

Specifications

§401. Plan Requirements. Subdivision and Land Development Plans shall conform to and include the following:

1. Plans shall conform to the provisions and requirements of this Ordinance. Terms used in these Specifications which are defined in Part 2, "Definitions", of this Ordinance shall have the same meanings indicated in said Part hereof.
2. A Plan of Lots suitable for recording at the Blair County Courthouse, including a space for acknowledgment of receipt and recording of the plan by the Blair County Recorder of Deeds Office shall be provided. The Plan of Lots shall contain a statement of acknowledgment in legal form, executed by a Notary Public, stating that the Developer is the Owner, equitable Owner or has the written permission of the Owner of record as reflected in the Record of Deed Office in and for Blair County of the property as shown on the Plan of Lots including all property needed for ingress, egress and regress and/or has written easements for same together with any and all easements for utilities and stormwater management, that the subdivision/land development as shown on the Plan of Lots is the act and deed of the Developer and that the Developer desire the same to be recorded as such, according to law.
3. The Plan of Lots shall contain tax map parcel numbers for all parcels included in the subdivision/land development and all parcels adjoining the subdivision/land development
4. The Plan of Lots shall contain the name and deed references of all owners of property included in the subdivision/land development and all owners of property adjoining the subdivision/land development.
5. [Reserved]
6. Five (5) sets of preliminary and final subdivision/land development plans and supporting information shall be provided. Preliminary and final plans shall be at a scale of not more than fifty (50)

feet to an inch. Plans shall be submitted on sheets 24" x 36". Plans intended for recording purposes shall not be larger 16" x 22".

7. The following information regarding proposed public improvements:

A. Design of proposed roadways including a profile of existing ground surface along the centerline of roadways; proposed centerline grade of roadways with percent of grade on tangents and elevations at intervals of fifty (50) feet, including grades at intersections and control points; vertical curve data of roadways, including chord lengths and elevations and sight distances as required by the Township Engineer; typical cross section and proposed contours. Details of storm sewers, curbing, inlets and other facilities involved in roadway construction. If applicable, provide copies of all required permits and/or approval letters from the Pennsylvania Department of Transportation (PennDOT).

B. Design of the proposed sanitary sewage collection and treatment facilities, if applicable, including plans showing the location of the sanitary sewage collection and treatment facilities, size of sanitary sewer lines with stations corresponding to the profile, profiles showing existing and proposed ground surface along the centerline of sanitary sewer lines, grades between manholes, elevation of flow line and top of each manhole, design engineer's report for the treatment facilities, details and other information required by the Township. If applicable, provide a letter from the provider of the public sanitary sewerage service approving the design of the proposed public sanitary sewerage facilities. The Developer shall provide a Land Development Planning Module (or planning exemption request) and a letter of approval of the module or exemption from the Pennsylvania DEP. If applicable, provide copies of all required permits from the Pennsylvania DEP and any other governmental agencies having jurisdiction.

C. If on-lot sewage treatment and disposal facilities are proposed, show soil types, location of soil probes and percolation test sites, suitable primary and replacement absorption bed areas on each lot with provisions for their protection and reservation and all other information required by the Township Sewage Enforcement Officer (SEO) and the Pennsylvania DEP. The following statement shall appear on the Plan of Lots and Plan Cover Sheet:

"Approval of this plan by The Board of Supervisors of the Township of Tyrone does not guarantee that a sewage permit will or will not be issued for any lot or parcel. The Township Sewage Enforcement Officer (SEO) must be contacted to conduct any further tests, if necessary, or design review to determine if a sewage permit will be issued."

D. Design of the proposed stormwater management controls in accordance with the provisions of these Specifications. Proposed contouring shall be provided for all detention/retention areas. The requirements for preparation of the stormwater plan are presented in Section 405, "Stormwater Plan Requirements", of these Specifications.

E. Design of the proposed water supply facilities, if applicable, including a plan showing location and size of waterlines and appurtenances with stations corresponding to the profile, profiles showing existing and proposed ground surface along the centerline of the waterlines, details and other information required by the purveyor providing the water service and the Pennsylvania DEP. If applicable, provide a letter from the provider of the water service

approving the design of the proposed water supply facilities. If applicable, provide copies of all required permits from the Pennsylvania DEP and any other governmental agencies having jurisdiction. With the exception of Minor Subdivisions, if individual wells are proposed for each lot, the Developer shall prepare a hydrogeological study of the development site. For Minor Subdivisions, the Township may direct the Developer to prepare a hydrogeological study of the development site.

F. Location and details of the soil erosion and sedimentation controls. An erosion and sedimentation control plan that meets the requirements of the Pennsylvania DEP Ordinance 102 (Erosion Control) Rules and Regulations along with a letter from the County Conservation District approving said plan shall be provided. The Developer shall provide copies of the appropriate National Pollutant Discharge Elimination System (NPDES) Permit for Storm Water Discharges from Construction Activities and, if applicable, the earth disturbance permit for sites involving five (5) or more acres.

G. Applicable permits issued by the Pennsylvania DEP and/or the U.S. Army Corps of Engineers for waterway obstructions and stream or wetland encroachments. If applicable, the Developer shall provide copies of the report prepared for the Developer regarding the delineation of wetlands and waters of the Commonwealth of Pennsylvania.

H. The Developer shall submit the plans to the Blair County Planning Commission and shall provide the Blair County Planning Commission's review letter regarding the plans.

8. Each plan sheet shall include a north arrow, graphic scale, and date of original plan sheet along with date and description of each revision to plan sheet.

9. Each plan sheet shall include a title block with name, address, registration seal and signature of the Registered Professional Engineer, Surveyor or Architect responsible for the plans.

10. Approval Signatures and Date: A place shall appear on the Plan of Lots and Plan Cover Sheet for the date of approval and signatures of the Chair, Vice-Chair and Secretary-Treasurer of the Board of Supervisors.

11. The following stormwater management statement shall appear on the Plan of Lots and Plan Cover Sheet:

"On this ____ day of _____, 20__ the Developer is responsible for the perpetual operation and maintenance of the stormwater management system. Furthermore, Developer acknowledges the stormwater management system to be a permanent fixture which can be altered or removed only after approval of the a revised stormwater plan by the Township."

(Individual)

(President, Vice-President)

(Partner)

(Secretary, Asst. Secretary)

(Partner)

If Corporation,
Affix Corporate Seal

12. The following Engineer's Certificate shall appear on the Plan of Lots and Plan Cover Sheet:

"I, _____, have reviewed the plans and specifications and hereby certify that the stormwater plan meets all design standards and criteria of all Federal and Commonwealth statutes and regulations and Tyrone Township Subdivision and Land Development Ordinance."

13. Roadway name and addresses for all lots proposed shall appear on the Plan of Lots. Roadway names and addresses shall be coordinated with the Blair County Emergency Management Agency (Blair County 911) and shall be assigned by the Township. In some cases the Township may allow the Developer to suggest the roadway names. If the subdivision/land development is to be constructed in phases, all lots in each phase must be contiguous to one another. No checkerboard phasing shall be permitted.

14. Lot descriptions including area, easements, rights-of-way and building restriction lines shall appear on the Plan of Lots. Subdivision/land development plans shall show building locations and parking areas in addition to the above information. As a minimum, each lot which abuts another lot shall have a ten (10) foot utility and drainage easement in the favor of the Township and for which the Township may assign around all sides of the lot not fronting a roadway, said easement being for the purpose of installing and maintaining utilities and to provide for surface or subsurface stormwater drainage systems. Lots not abutting another lot having a like utility and drainage easement on the abutting line shall have a twenty (20) foot utility and drainage easement on the side(s) of the lot which has no abutting a utility and drainage easement.

15. All existing property lines, easements and rights-of-way on and adjacent to the proposed subdivision/land development including location, width and purpose for which the easements and rights-of-way have been established shall appear on the plans.

16. Natural waterways, wetlands, flood plains, geologic, tree masses and other significant natural features on or adjacent to the subdivision/land development shall appear on the plans.

17. Ground elevations indicated by contours at intervals of two (2) feet for land with an average natural slope of ten (10) percent or less and at five (5) foot intervals for land with an average natural slope greater than ten (10) percent, and the location and elevation of the benchmark(s) and the datum used shall appear on the plans.

18. The plans shall show existing manmade features on and adjacent to the proposed subdivision/land development including structures, railroads, bridges, and driveways.

19. If applicable, the number of parking spaces provided shall appear on the plans.

20. List of utility companies on the Plan Cover Sheet in accordance with Commonwealth of Pennsylvania Act 187, as amended, shall appear on the plans.

21. The plans shall show all existing utilities on and adjacent to the property including location, type, size, and invert elevation of sanitary and storm sewers; location, type and depth of water mains, valves and fire hydrants; and location, type and depth of gas lines (natural and petroleum), oil and similar transmission lines, electric lines, telephone lines, television cable lines and utility poles.

22. A Legend shall be included on the Plan Cover Sheet describing symbols used on the plans.

23. Location map showing the proposed subdivision/land development in relation to municipal boundaries, public roads, streams and adjoining areas shall appear on the plans.

24. All existing roadways on and adjacent to the proposed subdivision/land development including name, location of right-of-way, right-of-way widths, pavement widths, shoulder widths, type of surfacing, elevation of surfacing, driveway cuts, and approximate grades shall appear on the plans.

25. If a preliminary plan is proposed to proceed to construction, with a final plan submitted for approval after completion of the required improvements, the following statement shall be shown on the Plan Cover Sheet:

"Approval of preliminary plan authorizes construction of facilities depicted on the plans, but does not authorize sales of lots or use of facilities."

§402. Additional Lot Requirements.

1. General.

A. Each lot, unless otherwise stated herein, shall abut a Public Street and each lot shall have a location along the public right-of-way bordering the lot that is suitable for a driveway.

2. Lot Width and Area.

A. Minimum Area. Residential lots shall have minimum area of forty-three thousand five hundred sixty (43,560) square feet, and a minimum width measured in the shortest distance at the building line, of one hundred fifty (150) feet.

B. Size requirements. Lots which are not served by public sewers and/or public water shall conform to the requirements of the Pennsylvania Sewage Facilities Act, Act 537, as amended, and as follows:

- | | |
|-------------------------------|--------------------|
| 1. Single-Family Dwellings | 43,560 |
| 2. Two-Family Dwellings | 52,000 square feet |
| 3. Lot Width at Building Line | 150 feet |

C. Depth. The minimum depth of lots shall be two (200) feet. Double frontage and reversed frontage lots shall be avoided except where necessary or to provide separation of residential development from traffic arterials or to overcome specific disadvantages of topography and orientation.

D. Sideyards. Sideyards shall be required. The combined sideyards of a lot shall be a minimum twenty five (25%) of the lot width, and in no case shall the building be closer than fifteen (15) feet to a side lot line.

E. Arrangement. On all lots, so far as is practicable, the side lot lines shall be at right angles to straight street lines, or radial to curved street lines, unless a variation to this rule will give a better street and lot plan.

F. Setback Lines.

(1) Building set-back lines shall be established for all lots. Corner lots shall be laid out wide enough to permit building space back of the building line of each street.

(2) Building set-back lines, shall be shown on the plat for lots intended for residential use of any character, and on commercial and industrial lots immediately adjoining residential areas.

(3) The subdivider or Developer shall establish building lines in accordance with the needs of each subdivision, but in no case shall such building lines be less than fifty (50) feet from the edge of the right-of-way.

(4) In all cases where a proposed subdivision borders on or includes a marked Federal or Commonwealth highway, a minimum building line set-back of seventy five (75) feet from the right-of-way of the existing or proposed highway shall be provided.

§403. Roadway and Drainage Improvements.

1. General.

A. proposed public and private streets shall be coordinated and aligned with existing or proposed Federal, Commonwealth, County and Township roadways in adjoining subdivisions/land developments.

B. With the exception of Minor Subdivisions, non-residential land developments of less than three- (3) acres, or residential land developments proposing no more than ten- (10) single-family detached dwellings, there shall be at least two (2) accesses for ingress, egress and regress

from and to the land to be developed or subdivided to a Federal, Commonwealth, County or Township roadway. When permitted by this section, developments proposing Single Access Streets as defined, and must be designed as specified in, Section 403.1.F. of this chapter.

C. Access shall be given to all lots and undeveloped portions of the tract in the subdivision/land development and to adjacent tracts of land unless the topography clearly indicates that such connection is not feasible. All roadways giving such access for egress, ingress and regress from and to subdivision/land development shall be improved to the limits of the subdivision/land development and shall be improved to the Township specifications.

D. The roadway and drainage construction standards contained herein are minimum standards and requirements for the promotion of the public health, safety, morals and general welfare. In no case shall a proposed design provide for less than these standards. Except as modified herein, all roadway improvements, public and private, shall conform to the design criteria set forth in PennDOT Bureau of Design, Publication 13, Design Manual, Part 2, Highway Design, latest edition. Except as modified herein, all roadway improvements, public and private, shall conform to the construction specifications of the PennDOT Publication 408 Specifications, latest edition, and Standards for Roadway Construction, RC 0-100, latest edition. Except as modified herein, all drainage facility construction shall also conform to these PennDOT construction specifications. Where a subdivision/land development abuts or contains an existing roadway of improper width or alignment, the Township shall require the dedication of land sufficient to widen the roadway and correct the alignment.

E. The source of all materials used in the construction of the roadways and drainage improvements shall be approved by the Township before delivery to the subdivision/land development is started.

F. Single Access Streets - Single Access Streets are a type of public street and shall be subject to the design requirements as specified under Paragraph 5E of Section 403 of these specifications in addition to the following:

- (1) No single access street shall be the sole means of vehicular access to more than ten (10) residential units
- (2) No single access street shall have a total cartway length in excess of five hundred (500) feet, as measured along the centerline from the curblines of the intersected street to the far curb of the turnaround area. Where a single access street has a branched configuration, the total length of all "branches" added to the length of the main "stem" shall not exceed five hundred (500) feet
- (3) Single access streets shall have a minimum length of two hundred fifty (250) feet, as measured along the centerline from the curblines of the intersected street to the far curb of the turn-around area.
- (4) All non-through streets shall be provided with an authorized sign stating that no outlet exists.

(5) PENNDOT “one-way” directional signs shall be placed at the beginning and end of the cul-de-sac circle.

(6) Where, in the opinion of the Board of Supervisors, the future extension of a proposed single access street to an adjoining tract is feasible, the full width of the right-of-way of such street shall be extended to the property line, and a paved turn-around area shall be provided.

(7) Turn-around areas

A. No single access street shall be designed as a dead-end street; that is, a street lacking a turn-around area.

B. Single access streets shall be provided with a paved turn-around area:
i. When designed as a circular cul-de-sac, such turn-around shall have a minimum paved radius of fifty (50) feet and a minimum right-of-way radius of sixty (60) feet. Such area shall be clear of all obstructions.
ii. Alternative turn-around designs may be permitted if design proves to be an equal or better alternative, and is approved by the Board of Supervisors.

C. The grade of the turn-around area shall not exceed five (5.0) percent in any direction.

D. The maximum number of lots permitted to have frontage on a turn-around is two (2).

E. On-street parking is to be prohibited within turn-around areas; as such “No Parking” signs shall be placed every 100 feet along the circumference of the paved area.

F. Single Access Streets may not provide access to more than two- (2) flag lots.

G. Reserve Strips - Controlling access to streets by reserve strips is prohibited except where their control is definitely placed in the Township under control approved by the Township. A reserve strip is a parcel of ground in separate ownership separating a street from other adjacent properties or from another street.

2. [Reserved]

3. Traffic Control Plan. A traffic control plan shall be submitted for all work on Township roads whenever it will be necessary to either close any portion of a travel lane during hours of darkness without work in progress or detour traffic in order to perform the permitted work. All plans shall comply with Section 6123 of the Commonwealth of Pennsylvania Vehicle Code and the applicable provisions of 67 PA Code, Ordinance 203. The Township may require the Developer to bond existing roadways.

4. [Reserved]

5. Roadway Design.

A. The roadway right-of-way width shall be at least forty (40) feet in width and not greater than one hundred twenty (120) feet in width.

B. The cartway (paved portion of the roadway) shall be at least twenty (20) feet in width, excluding the shoulders, ten (10) feet each side of the roadway centerline. The cross slope of the cartway shall two (2) percent in tangent sections and six (6) percent in super-elevated sections.

C. Each roadway shall have tapered shoulders on both sides, each being at least five (5) feet in width. Shoulders shall conform to PennDOT Paved Shoulders, Type 4 placed in accordance with PennDOT Publication 408 Specifications, Section 654. The cross slope of the shoulders shall be three (3) percent. The Township may approve the use of plain cement concrete curb or plain concrete mountable curb with a paved shoulder or plain cement concrete curb gutter in lieu of paved shoulders. Concrete curb, mountable curb and curb gutter shall conform to PennDOT Publication 408 Specifications, Section 630, Section 633 and Section 641, respectively.

D. The maximum roadway grade shall be ten (10) percent. The minimum roadway grade shall be seven-five hundredth (0.75) percent.

E. The entire roadway right-of-way shall be cleared. Each roadway and shoulder shall be cut out and graded to the above dimensions and shall be constructed as follows:

(1) Subbase: Six (6) inches, compacted thickness, of PennDOT 2A coarse aggregate placed in accordance with PennDOT Publication 408 Specifications, Section 350. Subbase stabilization, including the installation of geotextile material and/or AASHTO No. 1 coarse aggregate, shall be required when unsuitable subgrade conditions are encountered.

(2) Base Course: Four and one-half (4-1/2) inches, compacted thickness, of PennDOT bituminous concrete base course placed in accordance with PennDOT Publication 408 Specifications, Section 305.

(3) Wearing Course: One and one-half (1-1/2) inches, compacted thickness, of PennDOT bituminous wearing course, ID-2, placed in accordance with PennDOT Publication 408 Specifications, Section 420.

F. Traffic lines, double yellow center line and single white outside edges of pavement lines, shall be placed in accordance with PennDOT Publication 408 Specifications, Section 952.

G. All roadways shall have adequate stormwater drainage systems. The stormwater drainage systems shall be designed in accordance with Section 404 of these Specifications, PennDOT Standards for Highway Construction and the following sections of PennDOT Publication 408 Specifications, except as modified herein:

- (1) 201 Clearing and Grubbing
- (2) 203 Excavation
- (3) 212 Geotextiles
- (4) 601 Pipe Culverts
- (5) 604 Combination Storm Sewer and Underdrain
- (6) 605 Endwalls, Inlets, Manholes, and Spring Boxes
- (7) 610 Pipe Underdrain
- (8) 612 Subgrade Drains
- (9) 616 End Sections and Slope Pipe Fittings
- (10) 626 Gabions

H. Cul-de-sacs shall be constructed at the terminus points of roadways. Cul-de-sacs shall be constructed as follows:

- (1) The right-of-way radius shall be at least fifty (50) feet.
- (2) The outside edge of the shoulder shall be at least forty (40) feet
- (3) The outside edge of the cartway shall be at least thirty-six (36) feet.
- (4) The entire cul-de-sac, including the center, shall be constructed as specified under Paragraph 5E of Section 403 of these Specifications.

I. The following standards shall apply to all roadway intersections:

(1) Roadways shall intersect as nearly as possible at right angles. No roadway shall intersect another at an angle less than seventy-five (75) degrees or more than one hundred five (105) degrees.

(2) No more than two (2) roadways shall intersect at the same point.

(3) Roadways intersecting another roadway shall either intersect directly opposite to each other or shall be separated by at least one-hundred twenty-five (125) feet between center lines measured along the centerline of the roadway being intersected.

J Minimum site distance shall be provided at all roadway intersections in accordance with the Pennsylvania Code, Title 67, Section 8(h). Sight distance measurements shall be made from a point ten (10) feet from the edge of the cartway, three and one-half (3-1/2) feet high to a point four and one-quarter (4-1/4) feet above the cartway surface.

K. Guide rails shall be provided where directed by the Township. Guide rail materials and installation shall conform to PennDOT Publication 408 Specifications, Section 620.

L. The Township may require the Developer to provide rights-of-way to permit future roadway extensions into adjoining tracts.

6. Testing:

A. Subsurface: Prior to the final approval of the subdivision/land development, the

Township may direct the Developer to complete core borings and/or inspection pits excavations along the proposed roadway centerlines to determine the condition of the subgrade material. If the Township Engineer determines that the existing subgrade material will not support the construction of the proposed roadway, the plans shall include provisions for mitigating the unsuitable subgrade conditions.

B. Compaction: During construction of the roadways, the Township may direct the Developer to employ an independent testing laboratory, approved by the Township Engineer, to conduct soil and/or soil compaction tests of the roadway subgrade. Said laboratory shall present a certification to the Township that states that the fill in every portion of the roadway has been constructed in accordance with PennDOT Publication 408 Specifications, Section 210.3, as amended and supplemented to date.

7. Traffic Control and Roadway Identification Signs: Traffic control and roadway signs shall be constructed and lettered in accordance with PennDOT and Township standards. Signs shall be placed at all locations as directed by the Township. The signs shall be paid for by the Developer and installed by the Township.

§404. Stormwater Management

1. General Provisions.

A. Any Developer, and each person, corporation, or other entity that creates more than of five thousand (5,000) square feet impervious area shall be required to prepare and submit a stormwater plan for review and acceptance by the Township. Impervious areas shall include, but not be limited to, any roof, parking, or driveway areas, and any new roadways and sidewalks. Any areas designed to initially be gravel or crushed stone shall be assumed to be impervious for the purposes of these Specifications. These criteria shall apply to the total development even if the development is to take place in phases.

B. All proposed stormwater control measures shall be evaluated by the Township according to the following performance standard:

(1) Any Developer, and each person, corporation, or other entity engaged in the alternation or development of land which may affect stormwater runoff characteristics shall implement such measures as are reasonably necessary to prevent injury to health, safety or other property. Such measures shall include such actions as are required:

(a) To assure that the maximum rate of stormwater runoff after development is no greater the seventy-five (75) percent of the maximum rate of stormwater runoff prior to development activities or that amount of runoff permitted pursuant to the County's Stormwater Management Plan affecting the areas in question if the County's said plan is deemed by law to supercede the Township's regulations with regard to the issue of stormwater runoff, and

(b) To manage the quantity, velocity and direction of resulting stormwater runoff in a manner that otherwise adequately protects health and property from possible injury.

C. The stormwater plan for the development site shall consider all of the stormwater runoff flowing over the site.

D. All land disturbance activities shall be conducted in such a way as to minimize accelerated erosion and sedimentation. Measures to control erosion shall at a minimum meet the standards of the County Conservation District and the rules and regulations of the Pennsylvania DEP

E. No Developer or person, corporation, or other entity shall block, impede the flow of, alter, construct any structure, or deposit any material or thing, or commit any act which will affect normal or flood flow in any communal stream or natural watercourse without having prior approval from the Township and/or the Pennsylvania DEP, whichever is applicable.

F. Where a development site is traversed by a natural watercourse, there shall be provided a drainage easement or right-of-way conforming substantially to the line of such natural watercourse and of such width as will be adequate to preserve natural drainage. The terms of the easement or right-of-way shall prohibit excavation, the placing of fill or structures, and any alterations that may adversely affect the flow of stormwater within any portion of the easement or right-of-way. Also maintenance, including mowing of vegetation within the easement or right-of-way shall be required, except as approved by the appropriate governing authority. If applicable, the Developer shall obtain drainage easements or rights-of-way from downstream property owners.

G. Financial security all stormwater management facilities and natural waterway management facilities must be included in the financial security as required in Section 306 of this Ordinance.

2. Stormwater Runoff Quantity Control Standards

A. Runoff Rates. The maximum rate of stormwater runoff discharge from any activity covered by this Ordinance of the Township of Tyrone Code of Ordinances following completion Of the activity (post-development conditions) shall not exceed seventy five (75%) percent of the maximum rate of stormwater runoff discharge that would have occurred from the land prior to the activity (pre-development conditions) or that amount of runoff permitted pursuant to the County's Stormwater Management Plan affecting the areas in question if the County's said Plan is deemed by law to supercede the Township's regulations with regard to the issue of stormwater runoff. This criterion shall apply to the total activity even if the activity is to take place in stages. More stringent criteria may be required in sensitive areas where stormwater problems presently exist. These requirements may be modified based on a detailed engineering study completed by a licensed professional engineer of the Commonwealth of Pennsylvania, on behalf of the developer, which demonstrates that modification of these requirements is justified, and such plan is reviewed and recommended by the Tyrone Township Engineer for approval by the Tyrone Township Board of Supervisors.

(1) Off-site areas that drain through a proposed development site are not subject to this control standard when determining allowable peak runoff rates. However, on-site drainage facilities shall be designed to safely convey off-site flows through the development site.

(2) Where the site area to be impacted through a proposed development activity differs significantly from the total site area (less than ten percent), only the proposed impact area shall be subject to the runoff criteria.

B. Storm Frequencies. Stormwater management facilities proposed for all development sites shall control the peak stormwater discharge for the 2-, 10-, 25- and 100-year storm frequencies. The USDA NARCS 24-hour, Type H Rainfall Distribution shall be used for analyzing stormwater runoff for both pre- and post-development conditions. The 24-hour total rainfall for these storm frequencies in the watershed are:

Storm Frequency	Rainfall Depth (inches)
2-Year	2.6
10-Year	3.8
25-Year	4.6
100-Year	6.1

C. Calculation Methods

(1) Development Sites: For the purpose of computing peak flow rates and runoff hydro graphs from development sites, calculations shall be performed -using one of the following: USDA NARCS publications, Technical Release (TR) 55 or 20, HEC I or Penn State Runoff Model (PERM.) or Modified Rational Method. Under special circumstances other computation methods may be used subject to the approval of the Township Engineer.

(2) Stormwater Collection/Conveyance Facilities: For the purposes of designing storm sewers and other stormwater runoff collection and conveyance facilities, Rational Method or other method as approved by the Township Engineer may be applied. Rainfall intensities for design shall be obtained from the PennDOT, Storm Intensity-Duration-Frequency Charts, as amended to date.

(3) Routing of hydro graphs through detention/retention facilities for the purpose of designing those facilities shall be accomplished using the Modified-Pulls Method or other recognized reservoir routing method subject to the approval of the Township Engineer.

(4) Redevelopment Conditions: Redevelopment conditions shall be assumed to be those that exist on any site prior to commencing any development activities. SCS runoff curve numbers selected for use in the calculations shall accurately reflect existing conditions subject to the approval of the Township Engineer. The hydroponic conditions for all areas with pervious cover (i.e., fields, woods, lawn areas, pastures, cropland, etc.)

shall be assumed to be in "good" condition and the lowest recommended SCS runoff curve number (CN) shall be applied for all pervious land uses within the respective range for each land use and hydroponic soil group. Impervious cover shall include, but not be limited to, any roof, parking, or driveway areas, and any new roadways and sidewalks. Any areas designed to initially be gravel or crushed stone shall be assumed to be impervious for the purposes of these criteria. The computed existing runoff rates shall be reconciled with field observations and conditions. If the designer of the stormwater management facilities can substantiate through actual physical calibration that more appropriate runoff values should be used at a particular development site, then appropriate variations may be made upon review and approval of the Township Engineer. Calibration shall require detailed gauge and rainfall data for the particular development site in question.

3. Stormwater Quality Management Requirements

A. Applicability. In addition to the performance standards and design criteria requirements of these Specifications, the Developer shall implement the following water quality requirements unless otherwise exempted by the provisions of these Specifications.

B. Water Quality Requirements.

(1) No discharge materials, toxic or otherwise, shall be permitted into any stormwater management system except as may be permitted by applicable laws of the Commonwealth of Pennsylvania or the United States of America. Where required by a Federal, Commonwealth, County or Township regulation, the Developer shall be responsible for obtaining the appropriate National Pollutant Discharge Elimination System (NPDES) Permit for Storm Water Discharges from Construction Activities.

(2) In addition to the stormwater runoff quantity requirements of Section 404 of these Specifications, the Developer shall:

(a) Design the stormwater detention/retention basin so that the outlet of the basin shall, in addition to any other stormwater requirements of the Township stormwater regulations, discharge the 1 year, 24-hour storm over a 24-hour period.

(b) As an alternate to the requirement of (a) above, the water quality objectives may be achieved through the combination of the best management practices (B.V.'s) including, but not limited to, infiltration structures, detention/retention basins, vegetation filter strips and buffers. The combination of BLIP's shall be designed according to the requirements listed in these Specifications and in consultation with the Township Engineer.

(c) In lieu of (a) and (b) above, the Developer may submit original and innovative designs to the Township Engineer for review and approval by the Township.

C. BMP Selection Criteria

(1) In selecting the appropriate BLIP's or combinations thereof, the Developer shall consider the following:

- (a) Total contributing area.
- (b) Permeability and infiltration rate of the site soils.
- (c) Slope and depth to bed rock.
- (d) Seasonal high water table.
- (e) Proximity to building foundations and well heads.
- (f) Irritability of soils.
- (g) Land availability and configuration of the topography.

(2) The following additional factors shall be considered when evaluating the suitability of the BMP's used to control water quality at a given development site.

- (a) Peak discharge and required volume control.
- (b) Streambanks erosion.
- (c) Efficiency of the BMP's to mitigate potential water quality problems.
- (d) Volume of runoff that will be effectively treated.
- (e) Nature of the pollutant(s) being removed.
- (f) Maintenance requirements.
- (g) Recreation value.
- (h) Enhancement of aesthetics and property values.

4. Design Requirements for Stormwater Management Controls

A. General Criteria

(1) The Developer may select runoff control techniques, or a combination of techniques, which are most suitable to control runoff from the development site. All controls shall be subject to the approval of the Township Engineer. The Township Engineer may request specific information on design and/or operating features of the proposed stormwater management controls in order to determine their suitability and adequacy in terms of the standards of these Specifications.

(2) The Developer must consider the effect of the proposed stormwater management techniques on any special soil conditions or geological hazards that may exist on the development site. In the event such conditions are identified on the site, the Township Engineer may require in-depth studies by a competent geotechnical engineer. Not all stormwater methods may be allowable at a particular development site.

(3) In developing a stormwater plan for a particular site, stormwater controls shall be selected according to the following order of preference:

- (a) Infiltration of runoff on-site, such as underground perforated pipe with clean coarse aggregate backfill wrapped with geotextile material.

(b) Flow attenuation by use of open vegetated sales and natural depressions.

(c) Construction of stormwater detention/retention structures.

(4) Infiltration practices shall be used to the extent practicable to reduce volume increases and promote groundwater recharge. A combination of successive practices may be used to achieve the applicable minimum control requirements. The Developer shall provide justification for rejecting each of the preferred practices based upon actual site conditions.

B. Design Criteria for Infiltration Systems

(1) Infiltration systems shall be sized and designed based upon local soil and ground water conditions.

(2) All infiltration systems shall be located at least ten (10) feet from basement walls.

(3) Infiltration systems shall not be used to handle runoff from commercial or industrial working or parking areas. This prohibition does not extend to roof areas that are demonstrated to be suitably protected from the effects of the commercial/industrial activities.

(4) Infiltration systems may not receive runoff until the entire drainage area tributary to the system has received final stabilization.

(5) The stormwater infiltration facility design shall provide an overflow system with measures to provide a non-erosive velocity of flow along its length and at the outfall.

(6) Roof drain infiltration facilities shall provide an effective volume of at least one (1) cubic foot for every two (2) square feet of roof surface.

C. Design Criteria for Flow Attenuation Facilities

(1) If flow attenuation facilities are employed to assist in the control of peak flows of discharge, their effects must be quantified using SCS Technical Release (TR) 55, Urban Hydrology for Small Watersheds or other method approved by the Township Engineer. The effects of flow attenuation facilities on travel time should be reflected in the calculations.

(2) Flow attenuation facilities such as sales and natural depressions should be properly graded to ensure positive drainage and avoid prolonged pending of water.

(3) Sales shall be properly vegetatively stabilized or otherwise lined to prevent erosion.

(4) Sales shall be designed according to the recommendations contained in the latest edition of the Commonwealth of Pennsylvania Erosion and Sediment Pollution Control Program Manual latest edition-

D. Design Criteria for Stormwater Detention/Retention Facilities

(1) All detention/retention facilities shall be equipped with outlet structures to provide discharge control for the four (4) designated storm frequencies. Provisions shall also be made to safely pass the post-development 100-year storm runoff without damaging (i.e., impairing the continued function of the facilities). Should any stormwater management facilities qualify as a dam under Pennsylvania DEP Ordinance 105, the facility shall be designed in accordance with those regulations and shall meet the regulations of Pennsylvania DEP concerning dam safety.

(2) Shared-storage facilities that provide detention of runoff for more than one (1) development within a single subarea are encouraged wherever feasible and provided such facilities meet the criteria contained in these Specifications. In addition, runoff from the developments involved shall be conveyed to the facility in a manner that avoids adverse impacts (such as flooding or erosion) to channels and properties located between the development and the shared-storage facility.

(3) Where detention/retention facilities will be utilized, multiple use facilities (such as wetlands, lakes, ballfields or similar recreational/open space uses) are encouraged wherever feasible, subject to the approval of the Township Engineer and compliance with the Pennsylvania DEP's Ordinance 105 regulations.

(4) Construction of the detention/retention facilities shall conform to the construction specifications of the PennDOT Publication 408 Specifications, latest edition, and Standards for Roadway Construction, RC 0- 100, latest edition.

(5) Design of the detention/retention facilities shall include the following:

(a) Mow and outflow structures shall be designed and installed to prevent erosion to the side slopes. Mow and outflow structures, pumping stations and other structures shall be designed to minimize safety hazards.

(b) Bottoms of stormwater detention/retention basins shall be graded with sufficient slope to provide positive surface drainage. Bottoms of storage facilities shall be protected from erosion. A sub-drainage system may be required depending upon the location of the pond bottom relative to groundwater levels.

(c) Stormwater detention/retention basins shall have an emergency spillway. The emergency spillway shall have capacity to handle a one-hundred year (100) storm with at least one (1) foot of freeboard. The Township may require more stringent criteria in sensitive areas where stormwater problems presently exist. Erosion protection shall be provided for the emergency spillway

compatible with the computed maximum discharge velocity. The minimum size of rock lining shall be PennDOT Class R-4.

(d) If the fill height for a stormwater detention/retention facility exceeds five (5) feet, a compaction study must be performed. Fill must be placed in compacted lifts. Where the fill height exceeds five (5) feet, compaction testing shall be performed during construction and the Developer shall provide the Township with documentation that the fill was compacted to a density of at least ninety-five (95) percent of the Standard Proctor (ASTM Specification D698).

(e) Side slopes of the stormwater detention/retention basins shall not exceed a ratio of two and one-half to one (2.5:1) horizontal to vertical dimension. This requirement may be modified based on a detailed engineering study completed by a licensed professional engineer of the Commonwealth of Pennsylvania, on behalf of the developer, which demonstrates that modification of this requirement is justified, and such plan is reviewed and recommended by the Tyrone Township Engineer for approval by the Tyrone Township Board of Supervisors.

(f) Landscaping shall be provided for the stormwater detention/retention facility that harmonizes with the surrounding area. Vegetative cover shall be provided for all areas disturbed by the construction of the storage facilities, including the interior side slopes.

(g) Control and removal of debris both in stormwater detention/retention structure and in all inlet and outlet devices shall be a design consideration.

(h) Stormwater detention/retention facilities shall be located to facilitate maintenance taking into consideration the frequency and type of equipment that will be required.

(i) The perimeter of all detention/retention facilities shall be completely fenced with a fence having a minimum height of six (6) feet. Said fence shall be constructed of chain link or other similar material as may be approved by the Township. A double gate having a minimum width of twelve (12) feet shall be installed in the fence to provide access to the stormwater storage facilities. The Developer shall furnish a gate lock. To facilitate maintenance and inspection, all stormwater storage facilities shall be provided with a stabilized access road of a type subject to the approval of the Township Engineer. When located on undedicated land, the access road shall be placed within an easement not less than twenty (20) feet wide, as approved by the Township Engineer, who may require additional width of easement as circumstances warrant.

(j) Upon completion of the stormwater detention/retention facilities, the Developer shall provide to the Township a certification from an engineer, licensed by the Commonwealth of Pennsylvania, certifying that said facilities were constructed in accordance with these Specifications and the plans approved by the Township.