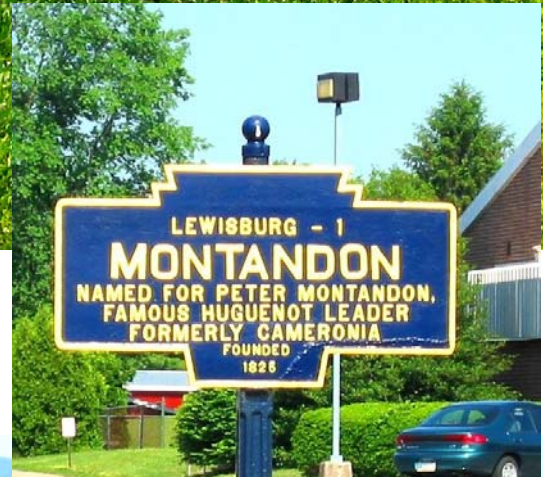


SUBDIVISION AND LAND DEVELOPMENT ORDINANCE

For

**West Chillisquaque Township
Northumberland County, Pennsylvania**



Adopted - December 28, 1992

Amended:

October 4, 1999

April 14, 2008

September 8, 2008

October 12, 2009

SUBDIVISION AND LAND DEVELOPMENT ORDINANCE

for

West Chillisquaque Township Northumberland County, Pennsylvania

prepared by a committee comprised of:

West Chillisquaque Township Planning Commission
West Chillisquaque Township Zoning Hearing Board
West Chillisquaque Township Supervisors
Robert E. Benion, Township Solicitor
Cummings & Smith, Inc., Consulting Engineers
Douglas W. Hovey, Project Planner

OFFICIAL ORDINANCE

Adopted - December 28, 1992

Amended:
October 4, 1999
April 14, 2008
September 8, 2008
October 12, 2009

Cummings & Smith, Inc., Consulting Engineers
8163 U.S. Highway 15
Montgomery, PA 17752

EXECUTIVE SUMMARY

Definition of Subdivision

"Subdivision," the division or redivision of a lot, tract, or parcel of land by any means into two or more lots, tracts, parcels or other divisions of land including changes in existing lot lines for the purpose, whether immediate or future, of lease, partition by the court for distribution to heirs or devisees, transfer of ownership or building development: Provided, however, That the subdivision by lease of land for agricultural purposes into parcels of more than ten acres, not involving any new streets or easement of access or any residential dwelling, shall be exempted.

Definition of Land Development

"Land Development," any of the following activities:

The improvement of one lot or two or more contiguous lots, tracts or parcels of land for any purpose involving:

- (i) 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
- (ii) the division or allocation of land or space, whether initially or cumulatively, 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.

A subdivision of land.

Exception from Subdivision Definition

Where small portions of existing lots, tracts, or parcels of land are being acquired by governmental units or public utilities for use in road improvements, utility lines, or utility structures, these divisions of land may be exempt from the requirements of this Ordinance as per P.U.C. regulations, state law, or federal law.

Exception from Land Development Definition

Act 170 of 1988 provides for the exclusion of certain activities from the definition of land development. The following shall not be regarded as land development in West Chillisquaque Township:

- (i) The conversion of an existing single-family detached dwelling or single-family semi-detached dwelling into not more than three residential units, unless such units are intended to be a condominium;

(ii) The addition of any accessory building, including farm buildings, on a lot or lots subordinate to an existing principal building; or

(iii) The addition or conversion of buildings or rides within the confines of an enterprise which would be considered an amusement park. For purposes of this subclass, an amusement park is defined as a tract or area used principally as a location for permanent amusement structures or rides. This exclusion shall not apply to newly acquired acreage by an amusement park until plans for the expanded area have been approved by proper authorities.

Jurisdiction

The West Chillisquaque Township Supervisors shall have the Authority to approve or disapprove all subdivision and land development plans for the township. The Township Planning Commission and other review agencies shall be accorded the opportunity to review plans in accord with the time limits stipulated in this Ordinance.

Abbreviated Table of Contents

Section 1 - General Provisions and Administration

Section 2 - Procedures

Section 3 - Plan Requirements

Section 4 - Subdivision and Design Construction Standards

Section 5 - Mobile Home Parks

Section 6 - Land Development Requirements

Section 7 - Definitions

List of Tables

Table 4-1 Minimum Street, Curb, and Sidewalk Design Standards

Table 4-2 Driveway Design Standards

Table 4-3 Street, Curb, and Sidewalk Construction Standards

Time Limits Specified For Subdivision and Land Development Procedures

A summary of the procedural actions that may be taken by the Applicant, the Township, and/or the Township Planning Commission during the development of a plan is presented below along with the Section reference where a detailed explanation of the procedure is located:

Review By Northumberland County Planning Commission - Section 1.4.1. - The Northumberland County Planning Commission shall provide its review within 30 days of the date of submission of the plan for review.

Disputed Review Fees - Section 1.9.3.1. - Any dispute of engineering review fees shall be initiated by the applicant within 10 days of the billing date.

Plan Submission - Section 2.1.3. - All plans shall be submitted at least 14 days in advance of the meeting at which they are to be considered.

Referral Of Plans - Section 2.1.5. - The Township Secretary shall forward preliminary and final plans to review agencies upon receipt of said plans.

Final Plan Submission - Section 2.2.3.4. - Final plans shall be submitted within 5 years of Preliminary Plan approval.

Plan Approval - Section 2.3.1. - The Township Supervisors shall render its decision and communicate it to the applicant within 90 days of the next meeting following plan submission.

Communication Of Decision To Applicant - Section 2.3.2.1. - Township Supervisor decisions shall be in writing and delivered to the applicant or mailed to him within 15 days of the decision.

Acknowledgement Of Conditional Approval By Applicant - Section 2.3.3. - Applicants shall return executed concurrence to the Township Supervisors within 30 days of the conditional approval.

Approval Resolution To Facilitate Financing - Section 2.3.4. - This resolution shall expire within 90 days if an Improvements Guarantee Agreement is not executed.

Improvements Guarantee Agreement - Section 2.4.2.3. - Improvements Guarantee Agreements shall be valid for one year unless extended by increasing the guarantee fund amount.

Inspection By Township Representative - Section 2.4.3. - The applicant shall give the Township 48 hours notice in advance of the installation of required improvements so that a township representative may be present to inspect their installation.

Inspection By Engineer - Section 2.4.3.1. - The inspection of required improvements by the Township Engineer shall occur within 45 days of the request to release improvements guarantee funds.

Completion Of Improvements - Section 2.4.3.2. - The Township shall authorize an engineering inspection within 10 days of notice that the improvements are complete.

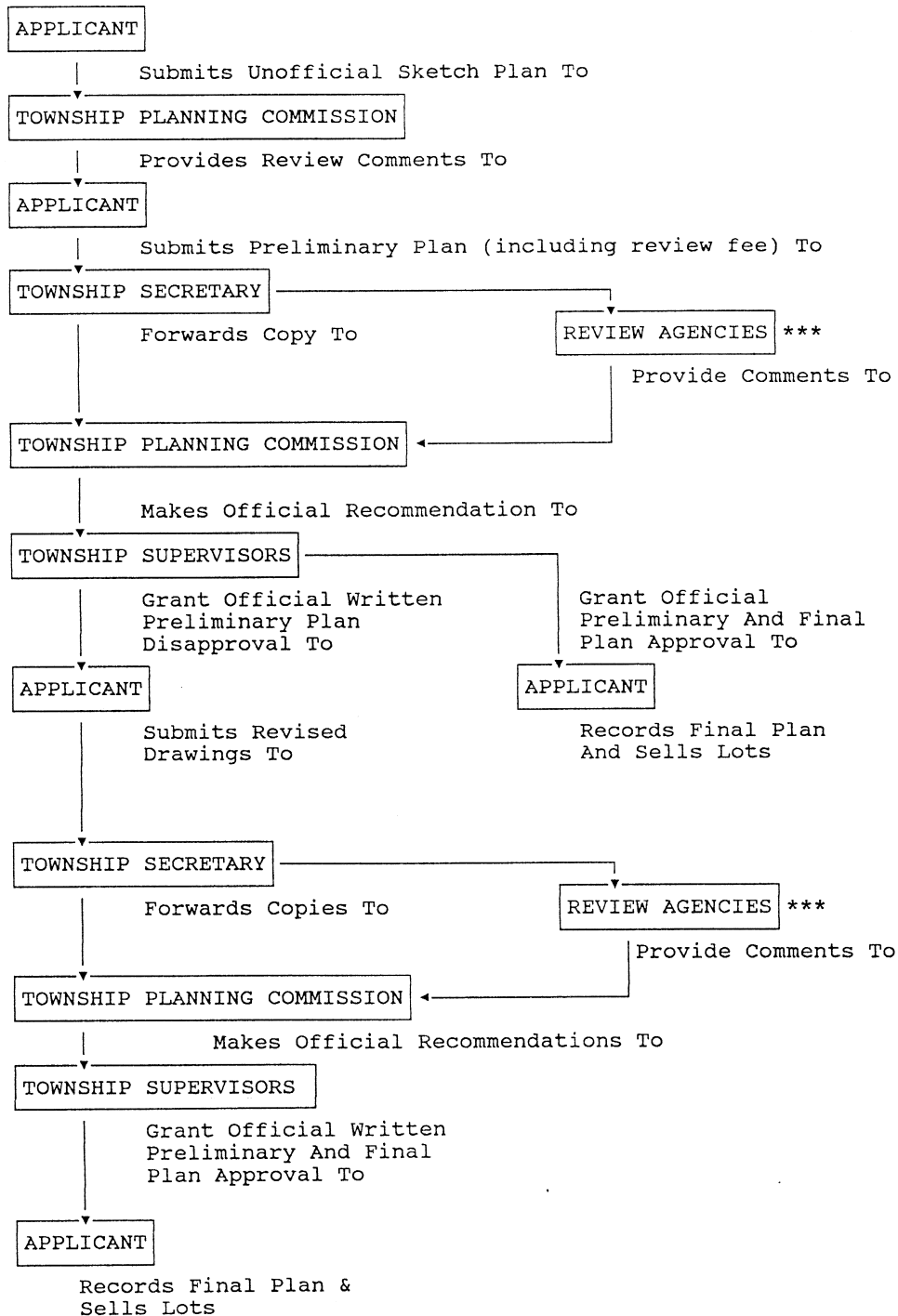
Engineer's Report Concerning Completeness of Improvements - Section 2.4.3.2. - The engineers

report shall be made to the applicant by certified mail within 30 days of the inspection authorization.

Maintenance Guarantee - Section 2.4.4.2. - The Township may require a maintenance guarantee to insure the integrity of the improvements for 18 months from the acceptance of the dedication of the improvements.

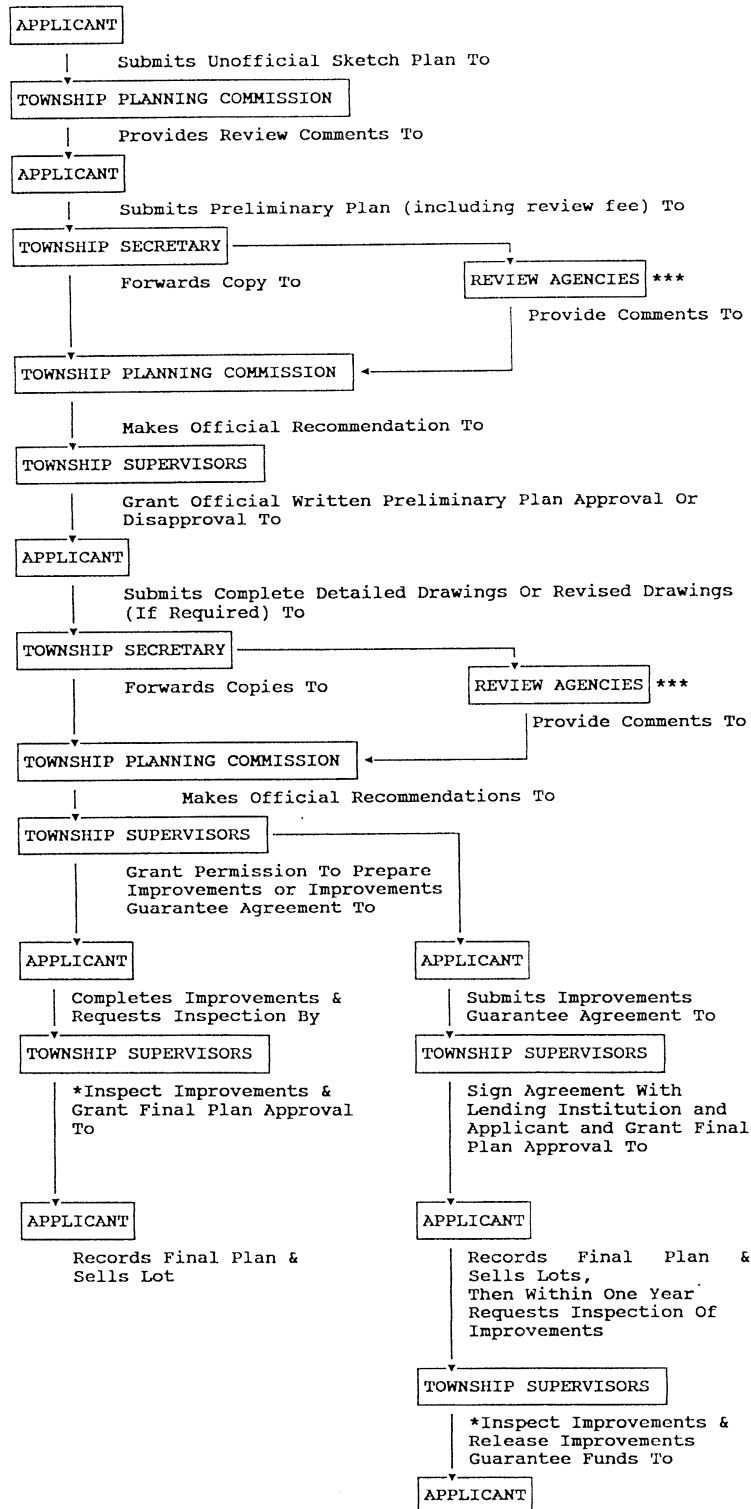
Recording Final Plan - Section 2.5.1. - Final plan approval by the Township Supervisors shall become null and void if the plan is not recorded at the Union County Records Office within 90 days of notification of final plan approval.

PROCEDURAL FLOW CHART FOR WEST CHILLISQUAQUE TWP. SLD ORD.
(FOR SUBDIVISION AND LAND DEVELOPMENT WITHOUT IMPROVEMENTS)



***REVIEW AGENCIES include:
West Chillisquaque Township Municipal Authority
Township Engineer
Northumberland County Planning Commission
Northumberland County Conservation District
PennDOT
Others As Required

PROCEDURAL FLOW CHART FOR WEST CHILLISQUAQUE TWP. SLD ORD.
(FOR SUBDIVISION AND LAND DEVELOPMENT WITH IMPROVEMENTS)



*Optional Maintenance Guarantee To Insure Integrity of The Improvements May Be Required By The Township At This Point.

***REVIEW AGENCIES include:
West Chillisquaque Township Municipal Authority
Township Engineer
Northumberland County Planning Commission
Northumberland County Conservation District
PennDOT
Others As Required

Table of Contents
West Chillisquaque Township
Subdivision and Land Development Ordinance

EXECUTIVE SUMMARY	ii
Definition of Subdivision	
Definition of Land Development	
Exception from Subdivision Definition	
Exception from Land Development Definition	
Jurisdiction	
Abbreviated Table of Contents	
List of Tables	
Time Limits	
PROCEDURAL FLOW CHART - WITHOUT IMPROVEMENTS	vi
PROCEDURAL FLOW CHART - WITH IMPROVEMENTS	vii
TABLE OF CONTENTS	viii

Article 1 - General Provisions and Administration

1.1	SHORT TITLE	1-1
1.2	AUTHORITY	1-1
1.3	PURPOSE	1-1
1.4	JURISDICTION	1-2
	1.4.1 Review By The Northumberland County Planning Commission	
	1.4.2 Review By The West Chillisquaque Township Planning Commission	
1.5	CONFLICT AND SEVERABILITY	1-3
	1.5.1 Conflict With Other Ordinances	
	1.5.2 Conflict With Private Provisions	
	1.5.3 Severability	
1.6	AMENDMENT	1-3
1.7	WAIVERS OR MODIFICATIONS	1-3
	1.7.1 Procedures	
1.8	RECORDS	1-4

1.9	REQUIRED FEES	1-4
1.9.1	Subdivision Plan Application Fee	
1.9.2	Review Fees	
1.9.3	Disputed Review Fees	
1.10	PREVENTIVE REMEDIES	1-5
1.11	ENFORCEMENT REMEDIES	1-5
1.12	PRIOR ORDINANCE AND AMENDMENTS	1-6
1.13	EFFECTIVE DATE	1-7
1.14	SAVING PROVISION	1-7

Article 2 - Procedures

2.1	GENERAL PROCEDURE	2-1
2.1.1	Classifications Of Subdivision	
2.1.1.1	Minor Subdivision	
2.1.1.2	Add-On Subdivision	
2.1.1.3	Major Subdivision	
2.1.2	Classifications Of Land Development	
2.1.2.1	Minor Land Development	
2.1.2.2	Major Land Development	
2.1.2.3	Land Development Exceptions	
2.1.3	Official Submission Dates	
2.1.4	Change In Regulations	
2.1.5	Referral Of Plans To Review Agencies	
2.1.6	Site Inspection	
2.2	TYPES OF SUBDIVISION AND LAND DEVELOPMENT PLANS	2-3
2.2.1	Sketch Plans	
2.2.1.1	Optional Sketch Plan	
2.2.1.2	Sketch Plan May Be Required	
2.2.2	Preliminary Plan	
2.2.2.1	Plans Requiring Improvements	
2.2.2.2	Preliminary Plan Approval	
2.2.3	Final Plan	
2.2.3.1	Submission In Sections	
2.2.3.2	Conformance With Preliminary Plan	
2.2.3.3	Required Improvements	
2.2.3.4	5 Year Rule	

2.3	APPROVAL OF PLANS	2-5
2.3.1	Deadline For Action By The Township Supervisors	
2.3.2	Notification To Applicant	
2.3.3	Conditional Approval	
2.3.4	Optional Approval Resolution To Facilitate Financing	
2.4	IMPROVEMENTS	2-6
2.4.1	General Requirements	
2.4.2	Improvements Guarantee Agreement	
2.4.3	Inspection of Improvements	
2.4.4	Dedication Of Improvements/ Maintenance Guarantee	
2.5	FINAL PLAN RECORDING	2-8
2.5.1	Time Limit For Recording	
2.5.2	Offer Of Dedication	
2.6	RESUBDIVISION PROCEDURES	2-8

Article 3 - Plan Requirements

3.1	GENERAL REQUIREMENTS	3-1
3.2	SKETCH PLAN	3-1
3.3	MINOR LAND DEVELOPMENT	3-1
3.4	MINOR SUBDIVISION PLAN	3-2
3.5	ADD-ON SUBDIVISION PLAN	3-4
3.6	PRELIMINARY PLAN - MAJOR SUBDIVISION AND MAJOR LAND DEVELOPMENT	3-5
3.6.1	Scale	
3.6.2	Information To Be Shown On Preliminary Plan	
3.6.3	Material To Be Submitted With The Preliminary Plan	
3.7	FINAL PLAN - MAJOR SUBDIVISION AND MAJOR LAND DEVELOPMENT .	3-8
3.7.1	Scale	
3.7.2	Information To Be Shown On Final Plan	
3.7.3	Material To Be Submitted With Final Plan	

Article 4 - Subdivision Design and Construction Standards

4.1	MINIMUM STANDARDS	4-1
4.2	GENERAL STANDARDS	4-1
4.2.1	Land Suitability	
4.2.2	Municipal Boundaries	

4.3	STREET CLASSIFICATION SYSTEM	4-1
4.3.1	Arterial Street	
4.3.2	Collector Street	
4.3.3	Minor Street	
4.4	OWNERSHIP AND MAINTENANCE OF STREETS	4-2
4.5	STREET DESIGN STANDARDS	4-2
4.5.1	Minimum Street, Curb, and Sidewalk Design Standards	
4.5.2	Right-Of-Way	
4.5.3	Cul-De-Sac Streets	
4.5.4	Street System Layout	
4.5.5	Street Intersections	
4.5.6	Street Grades and Alignments	
4.6	DRIVEWAY DESIGN STANDARDS	4-6
4.7	STREET CONSTRUCTION STANDARDS	4-6
4.7.1	New Streets	
4.7.2	Existing Private Streets	
4.7.3	Road Shoulders	
4.8	SIDEWALKS, CURBS, AND STREET TREES	4-9
4.9	BLOCKS	4-9
4.10	FLAG LOT	4-9
4.11	LOT SIZE AND BUILDING SETBACK LINES	4-10
4.12	MONUMENTS	4-10
4.13	EASEMENTS	4-10
4.13.1	Utility Easements	
4.13.2	Drainage Easements	
4.14	UTILITIES	4-11
4.15	SEWAGE FACILITIES	4-11
4.15.1	Sewage Disposal Method	
4.15.2	Sewage Planning Requirements	
4.15.2.1	10 Lots Or Less Utilizing On-Lot Facilities	
4.15.2.2	More Than 10 Lots Utilizing On-Lot Facilities, Private Sewer System, or Sewer Extension Of A Public Sewer System	
4.15.2.3	Subdivision Not Approved For On-Lot Sewage Disposal	
4.15.3	General Requirements	
4.16	WATER SUPPLY	4-12
4.16.1	Public Water Supply	
4.16.2	On-Lot Water Supply	
4.16.3	Documentation Of Available Water Supply	

4.17	STORM WATER MANAGEMENT	4-13
4.17.1	Applicability	
4.17.2	Exceptions	
4.17.3	General Requirements	
4.17.4	Water Quality Requirements	
4.17.5	Groundwater Recharge Requirements	
4.17.6	Channel Protection Storage Volume (Stream Bank Erosion)	
4.17.7	Overbank and Extreme Event Flood Protection Requirements	
4.17.8	Design Considerations	
4.17.9	Calculation Methodology	
4.17.10	No Harm Option	
4.17.11	Drainage Plan	
4.17.12	Plan Submission	
4.17.13	Drainage Plan Review	
4.17.14	Modification of Plans	
4.17.15	Re-submission of Disapproved Plans	
4.17.16	Fees and Expenses	
4.17.17	Financial Guarantee & Maintenance Responsibilities	
4.17.18	Enforcement Penalties	
4.18	SOIL EROSION AND SEDIMENT CONTROL	4-40
4.19	COMMUNITY FACILITIES	4-41
4.20	FLOODPLAIN MANAGEMENT	4-41
4.20.1	Purpose	
4.20.2	Plan Requirements	
4.20.3	Design Standards	
4.21	NATURAL FEATURES ANALYSIS	4-42
4.21.1	Purpose	
4.21.2	Requirements	
4.22	COMMUNITY IMPACT ANALYSIS	4-43
4.22.1	Purpose	
4.22.2	Requirements	

Article 5 - Mobile Home Parks

5.1	GENERAL REQUIREMENTS	5-1
5.1.1	Minimum Park Area	
5.1.2	Lot Requirements	
5.1.3	Setbacks	
5.2	PLAN REQUIREMENTS	5-1

5.3	REQUIRED SITE IMPROVEMENTS	5-2
5.3.1	Utilities, Services, and Controls	
5.3.2	Internal Street System	
5.3.3	Parking Space	
5.3.4	Grading and Ground Cover	
5.3.5	Mobile Home Pads	
5.3.6	Mobile Home Patio	
5.3.7	Recreation and Open Space	
5.3.8	Screening and Landscaping	

Article 6 - Land Development Requirements

6.1	APPLICABILITY	6-1
6.2	MULTIPLE FAMILY DWELLING DEVELOPMENTS	6-1
6.2.1	Development Concept	
6.2.2	Streets, Parking, and Utilities	
6.2.3	Open Space Requirement	
6.2.4	Setbacks	
6.3	CLUSTER HOUSING DEVELOPMENTS	6-2
6.3.1	Purpose	
6.3.2	Development Standards	
6.4	RECREATIONAL VEHICLE PARK AND CAMPGROUND DEVELOPMENTS ..	6-3
6.4.1	General Standards	
6.4.2	Development Standards	
6.5	COMMERCIAL LAND DEVELOPMENT	6-4
6.5.1	General Standards	
6.5.2	Access and Circulation	
6.5.3	Parking Area Requirements	
6.5.4	Screening And Landscaping	
6.6	INDUSTRIAL LAND DEVELOPMENT	6-5
6.6.1	General Standards	
6.6.2	Access And Circulation	
6.6.3	Parking And Loading Area Requirements	
6.6.4	Screening And Landscaping	

Article 7 - Definitions

Appendix A	Required Certificates
Appendix B-1	Subdivision Improvements Guaranty Agreement for use with an Escrow Account
Appendix B-2	Subdivision Improvements Guaranty Agreement for use with an Irrevocable Bank Line of Credit
Appendix C	Stormwater Credits For Effective Site Planning
Appendix D	Method for Computing Peak Discharge for Water Quality Storm
Appendix E	Acceptable Stormwater Best Management Practices (BMP's)
Appendix F	Runoff Curve Numbers
Appendix G	Runoff Coefficients For The Rational Method
Appendix H	Design Storm Rainfall Amount (Inches)
Appendix I	NRCS (SCS) Type II Rainfall Distribution
Appendix J	PENN DOT Storm Intensity-Duration-Frequency Curve Region 3
Appendix K	Manning Roughness Coefficients
Appendix L	Computation Of The Channel Protection Storage Volume (C_{pv})
Appendix M	Stormwater Management Facilities Maintenance Agreement

List of Tables

Table 4-1	Minimum Street, Curb, and Sidewalk Design Standards	4-3
Table 4-2	Driveway Design Standards	4-7
Table 4-3	Street, Curb, and Sidewalk Construction Standards	4-8

THE SUPERVISORS OF THE TOWNSHIP OF WEST CHILLISQUAQUE,
NORTHUMBERLAND COUNTY, PENNSYLVANIA, HEREBY ORDAIN AND ENACT:

ARTICLE 1
General Provisions and Administration

1.1 Short Title

These regulations shall be known and may be cited as the "West Chillisquaque Township Subdivision and Land Development Ordinance".

1.2 Authority

The Board of Supervisors of the Township of West Chillisquaque is vested by law with the authority to regulate subdivision and land development within the Township by Section 501 of the Pennsylvania Municipalities Planning Code (Act 247 of 1968, as amended by Act 170 of 1988).

1.3 Purpose

These regulations are adopted for the following purposes:

1.3.1 To protect and provide for the public health, safety, and general welfare of the Township.

1.3.2 To guide the future growth and development of West Chillisquaque, in accordance with the Comprehensive Plan of the Township.

1.3.3 To provide for adequate light, air, and privacy; to secure safety from fire, flood, and other danger; and to prevent overcrowding of the land and undue congestion of population.

1.3.4 To protect the character and the social and economic stability of the Township and to encourage the orderly and beneficial development of all parts of the Township.

1.3.5 To protect and conserve the value of land throughout the Township, and the value of buildings and improvements upon the land, and to minimize the conflicts among the uses of land and buildings.

1.3.6 To guide public and private policy and action in order to provide adequate and efficient transportation, water supply, sewerage, schools, parks, playgrounds, recreation, and other public requirements and facilities.

1.3.7 To provide the most beneficial relationship between the uses of land and buildings and the circulation of traffic within the Township, having particular regard to the avoidance of congestion in the streets and highways, and the pedestrian traffic movements appropriate to the various uses of land and buildings, and to provide for the proper

location and width of streets and building lines.

- 1.3.8** To establish reasonable standards of design and procedures for subdivision and resubdivisions, in order to further the orderly layout and use of land; and to insure proper legal descriptions and monumenting of subdivided land.
- 1.3.9** To insure that public facilities are available and will have a sufficient capacity to serve the proposed subdivision.
- 1.3.10** To prevent the pollution of air, streams, and ponds; to assure the adequacy of drainage facilities; to safeguard the water table; and to encourage the wise use and management of natural resources in order to preserve the community and value of the land.
- 1.3.11** To preserve the natural beauty and topography of the Township and to insure appropriate development with regard to these natural features.
- 1.3.12** To provide for open spaces through the most efficient design and layout of the land.
- 1.3.13** And finally, to ensure that documents prepared as part of a land ownership transfer fully and accurately describe the parcel of land being subdivided, and the new parcels thus created.

1.4 Jurisdiction

The West Chillisquaque Township Supervisors shall approve or disapprove all Subdivision and Land Development Plans for the Township.

1.4.1 Review By The Northumberland County Planning Commission

All plans for subdivision and land development within the township shall be forwarded, upon receipt by the township to the Northumberland County Planning Commission for review and recommendation. The township shall not approve or disapprove such plans until the County Planning Commission report is received or until the expiration of 30 days from the submission of the plan to the County Planning Commission, or within such further time as may be agreed upon between the County and the township.

A copy of the Northumberland County Planning Commission report shall be submitted to the Township Planning Commission for its review prior to township approval or disapproval of the plan.

1.4.2 Review By The West Chillisquaque Township Planning Commission

All plans for subdivision and land development received by the township shall be reviewed by the West Chillisquaque Township Planning Commission prior to any action by the Township Supervisors to approve or disapprove such plans. The Township Planning Commission may rely upon the review received from the Northumberland County Planning Commission to aid in its deliberations. Review comments from the Township Planning Commission shall be transmitted to the Township Supervisors in writing.

1.5 Conflict and Severability

1.5.1 Conflict With Other Ordinances

Should any provision of this Ordinance be found in conflict with the provisions of a zoning, building, fire, safety, health, or other ordinance or code of the township, the provision which establishes the higher standard for the protection of the health and safety of the township shall prevail.

1.5.2 Conflict With Private Provisions

This ordinance is not intended to invalidate any easement, covenant or any other private agreement or restriction, provided that where the provisions of this ordinance are more restrictive or impose higher standards or regulations than such easement, covenant, or other private agreement or restriction, the requirements of this ordinance shall govern.

Where the provisions of the easement, covenant or private agreement or restriction impose duties and obligations more restrictive, then the private provisions shall remain in effect and shall be operative and supplemental to these regulations.

1.5.3 Severability

Should any section, subsection, or provision of this Ordinance be declared by a court of competent jurisdiction to be invalid, such decision shall not affect the validity of Ordinance as a whole, or of any other part thereof. The Board of Supervisors of the Township of West Chillisquaque hereby declares that it would have enacted the remainder of this ordinance even without any such part, provision, or application.

1.6 Amendment

The West Chillisquaque Township Supervisors may, from time to time, revise, modify, and amend this Ordinance by appropriate action taken at a scheduled public meeting, in accord with Section 505 of Act 170 of 1988, as amended.

1.7 Waivers or Modifications

The Township Supervisors may grant a waiver or modification to the minimum standards of the Subdivision and Land Development Ordinance when the literal compliance with mandatory provisions is shown to the satisfaction of the Supervisors to be unreasonable, to cause undue hardship, or when an alternative standard can be demonstrated to provide equal or better results. Furthermore, the Supervisors may grant a modification of the requirements of one or more provisions if the literal enforcement will exact undue hardship because of peculiar conditions pertaining to the land in question, provided that such modifications will not be contrary to the public interest and that the purpose and intent of this Ordinance is observed.

1.7.1 Procedures

1.7.1.1 All requests for a waiver or modification shall be in writing and shall accompany the application for subdivision or land development. The request shall state the

grounds and facts of unreasonableness or hardship on which the request is based, the provision or provisions of the Ordinance involved and the minimum modification necessary.

1.7.1.2 The request for the modification shall be referred to the Planning Commission for advisory comments.

1.7.1.3 The Township Supervisors shall keep a written record of all action on the modification request.

1.8 Records

The Township Supervisors shall keep for the public record all plans upon which it takes action. The Supervisors shall also keep a record of all decisions and actions related thereto.

1.9 Required Fees

The Board of Supervisors shall by Resolution establish the required subdivision plan application and review fees. All fees shall be payable to West Chillisquaque Township.

1.9.1 Subdivision Plan Application Fee

The purpose of the subdivision plan application fee shall be to cover a portion of the plan processing cost incurred by the township.

1.9.2 Review Fees

The Township shall charge review fees to cover the actual cost of retaining the municipal engineer or consultant to evaluate subdivision plans or to inspect required improvements.

1.9.3 Disputed Review Fees

1.9.3.1 In the event the applicant disputes the amount of any such review fees, the applicant shall, within ten days of the billing date, notify the municipality that such fees are disputed, in which case the municipality shall not delay or disapprove a subdivision or land development application due to the applicant's request over disputed fees.

1.9.3.2 In the event that the municipality and the applicant cannot agree on the amount of review fees which are reasonable and necessary, then the applicant and the municipality shall follow the procedure for dispute resolution set forth in section 510(g) of Act 170 of 1988, as amended, the Pennsylvania Municipalities Planning Code.

1.10 Preventive Remedies

1.10.1 In addition to other remedies, the Township may institute and maintain appropriate actions by law or in equity to restrain, correct or abate violations, to prevent unlawful construction, to recover damages and to prevent illegal occupancy of a building, structure, or premises. The description by metes and bounds in instrument of transfer or other documents used in the process of selling or transferring shall not exempt the seller or transferor from such penalties or from the remedies herein provided.

1.10.2 The Township may refuse to issue any permit or grant any approval necessary to further improve or develop any real property which has been developed or which has resulted from a subdivision of real property in violation of any ordinance adopted pursuant to Article V of Act 170 of 1988. This authority to deny such a permit or approval shall apply to any of the following applicant:

1.10.2.1 The owner of record at the time of such violation.

1.10.2.2 The vendee or lessee of the owner of record at the time of such violation without regard as to whether such vendee or lessee had actual or constructive knowledge of the violation.

1.10.2.3 The current owner of record who acquired the property subsequent to the time of violation without regard as to whether such current owner had actual or constructive knowledge of the violation.

1.10.2.4 The vendee or lessee of the current owner of record who acquired the property subsequent to the time of violation without regard as to whether such vendee or lessee had actual or constructive knowledge of the violation.

As an additional condition for issuance of a permit or the granting of an approval to any such owner, current owner, vendee or lessee for the development of any such real property, the Township may require compliance with the conditions that would have been applicable to the property at the time the applicant acquired an interest in such real property.

1.11 Enforcement Remedies

1.11.1 Any person, partnership, or corporation who or which has violated the provisions of any subdivision or land development ordinance enacted under this act or prior enabling laws shall, upon being found liable therefor in a civil enforcement proceeding commenced by the Township, pay a judgment of not more than \$500 plus all court costs, including reasonable attorney fees incurred by the Township as a result thereof. No judgment shall commence or be imposed, levied or payable until the date of the determination of a violation by the district justice. If the defendant neither pays nor timely appeals the judgment, the township may enforce the judgment pursuant to the applicable rules of civil procedure. Each day that a violation continues shall constitute a separate violation, unless the district justice determining that there has been a violation further determines that there was a good faith basis for the person, partnership, or corporation violating the

ordinance to have believed that there was no such violation, in which event there shall be deemed to have been only one such violation until the fifth day following the date of the determination of a violation by the district justice and thereafter each day that a violation continues shall constitute a separate violation.

1.11.2 The court of common pleas, upon petition, may grant an order of stay, upon cause shown, tolling the per diem judgment pending a final adjudication of the violation and judgment.

1.11.3 Nothing contained in this section shall be construed or interpreted to grant to any person or entity other than the Township the right to commence any action for enforcement pursuant to this section.

1.11.4 District justices shall have initial jurisdiction in proceedings brought under this section.

1.12 Prior Ordinances and Amendments

1.12.1 The West Chillisquaque Subdivision and Land Development Ordinance became effective during February, 1979. Final plans submitted prior to February, 1979, for which a preliminary plan had previously been approved, were governed by the Northumberland County Subdivision Regulations of 1976.

1.12.2. The 1992 West Chillisquaque Township Subdivision and Land Development Ordinance became effective to all preliminary and final plans submitted to the Township on or after December 28, 1992, except those final plans for which a preliminary plan had previously been approved. In such case, the West Chillisquaque Subdivision and Land Development Ordinance of 1979 was in effect.

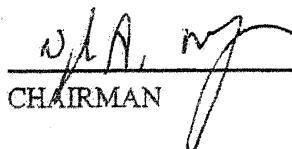
1.12.3 This Ordinance serves to amend under the terms of Section 505 of the Pennsylvania Municipalities Planning Code, Act of 1988, P.L. 805, No. 247, the 1992 West Chillisquaque Township Subdivision and Land Development Ordinance and any subsequent amendments to that Ordinance including the amendment of October 4, 1999.

1.13 Effective Date


This Ordinance, as amended, shall be effective on September 8, 2008.

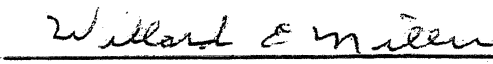
Adopted this 12th day of October, 2009.

BOARD OF SUPERVISORS,
WEST CHILLISQUAQUE TOWNSHIP



CHAIRMAN





1.14 Saving Provision

The adoption of this Ordinance shall not effect or prevent any pending or future prosecution of, or action to abate, any existing violation of the Ordinance adopted during February, 1979, if the action is in violation of the provisions of this Ordinance.

ARTICLE 2

Procedures

2

2.1 GENERAL PROCEDURE

The procedures established in this Article shall apply to all subdivisions and land developments that require approval by West Chillisquaue Township. It shall be the responsibility of the applicant to submit preliminary or final subdivision or land development plans that comply in all respects with the applicable provisions of this ordinance and to coordinate planning with utility or service agencies in the manner set forth in this ordinance.

2.1.1 Classifications Of Subdivision

2.1.1.1 Minor Subdivision

A minor subdivision is a subdivision of lots fronting on a public road and not involving the creation of any new streets. Note that the residual lot shall be counted as a lot. A minor subdivision is exempted from many of the plan requirements specified for a major subdivision. The plan requirements for Minor Subdivisions are specified in Section 3.4 of this Ordinance.

2.1.1.2 Add-On Subdivision

An add-on subdivision is the creation of a lot which is to be added to an existing contiguous lot and where no new building lot or land development is proposed. The plan requirements for an add-on subdivision are specified in Section 3.5 of this Ordinance.

2.1.1.3 Major Subdivision

All subdivisions which are not classified as minor or add-on subdivisions are major subdivisions and shall comply with all pertinent plan requirements of this Ordinance (see Sections 3.2, 3.6, and 3.7).

2.1.2 Classifications Of Land Development

2.1.2.1 Minor Land Development

Minor land development includes:

- » A single non-residential building of less than 2,000 square feet in size;
or
- » The placement of two (2) single family detached dwellings on a single lot.

A plan for a minor land development shall be prepared in accord with the plan requirements specified in Section 3.3 of this Ordinance.

2.1.2.2 Major Land Development

Major land development includes:

- » A non-residential building greater than 2,000 square feet in size; or
- » Two or more non-residential buildings on a single lot; or
- » Four (4) or more residential units or three or more residential structures on a single lot; or
- » Mobile Home Parks.

A major land development shall be prepared in accord with the plan requirements specified in Sections 3.2, 3.6, and 3.7 of this Ordinance.

2.1.2.3 Land Development Exceptions

Act 170 of 1988 provides for the exclusion of certain activities from the definition of land development. The following shall not be regarded as land development in West Chillisquaque Township although applicable zoning regulations shall apply:

- » The conversion of an existing single-family detached dwelling or single-family semi-detached dwelling into not more than three residential units, unless such units are intended to be a condominium; or
- » The addition of any accessory building, including farm buildings, on a lot or lots subordinate to an existing principal building; or
- » The addition or conversion of buildings or rides within the confines of an enterprise which would be considered an amusement park. For purposes of this subclass, an amusement park is defined as a tract or area used principally as a location for permanent amusement structures or rides. This exclusion shall not apply to newly acquired acreage by an amusement park until plans for the expanded area have been approved by proper authorities.

2.1.3 Official Submission Dates

For the purpose of these regulations the official submission date is the date when all the plans and materials, including review fees, are received at the Township Office by the Secretary or a designee. Plans shall be submitted to the Township Planning Commission not less than 14 days in advance of the regular meeting of the Commission at which the plan is to be considered.

2.1.4 Change In Regulations

From the time an application for approval of a plan, whether preliminary or final, is duly filed as provided in this Ordinance, and while such application is pending approval or disapproval, no change or amendment of the zoning, subdivision or other governing ordinance or plan shall affect the decision on such plan adversely to the applicant. The applicant shall be entitled to a decision in accordance with the provisions of the Ordinance as they stood at the time the application was filed.

2.1.5 Referral Of Plans To Review Agencies

Upon receipt of a preliminary or final subdivision or land development plan, the Township Secretary or a designee shall forward a copy of the plan to the West Chillisquaque Township Planning Commission, West Chillisquaque Township Municipal Authority (if public sewage service is contemplated), to the Northumberland County Planning Commission, to the Northumberland County Conservation District, to the Pennsylvania Department of Transportation (if a state highway is involved), and to other appropriate agencies or neighboring municipalities for review by those parties.

2.1.6 Site Inspection

The Township Planning Commission or its representative(s) shall visit the site in order to evaluate the proposed plan on the basis of the information presented before any recommendations are made to the Township Supervisors.

2.2 TYPES OF SUBDIVISION AND LAND DEVELOPMENT PLANS

2.2.1 Sketch Plan

2.2.1.1 Optional Sketch Plan

Subdividers are encouraged to prepare a sketch plan for informal discussion with the Township Planning Commission prior to submitting an official plan. Submission of a sketch plan will not constitute a formal filing of a plan with the Township.

2.2.1.2 Sketch Plan May Be Required

A sketch plan may be required showing the overall development concept when a preliminary plan is submitted for only a portion of a tract. The Township Planning Commission shall determine the need for a Sketch Plan under this section based upon:

- a history of previous subdivision and land development upon the tract; or
- critical design concerns that are present on the tract; or
- other criteria which become apparent during their evaluation of the subject tract.

2.2.2 Preliminary Plan

2.2.2.1 Plans Requiring Improvements

Subdivision plans proposing streets, sanitary sewers, storm water facilities, or other improvements shall be considered as preliminary plans unless an improvement guarantee agreement has been filed with the Township or unless the improvements have been completely installed (see Section 2.4.2).

2.2.2.2 Preliminary Plan Approval

Township approval of the preliminary plan shall constitute approval as to the character and intensity of the development, and the general layout and approximate dimensions of streets, lots, and other features. The approval binds the subdivider to the general scheme of the subdivision or land development shown and permits the subdivider to proceed with final detailed drawings of improvements, and with preparation of the final plan. Approval of the preliminary plan does not authorize the sale of lots nor the recording of the preliminary plan.

2.2.3 Final Plan

2.2.3.1 Submission In Sections

The final plan may be submitted in sections, each covering a portion of the subdivision or land development as shown on the preliminary plan. Each section, except for the last section, of a residential subdivision shall contain a minimum of 25% of the total number of dwelling units depicted on the preliminary plan, unless a lesser percentage is approved by the Township.

2.2.3.2 Conformance With Preliminary Plan

The final plan shall conform in all major respects with the approved preliminary plan. Otherwise the plan submitted shall be considered as a revised preliminary plan.

2.2.3.3 Required Improvements

Where improvements have been installed in accord with a previously approved preliminary plan, or an acceptable improvements guarantee agreement has been filed with the township, or where site improvements are not proposed by the subdivider, nor required by the township, the proposed subdivision plan may be considered as a final plan.

2.2.3.4 The 5 Year Rule

The applicant shall have a period of 5 years from the date of preliminary plan approval in which to submit a final plan. If the applicant fails to submit a final plan within the 5 year period, the approval of the preliminary plan shall become null and void unless an extension of time is requested by the subdivider in writing, along with a time schedule for submission of the final plan, and is approved by the township prior to the expiration date.

2.3 APPROVAL OF PLANS

2.3.1 Deadline For Action By The Township Supervisors

The Township Supervisors shall render a decision and communicate it to the applicant not later than 90 days following the date of the regular meeting of the Township next following the date that the plan is filed.

However, should the next regular meeting occur more than 30 days following the filing of the plan, the said 90 day period shall be measured from the 30th day following the day the plan has been filed.

An extension in the time period for notification of plan action can be obtained by either the Township or the applicant, provided that the request for an extension is in writing and is granted by the other party in writing prior to the deadline for action.

2.3.2 Notification To Applicant

At a public meeting the Township Supervisors shall consider the subdivision or land development plan to determine its conformity to the design standards and other requirements of this Ordinance and to evaluate review comments received from the Township and County Planning Commissions, and other pertinent parties. The Supervisors shall notify the applicant of its decision in accordance with the following:

2.3.2.1 The decision of the Supervisors shall be in writing and shall be communicated to the applicant personally or mailed to him at his last known address not later than 15 days following the decision.

2.3.2.2 When the application is not approved as filed the decision shall specify the defects found in the application and shall, in each case cite to the provisions of the Ordinance relied upon.

2.3.2.3 Failure of the Township to render a decision and communicate it to the applicant within the time and in the manner required herein shall be deemed an approval of the application (see Section 2.3.1).

2.3.3 Conditional Approval

The Township Supervisors may grant preliminary or final plan approval subject to conditions acceptable to the applicant. The Township Supervisors shall list all such conditions within 15 days of the date of the conditional approval and present the listing to the applicant for concurrence. Failure on the part of the applicant to execute such concurrence and return it to the Township Supervisors within 30 days of the conditional approval date shall nullify the conditional approval.

2.3.4 Optional Approval Resolution to Facilitate Financing

When required by the applicant, in order to facilitate financing, the Township Supervisors, shall furnish the applicant with a signed copy of a resolution indicating approval of the final plan contingent upon the applicant obtaining a satisfactory

improvements guarantee agreement. The final plan or record plan shall not be signed nor recorded until the improvements guarantee agreement is executed. This resolution shall expire and shall be considered revoked if the improvements guarantee agreement is not executed within 90 days unless a written extension is granted by the Township Supervisors.

2.4 IMPROVEMENTS

2.4.1 General Requirements

2.4.1.1 Improvements required by the Township for the subdivision or land development may include streets, sidewalks, sanitary sewers, water supply facilities, storm water facilities, utilities, parks, or other facilities needed for the development.

2.4.1.2 Improvements shall be installed by the applicant, or a suitable improvements guarantee agreement shall be provided which shall ensure the provision of the improvements at the standards set forth in these regulations. The final plan shall not be approved until final detailed design of the improvements is approved and the improvements are installed and inspected and determined to be in a satisfactory state of repair, or a suitable improvements guarantee agreement for installation and maintenance is provided (see Section 3.7.3.14.2).

2.4.2 Improvements Guarantee Agreement

2.4.2.1 In lieu of the completion of the improvements required as a condition of final plan approval, the applicant may file with the Township a fiscal guarantee or an improvements guarantee agreement in the amount of 110% of the cost of the improvements estimated as of 90 days after the scheduled completion date of the improvements. The cost of required improvements shall be established by a Professional Engineer selected by the applicant and shall be submitted to the Township for approval. The township may utilize the municipal engineer to review the estimate and choose to reject such estimate for reasonable cause.

2.4.2.2 If the applicant and the Township are unable to agree upon an estimate, then the estimate shall be recalculated and by a Professional Engineer mutually agreed upon by both the Township and the applicant. The estimate certified by this engineer shall be the final estimate. Fees for the service of this engineer shall be paid equally by the Township and the applicant.

2.4.2.3 Should the completion of the required improvements require more than one year, the Township may require and increase in the amount of improvements guarantee by an additional 10% for each year beyond the anniversary date of the original agreement.

2.4.2.4 The improvements guarantee agree shall be in a form acceptable to the Township. Bonds, an irrevocable bank letter of credit, or an escrow account are generally acceptable types of improvements guarantees.

2.4.3 Inspection of Improvements

The applicant shall notify the Township Secretary or a designee 48 hours in advance of the installation of any required improvements so that a township representative may be present to inspect their installation. In the event that the Township fails to perform an inspection after this notification, the inspection procedure stated below shall govern.

2.4.3.1 The Township may authorize the release of a portion of the improvements guarantee to the applicant necessary for payment to a contractor performing the installation of the requirements improvements. In the event that the Township did not inspect the installation of the improvements during construction (see Section 2.4.3), then it shall have 45 days from receipt of the request to authorize its engineer to inspect and determine that the improvements covered by the guarantee have been installed satisfactorily.

2.4.3.2 When all necessary improvements have been completed the developer shall notify the Township in writing by certified or registered mail of the completion. The Township shall, with 10 days after receipt of such notice, authorize an inspection by its engineer of the required improvements. A report shall be made in writing by certified mail to the developer within 30 days of the inspection authorization and shall indicate approval or rejection of the required improvements.

2.4.3.3 Upon approval of the completed improvements the Township shall release to the developer those funds remaining in the improvement guarantee including all interest accrued. Prior to the release of such funds, the developer shall guarantee to the Township in writing the integrity of the improvements for a period of eighteen (18) months.

2.4.3.4 If a portion of the completed improvements shall be found unsatisfactory, the engineer's report shall contain a statement of reasons for rejection. The developer shall proceed to correct or complete those improvements and upon completion shall notify the Township in accord with the procedures noted above.

2.4.3.5 Should the Township fail to comply with the time limitations as provided, all improvements will be deemed to have been approved and the developer shall be released from all liability pursuant to the fiscal guarantee agreement.

2.4.4 Dedication of Improvements/Maintenance Guarantee

2.4.4.1 Where the developer proposes to dedicate improvements to the Township, a deed which dedicates the land and such improvements to the Township shall be recorded with the final plan.

2.4.4.2 When the Township accepts dedication of all or some of the required improvements, the Township Supervisors may require up to 15% of the actual cost of installation of the improvements for a maintenance guarantee to insure the integrity of the improvements for a time period not to exceed 18 months from the date of acceptance of dedication.

2.4.4.3 The Township may approve a final plan without an offer to dedicate the streets or other improvements, provided that such improvements are noted as private on the final plan. The developer shall also be required to provide a notice in each deed, lease, or conveyance explaining who has the responsibility for the maintenance of the improvements. See limitations as spelled out in Section 4.4.3.

2.5 FINAL PLAN RECORDING

2.5.1 Time Limit for Recording

Upon notification of final plan approval, the subdivider shall record two copies of the approved plan in the office of the Northumberland County Register and Recorder within 90 days after approval. Failure of the subdivider to record the final plan within the 90 day period, shall cause the approval of the Township to become null and void unless an extension of time is requested by the subdivider in writing and is granted by the Township before the expiration date. The final plan shall be filed with the Northumberland County Register and Recorder before proceeding with the sale of lots or construction of buildings.

2.5.2 Offer of Dedication

Recording the final plan after approval by the Township has the effect of an irrevocable offer to dedicate all streets and other public areas to public use. The offer to dedicate streets, parks, or other areas or portions of them, does not impose any duty upon the Township concerning maintenance or improvement until the proper authorities of the Township have made actual appropriation by ordinance or resolution, by entry, or improvement.

2.6 RESUBDIVISION PROCEDURES

For any replotting or re-subdivision of land, the same procedures and regulations apply as prescribed for an original submission.

ARTICLE 3

Plan Requirements

3.1 GENERAL REQUIREMENTS

All subdivision and land development plans shall meet the requirements outlined in the following sections.

3.2 SKETCH PLAN

A sketch plan should show the following information, legibly drawn, but not necessarily to scale or showing precise dimensions:

3.2.1 Tract boundaries and location.

3.2.2 Title block, including the name of the owner, municipality, date, and the scale of the drawing (or the notation - drawing not to scale).

3.2.3 North arrow.

3.2.4 Significant topographic and physical features of the area.

3.2.5 Proposed general street and lot layout, including the acreage of the are to be developed and any data available regarding sewers, septic systems, soil test sites, other utilities, and rights-of-way and easements.

3.2.6 Location sketch of the surrounding area showing roads and significant community facilities within 1/2 mile of the proposed subdivision.

3.3 MINOR LAND DEVELOPMENT

In addition to the requirements of Section 3.2 above, a plan for minor land development (see Section 2.1.2.1) shall meet the following:

3.3.1 The plan shall be drawn at a scale of not more than 100 feet to the inch, and shall be on sheets 18" x 24" or 24" x 36".

3.3.2 Six (6) copies of the plan and two (2) copies of proposed deed restrictions, if any, shall be submitted.

3.3.3 The land development plan shall include detailed specifications for streets, sidewalks, parking lots, sewage disposal and water supply, other utilities, storm water facilities, and any other necessary site improvements.

3.3.4 A copy of the required DER Planning Module, if any, or other required certificates or approvals shall be provided.

3.4 MINOR SUBDIVISION PLAN

The purpose of a Minor Subdivision Plan is to provide for simplified plan requirements when the intent of the subdivision is to create Lots fronting on a public road and not involving the creation of any new streets (see Section 2.1.1.1).

The plan for a Minor Subdivision shall be drawn at a scale of not more than 100 feet to the inch, and shall be on sheets either 18" x 24" or 24" x 36". All plans shall appear on black-on-white or blue-on-white prints. Six (6) copies of the final mittet.

3.4.1 A plan for a Minor Subdivision shall show:

3.4.1.1 Title block containing the name of the subdivision, municipality in which located, name and address of the subdivider, date, and scale.

3.4.1.2 Name and address and certification, with seal, of the registered professional engineer or surveyor preparing the final plan survey and map.

3.4.1.3 North arrow.

3.4.1.4 Tract map showing the relationship of the proposed development to the entire tract.

3.4.1.5 Location map showing relation of tract to adjoining properties, related road and highway system, municipal boundaries, and community facilities within a minimum of 1/2 mile from the proposed subdivision.

3.4.1.6 Names of the owners on all adjoining property and the names of all abutting subdivisions.

3.4.1.7 The location of prominent topographic features such as streams, wetlands, drainage channels, floodplain, wooded areas and other pertinent features that may influence the design. The 100 year flood elevation shall be shown where available from the Township's Flood Insurance Study.

3.4.1.8 Soil types and soil boundaries (for more information contact the

Northumberland County Conservation District).

- 3.4.1.9** Existing buildings, sewers, water lines, and culverts, transmission lines, fire hydrants, and other significant man-made features.
 - 3.4.1.10** Deep probe and soil percolation test sites, if on-lot sewage facilities are proposed.
 - 3.4.1.11** All existing or recorded streets on or adjacent to the tract, including name or number, right-of-way width and width of pavement.
 - 3.4.1.12** Bearings to the nearest second and dimensions to the nearest 100th of a foot for existing and proposed boundaries, lot lines, streets, rights of way, and easements, and any other areas to be dedicated to the public use. Also to be shown are street names, building setback lines, total acreage of the entire tract, total number of lots or dwelling units, a consecutive lot numbering system, zoning classification, and the area of each lot in square feet. All survey areas shall close with an error not exceeding one (1) foot in 10,000 feet.
 - 3.4.1.13** A notation that states that a PennDOT Highway Occupancy Permit is required prior to the construction of a driveway onto a state highway.
 - 3.4.1.14** Affidavit or certificate of ownership with all appropriate signatures and dated prior to submission.
 - 3.4.1.15** Block for signatures of the chairperson and secretary of the West Chillisquaque Planning Commission indicating recommended action of the Commission and for signatures of the West Chillisquaque Township Board of Supervisors indicating approval of the plan (see Appendix A).
 - 3.4.1.16** Location and material of all permanent monuments and lot markers.
- 3.4.2** The following information, data, and documents shall be submitted as appropriate with the plan for a Minor Subdivision:
- 3.4.2.1** Completed application form and plan review fee.
 - 3.4.2.2** Copies of proposed deed restrictions, if any.
 - 3.4.2.3** A sewage facilities plan and required documentation as specified in Section 4.15 of this Ordinance.

3.5 ADD-ON SUBDIVISION PLAN

The purpose of an Add-On Subdivision Plan is to provide for simplified plan requirements when the intent of the subdivision is to create a lot to be added to an existing contiguous lot and when no new building lots or land development is proposed (see Section 2.1.1.2).

The Add-On plan shall be drawn at a scale of not more than 100 feet to the inch, and shall be on sheets either 18" x 24" or 24" x 36". All plans shall appear on black-on-white or blue-on-white prints. Six (6) copies of the final plan shall be submitted.

3.5.1 An "add-on" subdivision plan shall show:

- 3.5.1.1** Title block containing the name of the subdivision, municipality, tract owner, date, scale, and the name and profession of the individual preparing the plan.
- 3.5.1.2** North indicator.
- 3.5.1.3** Location map showing relation of tract to adjoining properties, related road and highway system, and municipal boundaries.
- 3.5.1.4** Tract map showing the relationship of the proposed lot to the entire tract and to the contiguous lot.
- 3.5.1.5** Names of the owners on all adjoining property.
- 3.5.1.6** Certification and seal of a professional land surveyor to the effect that the survey and map are correct.
- 3.5.1.7** Bearings to the nearest second and dimensions to the nearest 100th of a foot for existing boundaries, proposed lot lines, building setback lines, zoning classification, and the area of each lot in square feet. All surveyed areas shall close with an error not exceeding one (1) foot in ten thousand (10,000) feet.
- 3.5.1.8** The location of all required monuments (see Section 4.12).
- 3.5.1.9** Affidavit or certificate of ownership with all appropriate signatures and dated upon submission.
- 3.5.1.10** Block for signatures of the chairperson and secretary of the West Chillisquaque Planning Commission indicating recommended action of the Commission and for signatures of the West Chillisquaque Township Board of Supervisors indicating approval of the plan (see Appendix A).

3.5.1.11 A notation stating that: "This lot is an addition to existing land of record of Grantee as recorded in Deed Book _____Page _____. Both parcels to be considered as one for future subdivision, land transfers, land development, and/or building purposes."

3.5.1.12 In lieu of evidence of a sewage permit, SEO feasibility report, or access to central sewerage, it shall be noted on the subdivision plan, that: A permit for sewage disposal has been neither requested nor granted for this lot. The Grantee, his heirs and assigns, accept the responsibility for obtaining a permit for sewage facilities if, and at the time, same are necessary.

3.5.2 The following information, data, and documents shall be submitted as appropriate with the Add-On plan:

3.5.2.1 Completed application form and plan review fee.

3.5.2.2 Copies of proposed deed restrictions, if any.

3.6 PRELIMINARY PLAN - MAJOR SUBDIVISION AND MAJOR LAND DEVELOPMENT

The subdivider shall file six (6) copies of the preliminary plan and two (2) copies of the other required material along with the West Chillisquaque Subdivision And Land Development Review Application Form with the Township Secretary. The copies of the preliminary plan shall be either black and white or blue and white prints, and the sheet size shall be no small than 18" x 24" and no larger than 24" x 36".

3.6.1 Scale

The preliminary plan shall be drawn at a scale of 1" = 50' or 1" = 100'.

3.6.2 Information To Be Shown On Preliminary Plan

3.6.2.1 Title block containing the name of the subdivision, municipality in which located, date, scale, address, and name of owner or subdivider, and name of individual preparing the plan.

3.6.2.2 North arrow.

3.6.2.3 Location map showing relation of proposed subdivision to adjoining properties, related road and highway system, municipally boundaries, and community facilities within at least 1/2 mile of the proposed subdivision.

3.6.2.4 Tract map showing the relationship of the proposed development to the entire tract.

- 3.6.2.5** Names of owners of all adjoining property and names of all abutting subdivisions.
- 3.6.2.6** Existing and proposed topographic contours at vertical intervals of two (2) feet or five (5) feet and datum and bench marks to which contour elevations refer; contours at a two (2) foot interval may be required on level terrain or for intensive development projects. The Township may waive the contour requirement in low density developments involving no roads or utilities and where a site inspection provides adequate information for action on the plan.
- 3.6.2.7** Soil types and soil boundaries (for more information contact the Northumberland County Conservation District).
- 3.6.2.8** The location of prominent topographic features such as streams, wetlands, drainage channels, floodplains, wooded areas and other pertinent features that may influence the design. The 100 year flood elevation shall be shown where available from the Township's Flood Insurance Study.
- 3.6.2.9** Existing buildings, sewers, water mains, culverts, power transmission lines, oil and gas pipelines, fire hydrants, and other significant man-made features.
- 3.6.2.10** All existing or recorded streets on or adjacent to the tract, including name or number, right-of-way width and width of pavement.
- 3.6.2.11** Deep probe and soil percolation test sites, if on-lot sewage facilities are proposed.
- 3.6.2.12** Total acreage, number of lots, average lot size, and existing zoning classification.
- 3.6.2.13** Location and width of proposed streets, rights-of-way, and easements; proposed lot lines; and areas to be dedicated to public use.
- 3.6.2.14** Block for signatures of the chairperson and secretary of the West Chillisquaque Planning Commission indicating recommended action of the Commission and for signatures of the West Chillisquaque Township Board of Supervisors indicating approval of the plan (see Appendix A).

- 3.6.2.15** Preliminary plans shall include the full plan of the development, showing the location of all proposed streets, rights-of-way, easements, public areas including parks and playgrounds, proposed sewer and water facilities, proposed lot lines with bearings and dimensions, lot numbers and/or block numbers in consecutive order, and proposed building setback lines for each street.
- 3.6.2.16** Certification and seal of a professional land surveyor to the effect that the survey and map are correct.
- 3.6.2.17** Multi-family, commercial, and industrial land developments shall show building locations, driveways, internal streets, parking areas, loading areas, landscaped areas, outdoor recreation facilities, sidewalks and pathways, utilities, and storm water management facilities in addition to the above information.
- 3.6.2.18** All areas, streets, facilities, etc. proposed to be dedicated for future public use, together with the conditions of such dedications or reservations shall be shown.

3.6.3 Material To Be Submitted With The Preliminary Plan

The following information, data, and documents shall be submitted with the preliminary plan:

- 3.6.3.1** Subdivision application form.
- 3.6.3.2** Copies of proposed deed restrictions if any.
- 3.6.3.3** Tentative cross-sections and center-line profiles for each proposed street.
- 3.6.3.4** Preliminary designs of proposed bridges or culverts.
- 3.6.3.5** A sewage facilities plan and required documentation as specified in Section 4.15 of this Ordinance.
- 3.6.3.6** A water facilities plan and required documentation as specified in Section 4.16 of this Ordinance.
- 3.6.3.7** A storm water management plan in accord with Section 4.17 of this Ordinance.
- 3.6.3.8** Sketch of proposed street layout for the remainder of the tract where the preliminary plan covers only part of the subdivider's holdings.

- 3.6.3.9** An indication from the Municipality or the Union County Communications Center that proposed street names do not duplicate any now in use.
- 3.6.3.10** Estimated costs of required improvements.
- 3.6.3.11** An erosion and sedimentation control plan (and permit, if required) in accord with Title 25, Chapter 102 of the rules and regulations of the Department of Environmental Resources, as amended. For more information contact the Northumberland County Conservation District.
- 3.6.3.12** If any portion of a development project is in a floodplain area, then documentation shall be submitted indicating compliance with pertinent laws and regulations of the Township and the Pennsylvania DER;
- 3.6.3.13** If any alteration, excavation, or relocation of a watercourse is proposed, a copy of the DER permit shall be submitted. For more information contact the Northumberland County Conservation District.
- 3.6.3.14** If a subdivision of 25 or more lots or a land development generating more than 200 vehicles per day, a natural features analysis shall be provided in accord with Section 4.21 of this Ordinance.
- 3.6.3.15** If a subdivision of 25 or more lots or a land development generating more than 200 vehicles per day a Community Impact Analysis shall be provided in accord with Section 4.22 of this Ordinance.
- 3.6.3.16** When the land included in the proposed subdivision has a natural gas pipeline, a petroleum or petroleum products pipeline, or a power transmission line located thereon, the application shall be accompanied by a letter from the owner of such pipeline or transmission line stating the minimum set-back distance requirements from such pipeline or transmission line.

3.7 FINAL PLAN - MAJOR SUBDIVISION AND MAJOR LAND DEVELOPMENT

The subdivider or developer shall submit six (6) copies of the final plan and two (2) copies of other required materials to the Township Secretary. The copies of the final plan shall be either black and white or blue and white prints with a sheet size which is no smaller than 18" x 24" and no larger than 24" x 36". If the final plan is drawn in two or more sections, a key map showing the location of the sections shall be placed on each sheet.

3.7.1 Scale

The final plan shall be drawn at a scale of 1" = 50' or 1" = 100'.

3.7.2 Information To Be Shown On Final Plan

- 3.7.2.1** Title block containing the name of the subdivision, municipality in which located, name and address of the subdivider, date, and scale.
- 3.7.2.2** Name and address and certification, with seal, of the registered professional engineer or surveyor preparing the final plan survey and map.
- 3.7.2.3** North arrow.
- 3.7.2.4** Tract map showing the relationship of the proposed development to the entire tract.
- 3.7.2.5** Location map showing relation of tract to adjoining properties, related road and highway system, municipal boundaries, and community facilities within a minimum of 1/2 mile from the proposed subdivision.
- 3.7.2.6** Existing and proposed contours at vertical intervals of five (5) feet or less and benchmark to which contour elevations refer. Contours at a two (2) foot interval may be required on level terrain or for intensive development projects. The Township may waive the contour requirement in low density developments involving no roads or utilities and where a site inspection provides adequate information for action on the plan.
- 3.7.2.7** Names of the owners on all adjoining property and the names of all abutting subdivisions.
- 3.7.2.8** The location of prominent topographic features such as streams, wetlands, drainage channels, floodplains, wooded areas and other pertinent features that may influence the design. The 100 year flood elevation shall be shown where available from the Township's Flood Insurance Study.
- 3.7.2.9** Soil types and soil boundaries (for more information contact the Northumberland County Conservation District).
- 3.7.2.10** Existing buildings, sewers, water lines, and culverts, transmission lines, fire hydrants, and other significant man-made features.

- 3.7.2.11** Deep probe and soil percolation test sites, if on-lot sewage facilities are proposed.
- 3.7.2.12** All existing or recorded streets on or adjacent to the tract, including name or number, right-of-way width and width of pavement.
- 3.7.2.13** Bearings to the nearest second and dimensions to the nearest 100th of a foot for existing and proposed boundaries, lot lines, streets, rights of way, and easements, and any other areas to be dedicated to the public use. Also to be shown are street names, building setback lines, total acreage of the entire tract, total number of lots or dwelling units, a consecutive lot numbering system, zoning classification, and the area of each lot in square feet. All survey areas shall close with an error not exceeding one (1) foot in 10,000 feet.
- 3.7.2.14** A notation that states that a Penndot Highway Occupancy Permit is required prior to the construction of a driveway onto a state highway.
- 3.7.2.15** All corrected and updated material from the preliminary plan.
- 3.7.2.16** Affidavit or certificate of ownership with all appropriate signatures and dated prior to submission.
- 3.7.2.17** Block for signatures of the chairperson and secretary of the West Chillisquaque Planning Commission indicating recommended action of the Commission and for signatures of the West Chillisquaque Township Board of Supervisors indicating approval of the plan (see Appendix A).
- 3.7.2.18** Location and material of all permanent monuments and lot markers.
- 3.7.3 Material To Be Submitted With Final Plan**
- 3.7.3.1** Subdivision application form if different from application previously submitted.
- 3.7.3.2** Restrictions of all types which will run with the land and become covenants in the deeds of lots within the subdivision.
- 3.7.3.3** All covenants running with the land governing the reservation and maintenance of dedicated or undedicated land or open space.
- 3.7.3.4** Final cross-sections and center-line profiles for each proposed street.
- 3.7.3.5** Final designs for proposed bridges and culverts.
- 3.7.3.6** A sewage facilities plan and required documentation as specified in

Section 4.15 of this Ordinance.

- 3.7.3.7** A water facilities plan and required documentation as specified in Section 4.16 of this Ordinance.
- 3.7.3.8** A storm water management plan in accord with Section 4.17 of this Ordinance.
- 3.7.3.9** All revised and corrected material from the preliminary plan.
- 3.7.3.10** Copies of deeds of dedication of improvements to the Township.
- 3.7.3.11** An erosion and sedimentation control plan (and permit, if required) in accord with Title 25, Chapter 102 of the rules and regulations of the Department of Environmental Resources, as amended. If the improvements have been installed then a written verification shall be required from the Northumberland County Conservation District that the erosion and sedimentation control measures have been implemented.
- 3.7.3.12** If any portion of a development project is in a floodplain area, then documentation shall be submitted indicating compliance with pertinent laws and regulations of the Township and Pennsylvania Department of Environmental Resources.
- 3.7.3.13** If any alteration or relocation of a watercourse is proposed, a copy of the DER permit shall be submitted.
- 3.7.3.14** If improvements are required in the development, then one of the following requirements shall be met:
 - 3.7.3.14.1** A written acknowledgement shall be obtained from the Township Engineer that the improvements have been inspected and installed in accord with the approved preliminary plan; or
 - 3.7.3.14.2** An improvements guarantee agreement shall be executed between the Township Supervisors, the developer, and a financial guarantee agent. The improvements guarantee agreement shall be in a form acceptable to the Township. Bonds, a irrevocable bank letter of credit, or an escrow account are generally acceptable types of improvements guarantees. See Section 2.4.

ARTICLE 4

Subdivision Design and Construction Standards

4.1 MINIMUM STANDARDS

- 4.1.1** The standards outlined in this section shall be applied by the Township in evaluating plans for proposed subdivisions. The standards outlined herein shall be considered to be minimum standards, and the Township may require more restrictive standards. Whenever municipal or other applicable regulations impose more restrictive standards, such other regulations shall control.
- 4.1.2** The location of the subdivision shall conform to the West Chillisquaque Comprehensive Plan, and the use of land in the subdivision shall conform to the West Chillisquaque Zoning Ordinance.

4.2 GENERAL STANDARDS

The following requirements and guiding principles for subdivision and land development shall be observed by all developers.

- 4.2.1 Land Suitability:** Land subject to flooding and all land deemed by the Township to be uninhabitable because of other hazards to life, health, or property, (such as improper drainage, steep slopes, rock formations or topography, or utility easements or rights-of-way) shall not be plotted for residential occupancy, nor for such other uses as may increase danger to health, life, or property, or aggravate the flood hazard; but such land within an area for which a subdivision plan is developed shall be set aside for such uses as will not be endangered by periods of occasional flooding or will not result in unsatisfactory living conditions.
- 4.2.2 Municipal Boundaries:** Lot lines shall, where possible, follow municipal and county boundary lines rather than cross them.

4.3 STREET CLASSIFICATION SYSTEM

4.3.1 Arterial Street

A street serving a large volume of comparatively high speed and long distance traffic, including all streets classified as arterial streets in the West Chillisquaque Township Comprehensive Plan. Route 147 is an example of an arterial street in West Chillisquaque Township.

4.3.2 Collector Street

A street which, in addition to providing access to abutting properties, intercepts minor streets to provide a route to arterial streets. Collector streets are so designated in the West Chillisquaque Township Comprehensive Plan. Route 45, Route 405, and Housels Run Road are examples of collector streets in West Chillisquaque Township.

4.3.3 Minor Street

Streets within subdivisions and developments, including marginal access streets and cul-de-sac streets, and streets which serve rural areas, which are designed to afford primary access to abutting property.

4.4 OWNERSHIP AND MAINTENANCE OF STREETS

4.4.1 The State Highway System includes all public streets and highways maintained by the Pennsylvania Department of Transportation.

4.4.2 The Township Road Network includes all public streets and roads maintained by the Township. A subdivider proposing dedication of streets or roads to the Township shall submit road plans and specifications that meet or exceed the minimum requirements of this ordinance. A deed of dedication shall be recorded with the final plan in all cases where roads are to be dedicated to the Township.

4.4.3 Private streets shall include all streets not dedicated or maintained as part of the State Highway System or the Township Road Network. Private streets, including internal streets serving mobile home parks, townhouse and multi family housing developments, commercial and industrial parks and recreational vehicle park and campground developments, may only be permitted under the following conditions:

4.4.3.1 The plan shall show a notation regarding the private nature of the street and right-of-way.

4.4.3.2 Private streets shall be constructed in accord with the **design** standards of Section 4.5 and the **construction** standards of Section 4.7.

4.4.3.3 The subdivider shall provide for inclusion in the deed or lease a Maintenance and Use Agreement indicating maintenance responsibilities for the private street. Both the responsibilities of the buyer or lessee and the subdivider shall be indicated.

4.4.3.4 In the event that the access to a proposed subdivision or development is along an existing private right-of-way, the subdivider shall furnish a Maintenance and Use Agreement for both the existing right-of-way users and the proposed users of the contemplated development. This agreement shall be recorded with the final plan and shall describe right-of-way width and location and maintenance responsibilities of all the parties involved.

4.5 STREET DESIGN STANDARDS

4.5.1 Minimum Street, Curb, and Sidewalk Design Standards

Minimum design standards are found in Table 4-1. Exceptions to the standards and details covering unique situations are included below.

Table 4-1**Minimum Street, Curb, and Sidewalk Design Standards¹**

<i>Specification</i>	<i>Standard</i>
MINOR STREET	
Right-of-way Width	50 ft.
Cartway Width	20 ft. + 8 ft. shoulder each side
Cul-de-sac Turn Around Right-of-way Radius Cartway Radius	50 ft. 40 ft.
Grade: Minimum Maximum	0.5 % 12 %
Sight Distance	200 ft. measured along the centerline
Centerline Radius for Horizontal Curves	150 ft.
Tangent Between Reverse Curves	none required
Sidewalk Width	5 ft.
Curb Width	8" at base tapering along the cartway side to 7"
COLLECTOR STREET	
Right-of-way Width	60 ft.
Width Cartway	24 ft. + 8 ft. shoulder each side
Grade: Minimum Maximum	0.5 % 7 %
Sight Distance	400 ft. measured along the centerline
Centerline Radius for Horizontal Curves	300 ft.
Tangent Between Reverse Curves	100 ft.
Sidewalk Width	5 ft.
Curb Width	8" at base tapering along the cartway side to 7"
RV PARK/CAMPGROUND STREET	
Width Cartway	16 ft.

¹The Township may require curbs, sidewalks, and increased cartway widths for higher density development and commercial development and/or for stormwater control measures.

4.5.2 Right-of-Way

- 4.5.2.1** Where a subdivision or development abuts or contains an existing street of inadequate right-of-way width, additional or future right-of-way width may be required in accord with Table 4-1. However, if the development abuts only one side of the road the subdivider shall be required to provide only one-half of the additional right-of-way, if required.
- 4.5.2.2** Where a subdivision or development abuts or contains an existing street or road on the state highway system, the Pennsylvania Department of Transportation shall make a recommendation concerning necessary additional right-of-way width of the state road and minimum building setback from the state road. Any additional right-of-way width required to correct existing problems or to allow necessary improvements shall be reserved on the plan but dedication of this additional right-of-way will not be required for plan approval. Building setback lines shall be measured from this required ultimate street right-of-way line.
- 4.5.2.3** Additional street right-of-way may be required by the Township for public safety and convenience, for acceleration or deceleration lanes into parking lots or streets, and in high density residential developments.

4.5.3 Cul-De-Sac Streets

- 4.5.3.1** Cul-de-sac streets permanently designed as such shall be provided with a turnaround in accord with Table 4-1. They shall not exceed 1200 feet in length or provide access to more than 20 dwelling units. In instances where the Township agrees to modify either of these requirements due to terrain conditions, an intermediate turnaround with a center island to guide traffic may be required.
- 4.5.3.2** A temporary all weather turnaround shall be provided for all dead end streets that provide access to future development on adjacent tracts of land. This turnaround shall as a minimum be constructed in accord with the subbase and base specifications for a local street.
- 4.5.3.3** Innovative alternatives to the standard circular turnaround may be permitted by the Township where equivalent area for a turnaround in accord with Table 4-1 is provided. The use of an innovative alternative may jeopardize the eligibility for PennDOT Liquid Fuels Tax reimbursement for the cul-de-sac street.

4.5.4 Street System Layout

- 4.5.4.1** Streets shall be laid out to conform as much as possible to the topography, to permit efficient drainage and utility systems, and to require the minimum number of streets necessary to provide convenient and safe access to property.
- 4.5.4.2** Minor streets shall be laid out to discourage through traffic, although provisions for street connections into and from adjacent areas will generally be required.

4.5.4.3 Alleys shall not be permitted in residential subdivisions.

4.5.4.4 If the lots in a development are large enough for re-subdivision, or if a portion of the tract is not subdivided, adequate street right-of-way to permit further subdivision shall be provided as necessary.

4.5.4.5 Where a subdivision or land development abuts a major collector or arterial street, the Township may require an internal street system, marginal access street, rear service street, reverse frontage lots, or such other treatment as will provide protection for abutting properties, reduction in the number of intersections and driveways with the major or arterial street, and separation of local and through traffic. Direct driveway access to SR 0045 and SR 0147 shall be prohibited.

4.5.4.6 Proposed streets shall conform to the Official Map of the Township, if such a map has been adopted in accord with Article IV of Act No. 170 of 1988, as amended.

4.5.5 Street Intersections

4.5.5.1 Minor and collector streets shall not intersect with collector and arterial streets at intervals of less than 800 feet as measured between their centerline.

4.5.5.2 Streets entering opposite sides of another street shall be laid out either directly opposite one another or with a minimum offset of 150 feet as measured between their centerline.

4.5.5.3 Intersections involving the junction of more than two streets shall be prohibited.

4.5.5.4 Streets shall be laid out to intersect as nearly as possible at right angles. No minor street shall intersect another at an angle of less than sixty (60) degrees. This standard shall be increased to seventy five (75) degrees for the intersection of a minor street with either a collector street or with a street on the State Highway System.

4.5.5.5 Minimum curb radius at the intersection of two minor streets shall be at least twenty (20) feet; and minimum curve radius at an intersection of a minor street and a collector or arterial street shall be at least twenty-five (25) feet.

4.5.5.6 Clear site triangles shall be maintained in accord with the schedule below for the different street classifications, and as measured along the centerline from the point of intersection. No significant obstructions or plantings higher than thirty (30) inches above the road surface or tree limbs lower than eight (8) feet shall be permitted within this area.

	<u>Arterial</u>	<u>Collector</u>	<u>Minor</u>
Arterial	150 feet	100 feet	100 feet
Collector	100 feet	75 feet	75 feet
Minor	100 feet	75 feet	75 feet

4.5.6 Street Grades and Alignments

4.5.6.1 All streets shall be provided with a leveling area having a grade of four (4) percent or less for a distance of 25 feet measured from the edge of the shoulder or curb of the intersecting street.

4.5.6.2 Vertical curves shall be required at changes of grade exceeding one (1) percent.

4.5.6.3 Whenever street lines are deflected in excess of five (5) degrees, connection shall be made by horizontal curves.

4.5.6.4 The grade of a street cross section measured from the crown shall be within the limits of 1/4 inch to 3/8 inch per foot. Shoulder cross-slopes shall be 3/4 inch per foot.

4.6 DRIVEWAY DESIGN STANDARDS

4.6.1 Proposed lots or land developments shall be laid out in relation to public and private streets so that safe driveway access can be provided in accord with Table 4-2.

4.6.2 Plans for proposed lots or land developments requiring access to the State Highway System shall contain a notice that a highway occupancy permit is required pursuant to Section 420 of the Act of June 1, 1945 (P.L. 1242, No. 428), known as the "State Highway Law," before driveway access to the state highway is permitted.

4.7 STREET CONSTRUCTION STANDARDS

4.7.1 New Streets

Streets shall be built in accord with the subdivision plan approved by the township. The construction standards of Table 4-3 shall govern unless the township requires more stringent standards due to adverse soils or other conditions.

4.7.2 Existing Private Street

Existing private streets shall be upgraded to the standards of the subdivision ordinance (including Tables 4-1 and 4-3) when being utilized as access to a proposed subdivision or land development.

4.7.3 Road Shoulders

Road shoulders, if required, shall be constructed of either 2A "subbase" or 2RC material in accord with PennDOT 408 specifications. This material shall be compacted to the depth of the road base and wearing surface combined and shall have a cross slope in accord with Section 4.5.6.4.

Table 4-2

Driveway Design Standards

<i>Standard</i>	<i>Driveway Type</i>		
	Single Family Residential	Multi-Family Residential	Commercial/ Industrial
Minimum Width	10 ft.	15 ft.	15 ft.
Maximum Width	20 ft.	35 ft.	35 ft.
Maximum Grade ²	15 %	12 %	8 %
Minimum Curb Radius ³	10 ft.	15 ft.	15 ft.
Minimum Intervals ⁴	40 ft.	40 ft.	40 ft.
Minimum Sight Distance ⁵	150 ft.	200 ft.	300 ft.

² All driveways shall maintain the grade of the road shoulder and provide a leveling area with a grade of 5 % or less for a 25 ft. distance measured from the curb or the outside edge of the shoulder. The driveway shall intersect the street at an angle of not less than 60 degrees.

³ Where drop curbs are used for driveway openings, the minimum drop curb width for single family residential shall be 20 feet. For multi-family and nonresidential uses the minimum width shall be 35 feet.

⁴ The minimum interval for single family residential development shall apply only between an intersection and the first driveway removed from the intersection. In the case of multi-family and nonresidential driveways the minimum interval shall apply between all driveways and street intersections.

⁵ The minimum sight distance shall be measured from the point of intersection of the driveways centerline and street right-of-way line to a point on the cartway centerline. No significant obstructions or plantings higher than 30 inches or tree limbs lower than eight (8) feet as measured from the road surface shall be permitted within this area.

Table 4-3
Street, Curb, and Sidewalk Construction Standards⁶⁷⁸

<i>Street Type</i>	<i>Course⁹</i>	<i>Type of Material</i>	<i>Depth of Material¹⁰</i>
Collector	Wearing Surface	ID-2A	2½"
	Base	Bit. Concrete, Dense Grade or Crushed Aggregate	4"
	Subbase	2A Subbase	6"
Minor Street	Wearing Surface	ID-2A	1½"
	Base	Bit. Concrete Base Course	4"
	Temporary Wearing Surface	Dust Oil and Double Seal Coat Using 1B Stones	
	Subbase	2A Subbase	6"
RV Park/ Campground	Wearing Surface	-	-
	Base	2A, 2C	4"
	Subbase	Shale	6"
Sidewalks	Wearing Surface	Concrete/ Brick/ ID-2A	4"
	Base	Crushed Aggregate	4"
Curbs	Material	Concrete	18"

⁶All materials and their application shall conform with Penndot, Form 408.

⁷See Section 4.7.3. for shoulder specifications.

⁸Where poor soil conditions exist, additional subbase and base materials may be required.

⁹The subbase course shall extend 6" in width beyond the finished wearing surface width.

¹⁰All materials shall be compacted with a minimum of a ten ton roller.

4.8 SIDEWALKS, CURBS, AND STREET TREES

- 4.8.1** Sidewalks and/or curbs, if required, shall be constructed of portland cement concrete, equal to, or higher in quality, than Class A concrete, in accord with Table 4-3 and PennDOT Form 408 specifications, as amended. Sidewalks may also be constructed with a wearing surface of brick or ID-2A material. Compliance with the Township's Curb and Sidewalk Ordinance, if any, shall also be required.
- 4.8.2** Sidewalks shall be installed in subdivisions where two-family dwellings, townhouses, or multiple family dwellings are planned, or where lot widths are less than eighty (80) feet or where the subdivision abuts areas which have existing sidewalks. Sidewalks may also be required to provide access to community facilities such as schools, shopping centers, or recreation areas if the Planning Commission deems that a hazard would exist without them.
- 4.8.3** Whenever sidewalks are constructed or repaired, provisions shall be made to facilitate handicapped accessibility.
- 4.8.4** No trees or shrubs shall be permitted in the street right-of-way.

4.9 BLOCKS

- 4.9.1** Blocks shall be a maximum of 1,600 feet in length, although the township may grant a waiver to this requirement in the event of unusual topographic conditions.
- 4.9.2** Blocks shall have sufficient widths to provide for two (2) tiers of lots of appropriate depths. Exceptions to this prescribed block width shall be permitted in blocks adjacent to arterial streets, railroads, or waterways.
- 4.9.3** In large blocks with interior parks or playgrounds, in exceptionally long blocks where access to a school, shopping center, or to any other facility is necessary, or where cross streets are impractical or unnecessary, a crosswalk with a minimum right-of-way of twelve (12) feet with a minimum surfaced width of five (5) feet may be required by the Planning Commission.

4.10 FLAG LOT

May be allowed where warranted by physical conditions of land form, relative isolation of the lot, existing lot pattern or unusual size or shape of parcels. A flag lot shall only be considered in accord with the Waiver or Modification procedures of this ordinance (Section 1.7.1) and in accord with the following criteria:

- 4.10.1** The narrow strip of land known as the "flag pole" portion of the lot which provides the connection between the lot and the public street shall be a minimum of 20 ft. in width;
- 4.10.2** The "flag pole" portion of the lot shall be platted with the lot;
- 4.10.3** The lot area standards for the flag lot shall be the same as for the zoning district in which the lot is to be situated, except that the "flag pole" portion of the lot shall not be included for the

purpose of calculating the minimum lot area;

4.10.4 The "flag pole" access to the lot shall be improved to a mud free and passable condition based upon a minimum construction specification including: width - 12 ft.; subbase course - 6" of shale; base course - 4" of 2A or 2RC. The specification shall also be indicated on the subdivision plan for the flag lot. The "flag pole" shall not cross a live stream, ravine, ditch, or similar topographic feature without provision of an adequate structure or fill and culvert, according to standards established by the township.

4.11 LOT SIZE AND BUILDING SETBACK LINES

Minimum lot sizes and building setback lines for the township are found in the township zoning code. Dimensional requirements for special types of land development are also found in Article 6 of this Ordinance.

4.12 MONUMENTS

Monuments shall be solid steel, copper, or brass bars at least 30" x 1/2" diameter and shall be set at all newly established points where lines or lines and curves intersect. Survey caps and underground magnetic markers may also be utilized in conjunction with bars used for monuments.

In subdivisions of 10 lots or greater, a minimum of two permanent reference monuments shall be established in the external boundary of the subdivision where the bar is set in concrete at least 6" x 6" x 30".

4.13 EASEMENTS

4.13.1 Utility Easements

The width and location of utility easements shall be as specified by the particular utility company. To the maximum extent possible easements shall be centered on or located adjacent to side or rear property lines or adjacent to the street right-of-way in the front yard. If feasible, utility easements may also be located within the street right-of-way.

4.13.2 Drainage Easements

Where a subdivision or land development is traversed by a water course, drainage way, channel, or stream, there shall be provided a drainage easement conforming substantially with the line of such watercourse, drainage way, channel, or stream and of such width as will be adequate to preserve the unimpeded flow of natural drainage without damaging adjacent property.

Drainage easements shall also be provided for the maintenance and protection of storm sewers and other storm water management facilities. Easements shall permit necessary public or private channel maintenance or improvement work and access of equipment, and shall prohibit buildings or other permanent structures. Maintenance responsibilities for private easements shall be provided in accord with Section 2.4.4.3. of this ordinance.

4.14 UTILITIES

Utilities including electric, telephone, and cable television shall be installed underground in accord with the PA Underground Utilities Act No. 287 of 1974. Underground utilities are not required for any of the following situations:

- 4.14.1** For a residential subdivision of less than five (5) lots bordering an existing street which is presently served by overhead utility service;
- 4.14.2** For service to a commercial or industrial development;
- 4.14.3** For a project where a variance under Act 287 has been granted by the Pennsylvania Public Utility Commission.

4.15 SEWAGE FACILITIES

4.15.1 Sewage Disposal Method

Subdivisions shall be connected to a public sewer system in accord with the requirements of the Township Municipal Authority and the Pennsylvania Department of Environmental Resources unless connection is not feasible. The Township may permit the following alternatives listed in order of preference:

- 4.15.1.1** Connection to a private sewer system designed and constructed by the developer in accord with the requirements of the Pennsylvania Department of Environmental Resources.
- 4.15.1.2** Utilization of on lot sewage disposal facilities in accord with the requirements of the Pennsylvania Department of Environmental Resources.

4.15.2 Sewage Planning Requirements

The developer shall submit documentation with the preliminary plan application that verifies Township Municipal Authority or Township Sewage Enforcement Officer approval of the proposed sewage disposal method. Additional documentation shall be provided that verifies Pennsylvania Department of Environmental Resources approval.

4.15.2.1 10 Lots or Less Utilizing On-Lot Facilities

Copies of the approved sewage disposal permits for each lot shall be provided. As an alternative, disposal permits may not be required for every lot, provided that the developer shall submit a Pennsylvania Department of Environmental Resources Component I - Planning Module signed by the Sewage Enforcement Officer which states that the soils for the subdivision are generally suitable for on-lot facilities.

4.15.2.2 More Than 10 Lots Utilizing On-Lot Facilities, Private Sewer System, or Sewer Extension of a Public Sewer System

A copy of the approved Pennsylvania Department of Environmental Resources Planning Module for a Revision or Supplement shall be provided.

4.15.2.3 Subdivision Not Approved For On-Lot Sewage Disposal

The Township may elect to grant subdivision approval without approved on-lot sewage facilities provided the following notation is prominently affixed to the plan:

"Lot #___ is not approved for on-lot sewage disposal. Subdivision plan approval does not guarantee that a permit for on-lot disposal can be obtained. No building or zoning permit for a structure or use requiring sewage facilities shall be issued by the Township for this lot until an on-lot sewage disposal permit has been obtained."

4.15.3 General Requirements

4.15.3.1 The Township may require the installation of capped sewers if the proposed subdivision or land development is located in an area which will be served by public sewers within five (5) years.

4.15.3.2 If the proposed subdivision lies within one thousand (1,000) feet of an existing public sewer, the sewer must be extended to serve the subdivision at the expense of the developer.

4.16 WATER SUPPLY

4.16.1 Public Water Supply

The subdivision or land development shall be connected to a public water supply company unless the developer provides documentation that such a connection is not feasible. The Township may require that the developer provide a cost feasibility study prepared by a licensed professional engineer as part of the documentation.

4.16.2 On-Lot Water Supply

In the event that the water supply to a proposed subdivision or land development is proposed via individual on-lot wells and where known groundwater problems exist, the Township may require that the developer provide a feasibility study by a licensed professional engineer or hydrogeologist to evaluate the adequacy of water quality and quantity for the proposed development. Prior to subdivision plan approval the developer shall demonstrate that adequate, safe, and reliable water supply exists for the proposed development in accord with the standards of the Safe Water Drinking Act.

4.16.3 Documentation of Available Water Supply

If water is to be provided by means other than private wells owned and maintained by the individual owners of lots within the subdivision or development, applicants shall present evidence to the township that the subdivision or development is to be supplied by a certificated public utility, a bona fide cooperative association of lot owners, or by a municipal corporation, authority or utility. A copy of a Certificate of Public Convenience from the Pennsylvania Public Utility Commission or an application for such certificate, a cooperative agreement, or a commitment or agreement to serve the area in question, whichever is appropriate, shall be acceptable evidence.

4.17 STORM WATER MANAGEMENT

4.17.1 Applicability - This Ordinance shall apply in all watersheds within West Chillisquaque Township and shall only apply to permanent stormwater management facilities constructed as part of any regulated activities listed in this Section. This Ordinance contains only the stormwater management performance standards and design criteria that are necessary or desirable from a watershed-wide perspective.

The following activities are defined as “Regulated Activities” and shall be regulated by this Ordinance:

- 4.17.1.1** Land development.
- 4.17.1.2** Subdivision.
- 4.17.1.3** Construction of new or additional impervious or semi-pervious surfaces (driveways, parking lots, etc.).
- 4.17.1.4** Construction of new buildings or additions to existing buildings.
- 4.17.1.5** Diversion or piping of any natural or man-made stream channel.
- 4.17.1.6** Installation of stormwater management facilities or appurtenances thereto.

4.17.2 Exceptions

- 4.17.2.1** Any Regulated Activity on parcels generating less than 5,000 square feet of total impervious area may be granted an exemption from the provisions of this Ordinance. This criterion shall apply to the total development even if development is to take place in phases. The date of this Ordinance adoption shall be the starting point from which to consider tracts as “parent tracts” in which future subdivisions and respective impervious area computations shall be cumulatively considered. Exemptions shall be at discretion of Municipal Engineer upon review of site conditions, topography, soils and other factors as deemed appropriate.

4.17.2.2 Prior to the granting of an exemption, the Applicant must provide documentation that the increased flows from the site leaves the site in the same manner as the pre-development condition, and that there will be no adverse affects to properties along the path of flow(s), or that the increased flow(s) will reach a natural watercourse or an existing stormwater management structure before adversely affecting any property along the path of the flow(s). This documentation must include a signed statement by the landowner indicating the total impervious area constructed since the date of adoption of this Ordinance.

4.17.2.3 No exemption shall be provided for Regulated Activities as defined in Section 4.17.1.5 and 4.17.1.6 of this Ordinance.

4.17.3 General Requirements -The management of stormwater on the site, both during and upon the completion of construction, and the design of any temporary or permanent facilities or structures and the utilization of a natural drainage system shall be in full compliance with this section.

4.17.3.1 Site designs shall minimize impervious surfaces and shall promote the infiltration of runoff through seepage beds, infiltration trenches, etc. where soil conditions permit to reduce the size or eliminate the need for detention facilities.

4.17.3.2 Stormwater runoff generated from development discharged directly into a wetland or other waters of the Commonwealth shall be done in accordance with Federal and State regulatory requirements and shall be adequately treated to prevent degradation.

4.17.3.3 Annual groundwater recharge rates shall be maintained by promoting infiltration. At a minimum annual recharge from the post development site shall mimic the annual recharge from the pre-development site conditions.

4.17.3.4 Applicants may select runoff control techniques, or a combination of techniques, which are most suitable to control stormwater runoff from the development site. West Chillisquaque Township encourages applicants to consider alternative solutions, including Best Management Practices (BMP's) for stormwater management. Applicants are urged to consult the Pennsylvania Best Management Practices Manual and with the Municipal Engineer and the County Conservation District. All stormwater designs are subject to the approval of the Municipal Engineer. The Township may request specific information on design and/or operating features of the proposed stormwater controls in order to determine their suitability and adequacy in terms of the standards of this Ordinance.

- 4.17.3.5** All stormwater management facilities including detention basins, BMP's, sewers, and culverts shall be designed by an individual qualified and/or experienced in their design. These qualifications should be listed on the front cover of the plan narrative.
- 4.17.3.6** The anticipated peak rate of stormwater runoff from the site during and after full development shall comply with Section 4.17.7, measured in accordance with the standards and criteria of this Ordinance.
- 4.17.3.7** Roof drains shall not be connected to streets, sanitary sewers or roadside ditches but shall be allowed to drain to the land surface to promote overland flow and infiltration of stormwater, to the fullest extent possible.
- 4.17.3.8** Existing points of concentrated drainage that discharge onto adjacent property shall not be altered without permission of the affected property owner(s) and shall be subject to any applicable discharge criteria specified in this Ordinance.
- 4.17.3.9** If existing diffused stormwater flow is proposed to be concentrated the applicant must document that adequate downstream conveyance facilities exist to safely transport the concentrated discharge, or otherwise prove that no erosion, sedimentation, flooding or other harm will result from concentrated discharge.
- 4.17.3.10** Storm sewers, swales, culverts, bridges, and related facilities shall be provided to:
- (a) Permit the unimpeded flow of natural watercourses;
 - (b) Insure the drainage of all points along the line of streets;
 - (c) Intercept stormwater runoff along streets at reasonable intervals related to the extent and grade of the area drained, and to prevent the flooding of intersections and the undue concentration of storm water;
 - (d) Insure unrestricted flow of stormwater under driveways, and at natural watercourses or drainage swales.; and
 - (e) Consideration should be given to anticipated up slope development.
- 4.17.3.11** All natural streams, channels, swales, drainage systems and/or areas of surface water concentration shall be maintained in their existing conditions unless an alteration is approved by the Township due to topographic conditions.

- 4.17.3.12** Easements shall be provided conforming to the line of all natural streams, channels, swales, and drainage systems and other stormwater infrastructure installed to comply with this Ordinance. The terms of such easements shall prohibit excavation, the placement of fill or structures and any other alterations, including the growth of stiff or woody vegetation that may adversely affect the flow of stormwater.
- 4.17.3.13** All stream encroachment activities, including work in and adjacent to waters of the Commonwealth or wetlands, shall comply with applicable PA DEP requirements.
- 4.17.3.14** Any stormwater facility located on a state highway right-of-way shall be subject to the approval of the Pennsylvania Department of Transportation and any facility located on a Township road or street right-of-way shall be subject to the approval of the Township.
- 4.17.3.15** Applicants are encouraged to incorporate designs to take advantage of the stormwater credits presented in Appendix C of this Ordinance.
- 4.17.3.16** Off-site areas that drain through a proposed development site are not subject to release rate criteria when determining allowable peak runoff rates; however, on-site drainage facilities shall be designed to safely convey off-site flows through the development site.
- 4.17.3.17** The design of all stormwater management facilities shall incorporate sound engineering principles and practices. The Township shall reserve the right to disapprove any design that would result in the occupancy or continuation of an adverse hydrologic or hydraulic condition.

4.17.4 Water Quality Requirements

- 4.17.4.1** **For water quality, the objective is to provide adequate storage to capture and treat the runoff from 90% of the average annual rainfall in accordance with the following where P represents the depth of rain associated with 90% of the total rainfall events over 0.11 inches.**

- (a) The size of the water quality facility shall be based upon the following equation:

$$WQ_v = \frac{(1.2)(R_v)(A)}{12} \quad P = 1.2 \text{ inches of rainfall}$$

Where: WQ_v = water quality volume (in ac-ft)

R_v = $0.05 + 0.009(I)$ where I is percent impervious cover

A = area in acres*

*Treatment of the Water Quality Volume (WQ_v) for offsite areas and areas not disturbed is not required.

- (b) Treatment of the WQ_v shall be provided at all developments where stormwater management is required, in accordance with Section 4.171.1 through 4.17.1.4 of this Ordinance. A minimum WQ_v of 0.2 inches per acre shall be met at sites or in drainage areas that have less than 15% impervious cover.
- (c) The WQ_v shall be based on the impervious cover for the proposed site. Offsite existing impervious areas may be excluded from the calculation of the water quality volume requirements.
- (d) When a project contains or is divided by multiple drainage areas, the WQ_v shall be addressed for each drainage area.
- (e) Drainage areas having no impervious cover and no proposed disturbance during development may be excluded from the WQ_v calculations. Designers are encouraged to use these areas as non-structural practices for WQ_v treatment.
- (f) Where structural practices for treating the Recharge Volume (Re_v) are employed upstream of a BMP, the Re_v may be subtracted from the WQ_v used for design.
- (g) Where non-structural practices are employed in the site design, the WQ_v can be reduced in accordance with the conditions outlined in Appendix C of this Ordinance.
- (h) The design of the facility shall consider and minimize the chances of clogging and sedimentation potential. Orifices smaller than three (3) inches diameter are not recommended. However, if the Design Engineer can provide proof that the smaller orifices are protected from clogging by use of trash racks, etc. smaller orifices may be permitted.

- (i) When designing flow splitters for off-line practices, consult the small storm hydrology method provided in Appendix D of this Ordinance.

4.17.4.2 To accomplish adequate water quality treatment the final WQ_v shall be treated by an acceptable BMP from the list presented in Appendix E or an equivalent practice approved by the Municipal Engineer. The applicant may submit original and innovative designs to the Municipal Engineer for review and approval. Such designs may achieve the water quality objectives through a combination of BMPs.

4.17.4.3 The water quality requirement can be met by providing a minimum 24-hour to maximum 48-hour draw down of a portion of the WQ_v in conjunction with a stormwater pond or wetland system. Referred to as extended detention (ED), this is different than providing the extended detention of the one-year storm for the Channel Protection Volume (Cp_v). The ED portion of the WQ_v may be included when routing the Cp_v .

4.17.4.4 In selecting the appropriate BMPs or combinations thereof, the applicant shall consider the following:

- (a) Permeability and infiltration rate of the site soils.
- (b) Slope and topography.
- (c) Seasonal high water table.
- (d) Depth to bedrock.
- (e) Proximity to building foundations and wellheads.
- (f) Erodibility of soils.
- (g) Subgrade stability and susceptibility to sinkhole formation.
- (h) Land availability and configuration of the topography.
- (i) Peak discharge and required volume control.
- (j) Stream bank erosion.
- (k) Efficiency of the BMPs to mitigate potential water quality problems.
- (l) The volume of runoff that will be effectively treated.
- (m) The nature of pollutants being removed.
- (n) Creation and protection of wildlife habitat.
- (o) Enhancement of aesthetic and property value.
- (p) Maintenance requirements.

4.17.4.5 Stormwater Hotspots - If a site is designated as a stormwater hotspot as per Section 4.17.4.5.5 it has important implications for how stormwater is managed.

4.17.4.5.1 A greater level of stormwater treatment is required at hotspot sites to prevent pollutant wash off after construction.

- 4.17.4.5.2** For areas designated as hotspots a Stormwater Pollution Prevention Plan may be required to be designed and implemented that contains operation practices at the site to reduce the generation of pollutants by preventing contact with rainfall.
- 4.17.4.5.3** Stormwater Pollution Prevention Plans shall follow the requirements of the U.S. EPA NPDES stormwater program.
- 4.17.4.5.4** The following land uses and activities are not normally considered hotspots: residential streets and rural highways, residential development, institutional development, commercial and office developments, non-industrial rooftops, pervious areas except for golf courses and nurseries. Large highways are not designated as hotspots although it is important to ensure that stormwater plans for these facilities adequately protect groundwater.
- 4.17.4.5.5 Stormwater Hotspots:**
- (a) Vehicle Salvage Yards and Recycling Facilities*
 - (b) Vehicle Service and Maintenance Facilities
 - (c) Vehicle and Equipment Cleaning Facilities*
 - (d) Fleet Storage Areas (bus, truck, etc)*
 - (e) Retail gasoline outlets
 - (f) Industrial Sites
 - (g) Marinas (service and maintenance)*
 - (h) Outdoor Liquid Container Storage
 - (i) Outdoor Loading/Unloading Facilities
 - (j) Public Works Storage Areas
 - (k) Facilities that Generate or Store Hazardous Materials*
 - (l) Commercial Container Nursery
 - (m) Golf Courses
 - (n) Other land uses and activities as designated.

*Stormwater Pollution Plan implementation may be required for these land uses or activities under the U.S. EPA NPDES stormwater program.

4.17.5 Groundwater Recharge Requirements

- 4.17.5.1** Design of the infiltration/recharge stormwater management facilities shall give consideration to providing groundwater recharge to compensate for the reduction in the percolation that occurs when the ground surface is paved and roofed over. These measures are encouraged, particularly in hydrologic soil groups A and B and shall be utilized wherever feasible.
- 4.17.5.2** The criteria for maintaining recharge is based on the USDA average annual recharge volume per soil type divided by the annual rainfall in Northumberland County (40 inches per year) and multiplied by 90%. This keeps the recharge calculation consistent with the WQ_v methodology. Thus,

an annual Recharge Volume (Re_v) requirement shall be specified for a site as follows:

(a) Percent Volume Method

$$Re_v = [(S)(R_v)(A)]/12$$

Where: $R_v = 0.05 + 0.009(I)$
where I is percent impervious cover
A = site area in acres

(b) Percent Area Method

$$Re_v = (S)(A_i)$$

Where: A_i = the measured impervious cover

<u>Hydrologic Soil Group</u>	<u>Soil Specific Recharge Factor (S)</u>
A	0.40
B	0.27
C	0.14
D	0.07

- (c) The recharge volume is considered part of the total WQ_v that must be provided at a site and can be achieved either by a structural practice (e.g., infiltration, bioretention), a non-structural practice (e.g., buffers, disconnection of rooftops), or a combination of both.
- (d) Drainage areas having no impervious cover and no proposed disturbance during development may be excluded from the Re_v calculations. Designers are encouraged to use these areas as non-structural practices for Re_v treatment.
- (e) The Re_v and WQ_v are inclusive. When treated separately, the Re_v may be subtracted from the WQ_v when sizing the water quality BMP.
- (f) Recharge/infiltration facilities may be used in conjunction with other innovative or traditional BMPs, stormwater control facilities, and nonstructural stormwater management alternatives.

4.17.5.3 Basis for Determining Recharge Volume

- 4.17.5.3.1 If more than one Hydrologic Soil Group (HSG) is present at a site, a composite soil specific recharge factor shall be computed based on the proportion of total site area within each HSG. **The recharge volume provided at the site shall be directed to the most permeable HSG available.**

- 4.17.5.3.2** The “percent volume” method is used to determine the Re_v treatment requirement when structural practices are used to provide recharge. These practices must provide seepage into the ground and may include infiltration and exfiltration structures (e.g., infiltration, bioretention, dry swales or sand filters with storage below the under drain). Structures that require impermeable liners, intercept groundwater, or are designed for trapping sediment (e.g., forebays) may not be used. In this method, the volume of runoff treated by structural practices shall meet or exceed the computed recharge volume.
- 4.17.5.3.3** **The “percent area” method is used to determine the Re_v treatment requirements when non-structural practices are used.** Under this method, the recharge requirements are evaluated by mapping the percent of impervious area that is effectively treated by an acceptable non-structural practice and comparing it to the minimum recharge requirements.
- 4.17.5.3.4** Acceptable non-structural practices are those identified in Appendix C and include filter strips that treat rooftop or parking lot runoff, sheet flow discharge to stream buffers, grass channels that treat roadway runoff, and conservation design.
- 4.17.5.3.5** The recharge volume criterion does not apply to any portion of a site designated as a stormwater hotspot or any project considered as redevelopment. In addition, the Municipal Engineer may alter or eliminate the recharge volume requirement if the site is situated on unsuitable soils (e.g. marine clays), karst or in an urban redevelopment area. In this situation, non-structural practices (percent area method) shall be implemented to the maximum extent practicable and the remaining or untreated Re_v included in the WQ_v treatment.
- 4.17.5.3.6** If Re_v is treated by structural or non-structural practices separate and upstream of the WQ_v treatment, the WQ_v is adjusted accordingly.

4.17.5.4 Soils Evaluation

- 4.17.5.4.1 A detailed soils evaluation of the project site shall be performed to determine the suitability of recharge facilities.** The evaluation shall be performed by a qualified professional, and at a minimum, address soil permeability, depth to bedrock, susceptibility to sinkhole formation, and subgrade stability. Advanced testing methods such as the double-ring infiltrometer test are encouraged. The municipal engineer reserves the right to require additional soils evaluation when it is believed that test results are not reasonable.

4.17.5.4.2 **Extreme caution shall be exercised where infiltration is proposed in geologically susceptible areas such as strip mine or limestone areas.** Extreme caution shall also be exercised where salt or chloride would be a pollutant since soils do little to filter this pollutant and it may contaminate the groundwater. It is also extremely important that the design professional evaluates the possibility of groundwater contamination from the proposed infiltration/recharge facility and recommends a hydrogeologic justification study be performed if necessary. Whenever a basin will be located in an area underlain by limestone, a geological evaluation of the proposed location may be required to determine susceptibility to sinkhole formations. The design of all facilities over limestone formations shall include measures to prevent ground water contamination and, where necessary, sinkhole formation.

4.17.5.4.3 The Township may require the installation of an impermeable liner in detention basins underlain by limestone or in areas of karst topography. The Township may require a detailed hydrogeologic investigation. The developer may also be required to provide safeguards against groundwater contamination for uses that may cause groundwater contamination, should there be an accident or spill.

4.17.5.5 All recharge/infiltration facilities shall be designed to completely drain within 72 hours of reaching maximum capacity.

4.17.6 Channel Protection Storage Volume (Stream Bank Erosion)

4.17.6.1 Stream Channel Protection shall be considered in implementing the standards of Section 4.17.7 of this Ordinance. If a stormwater storage facility needs to be constructed then, to protect channels from erosion, the outflow structure shall be designed to provide **minimum 24 hour to maximum 48 hour extended detention of the one-year; 24-hour storm event**. The method for determining the Cp_v requirement is detailed in Appendix L of this Ordinance.

4.17.6.2 Basis for Determining Channel Protection Storage Volume

4.17.6.2.1 The models HEC-HMS, TR-55 and TR-20 (or an equivalent approved by the Municipal Engineer) shall be used for determining peak discharge rates.

4.17.6.2.2 The rainfall depth for the one-year 24-hour storm event in Upper Northumberland County is 2.32 inches.

4.17.6.2.3 Off-site areas shall be modeled as present land use in good condition for the one (1) year storm event.

- 4.17.6.2.4** The length of overland flow used in time of concentration (t_c) calculations is limited to no more than 150 feet.
- 4.17.6.2.5** The Cp_v storage volume shall be computed using the detention lag time between hydrograph procedures outlined in Appendix L of this Ordinance. The detention lag time (T) for a one-year (1) storm is defined as the interval between the center of mass of the inflow hydrograph and the center of mass of the outflow hydrograph.
- 4.17.6.2.6** Cp_v is not required at sites where the one-year post development peak discharge (q_i) is less than or equal to 2.0 cfs. A Cp_v orifice diameter (d_o) of less than 3.0 inches is subject to approval by the Municipal Engineer and is not recommended unless an internal control for orifice protection is used.
- 4.17.6.2.7** Cp_v shall be addressed for the entire site. If a site consists of multiple drainage areas, Cp_v may be distributed proportionately to each drainage area.
- 4.17.6.2.8** Extended detention storage provided for the Cp_v does not meet the WQ_v requirement (i.e. Cp_v and WQ_v shall be treated separately).
- 4.17.6.2.9** The stormwater storage needed for the Cp_v may be provided above the WQ_v storage in stormwater ponds and wetlands; thereby meeting all storage criteria except Re_v in a single facility with appropriate hydraulic control structures for each storage requirement.
- 4.17.6.2.10** Infiltration is not recommended for Cp_v control because of large storage requirements.

4.17.7 Overbank and Extreme Event Flood Protection Requirements

For a site located within two or more districts the peak discharge rate from any sub-area shall be the pre-development peak discharge for that sub-area. The calculated peak discharges shall apply regardless of whether the grading plan changes the drainage area by sub-area. Pre-development and post-development runoff for specific sites shall be computed using an approved method as per Section 4.17.9.12 for the 2-, 10-, 25-, and 100-year storm.

- 4.17.7.1** **Chillisquaque Creek** - Reserved for performance standards to be determined by a Chillisquaque Creek Act 167 Plan. Until such time as an Act 167 Plan is duly adopted the post-development rate of runoff shall not exceed 50% of the pre-development rate of runoff for the 2-, 10-, 25-, and 100-year storm events.
- 4.17.7.2** **West Branch Susquehanna** - Reserved for performance standards to be determined by a West Branch Susquehanna Act 167 Plan. Until such time as an Act 167 Plan is duly adopted the post-development rate of runoff shall

not exceed 50% of the pre-development rate of runoff for the 2-, 10-, 25-, and 100-year storm events.

4.17.8 Design Considerations

- 4.17.8.1** All storm sewers and manmade channels (i.e. swales) shall be able to convey the post-development runoff from a 25-year design storm without surcharging inlets and shall be constructed using Penn DOT Form 408 Specifications, Standard Details unless otherwise directed by the Municipal Engineer. The minimum pipe size for storm piping shall be 15".
- 4.17.8.2** Conveyance facilities (e.g. swale, pipe, etc) draining to a stormwater control device (e.g. stormwater basin) shall have the capacity to convey the 100-year storm.
- 4.17.8.3** Stormwater roof drains shall not discharge into any municipal sanitary sewer line or over a sidewalk.
- 4.17.8.4** Inlets shall be placed at the curb line where a curbed section is installed. Inlets required for parallel or cross drainage without a curbed section shall be set at the centerline of the ditch.
- 4.17.8.5** Structures shall be Penn DOT Type M pre-cast concrete or cast-in-place Class A concrete. Brick or block structures shall not be permitted. Solid concrete block or brick may be incorporated into a structure only for grade adjustment of the casting.
- 4.17.8.6** All water obstructions (bridges, culverts, outfalls or stream enclosures) shall have ample waterway opening to carry expected flows, based on a minimum post development peak storm frequency of twenty-five (25) years without damage to the drainage structure or roadway.
- 4.17.8.7** Construction of water obstructions shall be in accordance with the Pennsylvania Department of Transportation specifications and shall meet the requirements of the Pennsylvania Department of Environmental Protection (PA DEP). Any work involving wetlands shall be designed in accordance with the specification of the PA DEP and United States Army Corps of Engineers.
- 4.17.8.8** Roadway crossings located within designated floodplain areas shall be able to convey runoff from a 100-year design storm.
- 4.17.8.9** Whenever the vegetation and topography are to be disturbed, such activity must be in conformance with Chapter 102, Title 25, Rules and Regulations, Part I, Commonwealth of Pennsylvania, Department of Environmental Protection, Subpart C, Protection of Natural Resources, Article II, Water Resources, Chapter 102, "Erosion Control," and in accordance with the Northumberland County Conservation District.

- 4.17.8.10** Any stormwater management facility designed to store runoff and requiring an earthen berm or embankment shall be designed to provide an emergency spillway to handle flow up to and including the 100-year post-development conditions. The height of the embankment must be set as to provide a minimum of one (1) foot of freeboard above the maximum pool elevation computed when the emergency spillway conveys for the peak 100-year post-development inflow.
- 4.17.8.11** Stormwater management facilities that require a dam safety permit under PA DEP Chapter 105 shall meet the applicable dam safety requirements that may require the facility to pass storms larger than the 100-year event.
- 4.17.8.12** Adequate erosion protection shall be provided along all open channels and at all points of discharge.
- 4.17.8.13** Additional erosion and sedimentation control design standards and criteria that must be or are recommended to be applied where infiltration BMPs are proposed shall include the following:
- 4.17.8.13.1** Areas proposed for infiltration BMPs shall be protected from sedimentation and compaction during the construction phase, so as to maintain their maximum infiltration capacity.
 - 4.17.8.13.2** Constructed infiltration BMPs shall be protected from receiving sediment-laden runoff.
- 4.17.8.14** Detention basins for stormwater peak discharge storage shall comply with the following criteria:
- 4.17.8.14.1** Basins shall be installed prior to any earthmoving or land disturbance that they will serve. The phasing of their construction shall be noted in a narrative and on the plan.
 - 4.17.8.14.2** Basins located in an area underlain by limestone may require a geologic evaluation of the proposed location to determine susceptibility to sinkhole formations. The design of all facilities over limestone formations shall include measures to prevent ground water contamination and, where necessary, sinkhole formation. The Township may require basins located over limestone to have an impermeable liner.
 - 4.17.8.14.3** Soils used for the construction of basins shall have low erodability factors ("K factors").
 - 4.17.8.14.4** Energy dissipators and/or level spreaders shall be installed at points where pipes or drainage ways discharge to or from basins.

Discharge from basins shall be into a natural waterway or drainage way.

- 4.17.8.14.5** Exterior slopes of compacted soil shall not exceed one foot (1') vertical per three feet (3') horizontal and may be further reduced in soils of unstable characteristics.
- 4.17.8.14.6** Interior slopes of the basin shall not exceed one foot (1') vertical per three feet (3') horizontal except with the approval of the Municipal Engineer. Where concrete, stone, or brick walls are used for steeper interior slopes, the basin shall be fenced with a permanent wire fence at least forty-two inches (42") in height and a ramp of durable, non-slip materials for maintenance vehicles shall be provided for basin access.
- 4.17.8.14.7** Outlet structures within basins which will control peak discharge flows and distribute the flows by pipes to discharge areas shall be constructed of concrete, polymer-coated steel or aluminum and shall have childproof, non-clogging trash racks over all design openings exceeding twelve (12") inches in diameter, except those openings used to carry perennial stream flows. Small outlet structures may be constructed of Schedule 40 PVC.
- 4.17.8.14.8** Where spillways will be used to control peak discharges in excess of the ten (10) year storm, control weirs shall be constructed of concrete of sufficient mass and structural stability to withstand the pressures of impounded waters and outlet velocities.
- 4.17.8.14.9** Concrete outlet aprons shall be designed as level spreaders and shall extend at a minimum to the toe of the basin slope. The incorporation of any large stone found on the site into the concrete apron to provide a more natural appearance is encouraged.
- 4.17.8.14.10** Inlet and outlet structures shall be located at maximum distance from each other. The Township may require a rock filter berm or rock-filled gabions between inlet and outlet areas when the distance is deemed insufficient for sediment trappings.
- 4.17.8.14.11** Temporary and permanent grasses or stabilization measures shall be established on the sides of all earthen basins within fifteen (15) days of initial construction.
- 4.17.8.14.12** A minimum embankment top width of 5 feet shall be provided. Basin embankments shall include a clay core and key trench for basins with water depths of 2-feet or greater.

- 4.17.8.14.13** The minimum basin outlet pipe size shall be 15", unless the small size of a basin warrants a smaller outlet pipe, as approved by the township engineer. Anti-seep collars shall be provided.

4.17.9 Calculation Methodology

- 4.17.9.1** Stormwater calculations to determine runoff, peak flow rates, peak discharge, hydrographs and to design stormwater runoff rate reduction facilities shall use a generally accepted calculation technique that is based on the Natural Resource Conservation Service (NRCS) Soil-Cover Complex method. Section 4.17.9.12 summarizes acceptable methods.
- 4.17.9.2** It is assumed that all methods will be selected by the design professional based on the individual limitations and suitability of each method for a particular site. The Township may allow the use of the Rational Method to estimate **peak discharges** from drainage areas that contain 200 acres or less; however, the Rational Method shall not be used to generate **pseudo-hydrographs** for drainage areas greater than 10 acres.
- 4.17.9.3** For predevelopment flow rate determination it shall be assumed that all undeveloped and pervious land shall be considered as "meadow" in good condition, unless the natural ground cover generates a lower curve number or Rational "C" value (i.e. forest) as listed in Appendix F or Appendix G of this Ordinance.
- 4.17.9.4** All calculations using the Soil Cover Complex method shall use the appropriate design rainfall depths for the various return period storms as presented in the table in Appendix H of this Ordinance. If a hydrologic computer model such as PSRM or HEC-HMS is used for stormwater runoff calculations then the duration of rainfall shall be 24 hours. The SCS "S" curve shown in Appendix I of this Ordinance shall be used for the rainfall distribution.
- 4.17.9.5** All calculations using the Rational Method shall use rainfall intensities consistent with appropriate times of concentration for overland flow and return periods from the Design Storm Curves from PA Department of Transportation Design Rainfall Curves (1986) shown in Appendix J of this Ordinance. Times of concentration for overland flow shall be calculated using the methodology presented in Chapter 3 of Urban Hydrology for Small Watersheds, NRCS, TR-55 (as amended or replaced from time to time by NRCS). Times of concentration for channel and pipe flow shall be computed using Manning's Equation.
- 4.17.9.6** Runoff Curve Numbers (CN) for both existing and proposed conditions to be used in the Soil Cover Complex method shall be obtained from the table in Appendix F of this Ordinance.

- 4.17.9.7** Runoff coefficients (c) for both existing and proposed conditions for use in the Rational Method shall be obtained from the table in Appendix G of this Ordinance.
- 4.17.9.8** Where uniform flow is anticipated the Manning Equation shall be used for hydraulic computations and to determine the capacity of open channels, pipes, and storm sewers. Manning's Equation shall not be used for analysis of pipes under pressure flow or for culvert analysis. Values for Manning's roughness coefficient (n) shall be consistent with Appendix K of this Ordinance.
- 4.17.9.9** When existing storm sewers, streets, roadside ditches or drainage swales are accessible; the applicant shall not connect the stormwater drainage system to the existing facilities without the approval of the Municipal Engineer and the facility owner.
- 4.17.9.10** Routing of hydrographs through detention/retention facilities for the purposes of designing those facilities shall be accomplished using the Storage-Indication method or other recognized routing method subject to approval of the Municipal Engineer. For drainage areas greater than 200 acres in size, the design storm hydrograph shall be computed using a calculation method that produces a full hydrograph. The Municipal Engineer may approve the use of any generally accepted full hydrograph approximation technique that shall use a total runoff volume that is consistent with the volume from a method that produces a full hydrograph.
- 4.17.9.11** Any method approved by the Pennsylvania Department of Transportation or the Pennsylvania Department of Environmental Protection may be used to design the waterway areas of bridges.

4.17.9.12 Acceptable Stormwater Management Computation Methodologies

Method	Method Developer	Applicability
TR-20 (or commercial package based on TR-20)	USDA NRCS	Where use of full hydrologic computer model is desirable or necessary
TR-55 (or commercial package based on TR-55)	USDA NRCS	For plans within limitations described in TR-55
HEC-1, HEC-HMS	U.S. Army Corps of Engineers	Where use of full hydrologic computer model is desirable or necessary
PSRM	Penn State University	Where use of full hydrologic computer model is desirable or necessary
Rational Method	Emil Kuichling (1889)	For sites less than 10 acres, or as approved by the Municipal Engineer
Other Methods	Varies	Other computations approved by Municipal Engineer

4.17.10 No Harm Option

4.17.10.1 For any proposed development site the developer has the option of using a less restrictive runoff control (including no detention) if the developer can prove that “no harm” would be caused by discharging at a higher runoff rate than that specified by the Plan. The “no harm” option is used when a developer can prove that the post-development hydrographs can match pre-development hydrographs, or if it can be proved that the post-development conditions will not cause increases in peaks at all points downstream. Proof of “no harm” would have to be shown based upon the following “Downstream Impact Evaluation” which shall include a “downstream hydraulic capacity analysis” consistent with Section 4.17.10.2 of this Ordinance to determine if adequate hydraulic capacity exists. The land developer shall submit to the Municipality this evaluation of the impacts due to increased downstream stormwater flows in the watershed.

4.17.10.1.1 The Downstream Impact Evaluation” shall include hydrologic and hydraulic calculations necessary to determine the impact of hydrograph timing modifications due to the proposed development upon a dam, highway, structure, natural point of restricted streamflow or any stream channel section, established with the concurrence of the Municipal Engineer.

4.17.10.1.2 The evaluation shall continue downstream until the increase in flow diminishes due to additional flow from tributaries and/or stream attenuation.

- 4.17.10.1.3** The peak flow values to be used for downstream areas for the design return period storms (1, 2-, 5-, 10-, 25-, 50-, and 100-year) shall be the values from the calibrated model used for the analysis and preparation of the particular Act 167 Stormwater Management Plan. These flow values can be obtained from the applicable watershed plan.
- 4.17.10.1.4** Developer-proposed runoff controls that would generate increased peak flow rates at storm drainage problem areas would, by definition, be precluded from successful attempts to prove “no-harm,” except in conjunction with proposed capacity improvements for the problem areas consistent with Section 4.17.10.2.
- 4.17.10.1.5** A financial distress shall not constitute grounds for granting a “no-harm” exemption.
- 4.17.10.1.6** Capacity improvements may be provided by the developer as necessary to implement the “no harm” option which proposes specific capacity improvements to provide that a less stringent discharge control would not create any harm downstream.
- 4.17.10.1.7** Any "no harm" justifications shall be submitted by the developer as part of the Drainage Plan submission per Section 4.17.11 of this Ordinance.
- 4.17.10.1.8** Qualification of no harm does not relieve the applicant of the other provisions of this Ordinance, including but not limited to the water quality, groundwater recharge and channel protection volume requirements of Sections 4.17.4, 4.17.5 and 4.17.6 of this Ordinance.
- 4.17.10.2** “Downstream Hydraulic Capacity Analysis” - Any downstream capacity hydraulic analysis conducted in accordance with this Ordinance shall use the following criteria for determining adequacy for accepting increased peak flow rates:
- 4.17.10.2.1** Natural or man-made channels or swales must be able to convey the increased runoff associated with a 2-year return period event within their banks at velocities consistent with protection of the channels from erosion. Acceptable velocities shall be based upon criteria included in the DEP *Erosion and Sediment Pollution Control Program Manual*.
- 4.17.10.2.2** Natural or man-made channels or swales must be able to convey increased 25-year return period runoff without creating any hazard to persons or property.

- 4.17.10.2.3** Culverts, bridges, storm sewers or any other facilities which must pass or convey flows from the tributary area must be designed in accordance with DEP Chapter 105 regulations (if applicable) and, at minimum, pass the increased 25-year return period runoff.

4.17.11 Drainage Plan

4.17.11.1 General Requirements

The Drainage Plan shall consist of all applicable calculations, drawings, maps, and plans. The cover sheet of the computations and erosion and sedimentation control plan shall refer to the associated maps by title and date. All Drainage Plan materials shall be submitted to the Township in a format that is clear, concise, legible, neat, and well organized; otherwise, the Drainage Plan shall be disapproved and returned to the Applicant. The following items shall be included in the Drainage Plan:

- (a) General description of project.
- (b) General description of permanent stormwater management techniques, including construction specifications of the materials to be used for stormwater management facilities.
- (c) Complete hydrologic, hydraulic, and structural computations for all stormwater management facilities.
- (d) Drainage Plans shall be prepared by a professional with demonstrated competency in stormwater management and design.
- (e) Drainage Plans and related documentation shall contain the seal and signature of the professional that prepared the plans.

4.17.11.2 Drainage Plans and Maps

Drawings(s), maps and plans of the project area shall be submitted on 24-inch x 36-inch sheets and shall be prepared in a form that meets the requirements for recording at the offices of the Recorder of Deeds of Northumberland County. The contents of the maps(s) shall include, but not be limited to:

- (a) The location of the project relative to highways, municipalities or other identifiable landmarks.
- (b) Existing contours at intervals no greater than two foot. In areas of steep slopes (greater than 15 percent), five-foot contour intervals may be used.

- (c) Existing streams, lakes, ponds, field delineated wetlands, or other bodies of water within the project area.
- (d) Other physical features including flood hazard boundaries, sinkholes, streams, existing drainage courses, areas of natural vegetation to be preserved, and the total extent of the upstream area draining through the site.
- (e) The locations of all existing and proposed utilities, sanitary sewers, and water lines within 50 feet of property lines.
- (f) An overlay showing soil names and boundaries.
- (g) Proposed changes to the land surface and vegetative cover, including the type and amount of impervious area that would be added.
- (h) Proposed structures, roads, paved areas, and buildings.
- (i) Final contours at intervals of no greater than two foot. In areas of steep slopes (greater than 15 percent), five- foot contour intervals may be used.
- (j) The name and address of the development, the name and address of the owner of the property, and the name of the individual or firm preparing the plan.
- (k) The date of submission.
- (l) A graphic and written scale of one (1) inch equals no more than fifty (50) feet; for tracts of twenty (20) acres or more, the scale shall be one (1) inch equals no more than one hundred (100) feet.
- (m) A North arrow.
- (n) The total tract boundary and size with distances marked to the nearest foot and bearings to the nearest degree.
- (o) Existing and proposed land use(s).
- (p) A key map showing all existing man-made features beyond the property boundary that would be affected by the project.
- (q) Horizontal and vertical profiles of all open channels, including hydraulic capacity.
- (r) Overland drainage paths.

- (s) A minimum fifteen-foot wide access easement around all stormwater management facilities that would provide ingress to and egress from a public right-of-way. The fifteen feet shall extend from the top of bank of any channel or berm of any basin.
- (t) A note on the plan indicating the location and responsibility for maintenance of stormwater management facilities that would be located off-site. All off-site facilities shall meet the performance standards and design criteria specified in this Ordinance.
- (u) A construction detail of any improvements made to sinkholes.
- (v) A statement, signed by the landowner, acknowledging the stormwater management system to be a permanent fixture that can be altered or removed only after municipal approval of a revised plan.
- (w) The location of all erosion and sedimentation control facilities.
- (x) Where pervious pavement is permitted for parking lots, recreational facilities, non-dedicated streets or other areas, pavement construction specifications shall be noted on the plan.
- (y) It shall be the applicant's responsibility to verify if the site is underlain by limestone. The following note shall be affixed to all drainage plans and signed and sealed by the engineer, surveyor, landscape architect or geologist:

I, _____, certify that this site and any detention basins located thereon are/are not underlain by limestone.

4.17.11.3 Supplemental Information

- (a) A written description of the following information shall be submitted.
 - (1) The overall stormwater management concept for the project.
 - (2) Stormwater runoff computations as specified in this Ordinance.
 - (3) Existing and proposed drainage area maps, which include time of concentration flow paths used for pre- and post-development runoff calculations.

- (4) Stormwater management techniques to be applied both during and after development.
- (5) Expected project time schedule.
- (b) A soil erosion and sedimentation control plan, where applicable, including all reviews and approvals, as required by PA DEP.
- (c) A geologic assessment of the effects of runoff on sinkholes as specified in this Ordinance.
- (d) The effect of the project (in terms of runoff volumes and peak flows) on adjacent properties and on any existing municipal stormwater collection system that may receive runoff from the project site.
- (e) A Declaration of Adequacy and Highway Occupancy Permit from the PENNDOT District Office when utilization of a PENNDOT storm drainage system is proposed.

4.17.11.4 Stormwater Management Facilities

- (a) All stormwater management facilities must be located on a plan and described in detail.
- (b) When groundwater recharge methods such as seepage pits, beds or trenches are used, the locations of existing and proposed septic tank infiltration areas and wells must be shown.
- (c) All calculations, assumptions, and criteria used in the design of the stormwater management facilities must be shown.

4.17.12 Plan Submission

4.17.12.1 The Drainage Plan shall be submitted by the developer as part of a Preliminary and/or Final Plan application for subdivision and land development activity or separately if the activity regulated by this Ordinance is not being conducted in conjunction with a subdivision or land development.

4.17.12.2 Four (4) copies of the Drainage Plan and all supplemental material shall be submitted to the Township.

4.17.13 Drainage Plan Review

4.17.13.1 The Municipal Engineer shall review the Drainage Plan for consistency with this Ordinance and applicable Act 167 Stormwater Management Plans. The Township shall require receipt of a complete plan, as specified in this Ordinance.

- 4.17.13.2** For activities regulated by this Ordinance, the Municipal Engineer shall notify the Township in writing, whether the Drainage Plan is consistent with this Ordinance. Should the Drainage Plan be determined to be consistent with this Ordinance, the Municipal Engineer will forward an approval letter to the Township Secretary.
- 4.17.13.3** Should the Drainage Plan be determined to be inconsistent with this Ordinance the Municipal Engineer will forward a disapproval letter to the Municipal Secretary citing the specific sections of the Ordinance and reason(s) for the disapproval.
- 4.17.13.4** The Municipal Secretary shall forward a copy of the Municipal Engineer's review of the Drainage Plan to the applicant and the Township Building Permit Officer, Zoning Officer, and Township Planning Commission.
- 4.17.13.5** For Regulated Activities requiring a PA DEP Joint Permit Application, the Municipal Engineer shall notify PA DEP whether the Drainage Plan is or is not consistent with this Ordinance and the Act 167 Stormwater Management Plan and forward a copy of the review letter to the Municipality and the developer. PA DEP may consider the Municipal Engineer's review comments in determining whether to issue a permit.
- 4.17.13.6** The Township shall not approve any subdivision or land development for Regulated Activities specified in Section 106 of this Ordinance if the Drainage Plan has been found to be inconsistent with this Ordinance or the Act 167 Stormwater Management Plan, as determined by the Municipal Engineer.
- 4.17.13.7** The Municipal Building Permit and Zoning Officers shall not issue building and/or zoning permits for any Regulated Activity specified in this Ordinance if the Drainage Plan has been found to be inconsistent with this Ordinance as determined by the Municipal Engineer.
- 4.17.13.8** The applicant shall be responsible for completing record drawings of all stormwater management facilities included in the approved Drainage Plan. The record drawings and an explanation of any discrepancies with the design plans shall be submitted to the Municipal Engineer for final approval. In no case shall the Township approve the record drawings until a copy of an approved Declaration of Adequacy; Highway Occupancy Permit is received from the PENNDOT District Office, and any applicable permits from PA DEP.
- 4.17.13.9** The approval of a Drainage Plan shall be valid for a period not to exceed five (5) years. This 5-year time period shall commence on the date that the Township signs the approved Drainage Plan. If stormwater management facilities included in the approved Drainage Plan have not been constructed, or if constructed, and record drawings of these facilities have not been

approved within this 5-year time period, then the Township may consider the Drainage plan disapproved and may revoke any and all approvals and/or permits. Drainage Plans that are considered disapproved by the Township shall be resubmitted in accordance with this Ordinance.

4.17.14 Modification of Plans

A management facilities or techniques, or that involves the relocation or re-design of stormwater management facilities, or that is necessary because soil or other conditions are not as stated on the Drainage Plan as determined by the Municipal Engineer, shall require a resubmission of the modified Drainage Plan and a review consistent with this Ordinance.

A modification to an already approved or disapproved Drainage Plan shall be submitted to the Township, accompanied by the applicable review fee. A modification to a Drainage Plan for which the Township has not taken a formal action shall be submitted to the Township.

4.17.15 Re-submission of Disapproved Drainage Plans

A disapproved Drainage Plan may be resubmitted, with the revisions addressing the Municipal Engineer's concerns documented in writing, to the Township Secretary in accordance with this Ordinance and distributed accordingly and is subject to review as specified in this Ordinance.

4.17.16 Fees and Expenses

Applicants are responsible for paying all applicable costs incurred by the Township in reviewing Drainage Plans in accord with Section 1.9 Required Fees. The fees required to review Drainage Plans shall at a minimum cover:

- (a) Administrative costs.
- (b) The review of the Drainage Plan by the Municipality and the Municipal Engineer.
- (c) The site inspections.
- (d) The inspection of stormwater management facilities and drainage improvements during construction.
- (e) The final inspection upon completion of the stormwater management facilities and drainage improvements presented in the Drainage Plan.
- (f) Any additional work required to enforce any permit provisions regulated under Section 4.17, correct violations, and assure proper completion of stipulated remedial actions.

4.17.17 Financial Guarantee & Maintenance Responsibilities

4.17.17.1 Improvement Guarantee

The Improvements Guarantee stipulated under Section 2.4.2 of this Ordinance shall include a financial guarantee to the Municipality for the timely installation and proper construction of all stormwater management controls as required by the approved drainage plan.

4.17.17.2 Schedule of Inspections

- (a) The Municipal Engineer shall inspect all phases of the installation of the permanent stormwater management facilities as deemed appropriate by the Municipal Engineer and consistent with Section 2.4.3 of this Ordinance.
- (b) At the completion of the project, and as a prerequisite for the release of the improvement guarantee, the owner or his representatives shall:

 - (1) Provide a certification of completion from an engineer, architect, surveyor or other qualified person verifying that all permanent facilities have been constructed according to the plans and specifications and approved revisions thereto.
 - (2) Provide a set of as-built (record) drawings.
- (c) After receipt of the certification by the Township, a final inspection shall be conducted by the Municipal Engineer or designated representative.

4.17.17.3 Maintenance Responsibilities

- (a) The Drainage Plan for the development site shall contain an operation and maintenance plan prepared by the developer and approved by the Municipal Engineer. The operation and maintenance plan shall outline required routine maintenance actions and schedules necessary to insure proper operation of the facility(ies).
- (b) The Drainage Plan for the development site shall establish responsibilities for the continued operation and maintenance of all proposed stormwater control facilities, consistent with the following principals:

- (1) If a development consists of structures or lots which are to be separately owned and in which streets, sewers and other public improvements are to be dedicated to the Township, stormwater control facilities may also be offered for dedication to the Township (the Township is not obligated to accept ownership).
- (2) If a development site is to be maintained in a single ownership or if sewers and other public improvements are to be privately owned and maintained, then the ownership and maintenance of stormwater control facilities shall be the responsibility of the owner or private management entity.
- (c) The governing body, upon recommendation of the Municipal Engineer, shall make the final determination on the continuing maintenance responsibilities prior to final approval of the drainage plan. The governing body reserves the right to accept or reject the ownership and operating responsibility for any or all of the stormwater management controls.

4.17.17.4 Maintenance Agreement For Stormwater Facilities

- (a) Prior to final approval of the site's drainage plan, the property owner shall execute a maintenance agreement suitable for recording in the Northumberland County Recorder of Deeds Office, an example of which is contained in Appendix M, covering all stormwater control facilities that are to be privately owned.
- (b) Other items may be included in the 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.

4.17.18 Enforcement and Penalties

4.17.18.1 Right of Entry

Upon presentation of proper credentials, duly authorized representatives of the Township may enter at reasonable times upon any property within the Township to inspect the condition of the stormwater structures and facilities in regard to any aspect regulated by this Ordinance.

4.17.18.2 Notification

In the event that a person fails to comply with the requirements of an approved Drainage Plan, the Township shall provide written notification of the violation. Such notification shall set forth the nature of the violation(s)

and establish a time limit for correction of these violation(s). Failure to comply within the time specified shall subject such person to the Preventive Remedies and Enforcement Remedies stipulated in Sections 1.10 and 1.11 of this Ordinance.

4.17.18.3 Enforcement

The Township Board of Supervisors is hereby authorized and directed to enforce all of the provisions of this Ordinance. All inspections regarding compliance with the Drainage Plan shall be the responsibility of the Municipal Engineer or other qualified persons designated by the Township.

- (a)** A set of design plans approved by the Township shall be on file at the site throughout the duration of the construction activity. Periodic inspections may be made during construction.
- (b)** It shall be unlawful for any person, firm or corporation to undertake any regulated activity under Section 4.17.1 on any property except as provided for in the approved Drainage Plan and pursuant to the requirements of this Ordinance. It shall be unlawful to alter or remove any control structure required by the Drainage Plan pursuant to this Ordinance or to allow the property to remain in a condition that does not conform to the approved Drainage Plan.
- (c)** Suspension and Revocation of Approvals and/or Permits
 - (1)** Any approval or permit issued under this Ordinance may be suspended or revoked by the governing body for:
 - i)** Non-compliance with or failure to implement any provision of the permit.
 - ii)** A violation of any provision of this Ordinance or any other applicable law, ordinance, rule or regulation relating to the project.
 - iii)** 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.
 - (2)** A suspended approval or permit shall be reinstated by the governing body when:
 - i)** The Municipal Engineer or his designee has inspected and approved the corrections to the stormwater management and erosion and sediment pollution control measure(s), or the elimination of the hazard or nuisance, and/or;

- ii) The governing body is satisfied that the violation of the Ordinance, law, or rule and regulation has been corrected.
- iii) A permit that has been revoked by the governing body cannot be reinstated. The Applicant may apply for a new permit under the procedures outlined in this Ordinance.

(3) Occupancy Permits

An occupancy permit shall not be issued unless the certification of completion pursuant to Sections 4.17.17.2 (b) and (c) has been secured. The occupancy permit shall be required for each lot owner and/or developer for all subdivisions and land development in the Municipality.

4.17.18.4 Penalties and Appeals

The Enforcement Remedies of Section 1.11 shall govern for Drainage Plan violations and appeal actions.

4.18 SOIL EROSION AND SEDIMENT CONTROL

4.18.1 In order to prevent accelerated erosion and resulting sedimentation, land disturbance activities shall be conducted only in conformity with the following principles and in concurrence with DER's Erosion and Sediment Pollution Control Program Manual, available from the Northumberland County Conservation District:

- 4.18.1.1** There shall be no increase in discharge of sediment or other solid materials from the site as a result of storm water runoff; and
- 4.18.1.2** Erosion and sedimentation devices such as temporary vegetative cover, mulch, temporary detention basins, diversion terraces, rock filter berms, or hay bales appropriate to the scale of operations shall be installed concurrent with earthmoving activities and whenever a situation is created which would contribute to increased erosion; and
- 4.18.1.3** Earthmoving and the addition of fill shall be minimized where possible and practicable to preserve desirable natural features and the topography of the site. Changes in grade and topography and other earthmoving shall be in accordance with the storm water management plan prepared by the subdivider and approved by the Township; and
- 4.18.1.4** Stripping of vegetation, regrading or other development shall be done in such a way that will minimize erosion; and
- 4.18.1.5** Sediment in runoff water shall be trapped and removed to assure adequate capacity in the basins or traps.

- 4.18.2** Applicants shall submit a narrative describing all proposed earthmoving and grading along with the proposed soil stabilization and site restoration plans.

Applicants shall also meet the requirements of Chapter 102 of Administrative Code, Title 25, as authorized by the Clean Streams Law, Act 222, as amended, by submitting a Soil Erosion and Sedimentation Control Plan, (required when disturbing 25 or more acres), to the Pennsylvania Department of Environmental Resources.

- 4.18.3** The Soil Erosion and Sedimentation Control Plan, as required, must be prepared by a person trained and experienced in erosion and sedimentation control methods and techniques. It will be examined for comparison with standards using an erosion control handbook, soil survey, Department of Environmental Resources Erosion and Sediment Pollution Control Program Manual (available from the Northumberland County Conservation District), and sound erosion control principles as the basis for acceptability.

4.19 COMMUNITY FACILITIES

In reviewing subdivision plans, the Planning Commission will consider the adequacy of existing or proposed community facilities to serve the additional dwelling units to be developed, and may request the reservation or dedication of land for such facilities.

4.20 FLOODPLAIN MANAGEMENT

4.20.1 Purpose

The purpose of this section is to comply with the requirements of the National Flood Insurance Program and the Pennsylvania Floodplain Management Act (Act 166 of 1978), and to minimize future damage from flooding in the Township.

4.20.2 Plan Requirements

- 4.20.2.1** All subdivision and land development plans for property located within a designated floodplain area must show the location of the 100 year Floodplain Boundary and the location of the Floodway, according to the most current National Flood Insurance Maps for the Township.
- 4.20.2.2** Where detailed mapping indicating 100 year floodplain and floodway locations is not available, Flood Hazard Boundary Maps, or the best available elevation and floodplain information from other sources shall be used to determine the flood hazard area.
- 4.20.2.3** Where applicable, and as required by the Pennsylvania Department of Community Affairs, a copy of a Special Permit Application shall be submitted for evaluation along with the subdivision and land development plan.

4.20.3 Design Standards

- 4.20.3.1** The finished elevation of new streets shall be not more than one (1) foot below the 100 year flood elevation.
- 4.20.3.2** New or replacement water and sanitary sewer facilities shall be located, designed, and constructed to minimize or eliminate flood damages and the infiltration of flood waters.
- 4.20.3.3** No part of any on-site sewage system shall be located within any identified floodplain area, except in strict compliance with all state and local regulations for such system.
- 4.20.3.4** All other utilities, such as gas, electrical, and telephone, shall be located and constructed to minimize the chance of impairment during a flood.
- 4.20.3.5** Any new construction, development, use, activity, or proposed encroachment in the floodway which will cause an increase in flood heights shall be prohibited.
- 4.20.3.6** In all floodplain areas, all new or substantially improved residential structures shall be elevated at least one and one half (1.5) feet above the 100 year flood elevation; and, all new or substantially improved non-residential structures shall be elevated to or above the 100 year flood elevation or flood proofed in accord with the flood proofing regulations of the township (see Ordinance 18, adopted June 20, 1977, and Ordinance 39, adopted March 4, 1986, as amended).

4.21 NATURAL FEATURES ANALYSIS

4.21.1 Purpose

The purpose of this section is to provide the applicant and the Township with information and data which will forecast the environmental impacts of a proposed large subdivision or land development (see Section 3.6.3.14). A natural features analysis will be required for a subdivision of 25 or more lots or a land development generating more than 200 vehicle trips per day.

4.21.2 Requirements

4.21.2.1 Hydrology

An analysis of natural drainage patterns and water resources shall be provided including streams, natural drainage swales, ponds or lakes, wetlands, floodplain areas, and permanent and seasonal high water tables throughout the site.

4.21.2.2 Geology

An analysis of the characteristics of rock formations underlying the site shall be provided including defining aquifers (particularly those locally subject to pollution), shallow bedrock areas, and areas, in which rock formations are unstable.

4.21.2.3 Soils

An analysis of the types of soils present in the site area shall be provided including delineation of prime agricultural soil areas, aquifer recharge soil areas, unstable soils, soils most susceptible to erosion, and soils suitable for residential, commercial, or industrial development. This analysis shall be based upon the Northumberland County Soil Survey of the U.S. Soil Conservation Service.

4.21.2.4 Topography

An analysis of the terrain in the site area shall be provided including mapping of elevation and delineation of slope areas in excess of twenty percent, between ten and twenty percent, and under ten percent.

4.21.2.5 Vegetation

An analysis of tree and plant cover on the site, emphasizing the location of woodland and meadowland areas. Dominate tree and plant species shall be identified and certification shall be made that no vegetation on the site is classified as "Rare or Threatened" on the Pennsylvania Natural Diversity Index.

4.22 COMMUNITY IMPACT ANALYSIS

4.22.1 Purpose

The purpose of this section is to provide the applicant and the Township with information and data which will forecast the community impacts of a proposed large subdivision or land development (see Section 3.6.3.15). A community impact analysis will be required for a subdivision of 25 or more lots or a land development generating more than 200 vehicles per day.

4.22.2 Requirements

4.22.2.1 Fiscal

A comparison of costs for services to the municipality verses revenues estimated to be produced shall be submitted. The most recent municipal and authority budgets shall be the basis for this analysis.

4.22.2.2 Traffic

An analysis of expected traffic patterns and volumes shall be submitted.

4.22.2.3 Utilities

The applicant shall demonstrate that the appropriate providers of utility services (electrical power, water, sewer, refuse disposal) have certified that services can and will be provided to the site.

4.22.2.4 Market Analysis

The applicant shall demonstrate that a sufficient market exists for the specific type of development proposed.

ARTICLE 5

Mobile Home Parks

5

5.1 GENERAL REQUIREMENTS

Mobile Home Parks shall comply with all applicable requirements of the Township Zoning Code including district regulations and special exception criteria. Mobile Home Parks shall also comply with any other applicable codes of the Township and with the requirements of this Ordinance and with this Article.

5.1.1 Minimum Park Area

A mobile home park shall have a minimum gross area of five (5) contiguous acres of land suitable for development.

5.1.2 Lot Requirements

5.1.2.1 The maximum number of mobile home lots or spaces within a mobile home park shall not exceed seven (7) lots per acre of the total area of the mobile home park.

5.1.2.2 The minimum lot size for mobile homes in a mobile home park shall be not less than five thousand five hundred (5,500) square feet. The minimum width of a mobile home lot shall be not less than fifty (50) feet, and the minimum length of a mobile home lot shall be not less than one hundred (100) feet or thirty (30) feet greater than the overall length of the mobile home to be located on such lot, whichever is greater.

5.1.2.3 All mobile home lots shall abut a street of the mobile home park internal street system. Lots may be laid out at an angle to the street line, but in no case shall the frontage on each lot be less than forty-five (45) feet.

5.1.3 Setbacks

5.1.3.1 All mobile homes, auxiliary park buildings, and other structures shall be located at least forty (40) feet from the mobile home park boundary lines and eighty (80) feet from public street right-of-ways.

5.1.3.2 Mobile homes shall be located at least fifty (50) feet from any auxiliary park buildings and any repair, maintenance, or storage areas or buildings.

5.2 PLAN REQUIREMENTS

5.2.1 Mobile home park plans shall be prepared in accordance with all the applicable plan procedures and requirements as specified for Major Land Development in Articles II and III of this Ordinance.

- 5.2.2** A notation shall be placed on the land development plan stating that the mobile home park owner shall be responsible for maintenance of all park facilities including roads, storm water management facilities, sewage and water facilities, and recreation/ open space areas.

5.3 REQUIRED SITE IMPROVEMENTS

5.3.1 Utilities, Services, and Controls

Public or private community wide sewer and water facilities shall be provided for the mobile home park; individual on-lot facilities shall be unacceptable. Mobile home parks shall be served by utilities, facilities, and controls as specified in Article IV of this Ordinance including:

- Utilities: Section 4.14
- Sewage Facilities: Section 4.15
- Water Supply: Section 4.16
- Storm Water Management: Section 4.17
- Soil Erosion and Sedimentation Control: Section 4.18
- Floodplain Management: Section 4.20

5.3.2 Internal Street System

All lots and facilities within the mobile home park shall be served by an internal street system built in accord with the design and construction specifications for minor streets found in Sections 4.5 and 4.7 of this Ordinance.

5.3.3 Parking Space

A minimum of two (2) auto parking spaces shall be provided for each mobile home lot within the mobile home park. These spaces shall be located within two hundred (200) feet of the mobile home lot that they are intended to serve.

5.3.4 Grading and Ground Cover

The ground surface in all parts of the mobile home park shall be graded to facilitate storm water drainage and shall be seeded for maintenance and erosion control.

5.3.5 Mobile Home Pads

The mobile home pads shall be graded and compacted for durability and shall provide adequate support for the placement of the mobile home unit. Each unit shall be provided with an anchoring system designed to resist the natural forces of wind, floatation, or collapse. The minimum standards for anchoring shall be as found in the West Chillisquaque Township Floodplain Ordinance #18 as amended, Section 5.1.D.4.

5.3.6 Recreation and Open Space

A minimum of five (5) percent of the gross area of the mobile home park or ten thousand (10,000) square feet of space, whichever is greater, shall be reserved for recreational space. This space shall be suitable for various outdoor recreational uses

and shall not include right-of-ways, retention basins, or utility easements. Lands dedicated for this purpose shall be usable in terms of size, shape, and terrain, and soil conditions.

5.3.7 Screening and Landscaping

Mobile home park developers are urged to incorporate landscaping improvements into their project design to enhance the liveability and the visual impact of the park and the surrounding community. The minimum landscaping and screening improvements required for a Mobile Home Park are specified in the section on Screening and Landscaping in the township zoning code.

ARTICLE 6

Land Development Requirements

6

6.1 APPLICABILITY

The standards outlined in this Article shall be applied by the Township in evaluating Land Developments. A specialized type of subdivision, a land development requires the approval of a site plan by the Township utilizing the same procedures required for the approval of a conventional subdivision. Generally the site plan shall show the location of proposed buildings and all facilities included within the development for the common use of occupants or the general public. Facilities that shall be shown on the site plan include driveways, internal streets, parking areas, loading areas, landscaped areas, outdoor recreation facilities, sidewalks and pathways, utilities, and storm water management facilities. The detail and precision required in the preparation of the land development plan is dependent upon the type of land development, specifically whether it is a major or minor land development (see Section 2.1.2). In addition, all other applicable standards of this Ordinance and the Township Zoning Code not in conflict herewith shall apply unless otherwise noted in this Article.

6.2 MULTIPLE FAMILY DWELLING DEVELOPMENTS

6.2.1 Development Concept

6.2.1.1 The developer shall submit with the land development plan a description of the type of multiple family housing proposed, indicating the number of dwelling units per structure.

6.2.1.2 If the developer proposes to subdivide and convey individual dwelling units within the development, an exact legal description of the areas or dwelling units to be conveyed shall be provided.

6.2.1.3 The developer shall submit with the land development or subdivision plan a proposal for the maintenance of all facilities which are shared by residents within the proposed development. If the developer proposes to subdivide and convey individual dwelling units within the development, an agreement which assigns maintenance responsibility for commonly used facilities shall be recorded with the subdivision plan and referenced in the deeds for all properties in the development.

6.2.2 Streets, Parking, and Utilities

6.2.2.1 All internal streets within the development shall meet the design and construction specifications found in Section 4.5 and 4.7 of this Ordinance.

6.2.2.2 Access to public streets shall be limited to well defined entrance and exit lanes. They shall be separated by dividers or planting islands.

6.2.2.3 Painted lines, arrows, and dividers shall be provided and maintained to control parking and internal circulation. Parking and service areas shall be separated from driving lanes.

6.2.2.4 All developments of this type shall be connected to public sewer and water supply systems or provide private central sewerage and water supply systems certified by the Pennsylvania Department of Environmental Resources.

6.2.2.5 A minimum of two (2) off-street parking spaces per dwelling unit within the development shall be provided within two hundred (200) feet of the dwelling unit intended to be served.

6.2.3 Open Space Requirement

A minimum of five hundred (500) square feet of usable open space, exclusive of streets, parking areas, structures, and service areas, shall be provided for each dwelling unit within the development.

6.2.4 Setbacks

6.2.4.1 The minimum space between buildings shall be not less than the height of the tallest building or forty (40) feet, whichever is greater.

6.2.4.2 Minimum building setbacks from the road right-of-way shall be fifty (50) feet.

6.2.4.3 Minimum setback distance from the boundaries of the development shall be thirty (30) feet.

6.3 CLUSTER HOUSING DEVELOPMENTS

6.3.1 Purpose

A Cluster Housing Development is an optional form of residential development which allows the developer more choices of housing types, and enables him to develop lots smaller than otherwise specified in the municipal zoning ordinance, provided that the land saved is reserved for permanent common use, usually in the form of open space. A detailed explanation of the concept and the regulations for a Cluster Housing Development are found in the West Chillisquaque Township Zoning Ordinance. This type of development shall be designed to achieve:

6.3.1.1 A characteristic of design and site planning in which houses are grouped together on a tract of land and each cluster of homes is set off from others like it by an intervening space that helps give visual definition to each individual cluster; and

6.3.1.2 The preservation and utilization of unusual and important physical features of undeveloped land that is held for the common recreational enjoyment of the adjacent residents or the township at large; and

6.3.1.3 More efficient use of the land and of public facilities required to serve new residential developments.

6.3.2 Development Standards

The following development standards shall be met in addition to the standards specified in the CLUSTER HOUSING DEVELOPMENT section of the Township Zoning Code:

6.3.2.1 All internal streets and driveways (other than individual dwelling unit driveways) within the development shall meet the design and construction specifications found in sections 4.5 and 4.7 of this Ordinance.

6.3.2.2 Convenient off street parking spaces shall be provided within 200 feet of the dwelling unit served.

6.3.2.3 Access to public streets shall be limited to well defined entrance and exit lanes.

6.3.2.4 Painted lines, arrows, and dividers shall be provided and maintained to control parking and internal circulation. Parking and service areas shall be separated from driving lanes.

6.4 RECREATIONAL VEHICLE PARK AND CAMPGROUND DEVELOPMENTS

6.4.1 General Standards

It shall be noted on the land development plan that:

6.4.1.1 Recreational Vehicle Parks or Campgrounds are designed for intermittent recreational use, and that recreational vehicles used for full time residential occupancy shall not be permitted within the development except as provided in Section 6.4.1.3;

6.4.1.2 It shall be the responsibility of the park owner to maintain all park facilities, including internal roads, sewage disposal facilities, and areas designated for open space; and

6.4.1.3 Up to a maximum of three (3) recreation vehicles may be utilized for permanent residences for staff or employees of the development provided that adequate utilities are provided for year around use.

6.4.2 Development Standards

6.4.2.1 The maximum number of lots or camping spaces within each park or campground shall be no more than fifteen (15) per acre of the total area of the park or campground.

6.4.2.2 The minimum size of each lot or camping space shall be not less than one thousand five hundred (1,500) square feet in area.

6.4.2.3 A minimum of two (2) off street parking spaces shall be provided for each site or camping space within the development.

6.4.2.4 All internal streets within the development shall have a minimum cartway of sixteen (16) feet.

6.4.2.5 Developments designed to accommodate travel trailers or recreational vehicles shall be provided with individual sewer hookups at each site or with a community dump station for sewage disposal. Sewage disposal and water supply

facilities shall be constructed in accord with the standards of the Department of Environmental Resources and Sections 4.15 and 4.16 of this Ordinance.

6.5 COMMERCIAL LAND DEVELOPMENT

6.5.1 General Standards

6.5.1.1 Commercial development plans, including shopping centers and motels shall comply with the following standards and requirements as well as with all other applicable provisions of this ordinance and the Township Zoning Code not in conflict herewith.

6.5.1.2 Utilities, services, and development controls shall be as specified in Section 4 of this Ordinance including:

- Utilities: Section 4.14
- Sewage Facilities: Section 4.15
- Water Supply: Section 4.16
- Storm Water Management: Section 4.17
- Soil Erosion & Sedimentation Control: Section 4.18
- Floodplain Management: Section 4.20

6.5.1.3 Commercial development areas shall be designed with consideration of site conditions to insure:

- desirable land utilization;
- convenient traffic circulation emergency vehicle access, and parking;
- pedestrian safety;
- adequate service, delivery, and pickup areas; and
- coordination of development with adjacent parcels of land.

6.5.2 Access and Circulation

6.5.2.1 Access to public streets shall be limited to well defined entrance and exit lanes. They shall be separated by dividers or planting islands.

6.5.2.2 Painted lines, arrows, and dividers shall be provided and maintained to control parking and internal circulation. Customer parking and driving lanes shall be separated from delivery drives and loading areas.

6.5.2.3 All parking areas, service drives, loading areas, driveways, and internal roadways shall be built in accord with the design and construction specifications for collector streets found in Sections 4.5 and 4.7 of this Ordinance.

6.5.3 Parking Area Requirements

6.5.3.1 One (1) parking spaces per three hundred (300) square feet of gross leasable commercial area shall be provided.

6.5.3.2 To the greatest extent possible, parking aisles shall be designated at right angles to the stores.

6.5.3.3 Parking area shall be set back from the street right-of-way lines and property boundaries a minimum distance of five (5) feet and a minimum of ten (10) feet from dwellings.

6.5.3.4 The setback areas between the parking area and street right-of-way or property lines shall be maintained as a planting area.

6.5.4 Screening and Landscaping

Commercial project developers are urged to incorporate landscaping improvements into their project design to enhance the visual impact of their project upon the surrounding community. Refer to the Township Zoning Code - Screening and Landscaping section for required applications for commercial development projects.

6.6 INDUSTRIAL LAND DEVELOPMENT

6.6.1 General Standards

6.6.1.1 Industrial development plans, including plans for industrial parks and buildings shall comply with the following standards and requirements as well as with all other applicable provisions of this ordinance and the Township Zoning Code not in conflict herewith.

6.6.1.2 Utilities, services, and development controls shall be as specified in Section 4 of this Ordinance including:

- Utilities: Section 4.14
- Sewage Facilities: Section 4.15
- Water Supply: Section 4.16
- Storm Water Management: Section 4.17
- Soil Erosion & Sedimentation Control: Section 4.18
- Floodplain Management: Section 4.20

6.6.1.3 Industrial development areas shall be designed with consideration of site conditions to insure:

- desirable land utilization;
- convenient traffic circulation, emergency vehicle access, loading and unloading facilities, and parking;
- pedestrian safety;
- adequate service, delivery, and pickup areas; and
- coordination of development with adjacent parcels of land.

6.6.1.4 All proposed industrial development shall provide written approval from the Pennsylvania Department of Environmental Resources and the Township Municipal Authority of plans for adequate treatment and/or pretreatment of any industrial wastes generated within the development. Adequate air and water pollution controls shall be required within these developments. Performance bonds for provision of these controls may be required for approval.

6.6.2 Access and Circulation

6.6.2.1 Access to public streets shall be limited to well defined entrance and exit lanes. They shall be separated by dividers or planting islands.

6.6.2.2 Painted lines, arrows, and dividers shall be provided and maintained to control parking and internal circulation. Employee parking and driving lanes shall be separated from delivery drives and loading areas.

6.6.2.3 All parking areas, service drives, loading areas, driveways, and internal roadways shall be built according to the design and construction specifications for collector streets as specified in Section 4.5 and 4.7 of this Ordinance.

6.6.3 Parking and Loading Area Requirements

6.6.3.1 Off-street parking shall be provided for all employees plus extra spaces for visitors in accord with the Off-Street Parking and Loading standards of the township zoning ordinance.

6.6.3.2 All loading and unloading areas and service areas of the development shall be provided off-street with access from internal roadways and shall be designed not to cause interruptions to adjacent street traffic.

6.6.3.3 Parking area shall be set back from the street right-of-way lines and property boundaries a minimum distance of five (5) feet and a minimum of ten (10) feet from dwellings.

6.6.3.4 The setback areas between the parking area and street right-of-way or property lines shall be maintained as a planting area.

6.6.4 Screening and Landscaping

Industrial project developers are urged to incorporate landscaping improvements into their project design to enhance the visual impact of their project upon the surrounding community. Refer to the Township Zoning Code - Screening and Landscaping section for required applications for commercial development projects. All storage, service or unsightly areas within the industrial development shall be adequately screened from any adjacent developments and streets.

ARTICLE 7

Definitions

Except where specified in the following definitions, all words used in this Ordinance shall carry their customary meanings. Words used in the present tense include the future; the singular shall include the plural, and the plural the singular; the word "building" shall include the word "structure"; the word "shall" is intended to be mandatory; and the word "person" includes a partnership or corporation as well as individual.

Accelerated Erosion - The removal of the surface of the land through the combined action of man's activity and the natural processes of a rate greater than would occur because of the natural process alone.

Accessory Structure - A structure subordinate to, and located on the same lot as the principal building and serving a purpose customarily incidental to the use of the principal building.

Add-On Subdivision - See Subdivision.

Agricultural Purposes - The use of more than ten (10) acres of land for the purpose of producing agricultural commodities which shall include but not be limited to: growing grains, fruits, vegetables, nursery plants, Christmas trees, or timber; raising poultry or livestock; producing agricultural commodities through greenhouse production.

Alteration - As applied to land, a change in topography as a result of the moving of soil and rock from one location or position to another; also the changing of surface conditions by causing the surface to be more or less impervious; land disturbance.

Anchoring System - A system of tie-downs and anchors designed and installed on mobile home pads in accordance with the standards of Section 5.1.D.4 of the West Chillisquaque Township Floodplain Management Ordinance #18, (as amended) to resist the floatation, collapse, and lateral movement of mobile homes.

Applicant - A landowner, developer, or subdivider, as hereinafter defined, who has filed an application for a subdivision, mobile home park, or land development including his heirs, successors, agents and assigns.

BMP (Best Management Practice) - Stormwater structures, facilities and techniques to control, maintain or improve the quantity and quality of surface runoff.

Building - Any structure having a roof supported by columns or walls used for shelter, housing, or enclosure of persons, animals, or property.

Building, Principal - A building housing the main or principal use of the lot on which the building is located.

Building, Accessory - A building housing an incidental and subordinate use to the principal use of the lot on which the building is located.

Campground - A tract or tracts of land, or any portion thereof, used for the purpose of providing two or more spaces for travel trailers or tents, with or without a fee charged for the leasing, renting or occupancy of such space.

Cartway - The surface of a street or alley available for vehicular traffic.

Centerline - A line located exactly in the center of the width of the cartway, right-of-way, easement, access, road, or street.

Channel Erosion - The widening, deepening, and headward cutting of small channels and waterways, due to erosion caused by moderate to large floods.

Cistern - An underground reservoir or tank for storing rainwater.

Clear Sight Triangles - An area of unobstructed vision at street intersections or street and driveway intersections defined by lines of sight between points at a given distance from the intersection of the street and/or driveway centerline.

Cluster Subdivision - A large scale residential development of ten (10) acres or more, in which individual dwelling units or buildings are grouped together. Modifications or reduction of the minimum yard and lot size requirements of the Township Zoning Ordinance are permitted in exchange for an equivalent amount of land to be preserved for scenic, recreation, or conservation purposes.

County Planning Commission - The Northumberland County Planning Commission.

Community Facility - A building or structure, or non-structural improvement such as an easement for utilities or storm water controls, jointly owned and/or maintained by property owners within a subdivision, or by a governmental agency, to provide a service to the public.

Condominium - A building, a group of buildings, in which units are owned individually, and the structure, common areas and facilities are owned by all the owners on a proportional, undivided basis.

Conservation District - The Northumberland County Conservation District.

Culvert - Structure with appurtenant works that carries a stream or channel under or through an embankment or fill.

Dam - An artificial barrier, together with its appurtenant works, constructed for the purpose of impounding or storing water or another fluid or semi fluid, or a refuse bank, fill or structure for highway, railroad or other purposes which does or may impound water or another fluid or semi fluid.

Design Storm - The magnitude and temporal distribution of precipitation from a storm event measured in probability of occurrence (e.g., a 5-year storm) and duration (e.g., 24-hours), used in the design and evaluation of stormwater management systems.

Detention Basin - An impoundment structure designed to manage stormwater runoff by temporarily storing the runoff and releasing it at a predetermined rate.

Detention District - Those subareas in which some type of detention is required to meet the Plan requirements and the goals of Act 167.

Developer - Any landowner, agent of such landowner or lessee with the permission of such landowner, who makes or causes to be made a subdivision or a land development.

Development - See definition of Land Development.

Downslope Property Line - That portion of the property line of the lot, tract, or parcels of land being developed located such that all overland or pipe flow from the site would be directed towards it.

Drainage Conveyance Facility - A stormwater management facility designed to transmit stormwater runoff and shall include streams, channels, swales, pipes, conduits, culverts, storm sewers, etc.

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

Drainage Plan - The plan and documentation prepared by the developer or his representative indicating how stormwater runoff will be managed and the stormwater management system, if any, to be used for a given development site, the contents of which are established in this Ordinance.

Driveway - A vehicular way for entrance and exit to a property and circulation within the property.

Drop Curb - A section of curbing which is lowered to the street pavement level to permit access into a property or properties.

Dwelling - Any structure, or portion thereof, which is designed or used for residential purposes. The term dwelling shall not be deemed to include motel, rooming house, tourist home, hotel, hospital, or nursing home.

Dwelling, Mobile Home - A single-family detached factory manufactured housing unit build on a chassis. A mobile home shall be constructed to remain a mobile home, subject to all

regulations applying thereto, whether or not wheels, axles, hitch, or other appurtenances of mobility are removed and regardless of the nature of the foundation provided. This term does not include recreation vehicles or travel trailers.

Dwelling, Modular Home - A structure intended for permanent occupancy as a dwelling consisting of prefabricated sections or components constructed according to nationally recognized building codes at another location and transported to the site for assembly, placement upon and attachment to a permanent foundation.

Dwelling, Single Family Attached - See Townhouse.

Dwelling, Single Family Detached - A dwelling designed for and occupied by not more than one family and having no roof, wall, or floor in common with any other dwelling unit and having an additional lot with private yards on all four sides of the house.

Dwelling, Two-Family - Two dwelling units, each of which is attached side to side, or one above the other, each one sharing only one common wall with the other. Each unit shall have individual access to the outside.

Dwelling, Multiple Family - A building designed for or containing two or more dwelling units, sharing access from a common hall, stair, or balcony.

Earth Disturbance - Any activity including, but not limited to, construction, mining, timber harvesting and grubbing which alters, disturbs, and exposes the existing land surface.

Easement - Authorization by a property owner for use by another of any designated part of his property for a specified purpose.

Emergency Spillway - A depression in the embankment of a pond or basin that is used to pass peak discharge greater than the maximum design storm controlled by the pond.

Engineer - A licensed engineer registered in the Commonwealth of Pennsylvania.

Erosion - The movement of soil particles by the action of water, wind, ice, or other natural forces.

Erosion and Sediment Pollution Control Plan - A plan that is designed to minimize accelerated erosion and sedimentation.

Existing Conditions - The initial condition of a project site prior to the proposed construction. If the initial condition of the site is undeveloped land, the land use shall be considered as “meadow” in good condition unless the natural land cover is proven to generate lower curve numbers or Rational “C” value, such as forested lands.

Flag Lot - A lot, the main use or building area of which does not abut a public street, but is connected thereto by a narrow strip of land which is part of the lot.

Flood - A temporary inundation of normally dry land areas.

Flood, One Hundred Year - A flood that, on the average, is likely to occur once every 100 years, or that has a one percent chance of occurring in any given year.

Flood Fringe - That portion of the 100 year floodplain outside the floodway.

Floodplain - A relatively flat or low land area adjoining a stream, river, or watercourse, which is subject to partial or complete inundation. The boundary of this area shall coincide with the boundary of the 100 year flood as defined in the Township Floodplain Ordinance No. 18, as amended.

Floodway - The channel of a river or other watercourse and the adjacent land areas required to carry and discharge a flood of a 100 year frequency without cumulatively increasing the water surface elevation more than one (1) foot at any point.

Forest Management/Timber Operations - Planning and activities necessary for the management of forestland. These include timber inventory and preparation of forest management plans, silvicultural treatment, cutting budgets, logging road design and construction, timber harvesting, site preparation and reforestation.

Freeboard - A vertical distance between the elevation of the design high water and the top of a dam, levee, tank, basin, or diversion ridge. The space is required as a safety margin in a pond or basin.

Forest Management/Timber Operations - Planning and activities necessary for the management of forestland. These include timber inventory and preparation of forest management plans, silvicultural treatment, cutting budgets, logging road design and construction, timber harvesting, site preparation and reforestation.

Freeboard - A vertical distance between the elevation of the design high water and the top of a dam, levee, tank, basin, or diversion ridge. The space is required as a safety margin in a pond or basin.

Governing Body - The Board of Township Supervisors, Township of West Chillisquaque, County of Northumberland, Commonwealth of Pennsylvania.

Grade - A slope, usually of a road, channel or natural ground specified in percent and shown on plans as specified herein. (To) Grade - to finish the surface of a roadbed, top of embankment or bottom of excavation.

Grassed Waterway - A natural or constructed waterway, usually broad and shallow, covered with erosion-resistant grasses.

Groundwater Recharge - Replenishment of existing natural underground water supplies.

HEC-HMS (Hydrologic Engineering Center Hydrologic Modeling System) - The computer-based hydrologic modeling technique adapted to a particular watershed as part of an official Act 167 Watershed Plan and calibrated to reflect actual recorded flow values by adjoining key model input

parameters.

Impervious Surface - A surface that prevents the percolation of water into the ground. For the purposes of this Ordinance impervious surface may include, but not be limited to, the following: concrete, asphalt, building coverage, water impoundments, gravel and crushed stone areas, highly compacted soil, etc.

Impoundment - A retention or detention basin designed to retain stormwater runoff and release it at a controlled rate.

Improvements - Those physical additions and changes to the land that may be necessary to produce usable and desirable lots.

Improvements Guarantee Agreement - A deposit consisting of cash, a bond, a binding letter of credit, escrow account, or negotiable securities **and an agreement** guaranteeing the developer will install the required improvements. See model agreement in Appendix B.

Infiltration Structures - A structure designed to direct runoff into the ground (e.g., French drains, seepage pits, seepage trench).

Inlet - A surface connection to a closed drain. A structure at the diversion end of a conduit. The upstream end of any structure through which water may flow.

Karst – A type of topography that is formed over limestone, dolomite, or gypsum by bedrock solution, and that is characterized by closed depressions or sinkholes, caves and underground drainage (from AGI, Glossary of Geology, 1972.)

Land Development - (1) The improvement of one lot or two or more contiguous lots, tracts or parcels of land for any purpose involving:

(i) 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

(ii) the division or allocation of land or space, whether initially or cumulatively, 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 of other features; or

(2) a subdivision of land.

Land Earth Disturbance - Any activity involving grading, tilling, digging, or filling of ground or stripping of vegetation or any other activity that causes an alteration to the natural condition of the land.

Land Owner - The legal or beneficial owner or owners of land including the holder of an option or contract to purchase, a lessee if he is authorized under the lease to exercise the rights of the land owner, or any other person having a proprietary interest in land.

Leveling Area - A safe stopping area at the intersection of streets or the intersection of a driveway and a street which is designed in accordance with the standards of this Ordinance.

Limestone – A rock that is chiefly formed by the accumulation of organic remains, consisting mainly of calcium carbonate.

Lot: A piece or parcel of land undivided by any street or right-of-way and occupied or intended to be occupied by a principal building or use or a group of buildings conforming with the regulations of this Ordinance and its accessory buildings and uses, including all open spaces required by this Ordinance, and having frontage on a road

Lot Area - The computed area contained within the lot lines exclusive of any street right-of-ways, but including the area of any easement.

Lot, Corner - A lot abutting the intersection of two streets.

Lot Depth - The mean horizontal distance between the front and rear lot lines.

Lot, Double Frontage - A lot with street frontage at both the front and the rear.

Lot, Reverse Frontage - A lot extending between and having frontage on an arterial street and on a minor street, with vehicular access being provided solely from the minor street.

Lot, Width - The width of the lot measured at right angles to its center line, at the front building line.

Main Stem (Main Channel) - Any stream segment or other runoff conveyance facility used as a reach in any Act 167 Watershed Plan hydrologic model runs.

Maintenance Guarantee - A deposit consisting of cash, a bond, a binding letter of credit, escrow account, or negotiable securities and an agreement insuring that the improvements have been properly installed (see section 2.4.4.2).

Manning Equation in (Manning formula) - A method for calculation of velocity of flow (e.g., feet per second) and flow rate (e.g., cubic feet per second) in open channels based upon channel shape, roughness, depth of flow and slope. “Open channels” may include closed conduits so long as the flow is not under pressure.

Minor Subdivision - See Subdivision.

Mobile Home - See Dwelling, Mobile Home.

Mobile Home Lot - A parcel of land in a Mobile Home Park improved with the necessary utility connections and other appurtenances necessary for the erection thereon of a single Mobile Home, which is leased by the park owner to the occupants of the Mobile Home erected on the lot.

Mobile Home Park - A parcel or contiguous parcels of land which has been so designated and improved that it contains two or more mobile home lots for the placement thereon of mobile homes.

Monument - As utilized in the context of these regulations, a monument shall designate survey reference points utilized in laying out a given development. Each monument shall be constructed and placed as detailed in these regulations (see Section 4.12).

Municipality - The municipal corporation known as the Township of West Chillisquaque, Northumberland County, Pennsylvania.

Nonpoint Source Pollution - Pollution that enters a watery body from diffuse origins in the watershed and does not result from discernible, confined, or discrete conveyances.

Non-Structural BMP's - Stormwater runoff treatment techniques which use natural measures to reduce pollution levels, do not require extensive construction efforts and/or promote pollutant reduction by eliminating the pollutant source. Acceptable non-structural BMPs are identified in Appendix C.

NRCS - Natural Resource Conservation Service (previously SCS).

Open Channel - A drainage element in which stormwater flows with an open surface. Open channels include, but shall not be limited to, natural and man-made drainage ways, swales, streams, ditches, canals, and pipes flowing partly full.

Overbank and Extreme Event Flood Protection Volume - See Release Rates.

Outfall - Point where water flows from a conduit, stream, or drain.

Outlet - Points of water disposal from a stream, river, lake, tidewater or artificial drain.

Parking Lot Storage - Involves the use of impervious parking areas as temporary impoundments with controlled release rates during rainstorms.

Pavement - A sub-base, base course, or surface course placed on a sub-grade to support traffic load.

Peak Discharge - The maximum rate of stormwater runoff from a specific storm event.

Penn State Runoff Model (PSRM) - The computer-based hydrologic modeling technique adapted to a particular watershed as part of an official Act 167 Watershed Plan and calibrated to reflect actual recorded flow values by adjoining key model input parameters.

Pipe - A culvert, closed conduit, or similar structure (including appurtenances) that conveys stormwater.

Plan - A map or plat of a subdivision or land development, whether sketch, preliminary or final (see Subdivision Plan).

Planning Commission - The Planning Commission of West Chillisquaque Township, Northumberland County, Pennsylvania.

Plat - See **Plan**.

PMF - Probable Maximum Flood - The flood that may be expected from the most severe combination of critical meteorological and hydrological conditions that is reasonably possible in any area. The PMF is derived from the probable maximum precipitation (PMP) as determined based on data obtained from the National Oceanographic and Atmospheric Administration (NOAA).

Rational Formula - A rainfall-runoff relation used to estimate peak flow.

Recharge Volume (Re_v) - The volume of stormwater runoff from a site that must be infiltrated into the soil to promote the maintenance of groundwater recharge rates that existed prior to development.

Recreational Vehicle - A vehicular type of portable structure without permanent foundation, which can be towed, hauled, or driven and primarily designed as temporary living accommodation for recreational, camping and travel use and including but not limited to travel trailers, truck campers, camping trailers, and self-propelled motor homes.

Recreational Vehicle Park - Any site upon which two or more recreational vehicles are, or are intended to be located.

Regulated Activities - Actions or proposed actions that have an impact on stormwater runoff and that are specified in Section 4.17.1 of this Ordinance.

Release Rate - The percentage of pre-development peak rate of runoff from a site or subarea to which the post development peak rate of runoff must be reduced to protect downstream areas.

Residual Lot - The lot or parcel created through subdivision which is the remaining portion of the parent tract. The residual property shall be considered as an integral part of the proposed subdivision and shall be required to meet the standards of this Ordinance, where determined appropriate by the Township.

Retention Basin - An impoundment in which stormwater is stored and not released during the storm event. Stored water may be released from the basin at some time after the end of the storm.

Return Period - The average interval, in years, within which a storm event of a given magnitude can be expected to recur. For example, the 25-year return period rainfall would be expected to recur on the average of once every twenty- five years.

Right-of-Way - That portion of land dedicated to the public for use as a street, drain, ditch, stream, utility easement or cross walk.

Right-of-Way, Future - The planned future width of an existing substandard right-of-way based on the criteria established by this Ordinance, applicable Township plans, or PennDOT.

Riser - A vertical pipe extending from the bottom of a pond that is used to control the discharge rate from the pond for a specified design storm.

Rooftop Detention - Temporary ponding and gradual release of stormwater falling directly onto flat roof surfaces by incorporating controlled-flow roof drains into building designs.

Runoff - Any part of precipitation that flows over the land surface.

Screen Planting - A visual obstruction or suitable fence or wall at least six feet high or attractive, maintained shrubs or hedges a minimum of four feet high intended as a barrier to visibility, glare and noise between adjacent properties.

Sediment Basin - A barrier, dam, retention or detention basin located and designed to retain rock, sand, gravel, silt, or other material transported by water.

Sediment Pollution - The placement, discharge or any other introduction of sediment into the waters of the Commonwealth occurring from the failure to design, construct, implement or maintain control measures and control facilities in accordance with the requirements of this Ordinance.

Sedimentation - The process by which mineral or organic matter is accumulated or deposited by the movement of water.

Seepage Pit/Seepage Trench - An area of excavated earth filled with loose stone or similar coarse material, into which surface water is directed for infiltration into the ground.

Setback - The horizontal distance between a structure and a street line or property line.

Sewerage System - Facilities developed and approved in accordance with Section 4.15 of this Ordinance for the disposal of sewage.

Sewage System, Community (or Central) - A sewer collection and treatment system which serves facilities on a community, area-wide, or regional basis. The facility company must be approved by and (or) licensed by the Pennsylvania Department of Environmental Resources.

Sewage System, Individual - An on-lot sewage treatment system serving a single residence or user which must be approved by the Township Sewage Enforcement Officer and/or the Pennsylvania Department of Environmental Resources.

Sheet Flow - Runoff that flows over the ground surface as a thin, even layer, not concentrated in a channel.

Shopping Center - A land development involving a group of commercial establishments planned, constructed, and managed as a total entity, with customer and employee parking provided on-site, provision for goods delivery separated from customer access, aesthetic considerations and protection from the elements, and landscaping and signs in accord with an approved plan.

Shoulder - That portion of the roadway which is adjacent to the cartway and is provided for lateral support of the pavement and for emergency stopping.

Slope - The rise or fall of the land usually measured in percent slope. The percent slope is equal to the rise or fall in feet for a horizontal distance of 100 feet.

Soil-Cover Complex Method - A method of runoff computation developed by the NRCS that is based on relating soil type and land use/cover to a runoff parameter called Curve Number (CN).

Soil Group, Hydrologic - A classification of soils by the Natural Resources Conservation Service, formerly the Soil Conservation Service, into four runoff potential groups. The groups range from A soils, which are very permeable and produce little runoff, to D soils, which are not very permeable and produce much more runoff.

Storage Indication Method - A reservoir routing procedure based on solution of the continuity equation (inflow minus outflow equals the change in storage) with outflow defined as a function of storage volume and depth.

Storm Frequency - The number of times that a given storm “event” occurs or is exceeded on the average in a stated period of years. See “Return Period.”

Storm Sewer - A system of pipes and/or open channels that convey intercepted runoff and stormwater from other sources, but excludes domestic sewage and industrial wastes.

Stormwater - The total amount of precipitation reaching the ground surface.

Stormwater Hotspot – A land use or activity that generates higher concentrations of hydrocarbons, trace metals, or toxicants than are found in typical stormwater runoff, based on monitoring studies. Typical stormwater hotspots are listed in Section 4.17.4.5.5 of this Ordinance.

Stormwater Management Credits - Incentive based non-structural stormwater management applications that can be incorporated into the site design process to promote water quality, groundwater recharge, volume control, and other stormwater objectives. These include conservation of natural areas, disconnection of rooftop runoff, disconnection of non-rooftop runoff, sheet flow to buffers, grass channels and environmentally sensitive or low impact development.

Stormwater Management Facility - Any structure, natural or man-made, that, due to its condition, design, or construction, conveys, stores, or otherwise affects stormwater runoff. Typical stormwater management facilities include, but are not limited to, detention and retention basins, open channels, storm sewers, pipes, and infiltration structures.

Stormwater Management Plan - A plan for managing stormwater runoff from the proposed subdivision or land development, prepared by the developer in accordance with the standards of this Ordinance (see Section 4.17.).

Stream Enclosure - A bridge, culvert or other structure in excess of 100 feet in length upstream to downstream which encloses a regulated water of this Commonwealth.

Street - A public or private right-of-way of the required width which affords the principal means of access for vehicles and pedestrians to abutting property. The term "street" shall include street, avenue, drive, circle, highway or any similar term except an alley.

Alley or Service Drive - A public or private way affording secondary means of access to abutting property.

Street, Arterial - A street serving a large volume of comparatively high speed and long distance traffic, including all streets classified as arterial streets in the West Chillisquaque Township Comprehensive Plan.

Street, Collector - A street which, in addition to providing access to abutting properties, intercepts minor streets to provide a route to arterial streets. Collector streets are so designated in the West Chillisquaque Township Comprehensive Plan.

Street, Cul-de-Sac - A street intersecting another street at one end and terminating at the other in a vehicular turn-around.

Street, Dead-end - A street with only a single outlet.

Street, Marginal Access - A street which is parallel and adjacent to arterial or limited access highways and is intended to provide access to abutting properties and control intersections along collector or arterial streets.

Street, Minor - Streets within subdivisions and developments, including marginal access streets and cul-de-sac streets, which are designed to afford primary access to abutting property.

Street, Public - All streets and rights-of-way open to public use and maintained by, or dedicated to and accepted by the Township or PennDOT.

Street, Private - All streets and rights-of-way not dedicated, accepted, and maintained as public streets.

Street Right-of-Way Line - The closest edge of the right-of-way as required by this Ordinance.

Street System - All of the public and private streets that make up the highway system of the Township.

Street System, Township - All public streets and rights-of-way maintained by West Chillisquaque Township, including minor and collector streets.

Street System, State - All public streets and rights-of-way maintained by the Pennsylvania Department of Transportation, including minor, collector, arterial, and interstate highways.

Structure - Any man-made object having an ascertainable stationary location on or in land or water, whether or not affixed to the land.

Subarea (sub-watershed) - The smallest drainage unit of a watershed for which stormwater management criteria have been established in an Act 167 Stormwater Management Plan.

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

Subdivision - The division or redivision of a lot, tract, or parcel of land by any means into two or more lots, tracts, parcels or other divisions of land including changes in existing lot lines for the purpose, whether immediate or future, of lease, partition by the court for distribution to heirs or devisees, transfer of ownership or building development: Provided, however, that the subdivision by lease of land for agricultural purposes into parcels of more than ten acres, not involving any new streets or easements of access or any residential dwelling, shall be exempted.

As a further exception, the division of small portions of existing lots, tracts, or parcels of land being acquired by governmental units or public utilities for use in road improvements, utility lines, or utility structures may be exempt from the requirements of this Ordinance as per P.U.C. regulations, state law, or federal law.

Subdivision, Add-On - A subdivision which creates a lot which is to be added to an existing contiguous lot and where no new building lot or land development is proposed.

Subdivision, Minor - A subdivision of lots fronting on a public road and not involving the creation of any new streets.

Subdivision Plan - A proposal to subdivide or develop one or more tracts of land. The plan shall include the proposed layout of the subdivision or land development and shall be accompanied by all other supplementary materials required by this Ordinance when submitted for consideration.

Plan, Sketch - An informal plan, not necessarily to exact scale, indicating important features of the tract and its surroundings and the general layout of a proposed subdivision.

Plan, Preliminary - A tentative subdivision plan, in lessor detail than the final plan, indicating the approximate proposed layout of a subdivision as a basis for consideration prior to preparation of the final plan.

Plan, Final - A complete and exact subdivision plan prepared for official recording following approval of the Board of Supervisors of West Chillisquaque Township.

Surveyor - A licensed professional land surveyor registered in Pennsylvania.

Swale - A low-lying stretch of land that gathers or carries surface water runoff.

Technical Release 20 (TR-20) - Project Formulation-Hydrology, Computer Program. NRCS.

Technical Release 55 (TR-55) - Urban Unit Hydrology for Small Watersheds. NRCS.

Time-of-Concentration (Tc) - The time for surface runoff to travel from the hydraulically most distant point of the watershed to a point of interest within the watershed. This time is the combined total of overland flow time and flow time in pipes or channels, if any.

Townhouse - A single-family attached dwelling of three or more adjoining dwelling units, each of which is separated from the other by one or more unpierced firewalls from ground to roof, having individual outside access. Rows of attached townhouses shall not exceed eight dwelling units.

Township - West Chillisquaque Township, Northumberland County, Commonwealth of Pennsylvania.

Watercourse - A permanent or intermittent stream, river, spring, brook, creek, channel, ditch, or swale for water whether natural or man-made.

Waters of the Commonwealth - Any and all rivers, streams, creeks, rivulets, ditches, watercourses, storm sewers, lakes, dammed water, wetlands, ponds, springs, and all other bodies or channels of conveyance of surface and underground water, or parts thereof, whether natural or artificial, within or on the boundaries of this Commonwealth.

Water Quality Volume (WQ_v) - The storage needed to capture and treat the runoff from 90% of the average annual rainfall. For Upper Northumberland County the depth of rain associated with 90% of the total of all rainfall events is 1.2 inches.

Water System - A system for the provision of water to individual lots or the public for domestic, community commercial, or industrial use.

Water System, Public - A water system, as defined by the Pennsylvania Department of Environmental Resources which has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days out of the year.

Water System, Private - All water systems which are not public water systems.

Wetland - Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions, including swamps, marshes, bogs and similar areas.

APPENDIX A
REQUIRED CERTIFICATES

Blocks for signatures shall be provided on subdivision and land development plans including:

1. Recommendation For Approval - West Chillisquaque Township Planning Commission:

REVIEWED AND RECOMMENDED FOR APPROVAL
BY THE
WEST CHILLISQUAQUE PLANNING COMMISSION

date:_____

plan no._____

Chairman_____

Secretary_____

2. Approved By The West Chillisquaque Township Board of Supervisors:

APPROVED BY THE
BOARD OF SUPERVISORS
WEST CHILLISQUAQUE TOWNSHIP

date:_____

plan no._____

APPENDIX B-1

SUBDIVISION IMPROVEMENTS GUARANTY AGREEMENT

for use with an

ESCROW ACCOUNT

THIS AGREEMENT, made this _____ day of _____ 199____, by and between:

1. The TOWNSHIP OF WEST CHILLISQUAQUE, Northumberland County, Montandon, Pennsylvania 17850, hereinafter referred to as "Township";

2. The _____, of _____, hereinafter referred to as "Bank"; and

3. _____, of _____, hereinafter referred to as "Developers".

WITNESSETH:

WHEREAS, the Developers own a _____ acre parcel of land located in West Chillisquaque Township, Northumberland County, Pennsylvania, and further designated as part of Parcel _____ on Sheet _____ of the Northumberland County Tax Atlas, of which they do intend to subdivide and develop; and

WHEREAS, §509 of the Pennsylvania Municipalities Planning Code, Act 170 of 1988, P.L. 1329, as amended (P.S. _____), hereinafter referred to as "the Code", and the Subdivision and Land Development Ordinance for West Chillisquaque Township, prohibit final approval of any land subdivision unless and until all streets in such plat have been improved as may be required by the subdivision and land development ordinance of the Township or any other improvements as may be required by the Township Ordinance; and

WHEREAS, §509 of the Code does provide an alternative method for developers to proceed with their subdivision and land developments without first completing all such improvements. The developer is required to place with the Township, financial security in an amount sufficient to cover the cost of any such improvements or common amenities as mentioned above; and

WHEREAS, the Developers do desire to commence development of their aforesaid parcel and transfer vacant lots therefrom as soon as practicable in accordance with the Subdivision and Land Development Ordinance for West Chillisquaque, as amended; and

WHEREAS, the Township, Developers, and Bank do desire to enter into an agreement setting forth the responsibilities of each to facilitate the approval and implementation of the approved subdivision plan and the installation of the improvements required therefor;

NOW, THEREFORE, in consideration of the final subdivision approval by the Township of the subdivision plan of the _____ Development in West Chillisquaque Township, dated the _____ day of _____, 199____, drawn and prepared by _____, submitted by the Developers, and in an effort to protect and promote the public health, safety and general welfare of the community, the parties hereto, intending to be legally bound, do hereby AGREE AS FOLLOWS:

1. Developers have received and provided the Township with bona fide bids for installation of all improvements shown on the approved subdivision plan of the _____ Development. A true and correct copy of said bids, designated as Exhibit A, is attached hereto and made a part hereof.

2. The subdivision plan of _____ Development, dated the _____ day of _____, 199____, prepared by _____, plan # _____ submitted by the Developers and preliminarily approved by the Township, contingent upon the execution of this agreement, is incorporated herein by reference.

3. As a guaranty of the installation of all improvements of this subdivision as proposed and approved, the Developers have deposited _____ dollars (\$ _____,000.00) into an escrow account with the Bank. The amount of this deposit is in excess of one hundred ten percent (110%) of the cost of the required improvements for which the deposit is being posted.

4. During the period of one (1) year from the date of this agreement, withdrawal from the deposit into this escrow account may only be made with the written approval of the Township which will not be unreasonably withheld.

Any change orders on the bids for the improvements must be approved by the Township. In this event, the Township may require an additional increase in the escrow deposit consistent with any increases in costs caused by the change order.

5. Developers will proceed to construct (road improvements), (walkways), (curbs), (gutters), (street lights), (fire hydrants), (shade trees), (water mains), (sanitary sewers), (storm drains), and other improvements as required by the Subdivision and Land Development Ordinance of the Township and as provided for by the _____ Subdivision Plan.

6. All improvements shown on the approved plan as further described herein will be completed within one (1) year of the date of the execution of this Agreement unless an extension of time is granted to developers by the Township upon written request to the Township by the Developers.

7. After written notice from the Developers that the improvements have been completed, the Township or its agents, shall make timely inspection of the installation of such improvements.

8. Should the inspection of the improvements indicate that all proposed and required improvements have been installed as designed and approved, the Township shall then withdraw the requirement of its approval for release of funds from the escrow account and all obligations of the Developers under this agreement shall then be terminated as to financial limitations.

9. In the event the improvements shown on the approved subdivision plan of _____ Development have not been completed within one (1) year of the date of this Agreement, or such later date as may be agreed upon through extensions granted by the Township, the Township may conclusively presume default on this agreement.

10. Upon default of this agreement, the Developers do authorize the Township to withdraw funds from the escrow account with the Bank for the purpose of completing the improvements of this subdivision. The Bank is hereby authorized by the Developers to release to the Township any such funds necessary for the installation or completion of these improvements.

11. Nothing herein shall be construed in any way to relieve the Developer from full complete compliance with the Subdivision and Land Development Ordinance for West Chillisquaque Township, as amended, except as specifically herein stated.

IN WITNESS WHEREOF, the parties hereto, intending to be legally bound hereby, have hereunto set their hands and seals, the day, month and year first above written.

Witness:

DEVELOPERS:

THE _____BANK

Attest:

BY:_____

TOWNSHIP OF WEST CHILLISQUAQUE

Attest:

BY:_____

APPENDIX B-2

SUBDIVISION IMPROVEMENTS GUARANTY AGREEMENT

for use with an

IRREVOCABLE BANK LINE OF CREDIT

THIS AGREEMENT, made this _____ day of _____ 199____, by and between:

1. The TOWNSHIP OF WEST CHILLISQUAQUE, Northumberland County, Montandon, Pennsylvania 17850, hereinafter referred to as "Township";

2. The _____, of _____, hereinafter referred to as "Bank"; and

3. _____, of _____, hereinafter referred to as "Developers".

WITNESSETH:

WHEREAS, the Developers own a _____ acre parcel of land located in West Chillisquaque Township, Northumberland County, Pennsylvania, and further designated as part of Parcel _____ on Sheet _____ of the Northumberland County Tax Atlas, of which they do intend to subdivide and develop; and

WHEREAS, §509 of the Pennsylvania Municipalities Planning Code, Act 170 of 1988, P.L. 1329, as amended (P.S. _____), hereinafter referred to as "the Code", and the Subdivision and Land Development Ordinance for West Chillisquaque Township, prohibit final approval of any land subdivision unless and until all streets in such plat have been improved as may be required by the subdivision and land development ordinance of the Township or any other improvements as may be required by the Township Ordinance; and

WHEREAS, §509 of the Code does provide an alternative method for developers to proceed with their subdivision and land developments without first completing all such improvements. The developer is required to place with the Township, financial security in an amount sufficient to cover the cost of any such improvements or common amenities as mentioned above; and

WHEREAS, the Developers do desire to commence development of their aforesaid parcel and transfer vacant lots therefrom as soon as practicable in accordance with the Subdivision and Land Development Ordinance for West Chillisquaque, as amended; and

WHEREAS, the Township, Developers, and Bank do desire to enter into an agreement

setting forth the responsibilities of each to facilitate the approval and implementation of the approved subdivision plan and the installation of the improvements required therefor;

NOW, THEREFORE, in consideration of the final subdivision approval by the Township of the subdivision plan of the _____ Development in West Chillisquaque Township, dated the _____ day of _____, 199____, drawn and prepared by _____, submitted by the Developers, and in an effort to protect and promote the public health, safety and general welfare of the community, the parties hereto, intending to be legally bound, do hereby AGREE AS FOLLOWS:

1. Developers have received and provided the Township with bona fide bids for installation of all improvements shown on the approved subdivision plan of the _____ Development. A true and correct copy of said bids, designated as Exhibit A, is attached hereto and made a part hereof.

2. The subdivision plan of _____ Development, dated the _____ day of _____, 199____, prepared by _____, plan # _____ submitted by the Developers and preliminarily approved by the Township, contingent upon the execution of this agreement, is incorporated herein by reference.

3. As a guaranty of the installation of all improvements of this subdivision as proposed and approved, the Developers have established an irrevocable line of credit with the Bank, in the amount of _____ dollars (\$ _____,000.00) with the Bank. The amount of this irrevocable line of credit is equal to at least one hundred ten percent (110%) of the cost of the required improvements for which this credit is being posted.

4. During the period of one (1) year from the date of this agreement, withdrawal from this irrevocable line of credit may only be made with the written approval of the Township.

Any change orders on the bids for the improvements must be approved by the Township. In this event, the Township may require an additional increase in the irrevocable line of credit with the Bank consistent with any increases in costs caused by the change order.

5. Developers will proceed to construct (road improvements), (walkways), (curbs), (gutters), (street lights), (fire hydrants), (shade trees), (water mains), (sanitary sewers), (storm drains), and other improvements as required by the Subdivision and Land Development Ordinance of the Township and as provided for by the _____ Subdivision Plan.

6. All improvements shown on the approved plan as further described herein will be completed by the _____ day of _____, 199____, unless an extension of time is granted to developers by the Township upon written request to the Township by the Developers.

7. After written notice from the Developers that the improvements have been completed, the Township or its agents, shall make timely inspection of the installation of such improvements.

8. Should the inspection of the improvements indicate that all proposed and required improvements have been installed as designed and approved, the Township shall then withdraw the requirement of its approval authority from the aforementioned irrevocable line of credit with the Bank. All obligations of the Developers under this agreement shall then be terminated.

9. In the event the improvements shown on the approved subdivision plan of _____ Development have not been completed by the _____ day of _____,

_____, 199____, or such later date as may be agreed upon through extensions granted by the Township, the Township may conclusively presume default on this agreement.

10. Upon default of this agreement, the Developers do authorize the Township to withdraw funds from said line of credit with the Bank for the purpose of completing the improvements of this subdivision. The Bank is hereby authorized by the Developers to release to the Township any such funds necessary for the installation or completion of these improvements.

11. Nothing herein shall be construed in any way to relieve the Developer from full complete compliance with the Subdivision and Land Development Ordinance for West Chillisquaque Township, as amended, except as specifically herein stated.

IN WITNESS WHEREOF, the parties hereto, intending to be legally bound hereby, have hereunto set their hands and seals, the day, month and year first above written.

Witness:

DEVELOPERS:

THE _____BANK

Attest:

BY:_____

TOWNSHIP OF WEST CHILLISQUAQUE

Attest:

BY:_____

APPENDIX C

Stormwater Credits For Effective Site Planning

C.1 Stormwater Credits

In Pennsylvania, there are many programs at both the State and local level that seek to minimize the impact of land development. Critical areas, forest conservation, and local stream buffer requirements are designed to reduce nonpoint source pollution. Non-structural practices can play a significant role in reducing water quality impacts and are increasingly recognized as a critical feature of every stormwater BMP plan, particularly with respect to site design. In most cases, non-structural practices must be combined with structural practices to meet stormwater requirements. The key benefit of non-structural practices is that they can reduce the generation of stormwater from the site; thereby reducing the size and cost of stormwater storage. In addition, they can provide partial removal of many pollutants. Non-structural practices have been classified into six broad groups and are designed to mesh with existing state and local programs (e.g., forest conservation, stream buffers, etc.). To promote greater use, a series of six stormwater credits are provided for designers that use these site planning techniques.

Credit 1. Natural Area Conservation

Credit 2. Disconnection of Rooftop Runoff

Credit 3. Disconnection of Non-Rooftop Runoff

Credit 4. Sheet Flow to Buffers

Credit 5. Grass Channel

Credit 6. Environmentally Sensitive Development

This Appendix describes each of the credits for the six groups of non-structural practices, specifies minimum criteria to be eligible for the credit, and provides an example of how the credit is calculated. Designers should check with the Municipal Engineer to ensure that the credit is applicable to their jurisdiction.

In general, the stormwater sizing criteria provide a strong incentive to reduce impervious cover at development sites. Storage requirements for all five stormwater sizing criteria are directly related to impervious cover. Thus, significant reductions in impervious cover result in smaller required storage volumes and, consequently, lower BMP construction costs.

These and other site design techniques can help to reduce impervious cover, and consequently, the stormwater treatment volume needed at a site. The techniques presented in this Chapter are considered options to be used by the designer to help reduce the need for stormwater BMP storage capacity. Due to local safety codes, soil conditions, and topography, some of these site design features will be restricted. Designers are encouraged to consult with the Municipal Engineer to determine restrictions on non-structural strategies.

NOTE: In this chapter, *italics* indicate mandatory performance criteria, whereas suggested design criteria are shown in normal typeface.

These credits are an integral part of a project's overall stormwater management plan and BMP storage volume calculation. Therefore, use of these credits shall be documented at the initial (concept) design stage, documented with submission of final grading plans, and verified with "as-built" plans. If a planned credit is not implemented, then BMP volumes shall be increased appropriately to stormwater sizing criteria.

Table C.1 Summary of Stormwater Credits

Stormwater Credit	WQ_v	Re_v	Cp_v or Q_p
Natural Area Conservation	Reduce Site Area	No credit. Use as receiving area w/Percent Area Method.	Forest/meadow CN for natural areas
Disconnection of Rooftop Runoff	Reduced R _v	No credit. Use with Percent Area Method.	Longer tc (increased flow path). CN credit.
Disconnection of Non-Rooftop Runoff	Reduced R _v	No credit. Use with Percent Area Method.	Longer tc (increased flow path) CN credit
Sheet Flow to Buffers	Subtract contributing site area to BMP	Reduced Re _v	CN credit
Open Channel Use	May meet WQ _v	Meets Re _v	Longer tc (increased flow path) No CN credit
Environmentally Sensitive Development	Meets WQ _v	Meets Re _v	No CN credit tc may increase

C.2 Natural Area Conservation Credit

A stormwater credit is given when natural areas are conserved at development sites, thereby retaining pre development hydrologic and water quality characteristics. A simple WQ_v credit is granted for all **conservation areas permanently protected under conservation easements or other locally acceptable means**. Examples of natural area conservation include:

- forest retention areas
- non-tidal wetlands and associated buffers
- other lands in protective easement (floodplains, open space, steep slopes)
- stream systems

Under the credit, a designer can subtract conservation areas from total site area when computing the water quality volume. **The volumetric runoff coefficient, R_v, is still calculated based on the percent impervious cover for the entire site.**

As an additional incentive, the post development curve number (CN) used to compute the Cp_v or Qp2, and Qp10 for all natural areas protected by conservation easements can be assumed to be woods in good condition when calculating the total site CN.

As an example, the required WQ_v for a ten acre site with three acres of impervious area and three acres of protected conservation area before the credit would be:

$$WQ_v = [(P)(R_v)(A)]/12; \text{ where } P= 1.2'', R_v= 0.05+0.009(30\%)$$

$$WQ_v = [(1.2'') (0.32)(10 \text{ acres})]/12 = 0.320 \text{ ac-ft}$$

Under the credit, three acres of conservation are subtracted from total site area, which yields a smaller storage volume:

$$WQ_v = [(P)(R_v)(A)]/12; \text{ where } P=1.2'', R_v=0.05+0.009(30\%)$$

$$WQ_v = [(1.2'')(0.32)(10-3 \text{ acres})]/12 = 0.224 \text{ ac-ft}$$

The recharge requirement (Re_v) is not reduced using this credit.

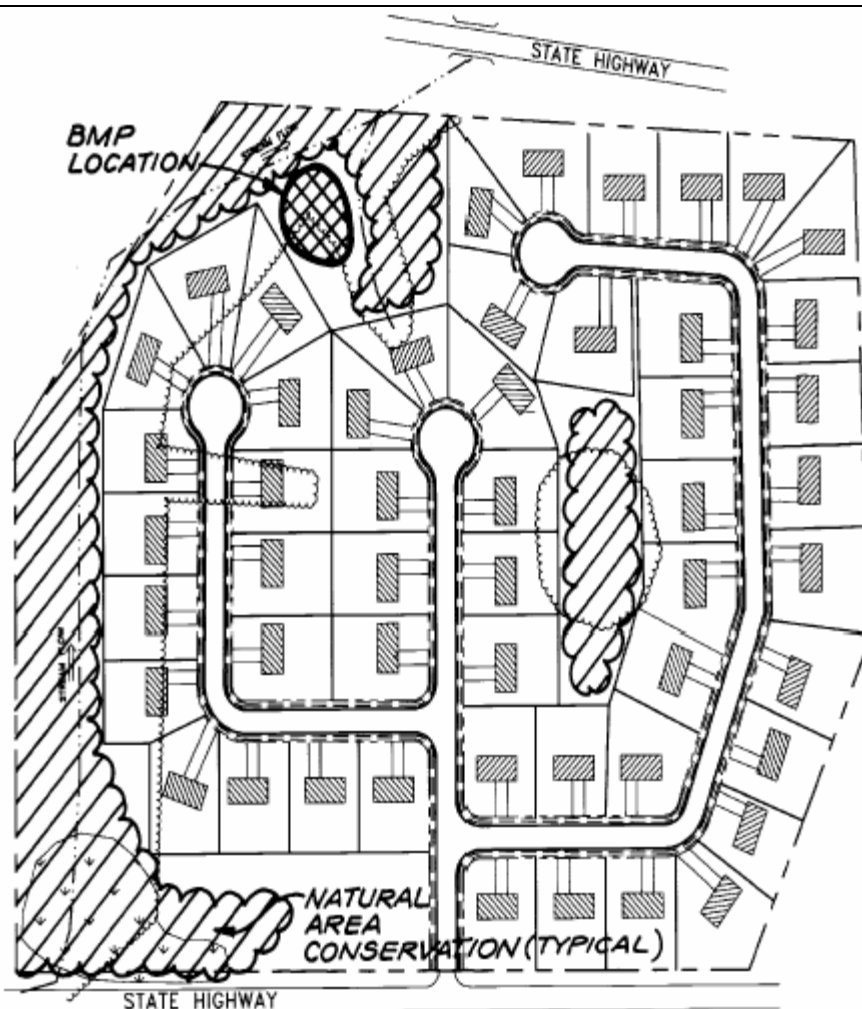
Criteria for Natural Area Credit

To receive the credit, the proposed conservation area:

- *Shall not be disturbed during project construction (e.g., cleared or graded) except for temporary impacts associated with incidental utility construction or mitigation and afforestation projects.*
- *Shall be protected by having the limits of disturbance clearly shown on all construction drawings and delimited in the field except as provided for above.*
- *Shall be located within an acceptable conservation easement or other enforceable instrument that ensures perpetual protection of the proposed area. The easement must clearly specify how the natural area vegetation shall be managed and boundaries will be marked [Note: managed turf (e.g., playgrounds, regularly maintained open areas) is not an acceptable form of vegetation management], and shall be located within the project site.*

Example of Calculating Natural Area Credit

Site Data - 51 Single Family
Lots
Area = 38 ac
Conservation Area = 7.0 ac
Impervious Area = 13.8 ac
 $R_v = .38$, $P = 1.2''$
Post dev. CN = 78
Original $WQ_v = 1.44$ ac-ft
Original $Re_v = 0.25$ ac-ft
Original $Cp_v = 1.65$ ac-ft



Computation of Stormwater Credits

$$\begin{aligned} WQ_v &= [(P)(R_v)(A)]/12 \\ &= [(1.2)(.38)(38.0 - 7.0 \text{ ac})]/12 \\ &= 1.18 \text{ ac-ft} \end{aligned}$$

Re_v = Same as original

(However, area draining to Natural Area may be used with the Percent Area Method)

CN reduced from 78 to 75

C.3 Disconnection of Rooftop Runoff Credit

A credit is given when rooftop runoff is disconnected and then directed to a pervious area where it can either infiltrate into the soil or filter over it. The credit is typically obtained by grading the site to promote overland filtering or by providing bioretention areas on single family residential lots.

If a rooftop is adequately disconnected, the disconnected impervious area may be deducted from total impervious cover (therefore reducing WQ_v). In addition, disconnected rooftops can be used to meet the Re_v requirement as a non-structural practice using the percent area method.

Post development CN's for disconnected rooftop areas used to compute Cp_v and Q_p can be assumed to be woods in good condition.

Criteria for Disconnection of Rooftop Runoff Credit

The credit is subject to the following restrictions:

- *Rooftop cannot be within a designated hotspot.*
- *Disconnection shall cause no basement seepage.*
- *The contributing area of rooftop to each disconnected discharge shall be 500 square feet or less.*
- *The length of the "disconnection" shall be 75 feet or greater, or compensated using Table C.1*
- *Dry wells, french drains, raingardens, or other similar storage devices may be utilized to compensate for areas with disconnection lengths less than 75 feet. (See Table C.1 and Figure C.1, dry wells are prohibited in "D" soils)*
- *In residential development applications, disconnections will only be credited for lot sizes greater than 6000 sq. ft.*
- *The entire vegetative "disconnection" shall be on an average slope of 5% or less.*
- *The disconnection must drain continuously through a vegetated channel, swale, or through a filter strip to the property line or BMP.*
- *Downspouts must be at least 10 feet away from the nearest impervious surface to discourage "re-connections".*
- *For those rooftops draining directly to a buffer, only the rooftop disconnection credit or the buffer credit may be used, not both.*

Figure C.1 Schematic of Dry Well

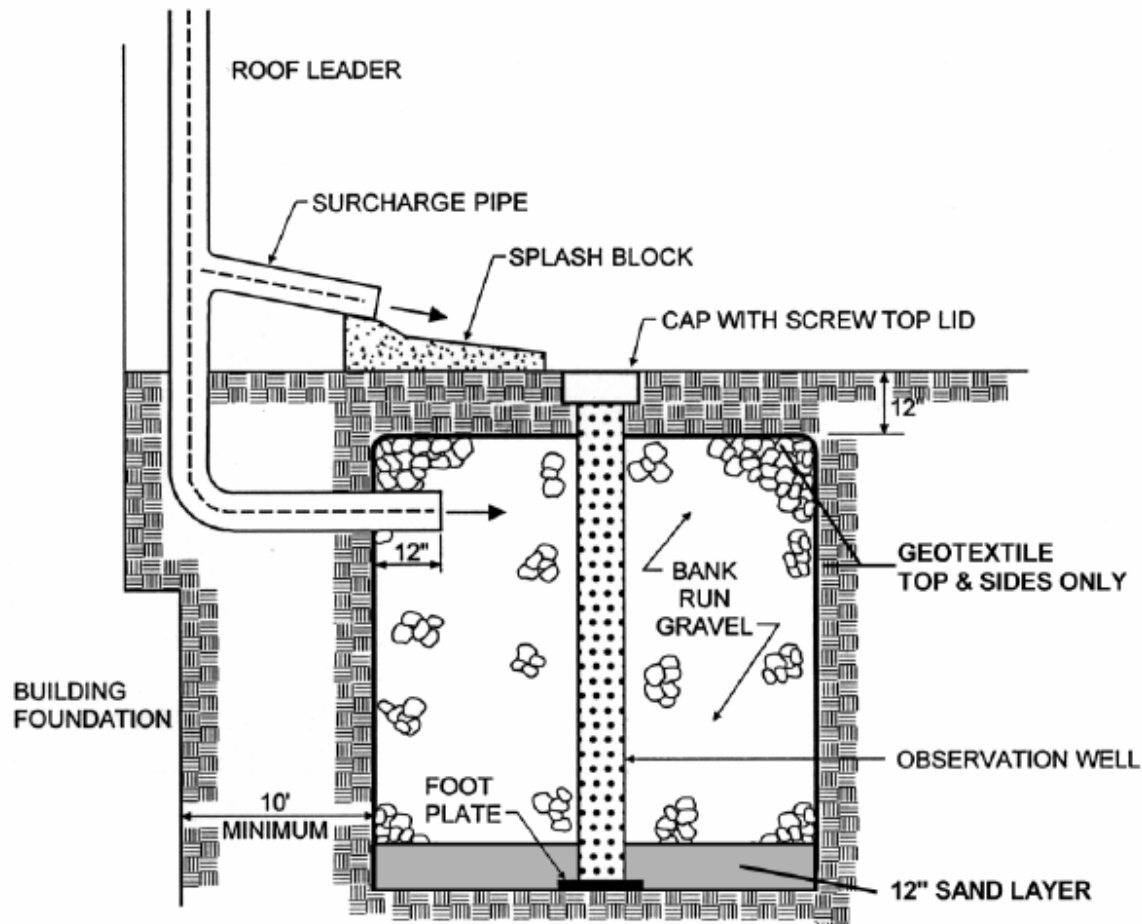


Table C.1 Rooftop Disconnection Compensation Storage Volume Requirements (Per Disconnection Using Drywells, Raingardens, etc.)

Disconnection Length Provided	0 - 14 ft.	15 - 29 ft.	30 - 44 ft.	45 - 59 ft.	60 - 74 ft.	≥75 ft.
% WQ _v Treated by Disconnect	0%	20%	40%	60%	80%	100%
% WQ _v Treated by Storage	100%	80%	60%	40%	20%	0%
Max. Storage Volume*	48 cu-ft.	39 cu-ft.	30 cu-ft.	21 cu-ft.	12 cu-ft.	0 cu-ft.

*Assuming 500 square feet roof area to each downspout.

Example of Using the Rooftop Disconnection Credit

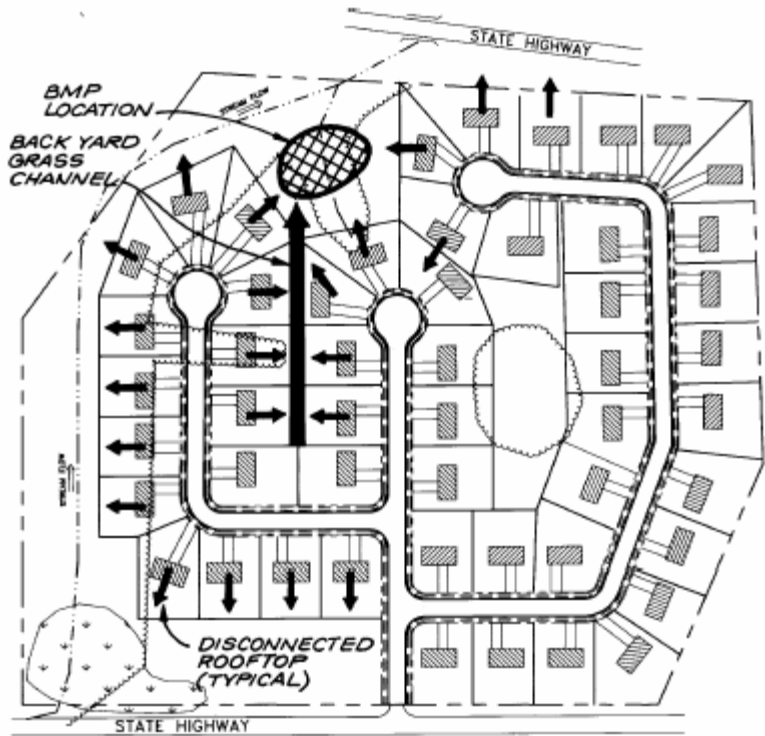
Site Data - 51 Single Family Lots
 Area = 38 ac, ½ ac lots
 Original Impervious Area = 13.80 ac
 Original $R_v = 0.38$
 Post dev. CN = 78
 # of Disconnected Rooftops = 22
 Original $WQ_v = 1.44$ ac-ft
 Original $Re_v = 0.25$ ac-ft
 Original $Cp_v = 1.65$ ac-ft

60% B Soils
 40% C Soils
 Composite $S = 0.218$ (21.8%)

22 Lots Disconnected w/5
 Downspouts each
 2500 sf. each lot

Net impervious area reduction =
 $(22)(2500)/43560 = 1.3$ ac

Net Impervious Area =
 $13.8 - 1.3 = 12.5$ ac



Computation of Stormwater Credit:

New $R_v = 0.05 + 0.009 (12.5 \text{ ac}/38 \text{ ac}) = 0.35$
 $WQ_v = [(1.2)(.35)(38 \text{ ac})]/12 = 1.33$ ac-ft

Required Re_v (Percent Area Method)

$Re_v = 21.8\% \times 13.8 \text{ ac.} = 3.01$ ac

Re_v treated by disconnection = 1.3 ac

Re_v remaining for treatment = 1.71 acres non structurally or 0.14 ac-ft structurally

CN reduced from 78 to 76

C.4 Disconnection of Non-Rooftop Runoff Credit

Credit is given for practices that disconnect surface impervious cover runoff by directing it to pervious areas where it is either infiltrated into the soil or filtered (by overland flow). This credit can be obtained by grading the site to promote overland vegetative filtering or providing bioretention areas on single family residential lots.

These “disconnected” areas can be subtracted from the impervious area when computing WQ_v . In addition, disconnected surface impervious cover can be used to meet the Re_v requirement as a non-structural practice using the percent area method.

Criteria for Disconnection of Non-Rooftop Runoff Credit

The credit is subject to the following restrictions:

- *Runoff cannot come from a designated hotspot.*
- *The maximum contributing impervious flow path length shall be 75 feet.*
- *The disconnection shall drain continuously through a vegetated channel, swale, or filter strip to the property line or BMP.*
- *The length of the “disconnection” must be equal to or greater than the contributing length.*
- *The entire vegetative “disconnection” shall be on an average slope of 5% or less.*
- *The surface impervious area to any one discharge location cannot exceed 1,000 ft².*
- *Disconnections are encouraged on relatively permeable soils (HSG’s A and B).*
- *If the site cannot meet the required disconnect length, a spreading device, such as a french drain, gravel trench or other storage device may be needed for compensation.*
- *For those areas draining directly to a buffer, only the non rooftop disconnection credit or the stream buffer credit can be used, not both.*

Example of Calculating the Non-Rooftop Disconnection Credit

Site Data -Community Center

Area = 3.0 ac

Original Impervious Area =

1.9 ac = 63.3%

Original $R_v = .62$

Post dev. CN = 83

B Soils, $S = 0.27$

Original $WQ_v = 8102 \text{ ft}^3$

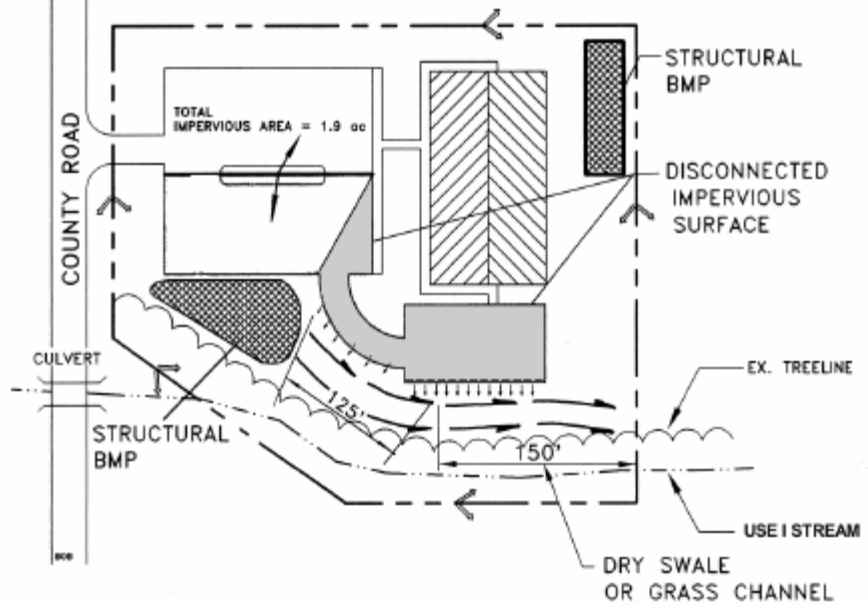
Original $Re_v = 1688 \text{ ft}^3$

Original $Cp_v = \text{N/A}$

0.33 ac of surface imperviousness disconnected

Net impervious area reduction

$1.9 - 0.33 = 1.57 \text{ ac}$



Computation of Stormwater Credit:

New $R_v = 0.05 + 0.009 (1.57 \text{ ac} / 3.0 \text{ ac}) = .52$

$WQ_v = [(1.2)(0.52)(3.0 \text{ ac})] 12 = 0.16 \text{ ac-ft} (6795 \text{ ft}^3)$

Required Re_v (Percent area method)

$Re_v = (S)(Ai) = (0.27)(1.9 \text{ ac}) = 0.51 \text{ ac}$

Re_v treated by disconnection = 0.33 ac

Re_v remaining for treatment = 0.18 ac non structurally or 595.8 cf structurally

Post developed CN may be reduced

C.5 Sheetflow to Buffers Credit

This credit is given when stormwater runoff is effectively treated by a natural buffer to a stream or forested area. Effective treatment is achieved when pervious and impervious area runoff is discharged to a grass or forested buffer through overland flow. The use of a filter strip is also recommended to treat overland flow in the green space of a development site.

The credits include:

1. The area draining by sheet flow to a buffer is subtracted from the total site area in the WQ_v calculation.
2. The area draining to the buffer contributes to the recharge requirement, Re_v .
3. A wooded CN can be used for the contributing area if it drains to a forested buffer.

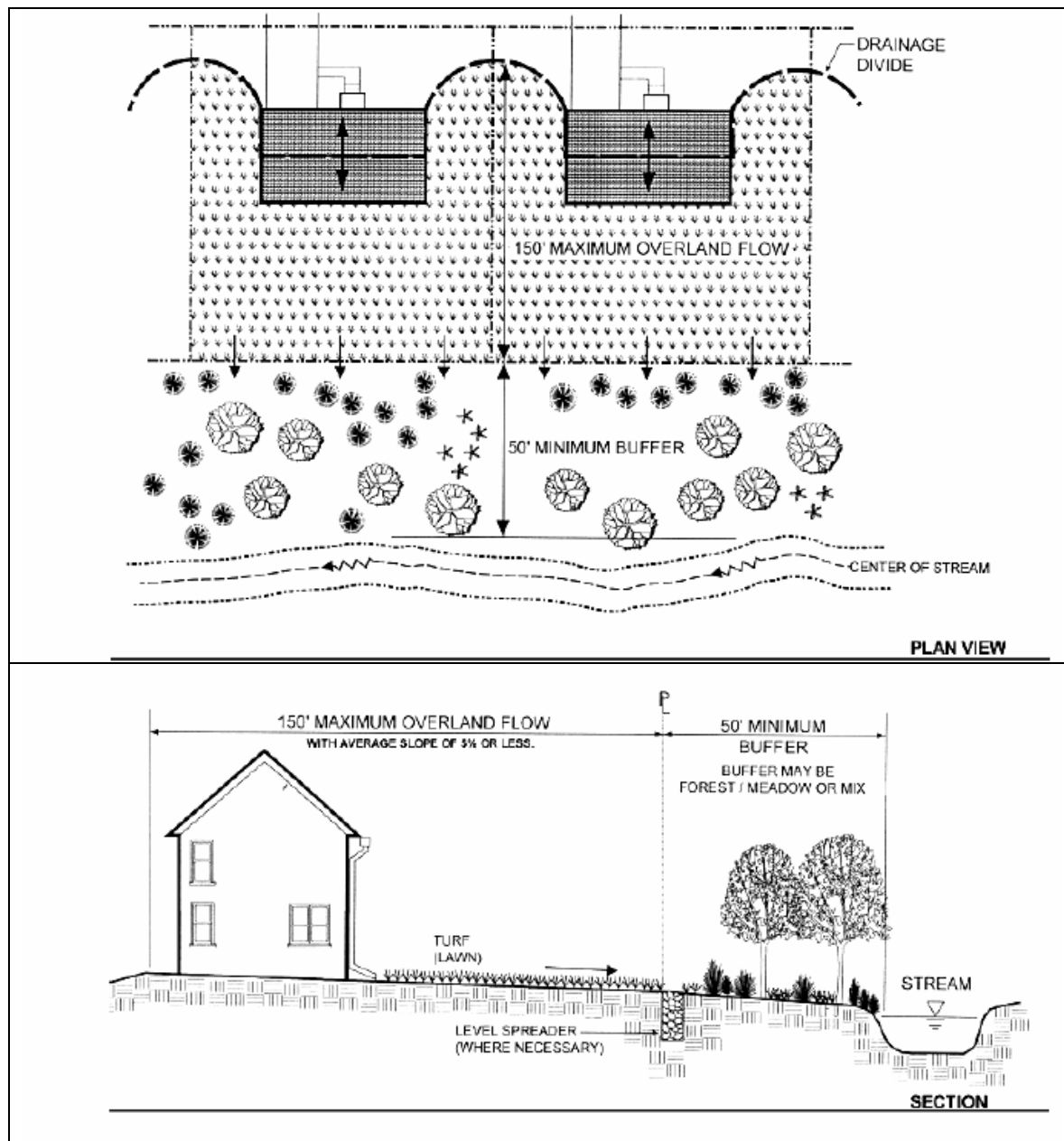
Criteria for Sheetflow to Buffers Credit

The credit is subject to the following conditions:

- *The minimum buffer width shall be 50 feet as measured from bankfull elevation or centerline of the buffer.*
- *The maximum contributing length shall be 150 feet for pervious surfaces and 75 feet for impervious surfaces.*
- *Runoff shall enter the buffer as sheet flow. Either the average contributing overland slope shall be 5.0% or less, or a concrete level spreading device shall be used where sheet flow can no longer be maintained.*
- *Not applicable if rooftop or non rooftop disconnection is already provided.*
- *Buffers shall remain unmanaged other than routine debris removal.*
- *Shall be located within an acceptable conservation easement or other enforceable instrument that ensures perpetual protection of the proposed area. The easement must clearly specify how the natural area vegetation shall be managed and boundaries will be marked [Note: managed turf (e.g., playgrounds, regularly maintained open areas) is not an acceptable form of vegetation management].*
- The Rev credit for sheetflow to buffer is not applicable in HSG's C and D.

Figure C.2 illustrates how a buffer or filter strip can be used to treat stormwater from adjacent pervious and impervious areas.

Figure C.2 Example of Sheetflow to Buffers Credit



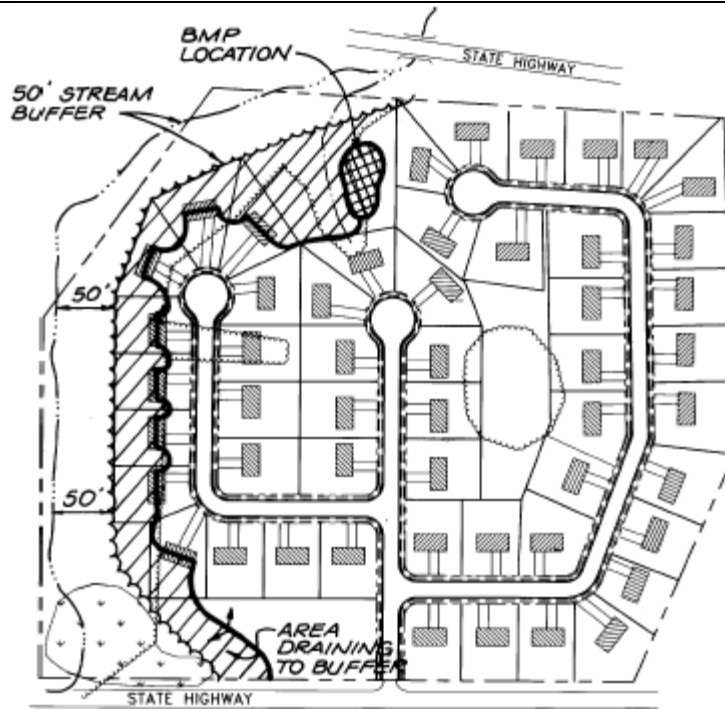
Example of Using the Sheetflow to Buffers Credit

Site Data - 51 Single Family
Area = 38.0 ac
Original Impervious Area =
13.8 ac = 36.3%
Original $R_v = .38$
Post-dev. CN = 78

Original $WQ_v = 1.44$ ac-ft
Original $Re_v = 0.24$ ac-ft
Original $Cp_v = 1.65$ ac-ft

Credit

5.0 ac draining to buffer/filter strip
Rooftops represent 3% of site
imperviousness = 0.41 ac



Computation of Stormwater Credits

New drainage area = 38 ac - 5 ac = 33.0 ac
 R_v remains unchanged to BMP; $R_v = 0.05 + 0.009(36.3) = 0.38$

$$\begin{aligned} WQ_v &= [(P)(R_v)(A)]/12 \\ &= [(1.2)(0.38)(33.0 \text{ ac.})]/12 \\ &= 1.25 \text{ ac-ft} \end{aligned}$$

Required Re_v (Percent Area Method)

$Re_v = 21.8\% \times 13.8 \text{ ac.} = 3.01 \text{ acres}$
 Re_v treated by disconnection = 0.41 acres
 Re_v remaining for treatment = 2.60 acres non structurally or 0.207 ac-ft structurally

CN is reduced slightly

C.6 Grass Channel Credit (in lieu of Curb and Gutter)

Credit may be given when open grass channels are used to reduce the volume of runoff and pollutants during smaller storms (e.g., < 1 inch). The schematic of the grass channel is provided in Figure C.3.

Use of a grass channel will automatically meet the Re_v for impervious areas draining into the channel. However, Re_v for impervious areas not draining to grass channels must still be addressed. If designed according to the following criteria, the grass channel will meet the WQ_v as well.

CNs for channel protection or peak flow control (Cp_v or Q_p) will not change.

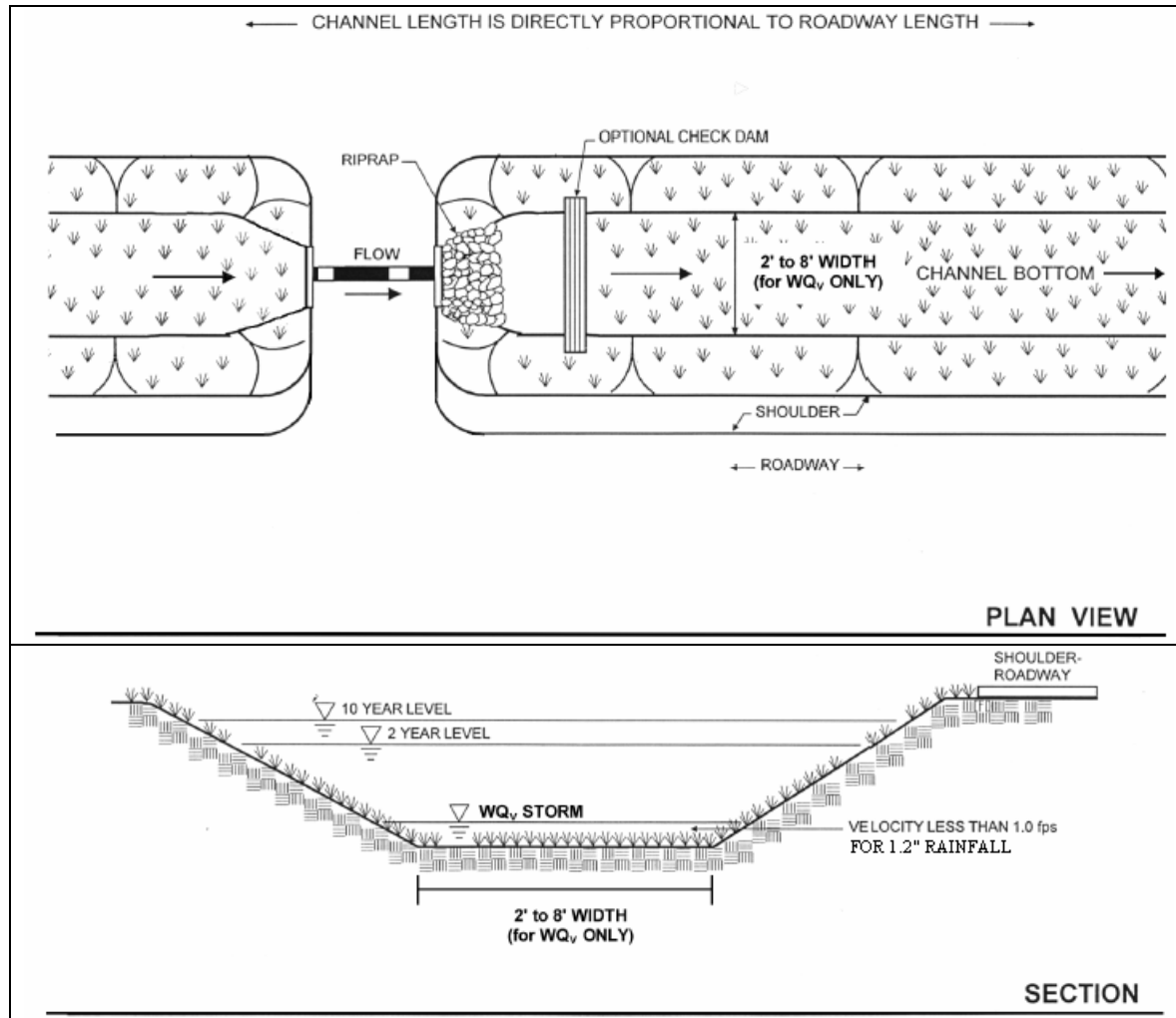
Criteria for the Grass Channel Credit

The WQ_v credit is obtained if a grass channel meets the following criteria:

- *The maximum flow velocity for runoff from the 1.2 inch rainfall shall be less than or equal to 1.0 fps (see Appendix L for methodology to compute flowrate).*
- *The maximum flow velocity for runoff from the 10-year design event shall be non-erosive.*
- *The bottom width shall be 2 feet minimum and 8 feet maximum.*
- *The side slopes shall be 3:1 or flatter.*
- *The channel slope shall be less than or equal to 4.0%.*
- *Not applicable if rooftop disconnection is already provided (see Credit C.2).*
- *Credit for use of grass channels is not applicable in HSG's C and D.*

An example of a grass channel is provided in Figure C.3.

Figure C.3 Example of Grass Channel



Example of Grass Channel Credit

Site Data - 51 Single Family

Residences

Area = 38.0 ac

Original Impervious Area =
13.8 = 36.3%

$R_v = 0.38$

CN = 78

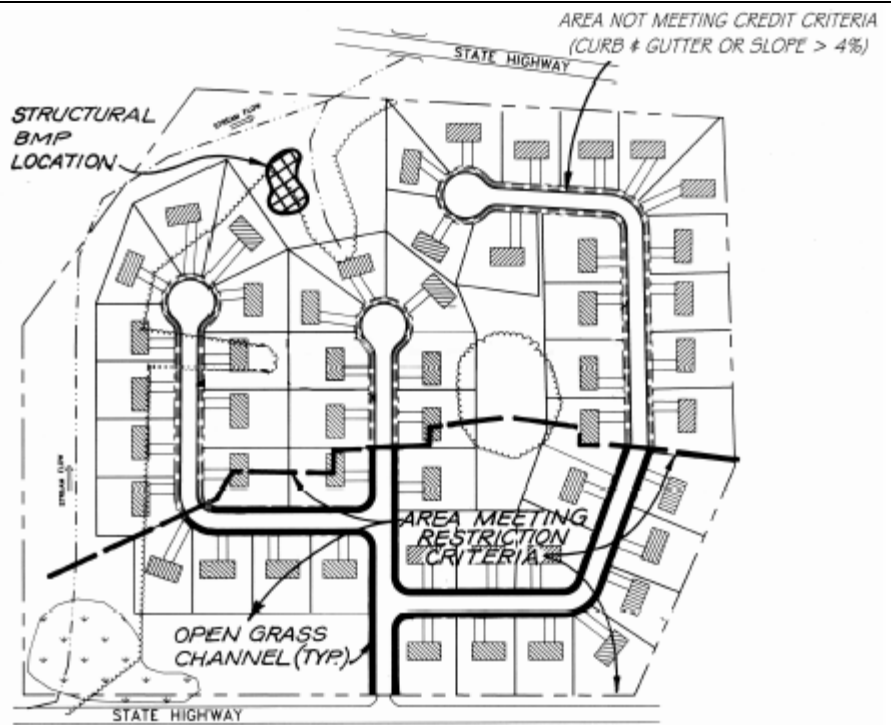
Original $WQ_v = 1.44$ ac-ft

Original $Re_v = 0.25$ ac-ft

Original $Cp_v = 1.65$ ac-ft

Credit

12.5 ac meet grass channel criteria



Computation of Stormwater Credits

New WQ_v Area = 38 ac - 12.5 ac = 25.5 ac

$WQ_v = [(1.2)(0.38)(25.5 \text{ ac})]/12$
= 0.97 ac-ft

Required Re_v (Percent Area Method)

$Re_v = 21.8\% \times 13.8 \text{ ac} = 3.01 \text{ ac}$

4.5 ac of imperviousness lie within area drained by grass channels, and

4.5 ac > 3.01 ac

Re_v requirement is met

Cp_v and Q_p : No change

C.7 Environmentally Sensitive Development Credit

Credit is given when a group of environmental site design techniques are applied to low density or residential development. The credit eliminates the need for structural practices to treat both the Re_v and WQ_v and is intended for use on large lots.

Criteria for Environmentally Sensitive Development Credit

These criteria can be met without the use of structural practices in certain low density residential developments when the following conditions are met:

For Single Lot Development:

- *Total site impervious cover is less than 15%.*
- *Lot size shall be at least two acres.*
- *Rooftop runoff is disconnected in accordance with the criteria outlined in Section C.3.*
- *Grass channels are used to convey runoff versus curb and gutter.*

For Multiple Lot Development:

- *Total site impervious cover is less than 15%.*
- *Lot size shall be at least two acres if clustering techniques are not used.*
- *If clustering techniques are used, the average lot size shall not be greater than 50% of the minimum lot size as identified in the appropriate local zoning ordinance and shall be at least one half acre.*
- *Rooftop runoff is disconnected in accordance with the criteria outlined in Section C.3.*
- *Grass channels are used to convey runoff versus curb and gutter.*
- *A minimum of 25% of the site is protected in natural conservation areas (by permanent easement or other similar measure).*
- *The design shall address stormwater (Re_v , WQ_v , Cp_v , and extreme events) for all roadway and connected impervious surfaces.*

Example of Environmentally Sensitive Development Credit

Site Data - 1 Single Family Lot

Area = 2.5 ac

Conservation Area = 0.6 ac

Impervious Area = .35 ac (includes adjacent road surface) = 14%

B soils

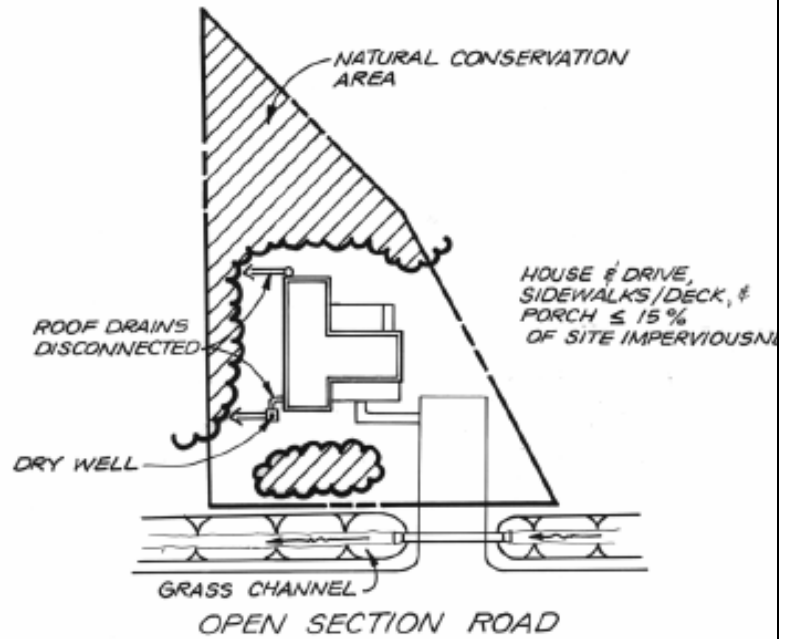
$R_v = 0.05 + 0.009(14) = 0.18$

CN = 65

WQ_v : Use $P=0.2$ as $I < 15\%$

$WQ_v = [(0.2)(A)]/12$
 $= [(0.2)(2.5)]/12 \times (43560 \text{ ft}^2/\text{ac})$
 $= 1,815 \text{ ft}^3$

$Re_v = [(S)(R_v)(A)]/12$
 $= [(0.27)(0.18)(2.5)]/12 \times (43,560 \text{ ft}^2/\text{ac})$
 $= 441.0 \text{ ft}^3$



Computation of Stormwater Credits:

WQ_v is met by site design

Re_v is met by site design

Cp_v : No change in CN, t_c may be longer which would reduce Q_p requirements

APPENDIX D

Method for Computing Peak Discharge for Water Quality Storm

(Adapted from Claytor and Schueler, 1996)

The peak rate of discharge is needed for the sizing of off-line diversion structures and to design grass channels. Conventional SCS methods underestimate the volume and rate of runoff for rainfall events less than 2 inches. This discrepancy in estimating runoff and discharge rates can lead to situations where a significant amount of runoff by-passes the filtering treatment practice due to an inadequately sized diversion structure or leads to the design of undersized grass channels.

The following procedure can be used to estimate peak discharges for small storm events. It relies on the volume of runoff computed using the Small Storm Hydrology Method (Pitt, 1994) and utilizes the NRCS, TR-55 Graphical Peak Discharge Method (USDA, 1986).

Using the WQv methodology, a corresponding Curve Number (CN) is computed utilizing the following equation:

$$CN = \frac{1000}{[10+5P+10Q_a - 10 (Q_a^2 + 1.25 Q_a P)^{1/2}]}$$

Where: P = rainfall, in inches (use 1.2" for the Water Quality Storm)

Q_a = runoff volume, in inches (equal to P x R_v)

Note: The above equation is derived from the SCS Runoff Curve Number method described in detail in NEH-4, Hydrology (SCS 1985) and SCS TR-55 Chapter 2: Estimating Runoff. The CN can also be obtained graphically using Figure 1 of this Appendix from TR-55.

Once a CN is computed the time of concentration (t_c) is computed (based on the methods identified in TR-55, Chapter 3: "Time of Concentration and Travel Time").

Using the computed CN, t_c and drainage area (A), in acres; the peak discharge (Q_p) for the Water Quality Storm is computed (based upon the procedures identified in TR-55, Chapter 4: "Graphical Peak Discharge Method"). Use Rainfall distribution type II.

- Read initial abstraction (I_a), compute I_a/P
- Read the unit peak discharge (q_u) from Exhibit 4-II for appropriate t_c
- Using the runoff volume (Q_a), compute the peak discharge (Q_p); $Q_p = q_u \times A \times Q_a$

Where: Q_p = the peak discharge, in cfs

q_u = the unit peak discharge, in cfs/mi²/inch

A = drainage area, in square miles

Q_a = runoff volume, in watershed inches

Example Calculation of Peak Discharge for Water Quality Storm

Using a 3.0 acre small shopping center having a 1.0 acre flat roof, 1.6 acres of parking, and 0.4 acres of open space, and using P = 1.2"; the weighted volumetric runoff coefficient (R_v) is:

$$\begin{aligned} R_v &= 0.05 + 0.009(I); I = 2.6 \text{ acres} / 3.0 \text{ acres} = 0.867 (86.7\%) \\ &= 0.05 + 0.009(86.7\%) \\ &= 0.83 \end{aligned}$$

The runoff volume, Q_a is:

$$\begin{aligned}Q_a &= P \times R_v \\&= 1.2" \times 0.83 \\&= 1.0 \text{ watershed inches}\end{aligned}$$

and WQ_v is:

$$WQ_v = \frac{[(1.2")(1.0)(3.0 \text{ acres})]}{12} \times \frac{43,560 \text{ ft}^2}{\text{acre}} = 13,016 \text{ ft}^3$$

Using $Q_a = 1.0$ watershed inches and $P = 1.2"$; CN for the water quality storm is:

$$CN = \frac{1000}{[10 + (5)(1.2") + (10)(1.0) - 10((1.0)^2 + 1.25(1.0)(1.2"))^{1/2}]} = 98$$

Using: $t_c = 10$ minutes (0.17 hour);

$$I_a = (200/CN)^2 = 0.041;$$

$$I_a/P = (0.041/1.2") = 0.049; \text{ (Use } I_a/P = 0.10, \text{ Ref: } TR-55 \text{ Limitations)}$$

$$q_u = 850 \text{ csm/in. (from TR-55 Exhibit 4-II); and}$$

$$A = 3.0 \text{ acres} \times 1/640 \text{ mi}^2 \text{ per acre} = 0.0047 \text{ mi}^2$$

$$Q_p = (850 \text{ csm/in.})(0.0047 \text{ mi}^2)(1.0") = 4.0 \text{ cfs}$$

For computing runoff volume and peak rate for storms larger than the Water Quality Storm (i.e. 2-, 10-, 25-, and 100-year storms) use the published CN's from TR-55 and follow the prescribed procedure in TR-55.

In some cases the Rational Formula may be used to compute peak discharges associated with Water Quality Storm. The designer must have available reliable intensity, duration, frequency (IDF) tables or curves for the storm and region of interest. This information may not be available for many locations and therefore the TR-55 method described above is recommended.

APPENDIX E

Acceptable Stormwater Best Management Practices (BMP's)

BMP Group 1 - Stormwater Ponds

Stormwater Ponds - Practices that have a combination of permanent pool, extended detention or shallow wetland equivalent to the entire WQ_v include:

- Micropool Extended Detention
- Wet Pond
- Wet Extended Detention Pond
- Multiple Pond System
- Pocket Pond

BMP Group 2 - Stormwater Wetlands

Stormwater Wetlands - Practices that include significant shallow wetland areas to treat stormwater runoff but often may also incorporate small permanent pools and/or extended detention storage to achieve the full WQ_v include:

- Shallow Wetland
- Extended Detention Shallow Wetland
- Pond/Wetland System
- Pocket Wetland

BMP Group 3 - Infiltration Practices

Infiltration Practices - Practices that capture and temporarily store the WQ_v before allowing it to infiltrate into the soil over a two-day period include:

- Infiltration Trench
- Infiltration Basin

BMP Group 4 - Filtering Practices

Filtering Practices - Practices that capture and temporarily store the WQ_v and pass it through a filter bed of sand, organic matter, soil or other media are considered to be filtering practices. Filtered runoff may be collected and returned to the conveyance system. Design variants include:

- Surface Sand Filter
- Underground Sand Filter
- Perimeter Sand Filter
- Organic Filter
- Pocket Sand Filter
- Bioretention*

* May also be used for infiltration

BMP Group 5 - Open Channel Practices

Open Channel Practices - Vegetated open channels that are explicitly designed to capture and treat the full WQ_v within dry or wet cells formed by checkdams or other means include:

- Dry Swale
- Wet Swale

BMP Group 6 - Non-Structural BMP's

Non-structural BMP's - These are increasingly recognized as a critical feature of stormwater BMP plans, particularly with respect to site design. In most cases, non-structural BMP's shall be combined with structural BMP's to meet all stormwater requirements. The key benefit of non-structural BMP's is that they can reduce the generation of stormwater from the site; thereby reducing the size and cost of structural BMP's. In addition, they can provide partial removal of many pollutants. The non-structural BMP's have been classified into seven broad categories. To promote greater use of non-structural BMP's, a series of credits and incentives are provided for developments that use these progressive site-planning techniques in Appendix O of this Ordinance.

- Natural Area Conservation
- Disconnection of Rooftop Runoff
- Disconnection of Non-Rooftop Impervious Area
- Sheet Flow to Buffers
- Grass Channel
- Environmentally Sensitive Development

There are numerous sources of information available related to BMP's. This brief list has been provided for your convenience:

United States Environmental Protection Agency - www.epa.gov
PA Department of Environmental Protection - www.dep.state.pa.us
The Center for Watershed Protection - www.cwp.org
The Pennsylvania Handbook of Best Management Practices for Developing Areas
2000 Maryland Stormwater Design Manual
New York Stormwater Management Design Manual

APPENDIX F

Runoff Curve Numbers Source: NRCS (SCS) TR-55

Runoff Curve Numbers for Urban Areas					
Cover Description		Curve Numbers for Hydrologic Soil Groups			
<i>Cover Type and Hydrologic Condition</i>	<i>Average % Impervious Area</i>	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>
<i>Fully Developed Urban Areas (Vegetation Established)</i>					
Open Space (lawns, parks, golf courses, etc)					
Poor Condition (grass cover < 50%)		68	79	86	89
Fair Condition (grass cover 50% to 75%)		49	69	79	84
Good Condition (grass cover > 75%)		39	61	74	80
Impervious Areas					
Paved Parking Lots, Roofs, Driveways, etc.		98	98	98	98
Streets and Roads					
Paved: Curbed and Storm Sewers		98	98	98	98
Paved: Open Ditches		83	89	92	93
Gravel		76	85	89	91
Dirt		72	82	87	89
Western Desert Urban Areas					
Natural Desert Landscaping (pervious area only)		63	77	85	88
Artificial Desert Landscaping (impervious weed barrier, desert shrub with 1- to 2-inch sand or gravel mulch and basin borders)		96	96	96	96
Urban Districts					
Commercial and Business	85%	89	92	94	95
Industrial	72%	81	88	91	93
Residential Districts by Average Lot Size					
1/8 Acre	65%	77	85	90	92
1/4 Acre	38%	61	75	83	87
1/3 Acre	30%	57	72	81	86
1/2 Acre	25%	54	70	80	85
1 Acre	20%	51	68	79	84
2 Acres	12%	46	65	77	82

APPENDIX F (Cont'd.)

Runoff Curve Numbers Source: NRCS (SCS) TR-55

Runoff Curve Numbers for Cultivated Agricultural Lands						
Cover Description			Curve Numbers for Hydrologic Soil Groups			
<i>Cover Type</i>	<i>Treatment</i>	<i>Hydrologic Condition</i>	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>
Fallow	Bare Soil	--	77	86	91	94
	Crop Residue Cover (CR)	Poor	76	85	90	93
		Good	74	83	88	90
Row Crops	Straight Row (SR)	Poor	72	81	88	91
		Good	67	78	85	89
	SR + CR	Poor	71	80	87	90
		Good	64	75	82	85
	Contoured (C)	Poor	70	79	84	88
		Good	65	75	82	86
	C + CR	Poor	69	78	83	87
		Good	64	74	81	85
	Contoured & Terraced (C & T)	Poor	66	74	80	82
		Good	62	71	78	81
	C & T + CR	Poor	65	73	79	81
		Good	61	70	77	80
Small Grain	SR	Poor	65	76	84	88
		Good	63	75	83	87
	SR + CR	Poor	64	75	83	86
		Good	60	72	80	84
	C	Poor	63	74	82	85
		Good	61	73	81	84
	C + CR	Poor	62	73	81	84
		Good	60	72	80	83
	C & T	Poor	61	72	79	82
		Good	59	70	78	81
	C & T + CR	Poor	60	71	78	81
		Good	58	69	77	80
Close Seeded or Broadcast Legumes Or Rotation Meadow	SR	Poor	66	77	85	89
		Good	58	72	81	85
	C	Poor	64	75	83	85
		Good	55	69	78	83
	C & T	Poor	63	73	80	83
		Good	51	67	76	80

APPENDIX F (Cont'd.)

RUNOFF CURVE NUMBERS

Source: NRCS (SCS) TR-55

Runoff Curve Numbers for Other Agricultural Lands					
Cover Description		Curve Numbers for Hydrologic Soil Groups			
<i>Cover Type</i>	<i>Hydrologic Condition</i>	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>
Pasture, Grassland, or Range - Continuous Forage for Grazing	Poor	68	79	86	89
	Fair	49	69	79	84
	Good	39	61	74	80
Meadow - Continuous Grass, Protected from Grazing and Generally Mowed for Hay	--	30	58	71	78
Brush - Brush, Weed, Grass Mixture with Brush the Major Element	Poor	48	67	77	83
	Fair	35	56	70	77
	Good	30	48	65	73
Woods - Grass Combination (Orchard or Tree Farm)	Poor	57	73	82	86
	Fair	43	65	76	82
	Good	32	58	72	79
Woods	Poor	45	66	77	83
	Fair	36	60	73	79
	Good	30	55	70	77
Farmsteads - Buildings, Lanes, Driveways, and Surrounding Lots	--	59	74	82	86

APPENDIX F (Cont'd.)

Runoff Curve Numbers Source: NRCS (SCS) TR-55

Runoff Curve Numbers For Cultivated Agricultural Lands					
Cover Description		Curve Numbers for Hydrologic Soil Groups			
<i>Cover Type</i>	<i>Hydrologic Condition</i>	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>
Herbaceous - Mixture of Grass, Weeds, and Low-Growing Brush, With Brush the Minor Element	Poor	--	80	87	93
	Fair	--	71	81	89
	Good	--	62	74	85
Oak-Aspen - Mountain Brush Mixture of Oak Brush, Aspen, Mountain Mahogany, Bitter Brush, Maple, and Other Brush	Poor	--	66	74	79
	Fair	--	48	57	63
	Good	--	30	41	48
Pinyon-Juniper - Pinyon, Juniper, or Both; Grass Understory	Poor	--	75	85	89
	Fair	--	58	73	80
	Good	--	41	61	71
Sagebrush With Grass Understory	Poor	--	67	80	85
	Fair	--	51	63	70
	Good	--	35	47	55
Desert Shrub - Major Plants Include Saltbrush, Greasewood, Creosotebush, Blackbrush, Bursage, Palo Verde, Mesquite, and Cactus	Poor	63	77	85	88
	Fair	55	72	81	86
	Good	49	68	79	84

APPENDIX G

Runoff Coefficients For The Rational Method

Source: Rawls, W.J., S.L. Long, and R.H. McCuen, 1981. Comparison of Urban Flood Frequency Procedures. Preliminary Draft Report prepared for the Soil Conservation Service, Beltsville, Maryland.

Land Use	A			B			C			D		
	0-2%	2-6%	6+%	0-2%	2-6%	6+%	0-2%	2-6%	6+%	0-2%	2-6%	6+%
Cultivated	0.08 ^a	0.13	0.16	0.11	0.15	0.21	0.14	0.19	0.26	0.18	0.23	0.31
Land	0.14 ^b	0.08	0.22	0.16	0.21	0.28	0.20	0.25	0.34	0.24	0.29	0.41
Pasture	0.12	0.20	0.30	0.18	0.28	0.37	0.24	0.34	0.44	0.30	0.40	0.50
	0.15	0.25	0.37	0.23	0.34	0.45	0.30	0.42	0.52	0.37	0.50	0.62
Meadow	0.10	0.16	0.25	0.14	0.22	0.30	0.20	0.28	0.36	0.24	0.30	0.40
	0.14	0.22	0.30	0.20	0.28	0.37	0.26	0.35	0.44	0.30	0.40	0.50
Forest	0.05	0.08	0.11	0.08	0.11	0.14	0.10	0.13	0.16	0.12	0.16	0.20
	0.08	0.11	0.14	0.10	0.14	0.18	0.12	0.16	0.20	0.15	0.20	0.25
Residential	0.25	0.28	0.31	0.27	0.30	0.35	0.30	0.33	0.38	0.33	0.36	0.42
1/8 Acre	0.33	0.37	0.40	0.35	0.39	0.44	0.38	0.42	0.49	0.41	0.45	0.54
1/4 Acre	0.22	0.26	0.29	0.24	0.29	0.33	0.27	0.31	0.36	0.30	0.34	0.40
	0.30	0.34	0.37	0.33	0.37	0.42	0.36	0.40	0.47	0.38	0.42	0.52
1/3 Acre	0.19	0.23	0.26	0.22	0.26	0.30	0.25	0.29	0.34	0.28	0.32	0.39
	0.28	0.32	0.35	0.30	0.35	0.39	0.33	0.38	0.45	0.36	0.40	0.50
1/2 Acre	0.16	0.20	0.24	0.19	0.23	0.28	0.22	0.27	0.32	0.26	0.30	0.37
	0.25	0.29	0.32	0.28	0.32	0.36	0.31	0.35	0.42	0.34	0.38	0.48
1 Acre	0.14	0.19	0.22	0.17	0.21	0.26	0.20	0.25	0.31	0.24	0.29	0.35
	0.22	0.26	0.29	0.24	0.28	0.34	0.28	0.32	0.40	0.31	0.35	0.46
Industrial	0.67	0.68	0.68	0.68	0.68	0.69	0.68	0.69	0.69	0.69	0.69	0.70
	0.85	0.85	0.86	0.85	0.86	0.86	0.86	0.86	0.87	0.86	0.86	0.88
Commercial	0.71	0.71	0.72	0.71	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72
	0.88	0.88	0.89	0.89	0.89	0.89	0.89	0.89	0.90	0.89	0.89	0.90
Streets	0.70	0.71	0.72	0.71	0.72	0.74	0.72	0.73	0.76	0.73	0.75	0.78
	0.76	0.77	0.79	0.80	0.82	0.84	0.84	0.85	0.89	0.89	0.91	0.95
Open Space	0.05	0.10	0.14	0.08	0.13	0.19	0.12	0.17	0.24	0.16	0.21	0.28
	0.11	0.16	0.20	0.14	0.19	0.26	0.18	0.23	0.32	0.22	0.27	0.39
Parking or	0.85	0.86	0.87	0.85	0.86	0.87	0.85	0.86	0.87	0.85	0.86	0.87
Impervious	0.95	0.96	0.97	0.95	0.96	0.97	0.95	0.96	0.97	0.95	0.96	0.97

a = Runoff coefficients for storm recurrence intervals less than 25 years

b = Runoff coefficients for storm recurrence intervals of 25 years or more

APPENDIX H

DESIGN STORM RAINFALL AMOUNT (INCHES)

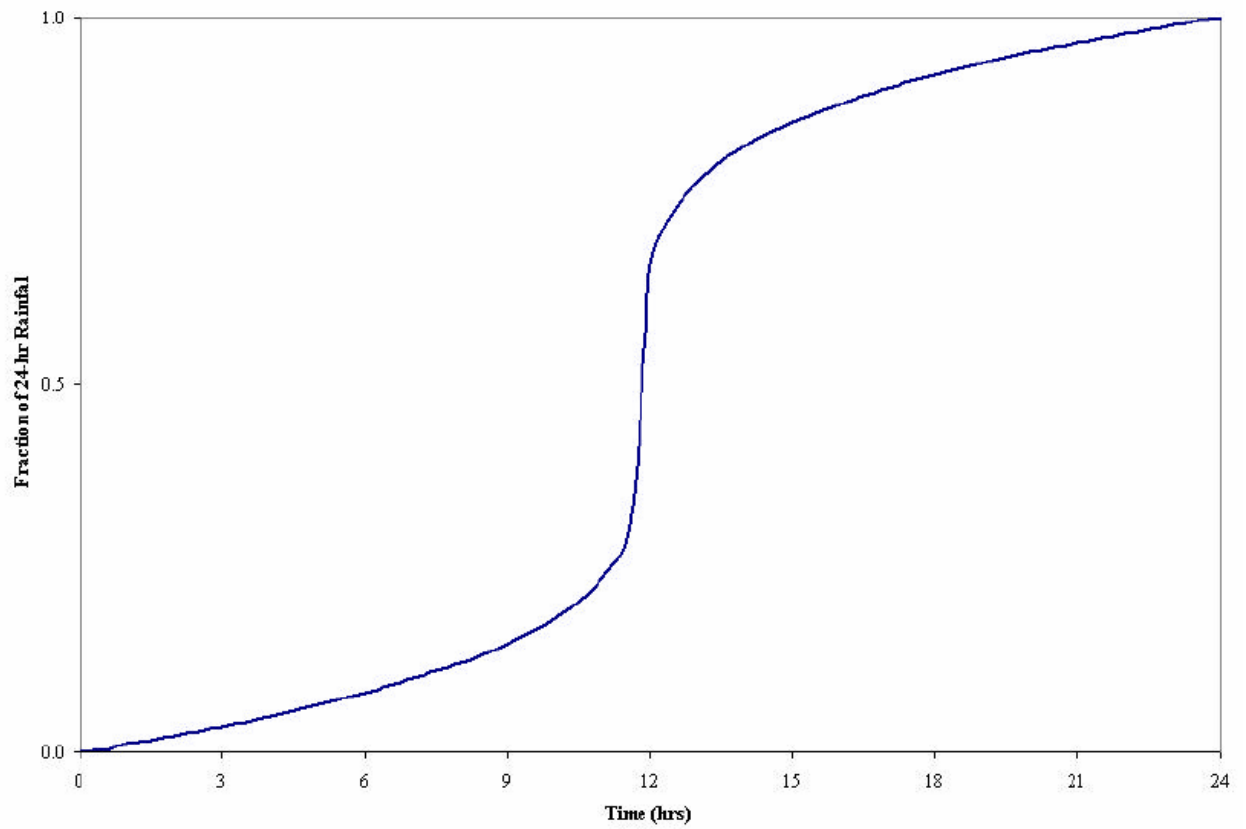
The design storm rainfall amount chosen for design shall be obtained from the PENNDOT Region III Storm Intensity-Duration-Frequency Curve according to Appendix J.

Source: NRCS (SCS) TR-55

Design Storm Frequency (years)	24 Hours Rainfall Amount (inches)
1	2.2
2	2.6
5	3.1
10	3.8
25	4.6
50	5.3
100	6.0

APPENDIX I

NRCS (SCS) Type II Rainfall Distribution



APPENDIX J

PENN DOT Storm Intensity-Duration-Frequency Curve Region 3

Source: "Field Manual of Pennsylvania Department of Transportation"
STORM INTENSITY-DURATION-FREQUENCY CHARTS
P D T - I D F" May 1986

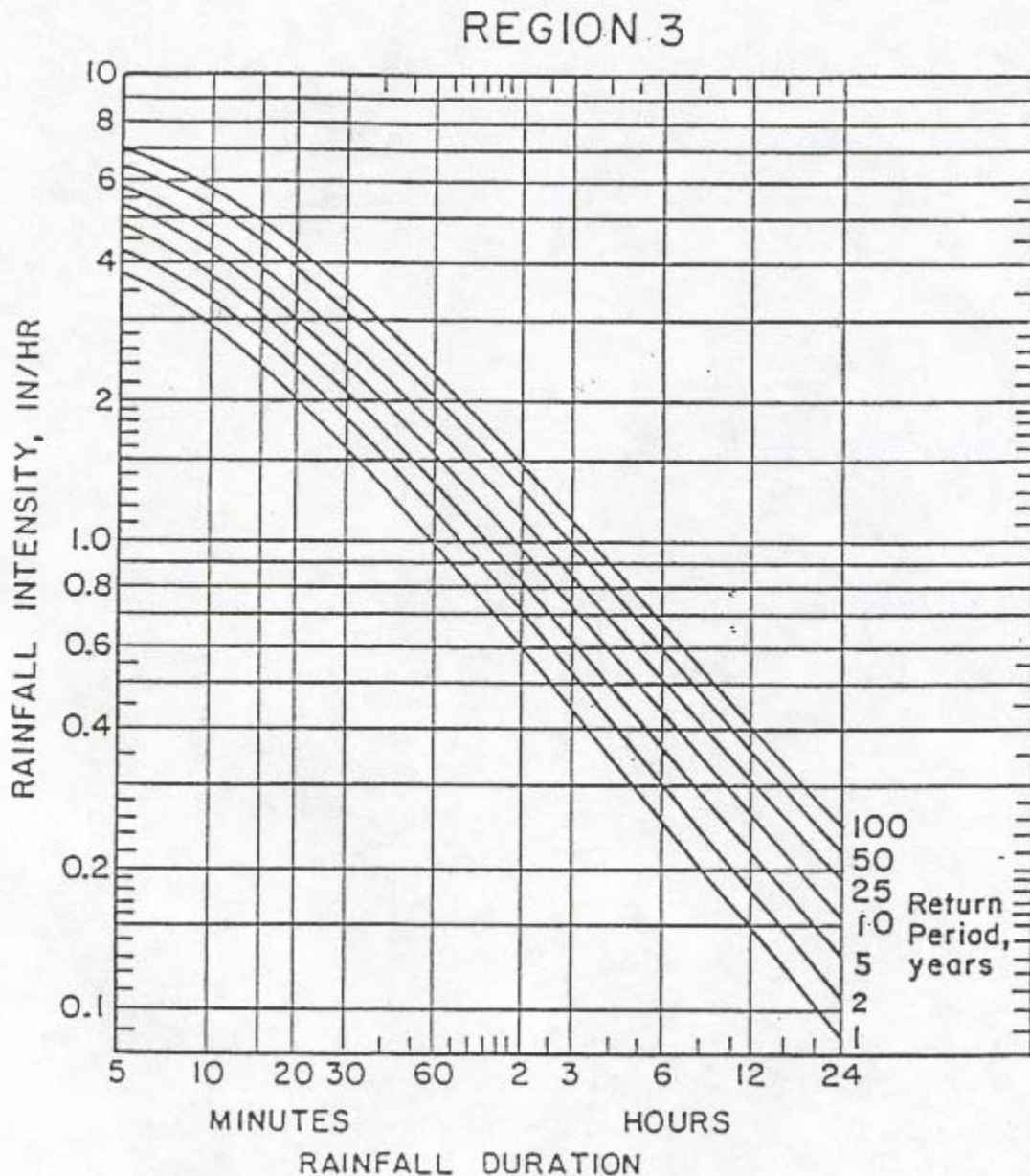


Figure 4 . Storm intensity-duration-frequency curves for Region 3.

APPENDIX K

Manning Roughness Coefficients

Roughness Coefficients (Manning's "n") For Overland/Sheet Flow
(From U.S. Army Corps of Engineers & NRCS TR-55)

Surface Description	n
Dense Growth	0.4 - 0.5
Pasture	0.3 - 0.4
Lawns	0.2 - 0.3
Bluegrass Sod	0.2 - 0.5
Short Grass Prairie	0.1 - 0.2
Sparse Vegetation	0.05 - 0.13
Bare Clay - Loam Soil (eroded)	0.01 - 0.03
Concrete/Asphalt - very shallow depths (less than 1/4 inch)	0.10 - 0.15
- small depths (1/4 inch to several inches)	0.05 - 0.10
Fallow (no residue)	0.05
Cultivated Soils	
Residue Cover Less Than or = 20%	0.06
Residue Cover Greater Than 20%	0.17
Grass	
Dense Grasses	0.24
Bermuda Grass	0.41
Range (natural)	0.13
Woods (Light Underbrush)	0.40

APPENDIX L

Computation Of The Channel Protection Storage Volume (Cp_v)

The following procedure shall be used to design the channel protection storage volume (Cp_v). The method is based on the Design Procedures for Stormwater Management Extended Detention Structures (MDE, 1987) and utilizes the NRCS, TR-55 Graphical Peak Discharge Method (USDA, 1986).

- Compute the time of concentration (tc) and the one-year post-development runoff depth (Qa) in inches.

$$Qa = \frac{(2.4 - Ia)^2}{(2.4 - Ia) + S} \quad \text{where } S = (1000/CN) - 10, Ia = (200/CN) - 2$$

- Compute the ratio $Ia/2.4$ where 2.4 is the one-year rainfall depth (Source: NRCS (SCS) TR-55).
- With tc and Ia/P , find the unit peak factor (qu) from Figure 1 and compute the one year post-development peak discharge $qi = quAQa$ where A is the drainage in square miles.
- **If $qi \leq 2.0$ cfs, Cp_v is not required.** Provide for water quality (WQv) and groundwater recharge (Re_v) as necessary.
- With qu , find the ratio of outflow to inflow (qo/qi) for T = 12 or 24 hours from Figure 2.
- Compute the peak outflow discharge $qo = (qo/qi) \times qi$
- With qo/qi , compute the ratio of storage to runoff volume (Vs/Vr).
 - $Vs/Vr = 0.683 - 1.43(qo/qi) + 1.64(qo/qi)^2 - 0.804(qo/qi)^3$
- Compute the extended detention storage volume $Vs = (Vs/Vr) \times Vr$ (note: $Vr = Qa$);
- Convert Vs to acre-feet by $(Vs/12) \times A$, where Vs is in inches and A is in acres.
- Compute the required orifice area (Ao) for extended detention design:

$$Ao = \frac{qo}{C(2gho)^{0.5}} = \frac{qo}{4.18(ho)^{0.5}}$$

- Where ho is the maximum storage depth associated with Vs .
- Determine the required maximum orifice diameter (do) $do = (4Ao/\pi)^{0.5}$
- A do of less than 3.0 inches is subject to local jurisdictional approval, and is not recommended unless an internal control for orifice protection is used.

Figure 1 SCS Graphical Method of Determining Peak Discharge (q_u) in csm/in
For 24-Hour Type II Storm Distribution

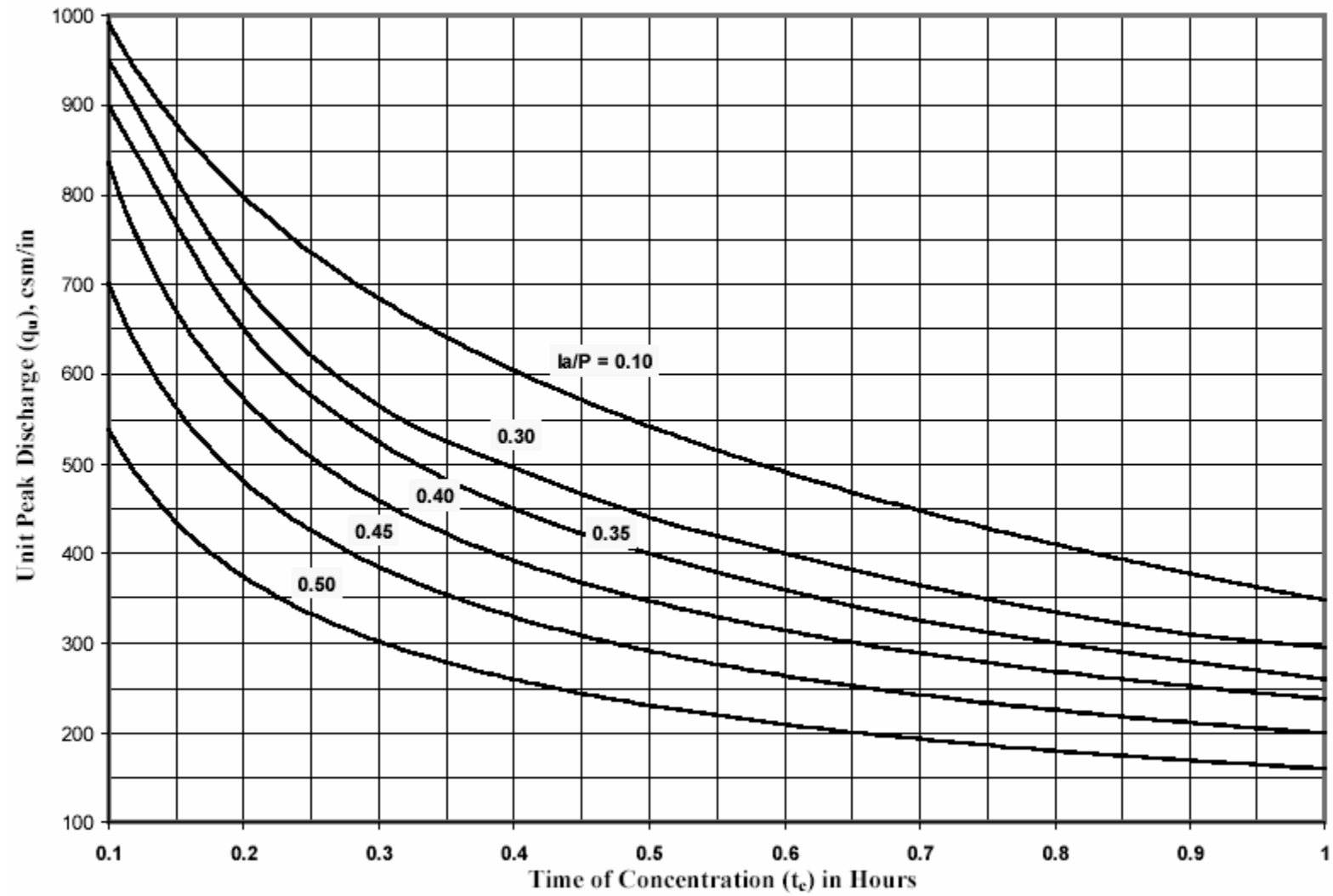
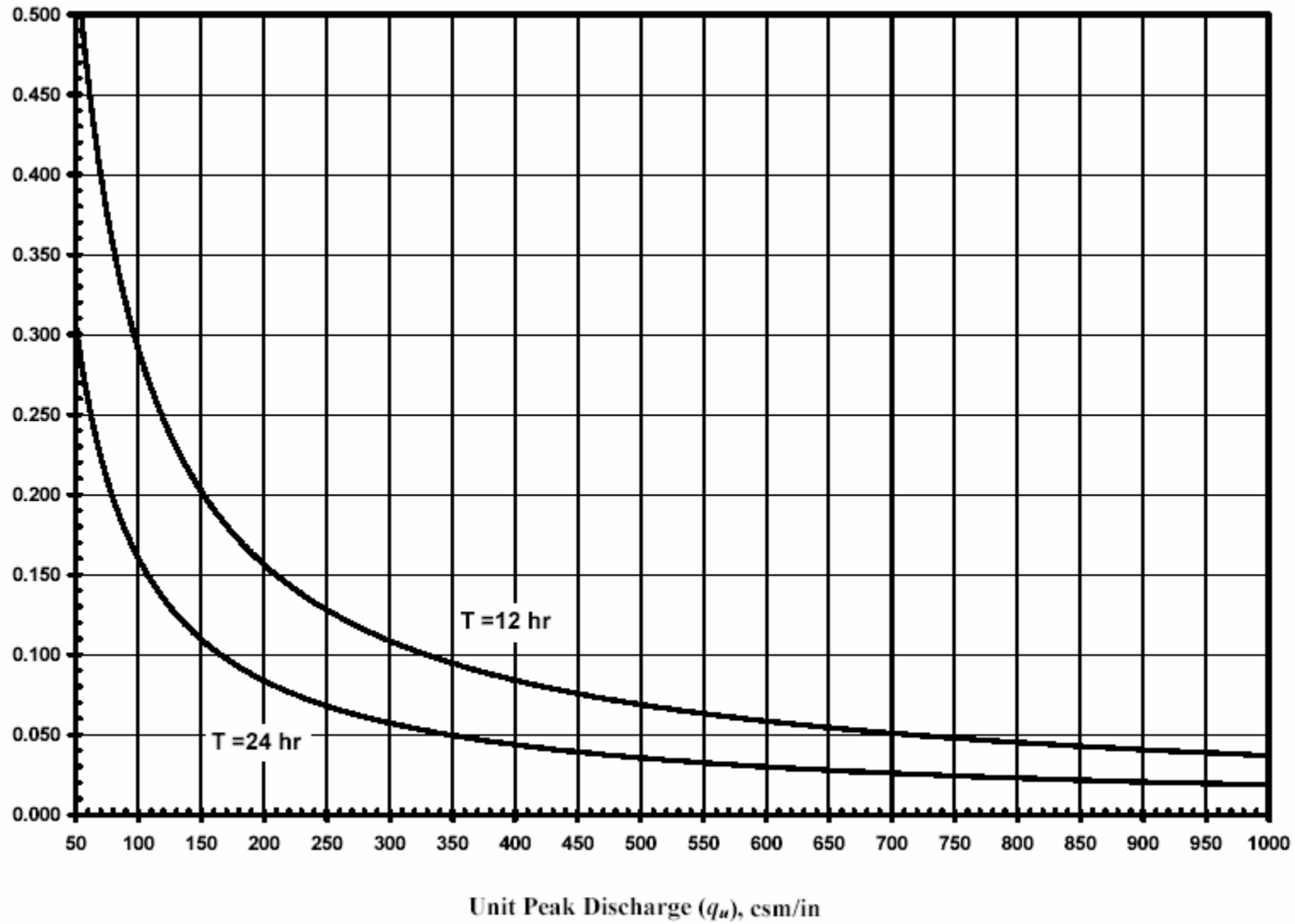


Figure 2 Detention Time Versus Discharge Ratios (q_o/q_i)



APPENDIX M

STORMWATER MANAGEMENT FACILITIES MAINTENANCE AGREEMENT

THIS AGREEMENT, made and entered into this _____ day of _____, 20____, by and between _____ (hereinafter the “Landowner”), _____, Northumberland County, Pennsylvania, 17____;

AND

West Chillisquaque Township (hereinafter the “Township”), P.O. Box 252, Montandon, Northumberland County, Pennsylvania, 17850.

WITNESSETH

WHEREAS, the Landowner is the fee simple owner of a certain tract of real property as recorded and vested by deed in the land records of Northumberland County, Pennsylvania, Recorder of Deeds Office Deed Book _____ at Page _____, and identified by Tax Parcel Identification Number(s) _____ (hereinafter “Property”);

WHEREAS, the Landowner intends to build and develop this Property by constructing permanent improvements as more fully shown upon a plan prepared by _____ entitled “Final Subdivision/Land Development Plan of _____” (hereinafter “Plan”) dated _____ 200____, which is expressly made a part hereof as approved by West Chillisquaque Township;

WHEREAS, the “Plan” for _____ provides for the detention, retention, infiltration, and/or conveyance of stormwater within the confines of the Property; and

WHEREAS, the Township and the Landowner and his heirs, successors and assigns, including a homeowners or other association of owners, agree that the health, safety, and welfare of the residents of the Township require that on-site stormwater management facilities be constructed and maintained on the Property; and

WHEREAS, West Chillisquaque Township requires, through the implementation of the West Chillisquaque Township Subdivision and Land Development Ordinance, that stormwater management facilities as shown on the Plan be constructed and adequately maintained by the Landowner, his heirs, successors and assigns.

NOW, THEREFORE, in consideration of the foregoing premises, the mutual covenants contained herein, and the following terms and conditions, the parties hereto, intended to be legally bound hereby, agree as follows:

1. The on-site stormwater management facilities shall be constructed by the Landowner, his heirs, successors and assigns, in accordance with the terms, conditions and specifications identified on the Plan.
2. The Landowner, his heirs, successors, and assigns do hereby establish a permanent easement for stormwater management facilities and access to said facilities as more fully shown upon the Plan. The stormwater management facility easement shall run with and bind the land and fee simple owners, their heirs, executors, administrators, successors and assigns.
3. The Landowner, his heirs, successors and assigns, shall maintain the stormwater management facilities in good working condition, acceptable to the Township so that they are performing their design functions. This includes maintenance of all pipes, channels, swales and other structures built to convey stormwater to the facility as well as all structures, improvements, and vegetation provided to control the quantity and quality of the stormwater. The Landowner, his heirs, successors and assigns shall notify the West Chillisquaque Township Supervisors and Northumberland County Conservation District prior to initiating any major repair activities.
4. The Landowner, his heirs, successors and assigns shall inspect the stormwater management facilities and submit an inspection report consistent with the schedule below. The purpose of the inspection is to assure safe and proper functioning of the facilities. The inspection report shall cover the entire facility including berms, outlet structure, pond areas, access roads, etc. Deficiencies shall be noted in the inspection report. At a minimum, maintenance inspections shall be performed in accordance with the following schedule:
 - Annually for the first 5 years after the construction of the stormwater facilities,

- Once every 2 years thereafter, or
- During or immediately upon the cessation of a 100 year or greater precipitation event.

At a minimum the inspection shall include the following:

- (1) An examination of the stormwater collection, conveyance, detention and infiltration facilities for debris deposition (such debris may include, but is not limited to, aggregate material, leaves, grass clippings, and soil material); and
- (2) An examination of the stormwater facilities for settlement, sinkholes, structural cracking, excessive vegetation, erosion, etc.

5. The Landowner, his heirs, successors and assigns, hereby grant permission to the Township, its authorized agents and employees upon presentation of proper identification, to enter upon the Property at reasonable times, and to inspect the stormwater management facilities whenever the Township deems necessary. The purpose of the inspection is to assure safe and proper functioning of the facilities. The inspection shall cover the entire facilities, berms, outlet structures, pond areas, access roads, etc. When inspections are conducted, the Township shall give the Landowner, his heirs, successors and assigns copies of the inspection report with findings and evaluations.
6. All reasonable costs for said inspections shall be born by the Landowner, his heirs, successors and assigns and payable to the Township.
7. In the event the Landowner, his heirs, successors and assigns, fails to maintain the stormwater management facilities in good working condition acceptable to the Township, the Township may enter upon the Property and take such necessary and prudent action to maintain said stormwater management facilities and to charge the costs of the maintenance and/or repairs to the Landowner, his heirs, successors and assigns. This provision shall not be construed as to allow the Township to erect any structure of a permanent nature on the land of the Landowner, outside of any easement belonging to the Township. It is expressly understood and agreed that the Township is under no obligation to maintain or repair said facilities, and in no event shall this Agreement be construed to impose any such obligation on the Township.

8. The Landowner, his heirs, successors and assigns, will perform maintenance in accordance with the maintenance schedule for the stormwater management facilities including sediment removal as outlined on the Maintenance Plan and schedule described in Exhibit A, attached hereto.
9. In the event the Township, pursuant to this Agreement, performs work of any nature, or expends any funds in performance of said work for labor, use of equipment, supplies, materials, and the like on account of the Landowner, his heirs, successors and assigns failure to perform such work, the Landowner, his heirs, successors and assigns, shall reimburse the Township upon demand, within 30 days of receipt of invoice thereof, for all costs incurred by the Township hereunder. If not paid within the said 30-day period, the Township may enter a lien against the Property in the amount of such costs and attorney fees as authorized under the provisions of the Municipal Lien Law and Township ordinances or may proceed to recover its costs through proceedings in equity or at law.
10. The Landowner, his heirs, successors and assigns, shall indemnify the Township and its agents and employees against any and all damages, accidents, casualties, occurrences or claims which might arise or be asserted against the Township for the construction, presence, existence or maintenance of the stormwater management facilities by the Landowner, his heirs, successors and assigns.
11. In the event a claim is asserted against the Township, its agents or employees, the Township shall promptly notify the Landowner, his heirs, successors and assigns, and the Landowner, his heirs, successors and assigns shall defend, at their own expense, any suit based on such claim. If any judgment or claims against the Township, its agents or employees shall be allowed, the Landowner, his heirs, successors and assigns shall pay all costs and expenses in connection therewith.
12. In the advent of an emergency or the occurrence of special or unusual circumstances or situations, the Township may enter the Property, if the Landowner, his heirs, successors and assigns are not immediately available, without notification or identification, to inspect and perform necessary maintenance and repairs, if needed, when the health, safety or welfare of the citizens is at jeopardy. However, the Township shall notify the landowner, his heirs, successors and assigns of any inspection,

maintenance, or repair undertaken within 5 business days of the activity. The Landowner, his heirs, successors and assigns shall reimburse the Township for its costs.

13. No structures may be placed within or on the Stormwater Management Facilities and easement and no landscaping or grading is permitted within said easement which would impede stormwater flow or alter the course of the flow within said easement, nor impede the functioning of stormwater inlets, outlet structures, infiltration beds, or any other element of the stormwater management facility.

IN WITNESS WHEREOF, intending to be legally bound hereby, the parties hereto have set their hands and seals the day and year first above written

ATTEST:

WEST CHILLISQUAQUE TOWNSHIP

Chairman

Vice Chairman

Secretary

ATTEST:

LANDOWNER

STATE OF PENNSYLVANIA

)

)SS:

COUNTY OF NORTHUMBERLAND

)

West Chillisquaque Township, County of Northumberland, Pennsylvania.

I, _____, a Notary Public in and for the County and State aforesaid, whose commission expires on the _____ day of _____, 20____, do hereby certify that _____, the landowner whose name is signed to the foregoing Agreement bearing the date of the _____ day of _____, 20____, personally appeared before me (known to me or satisfactorily proven) in my said County and State and acknowledges that he executed the same for the purpose therein contained.

GIVEN UNDER MY HAND THIS _____ day of _____, 20____.

NOTARY PUBLIC

This Agreement shall be recorded among the land records of Northumberland County, Pennsylvania and shall constitute a covenant running with the Property and/or equitable servitude, and shall be binding on the Landowner, his administrators, executors, assigns, heirs and any other successors in interests, in perpetuity.

RECORDED in the Office of the Recorder of Deeds in and for Northumberland County, in Record Book_____, Page _____.

WITNESS my hand and official seal this _____ day of _____, 20____.

RECORDER OF DEEDS