

NOVI MS4 STORMWATER DISCHARGE APPLICATION

Permit No: MIG610030

Submitted by:



City of Novi
26300 Lee BeGole Dr.
Novi, MI 48375
248-735-5640



In collaboration with:



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Canton, Michigan 48188
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April 1, 2022

National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Application Form (Reissuance)

version 1.4

(Submission #: 2E9-H5NC-FD6V, version 1)

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Summary

Submission #:	2E9-H5NC-FD6V	Date Submitted:	3/31/2016 2:33 PM
Form:	National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Application Form (Reissuance)	Status:	Submitted
Applicant:	Meghan Price	Active Steps:	
Reference #:			
Description:	National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Application Form (Reissuance)		

Notes

There are currently no Submission Notes.

Details**Existing Permit Details**

Existing Permit ID (Read Only)

NONE PROVIDED

Existing Permit Number (Read Only)

NONE PROVIDED

Section 1. Applicant Information**Applicant Information****Contact****Prefix:** NONE PROVIDED**First Name:** Adam**Last Name:** Wayne**Company:** City of Novi**Title:** Civil Engineer**Ext:** NONE PROVIDED**Phone:** 248-735-5640**FAX:** 248-735-5683**Email:** awayne@cityofnovi.org**Address****Address Line 1:** 26300 Lee BeGole Dr.**Address Line 2:** NONE PROVIDED**Description:** NONE PROVIDED**City:** Novi**State:** MI**Postal Code:** 48375**Country:** USA**County:** -9999**Section 2. MS4 Location Information****Municipal Entity Name (e.g., City of Lansing)**

City of Novi

Identify the Primary Municipal Facility or the Mailing Address Location

A site needs to be identified as part of the application. Identify the physical address for the municipal entity, such as the primary municipal facility (e.g., City Hall).

Facility Location

42.4837738,-83.46253289999998

Section 3. MS4 Contacts (1)**CONTACTS**

A contact must be provided for each of the roles listed below. You may assign more than one role to a single contact by holding down the 'Ctrl' key while selecting each role. Use the "+" (repeat section) button to add an additional contact.

Contact

Storm Water Billing Contact

Storm Water Program Manager

Application Contact

Contact**Contact****Prefix:** Mr.**First Name:** Adam**Last Name:** Wayne**Company:** City of Novi**Title:** Civil Engineer**Ext:** NONE PROVIDED**Phone:** 248-735-5640**FAX:** 248-735-5659**Email:** awayne@cityofnovi.org**Address****Address Line 1:** 26300 Lee BeGole Dr.**Address Line 2:** NONE PROVIDED**Description:** NONE PROVIDED**City:** Novi**State:** MI**Postal Code:** 48375**Country:** USA**Section 4: Regulated Area, Outfalls/Points of Discharge, and Nested Jurisdictions (1)**

Regulated Area

Identify the urbanized area within the applicant's jurisdictional boundary as defined by the 2010 Census. The regulated MS4 means an MS4 owned or operated by a city, village, township, county, district, association, or other public body created by or pursuant to state law and the nested MS4 identified below that is located in an urbanized area and discharges storm water into surface waters of the state. The 2010 Census maps are located at the Urbanized Area Link below.

[Urbanized Area Link](#)**Select an Urbanized Area**

Detroit

Outfall and Point of Discharge Information

Provide the following information for each of the applicant's MS4 outfalls and points of discharge within the regulated area: identification number, description of whether the discharge is from an outfall or point of discharge, and the surface water of the state that receives the discharge. An outfall means a discharge point from an MS4 directly to surface waters of the state. A point of discharge means a discharge from an MS4 to an MS4 owned or operated by another public body. In the case of a point of discharge, the surface water of the state is the ultimate receiving water from the final outfall. Please note that an MS4 is not a surface water of the state. For example, an open county drain that is a surface water of the state is not an MS4. An example table is available at the link below.

[Outfall and Point of Discharge example table link](#)**OUTFALL AND POINT OF DISCHARGE INFORMATION - Attachment(s)**[Novi_Appendix A_map1of2.pdf](#)[Novi_Appendix A_map2of2.pdf](#)

Comment: See Appendix A

Nested Jurisdictions

Submit the name and general description of each nested MS4 for which a cooperative agreement has been reached to carry out the terms and conditions of the permit for the nested jurisdiction. The applicant shall be responsible for assuring compliance with the permit for those nested jurisdictions with which they have entered into an agreement and listed as part of the Application. If the primary jurisdiction and the nested jurisdiction agree to cooperate so that the terms and conditions of the permit are met for the nested MS4, the nested jurisdiction does not need to apply for a separate permit. A city, village, or township shall not be a nested jurisdiction.

Use the "+" (repeat section) button to add an additional Jurisdiction contact.

Nested Jurisdiction

Contact

Prefix: NONE PROVIDED

First Name: NONE PROVIDED

Last Name: NONE PROVIDED

Company: NONE PROVIDED

Title: NONE PROVIDED

Ext: NONE PROVIDED

Phone: NONE PROVIDED

FAX: NONE PROVIDED

Email: NONE PROVIDED

Address

Address Line 1:

Address Line 2: NONE PROVIDED

Description: NONE PROVIDED

City:

State:

Postal Code:

Country:

Section 5: General SWMP, Enforcement Response Procedure, and Public Participation/Involvement Program

STORM WATER MANAGEMENT PROGRAM (SWMP)

This Application requires a description of the Best Management Practices (BMPs) the applicant will implement for each minimum control measure and the applicable water quality requirements during this permit cycle. The applicant shall incorporate the BMPs to develop a SWMP as part of the Application. The SWMP shall be developed, implemented, and enforced to reduce the discharge of pollutants from the MS4 to the Maximum Extent Practicable and protect water quality in accordance with the appropriate water quality requirements of the NREPA 451, Public Acts of 1994, Part 31, and the Federal Water Pollution Control Act, as amended, (33 U.S.C. 1251 et seq.). The Maximum Extent Practicable may be met by implementing the BMPs identified in the SWMP and demonstrating the effectiveness of the BMPs. The applicant shall attach any appropriate and necessary documentation to demonstrate compliance with the six minimum control measures and applicable water quality requirements as part of the Application. The applicant shall complete this Application to the best of its knowledge and ensure that it is true, accurate, and meets the minimum requirements for a SWMP to the Maximum Extent Practicable. Several minimum control measures include a statement requesting the applicant to indicate in the response if you are, or will be, working collaboratively with watershed or regional partners on any or all activities to meet the minimum control measure requirements. If the applicant chooses to work collaboratively with watershed or regional partners to implement parts of the SWMP, each applicant will be responsible for complying with the minimum permit requirements. For purposes of this Application, a procedure means a written process, policy or other mechanism describing how the applicant will implement minimum requirements. When answering the questions in this section of the Application, the applicant's MS4 encompasses what the applicant identified in Sections 4. The applicant shall include a measurable goal for each BMP. Each measurable goal shall include, as appropriate, a schedule for BMP implementation (months and years), including interim milestones and the frequency of the action. Each measurable goal shall have a measure of assessment to measure progress towards achieving the measurable goal. A United States Environmental Protection Agency (USEPA) guidance document on measurable goals is available at the link below.

[USEPA measurable goals guidance document link](#)

Enforcement Response Procedure (ERP)

The applicant shall describe the current and proposed enforcement responses to address violations of the applicant's ordinances and regulatory mechanisms identified in the SWMP. The following question represents the minimum requirement for the ERP. Please complete the question below.

ERP - Attachment(s)

[Novi_Appendix B_ERP_1of2.pdf](#)

[Novi_Appendix B_ERP_2of2.pdf](#)

Comment: See Appendix B

Public Participation/Involvement Program (PPP)

The applicant shall describe the current and proposed BMPs to meet the minimum control measure requirements for the PPP to the maximum extent practicable, which shall be incorporated into the SWMP. Please indicate in your response if you are, or will be, working collaboratively with watershed or regional partners on any or all activities in the PPP during the permit cycle (i.e., identify collaborative efforts in the procedures). The following questions represent the minimum control measure requirements for the PPP. Please complete all the questions below. A measurable goal with a measure of assessment shall be included for each BMP, and, as appropriate, a schedule for implementation (months and years), including interim milestones and the frequency of the BMP. The responses shall reflect the nested MS4s identified in Section 4.

Proposing to work collaboratively on any or all activities in the PPP during the permit cycle?

Yes

PPP Procedures - Attachment(s)

[Appendix C FINAL PPP 3-22-16.pdf](#)

Comment: See Appendix C for the Collaborative PPP which will apply to all of the City of Novi, including areas outside of the Rouge River watershed.

2. Provide the reference to the procedure submitted above for making the SWMP available for public inspection and comment. The procedure shall include a process for notifying the public when and where the SWMP is available and of opportunities to provide comment. The procedure shall also include a process for complying with local public notice requirements, as appropriate. (page and paragraph of attachments): e.g., Attachment A, Page 3, Section b.

See Appendix C, Section B

3. Provide the reference to the procedure submitted above for inviting public involvement and participation in the implementation and periodic review of the SWMP. (page and paragraph of attachments):

See Appendix C, Section D

Section 6. Public Education Program

Proposing to work collaboratively on any or all activities in the PEP during the permit cycle?

Yes

PEP Procedures - Attachment(s)

[Appendix D Final ARC Collaborative PEP_032116.pdf](#)

Comment: See Appendix D for the Collaborative PEP which will apply to all of the City of Novi, including areas outside of the Rouge River watershed.

4. PEP activities may be prioritized based on the assessment of high priority, community-wide issues and targeted issues to reduce pollutants in storm water runoff. If prioritizing PEP activities, provide the reference to the procedure submitted above with the assessment and list of the priority issues (e.g., Attachment A, Section 1).

See Appendix D, Section A

5. Provide the reference to the procedure submitted above identifying applicable PEP topics and the activities to be implemented during the permit cycle. If prioritizing, prioritize each applicable PEP topics as high, medium, or low based on the assessment in Question 4. For each applicable PEP topic below, identify in the procedure the target audience; key message; delivery mechanism; year and frequency the BMP will be implemented; and the responsible party. If a PEP topic is determined to be not applicable or a priority issue, provide an explanation. An example PEP table is available at the link below.

[PEP table example link](#)

A. Promote public responsibility and stewardship in the applicant's watershed(s). Provide the reference to the procedure submitted above or explanation as to why the topic is not applicable.

High. See Appendix D, Section C

B. Inform and educate the public about the connection of the MS4 to area waterbodies and the potential impacts discharges could have on surface waters of the state. Provide the reference to the procedure submitted above or explanation as to why the topic is not applicable.

High. See Appendix D, Section C

C. Educate the public on illicit discharges and promote public reporting of illicit discharges and improper disposal of materials into the MS4. Provide the reference to the procedure submitted above or explanation as to why the topic is not applicable.

High. See Appendix D, Section C

D. Promote preferred cleaning materials and procedures for car, pavement, and power washing. Provide the reference to the procedure submitted above or explanation as to why the topic is not applicable.

Medium. See Appendix D, Section C

E. Inform and educate the public on proper application and disposal of pesticides, herbicides, and fertilizers. Provide the reference to the procedure submitted above or explanation as to why the topic is not applicable.

High. See Appendix D, Section C

F. Promote proper disposal practices for grass clippings, leaf litter, and animal wastes that may enter into the MS4. Provide the reference to the procedure submitted above or explanation as to why the topic is not applicable.

High. See Appendix D, Section C

G. Identify and promote the availability, location, and requirement of facilities for collection or disposal of household hazardous wastes, travel trailer sanitary wastes, chemicals, and motor vehicle fluids. Provide the reference to the procedure submitted above or explanation as to why the topic is not applicable.

High. See Appendix D, Section C

H. Inform and educate the public on proper septic system care and maintenance, and how to recognize system failure. Provide the reference to the procedure submitted above or explanation as to why the topic is not applicable.

High. See Appendix D, Section C

I. Educate the public on, and promote the benefits of, green infrastructure and low impact development. Provide the reference to the procedure submitted above or explanation as to why the topic is not applicable.

High. See Appendix D, Section C

J. Identify and educate commercial, industrial, and institutional entities likely to contribute pollutants to storm water runoff. Provide the reference to the procedure submitted above or explanation as to why the topic is not applicable.

Low. See Appendix D, Section C

6. Provide the reference to the procedure submitted above for evaluating and determining the effectiveness of the overall PEP. The procedure shall include a method for assessing changes in public awareness and behavior resulting from the implementation of the PEP and the process for modifying the PEP to address ineffective implementation. e.g., Attachment A, Page 3, Section b.

See Appendix D, Section D

Section 7. Illicit Discharge Elimination Program

>>[Click here to access the MDEQ IDEP Compliance Assistance Document](#)

>>[Click here to access the Center for Watershed Protection guide](#)

Proposing to work collaboratively on any or all BMPs in the IDEP during the permit cycle?

Yes

Illicit Discharge Elimination Program Procedures - Attachment(s)

[Appendix E Final Collaborative IDEP_032416.pdf](#)

[Novi_Appendix E_IDEP_2of2.pdf](#)

Comment: See Appendix E, The City has 2 outfalls discharging to the Huron River. These 2 outfalls will undergo dry weather screening once per permit cycle and all other procedures will follow the Collaborative plan.

Storm Sewer System Map

7. Provide the location where an up-to-date storm sewer system map(s) is available. The map(s) shall identify the following: the storm sewer system, the location of all outfalls and points of discharge, and the names and location of the surface waters of the state that receive discharges from the permittee's MS4 (for both outfalls and points of discharge). A separate storm sewer system includes: roads, catch basins, curbs, gutters, parking lots, ditches, conduits, pumping devices, and man-made channels. A storm sewer system map(s) may include available diagrams, such as certification maps, road maps showing rights-of-way, as-built drawings, or other hard copy or digital representation of the storm sewer system. (e.g., The Department of Public Works office)

The Department of Public Service office at 26300 Lee BeGole Dr., Novi

Illicit Discharge Identification and Investigation

8. The MS4 may be prioritized for detecting non-storm water discharges during the permit cycle. The goal of the prioritization process is to target areas with high illicit discharge potential. If prioritizing, provide the reference to the procedure submitted above with the process for selecting each priority area using the list below. (e.g., Attachment A, page 3, Section b.) • Areas with older infrastructure • Industrial, commercial, or mixed use areas • Areas with a history of past

illicit discharges • Areas with a history of illegal dumping • Areas with septic systems • Areas with older sewer lines or with a history of sewer overflows or cross-connections • Areas with sewer conversions or historic combined sewer systems • Areas with poor dry-weather water quality • Areas with water quality impacts, including waterbodies identified in a Total Maximum Daily Load • Priority areas applicable to the applicant not identified above

Provide the reference to the procedure submitted above (page and paragraph of attachments): e.g., Attachment A, Section b.

See Appendix E, Section C

9. If prioritizing dry-weather screening, provide the reference to the document submitted above with the geographical location of each prioritized area using either a narrative description or map and identify the prioritized areas that will be targeted during the permit cycle.

See Appendix E, Section C

10. Provide the procedure for performing field observations at all outfalls and points of discharge in the priority areas as identified in the procedure above or for the entire MS4 during dry-weather at least once during the permit cycle. The procedure shall include a schedule for completing the field observations during the permit cycle or more expeditiously if the applicant becomes aware of a non-storm water discharge. As part of the procedure, the applicant may submit an interagency agreement with the owner or operator of the downstream MS4 identifying responsibilities for ensuring an illicit discharge is eliminated if originating from the applicant's point(s) of discharge. The interagency agreement would eliminate the requirement for performing a field observation at that point(s) of discharge. Areas not covered by the interagency agreement shall be identified with a schedule for performing field observations included in the procedure. The focus of the field observation shall be to observe the following: • Presence/absence of flow • Water clarity • Deposits/stains on the discharge structure or bank • Color • Vegetation condition • Odor • Structural condition • Floatable materials • Biology, such as bacterial sheens, algae, and slimes

Provide the reference to the procedure submitted above (page and paragraph of attachments): e.g., Attachment A, Section b.

See Appendix E, Section D

11. Provide the reference to the procedure submitted above for performing field screening if flow is observed at an outfall or point of discharge and the source of an illicit discharge is not identified during the field observation. Field screening shall include analyzing the discharge for indicator parameters (e.g., ammonia, fluoride, detergents, and pH). The procedure shall include a schedule for performing field screening.

See Appendix E, Section D

12. Provide the reference to the procedure submitted above for performing a source investigation if the source of an illicit discharge is not identified by field screening. The procedure shall include a schedule for performing a source investigation.

See Appendix E, Section D

13. Provide the reference to the procedure submitted above for responding to illegal dumping/spills. The procedure shall include a schedule for responding to complaints, performing field observations, and follow-up field screening and source investigations as appropriate.

See Appendix E, Section D

14. If prioritizing, provide the reference to the procedure submitted above for responding to illicit discharges upon becoming aware of such a discharge outside of the priority areas. The procedure shall include a schedule for performing field observations, and follow-up field screening and source investigation as appropriate. If not prioritizing, enter "Not Applicable."

See Appendix E, Section D

15. Provide the reference to the procedure submitted above which includes a requirement to immediately report any release of any polluting materials from the MS4 to the surface waters or groundwaters of the state, unless a determination is made that the release is not in excess of the threshold reporting quantities in the Part 5 Rules, by calling the appropriate MDEQ District Office, or if the notice is provided after regular working hours call the MDEQ's 24-Hour Pollution Emergency Alerting System telephone number: 800-292-4706. (Example threshold reporting quantities: a release of 50 pounds of salt in solid form or 50 gallons in liquid form to waters of the state unless authorized by the MDEQ for deicing or dust suppressant.)

See Appendix H, Spill Response, Section C

16. If the procedures requested in Questions 8 through 14 do not accurately reflect the applicant's procedure(s), provide the reference to the procedure(s) submitted above describing the alternative approach to meet the minimum requirements.

The Collaborative and Alternative approach meets and/or exceeds the expected results from minimum control measure requirements as described in Attachment E, Section B

17. Provide the reference to the procedure submitted above for responding to illicit discharges once the source is identified. The procedure shall include a schedule to eliminate the illicit discharge and pursue enforcement actions. The procedure shall also address illegal spills/dumping.

See Appendix E, Section E

IDEP Training and Evaluation

18. Provide the reference to the program submitted above to train staff employed by the applicant, who, as part of their normal job responsibilities, may come into contact with or otherwise observe an illicit discharge to the regulated MS4, on the following topics. The program shall include a training schedule for this permit cycle. It is recommended that staff be trained more than once per permit cycle. • Techniques for identifying an illicit discharge or connection, including field observation, field screening, and source investigation. • Procedures for reporting, responding to, and eliminating an illicit discharge or connection and the proper enforcement response. • The schedule and requirement for training at least once during the term of this permit cycle for existing staff and within the first year of hire for new staff.

Provide the reference to the program submitted above (page and paragraph of attachments): e.g., Attachment A, Section b.

See Appendix E, Section D

19. Provide the reference to the procedure submitted above for evaluating and determining the overall effectiveness of the IDEP. The procedure shall include a schedule for implementation. Examples of evaluating overall effectiveness include, but are not limited to, the following: evaluate the prioritization process to determine if efforts are being maximized in areas with high illicit discharge potential; evaluate the effectiveness of using different detection methods; evaluate the number of discharges and/or quantity of discharges eliminated using different enforcement methods; and evaluate program efficiency and staff training frequency.

See Appendix E, Section F

Illicit Discharge Ordinance or Other Regulatory Mechanism

20. Provide the reference to the in effect ordinance or regulatory mechanism submitted above that prohibits non-storm water discharges into the applicant's MS4 (except the non-storm water discharges addressed in Questions 21 and 22).

See Appendix E, Attachment E, Table 1

21. Provide the reference to the ordinance or other regulatory mechanism submitted above that excludes prohibiting the discharges or flows from firefighting activities to the applicant's MS4 and requires that these discharges or flows only be addressed if they are identified as significant sources of pollutants to waters of the State. The ordinance shall not authorize illicit discharges; however, the applicant may choose to exclude prohibiting the discharges and flows from firefighting activities if they are identified as not being significant sources of pollutants to waters of the state.

See Appendix E, Attachment E, Table 1

22. Provide the reference to the ordinance or other regulatory mechanism submitted above that excludes prohibiting the following categories of non-storm water discharges or flows if identified as significant contributors to violations of Water Quality Standards. The ordinance shall not authorize illicit discharges; however, the applicant may choose to exclude prohibiting the following discharges or flows if they are identified as not being a significant contributor to violations of Water Quality Standards. a. Water line flushing and discharges from potable water sources b. Landscape irrigation runoff, lawn watering runoff, and irrigation waters c. Diverted stream flows and flows from riparian habitats and wetlands d. Rising groundwaters and springs e. Uncontaminated groundwater infiltration and seepage f. Uncontaminated pumped groundwater, except for groundwater cleanups specifically authorized by NPDES permits g. Foundation drains, water from crawl space pumps, footing drains, and basement sump pumps h. Air conditioning condensation i. Waters from noncommercial car washing j. Street wash water k. Dechlorinated swimming pool water from single, two, or three family residences. (A swimming pool operated by the permittee shall not be discharged to a separate storm sewer or to surface waters of the state without NPDES permit authorization from the MDEQ.)

Provide the reference to the procedure submitted above (page and paragraph of attachments): e.g., Attachment A, Section b.

See Appendix E, Attachment E, Table 1

23. Provide the reference to the ordinance or regulatory mechanism submitted above that regulates the contribution of pollutants to the applicant's MS4 in the attachment above.

See Appendix E, Attachment E, Table 1

24. Provide the reference to the ordinance or regulatory mechanism submitted above that prohibits illicit discharges, including illicit connections and the direct dumping or disposal of materials into the applicant's MS4 in the attachment above.

See Appendix E, Attachment E, Table 1

25. Provide the reference to the ordinance or regulatory mechanism submitted above with the authority established to inspect, investigate, and monitor suspected illicit discharges into the applicant's MS4 in the attachment above.

See Appendix E, Attachment E, Table 1

26. Provide the reference to the ordinance or regulatory mechanism submitted above that requires and enforces elimination of illicit discharges into the applicant's MS4, including providing the applicant the authority to eliminate the illicit discharge in the attachment above.

See Appendix E, Attachment E, Table 1

Section 8. Construction Storm Water Runoff Control Program

Proposing to work collaboratively on any or all requirements of the Construction Storm Water Runoff Control Program during the permit cycle?

No

Qualifying Local Soil Erosion and Sedimentation Control Programs

[Click here to access the list of approved Part 91 Agencies](#)

27. Is the applicant a Part 91 Agency?

Yes

If yes, choose type

Municipal Enforcing Agency

No the applicant relies on the following Qualifying Local Soil Erosion and Sedimentation Control Program (Part 91 Agency)

NONE PROVIDED

Construction Storm Water Runoff Control

Construction Storm Water Runoff Control Program Procedure Attachment - Attachment(s)

[Novi_Appendix F_Construction_1of2.pdf](#)

[Novi_Appendix F_Construction_2of2.pdf](#)

Comment: See Appendix F

28. Provide the reference to the procedure submitted above with the process for notifying the Part 91 Agency or appropriate staff when soil or sediment is discharged to the applicant's MS4 from a construction activity, including the notification timeframe. The procedure shall allow for the receipt and consideration of complaints or other information submitted by the public or identified internally as it relates to construction storm water runoff control. For non-Part 91 agencies, consideration of complaints may include referring the complaint to the qualifying local Soil Erosion and Sedimentation Control Program as appropriate. Construction activity is defined pursuant to Part 21, Wastewater Discharge Permits, Rule 323.2102 (K). The applicant may consider as part of their procedure when and under what circumstances the Part 91 Agency or appropriate staff will be contacted.

See Appendix F, Section B

29. Provide the reference to the procedure submitted above with the requirement to notify the MDEQ when soil, sediment, or other pollutants are discharged to the applicant's MS4 from a construction activity, including the notification timeframe. Other pollutants include pesticides, petroleum derivatives, construction chemicals, and solid wastes that may become mobilized when land surfaces are disturbed. The applicant may consider as part of their procedure when and under what circumstances the MDEQ will be contacted.

See Appendix F, Section E

30. Provide the reference to the procedure submitted above for ensuring that construction activity one acre or greater in total earth disturbance with the potential to discharge to the applicant's MS4 obtains a Part 91 permit, or is conducted by an approved Authorized Public Agency as appropriate. Note: For applicants that conduct site plan review, the procedure must be triggered at the site plan review stage.

See Appendix F, Section B

31. Provide the reference to the procedure submitted above to advise the landowner or recorded easement holder of the property where the construction activity will occur of the State of Michigan Permit by Rule (Rule 323.2190).

See Appendix F, Section F

Section 9. Post-Construction Storm Water Runoff Program

>>[Click here to access the Low Impact Development Manual for Michigan. Chapter 9 of the manual provides a methodology for addressing post-construction storm water runoff.](#)

The MDEQ has the following resources available to assist with development of a Post-Construction Storm Water Runoff Program.

>>[Click here to access the Post-Construction Storm Water Runoff Program Compliance Assistance Document](#)

Post-Construction Storm Water Runoff Program Procedures, Ordinances, and Regulatory Mechanisms - Attachment(s)[Novi_Appendix G_Post Construction_1of4.pdf](#)[Novi_Appendix G_Post Construction_2of4.pdf](#)[Novi_Appendix G_Post Construction_3of4.pdf](#)[Novi_Appendix G_Post Construction_4of4.pdf](#)

Comment: See Appendix G

Ordinance or Other Regulatory Mechanism

32. Provide the reference to the in-effect ordinance or regulatory mechanism submitted above to address post-construction storm water runoff from new development and redevelopment projects, including preventing or minimizing water quality impacts. The ordinance or other regulatory mechanism shall apply to private, commercial, and public projects, including projects where the applicant is the developer. This requirement may be met using a single ordinance or regulatory mechanism or a combination of ordinances and regulatory mechanisms. If not available at this time, provide the date the ordinance or regulatory mechanism will be available.

See Appendix G, Section B

33. Provide the reference to the ordinance or other regulatory mechanism submitted above that applies to projects that disturb at least one or more acres, including projects less than an acre that are part of a larger common plan of development or sale and discharge into the applicant's MS4. If not available at this time, provide the date the ordinance or regulatory mechanism will be available.

See Appendix G, Section B

Federal Facilities

Federal facilities are subject to the Energy Independence and Security Act of 2007. Section 438 of this legislation establishes post-construction storm water runoff requirements for federal development and redevelopment projects.

34. Is the applicant the owner or operator of a federal facility with a storm water discharge

No, skip to Question 36

35. Provide the reference to the regulatory mechanism submitted above with the requirement to implement the post-construction storm water runoff control requirements in Section 438 of the Energy Independence and Security Act. If not available at this time, provide the date the regulatory mechanism will be available. The United States Environmental Protection Agency (USEPA) has a technical guidance available at the following link.

[USEPA Technical Guidance on Implementing the Stormwater Runoff Requirements](#)

Provide the reference to the regulatory mechanism submitted above (page and paragraph of attachments): e.g., Attachment A, Section b.

NONE PROVIDED

Water Quality Treatment Performance Standard

36. Does the ordinance or other regulatory mechanism include one or more of the following water quality treatment standards?

Treat the first one inch of runoff from the entire project site. Provide the ordinance or regulatory mechanism reference in the attachment above (page and paragraph of attachments): e.g., Attachment A, Pages 1-15

NONE PROVIDED

Treat the runoff generated from 90 percent of all runoff-producing storms for the project site. Provide the ordinance or regulatory mechanism reference in the attachment above (page and paragraph of attachments): e.g., Attachment A, Pages 1-15

NONE PROVIDED

If no, provide the date the ordinance or regulatory mechanism will be submitted.

NONE PROVIDED

37. If the applicant has chosen the water quality treatment standard of requiring treatment of the runoff generated from 90 percent of all runoff-producing storms, what is the source of the rainfall data? The MDEQ memo included in the sources below is available at the following link.

[March 24, 2006 MDEQ memo providing the 90 percent annual non-exceedance storm statistics](#)**Sources**

Other rainfall data source (page and paragraph of attachments)

See Novi Engineering Design Manual, Chapter 5

38. Provide the reference to the ordinance or regulatory mechanism submitted above with the requirement that BMPs be designed on a site-specific basis to reduce post-development total suspended solids loadings by 80 percent or achieve a discharge concentration of total suspended solids not to exceed 80 milligrams per liter. If not available at this time, provide the date the ordinance or regulatory mechanism will be available.

See Novi Engineering Design Manual, Chapter 5

Channel Protection Performance Standard

39. Provide the reference to the ordinance or regulatory mechanism submitted above with the requirement that the post-construction runoff rate and volume of discharges not exceed the pre-development rate and volume for all storms up to the two-year, 24-hour storm at the project site. At a minimum, pre-development is the last land use prior to the planned new development or redevelopment. If not available at this time, provide the date the ordinance or regulatory mechanism will be available. A MDEQ spreadsheet is available to assist with these calculations at the following link.

[Calculations for Storm Water Runoff Volume Control Spreadsheet](#)

Provide the reference to the ordinance or regulatory mechanism submitted above.

See Novi Engineering Design Manual, Chapter 5

If pursuing an alternative approach, provide the reference to the ordinance or other regulatory mechanism submitted above describing the alternative to meet the minimum requirements, including an explanation as to how the channel protection standard will prevent or minimize water quality impacts.

NONE PROVIDED

40. The channel protection performance standard is not required for the following waterbodies: the Great Lakes or connecting channels of the Great Lakes; Rouge River downstream of the Turning Basin; Saginaw River; Mona Lake and Muskegon Lake (Muskegon County); and Lake Macatawa and Spring Lake (Ottawa County). If applicable, provide the reference to the ordinance or regulatory mechanism submitted above that excludes any waterbodies from the channel protection performance standard. If not available at this time, provide the date the ordinance or regulatory mechanism will be available.

NONE PROVIDED

Site-Specific Requirements

41. Provide the reference to the procedure submitted above for reviewing the use of infiltration BMPs to meet the water quality treatment and channel protection standards for new development or redevelopment projects in areas of soil or groundwater contamination in a manner that does not exacerbate existing conditions. The procedure shall include the process for coordinating with MDEQ staff as appropriate.

See Oakland County Stormwater Management Standards

42. Provide the reference to the ordinance or regulatory mechanism submitted above that requires BMPs to address the associated pollutants in potential hot spots as part of meeting the water quality treatment and channel protection standards for new development or redevelopment projects. Hot spots include areas with the potential for significant pollutant loading such as gas stations, commercial vehicle maintenance and repair, auto recyclers, recycling centers, and scrap yards. Hot spots also include areas with the potential for contaminating public water supply intakes. If not available at this time, provide the date the ordinance or regulatory mechanism will be available.

See Oakland County Stormwater Management Standards

Off-Site Mitigation and Payment in Lieu Programs

43. An applicant may choose to allow for the approval of off-site mitigation for redevelopment projects that cannot meet 100 percent of the performance standards on-site after maximizing storm water retention. Off-site mitigation refers to BMPs implemented at another location within the same jurisdiction and watershed/sewershed as the original project. A watershed is the geographic area included in a 10-digit Hydrologic Unit Code and a sewershed is the area where storm water is conveyed by the applicant's MS4 to a common outfall or point of discharge. If proposing to allow for off-site mitigation, provide the reference to the ordinance or regulatory mechanism submitted above with the off-site mitigation requirements. If not available at this time, provide the date the ordinance or regulatory mechanism will be available.

NONE PROVIDED

44. An applicant may choose to allow for the approval of payment in lieu for projects that cannot meet 100 percent of the performance standards

on-site after maximizing storm water retention. A payment in lieu program refers to a developer paying a fee to the applicant that is applied to a public storm water management project within the same jurisdiction and watershed/sewershed as the original project in lieu of installing the required BMPs onsite. The storm water management project may be either a new BMP or a retrofit to an existing BMP and shall be developed in accordance with the applicant's performance standards. A watershed is the geographic area included in a 10-digit Hydrologic Unit Code and a sewershed is the area where storm water is conveyed by the applicant's MS4 to a common outfall or point of discharge. If proposing to allow for payment in lieu, provide the reference to the ordinance or regulatory mechanism submitted above with the payment in lieu requirements. If not available at this time, provide the date the ordinance or regulatory mechanism will be available. If not pursuing the options available in Questions 43 and 44, skip to Question 52.

NONE PROVIDED

45. Provide the reference the the ordinance or regulatory mechanism submitted above that establishes criteria for determining the conditions under which off-site mitigation and/or payment in lieu are available and require technical justification as to the infeasibility of on-site management. The determination that performance standards cannot be met on-site shall not be based solely on the difficulty or cost of implementing, but shall be based on multiple criteria related to the physical constraints of the project site, such as: too small of a lot outside of the building footprint to create the necessary infiltrative capacity even with amended soils; soil instability as documented by a thorough geotechnical analysis; a site use that is inconsistent with the capture and reuse of storm water; too much shade or other physical conditions that preclude adequate use of plants. The criteria shall also include consideration of the stream order and location within the watershed/sewershed as it relates to the water quality impacts from the original project site (e.g., the water quality impact from a project site with a discharge to a small-sized stream would be greater than a project site on a large river and an offset downstream of the project site may provide less water quality benefit.) The highest preference for off-site mitigation and in lieu projects shall be given to locations that yield benefits to the same receiving water that received runoff from the original project site. If not available at this time, provide the date the ordinance or regulatory mechanism will be available.

NONE PROVIDED

46. Provide the reference to the ordinance or regulatory mechanism submitted above that establishes a minimum amount of storm water to be managed on-site as a first tier for off-site mitigation or payment in lieu. A higher offset ratio is required if off-site mitigation or payment in lieu is requested for the amount of storm water identified as the first tier. For example, a minimum of 0.4 inches of storm water runoff shall be managed on-site as a first tier. If not available at this time, provide the date the ordinance or regulatory mechanism will be available.

NONE PROVIDED

47. Provide the reference to the ordinance or regulatory mechanism submitted above that requires an offset ratio of 1:1.5 for the amount of storm water above the first tier (identified in Question 46) not managed on-site to the amount of storm water required to be mitigated at another site or for which in-lieu payments shall be made. If not available at this time, provide the date the ordinance or regulatory mechanism will be available.

NONE PROVIDED

48. Provide the reference to the ordinance or regulatory mechanism submitted above requiring that if demonstrated by the developer to the applicant that it is completely infeasible to manage the first tier of storm water identified in Question 47 on-site, the offset ratio for the unmanaged portion is 1:2. If not available at this time, provide the date the ordinance or regulatory mechanism will be available.

NONE PROVIDED

49. Provide the reference to the ordinance or regulatory mechanism submitted above that requires a schedule for completing off-site mitigation and in-lieu projects. Off-site mitigation and in-lieu projects should be completed within 24 months after the start of the original project site construction. If not available at this time, provide the date the ordinance or regulatory mechanism will be available.

NONE PROVIDED

50. Provide the reference to the ordinance or regulatory mechanism submitted above that requires that offsets and in-lieu projects be preserved and maintained in perpetuity, such as deed restrictions and long-term operation and maintenance. If not available at this time, provide the date the ordinance or regulatory mechanism will be available.

NONE PROVIDED

51. Describe the tracking system implemented, or to be implemented, to track off-site mitigation and/or in-lieu projects.

NONE PROVIDED

52. If there are any other exceptions to the performance standards (other than off-site mitigation and payment in lieu) being implemented or to be implemented during the permit cycle, provide the reference to the document submitted above describing the exception(s). The applicant shall demonstrate how the exception provides an equivalent or greater level of protection as the performance standards.

NONE PROVIDED

Site Plan Review

53. Provide the reference to the ordinance or regulatory mechanism submitted above that includes a requirement to submit a site plan for review

and approval of post-construction storm water runoff BMPs. If not available at this time, provide the date the ordinance or regulatory mechanism will be available.

See Appendix G Attachments

54. Provide the reference to the procedure submitted above for site plan review and approval. If not available at this time, provide the date the procedure will be available.

See Appendix G, Ordinance Section 12-217

55. Provide the reference to the site plan review and approval procedure submitted above describing the process for determining how the developer meets the performance standards and ensures long-term operation and maintenance of BMPs in the attachment above. If not available at this time, provide the date the procedure will be available.

See Appendix G Attachments

Long-Term Operation and Maintenance of BMPs

56. Provide the reference to the ordinance or regulatory mechanism submitted above that requires the long-term operation and maintenance of all structural and vegetative BMPs installed and implemented to meet the performance standards in perpetuity. If not available at this time, provide the date the procedure will be available.

See Appendix G Attachments

57. Provide the reference to the ordinance or regulatory mechanism submitted above that requires a maintenance agreement between the applicant and owners or operators responsible for the long-term operation and maintenance of structural and vegetative BMPs installed and implemented to meet the performance standards. If not available at this time, provide the date the procedure will be available.

See Appendix G Attachments

58. Does the maintenance agreement or other legal mechanism allow the applicant to complete the following? (Check if yes)

Inspect the structural or vegetative BMP

Perform the necessary maintenance or corrective actions neglected by the BMP owner or operator

Track the transfer of operation and maintenance responsibility of the BMP (e.g., deed restrictions)

If any of the boxes above were not checked, provide a response explaining how the maintenance agreement or other legal mechanism allows the applicant to verify and ensure maintenance of the BMP.

See Appendix G Attachments and Oakland County Stormwater Management Standards

59. Provide the reference to the procedure submitted above for tracking compliance with a maintenance agreement or other legal mechanism to ensure the performance standards are met in perpetuity in the attachment above.

See Appendix G Attachments and Oakland County Stormwater Management Standards

Section 10. Pollution Prevention and Good Housekeeping Program

Pollution Prevention and Good Housekeeping Program Procedures - Attachment(s)

[Novi_Appendix H_P2GH_1of2.pdf](#)

[Novi_Appendix H_P2GH_2of2.pdf](#)

Comment: See Appendix H

Municipal Facility and Structural Storm Water Control Inventory

60. Provide the reference to the up-to-date inventory submitted above identifying applicant-owned or operated facilities and storm water structural controls with a discharge of storm water to surface waters of the state. The inventory shall include the location of each facility. Provide an estimate of the number of structural storm water controls throughout the entire MS4 for each applicable category below (e.g., 100 catch basins and 7 detention basins). For example, Attachment A, Page 3, Section B.

See Appendix H, P2GH, Table 1

Facilities that may have the high potential to discharge pollutants:

Equipment storage and maintenance facilities

Fleet maintenance facilities

Materials storage and Public Works yards

Salt storage facilities

Check all applicant-owned or operated facilities with a discharge of storm water to surface waters of the state:

Administration buildings and libraries
Cemeteries
Fire Stations
Parks
Police Stations
Public parking lots
Recycling facilities
Vacant land and open space
Vehicle storage

Check all applicant-owned or operated structural storm water controls with a discharge of storm water to surface waters of the state:

Catch basins
Detention basins
Oil/water separators
Rain gardens
Secondary containment

61. Provide the location where an up-to-date map (or maps) is available with the location of the facilities and structural storm water controls identified in Question 60. The location of the facilities and structural storm water controls may be included on the storm sewer system map maintained for the IDEP. The map (or maps) is available at the following location: (e.g., The Department of Public Works office)

Department of Public Service, 26300 Lee BeGole Dr., Novi

62. Provide the reference to the procedure submitted above for updating and revising the inventory in Question 60 and map (or maps) identified in Question 61 as facilities and structural storm water controls are added, removed, or no longer owned or operated by the applicant in the attachment above. A suggested timeframe for updating/revising the inventory and map(s) is 30 days following adding/removing a facility or structural storm water control.

See Appendix H, Section C

Facility-Specific Storm Water Management

63. Provide the reference to the procedure submitted above for assessing each facility identified in Question 60 for the potential to discharge pollutants to surface waters of the state. The procedure shall include a process for updating and revising the assessment. A recommended timeframe for updating/revising the assessment is 30 days prior to discharging storm water from a new facility and within 30 days of determining a need to update/revising the facility assessment. The applicant should consider the following factors when assessing each facility:

- Amount of urban pollutants stored at the site (e.g., sediment, nutrients, metals, hydrocarbons, pesticides, fertilizers, herbicides, chlorides, trash, bacteria, or other site-specific pollutants)
- Identification of improperly stored materials
- The potential for polluting activities to be conducted outside (e.g., vehicle washing)
- Proximity to waterbodies
- Poor housekeeping practices
- Discharge of pollutants of concern to impaired waters

If the applicant does not own a facility that discharges storm water to surface waters of the state in the urbanized area, skip to Question 71.

Provide the reference to the procedure submitted above (page and paragraph of attachments): e.g., Attachment A, Section b.

See Appendix H, Section B

If not applicable

64. Provide the reference to the list of prioritized facilities submitted above using the assessment in Question 63. Each facility shall be prioritized based on having the high, medium, or low potential to discharge pollutants to surface waters of the state. Facilities with the high potential for pollutant runoff shall include, but are not limited to, the applicant's fleet maintenance and storage yards. The applicant may choose to demonstrate how a fleet maintenance/storage yard has the low potential to discharge pollutants to surface waters of the state. If demonstrating a low potential, provide the reference to the demonstration submitted above for the fleet maintenance and/or storage yard.

See Appendix H, Section D

65. Is a site-specific standard operating procedure (SOP) available identifying the structural and non-structural storm water controls implemented and maintained to prevent or reduce pollutant runoff at each facility with the high potential for pollutant runoff? The SOP shall be available at

each facility with the high potential for pollutant runoff and upon request from the MDEQ. The SOP shall identify the person responsible for oversight of the facility. The MDEQ may request the submission of the SOP during the application review process.

Yes, a site-specific SOP is available at each facility with the high potential for pollutant runoff

66. Provide the reference in the SOP, for each facility with the high potential for pollutant runoff, to the following: the list of significant materials stored on-site that could pollute storm water; the description of the handling and storage requirements for each significant material; and the potential to discharge the significant material. (SOP Reference Example: DPW Yard SOP – Section 2)

See Appendix H, Section E, DPS Facility

67. Provide the reference in the SOP, for each facility with the high potential for pollutant runoff, identifying the good housekeeping practices implemented at the site. Good housekeeping practices include keeping the facility neat and orderly, properly storing and covering materials, and minimizing pollutant sources to prevent or reduce pollutant runoff. (SOP Reference Example: DPW Yard SOP – Section 2)

See Appendix H, Sections J through O

68. Provide the reference in the SOP, for each facility with the high potential for pollutant runoff, to the description and schedule for conducting routine maintenance and inspections of storm water management and control devices to ensure materials and equipment are clean and orderly and to prevent or reduce pollutant runoff. A biweekly schedule is recommended for routine inspections. (SOP Reference Example: DPW Yard SOP – Section 2)

See Appendix H, Section O

69. Provide the reference in the SOP, for each facility with the high potential for pollutant runoff, to the description and schedule for conducting a comprehensive site inspection at least once every six months. The comprehensive inspection shall include an inspection of all structural storm water controls and a review of non-structural storm water controls to prevent or reduce pollutant runoff. (SOP Reference Example: DPW Yard SOP – Section 2)

See Appendix H, Section O

70. Provide the reference to the procedure submitted above identifying the BMPs currently implemented or to be implemented during the permit cycle to prevent or reduce pollutant runoff at each facility with the medium and lower potential for the discharge of pollutants to surface waters of the state using the assessment and prioritized list in Questions 63 and 64.

See Appendix H, Section G, I and N

Structural Storm Water Control Operation and Maintenance Activities

71. Provide the reference to the procedure submitted above for prioritizing each catch basin for routine inspection, maintenance, and cleaning based on preventing or reducing pollutant runoff. The procedure shall include assigning a priority level for each catch basin and the associated inspection, maintenance and cleaning schedule based on preventing or reducing pollutant runoff. The procedure shall include a process for updating/revising the priority level for a catch basin giving consideration to inspection findings and citizen complaints. A recommended timeframe for updating/revising the procedure is 30 days following the construction of a catch basin or a change in priority level. If the applicant does not own or operate catch basins skip to Question 75.

See Appendix H, Section F

72. Provide the reference to the narrative description or map submitted above with the geographic location of the catch basins in each priority level.

See Appendix H, Section F

73. Provide the reference to the procedure submitted above for inspecting, cleaning, and maintaining catch basins to ensure proper performance. Proper cleaning methods include ensuring accumulated pollutants are not discharged during cleaning and are removed prior to discharging to surface waters of the state. An MDEQ Catch Basin Cleaning Activities guidance document is available at the following link.

[Catch Basin Cleaning Activities Guidance Document](#)

Provide the reference to the procedure submitted above (page and paragraph of attachments): e.g., Attachment A, Section b.

See Appendix H, Section G

74. Provide the reference to the procedure submitted above for dewatering, storage, and disposal of materials extracted from catch basins. An MDEQ Catch Basin Cleaning Activities guidance document is available at the following link.

[Catch Basin Cleaning Activities Guidance Document](#)

Provide the reference to the procedure submitted above (page and paragraph of attachments): e.g., Attachment A, Section b.

See Appendix H, Section H

75. If the applicant owns or operates structural storm water controls identified in Question 60, excluding the structural storm water controls included in an SOP as part of Question 65 and catch basins, provide the reference to the procedure submitted above for inspecting and maintaining the structural storm water controls. The procedure shall include a description and schedule for inspecting and maintaining each structural storm water control and the process for disposing of maintenance waste materials. The procedure shall require that controls be maintained to reduce to the maximum extent practicable the contribution of pollutants to storm water. The procedure shall include a process for updating/revising the procedure to ensure a maintenance and inspection program for each structural storm water control. A recommended timeframe for updating/revising the procedure is 30 days following the implementation of a new structural storm water control.

See Appendix H, Section N

76. Provide the reference to the procedure submitted above requiring new applicant-owned or operated facilities or new structural storm water controls for water quantity be designed and implemented in accordance with the post-construction storm water runoff control performance standards and long-term operation and maintenance requirements.

See Appendix H, Section P

Municipal Operations and Maintenance Activities

77. Provide the reference to the procedure(s) submitted above with the assessment of the following operation and maintenance activities, if applicable, for the potential to discharge pollutants to surface waters of the state. The assessment shall identify all pollutants that could be discharged from each applicable operation and maintenance activity and the BMPs being implemented or to be implemented to prevent or reduce pollutant runoff. The procedure shall include a process for updating and revising the assessment. A suggested timeframe for updating/revising the assessment is 30 days following adding/removing BMPs to address new and existing operation and maintenance activities.

At a minimum, the procedure shall include assessing the following municipal operation and maintenance activities if applicable (check all that apply):

Road, parking lot, and sidewalk maintenance (e.g., pothole, sidewalk, and curb and gutter repair)

Bridge maintenance

Right-of-way maintenance

Cold weather operations (e.g., plowing, sanding, application of deicing agents, and snow pile disposal)

Vehicle washing and maintenance of applicant-owned vehicles (e.g., police, fire, school bus, public works)

Provide the reference to the procedure submitted above (page and paragraph of attachments): e.g., Attachment A, Section b.

See Appendix H, Sections J, L and M

78. Provide the reference to the procedure submitted above for prioritizing applicant-owned or operated streets, parking lots, and other impervious infrastructure for street sweeping based on the potential to discharge pollutants to surface waters of the state. The procedure shall include assigning a priority level for each parking lot and street and the associated cleaning schedule (i.e., sweeping frequency and timing) based on preventing or reducing pollutant runoff. The procedure shall include a process for updating/revising the priority level giving consideration to street sweeping findings and citizen complaints. A recommended timeframe for updating/revising the prioritization is 30 days following the construction of a new street, parking lot, or other applicant-owned or operated impervious surface or within 30 days of identifying a need to revise a priority level. If the applicant does not own or operate any streets, parking lots, or other impervious infrastructure, skip to Question 82.

See Appendix H, Section I

79. Provide the reference to the narrative description or map submitted above with the geographic location of the streets, parking lots, and other impervious surfaces in each priority level.

See Appendix H, Section I

80. Provide the reference to the procedure submitted above identifying the sweeping methods based on the applicant's sweeping equipment and use of additional resources in sweeping seasonal leaves or pick-up of other materials. Proper sweeping methods include operating sweeping equipment according to the manufacturers' operating instructions and to protect water quality.

See Appendix H, Section I

81. Provide the reference to the procedure submitted above for dewatering, storage, and disposal of street sweeper waste material. An MDEQ Catch Basin Cleaning Activities guidance document is available at the following link and includes information on street sweeping requirements.

[Catch Basin Cleaning Activities Guidance Document](#)

Provide the reference to the procedure submitted above (page and paragraph of attachments): e.g., Attachment A, Section b.

See Appendix H, Section H

Managing Vegetated Properties

82. If the applicant's pesticide applicator does not exclusively use ready-to-use products from the original container, provide the reference to the procedure submitted above requiring the applicant's pesticide applicator to be certified by the State of Michigan as an applicator in the applicable category, to prevent or reduce pollutant runoff from vegetated land. A description of the certified applicator categories is available at the following link. If the applicant only applies ready-to-use products from the original container, enter "Not Applicable."

[Commercial Pesticide Application Certification Categories](#)

Provide the reference to the procedure submitted above (page and paragraph of attachments): e.g., Attachment A, Section b.

See Appendix H, Section Q

Contractor Requirements and Oversight

83. Provide the reference to the procedure submitted above requiring contractors hired by the applicant to perform municipal operation and maintenance activities comply with all pollution prevention and good housekeeping BMPs as appropriate. The procedure shall include the process implemented for providing oversight of contractor activities to ensure compliance.

See Appendix H, Section S

Employee Training

84. Provide the reference to the employee training program submitted above to train employees involved in implementing or overseeing the pollution prevention and good housekeeping program. The program shall include the training schedule. At a minimum, existing staff shall be trained once during the permit cycle and within the first year of hire for new staff.

See Appendix H, Section R

Section 11. Total Maximum Daily Load Implementation Plan

The USEPA has a document to assist with developing a TMDL Implementation Plan available at the following link.

[Understanding Impaired Waters and Total Maximum Daily Load \(TMDL\) Requirements for Municipal Stormwater Programs](#)

Total Maximum Daily Load Implementation Plan - Attachment(s)

[Appendix I Final Collaborative TMDL 032416.pdf](#)

Comment: See Appendix I for the Collaborative TMDL. Additionally, the City was given late notice of additional TMDLs which apply to the portion of the City discharging to the Huron River. This response will be submitted separately.

Proposing to work collaboratively on any or all activities in the TMDL Implementation Plan during the permit cycle.

Yes

85. If a TMDL(s) was included in the applicant's application notice, provide the name(s) below. If no TMDL was identified, skip to the next section.

Rouge River Watershed (Biota, E. coli), Johnson Creek (DO)

86. Provide the reference to the procedure submitted above describing the process for identifying and prioritizing BMPs currently being implemented or to be implemented during the permit cycle to make progress toward achieving the pollutant load reduction requirement in each TMDL identified in Question 85. The procedure shall include a process for reviewing, updating, and revising BMPs implemented or to be implemented to ensure progress in achieving the TMDL pollutant load reduction.

See Appendix I

87. Provide the reference to the TMDL BMP Priority List submitted above with prioritized BMPs currently being implemented or to be implemented during the permit cycle to make progress toward achieving the pollutant load reduction requirement in each TMDL identified in Question 85. Each BMP shall include a reference to the targeted TMDL pollutant.

See Appendix I

88. Provide the reference to the TMDL Monitoring Plan submitted above for assessing the effectiveness of the BMPs currently being implemented, or to be implemented, in making progress toward achieving the TMDL pollutant load reduction requirement, including a schedule for completing the monitoring. Monitoring shall be specifically for the pollutant identified in the TMDL. Monitoring may include, but is not limited to, outfall monitoring, in-stream monitoring, or modeling. At a minimum, monitoring shall be conducted two times during the permit cycle or at a frequency sufficient to determine if the BMPs are adequate in making progress toward achieving the TMDL pollutant load reduction. Existing monitoring data may be submitted for review as part of the plan to meet part of the monitoring requirement.

See Appendix I

Section 12. Phase I only – Industrial Facility Inspection Program

Industrial Facility Inspection Program Procedures - Attachment(s)

NONE PROVIDED

Comment: NONE PROVIDED

89. Provide the reference to the procedure submitted above describing the process for identifying existing industrial facilities, as defined below, within the applicant's jurisdiction that discharge stormwater to the applicant's MS4. Industrial facilities include, but are not limited to, the following: • Industrial facilities that the applicant determines are contributing a substantial pollutant loading to the MS4 • Industrial facilities subject to the Superfund Amendments and Reauthorization Act (SARA) • Hazardous waste treatment, disposal, storage, and recovery facilities

Provide the reference to the procedure submitted above (page and paragraph of attachments): e.g., Attachment A, Section b.

NONE PROVIDED

90. Provide the reference to the inventory of industrial facilities submitted above using the procedure in Question No. 89.

NONE PROVIDED

91. Provide the reference to the procedure submitted above for prioritizing the industrial facilities identified in Question No. 90 for inspection. Each industrial facility shall be evaluated and prioritized based on having a high, medium or low potential to discharge pollutants to the applicant's MS4. The procedure shall include a process for updating and revising the prioritization, including modifying the priority level based on contribution of significant pollutant loading to the MS4, inspection findings, and the potential to discharge pollutants. The applicant should consider the following factors when prioritizing an industrial facility: • Pollutant sources stored on site • Pollutants of concern • Proximity to impaired surface waters of the state • The applicant's violation or complaint history with the facility

Provide the reference to the procedure submitted above (page and paragraph of attachments): e.g., Attachment A, Section b.

NONE PROVIDED

92. Provide the reference to the list of the prioritized industrial facilities for inspection submitted above.

NONE PROVIDED

93. Provide the reference to the procedure submitted above for inspecting industrial facilities based on the prioritized list in Question No. 92 to evaluate pollutant source controls. The number or percentage of facilities to be inspected (e.g., 20% annually) or the inspection frequency for the different priority levels (e.g., high priority facilities inspected annually) shall be identified with the highest priority facilities receiving more frequent inspections. The procedure shall include a process for inspecting facilities based on complaints concerning pollutants discharged to the applicant's MS4. At a minimum, inspections shall include an evaluation of BMPs implemented and maintained to control pollutant sources at the industrial facility and for evidence of unauthorized discharges, illicit connections, and potential discharges of pollutants to the applicant's MS4. The procedure shall include notifying the applicable Water Resources Division District Office if an industrial facility appears to be in violation of the NPDES industrial stormwater program.

Provide the reference to the procedure submitted above (page and paragraph of attachments): e.g., Attachment A, Section b.

NONE PROVIDED

94. Provide the reference to the employee training program submitted above to train employees whose primary job duties are to implement the industrial facility inspection program. The program shall include the training schedule. At a minimum, existing staff shall be trained once during the permit cycle and new hires within the first year of their hire date. The training shall cover facility inspection procedures.

[Click here to access the State of Michigan Industrial Stormwater program page](#)

Provide the reference to the program submitted above (page and paragraph of attachments): e.g., Attachment A, Page 3, Section b.

NONE PROVIDED

Section 13. Certify and Submit

4/12/2016

MDEQ MiWaters Portal System - View Submission

Comments (As needed)

NONE PROVIDED

Additional Documents (As needed) - Attachment(s)

NONE PROVIDED

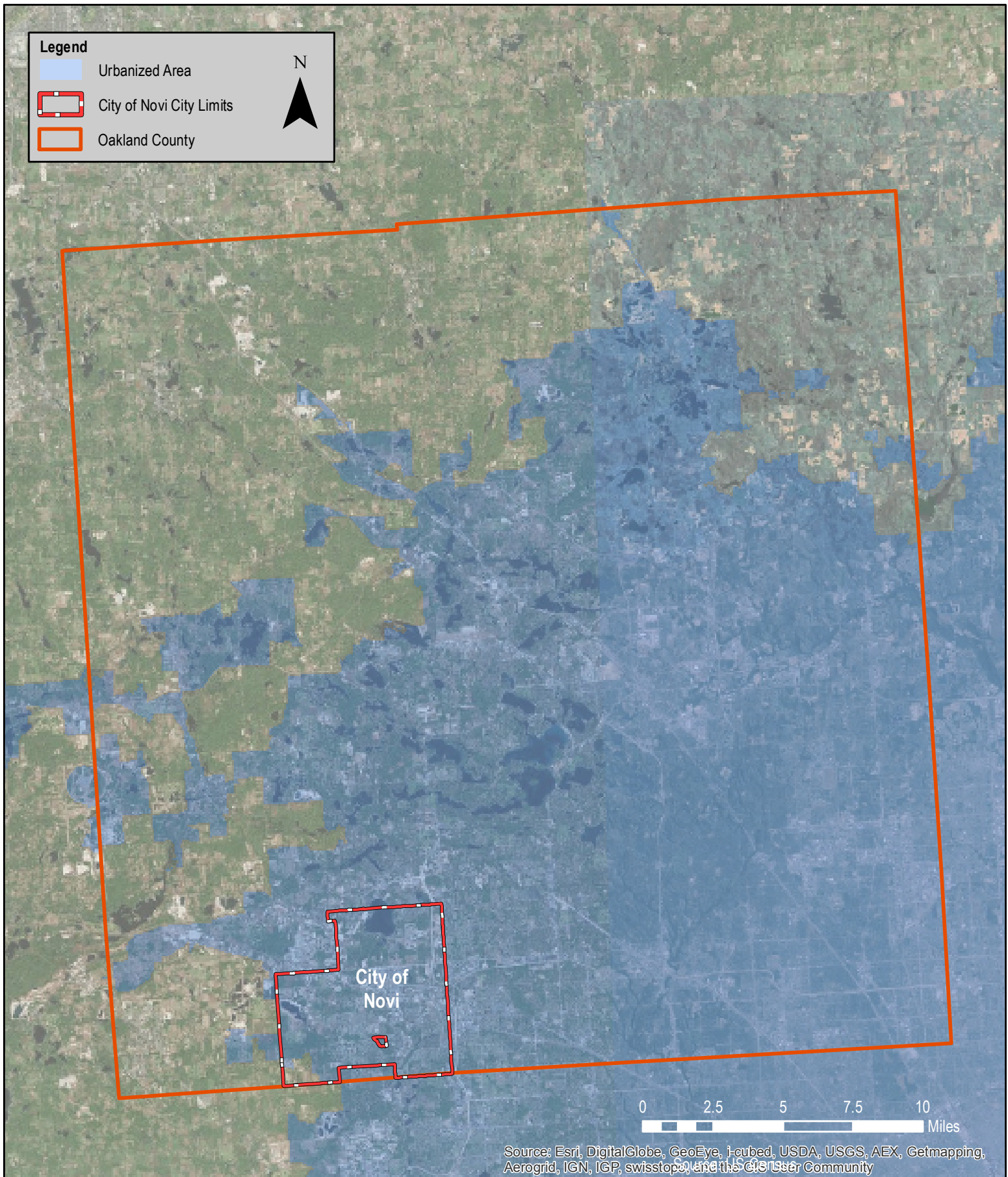
Comment: NONE PROVIDED

Attachments		
Date	Attachment Name	Context

Status History		
Date	User	Processing Status
3/31/2016	Adam Wayne	Submitted

Processing Steps		
Step Name	Assigned To/Completed By	Date Completed
Form Submitted	Adam Wayne	03/31/2016 02:33 PM

APPENDIX A
Outfall and Point of Discharge Information



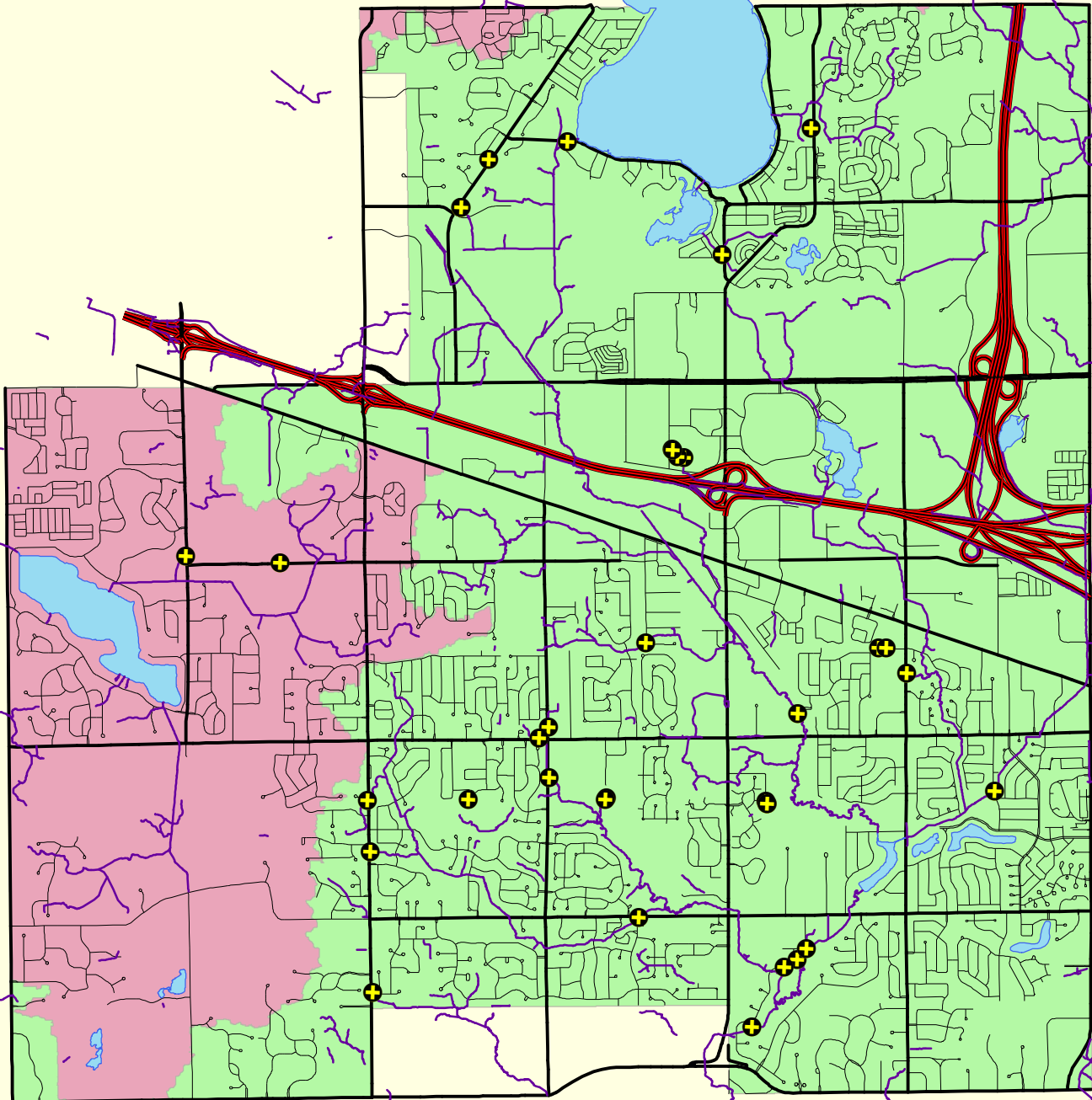
City of Novi - Urbanized Area

Detroit Area Cluster

Alliance of Rouge Communities

City Of Novi MS4 Outfalls

Location Map



Map Author: A. Wayne
Date: 3/7/2016
Project:
Version #:

Amended By:
Date:
Department:

MAP INTERPRETATION NOTICE

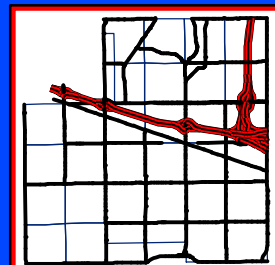
Map information depicted is not intended to replace or substitute for any official or primary source. This map was intended to meet National Map Accuracy Standards and use the most recent, accurate sources available to the people of the City of Novi. Boundary measurements and area calculations are approximate and should not be construed as survey measurements performed by a licensed Michigan Surveyor as defined in Michigan Public Act 132 of 1970 as amended. Please contact the City GIS Manager to confirm source and accuracy information related to this map.

Legend

✚ MS4 Discharge Point

Watershed

HURON
 ROUGE



City of Novi

Engineering Division
Department of Public Services
26300 Lee BeGole Drive
Novi, MI 48375
cityofnovi.org

0 950 1,900 3,800 5,700
Feet
1 inch = 4,790 feet



APPENDIX B
Enforcement Response Procedure

STANDARD OPERATING PROCEDURE ENFORCEMENT RESPONSE

PREPARED FOR:

THE CITY OF NOVI
45175 W 10 MILE ROAD, NOVI, MICHIGAN 48375



APRIL 2016

SECTION A – PURPOSE

The Michigan Department of Environmental Quality (MDEQ) National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Phase II Stormwater Discharge Permit Application requires a procedure for Enforcement Response to address violations of the ordinances or regulatory mechanism identified in the Stormwater Management Plan.

SECTION B – GENERAL PENALTY

Section 1.11 of Chapter 1 General Provision of the City of Novi Code of Ordinances defines the penalties levied by the City for ordinance violations. The section specifically defines penalties for misdemeanors or civil infractions and continuing violations.

B.1 Section 1.11c – General penalty

(c) Penalties, sanctions and remedies for Code violations.

(1) Penalties for misdemeanors.

a. A person convicted of violating an ordinance provision punishable as a misdemeanor shall be guilty of a misdemeanor, and shall be sentenced by the court for a period not to exceed ninety (90) days in jail and/or ordered to pay a fine not to exceed five hundred dollars (\$500.00), unless the ordinance corresponds to a violation of state law that is a misdemeanor for which the maximum period of imprisonment is ninety-three (93) days, in which case the sentence of the court shall be for a period not to exceed ninety (93) days in jail and/or a fine not to exceed five hundred dollars (\$500.00).

b. Continuing offense. Each act of violation, and each day upon which any such violation shall occur, shall constitute a separate offense.

c. Penalties not exclusive. In addition to any penalties provided for in a city ordinance, any equitable or other remedies available may be sought.

(2) Penalties for municipal civil infraction.

a. The following civil fines shall apply in the event of a determination of responsibility for a municipal civil infraction, unless a different fine is specified in connection with a particular ordinance provision:

1. First offense. A civil fine for a first offense violation shall be in an amount of two hundred dollars (\$200.00), plus costs and other sanctions, for each offense.

2. Repeat offense. A civil fine for any offense which is a repeat offense shall not exceed five hundred dollars (\$500.00), plus costs and other sanctions, for each offense.

b. In addition to ordering the defendant determined to be responsible for a municipal civil infraction to pay a civil fine, costs, damages, and expenses, the judge or magistrate shall be authorized to issue any judgment, writ or order necessary to enforce, or enjoin violation of, the ordinance.

c. Continuing offense. Each act of violation, and on each day upon which any such violation shall occur, shall constitute a separate offense.

- d. Remedies not exclusive. In addition to any remedies provided for by city ordinance, any equitable or other remedies available may be sought.*
- e. The judge or magistrate shall also be authorized to impose costs, damages and expenses as provided by law.*

(3) Exclusion. A municipal civil infraction shall not be a lesser included offense of a criminal offense or of an ordinance violation which is not a civil infraction.

SECTION C – PART 91 MUNICIPAL ENFORCEMENT AGENCY

The City of Novi is an approved Municipal Enforcement Agency under the Part 91 of the Natural Resources and Environmental Protection Act (NREPA), 1994 PA 451, as Amended. As an enforcing agency, the City is responsible for implementing and enforcing their Grading and Soil Erosion Control Ordinance.

C.1 Section 29.19 – Jurisdiction

“Unless otherwise provided by law, the administration and enforcement of this article shall be as follows:

- (a) The department of building and safety shall be the municipal enforcing agency and shall have jurisdiction throughout the city in the administration and enforcement of this ordinance, Part 91 and Rules, including all amendments adopted unless otherwise specifically stated, except with regard to earth changes by an authorized public agency who is approved under Section 9110 of Part 91.*
- (b) Those authorized for administering this article, Part 91 and the Rules and who also have decision making authority shall have current certificates of training pursuant to MCL 324.9123.”*

C.2 Section 29.47 – Violations

- (a) “A person shall not maintain or undertake an earth change governed by Part 91 or the rules promulgated under Part 91, or this article, except in accordance with Part 91, the rules promulgated under Part 91 or this article, and pursuant to any required SESC plan or SESC permit approved by the department of building and safety.*
- (b) Except in accordance with or otherwise allowed by the provisions of this article, Part 91, or the rules promulgated under Part 91 and pursuant to any required plan or permit(s), a person shall not, by act or omission, maintain any condition, or cause, contribute or engage in any activity that results in accelerated soil erosion or sedimentation of adjacent properties, infrastructure, or the waters of the state and city wetlands.*
- (c) Unless otherwise required or provided by this article, Part 91, the rules promulgated thereunder, or pursuant to any approved plan or permit, a person shall*

not remove, destroy, alter, molest, damage, or tamper with any soil erosion or sediment control measure or devise nor shall any person knowingly impede, prevent, obstruct, or harass any person lawfully engaged in implementing any soil erosion or sediment control measures.

(d) A notice of erosion control deficiency will be sent for violations of Part 91 rules or this article. Upon reinspection if it is found that non-compliance still exists, a "recommendation to show cause" will be issued and determination for the department of building and safety may issue a cease and desist order, stop work order and/or revoke a permit upon its finding that there is a violation of Part 91, the rules promulgated pursuant to Part 91 or this article, or a finding that there is a violation of a soil erosion and sedimentation control permit or an approved soil erosion and sedimentation control plan.

(e) If the department of building and safety determines that soil erosion or sedimentation of adjacent properties, infrastructure, or to the waters of the state or city wetlands has or will reasonably occur from land in violation of Part 91 or the rules promulgated under Part 91 or this article, the department of building and safety may seek to enforce a violation by notifying any person who violates this article, Part 91 or the rules promulgated under Part 91, or the person who owns or possesses the land, by mail, with return receipt requested, of its determination. The notices shall contain a description of the violation and what must be done to remedy the violation with a compliance time of five (5) days.

(f) After a notice of violation has been issued under subsection (e), a landowner or any person who causes, contributes, maintains, or commits a violation of Part 91, the rules promulgated under Part 91 or this article shall implement and maintain soil erosion and sedimentation control measures in conformance with Part 91, the rules promulgated under Part 91 or this article.

(g) Except as otherwise provided in this subsection, not sooner than five (5) days after notice of violation of Part 91, the rules promulgated under Part 91 or this article has been mailed, if the condition of the land, in the opinion of the department of building and safety, may result in or contribute to accelerated soil erosion or sedimentation contributing to adjacent properties, infrastructures or to the waters of the state or city wetlands, and if soil erosion and sedimentation control measures in conformance with Part 91, the rules promulgated under Part 91 or this article are not in place, the department of building and safety or its designated representative may enter upon the land and construct, implement, and maintain soil erosion and sedimentation control measures in conformance with Part 91, the rules promulgated under Part 91 or this article. However, the department of building and safety shall not expend more than ten thousand dollars (\$10,000.00) for the cost of the work, materials, labor, and administration without prior written notice in the notice provided in subsection (e) for the person who owns the land or commits any violation under this article that the

expenditure of more than ten thousand dollars (\$10,000.00) may be made. If more than ten thousand dollars (\$10,000.00) is to be expended under this section, then the work shall not begin until at least ten (10) days after the notice of violation has been mailed.”

C.3 Section 29.48 – Enforcement, expenses and liens for expenses

(a) “All expenses including all administrative, attorney or other professional fees incurred by the MEA to construct, implement, and maintain soil erosion and sedimentation control measures to bring land into conformance with Part 91, the rules promulgated under Part 91 or this article shall be reimbursed to the city by the person who owns the land.

(b) The city shall have a lien against nonconforming property for the expenses incurred for bringing the land into conformance with Part 91, the rules promulgated under Part 91 or this article. Or, the city may draw on any guarantee to obtain reimbursement for any and all expenses. However, with respect to single family or multi-family residential property, the lien for such expenses shall have priority over all liens and encumbrances filed or recorded after the date of such expenditure. With respect to all other property, the lien for such expenses shall be collected and treated in the same manner as provided for property tax liens under the general property tax act, 1893 PA 206, MCL 211.1 to 211.157.

(c) A person who knowingly violates Part 91, the rules promulgated under Part 91 or this article is responsible for a municipal civil infraction and may be ordered to pay a civil fine of not more than two thousand five hundred dollars (\$2,500.00) in addition to any further remedies authorized by law including injunctive, equitable and declaratory relief including abatement of the conditions or activities giving rise to any violation.

(d) A person who knowingly violates Part 91, the rules promulgated under Part 91 or this article or knowingly makes a false statement in an application for a permit or in a soil erosion and sedimentation control plan is responsible for the payment of a civil fine of not more than ten thousand dollars (\$10,000.00) for each day of violation.

(e) A person who knowingly violates Part 91, the rules promulgated under Part 91 or this article after receiving a notice of determination under subsection (e) is responsible for the payment of a civil fine of not less than two thousand five hundred dollars (\$2,500.00) or more than twenty-five thousand dollars (\$25,000.00) for each day of violation.

(f) Civil fines collected under this section shall be deposited with the city in the city's general fund. If necessary, the city reserves the right to review fines periodically and adopt a fee schedule by resolution.

(g) A default in the payment of a civil fine or costs ordered under this article or an installment of the fine or costs may be remedied by any means authorized under the revised judicature act of 1961, 1961 PA 236, MCL 600.101 to 600.9948.

(h) In addition to a fine assessed under this article, a person who violates Part 91 or the rules promulgated under Part 91 is liable to the state for damages for injury to, destruction of, or loss of natural resources resulting from the violation. The court may order a person who violates Part 91, the rules promulgated under Part 91 or this article to restore the area or areas affected by the violation to their condition as existing immediately prior to the violation or otherwise order abatement of the conditions and activities giving rise to any violation.

(i) This section of the article applies to the city, in addition to other persons. This section of the article does not apply to the department of building and safety with respect to its administration and enforcement of Part 91, the rules promulgated under Part 91 or this article.

(j) In addition to any sanctions or remedies expressly authorized under this article, any penalties, sanctions or remedies authorized by The Revised Judicature Act, as amended, Chapter 87, MCL 600.8701, et seq., may be imposed as well including injunctive, equitable and declaratory relief.”

SECTION D – ENFORCEMENT TRACKING

City will track all violations and issued permits. The following information will be collected and used for tracking records for each violation that is imposed by the City.

1. Name of responsible party (Business, Agency, Organization as applicable)
2. Date of initial violation
3. Location of the Violation (address, cross streets, parcel number, etc.)
4. Description of the Violation
5. Applicable Correspondence (written or verbal)
6. Follow-up Actions
7. Key Dates
8. Descriptions of the City’s Enforcement Response
9. Schedules for Achieving Compliance
10. Date the Violation was Resolved per City Staff

SECTION E – PROCESS FOR REVISION

Any questions on this policy and procedure should be directed to the Stormwater Manager or the Director of Community Development. This procedure shall be reviewed once per permit cycle by the Stormwater Manager for any updates to streamline the requirements.

Sec. 1-11. - General penalty.

(a) *Definitions.* Municipal civil infraction shall mean a violation of a provision of any city ordinance for which the remedy and/or penalty is prescribed to be a civil fine, or other sanction other than a criminal penalty. A municipal civil infraction is not a lesser included offense of a criminal offense or of an ordinance violation that is not a civil infraction.

Municipal civil infraction determination shall mean a determination that a defendant is responsible for a municipal civil infraction by one of the following:

- (1) An admission of responsibility for the municipal civil infraction.
- (2) An admission of responsibility for the municipal civil infraction, "with explanation".
- (3) A preponderance of the evidence at an informal hearing or formal hearing.
- (4) A default judgment for failing to appear at a scheduled appearance.

Repeat offense shall mean a determination of responsibility for a second, or a subsequent, municipal civil infraction with regard to the same ordinance provision, committed by the same person within any three-year period, unless some other period is specifically provided with regard to a specific ordinance provision.

Responsible or responsibility shall mean a determination entered by a court or magistrate that a person is in violation of a provision of any city ordinance prescribed to be a municipal civil infraction.

Violation shall mean any act which is prohibited or made or declared to be unlawful or an offense under any city ordinance, including affirmative acts as well as omissions and/or failures to act where the act is required by this Code.

(b) *Presumption of misdemeanor.* Unless a violation of an ordinance is specifically designated in the text of the ordinance to be a municipal civil infraction, a violation shall be deemed to be a misdemeanor.

(c) *Penalties, sanctions and remedies for Code violations.*

(1) *Penalties for misdemeanors.*

- a. A person convicted of violating an ordinance provision punishable as a misdemeanor shall be guilty of a misdemeanor, and shall be sentenced by the court for a period not to exceed ninety (90) days in jail and/or ordered to pay a fine not to exceed five hundred dollars (\$500.00), unless the ordinance corresponds to a violation of state law that is a misdemeanor for which the maximum period of imprisonment is ninety-three (93) days, in which case the sentence of the court shall be for a period not to exceed ninety (93) days in jail and/or a fine not to exceed five hundred dollars (\$500.00).
- b. Continuing offense. Each act of violation, and each day upon which any such violation shall occur, shall constitute a separate offense.
- c. Penalties not exclusive. In addition to any penalties provided for in a city ordinance, any equitable or other remedies available may be sought.

(2) *Penalties for municipal civil infraction.*

- a.

The following civil fines shall apply in the event of a determination of responsibility for a municipal civil infraction, unless a different fine is specified in connection with a particular ordinance provision:

1. *First offense.* A civil fine for a first offense violation shall be in an amount of two hundred dollars (\$200.00), plus costs and other sanctions, for each offense.
 2. *Repeat offense.* A civil fine for any offense which is a repeat offense shall not exceed five hundred dollars (\$500.00), plus costs and other sanctions, for each offense.
 - b. In addition to ordering the defendant determined to be responsible for a municipal civil infraction to pay a civil fine, costs, damages, and expenses, the judge or magistrate shall be authorized to issue any judgment, writ or order necessary to enforce, or enjoin violation of, the ordinance.
 - c. Continuing offense. Each act of violation, and on each day upon which any such violation shall occur, shall constitute a separate offense.
 - d. Remedies not exclusive. In addition to any remedies provided for by city ordinance, any equitable or other remedies available may be sought.
 - e. The judge or magistrate shall also be authorized to impose costs, damages and expenses as provided by law.
- (3) Exclusion. A municipal civil infraction shall not be a lesser included offense of a criminal offense or of an ordinance violation which is not a civil infraction.

(d) *Commencement of municipal civil infraction action.*

- (1) A municipal civil infraction action is commenced upon the issuance by an authorized official of a municipal civil infraction citation directing the person alleged to be responsible to appear in court. A notice that the violation exists may be served upon the responsible person before a civil infraction citation is issued.
- (2) The form of citation used to charge municipal civil infraction violations shall be in accordance with state law.
- (3) The basis for issuance of a municipal civil infraction citation shall be as set forth below:
 - a. An authorized official who witnesses a person violate an ordinance, the violation of which is a municipal civil infraction, shall prepare and subscribe, as soon as possible, an original and three (3) copies of a citation.
 - b. An authorized official may issue a citation to a person if, based upon investigation, the official has reasonable cause to believe that a person is responsible for a municipal civil infraction.
 - c. An authorized official may issue a citation to a person if, based upon investigation of a complaint by someone who allegedly witnessed the person violate an ordinance, a violation of which is a municipal civil infraction, the official has reasonable cause to believe that the person is responsible for a municipal civil infraction and if the prosecuting attorney or other attorney for the city for whom the authorized local office is acting approves in writing the issuance of the citation.
- (4) *Citations and infraction notices.* Municipal civil infraction citations and municipal civil infraction notices shall be served in the following manner:
 - a. Except as otherwise provided below, the authorized official shall personally serve a copy of the citation or notice upon the alleged violator.

- b. In a municipal civil infraction action involving the use or occupancy of land or a building or other structure, a copy of the citation need not be personally served upon the alleged violator but may be served upon an owner or occupant of the land, building or structure by posting the copy on the land or attaching the copy to the building or structure. In addition, a copy of the citation shall be sent by first class mail to the owner of the land, building or structure at the owner's last known address.
- c. A citation or notice served as provided in subsection b, above, shall be processed in the same manner as a citation or notice served personally upon a defendant.

(e) Authorized official.

- (1) The neighborhood services coordinator shall be an authorized official for purposes of carrying out the enforcement of this section.
- (2) A code compliance officer designated and described in section 2-129 of this Code shall be authorized officials for purposes of carrying out the duties of enforcing this section.
- (3) The city council is hereby authorized to appoint by motion or resolution such other person or persons, for such term or terms as may be designated in the motion or resolution, for purposes of carrying out the duties and responsibilities specified in this ordinance for officials charged with the enforcement of the city ordinances specified in the motion or resolution. The council may further, by motion or resolution, remove any person from such office, in the discretion of the council.
- (4) A person appointed by motion or resolution is authorized to enforce all ordinance provisions set forth in the motion or resolution. Where a particular officer is designated in any ordinance provision, that officer's authority shall continue in full force and effect, and shall not be diminished or impaired by the terms of this section, and the authority of the person appointed by motion or resolution shall be in addition and supplementary to the authority granted to such other specific officer.
- (5) The duties of a person appointed herein or by motion or resolution shall include the following: Investigation of designated ordinance violations; issuance and service of municipal civil infraction citations and municipal ordinance violation notices for the designated ordinance violations; appearance in court or other judicial or quasi-judicial proceedings in the administration of the designated city ordinances.

(Ord. No. 73-61, § 1.01, 9-24-73; Ord. No. 03-61.01, Pt. I, 10-20-03)

Charter reference— Limitation on penalties, § 7.4.

State law reference— Limitation on penalties, MCL 117.4i, MSA 5.2082.

Sec. 29-19. - Jurisdiction.

Unless otherwise provided by law, the administration and enforcement of this article shall be as follows:

- (a) The department of building and safety shall be the municipal enforcing agency and shall have jurisdiction throughout the city in the administration and enforcement of this ordinance, Part 91 and Rules, including all amendments adopted unless otherwise specifically stated, except with regard to earth changes by an authorized public agency who is approved under Section 9110 of Part 91.
- (b) Those authorized for administering this article, Part 91 and the Rules and who also have decision making authority shall have current certificates of training pursuant to MCL 324.9123.

(Ord. No. 06-82.05, Pt. I, 4-3-06)

Sec. 29-47. - Violations.

- (a) A person shall not maintain or undertake an earth change governed by Part 91 or the rules promulgated under Part 91, or this article, except in accordance with Part 91, the rules promulgated under Part 91 or this article, and pursuant to any required SESC plan or SESC permit approved by the department of building and safety.
- (b) Except in accordance with or otherwise allowed by the provisions of this article, Part 91, or the rules promulgated under Part 91 and pursuant to any required plan or permit(s), a person shall not, by act or omission, maintain any condition, or cause, contribute or engage in any activity that results in accelerated soil erosion or sedimentation of adjacent properties, infrastructure, or the waters of the state and city wetlands.
- (c) Unless otherwise required or provided by this article, Part 91, the rules promulgated thereunder, or pursuant to any approved plan or permit, a person shall not remove, destroy, alter, molest, damage, or tamper with any soil erosion or sediment control measure or devise nor shall any person knowingly impede, prevent, obstruct, or harass any person lawfully engaged in implementing any soil erosion or sediment control measures.
- (d) A notice of erosion control deficiency will be sent for violations of Part 91 rules or this article. Upon reinspection if it is found that non-compliance still exists, a "recommendation to show cause" will be issued and determination for the department of building and safety may issue a cease and desist order, stop work order and/or revoke a permit upon its finding that there is a violation of Part 91, the rules promulgated pursuant to Part 91 or this article, or a finding that there is a violation of a soil erosion and sedimentation control permit or an approved soil erosion and sedimentation control plan.
- (e) If the department of building and safety determines that soil erosion or sedimentation of adjacent properties, infrastructure, or to the waters of the state or city wetlands has or will reasonably occur from land in violation of Part 91 or the rules promulgated under Part 91 or this article, the department of building and safety may seek to enforce a violation by notifying any person who violates this article, Part 91 or the rules promulgated under Part 91, or the person who owns or possesses the land, by mail, with return receipt requested, of its determination. The notices shall contain a description of the violation and what must be done to remedy the violation with a compliance time of five (5) days.
- (f) After a notice of violation has been issued under subsection (e), a landowner or any person who causes, contributes, maintains, or commits a violation of Part 91, the rules promulgated under Part 91 or this article shall implement and maintain soil erosion and sedimentation control measures in conformance with Part 91, the rules promulgated under Part 91 or this article.
- (g) Except as otherwise provided in this subsection, not sooner than five (5) days after notice of violation of Part 91, the rules promulgated under Part 91 or this article has been mailed, if the condition of the land, in the opinion of the department of building and safety, may result in or contribute to accelerated soil erosion or sedimentation contributing to adjacent properties, infrastructures or to the waters of the state or city wetlands, and if soil erosion and sedimentation control measures in conformance with Part 91, the rules promulgated under Part 91 or this article are not in place, the department of building and safety or its designated representative may enter upon the land and construct, implement, and maintain soil erosion and sedimentation control measures in conformance

with Part 91, the rules promulgated under Part 91 or this article. However, the department of building and safety shall not expend more than ten thousand dollars (\$10,000.00) for the cost of the work, materials, labor, and administration without prior written notice in the notice provided in subsection (e) for the person who owns the land or commits any violation under this article that the expenditure of more than ten thousand dollars (\$10,000.00) may be made. If more than ten thousand dollars (\$10,000.00) is to be expended under this section, then the work shall not begin until at least ten (10) days after the notice of violation has been mailed.

(Ord. No. 06-82.05, Pt. I, 4-3-06)

Sec. 29-48. - Enforcement, expenses and liens for expenses.

- (a) All expenses including all administrative, attorney or other professional fees incurred by the MEA to construct, implement, and maintain soil erosion and sedimentation control measures to bring land into conformance with Part 91, the rules promulgated under Part 91 or this article shall be reimbursed to the city by the person who owns the land.
- (b) The city shall have a lien against nonconforming property for the expenses incurred for bringing the land into conformance with Part 91, the rules promulgated under Part 91 or this article. Or, the city may draw on any guarantee to obtain reimbursement for any and all expenses. However, with respect to single family or multi-family residential property, the lien for such expenses shall have priority over all liens and encumbrances filed or recorded after the date of such expenditure. With respect to all other property, the lien for such expenses shall be collected and treated in the same manner as provided for property tax liens under the general property tax act, 1893 PA 206, MCL 211.1 to 211.157.
- (c) A person who knowingly violates Part 91, the rules promulgated under Part 91 or this article is responsible for a municipal civil infraction and may be ordered to pay a civil fine of not more than two thousand five hundred dollars (\$2,500.00) in addition to any further remedies authorized by law including injunctive, equitable and declaratory relief including abatement of the conditions or activities giving rise to any violation.
- (d) A person who knowingly violates Part 91, the rules promulgated under Part 91 or this article or knowingly makes a false statement in an application for a permit or in a soil erosion and sedimentation control plan is responsible for the payment of a civil fine of not more than ten thousand dollars (\$10,000.00) for each day of violation.
- (e) A person who knowingly violates Part 91, the rules promulgated under Part 91 or this article after receiving a notice of determination under subsection (e) is responsible for the payment of a civil fine of not less than two thousand five hundred dollars (\$2,500.00) or more than twenty-five thousand dollars (\$25,000.00) for each day of violation.
- (f) Civil fines collected under this section shall be deposited with the city in the city's general fund. If necessary, the city reserves the right to review fines periodically and adopt a fee schedule by resolution.
- (g) A default in the payment of a civil fine or costs ordered under this article or an installment of the fine or costs may be remedied by any means authorized under the revised judicature act of 1961, 1961 PA 236, MCL 600.101 to 600.9948.
- (h) In addition to a fine assessed under this article, a person who violates Part 91 or the rules promulgated under Part 91 is liable to the state for damages for injury to, destruction of, or loss of natural resources resulting from the violation. The court may order a person who violates Part 91, the rules promulgated under Part 91 or this article to restore the area or areas affected by the violation to their condition as existing immediately prior to the violation or otherwise order abatement of the conditions and activities giving rise to any violation.
- (i) This section of the article applies to the city, in addition to other persons. This section of the article does not apply to the department of building and safety with respect to its administration and enforcement of Part 91, the rules promulgated under Part 91 or this article.

(j)

In addition to any sanctions or remedies expressly authorized under this article, any penalties, sanctions or remedies authorized by The Revised Judicature Act, as amended, Chapter 87, MCL 600.8701, et seq., may be imposed as well including injunctive, equitable and declaratory relief. (Ord. No. 06-82.05, Pt. I, 4-3-06)

APPENDIX C

Collaborative Public Participation/Involvement Program (PPP)

Click [here](#) for link to Collaborative PPP Plan

APPENDIX D

Collaborative Public Education Program (PEP)

Click [here](#) for link to Collaborative PEP Plan

APPENDIX E

Collaborative Illicit Discharge Elimination Plan (IDEP)

Click [here](#) for link to Collaborative IDEP

APPENDIX F
Construction Stormwater Runoff Control

STANDARD OPERATING PROCEDURE CONSTRUCTION STORMWATER RUNOFF CONTROL PROGRAM

PREPARED FOR:

THE CITY OF NOVI
26300 LEE BEGOLE DR., NOVI, MICHIGAN 48375



APRIL 2016

SECTION A – PURPOSE

The Michigan Department of Environmental Quality (MDEQ) National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Phase II Stormwater Discharge Permit Application requires a description of current and proposed BMPs to meet the minimum control measure requirements for the construction stormwater runoff control program to the maximum extent practicable. The City of Novi administers a Part 91 program and is a designated municipal enforcement agency. The following standard operating procedure provides a description of the procedures the City employs for construction site runoff control that includes notification procedures and ensuring proper permits are obtained by those disturbing greater than one acre of soil.

SECTION B – APPLICATION PROCEDURE

Prior to any earth disturbance, the City will ensure that construction activity one acre or greater in total earth disturbance with the potential to discharge to the MS4 does obtain a Part 91 Permit and/or a State of Michigan Permit by Rule or is reviewed by an approved Authorized Public Agency through the site plan review process. These requirements are documented in the City's Sedimentation Control Ordinance.

B.1 Section 29.41 – Soil erosion and sedimentation control permit required

(a) “[Generally.] It shall be unlawful to permit, authorize or conduct an earth change without first obtaining a SESC permit with approved SESC plans from the department of building and safety unless a permit and/or plans are not required under the provisions of this article, Part 91, or the rules.

(b) SESC Permit Requirements. Unless otherwise exempt by this article, Part 91, or the rules, a landowner or designated agent who contracts for, allows, or engages in, an earth change in this city shall obtain a SESC permit from the department of building and safety, which shall be kept current throughout all active earth change operations, before commencing an earth change which:

(1) Disturbs one (1) or more acres of land; or

(2) Is within five hundred (500) feet of any waters of the state and city wetlands.”

B.2 Section 29.23b-d – Earth change requirements and control plan requirements generally

(b) “A person shall conduct an earth change in a manner that will effectively reduce accelerated soil erosion and resulting sedimentation.

(c) A person engaged in an earth change that disturbs one (1) or more acres of land or is within five hundred (500) feet of any waters of the state and city wetlands shall:

(1) Obtain the permit(s) required by this article and Part 91, and the rules promulgated thereunder; said permit(s) shall be kept current and valid throughout all active earth change operations and until the site passes final inspection by the municipal enforcing agency.

(2) Plan, implement, and maintain acceptable soil erosion and sedimentation control measures in conformance with the requirements of this article and Part 91 and the rules promulgated thereunder, including, but not limited to, Rule 323.1703, which effectively reduce accelerated soil erosion and off-site sedimentation.

(3) Set forth soil erosion and sedimentation control measures in a plan as prescribed by this article. A person shall make the plan available for inspection at all times at the site of the earth change.

(4) Prepare a soil erosion and sedimentation control plan, signed and sealed by a registered engineer designed to effectively reduce accelerated soil erosion and sedimentation that shall identify factors that may contribute to soil erosion or sedimentation, or both.

(d) A soil erosion and sedimentation control plan shall conform to the requirements of this Article, as set forth in subsection 29-24(d)(5), Part 91, and the rules promulgated pursuant to Part 91, including, but not limited to, Rule 323.1703."

B.3 Section 29.25 – Review of plans

(a) "The soil erosion and sedimentation control plans as previously described in section 29-24, will be reviewed and approved by the department of building and safety or its designated representative who also has Part 91 certification, is current in training and has passed the examination. This review will not commence until such time that, all required fees have been paid as stated in section 29-28.

(b) The department of building and safety or its designated representative will approve, disapprove or require a revision to the plans within thirty (30) calendar days following the receipt of the plans and a complete application for an erosion control permit:

(1) Notification of approval will be in the form of the actual permit issuance.

(2) If disapproved, the applicant will be notified in writing. Reasons for disapproval and the conditions necessary to obtain approval will be stated.

(c) Any revisions or changes to the soil erosion and sedimentation control plans, must be submitted as required for review and approval by the MEA. However, to the extent such changes void or otherwise require duplication of engineering time expended in

review of the original plan, a supplemental fee will apply which shall be due and payable prior to issuance of the resultant permit.

(d) The soil erosion permit, or a copy thereof, along with a complete set of the approved soil erosion and sedimentation control plans, shall be available at the site of the earth change for inspection at all times.

SECTION C – INSPECTIONS/COMPLAINTS

As the Part 91 regulating authority, the City will inspect active construction sites that have obtained a Soil Erosion and Sedimentation Control Permit from the City.

C.1 Section 29.26a – Inspections

(a) “Right-of-way entry and inspection. The department of building and safety or its designated representative shall inspect all soil erosion control measures. At any reasonable time, the department of building and safety or its designated representative may enter upon public or private for the purpose of inspecting and investigating conditions or practices that may be in violation of this article, Part 91 or the rules. However, an investigation or inspection under this subsection shall comply with the United States constitution and the state constitution of 1963. No person shall interfere with an employee or its designated representative, of the department of building and safety, nor shall any person molest or resist him or her in the discharge of this duty.”

Complaints regarding soil erosion and sedimentation issues made by the public will be forward to the City Engineer’s office. At that time, the City Engineer will direct a site inspection to document any violations of the soil erosion and sedimentation/grading permit within 24 to 48 hours and pursue enforcement actions as appropriate. See the Enforcement Response Procedure for a summary of the enforcement protocols to ensure compliance with the City’s Part 91 program.

SECTION D – MEASUREABLE GOALS

To demonstrate the effectiveness of the City’s Part 91 program, the following metrics will be tracked for reporting purposes:

- Number of Part 91 related complaints received.
- Number of Part 91 permits issued by the City.
- Number of enforcement actions taken to achieve compliance with the City’s Part 91 program.

These metrics will be tracked over the reporting cycle that is specified in the City’s Certificate of Coverage for the MS4 Permit.

SECTION E – REPORTABLE DISCHARGES

The City will not report instances of *de minimis* soil discharges to MDEQ. For instances where the discharge of sediment cannot be immediately contained on site, or if there are other pollutants that include pesticides, petroleum derivatives, construction chemicals, and solid waste associated with the discharge in quantities that are consistent with the spill response plan as defined in Appendix H of the Stormwater Management Plan (SWMP), the City will notify the MDEQ through the Pollution Emergency Alert System (PEAS) at 1-800-292-4706.

SECTION F –STATE OF MICHIGAN PERMIT BY RULE

The City shall advise the landowner or recorded easement holder of the State of Michigan Permit by Rule (Rule 323.2190) for storm water discharge from construction activity if the area of the disturbance is greater than 5 acres. These criteria will be identified during the site plan review process and will be included in correspondence with the landowner as appropriate.

SECTION G – PROCESS FOR REVISION

Any questions on this policy and procedure should be directed to the Stormwater Manager or the Director of Community Development. This procedure shall be reviewed once per permit cycle by the Stormwater Manager for any updates to streamline the requirements.

Sec. 29-23. - Earth change requirements and control plan requirements generally.

- (a) The erosion and sedimentation control measures prescribed in this section and the Best Management Practices shall be incorporated into the soil erosion and sedimentation control plans, as described in section 29-24, unless the person preparing the plans demonstrates to the department of building and safety that proposed alternatives to these procedures will be superior in the prevention of accelerated soil erosion and its resulting sedimentation.
- (b) A person shall conduct an earth change in a manner that will effectively reduce accelerated soil erosion and resulting sedimentation.
- (c) A person engaged in an earth change that disturbs one (1) or more acres of land or is within five hundred (500) feet of any waters of the state and city wetlands shall:
 - (1) Obtain the permit(s) required by this article and Part 91, and the rules promulgated thereunder; said permit(s) shall be kept current and valid throughout all active earth change operations and until the site passes final inspection by the municipal enforcing agency.
 - (2) Plan, implement, and maintain acceptable soil erosion and sedimentation control measures in conformance with the requirements of this article and Part 91 and the rules promulgated thereunder, including, but not limited to, Rule 323.1703, which effectively reduce accelerated soil erosion and off-site sedimentation.
 - (3) Set forth soil erosion and sedimentation control measures in a plan as prescribed by this article. A person shall make the plan available for inspection at all times at the site of the earth change.
 - (4) Prepare a soil erosion and sedimentation control plan, signed and sealed by a registered engineer designed to effectively reduce accelerated soil erosion and sedimentation that shall identify factors that may contribute to soil erosion or sedimentation, or both.
- (d) A soil erosion and sedimentation control plan shall conform to the requirements of this Article, as set forth in subsection 29-24(d)(5), Part 91, and the rules promulgated pursuant to Part 91, including, but not limited to, Rule 323.1703.
- (e) A person shall remove sediment caused by accelerated soil erosion from runoff water before it leaves the site of the earth change.
- (f) A person shall design, construct, and complete an earth change in a manner that limits the exposed area of any disturbed land for the shortest possible period of time as determined by the department of building and safety. The department of building and safety shall have the power to require additional soil erosion techniques as needed in order to effectively reduce soil erosion and sedimentation.
- (g) A person shall design a temporary or permanent control measure that is designed and constructed for the conveyance of water around, through, or from the earth change area to limit the water flow to a non-erosive velocity.
- (h) A person shall install temporary soil erosion and sedimentation control measures before or upon commencement of the earth change activity and shall maintain the measures on a daily basis. A person shall remove temporary soil erosion and sedimentation control measures after permanent soil erosion measures are in place and the area is permanently stabilized. A person shall stabilize the area with permanent soil erosion control measures under approved standards and specifications as prescribed below.

- (i) A person shall complete permanent soil erosion control measures for all slopes, channels, ditches, or any disturbed land area within five (5) calendar days after final grading or the final earth change has been completed. If it is not possible to permanently stabilize a disturbed area after an earth change has been completed or if significant earth change activity ceases, then a person shall maintain temporary soil erosion and sedimentation control measures until permanent soil erosion control measures are in place and the area is stabilized.
- (j) A person shall complete all temporary and permanent erosion and sedimentation control measures according to the approved plan.
 - (1) A person shall install and maintain control measures in accordance with the standards and specifications of all of the following:
 - a. The product manufacturer.
 - b. The local conservation district.
 - c. The department.
 - d. The Michigan Department of Transportation.
 - e. The department of building and safety, if applicable and formally adopted.
 - (2) If a conflict exists between the standards and specifications, then the department of building and safety shall determine which specifications are appropriate for the project.
- (k) On construction sites during periods of low precipitation, low humidity, high temperature or high winds, apply dust suppressant to surfaces such as unpaved roadways, soil stockpile areas and general areas with unstabilized or fine soils.
- (l) A landowner of land on which an earth change has been made that may result in or contribute to soil erosion or sedimentation of any infrastructure or adjoining land or the waters of the state shall implement and maintain soil erosion and sedimentation control measures in conformance with the requirements of this article, Part 91 and Rules that will effectively reduce soil erosion or sedimentation from the land on which the earth change has been made.
- (m) During all active earth change operations on land subject to the permit(s) required by this article, Part 91 and Rules, the permittee shall be responsible for:
 - (1) The prevention of soil erosion and sedimentation, or damage to any infrastructure, public utilities or services within the limits of movement or placement of soil and along any routes of travel of equipment.
 - (2) The prevention of sedimentation, erosion or damage to adjacent property. No person shall cause an earth change activity or the movement or placement of soil so close to the property line as to endanger any adjoining public street, sidewalk, or any public or private property without protecting such property from soil erosion or sedimentation or other damage which might result.
 - (3) The prompt removal of all sediment, soil, miscellaneous debris or other materials spilled, applied, dumped or otherwise deposited on public streets, highways, sidewalks or other public thoroughfares or infrastructure resulting from any development related activity or operation.
 - (4) Maintenance and clean out of all sediment basins, ditches traps or other soil erosion measures as needed to ensure their proper function.
 - (5) Clearing, grubbing and any earth changes shall be limited to the phase of development under construction. If there is an earth change request or modification, an updated soil erosion and sedimentation control plan must be resubmitted for review and approval by the MEA.

(Ord. No. 06-82.05, Pt. I, 4-3-06)

Sec. 29-25. - Review of plans.

- (a) The soil erosion and sedimentation control plans as previously described in section 29-24, will be reviewed and approved by the department of building and safety or its designated representative who also has Part 91 certification, is current in training and has passed the examination. This review will not commence until such time that, all required fees have been paid as stated in section 29-28.
- (b) The department of building and safety or its designated representative will approve, disapprove or require a revision to the plans within thirty (30) calendar days following the receipt of the plans and a complete application for an erosion control permit:
 - (1) Notification of approval will be in the form of the actual permit issuance.
 - (2) If disapproved, the applicant will be notified in writing. Reasons for disapproval and the conditions necessary to obtain approval will be stated.
- (c) Any revisions or changes to the soil erosion and sedimentation control plans, must be submitted as required for review and approval by the MEA. However, to the extent such changes void or otherwise require duplication of engineering time expended in review of the original plan, a supplemental fee will apply which shall be due and payable prior to issuance of the resultant permit.
- (d) The soil erosion permit, or a copy thereof, along with a complete set of the approved soil erosion and sedimentation control plans, shall be available at the site of the earth change for inspection at all times.

(Ord. No. 06-82.05, Pt. I, 4-3-06)

Sec. 29-26. - Inspections.

- (a) *Right-of-way entry and inspection.* The department of building and safety or its designated representative shall inspect all soil erosion control measures. At any reasonable time, the department of building and safety or its designated representative may enter upon public or private for the purpose of inspecting and investigating conditions or practices that may be in violation of this article, Part 91 or the rules. However, an investigation or inspection under this subsection shall comply with the United States constitution and the state constitution of 1963. No person shall interfere with an employee or its designated representative, of the department of building and safety, nor shall any person molest or resist him or her in the discharge of this duty.
- (b) *Schedule.* On-site inspections before, during and after any change activity for which a permit required by this article has been issued will be performed as required by the extent and erosion potential of the activity.
- (c) *Notification of department of building and safety.* The permit holder shall notify the department of building and safety at least twenty-four (24) hours before starting any earth change activity for which a permit was issued.
- (d) *Invalidation of permit.* If upon inspection existing site conditions are found not to be as stated in the application on the approved plan and in accordance with soil erosion and sedimentation control specification rules, the permit will be invalidated. No earth disrupting work shall be undertaken, or continued by any person until revised plans have been submitted and a valid permit issued.
- (e) *Field changes.* Minor field changes and/or additional measures may be required or maintenance work shall be performed to assure erosion and sedimentation control. When it is determined by the department of building and safety or its designee that the revision(s) to the site is significant, revised plans must be submitted to (and approved by) the department of building and safety.

(Ord. No. 06-82.05, Pt. I, 4-3-06; Ord. No. 82.06, Pt. IV, 10-23-06)

Sec. 29-41. - Soil erosion and sedimentation control permit required.

- (a) [*Generally.*] It shall be unlawful to permit, authorize or conduct an earth change without first obtaining a SESC permit with approved SESC plans from the department of building and safety unless a permit and/or plans are not required under the provisions of this article, Part 91, or the rules.
- (b) *SESC Permit Requirements.* Unless otherwise exempt by this article, Part 91, or the rules, a landowner or designated agent who contracts for, allows, or engages in, an earth change in this city shall obtain a SESC permit from the department of building and safety, which shall be kept current throughout all active earth change operations, before commencing an earth change which:
 - (1) Disturbs one (1) or more acres of land; or
 - (2) Is within five hundred (500) feet of any waters of the state and city wetlands.

(Ord. No. 06-82.05, Pt. I, 4-3-06)

APPENDIX G
Post-Construction Stormwater Runoff Program

STANDARD OPERATING PROCEDURE POST CONSTRUCTION STORMWATER RUNOFF CONTROL

PREPARED FOR:

THE CITY OF NOVI
26300 LEE BEGOLE DR, NOVI, MICHIGAN 48375



APRIL 2016

SECTION A – PURPOSE

The Michigan Department of Environmental Quality (MDEQ) National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Phase II Stormwater Discharge Permit Application requires a description of current and proposed BMPs to meet the minimum control measure requirements for the post-construction stormwater runoff control program to the maximum extent practicable. Post-construction stormwater runoff controls are necessary to maintain or restore stable hydrology in receiving waters by limiting surface runoff rates and volumes and reducing pollutant loadings from sites that undergo development or significant redevelopment.

SECTION B – ADOPTION OF STORMWATER STANDARDS

The City of Novi intends to use its own stormwater management standards as outlined in the City's Engineering Design Manual. Should any revisions to these standards be necessary, the City will subsequently review and implement the revised standards as appropriate.

SECTION C – MEASURABLE GOALS

To demonstrate the effectiveness of the post construction stormwater runoff control program, the following metrics will be tracked for reporting purposes:

- Number of stormwater site plan reviews requested and completed
- Number of maintenance violations of constructed BMPs
- Number of instances where the City had to undertake corrective measures

These metrics will be tracked over the reporting cycle that is specified in the City's Certificate of Coverage.

SECTION D – PROCESS FOR REVISION

This procedure shall be reviewed every two years by the Stormwater Manager for any updates to streamline the requirements.



Engineering Design Manual for City of Novi Oakland County, Michigan

**CITY OF NOVI
ENGINEERING DESIGN MANUAL
UPDATED DECEMBER 23, 2014**



Engineering Division
Department of Public Services
Field Services Complex
26300 Lee BeGole Drive
Novi, MI 48375
t: 248.347.0454 or 248.735.5640
cityofnovi.org | InvestNovi.org

Reviewed and Approved:



Rob Hayes, P.E.
Director of Public Services/
City Engineer

Date: 12/11/2014



RESOLUTION OF AUTHORITY ENGINEERING DESIGN MANUAL

CITY COUNCIL

Mayor
David B. Landry

Mayor Pro Tem
Kim Capello

Bob Gatt

Terry K. Margolis

Andrew Mutch

Toni Nagy

Gene Paul

City Manager
Clay J. Pearson

City Clerk
Maryanne Cornelius

WHEREAS, the City of Novi's Code of Ordinances contains numerous technical details and specifications relating to construction; and,

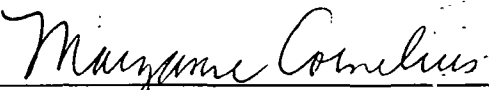
WHEREAS, standards in the construction industry change frequently as technologies, materials and equipment improve; and,

WHEREAS, the City and its development community would benefit from a streamlined, single document that contains construction details and specifications.

NOW, THEREFORE, BE IT RESOLVED that the Mayor and Council of the City of Novi authorize the City Engineer to prepare, maintain and approve the contents of an Engineering Design Manual for purposes of clearly conveying technical details and specifications related to construction within the City of Novi.

CERTIFICATION

I, Maryanne Cornelius, duly appointed Clerk of the City of Novi, do hereby certify that the foregoing is a true and complete copy of a resolution adopted by the City Council of the City of Novi at a regular meeting held this 24th day of September, 2007.



Maryanne Cornelius
City Clerk



TABLE OF CONTENTS

CHAPTER 1: RESERVED

CHAPTER 2: RESERVED

CHAPTER 3: RESERVED

CHAPTER 4: RESERVED

CHAPTER 5: STORMWATER MANAGEMENT5-1

<i>Part One: Performance Criteria</i>	5-1
5.1 Low Impact Development	5-1
5.2 Stormwater Quantity Control	5-2
5.2.1 Allowable Discharge Rate	5-3
5.2.2 Determination of Required Detention Storage Volume	5-4
5.2.3 Determination of Required Retention Storage Volume	5-4
5.2.4 Determination of Required Infiltration Storage Volume	5-4
5.2.5 Use of Existing Wetlands	5-5
5.3 Stormwater Quality Control	5-6
5.4 Stormwater Conveyance	5-6
<i>Part Two: Design Criteria for Stormwater Management Systems</i>	5-7
5.5 Determination of Surface Runoff	5-7
5.5.1 The Rational Method	5-8
5.5.2 Determination of Required Detention Storage Volume	5-11
5.5.3 Determination of Required Retention Storage Volume	5-11
5.6 Detention Basins	5-12
5.6.1 Detention Basin Types	5-13
5.6.2 Pond Geometry	5-14
5.6.3 Determination of Storage Provided	5-15
5.6.4 Basin Inlets & Outlets	5-15
5.6.5 Additional Requirements	5-18
5.7 Underground Detention	5-19
5.7.1 Restricted Outlet	5-20
5.8 Retention Basins	5-21
5.8.1 Minimum Site Requirements	5-21
5.8.2 Additional Requirements	5-22
5.9 Infiltration Facilities	5-23
5.9.1 Minimum Site Requirements	5-24
5.9.2 Design Requirements	5-24
5.9.3 Additional Requirements	5-25
5.10 Sediment Forebays	5-26
5.11 Manufactured Treatment Systems	5-28
5.11.1 General Performance & Design Specifications	5-28
5.12 Bioretention/Rain Gardens	5-29
5.12.1 Site Suitability	5-30
5.12.2 Design Guidelines	5-30
5.12.3 Additional Requirements	5-33
5.13 Stormwater Conveyance.....	5-34
5.13.1 Storm Sewer	5-34

5.13.2	Open Channels	5-34
5.13.3	Vegetated Swales	5-35
5.13.4	Natural Streams and Channels	5-36

Part Three: Maintenance Requirements..... 5-36

5.14	Easements for Stormwater Management Facilities	5-36
5.14.1	Easement Width	5-37
5.14.2	Additional Requirements	5-37
5.15	Maintenance Requirements for Stormwater Management Facilities	5-38
5.15.1	Maintenance Plan Requirements	5-39
5.15.2	Maintenance Guidelines	5-40

CHAPTER 6: RESERVED

CHAPTER 7: PAVEMENTS

7.1	RESERVED	
7.2	RESERVED	
7.3	RESERVED	
7.4	Off-Road Non-Motorized Facilities	7.4-1
7.4.1	Requirement	7.4-1
7.4.2	Design Considerations	7.4-1
7.4.3	Plans and Specifications	7.4-8
7.4.4	Construction	7.4-9

APPENDICIES

5-A	List of Suitable Plants for Bioretention Basins & Bioswales
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Cover Photos and Design by Phil Kerby

REVISIONS

September 2007

- Storm Water Standards added as Chapter 5 to first publication

December 23, 2014

- Design standards for off-road non-motorized facilities were added as Section 7-4
- The sections in Chapter 5 were renumbered to be consistent with new Section 7-4
- All references within Chapter 5 were updated to reflect the new section numbering
- The following sections of Chapter 5 were updated:
 - o *5.2.1 Allowable Discharge Rate* updated to address bankfull detention prior to discharge to an open channel
 - o *5.5.1 The Rational Method* updated to add runoff coefficients for pervious pavement and turf grass.
 - o *5.6.4 Basin Inlets and Outlets* –equation under (B)(1)(b) was updated and (C) was updated to allow a secondary stand pipe and to clarify elevations.
 - o *5.6.5 Additional Requirements* subsection H updated to better define that an easement is required, the width and cross-slope of the access.
 - o *5.7 Underground Detention* updated (H)(2) to clarify the number of soil borings required and updated (I) to allow the requirement for inspection ports.
 - o *5.7.1 Restricted Outlet* updated (F) to revise the minimum restrictor size.
 - o *5.10 Sediment Forebays* update the equation in F to correct a previous typo.
 - o *5.12.2 Design Guidelines* revised (B) to clarify design equation for bioretention basins.
 - o *5.14.1 Easement Width* updated (D) to clarify the width and location of the access easement.

CHAPTER 5

STORMWATER MANAGEMENT

This document sets forth specific performance, design, construction and maintenance standards that will be used by the city in review of proposed stormwater management systems in accordance with the objectives of managing both the quantity and quality of stormwater runoff.

It is difficult or impossible to develop one (1) set of uniform standards that can accommodate all variables and unique site circumstances. In particular, it is recognized that these standards shall be difficult to realize on small sites. Waivers or variances from specific provisions of these standards shall be requested, and alternatives consistent with the overall intent of stormwater quantity and quality management shall be proposed, subject to the approval of the city in accordance with the procedure and standards in the City's Code of Ordinances.

PART ONE - PERFORMANCE CRITERIA FOR STORMWATER MANAGEMENT SYSTEMS

This Part One sets forth performance standards that the City has adopted to meet the objectives of managing the quantity and quality of stormwater runoff. Designers may select any combination of stormwater management elements which meet the performance standards provided the selections: (1) comply with the requirements identified in this document and the City's Code of Ordinances; (2) comply with other local, county, state or federal requirements; and (3) do not conflict with the existing local stormwater management and watershed plans.

The performance standards described in this Section pertain to permanent stormwater management systems.

SECTION 5.1 LOW-IMPACT DEVELOPMENT

There are several additional methods of controlling the quantity of and improving the quality of stormwater runoff from the site. The designer should consider incorporating low impact design principles into the site design as a method of improving the stormwater quality and reducing peak flows. The goal of low impact design is to more closely mimic the watershed's natural hydrologic functions and include:

- Prevent stormwater impacts rather than having to mitigate for them.
- Manage stormwater quantity and quality as close to the source as possible and minimize the use of large or regional collection and conveyance.
- Preserve natural areas, native vegetation and reduce the impact on the watershed hydrology.

- Use natural drainage pathways as a frame work for site design.
- Utilize simple, non-structural methods for stormwater management that are lower cost and lower maintenance than structural controls.
- Create a multifunctional landscape.

Low impact design practices and techniques for site design include the following:

- A. Preservation of Natural Features and Conservation Design
 1. Preservation of undisturbed areas
 2. Preservation of buffers
 3. Reduction of clearing and grading
 4. Locating sites in less sensitive areas
 5. Open space design
- B. Reduction of Impervious Cover
 1. Roadway reduction
 2. Sidewalk reduction
 3. Driveway reduction
 4. Cul-de-sac reduction
 5. Building footprint reduction
 6. Parking reduction
- C. Utilization of Natural Features and Source Control for Stormwater Management
 1. Vegetated buffer/filter strips
 2. Open vegetated channels
 3. Bioretention, rain gardens and bioswales
 4. Infiltration
 5. Rooftop runoff mitigation
 6. Stream daylighting for redevelopment projects
 7. Tree planting

Additionally, the following techniques can improve the stormwater management plan for a site:

- Disconnection of impervious surfaces.
- Reduced slopes and increased roughness of flow paths.
- Avoid channelizing of stormwater flow.

SECTION 5.2 STORMWATER QUANTITY CONTROL

The design of a stormwater management system must incorporate elements for protecting against the effects of flooding. To control flooding, the City has adopted the following minimum performance standards for controlling the volume of stormwater runoff from development projects:

- A. Stormwater quantity control facilities must accommodate the 100-year storm event and provide additional protection for the bankfull flood and first flush events. Acceptable methods for determining the volume of runoff from the 100-year storm and bankfull flood are in Section 5.5.
- B. Stormwater management facilities shall, in every way feasible, conform to the natural drainage patterns within the site and the watershed in which it is located.
- C. Where a positive outlet (detention systems) is provided, the flow shall be restricted to provide protection for the 100-year storm event and bankfull flood as defined in Section 5.5.2 and Section 5.6 or Section 5.7.
- D. Stormwater management facilities shall not be constructed within the 100-year floodplain unless specifically approved by the Michigan Department of Environmental Quality, Oakland County and the City.
- E. The designer may consider the following stormwater management technologies for meeting these performance standards:
 - 1. Detention Basins
 - 2. Retention Basins
 - 3. Infiltration Trenches or Ponds
 - 4. Underground Detention Systems are typically discouraged unless the criteria outlined in Section 5.7 have been met.
 - 5. Use of Existing Wetlands for stormwater management is typically discouraged unless the criteria outlined in Section 5.2.5 have been met.

Additional design requirements for the above mentioned technologies are detailed in Part Two of this Chapter Five.

5.2.1 Allowable Discharge Rate

In no event shall the maximum design rate or volume of discharge exceed the maximum capacity of the downstream land, channel, pipe or watercourse to accommodate the flow and conform with all public and private rights. It is the applicant's obligation to meet this standard. Should a stormwater system, as built, fail to comply, it is the applicant's responsibility to design and construct, or to have constructed at his/her expense, any necessary additional and/or alternative stormwater management facilities. Such additional facilities shall be subject to the city's review and approval.

The stormwater discharge from the site shall be directed to a defined watercourse, channel or storm sewer. The stormwater discharge from the site shall not exceed **0.15 cfs per acre**, provided sufficient capacity exists within the downstream watercourse, channel or storm sewer. The applicant is required to identify the ultimate stormwater

outlet for the site (surface water body, established country drain, etc.) and provide documentation that sufficient conveyance capacity exists within the downstream watercourse between the site and the ultimate outlet for the discharge from the site.

If sufficient capacity does not exist within the downstream watercourse, channel or storm sewer to effectively handle a concentrated flow of water from the proposed development, allowable discharge rates shall be further reduced. If an open channel is used to convey storm water discharge to an off-site storm water basin for quantity control, bank full detention must be provided on the site prior to discharge into the open channel.

Discharge should outlet within the drainage basin where flows originate, and generally shall not be diverted to another basin.

5.2.2 Determination of Required Detention Storage Volume

Stormwater detention facilities must provide enough storage volume so as not to exceed the maximum allowable runoff rate for the site during a 100-year, 24-hour design storm event. Detention volume must be provided for all on-site and off-site acreage contributing to the detention basin. Alternatively, off-site drainage may be routed around the detention basin. The method for determining required detention volume is provided in Section 5.5.2. Additional requirements for detention facilities are identified in Section 5.6 or Section 5.7.

5.2.3 Determination of Required Retention Storage Volume

Retention of stormwater within a “no outlet” retention basin is discouraged and will only be considered when the designer can demonstrate that no possible stormwater outlet exists for the site. A retention basin is permissible only under specific site conditions that are outlined in Section 5.8.1.

Stormwater retention facilities must provide sufficient storage capacity for two consecutive 100-year storm events from the entire contributing tributary area including any off-site drainage. The method for determining required retention volume is provided in Section 5.5.3. Additional requirements for retention facilities are identified in Section 5.8.

5.2.4 Determination of Required Infiltration Storage Volume

Where infiltration facilities are installed to meet the performance standards for quantity control, the minimum design volume shall be calculated in a manner similar to the method used for determining required detention volume outlined above. The infiltration facility shall be sized to accommodate the runoff from a 100-year, 24-hour design storm. The “outlet” rate shall be determined based on the infiltration rate of the in-situ soils. Additional requirements for infiltration facilities are identified in Section 5.9.

5.2.5 Use of Existing Wetlands

The City discourages the use of existing wetlands for the purposes of providing stormwater quantity control. The City will only consider approval of use of an existing wetland for stormwater quantity control if all of the following requirements are satisfied:

- A. The wetland must already be highly altered by watershed development and meet certain benchmarks for isolation, high water level fluctuation, low wetland plant richness, dominance of invasive or aggressive plants and altered hydrology.
- B. It must be shown that the wetland site does not contain any unique wetland features.
- C. The wetland must be characterized as an emergent, submergent aquatic or open water wetland. In some cases, scrub-shrub or forested wetlands may be considered if it is clearly demonstrated that the additional storage would not jeopardize the health of the wetland community.
- D. An analysis of the pre-developed and post developed water balance for the wetland shows no negative impacts to the existing wetland or adjacent properties. The designer is required to provide the water balance documentation for review. The water balance shall include runoff from irrigation.
- E. A stormwater management easement shall be provided for the entire wetland. Where portions of the wetland are located on adjacent properties, the developer shall secure all of the required easements. See Section 5.14 of this chapter for additional easement requirements.
- F. Sufficient pretreatment of the stormwater is provided prior to its discharge to the wetland. Pretreatment shall be designed in accordance with the requirements of Section 5.2.
- G. A wetland enhancement plan shall be provided for all wetlands that are dominated by invasive species. The enhancement plan shall include some or all of the following: removal of all or some of the invasive species and restoration with native species as permitted by the City; planting of additional trees and shrubs; and creation of open water areas.
- H. For wetlands regulated by the Michigan Department of Environmental Quality, a permit from the MDEQ has been obtained all proposed stormwater discharges and use of the existing wetland for stormwater quantity control.
- I. For wetlands regulated by the City, a permit from the City has been obtained for all proposed stormwater discharges and use of the existing wetland for stormwater quantity control.

SECTION 5.3 STORMWATER QUALITY CONTROL

The design of a stormwater management system must incorporate elements for providing stormwater quality improvements. To protect water resources from stormwater pollutants, the City has adopted the following minimum performance standards for controlling the quality of stormwater runoff from development projects.

- A. Volume based stormwater quantity control facilities (sediment forebay, bioretention, etc.) must provide treatment for the first flush volume. The first flush volume is defined as the first ½ -inch of stormwater runoff and can be determined using the following relationship:

$$V_{ff} = 1815 \times \text{drainage area (acres)} \times \text{the relative imperviousness factor } C$$

- B. Flow based stormwater quality control facilities (manufactured treatment systems) must provide treatment for the peak flow associated with a 1-year storm event. The procedure for determining the peak flow rate associated with a 1-year storm event is provided in Section 5.5.1.
- C. The designer may consider the following stormwater management technologies for meeting these performance standards:
 - 1. Sediment Forebays
 - 2. Bioretention/Rain Gardens
 - 3. Wet Detention Basins (as approved by the City for small sites)
 - 4. Manufactured Treatment Systems are typically discouraged unless the criteria outlined in Section 5.11 have been met.

Additional design requirements for the above mentioned technologies are detailed in Part Two of this Chapter Five.

SECTION 5.4 STORMWATER CONVEYANCE

The design of the site shall include sufficient provisions for stormwater conveyance. Stormwater management facilities may use open channels or closed conduits or both for means of conveying stormwater runoff provided. To ensure adequate stormwater conveyance, the City has adopted the following minimum performance standards.

- A. Stormwater conveyance facilities shall have capacity to convey stormwater runoff from the 10-year storm event. Increased capacity requirements may be required by other governing agencies. Acceptable methods for determining the runoff associated with a 10-year storm event are included in Section 5.5.1.

- B. Open channels are generally preferred to closed conduits as a method for stormwater conveyance. Specifically, natural water courses, vegetated swales and channels and bioswales are preferred.

Additional design requirements for stormwater conveyance technologies are detailed in Section 5.13.

PART TWO - DESIGN CRITERIA FOR STORMWATER MANAGEMENT SYSTEMS

This Part Two sets forth specific design and construction standards that will be used by the City in review of proposed stormwater management systems in accordance with the objectives of meeting the performance standards.

The standards and design criteria set forth herein are intended to guide designers to develop a stormwater management system that controls the quantity and quality of stormwater discharge from a site. The internal drainage for a site as well as the downstream conditions will be reviewed. Every site is part of an overall watershed and the system shall be designed with this in mind. The system shall conform to natural drainage patterns both on and off-site. These standards are the minimum requirements of the City and shall not be construed as all-inclusive. The design engineer shall consider many factors when planning the stormwater management system. In particular, Federal, State and Local standards may be stricter than these standards. In the case where conflicting standards arise, the more stringent requirements will govern. Exceptions will be considered when conformance with a local community master plan, stormwater management plan or watershed plan is required.

SECTION 5.5 DETERMINATION OF SURFACE RUNOFF

The Rational Method of calculating stormwater runoff is generally acceptable for calculating peak flow rates at any particular location within a stormwater management system for sites less than 150 acres in size. More precise methodologies for predicting runoff such as runoff hydrographs are widely available, and may be required by the City for sizing drainage systems on large sites and/or smaller sites that are deemed potentially problematic. Acceptable alternative methods will include:

- A. Corps of Engineers HEC-1
- B. Soil Conservation Service UD-21, TR-20 and TR-55
- C. U.S. EPA's SWMM
- D. Continuous simulation (e.g. HSPF)

Unless a contiguous simulation approach to drainage system hydrology is used, all design rainfall events will be based on the SCS Type II distribution.

Computations of runoff hydrographs that do not rely on a continuous accounting of antecedent moisture conditions will assume a conservative wet antecedent moisture condition.

5.5.1 The Rational Method

For all stormwater management systems that are designed using the Rational Method, the following formula must be used for calculating peak flow rate:

$$Q = c \times i \times A$$

Where: Q = peak runoff (cfs)
C = composite runoff coefficient
I = design rainfall intensity (inches/hour),
A = drainage area in acres

A. Runoff Coefficient

A realistic runoff coefficient will be used based upon the imperviousness of the tributary area. The range of this coefficient shall vary from 0.15 for completely grassed areas to 0.95 for impervious areas and 1.0 for open water.

Certain calculations require use of a composite runoff coefficient value. The composite runoff coefficient is calculated as follows:

$$c = \frac{\sum_{i=1}^n c_i A_i}{\sum_{i=1}^n A_i}$$

Where: c = composite runoff coefficient
c_i = runoff coefficient for each sub-area
n = total number of sub-areas
A_i = drainage area in acres for each sub-area

Minimum runoff coefficients for various surface types are provided in the table below:

Type of Surface	Runoff Coefficient (c)
Water surfaces	1.0
Roofs	0.95
Asphalt or concrete pavements	0.95
Gravel or brick	0.85
Pervious Pavement	0.4 to 0.7 ¹
Turf grass lawn (minimum)	0.35

Semi-pervious²:

	Slope <4%	Slope 4-8%	Slope >4%
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

Notes:

1. Design engineer to provide supporting data for selected C-factor
2. Semi-pervious surfaces include meadow, forest, landscaped areas, etc.

Soil compaction reduces soil volume and increases runoff rates and volumes. Construction activity causes significant compaction of soils. Grading for new sites shall include a final de-compaction tillage to reduce soil bulk density and improve infiltration. Alternatively, when de-compaction is not done, the Hydrologic Soil Group for post-construction conditions shall be increased by one letter. That is, what used to be Group A becomes Group B due to compaction. Group C becomes D.

The runoff coefficient calculation must be included with plan submittal.

B. Design Rainfall Intensity

Formulas for determining rainfall intensities for various storm events are as follows:

<u>Design Storm</u>	<u>Intensity (in/hr)</u>
1-year	$72/(t_c+25)$
10-year	$175/(t_c+25)$
100-year	$275/(t_c+25)$

Where: t_c = Time of Concentration (min)

C. Time of Concentration

An initial time of concentration of 20 minutes will be used on residential subdivisions. The time of concentration must be calculated for commercial and industrial subdivisions.

The design engineer may also use a calculated time of concentration if desired. The methodology and computations must be submitted for review. The time of concentration for unimproved, pre-development lands will be checked using the following formulas:

$$\text{Small tributary - } T_c (\text{min}) = \frac{L'}{2.1\sqrt{S_o} \times 60}$$

$$\text{Waterway - } T_c (\text{min}) = \frac{L'}{1.2\sqrt{S_o} \times 60}$$

$$\text{Sheet Flow - } T_c (\text{min}) = \frac{L'}{0.48\sqrt{S_o} \times 60}$$

Where: L' = flow length, in feet
 S_o = slope, in %

When more than one type of flow exists, the individual flows shall be summed up to find the total time of concentration.

D. Determination of Runoff from Green Roofs, Porous Pavers, Cisterns and other LID Techniques

The design of green roofs, porous pavers, cisterns and other LID techniques varies greatly from site to site. The City recognizes that these technologies will provide a reduction in the peak flow rate and volume of runoff. The design engineer should work with the City to identify how use of these technologies fit into the overall stormwater management plan for a site. In general, the following information should be considered when these LID techniques are proposed:

1. The storage capacity (volume) of the system.
 - a. For green roofs and porous pavers: a porous material is often provided for the base materials and the capacity within the void space should be identified.
 - b. For cisterns: the total volume of the vessel.
2. The anticipated time for complete drainage of the system.
 - a. For green roofs: a summary of how long it takes for the base material and underdrain system to drain following a rain event.
 - b. For porous pavements: if infiltration is the only mechanism for drainage from the base material, the time for complete drainage will be based on the infiltration rate of the in-situ soil. Sufficient documentation (similar to the requirements for infiltration facilities outlined in Section 2.5) shall be provided to support the assumed infiltration rate. If an underdrain is proposed, the time to drain will be a function of the base material and pipe capacity.

- c. For cisterns: if water is to be used as grey water for a building or for irrigation purposes, an annual water balance calculation shall be provided.
3. An analysis of the overflow, including prediction of when overflow will occur (i.e. storm events larger than 1-year, etc.) and identification of where water will be directed.

5.5.2 Determination of Required Detention Storage Volume

The following equations can be used to determine the required storage volume for a 100-year, 24-hour storm event:

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

Where: Q_o = allowable outflow per acre imperviousness (cfs/ac. imp.)
 Q_a = allowable outflow (cfs) as defined in Section 1.2.1
 A = Tributary area (ac)
 c = runoff coefficient

$$T = -25 + \sqrt{\frac{10312.5}{Q_o}}$$

Where: T = time of maximum storage (min)
 Q_o = allowable outflow per acre imperviousness (cfs/ac. imp.)

$$V_s = \frac{16500T}{T + 25} - 40Q_oT$$

Where: V_s = Storage volume per acre imperviousness (cf/ac. imp.)
 T = time of maximum storage (min)
 Q_o = allowable outflow per acre imperviousness (cfs/ac. imp.)

$$V_t = V_s \times A \times c$$

Where: V_t = required detention storage volume (cf)
 V_s = Storage volume per acre imperviousness (cf/ac. imp.)
 A = Tributary area (ac)
 c = runoff coefficient

5.5.3 Determination of Required Retention Storage Volume

Retention of stormwater within a “no outlet” retention basin is discouraged and will only be considered when the designer can demonstrate that no possible stormwater outlet

exists for the site. A retention basin is permissible only under specific site conditions that are outlined in Section 5.8.1.

Stormwater retention facilities must provide sufficient storage capacity for two consecutive 100-year storm events from the entire contributing tributary area including any off-site drainage. The following formula can be used to determine the required retention volume.

$$V_r = 33,000 \times A \times c$$

Where: V_r = required retention storage volume (cf)
 A = Tributary area (ac)
 c = runoff coefficient

SECTION 5.6 DETENTION BASINS

Stormwater detention may be provided as part of a stormwater management system in order to satisfy the quantity control performance standards described in Section 5.2. Stormwater detention basins are generally acceptable for most sites. Detention ponds should be designed to be ecologically sustainable. Mosquito populations can proliferate in environments that are ecologically unbalanced. A detention pond environment rich with diverse vegetation, including wetland plantings and riparian buffer plantings supplemented with trees and shrubs in appropriate areas promotes a diverse wildlife population. Wildlife will include birds, butterflies, insects and various aquatic species. This combination creates a sustainable and ecologically balanced environment.

The following standards shall be adhered to when designing stormwater detention basins.

- A. Pretreatment shall be provided for the stormwater prior to discharge into the detention basin. Acceptable methods and performance standards for pretreatment of stormwater are outlined in Section 5.3.
- B. The volume of detention provided must be equal to or in excess of the volume of stormwater runoff generated from a 100-year storm event. The method for determining this volume is outlined in Section 5.5.2.
- C. Detention basins must have a positive method for draining. If a permanent pool is proposed, the basin must completely dewater to the elevation of the permanent pool. The outlet shall restrict the flow so that the flow does not exceed the maximum allowed outflow defined in Section 5.2.1.

- D. In general, wet ponds and stormwater marsh systems will be preferred to dry ponds. Dry ponds providing extended storage will be accepted when the development site's physical characteristics or other local circumstances make the use of a wet pond infeasible.
- E. Shade plantings on the west and south sides of facilities are encouraged unless such plantings would not thrive or are not otherwise in the public interest.
- F. Public safety will be a paramount consideration in stormwater system and pond design. Providing safe detention is the applicant's responsibility. Pond designs will incorporate gradual side slopes, vegetative and barrier plantings, and safety shelves. Where further safety measures are required, the applicant is expected to include them within the proposed development plans.
- G. Subdivision stormwater holding facilities and pretreatment systems shall be located in parks or outlots and not on a subdivision lot. During the plat approval process, the council may, at their discretion, allow the use of a lot for holding facilities and pretreatment systems when the lot has been oversized for this use or when construction on the lot is prohibited until elimination of the holding facilities and pretreatment system. Holding facilities and pretreatment systems within proposed septic field areas will not be permitted.

5.6.1 Detention Basin Types

Detention basins may be designed in a number of ways. The following are examples of types of ponds:

A. Wet detention basins

A wet detention basin is small man-made surface water designed to treat stormwater runoff. Incoming stormwater runoff displaces "old water" out of the basin and is then stored until the next storm. By retaining the water for long periods of time, pollutants are effectively removed. The basin also deters re-suspension of deposited materials. Wetland vegetation shall be used around the banks to help remove dissolved contaminants and algae. In addition to the general requirements for all detention basins outlined in this Manual, wet detention basins shall meet the following requirements:

1. A minimum permanent pool depth of 3 feet shall be provided. Where a permanent pool is provided for meeting the quality performance standards, the volume of the permanent pool shall be equal to or greater than the first flush volume.

2. A safety shelf of fringe wetland (minimum 4-foot wide and 1-foot deep) should be provided along the perimeter of the pond to establish aquatic vegetation and for safety concerns. The total area of the shelf should be 25-50% of the water surface area.
3. Plant vegetation should be used to control erosion and enhance sediment entrapment.
4. Where feasible, a drain for completely dewatering the pond should be installed for maintenance purposes.

B. Constructed wetlands

Constructed wetlands are characterized as a man-made basin with over 50% of its surface area covered by wetland vegetation. Permanent wetland pool depths should vary between 0.5 and 3.0 feet depending on vegetation type. Wetlands should be constructed to mitigate stormwater quality and quantity impacts associated with development projects and should not serve to mitigate the loss of natural wetlands or encroach on natural delineated wetland areas. Wet ponds and constructed marsh/wetland systems are an effective BMP for controlling both stormwater quantity and quality. In addition to the general requirements for all detention basins outlined in this Manual, constructed wetlands should meet the following requirements:

1. Basins should be designed to maximize sheet flow across the wetland. In general, a rectangular configuration should be used with a length to width ratio of 3 to 1 placing the inlet and outlet pipes at the opposite ends. Baffles may be used to increase the flow path and maintain the topography.
2. A diversity of depth zones throughout the basin should be used to meet the unique growing requirements of divergent wetland plants.

C. Dry detention basins

Dry detention basins are designed so to drain completely following a storm event. Dry ponds are generally not preferred except where thermal impacts to the receiving waters are a concern.

5.6.2 Pond Geometry

- A. Ponds (basins) shall be designed as an integral part of the overall site plan and shall be considered a natural landscape feature having an irregular shape.

- B. The basin shape should be such that flow entering the basin is evenly distributed and no stagnant zones can develop. An irregularly shaped basin is best. The inlet and the outlet shall be at opposite ends with the maximum distance possible between them. For dry basins, use of swales or berms on the bottom of the basin to maximize travel distance during periods of low flow is encouraged.
- C. A minimum length to width ratio of 3 to 1 should be provided.
- D. When there is no permanent pool of water, the bottom of all detention basins shall be graded in such a manner as to provide positive flow to the outlet.
- E. Detention basin side slopes shall generally not be flatter than 1 foot vertical to 20 feet horizontal and shall not exceed 1 foot vertical to 4 feet horizontal.
- F. One foot of freeboard shall be provided above the 100-year storm storage elevation.
- G. An emergency (secondary) overflow shall be provided at an elevation 6-inches above the 100-year storm storage elevation. Standards for the emergency overflow are provided in Section 5.6.5.
- H. Anti-seep collars should be installed on any piping passing through the sides or bottom of the basin to prevent leakage through the embankment.

5.6.3 Determination of Storage Volume Provided

- A. Storage volume shall be considered to be the volume above the invert elevation of the outflow device. Any storage within storm sewer shall not be considered as storage volume.

5.6.4 Basin Inlets & Outlets

Velocity dissipation measures shall be incorporated into basin designs to minimize erosion at inlets and outlets, and to minimize the resuspension of pollutants.

- A. *Basin Inlets.* All inlets to the detention basin shall meet the following requirements:
 - 1. The velocity of the storm water entering the storage facility should be a non-erosive velocity. This velocity is generally between 2.5 fps and 5 fps.

2. Oil and gas separators, designed to separate pollutants from stormwater within an enclosed storm drainage system shall be provided at the last structure prior to discharge to the detention system.
3. For all developments, regardless of size, a permanent four (4) foot deep sump is required to be constructed in the last stormwater structure that is readily accessible for maintenance prior to release off-site or into a sedimentation or stormwater holding facility.

B. *Restricted Outlet.* All detention basin outlets shall meet the following requirements

1. The outlet for storm water detention facilities shall be designed to meet the following requirements:
 - a. The maximum outlet rate at the design high water level shall not exceed the maximum allowable outflow rate as defined in Section 5.2.1.
 - b. Unless otherwise treated by a bioretention facility or sediment forebay, the first flush volume shall be retained for a minimum of 24 hours. The first flush volume is generally considered to be the first ½ inch of runoff from the site and can be determined by the following equation:

$$V_{ff} = 1815 \times \text{acreage} \times \text{the relative imperviousness factor } C$$

- c. The bankfull flood volume shall be retained in the detention facility for a minimum of 24 hours and no more than 40 hours. The bankfull flood is generally defined as the total rain from a 1.5-year, 24-hour design storm, which can be determined by the following equation:

$$V_{bf} = 5160 \times \text{acreage} \times \text{the relative imperviousness factor } C$$

2. V-notch weirs, dual outlets, riser pipe or other designs shall be utilized to assure an appropriate detention time and maximum outlet rate for the 100-year flood and bankfull flood volumes as required above. Where orifice holes or restrictor pipes are provided to restrict the flow and the required size is less than 4-inches, maintenance provisions for preventing clogging of the restrictor hole should be provided.
3. The outlet will be well protected from clogging.
4. All outlets will be designed to be easily accessible for heavy equipment required for maintenance purposes.
5. Riser pipe designs shall meet the following requirements:
 - a. Flow restrictive devices shall be located inside a standpipe. One (1) inch holes, spaced a minimum of 4-inches apart shall be provided around the

- perimeter of the riser between the elevation of the permanent water and the 100-year storm event. The riser will not function to restrict flow but will prevent clogging of the internal restrictive device.
- b. Hoods or trash racks shall be installed on the riser to prevent clogging.
 - c. The riser shall be placed near or within the embankment, to provide for ready maintenance access. Where the outlet structure is not located near enough to the bank to facilitate visual inspection of the structure, a stone bridge with a minimum top width of five (5) feet shall be provided.
 - d. The riser pipe shall be a minimum of three (3) feet in diameter and constructed of materials that will reduce future maintenance requirements.
6. Backwater on the outlet structure from the downstream drainage system will be evaluated when designing the outlet.
7. Pumped outlets are not permitted absent a variance from City Council, which shall require demonstration that it is in the public interest and no feasible alternative exists. IF City Council grants a variance to allow a pumped outlet, the following documentation shall be standards shall apply:
- a. The pump(s) shall be designed to meet the maximum discharge rate and time requirements for the 100-year and bankfull flood events. Minimum and maximum system head curves and pump curves shall be provided to verify the operating duty points of the pump(s).
 - b. Pumps shall be of appropriate construction for conveying storm water.
 - c. A redundant pump shall be provided.
 - d. A generator shall be provided for the pump station. A permanent on-site generator shall be provided or a generator receptacle in combination with a portable generator shall be provided.
 - e. A mechanism for determining failure of the pumps (alarm lights, water depth indicator, etc.) shall be provided. The mechanism shall be of a nature that ensures the ultimate property owner (filed with the Register of Deeds) will easily be able to identify a pump failure.
 - f. An operation and maintenance plan shall be provided and a maintenance agreement shall be in place with the ultimate property owner (filed with the Register of Deeds).

C. Overflow

1. An emergency spillway with a defined downstream drainage path or a secondary standpipe must be provided at an elevation 6-inches above the 100-year elevation to allow discharge from the basin when the flows exceed the capacity of the outlet structure. Provisions for preventing erosion of the spillway shall be provided. The emergency spillway or secondary standpipe shall have sufficient capacity to convey the peak flow associated with a 100-year design storm. Methods for determining the 100-year storm peak flows are outlined in Section 5.5.1.

5.6.5 Additional Requirements

- A. Fencing around detention basins shall not be permitted to allow for steeper side slopes unless specifically approved by the City Engineer.
- B. A permanent buffer strip of natural vegetation with a minimum width of 25 feet shall be provided and maintained for the following and preferably around the entire perimeter of the basin. The buffer strip should be planted with native vegetation. Chemical lawn care applications and mowing are prohibited in the buffer. Buffers shall be provided as follows:
 - a. In residential developments, buffers should be provided around the perimeter of the basin.
 - b. In commercial and industrial developments, buffers shall be provided in areas where impervious surface is directed to the basin via surface flow.
 - c. Where elevations allow, a buffer shall be provided at the outlets to the detention basin.
- C. All detention basins must be permanently stabilized to prevent erosion. Basins must be stabilized prior to directing stormwater flow to them.
- D. Construction of pretreatment systems is required prior to commencement of any construction activities on site except clearing and grubbing operations. Sump manhole construction must be completed as soon as is practicable during construction of the storm sewer system. Removal of collected sediment from the pretreatment systems is required at regular intervals during the construction process or at the direction of the City such that the basins are maintained in working order at all times.
- E. Landscaping shall be provided as required by the City's Landscape Design manual and as directed by the City's Landscape Architect.
- F. Detention basins constructed by building up on existing grade must have berms with a clay core keyed into native ground.
- G. Easement requirements for detention basins are outlined in Part Three of this Chapter Five.
- H. Adequate maintenance access from a public or private right-of-way to the basin shall be provided via an access easement granted to the City.. The access shall be a minimum of 15-feet wide, have a maximum running slope of 1-foot vertical to 5 feet horizontal, have a maximum cross-slope of three percent, and be stabilized to withstand the passage of heavy equipment. Additional maintenance requirements for detention basins are outlined in Part Three of this Chapter Five.

SECTION 5.7 UNDERGROUND DETENTION

Underground detention systems are the least preferred method of detention and may only be allowed for sites that meet at least one of the following criteria, as determined by City Engineer:

- The site is an existing developed site that is proposed to be redeveloped.
- The site has topographical constraints that would limit the effectiveness of a traditional basin.
- The site has size constraints (typically two acres or smaller).

The following will be required for underground detention facilities:

- A. Pretreatment shall be provided for the storm water prior to discharge into the underground detention facility. Acceptable methods and performance standards for pretreatment of storm water are outlined in Section 5.3.
- B. The volume of detention provided must be equal to or in excess of the volume of storm water runoff generated from a 100-year storm event. The method for determining this volume is outlined in Section 5.2.2.
- C. Oil and gas separators, designed to separate pollutants from stormwater within an enclosed storm drainage system shall be provided at the last structure prior to discharge to the detention system.
- D. For all developments, regardless of size, a permanent four (4) foot deep sump is required to be constructed in the last stormwater structure that is readily accessible for maintenance prior to release off-site or into a sedimentation or stormwater holding facility.
- E. Underground detention systems shall be designed, installed and maintained per the manufacturer's recommendations.
- F. Underground detention systems must have a positive method for draining. The outlet shall restrict the flow so that it does not exceed the maximum allowed outflow defined in Section 5.2.1.
- G. The bottom of the underground detention facility must be a minimum of three (3) feet above the groundwater elevation.
- H. Perforated pipe and open bottom systems shall be subject to the following requirements:

1. Perforated or open bottom systems will be permitted if a suitable outlet is provided for the total storage volume. Any potential infiltration will not be considered to reduce the required storage volume.
 2. Soil borings must be obtained within the location of the proposed detention system and extend to a depth of 25 below the existing ground or 20 feet below the proposed underground detention facility bottom elevation, whichever is greater. Additional boring depth may be appropriate for large detention systems. A minimum of one soil boring shall be obtained for every 1,000 square feet of detention area, with a minimum of two borings for any detention system. The soil borings shall be provided for review. The soil borings shall indicate the ground water elevation. The ground water elevation shall be at least 3 feet below the bottom of the storage volume.
 3. If storage volume is intended to be provided in the stone material adjacent to the pipe, the designer should assume that a maximum of 85% of the available void space is available for storage volume for any given stone mix to account for potential clogging of void space. The designer shall submit documentation supporting the volume of voids available in the proposed stone mix. Additionally, appropriate measures shall be provided to prevent migration of sediment into the adjacent stone material.
 4. Sufficient design provisions shall be made to facilitate cleaning of the system without disruption to the surrounding stone.
 5. If storage volume is intended to be provided within the stone base below the pipe or chamber, a mechanism for continuous drainage of the base material shall be provided.
- I. Permanent inspection and maintenance practices shall be considered when designing an underground detention facility. The final design shall minimize the effort required for regular inspection and maintenance of the facility by the future property owner (filed with the Register of Deeds). The City Engineer may require inspection ports or manholes depending on the design and configuration of the system. The designer will need to provide documentation indicating the procedures and required frequency for inspection and maintenance of the facility. Ease of inspection and maintenance will be considered in review of the underground detention system. A maintenance plan must be provided and a maintenance agreement must be in place with the ultimate property owner (filed with the Register of Deeds). Additional requirements for maintenance are identified in Part Three of this Chapter Five.

5.7.1 Restricted Outlet

- A. The outlet for underground detention facilities shall be designed to meet the following requirements:

1. The maximum outlet rate at the design high water level shall not exceed the maximum allowable outflow rate as required in Section 5.2.1.
2. The bankfull flood volume shall be retained in the facility for a minimum of 24 hours and no more than 40 hours. The bankfull flood is generally defined as the total rain from a 1.5-year storm, which can be determined by the following equation:

$$V_{bf} = 5160 \times \text{acreage} \times \text{the relative imperviousness factor } C$$

- B. V-notch weirs, orifice plates or other designs shall be utilized to assure an appropriate detention time for the 100-year flood and bankfull flood volumes as required above.
- C. The outlet will be well protected from clogging.
- D. All outlets will be designed to be easily accessible for heavy equipment required for maintenance purposes.
- E. The restricted outlet shall be located in a catch basin, manhole or other structure that will allow for regular inspection and maintenance.
- F. The standard orifice equation shall be used in determining the outflow from orifice holes used in the detention basin outlet. The minimum restrictor size is one inch diameter.
- G. Pumped outlets are not permitted for underground detention facilities.
- H. An emergency overflow with a defined drainage path shall be provided.

SECTION 5.8 RETENTION BASINS

5.8.1 Minimum Site Requirements

Stormwater retention may be approved on sites where the all of following can be documented. Soil borings must be obtained within the location of the proposed basin and extend to a depth of 25 below the existing ground or 20 feet below the proposed retention basin bottom elevation, whichever is greater. Additional boring depth may be appropriate for large basins. A minimum of one soil boring shall be obtained for every 500 square feet of basin area, with a minimum of two borings for any basin, or as directed by the City Engineer. The soil borings shall be provided for review.

- A. No stormwater outlet exists for the site.

- B. Soil types in the area of the proposed retention basin are hydrological soil group classifications of A or B.
- C. The permeability of the existing soils must be such that percolation of the retained stormwater is possible. Calculations performed by a professional geotechnical and/or hydrogeological engineer shall be submitted to support this. The calculations shall be based on the percolation rates for the soils encountered in the soil borings.
- D. The ground water elevation is a minimum of 3 feet below the bottom of the retention basin.

5.8.2 Additional Requirements

- A. Pretreatment shall be provided for the storm water prior to discharge into the detention basin. Acceptable methods and performance standards for pretreatment of storm water are outlined in Section 5.3.
- B. The retention basin shall have sufficient capacity to store the runoff from two consecutive 100-year storm events. The method for determining this volume is provided in Section 5.2.3. The City will consider approval of modified storage volumes based on the recommendation from a licensed hydrogeological engineer.
- C. Underground retention shall not be permitted.
- D. The side slopes of the proposed retention basin shall be no steeper than 1-foot vertical to 4-foot horizontal.
- E. One foot of freeboard shall be provided above the proposed high water level.
- F. A permanent buffer strip of natural vegetation with a minimum width of 25 feet shall be provided and maintained for the following and preferably around the entire perimeter of the basin. The buffer strip should be planted with native vegetation. Chemical lawn care applications and mowing are prohibited in the buffer.
 - 1. In residential developments, buffers should be provided around the perimeter of the basin.
 - 2. In commercial and industrial developments, buffers shall be provided in areas where impervious surface is directed to the basin via surface flow.
 - 3. Where elevations allow, a buffer shall be provided at the outlets to the detention basin.

- G. Oil and gas separators, designed to separate pollutants from stormwater within an enclosed storm drainage system shall be provided at the last structure prior to discharge to the basin.
- H. For all developments, regardless of size, a permanent four (4) foot deep sump is required to be constructed in the last stormwater structure that is readily accessible for maintenance prior to release off-site or into a sedimentation or stormwater holding facility.
- I. An overflow structure shall be provided and an overflow assessment shall be provided to the City for review. Elevations of the surrounding buildings, structures and other facilities that would be impacted by a basin overflow must be indicated. If an overflow structure cannot be constructed, a defined overflow routed must be indicated. The overflow route shall not endanger and existing structures. Downstream drainage easements shall be required for the overflow route.
- J. Subdivision stormwater holding facilities and pretreatment systems shall be located in parks or outlots and not on a subdivision lot. During the plat approval process, the council may, at their discretion, allow the use of a lot for holding facilities and pretreatment systems when the lot has been oversized for this use or when construction on the lot is prohibited until elimination of the holding facilities and pretreatment system. Holding facilities and pretreatment systems within proposed septic field areas will not be permitted.
- K. All retention basins must be permanently stabilized to prevent erosion. Basins must be stabilized prior to directing stormwater flow to them.
- L. Landscaping shall be provided as required by the City's Landscape Design Manual and as directed by the City's Landscape Architect.
- M. Adequate maintenance access from a public or private right-of-way to the basin shall be reserved. The access shall have a maximum slope of 1-foot vertical to 5 feet horizontal and stabilized to withstand the passage of heavy equipment. Additional maintenance requirements for retention basins are provided in Part Three of this Chapter Five.

SECTION 5.9 INFILTRATION FACILITIES

Stormwater infiltration systems are generally described as natural or constructed depressions located in permeable soils that capture, store and infiltrate stormwater runoff with a certain period of time. Stormwater infiltration may be provided through the use of infiltration trenches, infiltration basins or other mechanisms. While infiltration practices may not be practical as a sole method for meeting the performance

standard of this manual, they can be incorporated as one component of an overall stormwater management system.

5.9.1 Minimum Site Requirements

Stormwater infiltration may be approved on sites where the following can be documented. Soil borings must be obtained within the location of the proposed infiltration facility and extend to a depth of 20 feet below the proposed bottom elevation. Additional boring depth may be appropriate for large basins. A minimum of one soil boring shall be obtained for every 500 square feet of basin area, with a minimum of two borings for any basin, or as directed by the City Engineer. The soil borings shall be provided for review.

- A. Infiltration facilities will be permitted only on sites with undrained hydrologic soil group classifications of A or B. Where infiltration facilities are proposed, a sufficient number of soil borings will be provided in each location to evaluate the soil suitability.
- B. The infiltration rate of the existing soils must be such that percolation of the retained stormwater is possible within a reasonable time. Calculations performed by a professional geotechnical engineer shall be submitted to support this. The calculations shall be based on the percolation rates for the soils encountered in the soil borings. Pre and post construction percolation tests shall be performed to confirm the actual infiltration rate of the soil.
- C. The seasonal high ground water elevation or bedrock must be a minimum of 4 feet below the bottom of the infiltration facility.
- D. Infiltration facilities are not suitable for land uses or activities with potential for high sediment or pollutant loads.
- E. It is recommended that drainage areas for infiltration trenches not exceed 5 acres and drainage areas for infiltration basins be between 5 and 50 acres.
- F. Slopes in the tributary area shall not exceed 5% unless proper energy dissipation devices are installed.

5.9.2 Design Requirements

- A. Pretreatment shall be provided for the storm water prior to discharge into the infiltration facility. Acceptable methods and performance standards for pretreatment of storm water are outlined in Section 5.3. Special care shall be taken to ensure that coarse sediments and oil that would clog infiltration facilities are sufficiently removed from the storm water upstream of the infiltration facility.

1. The use of pretreatment systems that provide some degree of storage is encouraged.
 2. For infiltration facilities designed to meet the water quality performance standard, a vegetated filter strip with a minimum width of 25 feet is required.
 3. For discharges from an enclosed storm sewer, an oil/grit separator or other pretreatment mechanism that will remove oil and grease in addition to coarse soils shall be provided in the structure upstream of the infiltration facility.
 4. For all developments, regardless of size, a permanent four (4) foot deep sump is required to be constructed in the last stormwater structure that is readily accessible for maintenance prior to release off-site or into a sedimentation or stormwater holding facility.
- B. Where infiltration facilities are installed to meet the performance standards for quantity control, the facility shall be sized to accommodate the runoff from a 100-year, 24-hour design storm event as outlined in Section 5.2.4 and pretreatment shall be provided to meet the stormwater quality performance standards. Sufficient documentation shall be provided to support the infiltration rate of the in-situ soils.
- C. Infiltration facilities shall be designed to hold water for a minimum of 6 hours and a maximum of 72 hours.
- D. It is recommended that flows entering the infiltration facility (and exiting the pretreatment facility) have non-erosive velocities (less than 3 fps) and are evenly distributed across then width of the infiltration facility
- E. The bottom of the infiltration facility should be generally flat in order to enable even distribution and infiltration of storm water. Additionally, the bottom of the facility will be placed two (2) feet below the frost line to ensure operation during the winter.
- F. Where an overflow pipe is provided, the pipe will be placed near the surface of the trench and outlet to an acceptable point of discharge.

5.9.3 Additional Requirements

- A. It is recommended that infiltration facilities not be hydraulically connected to structure foundations or pavement to avoid seepage and frost heave concerns. A minimum separation of 100 feet shall be provided between infiltration facilities and building foundations.
- B. Infiltration facilities shall not be located with 100 feet of a water supply well.
- C. Uniform, washed stone. 1.5 inches to 3 inches in diameter will be used within the facility.

- D. Filter fabric shall be used to line the sides of the trench and either filter fabric or six 6 inches of sand shall be used on the bottom of the infiltration facility. Filter fabric placed six (6) to twelve (12) inches below the surface of the infiltration facility can prevent the need for major rehabilitation.
- E. An observation well, consisting of a perforated vertical pipe within the trench will be installed in every infiltration facility to monitor performance.
- F. Trenches and underground components shall be readily accessible for maintenance purposes.
- G. Infiltration facilities should not be built down slope of new construction until the entire development area has been permanently stabilized.
- H. Great care shall be taken during construction to avoid compaction of the existing in-situ soils. The bottom of the infiltration facility shall be scarified or roto-tilled to a depth of 6 inches or more to reduce the possibility of initial soil compaction caused by excavation with heavy equipment. All methods for avoiding soil compaction shall be provided on the site plan.
- I. A legally enforceable and binding maintenance agreement will be provided. All systems will require annual inspection and maintenance.
- J. Subdivision stormwater holding facilities and pretreatment systems shall be located in parks or outlots and not on a subdivision lot. During the plat approval process, the council may, at their discretion, allow the use of a lot for holding facilities and pretreatment systems when the lot has been oversized for this use or when construction on the lot is prohibited until elimination of the holding facilities and pretreatment system. Holding facilities and pretreatment systems within proposed septic field areas will not be permitted.

SECTION 5.10 SEDIMENT FOREBAYS

A sediment forebay is generally very compatible with an above ground detention or retention basin. However, it could also be used in combination with an underground detention system or infiltration system. Sediment forebays shall meet the following requirements:

- A. The sediment forebay shall be sized to accommodate the first flush volume. The first flush volume is generally considered to be the first ½ inch of runoff from the site and can be determined by the following equation:

$$V_{ff} = 1815 \times \text{acreage} \times \text{the relative imperviousness factor } C$$

The volume of storage provided in the forebay shall not be included as a part of the total provided storage volume required for storm water quantity control, above any permanent pool of water.

- B. Oil and gas separators, designed to separate pollutants from stormwater within an enclosed storm drainage system shall be provided at the last structure prior to discharge to the forebay.
- C. For all developments, regardless of size, a permanent four (4) foot deep sump is required to be constructed in the last stormwater structure that is readily accessible for maintenance prior to release off-site or into a sedimentation or stormwater holding facility.
- D. When used in combination with an above ground detention or retention basin, the sediment forebay shall be a separate cell, which can be formed by gabions or an earthen berm. For small sites, where the size of the forebay would not provide sufficient settling time, alternative methods of providing quality control should be considered.
- E. Forebay side slopes shall not exceed 1-foot vertical to 4 feet horizontal.
- F. The forebay should have a sump with a minimum of 2 feet deep to capture sediment and prevent resuspension of sediment. The bottom of the basin should slope toward the sump area to capture the sediment. The surface area of the sump should be approximately 1/3 of the total bottom area of the sediment forebay. The sump should be located near the inlet(s) to the forebay.
- G. The outlet shall be designed to capture the first flush volume and dewater the basin after 24 hours or longer. An outlet structure with restricted discharge is recommended. Guidelines for designing restricted outlets are provided in Section 5.6.5.
- H. An outlet (overflow) spillway shall be constructed in a manner that allows water to exit the forebay at non-erosive velocities. Overflow from the sediment forebay shall be directed into the storm water quantity control facility.
- I. All forebays must be permanently stabilized to prevent erosion. Basins must be stabilized prior to directing stormwater flow to them.
- J. Direct maintenance access to the forebay for heavy equipment shall be provided.
- K. An adequate disposal area should be provided for accumulated sediment.
- L. The forebay should also have a fixed vertical sediment depth marker to measure the amount of sediment that has accumulated. The depth marker shall have a marking

showing the depth where sediment removal is required. The sediment should be removed when half of the sediment storage capacity has filled in. The marker shall be constructed of a material that will not rust.

- M. Subdivision stormwater holding facilities and pretreatment systems shall be located in parks or outlots and not on a subdivision lot. During the plat approval process, the council may, at their discretion, allow the use of a lot for holding facilities and pretreatment systems when the lot has been oversized for this use or when construction on the lot is prohibited until elimination of the holding facilities and pretreatment system. Holding facilities and pretreatment systems within proposed septic field areas will not be permitted.

SECTION 5.11 MANUFACTURED TREATMENT SYSTEMS

Manufactured treatment systems include underground swirl concentrators, which are “treatment systems” used to remove sediment and other particulate matter from stormwater runoff. Manufactured treatment systems are the least preferred method for meeting the stormwater quality performance standard and will only be allowed for sites that meet at least one of the following criteria:

- The site is an existing developed site that is proposed to be redeveloped.
- The site has topographical constraints that would limit the effectiveness of a traditional sediment forebay or bioretention facility.
- The site has size constraints (typically two acres or smaller).

For sites where a forebay would be relatively small, a swirl concentrator device may an acceptable substitute because of the reduced effectiveness and inadequate detention time of small forebays.

5.11.1 General Performance and Design Specifications

- A. The system may be used to meet the storm water quality performance standards outlined in Section 5.3 as approved by the City Engineer. Only manufactured treatment systems approved by the City Engineer shall be used.
- B. Systems that have demonstrated 80% removal of the annual total suspended solids load based on third party independent testing are required.
- C. The system must treat 100% of the runoff from the 1-year, 24-hour storm event and remove a minimum of 80% of the Total Suspended Solids (TSS) load based on a 110-micron particle size. The peak runoff from a 1-year, 24-hour storm event can be calculated as provided in Section 5.5.1..

- D. Rain events larger than the 1-year, 24-hour event shall bypass the system without causing any re-suspension of trapped sediments and without causing re-entrainment of floatable contaminants.
- E. The system shall not create any backwater in the upstream pipe network during any dry weather conditions.
- F. The treatment system must prevent oil and floatable contaminants from entering downstream piping during routine maintenance and during rain events.
- G. Direct access must be provided to the sediment and floatable chambers to facilitate maintenance. There shall be no appurtenances or restrictions within these chambers.
- H. Systems that require confined space entry for inspections or maintenance are not approved for use as a treatment system.
- I. If the system is proposed in traffic areas, then it must be designed to handle H2O loadings.
- J. A maintenance plan must be provided and a maintenance agreement must be in place with the ultimate property owner (filed with the Register of Deeds). An inspection and maintenance manual must be provided for review specific to the model.
- K. All treatment systems shall be cleaned of accumulated sediment and other materials prior to inspection of the system by the City.
- L. Additional requirements for maintenance are identified in Part Three, of this Chapter Five.

SECTION 5.12 BIORETENTION/RAIN GARDENS

Bioretention basins (sometimes referred to as rain gardens) can generally be described as shallow, landscaped depressions that receive runoff and are designed to use soil and plant material to mimic the natural water cycle by storing, filtering and infiltrating stormwater into the ground. Bioretention areas may be used anywhere to meet the stormwater quality performance standards. Bioretention areas are the preferred method of meeting the stormwater quality performance standards of this Manual.

Some key components of bioretention facilities are defined below:

- *Pretreatment* – mechanism(s) for removing coarse sediments.
- *Ponding Area* – created by a “bowl-shaped” topography that allows for surface storage of runoff and promotes evaporation.

- *Plant Material* – takes up some of the nutrients and other pollutants from stormwater through natural processes. The use of native plant material is recommended for this component wherever possible.
- *Organic or Mulch Layer* – placed on top of the planting soil/filter media, this layer provides an environment for plant growth by maintaining moisture, providing micro-organisms, decomposing incoming organic matter and acts as a filter for finer particles.
- *Filter Media/Planting Soil* – is generally the thickest layer of the facility that provides the environment for water and nutrients to be made available to the vegetation. The soil particles can absorb some additional pollutants through cation exchange and voids within the filter media/planting soil can store some of the first flush volume. A minimum infiltration rate (permeability) of 0.5 inches per hour is desired.
- *Sand Bed* – provided to keep finer particles from washing out through the underdrain system.
- *Gravel Underdrain System* – used to collect and distribute the treated runoff where in-situ soils do not allow for sufficient infiltration of the runoff.
- *Overflow System* – allows for bypass of larger storm flow volumes to the downstream stormwater quantity treatment system.

5.12.1 Site Suitability

Bioretention basins are generally suitable for all land uses, provided the tributary area is appropriate for the size of the facility. Common bioretention opportunities include landscaping islands, cul-de-sacs, parking lot setback areas, open spaces and streetscapes.

5.12.2 Design Guidelines

- A. The bioretention basin shall be sized to accommodate the first flush volume. The first flush volume is generally considered to be the first ½ inch of runoff from the site and can be determined by the following equation:

$$V_{ff} = 1815 \times \text{acreage} \times \text{the relative imperviousness factor } C$$

Storage provided within the bioretention facility (including above-grade ponding and storage within the subsurface porous medium) and/or calculated infiltration will count toward the detention/retention storage requirements.

- B. The surface area of the bioretention basin shall generally be sized based on the principle's of Darcy's Law, as follows:

$$A_f = \frac{V_{ff} d_f}{k(h_f + d_f)t_f}$$

Where: A_f = Surface area of facility (sf)
 d_f = Depth of filter media/planting soil (ft) (generally 18-inches or as recommended by the Landscape Architect)
 k = Coefficient of permeability of filter media/planting soil¹ (ft/day) (minimum of 1 ft/day)
 h_f = Average height of water above filter media/planting soil (ft)
 t_f = design filter media bed drain time (days)

Notes: ¹ Where an underdrain is *not* provided, the lesser or the k value for the in-situ soils and filter media/planting soil shall be used.

Additionally, the designer must demonstrate that the volume provided within the bioretention facility is equal to or greater than the first flush elevation. Where the designer intends to consider storage volume provided within the planting media and stone base, documentation needs to be provided to support the assumed void space. Further, the designer shall assume that 15% of the void space is unavailable for storage. This will account for accumulation of sediment within the medias. The City may require a field test for verification of the assumed void space.

- C. A separation distance of 3 feet shall be provided between the bottom of the bioretention facility and the ground water elevation.
- D. The tributary area to a bioretention facility should be smaller than 5 acres and preferably less than one acre. For larger sites, multiple bioretention areas can be used.
- E. The maximum recommended ponding depth is 6 inches. A maximum ponding depth of 3 to 4 inches is preferred for areas that receive high hydraulic loading or have soils with low infiltration rates. The ponding depth may exceed 6 inches in cases where sandy soils and underdrain systems are being used to increase infiltration.
- F. An overflow structure shall be provided. Generally, a catch basin with a raised rim installed in the bioretention facility is appropriate. The rim of the overflow structure shall be located to allow for the design ponding depth and prevent water from overflowing the bioretention facility. The overflow structure and storm sewer outlet pipe shall be sized to convey the 10-year storm event and shall convey water into the storm water quantity treatment facility.

- G. An emergency overflow spillway shall be provided a minimum of 6 inches above the rim elevation of the overflow structure. The spillway shall be constructed in a manner that allows water to exit the bioretention facility at non-erosive velocities. Overflow from the bioretention facility shall be directed into the storm water quantity control facility
- H. Bioretention areas should be designed as off-line treatment systems wherever possible. This is to prevent erosive flow of water within the facility.
- I. Adequate pretreatment shall be provided to capture and remove coarse sediment particles from storm water prior to entering the bioretention facility. Pretreatment may be accomplished with the following methods:
 - 1. Grass filter strip
 - 2. Gravel diaphragm
 - 3. Mulch layer
 - 4. Forebay
- J. Oil and gas separators, designed to separate pollutants from stormwater within an enclosed storm drainage system shall be provided at the last structure prior to discharge to the forebay.
- K. For all developments, regardless of size, a permanent four (4) foot deep sump is required to be constructed in the last stormwater structure that is readily accessible for maintenance prior to release off-site or into a sedimentation or stormwater holding facility.
- L. Bioretention facilities must be permanently stabilized to prevent erosion. Facilities must be stabilized prior to directing stormwater flow to them.
- M. Bioretention areas shall not be hydraulically connected to structure foundations or pavement to avoid seepage and frost heave concerns. It is recommended that a minimum separation of 10 feet be provided between bioretention facilities and buildings or other structures.
- N. Sloped areas exceeding 20% shall not be used for bioretention. It is recommended that the slope of the surface of the bioretention facility not exceed 1% to promote even flow distribution.
- O. Bioretention facilities should be located away from traveled areas such as public pathways to avoid compaction.
- P. In parking lot applications, bumper blocks or gapped curbing should be used to prevent entry of vehicles into the bioretention area.

- Q. Underdrains should be installed for all facilities placed in residential areas and in areas where the slow infiltration rate of in-situ soils may cause excess surface ponding or other drainage problems. When in-situ soils are being used without an underdrain system, a soil investigation will be required to document the in-situ soil suitability. Additionally, a raised “underdrain” (located near the top of the stone subbase layer) is recommended for all systems to provide a mechanism for a subsurface “overflow”.
1. Underdrains shall have a hydraulic capacity greater than the planting soil infiltration rate.
 2. The underdrain shall be perforated. The locations of the perforations (invert of pipe or elsewhere) depends on the design of the facility. Typically, the perforations are placed closest to the invert of the pipe to achieve maximum potential for draining the facility. The perforations can be placed near the top of the pipe if an anaerobic zone is intended. Water below the perforated portion of the underdrain will have a tendency to accumulate during periods of saturation. Otherwise, water will have a tendency to infiltrate into the surrounding in-situ soils.
 3. Underdrains shall connect to a storm sewer or watercourse to achieve positive flow.
 4. A gravel bed is recommended to protect underdrain pipes and reduce clogging. Placement of 6 inches of gravel bedding is recommended beneath the discharge points.
 5. A mechanism for cleaning the underdrain system shall be provided.
- R. Geotextile filter fabric shall be provided to separate the planting material from the underdrain/base material or in-situ soils.
- S. The planting soil should have sufficient depth to provide adequate moisture capacity and create space for root systems. Soil for bioretention facilities should have a sandy loam, loamy sand, or loam texture per USDA textural triangle. Maximum clay content is <5%; soil mixture shall be 50-60% sand; 20-30% leaf compost; and 20-30% topsoil. Leaf compost is essentially composed of aged leaf mulch and provides added organic matter to improve the health of the soil and ensure adequate soil structure. The soil must be a uniform mix, free of stones, stumps, roots, or other similar objects larger than two inches. No other materials or substances should be mixed or dumped within the bioretention that may be harmful to plant growth, or prove a hindrance to the planting or maintenance operations. The planting soil must be free of plant or seed material of non-native, invasive species, or noxious weeds.

5.12.3 Additional Requirements

- A. In residential properties, bioretention facilities provided to meet the stormwater management performance standards must be located within common areas and

be protected from changes to grading and landscaping by the Master Deed or other appropriate document.

- B. Subdivision stormwater holding facilities and pretreatment systems shall be located in parks or outlots and not on a subdivision lot. During the plat approval process, the council may, at their discretion, allow the use of a lot for holding facilities and pretreatment systems when the lot has been oversized for this use or when construction on the lot is prohibited until elimination of the holding facilities and pretreatment system. Holding facilities and pretreatment systems within proposed septic field areas will not be permitted.
- C. Landscaping shall be provided as approved by the City's Landscape Architect. Plantings for bioretention facilities should be appropriate for the anticipated hydrologic and nutrient loading conditions. A list of suitable plantings for bioretention facilities is provided in Appendix 5-A. The list is not inclusive of all appropriate plant materials and the designer may choose to propose alternate plant materials.
- D. Maintenance requirements for bioretention facilities are provided in Part Three, of this Chapter Five.

SECTION 5.13 STORMWATER CONVEYANCE

Stormwater management facilities may use open channels or closed conduits or both for means of conveying stormwater runoff provided. Sufficient stormwater conveyance of a 10-year storm event is required. Methods for determining the 10-year design flow for a tributary area is outlined in Section 5.1.1. Generally, open channels are preferred to closed conduits and naturally vegetated or grassed lined channels or swales are preferred.

All stormwater conveyance structures shall be constructed in accordance with governing specifications that may include Michigan Department of Transportation, Oakland County Road Commission and/or the City. In the event of no other governing specifications, the latest edition of the Michigan Department of Transportation Standards will be observed.

5.13.1 Storm Sewer

Detailed requirements for storm sewer are provided in Chapter 11 of the City's Ordinance.

5.13.2 Open Channels

Detailed requirements for storm sewer are provided in Chapter 11 of the City's Ordinance.

5.13.3 Vegetated Swales

- A. Vegetated swales shall follow natural, predevelopment drainage paths insofar as possible and be well vegetated, wide and shallow.
- B. Flow velocities within the swale shall neither be siltative nor erosive. In general, the minimum acceptable velocity should be two (2.0) feet per second and the maximum acceptable velocity will be six (6.0) feet per second.
- C. Swale slopes shall be appropriate for the swale cross section and capacity, existing soils and proposed vegetation. Wherever possible, the slope shall be greater than 1.5 percent. For slopes less than 1.5 percent, additional inspection will be necessary to ensure proper, positive drainage. In no case shall slopes be less than one (1.0) percent, unless other techniques such as infiltration are implemented. Maintenance for these devices must be detailed in the overall maintenance plan.
- D. Side slopes of swales shall be no steeper than 1-foot vertical to 3-foot horizontal. Soil conditions, vegetative cover and access for maintenance will be the governing factors in determining side slope requirements.
- E. The sides and bottom of swales shall be temporarily and permanently stabilized to prevent erosion.
- F. A minimum swale length of 200 feet is recommended to increase the contact time of stormwater.
- G. A series of check dams or drop structures across swales should be provided to enhance water quality and reduce velocities.
- H. Bioswales are encouraged to enhance water quality. Bioswales shall generally be designed in accordance with the above noted requirements for vegetated swales and as follows:
 - 1. The longitudinal slope of the bioswale shall be steep enough to prevent ponding and shallow enough to slow water velocity. Recommended slopes range between one percent (1%) and four percent (4%).
 - 2. Flow velocity should be sufficiently low to provide adequate residence time within the channel.
 - 3. Channel bottom width should be maximized. A wider channel allows for maximum filtering surface and slower water velocities within the channel.

4. Flow depth should not be taller than the proposed vegetation. A maximum depth of four (4) inches is recommended.
5. The channel length shall be long enough to provide approximately 10 minutes of residence time.
6. Plantings for bioswales shall be appropriate for the anticipated hydrologic and nutrient loading conditions as approved by the City's Landscape Architect. A list of suitable plantings for bioretention facilities is provided in Appendix 5-A. The list is not inclusive of all appropriate plant materials and the designer may choose to propose alternate plant materials.

5.13.4 Natural Streams and Channels

- A. Natural stream are to be preserved. Modifications to existing natural streams, where unavoidable shall be designed and constructed according to governing regulations including, but not limited to, the Michigan Department of Environmental Quality, the U.S. Army Corps of Engineers and the Federal Emergency Response Agency.
- B. Natural swales and channels shall be preserved whenever possible.
- C. If channel modifications must occur, the physical characteristics of the modified channel will meet the existing channel in length, cross section, slope, sinuosity and carrying capacity. For unstable existing channels, a geomorphologic analysis should be completed to determine the most stable channel geometry and capacity.
- D. Streams and channels are expected to withstand all events up to the one-hundred year storm without increased erosion. Floodplains should be constructed where necessary. Armoring the banks with rip rap and other manufactured materials will only be accepted where erosion cannot be prevented in any other way.

PART 3 – EASEMENT AND MAINTENANCE REQUIREMENTS

SECTION 5.14 EASEMENTS FOR STORMWATER MANAGEMENT FACILITIES

Permanent easements shall be provided for all stormwater management facilities. If a facility is to be located within the right-of-way or any existing public utility easement, it shall be located such that it will not significantly increase the expense of maintaining the drainage facility. Easement requirements for legally established County Drains are detailed in the Oakland County Drain Commissioner's Standards. The following pertain to private storm water management facilities:

5.14.1 Easement Width

Minimum easements widths for facilities that are not part of a legally established County Drain are as follows:

- A. Open Drains and Watercourses – The minimum easement width shall be equal to the extreme width of the drain or watercourse plus fifteen (15) feet from the top of bank on both sides of the channel. Additional width may be required in some cases, including, but not limited to: water courses with floodplains delineated by FEMA, sandy soils, steep slopes and at access points from road crossings. Public easements shall be provided to the City for natural water courses that are not under the jurisdiction of the Oakland County Drain Commission, Michigan Department of Environmental Quality or other regulatory agency.
- B. Enclosed Drains – The easement width shall be equal to twice the depth of the sewer plus the size of the outside diameter of the pipe. Certain soil conditions may require larger easements. In no cases shall the easement width be smaller than twenty (20) feet. The easement shall be centered on the centerline of the pipe.
- C. Rear Yard Swales - The minimum easement width shall be twenty (20) feet centered on the centerline of the swale.
- D. Detention/Retention & Other Storm Water Management Facilities - Sufficient easement area to allow for operation and maintenance of the entire facility, including freeboard area, the banks and any berms at the top of the banks. Easements shall be 15-feet wide or greater and located to accommodate access and operation of equipment, spoils deposition and other activities identified in the maintenance plan. An access easement from the right-of-way shall be granted to the City as part of the maintenance agreement.

5.14.2 Additional Requirements

- A. Easement information shall be included on preliminary and final site plans.
- B. In cases where storm water is discharged to a drain or watercourse on adjoining private property, an improvement to the drain and agreement with the property owner (filed with the Register of Deeds) may be necessary. An off-site drainage easement will be required if:
 - 1. The watercourse is not depicted as a solid blue line on a USGS map.
 - 2. It is not indicated on the MIRIS map.
 - 3. The watercourse is not considered wetlands by the governing municipality.
- C. In cases where storm water is discharged to a wetland located on the development property, the developer may be required to obtain an easement from the adjacent

property owners, approved by the City, and filed with the Register of Deeds. An off-site drainage easement will be required if all of the following conditions are met:

1. The wetland extends onto adjacent properties
2. The development would cause a change in the natural flow of storm water from the development by diverting (or concentrating) additional storm water flow from the property into wetlands, which extend onto the adjacent property.
3. The development would cause the amount of water on the adjacent property to increase and/or changes the velocity of the water moving across the adjacent property

SECTION 5.15 MAINTENANCE REQUIREMENTS FOR STORM WATER MANAGEMENT FACILITIES

- A. All sites shall have a stormwater drainage facility maintenance easement agreement (SDFMEA) for the on-site storm water management facilities. A SDFMEA shall be submitted with all construction plans and included in the bylaws of all developments and site condominiums. Additional requirements for maintenance plans are provided in Section 5.15.1.
- B. The applicant may fulfill his or her obligation to ensure that a governmental entity will be responsible for drainage system maintenance by establishing a county drainage district, or other similar mechanism approved by the City to provide for the permanent maintenance of stormwater management facilities and necessary funding. If a county drain is not established, the applicant will submit evidence of a legally binding agreement with another governmental agency responsible for maintenance oversight.
- C. A legally binding private stormwater drainage facility maintenance easement agreement will be executed before final project approval is granted. The agreement shall be referenced on the property deed (or condominium master deed document) so that it is binding on all subsequent property owners.
- D. Stormwater management facilities shall be designed to minimize and facilitate maintenance, including, but not limited to:
 1. Riser pipes placed near or within pond embankments
 2. Easily accessible trash racks
 3. Alternative outflows for wet detention basins that can be used to completely drain the pool for sediment removal (pumping shall be considered if drainage by gravity is not feasible)
 4. Access for heavy equipment
 5. On-site area for spoil deposition, wherever possible

5.15.1 Maintenance Plan Requirements

The stormwater drainage facility maintenance easement agreement shall outline the tasks associated with maintenance of the storm water management facilities during the construction process and once the property owner (filed with the Register of Deeds) has assumed responsibility of the storm water management facilities. Where underground detention facilities, manufactured treatment systems and/or storm water pumps are proposed, the maintenance plan for the site shall be developed in accordance with the recommendations of the manufacturer.

The following information shall be included in the stormwater drainage facility maintenance easement agreement:

- A. A copy of the final approved drainage plan that delineates the facilities, easements, maintenance access and buffer areas.
- B. An estimated annual maintenance budget, itemized in detail by task and a description of the financing mechanism.
- C. A listing of appropriate maintenance tasks and a schedule for their implementation, including:
 - 1. Regular inspections
 - 2. Sediment/pollution removal
 - 3. Vegetation management
 - 4. Debris and litter control
 - 5. Embankment and outlet stabilization
- D. Identification of the party responsible for performing each of the inspection and maintenance described.
- E. Detailed descriptions of the procedure(s) for preventative and corrective maintenance activities. Preventative activities shall include:
 - 1. Periodic inspections, adjustments and replacements
 - 2. Record keeping of operations and expenditures
- F. Provisions for the routine and non-routine inspection(s) of all components within the system, including:
 - 1. Wet weather inspections of structural elements (including inspection for sediment accumulation in detention basins) should be conducted annually with as-built plans in hand. These inspections should be carried out by a professional engineer reporting to a responsible agency or owner.
 - 2. Housekeeping inspections, such as checking for trash removal, should be conducted at least annually.
 - 3. Emergency inspections on an as-needed basis, upon identification of severe problems, should be carried out by a professional engineer.

- G. A description of on-going landscape maintenance needs. The viability of plantings will be monitored by the applicant and for at least one (1) year after establishment and plantings will be replaced as needed. After one (1) year, the responsibility of monitoring and replacing plantings shall be the responsibility of the property owner. The City is not responsible for landscape maintenance.
- H. Provisions for the maintenance of vegetative buffers by homeowner's associations, conservation groups or a public agency. Buffers will be inspected annually for evidence of erosion or concentrated flows through or around the buffer.

5.15.2 Maintenance Guidelines

Specific minimum guidelines for maintenance of various storm water management facilities are as follows:

A. Detention Basins

1. Check outlets regularly for clogging and clean when necessary, especially after large storm events. Replace stone around standpipe as needed.
2. Inspect entire system at least annually including inlet/outlet pipes, animal grates and filters.
3. Inspect for and remove floatables and debris at least annually.
4. Regularly check banks and bottom for erosion (at least annually) and correct as necessary.
5. Reseed banks near inlet/outlet and stabilize eroded banks as necessary.
6. Add additional plantings as necessary.
7. Remove dead vegetation (in early spring) that obstructs flow.
8. Inspect for sediment accumulation. Remove sediment when accumulation reaches six inches or resuspension is observed.

B. Underground Detention Systems

1. Maintenance of underground detention systems shall performed be in accordance with the manufacturer's recommendations.
2. Underground detention systems should be inspected regularly in accordance with the manufacturer's recommendations and site conditions. At a minimum, the system should be inspected every six months.
3. Check outlets regularly for clogging and clean when necessary, especially after large storm events.
4. Accumulated sediment should be removed from the underground detention system on a regular basis.

C. Retention Basins

1. Regularly check banks and bottom for erosion (at least annually) and correct as necessary.

2. Inspect for and remove floatables and debris at least annually.
3. Reseed banks near inlets and stabilize eroded banks as necessary.
4. Add additional plantings as necessary.
5. Remove dead vegetation (in early spring) that obstructs flow.
6. Inspect for sediment accumulation. Remove sediment when accumulation reaches six inches or resuspension is observed.

D. Infiltration Facilities, including Porous Pavement

1. Infiltration systems, including porous pavement must be aggressively maintained and protected from clogging by sediment, including maintenance of vegetative buffer strips.
2. In the event of clogging by accumulated sediments, partial or total reconstruction of the infiltration facility shall be required.
3. Porous pavement shall be vacuum swept and jet hosed at least four (4) times per year to remove any grit or sediment trapped in the pores of the open-graded asphalt. Evidence of a regular service contract for performing this activity will be required.

E. Sediment Forebays

1. Check outlets regularly for clogging and clean when necessary, especially after large storm events. Replace stone around standpipe as needed.
2. Inspect entire system at least annually including inlet/outlet pipes, animal grates and filters.
3. Inspect for and remove floatables and debris at least annually.
4. Regularly check banks and bottom for erosion (at least annually) and correct as necessary.
5. Reseed banks near inlet/outlet and stabilize eroded banks as necessary.
6. Add additional plantings as necessary.
7. Remove dead vegetation (in early spring) that obstructs flow.
8. Remove sediment when accumulation reaches six inches or resuspension is observed.

F. Manufactured Treatment Systems

1. Treatment systems shall be maintained according to the manufacturer's recommendations.
2. At a minimum, the system must be inspected and cleaned every 6 months, or more frequently if recommended by the manufacturer or directed in the reasonable exercise or discretion by the City Engineer.

G. Bioretention Facilities

1. Mulch should be re-applied uniformly with 2 to 3 inches of depth every six months. The mulch layer should be removed and replaced every two (2) years.
2. Soils should be tested regularly and replaced when soil fertility (ability to filter pollutants) is lost.

3. Regular weeding should be performed to remove unwanted and/or invasive plants.
4. Take appropriate actions to correct clogging that causes long-term pooling water. This shall include:
 - a. Clean the underdrain system.
 - b. Remove the mulch layer and rake the surface to eliminate surface blockages.
 - c. Use small lengths of reinforcing bar (e.g. 2-3 feet or #4 rebar) to puncture the filter fabric with holes to correct blocked filter fabric.
 - d. Punch holes in the soil to eliminate blockages within the soil layer.
5. Water plantings if wilted plants do not recover in the evening or if soils are dry at depths below 4 inches.
6. Replace dead or diseased plants.
7. Trash and debris should be removed from the bioretention facility regularly.

APPENDIX 5-A
Short List of Suitable Plants for Bioretention Facilities

Bioretention Basin/Rain Garden Side Slopes	
Scientific Name	Common Name
<u>Trees and Shrubs</u>	
<i>Acer saccharinum</i>	silver maple
<i>Aronia melancocarpa</i>	black chokeberry
<i>Celtis occidentalis</i>	hackberry
<i>Cornus racemosa</i>	gray dogwood
<i>Cornus sericea</i>	red-osier dogwood
<i>Ilex verticillata</i>	winterberry
<i>Physocarpus opulifolius</i>	ninebark
<i>Quercus bicolor</i>	swamp white oak
<i>Salix nigra</i>	black willow
<i>Spiraea alba</i>	meadowsweet
<i>Viburnum lentago</i>	nannyberry
<i>Viburnum trilobum</i>	high bush cranberry
<u>Forbs and Ferns</u>	
<i>Anemone canadensis</i>	Canada anemone
<i>Asclepias tuberosa</i>	butterfly milkweed
<i>Aster laevis</i>	smooth aster
<i>Aster lanceoloatus</i>	panicle aster
<i>Aster macrophyllus</i>	big-leaved aster
<i>Aster novae-angliae</i>	New England aster
<i>Aster pilosus</i>	hairy aster
<i>Boltonia asteroides</i>	false aster
<i>Eryngium yuccifolium</i>	rattlesnake master
<i>Euthanmia graminifolia</i>	grass-leaved goldenrod
<i>Helianthus grosseserratus</i>	sawtooth sunflower
<i>Heuchera richardsonii</i>	prairie alumroot
<i>Matteuccia struthiopteris</i>	ostrich fern
<i>Monarda fistulosa</i>	wild bergamot
<i>Osmunda regalis</i>	royal fern
<i>Physosotegia virginianum</i>	mountain mint
<i>Smilacina racemosa</i>	false solomon's seal
<i>solidago flexicaulis</i>	broad-leaved goldenrod
<i>solidago riddellii</i>	Riddell's goldenrod
<i>solidago rigida</i>	stiff goldenrod
<i>tradescantia ohiensis</i>	common spiderwort
<i>Zizia aurea</i>	golden alexanders

<u>Grasses, Sedges and Rushes</u>	
<i>Andropogon gerardii</i>	big bluestem
<i>Bromus ciliatus</i>	fringed brome
<i>Panicum virgatum</i>	switchgrass
<i>schizachyrium scoparium</i>	little bluestem
<i>sorghastrum nutans</i>	indian grass

Bioretention Basin/Rain Garden Basin Bottom	
Scientific Name	Common Name
<u>Trees and Shrubs</u>	
<i>Aronia melancocarpa</i>	black chokeberry
<i>Cornus sericea</i>	red-osier dogwood
<i>Ilex verticillata</i>	winterberry
<i>Viburnum trilobum</i>	high bush cranberry
<u>Forbs and Ferns</u>	
<i>Anemone canadensis</i>	Canada anemone
<i>Asclepias incarnata</i>	swamp milkweed
<i>Aster novae-angliae</i>	New England aster
<i>Aster puniceus</i>	swamp aster
<i>Boltonia asteroides</i>	false aster
<i>Chelone glabra</i>	turtlehead
<i>Eupatorium maculatum</i>	joe-pye weed
<i>Eupatorium perfoliatum</i>	boneset
<i>Gentiana andrewsii</i>	bottle gentian
<i>Helenium autumnale</i>	sneezeweed
<i>Iris versicolor</i>	blue flag iris
<i>Lobelia cardinalis</i>	cardinal flower
<i>Lobelia siphilitica</i>	blue lobelia
<i>Lysimachia thrysiflora</i>	tufted loosestrife
<i>Onoclea sensibilis</i>	sensitive fern
<i>Osmunda regalis</i>	royal fern
<i>Physosotegia virginianum</i>	mountain mint
<i>rudbeckia subtomentosa</i>	brown-eyed susan
<i>Silphium perfoliatum</i>	cup plant
<i>Solidago rigida</i>	stiff goldenrod
<i>Thalictrum dasycarpum</i>	purple meadow rue
<i>Verbena hastata</i>	blue vervain
<i>Vernonia fasciculata</i>	ironweed
<i>Veronicastrum virginicum</i>	Culver's root

<u>Grasses, Sedges and Rushes</u>	
<i>Bromus ciliatus</i>	fringed brome
<i>Carex comosa</i>	bottlebrush sedge
<i>Carex crinita</i>	caterpillar sedge
<i>Carex hystericina</i>	porcupine sedge
<i>Carex vulpinoidea</i>	fox sedge
<i>Glyceria striata</i>	fowl manna grass
<i>Juncus effusus</i>	soft rush
<i>Panicum virgatum</i>	switchgrass
<i>Scirpus cyperinus</i>	woolgrass
<i>Spartina pectinata</i>	prairie cord grass

Bioswale	
Scientific Name	Common Name
<u>Trees and Shrubs</u>	
<i>Acer saccharinum</i>	silver maple
<i>Aronia melanocarpa</i>	black chokeberry
<i>Celtis occidentalis</i>	hackberry
<i>cornus racemosa</i>	gray dogwood
<i>Physocarpus opulifolius</i>	ninebark
<i>Quercus bicolor</i>	swamp white oak
<i>Salix nigra</i>	black willow
<i>Spiraea alba</i>	meadowsweet
<i>Viburnum lentago</i>	nannyberry
<i>Viburnum trilobum</i>	high bush cranberry
<u>Forbs and Ferns</u>	
<i>Anemone canadensis</i>	Canada anemone
<i>Asclepias tuberosa</i>	butterfly milkweed
<i>Aster laevis</i>	smooth aster
<i>Aster lanceolatus</i>	panicle aster
<i>Aster macrophyllus</i>	big-leaved aster
<i>Aster novae-angliae</i>	New England aster
<i>Aster pilosus</i>	hairy aster
<i>Boltonia asteroides</i>	false aster
<i>Eryngium yuccifolium</i>	rattlesnake master
<i>Euthamia graminifolia</i>	grass-leaved goldenrod
<i>Helianthus grosseserratus</i>	sawtooth sunflower
<i>Heuchera richardsonii</i>	prairie alumroot
<i>Matteuccia struthiopteris</i>	ostrich fern

<i>Monarda fistulosa</i>	wild bergamot
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<i>solidago rigida</i>	stiff goldenrod
<i>tradescantia ohiensis</i>	common spiderwort
<i>Zizia aurea</i>	golden alexanders
<u>Grasses, Sedges and Rushes</u>	
<i>Andropogan gerardii</i>	big bluestem
<i>Bromus ciliatus</i>	fringed brome
<i>Carex vulpinoidea</i>	fox sedge
<i>Elymus canadensis</i>	Canada wild rye
<i>Panicum virgatum</i>	switchgrass
<i>schizachyrium scoparium</i>	little bluestem
<i>sorghastrum nutans</i>	indian grass
<i>Sporobolis heterolepis</i>	prairie dropseed

SECTION 7.4 OFF-ROAD NON-MOTORIZED FACILITIES (SIDEWALKS AND PATHWAYS)

The City of Novi adopted a comprehensive Non-Motorized Master Plan in 2011 as a tool for short-term and long-term planning for the improvement of Non-Motorized Facilities within the City of Novi. This section establishes the minimum requirements for the design of off-road non-motorized facilities within the city, which includes but is not limited to sidewalks, pathways and regional trails within the right-of-way or within public easements.

7.4.1 Requirement

Off-road Non-Motorized Facilities shall be placed in those locations specified in Section 11-256 of the Novi Code of Ordinances, the City of Novi Subdivision Ordinance (Appendix C), and the City of Novi Zoning Ordinance (Appendix A). Site plans should be designed to incorporate all users of the public and private streets including, pedestrians, bicyclists and motor vehicles.

7.4.2 Design Considerations

- A. Standards and Guidelines: All Non-Motorized Facilities shall be designed and constructed in accordance with the following standards and guidelines, in addition to other regulatory standards and the City of Novi Code of Ordinances:
 - 1. *City of Novi Non-Motorized Master Plan*, Greenway Collaborative, 2011
 - 2. *Guide for the Planning, Design, and Operation of Pedestrian Facilities* AASHTO (latest edition)
 - 3. *Guide for the Development of Bicycle Facilities*, AASHTO (latest edition)
 - 4. *Proposed Guidelines for Pedestrian Facilities in the Public Right-of-way*, United States Access Board (latest edition).
 - 5. *Guidance for Installation of Pedestrian Crosswalks on Michigan State Trunkline Highways*, Michigan Department of Transportation, 2014.
 - 6. *Best Design Practices for Walking and Bicycling in Michigan*, Michigan Department of Transportation.
 - 7. *Michigan Manual of Uniform Traffic Control Devices*.
- B. Width: Non-Motorized facility width shall be in accordance with the “Master Plan for Bicycle and Pedestrian Paths” and the following minimum widths.
 - 1. Sidewalks shall be a minimum of five (5) feet wide along local streets.
 - 2. Sidewalks shall be a minimum of six (6) feet wide along collector and arterial streets.

3. Shared Use Pathways and Neighborhood Connectors shall be a minimum of eight (8) feet wide.
 4. Regional trails shall be a minimum of ten (10) feet wide.
- C. Location: Non-Motorized facility location shall be in accordance with the following requirements, unless otherwise approved by the City Engineer:
1. Sidewalks, pathways and trails shall generally be located such that the outside edge is located one (1) foot inside the future right-of-way line. In the case of private streets and roadways, the required sidewalks, pathways, and trails the outside edge should be located a minimum of 15 feet from the back of curb.
 2. Other dimensions for placement related to future right-of-way lines may be permitted by the City Engineer for the enhancement of natural resources, when the topography, existing landscaping, or an existing residence warrants an alternate location.
 3. Non-Motorized facilities shall not be placed closer than five (5) feet from back of curb for a curbed roadway, or twelve (12) feet from edge of pavement of an uncurbed roadway.
- D. Cross-Sections:
1. Sidewalks, Shared Use Pathways, and Neighborhood Connectors shall be constructed of Portland cement concrete. The cross-section shall conform to the minimum standard shown in Figure 7.4-1, unless otherwise approved by the City Engineer.

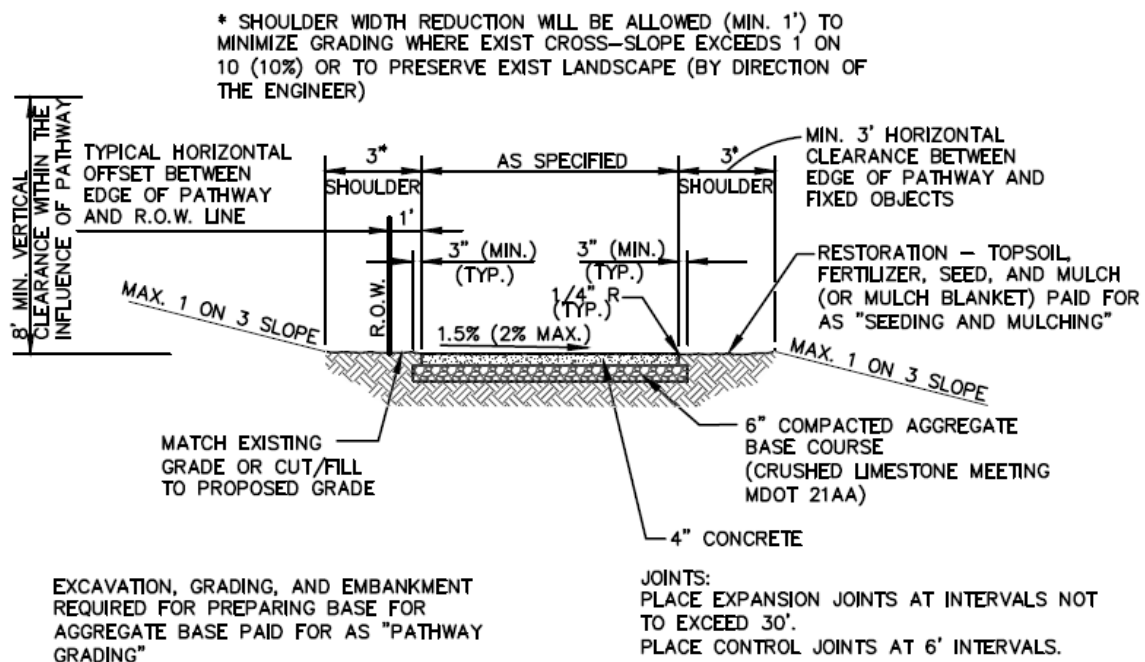


Figure 7.4-1. Standard Cross-Section for Concrete

2. Regional Trails shall be constructed of hot mix asphalt. The cross-section shall conform to the minimum standard shown in Figure 7-4.2, unless otherwise approved by the City Engineer.
3. The aggregate base course shall extend beyond the width of the pavement surface as indicated in Figure 7-4.1 and Figure 7-4.2.
4. The design engineer is responsible for the design of the cross-section based on the soil conditions found in the field.

* SHOULDER WIDTH REDUCTION WILL BE ALLOWED (MIN. 1') TO MINIMIZE GRADING WHERE EXIST CROSS-SLOPE EXCEEDS 1 ON 10 (10%) OR TO PRESERVE EXIST LANDSCAPE (BY DIRECTION OF THE ENGINEER)

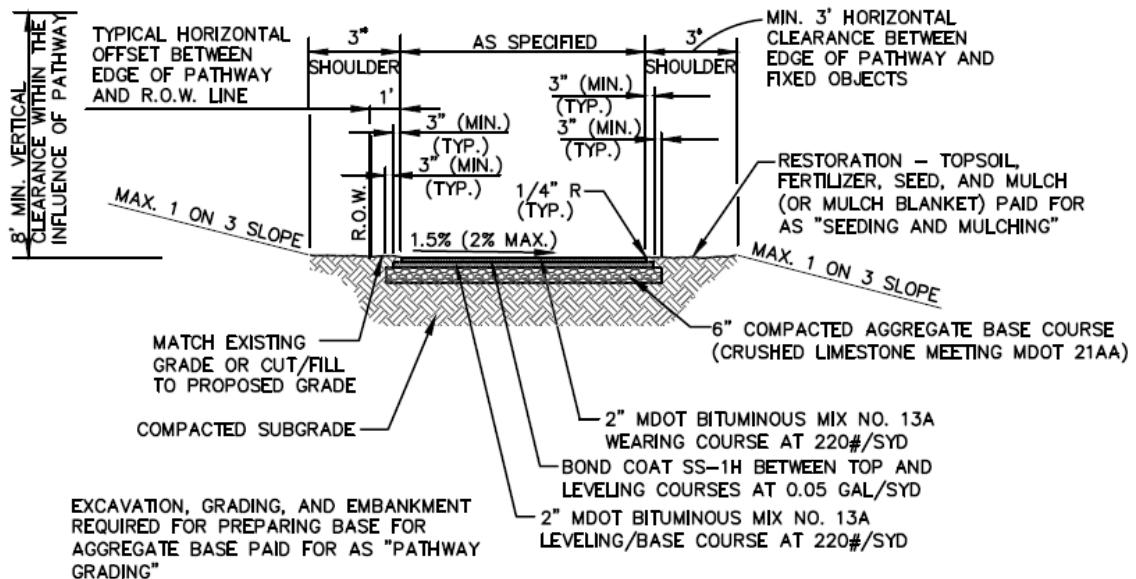


Figure 7.4-2. Standard Cross-Section for Asphalt

E. Slopes and Grade:

1. Non-Motorized facilities located in the right-of-way will generally follow the profile on the traveled road, and elevations shall blend in with the general grading plan of the abutting property and shall not impede drainage to presently established storm structures, ditch drainage, or site drainage swales.
2. Non-Motorized facilities located outside the roadway right-of-way will generally follow the longitudinal slope of the existing ground, with adjustments in grade provided for intersecting drives and streets or to accommodate drainage as appropriate.
3. To the extent possible, the maximum grade of a non-motorized facility shall be five (5.0) percent. Grades in excess of five (5.0) percent may be allowed in accordance with applicable ADA requirements as approved by the City Engineer.

4. Non-Motorized facilities will be sloped toward the road or street, unless existing surface drainage requires reversal of the pathway slope.
5. The maximum constructed cross slope is two (2.0) percent. The design cross-slope shall be 1.5 percent.

F. Clearances:

1. Non-Motorized facilities should be constructed no closer than three (3) feet from fences, trees or other permanent above grade obstructions.
2. The horizontal clearance from trees greater than six (6) inches diameter at breast height (d.b.h.) should be increased when possible to avoid the roots of the tree. As a general rule, the clearance from the tree shall be measured as follows:
 - i. Horizontal clearance shall be four (4) feet around trees less than or equal to eight (8) inches in diameter.
 - ii. Horizontal clearance shall be equal to the diameter of the tree in inches multiplied by one-half ($\frac{1}{2}$) foot per inch for all trees greater than eight (8) inches in diameter. For example, the excavation shall not approach closer than six (6) feet to a twelve-inch diameter tree.
3. Where the path must be closer than four (4) feet to such a tree, a physical barrier or herbicide impregnated barrier cloth must be placed under the path to prevent the tree roots from heaving the path. The area requiring the barrier shall include any portion of the path following within the points as set forth in section 11-50.
4. A minimum vertical clearance of eight (8) feet as measured from the final surface elevation along the entire length of the pathway shall be provided. The clearance shall be increased to 10 feet for shared use pathways and regional trails. Trees shall be professionally pruned to provide the necessary clearance.

G. Drainage and Grading: Construction of a Non-Motorized facility shall include grading of the existing land parallel to the path as shown in the standard cross-section in Section 7.4-2D such that all water drains away from the facility. Drainage on the street side shall be provided by slope grading to the existing ditch or to the back of curb. Typical cross sections shall provide sufficient detail of the work in these areas. Standing water is not allowed on a non-motorized facility. The path shall be designed to prevent the potential for any standing water.

H. Easements: Non-Motorized Facilities for use by the public that are constructed outside of the existing dedicated public right-of-way shall have an easement dedicated to the City and recorded with the County Register of Deeds. The easement shall be reviewed and approved by the City Engineer and the City Attorney prior to recording. Except for cases when a pathway is proposed for construction between two homes as a

neighborhood connector, the width of the permanent easement shall be based on the width of the pathway as indicated below, or as directed by the City Engineer.

Table 7-4.1. Pathway Easement Width Requirements

Width of Non-Motorized Facility	Width of Permanent Easement
5 feet	9 feet
6 feet	10 feet
8 feet	12 feet
10 feet	14 feet

When a pathway is proposed between residential parcels outside of the right-of-way, the pathway shall be constructed in a common area or park, outside of the adjacent parcels, along with an easement granted to the City for use by the public. The minimum width of the common area or park provided for the pathway shall be 20 feet. If it is not possible to provide a common area or park for the pathway as required above, the City Engineer may allow a 20-foot wide dedicated public easement.

I. Pathways and Sidewalks at Intersections:

1. All street crossings shall meet the requirements of the Americans with Disabilities Act and the following requirements:
 - i. All sidewalk ramps shall be constructed of Portland cement concrete.
 - ii. Detectable warning surfaces are required at all barrier free ramps and hazardous vehicular ways and shall be a color that contrasts with the adjacent surface. Detectable warning surfaces must be manufactured of a material approved by the City Engineer and cast into the concrete.
 - iii. The barrier-free ramps and level landing shall comply with the current MDOT standard detail for ADA Sidewalk Ramps and the Americans with Disabilities Act.
2. Pedestrian crosswalks shall be provided at all intersections and sidewalk ramps meeting the requirements above shall be constructed on all corners of an intersection within and adjacent to the project.
3. At street intersections where open ditch drainage prevails, a 12-inch minimum size or larger sixteen-gauge corrugated metal culvert pipe shall be installed and backfilled with Granular Material Class II (MDOT specification) prior to the non-motorized facility construction. The culvert pipe shall have sufficient length to provide for the path width with a grass area two and one-half (2 ½) feet wide each side at top, and a maximum slope of one (1) foot vertical on three (3) feet horizontal to the ditch flow line. The entire area of the filled ditch section, from the ditch bottom to the edges

of the new path, shall be protected with sod or other erosion control measures as approved by the City Engineer.

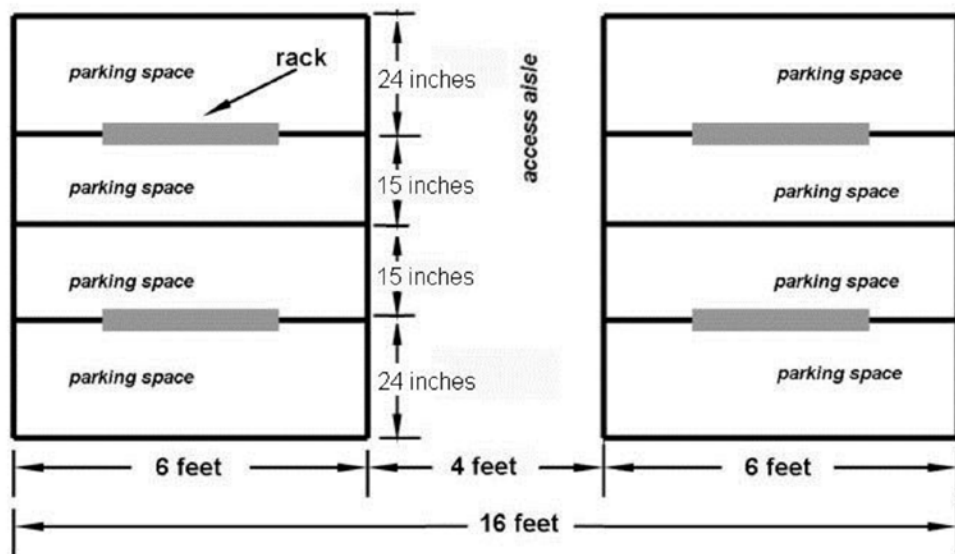
- J. Mid-Block Crossings: Mid-block crossings shall be required at one-half mile intervals along arterial and collector roads as shown in the Non-Motorized Master Plan, or as determined by the City Engineer to facilitate pedestrian movements to schools, parks and other public institutions. The mid-block crossing shall be designed and constructed in accordance with AASHTO guideline for pedestrian facilities and *Guidance for Installation of Pedestrian Crosswalks on Michigan State Trunkline Highways*. Mid-block crossings shall be illuminated and shall have adequate signage in accordance with the Michigan Manual of Uniform Traffic Control Devices.
- K. Driveway Crossings: At drive crossings, non-motorized facilities shall have priority and shall be constructed across driveways. The pavement cross-section (thickness) of the non-motorized facility at drive crossings shall be increased to six (6) inches, except for commercial or industrial driveway crossings which shall have a depth of eight (8) inches.
- L. Boardwalks and Non-Motorized Bridges: A wetland or water course that is regulated by the City or the State may necessitate the construction of a boardwalk or bridge to complete a segment of a non-motorized facility. The width of the bridge or boardwalk shall be a minimum of two (2) feet wider than the width of the adjacent non-motorized facility. The design of a boardwalk shall meet the minimum requirements of the *City of Novi Pathway and Boardwalk Standard Details*. A non-motorized bridge shall be designed by a professional engineer having competence in the field of structural engineering. Bridges and boardwalks require a separate building permit from the City of Novi Community Development Department.
- M. Sidewalks on Private Property: Sidewalks on private property shall meet the general requirements for off-road non-motorized facilities. The developer/property owner is responsible for compliance with the applicable rules and regulations for private development under the Americans with Disability Act.
- N. Bicycle Parking: When bicycle parking is required by the Zoning Ordinance, plans for the layout of bicycle parking facilities shall be in accord with the following minimum requirements:
 - 1. All bicycle parking spaces shall be paved and adjacent to a bicycle rack of the inverted "U" design, that is solid, cannot be easily removed with common tools, provides at least two (2) contact points for a bicycle, is at least three (3) feet in height, and permits the locking of a bicycle through the frame and one (1) wheel with a standard U-Lock or cable in an upright position. The rack shall be securely anchored in concrete or asphalt. Alternative installations and designs may be considered by the City Engineer if the proposed rack design functions similar to the inverted "U" design.

2. All bicycle parking facilities shall be accessible from adjacent street(s) and pathway(s) via a paved route that has a minimum width of six (6) feet.
3. All bicycle parking facilities shall be separated from automobile parking spaces and access aisles by a raised curb, landscape area, sidewalk, or other method that complies with all city ordinances.
4. The layout of the bicycle parking facilities shall be as follows:

Table 7-4.2. Bicycle Parking Standards

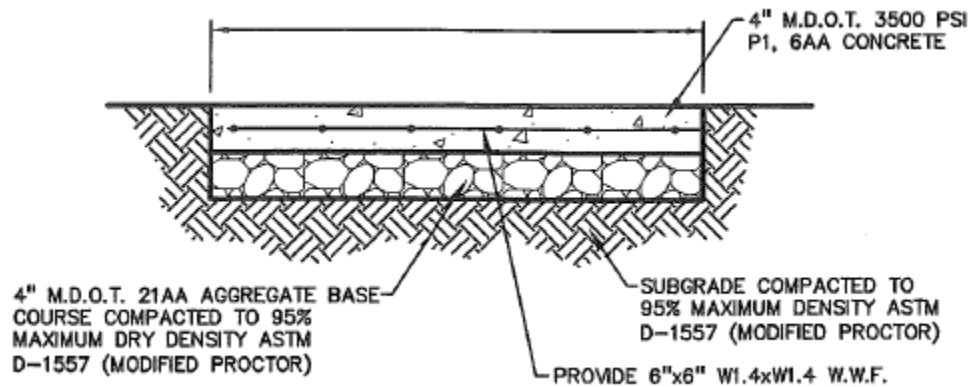
Bicycle Parking	Access Aisle Width	Parking Space Width	Parking Space Length	Total Width Of One Tier Of Spaces Plus Access Aisle	Total Width Of Two Tiers Of Spaces Plus Access Aisle
90°	Four (4) feet	Two (2) feet for single side parking, or two and one-half (2½) feet for double	Six (6) feet	Ten (10) feet	Sixteen (16) feet

Figure 7-4.3. Bicycle Parking Layout



5. The bicycle parking area shall be designed and constructed to meet the minimum cross-section shown in Figure 7.4-4.

Figure 7-4.4. Bicycle Parking Cross-Section



7.4.3 Plans and Specifications

- A. Seal: The plans and specifications shall be sealed by a civil engineer registered in the state of Michigan and shall have imprinted thereon the seal of that engineer in accordance with Public Act 299 of 1980, as amended, and Administrative Rules promulgated under the act.
- B. Plan Requirements: In addition to requirements elsewhere in this manual, plans shall consist of a cover sheet showing a plan view of the complete job, split plan and profile sheets drawn to a scale of one (1) inch equals one hundred (100) feet horizontal or better and one (1) inch equals five (5) feet vertical, and standard detail sheets. Profiles of existing centerline of the roadway, street right-of-way line and parallel drainage facilities are to be provided. The horizontal location of the centerline of each existing driveway within the limits of construction shall also be delineated in the profile view. Sheet size shall be twenty-four (24) inches by thirty-six (36) inches.
- C. Parcel Labels: The length of the frontage of each parcel of land abutting the proposed improvement shall be dimensioned on the plans. Each such parcel shall be identified by its subdivision name and lot number, or by its permanent parcel number, as established and assigned by the City Assessor. The plan shall also show the street address number, if applicable.
- D. Grading and Drainage:
 1. The plan shall include contours at one-foot intervals a minimum distance of 30 feet from the proposed pathway alignment, unless otherwise approved by the City Engineer. The direction of drainage from each parcel shall be indicated by drainage arrows. No drainage shall be directed toward the non-motorized facility.
 2. For any straight run of a non-motorized facility, grades shall be given in percent, with grade elevations provided for intervals not exceeding fifty (50) feet. For pathways with a width of 10-feet or greater, station and length of each vertical curve shall be shown.
 3. A minimum of six (6) spot elevations where the pathway crosses each driveway (one at each corner and two in the center of the

driveway on each side of the pathway) shall be provided. Spot elevations shall also be provided to demonstrate a level landing adjacent to each side of the pathway crossing.

4. Provide a minimum of four spot elevations at the intersection of the proposed pathway with any existing pathway to demonstrate that a turning space has been provided per Americans with Disabilities Act.
 5. No more than $\frac{1}{4}$ " vertical obstacle shall be allowed at each transition between a pathway and any drive approach.
 6. A blow-up detailed grading plan shall be provided for all ramps and level landings when required.
- E. Cross-Section: A standard cross-section for each type of pavement and/or non-motorized facility shall be provided in the plan set. The cross-section shall meet or exceed the standard cross-section provided in Section 7.4.2 of this manual.
- F. Miscellaneous:
1. Elevations shall be on U.S.G.S. datum. City of Novi bench marks shall be shown at least every one thousand two hundred (1,200) feet along the alignment. Street names and right-of-way widths, subdivision names, legend, list of quantities, and other pertinent information shall be shown on the plans. All existing easements shall be shown on the plan.
 2. The plans shall contain a note requiring that all construction shall conform to the city's construction standards.

7.4.4 Construction

- A. Materials: The construction materials shall meet the requirements specified in the applicable section of the state department of transportation's (MDOT) Standard Specification for Construction. The specific materials shall be as indicated in the standard cross-section (Figure 7.4-1 and Figure 7.4-2) or as shown on the plan approved by the City.
1. Portland Cement Concrete; the concrete mixture shall conform to the MDOT requirements listed for Grade of Concrete 35S.
 2. Hot Mix Asphalt; the hot mix asphalt concrete shall conform to the MDOT requirements listed for 36A. Other MDOT mixes including 13A and 5E1 will also be considered per the City Engineer.
 3. Aggregates;
 4. Premolded Joint Fillers;
 5. Concrete Curing Materials.
- B. Submittals: The developer shall provide the following submittals to the City or it's agent for review and approval prior to construction:
1. Shop Drawings
 2. Material Certifications

3. Mix Designs
 4. Substitutions
 5. Manufacturer specifications
- C. Field Quality Control: The engineer shall be responsible for quality control in the field and shall provide all testing results to the City Engineer, or his or her designee, to ensure quality control in the field.
- D. Observation of Work: The developer/contractor shall make the work available for observation by City staff or agents. All non-motorized facilities to be dedicated to the public shall be observed on a full time basis by the City or its agent. Defective work must be corrected prior to acceptance of the improvement.
- E. Tree Protection
1. All trees to be saved should have protective fencing installed prior to construction. Fencing should be installed as far away from the tree trunk as possible and should be inspected prior to construction commencing.
 2. Excavate as far away as possible (minimum of 8'), or as otherwise approved by the City.
 3. Roots over 2" that are broken should be cut flush. This will help the tree recover from its injury.
 4. Any areas adjacent to trees to be saved and where soil will be compacted by equipment should have 4 to 6 inches of woodchips placed in the area to help reduce compaction.
 5. No herbicides should be used in the construction area.
 6. No storage of materials, construction vehicles, and contractor traffic should take place under trees to be saved.
 7. Tree branches shall be pruned for vehicle clearance.
 8. Fertilizer applications before and after construction can enhance tree vigor. A slow-release organic form of nitrogen fertilizer is recommended. A soil-injection fertilizer may be recommended on sites with compacted soils.
- F. Construction:
1. All work shall conform to the requirements specified in the applicable section of the state department of transportation's (MDOT) Standard Specification for Construction.
 2. The General Construction Standards of the Design and Construction Standards applies to non-motorized facility construction.
 3. Non-Motorized facilities shall be flush with abutting curbs and paved surfaces.
 4. Concrete pavement shall meet the minimum design criteria in Figure 7-4.1 and Section 7.4.2(K). The concrete forms must be inspected by the city prior to pouring of concrete. Joints in concrete pathways shall be sawcut. No tooled joints will be allowed.

5. Preparation of base, mixing of materials, and placing and finishing of concrete paving is to be done in accordance with the applicable standards as detailed in "Standard Specifications for Construction," latest edition, published by the Michigan Department of Transportation.
6. Forms shall be clean and straight, composed of wood or metal. The height of the forms shall be the same height as the adjacent concrete section to be poured. The forms shall be staked to line and grade in a manner that will prevent deflection or settlement. Forms shall be oiled before placing PCC.
7. All unstable subgrade material shall be removed and replaced with Class II granular material per Michigan Department of Transportation specification. Subgrade material other than such Class II may be used with prior approval of the engineer.
8. The base shall be thoroughly wetted and the concrete deposited thereon to the proper depth. Concrete shall be vibrated along the forms, compressed and struck-off flush with the top of the forms. The surface shall be floated with a steel float, edges properly tooled, and then finished with a wood float or brush, transverse to the centerline of the pedestrian safety path to provide a nonslip surface. Joints shall be sawcut at the appropriate time and at a spacing interval equal to the width of the pathway. Special care shall be taken when a sawcut joint is in conflict with a structure to ensure that the pattern is revised to avoid cracking.
9. A transverse expansion joint, one-half inch wide, shall be placed the full depth of the pedestrian safety path, at uniform intervals not exceeding fifty (50) feet, at driveways, and where the new walk abuts existing concrete structures. Contraction joints shall be formed every five (5) feet or (6) feet based on the respective pathway width. All joints shall be constructed at right angles to the centerline of the safety path.
10. The concrete shall be cured with white membrane curing compound, wet burlap, or by other methods approved by the City Engineer, as soon as surface moisture has disappeared. Concrete shall not be placed on frozen ground. When the temperature is below forty (40) degrees Fahrenheit, or when freezing temperatures within the next twenty-four-hour period are forecast, concrete shall not be placed unless protection against freezing of the concrete, as required by the City engineer, is provided.
11. Along the frontage of lots in residential subdivisions and abutting cul-de-sacs, a physical barrier or herbicide impregnated barrier cloth shall be placed under the non-motorized facility to prevent street tree roots from heaving the pavement.

END OF SECTION 7.4

Sec. 12-217. - Standards for stormwater management plan approval.

All developments requiring a stormwater management plan shall be designed, constructed, and maintained to prevent flooding and protect water quality. The particular facilities and measures required on-site shall take into consideration the natural features, wetlands, and watercourses on the site; the potential for on-site and off-site adverse stormwater impacts, water pollution, and erosion; and the size of the site. The city strongly encourages the use of low impact development techniques for reducing and managing stormwater runoff.

(1) *General standards for on-site and off-site stormwater management.*

- a. Stormwater management conveyance, storage and infiltration measures and facilities shall be designed to prevent flood hazards and water pollution related to stormwater runoff, to prevent accelerated soil erosion from the proposed development, and shall conform with the requirements specified in the Engineering Design Manual.
- b. Natural topography and site drainage shall be preserved and site grading shall be minimized to the maximum extent reasonably achievable considering the nature of the development.
- c. Unless otherwise approved, stormwater runoff shall be conveyed through swales and vegetated buffer strips so as to decrease runoff velocity, allow for natural infiltration, allow suspended sediment particles to settle, and to remove pollutants. To the fullest extent possible, impervious surfaces should be disconnected from other impervious surfaces.
- d. Runoff rates from detention basins shall conform to the requirements specified in the Engineering Design Manual for the first flush, bankfull, and one-hundred-year storm.
- e. Watercourses shall not be deepened, widened, dredged, cleared of vegetation, straightened, stabilized or otherwise altered without applicable permits or approvals from the city, relevant county agencies and the Michigan Department of Environmental Quality.
- f. Drainage systems shall be designed to protect public health and safety and to facilitate efficient and effective maintenance.
- g. The stormwater management plan shall demonstrate a zero percent increase over the discharge or runoff permitted by applicable law and ordinances in relation to the predevelopment and post-development stormwater runoff.

(2) *Soil erosion control.*

- a. Cutting, filling and grading shall conform with the requirements specified in the Engineering Design Manual.
- b. All development and other earth changes shall be designed, constructed and completed in such a manner that the exposed area of any disturbed land is limited to the shortest practical period of time. Proposed erosion control measures shall be submitted to the city building department for determination that such measures comply with the city's soil erosion control ordinance [chapter 29 of this Code].
- c. Approved soil erosion control measures shall be installed and maintained between the disturbed area and any down gradient watercourses (including rivers, streams, creeks, lakes, ponds and other watercourses), wetlands, roadways and property lines.
- d.

Sediment resulting from accelerated soil erosion shall be removed from runoff water before it leaves the site of the development.

- e. Temporary and permanent soil measures designed and constructed for the conveyance of water around, through or away from the development or earth change area shall be designed to limit the water flow to a non-erosive velocity.
 - f. Temporary soil measures shall be removed after permanent soil measures have been implemented and stabilized. All developments and earth change areas shall be stabilized with permanent soil measures.
 - g. If inland lakes, ponds, rivers, creeks, streams or other watercourses and wetlands are located on or near the site, measures which trap sediment shall be provided. Straw bale berms may be used as temporary stormwater diversion structures but will not be considered sufficient by themselves for trapping sediment on-site. The use of temporary sediment basins, sediment traps, filter fabric, and rock filters in lieu of straw bale berms shall be employed as required as part of a permit. Other measures may be required if reasonably determined to be necessary to protect a watercourse or wetland.
 - h. When it is not possible to permanently stabilize a disturbed area after an earth change has been completed or where significant earth change activity ceases, temporary soil erosion control measures shall be implemented within two (2) calendar days.
 - i. Permanent soil measures for all slopes, channels, ditches, or any disturbed land area shall be completed within fifteen (15) calendar days after final grading or the final earth change has been completed. All temporary soil measures shall be maintained until permanent soil measures are implemented and stabilized.
 - j. Vegetated filter strips, twenty-five (25) feet in width, shall be created or retained along the edges of all lakes, creeks, streams, and other watercourses. As part of permit approval, the width of a particular filter strip may be reduced to the extent it is demonstrated that a portion of the width will serve no useful function, e.g., to the extent the grade is such that water flow will be away from the watercourse and the filter strip does not serve to protect wildlife habitat or other useful function.
 - k. The city shall have the authority to issue stop-work orders for failure to comply with the requirements of this section, provided a proprietor shall be entitled to a hearing before the chief building official or his designee within three (3) business days to determine whether the stop-work order shall continue.
- (3) *Stormwater storage, infiltration and treatment facilities.* Stormwater storage, infiltration and treatment facilities required pursuant to this article shall comply with the requirements specified in the Engineering Design Manual.
- (4) *Discharge of stormwater runoff to wetlands.*
- a. Wetlands will be protected from damaging modification and adverse changes in runoff quality and quantity associated with land developments. Before approval of a final plat or site plan, all necessary wetland permits from the Michigan Department of Environmental Quality (MDEQ) will be in place.
 - b. Direct discharge of untreated stormwater to a natural wetland is prohibited. All runoff from the development will be pretreated to remove sediment and other pollutants prior to discharge to a wetland. Such treatment facilities shall be constructed and operational before property grading begins.

- c. Site drainage patterns will not be altered in any way that will modify existing water levels in protected wetlands without proof that all applicable permits from the MDEQ and/or the city have been obtained. Proof that existing trees and vegetation will not "die off" as a result of any increase in wetlands stormwater discharge will be provided by the applicant's engineer.
- d. Wetland construction, reconstruction, or modification will be overseen by the applicant's qualified professional with specific wetland expertise.
- e. A mandatory period of two (2) years and a performance bond equal to the cost of the total wetland construction project is required as assurance that the constructed wetland will function and thrive.
- f. A permanent filter strip twenty-five (25) feet in width, preferably vegetated with native plant species, shall be maintained or restored around the periphery of wetlands.
- g. Wetlands will be protected during development by appropriate soil erosion and sediment control measures that are continuously maintained throughout the construction phase.

(Ord. No. 168, § 1, 5-20-02; Ord. No. 07-168.01, Pt. I, 9-24-07)

DIVISION 4. - PLAN REQUIREMENTS

Sec. 12-211. - Preapplication conference.

If required by the city, a preapplication conference shall be held with the city engineer prior to the submittal of a stormwater management plan. The purpose of the preapplication conference is to provide information about plan submittal requirements, and city and county regulations.

(Ord. No. 168, § 1, 5-20-02)

Sec. 12-212. - Contents of stormwater management plan.

(a) *Plan presentation.*

- (1) Through plans, illustrations, reports, and calculations, the stormwater management plan shall display the required information specified in part one of the appendix following this article.
- (2) The stormwater management plan must be sufficiently detailed to specify the type, location, and size of stormwater management facilities, using preliminary calculations. Detailed construction drawings are not required at the stormwater management plan review stage.
- (3) If it is proposed to develop a parcel in two (2) or more phases, the stormwater management plan shall be prepared and submitted for the total project unless a variance has been approved by the city council. Moreover, it shall be demonstrated that a sufficient "stand alone" plan shall exist upon the completion of each phase, i.e., assuming that future phases shall never be developed.

(b) *Plan preparation.* The stormwater management plan shall be prepared by a registered civil engineer or registered landscape architect, and shall meet the requirements specified in part one of the appendix [following this article]. Other persons and professionals may assist in the preparation of the plan.

(c) *Scale for mapping.* The stormwater management plan shall be drawn to a scale as specified in part one of the appendix [following this article].

(d) *Required information.*

- (1) *Identification and description.* The following information is required for all stormwater management plans:
 - a. Information specified in part one of the appendix.
 - b. Zoning classification of petitioner's parcel and all abutting parcels.
- (2) *Existing conditions.* The information describing existing site conditions for all stormwater management plans as specified in part one of the appendix.
- (3) *Proposed conditions.* A description of the site after the proposed development as specified in part one of the appendix.

(Ord. No. 168, § 1, 5-20-02)

Sec. 12-213. - Plan submission.

- (a) Four (4) copies of the stormwater management plan required under subsection 12-201(1) shall be submitted to the planning department.
- (b) For developments subject to site plan review, the proprietor shall submit a stormwater management plan to the planning department at the time that the preliminary site plan is submitted.

- (c) For developments subject to subdivision plat review, the proprietor shall submit a stormwater management plan to the planning department at the time that the tentative preliminary plan is submitted.
- (d) For other earth changes or activities subject to stormwater management plan requirements, the plan shall be submitted to the building department or planning department (as applicable) before construction drawings are submitted.
- (e) Compliance with the requirements of this article does not eliminate the need for the proprietor to obtain required permits and approvals from county and state agencies. Such permits and approvals include, but are not limited to, soil erosion permits from the city building department, drainage approvals from the Oakland County Drain Commissioner, road drainage approvals from the Oakland County Road Commission, wetlands permits from the city and Michigan Department of Environmental Quality, and dam construction permits from the Michigan Department of Natural Resources.
- (f) Compliance with the requirements of this article does not eliminate the need for the proprietor to comply with other applicable city ordinances and regulations.

(Ord. No. 168, § 1, 5-20-02)

Sec. 12-214. - Revision of plan.

If it becomes necessary to alter a development or earth change proposal after the stormwater management plan has been approved, a revised stormwater management plan must be submitted. All requirements and standards for stormwater management plans (division 5) shall apply.

(Ord. No. 168, § 1, 5-20-02)

Sec. 12-215. - Review procedures.

(a) *Planning commission review.*

- (1) The planning commission shall, following recommendation by the city engineer, review appropriate stormwater management plans to assure compliance with the approval standards listed in section 12-217.
- (2) Engineered site grading plans do not require planning commission review.
- (3) When the stormwater management plan appears on the planning commission's agenda for the first time, it will be distributed to city staff as applicable.
- (4) If the planning commission determines that all of the required information has not been received, the proprietor may request that the matter be tabled to allow for the submittal of the required information.
- (5) If the planning commission is the approving body for the proposed development or activity for which the plan has been submitted, the planning commission shall either approve, approve with conditions, or deny approval of the plan. If the planning commission is the recommending body to the city council for the proposed development or activity for which the plan has been submitted, the planning commission shall make a recommendation to the city council to approve, approve with conditions, or deny approval shall be made by the planning commission.

(b) *City council review.* If the city council is the final approving body for the proposed development or activity for which the plan has been submitted, the following shall apply:

- (1) The stormwater management plan approval request shall be placed on the city council agenda after recommendation by the planning commission.
- (2)

Following completion of its review of the stormwater management plan, the city council shall approve or deny the proposed stormwater management plan, with or without modifications and/or conditions.

(Ord. No. 168, § 1, 5-20-02)

Sec. 12-216. - Review fees.

The city council shall establish application fees and escrow requirements by resolution. Fees and escrow account payments shall be sufficient to cover administrative and technical review costs anticipated to be incurred by the city including the costs of on-site inspections.

(Ord. No. 168, § 1, 5-20-02)

Sec. 12-217. - Standards for stormwater management plan approval.

All developments requiring a stormwater management plan shall be designed, constructed, and maintained to prevent flooding and protect water quality. The particular facilities and measures required on-site shall take into consideration the natural features, wetlands, and watercourses on the site; the potential for on-site and off-site adverse stormwater impacts, water pollution, and erosion; and the size of the site. The city strongly encourages the use of low impact development techniques for reducing and managing stormwater runoff.

(1) *General standards for on-site and off-site stormwater management.*

- a. Stormwater management conveyance, storage and infiltration measures and facilities shall be designed to prevent flood hazards and water pollution related to stormwater runoff, to prevent accelerated soil erosion from the proposed development, and shall conform with the requirements specified in the Engineering Design Manual.
- b. Natural topography and site drainage shall be preserved and site grading shall be minimized to the maximum extent reasonably achievable considering the nature of the development.
- c. Unless otherwise approved, stormwater runoff shall be conveyed through swales and vegetated buffer strips so as to decrease runoff velocity, allow for natural infiltration, allow suspended sediment particles to settle, and to remove pollutants. To the fullest extent possible, impervious surfaces should be disconnected from other impervious surfaces.
- d. Runoff rates from detention basins shall conform to the requirements specified in the Engineering Design Manual for the first flush, bankfull, and one-hundred-year storm.
- e. Watercourses shall not be deepened, widened, dredged, cleared of vegetation, straightened, stabilized or otherwise altered without applicable permits or approvals from the city, relevant county agencies and the Michigan Department of Environmental Quality.
- f. Drainage systems shall be designed to protect public health and safety and to facilitate efficient and effective maintenance.
- g. The stormwater management plan shall demonstrate a zero percent increase over the discharge or runoff permitted by applicable law and ordinances in relation to the predevelopment and post-development stormwater runoff.

(2) *Soil erosion control.*

- a. Cutting, filling and grading shall conform with the requirements specified in the Engineering Design Manual.
- b.

All development and other earth changes shall be designed, constructed and completed in such a manner that the exposed area of any disturbed land is limited to the shortest practical period of time. Proposed erosion control measures shall be submitted to the city building department for determination that such measures comply with the city's soil erosion control ordinance [chapter 29 of this Code].

- c. Approved soil erosion control measures shall be installed and maintained between the disturbed area and any down gradient watercourses (including rivers, streams, creeks, lakes, ponds and other watercourses), wetlands, roadways and property lines.
- d. Sediment resulting from accelerated soil erosion shall be removed from runoff water before it leaves the site of the development.
- e. Temporary and permanent soil measures designed and constructed for the conveyance of water around, through or away from the development or earth change area shall be designed to limit the water flow to a non-erosive velocity.
- f. Temporary soil measures shall be removed after permanent soil measures have been implemented and stabilized. All developments and earth change areas shall be stabilized with permanent soil measures.
- g. If inland lakes, ponds, rivers, creeks, streams or other watercourses and wetlands are located on or near the site, measures which trap sediment shall be provided. Straw bale berms may be used as temporary stormwater diversion structures but will not be considered sufficient by themselves for trapping sediment on-site. The use of temporary sediment basins, sediment traps, filter fabric, and rock filters in lieu of straw bale berms shall be employed as required as part of a permit. Other measures may be required if reasonably determined to be necessary to protect a watercourse or wetland.
- h. When it is not possible to permanently stabilize a disturbed area after an earth change has been completed or where significant earth change activity ceases, temporary soil erosion control measures shall be implemented within two (2) calendar days.
- i. Permanent soil measures for all slopes, channels, ditches, or any disturbed land area shall be completed within fifteen (15) calendar days after final grading or the final earth change has been completed. All temporary soil measures shall be maintained until permanent soil measures are implemented and stabilized.
- j. Vegetated filter strips, twenty-five (25) feet in width, shall be created or retained along the edges of all lakes, creeks, streams, and other watercourses. As part of permit approval, the width of a particular filter strip may be reduced to the extent it is demonstrated that a portion of the width will serve no useful function, e.g., to the extent the grade is such that water flow will be away from the watercourse and the filter strip does not serve to protect wildlife habitat or other useful function.
- k. The city shall have the authority to issue stop-work orders for failure to comply with the requirements of this section, provided a proprietor shall be entitled to a hearing before the chief building official or his designee within three (3) business days to determine whether the stop-work order shall continue.

(3) *Stormwater storage, infiltration and treatment facilities.* Stormwater storage, infiltration and treatment facilities required pursuant to this article shall comply with the requirements specified in the Engineering Design Manual.

(4) *Discharge of stormwater runoff to wetlands.*

- a. Wetlands will be protected from damaging modification and adverse changes in runoff quality and quantity associated with land developments. Before approval of a final plat or site plan, all necessary wetland permits from the Michigan Department of Environmental Quality (MDEQ) will be in place.
- b. Direct discharge of untreated stormwater to a natural wetland is prohibited. All runoff from the development will be pretreated to remove sediment and other pollutants prior to discharge to a wetland. Such treatment facilities shall be constructed and operational before property grading begins.
- c. Site drainage patterns will not be altered in any way that will modify existing water levels in protected wetlands without proof that all applicable permits from the MDEQ and/or the city have been obtained. Proof that existing trees and vegetation will not "die off" as a result of any increase in wetlands stormwater discharge will be provided by the applicant's engineer.
- d. Wetland construction, reconstruction, or modification will be overseen by the applicant's qualified professional with specific wetland expertise.
- e. A mandatory period of two (2) years and a performance bond equal to the cost of the total wetland construction project is required as assurance that the constructed wetland will function and thrive.
- f. A permanent filter strip twenty-five (25) feet in width, preferably vegetated with native plant species, shall be maintained or restored around the periphery of wetlands.
- g. Wetlands will be protected during development by appropriate soil erosion and sediment control measures that are continuously maintained throughout the construction phase.

(Ord. No. 168, § 1, 5-20-02; Ord. No. 07-168.01, Pt. I, 9-24-07)

Sec. 12-218. - Off-site stormwater management.

(a) *Requirements.*

- (1) In lieu of on-site stormwater detention, the use of off-site stormwater conveyance, infiltration, and/or detention areas may be proposed. Off-site stormwater management facilities shall be designed to comply with the requirements specified in the Engineering Design Manual and all other standards provided by this article that are applicable to on-site facilities.
- (2) Off-site stormwater management areas may be shared with other landowners, provided that the terms of the proposal are approved by the city council and city attorney.
- (3) Adequate provision and agreements providing for maintenance and inspection of stormwater management facilities shall be made by recorded instrument, including an access easement, approved by the city.
- (4) Accelerated soil erosion shall be managed off-site as well as on-site.

(b) *Performance guarantees, inspections, maintenance, and enforcement.* All provisions of divisions 7 and 9 of this article, and of chapter 26.5 shall apply to off-site stormwater conveyance and detention. Additional requirements for maintenance of stormwater management facilities provided in the Engineering Design Manual shall also apply.

(Ord. No. 168, § 1, 5-20-02; Ord. No. 04-103.10, § 3, 9-13-04; Ord. No. 07-168.01, Pt. I, 9-24-07)

Secs. 12-219, 12-200. - Reserved.

APPENDIX H
Pollution Prevention and Good Housekeeping

STANDARD OPERATING PROCEDURE POLLUTION PREVENTION AND GOOD HOUSEKEEPING

GENERAL PROCEDURES

PREPARED FOR:

THE CITY OF NOVI
26300 LEE BEGOLE DR., NOVI, MICHIGAN 48375



APRIL 2016

SECTION A – PURPOSE

The Michigan Department of Environmental Quality (MDEQ) National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Phase II Stormwater Discharge Permit Application requires a description of current and proposed BMPs to meet the minimum control measure requirements for the Pollution Prevention and Good Housekeeping Program to the maximum extent practicable to prevent or reduce the discharge of pollutants from municipal facilities and operations.

SECTION B – FACILITY ASSESSMENT AND PRIORITIZATION

City of Novi owned and operated facilities have been assessed for their potential to discharge pollutants to the waters of the state. Each facility was evaluated based on the following criteria as outlined in the NPDES permit application:

1. Amount of urban pollutants stored at the site (i.e. sediment, nutrients, metals, hydrocarbons, pesticides, fertilizers, herbicides, chlorides, trash, bacteria, or other site-specific pollutants)
2. Identification of improperly stored materials
3. Potential for polluting activities to be conducted outside (i.e. vehicle washing)
4. Proximity to water bodies
5. Poor housekeeping practices
6. Discharge of pollutants of concern to impaired waters

Based on these criteria, the potential for each facility to discharge pollutants to the waters of the state were rated high, medium, or low. For low priority facilities where no assessment factors are present, catch basin cleaning and street sweeping will be performed as indicated in the applicable procedures for these activities. For medium priority facilities, appropriate BMPs are considered based on the assessment factors present to prevent or minimize the potential for pollutants from entering surface waters of the state. High priority facilities have specific procedures that are included in this document.

SECTION C – UPDATES AND PRIORITY REVISION

This inventory shall be updated within 120 days as facilities and structural stormwater controls are added, removed, or no longer owned or operated by the applicant. Priority level assessments shall be revised within 120 days of discharging stormwater at a new facility, or when the storage of materials, equipment, or vehicles changes at a facility.

SECTION D – MUNICIPAL INVENTORY AND ASSESSMENT

The following table identifies the City's owned or operated facilities with a discharge of stormwater to surface waters of the state. **Table 1** includes a list of properties owned or operated by the City that has stormwater controls on site and provides the estimated number of stormwater structural controls (i.e. catch basins, detention basins, etc.) at each site, along with the priority level of potential discharge of pollutants to waters of the state.

Table 1

Facility Name	Structural Controls	Priority Level	Assessment Factors	BMP's Implemented
DPS Facility	Catch Basins (10) Storm Manholes (5) Underground Storage Tank (3) Above Ground Storage Tank (1) Dumpsters (7) Materials Stockpiles (9) Salt Dome (1) Swirl Concentrator (1) Brine Tanks (2)	High	1, 3, 4	See Section E
Civic Center	Catch Basins (33) Storm Manholes (15) Detention Basins (3) Ditch (5)	Low	1	Catch basin cleaning Street sweeping Basin Maintenance Ditch Maintenance
Fire Station #1	Catch Basins (9) Storm Manholes (2)	Low	1	Catch basin cleaning Street sweeping
Fire Station #3	Catch Basins (2) Storm Manholes (1)	Low	1	Catch basin cleaning Street sweeping
Fire Station #4	Catch Basins (9) Detention Basin (1)	Low	1	Catch basin cleaning Street sweeping Basin Maintenance
Fuerst Park	Catch Basins (5) Storm Manholes (1)	Low	1	Catch basin cleaning Street sweeping
Novi Ice Arena	Catch Basins (9) Storm Manholes (8) Detention Basins (1) Ice Shavings (1)	Low	1	Catch basin cleaning Street sweeping Basin Maintenance
Lakeshore Park	Catch Basins (7) Dumpsters (1) Detention Basin (1)	Low	1	Catch basin cleaning Basin Maintenance
Rotary Park	Catch Basins (1) Storm Manholes (1) Rain Garden (1)	Low	1, 4	Catch basin cleaning Street sweeping
Novi Senior Center	Catch Basins (17) Detention Basins (1)	Low	1	Catch basin cleaning Street sweeping Basin Maintenance
Community Sports Park	Catch Basins (12) Detention Basins (1) Dumpsters (2) Materials Stockpiles (2)	Low	1	Catch basin cleaning Street sweeping Basin Maintenance
Wixom/11 Mile Park	Catch Basins (4)	Low	1	Catch basin cleaning Street sweeping
Pavilion Shore Park	Catch Basins (18) Storm Manholes (10)	Low	1	Catch basin cleaning Street sweeping

In addition to the properties in Table 1, the City also owns other lots with no structural stormwater controls, including parks and vacant or wooded lots, which total 98 parcels.

SECTION E –SITE SPECIFIC SOP FOR HIGH PRIORITY SITES

The MDEQ NPDES Phase II Stormwater Discharge Permit Application requires a standard operating procedure (SOP) for identifying the structural and non-structural stormwater controls implemented and maintained to prevent or reduce pollutant runoff at each facility with the high potential for pollutant runoff.

E.1 Inventory and Description of Materials and Activities

All of the City's Department of Public Service (DPS) operations are conducted at their 26300 Lee BeGole Drive facility. This site is considered a high priority due the following operations:

DPS Facility – 26300 Lee BeGole Drive

- Fuel Storage and Fueling
- Maintenance and cleaning of vehicles and equipment
- Salt Storage
- Stockpiled materials
- Significant dust or particulate generating processes

SECTION F –CATCH BASIN MAINTENANCE PRIORITY

Catch basins that are inspected and maintained by the City have been prioritized for routine inspection, maintenance, and cleaning. The criteria for the priority levels that include low, medium, and high are defined as follows:

Low Priority – Catch basins that are of low priority have very little sediment accumulation and do not require routine maintenance. Low priority catch basins are inspected annually and on an as needed basis based on complaints or by DPS staff during normal work activities.

Medium Priority – Catch basins that are of medium priority have a higher rate of sediment accumulation and will require maintenance more frequently than low priority catch basins.

High Priority – Catch basins that are of high priority have a high rate of sediment accumulation and will require regular routine maintenance and inspection. These catch basins are typically located in areas where sediment is easily mobilized and transported by runoff.

All of the City's catch basins have very little sediment accumulation rates, require little maintenance and are of low priority. Catch basins that prompt resident complaints or are subject

to isolated instances where structures are plugged or damaged will be maintained and inspected by DPS as needed. At that time, it will be determined if the catch basin will require maintenance on a more frequent interval and warrants a reclassification to a medium priority rating. In the event the priority rating of a catch basin is changed, or new catch basins are constructed, this procedure will be updated and revised to reflect the change in priority within 120 days.

SECTION G – CATCH BASIN INSPECTION, MAINTENANCE, AND CLEANING

Catch basins are visually inspected during cleaning activities, during normal work activities or if a complaint is registered by a resident. A visual inspection of the structure will identify any structural defects which may include collapse, cracking, frame damage, pipe collapse, blockage, etc. and will be documented using a standardized form. Structure repairs are prioritized based on public safety concerns. City owned catch basins are inspected concurrently with cleaning activities once per permit cycle (1/5 of City owned catch basins per year). DPS field staff utilizes a Vac-truck to remove all solids and liquids from the structure to the extent possible. At no time is collected sediment and water allowed to be discharged back into the storm sewer system during the cleaning process. Catch basins that are located on private property are not inspected, cleaned, or maintained by the City.

SECTION H – DISPOSAL OF COLLECTED MATERIAL

Collected material from catch basin maintenance and street sweeping activities is transported to the City's DPS facility located at 26300 Lee BeGole Drive, where it is stored in an unpaved stockpile area with perimeter controls comprised of an earthen berm. The spoils are allowed to dewater and are then transported off-site and disposed of by a third party.

SECTION I –STREET SWEEPING PRIORITIZATION

City owned and maintained streets have been prioritized for street sweeping. The criteria for the priority levels that include low, medium, and high are defined as follows:

Low Priority – Residential streets within the City are of low priority due to their minimal sediment accumulation rates. They are generally swept biannually.

Medium Priority – Major roads throughout the City are of medium priority due to the higher rate of sediment accumulation rates in comparison to low priority residential streets. Medium priority areas are swept at least biannually and as-needed determined by DPS field staff.

High Priority – Areas that are of high priority have a high rate of sediment accumulation and will require regular, frequent sweeping. These areas are typically located in areas where sediment is easily mobilized and transported by runoff. Additionally, areas that prompt resident complaint or are subject to excessive road sediments are also considered a high priority area. There are currently no areas that have been assigned a high priority rating due to excessive road sediments and resident complaints. However, if DPS receives

a complaint, a determination of the area will be made by DPS staff to increase sweeping on a more frequent interval as well as a reclassify the area to high priority rating.

In the event a priority rating is changed, or new City owned streets are constructed, this procedure will be updated and revised to reflect the change in priority within 120 days.

Street sweeping activities are conducted by City DPS staff using mechanical sweeping equipment according to manufacturer's specifications. Collected sediment from street sweeping activities is disposed of as described in Section H. On occasion, the City also retains the services of a licensed contractor to conduct street sweeping for some areas of the City that are determined on a case by case basis.

SECTION J – WINTER OPERATIONS

The City's DPS field staff applies rock salt and brine as part of their deicing procedures during the winter months. Bulk storage of road salt and brine is located at the City's DPS facility.

J.1 Salt Storage and Loading

The City has one (1) salt storage structure consisting of a domed building, with a floor that is comprised of an impervious cement pad. The building is not located within 50 feet of a lake shore, stream bank, or wetland, nor is it located in a 100-year floodplain.

The salt dome is completely enclosed and has a concrete loading pad. The loading area is swept regularly and maintained to be free of salt residue. Salt storage and application training is performed annually to DPS staff to minimize any track-out from loading operations.

J.2 Brine Storage and Loading

The City has two (2) 2,500-gallon brine storage tanks that are located on an uncovered impervious cement pad next to the main DPS building. The paved tank storage area is below grade and surrounded by concrete curbing. The drain for the secondary containment is maintained in the off position at all times and connected to the sanitary sewer. In the event of a brine spill or release, spilled liquid is confined to the storage area. There are not catch basins or drainage outlets location near the brine storage area.

SECTION K – FUEL STORAGE AND FUELING

The City's DPS facility currently has three (3) underground storage tanks, each with a maximum capacity of 10,000 gallons, which store gasoline (2) and diesel fuel (1). There is also one (1) above ground storage tank with a capacity of 1,000 gallons that stores waste oil. Part 5 Rules indicate that fuel storage areas "shall be designed, constructed, maintained, and operated to prevent the release of polluting materials through sewers, drains, or otherwise directly or indirectly into any public sewer system or to the surface or groundwater's of this state." The City has met this requirement through the proper storage and pollution prevention methods currently in place. These include the following:

- The underground gasoline and diesel fuel tanks are located outside within a designated fueling area. All tanks are equipped with an emergency power shut-off, leak detection and volume monitoring controls. They are filled weekly or on an as-needed basis.
- The above ground tank is single-walled, comprised of steel, and located next to the garage on a paved area. This tank also has secondary containment measures.
- All bulk liquid tanker delivery vehicles will only be allowed on site if contact has been made with properly trained personnel and it has been confirmed that these personnel will be present at the delivery point.
- Properly trained personnel will be in attendance to monitor the entire transfer process. They are authorized to terminate or to order the driver to terminate the transfer and have the driver move the tanker in case of an emergency. Attending personnel will be alert, have an unobstructed view of the cargo tank connections and be within 25 feet of the cargo tank during transfer operations.
- Properly trained DPS staff will direct the tanker for proper positioning, verify, and provide access to the correct fill port. Access to other fill ports or unlocking pipeline caps in anticipation of other delivery vehicles is strictly prohibited.
- Properly trained DPS staff will ensure a potential spill or release cannot enter storm drains by placing a protective barrier on or around affected storm drains (i.e. spill blanket or absorbent sock).
- Wheel chocks or other approved methods to prevent the tanker from moving during the transfer process or driving off without following proper disconnection practices will be required.
- Inspection of the truck to ensure that there are no leaks will be conducted before and after the transfer operation.
- Connected hoses and connections will be reviewed and verified prior to the transfer.
- The available volume of the tank will be verified prior to transfer to prevent over-filling.
- During removal of the transfer lines, trained staff will ensure that excess material is drained into the appropriate receiving tank or receptor to prevent a release of materials to the environment.
- Trained staff will monitor the termination process and inspect the lower most tanker manifold for evidence of leaks or damage prior to the tanker's departure.
- A spill kit will be stationed next to the storage tanks at all times.

A fueling log is maintained to track and record the volume of fuel dispersed for City vehicles and equipment. Completion of these logs is mandatory and used as secondary control to track the volume of fuel stored in the tanks.

SECTION L – ROAD, PARKING LOT, AND SIDEWALK MAINTENANCE

Road, parking lot, and sidewalk maintenance activities includes pothole repair, sidewalk repair/replacement, and curb and gutter repair. These services are addressed by DPS field staff as determined in the field on an as needed basis. Materials are purchased in quantities as needed to reduce waste. Left-over materials are stored in designated stockpile areas at the City DPS facility and covered with a tarp. In cases where a contractor is retained to perform these activities, a City representative is on site to oversee the work and ensure that left over material, concrete washout, and other associated pollutants are disposed of properly. Disposing of concrete washout and other excess repair materials into the storm sewer is strictly prohibited by the City.

L.1 Stockpiled Materials

Designated stockpile areas are located on the east side of the field services complex and on the south side of the property adjacent to 11 Mile Road. Materials are stockpiled at these locations infrequently and include topsoil, sand, gravel, and other inert earthen materials. All stockpiles have perimeter controls in place to prevent erosion which are comprised of either earthen berms or precast concrete blocks that are positioned at rear and sides of the stockpile. The fronts of the concrete bins are left open to provide access for loading. The storage yard is sloped toward the northwest and has a silt fence along that side to control sedimentation. Stockpiles are temporarily stabilized when left undisturbed for more than 30 days.

SECTION M – VEHICLE WASHING AND MAINTENANCE

Vehicle maintenance activities are conducted by DPS staff for the City's entire vehicle fleet, except for police vehicles. Maintenance of police vehicles are conducted at the Police Department on 10 Mile Road. Maintenance activities conducted by City staff include, but are not limited to, oil changes and other vehicle fluids, brakes, tune ups, and general repair tasks. All vehicle maintenance fluids are stored indoors in minimal quantities, and all vehicle maintenance activities are conducted indoors. Floor drains within the DPS building are connected to an oil/water separator which discharges into the sanitary sewer. Floor drains within the Police Department's maintenance are also connected to the sanitary sewer. A maintenance log is maintained to document all vehicle maintenance and repair activities.

Vehicle washing activities are conducted indoors. Vehicle wash water is discharged into floor drains that are connected to the sanitary sewer system.

SECTION N – OTHER STRUCTURAL STORMWATER CONTROLS

In addition to implementing the catch basin maintenance and street sweeping programs, the City also has other structural controls that are located on City owned and operated properties throughout the City.

N.1 Drainage Ditch Inspection/Maintenance

The routine inspection of drainage ditches located on City owned properties (i.e. parks) consists of visual evaluation of blockages or excessive sedimentation. Inspections generally occur during the course of daily park operations, or when complaints received by the City warrant an inspection. In most cases, follow up maintenance activities involve the removal of logjams or other debris that has accumulated within the ditch.

N.2 Detention Basin Inspection/Maintenance

Detention basins that are owned and operated by the City are inspected on a monthly basis. Inspections should assess the vegetation, erosion, flow channelization, bank stability, inlet/outlet conditions, embankment, and sediment and debris accumulations. Sediment should be removed from the basin forebay. If it is determined that maintenance activities are needed, the City will document the needed maintenance actions using a standardized inspection form and perform any maintenance activities as needed.

N.3 Swirl Concentrators

The City currently maintains one (1) swirl concentrator that is located at the DPS facility. At a minimum, inspections should occur twice per year in the spring and fall and involve a visual inspection of the amount of sediment that has accumulated in the sump. Cleaning of the unit should be completed when sediment has accumulated to a depth of two feet. Cleaning should be completed during a period of dry weather when no flow is entering the unit. After removing the manhole lid, the sediment can be removed from the unit using a Vac-truck. After all of the solids have been removed, replace the manhole lid securely to prevent the leakage of stormwater runoff from entering the unit from above.

N.4 Secondary Containment

The on-site AST is placed in secondary containment to mitigate spills and leaks. Containment measures are comprised of a self contained, steel tray that is not equipped with an outlet. Secondary containment measures are inspected over the course of daily operations by DPS staff and during waste disposal operations. If DPS staff observes that the secondary containment structure is nearing capacity (typically from precipitation), a licensed waste hauler is contracted to pump out the structure using a Vactor truck. Collected liquids are transported and disposed at an appropriate wastewater treatment facility by the third party.

N.5 On-Site Waste Disposal

Five (5) recycling receptacles maintained by the Recourse Recovery and Recycling Authority of Southern Oakland County (RRRASOC) are located north of the Field Services Complex on Lee BeGole Drive. One (1) dumpster for general refuse and one (1) dumpster for scrap metal are kept on-site at the Field Operations Complex. None of the dumpsters or receptacles is used for the disposing of hazardous materials. When not in use, the lids for both the recycling receptacles and the dumpsters are closed.

The City of Novi also participates in an annual household hazardous waste day administered by RRRASOC held at Power Park on the Civic Center Campus (45175 W. Ten Mile Road).

In the event additional structural stormwater controls are constructed, this procedure will be updated and revised to include the new controls within 120 days.

SECTION O – NON-STRUCTURAL CONTROLS

The City of Novi is committed to employing preventative maintenance practices through the use of several nonstructural controls to prevent stormwater pollution. These nonstructural controls are everyday types of activities undertaken by employees at the facility. The non-structural controls implemented at the DPS facility are as follows:

O.1 Routine Inspections and Good Housekeeping Procedures

Preventive maintenance involves the regular inspection, testing, and cleaning of facility equipment, vehicles, and operational systems. DPS foremen meet with field staff on a daily basis to discuss daily assignments and objectives. A routine inspection is conducted by facility staff during site walkthroughs during normal operations activities. The purpose of these inspections is to identify and prevent conditions that could lead to stormwater pollution. A log of corrective actions will be kept on file using the City's computer system.

Staff inspects all vehicles consistent with Commercial Drivers License Procedures, and performs detailed vehicle inspections every month. Completed vehicle maintenance records and fueling logs are kept on file at the DPS facility.

Part 5 rules also require surveillance of polluting materials. The routine inspections will include this information for the salt storage and fueling areas.

O.2 Comprehensive Site Inspections

The comprehensive site inspection will include the areas and equipment identified in the preventive maintenance program, good housekeeping procedures, a review of the routine preventive maintenance reports, and any other paperwork associated with this SOP. All DPS related activities will be evaluated during the comprehensive inspection. In contrast to the routine inspections, comprehensive inspections will focus on areas that have a reasonable potential for significant materials to contaminate stormwater runoff. The comprehensive site inspection for DPS areas will be conducted every (six) 6 months which generally coincides with a planned cleaning of the entire facility. Documentation of the comprehensive site inspection results will be prepared and kept on file.

SECTION P – NEW APPLICANT OWNED FACILITIES

In the event the City acquires or constructs new structural stormwater controls, the design of these structures will comply with the stormwater standards that have been established by

Oakland County. Site plans will be reviewed by the City, or its consultants, to ensure the appropriate standards are met.

SECTION Q – CERTIFIED PESTICIDE APPLICATOR

IT-Facilities has certified pesticide applicators on staff and regularly utilizes pesticides, herbicides, and fertilizers on City owned properties on a regular basis. The City also contracts the services of a pesticide application contractor that possesses a state applicator's license. Any application activities that occur are overseen by a City representative to ensure quality of work and proper application and disposal.

SECTION R – EMPLOYEE TRAINING

Employee training programs will be implemented to inform appropriate personnel at all levels of responsibility of safety, environmental impacts, and good housekeeping practices. The City participates in training opportunities that are made available by SEMCOG, Wayne County, the Alliance of Rouge Communities, and others as deemed appropriate. Employee training components for the City's DPS staff includes:

Employees Trained	Training Description and Frequency
New Novi DPS Employees	Upon hire, employees will: • Read and become familiar with the City of Novi's SOPs • Participate in a job shadow program where new staff is paired with a DPS foreman or grounds crewman for 30 days.
All Novi DPS Employees	Once per permit cycle: • View the Municipal Stormwater Pollution Prevention Storm Watch video (or similar) • Review proper materials storage and handling • Review good housekeeping and pollution prevention practices • Review examples of illicit discharges to the storm sewer system • Review the City's Spill Response procedure • Incorporation of stormwater BMPs into recurring staff meetings (DPS)
Key staff	Attend relevant training workshops by the Alliance of Rouge Communities, SEMCOG, or others, when available.

SECTION S –CONTRACT REQUIREMENTS AND OVERSIGHT

The contractors hired by the City to perform municipal operations that potentially impact stormwater are required to follow appropriate pollution prevention BMPs indicated in the City's contract language. All work performed by outside contractors are monitored by City staff through daily observation to ensure quality of work, adherence to the specified contract language, and to ensure that potential impacts to stormwater are minimized.

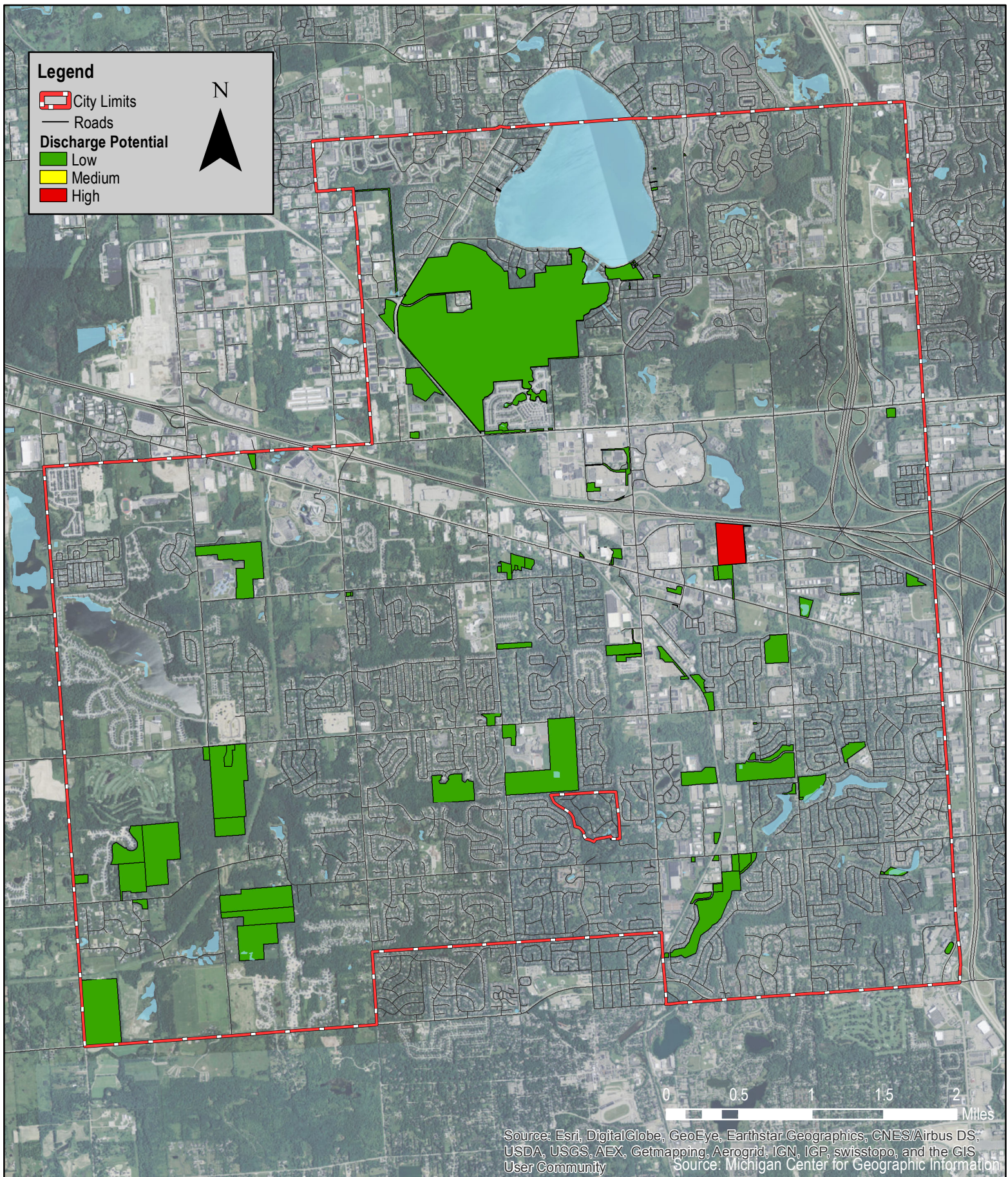
Measureable Goals – To demonstrate the effectiveness of this procedure, the following metrics will be tracked for reporting purposes.

- o Number of stormwater pollution related incidents pertaining to activities or work performed by the contractor.
- o Number of incidents where the City required corrective action by the contractor.

These metrics will be tracked over the reporting cycle that is specified in the City's Certificate of Coverage.

SECTION T – PROCESS FOR REVISION

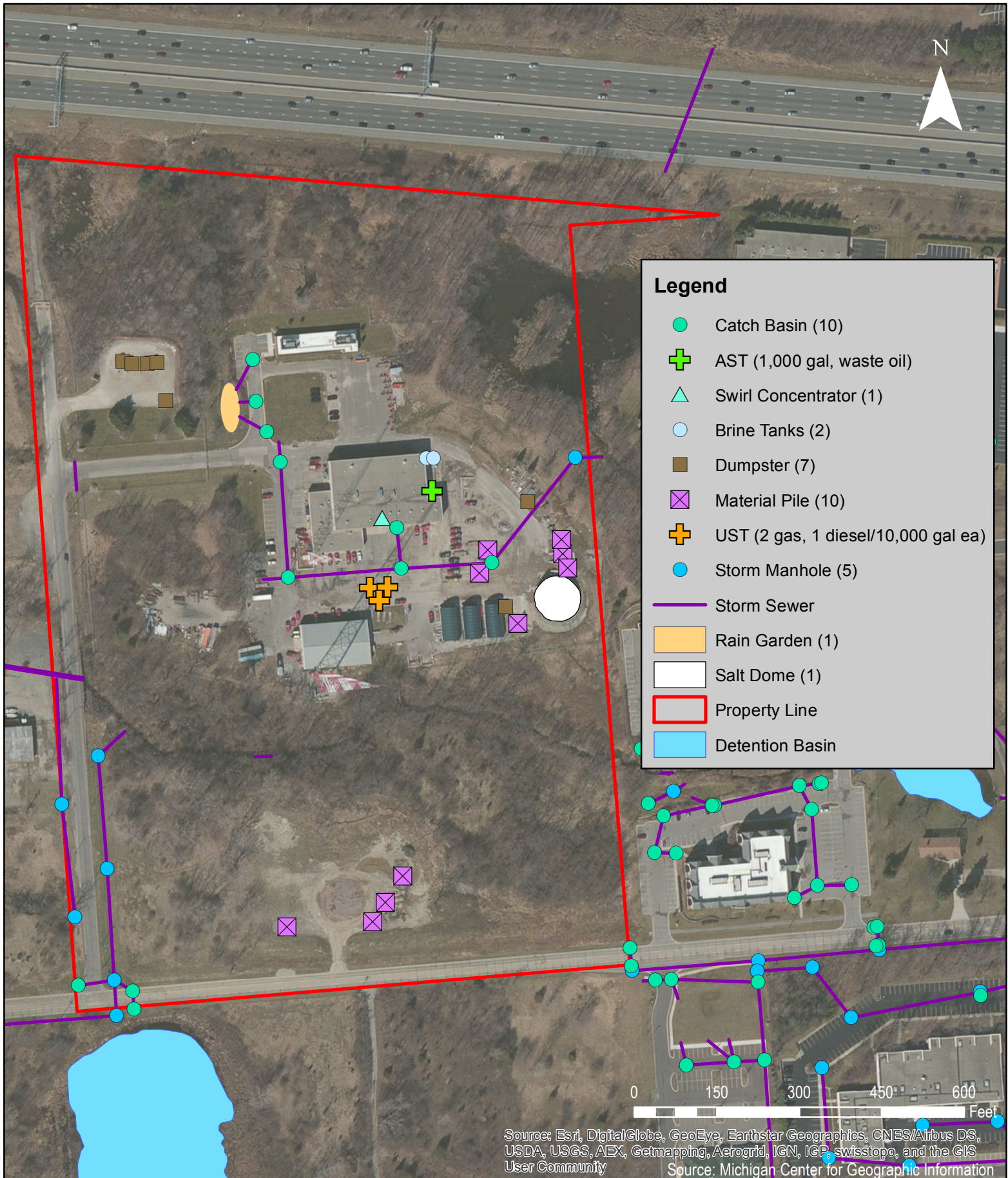
This procedure shall be reviewed once per permit cycle by the Stormwater Manager for any updates to streamline the requirements.



City of Novi Facilities Location Map

Oakland County, Michigan

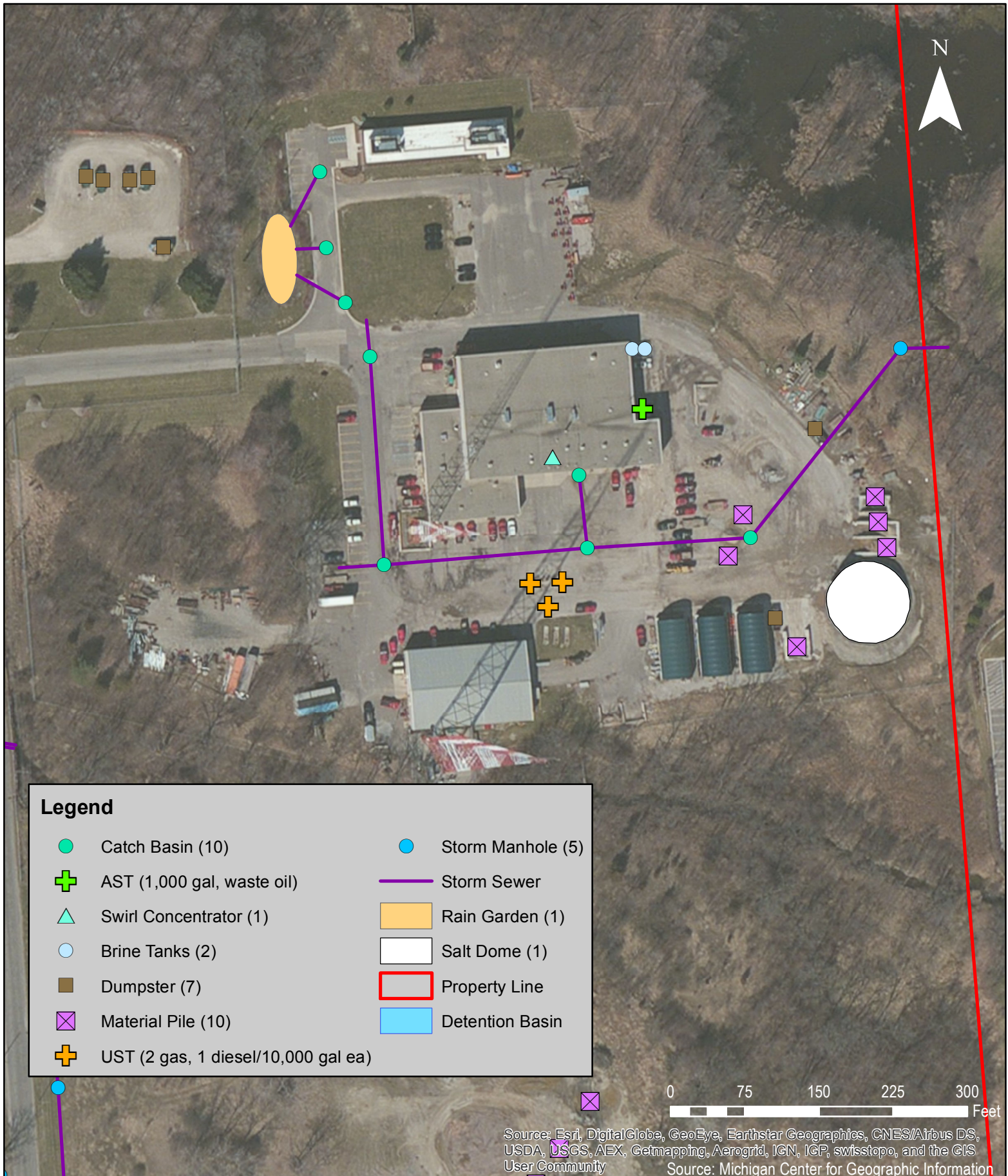




City of Novi - Department of Public Services

26300 Delwal Dr
Novi, MI 48375





City of Novi - Department of Public Services

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STANDARD OPERATING PROCEDURE

POLLUTION PREVENTION AND GOOD HOUSEKEEPING

SPILL RESPONSE

PREPARED FOR:

THE CITY OF NOVI
26300 LEE BEGOLE DR., NOVI, MICHIGAN 48375



APRIL 2016

SECTION A – PERSONNEL

The following City of Novi personnel have been identified as key staff in charge of spill response planning, implementation and maintenance of the Spill Response Plan.

Name	Phone
Novi Police Dispatch	(248) 348-7100
Jeffery Johnson – Director of EMS & Fire Operations/Spill Coordinator	(248) 347-0504
Rob Hayes – Director of Public Services	(248) 347-0454
Matt Wiktorowski – Field Operations Senior Manager	(248) 735-5640
Scott Roselle – Water & Sewer Asset Manager	(248) 735-5661
Brandon McCullough – Facilities Manager	(248) 347-0532
Adam Wayne – Stormwater Manager	(248) 735-5648

A.1 Responsibilities

- The **Spill Coordinator** has primary responsibility for coordinating the response to emergencies, including chemical spills
- **Supervisors** should ensure that employees are familiar with these procedures and receive the necessary training
- **All employees** should follow these procedures in the event of a chemical spill

A.2 Emergency Contact Numbers

The following telephone numbers should be posted near telephones and in other conspicuous locations:

Name	Affiliation	Phone
Novi Police Dispatch	Novi Police Department	(248) 348-7100
Jeffery Johnson – Director of EMS & Fire Operations	Novi Fire Department	(248) 347-0504
Rob Hayes – Director of Public Services	Novi DPS	(248) 347-0454
Matt Wiktorowski – Field Operations Senior Manager	Novi Field Operations	(248) 735-5640
Scott Roselle – Water & Sewer Asset Manager	Novi Water & Sewer	(248) 735-5661

Name	Affiliation	Phone
Brandon McCullough – Facilities Manager	Novi Facilities	(248) 347-0532
Adam Wayne – Stormwater Manager	Novi Engineering	(248) 735-5648
Other Emergency Contacts		Phone
MDEQ 24-Hour Pollution Emergency Alerting System (PEAS)		1-800-292-4706
MDEQ Southeast Michigan District Office		(586) 753-3794
City of Detroit Wastewater Treatment Plant		(313) 297-9400
National Response Center		1-800-424-8802
	Environmental Contractor	

Contact the City of Novi Fire Department at (248) 349-2293 for unknown, unsure, or general assistance.

SECTION B – CLEAN-UP PROCEDURES

Spilled chemical should be effectively and quickly contained and cleaned up. Employees should clean up spills themselves ***only if properly trained and protected***. Employees who are not trained in spill cleanup procedures should report the spill to the Responsible Person(s) listed above, warn other employees, and leave the area.

The following general guidelines should be followed for evacuation, spill control, notification of proper authorities, and general emergency procedures in the event of a chemical incident in which there is potential for a significant release of hazardous materials.

B.1 Evacuation

Persons in the immediate vicinity of a spill should *immediately evacuate* the premises (except for employees with training in spill response in circumstances described below). If the spill is of “medium” or “large” size, or if the spill seems hazardous, immediately notify emergency response personnel.

B.2 Spill Control Techniques

Once a spill has occurred, the employee needs to decide whether the spill is small enough to handle without outside assistance. Only employees with training in spill response should attempt to contain or clean up a spill.

NOTE: If you are cleaning up a spill yourself, make sure you are aware of the hazards associated with the materials spilled, have adequate ventilation, and proper personal protective equipment. Treat all residual chemical and cleanup materials as hazardous waste.

Spill control equipment should be located wherever significant quantities of hazardous materials are received or stored. Material Safety Data Sheets (SDSs), absorbents, over-pack containers, container patch kits, spill dams, shovels, floor dry, acid/base neutralizers, and “caution-keep out” signs are common spill response items.

B.3 Spill Response and Clean-up

Chemical spills are divided into three categories: Small, Medium, and Large. Response and cleanup procedures vary depending on the size of the spill. Persons shall refer to the SDS for detailed spill response directions.

Small Spills: Any spill where the major dimension is less than 18 inches in diameter. Small spills are generally handled by internal personnel and usually do not require an emergency response by police or fire department HAZMAT teams.

- Quickly control the spill by stopping or securing the spill source. This could be as simple as up-righting a container and using floor-dry or absorbent pads to soak up spilled material. Wear gloves and protective clothing, if necessary.
- Put spill material and absorbents in secure containers if any are available.
- Consult with the Facility Responsible Person and the SDS for spill and waste disposal procedures.
- Use Dry Cleanup Methods and **never** wash spills down the drain, onto a storm drain or onto the driveway or parking lot.
- Both the spilled material and the absorbent may be considered hazardous waste and must be disposed of in compliance with state and federal environmental regulations.

Medium Spills: Spills where the major dimension exceeds 18 inches, but is less than 6 feet. Outside emergency response personnel (police and fire department HAZMAT teams) may be called for medium spills. Common sense, however, will dictate when it is necessary to call them.

- Immediately try to help contain the spill at its source by simple measures only. This means quickly up-righting a container, or putting a lid on a container, if possible. Do not use absorbents unless they are immediately available. Once you have made a quick attempt to contain the spill, or once you have quickly determined you cannot take any brief containment measures, leave the area and alert Emergency Responders at 911. Closing doors behind you while leaving helps contain fumes from spills. Give police accurate information as to the location, chemical, and estimated amount of the spill.
- Evaluate the area outside the spill. Engines and electrical equipment near the spill area must be turned off. This eliminates various sources of ignition in the area. Advise Emergency Responders on how to turn off engines or electrical

sources. Do not go back into the spill area once you have left. Help emergency responders by trying to determine how to shut off heating, air conditioning equipment, or air circulating equipment, if necessary.

- If emergency responders evacuate the spill area, follow their instructions in leaving the area.
- After emergency responders have contained the spill, be prepared to assist them with any other information that may be necessary, such as SDSs and questions about the facility. Emergency responders or trained personnel with proper personal protective equipment will then clean up the spill residue. Do not re-enter the area until the responder in charge gives the all clear. Be prepared to assist these persons from outside the spill area with SDSs, absorbents, and containers.
- Reports must be filed with proper authorities. It is the responsibility of the spiller to inform both his/her supervisor and the emergency responders as to what caused the spill. The response for large spills is similar to the procedures for medium spills, except that the exposure danger is greater.

Large Spills: Any spill involving flammable liquid where the major dimension exceeds 6 feet in diameter; and any “running” spill, where the source of the spill has not been contained or flow has not been stopped.

- Leave the area and notify Emergency Responders (911). Give the operator the spill location, chemical spilled, and approximate amount.
- From a safe area, attempt to get SDS information for the spilled chemical for the emergency responders to use. Also, be prepared to advise responders as to any ignition sources, engines, electrical power, or air conditioning/ventilation systems that may need to be shut off. Advise responders of any absorbents, containers, or spill control equipment that may be available. This may need to be done from a remote area, because an evacuation that would place the spiller far from the scene may be needed. Use radio or phone to assist from a distance, if necessary.
- Only emergency response personnel, in accordance with their own established procedures, should handle spills greater than 6 feet in any dimension or that are continuous. Remember, once the emergency responders or HAZMAT team is on the job cleaning up spills or putting out fires, the area is under their control and no one may re-enter the area until the responder in charge gives the all clear.
- Provide information for reports to supervisors and responders, just as in medium spills.

SECTION C – REPORTING SPILLS

All chemical spills, regardless of size, should be reported as soon as possible to the Facility Responsible Person. The Responsible Person will determine whether the spill has the potential

to affect the environment outside of the facility and must be reported to local, state, or federal agencies. Examples of spills that could affect the outside environment include spills that are accompanied by fire or explosion and spills that could reach nearby water bodies.

C.1 Reporting Thresholds

The Spill Coordinator will report spills to MDEQ PEAS for spills that involve the following:

- Salt spills over 50 pounds or 50 gallons of brine onto the ground or into water (required by Part 5 rules)
- Gasoline release of 32 gallons or more onto the ground (required by Part 201)
- Oil release of 50 pounds (approximately 7½ gallons) onto the ground (required by Part 5 rules)
- Any amount of oil or fuel that reaches surface water or shorelines, call MDEQ PEAS and the National Response Center (as required by the Clean Water Act and Part 31)
- Any spill that is in doubt about reporting

C.2 Reporting Requirements

Within ten (10) days of release, submit a written report for the reportable releases to the following:

- MDEQ Water Resources Division Field Operations Chief, PO Box 30273, Lansing, Michigan 48909-7773
- Oakland County Water Resources Commissioner, 1 Public Works Road, Waterford, Michigan 48328 (248) 858-0931

Note: the optional report form EPQ 3465 can be found at:

http://www.michigan.gov/deq/0,4561,7-135-3307_29894_5959-20341--,00.html

The MDEQ may request other follow-up reports depending on the situation.

SECTION D – SPILL KIT INVENTORY

The following is a list of spill response equipment that will be maintained by the designated spill response coordinators at all locations where fuel products are stored and dispensed.

D.1 Minimum Spill Response Equipment

- 20 pounds of floor dry
- 1 shovel
- 1 broom
- Caution tape
- 2 Absorbent booms
- 20 Absorbent Pads

- Container for clean-up (30 gallons)
- Sample bottles

SECTION E – PROCESS FOR REVISION

This procedure shall be reviewed once per permit cycle by the Stormwater Manager and Spill Coordinator for any updates to streamline the requirements.

APPENDIX I
Total Maximum Daily Loads (TMDL)
Click [here](#) for link to Collaborative TMDL