

*Chapter 8 Part 4*

**FRANKLIN TOWNSHIP**

**STORMWATER MANAGEMENT ORDINANCE**

**ADOPTED: MAY 11, 2005**

## TABLE OF CONTENTS

	<u>Page</u>
I. Storm Sewer Pipe.....	1
A. Pipe Specifications.....	1
B. Pipe Size.....	1
II. Stormwater Inlets.....	1
A. Grates.....	1
B. Large Diameter Pipe.....	1
C. Ladder Bars.....	1
D. Base.....	1
E. Intersections.....	1
III. Stormwater Manholes.....	1
IV. Maximum Distances.....	2
A. Subsurface Drains.....	2
V. Storm Sewer Lateral Connections.....	2
A. Type of Storm Sewer Laterals.....	2
VI. Township Design Requirements for Stormwater Management.....	2
A. General Requirements.....	2
1. Intent.....	2
(a) Maximum Rate.....	2
(b) Management.....	2
(c) Conformity.....	2
2. Certification.....	2
3. Compliance.....	2
4. State Highways.....	2
5. Runoff from Project Site.....	3
6. Watershed.....	3
7. Upstream Runoff.....	3
8. DEP Permit.....	3
B. Stormwater Management Standards.....	3
1. Design Storms.....	3
2. Post Development Peak Flows.....	4
3. Calculation Methods.....	4
(a) Development Sites.....	4
(b) Stormwater Collection Conveyance Facilities.....	4
(i) 100-Year Storm Flood Events.....	4
(c) Pre-Development Conditions.....	5
(d) Post-Development Conditions.....	5
4. Stormwater Management Facilities.....	5

5.	Allowable Release Rates . . . . .	5
6.	Joint Development of Control Systems . . . . .	5
7.	Small Developments. . . . .	5
	(a) Plan . . . . .	5
	(b) Calculations. . . . .	5
	(c) Township Review . . . . .	5
C.	Stormwater Management Plan. . . . .	6
1.	General Requirements. . . . .	6
	(a) Subdivision and Land Development Plan and Permits . . . . .	6
	(b) Beaver County Conservation District. . . . .	6
	(c) Exemptions. . . . .	6
	(i) Gardening . . . . .	6
	(ii) Landscaping. . . . .	6
	(iii) Agriculture. . . . .	6
2.	Stormwater Management Report. . . . .	6
	(a) Name . . . . .	6
	(b) Date . . . . .	6
	(c) Narrative. . . . .	6
	(i) Objectives. . . . .	6
	(ii) Hydrologic Procedures. . . . .	6
	(iii) Pre-Development Conditions. . . . .	7
	(iv) Post-Development Conditions. . . . .	7
	(v) Plan. . . . .	7
	(vi) Facilities . . . . .	7
	(vii) Summary Tables. . . . .	7
	(d) Watershed Maps. . . . .	7
	(e) Hydrologic and Hydraulic Computations. . . . .	7
	(f) Storm Sewer Calculations. . . . .	7
	(g) Operation and Maintenance Program . . . . .	7
	(i) Entity. . . . .	7
	(ii) Type, Frequency, Personnel Costs . . . . .	7
	(iii) Notice of Recorded Plan . . . . .	7
3.	Erosion and Sedimentation Control Plan . . . . .	8
4.	Stormwater Controls. . . . .	8
5.	Easements, Rights-of-Ways, Deed Restrictions. . . . .	8
6.	PennDOT Approvals. . . . .	8
7.	100-Year Floodplain Delineation . . . . .	8
	(a) Township Floodplain Ordinance. . . . .	8
	(b) Delineation . . . . .	8
	(c) Methods of Delineation . . . . .	8
	(i) FEMA FIS . . . . .	8
	(ii) Hydrologic Report . . . . .	9
8.	Municipal Liability Disclaimer. . . . .	9
D.	Design Criteria for Collection/Conveyance facilities. . . . .	9
1.	Post-Development Peak Runoff Rates . . . . .	9

	2.	Outlet and Auxiliary Structures . . . . .	9
	3.	Shared Storage Facilities . . . . .	9
	4.	Detention Facilities . . . . .	9
	5.	Dry and Wet Basins . . . . .	9
	6.	Complete Drainage . . . . .	9
	7.	Outfall Pipes . . . . .	10
	8.	Dams . . . . .	10
	9.	Emergency Spillways . . . . .	10
	10.	Embankments . . . . .	10
	11.	Outside Slopes . . . . .	10
	12.	Crest . . . . .	10
	13.	Topsoil . . . . .	10
	14.	Endwalls . . . . .	10
	15.	Outlet Control Structures . . . . .	10
	16.	Access Easement . . . . .	11
	17.	Sedimentation Facilities . . . . .	11
	18.	Phased Subdivisions . . . . .	11
	19.	As-Build Drawings . . . . .	11
E.		Design Criteria for Collection/Conveyance Facilities . . . . .	11
	1.	General Rule . . . . .	11
	2.	Design . . . . .	11
	3.	Site Grading . . . . .	12
	4.	Proximity to Embankments . . . . .	12
	5.	Damage to Downslope Properties . . . . .	12
F.		Disposal of Stormwater from Roof, Foundation and Drains . . . . .	12
	1.	Individual Lots . . . . .	12
	2.	Roof, Driveway and Foundation Drains . . . . .	12
	3.	Sanitary Sewers . . . . .	12
	4.	Splash Blocks . . . . .	12
	5.	Corrugated Pipe . . . . .	12
	6.	Grading . . . . .	13
G.		Pre-Development Conditions . . . . .	13
	1.	Calculating Pre-Development Peak Flow Rates . . . . .	13
H.		Methods of Calculation of Runoff . . . . .	13
	1.	Complex Method . . . . .	13
	2.	Rational Method . . . . .	13
	3.	Analysis . . . . .	13
I.		Design Standards – Water Carrying Facilities . . . . .	13
	1.	Ten (10) year and 100 Year Storm and Flood Events . . . . .	13
	2.	Manning Equation . . . . .	14
	3.	Township Engineer . . . . .	14
	4.	Offsite Discharge . . . . .	14
	5.	Energy of Flow . . . . .	14
J.		Design Standards – Detention Facilities . . . . .	14
	1.	Rational Method . . . . .	14
	2.	Stage/Discharge Table . . . . .	14

	3.	Storage/Elevation Table .....	14
	4.	Calculations .....	14
	5.	Energy of Flow.....	14
	6.	Drainage .....	14
K.		Stormwater Management Plan Contents .....	14
	1.	Report.....	14
		(a) Name of Project .....	14
		(b) Landowner and Developer.....	15
		(c) Consultant .....	15
		(d) Date .....	15
		(e) Narrative.....	15
		(f) Calculations .....	15
		(g) Maintenance Responsibility.....	15
		(h) Ownership and Maintenance Program .....	15
		(i) Description.....	15
		(ii) Responsible Party.....	15
		(iii) Easements.....	15
		(iv) Roadway.....	15
	2.	Plans .....	15
		(a) Project.....	15
		(b) Developer .....	15
		(c) Consultant.....	15
		(d) Date.....	16
		(e) Location Map .....	16
		(f) Site Features .....	16
		(g) Contours .....	16
		(h) Watershed Boundaries.....	16
		(i) Areas .....	16
		(j) Tract Boundaries .....	16
		(k) Soil Types .....	16
		(l) Flow Path.....	16
	3.	100-Year Flood Delineation .....	16
		(a) Township Ordinance.....	16
		(b) Delineation .....	16
		(c) Methods .....	16
		(i) FEMA.....	16
		(ii) Registered Consultant.....	17
	4.	Township Liability Disclaimer .....	17
	5.	Outlet Structures.....	17
L.		Design Criteria for Stormwater Collection.....	17
M.		Location of Collection Facilities.....	17
N.		Storm Sewer Outfall Channels .....	17
O.		Springs.....	17
P.		Roof and Foundation Drains.....	17
Q.		Erosion and Sedimentation Control .....	18
	1.	Earth Disturbance Activity .....	18

	2.	NPDES Permit . . . . .	18
	3.	Necessary Permits . . . . .	18
	4.	Plans and Permits . . . . .	18
R.		Prohibited Discharges . . . . .	18
	1.	General Rule . . . . .	18
	2.	Exceptions . . . . .	18
	3.	Pollution . . . . .	19
	4.	Cessation . . . . .	19
	5.	Legal . . . . .	19
S.		Prohibited Connections . . . . .	19
T.		Post Construction Runoff Control Requirements . . . . .	20
	1.	Township Approval Required . . . . .	20
	2.	Test Management Practices . . . . .	20
	3.	Existing Uses . . . . .	20
	4.	BMPs . . . . .	20
	5.	Permits . . . . .	21
U.		Enforcement . . . . .	21
	1.	Notice . . . . .	21
	2.	Penalties . . . . .	21
	3.	Suspension of Work . . . . .	21
	4.	Injunction . . . . .	21

## FRANKLIN TOWNSHIP

### STORMWATER MANAGEMENT ORDINANCE

#### I. Storm Sewer Pipe

A. Pipe shall conform to pipe specified in PennDOT Form 408 latest edition and approved by the Township Engineer.

B. A minimum fifteen (15) inch diameter pipe shall be installed for all storm sewers to be maintained by the Township.

II. Stormwater Inlets. Stormwater inlets located in the street paving shall conform to the construction standard in PennDOT Publication No. 72, Standards for Roadway Construction, Drawing No. RC-34, Type "M" Inlet Detail, when required at low points. Stormwater inlets shall be placed at all low points, at street intersections and at points along both sides of the street to ensure adequate drainage, but in no case shall the distance between stormwater inlets along the street exceed three hundred (300) feet unless approved by the Engineer. Stormwater inlets at street intersections shall be placed on the tangent and not on the curved portion. Additional inlets shall be constructed in areas as may be directed by the Engineer during construction to provide for property control of surface water.

A. Grates and frames shall be structural street, bicycle safe.

B. Stormwater inlets shall be modified to accommodate larger diameter pipe as per Drawings in PennDOT Publication 72, Drawing No. RC-34.

C. Ladder Bars. Plastic ladder bars shall be installed in all inlets exceeding a depth of five (5) feet, and shall be in accordance with PennDOT Publication No. 72, Drawing No. RC-34.

D. A poured concrete invert shall be formed in the base of all inlets to provide full drainage out of and through the structure.

E. Stormwater inlets located at street intersections shall be located at the end of radius on the tangent.

III. Stormwater Manholes. All manholes shall be pre-cast concrete constructed in accordance with the Construction Standards in Penn Dot Publication No. 72, Drawing No. RC-39. Manholes shall be installed at all changes in alignment and grades of storm sewers as may be directed by the Engineer to provide for proper maintenance. If maintenance is not a problem, pipe may be installed on a curve provided the deflection angle of the pipe joint does not exceed the manufacturer's specifications. Inlets may be substituted for manholes where approved by the Engineer.

IV. Maximum Distance Between Structures. The maximum distance between structures (inlets or manholes) shall be three hundred (300) feet unless otherwise approved by the Engineer.

A. Subsurface Drains. Subsurface drains shall be installed in accordance with PennDOT's Publication No. 72, Drawing No. RC-30.

V. Storm Sewer Lateral Connection. All storm sewer lateral connections shall be made in accordance with application law. All storm sewer lateral connection shall be located at manholes, inlets or at locations approved by the Township Engineer or his designated representative.

A. All storm sewer laterals or runs designed to collect and/or connect to individual residential dwelling roof drains shall be smooth lined HDPT (high Density Polyethylene Pipe).

VI. Township Design Requirements for Stormwater Management.

A. General Requirements:

1. The design criteria are intended to elaborate on Township Code such as Subchapters 180.38 and 180.12.c(28) and to compliment Stormwater Management Act P. L. 864, No. 167. Said act requires that actions be taken:

(a) assure that the maximum rate of stormwater runoff is no greater after development than prior to development activities; or

(b) to manage the quantity, velocity and direction of resulting storm water runoff in a manner which otherwise adequately protects health and property from possible injury.

(c) Stormwater management design and construction will conform in general with the applicable recognized national and state acts, manuals, and references such as the PA Stormwater Management Act and PennDOT published forms.

2. All stormwater management plans shall be designed and certified by individuals registered in the Commonwealth of Pennsylvania and qualified to perform such duties.

3. Where applicable stormwater management facilities shall comply with the requirements of Chapter 105 (Dam Safety and Waterway Management) of Title 25, Environmental Protection of the Pennsylvania Department of Environmental Protection (DEP).

4. Stormwater management facilities which involve a state highway shall be subject to the approval of the Pennsylvania Department of Transportation.



5. Stormwater runoff from a project site shall flow directly into a natural watercourse or into an existing storm sewer system, or onto adjacent properties in a manner similar to the runoff characteristics of the pre-development flow.

6. Stormwater runoff shall not be transferred from one watershed to another unless the watersheds are sub-areas of a larger watershed that are tributary to a common point of interest within or near the perimeter of the property and documentation is provided that peak flow rates are not increased following development and that there will be no detrimental impact in downstream areas.

7. All stormwater runoff flowing over the project site shall be considered in the design of the stormwater management facilities.

8. For any stormwater management facility requiring a permit to be issued by DEP, said permit along with supporting report and plans used to secure the permit shall also be submitted.

B. Stormwater Management Standards

1. Design Storms. Stormwater management facilities on all development sites shall control the peak stormwater discharge for the 2, 10 and 25-year design storms. For developments larger than three (3) acres, the SCS 24-hour, Type II Rainfall Distribution shall be used for analyzing stormwater runoff in pre-and post-development conditions, as well as for designing runoff control facilities (except storm runoff collection and conveyance facilities). For development sites less than three (3) acres, the Rational Method may be utilized to determine peak flows and the Modified Rational Method used for design and routing of runoff control facilities. The rainfall data to be used for SCS TR-55 computations in Franklin Township are:

<u>Design Storm Return Period</u>	<u>24-Hour Rainfall Depth in Inches</u>
2-year	2.6
10-year	3.8
25-year	4.3

(For additional information or data on other return periods, consult the "Rainfall Duration Frequency Tables for Pennsylvania", produced by Pennsylvania DEP, Office of Resource Management, Bureau of Dams and Waterways, Harrisburg, February 1983, or in its most recent update.)

If the Rational Method is used, the Region No. 1, Pennsylvania Rainfall Intensity - Duration - Frequency Chart shown in the Pennsylvania Department of

Transportation, Design Manual, Part 2, July 1986, shall be used to determine the rainfall intensity in inches per hour. See chart in the Appendix A.

2. Where, in the judgment of the Engineer/Township, the additional volume of stormwater runoff associated with a proposed development site will have a detrimental impact on downstream properties, and/or an existing downstream flood problem is documented, post-development peak flows may be required to be reduced to less than pre-development peak flows. Under these circumstances, acceptable peak flow rates will be determined at the discretion of the Engineer/Township for a given storm event(s) based on existing downstream restrictions. Additional hydrologic studies or analyses may also be required.

3. Calculation Methods.

(a) Development Sites. For the purposes of computing peak flow rates, runoff hydrographs and storage requirements for development sites, either the SCS Soil Cover Complex method as presented in the most recent version of Technical Release 55 (TR-55) SHALL BE USED, OR THE Rational Method as specified in PennDOT Publication No. 13, Chapter 10, Drainage Design and Related Procedures. When the Rational Method is used, the technical data in Appendix A shall be used to determine rainfall intensities, time of concentration, and runoff coefficients. The use of alternative hydrologic methodologies may be approved by the Engineer/Township if sufficient justification and documentation of their application is provided.

(b) Stormwater Collection Conveyance Facilities. For the purpose of designing storm sewers, open swales and other stormwater runoff collection and conveyance facilities the Rational Method shall be utilized, rainfall intensities for design should be obtained from the Pennsylvania Department of Transportation rainfall charts in Appendix A. The design storm for storm sewers and swales that will discharge to detention facilities is the 100-year storm. The 10-year design storm for storm systems discharging to detention facilities shall be acceptable provided it can be documented that runoff exceeding the 10-year capacity of the storm system during a 100-year storm event will ultimately discharge to the detention facility by alternative means, without endangering public safety or damaging private property. The design storm for all other onsite storm sewers or swales is the 10-year storm event providing that larger storm events will not impact private property. Calculation sheets must be submitted. For storm inlets with multiple inflow pipes and/or bends where energy losses will be significant, inlet control conditions at the entrance to the outflow pipe shall be a design consideration to determine capacity.

(i) All stormwater collection and/or conveyance systems routing water through or around the development site shall be designed for the 100-year storm event, unless it can be documented that said facilities will not create a hazard. A drainage easement shall be provided to contain and convey the 100-year flood event through the project site, beginning at the furthest upstream property line of the proposed development in the watersheds.

(c) Pre-Development Conditions. The cover type for all sites will be considered to be woods with light under brush in good hydrologic conditions at the time of proposed development. All hydrologic parameters used to calculate peak flow rates shall use the appropriate coefficients pertaining to these conditions. If the rational method is used, the Runoff C Factor for Pre-Development Conditions shall be 0.30 or less if existing conditions warrant a lower number.

(d) Post-Development Conditions. The hydrologic parameters used to develop peak flow rates shall be reflective of anticipated soil runoff characteristics following grading and development of the site.

4. Stormwater Management Facilities. Peak runoff rates for all areas within or impacting the project site shall be determined and considered in the design of stormwater management facilities. These calculations shall be based on land use, time of concentration and other standard hydrologic parameters.

5. Allowable Release Rates. The allowable release rates from stormwater management facilities, or a development site in general, shall be less than or equal to the pre-development peak runoff rates generated for the site. All stormwater runoff discharged from the site that is not controlled by a stormwater management facility shall be accounted for in the determination of the allowable release rates for the full range of storm events.

6. Joint Development of Control Systems. Stormwater control systems may be planned and constructed in coordination by two (2) or more development so long as they are in compliance with this Article.

7. Small Developments. A small development shall be defined as a site that creates less than 5,000 square feet of impervious surface, and shall be exempt from the preparation of detailed stormwater management plan. However, such developments must still provide safe management of stormwater runoff in accordance with the performance standards of this Article and as approved by the Township.

(a) 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.

(b) Runoff calculations, as required at the discretion of the Township, shall be prepared.

(c) The township shall review and approve the proposed provisions for stormwater management for a small development.

C. Stormwater Management Plan.

1. General Requirements.

(a) No final subdivision or land development plan shall be approved, no permit authorizing construction issued, or any earthmoving or land disturbance activity initiated until the final stormwater management plan for the development site is approved in accordance with the provisions of this Article.

(b) A letter from the Beaver County Conservation District (BCCD) approving the Erosion and Sedimentation Control Plan must also be received prior to the initiation of any grading.

(c) Exemptions. The following activities are specifically exempt from this Article:

(i) Use of land for gardening primarily for home consumption.

(ii) Use of land for construction of landscaping improvements, provided such improvements do not significantly alter the runoff characteristics for the land.

(iii) Agricultural use of lands when operated in accordance with a farm conservation plan approved by the local soil conservation district, or when it is determined by the local soil conservation district that such use will not cause excessive erosion and sedimentation.

2. Stormwater Management Report. A written and bound report shall be submitted including, but not necessarily limited to the following information.

(a) Proposed name or identifying title of project, the name and address of the landowner and developer of the project site, as well as the name, address, and phone number of consultant who prepared the stormwater management plan.

(b) Stormwater management report date and date of the latest revision to the report.

(c) Typewritten narrative report that should include sections describing the following items:

(i) Stormwater management plan objectives.

(ii) Hydrologic procedures used to develop plan.

conditions. (iii) Descriptions of pre-development watershed

conditions. (iv) Descriptions of post-development watershed

handle post-development runoff. (v) Descriptions of proposed plan and methods to

proposed outlet control (vi) Descriptions of proposed detention facility(s) and

(vii) Summary tables for pre-development and post-development peak flows, detention facility(s) allowable release rates, stage-storage-outflow characteristics and storm-routing results.

(d) Watershed maps delineating pre-development and post-development watershed boundaries, as well as the flow path and segments used to determine time of concentrations for each watershed.

(e) All hydrologic and hydraulic computations associated with the stormwater management plan, appended and referenced in the narrative.

(f) Storm sewer calculations and delineating all sub-areas used to for storm sewer system.

(g) Operation and Maintenance Program. The report shall contain a proposed maintenance plan for all stormwater control facilities, in accordance with the following:

(i) Identify the proposed ownership entity (e.g. Township, property owner, homeowner's association, other management entity.)

(ii) A maintenance program for all facilities, outlining the type of maintenance activities, probable frequencies, personnel and equipment requirements, and estimated annual maintenance costs.

(iii) A note shall be placed on the recorded plan: "As per the approved Stormwater Management Plan, the Township shall have right of access to the onsite detention facility for the right of maintenance in the event the owner, assigns or heirs do not adequately maintain the facility. The owner, assigns or heirs shall reimburse the Township for all costs associated with said maintenance. The aforementioned rights granted the Township in no way diminish the responsibility of the owner, assigns or heirs of said maintenance, and no

liability will be assumed by the Township associated with the required access for maintenance purposes."

3. A copy of the proposed Erosion and Sedimentation Control narrative and plans shall be submitted to the Township. The narrative and accompanying plans shall also be submitted to the Beaver Conservation District for review and approval.

4. Stormwater Controls. All proposed stormwater runoff control measures must be shown on the development site plans, including methods for collecting, conveying and storing stormwater runoff on-site. The preliminary plan should provide information on the general type, location, sizing, etc. of all proposed facilities and their relationship to the existing watershed drainage system.

5. Easements, Rights-of-Ways, Deed Restrictions. All existing and proposed easements and rights-of-way for drainage and/or access to stormwater control facilities shall be shown, and the proposed owner identified. Drainage easements shall be delineated and recorded for all permanent facilities, swales and storm sewers to identify their permanency and provide maintenance access. Show any areas subject to special deed restrictions relative to or affecting stormwater management on the development site.

6. Permits/Approvals. A list of any permits/approvals relative to stormwater management that will be required from other governmental agencies (e.g. an obstructions permit from Pennsylvania DEP) and anticipated dates of submission/receipt should be included with the plan submission. Copies of applications may be requested by the Township. All stormwater or drainage-related computations or reports associated with these permit applications shall be submitted to the Township for reference and for review.

7. 100-Year Floodplain Delineation.

(a) Stormwater management facilities located with or affecting the floodplain of any watercourse shall also be subject to the requirements of Township Code "Flood Plains", as amended from time to time, which regulates construction and development within areas of the Township subject to flooding.

(b) The 100-year floodplain must be delineated on all plans for all watercourses which have a watershed area of 150 acres or greater. Where, in the judgment of the Township, private property or public facilities may be adversely affected by the proposed activities, the 100-year floodplain shall be established for any watercourse.

(c) The 100-year floodplain shall be delineated by one of the following methods:

(i) The FIS study by the Federal Emergency Management Agency (FEMA)

(ii) A hydrologic report prepared by an individual registered in the Commonwealth of Pennsylvania to perform such duties. Calculations and channel hydraulic characteristics used to determine floodplain limits be provided.

8. Municipal Liability Disclaimer. Approval of a stormwater management plan by the Township shall not be construed as an indication that said plan complies with the requirements, laws, or standards of any agency of the Commonwealth which may or may not govern said activity.

D. Design Criteria for Stormwater Detention Facilities. The following criteria shall be utilized for the design of proposed detention facilities:

1. Detention facility(s) shall be designated such that the post-development peak runoff rates from the developed site are controlled at levels consistent with the allowable release rates determined for the 2, 10 and 25-year design storms.

2. All detention facilities shall be equipped with outlet structures to provide discharge control for the 2, 10 and 25-year storm events. Provisions shall also be made for auxiliary structures that are capable of passing the post-development 100-year storm peak runoff flows, presuming blockage of all lower flow controls, without damaging the facilities.

3. Shared storage facilities, which provide stormwater detention for more than one development site, will be encouraged. Such facilities shall meet the design criteria contained in this section. Runoff from the development sites involved shall be conveyed to the facility in a manner so as to void adverse impacts, such as flooding or erosion, to channels and properties located between the development site and the shared storage facilities.

4. Where detention facilities are used, the design of multiple-use facilities, such as ball fields or similar recreational uses, are encouraged wherever feasible.

5. As a general rule, detention facilities will be designed as dry basins, although wet facilities will be considered in specific situations where they can be shown to represent a significant amenity to the development and/or the Township. Facilities should be designed to induce water depths as shallow as possible.

6. Except in approved wet basins, stormwater detention basins will be designed to drain completely. A low-flow channel shall be installed to facilitate the conveyance of storm sewer flows to the main outlet during frequent storm events. All interior portions of the basin will slope toward the outlet or low flow channel at a minimum slope of one percent (1%). All impoundment areas shall be adequately under drained to prevent long term ponding of water.

7. Detention facility outfall pipes shall have an anti-seepage collar installed along the profile of the pipe. Anti-seepage collar detail shall be approved by the Township Engineer.
8. All detention facilities designed with an earthen dam shall provide a minimum of one (1) foot of freeboard between the peak emergency spillway design flow elevation and the top of the embankment.
9. Where emergency spillways cannot be excavated into the existing undisturbed ground, they shall be designed and constructed with an approved Geotextile Fabric Lining under the riprap. All riprap spillways shall be provided with a concrete cutoff wall at the spillway design crest elevation.
10. All embankments shall be designed according to sound engineering practice for such structures and must meet the approval of the Township. Facilities with a design water depth in excess of ten (10) feet may require a supporting report from a geotechnical engineer. In general, impoundment areas shall be designed to be contained within areas excavated within existing ground, rather than fill whenever possible. Impoundment areas designed within fill shall require a supporting report from a geotechnical engineer addressing potential infiltration concerns and recommended solutions.
11. The outside slopes of the embankment shall not exceed four (4) horizontal to one (1) vertical. The interior slopes of the structure within the pool area shall not exceed a slope of three (3) horizontal to one (1) vertical. Design of facilities with flatter slopes for aesthetics and as a maintenance consideration are encouraged. Crest of the embankment shall have a minimum width of not less than 10.00 feet.
12. The embankment shall be level along the crest and along the longitudinal center line. In the event that the embankment would be over topped by stormwater runoff the flow over the crest and down the downstream slope would be sheet flow rather than being concentrated and eroding away the embankment. No trees shall be planted on the embankment. Should any type of protective fence placed around the impoundment, the fence shall not be placed on the embankment or across the primary or emergency spillways.
13. Except where special erosion protection measures are provided, all disturbed areas will be graded evenly, topped with four (4) inches of topsoil, fertilized, seeded and mulched by methods consistent with PennDOT Publication 408.
14. All outfalls to and from the facility shall be provided with end walls and erosion control measures as per PennDOT Publication No. 72, Drawing No. RC-31 and Drawing No. RC-70.
15. Outlet control structures shall be constructed of reinforced concrete (cast-in-place or pre-cast) and shall be recessed into the embankment wherever practical. Trash



racks for low-flow control openings should be designed to provide 4-10 times the area of the low-flow opening, and facilitate debris removal and maintenance.

16. An access easement with a minimum width of twenty (20) feet to all stormwater detention facilities shall be provided to the Township. This access shall be improved with a cartway having a minimum width of ten (10) feet and a maximum grade of fifteen (15%) percent. The access easement shall include a statement on the recorded plan from the owner/operator of the facility granting access to the Township.

17. Detention facilities that are designed as sedimentation facilities during construction operations shall be desilted and regarded to original design dimensions and have all temporary sedimentation control devices removed prior to their conversion to detention facilities. Low-flow channels and under drains should be installed with the conversion of the facility.

18. In subdivisions or projects that are constructed in phases with individual detention facilities employed as sedimentation basins, said facilities shall be converted to their ultimate use as stormwater management facilities as soon as their tributary areas are stabilized per BCCD standards. This conversion may be requested by the Township, with supportive corroboration from the Beaver County Conservation District, and shall be implemented and the approved Erosion and Sedimentation Control Plan.

19. An as-built drawing shall be required for each stormwater detention facility constructed. The drawing shall represent certification of the volume of the facility and the depth vs. storage relationship, as well as the elevational relationships and dimensions of flow controls, including emergency spillways as appropriate. These relationships shall be shown on the drawing in table form or in report form. In the event that these relationships vary from the computations provided in the approved plan, revised storm routings may be required at the discretion of the Township. The drawing shall be stamped by a Registered Professional Engineer or Surveyor and submitted to the Township within sixty (60) days of the completion of the facility. No facility will be approved until this requirement has been fulfilled.

E. Design Criteria for Collection/Conveyance Facilities.

1. As a general rule, no stormwater may be discharged to unprotected areas such as hillsides or fills without special erosion and/or energy dissipation controls being installed. Stormwater shall either be conveyed to the nearest established stream channel as approved by the Township, or provided with an approved energy dissipation device. Conveyance shall be by pipe or erosion protected ditch.

2. The design for culverts, pipes, and other stormwater conveyance structures shall be consistent with the design of the other stormwater management facilities. In

the event that these structures are to be permitted by Pennsylvania DEP or PennDOT, the design criteria required by the state agency shall be utilized.

3. All sites shall be graded to provide drainage away from and around structures to prevent potential flooding damage.

4. Collection/conveyance facilities should not be installed parallel to or close to the top or bottom of major embankments to avoid the possibility of embankment failure, with the exception of those facilities specifically designed to prohibit stormwater runoff from eroding slopes or preventing runoff from damaging downstream properties.

5. Stormwater shall be collected and conveyed from upslope areas in a manner designed to prevent damage to downslope property(s) consistent with appropriate engineering standards. This system shall be identified by permanent easements with the party responsible for maintenance identified.

F. Disposal of Stormwater from Roof, foundation and Driveway Drains.

1. Individual lots that are required to provide for on lot stormwater management facilities per the stormwater management plan shall be identified on the recorded plan(s) for the subdivision.

2. No roof, driveway or foundation drains shall be discharged onto the right-of-way of any street or the pavement of any street. They may be connected to the street stormwater collection system of pipes or inlets. All residential dwellings not connected to a private or public stormwater collection and management system shall install a stormwater containment and disposal system at the direction of the Township. Other acceptable methods of disposal include underground tank, infiltration devices, storm sewers, large diameter pipe chamber systems and grassed or other ground surfaces provided adequate consideration is given to erosion protection, or any other method approved by the Township.

3. At no time will any roof, driveway or foundation drains be allowed to be connected to the sanitary sewer line.

4. The use of splash blocks is permitted. The location of the splash block discharge must be a minimum of five (5) feet from foundations and five (5) feet from the property line. Exceptions to this method may be permitted in the instance of townhouses or similar structures where common property lines exist. No stormwater runoff may be directed in such a manner as to disturb or damage neighboring properties.

5. Houses located on the low side of the road can use a solid pipe or corrugated pipe (minimum of 4" diameter) to the rear of the lot to a point of discharge onto a rock apron (size and dimensions to be specified) not less than ten (10) feet from the adjacent

neighboring property line provided said discharge has been accounted for within the approved stormwater management plan and the discharge does not impact downstream property owners.

6. Lots shall be graded in such a manner as to divert stormwater runoff away from adjacent property and structures consistent with appropriate engineering standards.

G. Pre-Development Conditions.

1. For the purposes of calculating pre-development peak flow rates, all sites will be considered to be woods with light underbrush in good hydrologic condition at the time of proposed development.

H. Methods of Calculations of Runoff.

1. The USDA Soil Conservation Service Soil-Cover-Complex Method as set forth in the latest edition of Urban Hydrology for Small Watersheds, Technical Release No. 55 as published by SDCS; or the Rational Method when approved by the Engineer for small sites.

2. The Rational Method of  $Q=CIA$  where  $Q$  is the peak discharge of the watershed in cubic feet per second,  $C$  is the coefficient of runoff.  $I$  is the intensity of rainfall in inches per hour, and  $A$  is the area of watershed in acres.

3. Runoff calculations shall include a hydrologic and hydraulic analysis indicating volume and velocities of flow and the grades, sizes, and capacities of water carrying structures, sediments basins, retention and detention structures and sufficient design information to construct such facilities. Runoff calculations shall also indicate both pre-development and post-development rates for peak discharge of stormwater runoff from the project site.

I. Design Standards – Water Carrying Facilities.

1. All storm sewer pipes, culverts and bridges (excluding detention and detention basin outfall structures) conveying water originating only from within the boundaries of the project site shall be designed for a ten (10) year storm event. All storm sewer pipes, culverts and bridges (excluding detention and retention basin outfall structures) conveying water originating from off-site shall be designed for one hundred (100) year storm event, unless it can be demonstrated that said facilities will not create a hazard. Natural drainage easement shall be provided to contain and convey the 100-year frequency flood throughout the project site. Easements shall begin at the furthest upstream property line of the proposed development in a watershed.

2. The capacities of storm sewers and open swales or channels shall be computed from the Manning Equation.

3. Additional engineering analysis may be required by the Township Engineer.

4. Discharging stormwater off the property to an existing facility will require supporting calculations to prove the adequacy of the downstream facilities. The developer, subject to Township approval, may elect to upgrade downstream facilities to accommodate the generated runoff.

5. All storm sewer pipes, culverts, bridges, outlet structures and emergency spillways shall include a satisfactory means of dissipating the energy of flow at its outlet to assure conveyance of flow without endangering the safety and integrity of the downstream drainage area.

J. Design Standards – Detention Facilities.

1. If the Rational Method is used, the design storm duration will be the one which requires the maximum storage. Such a storm will be determined by analyzing various rainfall durations to determine the maximum storage required.

2. Provide a stage/discharge table for the detention facilities.

3. Provide a storage/elevation table for the detention facilities.

4. Provide calculations, planimeter readings or other data to document storage/elevation table.

5. All outlet structures and emergency spillways shall include a satisfactory means of dissipating the energy of flow at its outlet to assure conveyance of flow without endangering the safety and integrity of the basin and the downstream drainage area.

6. To ensure that the detention system will not become a health hazard or public nuisance, means shall be provided to drain the pond completely.

K. Stormwater Management Plan Contents. The following items shall be included as part of the stormwater management plan:

1. Written and bound report including the following information:

(a) Proposed name or identifying title of project.

(b) Name and address of the landowner and developer of the project site.

(c) Name, address and phone number of the consultant who prepared the stormwater management plan.

(d) Stormwater management report date and date of the latest revision to the report.

(e) Typewritten narrative outlining the objectives of the proposed stormwater management plan.

(f) Stormwater runoff calculations for both pre-development and post-development conditions.

(g) Maintenance responsibility for the detention system shall remain with the developer and his successor in title. A legal agreement will be recorded with the Final Plat to that effect.

(h) An ownership and maintenance program that clearly sets forth the ownership and maintenance responsibility of all temporary and permanent stormwater management facilities and erosion and sedimentation control facilities, including:

(i) Description of temporary and permanent maintenance requirements.

(ii) Identification of a responsible individual, corporation, association or other entity for ownership and maintenance of both temporary and permanent stormwater management and erosion sedimentation control facilities.

(iii) Establishment of suitable easements for access to all facilities.

(iv) Establishment of a graded roadway from public highway to the detention facilities suitable for maintenance equipment access.

2. Plans showing the following information:

(a) Proposed name or identifying title of project.

(b) Name of the landowner and developer of the project site.

(c) Name and address of consultant who prepared the stormwater management plan.

- (d) Plan date and date of the latest revision to the plan.
- (e) Location Map – provide a key map showing the development site location at a minimum scale of 2,000 feet to the inch.
- (f) The names, locations and dimensions of streets, buildings, water courses, bodies of water, swales, drainage facilities, tree masses, significant trees, wetlands and other existing or proposed features on the site or which will be affected by runoff from the development.
- (g) Existing and final contours with sufficient detail to show all stormwater surface drainage. The location of the benchmark and the datum used shall also be indicated.
- (h) The boundaries of the watershed(s) and (where applicable) sub-basin(s) as they are located on the development site and identify name(s) and number(s).
- (j) Tract boundaries showing bearings.
- (k) Soil types and boundaries as designated by the USDA SCS Soil Survey of Beaver County.
- (l) Show the location of the flow path utilized to estimate the pre-development and post development time of concentration and identify each flow segment on the topographic plan.

3. 100-Year Floodplain Delineation.

(a) Stormwater management facilities located within or affecting the floodplain of any watercourse shall also be subject to the requirements of Township Code “Flood Plains”, as amended from time to time, which regulates construction and development within areas of the Township subject to flooding.

(b) The 100-year floodplain must be delineated on all plans for all watercourses which have a watershed area of 150 acres or greater. Where, in the judgment of the Township Engineer, private property or public facilities may be adversely affected by the proposed activity, the 100-year floodplain shall be established for any watercourse.

(c) The 100-year floodplain shall be delineated by one of the following methods:

(i) A hydrologic report prepared by the Federal Emergency Management Agency (FEMA).

(ii) A hydrologic report prepared by an individual registered in the Commonwealth of Pennsylvania to perform such duties.

4. Township Liability Disclaimer. Approval of a Stormwater Management Plan by the Township shall not be construed as an indication that said plan complies with the requirements, laws or standards of any agency of the Commonwealth which may or may not govern said activity.

5. Outlet Structures in Detention Basins. Outlet structures in detention basins shall be constructed with reinforced concrete.

L. Design Criteria for Stormwater Collection/Conveyance Facilities. For the purpose of designing storm sewers, open swales and other stormwater runoff collection and conveyance facilities, the Rational Method shall be applied. Rainfall intensities for design should be obtained from the Pennsylvania Department of Transportation Rainfall Charts. The design storm for storm sewers is ten (10) years. The design storm for storm sewer outfall channels is ten (10) years. Calculation sheets must be submitted, except as follows: where it is required to collect and convey the 100-year event to the detention facilities, the storm sewers shall be sized as required to accommodate such an event without overflowing.

M. Location of Collection/Conveyance Facilities. Collection/Conveyance facilities should not be installed parallel and close to the top or bottom of a major embankment to avoid the possibility of damage to the facility due to embankment failure or of damage to the embankment due to facility failure.

N. Storm Sewer Outfall Channels and Drainage Swales. Permissible velocities of various channel linings (vegetation, rock lined, rip-rap, gabions shall be in accordance with Chapter 4 of the Erosion and Sediment pollution Control Program Manual published by the Pennsylvania Department of Environmental Protection. Storm sewer outfall channels shall be trapezoidal or triangular shape with side slopes not to exceed two (2) horizontal: one (1) vertical (Ratio). Storm sewer outfall channels shall be designed in accordance with Chapter 13 of the Pennsylvania Department of Transportation Design Manual Part 2 – Publication 13, Section 13.3 titled “Watercourse Erosion Protection”. Where drainage swales or open channels are used, they shall be suitably designed for ease of maintenance.

O. Springs. Any springs encountered during construction shall be piped and connected to the storm sewer system or extended to a natural watercourse as may be approved by the Engineer.

P. Roof and Foundation Drains. No roof or foundation drains shall be discharged on the right-of-way of any street or the pavement of any street. They may be connected to the street stormwater collection system of pipes or inlets. All residential dwellings

not connected to a private or public stormwater collection and management system shall install a stormwater containment and disposal system.

Q. Erosion and Sediment Control. Measures shall be designed and used during construction as per approved plans from the Beaver County Conservation District and in accordance with the details presented in the Pennsylvania DEP Chapter 102, Revised Erosion and Sedimentation Control Program Manual. The following DEP Construction Details shall be included and made a part of the Construction Plans.

1. Any earth disturbance activity of 5,000 square feet or more shall comply with the regulations issued by the Pennsylvania Department of Environmental Protection (DEP) requiring the preparation and approval of an erosion and sediment control plan, 25 Pa. Code § 102.4(b).

2. A DEP NPDES Construction Activities Permit is required for any earth disturbance of one (1) acre or more with a point source discharge to surface waters or the Township's storm sewer system, or five (5) 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.

3. Evidence of any necessary permit(s) for regulated earth disturbance activities from the appropriate DEP regional office or County conservation District must be provided to the Township. The issuance of a NPDES Construction Permit, or permit coverage under the statewide general permit (PAG-2).

4. 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.

R. Prohibited Discharges.

1. No person in the Township shall allow, or cause to allow, stormwater discharges into the township's separate storm sewer system which are not composed entirely of stormwater, except as provided in Subsection S(2) below and discharges allowed under a state or federal permit.

2. Discharges which may be allowed, based on a finding of the Township that the discharge(s) do not significantly contribute to pollution of surface waters of the Commonwealth, are:

- (a) Discharges from fire-fighting activities;
- (b) Potable water sources including dechlorinated water line and fire hydrant flushings;



- (c) Irrigation drainage;
- (d) Routine external building washdown (which does not use detergents or other compounds);
- (e) Air conditioning condensate;
- (f) Water from individual residential car washing;
- (g) Springs;
- (h) Water from crawl space pumps;
- (i) Uncontaminated water from foundation or from footing drains;
- (j) Flows from riparian habitats and wetlands;
- (k) Lawn watering;
- (l) Pavement washwaters where spills or leaks of toxic or hazardous materials have not occurred (unless all spill material has been removed) and where detergents are not used;
- (m) Dechlorinated swimming pools discharges; and
- (n) Uncontaminated groundwater.

3. In the event that the Township determines that any of the discharges identified in Subsection S(2) above significantly contribute to pollution of waters of the Commonwealth, or is so notified by DEP, the Township will notify the responsible person to cease the discharge.

4. Upon notice provided by the Township under Subsection S(3) hereof, the discharger will have a reasonable time, as determined by the Township, to cease the discharge consistent with the degree of pollution caused by the discharge.

5. Nothing in this section shall affect a discharge's responsibilities under state law.

S. Prohibited Connections. The following connections are prohibited:

1. Any drain or conveyances, whether on the surface or subsurface, which allows any non-stormwater discharge including sewage, process wastewater, and waste

water, to enter the separate storm sewer system, and any connection to the storm drain system from indoor drains and sinks.

2. Any drain or conveyance connected from a commercial or industrial land use to the separate storm sewer system which has not been documented in plans, maps, or equivalent records and approved by the Township.

T. Post-construction Runoff Control Requirements.

1. 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.

2. DEP has regulations that require townships 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.

3. 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").

4. 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:

(a) Infiltration: replication of pre-construction stormwater infiltration conditions;

(b) Treatment: use of water quality treatment BMPs to ensure filtering out of chemical and physical pollutants from the stormwater runoff; and

(c) Streambank 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).

5. Evidence of any necessary Permit(s) for regulated earth disturbance activities from the appropriate DEP regional office or County Conservation District must be provided to the Township. The issuance of a NPDES Construction Permit, or Permit coverage under the statewide general permit (PAG-2).

U. 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 stormwater 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 with the time specified shall also subject such person to the penalty provisions of this chapter. 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.

3. 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:


- (a) Noncompliance with or failure to implement any provision of the permit;
- (b) A violation of any provision of this chapter; or

(c) 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.

4. 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 Chapter. 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.

ATTEST:

FRANKLIN TOWNSHIP BOARD OF  
SUPERVISORS

  
Sandra S. Greer  
Sandra S. Greer, Secretary

By: James Norton  
James Norton, Chairman

By: Gary McKeough  
Gary McKeough

By: Michael Boots  
Michael Boots