TOWNSHIP OF CENTER

ORDINANCE NO. 7-2014

AN ORDINANCE OF THE TOWNSHIP OF CENTER, BEAVERCOUNTY, PENNSYLVANIA, TO: REVISE THE STORMWATER MANAGEMENT CHAPTER 608 OF THE TOWNSHIP CODE (LAND USE CODE) TO REQUIRE THE ENTIRE TOWNSHIP TO BE SUBJECT TO THE STORMWATER MANAGEMENT ORDINANCE, AND INCLUDE THE PA DEP REQUIRED REVISIONS TO CONFORM TO THE MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4), NPDES, PHASE II REQUIREMENTS.

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Section 608 STORMWATER MANAGEMENT

608.1 Purpose

This Chapter is adopted and implemented to achieve the following general purposes and objectives:

A. To manage stormwater runoff resulting from land alterations and disturbance activities in accordance with the Pennsylvania Stormwater Management Act (Act 167 of 1978, as amended;

B. To utilize and preserve the desirable existing natural drainage systems and to preserve the flood-carrying capacity of streams;

C. To encourage natural infiltration of rainfall to preserve ground water supplies and stream flows; and

D. To provide for adequate maintenance of all permanent stormwater management facilities in the Township.

608.2 Applicability

Stormwater management facilities shall be provided for subdivisions, land developments, and all activities which change the slope of the land or the land cover and shall be designed to ensure that the maximum rate of stormwater runoff from the site shall be no greater after development than is the rate of runoff from the site prior to development.

608.3 Repealer

This Chapter shall repeal all other Code provisions or parts thereof, which are contrary to or conflict with the provisions of this Chapter to the extent necessary to give this Chapter full force and effect.

608.4 Severability

Should any part of this Chapter be declared invalid, such decision shall not affect the validity of any other part, nor the article as a whole.

608.5 Definitions

For the purposes of this Chapter, the terms used herein shall have the following definitions. The words "shall" and "must" shall be mandatory, single and plural, and feminine and masculine are equivalent.

A. "Applicant": A landowner or developer, as defined by this Chapter who has filed an application for development, including his/her heirs, successors and assigns.

B. "Channel": A natural stream that conveys water; a manmade ditch or open channel excavated for the flow of water.

C. "Conservation District": The Beaver County Conservation District (ACCD).

D. "County": The County of Beaver. Pennsylvania.

E. "Culvert": A closed conduit for the free passage of surface drainage under a highway, railroad, canal, or other embankment.

F. "Design Criteria": Engineering guidelines specifying construction details and materials, or objectives, results, or limits which must be met by a facility, structure or process in performance of its intended functions.

G. "Design Storm": The magnitude of precipitation from a storm event, measured in probability of occurrence, such as the 100-year storm and duration, such as 24-hour, and used in designing stormwater management control systems.

H. "Detention": The slowing, dampening, or attenuating of runoff entering the natural drainage pattern or storm drainage system by temporarily holding water in areas such as detention basins, reservoirs, roof tops, streets, parking lots, or within the drainage system itself.

I. "Detention Basin": A basin designed to retard stormwater runoff by temporarily storing the runoff and releasing it at a predetermined rate. A detention basin is designed to drain completely after a storm; also called a dry basin.

J. "Developer": Any landowner, agent of such landowner or tenant with the permission of such landowner who makes or causes to be made a subdivision or land development.

K. "Development": Any activity, construction, alteration, changes in land use or similar action that affects stormwater runoff characteristics.

L. "Development Site": A lot, parcel or tract of land on which development is taking place or is proposed.

M. "Discharge Rate": The rate of flow, specifically fluid flow. A volume of fluid (in this case water) per unit of time flowing in or from a conduit or channel, usually expressed in cubic feet per second.

N. "Drainage": The interception and conveyance of excess surface water or groundwater from land by artificial or natural means.

O. "Drainage Area": The area which contributes runoff to a designated point of a drainage system usually expressed in acres or square miles; also called a catchment area, watershed, or river basin.

P. "Drainage Easement": A right granted by a landowner to a grantee allowing the use of private land for stormwater management purposes.

Q "Embankment": A mound of earth or stone constructed above the natural ground surface, and in stormwater management with the specific purpose of detaining or diverting stormwater runoff.

R "Engineer": The professional engineer duly appointed as the engineer for the Township.

S "Erosion": The wearing away of the land surface by running water, wind, ice, or other geologic agents, including such process as gravitational creep.

T. "Erosion Control" land surfaces. The application of measures to reduce erosion of land surfaces.

U. "Flood Plain": A normally dry land area adjacent to stream channels that is susceptible to being inundated by overbank stream flows. For regulatory purposes, the Pennsylvania Flood Plain Management Act (Act of October 4. 1978. P.L. 851. No. 166) and regulations pursuant to the Act define the flood plain as the area inundated by the 100-year flood and delineated on a map by FEMA (Federal Emergency Management Agency) or by the applicant in accordance with Township Code requirements.

V. "Ground Cover": Materials covering the ground surface.

W. "Ground Water Recharge": Replenishment of ground water by infiltration, naturally by precipitation or runoff or artificially by spreading or injection

X. "Hydraulics": The branch of science concerned with the mechanics of fluids, especially liquids. As applied in stormwater management, the study of the characteristics of water flowing in conveyance channels, and from control facilities.

Y. "Hydrology": The science dealing with waters of the earth and their distribution and circulation through the atmosphere.

Z. "Infiltration": The flow or movement of water through the interstices or pores of a soil or other porous medium, or the absorption of liquid by the soil.

AA. "Land Development": The improvement of one lot or two or more contiguous lots, tracts or parcels of land for any purpose involving a group of two or more residential or nonresidential buildings, whether proposed initially or cumulatively. or a single nonresidential building on a lot, or lots regardless of the number of occupants or tenure, or the division or allocation of land or space between or among two or more existing or prospective occupants by means of or for the purpose of streets, common areas, leaseholds, condominiums, building groups, or other features, or a subdivision of land.

BB " Land Disturbance": Any activity involving grading, tilling, digging, or filling or stripping of vegetation; or any other activity which causes land to be exposed to erosion. This includes the disturbance of site stone base below pavement materials.

CC. "Maintenance": The upkeep necessary for efficient operation of physical properties.

DD. "Municipality": The Township of Center.

EE. "Township": Center Township, Allegheny County, Pennsylvania.

FF. "NRCS": The National Resources Conservation Service (formerly the Soil Conservation Service), U.S. Department of Agriculture.

GG. "Outfall": The point or location at which stormwater leaves a site, which may include streams, storm sewers, swales or other well defined natural or artificial drainage features, as well as areas of dispersed overland flow.

HH. "Outlet control structure": A structure designed to control the rate of stormwater runoff released from a detention system.

II. "Peak Discharge": The maximum rate of flow of water at a given point and time resulting from a specified storm event.

JJ. "Peak Flow": Maximum flow.

KK. "Performance Standard": A standard which establishes an end result or outcome which is to be achieved, but does not prescribe specific means for achieving it.

LL. "Pervious": A surface which permits the passage or entrance of water or other liquid.

MM. "Point of Interest": A point of hydraulic concern such as a bridge, culvert, or channel section, for which the rate of runoff is computed or measured.

NN. "Rate of Runoff": The instantaneous rate of water flow is usually expressed in cubic feet per second.

OO. "Regulated Earth Disturbance": Earth disturbance activity of one acre or more. This includes earth disturbance on any portion of, part, or during any stage of, a larger common plan of development. This only includes road maintenance activities where pavement stone base is disturbed.

PP. "Release Rate Percentage": The percentage of predevelopment peak rate of runoff from a watershed subbasin (as delineated in the watershed plan), which defines the allowable post -development peak discharge from any development site in that subbasin.

QQ. "Retention Pond": A basin, usually enclosed by artificial dikes, that is used to retard stormwater runoff by temporarily storing the runoff for an extended period of time and releasing it at a pre-determined rate. These are "wet ponds".

RR. "Return Period": The average interval in years over which an event of a given magnitude can be expected to recur.

SS. "Runoff": The part of precipitation which flows over the land

TT. "Runoff Characteristics": The hydrologic, geologic, and land cover characteristics of any watershed which affect the rate, amount, and direction of stormwater runoff. These may include but are not limited to: vegetation, soils, slopes, and man-made landscape alterations.

UU. "SCS": The Soil Conservation Service. U. S. Department of Agriculture

VV. "Sediment": Solid material, both mineral and organic, that is in suspension, is being transported, or has been moved from its site or origin by air, water, gravity, or ice and has come to rest on the earth's surface.

WW. "Small development": Any subdivision or land development which results (or will result when fully constructed) in the creation of 5,000 or fewer square feet of impervious surface area.

XX. Soil Cover Complex Method": A method of runoff computation developed by the SCS and utilized in its publication, "Urban Hydrology for "Small Watersheds", Technical Release No. 55, SCS, June, 1986 (or the most current edition).

YY. "Storm Sewer": A sewer that carries intercepted surface runoff, street water and other drainage, but excluding domestic sewage and domestic wastes.

ZZ. "Stormwater Collection/Conveyance System": Natural or engineered structures which collect and transport stormwater through or from a drainage area to the point of final outlet, including but not limited to, any of the following: conduits and appurtenant features, canals, channels, ditches, streams, culverts, streets, and pumping stations.

AAA. "Stormwater Management Plan": The plan for managing stormwater runoff from a specific development site within the watershed.

BBB. "Stormwater Runoff": Water generated in a drainage basin resulting from snow melt or precipitation events.

CCC. "Stormwater Runoff Volume": The quantity of water resulting from a storm event, usually expressed in cubic feet, acre feet, or inches over acreage of the watershed.

DDD. "Stream": A watercourse, whether relatively permanent or non-relatively permanent.

EEE. "Subbasin": A portion of the watershed that has similar hydrologic characteristics and drains to a common point.

FFF. "Swale": A low-lying trench which gathers or carries surface water runoff.

GGG. "Time of concentration": The time period necessary from surface runoff to reach the outlet of a subarea from, hydraulically, the most remote point in the tributary drainage area.

HHH. "Watercourse": Any channel for conveyance of surface water having a defined bed and banks, whether natural or artificial, with perennial or intermittent flow.

III. "Watershed": The entire area drained by a river stream, or other body of water whether natural or manmade.

608.6 Design Calculations and Reports

Stormwater runoff and design calculations shall be submitted to the Township Engineer for review and approval with the application for combined Preliminary and Final Approval of a land development plan. Cross sections and specifications showing complete construction details shall be submitted with the application for Final Approval.

The stormwater runoff and design calculations shall be prepared by a Pennsylvania registered engineer with qualifications and experience in preparing stormwater management plans.

Additional analysis, calculations and design criteria may be required for both on-site and off-site stormwater systems where it has been determined by the Township Engineer that further study is necessary.

Upon request by the Township Engineer, stormwater runoff calculations shall be provided for: the outlet and inlet sides of all stormwater drainage and storage facilities and structures; at points in a public street with a change of grade; or where water from a proposed structure, facility or vehicular way is to enter an existing public street, existing storm sewer, existing drainage ditch or existing stormwater storage facility.

608.7 Exemptions for Small Developments

At the time of application, the Township Engineer shall determine if the development qualifies as a "small development" and, therefore, is eligible for a simplified stormwater plan submission. For the purposes of this Ordinance, a small development is:

> Any development which results (or will result when fully constructed) in the creation of 10,000 square feet or less of impervious surface area.

A small development shall be exempt from the preparation of a stormwater management plan as required by Section 608 of this Ordinance. However, such developments shall provide safe management of stormwater management in accordance with the performance standards of this Ordinance and as approved by the Township Engineer.

Applications for small developments shall include a plan which describes, narratively and graphically, the type and location of proposed on-site stormwater management techniques or the

proposed connection to an existing storm sewer system. Depending upon actual site conditions, the number of lots proposed and similar considerations, the Township Engineer shall determine if the plan must be prepared by a registered professional engineer.

The Township Engineer shall review the proposed provisions for stormwater management for small developments. Where the applicant is proposing to connect to an existing storm sewer, the applicant's engineer shall determine that sufficient capacity exists in the storm sewer from the point of connection to the point of outlet in the natural drainage system. The Township Engineer shall also determine if the proposed development site is part of a larger parcel or tract which was subject to any specific stormwater management controls contained in a prior plan.

For a parcel or tract of land held in single ownership, only one (1) application for a small development, as defined above, shall be permitted before requiring a stormwater management plan for the entire parcel. A project cannot be phased to circumvent the stormwater requirements by using the exemption for small developments.

608.8 Municipal Separate Storm Sewer System Ordinance

In conjunction with meeting the requirements of the ordinance, the Applicant shall refer to and meet all conditions and requirementsset forth in the Township of Center's Municipal Separate Storm Sewer System (MS4) Ordinance.

608.9 Stormwater Plan Content

The Stormwater Management Plan for all developments except small developments, as defined in 608.7, shall consist of the following three (3) components:

A. Narrative Report

The Narrative Report shall consist of a general statement of the project giving the purpose and engineering assumptions and calculations for control measures and facilities. The following information shall be included.

1. General description of the project.

2. General description of accelerated runoff control plan.

3. General description of erosion and sedimentation control plan.

4. Expected project time schedule, including anticipated start and completion dates.

5. Location and watershed characteristics.

6. Hydraulic and hydrologic calculations, methodology and basis of design.

7. Brief soils description.

B. Preliminary Plan

The preliminary plan shall provide, and be accompanied by, maps and other descriptive material indicating the feasibility of the plan and showing the following:

1. A key map showing the development site's location within the designated watershed and watershed subsheds (consult watershed stormwater plans for boundaries). On all site drawings, show the boundaries of the watershed(s) and subarea(s) as they are located on the development site and identify the watershed names and/or subshed numbers.

2. Location of the 100-year floodplain on the development site based on the Center Township Flood Insurance Study Maps or a determination by the applicant's engineer.

3. An overlay showing soil types and boundaries within the development site.

4. The streets, storm sewers and other storm drains to be built, the basis of their design, the outfall and outlet locations and elevations, the receiving stream or channel and its high water elevation and the functioning of the drains during high water conditions.

5. The parts of the proposed parking area pavements, if any, which are planned to be depressed to provide stormwater storage or conveyance. A maximum of six inches (6") depth of water may be ponded in a proposed parking area.

6. Existing streams and watercourses to be maintained and new channels to be constructed, their locations, cross-sections and profiles.

7. Proposed culverts and bridges to be built, if any, their materials, elevations, waterway openings and basis of design.

8. Existing detention ponds and basins to be maintained, enlarged or otherwise altered and new ponds or basins to be built and the basis of their design.

9. The approximate location and percentage of the total land area in the development which will be covered by impervious surfaces after construction is completed.

10. The slope, type and size of all proposed and existing storm sewers and other waterways.

11. Existing contours at intervals of two (2) feet except in areas with slopes greater than fifteen percent (15%), in which case five (5) foot contour intervals may be used.

12. All natural features, including bodies of water (natural and artificial), watercourses (permanent and intermittent), swales, wetlands and other natural drainage courses on the development site and those off-site which will be affected by runoff from the development.

13. Approximate depth, shape, size and storage of any proposed retention facility.

14. One or more typical cross-sections of all existing and proposed channels or other open drainage facilities, showing the elevation of the existing land and the proposed changes thereto, together with the high water elevations expected from the 100-year storm under the controlled conditions called for by this Ordinance and the relationship of structures, streets and other utilities.

15. A site plan showing the property lines, dimensions of the site and location of existing and proposed structures, sewers, waterlines, easements and rights-of-way.

16. Certification of the registered professional engineer responsible for preparation of the plan.

17. A list of the permits and approvals relative to stormwater management that will be required from other governmental agencies and anticipated dates of submission and receipt. Copies of the applications may be requested by

the Township Engineer where they may be helpful for the stormwater plan review.

C. Final Plan

Upon approval of the preliminary plan, the final plan shall be submitted to the Township. The final plan shall provide all descriptive material and maps previously submitted and required prior to the final plan, in addition to the following items:

1. All calculations, assumptions and criteria used in the design of the storm sewer system, detention facilities and sediment and erosion control operations. Hydraulic and energy grade lines shall be provided for proposed storm sewers if, in the opinion of the Township Engineer, they are required to evaluate the storm system.

2. All plans and profiles of proposed storm sewers and open channels, including horizontal and vertical controls, elevations, sizes, slopes and materials.

3. Locations, dimensions and design details required for the construction of all facilities.

4. For all detention basins, a plot or tabulation of storage volumes with corresponding water surface elevations and basin outflow rates for those water surface elevations.

5. For all detention basins, design hydrographs of inflow and outflow for the peak design flows from the site under natural and developed conditions.

6. A description of operation for all detention basins.

7. Contours of the finished project site at intervals of two (2) feet, except in areas with slopes greater than fifteen percent (15%), in which case, five (5) foot contour intervals may be used.

8. The staging of earthmoving activities and program of operation, including a schedule for the installation of all temporary and permanent stormwater control measures and devices.

9. All information relative to the design and operation of emergency spillways.

10. Emergency routing of outfall for stormwater runoff in the event of failure of off-site drainage structures.

11. When major control facilities, such as retention basins, requiring a PA DEP permit, are planned, soil structures and characteristics shall be investigated. Plans and data prepared by a licensed professional engineer or geologist with experience and education in soil mechanics shall be submitted. These submissions should consider and offer design solutions for frost heave potential, shrink/swell potential, soil bearing strength, water infiltration, soil settling characteristics, fill and backfilling procedures and soil treatment techniques as required to protect the improvements or structures.

12. All erosion and sedimentation control measures, temporary, as well as permanent, in sufficient detail to clearly indicate the effectiveness of the plan.

13. Project specifications relative to stormwater control, erosion and sedimentation.

14. Evidence that all on-site and off-site easements required to convey runoff flow to an existing public drainage facility or a permanent stream have been granted to the operating entity.

15. Provide the information to conform with the requirements noted in sections 608.11, 608.12 and 608.13.

D. Maintenance Plan

A maintenance plan establishing ownership and maintenance responsibilities for all stormwater control facilities (identifying the specific person or entity responsible) and detailing financial requirements and sources of funding shall be submitted with the Final Plan. Any legal agreements or covenants required to implement the maintenance program shall be submitted. A maintenance schedule shall be submitted in accordance with the Standardized Maintenance Schedule in Appendix I.

608.10 General Standards

The following provisions shall be considered the over-riding performance standards against which all proposed stormwater control measures shall be evaluated:

A. Any landowner and any person engaged in the alteration or development of land which may affect stormwater runoff characteristics shall implement such measures as are reasonably necessary to prevent injury to health, safety and other property. Such measures shall include, but not be limited to, such actions as are required to:

1. Assure that the maximum rate of stormwater runoff is no greater after development than prior to development activities.

2. Manage the quantity, velocity and direction of resulting stormwater runoff in a manner which will not adversely impact the health on, or value of, any affected properties.

3. No discharge of toxic materials into any stormwater management system will be permitted.

B. Design Storms

1. Stormwater management facilities within a development shall be designed to handle the peak rate of runoff from two (2) year, five (5) year, ten (10) year, twenty-five (25) year and one hundred (100) year frequency storm events. Whenever the provisions of Federal or State law impose a greater design storm frequency, as for example, where drainage systems cross highways, the stricter standards shall prevail.

2. All stormwater retention/detention facilities shall be designed with emergency overflow facilities for the 100-year, 24-hour duration storm, unless positive measures are installed to control the inflow so as not to exceed the safe capacity of the retention/detention facility.

3. The stormwater volume required for all stormwater retention/detention facilities shall be that volume necessary to handle runoff of a 100-year storm in any development, less that volume discharged during the same storm period used to calculate the volume of rainfall, at the approved release rate.

4. The SCS, Type II Rainfall Distribution shall be used for all analyses. The design storm frequencies for the watershed are:

Design Storm	Rainfall Depth 24 Hours
2 year	2.6 inches
5 year	3.3 inches
10 year	3.8 inches
25 year	4.4 inches
100 year	5.0 inches

C. The Stormwater Management Plan shall consider all of the stormwater runoff flowing over the project site. Runoff calculations shall be made to insure that runoff from the fully developed upstream watershed area (based on the

Township's Comprehensive Land Use Plan) can be accommodated by the pipes, drainage easements and watercourses, etc. on the site.

D. For the analysis of redevelopment projects twenty percent (20%) of the existing impervious surface shall be considered meadow in good condition.

D. Joint Development of Control Systems

Stormwater control systems may be planned and constructed in coordination with two (2) or more developments, provided they are in compliance with the applicable provisions of this Ordinance.

E. Method of Computation

All computations used in conjunction with the analysis and design of stormwater management facilities shall be based on one (1) or more of the following methods:

1. TR-55-Soil Conservation Service Technical Release No. 55
2. TR-20-Soil Conservation Service Technical Release No. 20
3. Modified Rational Method
4. Penn State Runoff Model
5. Virginia Tech/Penn State Runoff Mode

These methods for determining peak discharge shall be used to:

a. Determine pre-development runoff conditions;

b. Analyze the impact of development; and

c. Perform calculations in the design of any detention/retention facilities used in controlling runoff.

These methods of runoff computation developed and used by the Soil Conservation Service and other authorities are hereby adopted by the Township.

The use of the Basic Rational Method in estimating runoff may be employed in the design of the storm sewer system within the development. The storm sewer

system shall be interpreted as the conduits, culverts, inlets and appurtenant features for the conveying of stormwater to, through or from a development site to the point of final discharge or control facility. The Rational Method shall not be used in the analysis of stormwater runoff from the development in its entirety or in conjunction with the design of any retention/detention facilities or other runoff control measures.

F. Release of Detained Stormwater

The approved peak release rate of stormwater from all retention/detention facilities for any storm event shall be that which is experienced prior to development for the same storm event up to and including the 100-year storm. Therefore, all retention/detention facilities shall provide staged release of the 2, 5, 10, 25 and 100-year storms.

G. Stormwater Management Facilities

Design of stormwater management facilities outlined in the plan requires that runoff calculations be made for the site and areas which contribute drainage to the site. These calculations should be based on land use, time of concentration and other standard aspects of hydraulic analysis.

1. Temporary Control Measures/Facilities

Runoff calculations of the site's condition during development will be used to size temporary control measures.

2. Permanent Control Measures/Facilities

In most cases, permanent control measures/facilities shall be designed to assure that the maximum rate of stormwater runoff is no greater after development than prior to development activities, utilizing the 100-year storm as a basis for calculations. Storm sewer systems may be designed for the 25-year storm provided that the runoff will naturally drain to the detention facility, otherwise the storm sewer system must be designed for the 100-year storm event. Runoff calculations must be made to insure that runoff from the upstream watershed area can be accommodated by the pipes, drainage easements, water courses, etc. on the site as well as those downstream of the site to a point of permanent discharge, where downstream facilities are not adequate to convey the flow, reduced release rates shall be considered to ensure no detrimental impact to the downstream facilities shall occur as a result of the development.

H. Runoff calculations shall also include complete hydrology and hydraulic analysis of all downstream swales and pipe facilities to the discharge point as well as erosion control facilities, including, but not limited to:

1. Velocities of flow, slopes, capacity and roughness co-efficient of conduits and grassed waterways.

2. Capacity of sediment basins and permanent holding ponds.

3. All drainage facilities shall be designed to contain the energy gradeline for the peak flow rate for the design storm within the structures a minimum of two (2) feet below the surface elevation. The hydraulic gradeline must be within the pipe. Swales and channels shall provide at least one (1) foot of freeboard. Backwater effects of pipes discharging under surcharge conditions shall be included.

I. Single Family Lots

Retention facilities shall be constructed for all existing single family lot developments or single family lots located in land developments which for terrain reasons cannot utilize the development's retention systems. Retention facilities shall consist of gravel filled sumps, ponds, tanks or other approved facilities, sized in accordance with standard details in the Township Construction Standards. Refer to Figures SWM 6, 6-A and 7 for minimum volume size per single residence roof area.

Storage volumes for roof areas greater than 10,000 square feet shall be calculated using the methods outlined in §608.10-E.

J. Easements

Easements for stormwater management facilities shall be required to have a minimum width of twenty (20) feet. Where a subdivision or land development is, or will be, traversed by a watercourse, there shall be provided a stormwater or drainage easement of a width sufficient for the purpose, but not less than twenty (20) feet. The stormwater detention facilities must be provided within a drainage easement. An access easement must be provided from the public right-of-way to the stormwater detention facility with a minimum width of twenty (20) feet.

K. Flood-prone Areas

Land identified as flood-prone on maps issued by the Federal Insurance Administration shall be subject to the regulations of the National Flood Insurance Program and shall comply with the provisions of the Township Zoning Ordinance governing flood plains.

L. Stormwater Detention Facilities

1. If detention facilities are utilized for the development site, the facility shall

be designed such that the post development peak runoff rates from the development site are controlled to those rates defined by the subarea release-rate percentage or no-harm evaluation for the two-, five-, ten-, twenty-five-, and one hundred-year design storms. Except, however, where downstream flooding problems exist, the Township may impose additional reduced release rate criteria.

2. All detention facilities shall be equipped with multistage outlet structures to provide discharge control for the two-, five-, ten-, twenty-five-, and one hundred-year storm frequencies. Provisions shall also be made for safely passing the post development one hundred-year storm runoff flows without damaging (ie: impairing the continued function of) the facilities.

3. Shared-storage facilities, which provide detention of runoff for more than one (1) development site, may be considered within a single subarea. Such facilities shall meet the design criteria contained in this section. In addition, runoff from the development sites involved shall be conveyed to the facility in a manner so as to avoid adverse impacts, such as flooding or erosion, to channels and properties located between the development site and the shared-storage facility.

4. Where detention facilities will be utilized, multiple-use facilities, such as lakes, ball fields or similar recreation uses, are encouraged wherever feasible.

5. Other considerations which should be incorporated into the design of the detention facilities include:

   a. Inflow and outflow structures shall be designed and installed to prevent erosion, and bottoms of impoundment-type structures should be protected from soil erosion.

   b. Control and removal of debris, both in the storage structure and in all inlet or outlet devices, shall be a design consideration.

   c. Inflow and outflow structures, pumping stations and other structures shall be protected and designed to minimize safety hazards.

   d. The water depth of a storage pond shall be limited to that which is safe for children. Otherwise, appropriately landscaped fencing at least four (4) feet in height shall be required.

   e. Side slopes of storage ponds shall not exceed a ratio of three to one (3:1) horizontal to vertical dimension.

f. Landscaping shall be provided for the facility which harmonizes with the surrounding area.

g. All stormwater detention facilities shall be screened from view of existing roads or streets located within the Township, which is a minimum of 6-feet in height with sufficient access for maintenance vehicles. The screening material must be approved by the Township. Landscaping of the pond embankment shall not be permitted at any time.

h. The facility shall be located to facilitate maintenance, considering the frequency and type of equipment that will be required.

i. The facility shall be equipped with an access road at least eight (8) feet wide and with a maximum of grade of 15 percent.

j. All pond outlet structures shall have suitable gaskets to prevent leakage and piping of water through the pond embankment. All storm pipe installed through the pond embankment must be constructed of reinforced concrete pipe.

6. A geotechnical investigation report for the construction of the stormwater detention/retention and infiltration facilities must be provided including design recommendation for embankment construction, interior and exterior slopes, drainage swales and infiltration areas.

608.11 Construction Criteria for Stormwater Control Facilities

Stormwater management facilities shall be constructed in accordance with the following minimum specifications:

A. All workmanship and materials shall conform to the Township Construction Standards. In addition, all workmanship and materials shall conform to the latest edition of Penn DOT Form 408.

B. All connections to existing storm sewer pipes shall be made by construction of a suitable junction box (inlet or manhole) to provide access for clean-out. No blind connections shall be permitted.

C. All pond outlet structure pipes shall have suitable gaskets to prevent leakage and piping of water through the pond embankment.

D. All pipe outlets shall discharge onto a stone rip-rap blanket to prevent erosion of soil. Rip-rap will be sized considering pipe exit velocities.

E. Controls shall be installed at initial stages of earthmoving and otherwise as

outlined in the staging of earthmoving activities section of the erosion and sedimentation control plan.

F. The discharge of stormwater runoff shall be to a well-defined drainage course which has a defined bed and bank. If stormwater runoff cannot be discharged to a defined drainage course, documentation of written permission from each downstream property owner shall be provided for all properties between the source of discharge and the defined drainage course.

G. All stormwater detention facilities shall be enclosed by a fence which is a minimum of six (6) feet in height with a locking gate of sufficient width to provide access for maintenance vehicles.

H. Provide a Geotechnical Report for the construction of all stormwater facilities including the following: stormwater detention/retention basins and the embankment; drainage swales; and infiltration areas.

608.12 Maintenance Criteria for Stormwater Control Facilities

Maintenance is an essential part of the successful functioning of a stormwater management system and the following shall be required:

A. Maintenance During Development

Maintenance during development of a project shall be the responsibility of the developer and/or landowner and shall usually include, but shall not be limited to:

1. Removal of silt from all debris basins, traps or other structures or measures when forty percent (40%) of capacity is filled with silt.

2. Disposal of collected silt in a manner which will not adversely affect the environment.

3. Periodic maintenance of temporary control facilities such as replacement of straw bale dikes, straw filters or similar measures.

4. Establishment or re-establishment of vegetation by seeding and mulching or sodding of scoured areas where vegetation has not been successfully established. A developer or landowner retains this obligation as to property he or she has developed or improved even if the proper season for "seeding" occurs initially sometime after the project is otherwise completed in whole or as to a particular phase.

5. Installation of necessary controls sufficient to protect against problems caused by storm events within design frequencies.

6. Removal of all temporary measures upon completion of the project.

B. After Acceptance of the Plan by the Township

In the event that the Township accepts public improvements in the plan, except in cases where an agreement between the developer and the Township have been executed to the contrary, the maintenance shall be the responsibility of the Township and shall include, where necessary:

1. Mowing to maintain adequate stands of grass and to control weeds. Chemical weed control may be used if State and Township regulations are met. Selection of seed mixtures shall reflect the type of maintenance desired by the Township.

2. Removal of silt from all permanent structures which trap silt or sediment to keep this material from building up in grassed waterways and other permanent structures, thereby reducing their capacity.

3. Removal of trees and shrubs from pond embankments.

4. Repair of animal burrows and removal of animals causing same.

C. It shall be the responsibility of the Developer to inspect all permanent facilities to see that corrective action is taken where necessary.

D. Stormwater facilities located on private property shall be maintained by the Landowner or his agent; however, this does not relieve the Landowner or his agent of the obligation to inspect their own facilities. The Township reserves the right to enter upon private property to make periodic reasonable inspections and to require the Landowner to take necessary corrective actions. An easement shall be recorded granting access over private property to the stormwater facilities.

E. The Owner shall convey to the Township easements and/or rights-of-way to assure access for periodic inspections by the Township and maintenance if required.

F. The Owner shall keep on file with the Township the name, address and telephone number of the person or company responsible for maintenance activities; in the event of a change, new information will be submitted to the Township within ten (10) days of the change.

G. The Owner shall establish any special maintenance funds or other financing sources, in accordance with the approved maintenance plan.

H. The Owner shall pay the amount due to the Special Stormwater Facility Maintenance Fund.

1. Persons installing stormwater storage facilities will be required to pay a specified amount to the Center Township Stormwater Facility Maintenance Fund to help defray the costs of periodic inspections and annual maintenance expenses. The amount of the deposit shall be determined as follows:

   a. If the storage facility is to be privately owned and maintained, the deposit shall cover the cost of periodic inspections performed by the Township for a period of ten (10) years, as estimated by the Township. After that period of time, inspections will be performed by the Township and billed directly to the Owner.

   b. If the storage facility is to be Owned and maintained by the Township, the deposit shall cover the estimated annual costs for maintenance and inspections for ten (10) years, as estimated by the Township.

   c. The amount of the deposit to the maintenance fund covering annual inspection and maintenance costs shall be converted to present worth of the annual series values. The Township Manager shall determine the present-worth equivalents, which shall be subject to the final approval of the Township Supervisors.

2. If the storage facility is proposed, which also serves as a recreation facility, such as a lake or ballfield, the Township may reduce or waive the amount of the maintenance fund based on the value of the land for public recreation purposes.

3. If at some future time any storage facility (whether publicly or privately owned) is eliminated due to the installation of storm sewers or another storage facility (ie: a distributed storage facility), the unused portion of the maintenance fund will be applied to the cost of abandoning the facility and connecting to the storm sewer system or other facility. Any amount of the deposit remaining after the costs of abandonment are paid will be returned to the Depositor.

I. If the Owner fails to maintain the stormwater control facilities, following due notice by the Township to correct the problems, the Township shall perform the necessary maintenance or corrective work. The Owner shall reimburse the Township for all costs.

J. Additional items may be included in the maintenance agreement where determined necessary to guarantee the satisfactory maintenance of all facilities. The maintenance agreement shall be subject to the review and approval of the Township's Solicitor.

K. Post-Construction Stormwater Record Plan

1. Prior to issuance of an Occupancy Permit or utilization of the proposed improvements the Applicant must provide the Township a copy of a recorded post-constructed stormwater management plan and the proof of recording for any project containing stormwater management facilities including storm sewers and BMP's.

2. The owner shall provide a digital file, on state plain coordinate system, of the location of all BMP's constructed on the property.

608.13 Stormwater Culverts

Stormwater culverts, bridges and similar structures serving public streets, access driveways or other vehicular rights-of-way shall be designed to support HS-20 loading and any other imposed loadings necessary without structurally damaging the drainage system. Stormwater culverts, bridges or other structures which do not serve vehicular traffic shall be designed to support the necessary loading without structurally damaging the pipe or affecting its capacity for drainage. Said design shall be approved by the Township Engineer and shall comply with the following requirements.

A. Conduit size of culverts and other enclosed components of a stormwater drainage system shall be based on computed hydrologic and hydraulic data and computations shall be approved by the Township. The minimum size of any enclosed structure to be maintained by the Township shall be fifteen (15) inches in diameter. The minimum size of any enclosed structure to be privately maintained shall be fifteen (15) inches in diameter, unless the design calculations, approved by the Township, justify a lesser size. In no case shall larger pipes/culverts be connected to smaller pipes/culverts.

B. The design of any enclosed drainage course shall provide a minimum cleaning velocity of two (2) feet per second. When the design provides for a maximum velocity greater than ten (10) feet per second, the enclosed components shall be lined or protected to prevent scour.

C. The design of headwall and endwall structures for enclosed stormwater facilities shall be approved by the Township and shall be in accordance with the Township Construction Standards.

D. Energy dissipaters shall be required at the outlet side of all enclosed culverts or similar components and shall be designed in accordance with the Township Construction Standards.

E. The type of materials used for enclosed culverts and similar components shall comply with the Township Construction Standards. No stormwater facility shall

be enclosed or covered over until the Township has field reviewed the construction.

608.14 Open Stormwater Drainage Courses

Open stormwater drainage courses shall be designed for a maximum velocity not to exceed ten (10) feet per second and a minimum velocity of five (5) feet per second. A minimum velocity of one (1) foot per second may be authorized by the Township Engineer where a greater slope cannot be achieved to permit the standard required minimum velocity. An open stormwater drainage course shall include a lining (rip-rap, concrete or bituminous) to prevent erosion. The applicant shall obtain approval from the Beaver County Soil Conservation Service, if required.

608.15 Inspections of Stormwater Management Controls During Construction

A. The Township or a designated representative shall field review the construction of the temporary and permanent stormwater management facilities for the development site. The Permittee shall notify the Township forty-eight (48) hours in advance of the completion of the following key development phases:

1. At the completion of the preliminary site preparation, including stripping of vegetation, stockpiling of topsoil and construction of temporary stormwater management and erosion control facilities.

2. At the completion of rough grading, but prior to placing topsoil, permanent drainage or other site development improvement and ground covers.

3. During construction of the permanent stormwater facilities at such times as specified by the Township.

4. Completion of permanent stormwater management facilities, including established ground covers and plantings.

5. Completion of any final grading, vegetative control measures or other site restoration work done in accordance with the approved plan and permit.

B. No work shall commence on any subsequent phase until the preceding one has been field reviewed by the Township Engineer and approved by the Township in writing. If there are deficiencies in any phase, the Township shall issue a written description of the required corrections and stipulate the time by which the corrections must be made.

C. If during construction the Contractor or Permittee identifies any site conditions, such as subsurface soil conditions or alterations in surface or subsurface drainage, which could affect the feasibility of the approved stormwater facilities, said person must notify the Township within twenty-four (24) hours of the discovery

of such condition and request a field review by the Township. The Township shall determine if the condition requires a stormwater plan modification.

D. In cases where stormwater facilities are to be installed in areas of landslide-prone soils or where other special site conditions exist, the Township may require special precautions, such as soil tests and core borings, full-time resident project representative services and/or similar measures. All costs of any such measures shall be borne by the Permittee.

608.16 Requirement for Erosion and Sediment Controls

A. No Regulated Earth Disturbance activities within the Township shall commence until approval by the Township of an Erosion and Sediment Control Plan for construction activities.

B. The Pennsylvania Department of Environmental Protection (DEP) has regulations that require an Erosion and Sediment Control Plan for any earth disturbance activity of 5,000 square feet or more, under 25 Pa. Code § 102.4(b).

C. In addition, under 25 Pa. Code Chapter 92, a DEP "NPDES Construction Activities" permit is required for any earth disturbance one acre of more with a point source discharge to surface waters or the Township's storm sewer system, or five acres or more regardless of the planned runoff (hereinafter collectively referred to as "Regulated Earth Disturbance Activities"). This includes earth disturbance on any portion of, part of, or during any stage of, a larger common plan of development.

D. Evidence of any necessary permit(s) for Regulated Earth Disturbance activities from the appropriate DEP regional office or Allegheny County Conservation District must be provided to the Township. The issuance of an NPDES Construction Permit (or permit coverage under the statewide General Permit (PAG-2)) satisfies the requirements subsection A.

E. A copy of the Erosion and Sediment Control plan and any required permit, as required by DEP regulations, shall be available at the project site at all times.

608.17 Post-Construction Runoff Control Requirements

A. Post-Construction Stormwater Runoff Controls for New Development and Redevelopment, Including Operations and Maintenance of Stormwater BMPs

B. No Regulated Earth Disturbance activities within the Township shall commence until approval by the Township of a plan which demonstrates compliance with State Water Quality Requirements after construction is complete.

C. The BMPs must be designed to protect and maintain existing uses (e.g., drinking

water use; cold water fishery use) and maintain the level of water quality necessary to protect those uses in all streams, and to protect and maintain water quality in "Special Protection" streams, as required by statewide regulations at 25 Pa. Code Chapter 93 (collectively referred to herein as "State Water Quality Requirements").

D. To control post-construction stormwater impacts from Regulated Earth Disturbance activities, State Water Quality Requirements can be met by BMPs, including site design, which provide for replication of pre-construction stormwater infiltration and runoff conditions, so that post-construction stormwater discharges do not degrade the physical, chemical or biological characteristics of the receiving waters. As described in the DEP Comprehensive Stormwater Management Policy (#392-0300-002, September 28, 2002), this may be achieved by the following:

1. Infiltration: replication of pre-construction stormwater infiltration conditions,
2. Treatment: use of water quality treatment BMPs to ensure filtering out of chemical and physical pollutants from the stormwater runoff, and
3. Stream bank and Streambed Protection: management of volume and rate of post-construction stormwater discharges to prevent physical degradation of receiving waters (e.g., from scouring and erosion).

E. DEP has regulations that require municipalities to ensure design, implementation and maintenance of Best Management Practices ("BMPs") that control runoff from new development and redevelopment (hereinafter "development") after Regulated Earth Disturbance activities are complete. These requirements include the need to implement post-construction stormwater BMPs with assurance of long-term operations and maintenance of those BMPs.

F. Evidence of any necessary permit(s) for Regulated Earth Disturbance activities from the appropriate DEP regional office or Allegheny County Conservation District must be provided to the Township. The issuance of an NPDES Construction Permit (or permit coverage under the statewide General Permit (PAG-2)) satisfies the requirements subsection A.

608.18 Sanctions

A. Public Nuisance

1. The violation of any provision of this ordinance is hereby deemed a Public Nuisance.
2. Each day that a violation continues shall constitute a separate violation.

B. Enforcement

1. Whenever the Township finds that a person has violated a prohibition or failed to meet a requirement of this Ordinance, the Township may order compliance by written notice to the responsible person. Such notice may require without limitation:

   a. The performance of monitoring, analyses, and reporting;

   b. The elimination of prohibited discharges;

   c. Cessation of any violating discharges, practices, or operations;

   d. The abatement or remediation of storm water pollution or contamination hazards and the restoration of any affected property;

   e. Payment of a fine to cover administrative and remediation costs;

   f. The implementation of stormwater BMPs; and

   g. Operation and maintenance of stormwater BMPs.

2. Failure to comply within the time specified shall also subject such person to the penalty provisions of this Ordinance. All such penalties shall be deemed cumulative and shall not prevent the Township from pursuing any and all other remedies available in law or equity.

C. Suspension and Revocation of Permits and Approvals

Any building, land development or other permit or approval for Regulated Earth Disturbance Activities issued by the Township may be suspended or revoked by the governing body for:

1. Non-compliance with or failure to implement any provision of the permit,

2. A violation of any provision of this Ordinance, or

3. The creation of any condition or the commission of any act during construction or development which constitutes or creates a hazard or nuisance, pollution or which endangers the life or property of others.

D. Penalties

1. Any person violating the provisions of this Ordinance shall be guilty of a summary offence and upon conviction shall be subject to a fine of not more than $ 300.00 for each violation, recoverable with costs, or imprisonment of not more than 90 days, or both. Each day that the

violation continues shall be a separate offense.

2. In addition, the Township, through its Solicitor, may institute injunctive, mandamus or any other appropriate action or proceeding at law or in equity for the enforcement of this Ordinance. Any court of competent jurisdiction shall have the right to issue restraining orders, temporary or permanent injunctions, mandamus or other appropriate forms of remedy or relief.

CHAPTER 609 STORM SEWERS AND DRAINAGE FACILITIES

609.1 Stormwater Collection and Conveyance

A. Applicants are encouraged to design conveyance systems that encourage infiltration and improve water quality wherever practicable.

B. Wherever conveyance channels are necessary, drainage shall be maintained by an open channel with landscape banks designed to carry the 100-year, 24-hour stormwater runoff from upstream contributory areas. If the runoff from stormwater collection and conveyance facilities would drain over land to a stormwater detention facility, the 25-year frequency storm event may be used. The Township Engineer with the approval of the Township may increase the design storm, as conditions require. All open channels shall be designed with one (1) foot of freeboard above the design water surface elevation of the design runoff condition.

C. Flood relief channels shall be provided and designed to convey the runoff from the 100-year, 24-hour storm, such that a positive discharge of this runoff is to a natural drainage course with a defined bed and bank.

D. Manholes and/or inlets shall not be spaced more than three hundred (300) feet apart for pipe sizes up to twenty-four (24) inches in diameter and not more than four hundred fifty (450) feet apart for larger pipe sizes.

E. Where drainage swales are used in lieu of or in addition to storm sewers, they shall be designed to carry the required runoff without erosion and in a manner not detrimental to the properties they cross. Drainage swales shall provide a minimum grade of one percent (1%) but shall not exceed a grade of nine percent (9%). Drainage swales used strictly for conveyance are not the same as Open Vegetated Channels.

F. Street curbing for the purpose of stormwater conveyance is discouraged. On streets that must contain curbing, storm sewers shall be placed in front of the curbing. To the greatest extent possible, storm sewers shall not be placed directly under curbing. At curbed street intersections, storm inlets shall be placed in the tangent section of the road.

G. Use of grassed swales or open vegetated swales in lieu of curbing to convey, infiltrate and/or treat stormwater runoff from roadways is encouraged. Inlets shall be placed at the center of the shoulder swale draining the street and shall be located no closer than four (4) feet from the edge of the cartway.

H. When requested by the Township the developers shall obtain or grant a minimum twenty (20) foot wide drainage easement over all storm sewers, drainage swales, channels, etc., that are a component of the stormwater management system when located within undedicated land. All permanent detention basins and/or other stormwater management facilities providing stormwater control for other than a single residential lot shall be located within a defined drainage easement that allows proper legal access and maintenance vehicle access.

I. No property owner shall obstruct or alter the flow, location or carrying capacity of a stream, channel or drainage swale to the detriment of any other property owner, whether upstream or downstream. All subdivision and/or land development plans containing streams, channels, drainage swales, storm sewers or other conveyance systems that cross property boundaries, existing or proposed, or whose discharge crosses such boundaries shall contain a note stating the above.

J. Water Quality Inlets. Storm drainage systems that collect runoff from parking areas and/or loading areas exceeding 5,000 square feet of impervious coverage and discharge to stormwater management systems, including surface or subsurface infiltration systems, shall have a minimum of one (1) water quality inlet per each acre of drainage area. The purpose of water quality inlets is to remove oil, grease, and heavy particulates or total suspended solids, hydrocarbons and other floating substances from stormwater runoff, Methods other than water quality inlets may be permitted if the Applicant demonstrates to the Borough's satisfaction that any such alternative will be as effective and as easily maintained. Periodic cleaning of these systems shall be addressed in the Operation and Maintenance Plan submitted to the Township.

K. Suitable drainage structures, culverts, storm sewers, swales and related installations shall be provided along roads to insure removal of stormwater from all gutters, at all low points and at intervals elsewhere not exceeding 600-feet, such that the width of stormwater flow in any gutter does not exceed ¼ of the total cartway width.

L. No stormwater pipe (public or private) shall be less than 15-inches in diameter that conveys surface runoff. The minimum pipe slope shall be such that a minimum of 2 ft/sec velocity is maintained. Where a culvert or pipe is used to replace a stream, the cross-sectional area shall be at least as large as the original stream channel. All stormwater BMPs shall be constructed in accordance with the Borough's "Standard Details". Minimum pipe cover shall conform to the

Manufacturer's recommendations. Stormwater conveyance pipes utilized in BMPs shall have a pipe size of 4-inch diameter or larger.

M. Where open watercourses for stormwater drainage are used the following standards shall apply:

1. Artificial channels shall be of trapezoidal cross section, with the channel width at the bottom at least 10 times the maximum water depth which would be produced by the 100-year design storm and with rough, permeable and flexible sides and bottom. No artificial channel shall be used to replace a natural stream.

2. At all points in the drainage system the velocity shall be less than the erosion threshold of the conveyance material, including at the outlet from the construction area or subdivision site.

N. All stormwater collection and conveyance facilities (pipes, swales, and structures) shall be designed for a 100-year design storm event, unless the runoff would naturally drain overland to a stormwater detention facility, in which case a 25-year design storm event may be used. All drainage facilities shall be designed to contain the energy gradeline for the peak flow rate for the design storm within the structures a minimum of two (2) foot below surface elevation. The hydraulic grade line must be within the pipe. Swales and channels shall provide at least one foot of freeboard above the energy gradeline. Backwater effects of pipes discharging under surcharge conditions shall be included in the calculations.

O. All workmanship and materials shall conform to the Township's Construction Standards. In addition, all workmanship and materials shall conform to the latest edition of PennDOT Form 408 and be supplied by manufacturers of suppliers listed in PennDOT's Bulletin 15.

P. All connections to existing storm sewer pipes shall be made by construction of a suitable junction box (inlet or manhole) to provide access for cleanout. No blind connections shall be permitted.

Q. All pipe outlets shall discharge onto a stone riprap blanket to prevent erosion of soil. Riprap shall be sized considering pipe exit velocities.

R. The discharge of stormwater runoff shall be to a well-defined drainage course, which has a defined bed and bank. If stormwater runoff cannot be discharged to a defined drainage course, documentation of written permission from each downstream property owner shall be provided for all properties between the source of discharge and the defined drainage course.

S. Inlets of each type shown in the Township Construction Standards shall be installed. Inlets at street intersections shall be placed on the tangent and not on the curved portion of the intersection radii.

T. Manhole and inlet castings shall conform to the Pennsylvania Department of Transportation Form 408 and PennDOT Standards for Roadway Construction. Inlet grates shall be bicycle safe. Frames and grates shall be cast iron or structural steel. Concrete frames shall not be permitted.

U. All roof drains shall discharge to an on-lot sump, or to a storm sewer system which is controlled by a detention pond. Outlets from roof drain sumps shall not discharge directly to fill slopes. Outlets shall not discharge directly to the gutter line of any street. All pipes from roof drains shall be a minimum four-inch Schedule 40 ABS, PVC or SDR 26 pipe. Four-inch Schedule 40 PVC or ABS pipe is required for a distance of 10-feet from the foundation of the dwelling. No stormwater drainage system shall be permitted to be constructed through any curbing on any public street. Minimum pipe size for sump stormwater piping is four (4) inches.

V. All bridges and culverts shall be designed to support expected loads and to carry expected flows and shall be designed to meet current standards of the Pennsylvania Department of Transportation. All bridges and culverts shall be subject to all permits required by the Pennsylvania Department of Environmental Protection, Bureau of Dams and Waterways.

X. Disposal of Stormwater from Roof and Driveway Drains:

1 Unless otherwise approved by the Township, no stormwater from roofs or driveway drains shall be discharged to the street surface or curb underdrain.

2 Acceptable methods of disposal include properly designed dry sumps, grassed or other round surfaces with adequate consideration being given to erosion protection, storm sewers, or any other method approved by the Township.

609.2 Unnatural Drainage

All points of concentrated flow discharge shall outlet directly to a well-defined drainage channel, with a defined bed and bank. Whenever construction stops or concentrates the natural flow of storm drainage in such a way as to affect adjoining properties, approval of the Owners shall be obtained in writing. Approval of plans by the Township shall not authorize or sanction drainage affecting adjoining properties.

609.3 Water Courses

Open water courses shall not be permitted within the rights-of-way of streets. The stopping, filling up, confining or other interference with, or changing the course of, drains, ditches, streams and water courses in the Township shall not be permitted unless approval in writing is obtained from the Board of Commissioners. A permit must be obtained from the Department of Environmental Protection (DEP) of the Commonwealth of Pennsylvania for construction or changes in a water course subject to the regulations of the Pennsylvania Department of Environmental Protection.

609.4 Bridges and Culverts

All bridges and culverts shall be designed to support expected loads and to carry expected flows and shall be designed to meet current standards of the Pennsylvania Department of Transportation. All bridges and culverts shall be subject to all permits required by the Pennsylvania Department of Environmental Protection, Bureau of Dams and Waterways.

609.5 Intersections of Private Driveways and Public Streets

Stormwater drainage facilities shall be placed where each private driveway intersects with a public street. The design shall be approved by the Township and shall meet the following requirements:

A. The facility shall be placed to maintain the flow line of the stormwater drainage facility in the public street.

B. Where an apron gutter is to be utilized, said apron gutter shall be designed and constructed in accordance with the Township Construction Standards.

C. Where reinforced concrete, metal or tile pipe is to be used beneath the driveway, said pipe shall not be less than fifteen (15) inches in diameter and shall extend across the full width of the driveway and beyond the driveway for a distance determined by the Township. The pipe shall be installed with flared end sections and shall be designed to support H-15 loading and any other imposed loadings necessary without structurally damaging the system. The installation of the pipe shall be in accordance with the Township Construction Standards.