CITY OF LINCOLN PARK

DEVELOPMENT PROCEDURES AND ENGINEERING STANDARDS

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Introduction

This manual is intended to guide applicants through the City of Lincoln Park's development process. The process starts with initiation and ends with the issuance of a final certificate of occupancy. Lincoln Park is a certified "Redevelopment Ready" community.

The following Standards are intended to provide a basis upon which all commercial, industrial, and residential sites within the City of Lincoln Park are to be designed. The requirements herein reflect the requirements of the Building Department, Department of Public Services, Planning and Zoning Department, and the City Engineer, and conform to current engineering practices in Southeastern Michigan. These standards are by no means intended as a substitute for sound professional engineering, architectural, or planning judgment. These standards are not intended to repeal, abrogate, annul or in any manner interfere with the existing regulations or laws of the City of Lincoln Park nor to conflict with any statues of the State of Michigan or Wayne County, except that these standards will prevail in cases where they impose a greater restriction than is provided by the existing statues, laws, or regulations.

CITY OF LINCOLN PARK

Development Procedure Manual

A. Site Plan Process

Persons seeking site plan approval in the City of Lincoln Park shall follow these procedures:

Site plans shall be submitted in compliance with Section 1296.01 the City of Lincoln Park Zoning Ordinance and shall be prepared in accordance with the provisions of the site plan review requirements. A copy of Section 1296.01 of the City Zoning Ordinance regarding site plan review can be found in Appendix N.

Per Section 1296.01 of the Zoning Ordinance regarding site plan review, an applicant seeking site plan approval should follow the requirements listed below:

1. Application procedure, contents. The following information shall accompany all site plans and sketch plans submitted for all reviews:

   a. An application for site plan review, supplied by the Building Department, shall be submitted to the Building Superintendent, along with the required application fee and six copies of the site plan at the following scales:

      - A scale of not less than one inch equals twenty feet for property less than one acre;
      - One inch equals thirty feet for property larger than one acre but less than three acres; and,
      - One inch equals fifty feet for property larger than three acres.

   b. A completed site plan application and site plan materials must be submitted at least twenty-one days prior to the Planning Commission or City Council meeting at which the review is requested. Upon confirmation from the City Planner, City Engineer, City Attorney and other City consultants and staff that the site plan substantially meets the requirements of this chapter, an additional ten copies of the site plan shall be submitted to the Building Department. The Commission may prepare forms and require the use of such forms in site plan preparation. A separate escrow deposit may be required for administrative charges to review the site plan submittal.

c. Current proof of ownership of the land to be utilized or evidence of a contractual arrangement to acquire such land, such as an option or purchase agreement, and a title search or other evidence of any applicable easements or deed restrictions shall be provided.

2. Distribution of plans. Upon submission of all required application materials, the site plan proposal shall be distributed, at the option of the Manager of Engineering and Building, to the City Planner, City Engineer, City Attorney and other City consultants and staff for review. Determination of compliance with City ordinances and regulations shall be made within fifteen days of receiving an application for site plan review. Site plans determined to be in substantial compliance proceed to final site plan review Section 1296.01.D3. For site plans determined not to be in substantial compliance, the applicant may be required to complete revisions and re-submit the plans for further review prior to final action. Upon receipt of the revised site plans, determination of compliance shall be made within fifteen days.

B. Construction Plan Process

1. Once the Planning Commission has given Site Plan approval, the Construction Plans must then be submitted, reviewed and approved by the Building Department, Fire Department, Department of Public Services, and the City Engineer before construction can start. The construction plans must meet the requirements of the City of Lincoln Park codified ordinances, applicable standard building and fire codes, and this manual.

2. For construction plan review, three (3) full sets of site engineering drawings and six (6) full sets of construction drawings, including building and engineering drawings, will be required. All plans must be signed and sealed by an engineer or architect, as applicable, licensed in the State of Michigan, pursuant to Act 299 of 1980. These plans shall be submitted to Building Department along with the appropriate fees.

3. The Building Department will forward plans to all City departments that may have jurisdiction over a certain phase or area of the site. The applicant shall submit plans to all other concerned outside agencies that may have jurisdiction over a certain phase of the work or area of site, except the Michigan Department of Environmental Quality for sanitary sewer construction, or the Detroit Water and Sewer Department for water main construction. The City Engineer will submit the plans for these two items upon his/her approval and receipt of the necessary number of "as approved" plans from the designer.

   The different City departments will review the following areas of the Construction Plans.

- Building Department
  i. Review plans to ensure that they are the same as approved by the Planning Commission before the plans are forwarded to other departments.
  ii. Building Foundations and Footings
  iii. Building Structure
  iv. Building Electrical System
  v. Building Mechanical System
  vi. Building Plumbing System
  vii. Applicable Codes
    (a) State Construction Code
    (b) State Mechanical Code
    (c) State Plumbing Code
    (d) National Electrical Code and R.E.C.I.

- Fire Department
  i. Fire Suppression System
  ii. Fire Hydrant Location on the Site
  iii. Available Water Flow to the Site
  iv. Fire Fighting Access
  v. Fire Alarm Systems
  vi. Applicable Codes
    (a) BOCA National Fire Prevention Code
    (b) NFPA, where referenced by BOCA
    (c) State Construction Code

- Police Department
  i. Lighting coverage
  ii. Public safety

- Director of Public Services and City Engineer
  i. On-Site Utilities
    (a) Sanitary Sewers
    (b) Water main
    (c) Leads for sanitary sewer and water
  ii. Site Grading Plan
    (a) Storm Drainage Systems
  iii. Parking Lots
  iv. Topographical Survey
  v. Applicable Codes
    (a) Engineer Design Manual Section of this Document

4. The results of the review by the City Engineer, incorporating comments from the Department of Public works and Fire Department and any other necessary consultants, will be sent to the Applicant. Should the plans be in need of revisions and/or corrections, the plans will be returned to the designer until the

plans meet City requirements. **Under no circumstances will partial construction plan approvals be issued**. Additional escrow may need to be paid for additional reviews by the City Engineer.

5. The result of the review by the Building department will be sent to the applicant/engineer/architect. Should the plans require revisions and/or corrections, the plans will be returned to the designer as many times as is necessary to meet City requirements. Partial construction plan approvals will not be given. Additional fees may need to be paid for additional reviews by the Building Department.

C. Approval Procedures

1. A set of approved plans will not be returned to the designer until the full review escrow and applicable fees has been deposited with the City, and all approvals from the County and/or State agencies (except for water and sanitary) have been obtained and filed with the City.

2. Construction Plan approvals are valid for a period of **one** year. If construction has not proceeded within six months from the date of Construction Plan Approval, the plan shall be resubmitted for review, along with additional review fees as required by the City, and revised, if necessary, to conform to current standards.

3. After site infrastructure improvements are complete, a walkthrough inspection will occur with the City Engineer, contractor, design engineer and DPS Director. A final walkthrough inspection of the site will not occur until all building construction is complete. After punch list items are addressed, final acceptance of water and sewer will be requested from the City Council.

D. Utility Permit Requirements

1. Construction Plan:

   The construction plan as approved by the City Engineer encompasses all utility permits required for the site work as required by the Department of Public Services and Fire Department. Note, however, other departments of the City and other agencies may require additional permits.

2. Soil Erosion and Sedimentation Control Permit:

   This permit is required **prior** to the start of any site improvements and is issued by the Wayne County Department of Environment. The Permit Procedures for Soil Erosion and Sedimentation Control, in effect at the time these engineering standards were created, has been included in Appendix H.

3. City of Lincoln Park Department of Public Services:

   The City Department of Public Services requires additional permits for water and sewer taps, hydrant use, etc. The developer shall contact the Department of Public Services for information. Inspection will be performed by the Department of Public Services and/or City Engineer.

4. Detroit Water and Sewerage Department (Water Main):

   Water main requires approval from the Detroit Water and Sewerage Department. The City Engineer will directly request approval from the DWSD.

5. Michigan Department of Environmental Quality (Water Main):

   All proposed water main construction requires a construction permit from the Michigan Department of Environmental Quality (MDEQ). The City Engineer will directly request approval and the permit from the MDEQ. Upon approval of the water main plans by the City Engineer, the designer shall submit eight (8) sets of "as approved" plans to the City Engineer for forwarding to the Detroit Water and Sewerage Department for approval and submittal to the Michigan Department of Environmental Quality for the Construction Permit. The permit application must be completed by the developer's engineer. The plans shall be signed and sealed by a Professional Engineer licensed in the State of Michigan.

6. Wayne County (Sanitary Sewer):

   All proposed sanitary sewer construction requires approval from the Wayne County Public Works Division. The City Engineer will directly request approval from Wayne County.

7. Michigan Department of Environmental Quality (Sanitary Sewer):

   All public sanitary sewer requires a construction permit from the Michigan Department of Environmental Quality (MDEQ). The City Engineer will directly request approval and the permit from the MDEQ. Upon approval by the City Engineer, the designer shall submit six (6) sets of "as approved" plans to the City Engineer for forwarding to the Wayne County Public Works Division for approval and submittal to the Michigan Department of Environmental Quality for the Construction permit. The permit application must be completed by the developer's engineer. The plans shall be signed and sealed by a Professional Engineer licensed in the State of Michigan.

8. Michigan Department of Environmental Quality (Wetlands, Inland Lakes and Streams):

It is the Owner's responsibility to obtain MDEQ permits as required under the Wetland's Protection Act 203 and the Inland Lakes and Streams Act 346.

9. Michigan Department of Transportation (Right-of-Way):

   All work in a state road right of way require a permit from the MDOT. The designer or contractor is responsible for obtaining this permit prior to work starting. The following roads are under MDOT Jurisdiction:
   - Fort Street (Full Length)
   - Southfield Road (Fort Street to western City Limits)
   - Interstate Highway 75 and all access ramps

10. Wayne County Department of Pubic Services (Right-of-Way):

    All work in county road Right-of-Way requires a permit from the Wayne County Department of Public Services. The Applicant is responsible for obtaining this permit. The following roads are under Wayne County Jurisdiction:
    - Dix Avenue (Full Length)
    - Southfield Road (Fort Street to eastern City Limit)
    - Outer Drive (Full Length)
    - Goddard (West City Limits to Fort Street)

    Dix Avenue, Southfield Road from Fort to the Western City limits and Outer Drive are all under Wayne

11. Wayne County Department of Public Services, (Storm Sewer and Drains):

    All storm sewer installation work in county drains, connection or discharge to county drains, taps to storm sewers within Wayne County right-of-way or storm water detention systems are under the jurisdiction of the Wayne County Department of Public Services and requires a permit. The Applicant is responsible for obtaining this permit.

12. Other Permits:

    Other agencies from which the Applicant may require a permit will be designated on the approved plan. These permits are generally the Contractor's responsibility and will be required prior to construction. The applicant is required to alert the City and the City Engineer of all applicable permits.

    The builder/engineer has the authority to waive certain requirements as outlined above dependant upon circumstances.

E. Review & Inspection Fees

All fees must be submitted to the Finance Office.

1. Site Plan Review

   Fees shall be set periodically by resolution by the Mayor and City Council. Any revision to approved plans requiring the City Engineer's review will require additional Review Fees to be deposited. The minimum fee shall be $700 per review.

2. Construction Plan Review

   The Engineering Review Escrow for construction plans shall be collected by the Building Department at the time plans are submitted with the exception of review fees for site improvements which must be submitted prior to plan approval by the Department of Public Services & Engineering.

   Review escrow is calculated based on the engineer's opinion of probable construction cost of all site improvements in accordance with the chart below. An itemized unit cost estimate must be submitted for use in this regard.

Construction Estimate	Review Escrow
<$25,000	5.0%
$25,000 to $50,000	4.0%
$50,000 to $75,000	3.0%
>$75,000	2.0%

3. Engineering Construction Services

   Prior to the start of construction (as defined above), a construction observation deposit must be made to cover anticipated costs. Unused monies will be refunded after approval of record plans and acceptance of public utilities by the City.

   Construction escrow is based on the engineer's opinion of probable cost of site improvements except building construction in accordance with the chart below. Before any construction of a building can commence, including site preparation work, the escrow funds for construction services must be deposited.

Construction Cost	Inspection Escrow
<$25,000	10%
$25,000 to $100,000	$3,000 + 7% of amount over $25,000
$100,000 to $250,000	$8,000 + 5% of amount over $100,000
>$250,000	$15,000 + 4% of amount over $250,000

If the construction escrow is not sufficient, an additional deposit will be required prior to the continuation of activities.

4. Soil Erosion and Sedimentation Control

   This is under the jurisdiction of the Wayne County Department of Environment. The applicant will be responsible for any applicable fee, escrow deposits, bonds and insurances. If there are any questions, contact the Wayne County office.

5. Building Construction Plan Review Fee

   Per City Ordinance.

6. Water Taps, Connections (including temporary connections to hydrants), Meter, and Backflow Prevention

   Per City Ordinance 1042.02. Applications to be filed with the Department of Public Services and water tap fees must be paid before any construction of a building can commence, including site preparation work. A certificate of occupancy will not be issued until the installation charge is received by the City Treasurer.

F. Pre-construction Meeting

Before any construction can begin, the owner, his/her contractor, and any sub-contractor shall attend a pre-construction meeting. The pre-construction meeting will be arranged by the City Engineer. Prior to the pre-construction meeting, the required escrow accounts must be established, construction plans must be approved by all departments and outside agencies, all required permits must be obtained, and six (6) sets of "As Approved" plans must be provided to the City Engineer. These plans shall contain the following statement:

"I hereby certify that this plan dated _____, is a true and accurate copy of the plan as accepted by Orchard, Hiltz & McCliment, Inc., on _____."
Signature: _____
P.E. License No. _____
Date: _____

After the pre-construction meeting, a minimum of **72 hours** notice is required to schedule inspection for the start of construction.

G. Easement Dedication Procedure

1. After construction plan approval by the City Engineer, the developer shall submit easement descriptions to the City Engineer for review. All easements and legal descriptions shall be accompanied by a sketches and other exhibits as necessary. Copies of standard easement documents can be found in Appendix O.

2. Upon approval of the easement description(s), the developer shall incorporate the description into grant form.

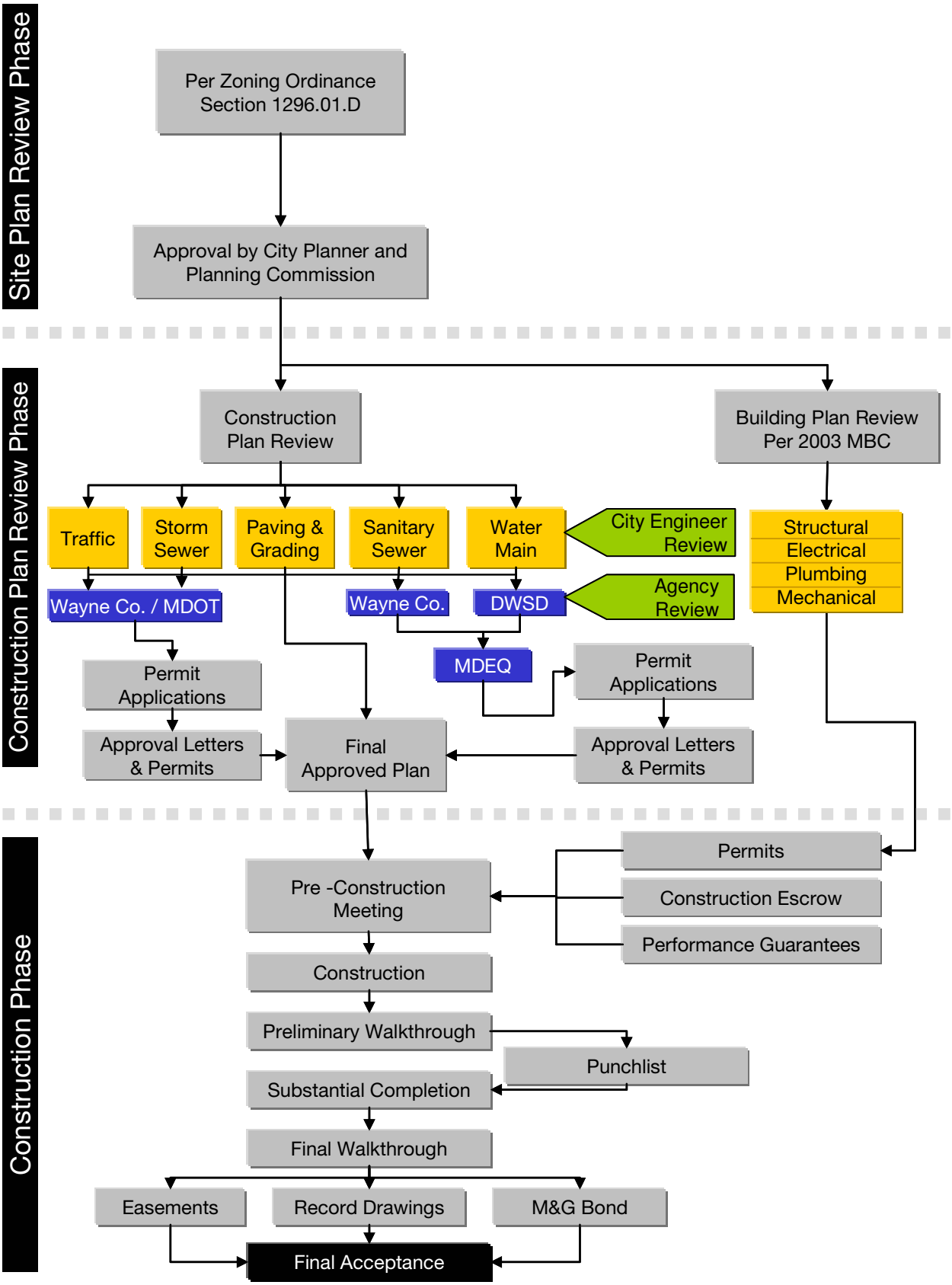
3. The executed grant of easement form along with a copy of the current property deed shall be returned to the City Engineer.

4. Prior to beginning construction, appropriate easements must be approved for all public improvements.

5. Upon completion of construction and prior to final acceptance, a copy of the appropriate recorded easements shall be submitted to the City Engineer for approval. Once easements documents are approved, the City Clerk's office will mail the Developer/Municipality the easements to be recorded by the County Register of Deeds. Once the easements are recorded with liber and page number, recorded copies will need to be forwarded to the Municipality and the City Engineer.

H. Site Improvement Review Flow Chart

The following page contains the general process for site plan approval, construction plan approval, and construction phase of a site improvement review.


Site Plan Review Phase
Per Zoning Ordinance Section 1296.01.D
Approval by City Planner and Planning Commission
Construction Plan Review Phase
Construction Plan Review
Building Plan Review Per 2003 MBC
Traffic
Storm Sewer
Paving & Grading
Sanitary Sewer
Water Main
City Engineer Review
Structural
Electrical
Plumbing
Mechanical
Wayne Co. / MDOT
Wayne Co.
DWSD
Agency Review
MDEQ
Permit Applications
Permit Applications
Approval Letters & Permits
Final Approved Plan
Approval Letters & Permits
Construction Phase
Permits
Pre -Construction Meeting
Construction Escrow
Performance Guarantees
Construction
Preliminary Walkthrough
Punchlist
Substantial Completion
Final Walkthrough
Easements
Record Drawings
M&G Bond
Final Acceptance

I. Insurance Requirements

1. Prior to the construction of any development and/or project improvements, the applicant's contractor will procure and maintain, during the term of the project, public liability and property damage insurance with a responsible insurance company which meet the approval of City of Lincoln Park, in such amounts as will be adequate to protect the public and all parties of interest, and will not be less than the limits set forth herein.

2. Type of insurance:
   a. Workmen's Compensation Insurance and Employer's Liability. Limits as required by laws of the State of Michigan
   b. Public Liability and Property Damage:
      i. Bodily Injury: Each Occurrence: $500,000
         Aggregate: $1,000,000
      ii. Property Damage: Each Occurrence: $250,000
         Aggregate: $500,000
   c. Owner's and Contractor's Protective Liability and Property Damage:
      i. Bodily Injury: Each Occurrence: $1,000,000
      ii. Property Damage: Each Occurrence: $250,000
         Aggregate: $500,000
         Or combined single limit of $1,500,000
   d. Motor Vehicle, (including Owner, Hired and Non-Owned Vehicles):
      i. Bodily Injury: Each Occurrence: $500,000
      ii. Property Damage: Each Occurrence: $200,000
         Combined single limit: $1,000,000

3. Policies will be made available to City of Lincoln Park for examination as to their validity and any undesirable exclusion deemed improper by legal opinion rendered to the City regarding same.

4. Underground construction, where applicable, will be specified in the coverage.

5. Certificates of coverage signed by the insurance carriers will include a guarantee that 30 days written notice will be given by the insurance carrier to City of Lincoln Park prior to cancellation of, or any change in, the respective policies. In the event that the insurance is cancelled, operations will cease prior to the cancellation date and will not resume until evidence is provided that proper insurance is again in effect.

6. **Additional Named Insured under Owners and Contractors Protective Public Liability and Property Damage Insurance will include City of Lincoln Park, the City Council and individual members of the City Council, City employees and agents for the City, and the City of Lincoln Park's Consulting Engineer and their employees.**

CITY OF LINCOLN PARK

Engineering Design Manual

A. General Plan Requirements

1. Plans shall be submitted on 24" x 36" white prints having blue or black lines. Only engineering scales may be used on site plans. Acceptable scales shall be 1"=20', 1"=30', 1"=40', 1"=50' and 1"=60', according to the size of the site. Generally the largest scale allowing complete depiction of the proposed development shall be used.

2. Should the size of the site prohibit the entire site from being shown on a single sheet, a 1"=100' or 1"=200' general plan is to be provided. The general plan should show the streets and their names, pavement, all units, all utilities and site dimensions.

3. The site plan or general plan shall also include abutting rights-of-way and lot or parcel dimensions.

4. A location map with the same orientation as the site plan shall be shown on the cover sheet. It shall show the location of the site relative to major roads.

5. Title block for each sheet is required. When many plans are in a set, each plan shall include a summary of that particular sheet in its title block. The current date and revision number must be included in the title block.

6. All plans submitted for review must be signed and sealed by a Professional Engineer or Architect licensed to practice in the State of Michigan. The name, address, and telephone numbers of the owner and design professional who prepared the plan shall be shown on the plans. All correspondence concerning the design of the site will be directed to the Engineer or Architect whose seal appears on the plan.

7. City of Lincoln Park Standard Notes must appear on the plans. Copies are enclosed in this document under Appendix A.

8. Proposed sanitary sewer and water main installations must be shown on the same plan view. Profiles are required for all sanitary sewers, all storm sewers and all water mains 8-inch diameter and larger. All pipe crossings and their elevations must be supplied in the profiles.

9. Profiles shall have a vertical scale of 1"=5' or less. The profile shall be shown directly below the plan view where possible.

10. All existing and/or proposed easements shall be shown.

11. All setbacks and building separations must be shown conforming to all requirements of the Zoning Ordinance. A striping plan for parking areas must also be shown in accordance with the Zoning Ordinance requirements.

12. Drawings must show all items in accordance with the Zoning Ordinance such as:

    a. height of all proposed buildings and lighting structures
    b. loading spaces
    c. Screen walls or berms, if required
    d. proposed building use
    e. required plantings
    f. location of all solid waste / dumpster areas and types of screening
    g. location, height, and setback of proposed signs
    h. location of gas, electric, telephone and cable television services
    i. zoning classification of proposed site and all abutting parcels

13. If the site is near an established floodplain, the floodplain contour shall be shown. All existing wetlands must also be shown.

14. The most current version of all pertinent City of Lincoln Park Standard Detail Sheets shall be made a part of the plan set. Copies can be obtained from the City of Lincoln Park Engineer for a nominal fee.

15. A copy of the general plan requirements checklist is provided in Appendix D, "Site Plan Requirements Checklist."

B. Topographical Survey

1. A complete topographical and property survey is required for all sites. The topographical survey shall cover a minimum of 100 feet offsite abutting the entire perimeter of the site. Existing elevations on a maximum 50 foot grid and locations, and/or elevations, of the following shall be included:

    a. Elevations at all property corners and along all property lines.
    b. Elevations at any sudden grade change.
    c. Existing drainage course including upstream and downstream.
    d. All utilities including sanitary, water main, storm, gas, telephone, electrical, etc. Pipe sizes, inverts, casting elevations and finish grades are required where applicable.
    e. Finished grade of all adjacent buildings.
    f. All easements.
    g. All other information pertaining to the site which may impact developmen

2. Road topography shall extend across the entire site with elevations shown on both sides of the street for:

    a. Property line or sidewalk
    b. Top of bank
    c. Ditch centerline
    d. Edge of shoulder
    e. Edge of pavement or top of curb
    f. Crown or centerline

3. Property lines must be indicated by distances and bearings.

4. A metes and bounds legal description of the property shall be included on the plans.

5. A minimum of two (2) benchmarks are required per plan sheet on the State Plane Coordinate System. All benchmarks shall be clearly indicated on the plans. The elevations shall be to North American Vertical Datum of 1929 (NAVD-29). Horizontal coordinates must be to State Plane Coordinates System. Benchmark information may be obtained from the City Engineer.

6. Existing right-of-way of adjacent roads must be indicated.

7. The 100-year Flood Plain must be shown by a contour line (if applicable).

8. All wetland boundaries shall be shown.

9. A Property Survey must be signed and sealed by a Land Surveyor licensed to practice in the state of Michigan.

10. A copy of the topography requirements checklist is provided in Appendix D, Site Plan Requirements Checklist.

C. Water Main

1. General

    a. All water main used, or intended for use, for the purpose of furnishing water for drinking, household purposes or which shall be authorized by the City, must come from a public water main.

    b. Domestic and fire suppression lines shall be separate and must come from a public water main.

c. All construction shall conform to the current City of Lincoln Park Specifications and Standards for Water Main.

d. When construction of water main is proposed, the current City of Lincoln Park Standard Water Main Detail Sheets must accompany the plans.

e. No other utilities or services can be placed in a water main easement, except where the utilities cross.

f. The following information must be shown in the plan view of the proposed water supply system improvements:

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

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

h. Water main jacking and boring shall extend a minimum of 10 feet outside the edges of pavement. Water main pipe shall be placed on plastics skids. ngth, size and invert of casing and pipe must be shown at all bore locations. All casing pipes shall be filled with sand when complete unless otherwise directed by the Engineer.

i. A copy of the water main requirements checklist is provided in Appendix D, Site Plan Requirements Checklist and also in Appendix E, Construction Plan Requirements Checklist.

2. Sizes and Distribution

   a. Eight (8) inches shall be the minimum size water main in City of Lincoln Park. Six (6) inch mains may be used only for single fire hydrant leads having a maximum length of 40 feet.

      Maximum length of dead-end mains are as follows:
      400 feet for 8-inch mains
      1000 feet for 12-inch mains

   b. Looping of water mains will be required wherever possible. All dead end mains must end with a gate valve and hydrant.

   c. For industrial and multiple sites, twelve (12) inch water main are the minimum size permitted.

   d. Services shall be a minimum of 1-inch diameter.

   e. Services will not be allowed from a six (6) inch hydrant lead or a water main over 16 inches in diameter. Water services may not connect to DWSD transmission mains.

   f. Facilities with fire suppression systems shall have water main designed to provide minimum fire flows of 4000 gallons per minute for commercial buildings and 6000 gallons per minute for industrial buildings.

3. Valve Spacing

   a. In commercial districts, there shall be a maximum of 500 feet between gate valves, and a maximum 800 feet in other districts.

   b. All gate valves are to be located in pre-cast 5-foot gate wells, except those at hydrants. Valves at fire hydrants shall be installed with a three-piece, adjustable valve box.

   c. Gate valves shall be located so they will not be in the sidewalk, driveway or pavement. Where possible, valves shall be located near street or road intersections.

   d. Gate Valve Spacing shall generally meet the following provisions in the event of breakage:

      i. No more than two (2) hydrants will be out of service, where possible
      ii. No more than four (4) valves shall have to be closed to isolate a break
      iii. No more than 30 single family units will lose service
      iv. No more than 30 multiple units will lose service

4. Metered Fire Service Connections

    a. All types of fire service connections shall require a meter and RPZ backflow prevention.

    b. Hydrant shall not be downstream of any check valve used for automatic sprinkler protection. Where hydrants are necessary, separate mains shall be installed for fire sprinkler services and hydrant protection.

    c. Internal fire sprinkler systems cannot be substituted for standard requirements for hydrants.

5. Hydrant Spacing and Height

    a. All hydrant leads shall be not less that 6 inch, or no more than 40 feet in length

    b. In single-family residential districts, no part of any building shall be more than 250 feet from a fire hydrant and there shall be no more than 500 feet between fire hydrants. In all other districts, no part of any building shall be more than 300 feet from a fire hydrant, and there shall be no more than 300 feet between fire hydrants.

    c. The distance required for the measurement of hydrant spacing shall be measured along the pubic or private roads, wherever the structure is located, and shall not be measured across private property.

    d. No parking will be allowed within ten feet of a hydrant. Any hydrant located in a parking lot stall shall be protected by a minimum of six-inch curb or standard hydrant guard posts.

    e. No trash receptacles shall be within 15 feet of a hydrant.

    f. Additional hydrants may be required depending on the specific use.

    g. Hydrant nozzles shall be set at twenty-one (21) to twenty-four (24) inches above the finished grade.

    h. All hydrants require pumper nozzles with at lease one Stortz fitting.

6. Materials

    a. All materials shall be in conformance with City of Lincoln Park current Standards and Specifications.

b. All water main pipe shall be Ductile Iron Class 54 (minimum) or as approved by the City Engineer.

c. All water services 2 inches and smaller (minimum is 1 inch) shall be "K-Copper" conforming to ASTH B-88 Standard specifications for Seamless Copper Water Tube. Taps for the service shall be at the 9:00 or 3:00 position and shall be completed by the Lincoln Park Department of Public Services.

d. For 2 inches and smaller services full 60 feet lengths of "K-Copper" pipe shall be used. Splicing of shorter pieces is not permitted.

e. Flare fittings or compression fittings are acceptable for water services. Saddles for water services are to be bronze with double strap or stainless steel.

f. All services 3 inches or larger shall be Ductile Iron Class 54 pipe.

g. Gate valves for 6 inch through 16-inch diameter will be iron body, resilient wedge with non-rising stem and all stainless hardware.

h. Gate wells shall be constructed of pre-cast reinforced concrete in accordance with the City standard details.

i. Fire hydrants shall be East Jordan Iron Works model 5BR 250. All conforming to all applicable AWWA standards.

7. Location

a. Water main shall be located between the road and right-of-way line on the south or east side of the street and 8 feet off the property line (opposite of the sanitary sewer), wherever possible. Variations will be approved on a case-by-case basis.

b. Horizontal Separation

Water mains and services must be laid at least 10 feet, horizontally, from any existing or proposed sewer (sanitary or storm). There is to be a minimum of 10 feet of undisturbed earth between the utilities. Should local conditions prevent a lateral separation of 10 feet, a water main may be approved by the City Engineer on a case-by-case basis to be laid closer than 10 feet to a sewer provided that the water main is laid in a separate trench or on an undisturbed earth shelf located on one side of the sewer at such elevation that the bottom of the water main and service is at least 18 inches above the top of the sewer.

c. Vertical Separation

Water main crossing of sewers shall be laid to provide a minimum vertical distance of 18 inches between the outside of the water main and the outside of the sewer. This shall be the case where the water main is either above or below the sewer. At crossings, one full length of water pipe shall be located so both joints will be as far from the sewer as possible. Special structural support for the water and sewer pipes may be required. When the elevation of the sewer cannot to buried to meet the above requirements, the water main shall be lower per City Standard Detail to meet this requirement.

d. Approval of the location of water meters and backflow preventors will be given by the City of Lincoln Park Department of Public Service prior to a permit being issued for occupancy. All backflow certifications must be submitted to the Department of Public Service prior to occupancy.

e. Stop boxes must be outside of easements and set at final grade elevation. Stop boxes shall not be encased in concrete. Stop boxes shall be McDonald with Ford B22-44 curb stops, arch pattern, 1-inch uppers with two hole lids and one 3-foot rod.

f. Water gate wells shall not be located in driveways or sidewalks.

8. Cover

a. Six (6) feet of cover, from final grade, is required for all water main. Wayne County requires seven and a half (7 ½) feet of cover within their right-of-way.

b. Water services require five and a half (5 ½) feet of cover.

c. Water mains and services require a minimum of 18-inch vertical clearance when crossing other utilities.

d. All water mains and water services shall be run as straight as possible in both the horizontal and vertical directions.

9. Easements

a. All public water mains must be located in an easement or public right-of-way. The minimum easement shall be 12 feet centered on the water main (6-foot on either side). The easement must be recorded prior to City's final acceptance of the system.

b. The easement description shall be prepared by a Licensed Land Surveyor or a Licensed Professional Engineer with the centerline of the easement coinciding with the water main alignment.

10. Notes

a. The City of Lincoln Park Standard Water Main Notes must appear on the plans.

b. A quantity list itemizing all proposed public water main construction must appear on the cover sheet.

11. Construction

a. No building permits will be issued for any portions above the foundation prior to the active service of proposed water mains and hydrants along with adequate access for fire fighting equipment and acceptance by the Department of Public Services.

b. No water main work can begin prior to the issuance of a Construction Permit by the Michigan Department of Environmental Quality and the City of Lincoln Park Department of Public Services.

D. Sanitary Sewer

1. General

a. When construction of a sanitary sewer is proposed, the City of Lincoln Park Standard Sanitary Sewer Detail Sheets must accompany the plans.

b. A separate building taps and service leads shall be provided for each building or dwelling.

c. Sewers must be public sanitary sewers when two or more connections are made.

d. All construction shall conform to the current City of Lincoln Park Standard Details and Specifications.

e. The minimum size for public sanitary sewers is 10 inches diameter. The minimum size for residential or commercial building leads is 6 inches.

f. No utilities or services shall be placed within the sanitary sewer easement except where the utilities cross.

g. Testing shall conform to the notes provided in the City Standard Sanitary Sewer Detail Sheets. A nine-point deflection test using a Mandrel will be conducted to ensure the flexible pipe has been properly bedded and back-filled.

h. Video taping of the complete sanitary system shall be completed by the contractor no sooner than 30 days after completion of backfill.

i. A copy of the sanitary sewer requirements checklist is provided in Appendix D, Site Plan Requirements Checklist and also in Appendix E, Construction Plan Requirements Checklist.

2. Design Velocities and Flows

a. Sewers shall be designed for mean velocities when flowing full, at design flows of not less than two (2.0) feet per second.

b. Maximum design velocities shall not be greater than 15 feet per second with pipe flowing full. The following table represents the minimum and maximum grade for public sanitary sewer. These may vary slightly based on pipe material selected

Size	Standard Grade	Minimum Grade	Maximum Grade
10”	0.60%	0.30%	6.2%
12”	0.40%	0.22%	6.0%
15”	0.24%	0.16%	3.6%
18”	0.18%	0.12%	2.8%
21”	0.14%	0.10%	2.2%

c. Sanitary sewers shall be designed on the basis of an average flow of 100 gallons per capita per day. The sewer shall be designed to carry the peak flow when running full. Peak flow shall be equal to:

$$\frac{18 + (P)^{1/2}}{4 + (P)^{1/2}} \text{ X average flow. (P = Population in thousands).}$$

In general, the current G.L.U.M.R.B. recommended standards for sewage works shall be followed for design of sanitary sewers.

d. When a smaller sewer joins a larger one, the invert of the larger sewer shall be lowered at least enough to maintain the eight-tenths (0.8) depth point of both sewers at the same elevation.

3. Manholes

   a. Sanitary sewers of 48-inch diameter and less shall not have more than 350 feet between manholes.

   b. Sanitary sewers greater than 48-inch diameter shall have manholes spaced at approximately 100 times the sewer diameter.

   c. An allowance of 0.10 feet in grade shall be made for loss of head through all proposed manholes.

   d. A manhole will be required at all changes in alignment, size, grade, at the end of each line, and at all intersections. Covers shall be marked "City of Lincoln Park Sanitary Sewer," according to the Utility Structure Cover Details in Appendix K.

   e. Manholes shall be located such that they will not be in a driveway, driveway approach, sidewalk, or street.

4. Materials

   a. All materials shall be in conformance with the City of Lincoln Park Current Standards and Specifications.

   b. Sanitary sewer pipe and fittings:

      i. Reinforced concrete pipe conforming to ASTM C-76; joints shall be modified tongue and groove conforming to ASTM C-443 compression type O-ring rubber gasket.

      ii. PVC pipe in sizes 6 inch through 15 inch shall be ASTM D3034 SDR26, and in sizes 18 inch through 27 inch shall be ASTM F679 SDR26. Joints shall be push on type with elastometric ring gasket, ASTM D-3212.

      iii. PVC, A2000 and perlite concrete truss pipe conforming to ASTMD-2680, latest revision; joints shall be plastic couplings chemically bonded in accordance with ASTM D-2680.

   c. Sanitary sewer manholes:

      i. Manholes shall be precast concrete structures in accordance with the City's standard details.
      ii. Precast manhole joints shall be sealed with rubber "O" ring gaskets.
      iii. Manhole steps shall be M.A. industries PS2-PFS or equal.

iv. Manhole frames shall be EJIW #1040 with APT or APTGS cover bearing the City of Lincoln Park logo. A detail of this is provided in Appendix K, Utility Structure Cover Details.
v. Precast concrete rings must be used for final adjustments, bricks will not be accepted.

5. Location

a. Sanitary sewers shall be located between the road right-of-way line and opposite of the water main wherever possible. Variations will be approved on a case-by-case basis.

b. The gas main shall be located on the same side of the street as the sanitary sewer wherever possible.

c. There must be a minimum alignment separation of 10 feet maintained between the sewer and all water main or storm sewer.

d. A minimum of 10 feet separation must be maintained between the sanitary sewer and any permanent structures, such as buildings.

e. 18-inch minimum clearance is required between storm sewer or water main. Top of pipe and bottom of pipe elevations at crossings must be provided.

f. See the water main section for additional location requirements.

6. Leads

a. Sanitary Sewer leads shall be a minimum of 6-inch diameter with a minimum slope of 1.0%. There shall be no size reduction for cleanouts, etc.

b. Invert elevations at the building of the finished floor grade of the building shall be provided on the plan.

c. Private sanitary sewer leads of excessive lengths, although not a public sewer, may require testing in addition to inspection. Each case will be considered individually by the DPS Director.

d. Building leads shall have a maximum of 100 feet between cleanouts. Cleanouts are to be J.R. Smith #4240U4 or approved equal. The number and location of cleanouts shall be approved by the Department of Public Service.

e. Risers shall be called for on the plans where the sewer is over 8 feet deep.

f. Where a previously constructed wye exists, it shall be utilized for the sewer lead unless otherwise directed by the Department of Public Service.

7. Drop Connections

Drop connections are required where the invert of the outlet pipe is greater than 18 inches below the invert of the inlet pipe. The drop connection must be an external drop, internal drop connections are not allowed.

8. Easements

a. All public sewers must be located in a public right-of-way or dedicated easement. The easement size will vary individually as required for maintenance access based upon site conditions and the sewer depth. The minimum easement width shall be 20 feet for sanitary sewers.

b. The easement description shall be prepared by a Land Surveyor or a Professional Engineer licensed within the state of Michigan, with the centerline of the easement coinciding with the centerline of the sanitary sewer. The easement must be recorded prior to City's final acceptance of the system.

9. Plan and Profile

a. All sanitary sewer must be shown in both plan and profile.

b. Pipe length, size, type and all easements must be shown on the plan.

c. The sanitary sewer profile shall include the following information:

i. Length of run between manholes
ii. Type and class of pipe between manholes
iii. Size and percent of slope of pipe between manholes
iv. Top of casting elevations of all manholes
v. Inverts of sewers at the manhole
vi. Existing and proposed ground elevations along the centerline of the sewer
vii. Manholes are to be numbered progressively
viii. All utility crossings with the top or bottom elevation (whichever is closest to the sanitary sewer) of the utility shown
ix. Special backfill areas (including granular backfill or stone areas)
x. Coordinates for all manholes, cleanouts, wyes, and ends of services.

10. Connections and Taps

a. Downspouts, weep tile, footing drains, sump pumps, or any conduit that carries storm or groundwater shall not be allowed to discharge into the sanitary sewer system. Illegal taps or discharges into the sanitary sewer may result in fines.

b. Industrial and Groundwater Leachate-type discharges shall not discharge to the sanitary sewer system without a permit from the City and other required agencies, including approval from the City Council for Groundwater Leachate-type Discharge.

c. The limits for fats, oil and grease concentration from industrial and commercial dischargers shall not exceed 100 mg/l.

11. Notes

a. The City of Lincoln Park Standard Sanitary Sewer Notes shall appear on the plans.

b. A quantity summary itemizing all proposed public sanitary sewer construction must appear on the cover sheet of the plans.

c. A copy of the "Basis of Design" as per Michigan Department of Environmental Quality rules **must** appear on the plans.

E. Storm Sewer

1. General

a. All storm sewer construction must, as a minimum, conform to the Wayne County Storm Water Management Program, Storm Water Management Standards, latest revision. This applies to both public and private storm sewer systems. A copy of the current Storm Water Management Program in effect at the time these engineering standards were created is included in Appendix I. Certain other minimum design requirements are presented here.

b. A minimum 10 feet horizontal separation is required between storm sewer and water main.

c. A minimum 18-inch vertical clearance between water main and sanitary sewer is required. Top of pipe and bottom of pipe elevations shall be provided.

d. Design velocity for storm sewer shall be a minimum of 2.5 feet per second and a maximum of 10 feet per second with pipe flowing full.

e. Discharge must not be averted to abutting properties. The outlet must be an approved public system or public open drainage course.

f. A storm drainage area map shall be provided in the plan set overlaid on a proposed grading plan for the site. This sheet shall include the storm system, sub-areas contributing to each structure, along with the overall drainage district limits (including off-site flow). Areas and structures shall be labeled and correspond with the calculations.

g. Composite runoff coefficient may be determined for each individual drainage area and calculations for each drainage area must be submitted as part of the design computations. Composite coefficient design is based on the sum of the percentages of each drainage area covered by impervious and pervious areas multiplied by the respective coefficient per the Wayne County standards.

h. Storm sewer design computations that include capacity, flow, velocity and hydraulic grade must be submitted for review on a sewer design form/spreadsheet. These calculations shall be provided on the plan set.

i. Typically, the hydraulic gradient shall be maintained within the pipe. However, the gradient must always be maintained a minimum 2 feet below the top of all structures.

j. Minimum size for storm sewers shall be 12 inches in diameter. However, a sump pump lead or roof drain which accepts no direct surface runoff may be 6 or 8 inches in diameter. Drain pipe shall have cleanouts at all pipe deflections. Drain pipes less than 12-inches shall not exceed 100 feet in length.

k. A copy of the storm sewer requirements checklist is provided in the Appendix D, Site Plan Requirements Checklist and also in Appendix E, Construction Plan Requirements Checklist.

2. <u>Depth of Sewer</u>

a. Minimum depth of cover to top of pipe shall be 3 feet. 2.5 feet of cover is acceptable for the most upstream catch basin.

b. The maximum depth to invert of any storm sewer shall not exceed the depth recommended by the manufacturer for each size and class of pipe.

c. Low-head (flat top) structures are required if cover is less than 4 feet at a structure. Plan and profile shall specify low-head structures where necessary.

3. Easements

a. All storm sewers and detention/retention basins must be located in a public right-of-way or dedicated easement. The exception to this would be a site with a single lot, building, and owner. The easement size will vary individually as required for maintenance and access based upon sewer depth.

b. Public storm sewer easements shall be dedicated to the appropriate Wayne County office.

c. Private storm sewer and detention/retention basin easements shall be dedicated to the organization or association responsible for maintenance of the storm sewer system.

d. The easement must be recorded prior to City's final acceptance of the system.

e. A Wayne County Storm Sewer Maintenance Agreement document shall be submitted with the easements.

4. Plan and Profile

a. All storm sewer must be shown in both plan and profile.

b. Pipe length, size, type and all easements must be shown on the plan.

c. The storm sewer profile shall include the following information:

i. Type and class of pipe between manholes and catch basins.
ii. Size and slope of pipe between manholes and catch basins.
iii. Top of casting and invert elevations of all manholes and catch basins.
iv. Existing and proposed ground elevation along the route of the sewer.
v. Progressive numbering system.
vi. All utility crossings (18 inch minimum clearance).
vii. Special backfill areas (shown graphically as well as in notes).
viii. Hydraulic grade line for the 10-year storm.

5. Grade

The following table represents the minimum and maximum grade for storm sewers. Note that these are minimum and maximum requirements and will generally be used only when topography requires it.

Size	Minimum Grade	Maximum Grade
12”	0.34%	4.80%
15”	0.26%	3.60%
18”	0.20%	2.60%
21”	0.16%	2.20%
24”	0.14%	1.80%
27”	0.12%	1.50%
30”	0.10%	1.30%
36”	0.08%	1.00%
42”	0.06%	0.80%
48”	0.05%	0.70%

6. Storm Structures (Manholes and Catch Basins)

a. Structures (manholes and catch basins) shall generally be placed at intervals of 250 feet, at every change in grade, alignment, direction, pipe size, and at all junctions. A 0.10-foot drop should also be placed at all changes in horizontal alignment. Maximum distance between manholes shall be 300 feet for sewers 36 inches in diameter and smaller. Sewer larger than 36 inches in diameter will be considered individually.

b. Catch basins shall be placed at all low points in the gutter lines and not over 500 feet from a high point. Multiple catch basins may be required at a low point based upon the drainage area (catch basins at low points shall not receive drainage from an area larger than one acre for a paved surface). Catch basins shall be placed at rear lot lines as directed by the City Engineer to provide proper site drainage.

c. Pre-treatment devices or sedimentation forebays are required prior to introducing storm drainage into detention or retention storage. Sizing of these chambers shall be per the manufacturers requirements and shall satisfy the requirements of the Wayne County Storm Water Standards manual, latest revision.

d. The minimum diameter for manholes and catch basins shall be 48 inches except for 2-foot inlets, which may be used at the beginning of lines located in greenbelt areas.

e. All storm structure sizing shall conform to the manufacturer's specifications based upon a 6-inch minimum spacing between openings, the pipe size being installed and it's orientation within the structure.

f. All connections must be made at a structure. Blind taps are not allowed except for sump pump and footing drain discharges.

g. Storm structures shall not be located in sidewalks or drive approaches.

7. Detention/Retention

a. All detention and retention pond design must, as a minimum, conform to the Wayne County Storm Water Management Program, Storm Water Management Standards, latest revision. Sample design formulas and calculations are provided in that manual. Certain minimum design requirements are presented here.

b. Where no outlet exists for a site, a retention pond shall be designed to be capable of storing two consecutive 100-year storms.

c. Maximum side slopes of basins are 5 horizontal to 1 vertical. If slopes steepness exceeds 5 horizontal to 1 vertical, a fence is required.

8. Materials

a. Storm Sewer Pipe
   i. Storm sewer pipe will conform to the ASTM "Specifications for Reinforced Concrete Culvert, Storm Drain and Sewer Pipe," ASTM C-76 for circular pipe, latest revision or C-507 for horizontal elliptical pipe, latest revision.

   ii. If other materials are proposed for use, the Owner will furnish the load carrying design analysis for the pipe for the proposed depth conditions. Plastic storm sewer pipe may be allowed in green belt areas only depending on the depth of the pipe. Type of plastic pipe will be reviewed by the City on a case-by-case basis. All storm sewer within the influence of pavement or within the public right of way shall be reinforced concrete pavement.

b. Pipe Joints
   i. Modified Grooved Tongue (MGT) pipe will have a rubber gasket snapped into a groove cast into the tongue.

   ii. The modified groove or bell end of the pipe will be made smooth and will have not over a 3.5 degree slope for sizes 10 to 24 inches, or a 2 degree slope for sizes 27 inches to 108 inches, tapered to fit the rubber

gasket to tolerances as determined by the gasket manufacturer. MGT joints will be lubricated and coupled according to the pipe manufacturer's printed instructions.

iii. Rubber gasket joints will follow the Tentative Specification for "Joints for Circular Concrete Sewer and Culvert Pipe, Using Flexible, Watertight, Rubber Type Gaskets," ASTM Designation: C-443, latest revision. Rubber gasket joints will be lubricated and coupled according to the pipe manufacturer's printed instructions.

c. Manholes
   i. Manholes will be constructed of concrete block or precast reinforced concrete sections.

   ii. Precast reinforced concrete manhole sections will follow the requirements of the ASTM "Specifications for Precast Reinforced Concrete Manhole Risers and Tops," ASTM Designation C-478, latest revision. Wall thicknesses will depend on depth and will be subject to the approval of the City Engineer.

   iii. Final grade adjustments for structures shall be made with pre-cast concrete rings. Brick adjustments shall not be accepted. Grade rings shall be a minimum of 3 inches thick and reinforced with 2 full circles of 3/16 inches diameter steel reinforcing wire. Manhole casting frame and concrete adjustments rings shall be secured to precast cone section with a minimum of 4, 5/8 inches diameter cadmium coated threaded studs or bolts. All joints in the assembly shall be sealed with rubber "O" ring gaskets.

   iv. Manhole covers and frames shall be EJIW #1040 with Type “C” cover or approved equal.

d. Catch Basins
   i. Catch basins shall be precast reinforced concrete manhole sections.

   ii. Catch basin and inlet frame and covers will be EJIW No. 5080 Type M1 cover or approved equal when in pavement edge or gutter line.

   iii. If accepted by the City, catch basin and inlet frame and covers can be EJIW No. 1010 Type M cover, or approved equal when in paved areas other than edge gutter line.

   iv. Catch basin and inlet frame and covers will be EJIW M.D.O.T. beehive with Type "N" cover or equivalent when in yard areas.

v. All catch basins and manhole shall have the words "Dump No Waste, Drains to Lakes and Streams" and a fish logo cast onto the covers and/or frame.

F. Paving

1. General

a. All paving improvements for public or private roadways must conform to the requirements of the City of Lincoln Park Standard Plans and Specifications. Some improvements may defer to the Michigan Department of Transportation Standard Specifications for Construction, latest revision, or the Wayne County DPS standards when work is proposed within their respective right-of-way.

b. Plan and profile views shall be provided for all proposed paving improvements.

c. The following information shall be shown in the plan view of the proposed pavement improvements:

i. Existing right-of-way or road easement as well as the proposed right-of-way or road easement.
ii. Centerline alignment, including curve data, stationing, edge of pavement and/or curb. Centerline and stationing are not required for parking lots.
iii. Location of existing and proposed topographic features including utilities, traffic control devices, and streetlight poles.
iv. Radii for all curves at intersections or at bends in the horizontal alignments.

d. The following information shall be shown in the profile view of the proposed pavement improvements:

i. Existing and proposed ground at the centerline.
ii. Percent of grade and vertical curve data.

e. Cross-sections of all proposed pavement improvements must be included on the plans showing dimensions, materials, type and thickness of the proposed pavement.

f. Edge drains will be required for all paving improvements.

g. Soil borings must be taken and analyzed by a professional engineering firm qualified to do such work at the locations of all proposed roads. The City may request copies of the report. It is recommended that a soils

investigation be done and a report prepared for all areas where pavement is proposed.

h. Sufficient proposed grades must be shown on the plan to clearly show the drainage patterns.

i. Passing lanes, turning lanes, acceleration lanes/tapers and deceleration lanes/tapers will be required according to Wayne County DPS guidelines.

j. The minimum general longitudinal paving slope shall be 1.0% for asphalt and 0.4% for concrete.

k. Provide adequate space for turning movements of vehicles including commercial trucks and fire engines.

l. A copy of the paving requirements checklist is provided in Appendix D, Preliminary Site Plan Requirements Checklist.

m. All signage shall be in accordance with the MMUTCD, latest edition.

2. Typical Road Cross Section

a. Cross sections and design guidelines for both public and private roads shall be provided on the plans with section thicknesses and materials clearly indicated.

b. Pavement for all public roadways shall consist of the following minimum design base courses, and wearing courses:

i. Base Course: 6" thick compacted aggregate MDOT 21AA

ii. Pavement Course: 7" thick plain concrete MDOT spec. 601 mixture P1 with aggregate base required.

The ultimate pavement design shall be subject to traffic and roadway functional classification requirements.

c. Pavement for all public alleys shall consist of the following minimum design base courses, and wearing courses:

ii. Base Course: 6" thick compacted aggregate MDOT 21AA

iii. Pavement Course: 6" thick plain concrete MDOT spec. 601 mixture P1 with aggregate base required

d. For parking lots and internal roads at nonresidential sites, the cross section requirements will be based on the functional class of the public road serving the property.

3. Sidewalks

a. Sidewalks are required as determined by the Planning Commission and Building Official and shall typically be located in the right-of-way, one foot from the right-of-way line.

b. The walk shall be a minimum of 5 feet wide constructed of 4 inches of concrete on 4 inches compacted sand subgrade. The walk must be continued through driveway sections where it shall be increased in thickness to match the thickness of the approach (minimum 6" residential, 8" commercial). Curbs must be tapered to meet the walk. Cross slopes on the sidewalk shall be ¼ inch per foot toward the street.

c. Proposed elevations must be indicated on the plans along the property line and on the walk, driveway, and intermittent locations (50' typical) along the length of the walk.

d. All sidewalk and sidewalk ramp construction shall be in accordance with current local, state and federal laws regarding barrier free requirements and shall be designed to meet the requirements of the American Disabilities Act, as amended.

e. Any structures, hydrants, poles, manholes, valve boxes, etc., that are existing along the alignment of the walk, must be adjusted or relocated at the expense and coordination of the Developer and shall conform to City specifications.

4. Parking

b. Concrete curb will be required for all paved drives and parking lots. Details of curb shall be provided.

c. Minimum parking lot surface grade for asphalt shall be 1.0% and 0.5% for concrete. In general, pavement grades shall not exceed 6%.

d. Parking spaces, maneuvering lanes and drives shall conform in size and configuration to the City ordinances.

e. Pavement shall consist of the following minimum design granular subbase, base courses, and wearing courses.

i. Base Courses

a) 6” thick compacted aggregate MDOT 21AA
b) 4” thick compacted HMA MDOT 13A

iv. Wearing Courses
a) 4” thick compacted HMA MDOT 13A or 36A in combination with a) above.
b) 1.5” thick compacted HMA MDOT 13A or 36A in combination with b) above
c) 6” thick plain concrete MDOT spec. 601 mixture P1 with aggregate base required

f. Parking lots for industrial uses will be reviewed on an individual bases with consideration give to intended use, type and volume of traffic, and subsoil conditions.

5. Materials

a. Bituminous pavement materials shall be in accordance with Michigan Department of Transportation (MDOT) requirements as specified on the typical sections.

b. Concrete pavement materials shall be in accordance with MDOT requirements as specified on the typical sections.

c. Aggregate base course shall be dense graded aggregate conforming to the requirements for MDOT specifications 21AA limestone compacted in place.

d. Subbase materials shall conform to the requirements of MDOT Class II granular material, compacted in place.

e. Subgrade material shall consist of loam, clay, sand, gravel or other similar material. The finished subgrade surface shall be free of all topsoil, stones, stumps, organic matter, peat, and frost heave material.

f. Underdrain pipe shall be smooth plastic pipe or corrugated plastic tubing meeting MDOT requirements.

G. Site Grading

1. The plans must have sufficient proposed elevations indicated to ensure that:

a. No surface drainage from the site is discharged into adjacent property including rights-of-way.

b. No adjacent property drainage is restricted or blocked.

c. The site, in general, drains without standing water.

d. All paving is in accordance with the standards outlined herein.

e. Grades provided cover at least 100 feet off-site in all directions.

2. Grading plans shall take into account the natural features of the land as much as possible.

3. Proposed grading shall meet existing abutting property line elevations.

4. High and low grade points, slope direction (by arrow) and the location of all catch basins, inlets and drainage ditches shall be shown on the grading plan.

5. Differentials in grade must incorporate a maximum of 4 horizontal to 1 vertical slope to the abutting property line.

6. Retaining walls are discouraged. Any wall separating a differential grade of more than 12 inches shall be considered a retaining structure and will require detailed structural engineering plans and design calculations signed and sealed by the design engineer to be submitted for approval.

7. Elevations representing the brick ledge, finished grade, and the first floor, must be indicated.

8. The grading plans shall show the existing elevation topography either by contour method or grade point grid method.

9. The existing and proposed floodplain contour shall be shown if the site is within an established floodplain. Wetland boundaries must also be delineated on the plan.

10. No filling will be allowed in any areas of land within the flood plain of a river, stream, creek or lake under the terms of a permit granted by the Michigan Department of Environmental Quality.

11. Any existing drain within the development shall be cleaned and graded to the original grades established by the Wayne County Department of Environment. The section of the drain downstream of the development will also be cleaned at the applicant's expense as directed by the City Engineer.

CITY OF LINCOLN PARK

Construction Services Manual

A. Escrow Account for Construction Services by City Engineer

1. This is a cash amount to be deposited with the City in an escrow account to cover the costs of the City Engineer's construction observation and testing. The deposit is based on the construction cost of all site stripping and earth balancing, water mains, sanitary sewers, storm sewers and paving that require Engineering inspection. The construction cost shall be defined as the designer's signed and sealed itemized cost opinion for the work based upon the plans and as approved by the City Engineer. The City Engineer will review the cost estimate to ensure its compliance with current construction costs.

2. The applicant shall deposit the construction services escrow monies with the City at least 72 hours prior to the preconstruction meeting. Instructions regarding the inspection escrow will be provided in the project approval letter from the City

3. Inspection will be charged against the escrow account at the hourly rate established in the latest agreement with the City. Overtime is defined as any hour worked over eight on any particular day or on Saturday, Sunday, or Holidays.

4. A minimum of two (2) hours will be charged if the inspector keeps a scheduled inspection appointment and the contractor does not work.

5. Any fraction of a ½ hour will be charged as a ½ hour.

6. If an account is depleted during the course of construction and changes to the approved plans resulted in additional project costs, additional deposits, as estimated by the City Engineer, shall be made. A certificate of occupancy will not be issued if the funds are not deposited.

7. The balance remaining in the escrow account will be returned to the depositor when the items following have been addressed: completion of the project and verification that all engineering costs have been billed and paid, record plan drawings, meeting the requirements specified in this manual, have been submitted to and approved by the City Engineer. All easements must be recorded and the applicant must submit the required letter of credit for maintenance and guarantee.

B. Pre-construction Meeting

1. A pre-construction meeting shall be held prior to the start of construction for all projects. Pre-construction meeting requests must be made at least 10 working days prior to the date of the proposed meeting. Additionally, the Applicant should request the meeting time at least 10 days prior to start of work but no more than 30 days prior to the start of construction. The Applicant, Project Managers, Contractors, Design Engineers, City Officials, and the City Engineer must be in attendance at the pre-construction meeting.

2. Certificates of insurance in accordance with the General Requirements and Procedures section of this document shall be submitted to and approved by the City prior to the scheduling a pre-construction meeting.

C. Inspection and Construction Requirements

1. City of Lincoln Park will provide inspection on all public utilities and on improvements in the City. Inspection will be full time on public water mains, water taps, sanitary sewer taps and any sewers or water mains connecting to a public system. Inspection will be provided on a full-time or part-time basis at the discretion of the City Engineer for private water mains, sanitary sewers, storm sewers, sidewalks and paving.

2. All improvements must be field staked under the supervision of a Professional Engineer or Land Surveyor licensed to practice in the State of Michigan. All staking must be based upon a coordinate system as shown on the plans approved by the City Engineer.

3. The applicant or his contractor is to provide all necessary labor and equipment to allow the City to perform a final inspection of all improvements.

4. Final as-built grade certification will be required indicating that all work has been completed in accordance with the approved plans. This will need to be certified by a Professional Engineer or Land Surveyor licensed to practice in the State of Michigan. An as-built coordinate plan shall also be required.

D. Record Plan Requirements

1. Two (2) sets of bond paper Record Plans, one (1) set of mylar Record Plans, and two (2) CD-ROM discs containing electronic record drawings and PDF plot plans must be submitted to and approved by the DPS Director and City Engineer prior to the City final acceptance of any water mains, sanitary sewers, detention systems, or storm sewers. The electronic drawings shall be AutoCAD (Version 14 or newer) format to the City Engineer. The electronic

drawings shall include all relevant CTB and XREF files and shall be on State Plane Coodinates. In order to reproduce the same presentation of plots, PDF files will also be required. The PDF files should be created using the same plotting configurations used to generate the original plan set. Note, for 24"x36" plan sheets use 600 dpi when creating the PDF. Refer to the City Record Plan Specifications located in the Appendix F of this document.

2. Prior to issuance of a certificate of occupancy, the Building Permit applicant shall submit to the Building Department a reproducible drawing showing the as-constructed location of all underground utilities (i.e., gas, electric, telephone, lighting, water service, on-site hydrants, sanitary sewer building lead, downspout connections, sump pumps, etc.).

3. The record plans must be signed and sealed by a Professional Engineer or Surveyor licensed to practice in the State of Michigan.

4. A copy of the Record Plan Requirements Checklist is provided in Appendix F.

E. Quality Control Testing Requirements

1. The City Engineers will engage a qualified geotechnical engineer (testing engineer) to perform trench backfill compaction testing.

2. Concrete and/or asphalt testing shall be required for all road, sidewalk, driveway, and parking lot paving. This testing will also be performed by the Testing Engineer.

3. The Applicant shall coordinate the testing between the Applicant's contractor and the Testing Engineer.

4. The testing by the Testing Engineer to determine if the work meets City requirements does not preclude the Applicant or contractor from having tests performed by another testing firm to determine if the work meets the requirements of the Applicant and/or contractor.

5. Pressure testing will be conducted by the Detroit Water and Sewer Department with the City Engineer or designee witnessing on behalf of the City. Water main testing shall be per Detroit Water and Sewer Department Standards.

6. No bacterial tests will be performed until pressure tests have been passed. Bacteria samples (two consecutive days) will be obtained by the Detroit Water and Sewer Department, with the Contractor present.

7. All other testing will be the responsibility of the developer. Notify both the City Engineer and Department of Public Works 48 hours prior to beginning the test for witnessing.

F. Maintenance and Guarantee Requirements

1. Prior to City final acceptance for continuous maintenance, all repair or corrective work shall be the responsibility of the Applicant. In an emergency situation, should the City have to make a repair, the developer shall reimburse the City the cost of such repair work.

2. Prior to final acceptance, the Owner shall post a letter of credit for maintenance and guarantee, in the amount equal to 50 percent of the cost of the improvements. A maintenance and guarantee form has been provided in Appendix G.

3. Prior to City final acceptance, as-built drawings must be submitted and approved prior to issuance of a final certificate of occupancy and an escrow refund.

Appendix A

City of Lincoln Park
General Notes

1. All workmanship and materials shall be in accordance with the current standards and specifications of the City of Lincoln Park or agency having jurisdiction.

2. The contractor and his subcontractors shall attend a pre-construction meeting at a time and place arranged by the engineer in which the affected utility companies and government agency representatives will be present.

3. After a pre-construction meeting is held, the contractor shall notify Orchard, Hiltz & McCliment, Inc. (734) 522-6711, a minimum of three (3) working days prior to the start of construction for inspection.

4. Contractor shall notify Miss Dig for existing utility stake out 72 hours in advance of construction. The project will be billed for excessive stakeouts.

5. Locations and elevations of existing underground utilities as shown on the plans are approximate. No guarantee is either expressed or implied as to the completeness or accuracy thereof. The contractor shall be exclusively responsible for determining and verifying the location, depth, and elevation of existing utilities, and proposed utilities crossing the construction area prior to start of construction. Contractor shall notify engineer if any conflicts are apparent or if locations and depths differ significantly from the plans.

6. All elevations refer to current North American Vertical Datum of 1929 (NAVD-29).

7. All properties or facilities in the surrounding areas, public or private, destroyed or otherwise damaged by the contractors operations shall be replaced or repaired to the satisfaction of the authority having jurisdiction of the property or facility by the contractor at their own expense.

8. Contractor shall provide and maintain all necessary barricades and traffic control devices required by the City of Lincoln Park or other agencies having jurisdiction.

9. All required soil erosion and sedimentation control measures by Wayne County or other agencies having jurisdiction must be in place prior to starting construction.

10. All trenches under a 1-on-1 influence of existing or proposed pavement, curb, sidewalk, and driveways shall be backfilled with MDOT Class II material (Trench B) and compacted in one-foot layers to 95% maximum unit weight (Modified Proctor).

11. All trenches parallel and adjacent to right-of-way, except where MDOT Class II material (Trench B) backfill is required, shall be backfilled with suitable excavated material (excluding blue clay) compacted in one-foot layers.

12. Four inches of MDOT Class II bedding shall be placed under all utilities and to one foot above the top of the pipe.

13. All public improvements and private improvements connecting to a public utility and/or right-of-way shall be field staked under the supervision of a professional engineer or land surveyor licensed to practice in the State of Michigan.

14. All work within Wayne County and State of Michigan right-of-way shall be in accordance with their specifications. A permit is required.

15. All distributed lawn areas shall be restored with 3 inches of topsoil and Class "A" sod. The Contractor will be responsible for watering and maintaining the sod until it is firmly knitted in place and in a vigorous growing condition. Areas designated by the Township Engineer as non-lawn areas, but grass areas, shall have upon them: 3 inches of topsoil, a chemical fertilizer, a Michigan Department of Transportation roadside mixture of seed sowed, and mulch applied in accordance with the City of Lincoln Park Standard Specifications.

16. Contractor shall provide a portable restroom for any construction site as directed by the City Engineer.

Appendix B

City of Lincoln Park
Standard Water Main Notes

1. All water main pipe 3-inch diameter and larger shall be ductile iron class 54, ANSI, A21.51 unless approved by the City Engineer.

2. Slip-on joints may be used except at tees, bends, and hydrants, where mechanical joints are required.

3. Four inches of compacted approved bedding shall be placed under all water main.

4. All water mains shall be installed a minimum of 5.5 feet below proposed finished grade. Seven and a half (7 ½) foot minimums are required when in County Right-of-Way. When a water main must dip to pass under a storm sewer or sanitary sewer, the sections that are deeper than normal shall have a minimum of 18-inch clearance between utilities and be in accordance with the standard detail.

5. No pipe shall be deflected more than 3 degrees. Where deflections greater than 3 degrees are required, vertical or horizontal bends will be required in accordance with the details.

6. A thrust block is required on the opposite side of each hydrant, tee, cap and bend.

7. Connections to existing water mains shall not be made until after hydrostatic/bacteriological tests have been successfully completed by the contractor and reviewed by the City Engineer.

8. The water main shall be pressure tested in accordance with AWWA C600 at 150 psi for 2 hours with an allowable leakage of $L=(SD\sqrt{P})/133,200$.

   L = gal/hour
   S = length in feet
   D = diameter in inches
   P = test pressure (psi)

   Test sections shall not exceed 1,000 feet.

9. Fire hydrants shall be East Jordan Iron Works (EJIW) 5BR 6-inch, AWWA C502 equipped with two – 2 ½ inch hose connections and one – 4 inch pump connector in commercial, industrial, and residential areas. Opening shall be in a counter-clockwise direction. Threads shall be Detroit Standard Threads with 1 1/8-inch pentagonal nut.

10. All hydrants shall be properly oriented prior to the pressure test.

11. All hydrants not in service shall be covered with black plastic until such time as they are put in service or removed.

12. All gate valves shall be right hand open resilient wedge valves as approved by the engineer.

13. Water gatewells, gate valves, stop boxes, or service leads shall not be located in driveways or sidewalks. If, during construction, any of the above items are located in the driveway or sidewalk, the items shall be removed and relocated by the developers, contractor, or owner at their own expense.

14. All water stop boxes shall be Ford B22-44 curb stop with McDonald stop box.

15. Gate valves and stop boxes shall only be operated by City of Lincoln Park Department of Public Service personnel except in an emergency.

16. Contractor shall compact all trenched and excavation in one-foot lifts by vibratory means during the backfilling operations to 95% maximum unit weight (Modified Proctor).

17. All construction shall conform to current City of Lincoln Park Detailed Specifications for water main.

18. The Detroit Water and Sewerage Department and the City of Lincoln Park Department of Public Service shall be notified at least three (3) working days prior to any water main construction.

19. Prior to the pre-construction meeting, a water use permit and meter must be obtained from the Township by the contractor. No water can be used for the site until the permit is issued and the meter is installed.

20. The contractor, developer, or homeowner must repair any water main or service lead leaks immediately. If it is not repaired within 24 hours, the City Department of Public Services will perform the repairs, bill the contractor, developer, or homeowner, and charge a minimum of $100 per day for water loss.

Appendix C

Lincoln Park
Standard Sanitary Sewer Notes

1. All sanitary sewer pipe shall be placed on bedding approved by the City Engineer prior to any construction beginning.

2. All sanitary sewer shall be PVC SDR 26 ASTM D-3034 (6"-15"), ASTM F-679 (18"-27") and of the size shown on the plans. All wyes, risers and building service leads shall be 6-inch PVC SDR 26 ASTM D-3034.

3. All sanitary sewer wye openings shall contain factory installed premium joints.

4. No connection receiving storm water, surface water, or ground water shall be made to sanitary sewers.

5. Infiltration for any section of sewer between manholes shall not exceed 100 gallons per inch diameter, per mile, per 24 hours.

6. Each wye or end of building lead to be capped shall have a cap with the same type of material as the lead and shall have a solvent weld joint. Cleanouts shall have JR Smith #4240U4 or approved equal covers.

7. Sanitary sewer leads shall be installed to a minimum of 1 foot past the right-of-way or easement line as shown on these plans.

8. A bulkhead shall be installed at each outlet to an existing system and shall not be removed until the new sewer system has been accepted by the City of Lincoln Park.

9. All sewers shall be subjected to an air filtration, or exfiltration test or a combination of same prior to acceptance. All sewers over 24-inch diameter shall be subjected to infiltration tests. All sewers of 24-inch diameter or smaller, where the groundwater level above the top of the sewer is over 7 feet, shall be subjected to infiltration tests. All sewers of 24-inch diameter or less, where the groundwater level above the top of the sewer is 7 feet or less, shall be subjected to air tests or exfiltration tests.

10. All sewers shall be televised by the contractor at no additional cost to Huron Township. The test results must be approved and a copy of the sewer videotape supplied to the Township prior to placing the sewer in service.

11. Manhole casting shall be watertight, bolt down type with "Wrapid Seal" Manhole Encapsulation System or approved equal external seal.

12. Contractor shall notify City of Lincoln Park (313) 386-9000, at least three (3) working days prior to start of construction.

13. All construction shall conform to current City of Lincoln Park Detailed Specifications for Sanitary Sewer and other agencies having jurisdiction over the construction area.

14. All stubs shall have a water and airtight bulkhead approved by the township.

15. Whenever existing manholes or sewer pipe are to be tapped, core manhole with a coring machine and install a rubber boot with stainless steel bands. Use Kor-N-Seal Korband external contraction bands or approved equal.

16. Deflection Tests:

    a. Deflection tests shall be performed on all flexible pipe. The test shall be conducted after the final backfill has been in place at least 30 days.

    b. No pipe shall exceed a deflection of 5%.

    c. If the deflection test is to be run using a rigid ball or mandrel, it shall have a diameter equal to 95% of the inside diameter of the pipe. The test shall be performed without mechanical pulling devices.

17. Sanitary sewer manholes or service leads shall not be located in driveways or sidewalks. If during construction any of the above items are located in a driveway or sidewalk, the items shall be removed and relocated by the developer, contractor, or owner at their own expense.

18. No footings drains or downspouts shall be connected to the building sewer.

19. The contractor must notify the Wayne County Department of Public Services 48 hours prior to the start of construction.

Appendix D

Site Plan Requirements Checklist

A. General Plan Requirements

- ❑ 1. Plans submitted on 24”x36” white prints having blue or black lines. Engineering scales of 1”=20’, 1”=30’, 1”=40’, 1”=50’ and 1”=60’, according to the size of the site.

- ❑ 2. Should the size of the site prohibit the entire site from being shown on a single sheet, a 1”=100’ or 1”=200’ general plan is to be provided showing the streets and their names, pavement, all units, all utilities and site dimensions.

- ❑ 3. The site plan or general plan includes abutting rights-of-way and lot or parcel dimensions.

- ❑ 4. A location map with the same orientation as the site plans shown on the cover sheet showing the location of the site relative to major roads.

- ❑ 5. Title block for each sheet with a summary of each particular sheet included in its title block.

- ❑ 6. Signature and seal of a Michigan Professional Engineer or Architect. The name, address, and telephone numbers of the owner, engineer and/or architect shown on plans.

- ❑ 7. City of Lincoln Park standard notes must appear on the plans (Appendix A).

- ❑ 8. Sanitary sewer and water main shown on the same plan view. Profiles for all sanitary sewers, all storm sewers and all water main 8 inches in diameter and larger.

- ❑ 9. Vertical scale of profile not greater than 1”=5’ and the profile should be directly under the plan view where possible.

- ❑ 10. All existing and/or proposed easements shown.

- ❑ 11. All setbacks and building separations shown and striping for parking areas (check with Zoning Ordinance for these).

- ❑ 12. Drawings show all items in accordance with the Zoning Ordinance such as:

    a. Height of all buildings and lighting structures
    b. Loading spaces
    c. Wall or berm, if needed
    d. Proposed building use

e. Required plantings
f. Location of all solid waste storage areas and types of screening
g. Location, height, and setback of proposed signs
h. Location of gas, electric, telephone and cable services
i. Zoning classification of proposed site and all abutting parcels

❑ 13. Pertinent City of Lincoln Park Standard Detail Sheets included with plans.

B. Topographical Survey

❑ 1. Topography needs to cover a minimum of 100 feet off-site. Existing elevations on a max. 50-foot grid of the following:

a. All property corners and along property lines
b. Any sudden grade changes
c. Existing drainage course including upstream and downstream
d. All utilities including sanitary, water main, storm, gas, telephone, electrical, etc. Pipe sizes, inverts, casting elevations and finish grades are required where applicable
e. Finished grade of all adjacent buildings
f. All easements

❑ 2. Road topography include elevations on both sides of the street for:

a. Property line or sidewalk
b. Corners of sidewalk ramps
c. Top of bank
d. Ditch centerline
e. Edge of shoulder
f. Edge of pavement or top of curb
g. Crown or centerline

❑ 3. Property lines identified by bearing and distance. Also existing rights-of-way for adjacent roads.

❑ 4. A minimum of two (2) benchmarks (NGVD-29) on State Plane Coordinates System per plan sheet.

❑ 5. A metes and bounds legal description of the property that closes within acceptable limits (1 part in 5000).

❑ 6. Show 100-year flood plain by contour line, if applicable.

❑ 7. All wetland boundaries shown, where applicable.

- ❑ 8. Property Survey signed and sealed by a licensed surveyor.

C. Water main

1. General

- ❑ a. All water main used for drinking, household purposes or any maintained by the City must be PUBLIC water main.
- ❑ b. Construction conforms to the current City Specifications and Standards for water main.
- ❑ c. Include City of Lincoln Park Standard Water Main Details Sheets.
- ❑ d. Water main easements must be a minimum of 12 feet wide. No other utilities or services placed inside a water main easement, except at a crossing.
- ❑ e. The Department of Public Services determines if the onsite water main will be public or private. All private main will require a backflow preventor and meter before any on-site hydrant.
- ❑ f. Water main and services run as straight as possible.

2. Sizes and Distribution

- ❑ a. Minimum size water main is 8-inch diameter. Hydrant leads can be 6-inches for a max length of 40 feet. No service leads can come from a 6-inch main.
- ❑ b. Maximum length of dead end mains are 500 feet for 8-inch and 1200 feet for 12-inch.
- ❑ c. Looping of water main whenever possible. Gate valve and hydrant at any dead end main.
- ❑ d. Min. size main for industrial and multiple sites is 12-inch diameter main.
- ❑ e. Services min. of 1-inch diameter.
- ❑ f. No services are allowed from a 6-inch hydrant lead or water main 16 inches and greater.

3. Valve Spacing

- ❑ a. Valve spacing in commercial district is a max. of 500 feet, max. of 800 feet in other districts.

- ❑ b. Gate valves located in pre-cast Gatewells. Hydrant valves located in three-piece adjustable valve box.

- ❑ c. Gate valve spacing must generally meet the following in case of breakage:

    i. No more than 2 hydrants can be out of service
    ii. No more than 4 valves have to be closed to isolate a break
    iii. No more than 30 single family units will lose service
    iv. No more than 30 multiple units will lose service

4. Metered Fire Service Connections

- ❑ a. No hydrants can be downstream of any check valve used for automatic sprinkler protection, use separate mains for fire sprinkler services and hydrant protection.

- ❑ b. Internal fire sprinkler systems cannot be substituted for hydrant requirements.

5. Hydrant Spacing and Height

- ❑ a. Spacing max. of 500 feet in single family residential.

- ❑ b. Commercial, industrial, and multiple spacing max. of 300 feet on line but may vary to meet these following requirements: all points on the exterior of a building no further than 250 feet from a hydrant, nor closer than 50 feet.

- ❑ c. No parking within 10 feet of a hydrant. Guard posts or 6-inch min. curb used to protect any hydrant located in a parking lot stall.

- ❑ d. No trash receptacles within 15 feet of a hydrant.

6. Materials

- ❑ a. All water main must be ductile iron class 54.

- ❑ b. All services 2 inches and smaller must be full 60-foot lengths of Type-K copper.

- ❑ c. All services larger than 2 inches shall be ductile iron class 54.

- ❑ d. Flare fittings are acceptable for water services. Saddles for water services are to be bronze with double straps or stainless steel.

- ❑ e. Gate valves for 6-inch through 16-inch diameter will be iron body, resilient wedge with non-rising stem and all stainless hardware.

- ❑ f. Gate wells constructed of pre-cast reinforced concrete.

- ❑ g. Fire hydrants specified as EJIW 5BR model.

7. Location

- ❑ a. Water main separation at least 10 feet horizontally from any existing or proposed sewer (storm and sanitary). If this cannot be met then the location will be approved on a case-by-case basis.

- ❑ b. Water main crossing sewers maintain 18 inches of vertical separation (either above or below the sewer). One full length of pipe located at crossing locations.

- ❑ c. Stop boxes outside of easements and set at final grade elevation and not encased in concrete.

- ❑ d. No gate wells can be placed in driveways or sidewalks.

- ❑ e. Locate water on the opposite side of the road from the sanitary sewer.

8. Cover

- ❑ a. 5 ½ feet of cover from final grade for water main and services. 7 ½ feet of cover is required within a 1 on 1 influence from final ground of a Wayne County right-of-way.

- ❑ b. Run water main and services as straight as possible.

- ❑ c. At least 18 inches of clearance between water main or services and all other utilities.

D. Sanitary Sewer

1. General

- ❑ a. Separate building tap and service for each building.

- ❑ b. When two or more connections are made to the sewer it is considered public sanitary sewer.

- ❑ c. Construction conforms to the current City Specifications and Standards for sanitary sewer.

- ❑ d. Minimum size for public sanitary is 8-inch diameter. Minimum size for building leads is 6-inch diameter.

- ❑ e. No other utilities placed inside the sanitary sewer easement except at crossings.

2. Manholes

- ❑ a. No more than 350 feet between manholes for sewers of 48 inches or less.

- ❑ b. Sanitary over 48 inches space manholes at approx. 100 times the sewer diameter.

- ❑ c. Manhole at all changes in alignment, size, grade, end of each line, and all intersections.

- ❑ d. Manholes are precast reinforced concrete with rubber "O" ring gaskets.

- ❑ e. Steps are M.A. industries PS2-PFS or equal.

- ❑ f. Frames are EJIW 1040 APT or APTGS cover bearing "City of Lincoln Park".

3. Location

- ❑ a. Minimum 10 feet horizontal separation from water mains.

- ❑ b. Sanitary located on opposite sides of the street as water main, where possible.

- ❑ c. Gas main located on same side of the street as sanitary, where possible.

- ❑ d. 18 inches minimum vertical clearance between sanitary sewer and all other utilities.

- ❑ e. Manholes not located in a driveway, approach, sidewalk or street.

4. Leads

- ❑ a. Minimum size of sanitary lead is 4-inch dia. with a 1.0% minimum slope.

- ❑ b. Maximum 100 feet between cleanouts on building leads.

- ❑ c. Risers used where the sewer is over 8 feet deep.

- ❑ d. Use existing wyes for leads where possible.

5. Easements

- ❑ a. Public sanitary sewer located in a public right-of-way or an easement. 20 feet width minimum. If over 10 feet deep, the width of the easement will be determined by the City Engineer.

E. Storm Sewer

Note: Storm is under the jurisdiction of the Wayne County Department of Public Services. Refer to the current Storm Water Management Program included in Appendix I of these engineering standards for additional information.

1. General

- ❑ a. All pipe and catch basin sizes noted on plans.
- ❑ b. Upstream/offsite drainage accommodated.
- ❑ c. Proposed invert and rim elevations for all storm structures on plans.
- ❑ d. Discharge not averted to abutting properties.
- ❑ e. General detention site drainage detail.
- ❑ f. Proposed collection points, system layout, sizes and outlets shown on the site plan.
- ❑ g. Preliminary storm calculations provided complete with detention sizing, pipe sizing, delineation of drainage areas, etc.
- ❑ h. Maintain 20 feet of separation from property lines.
- ❑ i. Located in public right-of-way or 12 feet wide minimum easement.

2. Location

- ❑ a. Minimum 3.0 feet of cover over pipe at all times.
- ❑ b. Minimum 18 inches vertical separation between storm sewer and all other utilities.
- ❑ c. Minimum 10 feet horizontal separation between storm sewer and water main.

3. Structures

- ❑ a. Oil water separator must be included in parking lots and for the catch basin prior to site outlet.
- ❑ b. Structures generally placed at 250 foot (max. 300 foot) intervals, changes in grade, alignment, direction, pipe size, and at all junctions.
- ❑ c. Drop of 0.10 feet placed at all changes in horizontal alignment.
- ❑ d. Structures located outside of sidewalks and driveways.
- ❑ e. Precast concrete or concrete block manholes with EJIW 1040 frame and type "C" cover, or equal.
- ❑ f. Precast reinforced concrete catch basins with EJIW 5080 frame and type "M1" cover, or equal, when in pavement edge or gutter line, or EJIW 1010 frame with type "M" cover, or equal, when in paved areas other than edge gutter line, or EJIW MDOT beehive with type "N" cover, or equal, when in yard areas.

F. Paving

1. General

- ❑ a. Following shown in the plan view:
  i. Existing right-of-way or road easement.
  ii. Proposed right-of-way or road easement.
  iii. Centerline of alignment, including curve data, stationing, edge of pavement and/or curb.
  iv. Location of existing and proposed topographic features.
- ❑ b. Following shown in the profile view:
  i. Existing and proposed ground at centerline.
  ii. Percent of grade and vertical curve data.
- ❑ c. Cross-sections of all proposed pavement included on the plans showing dimensions, materials, type and thickness of the proposed pavement.
- ❑ d. Minimum longitudinal paving slope of 1.0% for asphalt and 0.4% for concrete.
- ❑ e. Adequate space provided for turning movements of commercial trucks and fire engines.

2. Sidewalk

- ❑ a. Located within the right-of-way, one foot from the right-of-way line.
- ❑ b. 5 foot wide walk, 4 inches thick (6 inches across driveways). Cross slope of ¼ inch per foot towards the street.
- ❑ c. Adjust or relocate any structures, hydrants, poles, manholes, valve boxes that are existing along the alignment of proposed walk.
- ❑ d. Typical cross section for proposed walk provided.
- ❑ e. All sidewalks and sidewalk ramps meet the American Disabilities Act requirements.

G. Site Grading

- ❑ 1. Sufficient proposed elevations indicated to ensure that:
  - a. No surface drainage from the site is discharged into adjacent property including rights-of-way
  - b. No adjacent property drainage is restricted or blocked
  - c. The site in general, drains without standing water
- ❑ 2. Proposed grading meets abutting property line elevations.
- ❑ 3. Detailed structural engineering plans and design calcs for retaining structure separating a differential grade of more than 12 inches.
- ❑ 4. Elevations shown for brick ledge, finished grade, and the first floor.
- ❑ 5. Existing and proposed floodplain contour and wetland boundaries shown, if any.
- ❑ 6. High and low road grade points, slope direction and the location of all catch basins, inlets and drainage ditches are shown.
- ❑ 7. Differentials in grade incorporate a maximum of 4 horizontal to 1 vertical slope to the abutting property line.
- ❑ 8. Grades shown by grade point grid method with contours at appropriate intervals.

Appendix E

Construction Plan Requirements Checklist

A. General

All requirements specified in the Site Plan phase must appear on the plans along with the following required for Construction Plans.

B. Water Main

- ❑ 1. Plan view of the proposed water main includes the following:
  a. Type, class and size of pipe
  b. Length between fittings and/or appurtenances
  c. Water service locations and sizes
  d. Dedicated water main easement, width must meet which ever of the following is greater, minimum of 15 feet wide or twice the depth of bury plus the pipe diameter plus 2 feet

- ❑ 2. Profile view of the proposed water main must include the following:
  a. Type, class and size of pipe
  b. Length between fittings and/or appurtenances
  c. Top of casting elevation on valve wells and/or boxes as well as the finished grade for fire hydrants
  d. Crossing of all existing and proposed utilities
  e. Granular backfill, trench details, special bedding, bores and/or other special construction methods
  f. Existing and proposed ground elevations

- ❑ 3. Itemized quantity list included.

- ❑ 4. Meter and RPZ backflow preventer on fire service connections (note or detail).

- ❑ 5. Pumper nozzles on hydrants (note or detail).

- ❑ 6. Hydrant nozzles 21 inches-24 inches above finished grade.

- ❑ 7. Gate valves and hydrants in accordance with the City standard water main notes and details.

- ❑ 8. Easement description prepared by a land surveyor or a registered professional engineer licensed to practice in the state of Michigan with the centerline of easement coinciding with the water main.

- ❑ 9. The City of Lincoln Park standard water main notes must appear on the plans.

B. Sanitary Sewer

- ❑ 1. Sewers designed for mean velocities at design flow not less than 2.0 feet per second when flowing full, based on Manning's formula using an "n" value of 0.0013.

- ❑ 2. Maximum velocities no greater than 15 feet per second.

- ❑ 3. Designed on basis of an average flow of 100 gallons per capita per day to carry the peak flow when running full. Peak flow is:

  $[(18+P^{1/2}) / (4+P^{1/2})]$ x average flow
  P = Population in thousands

- ❑ 4. At joining of a small and large sewer, the invert of the larger sewer lowered enough to maintain 0.8 depth point of both sewers at the same elevation.

- ❑ 5. Allowance in grade of 0.10 feet through all proposed manholes.

- ❑ 6. Reinforced concrete pipe with compression type o-ring rubber gaskets or PVC pipe with push-on type joints with elastometric ring gasket.

- ❑ 7. Drop connections when the invert of the outlet pipe is greater than 24 inches below the invert of the inlet pipe. External drop only, internal is not allowed.

- ❑ 8. Sanitary sewer shown in both plan and profile. Profiles include the following information:

  a. Length of run between manholes
  b. Type and class of pipe between manholes
  c. Size and percent of pipe slope between manholes
  d. Rim elevation of all manholes
  e. Inverts of sewers at the manhole
  f. Existing and proposed ground elevations along centerline of sewer
  g. Manholes numbered progressively
  h. Top or bottom elevation (whichever is closest to sewer) of utility crossings
  i. Special backfill areas
  j. Coordinates for all manholes, cleanouts, wyes and ends of service

- ❑ 9. The City of Lincoln Park Standard Sanitary Sewer Notes on the plans.

- ❑ 10. Itemized quantity list included.

- ❑ 11. Copy of "Basis of Design" per MDEQ rules on the plans.

- ❑ 12. No discharge from downspouts, weep tile, footing drains, sump pumps, or any water-carrying conduit into the sanitary system.

- ❑ 13. No industrial and groundwater leachate-type discharges into the sanitary system without a permit from the Township and other required agencies.

- ❑ 14. Concentration of fats, oil and grease from commercial and industrial dischargers shall not exceed 100 mg/l. Installation of an interceptor for FOG at a minimum of 750 gallons necessary to achieve and maintain the discharge limits.

- ❑ 15. Easement description prepared by a licensed land surveyor or a registered PE with the centerline of easement coinciding with the sewer.

C. Storm Sewer

Note: Storm discharge to County drains is under the jurisdiction of the Wayne County DPS. Refer to the current Storm Water Management Program included in Appendix I of these engineering standards for additional information. Storm not connecting directly to county facilities will still follow the aforementioned standards but will be approved by the City and their Engineer.

- ❑ 1. Following storm sewer information shown in plan view:

    a. Length between manholes.
    b. Type, class and size of pipe.
    c. Direction of flow.
    d. Top of casting elevations.
    e. Manholes numbered progressively.

- ❑ 2. Profiles shown for all storm sewer that includes the following:

    a. Hydraulic gradient line.
    b. Length, type, class, size and slope of pipe between manholes.
    c. Top of casting and sewer invert elevations at all manholes.
    d. Existing and proposed ground elevations.
    e. All utility crossings.
    f. Manholes numbered progressively.
    g. Stationing coinciding with that of the road layout.
    h. Check minimum storm pipe slope requirements.
    i. Special back fill areas.

- ❑ 3. Itemized quantity list included.

- ❑ 4. Design velocity minimum of 2.5 feet per second and maximum of 10 feet per second.

- ❑ 5. Calculations and details for design of detention.

- ❑ 6. Final storm calculations provided complete with detention sizing, pipe sizing, delineation of drainage areas, etc.

- ❑ 7. Composite runoff coefficient computed for each individual drainage area and applied to storm system calculations.

- ❑ 8. Storm drainage map provided including the storm system, areas contributing to each structure and overall drainage districts.

- ❑ 9. Minimum structure size 48-inch diameter, except for 24-inch diameter inlets located at the beginning of lines in greenbelts.

- ❑ 10. Storm structures sized to conform to manufacturer's specifications based upon a 6-inch minimum spacing between openings, the pipe size being installed and it's orientation within the structure.

- ❑ 11. Storm sewer pipe conforms to ASTM C-76 for circular pipe or C-507 for elliptical pipe.

- ❑ 12. Modified grooved tongue joints with rubber gasket.

D. Paving

- ❑ 1. Sufficient proposed grades shown on the plan to clearly show the drainage patterns.

- ❑ 2. Proposed elevations along the property line and on the walk, driveway, and intermittent locations (50 feet typical) along the walk.

- ❑ 3. HMA and concrete pavement materials meet requirements as specified by the City, Wayne County DPS or MDOT.

- ❑ 4. Aggregate base course conforms to MDOT requirements for 21AA.

- ❑ 5. Subbase conforms to MDOT Class II granular material requirements.

- ❑ 6. Underdrain pipe meets MDOT requirements for smooth plastic pipe or corrugated plastic tubing.

Appendix F

Record Plan Requirements Checklist

A. General

- ❑ 1. Two (2) sets of bond paper record plans and one (1) mylar set submitted to the Township Engineer.

- ❑ 2. Two (2) CD-ROM discs containing electronic record drawings in AutoCAD version 14 or newer and PDF plot plans. PDF files will be required using the same plotting configurations used to generate the original plan set. Note, for 24"x36" plan sheets use 600 dpi when creating the PDF.

- ❑ 3. For a Building Permit applicant, submit to the Building Department a reproducible drawing showing the as-constructed location of all underground utilities (i.e., gas, electric, telephone, lighting, water service, on-site hydrants, sanitary sewer building lead, downspout connections, sump pumps, etc.)

- ❑ 4. Record plans signed and sealed by a Professional Engineer or Surveyor licensed to practice in the State of Michigan.

- ❑ 5. Include record plan quantities for all items regarding water main, sanitary sewer, storm sewer, paving operations, etc.

- ❑ 6. Locations shown on the plans with an accuracy of +/- one foot.

B. Water Main

- ❑ 1. Indicate the offset of water mains from nearest property line.

- ❑ 2. Locate gate valve and wells, hydrants, stop boxes and all water system appurtenances from fixed objects such as back-of-curb lines.

- ❑ 3. The following shown in the water system plan sheets as constructed:

    a. Lengths between gate valve & wells, hydrants and appurtenances
    b. Size of pipe
    c. Type and class of pipe, including poly wrap
    d. Finish grade of hydrants
    e. Top of casting grades for gate valves and wells
    f. Horizontal bend locations
    g. Location of thrust blocks & types of restraints
    h. Sequentially numbered gate valve & wells, and hydrants
    i. Permit numbers from DWSD and MDEQ
    j. Manufacturer of pipe, hydrants, and valves
    k. Show all water main easements on plan

l. Provide sketch and legal description of water main easements

❑ 4. The following shown in the water system profile sheets as constructed:

a. Lengths between gate valves & wells, hydrants, and appurtenances
b. Size of pipe
c. Type and class of pipe
d. Gate valve and well locations
e. Hydrant location (identify special structures such as blow off)
f. Air relief valves/blow off valve locations
g. Vertical bend locations
h. Top of casting grades for gate valves and wells

C. Sanitary Sewer

❑ 1. Indicate the offset of sanitary sewers from property lines.

❑ 2. The following shown in the sanitary sewer plan sheets as constructed:

a. Lengths between manholes
b. Size of pipe
c. Lengths of casing pipe (if applicable)
d. Ties to manholes from fixed objects such as back-of-curb lines
e. Type and class of pipe and joint
f. Top of casting grades for manholes
g. Wye locations
h. Permit number from MDEQ
i. Manufacturer of pipe and manholes
j. Sequential manhole numbering
k. Show all sanitary sewer easements on plans
l. Provide sketch and legal description of sanitary sewer easements

❑ 3. The following shown in the sanitary sewer profile sheets as constructed:

a. Lengths between manholes
b. Size of pipe
c. Lengths of casing pipe (if applicable)
d. Location and depth of wye & riser
e. Invert grades
f. Type and class of pipe and joint
g. Top of casting grades for manholes
h. Percent slope between manholes
i. Sequential structure numbering

D. Storm Sewer

- ❑ 1. Indicate the offset of storm sewers from property lines.

- ❑ 2. The following shown in the storm sewer plan sheets as constructed:

    a. Lengths between manholes, catch basins and inlets
    b. Size of pipe
    c. Ties to manholes, catch basins and inlets from fixed objects such as back-of-curb lines
    d. Type and class of pipe and joint
    e. Top of casting grades for all storm structures
    f. Sequential structure numbering
    g. Special structures (low head, sumps, large diameter, etc.)
    h. Permit number from Wayne County
    i. Show all easements for storm sewer
    j. Provide the as-constructed storm sewer calculations
    k. Provide sketch and legal description of storm sewer and detention/retention basin easements

- ❑ 3. The following shown in the storm sewer profile sheets as constructed:

    a. Lengths between manholes, catch basins, and inlets
    b. Size of pipe
    c. Type and class of pipe and joint
    d. Invert grades
    e. Top of casting grades for all structures
    f. Sequential structure numbering
    g. Percent slope between manholes

E. Paving

- ❑ 1. Width and station of pavement measured from the centerline for the following:

    a. At end of radius of intersections
    b. At beginning and end of tapers
    c. Any changes in alignments
    d. Radius at intersections
    e. Right-of-way survey data

- ❑ 2. Location, width and radius of all drives.

- ❑ 3. Location, width, ramps, and changes in alignment for sidewalks.

F. Site Grading

- ❑ 1. Submit a sealed grading certificate attesting that finish elevations are in compliance with approved grading plan along with the as-constructed grading plan showing any changes that were made in the field.
- ❑ 2. Indicate the offset of building and all utility structures.
- ❑ 3. Elevations of all property corners and property lines.
- ❑ 4. Sudden grade changes.
- ❑ 5. All drainage courses including upstream and downstream
- ❑ 6. All utility structure top of casting or ground elevations
- ❑ 7. 100 year floodplain contour elevation (if applicable)
- ❑ 8. All wetlands and easements shown on the plans.

Appendix G

MAINTENANCE AND GUARANTEE FORM

(for private site development)

Obligee Review or Project No._____ Bond No._____
(if applicable)

KNOW ALL MEN BY THESE PRESENTS:

That we, the developer, _____ (hereinafter called Principal), provide a Letter of Credit unto the municipal/public agency known as _____ _____ (hereinafter called Obligee) in the full and just sum of _____ Dollars and _____ Cents ($_____), lawful money of the United States of America, for the payment of which sum, well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, said Principal has constructed or caused to have constructed the following described public improvements in a public easement and/or right-of-way:

(Check all applicable items)

_____Storm Sewer System
_____Sanitary Sewer System
_____Water Main System
_____Roadway
_____Sidewalk or Pathway
_____Other: _____

which have been or are about to be accepted by the Obligee for the project known as _____ _____ and located in Section _____, T_____, and R_____; more specifically at _____.

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 Letter of Credit shall be used to take such action as it deems necessary to insure performance of the Principal's obligation. If such defect is not corrected, then the Obligee shall have the right to correct such defect and the Principal, shall pay all costs and expenses incurred by Obligee in correcting such defect; including but not limited to, the engineering, legal, administration 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 may take immediate steps to repair or barricade such defects without notice to the Principal. In such accounting, the Obligee shall not be held to obtain the lowest figures for the doing of the work, or any part thereof, but all sums actually paid therefore shall be charged to the Principal. In this instance, the judgment 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 brought or claimed against them for, or on account of, any injury or 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, of the State of Michigan.

NOW, THEREFORE, if the said Principal shall for a period of ____ year(s) from and after the date of 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 ____ year(s) from the date of acceptance by the Obligee.

IN WITNESS WHEREOF, the parties have caused this instrument to be signed and sealed by their respective authorized officers this_____day of_____,
20___.

WITNESS

_____

Name:_____

PRINCIPAL

_____
(seal)

By:_____

Name:_____

Title:_____

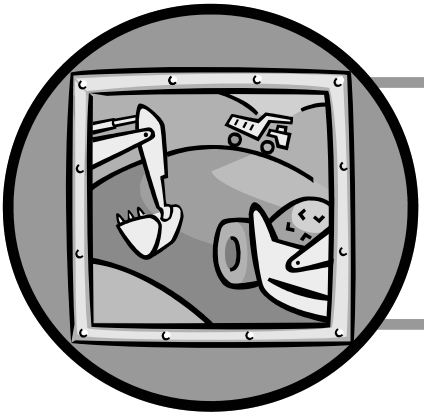
Address:_____

_____

Phone:_____

Fax:_____

Appendix H



Permit Procedures For Soil Erosion And Sedimentation Control

As prescribed by Part 91 of Act 451, The Natural Resources and Environmental Protection Act.

This earthwork project will be assigned a specific Soil Erosion and Sedimentation Control Project/Permit (SESC #) number which will always appear in the caption of each letter referencing to same. All your correspondence with this Division concerning this earthwork project must refer to this assigned number.

Wayne County
Department of Environment
Land Resource Management
Division
3600 Commerce Court, Bldg. E
Wayne, Michigan 48184
Phone: (734) 326-3936
Fax: (734) 326-4421

Robert A. Ficano
County Executive

Department of Environment
Wayne County

Revised August 2007

http://www.waynecounty.com/doe/land/permitInfo.htm

The Soil Erosion and Sedimentation Control Permit

This permit is designed to help protect Michigan's water resources from sediment pollution

As parcels of land are cleared for the construction of subdivisions, industrial parks and shopping centers, large amounts of soil are disturbed and accelerated soil erosion occurs. Soil and sediment from these disturbed areas finds its way offsite into waterways causing clogged ditches, culverts, and storm sewers. Sediment discharge reduces channel capacity and may increase flooding. Sediment fills in wetlands, ponds, lakes, and reservoirs resulting in damage to aquatic plant and animal habitat. To curtail the amount of sediment damage to Michigan waterways from accelerated soil erosion, Part 91 of the Natural Resource and Environmental Protection Act was adopted.

Who needs a permit?

All earth changes require a soil erosion permit prior to beginning earthwork if:

- The land area to be disturbed will be one acre (43,560 sq. ft.) or more in size, **or**...
- The earth change is within 500 feet of a lake or stream of this state. (Note that county drains and wetlands regulated under Parts 301 and 303 of Act 451, the Natural Resource and Environmental Protection Act are considered waters of the state.)

Determine if the project site will have earthwork over one acre in size or within five hundred feet of a water of the state to determine if you need a soil erosion permit.

Failure to obtain a soil erosion permit, where one is necessary prior to commencing earth change activity, is a violation of Part 91.

If you are in doubt whether a permit is necessary, contact the Wayne County Department of Environment, Land Resource Management Division at (734) 326-3936.

"Sediment is the greatest pollutant by volume entering Michigan lakes and streams."
Michigan DEQ

Communities in Wayne County which are municipal enforcing agencies as of August 2007

Belleville
City of Plymouth
Dearborn
Grosse Pointe Woods
Livonia
Southgate
Taylor
Trenton
Westland
Wyandotte

Jurisdiction

The Wayne County Department of Environment, Land Resource Management Division is currently responsible for issuing MDEQ prescribed permits for earth change projects subject to Part 91 of Act 451. That responsibility is carried out in all cities, villages, and townships in Wayne County **EXCEPT** those listed at left. The communities listed at left have adopted soil erosion ordinances and have had their local ordinances and soil erosion and sedimentation control programs approved by the Michigan Department of Environmental Quality. Since other community ordinances may be approved in the future, please contact this Department for current approval status.

PERMIT PROCEDURES

Part 91 of Act 451 of 1994

Permit No: _____
Submittal Date: _____
Check No.: _____

Permit application instructions are found on Page 6.

General Information:

A. Project Name: _____

B. Community: _____ Lot Numbers: _____

C. Section No.: _____ Nearest Major Crossroads: _____

D. Address of Property (if known): _____

Names, Addresses and Phone Numbers (Please Print or Type):

Address #1: Property Owner of Record

Company Name: _____
Address: _____
_____
City: _____
State: _____ Zip: _____
Legal Agent: _____
Phone: ( ) _____
Pager: ( ) _____
Fax: ( ) _____
E-mail: _____

Address #2: Applicant

Company Name: _____
Address: _____
_____
City: _____
State: _____ Zip: _____
Legal Agent: _____
Phone: ( ) _____
Pager: ( ) _____
Fax: ( ) _____
E-mail: _____

Address #3: Erosion Control Plan By:

Company Name: _____
Address: _____
_____
City: _____
State: _____ Zip: _____
Contact Person: _____
Date of Plans: _____
Phone: ( ) _____
Fax: ( ) _____
E-mail: _____

Address #4: Project Contact:

Contact Name: _____
Company Name: _____
Address: _____
_____
City: _____
State: _____ Zip: _____
Field/Cell Phone: ( ) _____
Phone: ( ) _____
Fax: ( ) _____
E-mail: _____

Please fill out all information completely. Incomplete applications WILL BE RETURNED.

Project Information:

Type of Development: (Check One)

☐ Res. Subdivision ☐ Commercial ☐ Utility ☐ Industrial ☐ Multi-Family

☐ Other (Specify): _____

Total area of parcel: _____

Total area of proposed earth disturbance (**in acres, round up to next whole acre**): _____

Has earth disturbance started on site? (Yes or No) _____

Anticipated earth disturbance starting date(MM/YY): _____

Anticipated final inspection date (MM/YY): _____

Type of Soil(s): _____

Description of proposed earth disturbance. (Example: Grading and excavation for the construction of a…)

_____

_____

Hydrologic Characteristics of Site:

Type of ultimate drainage outlet(s):

_____ County Drain Name of Drain: _____

_____ Lake/Pond Name of Lake/Pond: _____

_____ River/Stream Name of River/Stream: _____

_____ Enclosed Drain Name of Drain: _____

_____ Wetland _____ Open Ditch _____ City Sewer _____ County Sewer

Does the project include any work within a lake, stream, flood plain, county drain or wetland (Yes or No)? _____

Is an MDEQ Wetland Permit required (Yes or No)? _____
Wetland as defined in Section 301/303 of PA 451 of 1994
If yes, what is the MDEQ File No.?: _____

In an MDEQ Floodplain Permit required (Yes or No)? _____
Floodplain as defined in Section 31 of PA 451 of 1994
If yes, what is the MDEQ File No.?: _____

Distance to nearest drain, lake/pond, river/stream, wetland (in feet) _____

Name? _____

Fees: (Fee schedule on page 6. **Round up to next whole acre**.)

Plan Review Fee	Permit and Inspection Fee	Total
$	$	$

Performance Deposit: (This is not a fee. $1500 per acre.)

Write the total amount in the box below the appropriate deposit type.

Surety Bond	Irrevocable Letter of Credit	Cashiers Check
$	$	$
Surety Bond #	Letter of Credit #	Check # Tax ID# Required

Enforcement Agreement

(Please Read Carefully Before Signing)

This permit will expire 30 months from the date of issue. Should the project not be completed within that period, I agree to apply for a permit renewal and pay the permit renewal fee.

Should I intend to sell any or all of the property while the permit is active, as a condition of sale, I shall:

A. Direct the purchaser to make application to this Office for a replacement SESC permit as the new property owner of record, or,

B. Ensure that I am legally empowered as an agent of the new land owner to install, maintain, and implement all required erosion control measures as specified by the SESC permit and approved plan.

Should an inspection reveal that soil erosion and sedimentation control measures have not been installed or maintained five (5) days after a written Notice of Violation has been issued, Wayne County, or an agent retained by Wayne County, may install or repair the required measures as authorized by Section 9119 of Part 91 of Act 451 of 1994. The cost of the work will be billed to the owner of the land, and if not paid, the performance deposit will be utilized as payment, or a lien may be filed on the property as provided under Section 9120 of Part 91.

Signature:

I have read and understand the information contained in this permit application package. I intend to comply, to the best of my ability, with the terms and conditions of the permit and the approved Erosion Control Plan in conformance with Part 91 of Act 451 of 1994.

_____

Owner/Owner's Legal Agent (signature) *Date*

_____

Applicant/Applicant's Legal Agent (signature) *Date*

BOTH SIGNATURES ARE NEEDED, EVEN IF SAME PERSON

Permit Application Instructions:

1.) Complete all sections of the application. Type or print clearly all responses.

2.) Prepare three (3) sets of Soil Erosion and Sedimentation Control Plans including all of the requirements on Page 7 of this application.

Note: THE SOIL EROSION AND SEDIMENTATION CONTROL PLAN IS THE MOST IMPORTANT PART OF THIS APPLICATION. ANY APPLICATION RECEIVED WITH INCOMPLETE SOIL EROSION CONTROL PLANS WILL BE RETURNED.

3.) Determine the appropriate fee according to the fee schedule below. **Checks for payment of fees are to be made payable to Wayne County and are to be submitted with the application for permit.**

4.) Prepare an appropriate performance deposit as described on Page 8 of this application.

5.) Submit Items 1 through 4 a minimum of one month before project start-up to the Land Resource Management Division of the Department of Environment, 3600 Commerce Court, Building E, Wayne, Michigan 48184.

6.) The Wayne County Department of Environment will approve, deny, or require modification of the application for a Soil Erosion and Sedimentation Control Permit within thirty (30) days of receiving the completed application. Notification of approval or non-approval will be by certified mail or hand delivered to the applicant. If not approved, the enforcing agency will advise the applicant of deficiencies in the application and advise them of requirements for

Soil Erosion and Sedimentation Control Fee Schedule

Fees Effective October 1, 2003

Permit Class	Size of Earth Change	Plan Review Fee	Permit and Inspection Fee
Single Family Residence Construction	—	$60.00[1]	$240.00 per 2 years
Construction	Less than one acre	$60.00	$290.00
	One acre to 9 acres	$60.00 per acre	$290.00 per acre
	10 acres to 39 acres	$600+$40/acre over 10 acres	$2900+$150/acre over 10 acres
	40 acres and above	$1800+$30/acre over 40 acres	$7400+$100/acre over 40 acres
Annual[2]	—	$60/acre	$50/acre/year

Notes:

1.) When a request is submitted for issuance of a permit waiver, and a field visit is necessary to determine that a waiver can be granted, a $60.00 fee will be charged. If waiver cannot be granted, and a permit is required, the $60.00 fee will be applied towards the total permit fee.

2.) Annual permits are issued for sanitary landfills, sand and gravel operations, large earth fill projects and similar operations that will continue for more than thirty (30) months.

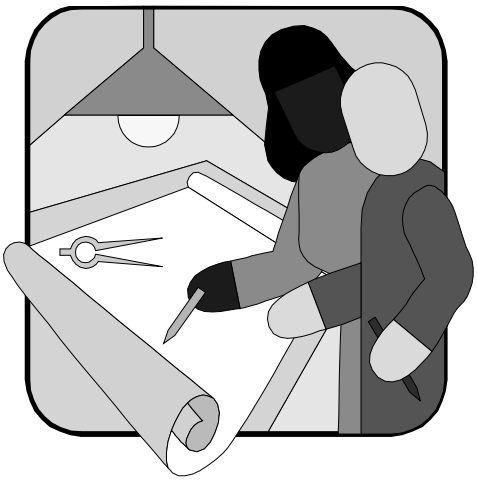
3.) Fees apply to total project site unless applicant clearly demonstrates on the plans that only a specific portion of the site will involve an earth change. For projects in easements or rights-of-way, determine the earth change area by multiplying project length by total construction easement width. Minimum easement width - 20 feet.

4.) Round fractional acreage up to nearest whole acre.

Plan Requirements

Three sets of earth change plans must be submitted. The plan must be sealed by a registered engineer or a registered landscape architect**.**

- A plan or plans at a scale not more than 100 feet to the inch, including a legal description; a site location map which includes the proximity of any proposed earth change to lakes, streams or wetlands; existing structures; existing contour intervals which clearly show the character of the land; proposed contour intervals which clearly show the future character of the land; and a description of the existing vegetation on the site.
- Details for the proposed earth changes, including:
  - 1.) Location of the physical limits of each proposed earth change including the location of temporary soil stockpile areas. If soil is to be removed from the site, indicate the location of the offsite disposal area.
  - 2.) A description and location of all existing and proposed on-site drainage facilities, including detailed storm sewer plans, drainage arrows for surface drainage, and the ultimate drainage outlet for the site.
  - 3a.) Time and sequence of each proposed earth change with approximate dates for major grading activities, including clearing, rough grading and cut and fill; construction of detention basin, roads and underground utilities; digging basements and backfilling lots; final grading, landscaping and paving.
  - 3b.) This sequence must include a description of erosion and sediment control measures to prevent sediment from leaving the project site **during each step** indicated in Item 3a above.
  - 4.) A description and location of all proposed temporary and permanent soil erosion control measures.
  - 5.) Approved standard details of all temporary and permanent soil erosion control measures must be shown on the plan.



Performance Requirements

Along with the general plan requirements, there are also requirements for Wayne County. **(These design and maintenance features must be shown on the plan and included in the construction sequence.)**

1.) A perforated riser pipe with stone filter will be required on all detention and sediment basins on projects five acres or more in size.

2.) A temporary crushed rock tracking pad will be installed at the construction entrance and exit. This tracking pad will be maintained with fresh stone. Construction traffic will be limited to the designated entrance and exit.

3.) A street scraping and sweeping schedule. (Minimum - at least one sweeping a week, and a scraping at the end of each workday.)

4a.) Paved storm sewer inlets shall be protected by a single sheet of filter fabric conforming to Geotex III F as manufactured by Synthetic Industries, Inc. or equivalent woven **monofilament** filter fabric (ASTM flow rate =110 gallons per minute/ per square foot).

4b.) Rear yard (beehive-type) storm sewer inlets shall be protected by a filter fabric fence conforming to Ecolofence CB as manufactured by Amoco Fabrics and Fibers Company or equivalent woven geotextile filter fence 24 inches in height securely fixed with lath and staples to hardwood stakes spaced no more than four feet on center. The silt fence shall be trenched in a minimum of eight inches into the ground.

5.) All catch basins and inlets in areas that are determined to be susceptible to flooding will have high flow sack type catch basin filters.

6.) All exposed earth shall be stabilized with seed and mulch or sod within 5 days of final grade. Sediment basins shall be stabilized with seed and straw mulch blankets. Straw mulch blankets shall be staked into the ground 5 days after the construction of the sediment basin.

7.) An undisturbed, vegetative buffer strip of at least 25 feet shall be retained around rivers, creeks, streams, wetlands, drains, and other sensitive areas.

8.) Straw mulch blankets shall be used on 3:1 slopes or greater. (Three foot horizontal, one foot vertical)

9.) Ditches, swales, and other areas that will channel concentrated runoff **MUST** be stabilized within 15 days of construction. Temporary rock check dams will be required to slow water to non-erosive velocities in areas of concentrated flow.

10.) Road right-of-ways must be stabilized with seed and mulch within 5 days of completing utility work in the right of way.

11.) Areas of earth change that are disturbed beyond the fall seeding deadline (Nov. 1) must be temporarily stabilized with a minimum of straw mulch securely crimped to the ground.

12.) Rip Rap will be placed immediately following installation of pond outlets and culverts.

13a.) Single family lots, during construction, must have a silt fence barrier installed across the front with a temporary crushed rock-tracking pad at each lot.

13b.) A single family residence, prior to receiving a Certificate of Occupancy, must have a silt fence barrier, or 10 feet of curlex blanket installed back of the curb across the entire front of the lot. The silt fence shall be trenched a minimum of six inches into the ground.

Performance Deposit

The Performance Deposit is held until final inspection and approval by a W.C. D.O.E. Inspector. The bond is then refunded.

A soil erosion permit shall not be issued for an earth change unless the permittee shall first post with Wayne County a bond, certified check, or irrevocable bank letter of credit in the amount equal to that which would be required for the surety bond. If a bond is used, it must be executed by the permittee and a corporate surety with authority to do business in this state as a surety. The bond shall be in the amount of the established total cost of the earth change work authorized by the permit, **but in no case shall the bond amount be for less than $1,500.00 per acre of earth change.**

Each bond shall provide assurance for the maintenance of the finished project for a period of one year after the "project completion" inspection is made. Deposits or bonds shall be submitted to the Wayne County Department of Environment with the permit application. Upon permit issuance, the bond will be posted with the County Clerk by the Wayne County Department of Environment. A copy of the Wayne County Department of Environment surety bond form is attached.

No performance deposit will be required for a permit classified as a single-family residence.

NOTE:
The County Clerk deposits all cash bonds received as performance deposits into interest bearing accounts. Upon release of these funds, the principle plus any accrued interest will be returned from the County Clerk minus a handling fee of one tenth of the interest, but no more than $100 per year or part of the year as authorized by MCR 8.106(B).

Inspections and Enforcement

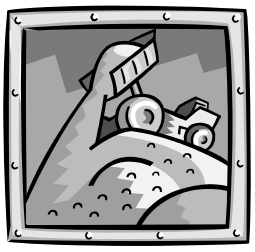
Once an application for a permit is received by the Department and before a permit is issued, an initial site investigation is made in the field. After permit issuance, earth change inspections are made periodically to assure compliance with the permit and Act 451. When all grading is complete and all permanent erosion control measures are installed, a project completion inspection is made. Finally, one year after the completion inspection, a final inspection is made to ensure that permanent erosion control measures are adequate.

NOTE:
No earth change work (cut, fill, topsoil stripping, etc.) within 500 feet of a lake, stream or drain or that disturbs more than one acre of land may begin until a permit is issued under Act 451, Public Acts of 1994, As Amended. Such earthwork that begins without a permit is in violation of the law and subject to legal proceedings.

Extension of Permit

If the permittee is unable to complete the work within the 30 month permit period, he **must** present in writing to the Wayne County Department of Environment, Land Resource Management Division, a request for an extension of the permit. Requests for extension shall be made at least ten (10) days before permit expiration. If, in the opinion of the Wayne County Department of Environment, Land Resource Management Division, such an extension is warranted, additional time may be granted for the completion of the work. An additional permit and inspection fee is required to extend the permit.

Modification of Plans



All proposed modifications of the approved earth change plans must be submitted to and approved by the Wayne County Department of Environment. All necessary specifications and related reports shall be submitted with any proposal to modify the approved earth change plan. No earthwork in connection with any proposed modifications shall be permitted without the approval of the Wayne County Department of Environment.

Appendix I

CHAPTER 6: GENERAL DESIGN STANDARDS

Designing storm water management systems to meet the performance standards in the Wayne County Storm Water Management Standards is the responsibility of the applicant or its designee. Wayne County maintains the right to require applicants to modify storm water management system designs to ensure that the performance standards are satisfied. Applicants must evaluate the project's impact over the long-term and on a watershed scale. Taking these factors into account, the following sections describe general design standards for storm water management systems.

Additional design standards for storm water management systems may be found in Chapters 7 and 8.

6.1 Determination of Peak Flow Rate

6.1.1 Rational Method

The Rational Method for calculating storm water runoff is generally acceptable for calculating peak flow rate at a particular location within a storm water management system. Alternative methods may be required when the County determines that another method is necessary to satisfy the requirements of the Standards (see Section 6.1.2).

To calculate peak flow rate using the Rational Method, an applicant must use the following Rational Method Formula:

$$Q = C \times I \times A$$

where: Q = peak flow rate (cfs)
C = runoff coefficient
I = rainfall intensity (in/hr)
A = drainage area (acres)

The peak flow rate for each component of a storm water management system must be calculated using a composite runoff coefficient, the entire tributary drainage area, and a design rainfall intensity adjusted based on time of concentration. Values for the various terms used in the Rational Method Formula in determining peak flow at a particular location must be determined as follows:

- Drainage area (A) means the entire upstream land area that drains to that location, including any off-site drainage area. (In general, drainage from off-site should not be passed through on-site storm water management facilities. However, there are situations where this is unavoidable.)

- Peak flow rate (Q) must be calculated with the assumption that off-site drainage areas are developed consistent with any applicable master land use plan, storm water standards and storm water master plan enacted by the local community in which the storm water management system is located, and the Wayne County Storm Water Management Standards.

- The composite runoff coefficient (C) must be based on the percentage of surface types in the drainage area upstream of that location. Surface types to be used are shown in the following table.

- Applicable rainfall formulas for calculating rainfall intensity (I) are provided in the table below for several design storms. Calculation of rainfall intensity

MINIMUM ACCEPTABLE RUNOFF COEFFICIENTS

Type of Surface	Runoff Coefficient (C)
Water Surfaces	1.00
Roofs	0.95
Asphalt or concrete pavements	0.95
Gravel, brick, or macadam surfaces	0.85

Semi-pervious: lawns, parks, playgrounds

	Slope <4%	Slope 4-8%	Slope >8%
Hydrologic Soil Group A	0.15	0.20	0.25
Hydrologic Soil Group B	0.25	0.30	0.35
Hydrologic Soil Group C	0.30	0.35	0.40
Hydrologic Soil Group D	0.45	0.50	0.55

Adapted from "Rules of the Washtenaw County Drain Commissioner, Procedures and Design Criteria for Storm Water Management Systems", May 2000.

depends on the time of concentration (t), which is the time duration (in minutes) that is required for runoff from the most remote area of the watershed to reach the storm water management system component being designed.

DESIGN RAINFALL INTENSITIES

Design Storm	Intensity (in/hr) for t < 60 min.	Intensity (in/hr) for t > 60 min.
10-year	151.8/(t+19.9)	162.3/(t+25.4)
50-year	212.5/(t+23.3)	230.3/(t+30.3)
100-year	233.7/(t+23.5)	294.0/(t+45.0)

t = time of concentration: the time duration (minutes) required for runoff from the most remote area of the watershed to reach the point of study.

Data from U.S. Weather Service Station Records for Detroit, 1896 - 1942

- The time of concentration for a particular design storm varies with slope, surface cover, and the length of the surface flow path. Other variables, including anticipated rainfall intensity and infiltration capacity of the soil and surface cover, also affect the time of concentration.
- For the most upstream end of the storm water management system, the time of concentration is referred to as the initial time of concentration and is determined in accordance with the following table.

  For all other downstream locations in the storm water management system, the time of concentration (t) is the sum of (1) the initial time of concentration and (2) the travel time from the upstream end to the location being analyzed.

INITIAL TIME OF CONCENTRATION

Type of Land Use	Time of Conc. (t_o) (min)
Multiple Units	15
Commercial/Industrial	15
Single family residential	20
Unimproved land	$t_o = L / (60 \times V)$ and $V = 0.48 \times S^{½}$

where

t_o = initial time of concentration (minutes)
L = length of overland sheet flow (feet)
S = slope of overland sheet flow (%)
V = velocity of overland sheet flow (ft/sec)

6.1.2 Alternative Methods

The Rational Method Formula may not be an adequate design tool for calculating storm water runoff from large drainage systems. Alternative runoff hydrograph prediction methods are widely available and may be required by the Permit Office for sizing the drainage systems on large sites and/or smaller sites that present unique flood control or water resources protection issues. Acceptable alternative methods are:

- Corps of Engineers HEC-RAS or HEC-HMS;
- Soil Conservation Service UD-21, TR-20 or TR-55; and
- U.S. EPA's Storm Water Management Model (SWMM).

These methods must be based on the SCS Type II, 24-hour rainfall distribution and assume a conservative wet weather antecedent conditions.

6.2 General Design Standards for Flood Control

Storm water management systems designed to satisfy the flood control performance standards described in Section 5.1 must include a detention system and/or retention basin that is designed and constructed in accordance with this Section.

6.2.1 Detention Systems

Generally, two types of detention systems are most often designed in Wayne County: open detention basins and underground detention systems.

Open detention basins are man-made surface waters designed to temporarily detain storm water runoff to control peak flow rates and provide for pollutant removal through settling and plant uptake. There are two types of open detention basins traditionally used in Wayne County:

- Traditional detention basins, which detain storm water runoff for an extended period of time in a permanent pool and remove sediment and other pollutants via settling. The permanent pool in a traditional detention basin must be a minimum of 4 feet deep.
- Constructed wetlands, where over 50% of the surface area typically is covered by wetland vegetation. Permanent wetland pool depths vary between 0.5 and 3.0 feet depending on vegetation type.

Underground detention systems consist of one or more underground pipes or structures designed to provide the required storage volumes (both the bank full flood and flood control volumes) for a development project. Just as with any above ground means of storm water detention, underground detention systems must have a restricted outlet that limits outflow for the bank full flood and for the maximum allowable release rate from the development site.

Additional design standards for open detention basins and underground detention systems is presented in Chapter 8.

Flood Control Storage Volume

Detention systems that are designed to meet the flood control performance standards described in Section 5.1 must provide enough flood control storage volume so as not to exceed the maximum allowable runoff rate for the site. Equations used to determine the required storage volume are shown in the box below.

Detention Systems:
Flood Control Storage Volume Requirements

Drainage Areas Greater Than Five Acres

Detention of the 100-year storm is required to control flooding events. Volume required should be based on the following relationships:

$Q_a = 0.15 \text{ cfs/acre} \times A$

$Q_o = \frac{Q_a}{A \times C}$

$T_{100} = -45 + \sqrt{\frac{19845}{Q_o}}$

$V_{s\,100} = \frac{17649 \times T_{100}}{(T_{100} + 45)} - 40 \times Q_o \times T_{100}$

$V_{t\,100} = V_{s\,100} \times A \times C$

Drainage Areas Five Acres or Less

Detention of the 10-year storm is required for flood control purposes. Volume required should be based on the following relationships:

$Q_a = 0.15 \text{ cfs/acre} \times A$

$Q_o = \frac{Q_a}{A \times C}$

$T_{10} = -19.9 + \sqrt{\frac{4530}{Q_o}}$

$V_{s\,10} = \frac{9108 \times T_{10}}{(T_{10} + 19.9)} - 40 \times Q_o \times T_{10}$

$V_{t\,10} = V_{s\,10} \times A \times C$

where:

Q_a = Maximum allowable outflow rate from the detention system (cfs)

Q_o = Maximum allowable outflow rate per acre imperviousness (cfs /acre imperviousness)

T = Storage time defined as the instant storage begins until peak storage is attained (minutes)

V_s = Maximum volume of water stored in the detention system per acre imperviousness (ft^3/acre imperviousness)

V_t = Maximum volume of water stored in the detention system (ft^3)

A = Drainage area (acres)

C = Runoff coefficient

6.2.2 Retention Basins

Retention basins are man-made surface waters designed to store storm water runoff and provide gravity settling of pollutants. Retention basins infiltrate storm water into the soil rather than discharging it to a surface water or closed conduit.

Flood Control Storage Volume

Retention basins that are designed to meet the flood control performance standards described in Section 5.1 must provide enough flood control storage volume to retain the volume of storm water equal to the runoff from two consecutive 100-year storm events. The equation used to determine the required storage volume is shown in the box below.

Retention Basins:
Flood Control Storage Volume Requirements

Retention basins are required to retain the volume of storm water equal to the runoff from two consecutive 100-year storm events. Volume required should be based on the following relationship:

$$V_r = 2 \times 16500 \times A \times C$$

where:

V_r = Flood control storage volume of retention basin (ft^3)

A = Drainage area (acres)

C = Runoff coefficient

6.2.3 Adequate Outlet

Storm water management systems must have an adequate storm water outlet. At a minimum, the capacity of the outlet must not exceed the discharge's reasonable share of the maximum capacity of the downstream closed conduit or watercourse, as determined by the County.

If the County determines that a proposed detention system does not have an adequate outlet, the applicant may be required to design and construct improvements to the downstream County Drain, watercourse, or closed conduit. The County will determine the extent to which downstream improvements are required.

6.2.4 Flood Plain Restrictions

Storm water management systems may not be constructed within a 100-year floodplain unless the storm water management system satisfies the requirements listed below. Construction within a 100-year floodplain must be approved by MDEQ as well as the County.

- The storm water management system must not diminish the net storage capacity of the floodplain. Compensatory storage is required for any reduction in floodplain storage capacity.

- The storm water management system must not negatively alter the conveyance of the watercourse.

- During a design storm event, the storage capacity of the storm water management system must remain available for detention of storm water runoff from the development site.

- The storm water management system must minimize disruption to the riparian habitat of the floodplain by developing and implementing a plan for minimizing disturbance that is acceptable to the County.

6.2.5 Additional Requirements

To the fullest extent possible, storm water management systems must follow the natural drainage patterns within the development site and within the watershed in which it is located.

Storm water management systems that include surface water components cannot be located within pre-existing surface waters.

6.3 General Design Standards for Water Resources Protection

6.3.1 Pretreatment Systems

Storm water management systems must include a pretreatment system at each inlet to each detention system

and/or retention basin. The pretreatment system must either:

(1) Be designed and constructed such that the storm water management system achieves the pollutant removal rate (80% or more of the annual average total suspended solids load) specified by the water resources protection performance standard (see Section 5.2); and/or

(2) Be designed and constructed to capture the first flush and release it gradually to the detention system and/or retention basin over a period of twenty-four (24) hours.

If an applicant designs a system to capture and release the first flush (as described above in option 2), the storage volume required to capture the first flush for the area tributary to the pretreatment system must be calculated based on the following relationship.

$$V_{t\,ff} = 1815 \times A \times C$$

where:

$V_{t\,ff}$ = first flush storage volume (ft^3)
A = drainage area tributary to inlet (acres)
C = runoff coefficient

Additionally, for option 2, the pretreatment system must have a flow restrictor designed to gradually release the first flush storage volume over a period of twenty-four (24) hours. The 24-hour average allowable release rate must be determined in accordance with the following relationship:

$$Q_{avg\,ff} = V_{t\,ff} / 86400$$

where:

$Q_{avg\,ff}$ = 24-hour average allowable outflow rate (cfs)
$V_{t\,ff}$ = first flush storage volume (ft^3)

If one or more forebays are used as pretreatment system(s), the volume of the forebays above any permanent pool may be used to satisfy a portion of the flood control storage volume (described in Section 6.2.1) and the bank full flood storage volume (described in Section 6.3.2). If a permanent pool is provided, the volume of the permanent pool may not be used to satisfy these other storage volume requirements.

6.3.2 Bank Full Flood Requirements

Soil erosion from stream banks and channels is of special concern in Wayne County. As development activity increases impervious surface area, the frequency and duration of bank full flow conditions increases. As a result, streams naturally attempt to become wider and deeper to convey the increased flows. This process can lead to channel and bank erosion and the destruction of aquatic habitat.

To address this concern, each storm water management system (except for retention basins), must capture runoff from the bank full flood and release it gradually over a period of forty (40) hours. The storage volume necessary to capture and treat runoff from the bank full flood must be calculated based on the following relationship:

$$V_{t\,bf} = 5160 \times A \times C$$

where:

$V_{t\,bf}$ = bank full flood storage volume (ft^3)
A = drainage area (acres)
C = runoff coefficient

Additionally, the pretreatment system must have a flow restrictor designed to gradually release the bank full flood storage volume over a period of forty (40) hours. The 40-hour average allowable release rate must be determined in accordance with the following relationship:

$$Q_{avg\,bf} = V_{t\,bf} / 144000$$

where:

$Q_{avg\,bf}$ = 40-hour average allowable outflow rate (cfs)
$V_{t\,bf}$ = bank full flood storage volume (ft^3)

For detention systems that are intended to meet both the flood control and water resources protection performance standard, the lower portion of the flood control storage volume can also be used to capture the bank full flood. With this approach, the total volume required is equal to

the flood control storage volume, not the sum of the flood control and bank full storage volumes.
The volume of the permanent pool within an open detention system does not satisfy any of the flood control or bank full storage volume requirements.

6.3.3 Additional Requirements

To protect water resources, Wayne County has adopted the following additional requirements to minimize pollutants in storm water runoff from development projects.

Buffer Strip

A buffer strip is a zone that is used for filtering direct storm water runoff into a storm water management system and for providing maintenance access to a storm water management system. A buffer strip, minimum 25 feet wide, must be established and/or preserved along the edge of any surface water in the development site (except for bioretention areas and vegetated swales).

- Along watercourses, the width of a buffer strip must be measured from the top of bank of the watercourse. Around other surface waters, the width of the buffer strip must be measured from the minimum freeboard elevation of the surface water. Additional requirements for buffer strips associated with open detention basins and retention basins are described in Section 8.1.
- The ground slope of a buffer strip should not be steeper than 1:6.
- Construction activities, paving, and chemical application, except for construction activities needed to create or establish the buffer strip, are prohibited in the buffer strip.

Landscape Plan

Because vegetation is an important part of many components of storm water management systems, a landscaping plan must be submitted to the County.

- The plan must depict landscaping elements that function as part of the storm water management system, including the buffer strip.
- The landscape plan must include (at a minimum) specifications for the soils and plant materials that the applicant proposes to include in the landscape; and a description of the methods and planting techniques that the applicant proposes to utilize during landscape installation.
- The installation and maintenance of the landscaping described in the landscape plan is included as regulated construction activity for which the County may require financial assurance.

Guidance and requirements for landscaping plans are described in Chapter 8.

Other

Healthy streams have natural temperatures that are cooler than that of stormwater runoff. Applicants should consider incorporating landscaping or other features to minimize the temperature of storm water runoff, and the adverse effect that high water temperatures may have on the receiving water quality. For example:

- Provide trees or other means to shade open detention basins and certain other storm water management components.
- Provide an outlet structure for open detention basins which draws water from the (cooler) bottom of the basin.

CHAPTER 7: ADDITIONAL REQUIREMENTS

This chapter presents additional requirements that may apply to storm water management systems in Wayne County.

7.1 Storm Water Conveyances

Storm water management systems may use watercourses or structures such as closed conduits, culverts, or bridges as a means of conveying stormwater runoff. Watercourses and closed conduits must be designed to standards described in this section. Storm water runoff conveyed within or under County Roads must also meet the additional requirements described in Section 7.3.

7.1.1 Watercourses

Natural watercourses should be preserved whenever possible. The Permit Office will not approve modifications to natural watercourses (e.g., installing a concrete channel or enclosure) unless the modification is necessary to address a demonstrated public safety, health or welfare issue. When such modifications are deemed necessary, the appropriate governmental agencies must be contacted for review and approval.

The flow capacity of each reach of a watercourse that is part of a storm water management system must be equal to or greater than the peak flow rate for a 10-year storm. The flow capacity of a watercourse must be calculated in accordance with the "Manning Formula" as follows:

$$Q = \frac{1.486 \times A \times R^{2/3} \times S^{1/2}}{n}$$

where:

Q = flow capacity (cfs)
A = cross sectional flow area (ft^2)
n = Manning's coefficient of roughness
P = wetted perimeter (feet)
R = hydraulic radius = (A/P in feet)
S = hydraulic gradient (ft/ft)

In general, a minimum "n" of 0.035 will be used for the roughness coefficient unless special treatment is given to the bottom and side slopes, such as sodding, riprap or paving.

7.1.2 Closed Conduits

The flow capacity of each reach of a closed conduit that is part of a storm water management system must be equal to or greater than the peak flow rate for a 10-year storm. The Manning Formula (shown above) must be used to determine the flow capacity of a closed conduit.

The invert elevation of each closed conduit entering a forebay with a permanent pool must be equal to or greater than the permanent pool elevation.

The hydraulic grade lines (HGLs) of closed conduits must meet both of the following requirements:

- The hydraulic grade line must be calculated based on 10-year storm flows, starting with the crown elevation at the outlet. This gradient must not be higher than 2.5 feet below the rim elevation at any upstream manhole location. However, exceptions may be granted in special circumstances such as for managing storm water in and around truck docks.
- The rim elevation at any manhole location along the closed conduit upstream of a detention system must be at least one (1) foot above the design water level of the detention system.

The minimum and maximum allowable closed conduit velocities are 2.5 and 8.0 feet per second, respectively. The maximum allowable velocity within the conduit may only be exceeded where special provisions have been made to dissipate energy.

The maximum distance between manholes, catch basins, and inlets may not exceed 300 feet plus 100 additional feet for every 1 foot of diameter for closed conduits over 36 inches in diameter.

Manholes or junction chambers must be constructed at all closed conduit junctions and angle points and at all changes in conduit size and/or slope.

The inlets and outlets for all closed conduits require an end treatment and soil stabilization measures, and some closed conduits may also require a grate to prevent entry into the conduit by children and animals. The specific requirements, which depend on the size of the conduit and the location/configuration of the inlet or outlet, are provided in Section 8.3.1.

7.1.3 County Road Culverts and Bridges

Under separate requirements administered by the Wayne County Permit Office, special provisions apply to culverts and bridges that convey a watercourse under a County Road, whether the culvert or bridge will be newly constructed or will be constructed to replace an existing culvert or bridge. If the watercourse is a County Drain, see Sections 7.4 and 7.5 for additional requirements that may apply.

The hydraulic capacities of culverts and bridges must be calculated using a method approved by the County. All bridges and culverts also must be designed with adequate soil erosion protection.

Bridges that convey a watercourse under a County Road must be designed to pass the peak flow rate for a 100-year storm with no harmful increase in backwater elevations. The 100-year storm elevation upstream of a bridge also must be at least one (1) foot below the lowest elevation of either the bridge deck or the approach pavements to the structure.

Culverts that convey a watercourse under a County Road must be designed to convey at least the peak flow rate for a 10-year storm, as determined using the methods described in Section 6.1.1. Culverts that will be inundated by storms larger than the design storm established by the Michigan Department of Transportation or the Michigan Department of Environmental Quality must be designed with soil erosion protection that is adequate for the inundated condition.

7.2 Downstream Improvements

If the County determines that a proposed storm water management system does not include an adequate storm water outlet, the Applicant may be required to design and construct improvements to the downstream drain, watercourse or closed conduit. The County determines the extent to which downstream improvements may be required to provide an adequate storm water outlet.

7.3 County Roads

The County may establish additional or alternative requirements for storm water management systems in County Roads. Three such requirements are described below. Contact the Wayne County Permit Office for more information on these and other requirements.

1. The minimum diameter of closed conduits in County road rights-of-way is 12 inches.

2. As a general policy, Wayne County does not permit the discharge of storm water runoff from improved property abutting a County Road into the County Road storm drainage system. Exceptions to this policy can be made on the basis of economic hardship if (1) there are no other cost-feasible storm outlets available and (2) there is adjudged sufficient capacity in the Road storm drainage system. When exceptions are granted, the permitted storm discharge into the County Road storm drainage system is restricted to a discharge rate equal to the lesser of the following criteria based on a 10-year storm:
   - 0.103 cfs per station (100 feet) of County Road frontage available to the site;
   - 0.15 cfs per acre of area proposed to drain into the County Road drainage system.

3. Required design standards and construction specifications for storm water management systems in the County Road right-of-way must conform to Wayne County's most current standards. Information regarding these standards can be obtained from the Permit Office.

7.4 Easements

Pursuant to the Drain Code, Wayne County generally requires the following minimum easement widths for established County Drains and other watercourses.

1. An open County Drain or watercourse with a maximum bank to bank width that exceeds 30 feet must have an easement to the extreme width of the drain, plus 30 feet. The easement must be centered on the centerline of the drain or watercourse.
2. An open County Drain or watercourse with a maximum bank to bank width that is less than 30 feet must have an easement equal to the extreme width of the drain, plus 24 feet. The easement must be centered on centerline of the drain or watercourse.
3. Enclosed County Drains with an internal diameter of 8 feet or less must have an easement of 20 feet centered on the centerline of the enclosure.
4. Enclosed County Drains with an internal diameter that exceeds 8 feet must have an easement of 25 feet centered on the centerline of the enclosure.

The easement widths described above govern generally. The County may require an alternative width if the County determines that additional easement is required for proper construction, or because of special circumstances. Note that Wayne County does not allow any buffer strips required under the Storm Water Management Standards to overlap with County Drain easements. Exceptions to the easement requirements described above are within the County's sole discretion.

7.5 County Drains

Applicants who propose projects that would modify an established County Drain or an established drainage district may be subject to additional requirements. The Wayne County Drains Office is located within the Wayne County Department of Environment.

7.6 County Park Property

The County may establish additional or alternative requirements for storm water management systems in County park property or which outlet within County park property. For example, special provisions apply to inlets/outlets on County park property as described in Section 8.3.1 and Appendix E-1.

7.7 Wetlands

The natural drainage pattern of the land within a development site must not be altered in any way that may cause adverse affects to existing wetland areas. Untreated storm water will not be permitted to outlet directly into a natural or mitigation wetland area. The level of treatment required to discharge storm water runoff to a natural or mitigation wetland area is determined by MDEQ. However, at a minimum, storm water discharged into a natural or mitigation wetland must pass through a pretreatment system. The pretreatment system must be designed in accordance with the requirements described in Section 6.3.1.

In addition to Wayne County approval of the storm water management system for a development project, the design of any wetland created for mitigation must also be approved by MDEQ.

7.8 Temporary Measures during Construction

As described in Chapter 3, projects that involve earth change activities may need to implement temporary storm water management measures to comply with additional federal NPDES requirements that apply to construction activity that disturbs one or more acres of land. More information about the NPDES requirements is available from MDEQ's Water Bureau; see Chapter 12 for contact information.

Projects that involve earth change activities also may need to implement temporary storm water management measures under the state Soil Erosion and Sedimentation Control (SESC) program and Wayne County's Soil Erosion

and Sedimentation Control Ordinance, Chapter 94 of the Code of Ordinances of Wayne County (2001). More information about these programs and the types of projects that require a permit under these programs is available in Chapter 3.

Projects within Wayne County that must obtain a SESC permit from WCDOE must comply with the measures described in this section. An overview of the permit process is shown in Figure 7-1. WCDOE will not issue a SESC permit for a project that requires a storm water construction approval from the Permit Office until storm water construction approval has been obtained. Additional information about Wayne County's SESC program, and a downloadable copy of the permit application package, is available from the County's website (www.waynecounty.com/doe/land).

7.8.1 General Earth Change Requirements

In conformance with the state SESC program and the SESC Ordinance, Wayne County generally requires the following temporary measures during construction:

- The proposed work shall be carried out in accordance with approved earth change plans and in compliance with all requirements of the permit and state laws and regulations.

- Earth changes must be conducted in a manner that effectively reduces accelerated soil erosion and resulting sedimentation.

- Persons engaged in earth change activities must, in conformance with state law, implement and maintain acceptable soil erosion and sedimentation control measures that effectively reduce accelerated soil erosion.

- Earth changes must be scheduled and completed in a manner that will limit the exposed area of any disturbed land for the shortest possible period of time, as determined by WCDOE.

- Sediment caused by accelerated soil erosion must be removed from runoff water before it leaves the site of the earth change.

- Temporary or permanent facilities designed and constructed for the conveyance of water around, through or from the earth change area must be designed to limit the water flow to a non-erosive velocity.

- Temporary soil erosion control measures must be maintained until permanent soil erosion measures are installed and approved. Permanent soil erosion control measures must be maintained for a minimum of one year after the project passes WCDOE's "completion inspection."

- Permanent soil erosion control measures for all slopes, channels, ditches, or any other disturbed land area must be completed within five calendar days after final grading or earth moving activity has been completed.

- Soil tracked, spilled, dumped or deposited onto public streets, highways, sidewalks, or other public thoroughfares must be removed promptly.

- Permittees shall notify the WCDOE as to when the "project completion" inspection can be made.

7.8.2 General Plan Requirements

Under state law and the SESC Ordinance, three sets of earth change plans must be submitted before regulated earth changes may commence. The plans must be sealed by a Professional Engineer or Landscape Architect registered in the State of Michigan.

Each set of earth change plans must include drawings of the earth change at a scale not more than 100 feet to the inch, including a legal description; a site location map which includes the proximity of any proposed earth change to lakes, streams or wetlands; existing structures; existing contour intervals which clearly show the character of the land; proposed contour intervals which clearly show the future character of the land; and a description of the existing vegetation on the site.

Each set of earth change plans must also include details for the proposed earth changes, including:

- Location of the physical limits of each proposed earth change including the location of temporary soil stockpile areas. If soil is to be removed from the site, the location of the offsite disposal area must be identified.

- A description and location of all existing and proposed on-site drainage facilities, including detailed storm sewer plans, drainage arrows for surface drainage, and the ultimate drainage outlet for the site.

- Time and sequence of each proposed earth change with approximate dates for major grading activities, including site stripping, rough grading and cut and fill; construction of detention basin, roads and underground utilities, digging basements and backfilling lots; final grading, landscaping paving. This sequence must include a description of temporary erosion control measures to prevent sediment from leaving the project site during each of the proposed earth change activities. A description and location of all proposed temporary and permanent soil erosion control measures.

- Approved standard details of all temporary and permanent soil erosion control measures.

7.8.3 Wayne County Plan Requirements

Wayne County imposes additional requirements for earth change plans. In addition to the general plan requirements discussed above, the following design and maintenance features must be shown on the plan and included in the construction sequence:

- A perforated riser pipe with stone filter must be installed on all open detention basins and sediment basins on projects five acres or more in size.

- A temporary crushed rock tracking pad must be installed at the construction entrance and exit. This tracking pad must be maintained with fresh stone periodically. Construction traffic must be limited to designated entrance and exit.

- Street scraping and cleaning (sweeping) must be conducted on a regular schedule. At a minimum, one sweeping must occur each week, and one scraping must occur at the end of each workday.

- Paved storm sewer inlets must be protected by a single sheet of filter fabric conforming to Geotex

- III P as manufactured by Synthetic Industries, Inc. or equivalent woven monofilament filter fabric (ASTM flow rate = 110 gallons per minute/per square foot).

- Catch-all type inlet filters are required at all low points in the paved roads of multi-family housing projects.

- Rear yard (beehive-type) storm sewer inlets must be protected by a woven geotextile filter fence 24 inches in height securely fixed with lath and staples to hardwood stakes spaced no more than four feet on center. The silt fence must be trenched in a minimum of six inches into the ground.

- All catch basins and inlets in areas that are determined to be susceptible to flooding must have catch-all type inlet filters.

- All exposed earth must be stabilized with seed and mulch or sod within five days of final grade. Sediment basins must be stabilized with seed and straw mulch blankets. Straw blankets must be staked into the ground five days after the construction of the sediment basin.

- An undisturbed, vegetative buffer strip of at least 25 feet must be retained around rivers, creeks, streams, wetlands, drains, and other sensitive areas.

- Straw mulch blankets must be used on 3:1 slopes or greater. (Three foot horizontal, one foot vertical)

- Ditches, swales, and other areas that will channel concentrated runoff must be stabilized within five days of construction. Temporary rock check dams must be installed to slow water to non-erosive velocities in areas of concentrated flow.

- Road rights-of way must be stabilized with seed and mulch within five days of completing utility work in the right of way.

- Areas of earth change that are disturbed beyond the fall seeding deadline (November 1) may require dormant seeding and straw mulch securely anchored to the ground.

- Single family lots, during construction, must have a silt fence barrier and a temporary crushed rock tracking pad installed as per the approved plan.

- A single family residence, prior to receiving a Certificate of Occupancy, must have a silt fence barrier, or 15 feet of mulch blanket installed back of the curb across the entire front of the lot. The silt fence must be trenched in a minimum of six inches into the ground

- Rip rap must be immediately installed after construction of outlets and culverts.

7.8.4 Performance Deposit

WCDOE does not issue SESC permits for an earth change unless the permittee first posts with Wayne County a bond, certified check, or irrevocable bank letter of credit in the amount equal to that which would be required for the surety bond. If a bond is used, it must be executed by the permittee and a corporate surety with authority to do business in this state as a surety. The bond must be in the amount of the established total cost of the earth change work authorized by the permit, but in no case may the bond amount be for less than $1,500.00 per acre of earth change.

Each bond must provide assurance for the maintenance of the finished project for a period of one year after the "project completion" inspection is made. Deposits or bonds shall be submitted to the WCDOE with the permit application. Upon permit issuance, the bond will be posted with the County Clerk by the WCDOE.

No performance deposit is required for a permit classified as a single-family residence.

7.8.5 Inspections and Enforcement

Once an application for a permit is received by WCDOE and before a permit is issued, an initial site investigation is made in the field. After permit issuance, earth change inspections are made periodically to assure compliance with the permit, state law, and the SESC Ordinance. When all grading is complete and all permanent erosion control measures are installed, a project completion inspection is made prior to permit expiration. Finally, one year after the completion inspection, a final inspection is made to ensure that permanent erosion control measures are still functioning effectively.

NOTE: No earth change work (grading, excavation, fill, topsoil, stripping, etc.) within 500 feet of a lake, stream, or drain or that disturbs more than one acre of land may begin until a permit is issued under state law. Such earthwork which begins without a permit is violation of the law and subject to legal proceedings.

7.8.6 Extension of Permit

If the permittee is unable to complete the work within the 30 month permit period, he must present in writing to the WCDOE, a request for an extension of the permit. Requests for extension shall be made at least ten (10) days before permit expiration. If, in the opinion of the WCDOE, such an extension is warranted, additional time may be granted for the completion of the work. An additional permit and inspection fee is required to extend the permit.

7.8.7 Modifications of Approved Plans

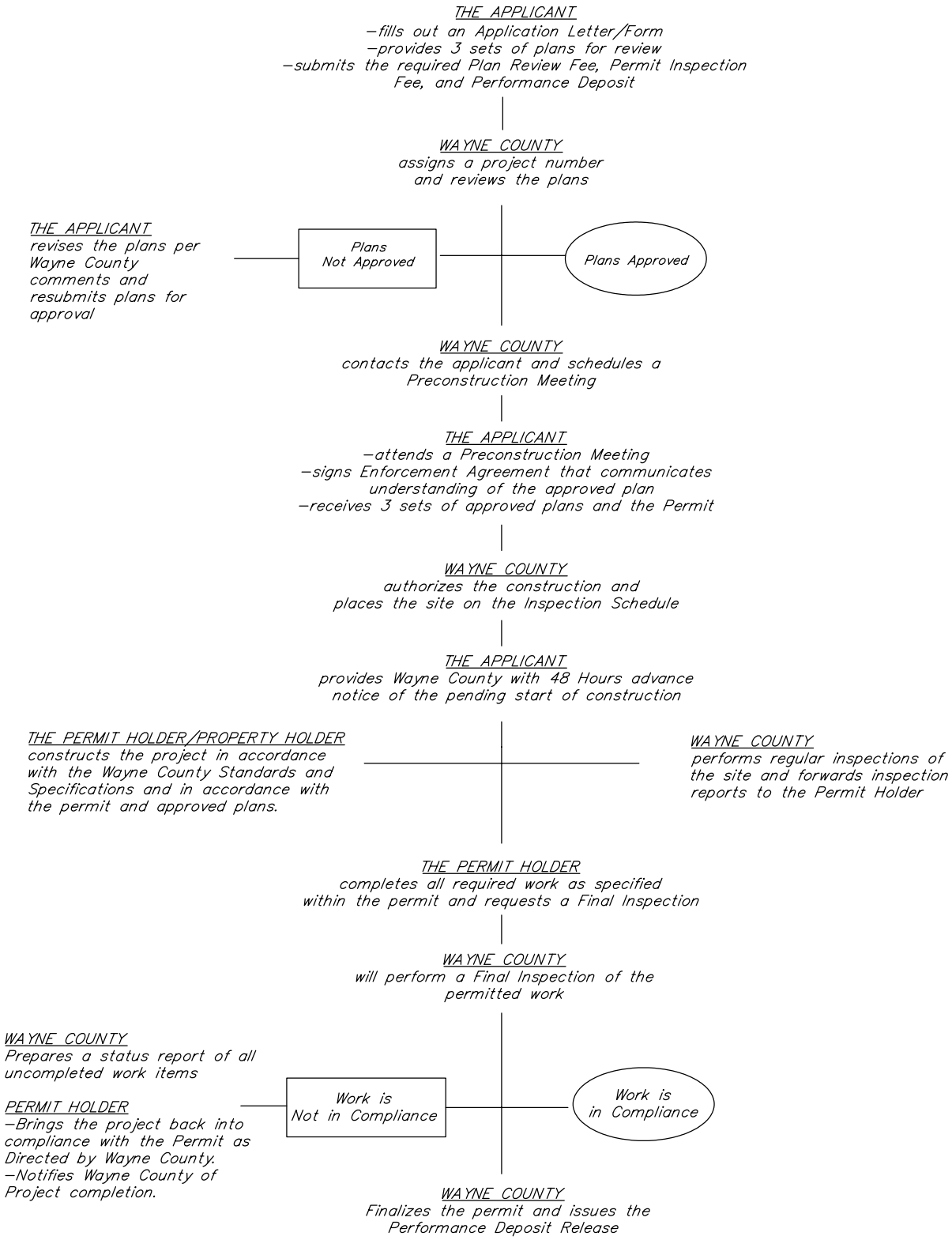
All proposed modifications of the approved earth change plans must be submitted to and approved by the WCDOE. All necessary specifications and related reports shall be submitted with any proposal to modify the approved earth change plan. No earthwork in connection with any proposed modifications is permitted without the approval of the WCDOE.

FIGURE 7-1

PROCEDURE FOR OBTAINING A
SOIL EROSION AND SEDIMENTATION CONTROL PERMIT

WAYNE COUNTY DEPARTMENT OF ENVIRONMENT
LAND RESOURCE MANAGEMENT DIVISION

PROCEDURE FOR OBTAINING A SOIL EROSION AND SEDIMENTATION CONTROL PERMIT



CHAPTER 11: SAMPLE CALCULATIONS

The following example is used to illustrate the calculations required to design a typical storm water management system. In this example, a single family residential development project is proposed on a 24-acre parcel of land and discharges to a water course. Determine the developed runoff coefficient, storm sewer, forebay, open detention basin, and outlet sizing requirements necessary for proper design of the storm water management system assuming no off-site area drains onto the parcel. The detention basin is intended to meet the flood control and water resource protection performance standards.

11.1 Runoff Volume Determination

In this example, the proposed land use for the site is as follows:

Land Use	Area (A) (acres)	Runoff Coefficient (C)
Roof	2	0.95
Lawn (Soil Group D, 3%)	19	0.45
Asphalt, concrete	3	0.95

Runoff coefficient information may be found in Chapter 6 of this manual.

Calculate the weighted runoff coefficient:

$C = \Sigma (A_i \times C_i) / A$

$C = [(2 \times 0.95) + (19 \times 0.45) + (3 \times 0.95)]/(2+19+3)$
$= 0.55$

C = runoff coefficient
A = drainage area (acres)

11.2 Closed Conduit Sizing

This sample closed conduit calculation is for three runs of storm sewer pipe within the storm water management system. The following equations are used:

Rational Method

$Q = C \times I \times A$

Q = peak flow rate (cfs)
C = runoff coefficient
I = rainfall intensity (in/hr)
A = drainage area (acres)

Rainfall Intensity

$I = 151.8 / (t + 19.9)$

I = rainfall intensity (in/hr)
t = time of concentration, or the time duration (minutes) required for runoff from the most remote area of the watershed to reach the point of study. An initial time of concentration of 20 minutes should be used for single family residential land use.

Manning Formula

$Q = (1.486 \times A \times R^{2/3} \times S^{1/2}) / n$

Q = flow capacity (cfs)
A = cross sectional flow area (ft^2)
n = Manning's roughness coefficient
P = wetted perimeter (feet)
R = hydraulic radius (A/P in feet)
S = hydraulic gradient (ft/ft)

Calculations

Sample calculations for determining conduit sizes are illustrated in the table at the top of the following page. The calculations are based on a Manning's roughness coefficient of 0.013.

Sample Calculations for Closed Conduit Sizing

(Q = C x 151.8/(t+19.9) x A)

Storm Sewer Line		Incre-mental Area (Acres)	C Factor	Equiva-lent Area 100% Acres CA	Total Area 100% Acres CA	t Time (min)	I (inch per hour)	Q = CIA (cfs)	Pipe diam. (in)	Slope %	Length of Line (ft)	Manning Vel. in Pipe (ft/sec)	Time of Flow (min)	Manning Capacity of Sewer (cfs)	H.G. Elev. Upper End (ft)	Upper Invert Elev. (ft)	Lower Invert Elev. (ft)	Upper Structure Rim Elev. (ft)
From Structure	To Structure																	
CB1	CB2	0.38	0.35	0.13	0.13	20.00	3.80	0.51	12	0.50%	105	3.23	0.54	2.54	24.61	24.75	24.22	27.75
CB2	R1	0.48	0.40	0.19	0.32	20.54	3.75	1.22	12	0.80%	78	4.07	0.32	3.20	24.59	24.12	23.50	27.75
R1	MH1	0.00	0.00	0.00	0.32	20.86	3.72	1.21	4	0.80%	1	1.61	0.01	0.08	24.50	23.50	23.49	28.00
						20.87												

11.3 Forebay Design

Since the detention basin has only one inlet pipe, the basin will be designed with a single forebay with a permanent pool at elevation 100.5 feet. In accordance with the Ordinance and Rules, the forebay will be designed to capture the first flush runoff from the site and gradually release it over a period of 24 hours.

Required Volume

Determine the forebay volume required to store the first flush of runoff from the site.

$V_{t\,ff} = 1{,}815 \times A \times C$

$V_{t\,ff} = 1{,}815 \times 24 \text{ acres} \times 0.55 = 23{,}958 \text{ ft}^3$

Storage Provided

The forebay storage volume provided should be shown in 1-foot (maximum) increments above the permanent pool water surface elevation (100.5 ft) as indicated in the table below. The incremental and cumulative storage volume provided at each elevation should be determined using the average surface area for that foot of depth.

Storage Provided in Forebay

Elevation (feet)	Area (ft^2)	Incremental Volume (ft^3)	Cumulative Volume (ft^3)
100.5	10,426	0	0
101.5	12,692	11,542	11,542
102.5	15,158	13,908	25,450

The total storage volume provided in the forebay should be greater than or equal to the required forebay volume, which is the first flush storage volume. Determine the water surface elevation corresponding to the first flush storage volume by interpolation from the table of storage provided, as follows:

Z_{ff} = first flush storage elevation in forebay (ft)

$Z_{ff} = 101.5 + (102.5 - 101.5) \times [(23{,}958 - 11{,}542) / (25{,}450 - 11{,}542)] = 102.4$ ft

Outlet Design

In this example, the forebay outlet will be designed as shown in the detail included in Section 8.1.4. The vertical riser and riser outlet pipe will be the primary outlet for the forebay. The weir/spillway will be the secondary outlet, which conveys flow into the detention basin when the forebay is full.

The top of the riser will be set at the first flush storage elevation (102.4 ft). The riser outlet pipe will have an upstream invert elevation of 100.5 feet. The crest of the weir/spillway (between the forebay and the detention basin) will be set to match the top of the riser (elevation 102.4 ft).

Riser Outlet Pipe and Flow Restrictor Sizing

To gradually release the first flush storage volume over a period of 24 hours, the desired average release rate is:

$Q_{avg\,ff} = V_{t\,ff} / 86{,}400$

$Q_{avg\,ff} = 23{,}958 / 86{,}400 = 0.277$ cfs

The riser outlet pipe and flow restrictor will be sized to convey the desired average release rate given the average head in the forebay. Numerous orifi will be placed in the riser to convey unrestricted flow from the forebay into the

riser. The riser outlet pipe (calculations follow) and not these orifi will serve as the restrictor for flow out of the forebay.

It should be noted that a similar riser and flow restrictor design are used for controlling the maximum release rate from the detention basin, but the calculations (shown on pg. 11-7) are performed differently. The forebay outlet pipe flow restrictor is sized using the average head to achieve an average release rate, while the detention basin outlet pipe flow restrictor is sized using the maximum head to achieve a maximum allowable release rate.

Since the forebay has a trapezoidal cross section, 2/3 of the maximum head in the forebay is a reasonable approximation to the average head as follows:

$h_{avg} = 0.667 \times (Z_{ff} - Z_{out})$

where: Z_{out} = upstream crown elevation of riser outlet pipe (ft) assuming the outlet pipe is designed to flow full at 0.277 cfs

The riser outlet pipe and flow restrictor calculations for the forebay are performed based on two key assumptions:

1. The forebay is completely full and the downstream detention basin is completely empty when forebay dewatering begins. This means the forebay will dewater in about 24 hours for a storm whose runoff matches the first flush storage volume, but will dewater faster for smaller storms (due to the smaller volume), and will dewater slower in larger storms (due to the higher downstream head on the riser outlet pipe).
2. During dewatering of the forebay (only), there is free discharge from the forebay riser outlet pipe into the detention basin.

Use the orifice equation to determine the required riser outlet pipe diameter which will yield the desired average release rate and holding time.

d_{out} = assume 4 inches (0.33 ft) for calculating h_{avg}

$Z_{out} = 100.5 + 0.33 = 100.83$ ft

$h_{avg} = 0.667 \times (102.4 - 100.83) = 1.05$ ft

$A_{out} = Q_{avg\ ff} / (0.62 \times \sqrt{2 \times g \times h_{avg}})$

$A_{out} = 0.277 / (0.62 \times \sqrt{2 \times 32.2 \times 1.05}) = 0.0543\ ft^2$

$d_{out} = 0.263$ ft (3.16 inches)

Since the riser outlet pipe should be a minimum of 4 inches in diameter, a 3-inch diameter hole will be drilled in the end cap on the vertical run of the outlet tee to act as the flow restrictor. No recalculation of h_{avg} is needed since the selected riser outlet pipe diameter equals the assumed diameter used in calculating h_{avg}.

$d_{out} = 4$ inches (0.333 ft)

$A_{out} = 0.0871\ ft^2$

$d_o = 3$ inches (0.25 feet)

$A_o = 0.0491\ ft^2$

The actual average release rate through the flow restrictor and outlet pipe is:

$Q_{avg\ ff} = 0.62 \times A_o \times \sqrt{2 \times g \times h_{avg}}$

$Q_{avg\ ff} = 0.62 \times 0.0491 \times \sqrt{2 \times 32.2 \times 1.05} = 0.250$ cfs

Actual holding time is:

$T_{ff} = V_{t\ ff} / (Q_{avg\ ff} \times 3{,}600)$

$T_{ff} = 23{,}958 / (0.250 \times 3{,}600) = 26.6$ hrs, or approximately 24 hrs --- O.K.

Riser Outlet Pipe Slope

Determine riser outlet pipe slope to be consistent with earlier assumption that it is flowing full at the actual average release rate. Use Manning's equation with n = 0.012 for PVC pipe.

Slope (ft/ft) = $[(Q_{avg\ ff} \times n)/(1.486 \times A_{out} \times R^{2/3})]^2$

$R = d_{out}/4 = 0.333/4 = 0.083$ ft

Slope (ft/ft) = $[(0.250 \times 0.012)/(1.486 \times 0.0871 \times 0.083^{2/3})]^2$

Slope = 0.0148 ft/ft (1.5 %)

Use 4 inch PVC pipe at 1.5 % slope.

Check velocity at full pipe flow condition against maximum allowable closed conduit velocity.

$V = Q_{avg\ ff} / A_{out} = 0.250 / 0.0871 = 2.87$ ft/sec

$2.87 < V_{max}$ of 8 ft/sec --- O.K.

Outlet Weir Design

The forebay outlet weir must be designed to convey flow from the forebay into the detention basin when the forebay level exceeds the top of the forebay storage volume. The weir must be designed to convey the peak flow rate tributary to the forebay for the 10-year design storm. The calculation assumes there is free discharge from the forebay into the detention basin.

From the storm sewer design calculations using the Rational Method (not included), the peak flow rate entering the forebay is 25 cfs. In this example, the embankment elevation between the forebay and detention basin will be set at 103.0 feet. The crest elevation of the weir within the embankment is set at the first flush storage elevation of 102.4 ft. The required width of the weir is determined using the following weir equation::

$$Q = C \times B \times H^{(3/2)}$$

where:

- Q = Peak flow rate (cfs)
- C = Coefficient (which varies with the type of weir)
- B = Bottom width of the weir (ft)
- H = Maximum allowable head on the weir (ft)

For this example, a weir coefficient of 3.4 will be assumed to be representative.

$B = 25 / [3.4 \times (103 - 102.4)^{(3/2)}]$

B = 15.8 ft

Therefore, the width of the weir from the forebay into the detention basin will be specified as 16 ft.

11.4 Open Detention Basin Design

Since the site is larger than 5 acres, the maximum allowable outflow from this site is 0.15 cfs/acre for the 100-year storm. The open detention basin will be designed with a permanent pool at elevation 100.0 feet, after verifying that this is below the downstream invert of the 30 foot long forebay riser outlet pipe as follows:

Downstream Invert = 100.5 – (.0148 x 30)
= 100.06 > 100.0 -- O.K.

Required Volume

Determine the flood control storage volume required.

Q_a = maximum allowable outflow rate from the detention system (cfs)

Q_a = 0.15 cfs/acre x A
Q_a = 0.15 cfs x 24 acres = 3.6 cfs

Q_o = maximum allowable outflow rate per acre imperviousness (cfs/acre imperviousness)

$Q_o = Q_a / (A \times C)$

$Q_o = 3.6 / (24 \times 0.55) = 0.27$ cfs/acre imperviousness

T_{100} = Storage time defined as the instant storage begins until peak storage is attained (minutes)

$T_{100} = -45 + \sqrt{19{,}845 / Q_o}$

$T_{100} = -45 + \sqrt{19{,}845 / 0.27} = 226.1$ minutes

V_s = Maximum volume of water stored in the detention system per acre imperviousness (ft^3/acre imperviousness)

$V_{s\ 100} = [(17{,}649 \times T_{100})/(T_{100} + 45)] - 40 \times Q_o \times T_{100}$

$V_{s\ 100} = [(17{,}649 \times 226.1)/(226.1 + 45)] - 40 \times 0.27 \times 226.1$

$V_{s\,100}$ = 12,278 ft^3/acre imperviousness

$V_{t\,100}$ = maximum volume of water stored in the detention system (ft^3)

$V_{t\,100} = V_{S\,100} \times A \times C$

$V_{t\,100}$ = 12,278 x 24 x 0.55 = 162,070 ft^3

Determine the bank full flood storage volume ($V_{t\,bf}$)

$V_{t\,bf}$ = 5,160 x A x C

$V_{t\,bf}$ = 5,160 x 24 x 0.55 = 68,110 ft^3

Storage Provided

The detention basin storage volume provided should be shown in one foot (maximum) increments above the permanent pool water surface elevation (100.0 ft) as indicated in the table shown at the top of the next column on this page. The incremental and cumulative storage volume provided at each elevation should be determined using the average surface area for that foot of depth. The volumes in this table include all volume in the detention basin, plus the portion of the forebay volume that is above the first flush storage elevation of 102.4 feet.

Storage Provided in Detention Basin and Forebay in Addition to First Flush Storage Volume

	Area (ft^2)		Incremental Volumes (ft^3)		
Elev. (feet)	Basin Only	Forebay (only above elev. Z_{ff})	Basin Only	Forebay (only above elev. Z_{ff})	Cumul. Volume (ft^3)
100.0	13,103	---	0	0	0
101.0	15,631	---	14,350	0	14,350
102.0	18,359	---	16,979	0	31,329
102.4	19,506	14,902	7,572	0	38,901
103.0	21,287	16,466	12,234	9,407	60,542
104.0	24,415	19,232	22,835	17,832	101,209
105.0	27,744	22,198	26,063	20,698	147,970

The total storage volume provided in the detention basin should be greater than or equal to the required flood control storage volume. Determine the water surface elevation corresponding to the bank full flood and 100-year flood by interpolation from the table of storage provided, as follows:

The portion of the bank full flood to be captured in the detention basin is determined by subtracting the first flush storage volume provided in the forebay.

$V_{t\,bf\,-\,adjusted}$ = 68,110 – 23,958 = 44,152 ft^3

Z_{bf} = bank full flood storage elevation (ft)

Z_{bf} = 102.4 + (103.0 – 102.4) x [(44,152 – 38,901) / (60,542 – 38,901)]
= 102.5 ft

The portion of the flood control storage volume to be captured in the detention basin is also determined by subtracting the first flush storage volume provided in the forebay.

$V_{t\,100\,-\,adjusted}$ = 162,070 ft^3 – 23,958 ft^3 = 138,112 ft^3

Z_{100} = flood control storage elevation (ft), also referred to as the design water level for the basin

Z_{100} = 104 + (105 – 104) x [(138,112 – 101,209) / (147,970 – 101,209)]
= 104.8 ft

Outlet Design

In this example, the detention basin outlet will be designed as shown in the detail in Section 8.1.4. The vertical riser and riser outlet pipe will be the primary outlet for the detention basin. The overflow structure will be the secondary outlet, which will only receive flow when the flood control storage volume is exceeded. The emergency spillway is provided to convey flow out of the detention basin during extreme storm events or if the outlet pipe is clogged.

The top of the riser and the overflow structure will both be set at the design water level of (104.8 ft). The riser outlet pipe will have an upstream invert elevation of 100.0 feet. The minimum freeboard elevation will be 105.8 ft. The crest

of the emergency spillway will be set at elevation 105.3 ft, or 6 inches below the freeboard elevation.

Bank Full Flood Flow Restrictor Sizing

To gradually release the bank full flood storage volume over a minimum of 40 hours. a number of holes will be drilled in the riser pipe at the permanent pool water elevation to act as the flow restrictor. The average release rate for the 40 hour period is calculated as follows:

$Q_{avg\ bf} = V_{t\ bf} / 144{,}000$

$Q_{avg\ bf} = 68{,}110 / 144{,}000 = 0.47$ cfs

The calculation above is based on the simplifying assumption that the portion of the bank full flood stored in the forebay and the portion stored in the detention basin can be handled as one common volume.

A number of 1-inch diameter holes will be drilled in the riser at elevation 100.0 feet. The number of holes will be selected to convey the average release rate for the bank full flood given the average head in the detention basin. Since the detention basin has a trapezoidal cross section, 2/3 of the maximum head on the orifice is a reasonable approximation for the average head on the orifice as follows:

$h_{avg\ us} = 0.667 \times (Z_{bf} - Z_{out})$

where: Z_{out} = water surface elevation inside the riser

Use the orifice equation to determine the required number of holes which will yield the <u>desired</u> average release rate and holding time. Since the riser outlet pipe will be sized to convey the maximum allowable 100 year flood release rate, it will have negligible depth at 0.47 cfs and Z_{out} can be approximated as the upstream invert elevation of the riser outlet pipe.

$h_{avg\ us} = 0.667 \times (102.5 - 100.0) = 1.67$ ft

$A_o = Q_{avg\ bf} / (0.62 \times \sqrt{2 \times g \times h_{avg}})$

$A_o = 0.47 \text{ cfs} / (0.62 \times \sqrt{2 \times 32.2 \times 1.67}) = 0.0731 \text{ ft}^2$

$d_o = 1$ inch (0.00545 ft^2)

Required number of 1-inch holes = 0.0731/0.00545
= 13.4

Use fourteen 1-inch diameter holes at elevation 100.0.

The <u>actual</u> average release rate through the orifice for the assumed conditions is:

$Q_{avg\ bf} = 0.62 \times A_o \times \sqrt{2 \times g \times h_{avg}}$

$Q_{avg\ bf} = 0.62 \times 14 \times 0.00545 \times \sqrt{2 \times 32.2 \times 1.67}$
= 0.491 cfs

<u>Actual</u> holding time for the bank full flood for the assumed condition is:

$T_{bf} = V_{t\ bf} / (Q_{avg\ bf} \times 3{,}600)$

$T_{bf} = 68{,}110 / (0.491 \times 3{,}600) = 38.5$ hrs, or approximately 40 hrs --- O.K.

Check of Forebay Design Assumption

In sizing the forebay outlet pipe and flow restrictor it was assumed that there was free discharge from the forebay riser outlet pipe into the detention basin when dewatering the forebay after a storm that just fills the first flush storage volume. Therefore it is necessary to verify that the bank full flood flow restrictor will pass the actual average release rate without inhibiting free discharge from the forebay riser outlet pipe.

The downstream crown elevation of the forebay riser outlet pipe is 100.39.

Use the orifice equation to determine the detention basin head for this condition.

$h = [Q_{avg\ ff} / (0.62 \times A)]^2 / (2 \times g)$

$h = [0.25 / (0.62 \times 14 \times 0.00545)]^2 / (2 \times 32.2)$
= 0.17 ft

Based on the bank full flood flow restrictor as designed, the water surface elevation in the detention basin when conveying the average release rate from the first flush

volume is 100.17 feet. Therefore, the basin water surface will not inhibit free discharge from the forebay riser outlet pipe into the detention basin.

Riser Outlet Pipe and Flood Control Flow Restrictor Sizing

The riser outlet pipe and flow restrictor will be sized to convey the desired maximum allowable release rate (for the 100 year flood) at the design water level in the detention basin (104.8 feet). Numerous orifi will be placed in the riser above the bank full flood elevation to convey unrestricted flow from the detention basin into the riser. These orifi will not serve as a flow restrictor for the maximum release rate. As noted in the forebay outlet pipe flow restrictor calculations (see page 11-3), the calculations below are based on the maximum head on the riser rather than the average head as used for the forebay calculations.

$Q_{max} = Q_a = 3.6$ cfs (from Storage Volume calculations)

$h_{max} = (Z_{100} - Z_{out})$

where: Z_{out} = upstream crown elev. of riser outlet pipe (ft) assuming the outlet pipe is designed to flow full at 3.6 cfs.

Determine the riser outlet pipe diameter to achieve the maximum release rate.

d_{out} = assume 10 inches (0.83 ft) for calculating h_{max}

$Z_{out} = 100.0 + 0.83 = 100.83$ ft

$h_{max} = 104.8 – 100.83 = 3.97$ ft

$A_{out} = Q_{max} / (0.62 \times \sqrt{2 \times g \times h_{max}})$

$A_{out} = 3.6 / (0.62 \times \sqrt{2 \times 32.2 \times 3.97}) = 0.363$ ft²

$d_{out} = 0.680$ ft (8.16 inches)

An 8-inch diameter outlet pipe without any orifice would achieve the desired maximum release rate. However, since it would require an excessive slope for the riser outlet pipe, a 10-inch diameter outlet pipe will be used instead with a flow restrictor. No recalculation of h_{max} is needed since the selected riser outlet pipe diameter equals the assumed diameter used in calculating h_{max}. An 8-inch diameter hole will be drilled in the end cap on the vertical run of the outlet tee.

$d_{out} = 10$ inches (0.833 ft)

$A_{out} = 0.545$ ft²

$d_o = 8$ inches (0.667 ft)

$A_o = 0.349$ ft²

The actual maximum release rate through the flow restrictor and outlet pipe is:

$Q_{max} = 0.62 \times A_o \times \sqrt{2 \times g \times h_{max}}$

$Q_{max} = 0.62 \times 0.349 \times \sqrt{2 \times 32.2 \times 3.97} = 3.46$ cfs.

Q_{max} of 3.46 cfs < 3.6 cfs and within 10% of 3.6 cfs --- O.K.

Riser Outlet Pipe Slope

The riser outlet pipe slope must be selected consistent with the earlier assumption that it is flowing full at the actual maximum release rate. Use Manning's formula with n = 0.012 for PVC pipe.

$\text{Slope (ft/ft)} = [(Q_{max} \times n)/(1.486 \times A_{out} \times R^{2/3})]^2$

$R = d_{out}/4 = 0.833/4 = 0.208$ ft

$\text{Slope (ft/ft)} = [(3.46 \times 0.012)/(1.486 \times 0.545 \times 0.208^{2/3})]^2$

Slope = 0.0213 ft/ft (2.13 %)

Use 10 inch PVC pipe at 2.1 % slope.

Check velocity at full pipe flow condition against minimum and maximum allowable closed conduit velocities:

$V = Q_{max} / A_{out} = 3.46 / 0.545 = 6.35$ ft/sec

$6.35 > V_{min}$ of 2.5 ft/sec; $6.35 < V_{max}$ of 8 ft/sec --- O.K.

Overflow Structure Outlet Pipe Size and Slope

The overflow structure outlet pipe must be sized to convey the peak flow rate into the storm water management system for the 10-year storm event. The calculation assumes there is free discharge from the overflow structure outlet pipe into the downstream surface water or closed conduit.

From the storm sewer design calculations using the Rational method (not included), the peak flow rate entering the system is 25 cfs. In this example, the designer will select 27-inch reinforced concrete pipe (RCP) and will determine required slope by using Manning's formula with n = 0.013 for RCP.

Slope (ft/ft) = $[(Q \times n)/(1.486 \times A \times R^{2/3})]^2$

$A = 3.98\ ft^2$

$R = d/4 = 2.25/4 = 0.563$ ft

Slope (ft/ft) = $[(25 \times 0.013)/(1.486 \times 3.98 \times 0.563^{2/3})]^2$

Slope = 0.00649 ft/ft (0.65 %)

Use 27 inch RCP at slope of 0.65 %.

Check velocity at full pipe flow condition against minimum and maximum allowable closed conduit velocities:

$V = Q / A = 25 / 3.98 = 6.28$ ft/sec

$6.28 > V_{min}$ of 2.5 ft/sec; $6.28 < V_{max}$ of 8 ft/sec --- O.K.

APPENDIX A

Engineer's Certificate of Construction

Engineer's Certificate of Construction

Wayne County: Construction permit #:_____

Review Number: _____

Project Name: _____

Project Address/Location:_____

City/Township of:_____, Wayne County, Michigan.

I hereby certify that the construction and installation of the Storm Water Management System of the project known as _____is complete as of the date _____. All components of the storm water management system have been constructed and installed in accordance with the construction plans approved by the Wayne County Department of Public Services, Permit Office and comply with the Wayne County Storm Water Management Program.

Signed: _____

Licensed Professional Engineer (Michigan)

NOTE:
This certification must be stamped with the seal of a professional engineer licensed in the State of Michigan. The certificate submitted must be the original.

Please Return Certification to:

Department of Public Services - Permit Office
Attn: Division Permit Construction Manager
33809 Michigan Avenue
Wayne, Michigan 48184

Revised: 11 July 2008

Attachment A to
Engineer's Certificate of Construction

THIS ATTACHMENT MUST BE COMPLETED IF:

1. The storm water management system contains elements where vegetation is critical to the functioning of a storm water management component, including but not limited to: Open Detention Basins, Bioretention Areas, Vegetated Swales, Streambank Stabilization, and Vegetation/Riparian Corridor Management.

   AND

2. Plantings incorporated into the system design are not included on plant lists in the Wayne County Storm Water Standards and were instead based on landscaping plans submitted by a Registered Landscape Architect (RLA).

Wayne County: Construction permit #:_____

Review Number: _____

Project Name: _____

Project Address/Location:_____

City/Township of:_____, Wayne County, Michigan.

I hereby certify that the plantings incorporated into the design of the Storm Water Management System for the project known as _____were completely and correctly installed as of the date _____. The plantings were installed in accordance with the construction plans for the landscaping elements approved by the Wayne County Department of Public Services, Permit Office and comply with the Wayne County Storm Water Management Program.

Signed: _____

Registered Landscape Architect (Michigan)

NOTE:
This certification must be stamped with the seal of a landscape architect licensed in the State of Michigan. The certificate submitted must be the original.

Please Return Certification to:

Department of Public Services - Permit Office
Attn: Division Permit Construction Manager
33809 Michigan Avenue
Wayne, Michigan 48184

APPENDIX C

Sample Long-Term Maintenance Permit

February 2007

72 HOURS PRIOR TO ANY CONSTRUCTION, CALL **(734) 595-6504** FOR INSPECTION

72 HOURS BEFORE YOU DIG DIAL MISS DIG **1-800-482-7161**

WAYNE COUNTY
DEPARTMENT OF PUBLIC SERVICES

COUNTY OF WAYNE, MICHIGAN
33809 Michigan Avenue
Wayne, MICHIGAN 48184
(734) 595-6504

PERMIT TO CONSTRUCT, OPERATE, USE, AND/OR MAINTAIN

PERMIT NO. C******	
ISSUE DATE	EXPIRES
REVIEW NO.	WORK ORDER

PROJECT NAME **********

LOCATION

CITY/TOWNSHIP: ********

PERMIT HOLDER			CONTRACTOR:		
**********			**********		
**********			**********		
**********			**********		
CONTACT	PHONE	24 HOURS PHONE	CONTACT	PHONE	24 HOUR PHONE
********	*********	**********	********	********	**********

DESCRIPTION OF PERMITTED ACTIVITY

Permit to maintain the storm water management system in accordance with the drawing attached as exhibit ”A”, the terms of the Long-Term Maintenance Plan attached as exhibit “B”, and the Wayne County Storm Water Management Ordinance and Administrative Rules.

1. (Entity) shall assume jurisdiction over and accept responsibility for maintenance of the storm water management system(s) to ensure that the storm water management systems function properly as designed and constructed. (Entity’s) responsibilities under this permit shall include, without limitations, (a) any and all monitoring and preventative maintenance activities set forth in the plan; (b) any and all remedial actions necessary to repair, modify or reconstruct the system and (c) any other activities or responsibilities for maintenance of the storm water management system as may be set forth in the Ordinance, Administrative Rules, the plan or this permit.

2. (Entity) shall perform all monitoring, maintenance, remedial and other responsibilities required by the Wayne County Ordinance, Administrative Rules, the plan and this permit, in perpetuity and at its sole cost expense.

3. (Entity) shall prepare, execute and (if necessary) record any and all agreements, contracts and other documents that may be required to perform its obligations hereunder and ensure maintenance of storm water management systems at the project in perpetuity.

If Wayne County finds it necessary to adjust or relocate all or any portion of the permitted storm water management system, the (Entity) shall cause this adjustment or relocation to be accomplished at no expense to the County. Prior to any work being performed in the right-of-way, a permit shall be secured from the Wayne County Department of Public Services. See construction permit ******** for construction of ********

REQUIRED ATTACHMENTS:

EXHIBIT A: Map Depicting Physical Limits of Storm Water Management System
EXHIBIT B: Long Term Maintenance Plan
EXHIBIT C: Binding Agreement (e.g., community resolution)

PERMIT VALID ONLY IF ACCOMPANIED BY ABOVE ATTACHMENTS

IN CONSIDERATION OF THE PERMIT HOLDER AND CONTRACTOR AGREEING TO ABIDE BY AND CONFORM WITH ALL TERMS AND CONDITIONS HEREIN, A PERMIT IS HEREBY ISSUED TO THE ABOVE NAMED TO CONSTRUCT, OPERATE, USE AND/OR MAINTAIN WITHIN THE ROAD RIGHT-OF-WAY, COUNTY EASEMENT AND/OR, COUNTY PROPERTY. THE PERMITED WORK DESCRIBED ABOVE SHALL BE ACCOMPLISHED IN ACCORDENCE WITH APPROVED PLANS, MAPS, SPECIFICATIONS, AND STATEMENTS FILED WITH THIS OFFICE WHICH ARE INTEGRAL TO AND MADE PART OF THIS PERMIT. FURTHERMORE, THE GENERAL CONDITIONS AS WELL AS ANY REQUIRED ATTACHEMENTS ARE INCORPRATED AS PART OF THIS PERMIT.

X_____ _____ WAYNE COUNTY DEPARTMENT OF PUBLIC SERVICES YCC/CAL _____
PERMIT HOLDER/AUTHORIZED AGENT DATE PREPARED BY

X_____ _____ _____ _____
CONTRACTOR/AUTHORIZED AGENT DATE VALIDATED BY/FOR WAYNE COUNTY HIGHWAY ENGINEER DATE

GENERAL CONDITIONS

1. **Specifications**. All work performed under this permit shall be done in accordance with the approved plans, specifications, maps, statements, and special conditions filed with the County and shall comply with the Wayne County Permit Specifications included as an attachment to this permit.

2. **Fees**. The PERMIT HOLDER shall be responsible for all fees incurred by the County in connection with this permit and shall deposit the fees and costs as determined by the County at the time the permit is issued.

3. **Bond**. The PERMIT HOLDER and/or the CONTRACTOR shall furnish a bond in cash or certified check in an amount acceptable to the County to guarantee performance under the conditions of this permit. The County may use all or any portion of the bond which shall be necessary to cover any expense, including inspection costs, or damage incurred by the County through the granting of this permit. Should the bond be insufficient to cover the expenses and damages incurred by the County, the PERMIT HOLDER shall pay such deficiency upon billing by the County. If the bond amount exceeds the expenses and damages incurred by the County, the excess portion will be returned to the depositor. The excess performance bond provided for herein, when it cannot be returned, shall be deposited in the County Road Find and become a part thereof unless claimed by the depositor within one year of the date of satisfactory completion of the construction authorized by this permit.

4. **Insurance**. The PERMIT HOLDER and/or the CONTRACTOR shall furnish proof of liability and property damage insurance in the form and amounts acceptable to the County with Wayne County named as an insured party. The PERMIT HOLDER or the CONTRACTOR shall maintain this insurance until the permit is released, revoked, or cancelled by the County.

5. **Indemnification**. The PERMIT HOLDER and/or the CONTRACTOR shall indemnify, hold harmless and defend Wayne County, the Wayne County Department of Public Services, its officials and employees against any and all claims, suits, and judgments to which the County, the Department, its officials and employees may be subject and for all costs and actual attorney fees which may be incurred on account of injury to persons or damage to property, including property of the County, whether due to negligence of the PERMIT HOLDER or the CONTRACTOR or to the joint negligence of the PERMIT HOLDER or the CONTRATOR and the County, arising out of any and all work performed under this permit, or in connection with work not authorized by this permit, or resulting from failure to comply with the terms of this permit, or arising out of the continued existence of the work product that is the subject of his permit.

6. **Start and Completion of Work**. This permit shall not become operative until it has been fully executed by the County. The PERMIT HOLDER or the CONTRACTOR shall notify the County at least 72 hours before starting construction and shall notify the County when work is completed. The PERMIT HOLDER or the CONTRACTOR or their representative shall have copies of the executed permit and approved plans in their possession on the job site at all times.

7. **Safety.** The PERMIT HOLDER and the CONTRACTOR agree that all work under this permit shall be performed in a safe manner and to keep the area affected by this permit in a safe condition until the work is completed and accepted by the County and to furnish, install, and maintain all necessary traffic controls and protection in accordance with the Michigan Manual of Uniform Traffic Control Devices.

8. **Underground Utilitie**s. The PERMIT HOLDER or the CONTRACTOR shall contact all utility owners regarding their facilities prior to starting work and shall comply with all applicable provisions of Act 53, Public Acts of 1974, as amended. The presence or absence of utilities is based on the best information available, and the County is not responsible for the accuracy of this information. The PERMIT HOLDER and the CONTRACTOR assume all responsibility for the interruption and damage to underground utilities.

9. **Assignability**. This permit is not transferable and is not assignable without the written consent of the County.

10. **Limitation of Permit**. This permit does not relieve the PERMIT HOLDER and the CONTRACTOR from meeting any and all requirements of law, or of other public bodies or agencies. The PERMIT HOLDER and/or the CONTRACTOR shall be responsible for securing and shall secure any other permits or permission necessary or required by law from governmental agencies and jurisdictions, corporations, or individuals.

11. **Restoration**. The PERMIT HOLDER and the CONTRACTOR agree to restore the county road, the county road right-of-way, county drain easement or county park property to a condition equal to or better than its condition before work under this permit began.

12. **Acceptance**. Acceptance by the County of work performed does not relieve the PERMIT HOLDER and/or the CONTRACTOR of full responsibility for work performed or the presence of the permitted facility. The PERMIT HOLDER acknowledges that the County has no liability for the presence of the PERMIT HOLDER'S facility located within the county road right-of-way, county drain easement, or county park property.

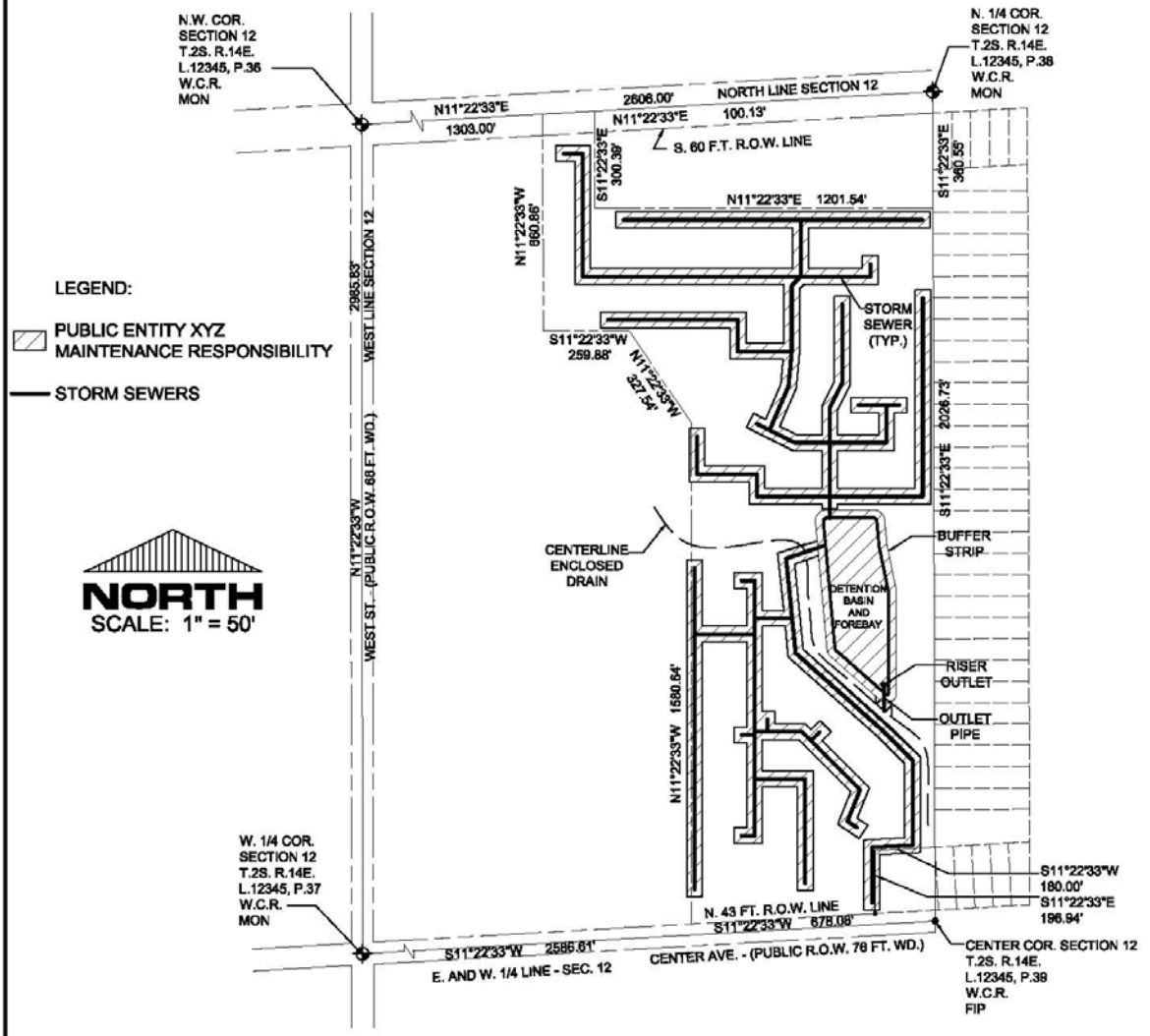
13. **Cost Responsibility**. The design, construction, operation, and maintenance of all work covered by this permit shall be at the PERMIT HOLDER'S expense with the exception that the PERMIT HOLDER will not be responsible for maintaining road widenings or similar facilities which become part of the County roadway.

14. **Revocation**. This permit may be suspended or revoked at the will of the County and, upon order of the County, the PERMIT HOLDER and the CONTRACTOR shall surrender this permit, cease operations, and remove, alter or relocate, at their expense, the facilities for which the permit was granted. The PERMIT HOLDER and the CONTRACTOR expressly waive any right to claim damages for compensation resulting from the revocation of the permit.

15. **Violation**. This permit shall become immediately null and void if the PERMIT HOLDER or the CONTRACTOR violates the terms of this permit and the County may require immediate removal of the PERMIT HOLDER'S facilities and restoration of the County property, or the County may remove the facilities and restore the County property at the PERMIT HOLDER'S expense. The PERMIT HOLDER and the CONTRACTOR agree that in the event of a violation of the terms of this permit or in the event the work authorized by this permit is not satisfactorily completed by the permit expiration date, the County may use all or any portion of the performance bond to restore the County road right-of-way, drain easement, wastewater facility or park property as necessary for reasonably safe and efficient operations and maintenance, or to establish extraordinary maintenance procedures as required to assure reasonably safe and efficient operation of the County facility.

16. **Design**. The PERMIT HOLDER is fully responsible for the design of the permitted facility, such design being consistent with applicable County standards, specifications, guidelines, and requirements, and with good engineering practice.

SAMPLE - EXHIBIT A
PHYSICAL LIMITS OF STORM WATER MANAGEMENT SYSTEM

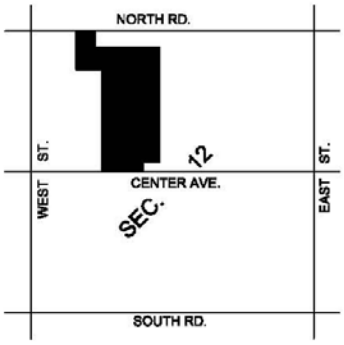


LEGAL DESCRIPTION

LAND IN THE CITY OF XYZ, WAYNE COUNTY, MICHIGAN BEING THAT PART OF THE NORTHWEST CORNER OF SECTION 12, TOWNSHIP 2 SOUTH, RANGE 14 EAST DESCRIBED AS FOLLOWS...

TAX IDENTIFICATION NUMBER (IF SPACE ALLOWS)

VICINITY MAP (N.T.S.)



ENGINEERING OR SURVEYING FIRM NAME & ADDRESS	APPLICANT'S COMPANY NAME & ADDRESS	Date: 3-11-05
		Sheet 1 of 1
		DR. By: ABC / CHK: XYZ
		Job No. 1234

EXHIBIT B

SAMPLE LONG-TERM MAINTENANCE PLAN

Property Information:	ABC Subdivision 123 Example Road City or Town, Michigan 48ZZZ
Applicant:	*[Name of Applicant]* *[Address of Applicant]*
Property Owner:	*[Name of Property Owner]* *[Address of Property Owner]*
Permit Number:	*[Insert Permit Number when available]*

A. Physical Limits of the Storm Water Management System

[This section defines the physical limits of the storm water management system to be maintained in accordance with this long-term maintenance plan.]

The storm water management system (SWMS) subject to this Long-term Maintenance Plan (Plan) is depicted on Exhibit A to the Permit and includes without limitation the storm sewers, swales, manholes, catch basins, storm water inlets, forebay, detention basin, outlet structure, emergency overflow, buffer strip, and closed conduits and watercourses that convey flow from the detention basin to _____ [*ADD other site specific elements (for example, manufactured treatment systems or underground detention) as necessary*].

For purposes of this Plan, this storm water management system and all of its components as shown on Exhibit A is referred to as _____ *[name of SWMS]*.

B. Time Frame for Long-Term Maintenance Responsibility

[This section clearly defines the point at which long-term maintenance responsibility commences, particularly for large development sites.]

[Name of Applicant] is responsible for maintaining the *[name of SWMS]*, including complying with applicable requirements of the local or Wayne County soil erosion and sedimentation control program, until Wayne County releases the construction permit. Long-term maintenance responsibility for the *[name of SWMS]* commences when defined by the maintenance permit issued by the County. Long-term maintenance continues in perpetuity.

C. Manner of Ensuring Maintenance Responsibility

[This section identifies the public entity responsible for long-term maintenance and defines the manner in which long-term maintenance of the storm water management system will be maintained in perpetuity. At a minimum, the plan must address the following two elements:

- *the legally-binding instrument with local unit of government(s) or another public corporation by which long-term maintenance is assumed in perpetuity, and*
- *a method of notifying subsequent property owners that long-term maintenance of the storm water management system is required and that the Property may be subject to limitations or restrictions related to storm water management.*

Chapter 6 of the Standards Manual summarizes options that may be available for addressing these elements.

The following section presents an example method of establishing long-term maintenance.]

Example: Agreement with Local Community

[City, Township, or other public entity] has assumed responsibility for long-term maintenance of *[name of SWMS]*. The resolution by which *[City, Township, or other public entity]* has assumed maintenance responsibility is attached to the Permit as Exhibit C. *[Name of Property Owner]*, through a maintenance agreement with the *[City, Township, or other public entity]*, has agreed to perform the maintenance activities required by this Plan. *[City, Township, or other public entity]* retains the right to enter the property and perform the necessary maintenance of the *[name of SWMS]* if *[Property Owner]* fails to perform the required maintenance activities.

To ensure that the *[name of SWMS]* is maintained in perpetuity, the map of the physical limits of the storm water management system (Exhibit A), this Plan (Exhibit B), the resolution attached as Exhibit C, and the maintenance agreement between the City and the Property Owner will be recorded with the Wayne County Register of Deeds. Upon recording, a copy of the recorded document will be provided to the County.

D. Long-Term Maintenance Plan and Schedule

[This section clearly identifies the monitoring, preventative, or remedial activities that will be completed for each element of the storm water management system. This section also includes a schedule for each activity.]

Table 1 identifies the maintenance activities to be performed, organized by category (monitoring/inspections, preventative maintenance, and remedial actions). Table 1 also identifies site-specific work needed to ensure that the storm water management system functions properly as designed. The following list supplements Table 1 and provides more information about site specific activities:

[Identify any additional requirements not shown on Table 1 in this section. For example:]

- While performing maintenance, chemicals should not be applied to the forebay, open detention basin, watercourses or anywhere in the 25 foot buffer strip around surface waters and along watercourses.

Table 1
Long-Term Maintenance Schedule
ABC Subdivision, 123 Example Road, City or Town, Michigan 48ZZZ

Maintenance Activities	System Component									Frequency
	Catch Basins, Inlets & Storm Sewers	Channels & Vegetated Swales	Inlets to Pretreatment Systems and Detention/Retention Systems	Forebays	Open Detention Basins & Retention Basins	Flow Restrictors, Overflow Structures & Outlet Pipes	Emergency Spillways	Riprap	Buffer Strip	
Monitoring/Inspection										
• Inspect for sediment accumulation**/clogging of stone filter	X	X	X	X	X	X	X			Annually
• Inspect for floatables, dead vegetation and debris	X	X	X	X	X	X	X		X	Annually and after major events
• Inspect for erosion and integrity of banks and berms		X	X	X	X		X	X	X	Annually and after major events
• Inspect all components during wet weather and compare to as-built plans	X	X	X	X	X	X	X	X	X	Annually
• Monitor plantings/vegetation		X		X	X		X		X	2 times per year
• Ensure means of access for maintenance remain clear/open	X	X	X	X	X	X	X	X	X	Annually
Preventative Maintenance										
• Mowing		X			X		X		X	Up to 2 times/year, select areas only*
• Remove accumulated sediment	X	X		X	X	X				As needed**
• Remove floatables, dead vegetation and debris	X	X	X	X	X	X	X			As needed
• Replace or wash/reuse stone riser filters						X	X	X		Every 3 years; more frequently as needed***
• Remove invasive plant species		X		X	X				X	Annually
Remedial Actions										
• Repair/stabilize areas of erosion		X	X	X	X		X	X	X	As needed
• Replaced dead plantings, bushes, trees		X		X	X				X	As needed
• Reseed bare areas		X		X	X		X		X	As needed
• Structural repairs	X		X			X	X	X		As needed
• Make adjustments/repairs to ensure proper functioning	X	X	X	X	X	X	X	X	X	As-needed

* Not to exceed the length allowed by local community ordinance.

** Forebays, open detention basins, and retention basins to be cleaned whenever sediment accumulates to a depth of 6-12 inches or if sediment resuspension is observed.

*** Replace stone if it cannot be adequately cleaned.

Table 1 (Continued)
Long-Term Maintenance Schedule
ABC Subdivision, 123 Example Road, City or Town, Michigan 48ZZZ

Maintenance Activities	System Component									Frequency
	Manufactured Treatment Systems	Underground Detention Systems	Bioretention Areas	Porous Pavement	Other Infiltration Features	Other Features	Other Features	Other Features	Other Features	
Monitoring/Inspection										
• Inspect for sediment accumulation**/clogging	X	X	X	X	X					Annually
• Inspect for floatables, dead vegetation and debris	X	X	X	X	X					Annually and after major events
• Inspect for erosion and integrity of system			X	X	X					Annually and after major events
• Inspect all components during wet weather and compare to as-built plans	X	X	X	X	X					Annually
• Monitor plantings/vegetation			X		X					2 times per year
• Ensure means of access for maintenance remain clear/open	X	X	X	X	X					Annually
Preventative Maintenance										
• Remove accumulated sediment	X	X	X		X					As needed**
• Remove floatables, dead vegetation and debris	X	X	X	X	X					As needed
• Re-apply / replace mulch layer			X							Reapply every 6 months. Replace every 2 years.
• Replace subsurface components (e.g., soil, underdrain systems, etc.)			X							Every 5 years or as needed (e.g., when water ponds more than 6 hours)
• Remove invasive plant species			X		X					Annually
• Street sweeping of paved surfaces				X						Semi-annually
• Other: Specify (e.g., recommended by manufacturer)	X			X						
Remedial Actions										
• Repair/stabilize areas of erosion			X		X					As needed
• Replaced dead plantings, bushes, trees			X		X					As needed
• Reseed bare areas			X		X					As needed
• Structural repairs	X	X	X	X	X					As needed
• Make adjustments/repairs to ensure proper functioning	X	X	X	X	X					As-needed

* Not to exceed the length allowed by local community ordinance.

** Manufactured treatment systems and underground detention systems to be cleaned according to manufacturer's recommendations; at a minimum, whenever sediment accumulates to a depth of 6-12 inches or if sediment resuspension is observed.

Appendix J

Appendix K

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
WATER BUREAU

PERMIT APPLICATION FOR WATER SUPPLY SYSTEMS

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

This application becomes an Act 399 Permit only when signed and issued by authorized DEQ Staff.
See instructions below for completion of this application.

1. **Municipality or Organization, Address and WSSN** that will own or control the water facilities to be constructed. This permit is to be issued to: **WSSN**:	Permit Stamp Area (DEQ use only)	
2. **Owner's Contact Person** (provide name for questions): Contact: Title: Phone:		
3. **Project Name** (Provide phase number if project is segmented):	4. **Project Location** (City, Village, Township):	5. **County** (location of project):

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

cc:

Issued by: _____

Reviewed by: _____

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

Instructions: Complete items 1 through 5 above and 6 through 21 on the following pages of this application. Print or type all information except for signatures. Mail completed application, plans and specifications, and any attachments to the Michigan Department of Environmental Quality District Office having jurisdiction in the area of the proposed construction.

Please Note:

a. This **PERMIT** only authorizes the construction, alteration, addition or improvement of the water system described herein and is issued solely under the authority of 1976 PA 399, as amended.
b. The issuance of this **PERMIT** does not authorize violation of any federal, state or local laws or regulations, nor does it obviate the necessity of obtaining such permits, including any other DEQ permits, or approvals from other units of government as may be required by law.
c. This **PERMIT** expires two (2) years after the date of issuance in accordance with R 325.11306, 1976 PA 399, administrative rules, unless construction has been initiated prior to expiration.
d. Noncompliance with the conditions of this permit and the requirements of the Act constitutes a violation of the Act.
e. Applicant must give notice to public utilities in accordance with 1974 PA 53, (MISS DIG), being Section 460.701 to 460.718 of the Michigan Compiled Laws, and comply with each of the requirements of that Act.
f. All earth changing activities must be conducted in accordance with the requirements of the Soil Erosion and Sedimentation Control Act, Part 91, 1994 PA 451, as amended.
g. All construction activity impacting wetlands must be conducted in accordance with the Wetland Protection Act, Part 303, 1994 PA 451, as amended.
h. Intentionally providing false information in this application constitutes fraud which is punishable by fine and/or imprisonment.

CONTINUE APPLICATION ON THE FOLLOWING PAGES

6. **Facilities Description –** In the space below provide a detailed description of the proposed project. Applications without adequate facilities descriptions **will be returned**. SEE EXAMPLES BELOW**.** Use additional sheets if needed.

EXAMPLES – EXAMPLES – EXAMPLES – EXAMPLES – EXAMPLES – EXAMPLES	
Water Mains	500 feet of 8-inch water main in First Street from Main Street north to State Street. **OR** 250 feet of 12-inch water main in Clark Road from an existing 8-inch main in Third Avenue north to a hydrant.
Booster Stations	A booster station located at the southwest corner of Third Avenue and Main Street, and equipped with two, 15 Hp pumps each rated 150 gpm @ 200 feet TDH. Station includes backup power and all other equipment as required for proper operation.
Elevated Storage Tank	A 300,000 gallon elevated storage tank located in City Park. The proposed tank shall be spherical, all welded construction and supported on a single pedestal. The tank shall be 150 feet in height, 40 feet in diameter with a normal operating range of 130 – 145 feet. The interior coating system shall be ANSI/NSF Standard 61 approved or equivalent. The tank will be equipped with a cathodic protection system, and includes a tank level control system with telemetry.
Chemical Feed	A positive displacement chemical feed pump, rated at 24 gpd @ 110 psi to apply a chlorine solution for Well No. 1. Chlorine is 12.5% NaOCL, ANSI/NSF Standard 60 approved and will be applied at a rate of 1.0 mg/l of actual chlorine.
Water Supply Well	Well No. 3, a 200 foot deep well with 170 feet of 8-inch casing and 30 feet of 8-inch, 10 slot screen. The well will be equipped with a 20 Hp submersible pump and motor rated 200 gpm @ 225 feet TDH, set at 160 feet below land surface.
Treatment Facilities	A 5 million gpd water treatment plant located at the north end of Second Avenue. The facility will include 6 low service pumps, 2 rapid mix basins, 4 flocculation/sedimentation basins, 8 dual media filters, 3 million gallon water storage reservoir and 6 high service pumps. Also included are chemical feed pumps and related appurtenances for the addition of alum, fluoride, phosphate and chlorine.

General Project Information – Complete all boxes below.

7. Design engineer's name, engineering firm, address, phone number, and email address:	8. Indicate who will provide project construction inspection: ☐ Organization listed in Box 1. ☐ Engineering firm listed in Box 7. ☐ Other - name, address, and phone number listed below.

9. Is a basis of design attached?
☐YES ☐NO

If no, briefly explain why a basis of design is not needed.

10. Are sealed and signed engineering plans attached?
☐YES ☐NO

If no, briefly explain why engineering plans are not needed.

11. Are sealed and signed construction specifications attached?
☐YES ☐NO

If specifications are not attached, they need to be on file at DEQ.

12. Were Recommended Standards for Water Works, AWWA guidelines, and the requirements of Act 399 and its administrative rules followed?
☐YES ☐NO

If no, explain which deviations were made and why.

13. Are all coatings, chemical additives and construction materials ANSI/NSF or other adequate 3rd party approved?
☐YES ☐NO

If no, describe what coatings, additives or materials did not meet the applicable standard and why.

14. Are all water system facilities being installed in the public right-of-way or a dedicated utility easement? (For projects not located in the public right-of-way, utility easements must be shown on the plans.)
☐YES ☐NO

If no, explain how access will be obtained.

15. Is the project construction activity within a wetland (as defined by Section 324.30301(d)) of Part 303, 1994 PA 451?
☐YES ☐NO

If yes, a wetland permit must be obtained.

16. Is the project construction activity within a 100-year floodplain (as defined by R 323.1311(e)) of Part 31, 1994 PA 451, administrative rules?
☐YES ☐NO

If yes, a flood plain permit must be obtained.

17. Is the project construction activity within 500 feet of a lake, reservoir, or stream?
☐YES ☐NO

If yes, a Soil and Erosion Control Permit must be obtained or indicate if the owner listed in box 2 of this application is an Authorized Public Agency (Section 10 of Part 91, 1994 PA 451) ☐ Owner is APA.

18. 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 storm water regulations?
☐YES: NPDES Authorization to discharge storm water from construction activities must be obtained.

☐NO: Describe why activity is not regulated:

Please call 517-241-8993 with questions regarding the applicability of the storm water regulations.

19. Is the project in or adjacent to a site of suspected or 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 district office for listings of Michigan sites of environmental contamination.

20. IF YOU ARE A CUSTOMER/WHOLESALE/BULK PURCHASER, COMPLETE THE FOLLOWING

1) Name and WSSN of source water supply system (seller) _____

2) 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 to #2, the producer/seller approval letter must be attached when submitted to DEQ.

21. **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.

OWNER'S CERTIFICATION

I, _____ (name), acting as the _____ (title/position) for
(print) (print)

_____ (entity owning proposed facilities) certify that this project has
(print)

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

_____ _____ _____
Signature* Date Phone

*Original signature only, no photocopies will be accepted.

PROJECT BASIS OF DESIGN – FOR WATER MAIN PROJECTS

PROJECT NAME: _____

For this PROJECT the following information must be provided per Act 399 unless waived by the Department. For projects other than water main installation, or if additional space is needed, attach separate sheet(s) with detailed Basis of Design calculations.

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

B. Number of service connections served by this permit application _____

C. Total number of service connections ultimately served by entire project _____

D. Residential Equivalent Units (REUs) served by this permit application _____

E. Total Residential Equivalent Units (REUs) ultimately served by entire project _____

F. Water flow rates for proposed project based on REUs listed in "D' and "E" above

1. Initial design average day flow (mgd) _____
2. Initial design maximum day flow (mgd) _____
3. Total design average day flow (mgd) _____
4. Total design maximum day flow (mgd) _____
5. Required fire flows: (1) _____ gpm for _____ hours

G. Actual flows and pressures of existing system at the connection point(s) (2)
_____ gpm at _____ psi
_____ gpm at _____ psi
_____ gpm at _____ psi
_____ gpm at _____ psi

H. Estimated minimum flows and pressures within the proposed water main system (3) _____ gpm at _____ psi

(1) Every water system must decide what levels of fire fighting flows they wish to provide. Fire flow should be appropriate for the area (residential, commercial, industrial) being served by the project. Typical fire flow rates can be obtained from the water supply, local fire dept., ISO or AWWA. The water system must then be designed to be able to provide the required fire flows while maintaining at least 20 psi in all portions of the distribution system.

(2) Flows and pressures at the connection points must be given to determine if the existing water main(s) are able to deliver water to the new service area. These numbers can be obtained from a properly modeled and calibrated distribution system hydraulic analysis or hydrant flow tests performed in the field. If more than one connection is proposed, list as needed.

(3) List what the estimated minimum flows can be expected in the proposed water mains based on estimated water demands, head losses, elevation changes and other factors that may affect flows, such as dead end mains.

Appendix L

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

WATER BUREAU

PERMIT APPLICATION FOR WASTEWATER SYSTEMS

CONSTRUCTION - ALTERATION - ADDITION OR IMPROVEMENT AS DESCRIBED HEREIN

Required under the Authority of Part 41, Act 451, PA 1994 as amended

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

INSTRUCTIONS: Complete items 1 through 5 below and 6 through 28 on the following pages of this application, complete the streamlined checklists for sewer projects that qualify, and complete the basis of design sheet (or provide same information in other format). Print or type all information except for signatures. Mail completed application, plans and specifications, and attachments to the Michigan Department of Environmental Quality District office having jurisdiction in the area of the proposed construction.

<table>
<tr><td>Permit Number (DEQ use only)</td><td colspan="2">Date of Issuance (DEQ use only)</td></tr>
<tr><td>1. Municipality or Organization, and Address which will own the wastewater facilities to be constructed. This permit is to be issued to:</td><td colspan="2" rowspan="2">Permit Stamp Area (DEQ use only)</td></tr>
<tr><td>2. Owner’s Contact Person (provide name for questions):
Contact:
Phone:</td></tr>
<tr><td>3. Project Name (Provide phase number if project is segmented)</td><td>4. Project Location
Click and Select</td><td>5. County (location of project)</td></tr>
</table>

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

cc:

Issued by: _____

Reviewed by: _____

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

GENERAL PERMIT CONDITIONS

a. this **PERMIT** only authorizes the construction, alteration, addition or improvement of the wastewater system described herein and is issued solely under the authority of Part 41 of Act 451, PA 1994, as amended (Act). Depending on the specific conditions of the project other permits from this Department or other governmental agencies may be required
b. the issuance of this **PERMIT** does not authorize violation of any federal, state or local laws or regulations, nor does it obviate the necessity of obtaining such permits, including any other DEQ permits, or approvals from other units of government as may be required by law
c. this **PERMIT** expires two (2) years after the date of issuance in accordance with rule 299.2939(2) of the General Rules of Michigan Department of Environmental Quality unless construction has been initiated prior to expiration
d. any portion of the herein described facilities if constructed prior to the date of issuance of this **PERMIT** is not authorized by this **PERMIT** and is a violation of the Act
e. any sanitary sewer constructed under the authority of this **PERMIT** shall not 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 the Act constitutes a violation of the Act
g. applicant must give notice of impending construction to public utilities in accordance with Act No. 53 of the Public Acts of 1974 (MISS DIG), being Section 460.701 to 460.718 of the Michigan Compiled Laws, and comply with each of the requirements of that Act
h. all earth changing activities must be conducted in accordance with the requirements of the Soil Erosion and Sedimentation Control Act, Part 91 of Act 451, PA 1994, as amended
i. all construction activity impacting wetlands shall be conducted in accordance with the Wetland Protection Act, Part 303 of Act 451, PA 1994, as amended
j. intentionally providing false information in this application constitutes fraud which is punishable by fine and/or imprisonment

Continue application on following pages

6. **Facilities Description –** In the space below provide a detailed description of the proposed project. Applications without adequate facilities descriptions **will be returned**. SEE EXAMPLES BELOW**.** Use additional sheets if needed.

EXAMPLES – EXAMPLES – EXAMPLES – EXAMPLES – EXAMPLES – EXAMPLES	
Sanitary Sewers and/or Force Mains	250 feet of 10-inch 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 submersible (wetwell/drywell, suction lift, etc.) 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 and 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 number, and email address:	8. Indicate who will prepare "as-built" plans for this project: ☐Design Engineer in Box 7. ☐Name, organization, address, and phone number:
9. Indicate who will provide project construction inspection: ☐Engineering firm listed in Box 7. ☐Name, organization, address, and phone number:	10. Is ground water dewatering expected for this project? ☐YES ☐NO If YES, provide dewatering specifications. If YES, will water wells or water bodies be impacted? ☐YES ☐NO
11. To which wastewater collection system will the project connect?	12. To which wastewater treatment system will the project connect? 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 30301(p) of Part 303 of Act 451, PA 1994)? ☐YES ☐NO If YES, has application been made for a wetland permit? ☐YES ☐NO	16. Is the project construction activity within a 100 year flood plain (as defined by Part 31 of Act 451, PA 1994, Section 324-3101 and the associated Administrative Rules)? ☐YES ☐NO If YES, has application been made for a flood plain permit? ☐YES ☐NO
17. Is the project construction activity below the ordinary high water mark of an inland lake or stream (as defined by 30101(f) of Part 301 of Act 451, PA 1994)? ☐YES ☐NO If YES, has application been made for an inland lakes and streams permit?	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 and Erosion Control Permit? ☐YES ☐NO Is owner listed in box 2 of this application an Authorized Public Agency (section 10 of Part 91, act 451, PA 1994)? ☐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 If YES, is this activity regulated by the National Pollutant Discharge Elimination System 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: Please contact 517-241-8993 with questions regarding the applicability of the storm water regulations.	
20. Is the project in or adjacent to a site of 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.	

Receiving Sewer System Capacity – Provide Rate and Units	Rate	Units
21. What is the total capacity of the existing outlet sewer?		
22. What is the current peak hour flow into the existing outlet sewer?		
23. What is the design capacity (capacity with largest pump out of service) of the existing downstream pumping station?		
24. What is current peak hour flow into existing downstream pump station?		

Overflows and Basement Flooding – For proposed sewer system projects mark all boxes that apply
25. Has the downstream collection system overflowed or flooded basements in the past five years? YES ☐ NO ☐ If YES, attach a listing of such events in the past five years including date, location, cause, and corrective action taken.
26. Has the downstream collection system owner entered into an agreement satisfactory to the Department to address sanitary sewer overflows and flooding of basements? ☐YES ☐NO If YES, enter agreement name and number: .

27. **Owner's Certification** The owner of the proposed facilities or the owner's authorized representative shall complete the owner's certification.

OWNER'S CERTIFICATION

I, (name), acting as the _____(title/position) for

_____ (entity owning proposed facilities) certify that the information provided in this application is true and accurate to the best of my knowledge. 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 Part 41 of Act 451 (PA 1994, as amended) Rule 41(a) 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."

_____ _____ _____
Signature Date Phone

28. **NON GOVERNMENTAL OWNERSHIP** If the owner of the proposed facilities **is not a governmental agency** this application must be accompanied by a program to ensure continued proper operation and maintenance of the system. The program may be one of the following:

A. A resolution from the local governmental agency stating that the local governmental agency shall assume responsibility for the effective and continued operation and maintenance of the proposed sewerage system if the owner of the proposed sewerage system in any way fails to perform in this capacity; and a copy of contractual or other arrangements between the owner of the proposed sewerage system and the local governmental agency which provides for the continuity of service.

B. A program that includes establishment of a legal entity to own the proposed facilities, a perpetual operation and maintenance fund in escrow, and a covenant running with the land for each parcel in the development which establishes a financial land owner responsibility for continued proper operation and maintenance. Please contact the local DEQ office to obtain a copy of the policy and guidance for non-governmentally owned wastewater facilities.

Please confirm your application is complete by using the following CHECKLIST. Your cooperation will reduce DEQ review time and speed permit issuance. INCOMPLETE OR INADEQUATE APPLICATIONS WILL BE RETURNED.

Boxes 1 to 27 of the application have been completed.	Owner's certification is signed and dated (box 27).
Submit project final plans and specifications sealed by a Professional Engineer licensed in Michigan	If project is in a contaminated area provide a copy of the plan for the proper handling of contamination (box 20)
Attach a detailed basis of design. Use form EQP 4600A (page 5) or a document providing same as required by Rule 35(3) of the Rules of Part 41 of Act 451, PA 1994.	Attach a copy of the resolution for non-governmental projects (see 27 A).
Attach other DEQ and other governmental permits (boxes 15, 16, 18 and 19).	Attach a copy of the program for continued operation and maintenance of non-governmental projects (see 28).

REMINDER: Upon completion of the project, a construction certification statement must be submitted to the DEQ office which issued the permit. A sample certification statement is attached to this application (Form EQP4600B - page 6)

PROJECT BASIS OF DESIGN

PROJECT NAME:_____

For this PROJECT the following information must be provided per Part 41 of Act 451, Rule 35 (3). 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 (REUs) _____

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 _____

2. Initial design peak flow _____ Units _____

3. Ultimate design average flow _____ Units _____

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

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.

DEQ

EQP4600B

CONSTRUCTION CERTIFICATION STATEMENT

To be Submitted to DEQ Upon Project Completion

Please Print or Type Indicated Information

Project Name _____

Part 41 Construction Permit No _____ **Permit Issuance Date** _____

I, _____ (name), acting as the _____ (title/position) for _____ (entity owning facilities constructed under this permit), certify that the facilities installed under this Permit were constructed in accordance with the approved plans and specifications documents without changes affecting flow, capacity or operation. These facilities have passed inspection and testing requirements as specified in the project documents and have been accepted by _____ (entity owning facilities constructed under this permit) as part of the sewerage system on _____ (date of acceptance).

Further, as built drawings of the project will be have been prepared and kept on file at _____ (as built storage location).

_____ _____ _____

Signature Date Phone

Basis for Certification

Inspection by community engineering department/DPW.

Inspection and/or certification by consulting engineering firm _____(name of consulting firm)

Other (please describe) _____

_____

Notice: Failure to certify project will result in delays in the processing of future construction applications submitted by owner.

Appendix M

RECOMMENDED REVISIONS TO SECTION 1296.01 OF THE ZONING ORDINANCE REGARDING SITE PLAN REVIEW

City of Lincoln Park

CROSS REFERENCES

Zoning and Planning in Home Rule Cities: See MCLA Sec. 117.4i; Regulation of Land Development and Establishment of District Provisions, Uniformity of Regulations; Designations; Limitations; See MCLA Sec. 125.3201; Districts Generally and Zoning Map: See Planning & Zoning 1266.

1296.01 Site Plan Review

A. Purpose and Intent.

1. The purposes of site plan review are to determine the following:
   a. Compliance with this Zoning Code;
   b. To promote the orderly development/redevelopment of the City through an open and predictable review process.
   c. To promote the stability of land values and investments and the general welfare;
   d. To help prevent the impairment or depreciation of land values and development/redevelopment by the erection of structures or additions thereto without property attention to siting and appearance;
   e. To require the gradual upgrade of existing site that do not conform with current standards of this Zoning Code; and
   f. To ensure that the arrangement, location, design and materials within a site are consistent with the Character of the City and the goals and design guidelines in the Comprehensive Development Plan.

B. Requirement.

1. Submission of a site plan shall be required prior to the erection of any building or structure in any zoning district for any principal permitted used in the City, any land use requiring special approval, conditional rezoning, or planned unit development, other than one single-family residence and accessory buildings and structures thereto, subject to the procedures set forth in this section unless otherwise provided in sub-section (2) below.
2. A sketch plan, rather than a complete site plan package, may be submitted for minor modifications to a legally existing and conforming use and building which is permitted in the zoning district (i.e. special land uses, conditional rezoning, and Planned Unit Developments are not eligible) including alterations to a building or site that do not result

in expansion or substantially affect the character or intensity of the use, vehicular or pedestrian circulation, drainage patterns, the demand for public infrastructure or services, significant environmental impacts or increased potential for hazards.

C. Authority to Approve Site Plans.

1. **Building Superintendent.** The Building Superintendent or his designee shall have authority to review and approve site plans, or sketch plans where applicable, for the following uses in accordance with subsection E:

   a. An increase in floor area of building up to one-thousand (1,000) square feet or five percent (5%) of existing floor area, whichever is less, with no required increase in parking area (only if the total number of expansions within the last five (5) years, as determined by the Building Superintendent, do not exceed this amount).

   b. A new use that is a principal permitted use in zoning district and requires no significant changes to the building footprint, facade, parking, landscaping, lighting, signs, or vehicular access.

   c. An expansion, replacing or alteration of landscaping areas consistent with the requirements of this Zoning Code.

   d. Improvements or installation of walls, fences, lighting or curbing consistent with the requirements of this Zoning Code.

   e. Alterations to the off-street parking layout or installation of pavement or curbing improvements, except for Off-Street Parking A Areas, provided the total number of spaces shall remain constant, and the construction plans and lot construction are approved by the City.

   f. Relocation of a waste receptacle to a more inconspicuous location, or the installation of screening, both consistent with the requirements of this Zoning Code.

   g. Changes to a facade, architectural features or wall signs, provided such changes are consistent with the requirements of this Zoning Code and do not significantly and materially change the appearance of the building. (An elevation plan showing changes and construction materials is required).

   h. A change from a nonconforming use, building or site to a more conforming situation consistent with the requirements of this Zoning Code.

   i. Modifications to upgrade a building to improve barrier-free design, comply with Americans with Disabilities Act or other federal, state or county regulations.

   j. Changes in use, as defined in this Zoning Code, that do not increase the gross floor area, provided all other improvements are consistent with the requirements of this Zoning Code.

   k. Internal construction or change in the floor plan for a conforming use that does not increase gross floor area, provided the construction cost over a twelve (12) month period does not exceed fifty percent (50%) of the building's state equalized value or affect parking requirements on a site.

   l. Repairing, resurfacing, re-striping or curbing of parking lots.

   m. Construction or erection of signs, retaining walls, fences, waste receptacles, sidewalks, antennae, lights, poles, cooling/heating or other mechanical equipment, telephone booth, newspaper boxes, landscaping or similar structures

which conform to the requirements of this Zoning Code or other City standards, and where site plan review is not specifically required under other sections of this Zoning Code.

n. Modifications or amendments to an approved site plan, subject to subparagraph E.6.h.

o. Approval of accessory uses associated with uses provided by right in the zoning district.

p. Bike path, pathway or sidewalk construction or relocation.

q. Grading, excavation, filling, soil removal, creation of ponds or clearing of trees within an area up to one hundred (100) square-feet on a lot occupied by a residential dwelling.

r. Re-occupancy of a building that has been vacant for more than 30 days, where the proposed use will be conducted fully within an enclosed building and re-occupancy will not require significant additional parking demands, access changes or other substantial modifications.

s. Land division of un-platted land.

t. Other similar applications that are subject to administrative review and do not require a public hearing under state law.

2. **Planning Commission.** Except as specified above in subsection (1), the Planning Commission shall have authority to grant final approval of the site plans for the following uses in accordance with subsection (E).

a. Any building or structure in any zoning district for any principal permitted use in the City;

b. Any land use requiring special approval, conditional rezoning or any planned unit development.

3. **Application Procedure, Contents.** The following information shall accompany all site plans and sketch plans submitted for all reviews:

a. An application for site plan review, supplied by the Building Department, shall be submitted to the Building Superintendent, along with the required application fee and six (6) copies of the site plan at the following scales:

i. A scale of not less than one (1) inch equals twenty (20) feet for property less than one (1) acre;

ii. One (1) inch equals thirty (30) feet for property larger than one (1) acre but less than three (3) acres; and,

iii. One (1) inch equals fifty (50) feet for property larger than three (3) acres.

b. A completed site plan application and site plan materials must be submitted at least 21 days prior to the Planning Commission or City Council meeting at which the review is requested. Upon confirmation from the City Planner, City Engineer, City Attorney and other City consultants and staff that the site plan substantially meets the requirements of this chapter, an additional ten (10) copies of the site plan shall be submitted to the Building Department. The Commission may prepare forms and require the use of such forms in site plan preparation. A separate escrow deposit may be required for administrative charges to review the site plan submittal.

c. Current proof of ownership of the land to be utilized or evidence of a contractual arrangement to acquire such land, such as an option or purchase agreement, and a title search or other evidence of any applicable easements or deed restrictions.

4. **Distribution of Plans.** Upon submission of all required application materials, the site plan proposal shall be distributed, at the option of the Building Superintendent, to the City Planner, City Engineer, City Attorney and other City consultants and staff for review. Determination of compliance with City ordinances and regulation shall be made within 15 days of receiving an application for site plan review. Site plans determined to be in substantial compliance proceed to Final Site Plan Review (Section 1296.01.D.3). For site plans determined not to be in substantial compliance, the applicant may be required to complete revisions and re-submit the plans for further review prior to final action. Upon receipt of the revised site plans, determination of compliance shall be made within 15 days.

D. Review Procedure and Authorization.

1. **Pre-Application Meeting.** In order to facilitate processing of a site plan in a timely manner, the City provides opportunities for potential applicants to meet with and discuss development/redevelopment proposals with City officials and staff for the purposed of obtaining information and guidance in the preparation of the required site plan and application materials. No formal action shall be taken on a site plan submitted for Pre-Application Meetings. The following two (2) options are available depending upon the type of proposal being considered:

   a. **Optional.** The applicant may request a pre-application site plan meeting with the Building Superintendent, City Planner, and/or City Engineer. The applicant need not present drawings or site plans at a pre-application conference, but even if drawings or site plans are presented, no formal action shall be taken on a site plan at a pre-application conference. The City Planner's and City Engineer's fees for any such pre-application conference shall be paid by the applicant.

   b. **Mandatory**. A Pre-Applicant Meeting is required for all proposed developments within the Downtown Development Authority (DDA) District by the DDA or its designated representative, the Building Superintendent, City Planner and City Engineer. The applicant need not present drawings or site plans at a pre-application conference, but even if drawings or site plans are presented, no formal action shall be taken on a site plan at a pre-application conference. The City Planner's and City Engineer's fees for any such pre-application conference shall be paid by the applicant.

2. **Conceptual Review by Planning Commission**. An applicant may file a written request for conceptual review of a preliminary site plan by the Planning Commission, prior to submission of a site plan for formal (final) review. Conceptual site plan review is required for all special land use, planned unit development, condominium and conditional rezoning projects. A site plan submitted for conceptual review shall be drawn to scale, and shall show site development features in sufficient detail to permit the Planning Commission to evaluate the following:

   a. Relationship of the site to nearby properties;

   b. Density;

   c. Adequacy of landscaping, open space, vehicular drives, parking areas, drainage, and proposed utilities; and,

   d. Conformance with City's development policies and standards.

Conceptual review fees shall be paid according to the fee schedule established by the City Council.

No formal action shall be taken on a site plan submitted for conceptual review, and neither the applicant nor the Planning Commission shall be bound by any comments or suggestions made during the course of the conceptual review.

3. **Final Sketch Plan/ Site Plan Review**. Upon determination that the site plans substantially complies with City ordinances and regulations, the site plans shall be placed the next available Planning Commission agenda. All required revisions must be completed prior to the site plan being placed on the Planning Commission agenda for review.

4. **Public Hearings**. A public hearing conducted by the Planning Commission is required for all zoning amendments, and for all site plans involving uses that are subject to Special Land Use Approval, applications for conditional rezoning and planned unit developments. After payment of appropriate fees, the Building Superintendent shall set the date of the public hearing.

5. **Authorization**. The Planning Commission, or when applicable, the Building Superintendent or planning consultant (as per subparagraph C.1) shall review the site plan proposal together with any public hearing findings and any requested reports and recommendations from the Building Official, City consultants, and/or other reviewing agencies.

   The Planning Commission or Building Superintendent (as per subparagraph C.1) is authorized to take the following action on the plan, subject to guidelines in the Zoning Ordinance: approval, approval with conditions, denial, or table the site plan, as follows:

   a. **Approval.** Upon determination that a site plan is in compliance with the standards and requirements of this Ordinance and other applicable ordinances and laws, approval shall be granted.

   b. **Approval Subject to Conditions.** Upon determination that a site plan is in compliance except for minor modifications, the conditions for approval shall be identified and the applicant shall be given the opportunity to correct the site plan. The conditions may include the need to obtain variances or obtain approvals from other agencies. If a plan is approved subject to conditions, the applicant shall submit a revised plan with a revision date, indicating compliance with the conditions the Building Superintendent or Planning Consultant, for final approval stamp after conditions have been met.

   c. **Denial.** Upon determination that a site plan does not comply with the standards and regulations set forth in this Article or elsewhere in this Ordinance, or requires extensive revision in order to comply with said standards and regulations, site plan approval shall be denied.

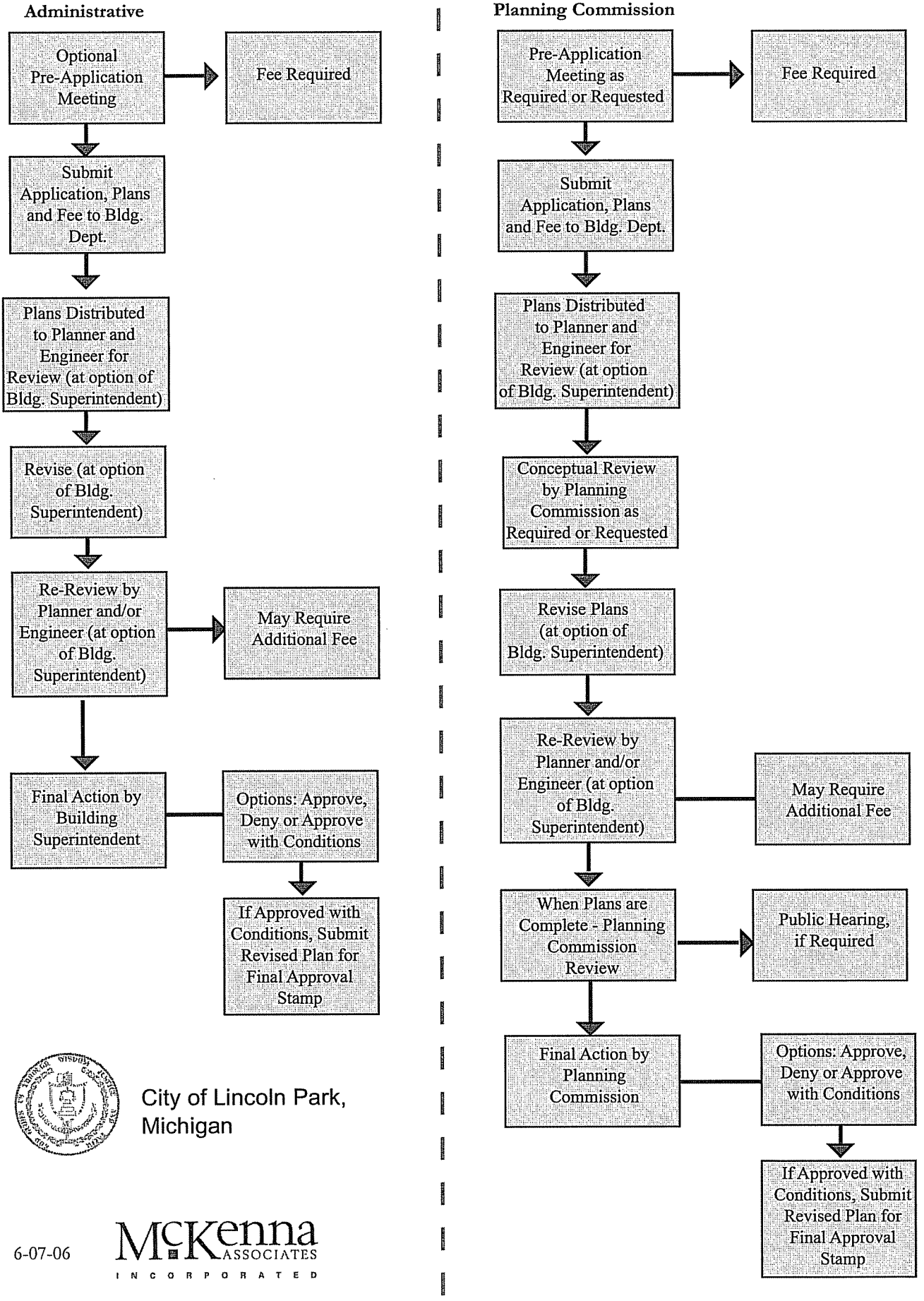
   d. **Tabling.** Upon determination that a site plan is not ready for approval or rejection, or upon a request by the applicant, the Planning Commission may table consideration of a site plan until a future meeting.

6. **Recording of Site Plan Review Action**. Each action taken with reference to a site plan review shall be duly recorded in the minutes of the Planning Commission, as appropriate. The grounds for action taken upon each site plan shall also be recorded in the minutes.

   After the Planning Commission or Building Superintendent (as per subparagraph C.1) has taken final action on a site plan and all steps have been completed, three copies of the

application and approved plans shall be stamped APPROVED and signed by the Building Superintendent or City Planner. One marked copy will be returned to the applicant and the other two copies will be kept on file in the City Hall.

SITE PLAN REVIEW



City of Lincoln Park, Michigan

6-07-06

McKenna ASSOCIATES INCORPORATED

E. Standards for Site Plan Approval. The following information shall be included on all site plans, where applicable:

1. **Adequacy of Information**. The site plan shall include all required information in sufficiently complete and understandable form to provide an accurate description of the proposed uses and structures.

2. **Site Design Characteristics**. All elements of the site design shall be harmoniously and efficiently organized in relation to topography, the size and type of parcel, the character of adjoining property, and the type and size of buildings. The site shall be developed so as not to impede the normal and orderly development or improvement of surrounding property for uses permitted by this Ordinance.

3. **Appearance**. Landscaping, earth berms, fencing, signs, walls, and other site features shall be designed and located on the site so that the proposed development is aesthetically pleasing and harmonious with nearby existing or future developments.

4. **Compliance with District Requirements.** The site plan shall comply with the district requirements for minimum floor space, height of building, lot size, open space, density and all other requirements set forth in the Schedule of Regulations (Section 1294.32), except as provided elsewhere in this Ordinance.

   a. **Site Condominiums.** In the case of site condominiums, these regulations shall be applied by requiring the site condominium unit and a surrounding limited common element to be equal in size to the minimum lot size and lot width requirements for the district in which the project is located. The site condominium unit shall be equivalent to the area of the lot where a principal building can be constructed and there shall be a limited common element associated with each site condominium unit which shall be at lease equivalent to the minimum yard area requirements.

      In addition, site condominium projects shall comply with the applicable design standards which have been developed for similar types of development in the City, as described in the City Subdivision Ordinance, the City Engineering Design Specifications, and other applicable ordinances and regulations, including requirements for streets, blocks, lots, utilities, and storm drainage. These requirements and specifications are hereby incorporated and are made a part of this Ordinance by reference.

   b. **Detached Condominiums.** In the case of detached condominiums, these regulations shall be applied by requiring that the detached condominium units comply with the requirements governing minimum distance between buildings, attachment of buildings, and other applicable requirements for the district in which the project is located. Furthermore, proposed detached condominium projects shall not exceed the maximum permitted density for the district in which the project is located.

      In addition, site condominium projects shall comply with the applicable design standards which have been developed for similar types of development in the City, as described in City Subdivision Ordinance, the City Engineering Design Specifications, and other applicable ordinances and regulations, including requirements for streets, blocks, lots, utilities, and storm drainage. These

requirements and specifications are hereby incorporated and are made a part of this Ordinance by reference.

c. **Condominium Document Review and Approval.**

i. The Planning Commission shall review the final condominium documents to determine compliance with site plan approval and City and State of Michigan condominium development requirements. The Planning Commission shall approve or deny the request for final approval of the condominium documents. Condominium documents include the Condominium Subdivision Plan (Exhibit B drawing), Master Deed and Bylaws.

ii. An application for condominium document review must be submitted to the Building Superintendent according to the requirements of Section 1296.01.C, subparagraphs 3-4, as applicable, within one (1) year after the date of approval of the condominium site plan by the Planning Commission, or such approval shall be deemed null and void, unless an extension subject to the requirements of Section 1296.01.E, subparagraph 6.c below is granted.

iii. No installation or construction of any improvements or land balancing or grading shall be made or begun until the final condominium documents have been approved. No removal of trees and/or other vegetation shall be started at this time except for minor clearing required for surveying and staking purposes.

5. **Site Plan Approval Criteria**. In order that buildings, open space and landscaping will be in harmony with other structures and improvements in the area, and to ensure that no undesirable health, safety, noise and traffic conditions will result from the development, the Planning Commission shall determine whether or not the site plan meets the following criteria, unless the Commission determines that one or more of such criteria are inapplicable:

a. **General.** All elements of the site plan shall be designed to take into account the site's topography, the size and type of plot, the character of adjoining property, and the traffic operations of adjacent streets. The site shall be developed so as not to impede the normal and orderly development or improvement of surrounding property for uses permitted in this Zoning Code. The site plan shall conform with all requirements of this Zoning Code, including those of the applicable zoning district(s).

b. **Building Design.** The building design shall relate to the surrounding environment in regard to texture, scale, mass, proportion, and color. High standards of construction and quality materials will be incorporated into the new development. In addition to following design guidelines adopted in specific district or sub-area plans, the building design shall meet the requirements of Section 1296.04, Standards for Architecture and Building Materials.

c. **Preservation of Significant Natural Features.** Judicious effort shall be used to preserve the integrity of the land, existing topography, and natural, historical, and architectural features as defined in this Zoning Code, in particular flood hazard areas and wetlands designated/regulated by the Michigan Department of Environmental Quality, and, to a lesser extent, flood hazard areas and wetlands which are not regulated by the Department.

d. **Streets.** All streets shall be developed in accordance with the City of Lincoln Park Subdivision Control Ordinance and construction standards, unless developed as a private road in accordance with the requirements of the City.

e. **Access, Driveways and Circulation.** Safe, convenient, uncongested, and well defined vehicular and pedestrian circulation within and to the site shall be provided. Drives, streets, parking and other elements shall be designed to discourage through traffic, while promoting safe and efficient traffic operations within the site and at its access points. All driveways shall meet the design and construction standards of the City. Access to the site shall be designed to minimize conflicts with traffic on adjacent streets, particularly left turns into and from the site. For uses having frontage and/or access on a major traffic route, as defined in the City of Lincoln Park Comprehensive Development Plan, the number, design, and location of access driveways and other provisions for vehicular circulation shall comply with the provisions of Section 1290.10, Access Management Standards.

f. **Emergency Vehicle Access.** All buildings or groups of buildings shall be arranged so as to permit necessary emergency vehicle access as required by the Fire Department and Police Department.

g. **Sidewalks, Pedestrian and Bicycle Circulation.** The arrangement of public or common ways for vehicular and pedestrian circulation shall be connected to existing or planned streets and sidewalks/pedestrian or bicycle pathways in the area. There shall be provided a pedestrian circulation system which is separated from the vehicular circulation system. In order to ensure public safety, special pedestrian measures, such as crosswalks, crossing signals and other such facilities may be required in the vicinity of primary and secondary schools, playgrounds, local shopping areas, fast food/service restaurants and other uses which generate a considerable amount of pedestrian or bicycle traffic.

h. **Barrier-Free Access.** The site has been designed to provide barrier-free parking and pedestrian circulation.

i. **Parking.** The number and dimensions of off-street parking [spaces] shall be sufficient to meet the minimum required by this Zoning Code. However, where warranted by overlapping or shared parking arrangements, the Planning Commission may reduce the required number of parking spaces, as provided in this Zoning Code.

j. **Loading.** All loading and unloading areas and outside storage areas, including refuse storage stations, shall be screened in accordance with this Zoning Code.

k. **Landscaping, Screening, and Open Space.** The landscape shall be preserved in its natural state, insofar as practical, by removing only those areas of vegetation or making those alterations to the topography which are reasonably necessary to develop the site in accordance with the requirements of this Zoning Code. Landscaping shall be preserved and/or provided to ensure that proposed uses will be adequately buffered from one another and from surrounding public and private property. Landscaping, landscape buffers, greenbelts, fencing, walls and other protective barriers shall be provided and designed in accordance with the provisions of Section 1296.03, Landscaping Standards. Recreation and open space areas shall be provided in all multiple-family residential and educational developments.

l. **Soil Erosion Control**. The site shall have adequate lateral support so as to ensure that there will be no erosion of soil or other material. The final determination as to adequacy of, or need for, lateral support shall be made by the Building Superintendent or City Engineer.

m. **Utilities**. Public water and sewer facilities shall be available or shall be provided for by the developer as part of the site development, where such systems are available.

n. **Stormwater Management**. Appropriate measures shall be taken to ensure that removal of surface waters will not adversely affect neighboring properties or the public storm drainage system. Provisions shall be made to accommodate stormwater which complements the natural drainage patterns and wetlands, prevent erosion and the formation of dust. Sharing of stormwater facilities with adjacent properties shall be encouraged. The use of detention/retention ponds may be required. Surface water on all paved areas shall be collected at intervals so that it will not obstruct the flow of vehicular or pedestrian traffic or create standing water.

o. **Lighting**. Exterior lighting shall be arranged so that it is deflected away from adjacent properties and so that it does not impede the vision of traffic along adjacent streets. Flashing or intermittent lights shall not be permitted.

p. **Noise**. The site has been designed, buildings so arranged, and activities/equipment programmed to minimize the emission of noise, particularly for sites adjacent to residential districts.

q. **Mechanical Equipment**. Mechanical equipment, both roof and ground mounted, shall be screened in accordance with the requirements of this Zoning Code.

r. **Signs**. The standards of the city's Sign Code are met.

s. **Hazardous Materials or Waste.** For businesses utilizing, storing or handling hazardous material such as automobile service and automobile repair stations, dry cleaning plants, metal plating industries, and other industrial uses, documentation of compliance with state and federal requirements shall be provided.

t. **Other Agency Reviews**. The applicant has provided documentation of compliance with other appropriate agency review standards, including, but not limited to, the Michigan Department of Natural Resources, Michigan Department of Environmental Quality, Michigan Department of Transportation, Wayne County Drain Commission, Wayne County Health Department, and other federal and state agencies, as applicable.

6. **Procedure After Site Plan Approval**.

a. **Application for Building Permit**. Following final approval of the site plan and the engineering plans, the applicant may apply for a building permit. It shall be the responsibility of the applicant to obtain all other applicable City, County, or State permits prior to issuance of a building permit.

A building permit for a structure in a proposed condominium project shall not be issued until evidence of a recorded Master Deed has been provided to the City. However, the Building Superintendent may issue permits for site grading, erosion control, installation of public water and sewage facilities, and construction of roads, prior to recording the Master Deed. No permit issued or work undertaken

prior to recording of the Master Deed pursuant to this Section shall grant any rights or any expectancy interest in the approval of the Master Deed.

b. **Performance guarantee**. Performance guarantees shall be required subject to the standards in Section 1262.09.

c. **Expiration of Site Plan Approval.** If construction has not commenced within twelve (12) months of final approval of the site plan, or if construction has not been completed within twelve (12) months after it was commenced, the site plan approval becomes null and void and a new application for site plan review shall be required. The Building Superintendent may grant an extension of up to twelve (12) months, upon written request from the applicant, if he or his designee finds that the approved site plan adequately represents current conditions on and surrounding the site and provided that the site plan conforms to the *current* Zoning Ordinance standards.

d. **Application for Certificate of Occupancy**. Following completion of site work and building construction, the applicant may apply for a Certificate of Occupancy or a Temporary Certificate of Occupancy from the Building Superintendent. It shall be the applicant's responsibility to obtain these required certificates prior to any occupancy of the property.

e. **Property Maintenance after Approval**. It shall be the responsibility of the owner of a property for which site plan approval has been granted to maintain the property in accordance with the approved site design on a continuing basis until the property is razed, or until new zoning regulations supersede the regulations upon which site plan approval was based, or until a new site design is approved. Any property owner who fails to so maintain an approved site design shall be deemed in violation of the use provisions of this Ordinance and shall be subject to the same penalties appropriate for a use violation.

   With respect to condominium projects, the Master Deed shall contain provisions describing the responsibilities of the condominium association, condominium owners, and public entities, with regard to maintenance of the property in accordance with the approved site plan on a continuing basis. The Master Deed shall further establish the means of permanent financing for required maintenance and improvement activities which are the responsibility of the condominium association. Failure to maintain an approved site plan shall be deemed in violation of the use provisions of this Ordinance and shall be subject to the same penalties appropriate for a use violation.

f. **Recorded and As-Built Condominium Documents**. Upon approval of the site plan for a condominium project involving new construction, the condominium project developer or proprietor shall furnish the City with the following:

   i. One (1) copy of the recorded Master Deed, and

   ii. One (1) copy of any Condominium Bylaws and restrictive covenants.

   Upon completion of the project, the condominium project developer or proprietor shall furnish the City with the following:

   i. Two (2) copies of an "as built survey", and

   ii. One (1) copy of the site plan on a mylar sheet of at least thirteen by sixteen (13 x 16) inches with an image not to exceed ten and one half by fourteen (10 ½ x 14) inches.

The as-built survey shall be reviewed by the City Engineer for compliance with City Ordinances. Fees for this review shall be established by the City Council.

g. **Revocation**. Approval of a site plan may be revoked by the Planning Commission or Building Superintendent if construction is not in conformance with the approved plans. In this case, at the discretion of the Building Superintendent, the site plan shall be placed on the agenda of the Planning Commission for consideration and written notice shall be sent to the applicant at least ten (10) days prior to the meeting. The Building Superintendent, applicant, and any other interested persons shall be given the opportunity to present information to the Planning Commission and answer questions. If the Planning Commission finds that a violation exists and has not been remedied prior to the hearing, then it shall revoke the approval of the site plan.

h. **Modification to Approved Plan**. A site plan approved in accordance with the provisions in this Section may be subsequently modified, subject to the following requirements:

i. **Review of Minor Modifications.** Minor modifications to an approved site plan may be reviewed by the City Building Superintendent or his designee.

(a) **Minor Modification Defined**. Minor modifications are changes that do not substantially affect the character or intensity of the use, vehicular or pedestrian circulation, drainage patterns, the demand for public services, or the vulnerability to hazards. Examples of minor modifications include:

- An addition to an existing commercial or industrial building that does not increase or decrease the floor space by more than twenty-five percent (25%) or three thousand (3,000) square feet, whichever is less.
- Re-occupancy of a vacant building that has been unoccupied for less than twelve (12) months.
- Changes to building height that do not add an additional floor.
- Additions or alterations to the landscape plan or landscape materials.
- Relocation or screening of the trash receptacle.
- Alterations to the internal parking layout of an off-street lot.

The construction of a new building or structure, adding or deleting parking or the addition of curb cuts onto a public road are examples of modifications which are not considered minor.

(b) **Determination of Minor Modification**. The Building Superintendent, or his designee, shall determine if the proposed modifications are minor in accordance with the guidelines in this section. In order to make the determination, the Building Superintendent shall solicit comments and recommendations from the Planner, Engineer, and public safety officials, as deemed necessary.

ii. **Modifications Not Deemed "Minor".** If the modifications are not deemed minor by the Building Superintendent, then full and approval review by the Planning Commission shall be required. Planning Commission review shall be required for all site plans that involve a request for a variance, a Special Land Use, Conditional Rezoning, and Planned Unit Development proposal that involves a discretionary decision, or a proposal that involves a nonconforming use or structure.

i. **Recording of Action**. Each action related to modification of a site plan shall be duly recorded in writing on a copy of the approved plan, and shall be kept on file in the office of the Building Superintendent. The Planning Commission shall be advised of all minor site plan modifications approved by the Building Superintendent and such modifications shall be noted on the site plan and in the minutes of the Planning Commission.

j. **Fees**. Fees for the review of site plans and inspections as required by this article shall be established and may be amended by resolution by the City Council.

F. Site plan contents. Each site plan submitted for review shall have a sheet size of at least twenty four (24) inches by thirty six (36) inches and shall include the following information:

1. **Descriptive and Identification Data**

a. Applicant's name and address, and telephone number.

b. Title block indicating the name of the development.

c. Scale.

d. Northpoint.

e. Dates of submission and revisions (month, day, year).

f. Location map drawn to scale with northpoint.

g. Legal and common description of property.

h. The dimensions of all lots and property lines, showing the relationship of the site to abutting properties. If the site is a part of a larger parcel, the plan should indicate the boundaries of total land holding.

i. A schedule for completing the project, including the phasing or timing of all proposed developments.

j. Identification and seal of architect, engineer, land surveyor, or landscape architect who prepared plan.

k. Written description of proposed land use.

l. Zoning classification of applicant's parcel and all abutting parcels.

m. Proximity to driveways serving adjacent parcels.

n. Proximity to section corner and major thoroughfares.

o. Notation of any variances which have or must be secured.

p. Net acreage (minus rights-of-way) and total acreage, to the nearest 1/10 acre.

2. **Site Data**

a. Existing lot lines, building lines, structures, parking areas, and other improvements on the site and within 100 feet of the site.

b. Front, side, and rear setback dimensions.

c. Topography on the site and within 100 feet of the site at two foot contour intervals, referenced to a U.S.G.S. benchmark.

d. Proposed site plan features, including buildings, roadway widths and names, and parking areas.

e. Dimensions and centerlines of existing and proposed roads and road rights-of-way.

f. Acceleration, deceleration, and passing lanes, where required.

g. Proposed location of driveway entrances and on-site driveways.

h. Typical cross-section of proposed roads and driveways.

i. Location of existing drainage courses, floodplains, lakes and streams, with elevations.

j. Location and dimensions of wetland areas. If deemed necessary because of site or soil conditions or because of the scope of the project, a detailed hydrology study may be required.

k. Location of sidewalks within the site and within the right-of-way.

l. Exterior lighting locations and method of shielding lights from shining off the site.

m. Trash receptacle locations and method of screening, if applicable.

n. Transformer pad location and method of screening, if applicable.

o. Parking spaces, typical dimensions of spaces, indication of total number of spaces, drives, and method of surfacing.

p. Information needed to calculate required parking in accordance with Zoning Ordinance standards.

q. The location of lawns and landscaped areas, including required landscaped greenbelts.

r. Landscape plan, including location, size, type and quantity of proposed shrubs, trees and other live plant material.

s. Location, sizes, and types of existing trees five (5) inches or greater in diameter, measured at one (1) foot off the ground, before and after proposed development.

t. Cross-section of proposed berms.

u. Location and description of all easements for public right-of-way, utilities, access, shared access, and drainage.

v. Designation of fire lanes.

w. Loading/unloading area.

x. The location of any outdoor storage of materials and the manner by which it will be screened.

3. **Building and Structure Details**

a. Location, height, and outside dimensions of all proposed buildings or structures.

b. Indication of the number of stores and number of commercial or office units contained in the building.

c. Building floor plans.

d. Total floor area.

e. Location, size, height, and lighting of all proposed signs.

f. Proposed fences and walls, including typical cross-section and height above the ground on both sides.

g. Building facade elevations, drawn to a scale of one (1) inch equals four (4) feet, or another scale approved by the Building Official and adequate to determine compliance with the requirements of this Ordinance. Elevations of proposed buildings shall indicate type of building materials, roof design, projections, canopies, awnings and overhangs, screen walls and accessory building, and any outdoor or roof-located mechanical equipment, such as air conditioning units, heating units, and transformers, including the method of screening such equipment. Such equipment shall be screened from view of adjacent properties and public rights of way. Such screening shall be designed to be perceived as an integral part of the building design.

4. **Information Concerning Utilities, Drainage, and Related Issues**

a. Schematic layout of existing and proposed sanitary sewers and septic systems; water mains, well sites, and water service leads; hydrants that would be used by public safety personnel to service the site; and, the location of gas, electric, and telephone lines.

b. Location of exterior drains, dry wells, catch basins, retention/detention areas, sumps and other facilities designed to collect, store, or transport stormwater or wastewater. The point of discharge for all drains and pipes should be specified on the site plan.

c. Indication of site grading and drainage patterns.

d. The following information shall be submitted as part of an application for permission to commence any type of development within a flood hazard area:

i. The elevation in relation to mean sea level of the floor, including basement, of all structures.

ii. A description of the extent to which any watercourse will be altered or relocated as a result of proposed development.

iii. Proof of development permission from appropriate local, state, and federal agencies as required by this Zoning Code, including a floodplain permit, approval, or letter of no authority from the Michigan Department of Environmental Quality under authority of Act 245 of the Public Acts of 1929, as amended by Act 167 of the Public Acts of 1968, the Flood Plain Regulatory Authority.

iv. Base flood elevation data where the proposed development is subject to Act 288 of the Public Acts of 1967, the Subdivision Control Act, or greater than five (5) acres in size.

e. Additional information which may be reasonably necessary to determine compliance with the provisions of this Zoning Code.

f. Soil erosion and sedimentation control measures.

g. Proposed finish grades on the site, including the finish grades of all buildings, driveways, walkways, and parking lots.

h. Listing of types and quantities of hazardous substances and polluting materials which will be used or stored on-site at the facility in quantities greater than 25 gallons per month.

i. Areas to be used for the storage, use, loading/unloading, recycling, or disposal of hazardous substances and polluting materials, including interior and exterior area.

j. Underground storage tanks locations.

k. Delineation of areas on the site which are known or suspected to be contaminated, together with a report on the status of site cleanup.

5. **Information Concerning Residential Development**

a. The number, type and location of each type of residential unit (one bedroom units, two bedroom units, etc.).

b. Density calculations by type of residential unit (dwelling units per acre).

c. Lot coverage calculations.

d. Floor plans of typical buildings with square feet of floor area.

e. Garage and carport locations and details, if proposed.

f. Pedestrian circulation system.

g. Location and names of roads and internal drives with an indication of how the proposed circulation system will connect with the existing adjacent roads. The plan should indicate whether proposed roads are intended to be private or dedicated to the public.

h. Community building location, dimensions, floor plans, and facade elevations, if applicable.

i. Swimming pool fencing detail, including height and type of fence, if applicable.

j. Location and size of recreation open areas.

k. Indication of type of recreation facilities proposed for recreation area.

6. **Information Applicable to Mobile Home Parks.**

a. Location and number of pads for mobile homes.

b. Distance between mobile homes.

c. Proposed placement of mobile home on each lot.

d. Average and range of size of mobile home lots.

e. Density calculations (dwelling units per acre).

f. Lot coverage calculations.

g. Garage and carport locations and details, if proposed.

h. Pedestrian circulation system.

i. Location and names of roads and internal drives.

j. Community building location, dimensions, floor plans, and facade elevations, if applicable.

k. Swimming pool fencing detail, including height and type of fence, if applicable.

l. Location and size of recreation open areas.

m. Indication of type of recreation facilities proposed for recreation area.

7. **Additional Information**

a. Information Related to Condominium Development. The following information shall be provided with all site plans including condominium development:

i. Condominium documents, including the proposed Master Deed, restrictive covenants, and condominium bylaws.

ii. Condominium subdivision plan requirements, as specified in Section 66 of Public Act 59 of 1978, as amended, and Rule 401 of the Condominium Rules promulgated by the Michigan Department of Commerce, Corporation and Securities Bureau.

8. **Items Not Applicable.** If any of the items listed are not applicable to a particular site, the following information should be provided on the site plan:

a. A list of each item considered not applicable.

b. The reason(s) why each listed item is not considered applicable.

c. Such other information as may be required by the City to assist in the consideration of the proposed development, including but not limited to an analysis of the planning implications of the proposed development including the methodology of how the planning implications were determined. The analysis shall be carried out by qualified individuals and shall include, but need not be limited to:

i. Estimated population holding capacity of any residential land uses to be included in the proposed development and general impact on community facilities such as primary and secondary schools and parks.

ii. A traffic analysis which relates the trip generation of the proposed development to existing and projected traffic capacities, volumes and patterns on surrounding streets.

G. Sketch plan contents. The sketch plan for administrative approval shall contain the following information, unless the Building Superintendent or his designee determines that some of the required information is not reasonably necessary: subparagraphs

1. The applicant's name.

2. The name of the development.

3. The preparer's name and the professional seal of the architect, engineer, surveyor, or landscape architect registered with the State of Michigan.

4. The date of preparation and any revisions.

5. A north arrow.

6. Property lines and dimensions.

7. A complete and current legal description and the size of the property in acres and square feet.

8. A small location sketch of sufficient size and scale (within a ¼ mile is suggested) showing the location of the area in relation to surrounding properties, streets, freeways, schools, schools sites, and other significant features of the City, where appropriate.

9. A narrative indicating the period of time within which the project will be completed.

10. One (1) copy of the final site plan, reduced in size to eight and one-half (8 ½) inches by fourteen (14) inches.

Appendix N

STORM SEWER EASEMENT

KNOW ALL MEN BY THESE PRESENTS, that, _____ _____ whose address is_____ _____hereinafter referred to as "Grantor", being title holder to the following described parcel of land, to wit:

Description of Parcel:

See Exhibit "A"

[Commonly known as:_____.]

Tax Identification Number:_____

For and in consideration of One ($1.00) Dollar, receipt of which is hereby acknowledged, does hereby grant and convey to the _____ whose address is _____, hereinafter referred to as "Grantee", a perpetual easement for storm sewer, over, upon, across, in, through, and under the following described real property to wit:

Easement Description:

See Exhibit "B"

and to enter upon sufficient land adjacent to said storm sewer easement for the purpose of exercising the rights and privileges granted herein. A sketch of the said storm sewer easement is attached hereto and incorporated herein.

Grantee may install, repair, replace and maintain storm sewer lines, and all necessary appurtenances thereto, within the easement herein granted.

Grantor agrees not to build or to convey to others permission to build any permanent structures on the above described easement.

The premises so disturbed by reason of the exercise of any of the foregoing powers, rights and privileges, shall be reasonably restored to its prior condition by Grantee.

This instrument shall be binding upon and inure to the benefit of the parties hereto, their heirs, representatives, successors and assigns.

IN WITNESS WHEREOF, the undersigned Grantor(s) has affixed signature (s) this _____ day of _____ A.D., 20____

WITNESSES:

Signature: _____

Print: _____

Signature: _____

Print: _____

CORPORATION:

By: _____
Signature

Its: _____
Printed Name and Title

STATE OF MICHIGAN)
)SS
COUNTY OF WAYNE)

On this _____ day of _____, A.D., 20____, before me, a Notary Public in and for said County, appeared _____, and to me known personally known, who, being by me duly sworn, did each for himself say that they are respectively the ____ and _____ of _____ , the corporation named in and which executed the within instrument and, that the seal affixed to said instrument was signed and sealed in behalf of said corporation by authority of its board of trustees; and acknowledged said instrument the free act and deed of said corporation.

_____
Notary Public, Wayne County, MI

My commission expires_____

This instrument drafted by:

Tax Identification Number:_____

WHEN SIGNED RETURN TO:
City of Lincoln Park DPS
500 Southfield Road
Lincoln Park, MI 48146

WHEN RECORDED RETURN COPY TO:
City of Lincoln Park Clerk
1355 Southfield Road
Lincoln Park, MI 48146

City of Lincoln Park DPS
500 Southfield Road
Lincoln Park, MI 48146

Orchard Hiltz & McCliment, Inc.
34000 Plymouth Road
Livonia, MI 48150

SANITARY SEWER EASEMENT

KNOW ALL MEN BY THESE PRESENTS, that, _____ _____ whose address is_____ _____hereinafter referred to as "Grantor", being title holder to the following described parcel of land, to wit:

Description of Parcel:

See Exhibit "A"

[Commonly known as: _____.]

Tax Identification Number:_____

For and in consideration of One ($1.00) Dollar, receipt of which is hereby acknowledged, does hereby grant and convey to the City of Lincoln Park, a Michigan Municipal Corporation, whose address is 1355 Southfield Road, Lincoln Park, MI 48146, hereinafter referred to as "Grantee", a perpetual easement for sanitary sewer, over, upon, across, in, through, and under the following described real property to wit:

Easement Description:

See Exhibit "B"

and to enter upon sufficient land adjacent to said sanitary sewer easement for the purpose of exercising the rights and privileges granted herein. A sketch of the said sanitary sewer easement is attached hereto and incorporated herein.

Grantee may install, repair, replace and maintain sanitary sewer lines, and all necessary appurtenances thereto, within the easement herein granted.

Grantor agrees not to build or to convey to others permission to build any permanent structures on the above described easement.

The premises so disturbed by reason of the exercise of any of the foregoing powers, rights and privileges, shall be reasonably restored to its prior condition by Grantee.

This instrument shall be binding upon and inure to the benefit of the parties hereto, their heirs, representatives, successors and assigns.

IN WITNESS WHEREOF, the undersigned Grantor(s) has affixed signature (s) this _____ day of _____ A.D., 20____

WITNESSES:

Signature: _____

Print: _____

Signature: _____

Print: _____

CORPORATION:

By: _____
Signature

Its: _____
Printed Name and Title

STATE OF MICHIGAN)
)SS
COUNTY OF WAYNE)

On this _____ day of _____, A.D., 20____, before me, a Notary Public in and for said County, appeared _____, and to me known personally known, who, being by me duly sworn, did each for himself say that they are respectively the ____ and _____ of _____ , the corporation named in and which executed the within instrument and, that the seal affixed to said instrument was signed and sealed in behalf of said corporation by authority of its board of trustees; and acknowledged said instrument the free act and deed of said corporation.

_____
Notary Public, Wayne County, MI

My commission expires_____

This instrument drafted by:

Tax Identification Number:_____

WHEN SIGNED RETURN TO:
City of Lincoln Park DPS
500 Southfield Road
Lincoln Park, MI 48146

WHEN RECORDED RETURN COPY TO:
City of Lincoln Park Clerk
1355 Southfield Road
Lincoln Park, MI 48146

City of Lincoln Park DPS
500 Southfield Road
Lincoln Park, MI 48146

Orchard Hiltz & McCliment, Inc.
34000 Plymouth Road
Livonia, MI 48150

WATER MAIN EASEMENT

KNOW ALL MEN BY THESE PRESENTS, that, _____
_____ whose address is_____
_____hereinafter referred to as "Grantor", being title holder to the following described parcel of land, to wit:

Description of Parcel:

See Exhibit "A"

[Commonly known as: _____.]

Tax Identification Number:_____

For and in consideration of One ($1.00) Dollar, receipt of which is hereby acknowledged, does hereby grant and convey to the City of Lincoln Park, a Michigan Municipal Corporation, whose address is 1355 Southfield Road, Lincoln Park, MI 48146, hereinafter referred to as "Grantee", a perpetual easement for a water main, over, upon, across, in, through, and under the following described real property to wit:

Easement Description:

See Exhibit "B"

and to enter upon sufficient land adjacent to said water main easement for the purpose of exercising the rights and privileges granted herein. A sketch of said water main easement is attached hereto and incorporated herein.

Grantee may install, repair, replace and maintain water main lines, and all necessary appurtenances thereto, within the easement herein granted.

Grantor agrees not to build or to convey to others permission to build any permanent structures on the above described easement.

The premises so disturbed by reason of the exercise of any of the foregoing powers, rights and privileges, shall be reasonably restored to its prior condition by Grantee.

This instrument shall be binding upon and inure to the benefit of the parties hereto, their heirs, representatives, successors and assigns.

IN WITNESS WHEREOF, the undersigned Grantor(s) has affixed signature (s) this _____ day of _____ A.D., 20____

WITNESSES:

Signature: _____

Print: _____

Signature: _____

Print: _____

CORPORATION:

By: _____
Signature

Its: _____
Printed Name and Title

STATE OF MICHIGAN)
)SS
COUNTY OF WAYNE)

On this _____ day of _____, A.D., 20____, before me, a Notary Public in and for said County, appeared _____, and to me known personally known, who, being by me duly sworn, did each for himself say that they are respectively the ____ and _____ of _____ , the corporation named in and which executed the within instrument and, that the seal affixed to said instrument was signed and sealed in behalf of said corporation by authority of its board of trustees; and acknowledged said instrument the free act and deed of said corporation.

_____
Notary Public, Wayne County, MI

My commission expires_____

This instrument drafted by:

Tax Identification Number:_____

WHEN SIGNED RETURN TO:
City of Lincoln Park DPS
500 Southfield Road
Lincoln Park, MI 48146

WHEN RECORDED RETURN COPY TO:
City of Lincoln Park Clerk
1355 Southfield Road
Lincoln Park, MI 48146

City of Lincoln Park DPS
500 Southfield Road
Lincoln Park, MI 48146

Orchard Hiltz & McCliment, Inc.
34000 Plymouth Road
Livonia, MI 48150