

COMMUNITY:

VILLAGE OF LAKE ORION, a
Michigan municipal corporation

By: _____

Its: _____

STATE OF MICHIGAN)
)ss.
COUNTY OF)

The foregoing instrument was acknowledged before me on this ___ day of _____,

20_____, by _____, the _____ of

the Village of Lake Orion, a Michigan municipal corporation, on behalf of said corporation.

_____
Notary Public

DRAFTED BY:

WHEN RECORDED RETURN TO:

Explanation of Exhibits

Exhibit A - Legal Description: Provide a legal description and reduced copy map to identify the land parcel(s) affected by this Agreement. This exhibit must be customized for each site. It must include a reference to a Subdivision Plat, Certified Survey number, or Condominium Plat, and a map to illustrate the affected parcel(s).

Exhibit B — Stormwater System Description and Map: Provide a written description and location map of the Stormwater System. This exhibit must be customized for each site. Map scale must be sufficiently large enough to show necessary detail.

Exhibit C — Stormwater O&M Plan: This exhibit explains the basic function of the stormwater management operation and maintenance plan, schedule, and budget providing the minimum specific maintenance activities and frequencies for each practice. The minimum elements of this exhibit include a description of the drainage area and the installed Stormwater System, a description of the specific maintenance activities which should include the following in addition to specific maintenance actions:

- Employee training and duties,
- Routine service requirements,
- Operating, inspection, and maintenance schedules, and
- Detailed construction drawings showing all critical components and their elevations.

The plan must include maintenance tasks and schedules. Refer to the Low Impact Development Manual for Michigan for maintenance task checklists for permanent BMPs and create a table of applicable maintenance tasks and schedules.

Return to TOC

Village of Lake Orion
21 E. Church Street
Lake Orion, MI 48362
248-693-8391

DRIVE IMPROVEMENT PERMIT APPLICATION (RESIDENTIAL OR COMMERCIAL)

I. LOCATION OF WORK		PERMIT NUMBER:	
ADDRESS		BOND NUMBER:	
SUBDIVISION	LOT #	DATE RECEIVED:	
PARCEL ID #	ZONING DISTRICT	DATE ISSUED:	

II. IDENTIFICATION

A. APPLICANT/CONTRACTOR/LICENSEE	EMAIL ADDRESS		TELEPONE #
NAME			MOBILE #
ADDRESS	CITY	STATE	ZIP CODE

B. PROPERTY OWNER	EMAIL ADDRESS		TELEPHONE NO.
NAME			MOBILE NO.
ADDRESS	CITY	STATE	ZIP CODE

III. TYPE OF WORK		EST.COST $	
	DRIVE APPROACH to PAVED STREET, CURBED	PERMIT FEE	$ TOTAL DUE $
	DRIVE APPROACH to PAVED STREET, UNCURBED	REVIEW FEE	$ TOTAL PAID $
	DRIVE APPROACH to UNPAVED STREET		CC/CASH/CHECK

IV. WORK TO BE PERFORMED

V. FIELD INSPECTION REPORT - TO BE COMPLETED BY VILLAGE PERSONNEL

DRIVE APPROACH									
	EXISTING CURB	☐ YES ☐ NO	CURB CUT REQ'D	☐ YES ☐ NO	DRIVE APRON REQ'D	☐ CONC ☐ ASPH			
	EXISTING DITCH	☐ YES ☐ NO	CULVERT REQ'D	☐ YES ☐ NO	CULVERT SIZE	SIGHT DISTANCE OK	☐ YES ☐ NO	CLEARING REQ'D	☐ YES ☐ NO
	GRAVEL SHOULDER	☐ YES ☐ NO	WIDTH						

REMARKS:

NOTE: ALL DRIVEWAYS TO BE A MINIMUM OF 6 FEET FROM THE EDGE OF ANY CATCH BASIN. NEW DRIVEWAYS SHALL NOT BE PLACED WITHIN 5 FEET OF ANY STREET TREE WITHOUT VILLAGE APPROVAL. DRIVEWAY AND RADII OR APPROACH FLARES SHALL BE KEPT WITHIN THE FRONTAGE OF THE SUBJECT PROPERTY UNLESS WRITTEN APPROVAL OF THE OWNER OF ADJACENT PROPERTY IS PROVIDED.

VI. PAVING DIMENSIONS - TO BE COMPLETED BY VILLAGE PERSONNEL

APPROACH WIDTH	FT	BOND: ____ FT X $20 / FT =
SIDEWALK SQ-FT	SFT	BOND: ____ SFT X $10 / SFT =

VII. PLAN REVIEW

DRIVE APPROACH	☐ PLAN SUBMITTED	PLANS MUST MEET REQUIREMENTS OF THE VILLAGE OF LAKE ORION

A minimum one-foot wide lawn or landscape strip shall be required between the edge of the parking area and all lot lines to provide adequate room for drainage, snow storage and privacy screening. Front yard circular or horseshoe drives are prohibited.

One curb cut and approach is permitted per parcel.

A FORM/COMPACTION INSPECTION IS REQUIRED BEFORE POURING OF CONCRETE / PLACING ASPHALT ON VILLAGE PROPERTY.

CALL THE PUBLIC WORKS DEPARTMENT AT 248-693-8391 x 106 TO SCHEDULE A DRIVEWAY INSPECTION.

ALL VILLAGE RIGHT-OF-WAY SHALL BE RESTORED TO ORIGINAL LIKE CONDITION. TEMPORARY RESTORATION MAY BE ALLOWED WITH VILLAGE APPROVAL.

SIGNATURE (OWNER)	DATE
SIGNATURE (CONTRACTOR)	DATE

PERMIT GRANTED: ☐ YES ☐ NO	AUTHORIZED SIGNATURE	DATE
FEE: ☐ _____ BOND: ☐ _____	TOTAL FEE: Appendix G	

CONDITIONS OF DRIVEWAY PERMIT

1. This permit is issued on the condition that Licensee and any person working under the authority of this permit shall comply with the requirements of Act 53 of the PA of 1974 –CALL MISS DIG BEFORE YOU DIG -PHONE (800) 482-7171 or oca.missdig811.org.

2. PRECAUTIONS: During the progress of any work undertaken within the limits of said highway in pursuance hereof, the Licensee shall provide watchmen and flagmen as may be required for the safety and convenience of the public and/or as shall seem advisable to the Manager; and shall furnish all barricades, signs and lights necessary to protect the public and/or such additional barricades, signs and lights as required by the Village. Two-Way traffic shall be maintained at all times unless otherwise indicated hereon by special endorsement of the Manager's duly authorized representative.

3. ACCIDENT LIABILITY AND INDEMNIFICATION: The said Licensee shall be liable for all damages, both to property and to persons, resulting from accidents which may occur as a result of the proposed operations in pursuance hereof. The Licensee shall save harmless and indemnify the Village of Lake Orion from any claim for damages of any nature whatsoever which may arise out of his operation under this permit and upon request, furnish proof of insurance coverage for the term of this permit.

4. VIOLATION: The violation of any condition of this permit by the said Licensee shall constitute a forfeiture of rights hereunder.

5. REVOCATION OF PERMIT: It is to be understood that the rights granted herein are revocable at the will of the Village and that the Licensee acquires no rights in the highway and expressly waives any right to claim damages or compensation in case this permit is revoked.

A copy of this permit shall be kept at the stated work location, subject to inspection at all times by the Village or any of its duly authorized agents.

STANDARD SPECIFICATIONS:

1. DRIVEWAY DIMENSIONS: The width at property line shall be at least 10 feet but no more than 25 feet. If the road is curbed, the width of the curb opening shall be as shown on the face of the permit but shall not be less than 16 feet or more than 31 feet.
    - EXCEPTION: If the road right-of-way or public road easement width is less than 30 feet AND the Front Setback or Established Front Setback is less than 20 feet, then a paved parking surface with a minimum area of 360 square feet or a maximum area of 400 square feet may be permitted regardless of driveway width at the property line so long as the width does not exceed the width of the parcel.

2. DRAINAGE: The driveway shall be constructed so that the drainage is not adversely affected by the driveway. The drainage and the stability of the road subgrade shall not be altered by driveway construction or roadside development All culvert pipe used shall be of a size adequate to carry the anticipated natural flow of the ditch; the culvert shall be no smaller than the size determined by the Department of Public Works, nor shall it be less than 12 inches inside diameter. Culvert length shall be at least 16 feet but not more than 36 feet. Except for driveways, the enclosure of ditches will not be permitted. End section or headwall is required. Culvert shall be of sufficient length to provide side slopes no steeper than 3 feet horizontal to 1 foot vertical. The use of sloped end sections is encouraged.

3. SURFACING: When the road is paved driveways shall be paved between the edge of pavement and the existing or proposed sidewalk. If there is no existing or proposed sidewalk, the surfacing shall extend at least 10 feet from the edge of pavement or to the right of way line, whichever distance is greater. When the road is unpaved paving of the driveway is not required. If such driveway is to be paved, the paving shall extend no closer to the road than one foot behind the driveway culvert location, or 5 feet from the edge of the gravel road if no culvert is needed. Driveway pavement within road right-of-way shall match existing road material and section.

4. DRIVEWAY GRADE: If the road is uncurbed, the grade of the driveway between the road edge of pavement and the edge of the shoulder shall conform to the slope of the shoulder. If the road is curbed the grade shall not exceed 10% (10 feet per 100 feet) upward or downward from the road.

Village of Lake Orion
21 E. Church Street
Lake Orion, Michigan 48362
Tel 248.693.8391
Fax 248.693.5874
www.lakeorion.org

HOLD HARMLESS AGREEMENT

FOR AND IN CONSIDERATION of the granting by the Village of Lake Orion to permit/allow *

_____

Activity/Event | Dates and Time

_____

General Description of Location

_____

as requested by the undersigned, the undersigned does hereby agree to fully hold harmless, defend and indemnify the Village of Lake Orion, and all of its officers, officials, agents and employees, with respect to all claims, losses, damages, causes of action, judgments, costs and expenses, including reasonable attorney fees, whether or not the same are now known, liquidated, discovered, discoverable or justifiable, which may be asserted, brought or rendered against, incurred or suffered by, and/or imposed upon, the Village of Lake Orion and/or its officers, officials, agents and employees, by reason of or arising out of the grant or exercise of the rights stated above granted by the Village of Lake Orion to the undersigned.

_____ Applicant/Property Owner/Contractor Signature**

_____ Witness One Signature ***

_____ Applicant/Property Owner/Contractor Printed Name

_____ Witness One Printed Name

_____ Date

_____ Witness Two Signature ***

_____ Witness Two Printed Name

* *Applicant MUST provide information regarding what the activity is, date(s), times activity will be held and the areas (public sidewalks, streets, parking spaces, etc.) that are affected.*

** *If the activity is obstructing public right-of-way for work on private property, the property owner or contractor MUST provide their signature.*

*** *The signatures from two (2) witnesses are required.*