October 28, 2014

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CITY OF ROSEVILLE
MACOMB COUNTY, MICHIGAN

RESOLUTION NO. ___

A RESOLUTION TO AMEND THE FEE SCHEDULE

At the regular meeting of the City Council for the City of Roseville held in the Council Chambers at 29777 Gratiot Ave., City of Roseville, Macomb County, Michigan 48066, on the _____ day of _____, 2014 commencing at 7:00 p.m.

Present: MEMBERS_____

Absent: MEMBERS_____

THE FOLLOWING MOTION WAS MADE:
_____ moved, _____ seconded, to adopt the following resolution:

WHEREAS, the City of Roseville Fire Department and Community Development Department wish to amend the Fee Schedule to update our fees consistent with those found in surrounding communities and to provide for the administrative costs and materials to respond to such request for services are adequately accounted for;

IT IS HEREBY RESOLVED, that the Fee Schedule, Chapter 133-9 is hereby amended as follows:

A. Fire and Ambulance Reports:

(1) Medical report (up to 5 pages), in person requests: $6.00
(2) Medical report (up to 5 pages), mail requests: $23.42
(3) Medical report additional pages: $1.00
(4) Fire report (up to six pages): $6.00
(5) Fire report additional pages: $1.00

. . .

D. Fire Inspections.

(1) Fire inspection: no charge
(2) Fire re-inspection: $80.00
(3) Second re-inspection and any additional inspections thereafter $110.00
(4) After hours, weekend and overtime/emergency inspections shall be charged at the cost of overtime incurred for the man hours expended.

. . .

F. Copy of fire investigation photographs

(1) 8 inch by 10 inch digital photo $5.00 each
(2) Digital photos (up to 6 per page) on 8 inch by 10 inch photo paper $6.00

(The remainder of the Fee Schedule hereunder is hereby deleted)

G. Ambulance Fees
[Added 12-14-2004; amended 1-25-2005; 11-24-2009]

(1) BLS: basic calls (requiring oxygen/transport only):

(a) BLS emergency: $450.

(b) BLS nonemergency: $425.

(2) ALS1: advanced calls with limited care (IVs/oxygen/monitor/dextrose/transport):

(a) ALS emergency: $530.

(b) ALS nonemergency: $530.

(3) ALS2: advanced calls with extensive care (invasive care/three medications): $770.

(4) BLS treatment/no transport: $397.

(5) ALS treatment/no transport $435.

(6) Mileage $12.90 per mile.

(7) Oxygen fee: $45.

(8) Extrication $500.

(9) Returned check fee: $45.

. . .

(L) False Alarm Fees

(1) False alarms first and second responses: no charge.

(2) False alarms third and fourth responses: $50.

(3) False alarms fifth and subsequent responses: $100.

(M) Miscellaneous.

(1) Fire door drop inspections per visit $25.

(2) Special request fire inspection (i.e., occupancy changes, emergency plan review, fire drills, emergency drills, etc.) $50.

(3) Special tent and trailer inspections (i.e., carnivals, haunted houses, outdoor sales, band, other occupancies, etc.) $50.

(4) Special inspections for valid occupancy complaint and/or code violations after hours, weekend and emergency inspection cost of overtime for the employee per union contract.

(5) Flash drive (MG) with digital pictures $75.

BE IT FURTHER RESOLVED, that the Fee Schedule, Chapter 133, Section 133-12, is hereby amended to provide as follows:

(1)	Industrial Development District Amendment Fee (For Industrial Facilities Tax Exemptions Certificate Application) *P.A. 198 of 1974, as amended)*	$ 500.00
(2)	Commercial Rehabilitation Exemption District Amendment Fee *P.A. 210 of 2005*	$ 500.00
(3)	Commercial Redevelopment Certificate Exemption Application Fee *P.A. 255 of 1978, as amended*	$1,000.00
(4)	Commercial Redevelopment Certificate District Amendment Fee *P.A. 255 of 1978, as amended*	$ 500.00

This resolution was duly PASSED and ADOPTED this _____ day of _____, 2014, and takes effect upon signing by the City of Roseville.

Any and all resolutions in conflict herewith are repealed only to the extent necessary to give this Resolution full force and effect.

This Resolution is deemed severable and should any provision, clause, word or sentence

be deemed unenforceable, the remainder shall remain in full force and effect.

AYES: _____

NAYS: _____

ABSENT: _____

RESOLUTION DECLARED ADOPTED.

_____
John Chirkun, Mayor

_____
Richard Steenland, Clerk

CERTIFICATION OF CLERK

I hereby certify that the foregoing constitutes a true and complete copy of a Resolution adopted by the Council of the City of Roseville, County of Macomb, State of Michigan, at a regular meeting held on _____, 2014, and that public notice of said meeting was given as required by Act 267, Public Acts of 1976, as amended.

_____
Richard Steenland, Clerk

MOTION MADE BY

_____

MOTION SECONDED BY

_____

TO AMEND THE CITY OF ROSEVILLE ORDINANCE, CHAPTER 256, SEWERS, TO ADD ARTICLE IV TO PROVIDE FOR STORM WATER SYSTEMS, CONSTRUCTION PLAN DESIGN STANDARDS FOR STORM WATER SYSTEMS INCLUDING GENERAL REQUIREMENTS, DRAINS, STORM SEWERS DESIGNS, OPEN CHANNELS, CULVERTS, BIORETENTION, PREDESIGNED SITE EVALUATION, DESIGN CRITERIA, INFILTRATION, DETENTION STORAGE FACILITIES, RETENTION BASINS, WETLANDS AND LOW LYING AREAS, OIL SEPARATORS, FIRST FLUSH BASINS AND SEDIMENT COLLECTION UNITS, TO PROVIDE FOR REPEALER, SEVERABILITY AND EFFECTIVE DATE.

CITY OF ROSEVILLE
MACOMB COUNTY, MICHIGAN

ORDINANCE NO. _____

AN ORDINANCE TO AMEND THE CITY OF ROSEVILLE ORDINANCE, CHAPTER 256, SEWERS, TO ADD ARTICLE IV TO PROVIDE FOR STORM WATER SYSTEMS, CONSTRUCTION PLAN DESIGN STANDARDS FOR STORM WATER SYSTEMS INCLUDING GENERAL REQUIREMENTS, DRAINS, STORM SEWERS DESIGNS, OPEN CHANNELS, CULVERTS, BIORETENTION, PREDESIGNED SITE EVALUATION, DESIGN CRITERIA, INFILTRATION, DETENTION STORAGE FACILITIES, RETENTION BASINS, WETLANDS AND LOW LYING AREAS, OIL SEPARATORS, FIRST FLUSH BASINS AND SEDIMENT COLLECTION UNITS, TO PROVIDE FOR REPEALER, SEVERABILITY AND EFFECTIVE DATE.

CITY OF ROSEVILLE ORDAINS:

Section 1. Preamble. This Ordinance is to provide for the construction plan design standards for storm water systems located within the City of Roseville, to provide for the health, safety and welfare of the residents of the City of Roseville with regard to storm water management requirements including best management practices.

Section 2. Chapter 256 is hereby amended by adding Article IV, Construction Plan Design Standards for Storm Water Systems, to provide as follows:

256.50 CONSTRUCTION PLAN DESIGN STANDARDS FOR STORMWATER SYSTEMS
Unless otherwise noted, the following design standards and requirements apply to construction plans submitted for review by the City of Roseville for all types of developments or drain-

related construction activities.

256.51 General Requirements

The following general storm water management requirements apply to all new developments and redevelopments in the City of Roseville.

A. The design process shall begin by identifying sensitive areas located on the site and laying out the site to protect the sensitive areas.

B. Best Management Practices (BMPs) that reduce the amount of storm water runoff and improve water quality are required and shall be designed on a site specific basis. Rate and volume reduction BMPs shall be used to protect open channel storm drains. All BMPs shall be included on the plans and will be subject to review and approval by the City of Roseville, the Macomb County Public Works Office (MCPWO) and the Michigan Department of Environmental Quality (MDEQ) as necessary for permits. For all sites that disturb one or more acres of land, or are located within 1,000 feet of waters of the state, BMP usage shall be monitored and recorded in the weekly Soil Erosion Sedimentation Control (SESC) reports. Areas with potential for significant pollutant loading, as determined by the MCPWO or the City Engineer, will require BMPs which address regulation of the specific hazard. In such cases, weekly SESC reports shall also be required.

   The Developer/Owner shall include a long-term operation and maintenance schedule for all permanent BMPs. A maintenance agreement between the Developer/Owner and the City is necessary for permanent BMPs which shall include but not be limited to: inspection of structural or vegetative BMPs, performance of maintenance and corrective actions when BMPs are neglected by the owner, and deed restrictions. All such maintenance agreements shall be binding on the property and shall remain in effect in the event the property ownership is transferred or sold.

C. Onsite management of storm water is required first and foremost, unless site constraints preclude this approach.

D. Storm water shall be managed using four standards: <u>stream protection,</u> <u>flood control,</u> <u>water quality,</u> and <u>pre-treatment</u> to protect both water resources and real property.

E. <u>Stream protection</u> shall be provided for surface water discharges to natural watercourses (directly or through pipes or ditches) by retaining onsite the difference in storm water

runoff volume between pre-development and post-development conditions for the 2-year, 24 hour storm as approved by the City Engineer. Stream protection for redevelopments shall be provided through retention of the difference in the2-year storm water runoff volume between existing and post-development conditions. Developments that disturb less than one acre, and are not part of a larger common plan of development or sale may be exempted from the City's stream protection standards as approved by the City Engineer. Developments which discharge directly to Lake St. Clair are exempted from the City's stream protection standards.

F. Flood control shall be provided for all sites through retention or detention. On-site detention or retention of storm water is required of all new developments or redevelopments to maintain the peak outflow to a rate similar to the pre-development runoff rate. Onsite flood control may be reduced or waived for direct discharges to large lakes and rivers if the Developer demonstrates no negative impacts, or if provided in a regional facility with adequate upstream infrastructure.

G. Overland flow routes and the extent of high water levels for the 100-year storm shall be identified for all sites.

H. Water quality treatment shall be provided for all sites. A minimum treatment volume equal to one inch of runoff from the directly contributing impervious area is required. A minimum volume of 900 cubic feet per acre is required for directly connected disturbed pervious areas (i.e. lawns). BMP's shall be designed to reduce post development solids loadings by 80% or to not exceed solids loadings of 80 milligrams per liter. Developments that disturb less than one acre, and are not part of a larger common plan of development or sale may be exempted from the City's water quality treatment standards as approved by the City Engineer.

I. Pre-treatment is required for infiltration, filtration and detention BMPs for ease of maintenance and to protect BMP integrity and preserve longevity.

J. Storm water discharges from activities with a high risk for an accidental spill of pollutants (storm water hot spots) shall provide spill containment.

K. The design maximum release rate, volume or concentration of storm water discharged from a site shall not exceed the capacity of existing infrastructure or cause impairment to the offsite receiving area. Evaluation of the existing outlet must be performed and an adequate outlet must be provided.

L. The use of many decentralized Low Impact Development (LID) BMPs is not mandated, but is encouraged on private sites.

M. Unless otherwise noted, hydraulic and hydrologic calculations (including rainfall volumes and distributions) shall be based on current MDEQ standards and procedures in place at the time of application.

N. Construction plans for a phased development shall show the existing and/or proposed drainage systems for all prior phases of the development, unless the drainage system for the current phase is entirely independent of the prior phases. Furthermore, drainage plans for a phase of a development must not be dependent upon work planned to be performed in a future phase.

O. Plans shall include a grading plan showing existing and proposed topographic contour lines and proposed finish floor and basement floor elevations.

P. All existing natural or manmade watercourses shall be shown on the plans. The proposed changes to the site must not interfere with Common Law Natural Flow Rights. Existing watercourses must be preserved or relocated, or the flow otherwise accommodated by the proposed plans. Provisions for the maintenance of the watercourse must be included in the deed restriction or an equivalent legally binding agreement. MDEQ and/or the Army Corps of Engineers may also require permits for changes made to such watercourses.

Q. No construction activities shall be allowed without approval of the City of Roseville Building Official in a 100-year floodplain as determined by the City of Roseville.

R. The cover sheet of the plans shall include a "Permit Status Table" indicating the status of all permits being obtained.

S. If an established drain is involved, construction plans shall include a note indicating that "All work performed in the

right-of-way of an established drain shall require a permit from the Drain Commissioner."

T. The engineer's seal shall be affixed to all sheets of the construction plans.

256.52 Established Drains

No construction activities shall be allowed without approval from the Macomb County Public Works Commissioner for any development discharging to or otherwise affecting an established County Drain.

256.53 Storm Sewers

A. Plans shall show boundaries and acreages of catchment areas contributing runoff to each proposed or existing catch basin and/or inlet. Runoff from off-site tributary areas must be accommodated in design or rerouted.

B. The required discharge capacity for each reach of sewer shall be determined by the Rational Method.
   1. A 10-year design storm shall be used such that rainfall intensity, I = 175 / (T + 25), where T = time of concentration in minutes.

   2. The runoff coefficient, C, shall be in conformance will normal design practice. Where a weighted average coefficient is employed, the computations shall be submitted for review.

C. A complete set of storm sewer design calculations shall accompany every set of construction plans submitted for review.
   1. Sewer capacities shall be based on the Manning equation.

   2. Energy losses from friction shall be based on calculated design storm peak discharges and velocities, not Manning design (i.e. full-pipe) capacities.

   3. Energy losses from friction shall be based on typical Manning "n" roughness values as approved by the City Engineer.

   4. Energy losses through manholes and other appurtenances shall be included in the design calculations OR reflected in friction losses through use of conservative Manning "n" roughness values as approved by the City Engineer.

D. The storm sewer pipe shall have a minimum diameter of 12 inches when constructed in a public right-of-way or easement.

E. Minimum allowable pipe velocity shall be 2.5 ft/sec. (except where the minimum diameter requirement makes this unachievable.) Desirable pipe velocity range shall be 4-8 ft/sec. Maximum allowable pipe velocity shall be 10 ft/sec.

F. Hydraulic grade lines for the 10-year storm shall be calculated and shown as a part of all storm sewer profiles. In no case shall the elevation of the hydraulic grade line exceed the elevation of a point lying 1 foot below the rim elevation of a manhole, catch basin or inlet. The hydraulic grade line upstream of a detention or retention storage facility shall be calculated assuming the design high water elevation (e.g. full detention basin).

G. The storm sewer plan and profile drawing shall show the following data:

1. Proper identification and numbering of manholes, catch basins and inlets

2. Invert and casting elevations for all structures

3. Pipe length (C/L to C/L to structures)

4. Pipe diameter

5. Pipe slope

6. Pipe class or designation

7. Detail of trench construction and type of backfill material

H. Generally, manholes shall be placed not more than 400 feet apart for sewers less than 30 inches diameter and 600 feet apart for larger sewers.

I. The minimum inside diameter of all manholes, catch basins and inlets shall be 48 inches, with the following exception: Inlet structures from which water will be discharged directly into a catch basin may be 24 inches inside diameter. The depth of such inlets shall be no greater 5.0 feet and no less than 3.5 feet from the top of frame and cover to the invert.

J. Manholes and inlets structures may be constructed of brick, manhole block, precast concrete (ASTM C478) or cast-in-place concrete.

K. All manhole block or brick structures shall be plastered on the outside with 1 to 2.5 mix of portland cement mortar, ½-inch thick. No calcium chloride or other chemical shall be added to lower the freezing point of the mortar, as the strength of the mortar may be lessened.

L. Inlet structures in the public street right-of-way shall be spaced a maximum of 400 feet apart (or a maximum of 400 feet on either side of a high point). The spacing and/or number of inlet structures required to accommodate the design flows in streets and in private drives and parking areas, shall be based on a maximum of 1 cfs per 90 square inches of opening in an inlet or catch basin cover.

M. All storm sewer pipe, manholes, catch basins, and inlets shall meet MDOT specifications.

N. Generally, drops of over 2.0 feet at manholes, from invert of higher pipes to lower pipes, shall be avoided.

O. Joints in concrete pipe having a diameter of 30 inches or larger shall be pointed up on inside with mortar after backfilling has been completed.

P. Where drainage is discharged to an established drain or natural watercourse, such outlets shall be so designed as to enter the drain or watercourse as an angle of 90 degrees or less, as determined by the upstream centerline. Preformed end sections, grouted riprap or specially designed outlet structures will be required.

Q. Unless the storm sewers are to be owned and maintained by a single private entity (i.e. municipal or commercial development, manufactured housing community, etc.), all storm sewers shall be located within an easement. The minimum easement width for a storm sewer shall be 12 feet centered on the sewer centerline.

R. All existing and proposed on-site drainage easements shall be clearly shown.

256.54 Open Channels

A. The peak 10-year flow in each reach of open channel shall remain within the banks of the channel. Off-site tributary area shall be included in the design, or the off-site tributary runoff shall be rerouted around the channel.

B. The values of Manning's "n" shall be no less than 0.040 except where the channel is smooth and paved in which case an "n" value of 0.013 to 0.022 shall be used.

C. The maximum velocity for grass lined channels shall not exceed 5 ft/sec. Where above velocity is exceeded, the channel shall be protected by cobble paving or other means to prevent scour.

D. The minimum acceptable non-siltation velocity should be 1.5 ft/sec.

E. Unless the open channels are to be owned and maintained by a single private entity (i.e. industrial/commercial development, manufactured housing community, etc.), all open channels shall be located within an easement. Open channels shall have a minimum right-of-way of 40 feet plus top width of channel centered on the centerline. A consistent right-of-way width shall be maintained along the entire reach of channel on the proposed site. A minimum width of 20 feet must be maintained from the top-of-bank to the edge of the right-of-way to allow for maintenance. The above minimum width shall govern generally; however, wider right-of-ways may be required at the discretion of the City Engineer.

F. Side slopes of open channels shall normally be no steeper than 1 vertical to 3 horizontal. Where conditions dictate steeper side slopes, consideration should be given to slope paving and fencing. The final decision in such matters rests with the City Engineer.

G. All existing and proposed on-site drainage easements shall be clearly shown on the plans.

256.55 Culverts

A. All culverts should be labeled on the plans as "existing", "proposed", or "to be extended".

B. Plans shall show boundaries and acreages of tributary areas contributing runoff to each proposed or existing culvert on the proposed site.

C. Proposed or extended culverts must be approved by the City Engineer. Proposed or extended culverts may also require the approval of the Macomb County Road Commission, the Macomb County Public Works Commission, the Michigan Department of Environmental Quality and/or the Michigan Department of Transportation (MDOT).

D. The Rational Method shall be used to determine the peak design flow for the culvert, if the tributary area to the culvert is less than 20 acres. For larger tributary areas, the SCS Method shall be used. The runoff coefficients used should be consistent with those in standard engineering practice, as approved by the City Engineer, and selected to reflect the future land use of the tributary area.

E. All culverts shall be designed with consideration of both inlet and outlet control conditions. Calculations of the 10-year and 100-year headwater elevations for all culverts thus designed shall accompany the final plans.

1. The 10-year headwater elevation of each culvert shall not exceed an elevation one foot below the road or driveway centerline elevation. The backwater shall not extend beyond the limits of the proprietor's property.

2. The 100-year headwater elevation of each culvert may overtop the road or driveway centerline elevation, but must remain below proposed finish floor elevations of all nearby existing and proposed structures.

3. The tail water elevation assumed for each culvert should be estimated as the normal depth of the peak flow in the downstream channel, unless the tail water is influenced by the headwater of another downstream culvert or the confluence of another watercourse.

F. Wing walls, headwalls, end sections, and all other culvert extremities shall be designed to ensure the stability of the surrounding soil, and to meet the requirements of other governing agencies (e.g. Macomb County Road Commission, MCPWO, MDOT, MDEQ) if applicable.

G. Roadways over culverts or bridges may be required to be paved or designed in such a way as to prevent the erosion of road material into the established drain or watercourse.

H. The following data shall be provided for all proposed or extended culverts:
   - Length
   - Diameter
   - Invert elevations
   - Material type
   - Protection for culvert ends

I. Riprap must be provided for all culverts in established drains or significant watercourses. The rip-rap provided for the protection of culvert ends shall:
   1. Extend at least one culvert diameter upstream of the culvert inlet and at least four culvert diameters downstream of the culvert outlet;

   2. Extend across the bottom of the channel and up the banks of the channel to at least the elevation of the crown of the culvert;

   3. Be inlayed such that it does not cause an obstruction in the watercourse; and

   4. Have a minimum dimension no smaller than that consistent with HEC-11 Design Guidelines for Rock Riprap and MDOT standards. (A conservative guideline for water depths less than 3 feet would be to use 8-inch diameter riprap for flow velocities up to 6 feet/sec, and 16-inch diameter riprap for flow velocities up to 11 feet/sec.)

J. Minimum diameter for a driveway or crossroad culvert shall be 18 inches or equivalent pipe arch.

K. The pipe used in culverts shall meet MDOT specifications and Macomb County Road Commission standards.

256.56 Bioretention

A bioretention system consists of a soil bed planted with native vegetation located above an underdrained sand layer. It can be configured as either a bioretention structure or a bioretention swale. Storm water runoff entering the bioretention system is filtered first through the vegetation and then the sand/soil mixture before being conveyed downstream by the underdrain system. Runoff storage depths above the planting bed surface are typically shallow. The adopted TSS removal rate for bioretention systems is 90 percent.

Bioretention systems are used to remove a wide range of pollutants, such as suspended solids, nutrients, metals, hydrocarbons, and bacteria from storm water runoff. They can also be used to reduce peak runoff rates and increase storm water infiltration when designed as a multi-stage, multi-function facility.

A. Pre-Design Site Evaluation

For infiltration trench and structure practices, a minimum field infiltration rate (fc) of 0.52 inches per hour is required; lower rates preclude the use of these practices. For surface sand filter and bioretention practices, no minimum infiltration rate is required if these facilities are designed with a "day-lighting" underdrain system; otherwise these facilities require a 0.52 inch per hour rate.

Feasibility testing is to be conducted to screen unsuitable sites, and reduce testing costs. A soil boring is not required at this stage. However, a designer or landowner may opt to engage Concept Design Borings at his discretion, without feasibility testing.

Initial testing involves either one field test per facility, regardless of type or size, or previous testing data, such as the following:

- On-site septic percolation testing, within 200 feet of the proposed BMP location, and on the same contour which can establish initial rate, water table and/or depth to bedrock,

- Geotechnical report on the site prepared by a qualified geotechnical consultant, or

- Natural Resources Conservation Service (NRCS) County Soil Mapping showing an unsuitable soil group such as a hydrologic group "D" soil in a low-lying area.

If the results of initial feasibility testing as determined by a qualified professional show that an infiltration rate of greater than 0.52 inches per hour is probable, then the number of concept design test pits shall be per the following table. An encased soil boring may be substituted for a test pit, if desired.

B. Design Criteria

1. Storage Volume, Depth, and Duration
   Bioretention systems shall be designed to treat the runoff volume generated by the storm water quality design storm (2 year). The maximum water depth during treatment of the storm water quality design storm shall be 12 inches in a

bioretention structure and 18 inches in a bioretention swale. The minimum diameter of any outlet or overflow orifice is 2.5 inches. The bottom of a bioretention system, including any underdrain piping or gravel layer, must be a minimum of 1 foot above the seasonal high groundwater table. The planting soil bed and underdrain system shall be designed to fully drain the storm water quality design storm runoff volume within 72 hours.

2. Permeability Rates

The design permeability rate through the planting soil bed must be sufficient to fully drain the storm water quality design storm runoff volume within 72 hours. This permeability rate must be determined by field or laboratory testing. Since the actual permeability rate may vary from test results and may also decrease over time due to soil bed consolidation or the accumulation of sediments removed from the treated storm water, a factor of safety of two shall be applied to the tested permeability rate to determine the design permeability rate. Therefore, if the tested permeability rate of the soil bed material is 4 inches/hour, the design rate would be 2 inches/hour (i.e., 4 inches per hour/2). This design rate would then be used to compute the system's storm water quality design storm drain time.

3. Planting Soil Bed

The planting soil bed provides the environment for water and nutrients to be made available to the vegetation. The soil particles can absorb some additional pollutants through cation exchange, and voids within the soil particles can store a portion of the storm water quality design storm runoff volume. The planting soil bed material should consist of 10 to 15 percent clays, a minimum 65 percent sands, with the balance as silts. The material's pH should range from 5.5 to 6.5. The material shall be placed in 12 to 18 inch lifts. The total depth or thickness of the planting soil bed should be a minimum of 3 feet. As noted above, the design permeability rate of the soil bed material must be sufficient to drain the storm water quality design storm runoff volume within 72 hours. Filter fabric should be placed along the sides of the planting soil bed to prevent the migration of soil particles from the adjacent soil into the planting soil bed.

4. Vegetation

The vegetation in a bioretention system removes some of the nutrients and other pollutants in the storm water inflow. The use of native plant material is recommended for bioretention systems wherever possible. The goal of the planting plan should be to simulate a forest-shrub community of primarily upland type. In general, trees should dominate the perimeter zone that is subject to less frequent inundation. Shrubs and herbaceous species that are adapted to moister conditions and

expected pollutant loads should be selected for the wetter zones. The number of stems per acre should average 1,000, with tree spacing of 12 feet and shrub spacing of 8 feet.

5. Sand Layer

The sand layer serves as a transition between the planting soil bed and the gravel layer and underdrain pipes. It shall be a minimum thickness of 12 inches and consist of clean medium aggregate sand (AASSHTO M-6/ASTM C-33 or MDOT Class II). To ensure proper system operation, the sand layer must have a permeability rate at least twice as fast as the design permeability rate of the planting soil bed.

6. Underdrain

The underdrain piping must be rigid Schedule 40 PVC pipe. The portion of drain piping beneath the planting soil bed and sand layer must be perforated. All remaining underdrain piping, including cleanouts, must be nonperforated. All joints must be secure and watertight. The underdrain piping must connect to a downstream storm sewer manhole, catch structure, channel, swale, or ground surface at a location that is not subject to blockage by debris or sediment and is readily accessible for inspection and maintenance. Blind connections to downstream storm sewers are prohibited.

7. Overflows

All bioretention systems must be able to safely convey system overflows to downstream drainage systems. The capacity of the overflow must be consistent with the remainder of the site's drainage system and sufficient to provide safe, stable discharge of storm water in the event of an overflow.

8. Tail water

The hydraulic design of the underdrain and overflow systems, as well as any storm water quantity control outlets, must consider any significant tail water effects of downstream waterways or facilities. This includes instances where the lowest invert in the outlet or overflow structure is below the flood hazard area design flood elevation of a receiving stream.

9. Maintenance

The following requirements must be included in the system's maintenance plan.

(a) General Maintenance

All bioretention system components expected to receive and/or trap debris and sediment must be inspected for clogging and excessive debris and sediment accumulation at least four times annually as well as after every storm

exceeding 1 inch of rainfall. Such components may include bottoms, trash racks, low flow channels, outlet structures, riprap or gabion aprons, and cleanouts.

Sediment removal should take place when the structure is thoroughly dry. Disposal of debris, trash, sediment, and other waste material should be done at suitable disposal/recycling sites and in compliance with all applicable local, state, and federal waste regulations.

(b) Vegetated Areas

Mowing and/or trimming of vegetation must be performed on a regular schedule based on specific site conditions. Grass should be mowed at least once a month during the growing season. Vegetated areas must be inspected at least annually for erosion and scour. Vegetated areas should also be inspected at least annually for unwanted growth, which should be removed with minimum disruption to the planting soil bed and remaining vegetation.

When establishing or restoring vegetation, biweekly inspections of vegetation health should be performed during the first growing season or until the vegetation is established. Once established, inspections of vegetation health, density, and diversity should be performed at least twice annually during both the growing and non-growing seasons. The vegetative cover should be maintained at 85 percent. If vegetation has greater than 50 percent damage, the area should be reestablished in accordance with the original specifications and the inspection requirements presented above.

All use of fertilizers, mechanical treatments, pesticides and other means to assure optimum vegetation health should not compromise the intended purpose of the bioretention system. All vegetation deficiencies should be addressed without the use of fertilizers and pesticides whenever possible.

(c) Structural Components

All structural components must be inspected for cracking, subsidence, spalling, erosion, and deterioration at least annually.

256.57 Infiltration

An infiltration structure is a facility constructed within highly permeable soils that provides temporary storage of storm water runoff. An infiltration structure does not normally have a structural outlet to discharge runoff from the storm water quality

design storm. Instead, outflow from an infiltration structure is through the surrounding soil. An infiltration structure may also be combined with an extended detention structure to provide additional runoff storage for both storm water quality and quantity management. The adopted TSS removal rate for infiltration structures is 80 percent.

Infiltration structures are used to remove pollutants and to infiltrate storm water back into the ground. Such infiltration also helps to reduce increases in both the peak rate and total volume of runoff caused by land development. Pollutant removal is achieved through filtration of the runoff through the soil as well as biological and chemical activity within the soil.

A. Pre-Design Site Evaluation

Infiltration structures can present some practical design problems. When planning for an infiltration structure that provides storm water quality treatment, consideration should be given to soil characteristics, depth to the groundwater table, sensitivity of the region, and runoff water quality. Specifically, infiltration structures must not be used in the following locations:

- Industrial and commercial areas where solvents and/or petroleum products are loaded, unloaded, stored, or applied or pesticides are loaded, unloaded, or stored.

- Areas where hazardous materials are expected to be present in greater than "reportable quantities" as defined by the U.S. Environmental Protection Agency in the Code of Federal Regulations at 40 CFR 302.4.

- Areas where infiltration structure use would be inconsistent with an NJDEP-approved remedial action work plan or landfill closure plan.

- Areas with high risks for spills of toxic materials such as gas stations and vehicle maintenance facilities.

- Areas where industrial storm water runoff is exposed to "source material." "Source material" means any material(s) or machinery, located at an industrial facility, that is directly or indirectly related to process, manufacturing, or other industrial activities, that could be a source of pollutants in any industrial storm water discharge to groundwater. Source materials include, but are not limited to raw materials, intermediate products, final products, waste materials, by-products, industrial machinery and fuels, and lubricants,

solvents, and detergents that are related to process, manufacturing, or other industrial activities that are exposed to storm water.

- Areas where their installation would create a significant risk for basement seepage or flooding, cause surficial flooding of groundwater, or interfere with the operation of subsurface sewage disposal systems and other subsurface structures. Such adverse impacts must be assessed and avoided by the design engineer.

Infiltration structures must be configured and located where their construction will not compact the soils below the structure. In addition, an infiltration structure must not be placed into operation until the contributing drainage area is completely stabilized.

General Setback Requirements for Infiltration Structures:

Soil Absorption Systems for Title 5 Systems:	50 ft.
Private wells:	100 ft.
Public wells:	150 ft.
Public reservoir, surface water sources for public water systems and their tributaries:	400 ft.
Other surface waters:	50 ft.
Property Lines:	10 ft.
Building foundations:	>10 to 100 ft, depending upon soil types and Infiltration Structure type

Soils are perhaps the most important consideration for site suitability. In general, County Soil Surveys can be used to obtain necessary soil data for the planning and preliminary design of infiltration structures. For final design and construction, soil tests are required at the exact location of a proposed structure in order to confirm its ability to function without failure.

Tests should include:

- determination of the textural classification
- permeability of the subgrade soil at and below the bottom of the proposed infiltration structure

The recommended minimum depth for subgrade soil analysis is 5 feet below the bottom of the structure or to the groundwater table. Soil permeability testing can be conducted in accordance with the Standards for Individual Subsurface Sewage Disposal Systems.

B. Design Criteria

(1) Storage Volume, Depth, and Duration

An infiltration structure must be designed to treat the total runoff volume generated by the structure's maximum design storm. This may either be the groundwater recharge or storm water quality design storm, depending upon the structure's proposed use. An infiltration structure must also fully drain this runoff volume within 72 hours. Runoff storage for greater times can render the structure ineffective and may result in anaerobic conditions, odor, and both water quality and mosquito breeding problems. The bottom of the infiltration structure must be at least 2 feet above seasonal high water table or bedrock. For surface structures, this distance must be measured from the bottom of the sand layer. The structure bottom must be as level as possible to uniformly distribute runoff infiltration over the subgrade soils.

To enhance safety by minimizing standing water depths, the vertical distance between the structure bottom and the maximum design storm water surface in surface infiltration structures should be no greater than 2 feet. Construction of an infiltration structure must be done without compacting the structure's subgrade soils. Excavation must be performed by equipment placed outside the structure whenever possible. This requirement should be considered when designing the dimensions and total storage volume of an infiltration structure. It is important to note that the use of infiltration structures is recommended only for the storm water quality design storm and smaller storm events. Use of infiltration structures for larger storm events and the requirements by which such structures are to be designed, constructed, and maintained should be reviewed and approved by all applicable reviewing agencies.

(2) Permeability Rates

The minimum design permeability rate of the soils below an infiltration structure will depend upon the structure's location and maximum design storm. The use of infiltration structures for storm water quality control is feasible only where soil is sufficiently permeable to allow a reasonable rate of infiltration. Therefore, infiltration structures designed for storms greater than the groundwater recharge storm can be constructed only in areas with Hydrologic Soil Group A and B soils.

Maximum Design Structure Location	Minimum Design Permeability Rate (Inches/Hour)
Groundwater Recharge Subsurface	0.2
Groundwater Recharge Surface	0.5
Storm water Quality Surface and Subsurface	0.5

In addition to the above, the design permeability rate of the soil must be sufficient to fully drain the infiltration structure's maximum design storm runoff volume within 72 hours. This design permeability rate must be determined by field testing (See Bioretention Pre Design). Since the actual permeability rate may vary from test results and may also decrease over time due to soil bed consolidation or the accumulation of sediments removed from the treated storm water, a factor of safety of two must be applied to the tested permeability rate to determine the design permeability rate. Therefore, if the tested permeability rate of the soils is 4 inches/hour, the design rate would be 2 inches/hour (i.e., 4 inches per hour/2). This design rate would then be used to compute the structure's maximum design storm drain time.

(3) Bottom Sand Layer

To help ensure maintenance of the design permeability rate over time, a 6 inch layer of sand must be placed on the bottom of an infiltration structure. This sand layer can intercept silt, sediment, and debris that could otherwise clog the top layer of the soil below the structure. The sand layer will also facilitate silt, sediment, and debris removal from the structure and can be readily restored following removal operations. The sand layer must meet the specifications of a MDOT Class II sand. This must be certified by a certified testing lab.

(4) Overflows

All infiltration structures must be able to convey overflows to downstream drainage systems in a safe and stable manner. The capacity of the overflow must be consistent with the remainder of the site's drainage system and sufficient to provide safe, stable discharge of storm water in the event of an overflow.

(5) Subsurface Infiltration Structures

A subsurface infiltration structure is located entirely below the ground surface. It may consist of a vault, perforated pipe, and/or stone bed. However, due to the greater difficulty in removing silt, sediment, and debris, all runoff to a subsurface infiltration structure must be pretreated. This pretreatment must remove 80 percent of the TSS in the runoff from the structure's maximum design storm.

(6) Basis of Design

The design of an infiltration basin is based upon Darcy's Law:

Q = KIA

where:

Q = the rate of infiltration in cubic feet per second (cfs)

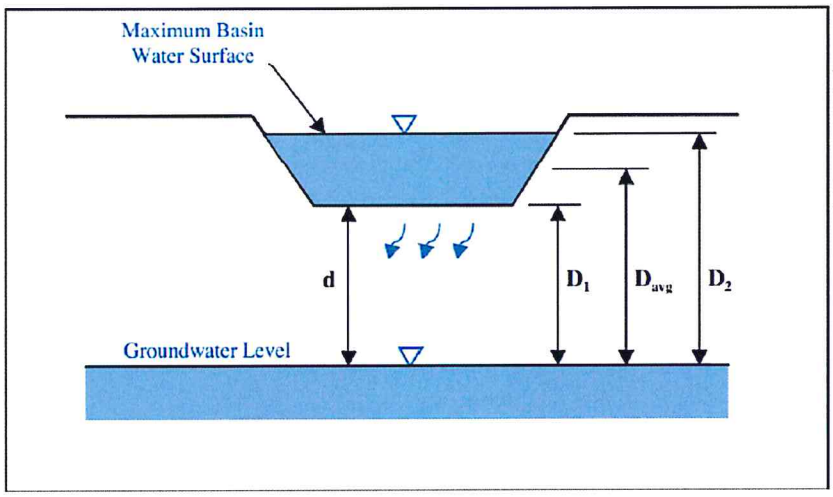
K = the hydraulic conductivity of the soil in feet per second (fps)

I = the hydraulic gradient

A = the area of infiltration in square feet (sf)

From the variables shown in the Figure below:

Average Hydraulic Gradient = D_{avg} /d
Minimum Hydraulic Gradient = D_1/d
Maximum Hydraulic Gradient = D_2/d



(7) Maintenance

The following requirements must be included in the system's maintenance plan.

General Maintenance

All infiltration structure components expected to receive and/or trap debris and sediment must be inspected for clogging and excessive debris and sediment accumulation at least four times annually as well as after every storm exceeding 1 inch of rainfall. Such components may include bottoms, riprap or gabion aprons, and inflow points. This applies to both surface and subsurface infiltration structures. Sediment removal should take place when the structure is thoroughly dry. Disposal of debris, trash, sediment, and other waste material should be done at suitable disposal/recycling sites and in compliance with all applicable local, state, and federal waste regulations.

256.48 Detention Storage Facilities

Detention storage facilities are designed to detain runoff for a short period of time and then release it to a watercourse where it returns to the hydrologic cycle. The objective of detention storage is to regulate the released runoff rate and to reduce the impact on downstream drainage systems. Detention storage should not be confused with retention storage (i.e. retention basins), a facility with no engineered outlet (other than an emergency-type outlet) designed to hold runoff for a considerable length of time. The water in a retention basin is not discharged to surface water, although it may infiltrate in to the ground, evaporate, or be consumed by plants.

In keeping with Common Law Natural Flow Rights and the Michigan Drain Code, concentrated discharges of storm water (such as the outflow from a detention facility) or increased surface water runoff over property owned by others must be pursuant to a valid right-of-way, easement, or other written permission from all property owners affected. The outflow from a detention facility is considered to be such a concentrated discharge of storm water.

All forms of detention storage shall meet the following criteria:

A. On-site detention (or retention - See Section 4.9 Retention Basin below) of storm water is required of all new developments or redevelopments to maintain the peak outflow to a rate similar to the pre-development runoff rate or to a discharge rate approved by the City Engineer. In no case shall the outflow from a site exceed the capacity of the receiving watercourse to accept the flow.

B. For development sites greater than 5 acres, the detention basin volume shall be determined for the 100-year flood volume from all tributary area, including off-site area.

   1. The tributary area shall include all acreage contributing runoff to the detention storage facility, including any off-site tributary area in its existing state, whether developed or undeveloped.

   2. The following equations shall be used to determine the 100-year detention volume:

      Q_a = Allowable release rate, cfs

      $Q_o = Q_a / (A\ C)$, where A = Tributary area in acres,

      C = weighted runoff coefficient

      Detention time in minutes, $T = -25 + \text{sqrt}(10{,}312.5/Q_o)$

Storage volume per impervious acre, $V_s = 16{,}500\ T / (T + 25) - 40\ Q_o\ T$

Required detention volume in cubic feet, $V = V_s \times A \times C$

C. For development sites 5 acres and less, the detention basin volume shall be determined for the 10-year flood volume from all tributary area, including off-site area.

1. The tributary area shall include all acreage contributing runoff to the detention storage facility, including any off-site tributary area in its existing state, whether developed or undeveloped.

2. The following equations shall be used to determine the 10-year detention volume:

Q_a = Allowable release rate, cfs

$Q_o = Q_a / (A\ C)$, where A = Tributary area in acres, C = weighted runoff coefficient

Detention time in minutes, $T = -25 + \text{sqrt}(6{,}562.5 / Q_o)$

Storage volume per impervious acre, $V_s = 10{,}500\ T / (T+25) - 40\ Q_o\ T$

Required detention volume in cubic feet, $V = V_s \times A \times C$

D. If the site is located near the downstream end of a watercourse or drainage district, the City Engineer may require that the proprietor's engineer generate and submit hydrographs of the outflow from the existing site and from the proposed site (i.e. detention facility) and a hydrograph of the flow in the receiving watercourse to verify that the detained outflow would not result in an increase in the peak flow in the receiving watercourse. If the detained outflow would result in an increase in the peak flow in the receiving watercourse, then storm water detention is not an acceptable storm water management option. Retention of storm water or other storm water management design approved by the City Engineer must be provided. See Section 4.9 Retention Basins for design requirements.

E. Portions of the developing site may be allowed to drain unrestricted (i.e. not through a detention facility) if either of the following conditions are met:

1. The areas draining unrestricted are not being disturbed or altered by the construction, such that they will maintain their existing drainage characteristics and patterns.

2. The areas draining unrestricted are being disturbed or altered but will be permanently stabilized to prevent erosion and will not contain any impervious surface post-construction. In this case, the unrestricted flow must be draining to a receiving watercourse with valid rights-of-way, or else written agreement from the affected property owners would have to be obtained per Common Law Natural Flow Rights and the Michigan Drain Code. In addition, the post-construction peak 100-year flow from these areas should be calculated and deducted from the total allowable peak flow from the detention facility (Qa). The detention outlet(s) should be designed to restrict the basin outflow(s) to this reduced allowable peak flow rate.

F. Where the detention facility is to be equipped with a pump discharge, the proprietor shall be required to furnish design data on pump(s) and discharge force main so that the capacity of the system can be verified. These data will include system curve calculations, the pump performance curves, and a profile of the system piping. The pumping station should be able to release the first flush volume over approximately 24 hours, the bankfull flood volume over 24-48 hours, and the 100-year flood volume at a rate not to exceed 0.15 cfs/ac of tributary area. A back-up generator will be required to ensure the operation of the pumping station in the event of power loss. The City discourages the use of pumped outlets, and will not accept responsibility for damages due to power failure, pump malfunction, or Acts of God that result in storm conditions that exceed the design conditions of the pump station.

G. An agreement for acceptance and maintenance of the detention facility, if executed by the proprietor, shall be submitted to the City of Roseville prior to final approval. The agreement both as form and content shall be subject to the approval of the City.

A. Detention Basins

A detention basin is a form of detention storage where the storm water is detained above ground as surface water. In addition to the general requirements indicated above in Section 4.8, detention basins shall meet the following requirements:

(1) Detention volume in a gravity-outlet detention basin must

be located:

(a) Above the invert of the lowest row of orifices in the outlet standpipe,

(b) Above the elevation of the dry weather base flow in the receiving watercourse,

(c) Above the elevation of the groundwater table. Soil boring data used to determine the groundwater table elevation shall be submitted with the plans.

(2) The detention basin outlet shall consist of a vertical standpipe with multi-level orifices to control the release of storm water from the basin, including the first flush volume, bankfull flood volume, and 100-year flood volume (or 10 year flood volume for sites less than 5 acres).

(a) The standpipe shall not be less than 36 inches in diameter.

(b) The standpipe shall contain multiple rows of orifices (i.e. holes) to control the release of the first flush runoff volume, the bankfull flood volume, and the 100-year flood volume (or 10-year for sites less than 5 acres).

- First flush orifices shall be located at the elevation of the basin floor (or permanent pool water level, if a wet basin),
- Additional bankfull flood orifices shall be at the elevation of the first flush volume in the basin, where the first flush volume is calculated as the first one inch of runoff over the site, or

  Vff (cf) = 3630 x A(acres) x C, where C is the runoff coefficient
- Additional 100-year (or 10-year for sites less than 5 acres) flood control orifices shall be located at the elevation of the bankfull flood volume in the basin, where the bankfull flood volume is calculated as the rainfall from a 1.5- year storm, or

  Vbf (cf) = 8170 x A(acres) x C

To promote improved filtering of runoff sediment from smaller, more frequent storm events, the bankfull flood and first flush volumes shall be based on the developing tributary site area only, and not include off-site tributary area.

(c) Orifices should not be less than 1 inch in diameter or greater than 4 inches in diameter.

(d) The top of the standpipe shall consist of a grating at or above the design (high) water level to serve as an overflow mechanism, in addition to the overflow spillway/berm.

(e) The standpipe shall be encased in stone extending to the design (high) water level to allow for filtering of the storm water prior to discharge from the basin. The encasement stone size shall be large enough so as not to plug or pass through the orifices in the standpipe.

(f) The standpipe shall contain a sediment sump with a depth of at least one foot.

(g) Double standpipes (e.g. a 36-inch diameter inner standpipe within a 48-inch diameter outer standpipe) are encouraged. Double standpipes are believed to be less prone to blockages of the control orifices, and therefore require less maintenance. The inner standpipe should contain the appropriate number and configuration of orifices to provide the controlled release of the first flush volume, the bankfull flood volume, and the 100-year (or 10-year for sites less than 5 acres) flood volume. The outer standpipe should contain at least several times the orifice area as the inner standpipe over the entire height of the standpipe, such that the head loss across the outer standpipe orifices is negligible.

(h) The outlet pipe extending from the standpipe to the receiving watercourse shall be sized to convey the calculated 100-year (or 10-year for sites less than 5 acres) peak inflow to the detention basin.

(i) The location of the outlet pipe extending downstream of the standpipe shall be indicated on a profile drawing of the receiving watercourse, whether or not the receiving watercourse is an established drain. The

receiving watercourse profile shall extend at least from the upstream end of the site to the downstream end of the site.

(3) A sediment sump shall be provided within the basin, below the lowest orifice elevation but above the groundwater table, to provide for sediment accumulation.

(a) The volume of the sump shall be equivalent to the first flush volume, or one inch of runoff over the site area. (Sump Volume, cf = V_{ff} = 3630 x A x C)

(b) Appropriate precautions shall be taken to protect public safety and to ensure that the sump does not constitute a nuisance.

(4) All detention basins must have standpipe overflow grates and spillways berms for emergency overflow at the high water level.

(a) The standpipe overflow grate and spillway must provide adequate capacity to overflow the peak 100-year (or 10-year for sites less than 5 acres) basin inflow with no more than one foot of head (i.e. water level must not exceed the one foot of freeboard).

(b) Downstream of the overflow spillway, the storm water overflow must be directed (either by overland flow or via a swale or ditch) to the receiving watercourse.

(5) A minimum of one-foot freeboard shall be provided above the design high water elevation.

(6) The side slopes shall not be steeper than 6 ft. horizontal to 1 ft. vertical. Slope protection shall be provided as necessary. Basin side slope elevation contours shall be shown on the plans.

(7) Unless the detention basin contains a permanent pool, the bottom of all detention basins shall be graded in such a manner as to provide positive flow to the outlet. A minimum bottom slope of 1% shall be provided.

(8) A 12-ft. wide minimum access easement shall be provided for all detention basins, as measured from the top of bank.

(9) A 25-ft. wide minimum setback from property lines shall be provided for all detention basins, as measured from the top of bank.

(10) Detention basin configurations where storm water must "back-up" into the basin (i.e. storm water enters the conveyance system downstream of the basin) will not be permitted.

(11) Multiple detention basins serving a single development should function independently. If the outflow from one basin passes through another basin before being discharged to the receiving watercourse, a full hydraulic analysis (i.e. a computer model simulation) will be required to ensure that the system functions satisfactorily.

(12) If at any time the detention basin is to function as a sediment basin (for use during the construction phase), an outlet filter shall be provided. Such an outlet filter is to be designed in accordance with criteria established by the Macomb County Public Works Office. Such use of a detention pond shall be considered a temporary measure only. The proprietor shall be responsible for sediment removal upon completion of construction.

(13) Detention basins shall meet all local ordinances and/or requirements for "ponds."

B. Underground Storage

Underground storage is a form of detention storage where the storm water is detained in underground pipes. Like a detention basin, the water is released at a controlled rate to a receiving watercourse.

In addition to the general requirements indicated above in Section 4.6, underground detention facilities shall meet the following requirements:

(1) Detention volume in an underground detention facility shall be located above the elevation of the dry weather baseflow in the receiving watercourse and above the elevation of the groundwater table. Soil boring data used to determine the groundwater table shall be submitted with the plans.

(2) To minimize sedimentation in the downstream drainage district, sediment shall be removed from the storm water before water enters the underground storage facility (e.g. in first flush forebay or within the catch basins using removable filtration inserts).

(3) The pipe material used for the underground storage facility shall have an expected life of at least 50 years.

(4) Access manholes shall be provided along the underground storage facility to allow for maintenance.

(5) A minimum of one foot of freeboard shall be provided between the design hydraulic grade line in the underground storage facility and the rim elevations of all access manholes.

(6) A 25-ft. wide setback from property lines shall be provided for all underground storage facilities.

(7) An access easement shall be provided to and above the underground storage facility.

(8) No permanent structures shall be constructed above the underground storage facility.

256.49 Retention Basins

A "Retention Basin" is a facility with no engineered outlet (other than an emergency-type outlet) designed to hold runoff for a considerable length of time. The water in a retention basin is not discharged to a natural watercourse, although it may be consumed by plants, evaporate, or infiltrate into the ground. A Retention Basin should not be confused with a "Detention Basin," a facility designed to detain runoff for a short period of time and then release it to a watercourse.

A. On-site retention (or detention - See section 4.8 Detention Storage Facilities) is required of all new developments or redevelopments to prevent an increase in peak flows downstream in the drainage district.

(1) Retention basins are an acceptable storm water management practice on sites where the soil has an infiltration rate of at least 0.52 inches per hour and a clay content of less than 30% (per recommendations in Guidebook of Best Management

Practices for Michigan Watersheds). The required storage volume of a retention basin is that of the runoff from a 100-year design storm as determined using the SCS Method. On sites with soils having a lower infiltration rate and/or higher clay content, the City Engineer may allow retention basins with storage volume for the runoff from two consecutive 100-year design storms.

(2) Retention basins shall accommodate runoff from off-site areas that drain onto/across the developing site. (An exception to this rule would be if off-site runoff were to be routed around the site to a receiving watercourse, if done in a manner such that runoff from the developing site would not contribute to this off-site flow. If the off-site flow were to be concentrated from overland flow to a point discharge into an receiving watercourse without valid rights-of-way, written agreement from the affected property owners would have to be obtained per Common Law Natural Flow Rights and the Michigan Drain Code.)

B. One foot of freeboard shall be provided above the design high water elevation.

C. Retention volume must be provided above the elevation of the groundwater table. Soil boring data used to determine the groundwater table elevation shall be submitted with the plans.

D. All retention basins must have a spillway for emergency overflow at the high water level.

(1) The spillway must provide adequate capacity to overflow the peak 100-year basin inflow with no more than two feet of head (i.e. water level must not exceed the two feet of freeboard).

(2) The plans must identify where the overflow would be directed to flow or stored in the event of an overflow.

E. The side slopes shall not be steeper than 6 ft. horizontal to 1 ft. vertical unless fenced in accordance with City requirements. Slope protection shall be provided as necessary.

Basin side slope elevation contours shall be shown on the plans.

F. A 12-ft. wide access easement shall be provided to and around all retention basins.

G. An agreement for acceptance and maintenance of the retention basin system, if executed by the proprietor, shall be submitted to the City of Roseville prior to final approval. The agreement both as form and content shall be subject to the approval of the City.

H. If at any time during the construction period the retention basin is to function as a sediment basin, the proprietor shall be responsible for sediment removal prior to completion of construction. (See Macomb County Department of Public Health for requirements regarding Soil Erosion and Sedimentation Control during construction.)

256.60 Wetlands and Low Lying Areas

A. In order to help in analyzing site hydrology and the pre-development runoff rate, soil types, the normal groundwater table, and an accurate delineation of wetlands must be provided as part of preliminary plats/plans. The City Engineer may require confirmation of the absence or presence of regulated wetlands from the Michigan Department of Environmental Quality (MDEQ) through its wetland assessment program. Construction activities to be performed within a regulated wetland may require a permit from the MDEQ.

B. Any regulated wetlands or other wetlands that will be part of the drainage system shall be designated as a common area and placed within a conservation easement.

C. If existing wetlands or low lying areas are to be used for storm water storage, all requirements under either section 4.8.1 Detention Basins or section 4.9 Retention Basins would apply, depending on whether the wetlands/area would have an outlet.

D. If any disturbed or impervious surfaces will drain into an existing wetland or low lying area, calculations may be required to be submitted indicating that the wetland will accommodate runoff from a 100-year design storm without

exceeding the finished grade elevation of any adjacent existing or proposed structure.

E. If a wetland will be used for storm water storage, a sediment forebay shall be provided upstream of the wetlands to reduce the storm water velocity and encourage sedimentation. Additionally, a permit from the MDEQ may be required.

256.61 Oil Separators

A. Oil must be removed from storm water as appropriate prior to discharge to a receiving watercourse. The City Engineer will consider means of oil removal on a case-by-case basis.

256.62 First Flush Basins and Sediment Collection Units

When stand-alone BMPs such as permanent first flush basins and prefabricated sediment collection units are proposed or required for a specific site, the following design standards shall apply:

A. A first flush basin or pre-fabricated sediment collection unit shall contain storage volume for the first one inch of runoff from the on-site impervious tributary area. The storage volume of a first flush basin can be calculated as:

V_{ff} (cf) = A x C x 3630 cf/ac-impervious

B. The outlet of a first flush basin or sediment collection unit shall be designed to release the first flush volume over 24-36 hours.

C. The outlet of a first flush basin or sediment collection unit shall not be submerged by the receiving watercourse at a 10-year design level.

D. The first flush basin or sediment collection unit shall contain a bypass structure and/or berm to allow the 10-year peak flow to bypass without hydraulic interference.

Section 3. Repealer. All ordinances or parts of ordinances in conflict herewith are repealed only to the extent necessary to give this ordinance full force and effect.

Section 4. Severability. If any article, section, subsection, sentence, clause, phrase, or portion of this ordinance is held invalid or unconstitutional by any court of competent jurisdiction, such portion shall be deemed a separate, distinct, and independent

provision and such holding shall not affect the validity of remaining portions of the ordinance, being the intent of the City that this ordinance shall be fully severable.

Section 5. Effective Date. Provisions of this Ordinance shall become effective twenty (20) days following adoption.

AYES _____

NAYS _____

ABSENT _____

_____
JOHN CHIRKUN, Mayor

Attested:

_____
RICHARD STEENLAND, City Clerk

CERTIFICATION OF CLERK

I, Richard Steenland, City Clerk of the City of Roseville, Macomb County, Michigan, do hereby certify that Ordinance No. _____ was adopted by the City Council of Roseville, assembled in regular session on October _____, 2014. Said Ordinance was posted in the following places:

Roseville Police Station, 29753 Gratiot Avenue
Roseville Public Library, 29777 Gratiot Avenue
Roseville Civic Center, 29777 Gratiot Avenue

Notice of said posting was published in *The Macomb Daily* on October _____, 2014.

_____
Richard Steenland, City Clerk

City of Roseville

Memo

To: Scott Adkins, City Manager

From: Paul VanDamme, Purchasing Assistant

Date: October 16, 2014

Re: Single Source Vendor, Dell Computers

Attached is an interoffice memo, Purchase Order and quote for 64 Dell OptiPlex 9020 MFF desktop PC's requested by Phil Longueuil, Information Services Director. This is a single source vendor allowed by City Code through Cooperative Purchasing. The quotation is through The Dell State of Michigan and Local Government contract #45ABZ in the amount of $68,991.43.

The desktop PC"s from Dell meet the City's specifications and is approved by Phil Longueuil. The City has done satisfactory business with Dell in the past. The project will be funded by Information Services in the amount of $68,991.43. Council will have to approve this purchase due to it being a single source vendor

If you have any questions please contact Phil Longueuil or myself.

Attachments

interoffice memo

Date: October 15, 2014

To: **Paul VanDamme, Purchasing Assistant**

From: Phil Longueuil, Information Services Director

RE: **Dell Computers**

At this time we are ready to proceed with our computer replacement project that was funded in the 2014/15 budget. Dell computers were specified. As in previous orders we are able to order from the Dell State and Local Government contract #45ABZ which provides us with the lowest pricing available. Our order will consist of 64 Dell OptiPlex 9020 MFF desktop PC's at $1,108.30 each for a total of $68,991.43. Please let me know if you require any further information.