

Stormwater Task Force Report and Recommendations

July 17, 2018

The Honorable Mayor Fournier and
Members of the City Commission:

Presented herewith is the long-awaited report of the Royal Oak Stormwater Task Force (Attachment 1). This task force was put together by me to assist in preparing a report and recommendation in response to an objective adopted by the commission in February 2016.

This is a long, complex report which includes several appendixes. For those who do not have the time or interest to plow through it all, I've tried to summarize it as briefly as possible below.

1. The August 11, 2014 rain event.

The August 11, 2014 rain event, and the increasing instability of weather patterns highlights the necessity for a comprehensive stormwater ordinance.

Prior to the August 2014 rain event a business led task force argued for relaxing storm water detention standards because the current standards discourage property owners from making improvements which trigger the stormwater detention requirements. The August 2014 rain event, made it absolutely clear that relaxing standards is not an appropriate option. We need a comprehensive look at storm water management and an ordinance that doesn't tie stormwater improvements to other property improvements.

2. Stormwater is everyone's problem.

Our current stormwater detention ordinance exempts all one and two family residential property and all property in the central business district (CDB) from its requirements. Further, it ties compliance to a property owner-instigated improvement trigger allowing those who are subject to the ordinance to delay compliance for years, or even decades.

We will never solve our stormwater problem until we are willing to impose stormwater requirements on all properties. Stormwater is everyone's problem. Everyone needs to be part of the solution. Fair and equitable stormwater management codes are a first step to achieve this objective.

3. Royal Oak's current stormwater detention ordinance is unfair and hinders reinvestment.

While it has resulted in 21.1 million gallons of stormwater detention facilities being constructed, it doesn't solve the underlying problem. It can't ever possibly solve the problem because it exempts 77 percent of all land in Royal Oak from its requirements, it is grossly unfair in putting most of the stormwater burden on a relatively few property owners, and it is a significant impediment to property maintenance and improvements. Also, the code has not been adapted to recognize newer methods for managing storm water. It desperately needs to be revised.

Everyone should be responsible for stormwater that falls on their own property. It is a common practice in Royal Oak, especially for new homes, to grade property to send stormwater onto a neighbor's property. This should be illegal. Property owners should also be required to pay for stormwater that flows from their property into the city streets or directly into city sewers.

4. The design capacity of the George W. Kuhn drain.

The George W. Kuhn drain (GWK), originally known as the 12 Towns Drain, was built to convey the region's storm and sanitary sewer flow to treatment facilities. Under normal conditions, it does just that. Like the city's sewers, this county drain also has capacity limitations on the amount of storm and waste water that can be accepted.

Royal Oak is one of the last communities to discharge into the GWK drain. It is important to understand that due to the size of the GWK drain and the amount of water that enters from upstream communities, the city does not have an unlimited ability to discharge stormwater. This creates limits upon the types of improvements that can be made to our system. In the end, all our stormwater and all of our sewage must discharge into the GWK drain.

While we are limited by the capacity of the GWK drain, we also don't believe upstream communities are doing enough to reduce their stormwater from entering the GWK drain.

5. Royal Oak's method of recapturing stormwater debt has been altered by litigation.

As part of the settlement agreement in Schroder vs City of Royal Oak, the city was required to must alter the methodology for recapturing the debt component of the stormwater system. We can no longer do this through sewer charges based on water consumption. The new methodology had to be in place by July 1, 2018.

The city is authorized through the Michigan Drain Code to levy an ad valorem tax to fund debt service and that is what we are doing for 2018-19. We see this as a short-term solution only. An ad valorem tax is not a desirable means of paying for the GW Kuhn debt or any stormwater costs. It does not result in a fair distribution of cost as there is no relationship between taxable value and stormwater put into the city sewers. It does not encourage property owners to manage their own stormwater as there is no financial benefit for them to do so. It also exempts institutions such as schools, churches and hospitals which contribute significant amounts of runoff.

We believe the best long-term solution is to establish a stormwater utility with charges based on stormwater runoff which credit property owners who reduced stormwater runoff from their property.

Recommendations

The list below is a summary of recommendations from the report. We've organized them into three categories: stormwater detention ordinance amendments; stormwater management planning; and stormwater project funding.

Stormwater detention ordinance Amendments

- The ordinance should include green infrastructure as an acceptable method to achieve compliance. Currently, green infrastructure is allowed under the variance provisions of the code and engineering has already approved some engineered green systems. Engineering recommends an easement requirement be part of the green infrastructure to allow monitoring and inspecting to prevent removal or alteration. It should be noted that these systems are not necessarily less costly than traditional "grey" detention systems, and they often require significantly more space to implement. Additionally, most green infrastructure requires more regular and intensive maintenance efforts.

It should be noted that green infrastructure does not necessarily function the same as standard detention systems, as far as being an equivalent and reliable means of keeping water out of city sewers. Green infrastructure systems must meet appropriateness of soil

conditions and amount of stormwater to be detained. Such systems should be engineered for specific site and soil conditions to be effective.

- The ordinance should be reviewed and updated to include current and accurate descriptions of the various detention methods that are acceptable to meet ordinance requirements; including underground storage facilities and surface lot detention areas.
- The ordinance sections that establish the numerical requirements for detention should be reviewed and updated. This may include a review of standard base line storm frequency values in light of climate change trends.
- The current exemption for one- and two-family residential uses should be removed. The ordinance should require compliance with stormwater management by all new and renovated properties within the city regardless of zoning category, including one- and two-family residential properties. This stormwater management should include both green and grey infrastructure. Remove the current exemptions for single- and two-family residential.
- The ordinance should have a requirement for new residential builds to implement stormwater management. When building new homes on parcels where older, smaller homes once stood, the new home would be required to detain the stormwater runoff or participate via payment in lieu of detention.
- All properties will participate in the management of storm water. This will be accomplished on older properties through the implementation of a storm water utility. New, and renovated, properties will be required to utilize either current accepted methods of detention or through payments in lieu to develop offsite detention.
- This or another city ordinance should be revised to prohibit property owners from conveying their stormwater runoff onto neighboring properties. To comply with this new provision, builders would have to prepare and submit a site grading plan to be reviewed by the city engineer as a component of site plan approval and/or a request for a building permit.
- The ordinance should be revised to require that properties in the CBD comply with the stormwater management program either through installation of detention systems, green infrastructure or payments in lieu of detention.
- The exemption from compliance for projects that are less than 6,100 sq. ft. or 0.14 acres in size should be eliminated. This part of the ordinance is very poorly drafted, and it is questionable that this was really originally intended to be an exemption.
- The ordinance should more clearly describe the types of repairs or renovations allowed before triggering the need for detention. Property owners need to have the ability to make repairs to their property without triggering new detention systems.

Stormwater management planning

Develop, adopt and implement a stormwater management plan to address and include the following:

- a program to include every property in some manner
- the use of green infrastructure, especially when cost effective
- a reduction in the overall imperviousness of the city

- an increase green space and tree canopy
- consistent city commission goals, objectives and direction
- a vigorous program of public education
- an effective and reliable source of funding
- address the required elements identified in the Michigan Stormwater Utility Act if it is enacted

Stormwater management funding

- Create and implement a stormwater utility user fee.
- The stormwater utility user fee will apply to all privately-owned property in the city.
- The stormwater utility user fees will be sufficient to cover the distribution and transmission costs (including debt on the transmission system). Revenue from stormwater utility user fees will replace the revenue lost from the required reduction of the sewer fees.
- The ordinance shall encourage and provide credits to those who install approved stormwater detention.
- The stormwater utility user fee should be assessed based on parcel size and estimated run-off, including the area of impervious surfaces.
- The stormwater utility fee should incentivize private property owners to comply with detention. The fees would encourage the use of green infrastructure and make all property owners responsible for stormwater management.
- The stormwater utility user fee would cover the costs associated with management of the utility; fund operations, maintenance, and replacement of the distribution system; and the revenue requirements of the transmission, retention and treatment system allocated to Royal Oak customers. These fees will be a replacement of the current revenue generated for these purposes through the wastewater fees.

The following resolution is recommended for approval:

Be it resolved, the city commission accepts the report of the Royal Oak Stormwater Task Force and directs staff to proceed towards implementing the recommendations.

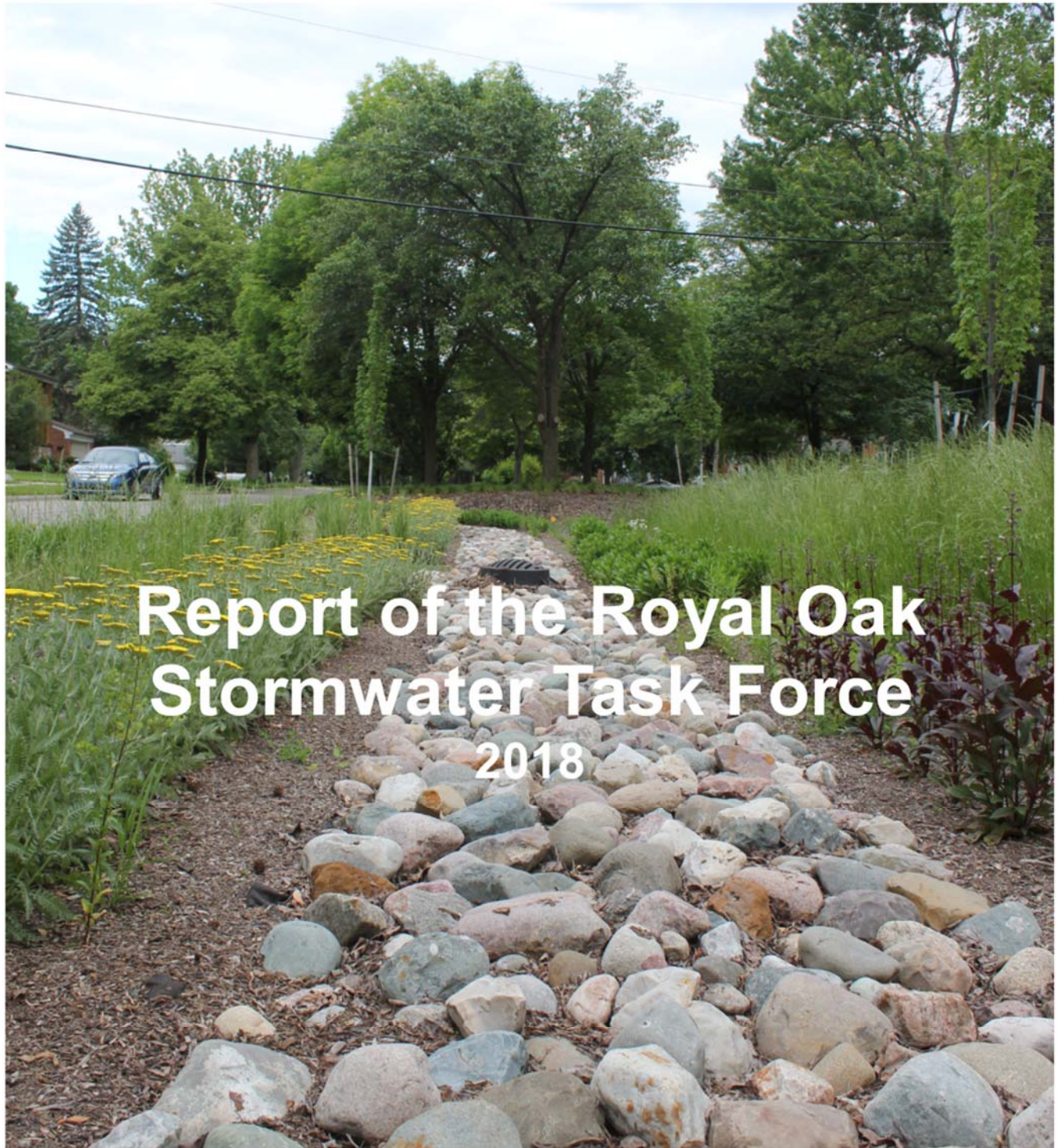
Respectfully submitted,
James Krizan
Assistant to the City Manager

Approved,



Donald E. Johnson
City Manager

1 Attachment



Report of the Royal Oak Stormwater Task Force 2018



Attachment 1

One of the goals adopted by the Royal Oak City Commission in February 2016 was to review and possibly amend the city's stormwater detention ordinance (Royal Oak Municipal Code § 644). Concerns raised by members of the business community and condominium associations about the high cost of ordinance compliance; and the recent storm induced flooding event provide some parameters for the ordinance reviews.

The members of the task force were appointed due to their expertise in certain subjects, such as green infrastructure or principles of civil engineering. It should not be assumed that all members were experts, or provided insight, on all topics related to the subject.

In August 2016, Royal Oak City Manager Don Johnson appointed the following to the stormwater task force:

Jennifer Acevedo – Royal Oak Environmental Advisory Board; Marketing and Promotions Specialist, Michigan Department of Environmental Quality

Matthew J. Callahan, P.E. – City Engineer, City of Royal Oak

Jason Gittinger – Immediate Past President, Greater Royal Oak Chamber of Commerce

Kelly Karll – Engineer, Southeast Michigan Council of Governments

James Krizan – Assistant to the City Manager, City of Royal Oak

Shawn Lewis-Lakin – Retired Superintendent, School District of the City of Royal Oak

Ilene Orlanski – President, Coventry Park Homes Condominium Association

Patricia Paruch – City Commissioner, City of Royal Oak

Jim Schneider, AIA – President, Schneider Smith Architects

Greg Rassel – Director of Public Services, City of Royal Oak

Devan Rostorfer - Environmental Planner, Southeast Michigan Council of Governments

History and Background

Royal Oak's Current Stormwater Management System

The City of Royal Oak has an intricate system for collecting and conveying both wastewater and stormwater to treatment facilities prior to discharging into a receiving body of water. Royal Oak's system is considered a combined sewer system with both the stormwater and wastewater collected in the same sewer. Some areas are served by separated storm sewers but even these ultimately empty into a combined sewer, so the entire system is considered a combined system. The combined wastewater and stormwater is treated at facilities in Oakland County and the City of Detroit and then discharged into the Detroit River or the Red Run Drain.



Above: Debris placed to a residential curb after the August 11, 2014 flood

Royal Oak is one of the fourteen Oakland County communities that make up the George W Kuhn (GWK) drainage district. The GWK drain, formerly known as the 12 Towns' Drain, is owned and operated by the Oakland County Water Resources Commission (OCWRC).

Royal Oak is one of the downstream communities along the OCWRC system. The City of Royal Oak has no ability to regulate the amount of stormwater flowing into this system from other communities. This highlights the importance of each community working together in concert with OCWRC to find ways to limit the amount of stormwater entering the system during rain events.

1991-1993 Improvements to the Stormwater Management System

In 1991, after two record rain storms on consecutive days, the city began a series of improvements to its stormwater management system. A four-pronged approach was adopted that involved performing detailed calculations on the city's sewer system to identify any capacity issues, implementing a catch basin restricted lid program to provide surface detention on local streets, constructing relief sewers where necessary and finally enacting an ordinance to require stormwater detention where cost effective and feasible.

Royal Oak's stormwater detention ordinance was implemented in 1991. Since that time, almost 21 million gallons of stormwater storage has been constructed on impervious surfaces such as parking lots and other paved surfaces throughout the city as well as in underground pipes and tanks on public and private property. Once detained during the storm event, stormwater is slowly released into sewers, freeing up sewer capacity during a storm event.

According to estimates from the city's engineering division, not including the cost of debt service for upgrades to the GWK drain, the city has spent over \$10 million on improving, maintaining and increasing capacity in its combined sewer system since 1993. The Oakland County Drain Commissioner's Office (now the WRC) constructed the region's largest retention and treatment facility in Madison Heights which is connected to the GWK drain to mitigate and manage combined sewer overflows from the regional system. The city constructed numerous relief sewers where restricted catch basin covers could not improve capacity issues.

The street catch basin lid restriction program also provides capacity relief in combined sewers across the city with a goal to maintain a 10-year rainfall capacity. Thousands of catch basins have been retrofitted on local streets. Such on-street detention slowly releases stormwater to the connected sewers resulting in temporary ponding on local streets, which frees up sewer capacity during the storm event.

The city needs to do a much better job explaining this program to residents. We commonly get complaints about flooded streets from residents who see that as a problem when it is part of a solution to a problem. We are flooding the streets on purpose to slow stormwater inflows into the sewer system and prevent basement flooding. One downside of the restricted catch basin covers is that they are much more easily plugged by debris.

Overall, efforts have been successful in handling stormwater under normal conditions (a 10-year storm). The city continues to implement stormwater management efforts to reduce the impact of stormwater runoff from impervious surfaces.

OHM Advisors Study and the Major 2014 Stormwater Event

The city contracted with OHM (Orchard, Hiltz and McCliment, Inc.) Advisors in 2014 to study select areas of combined sewers within the city. OHM was asked to determine how the larger system functions during rain events and whether stormwater detention efforts have been effective. The city also wanted to know if the data supported changes to current efforts and codes.

While OHM was conducting the study, a severe rainstorm on August 11, 2014 caused widespread combined sewer overflows and flooding across the entire Southeast Michigan Region. Over the course of just a few hours, approximately four to five inches of rain fell over Southeast Michigan with 5.04 inches of rain recorded as part of the sewer analysis study. The storm, which weather experts classified as having a probability of occurring once in 300 to 500 years, completely overwhelmed the sewer systems, open streams and depressed freeways. This was roughly three times the amount of rain that most sewer systems are typically designed to handle.

This storm was highly unusual not just for the total amount of water that fell in any given area but also for the broad geographic area that received this rainfall. Usually, rainstorms are isolated events that move across a region.

The damage caused by this event was staggering, with estimates of over \$125 million to public and private property. It resulted in state and federal declarations of emergency. In Royal Oak alone, nearly 6,500 tons of household refuse was discarded and collected due to the event. Total costs for additional refuse collection neared \$650,000.

The rain events in the late 1980s and early 1990s demonstrated a need for better regulation of the city's stormwater, just as now, we are seeing evidence of a need to limit the amount of stormwater entering the system. The question now is how the city can reduce or eliminate future stormwater damage. The task force proposes three avenues to explore: stormwater detention ordinance; stormwater management planning; and stormwater management funding.

1. Royal Oak's Stormwater Detention Ordinance

Overview

The City of Royal Oak adopted a stormwater detention ordinance (Chapter 644) in 1991. The stated objective of the ordinance is to "protect the health, safety and welfare" of the community

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by minimizing stormwater runoff from private property to reduce damaging effects of combined sewer overflows into basements.

It is a generally accepted best practice to manage stormwater runoff at the location where it falls. Allowing stormwater runoff to flow onto neighboring properties or the city's rights-of-way, only shifts the responsibility and liability for managing the stormwater to others at significant cost.

Most private properties in the city have the land area to store stormwater, either by utilizing the surface area of the property to "pond" the water or by constructing an underground detention facility. If adequate land and soil conditions exist, these properties may also infiltrate stormwater.

Royal Oak designed its ordinance to incorporate the recognized best practices at the time, detaining stormwater where it fell. The city's stormwater detention ordinance requires all new commercial, industrial, or multifamily developments where the area is at least 0.14 acre or 6,100 square-feet in size, detain the stormwater runoff on site. Existing commercial, industrial or multifamily developments renovating that would also meet the 0.14 acre or 6,100 square-feet size, are also required to comply with the ordinance. One and two-family properties and the CBD were exempted.

Representatives from the chamber of commerce, downtown development authority and school district, collaborated with the city to develop the 1991 stormwater detention ordinance. The parties agreed the ordinance was acceptable with its exemptions and tiered levels of compliance.

The ordinance considered many scenarios and options to alleviate a too heavy-handed nature. One option selected for inclusion into the final code was allowing those properties subject to the code the ability to renovate portions of their site, typically a previously developed site, up to 6,100 gsf before triggering the need to build detention. This leeway was termed a "temporary waiver". The improvements made were summarized in an "action lien" which was recorded with the registrar of deeds. The lien stated what work was done and what requirements would be required in the future. The lien was signed by the property owner acknowledging their understanding of the requirements. Because the lien was recorded against the property, future owners would have access to a legal notice indicating the previous owners had made improvements that counted against the 6,100 gsf. Most participants at the time felt this was a satisfactory compromise.

Royal Oak is not alone in requiring stormwater detention. Most communities in Oakland and Wayne counties have ordinances that require detention at the source. Most also have exemptions from their ordinance requirements. For instance, the following communities include these exemptions in their ordinances: Berkley excludes one and two-family homes; Ferndale excludes for green infrastructure projects; and Birmingham allows renovations at a capped amount to be excluded. Exemptions, no matter how well intended, create disparity and deficiencies.

Residential Exemptions

In 1991, the drafters of the ordinance cited two reasons to exclude properties zoned as one- and two-family residential. The first was overloaded sewers and basement flooding most negatively impact these types of properties causing damage and financial losses for the owners. Secondly, one- and two-family residential properties often have more surface area that is permeable, unlike commercial properties which are often 90 percent or more impermeable and are a major source of the runoff overloading the sewer system.

Condominium associations are classified as multi-family uses in the city's zoning ordinance and are not entitled to the residential exemption. This is appropriate for most condos because they

usually have little permeable surface area, more like commercial property than most single-family or two-family dwelling units. However, this isn't always the case. Detached condos may have a high a percentage of permeable land area. It would be better to make the distention based on percentage of permeable surface than type of ownership.

The cost of complying with the current ordinance can be burdensome for associations, especially those that were constructed prior to the code, with limited funds in their budgets for capital projects. Consequently, many associations must choose to put off or scale back necessary improvements because they would trigger ordinance requirements for additional detention and become cost prohibitive.

The current ordinance includes no requirement for one- and two-family residential properties to manage or detain stormwater, therefore stormwater can discharge onto their neighbor's property. In high volume, the runoff can create flooding to the neighbor's property. This needs to change.

Central Business District (CBD) Exemptions

Royal Oak's zoning ordinance allows owners of properties in the CBD to build structures right up to the property line. Many of the downtown structures were built decades ago, meaning there is no surface or underground space available for onsite detention. The stormwater detention ordinance exempted properties in the CBD from compliance as a matter of practicality due to the difficulty and cost to structurally retrofit an existing building with stormwater management. However, the ordinance should require owners of such buildings to participate financially in the construction of remote detention facilities through a payment in lieu of detention. Such facilities would probably have to be constructed by the city but a privately operated, for profit, detention facility is not inconceivable.

Commercial, Industrial, and Multi-Family Properties Temporary Exemptions

In Royal Oak, most existing commercial and industrial properties are relatively small and any improvements, renovations, or additions to the property fall within the allotted 6,100 square-feet and have been considered exempt, due to the interpretation of language we consider to be ambiguous in the code. Many of them have ninety percent or more impervious coverage and direct their runoff offsite.

Code applicable sites that make cumulative site improvements below the 6,100 square-feet measure must execute a recordable lien to the city. The lien shall state that when improvement occurs making the accumulated area of the lien and the improvements greater property greater than 6,100 square-feet, the owner will make the required stormwater detention improvements. Stormwater detention almost always is added to the parking lot, either on the surface of or below it.

While the stormwater detention ordinance has been in effect for over 25-years, it has long been a source of complaints from the business community, primarily from smaller developments. Property owners will often cite the cost of stormwater detention as an impediment to redevelopment. Claiming the requirement delays or cancels needed improvements due to the cost to make their property compliant. Established businesses may have difficulty financing with methods currently available. Financing can require extensive use of capital investment, not readily available to small businesses. This is problematic from both an economic development and stormwater detention management standpoint.

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Compliance with the stormwater detention ordinance has resulted in the creation of 21.1 million gallons cubic feet of additional detention area. The city's engineering division calculates an additional nine million cubic feet of stormwater detention area could be realized if the exemptions did not exist and every commercial, industrial and multi-family property were compliant with the ordinance.

City and School District Property

City property is not covered by the ordinance, but the city chooses to comply with its provisions anyway. While the city does not currently have an accurate assessment of the total amount of impervious surface on city rights-of-way, it continues to implement innovative methods of stormwater detention management when feasible. The city uses its streets as a detention facility via the restricted catch basin cover program. The city is planning a comprehensive green infrastructure feasibility study for city owned or controlled area during the 2017-18 fiscal year.

Under state law, the city cannot mandate the school district comply with the ordinance for any of its building improvements or renovations. The district has, however, voluntarily included stormwater detention management in its most recent renovation projects. Both the city and the school district hold large amounts of property with considerable impervious areas, however, both also own large permeable land areas.

Summary of Stormwater Detention Ordinance Deficiencies

The task force believes the stormwater detention ordinance has strengths and weaknesses. The ordinance provides a very clear and measurable method for calculating stormwater detention requirements for new and renovation projects. However, if the costs are too high for business owners to comply, they choose not to make the improvements which trigger the detention requirements. When this happens, we lose twice. No additional stormwater is detained and the property is not improved. There are no financial incentives in the ordinance for increasing stormwater detention.

No city ordinance prohibits directing runoff onto neighboring properties, and when stormwater is diverted onto neighboring properties, causing damage, the victimized property owner is left to civil court to remedy the situation. Finally, the ordinance creates inequality by not requiring all property owners to participate in stormwater detention management.

Recommendations for Royal Oak's Stormwater Detention Ordinance

We are reprinting the recommendations that appeared at the beginning of the document for the readers convenience below:

A primary focus of the stormwater task force has been evaluating the stormwater detention ordinance. The task force wanted to determine the importance of the ordinance as it relates to the overall strategy to of sewerage system. Does the ordinance provide the protection and enhancement the community expects? To answer this, the task force considered what an ideal stormwater detention management program would look like and identified potential amendments to the stormwater detention ordinance.

The task force concluded an ideal stormwater detention management program would have these objectives:

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- include all properties in the city regardless of their use or zoning classification.
- promote green infrastructure where feasible and effective.
- be cost effective in its implementation for both private property owners and public entities such as the city and the school district.

To achieve these objectives, the task force recommends the following revisions to the ordinance:

- The ordinance should include green infrastructure as an acceptable method to achieve compliance or reduce the amount of detention required.

The ordinance should be rewritten to include the use of green infrastructure in development projects as an appropriate method for satisfying the ordinance requirements. Green infrastructure, to be effective, must also be reliable. The task force believes that its use cannot be the only solution for stormwater management issues, but when appropriate, it can be an option. The appropriateness of the use of green infrastructure solutions should be based, among other factors, on soil conditions at the property and the amount of stormwater needed to be detained.

Certain areas of the city are more amenable to green infrastructure than other areas. Generally, the areas south of 12 Mile Road have predominantly sandy soil. This soil is well suited to such projects since the water percolates easily through the soil. On the other hand, the areas in the city north of 12 Mile Road have predominantly clay soils which are not well suited for green infrastructure projects because of their low permeability capacity.

There have been several proposals for green infrastructure alternatives to partially offset a developments requirement for storm detention that the city engineering department has reviewed and approved. In these instances, the approved systems were not necessarily less costly than traditional gray systems and require considerably more monitoring and maintenance.

The city engineering department recommends that when green infrastructure is used as an approved method for meeting the ordinance requirement for stormwater detention, the property owner must dedicate an easement to the city to allow monitoring and inspection. This is consistent with all other private stormwater management systems in the city. This will prevent its removal or alteration and allows the city to inspect the area without trespassing.

- The section of the ordinance that describes the various gray infrastructure detention methods that are available and acceptable should be reviewed and updated if necessary.

The current code establishes the numerical requirements for compliance and gives standards for certain types of detention methods. The ordinance should be reviewed and updated if necessary to include current and accurate descriptions of the various detention methods that are acceptable to meet ordinance requirements. This includes detention methods such as underground storage facilities and surface lot detention areas. The ordinance sections that establish the numerical requirements for detention should be reviewed and updated, if necessary.

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- The ordinance should require compliance with stormwater management by all properties within the city regardless of zoning category, including one- and two-family residential properties, which may be done through a payment in lieu of detention option.
- City ordinances should be revised to prohibit one property owner from allowing runoff from its property to flow onto neighboring properties.

To comply with this new provision, builders would have to prepare and submit a site grading plan to be reviewed by the city engineer as a component of site plan approval and/or a request for a building permit. Existing properties that are noncompliant with this provision will require significant staff time to investigate and remedy.

- The ordinance should be revised to require that properties in the CBD comply as best as possible with the stormwater management program which may be done through a payment in lieu of detention.

Small commercial properties and properties in the CBD will require more creative solutions as these sites are often entirely impervious. Green roofs and permeable surfaces in parking lots are two common actions that small and currently fully impervious sites could use.

The Detroit Zoo, the City of Southfield and Ford Motor Company are some local examples of owners using these types of innovative methods for managing stormwater. Both have both recently developed parking lots using permeable pavements and bio-swales while, over a decade ago, Ford Motor Company installed North America's largest green roof at the Ford Rouge Center.



Green Roof on Ford Rouge Center
Image courtesy of Ford Motor Company

- The temporary exemption from compliance for projects that are less than 6,100 square feet or 0.14 acres in size should be eliminated. All properties will need to participate in the management of stormwater runoff, this might be accomplished through implementation of a stormwater utility.
- Clarify the types of renovations or repairs that would trigger the detention requirement.

The ordinance should more clearly describe the types of repairs or renovations allowed before triggering the need for detention. For example, the current code allows property owners to resurface existing parking areas indefinitely which consist of capping existing paved areas with asphalt or concrete which does not trigger the detention requirement. In reviewing and permitting these improvements, the city does

review the site grading to correct any deficiency that directs runoff towards neighboring properties.

2. Stormwater Management Planning

The task force recognizes that not all problems with the current Royal Oak stormwater management program will be solved by rewriting the ordinance alone. Because the ordinance only applies to private developments and does not address any type of public right-of-way facilities or school properties, the task force reviewed other communities with successful stormwater management programs.

The task force reviewed the highly regarded stormwater management programs in the cities of Seattle, WA and Ann Arbor, MI. Both communities are required by the provisions of the federal and Clean Water Act to apply for and receive a National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Permit to discharge stormwater into Waters of the United States. For more information on these two communities, see Appendix B – Case Studies. As a component of their applications for the NPDES MS4 permit, federal and state rules require each community to develop a stormwater management plan. Detailed requirements for a stormwater management plan are set forth in federal rules. U.S. Environmental Protection Agency (EPA) (www.epa.gov) and the Michigan Department of Environmental Quality (MDEQ) (www.mich.gov/deg) both have detailed information about stormwater management plan requirements on their websites.

The MS4 permit regulates stormwater from public entities such as cities, counties, hospitals and school districts which discharge stormwater directly into waters of the state or the U.S. In our area, the Rochester Community Schools is classified as an MS4 permit entity. The school system has 24 buildings or facilities which discharge stormwater directly into drains which then discharge into the Clinton River and/or its tributaries. The school district is an active participant in the Clinton River Watershed Council and is required to prepare a stormwater management plan as a component of its MS4 permit application. A copy of the 2016-2020 stormwater management plan for the school district can be found on its website: (www.rochester.k12.mi.us/pages/5160/rochester.schools.stormwater.management.plan).

As previously described, the City of Royal Oak is part of a larger network of combined sewer systems which convey the combined stormwater and wastewater to the DWSD facility or GWK Retention and Treatment Facility, which discharges into the Detroit River or the Red Run Drain. Because Royal Oak is not required to obtain an MS4 permit and because it is not classified as a municipal separated storm sewer system (MS4) community for permitting purposes, Royal Oak is not required to develop, approve and implement an official stormwater management plan.

Although Royal Oak is not required to have a stormwater management plan it can be useful in helping a community organize efforts to handle stormwater issues. Non-MS4 communities can also utilize the format and structure of plans that permit-holding communities must follow.

MS4 Stormwater management plans all have the following required elements:

- Public Participation/Involvement
- Public Education
- Illicit Discharge Elimination
- Construction Stormwater Runoff control
- Post-Construction Stormwater Runoff

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- Pollution Prevention
- Total Maximum Daily Load Implementation

Royal Oak would need to contract with an outside consulting firm to assist in the development of a stormwater management plan and such an undertaking would require funding. Funding for a stormwater management plan and other related stormwater management activities could possibly be funded through the creation of a stormwater utility, which is discussed in the following section.

In January 2017, HB 4100 was introduced in the Michigan House of Representatives and in January 2018 SB 756 was introduced in the Michigan Senate. If enacted, these bills would require (among other things) that any community creating a stormwater utility develop a stormwater management plan using the plan elements required by the EPA rules. HB 4100 and SB 756 have both been sent to their respective local government committees for review and hasn't begun to move through the legislature, but this legislation may become a factor if Royal Oak were to consider developing its own stormwater management plan with or without creating a stormwater utility.

Recommendations for Stormwater Management Planning

The task force recommends the city consider developing, adopting and implementing a stormwater management plan. Coordination of all stormwater management activities through an official stormwater management plan would improve the city's efforts to meet the objectives identified earlier in this report.

The stormwater management plan should cover a multitude of aspects and best management practices. One of the most important aspects to the plan will be a component for public education. Efforts to educate the public on the impacts of stormwater runoff will be essential to help residents, businesses and other property owners understand how they can help reduce risks of flooding and backups in the future.

Initially, Royal Oak's plan should address and include the following:

- a more equitable stormwater management ordinance that can be consistently applied
- a program to include every property in some manner
- the use of green infrastructure, especially when cost effective
- a reduction in the overall imperviousness of the city
- an increase green space and tree canopy
- be consistent with city commission goals, objectives and direction - protect and preserve existing trees
- a vigorous program of public education
- an effective and reliable source of funding

The plan should also address the required elements identified in the Michigan Stormwater Utility Act if it is enacted to ensure that the city will be able to maintain possible future funding options as described in the next section of this report.

3. Funding Stormwater Improvements

Current Funding System

Between 1993 and 2015, the City of Royal Oak completed approximately \$10 million worth of projects to maintain, improve or increase the capacity of the combined sewer system in the city. Combined with the over \$33 million spent on debt service for the GWK improvements over \$43 million has been spent on the stormwater system. The city identified these projects based upon code requirements, engineering studies, or best practices within the industry.

Historically, projects relating to stormwater activities have been funded through the fees paid by rate payers into the city's water/sewer fund and through various state and federal grants. The city water and sewer fund is the primary funding source for operations, maintenance, and replacement of the system, as well as fees paid to the transmission system and debt service to cover major improvements to the both the distribution and transmission system.

The total amount of funding available for stormwater management activities is, unfortunately, very limited. The limited available funding makes the current funding model difficult to rely upon to maintain and improve or expand the current stormwater system. A more reliable funding mechanism will be necessary to improve the city's ability to evaluate and address stormwater needs.

Legal Limitations on Increasing or Imposing Additional Stormwater Fees

The current funding model also presents exposure to potential legal challenges. In 1998, a landmark Michigan Supreme Court decision (*Bolt v. City of Lansing*) held that the City of Lansing's fee schedule within its stormwater utility constituted a tax, not a fee, in violation of the state's Headlee amendment which requires voter approval of any new tax.

The court determined that in order for a fee to be valid it must meet three criteria. The fee must serve a regulatory purpose, not just a revenue raising purpose (such as regulating the amount of stormwater entering the system). The fee must be proportional to the necessary operational and capital costs of providing the service. Finally, the fees must be voluntary. For a fee to be voluntary, a user must have the ability to limit or opt out of the service.

In 2011, the City of Jackson's stormwater utility fee scheme faced a similar challenge. The court ultimately ruled that Jackson's fee schedule was also a tax which had not been approved by the voters because it failed to satisfy the three criteria set forth in the *Bolt* decision.

In *Schroeder vs City of Royal Oak*, plaintiff alleged that the water and sewer rates violated the Headley Amendment because charges assessed were in fact a tax intended to raise revenue rather than cover the costs of the water and waste water system. The city ultimately settled the lawsuit for \$2 million payable into a fund to reimburse rate payers. The agreement also mandates that, by July 1, 2018, the city develop a new method by which to fund debt service for the GWK drainage district. The city needs to find a method that provides adequate funding and is able to withstand a potential legal challenge.

Stormwater Utility

Other municipalities in Michigan, including Marquette, New Baltimore, Ann Arbor, and Birmingham have created a "stormwater utility" to fund their stormwater management activities, Ann Arbor's is the oldest, dating to 1984.

Attachment 1

While a stormwater utility does impose an additional cost on property owners, the size of the cost is relatively modest. Table 3, below, shows some examples of local costs for a single-family residence. This table uses an example of a single-family home with a lot that is 6,100 square feet with 3,000 square feet of impervious surface.

	Service Fee	Commodity Fee	Annual Total
Ann Arbor	6.77	\$29.75	\$146.08
Detroit	\$0	\$750 per Impervious Acre	\$206.61
Birmingham - Evergreen Farmington District (EF)	\$0	\$45.75	\$183.00
Birmingham - South Oakland District (SO)	\$0	\$59.50	\$238.00

Table 2: Sample Stormwater Fees in Michigan

Ann Arbor has a tiered fee system for residential properties based upon the impervious surface square footage of the property. For all other properties, Ann Arbor charges a flat fee per acre. Residents can opt out of the fees by installing rain barrels for roof runoff, by installing a rain garden, a cistern, or a dry well, or by participating in the Washtenaw County Riversafe Home program. Commercial property owners can opt out if they participate in the Community Partners for Clean Streams program, install a stormwater management system that reduces their discharge rate by at least 29.5%, or by instituting best stormwater management practices by installing retention ponds, green roofing, or a new wetland.

Recommendations for Funding Stormwater Improvements

The task force recommends the city explore creating and implementing a stormwater utility. A stormwater utility would provide the city with a stable and predictable source to fund stormwater system improvements and maintenance and perform condition assessment and asset management within the stormwater system. User fees would fund a stormwater utility. A user fee would also be an effective tool to implement and encourage better stormwater management, including the use of green infrastructure and compliance with a stormwater detention ordinance on private property.

To comply with the mandate from *Bolt*, the stormwater utility would have to be designed with opt out and credit provisions for both residential and non-residential property owners like those in the Ann Arbor stormwater utility (for examples of possible credits, see the Ann Arbor case study – Appendix B). For a property to completely opt out, the property would have to retain all stormwater on the site in perpetuity.

Instituting a stormwater utility would allow the city to be able to assess property owners a fee directly correlated to water runoff and the amount of impervious area on their property. A stormwater utility could also provide a method for ensuring compliance with the stormwater detention ordinance, encourage the use of green infrastructure, and would make all property owners responsible for stormwater management regardless of zoning classification.

Attachment 1

The fees charged by a stormwater utility would be limited to the amount necessary to cover the cost of oversight and management of the utility, fund stormwater charges from DWSD and OCWRC, and fund programs that improve storm and combined sewer capacity and integrity.

Depending on how complicated a stormwater utility code becomes, implementation of a stormwater utility could require an increase in city personnel to staff the utility operation. Additional staff would oversee and manage the operations of the utility. Staff in this department would be responsible for identifying and programming improvements, implementing a stormwater management plan (including public education components), as well as processing and assessing requests for credits.

Eventually, the fees generated by the utility would pay for the additional staff costs. But the initial establishment of a stormwater utility will be very labor intensive and could be quite costly. Every property in the city will need to be evaluated to determine the impervious and permeable area to establish a rate methodology that is related to either an equivalent residential unit (ERU), intensity of development (ID) or equivalent hydraulic area (EHA). Once a methodology is established, a rate structure based on the actual costs to operate the utility and the costs for future improvements, based upon a capital improvement plan will need to be established and regularly updated. Only then will the utility be an effective method to finance improvements, maintenance and operations of the stormwater system.

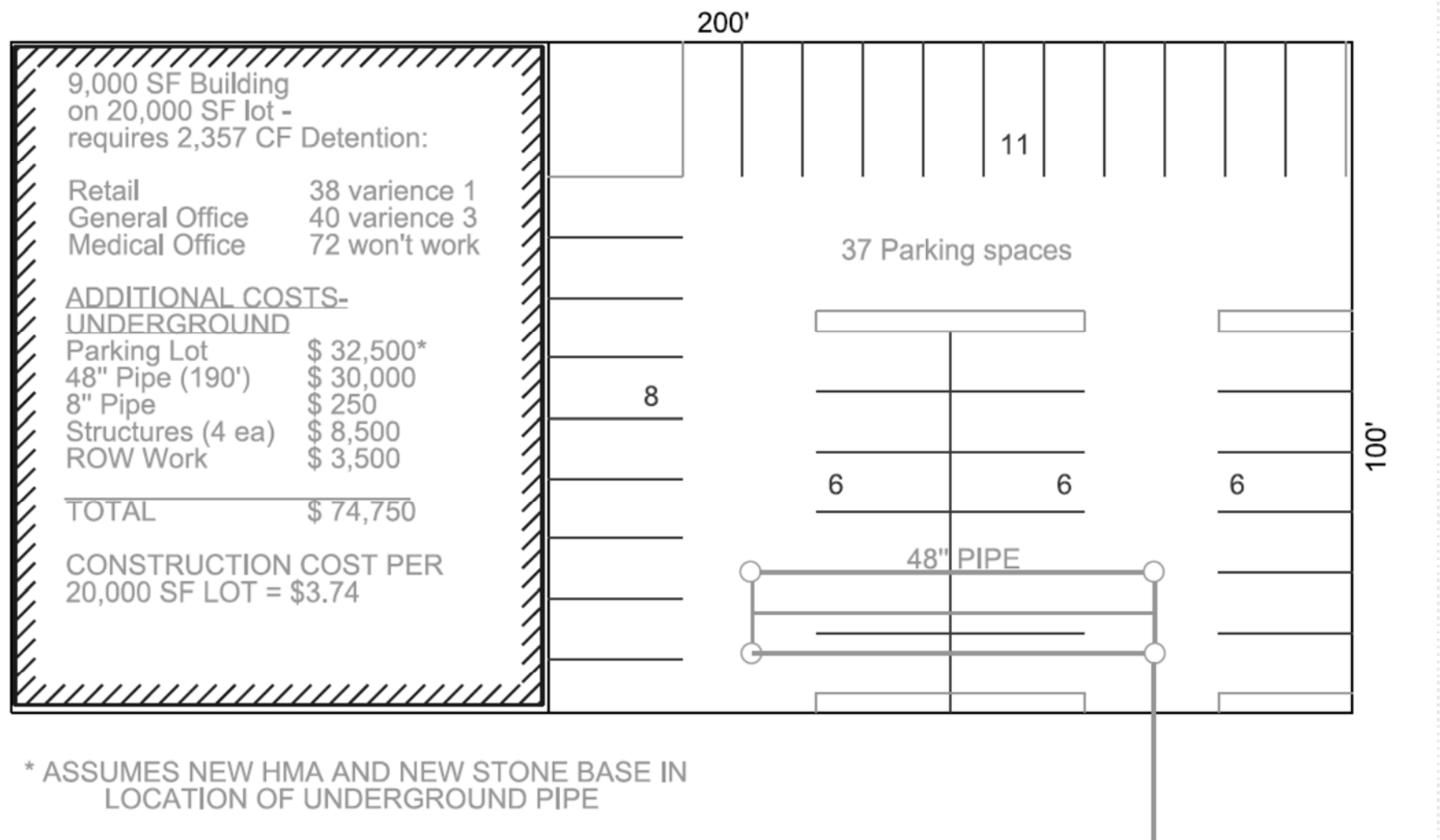
Conclusion

The task force did not make these recommendations to establish a stormwater utility lightly. The task force understands the political, practical and budgetary implications of imposing additional fees on property owners in the city. The task force believes, however, that the implementation of the recommendations summarized in the following section will meet the goal of improving the current stormwater management program by including the entire city in stormwater management, securing a stable and legal funding source, and expanding the use of green infrastructure.

Attachment 1

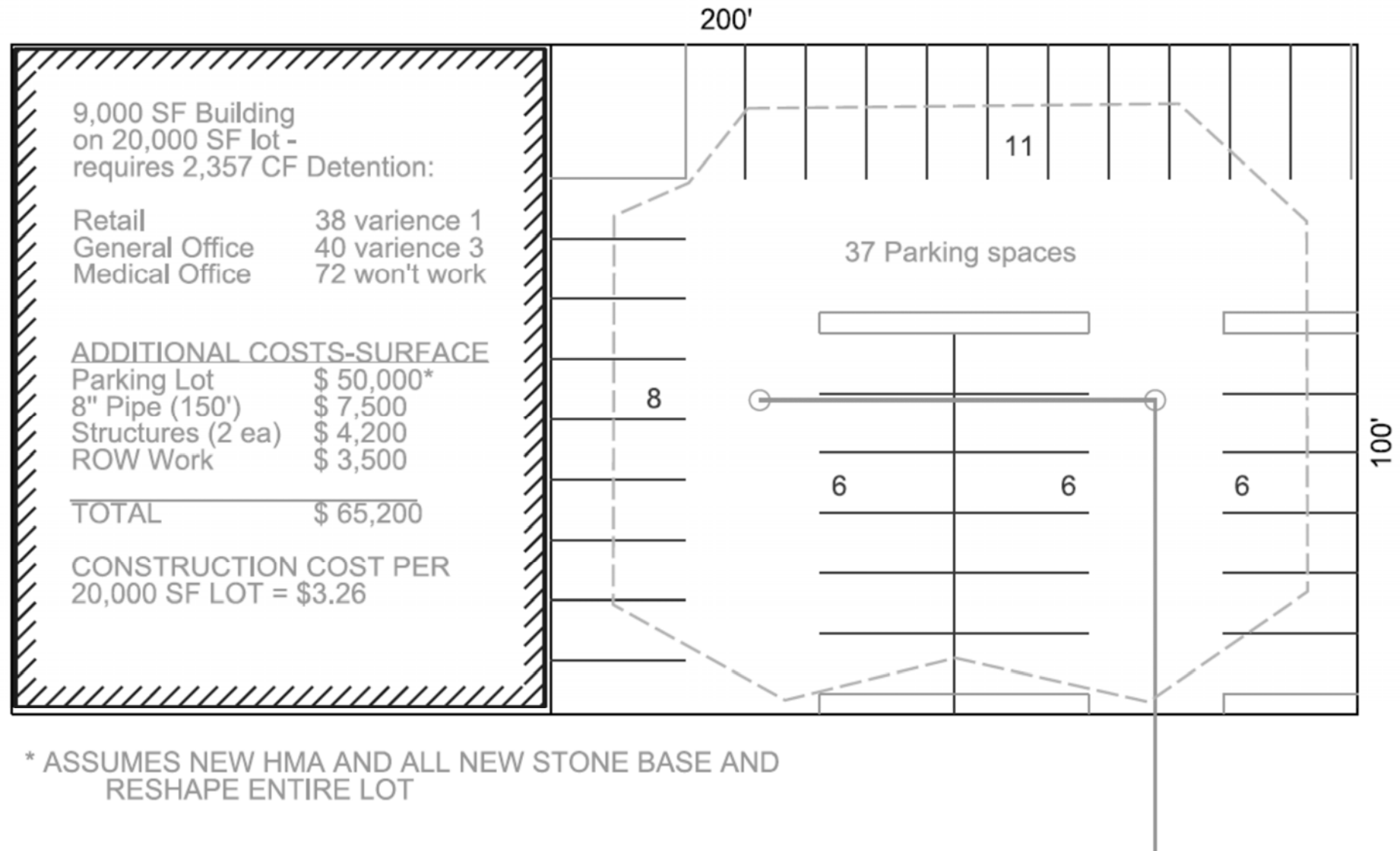
Appendix A – Detention Lot Designs and Costs

Underground Detention Design and Estimated Cost



Attachment 1

Surface Detention Design and Estimated Cost



Appendix B Case Studies

A Brief Overview of the City of Ann Arbor's Stormwater Program

The City of Ann Arbor is located approximately 45 miles west of Detroit and is part of the Middle Huron River Watershed. The city makes up approximately 27.8 square miles and has a population nearing 114,000 people. Ann Arbor has a municipal separated storm sewer system (MS4) that is made up of over 23,000 inlets and catch basins and 540 miles of storm sewer pipes that discharge untreated stormwater into the Huron River.

The city conveys stormwater runoff to help prevent localized flooding, but it also works to improve the quality and quantity of the stormwater that it ultimately discharges into the Huron River. It does this in a number of different ways.

Stormwater Code

The first is by regulating the amount of stormwater runoff that occurs from properties within the city. This is accomplished through the enforcement of their storm water code. The stormwater code regulates what properties require which types of stormwater management systems.

Whenever a residential property (one and two-family homes) increases impervious surface by 200 square feet they are required to do storm water management. In order to determine how much and what kind of management system to use, the city created a worksheet for residents providing all of the options (Appendix A).

Properties that have (or plan to have) more than 5,000 square feet of impervious surface require differing levels of stormwater management systems. Table 1 below shows the differing requirements for these properties. As you can see in the table, all properties require the infiltration or retention of the first flush (the initial runoff during a rainstorm) and as the size of the impervious area increases, so too does the size of the rain event that must be detained.

Amount of Impervious Surface (by square feet)	Required Retention/Infiltration of First Flush	Require Detention of 1-2 Year Storm Events	Require Detention of 100-Year Storm Event
5,000 to 9,999	Yes	No	No
10,000 to 14,999	Yes	Yes	No
15,000 and above	Yes	Yes	Yes

For properties that already have existing impervious surface and sites within the

Downtown Development authority, the code allows properties that provide stormwater detention to the maximum amount feasible to not meet the same criteria as illustrated in Table 1. In these circumstances, an impact fee of \$2.00 per square foot for residential properties and \$2.50 per square foot of commercial properties is required. These fees are used to improve stormwater management systems within the watershed. (Note: another option is the donation of land, with city council approval, instead of the impact fee).

Table 1: Infiltration and Retention Requirements by Impervious Area

Green Infrastructure

Another method that the City of Ann Arbor uses to help control the quality and quantity of stormwater discharged into the Huron River is through the use of green infrastructure. One example of the city's use of green infrastructure is the installation of a green roof. Simply put, a green roof is created by planting vegetation on a building's roof to allow for the infiltration of stormwater. Green roofs also create recreational opportunities (i.e. aesthetically pleasing natural areas for employees to enjoy lunches or breaks) where none existed prior.

Other green infrastructure initiatives that the City of Ann Arbor has used have been the installation of bio-swales and rain gardens during road improvement projects. Rain gardens are depressed areas with natural landscaping that allow for a greater infiltration of stormwater. As the water is infiltrated, it is filtered and eventually helps recharge the ground water table. In February of 2014 the city codified these efforts and created a Green Streets Policy. This policy requires the city to implement green infrastructure during all street construction and reconstruction projects.

Stormwater Management Program

As an MS4 community with over 100,000 residents, the City of Ann Arbor is required to have a National Pollution Discharge Elimination System Permit that requires the city have a Stormwater Management Program (SWMP). As the City of Royal Oak is not an MS4 community, but rather a combined sewer system community, there is no requirement to have an NPDES Permit or a SWMP. However, a SWMP could help guide any improvements in the Royal Oak system.

Ann Arbor's NPDES Permit outlines the specific topics that must be covered by the Program. The SWMP must include sections on public education, public involvement/participation, illicit discharge elimination program, post-construction stormwater management, construction stormwater runoff control and pollution prevention/good housekeeping for municipal operations. The Ann Arbor SWMP describes their pollution prevention compliance activities that they currently do as well as proposed activities, their operations and maintenance activities, and their public education activities.

Ann Arbor Stormwater Utility

In 1980, the city of Ann Arbor established a stormwater utility for the purposes of generating funds to improve, expand and maintain their stormwater system. Currently, the stormwater utility operates with an annual budget of roughly \$6 million. Of this between \$3.5 million and \$4 million is spent on capital improvements.

The rate structure for the utility incorporates a customer fee that all customers pay and a fee based on the total amount of impervious area on a property. Customers are able to apply for credits when they create stormwater facilities or other actions that result in a quantifiable cost savings to the city. There are different credits for different types of properties.

One or two-family residential credits include the use of rain barrels, cisterns or dry wells, one or more rain gardens resulting in at least 130 square feet and three to six inches deep and the participation in the River Safe Home Program. For nonresidential properties, credits are given for facilities that are constructed in accordance to the stormwater code, for participants in the Community Partners for Clean Streams Participants and for facilities that do not fully meet the code but do capture 50 percent of impervious area, capture the half inch of rain and release the captured volume to the city system in less than 24 hours.

Attachment 1

The City of Ann Arbor has an extensive stormwater management program and system funded through their stormwater utility. This steady funding source allows the city to utilize a combination of both green and grey infrastructure to continue to meet the needs of their residents as well as the requirements of their NPDES Permit.

The City of Seattle, WA

Background

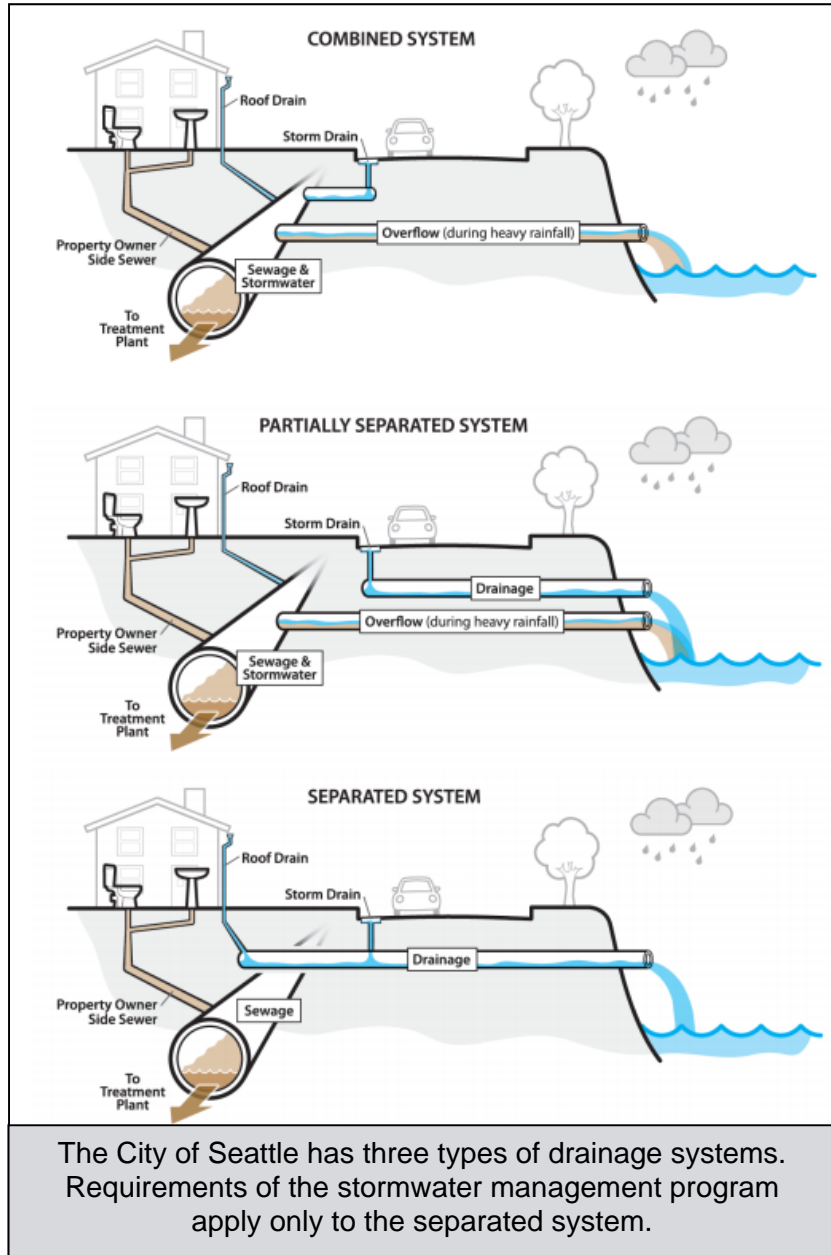
The City of Seattle, WA is often regarded as having one of the most robust stormwater management programs in the country. This is in large part due to their need to comply with the 2013 National Pollution Discharge Elimination System (NPDES) Phase I Municipal Stormwater Permit which establishes minimum performance requirements for the discharge of pollutants from their separate storm sewers. While this differs from the City of Royal Oak's combined sewer system which is treated, many of the quality objectives set by Seattle are addressed through quantity reduction methods which could be applicable in our case. These requirements must be reconciled with Seattle's primary purpose for its drainage infrastructure, to convey stormwater runoff in a manner that protects people and property.

Stormwater Management Requirements

Stormwater Code

The City of Seattle's stormwater code applies to all grading and drainage and erosion control, all land disturbing activities, all discharges directly or indirectly to a public drainage system or a public combined sewer, all discharges directly or indirectly into receiving waters within or contiguous to the city limits, all new and existing land uses, and all real property. The code applies regardless of whether a project requires a permit, and does extend to municipal properties. There are some exceptions to activities such as agriculture and forestry which are subject to other state requirements. Additional exceptions may be granted by the department director responsible for conducting a specific action.

All projects are required to maintain natural drainage patterns to the extent possible and to minimize changes to the pattern of flooding on and runoff to neighboring sites. The following table outlines minimum requirements for various project types.



Attachment 1

Single-Family Residential		Trails & Sidewalks	
Requirements/Applications	BMPs	Requirements/Applications	BMPs
<p>Applies to:</p> <p>Lots created or adjusted after January 1, 2016 where:</p> <ul style="list-style-type: none"> • Total new or replaced hard surface is 750 square feet or more, • 7,000 square feet or more of land is disturbed, and For lots that were drawn before January 1, 2016: • Any project that creates new or replaces 1500 square feet of hard surface, or • Disturbs 7,000 square feet of land or more 	<ul style="list-style-type: none"> • Full Dispersion • Infiltration Trenches • Dry Wells • Rain Gardens • Infiltrating Bioretention • Rainwater Harvesting • Permeable Pavement Facilities • Permeable Pavement Surfaces • Sheet Flow Dispersion • Concentrated Flow Dispersion • Splashblock Downspout Dispersion • Trench Downspout Dispersion • Non-infiltrating Bioretention • Vegetated Roofs • Cisterns • Perforated Stub-out Connections • Newly Planted Trees 	<p>Must retain and protect any undisturbed top soil and must amend all new, replaced, or disturbed topsoil.</p> <p>Must manage stormwater onsite for:</p> <ul style="list-style-type: none"> • All sidewalk and trail projects with 2,000 square feet or more of replaced or new hard surface, or • That disturb 7,000 square feet or more of land 	<ul style="list-style-type: none"> • Full Dispersion • Rain Gardens • Permeable Pavement Facilities • Permeable Pavement Surfaces • Sheet Flow Dispersion • Concentrated Flow Dispersion
Parcel-Based Projects			
Requirements/Applications		BMPs	

Attachment 1

<p>Lots created or adjusted after January 1, 2016 where:</p> <ul style="list-style-type: none"> • Total new or replaced hard surface is 750 square feet or more, • 7,000 square feet or more of land is disturbed, and <p>For lots that were drawn before January 1, 2016:</p> <ul style="list-style-type: none"> • Any project that creates new or replaces 1500 square feet of hard surface, or • Disturbs 7,000 square feet of land or more <p>If water discharges into wetlands:</p> <ul style="list-style-type: none"> • Total new plus replaced hard surface is greater than 5,000 square feet • Project converts more than ¼ acre of vegetation to lawn or landscaping, or • 2.5 or more acres is being converted to pasture <p>There are additional basin specific requirements for discharges into high risk waterways.</p> <p>For discharges into combined sewer systems requirements are triggered when new plus replaced hard surface equals 10,000 square feet or more.</p>		<ul style="list-style-type: none"> • Full Dispersion • Infiltration Trenches • Dry Wells • Rain Gardens • Infiltrating Bioretention • Rainwater Harvesting • Permeable Pavement Facilities • Permeable Pavement Surfaces • Sheet Flow Dispersion • Concentrated Flow Dispersion • Splashblock Downspout Dispersion • Trench Downspout Dispersion • Non-infiltrating Bioretention • Vegetated Roofs • Cisterns • Perforated Stub-out Connections • Newly Planted Trees
Roadway Projects		On-Site Stormwater Management
Requirements/Applications	BMPs	Requirements
<p>Must retain and protect any undisturbed top soil and must amend all new, replaced, or disturbed topsoil.</p> <p>Must manage stormwater onsite for:</p> <ul style="list-style-type: none"> • All roadway projects with 2,000 square feet or more of replaced or new hard surface, or • That disturb 7,000 square feet or more of land <p>There are additional basin specific requirements for discharges into high risk waterways.</p> <p>For discharges into combined sewer systems requirements are triggered when new plus replaced hard surface equals 10,000 square feet or more.</p>	<ul style="list-style-type: none"> • Full Dispersion • Rain Gardens • Infiltrating Bioretention • Permeable Pavement Facilities • Permeable Pavement Surfaces • Sheet Flow Dispersion • Concentrated Flow Dispersion 	<p>If hard surface coverage is less than 35 percent:</p> <ul style="list-style-type: none"> • Post-development discharge durations should match forested pre-development discharge rates between 8-50 percent of a 2-year storm. <p>For all other projects: Post-development discharge duration shall meet the pasture pre-developed discharge rates between 1-10 percent of a 10-year storm</p>

Other Plan Elements

Attachment 1

The City of Seattle is undergoing an extensive mapping process of its entire stormwater infrastructure, including that which is installed on private property. All projects are required to map stormwater infrastructure on their property which is turned into the city and incorporated in its GIS mapping system.

Additionally, the City of Seattle maintains extensive public engagement in its stormwater management including budget public hearings for the allocation of monies related to NPDES stormwater management, the creation of several citizen advisory groups, and an education and outreach component. Education initiatives can target school aged children, public, businesses, or professionals in the construction industry. A list of topics may be found in the table to the right.

Seattle reLeaf

The Seattle Releaf is a program designed to educate the public on the value of urban canopy and to encourage them to help build a well-maintained urban forest. Each year program staff and resident volunteers plant 1,000 trees.

Education and Outreach Topics

- General impacts of stormwater on surface waters
- Impacts from impervious surfaces
- Impacts of illicit discharges and reporting them
- Low Impact Development BMPs
- Stewardship activity opportunities
- Technical standards for site control and erosion plans
- Stormwater treatment facilities
- Use and storage of auto chemicals
- Equipment maintenance
- Prevention of illicit discharges
- Yard care for water quality
- Use and storage of yard and household chemicals
- Vehicle, equipment, and home/building maintenance
- Pet waste management
- Stormwater facility maintenance
- Dumpster maintenance

RainWise

The RainWise program provides education to the public and landscapers on low impact development techniques including the installation of rain retention, permeable paving, and rain gardens. The primary goal of this program is to slow the flow of runoff and increase infiltration. Program materials include a rain gardens website, guidebook, and plant list. Staff for the program led at least two public workshops each year and several rain garden demonstrations throughout the city.

Background

With a population of over 20,000 people and covering approximately 4.7 square miles, Royal Oak's neighbor, Birmingham, operates a sewer system like that of Royal Oak. As a combined sewer system, Birmingham conveys both wastewater and stormwater through a series of underground pipes and eventual is treated and discharged by the Great Lakes Water Authority (formerly Detroit Water and Sewer Department).

Like Royal Oak, sewer disposal fees for Birmingham are based off metered water consumed by the system. For many years communities like Royal Oak and Birmingham have also based stormwater costs associated with debt service through this same methodology. These debt services charges have been the basis of lawsuits against many communities in the area.

Birmingham Stormwater Utility

Because of the lawsuit, *Wolf v Birmingham*, the City of Birmingham was required to restructure their stormwater fees. To do so, Birmingham set out to develop a methodology for charging the fees that would conform to the three tests established in *Bolt v City of Lansing*. Birmingham contracted with Hubbell, Roth & Clark Inc (HRC) to perform a [stormwater apportionment study](#) from which to establish stormwater rates.

To look at the entire city, the study established seven categories of property (six single-family categories and one category for all others). To study the single-family residential, HRC created six property classes based on the size of the parcels. HRC then looked at the total impervious and pervious area for each property in the class and created an average runoff potential for the property class. Using the class with the most parcels in the city (.125 - .250 acres) as the standard unit, HRC established units for all other classes. This is done to create some standardization in billing rates. For the non-single-family properties HRC determined a runoff potential for each property. This runoff potential was then compared to the standard unit to determine the unit for that property.

The runoff potential from a property is based on hydrologic engineering principles for calculating runoff that use both the impervious surface area and pervious surface area.

Birmingham also established a credit system for properties to potential limit their use of the stormwater system and thereby reduced their cost for the system and a process for property owners to appeal their assessment. To date, Birmingham has only received one appeal.

Appendix C

Birmingham Stormwater Utility Ordinance

ARTICLE VI. - STORM WATER UTILITY FEE Sec. 114-400. - Definitions.

The following words, terms and phrases, when used in this article, shall have the meanings ascribed to them in this section, except where the context clearly indicates a different meaning:

Combined sewer system: Public sewers, drains, ditches, roads and retention ponds used for collecting and transporting storm water and non-storm water in the city.

Director: The city engineer or such other person as the city manager may designate.

Equivalent storm water unit (ESWU): A subunit of measurement which relates the volume of storm water discharged from a lot based on the amount of total and impervious lot area, compared to the standard unit. The formula for an equivalent storm water unit (ESWU) is as follows:

$$1 \text{ ESWU} = (0.15 (\text{TAs} - \text{IAs}) + (0.90 (\text{IAs})))$$

where,

TAs = total area of standard unit;

IAs = impervious area of standard unit;

0.15 = runoff coefficient for pervious area;

0.90 = runoff coefficient for impervious area.

One ESWU in the city is equal to the average runoff potential of the standard unit.

Impervious lot area: Impervious area means a surface area that is resistant to permeation by surface water.

Industrial sites Those sites that contain industrial activities which require wastewater discharge permits as set forth in section 114-202 of this Code.

Nonstorm water: All flows to the combined sewer system not defined as storm water in section 114-199, or as determined by the director.

Pervious lot area: All land area that is not impervious. Pervious lot area equals the total lot area, minus the impervious lot area. Pervious lot area has a runoff coefficient equal to 0.15.

Runoff potential: The runoff potential from a property is based on hydrologic principles for calculating runoff that use both the impervious surface area and the pervious surface area. Runoff potential is measured in square feet using the following formula:

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$$\text{Runoff Potential} = 0.15 \times [\text{Total Area} - \text{Impervious Area}] + 0.9 \times [\text{Impervious Area}]$$

Separated storm water sewer system: Public sewers, drains, channels, ditches, roads and retention ponds used for collecting and transporting storm water in the city.

Standard unit: Single-family residential parcel in the city within a lot size between 1.126 and 0.250 acres.

Storm water: Storm water runoff, snow melt runoff and surface runoff and drainage.

Storm water utility fee: The fee imposed for the use of that portion of the combined system that transports storm water, based on the number of ESWU's for a lot or parcel of land determined as provided in section 114-402.

Storm water sewer system: That portion of the combined sewer system and separated storm water sewer system that is attributable to the transportation and treatment of storm water.

User: An owner of property which directly or indirectly contributes to the combined sewer system.

(Ord. No. 2204, 12-5-16)

Sec. 114-401. - Storm water utility fees.

- (a) All users shall pay a storm water utility fee proportional to the volume of storm water which is projected to discharge into the combined sewer system and storm water sewer system from their property.
- (b) The city commission shall, by resolution, set storm water utility fees at a rate which will recover from each user its share of the costs of the storm water sewer system attributable to the discharge of storm water from the users' property to the storm water system. The city shall use the revenues of the storm water utility fees to pay the costs of the water treatment operation and maintenance of the storm water sewer system, and for necessary improvements and additions to the storm water sewer system.
- (c) The city may also collect from users fees imposed to pay the implementation and operation of any of the following:
 - (1) Monitoring, inspection and surveillance procedures;
 - (2) Reviewing discharge procedures and construction;
 - (3) Discharge permit applications; or
 - (4) Other fees as the city may deem necessary to operate the storm water sewer system.

(Ord. No. 2204, 12-5-16)

Sec. 114-402. - Calculation of fees and appeals.

- (a) Single-family residential ESWU. All single-family residential properties in each of the lot-size categories are assigned the same ESWU for that category. The ESWU values for the single-family residential categories are summarized in the fee schedule.

Property Type	SFR Class
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Single-Family Residential, 0.125 acres or less	Class A
Single-Family Residential, 0.126 acres to 0.250 acres	Class B
Single-Family Residential, 0.251 acres to 0.500 acres	Class C
Single-Family Residential, 0.501 acres to 0.750 acres	Class D
Single-Family Residential, 0.751 acres to 1.000 acres	Class E
Single Family Residential, 1.001 acres or larger	Class F

- (b) Non-single family ESWU. The storm water utility fee for non-single family lots shall equal the number of ESWU's for a given lot, multiplied by the annual rate established by the city commission per ESWU per year. The formula for determining the number of ESWU's per non-single family lot shall be calculated from the amount of pervious and impervious lot area as follows:

$$\text{Number of ESWU's} = \frac{0.15}{\text{Average runoff potential of the standard unit/ESWU}} (\text{TA} - \text{IA}) + 0.90 (\text{IA})$$

where,

TA = total area of each lot (reported in square feet);

IA = impervious area of each lot (reported in square feet).

- (c) Any non-single-family residential property owner liable for a storm water utility fee may appeal the determination that the property utilizes the storm water system or the amount of a storm water utility fee, including a determination on a reduction in or the elimination of the fee under subsections (a) and (b). An appeal may be based on the quantity of storm water runoff generated, the reductions established, the reductions allocated, or any other matter relating to the determination of the storm water utility fee.
- (d) A single-family residential property owner may appeal the determination that the property utilizes the storm water system, however, such an appeal shall be limited to the following reasons:
- (1) The size of the lot has been miscalculated, or
 - (2) All or part of the storm water runoff drains to an open drainage course, such as a river, lake or creek, which affects the quantity of the storm water runoff generated that gets into the storm water sewer system.
- (e) An appeal under subsection (c) shall be heard by a storm water utility appeals board appointed by the local unit of government. The appeals board shall consist of three members, two of whom shall be licensed professional engineers not employed by the local unit of government.
- (f) An appeal of a storm water utility fee shall not be brought more than one year after the fee was billed.
- (g) To prevail in an appeal of a storm water utility fee, the appellant shall demonstrate in accordance with the requirements of the plan for a non-single-family residential property that the use of the system by the property is less than the amount used by the local unit of government in the calculation of that property's storm water utility fee, or for all properties the classification of the property type is in error, or there was a mathematical error in the calculation of the fee.
- (h) The sole remedy for a property owner who prevails in an appeal of a storm water utility fee is a prospective correct recalculation of the storm water utility fee.
- (i) If in an appeal of a storm water utility fee the appeals board finds that the requirements of subsection (g) have not been met, that finding is conclusive until the property is modified to either increase or

Attachment 1

decrease the utilization of the system. The property owner remains eligible for reduction or elimination of fees under the storm water utility ordinance.

- (j) A property owner making an appeal shall provide the appeals board with information necessary to make a determination.
- (k) A person aggrieved by a decision of the appeals board on an appeal under this section may appeal to the circuit court in which the property is located. An appeal to the circuit court must be filed within 30 days of the appeals board's decision.

(Ord. No. 2204, 12-5-16; Ord. No. 2248, 9-11-17)

Sec. 114-403. - Credits.

- (a) The purpose of this section is to provide for each property owner's control over contributions of storm flows to the storm water utility system and the related storm water utility fees and to advance protection of the public health, safety, and welfare.
- (b) The city shall offer credits on an annual basis that will enable any property owner, through voluntary action, to reduce the storm water utility fees calculated for that property owner's property and will provide a meaningful reduction in the cost of service to the storm water system, or that shall be reasonably related to a benefit to the storm water system.
 - (1) Credits will only be applied if requirements outlined in this chapter and other applicable sections of the City Code are met, including, but not limited to: completion of ongoing maintenance, guaranteed right-of-entry for inspections, and submittal of annual self-certification reports.
 - (2) Credits will be defined as either set fee reduction or percent (%) reductions applied as a credit adjustment to the fee calculation equation.
 - (3) Credits are additive to each credit category.
 - (4) As long as the storm water facilities or management practices are functioning as approved, the credit reduction will be applied to the fee. If the approved practice is not functioning as approved or is terminated, the credit reduction will be cancelled and the fee will return to the baseline calculation. Once the credit reduction has been cancelled, a customer may not reapply for credit for a period of 12 months and only then if the deficiency has been corrected, as determined by city inspection.
 - (5) Credits will be applied to the next complete billing cycle after the application has been approved.
- (c) The director shall define a method for applying and granting credits on an annual basis, as well as criteria for determining the credits a property owner may receive. The director may, by regulation, establish credits for one or more of the following:
 - (1) Installation and maintenance of rain barrels, rain gardens, bioswales, cisterns, dry wells, infiltration trenches, porous pavement or pavers, or disconnecting footing drains;
 - (2) Installation and maintenance of a storm water control facility, or other water quantity controls; and
 - (3) Other actions of the property owner that, in the judgment of the director, result in a measurable reduction in storm water runoff.

(Ord. No. 2204, 12-5-16)

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Sec. 114-404. - Billing.

The billing for the storm water utility may be combined with the billing for other utility services. Final determinations on measurements per ESWU will be determined by the director.

(Ord. No. 2204, 12-5-16)

Sec. 114-405. - Collection.

Unpaid storm water utility fees shall constitute a lien against the property affected. Fees which have remained unpaid for a period of six months prior to April 30 may be certified to the city treasurer who shall place the fees on the next tax roll of the city. In the alternative, the city commission may direct the city attorney to take appropriate legal action to collect unpaid fees.

(Ord. No. 2204, 12-5-16)

Appendix D

Royal Oak Stormwater Detention Ordinance (Current)

Chapter 644 STORMWATER DETENTION

GENERAL REFERENCES

Fences — See Ch. 323.

Weeds — See Ch. 757.

Flood damage prevention — See Ch. 351.

Zoning — See Ch. 770.

Property maintenance — See Ch. 556.

§ 644-1. Short title.

This chapter shall be known and cited as the "Stormwater Detention Ordinance of the City of Royal Oak" and will be referred to herein as "this chapter."

§ 644-2. Purpose.

This chapter is intended to specifically apply to stormwater detention which is a prevailing need and which the absence of detention could endanger the property, health, safety and general welfare of the residents and property owners of the City.

§ 644-3. Definitions.

As used in this chapter, the following terms shall have the meanings indicated:

ADDITION — Any addition to an existing building.

APPROVAL — Written approval by the City Engineer of the City of Royal Oak, Michigan, or by his duly authorized agents, assistants, or representatives, limited to the specific duties assigned or entrusted to them.

BASIN — All designated or specified areas or devices where stormwater is detained to meet the requirements of this chapter.

CITY — The City of Royal Oak, Michigan. When used in this chapter in connection with any filing, submittal, delivery or payment to, or review, approval or other action, refers to the City Engineer.

CITY'S RIGHT-OF-WAY OR RIGHT-OF-WAY — Any and all public rightsof-way, streets, highways, roads, sidewalks, alleys, thoroughfares, public easements and public places located within the City, including within any curbs, shoulders, landscaped areas and/or other areas incidental and/or appurtenant.

DEVELOPMENT — Any new building, or paved driveway, parking lot or sidewalk, not including public roadways.

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ENGINEER or CITY ENGINEER — City Engineer of the City of Royal Oak, Michigan, or his duly authorized agents, assistants or representatives, limited to the specific duties assigned or entrusted to them.

PUBLIC EASEMENT — Any area of land which has been granted or dedicated to the City or to public use, including, but not limited to, road or right-of-way, utility, water main, sewer line, access, drainage, recreation, conservation and other public areas, whether in easements or in fee.

RENOVATION — Any existing building converted to other use or structurally altered, and which requires a City building permit and/or site plan for City Plan Commission review and approval as described in § 770-12, Site plan review, or any similar ordinance. Also, any paved parking lot, private street, drive or sidewalk removal and replacement. Renovation shall also include the pulverizing and/or crushing of existing pavement for use as a new pavement base material.

SITE IMPROVEMENTS — Additions, developments and renovations proposed for a specific property as defined.

STORM DETENTION SYSTEM — All features that comprise the requirements of this chapter, including but not limited to storm detention basins and their required components and finishes, restrictors, pumps and freeboard structures; and all collection and outlet piping, drainage structures and conveyance features, including curbing, swales, ditches; and all fences, gates and signage.

§ 644-4. Scope.

Any development, renovation or addition to an existing development within the City, excluding property in the Central Business District Zones and properties used for one- and two-family residential purposes, must detain the stormwater runoff from the improvement on-site.

§ 644-5. Temporary exemption.

- A. Developments, renovations or additions less than 0.14 acre or 6,100 square feet in area will not require stormwater detention at the time of the improvement. For such case, a recordable lien to the City must be executed by the property owner. The recordable lien shall state that when the next future improvement occurs on the property which will make the accumulated area of the recorded lien(s) and the future improvement greater than 0.14 acre or 6,100 square feet, the property owner will make the stormwater detention improvements as specified in this chapter on the accumulated area.
- B. Renovations and additions that do not involve parking lot, private street, drive or sidewalk removal and replacement will not require stormwater runoff detention at the time of the improvement, unless adequate undeveloped land is available for detention on the property. If stormwater detention is not included as part of the renovation, a recordable lien to the City must be executed by the property owner. 644-5 § 644-7

The recordable lien shall state that when the next future improvement occurs on the property, the property owner will make the stormwater detention improvements as specified in this chapter on the accumulated area.

- C. Lien(s) shall be prepared by the property owner using the standard form available from the City Engineering Department.

§ 644-6. Method used.

The Oakland County Method of Detention Basin Design, as made available by the Oakland County Drain Commissioner's office, shall be utilized in determining the volume of detention required. Basins with orifice or pumped outlets will be required to hold the volume for a ten-year storm while basins with no outlets will be required to hold two one-hundred-years storms. Discharge on an orifice or pumped outlet must be throttled to a restricted rate of 0.2 cfs per acre, or throttled to a restricted flow of 0.3 cfs if the total property area requiring detention is 1.5 acres or less.

§ 644-7. Submittal procedure.

For City approval of stormwater detention, the applicant shall furnish the City Engineering Department three sets of detention plans, 24 inches by 36 inches, with detention calculations shown on the plans.

- A. A professional engineer, licensed in the State of Michigan, shall affix his or her seal on the plans.
- B. The plans shall not be drawn to a scale smaller than one inch equals 30 feet. The City Engineer shall review the plans and calculations for conformity to the standards set forth in this chapter, and certify that they are consistent with the overall utility plans of the City, after which he will return a letter of review with appropriate comments. The applicant, after making any changes requested, shall resubmit three sets of the revised plans to the Engineering Department for approval. The applicant may be required to obtain approval of the City of Royal Oak Building Department, Oakland County Drain Commissioner, the Road Commission for Oakland County or the Michigan Department of Transportation when the outlet discharges to facilities under their jurisdiction.
- C. The detention plans shall clearly indicate the perimeter of all acreage contributing to the detention basin. The perimeter of the water surface for the volume of detention provided shall also be indicated on the plans including the water surface elevation.
- D. The plans shall include the calculation of an overall coefficient of runoff for the acreage contributing to the detention basin. The range of this coefficient shall vary from 0.15 for completely grassed areas to 0.90 for completely paved areas.

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- E. The detention calculations for each site shall include the number of total acres calculated to the nearest hundredth contributing to the detention basin. The total cumulative volume of required detention shall be calculated using all areas of proposed site improvements and shall include previous site improvement areas covered by this chapter.
- F. The detention calculations shall include the sizing of the restricting orifice or structure cover. The calculations for the restricting orifice size or restricted structures cover openings shall be made using a coefficient for a sharp-edged orifice entrance. Details for the restrictor are to be clearly indicated on submitted plans. The smallest pipe orifice size allowed is 2.5 inches in diameter. The orifice size shall be rounded down to the nearest one-half inch from the actual calculated size.
- G. Calculations for the volume of detention provided shall be included on submitted plans. The volume calculations shall be made using standard geometric formulas to determine the volume between appropriate contour elevations. For irregular-shaped basins, the

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geometric formula for the volume of a frustum of a cone or pyramid shall be used to estimate the volume between appropriate contour elevations.

- H. Plan approval constitutes conformance with this chapter in regards to calculations and method used to control runoff and achieve the required detention. Plan approval does not infer sanction or approval of construction governed by any other permit or subsequent approvals.
- I. After approval of plans, any change to the storm detention system shall be submitted to the City Engineer for approval prior to its construction.

§ 644-8. General basin construction.

- A. All basin design shall incorporate components that allow for visual inspection and maintenance by mechanical means of all areas designated for stormwater storage or restricted outflow.
- B. Acceptable means of detention can be achieved through standing water in parking areas, landscaped ponds, or buried vaults, chambers, pipes or other approved buried device. Either one or any combination of these designs may be utilized to achieve the required detention.
- C. All components of storm detention systems shall be constructed entirely on the private property of the proposed development, except for discharge piping and connections to public sewers. No portion of a basin shall be installed within a publicly owned utility easement. Connections to public sewers shall be at locations as approved by the City Engineer.
- D. Basins with orifice or pumped outlets must be constructed to drain entirely unless designed to retain a permanent water level that conforms to a Plan Commission approved landscape plan.

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- E. Basins with no outlets must be constructed in soils that have a saturated hydraulic conductivity of at least 0.004 feet per minute.
- F. A minimum of 12 inches of freeboard must be provided above the retained water surface of all detention basins and below the finished floor of all adjacent buildings. A minimum of six inches of freeboard must be provided above the maximum water surface created by the required positive nonerodable overflow to both adjacent buildings and adjacent properties.
- G. A positive nonerodable overflow capable of handling the capacity of a one-hundred-year storm must be provided and clearly identified on the plans, which shall not discharge onto abutting private property.
- H. Drainage from a development, renovation and addition shall not be diverted onto abutting private property. Drainage from a development, renovation and addition requiring detention shall be directed to the detention basin. Discharge from the basin and overflow shall not be diverted onto abutting private property.
- I. The City requires a building permit for all piping and drainage structures for compliance with other codes and ordinances including the current Michigan Plumbing Code

requirements for approved materials and drainage pipe cleanouts. Section P-708 of the code requires that manholes be provided as cleanouts at each major change of direction for underground piping over 10 inches in diameter.

- J. All storm detention systems shall be maintained in proper working order, free of debris, trash or anything else that may adversely affect the operability of the system, the required volume and outlet capacity. The storm detention systems shall be kept free of vermin and any creatures that may cause the system to become inoperable or harm the public. Maintenance of the storm detention system also requires treatment to prevent and control insects and microbes.

§ 644-9. Open pond basin construction.

- A. A paved open channel must be provided along the bottom of all detention basins designed to drain entirely. The open channel shall begin at the outlet for the basin and shall run the entire length of the basin with the channel extending to all pipes discharging into the basin. The channel shall be sized to equal the capacity of the outlet for the basin when flowing full with no pressure head. The channel shall provide a minimum velocity of two feet per second when the basin outlet is flowing full with no pressure head.
- B. The entire basin must be either sodded, paved, or have some other City approved method of stabilization. The maintenance of all stabilization and fencing in and around the detention basin shall be the responsibility of the property owner.

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- C. All grass and noxious weeds growing in or around the basin shall be maintained in accordance with Chapter 757, Weeds, as amended, or other similarly adopted property maintenance code.¹ No hydrophilic plants such as rushes, reeds, water iris, willow or cattails shall be allowed to grow or thrive within an open basin, or any tree, shrub or plant not specifically shown and approved on the required plans.
- D. Minimum grade on the bottom of the detention basin shall be 1.2% when sodded. For paved open channels in basins, the minimum grade shall be 0.5%.
- E. All pipes entering a detention basin shall have either a headwall or end section at the end of the pipe. Bar screens must be installed on all open ends of pipe 12 inches or larger in diameter. Restricting orifices shall be located in an accessible structure outside of the basin limits.
- F. Fencing.
 - (1) All open pond detention basins must be fenced if the side slopes exceed one vertical to six horizontal, or if the basin is designed to hold water to a depth of more than 18 inches when filled to capacity. This requirement may be waived by the City Plan Commission when the design is an integral part of the landscaping and the location and depth does not present a potential hazard.
 - (2) A three-foot minimum shoulder shall be provided between the fence and the side slopes for the basin. The side slopes shall not exceed one vertical to three horizontal.

¹. Editor's Note: See also Ch. 556, Property Maintenance.

- (3) Fences shall be a minimum of four feet high chain link or other fencing material of comparable durability and safety as approved by the City Plan Commission with a locked access gate, 10 feet wide with double opening. A key for a City Engineer approved lock shall be supplied to the City Public Service Department.
- (4) Depending upon location in relation to adjoining properties or rights-of-way, the City Plan Commission may require a landscape screen in front of the fencing.
- (5) All gates constructed directly in front of a paved roadway are to have an end of roadway marker (ER-1) and a "road ends" sign (W-14-2-a) securely fastened to the gate in accordance with the "Michigan Manual of Uniform Traffic Safety Control Devices." The sign material shall be high intensity reflectorized Scotchlite on 0.080 aluminum.
- (6) All fencing related shall be maintained to conform to Chapter 323, Fences, or other similarly adopted ordinance, as amended.

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§ 644-10. Pumped basins.

In cases where the drain outlet for the detention basin is not deep enough to completely dewater the basin by gravity, pumps must be installed. The pumps shall be installed in duplicate with each pump capable of handling the flow. Controls shall be set in the receiving water to regulate the flow.

- A. The controls may be electrodes placed inside a galvanized pipe stilling well at a location adequately protected from the backwater curve during discharge.
- B. A bubbler system in a stilling well protected as in Subsection A above. The operating controls and pumps shall be set in a fully designed pump house with adequate dimensions for working area. The pump house and west well must be located inside the fenced area.
- C. Pump controls shall be designed in a manner that accounts for the water level in the receiving sewer.
- D. Complete specifications for the pumps and controls and performance curves for the pumps called for must be submitted to the City Engineer for approval, including two operation manuals provided from the manufacturer.
- E. The City requires a building permit for all piping, electrical work and concrete structures for compliance with other codes and ordinances.
- F. A manhole with inside diameter of six feet is required between the lift station and the outlet. The twin discharge lines shall be ductile iron. They shall enter the manhole and a storm sewer shall be installed from the manhole to the outlet. The manhole cover shall be East Jordan Iron Works (EJIW) No. 8247A hinged type or equivalent.
- G. The pump house and gate to the detention basin shall be locked at all times. A key for a City Engineer approved lock to the pump house shall be supplied to the City Department of Public Service and Recreation.

§ 644-11. Easements.

- A. Easement for discharge piping. The property owner of any development, renovation or addition that contains a detention basin, excluding surface basins within vehicular parking areas, shall grant the City an easement for the detention basin discharge piping and all discharge piping appurtenances. The easement shall be a minimum 12 feet wide, unless otherwise determined by the City Engineer. The grant of easement shall provide the City the rights to access, inspect, and to rectify any City ordinance violation within the easement if the property owner fails to commence work on compliance within 21 days from the date of written notification by the City of a violation unless emergency circumstances dictate immediate compliance. All costs incurred by the City in rectifying an ordinance violation shall be assessed to the property owner.

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- B. Easement for basin. The property owner of any development, renovation or addition that contains a detention basin, excluding surface basins within vehicular parking areas, shall grant the City an easement encompassing the detention basin. The limits of the easement shall be a minimum three feet outside any fencing, or six feet from the tip of the side slope for the detention basin and shall include a minimum twelve-foot width to access the gate for the basin. The grant of easement shall provide the City the rights to access, inspect, and to rectify any City ordinance violation within the easement if the property owner fails to commence work on compliance within 21 days from the date of written notification by the City of a violation unless emergency circumstances dictate immediate compliance. All costs incurred by the City in rectifying an ordinance violation shall be assessed to the property owner.
- C. Easement grants. The property owner shall be responsible for providing the City Engineering Department with all property and easement descriptions. All grants of easement shall be executed by the property owner prior to City issuance of occupancy permits for the development.

§ 644-12. As-built plans.

- A. Prior to formal written acceptance by the City of the storm detention system, all turf must be established in open basins. In addition, a licensed professional engineer must furnish the City Engineer two sets of sealed as-built detention plans. As-built plans shall verify that the required detention volume has been provided using calculations based on newly constructed elevations within and surrounding the basin(s). Newly constructed elevations within and surrounding the basin shall be shown on the plans in sufficient quantity and interval to verify and correspond to the calculations. The required outlet, pump or restrictor installation, grading that conforms to the approved plans, and freeboard features constructed with overflow provided shall also be indicated on the as-built plans.
- B. All differences and deficiencies shall be noted. Plans to correct deficiencies in detention volume, outlet, pump or restrictor, freeboard and overflow features shall be submitted for City Engineer approval and included with the as-built plans. All deficiencies in detention volume, outlet, pump or restrictor, freeboard and overflow features shall be corrected prior to City issuance of occupancy permits for the development.

§ 644-13. Permit required for installation of parking lot pavements.

A permit will be required from the City for the installation of all parking lot pavements as addressed under this chapter. The permit allows for one post

construction site inspection by the City Engineer upon submittal of the required as-built plans to verify compliance with the permit provisions. The City Commission shall establish the permit fee by resolution.

§ 644-14. Enforcement; variance. [Amended 8-20-2007 by Ord. No. 2007-13; 6-15-2015 by Ord. No. 2015-13]

- A. The City Engineer is charged with the enforcement of this chapter. The City Engineer shall have the authority to grant variances from the stormwater detention regulations contained in this chapter upon a showing of practical difficulty by a property owner. A property owner requesting a variance shall submit a written request specifically stating which provision a variance is being requested from and describing the practical difficulty involved in strict compliance.
- B. The City Engineer shall have the authority to promulgate rules to allow for pilot projects that may vary from the stormwater detention regulations contained in this chapter as long as any development, renovation or addition to an existing development within the City, excluding property in the Central Business District Zones and properties used for one- and two-family residential purposes, detains stormwater runoff from the improvement on site. The City Commission shall adopt the rules before they become effective.

§ 644-15. Violations and penalties.

- A. Any person, permittee, owner, developer or subsequent property owner who violates any provision of this chapter, including failure to submit plans, obtain permits, pay any fees, charges or surcharges imposed, or any condition or limitation of a permit issued pursuant or who knowingly makes false statements, representations or certification in any application, record, report or plan or other document filed or required to be maintained pursuant to this chapter or who tampers with, alters or fails to maintain, or knowingly renders inoperable any detention basin, restrictor, fence or freeboard required under this chapter is guilty of a civil infraction and shall, upon conviction, be punished by the following:
 - (1) A person violating this chapter for the first time is responsible for a municipal civil infraction and subject to payment of a civil fine of not less than \$100 for each day of the violation, plus costs.
 - (2) A person violating this chapter for the second time is responsible for a municipal civil infraction and subject to payment of a civil fine of not less than \$250 for each day of the violation, plus costs.
 - (3) A person violating this chapter for the third time is responsible for a municipal civil infraction and subject to payment of a civil fine of not less than \$500 for each day of the violation, plus costs.
- B. The City Engineer, Royal Oak Building Official and City of Royal Oak Code Enforcement are hereby authorized to seek, through any authorized prosecutorial official, prosecution of charges against any person violating any provision of this chapter.

§ 644-16. Ownership and registration.

Ownership of a storm detention system and its subsequent maintenance and liability fall to the legal ownership of the property. In the case of condominiums or other development where shared ownership of the storm detention system is owned by multiple property owners, associations or entities, the association or joint owners of the detention system shall register the legal owner's name(s), contact representative, current address and telephone numbers with the City Clerk office annually before January 30 or 30 days after any change in ownership.

Appendix E

Senate Bill 756 – Stormwater Utility Act

SENATE BILL No. 756

January 18, 2018, Introduced by Senators KNOLLENBERG and PAVLOV and referred to the Committee on Local Government.

A bill to regulate the creation of stormwater management utilities by local units of government; to regulate the adoption and content of stormwater utility ordinances; to provide for the allocation of the costs of planning, constructing, operating, maintaining, financing, and administering a stormwater system to real property served by the system; to provide for the establishment and collection of stormwater utility fees; to provide for the reduction or elimination of fees; to provide for appeals; and to prescribe the powers and duties of certain local governmental officers and entities.

THE PEOPLE OF THE STATE OF MICHIGAN ENACT:

Sec. 1. This act shall be known and may be cited as the "stormwater utility act".

Sec. 2. As used in this act:

(a) "Fund" means a stormwater fund established pursuant to section 8.

(b) "Impervious area" means a surface area that is resistant

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to permeation by surface water.

(c) "Local unit of government" or "local unit" means a city, village, township, or county.

(d) "Operation and maintenance costs" means all costs, direct and indirect, of materials, labor, professional services, utilities, and other items for the management and uninterrupted operation of a stormwater system in a manner for which the stormwater system was designed and constructed.

(e) "Property" means real property or a parcel of real property, as indicated by the context.

(f) "Stormwater" means that term as defined in 40 CFR 122.26(b)(13).

(g) "Stormwater management" means 1 or more of the following:

(i) The quantitative regulation through the stormwater system of the volume and rate of stormwater runoff from property. Quantitative regulation includes, but is not limited to, flood control.

(ii) The qualitative regulation of stormwater runoff into the stormwater system or of stormwater discharged from the stormwater system. Qualitative regulation includes, but is not limited to, stormwater treatment, pollution prevention activities, and administration and enforcement of ordinances to reduce, eliminate, or treat pollutants carried from property into the stormwater system by stormwater.

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(iii) Notifying property owners about the stormwater management program, including, but not limited to, how to obtain a reduction or elimination of fees for use of the stormwater system.

(h) "Stormwater management plan" or "plan" means a plan described in and adopted pursuant to section 4.

(i) "Stormwater management program" means aspects of stormwater management undertaken by a local unit of government.

(j) "Stormwater system" means those features that are located or partially located within the geographic limits of a local unit of government and that are designed or actively managed by the local unit for collecting, storing, treating, or conveying stormwater, which may include roads, streets, highways, catch basins, curbs, gutters, ditches, storm and combined sewers and appurtenant features, pipes, interceptors, conduits, lakes, ponds, channels, swales, storm drains, county drains, canals, creeks, streams, gulches, gullies, flumes, culverts, bridges, siphons, retention or detention basins, treatment, screening, or disinfection facilities, dams, floodwalls, levees, pumping stations, and other similar facilities, and natural watercourses.

(k) "Stormwater utility fee" or "fee" means a fee provided for under section 5.

(l) "Stormwater utility ordinance" means an ordinance described in and adopted pursuant to section 3.

Sec. 3. (1) A stormwater management utility shall accomplish 1 or more of the following regulatory purposes:

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(a) Protect against economic loss, property damage, threats to public health and safety, and damage to the environment and natural resources from water pollution or from flooding or other instances of high volumes or rates of stormwater runoff.

(b) Enable property owners to fulfill legal obligations pertaining to increases in the quantity or reduction in the quality of stormwater runoff resulting from voluntary choices made in the manner of development of the property, including, but not limited to, obligations under section 3109 of the natural resources and environmental protection act, 1994 PA 451, MCL 324.3109, the natural flow doctrine, and the law of trespass and nuisance.

(c) Provide property owners paying stormwater utility fees with proportionate benefits described in subdivision (a). These benefits include reciprocal benefits to a property owner when other property owners pay fees to support the stormwater system and thereby fulfill their legal obligations to that property owner described in subdivision (b).

(2) To create a stormwater management utility, the legislative body of a local unit of government shall do both of the following:

(a) Adopt a stormwater management plan by resolution.

(b) Adopt a stormwater utility ordinance that is consistent with the adopted stormwater management plan.

Sec. 4. (1) A stormwater management plan shall include all of the following:

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(a) The time period covered by the plan.

(b) The service area of the stormwater management utility. The service area may consist of all of the territory of the local unit of government, a portion of the territory of the local unit, or all or a portion of the territory of 2 or more local units that jointly develop the plan.

(c) The type and level of stormwater management services to be provided by the stormwater management utility, including system reliability, level of flood protection, pollution control, and structural condition of system components.

(d) Projected direct and indirect costs to provide services as described in the plan pursuant to subdivision (c) for the stormwater management utility, including cost of planning, capital, operations, maintenance, permit compliance, and asset replacement.

(e) Recommendations for efficiencies to minimize costs.

(f) Current and projected impervious area and, if applicable under section 7(2), an inventory of impervious surfaces and parcel areas for properties within the stormwater management utility's service area.

(g) A determination of which properties will be subject to any stormwater utility fee for voluntary use of a stormwater system owned and operated by the local unit of government, as required under section 10(1), and the process and method that was used to make that determination.

(h) The method of calculating any stormwater utility fees proportionate to the cost of providing the locally determined level of service of stormwater management.

(i) Provisions to ensure that the cost of those elements of the stormwater management program directly or indirectly related to the amount of stormwater managed will be allocated in proportion to the amount of stormwater runoff from a property conveyed by the stormwater system, employing methods that are relatively accurate considering available technology.

(j) A description of the components of the stormwater system owned and operated by the local unit of government.

(k) A description of how a stormwater utility fee may be reduced or eliminated as provided under section 9.

(2) Before preparing a stormwater management plan, a local unit of government must give notice that it intends to prepare a stormwater management plan. The notice shall be given by all of the following means:

(a) If the local unit has a website that is accessible to the public free of charge, by posting on the website.

(b) By publication in a newspaper of general circulation within the local unit. If there is no newspaper of general circulation within the local unit, notice shall be given by first-class mail to all persons to whom real property taxes are assessed and to the occupants of all structures within the local unit.

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(c) By first-class mail to the county drain commissioner or water resources commissioner and to each local unit located adjacent to or located, in whole or in part, within the local unit preparing the plan. The notice under this subdivision shall request the recipient's cooperation in and comment on the preparation of the plan, including comment on jointly managing stormwater.

(3) Before adopting a stormwater management plan, a local unit of government must hold at least 1 public hearing on the proposed plan. The local unit shall give notice specifying the time, place, and purpose of the hearing and the place where a copy of the proposed plan is available for public inspection. The notice shall be given by all of the following means:

(a) If the local unit has a website that is accessible to the public free of charge, by posting the notice on the website at least 14 days before the hearing and maintaining the posting until the time of the hearing. The posting shall include a copy of the proposed plan.

(b) By publication in a newspaper of general circulation within the local unit. If there is no such newspaper, notice shall be given by first-class mail to all persons to whom real property taxes are assessed and to the occupants of all structures within the local unit. If the local unit has a website that is accessible to the public free of charge, the notice under this subdivision shall include the website address at which a copy of the proposed

plan is posted under subdivision (a). The notice under this subdivision shall be published or deposited in the United States mail at least 14 days before the date of the hearing.

(c) By first-class mail to the county drain commissioner or water resources commissioner and to each local unit located adjacent to or located, in whole or in part, within the local unit preparing the stormwater management plan. If the local unit has a website that is accessible to the public free of charge, the notice under this subdivision shall include the website address at which a copy of the proposed plan is posted under subdivision (a). The notice under this subdivision shall be deposited in the United States mail at least 14 days before the date of the hearing.

(4) A stormwater management plan may be extended or otherwise amended by resolution subject to the same procedure set forth in this section for the adoption of the original plan.

Sec. 5. (1) A stormwater utility ordinance shall identify the regulatory purposes under section 3(1) served by the ordinance.

(2) A stormwater utility ordinance may provide for a stormwater utility fee on property serviced by a stormwater system to pay the proportionate costs of the stormwater management program. A stormwater utility fee shall not include components other than as described in this section and sections 6 and 7.

(3) A stormwater utility ordinance shall describe the method or methods used to determine any stormwater utility fee.

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(4) A local unit of government may develop a corresponding stormwater utility fee, calculation method, or both for each stormwater management utility described in the stormwater management plan.

(5) A stormwater utility fee shall be proportionate to the direct and indirect cost to the local unit of government of providing stormwater management to each property in a stormwater management utility that uses the stormwater system that is not financed by revenue received by the local unit of government from any other source.

(6) A stormwater utility ordinance may define rate categories for classes of properties for which the proportionate cost of providing service is similar.

Sec. 6. (1) A stormwater management utility may assess a 1-time stormwater utility fee for connection to the stormwater system of newly developed or modified property benefited by the stormwater system. The purpose of the fee is to finance the capital costs to the local unit of government of elements of the public stormwater system needed to serve that property and not otherwise financed by the property developer or by revenue received by the local unit of government from any other source.

(2) A stormwater utility fee under subsection (1) shall be computed based on the newly developed or modified property's proportionate share of the local unit of government's cost to

expand the stormwater system to manage the additional stormwater from that property, including, if appropriate, the newly developed or modified property's proportionate share of the local unit of government's existing capital investment in the stormwater system. This proportionate share shall be calculated consistent with the method used by the local unit of government under section 7 considering the available data at the time of the property's development or modification.

Sec. 7. (1) A stormwater management utility may assess a stormwater utility fee for the use of a stormwater system.

(2) The method for determining a stormwater utility fee under subsection (1) shall be based on the quantity or quality, or both, of stormwater runoff from each property or category of property.

(3) A stormwater utility fee or portion thereof charged to a property for those elements of the stormwater management program whose cost is attributable to the quantity of stormwater runoff from each individual property or category of properties shall be calculated, consistent with stormwater management plan provisions under section 4(1)(i), using 1 or more methods generally accepted by licensed professional engineers or regional or national professional groups associated with stormwater experts, including, but not limited to, the following methods:

(a) Impervious area, based solely on the impervious area of the property.

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(b) Equivalent residential unit or equivalent service unit, based on the impervious area of the property in comparison to the typical impervious area associated with single-family residential properties within the service area of the stormwater management utility.

(c) Intensity of development, based on the total area of the property multiplied by a rate category. A rate category shall apply to properties with statistically similar stormwater-runoff-generating characteristics. The stormwater utility fee shall be proportionate to the percentage of the property's impervious area to its total area.

(d) Equivalent hydraulic area, calculated as follows:

(i) Multiply the impervious area of the property by a stormwater runoff factor.

(ii) Multiply the pervious area of the property by a stormwater runoff factor.

(iii) Add the products under subparagraphs (i) and (ii).

(e) Other billing methodologies that can be demonstrated to provide an equitable distribution of costs in proportion to the property's use of the stormwater system.

(4) A stormwater utility fee or portion thereof charged to a property for those elements of the stormwater management program whose cost is attributable to the quality of stormwater managed and is not covered by other revenue shall be proportionate to the cost

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of those elements of the stormwater management program.

Sec. 8. (1) A stormwater utility ordinance that establishes a stormwater utility fee shall establish a stormwater fund. All stormwater utility fees collected by the local unit of government shall be deposited into the fund. The treasurer of the local unit of government may receive money or other assets from any other source for deposit into the fund. Money in the fund shall be invested pursuant to 1943 PA 20, MCL 129.91 to 129.97a. The treasurer shall credit to the fund interest and earnings from fund investments. Money in the fund at the close of the fiscal year shall remain in the fund and shall not lapse to the general fund of the local unit.

(2) The treasurer of the local unit of government shall expend money from the fund, upon appropriation, only for the regulatory purpose of defraying any of the following stormwater management program costs:

(a) Operation, maintenance, planning, engineering, acquisition, construction, installation, improvement, or enlargement of a stormwater system, including financing and debt service costs and indirect and overhead costs that are fairly chargeable to such activities under applicable generally accepted accounting principles and the uniform budgeting and accounting act, 1968 PA 2, MCL 141.421 to 141.440a.

(b) Administration of the stormwater management program.

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(c) Development of a stormwater management plan.

(d) Providing user education related to the stormwater management plan or required by federal or state regulations or required by permits issued to the local unit of government by federal or state regulatory bodies.

(3) If the local unit of government has a website that is accessible to the public free of charge, the local unit shall post on its website the most recent audit report for the fund under the uniform budgeting and accounting act, 1968 PA 2, MCL 141.421 to 141.440a.

Sec. 9. (1) Subject to subsection (2), a stormwater utility ordinance that imposes a stormwater utility fee shall provide for the reduction or elimination of the stormwater utility fee for a property if a modification or improvement made to that property or to that and 1 or more other properties reduces the rate or volume of or eliminates runoff of or pollutant loadings in excess of natural levels of stormwater entering the stormwater system. Each property owner has the burden of demonstrating that the stormwater utility fee reduction or elimination is justified for that property, using methods that are reasonably accurate considering available technology.

(2) A reduction in or elimination of the stormwater utility fee under subsection (1) shall be proportionate to the reduction of the cost of service of the stormwater system to the property or

properties.

Sec. 10. (1) To ensure that stormwater utility fees are voluntary, property is not subject to a fee unless the local unit of government demonstrates both of the following:

(a) That the property utilizes the stormwater system.

(b) That such utilization imposes a net cost to the stormwater system when offset by any activities or conditions that reduce the cost of service to the stormwater system or are reasonably related to a benefit to the stormwater system provided by that property or its owner, including, but not limited to, modifications or improvements described in section 9(1).

(2) The local unit of government shall provide the owner of property initially determined to be subject to a stormwater utility fee under subsection (1) with the opportunity to demonstrate that the property either does not utilize the stormwater system or does not utilize the stormwater system to the extent calculated by the local unit of government in establishing the stormwater utility fee and is therefore entitled to the elimination of or a reduction in the fee. The stormwater utility ordinance shall set forth procedures to implement this subsection.

(3) A stormwater utility ordinance that establishes a stormwater utility fee shall provide that, when additional property begins to utilize the stormwater system, a stormwater utility fee, as determined by the local unit of government, accrues.

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Sec. 11. A stormwater utility ordinance shall designate an entity within the local unit of government to administer the stormwater management utility and shall establish the administrative duties. A stormwater utility ordinance shall establish administrative policies and procedures or authorize the administrator to establish the administrative policies and procedures. The administrative policies and procedures shall include at least the following topics, as applicable:

(a) Criteria used to determine whether a stormwater utility fee will be billed to the property owner.

(b) Procedures for updating billing data based upon changes in property boundaries, ownership, and stormwater runoff characteristics, and stormwater runoff calculation methods.

(c) Billing and payment procedures of the stormwater management utility including the billing period, billing methodology, credit application procedures, and penalties.

(d) Policies establishing the type and manner of service that will be provided by the stormwater management utility.

(e) Regulations governing the resolution of stormwater management disputes that arise between property owners within the stormwater management utility.

(f) Procedures for granting and modifying the reduction or elimination of a fee, as authorized pursuant to section 9.

(g) Procedures for appeals as described in section 13.

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(h) Enforcement policies and procedures.

(i) A process by which fees, formulas for calculating fees, and formulas for calculating fee reductions will be reviewed and updated at least every 3 years.

Sec. 12. (1) A stormwater utility ordinance shall establish remedies for any unpaid stormwater utility fees as described in this section.

(2) A local unit of government may collect a stormwater utility fee by any method authorized by law.

(3) A partial payment of delinquent stormwater utility fees shall be applied to the oldest delinquent fees, and remaining fees may continue to accrue interest and penalties.

Sec. 13. (1) A stormwater utility ordinance or the administrative policies and procedures adopted under the ordinance shall provide a procedure for appeals, the establishment of an appeals board, and the reduction or elimination of any stormwater utility fee. The procedure shall include at least all of the following:

(a) Any property owner liable for a stormwater utility fee may appeal the determination that the property utilizes the stormwater system or the amount of a stormwater utility fee, including a determination on a reduction in or the elimination of the fee under section 9. An appeal may be based on the quantity or quality of stormwater runoff generated, the reductions established, the

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reductions allocated, or any other matter relating to the determination of the stormwater utility fee.

(b) An appeal under subdivision (a) shall be heard by a stormwater utility appeals board appointed by the local unit of government. The appeals board shall consist of 3 members, 2 of whom shall be licensed professional engineers not employed by the local unit of government.

(c) An appeal of a stormwater utility fee shall not be brought more than 1 year after the fee was billed.

(d) To prevail in an appeal of a stormwater utility fee, the appellant must demonstrate in accordance with the requirements of the stormwater management plan that the property does not use the system to the extent determined by the local unit of government in the calculation of that property's stormwater utility fee or that there was a mathematical error in the calculation.

(e) The sole remedy for a property owner who prevails in an appeal of a stormwater utility fee is a prospective correct recalculation of the stormwater utility fee.

(f) If in an appeal of a stormwater utility fee a local unit of government finds that the requirements of subdivision (d) have not been met, that finding is conclusive until the property is modified to either increase or decrease the utilization of the system. The property owner remains eligible for a reduction in or elimination of fees under the stormwater utility ordinance.

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(g) A property owner making an appeal shall provide the appeals board with information necessary to make a determination.

(2) A person aggrieved by a decision of the appeals board on an appeal under this section may appeal to the circuit court in which the property is located.

Sec. 14. (1) This act does not expand existing authority of local units of government.

(2) This act does not limit existing authority of local units of government to cooperate with respect to or jointly create and operate stormwater management utilities, subject to section 3(1).

Enacting section 1. This act takes effect 90 days after the date it is enacted into law.

Appendix F

OHM Advisors 2014 Combined Sewer Analysis

A copy of the OHM Sanitary and Combined Sewer Study can be found at:

<https://www.romi.gov/DocumentCenter/View/19851>