

5.11.C.8.c. The paved surface for local streets and special purpose streets which serve only local, residential traffic shall consist of hot-mixed, hot-laid materials in two courses, the lower of which (binder course) shall be a bituminous surface (ID-2A) rolled down to 4 inches in thickness, and the upper of which (wearing course) shall be a bituminous surface (ID-2A) rolled down to 1 1/2 inch in thickness. The paved surface for all other streets including, but not limited to, arterial streets and special collector and collector streets, shall consist of hot-mixed, hot-laid materials in two courses, the lower of which (binder course) shall be a bituminous concrete base course surface rolled down to 6

5.11.C.8.b. The base for local streets and special purpose streets which serve only local, residential traffic shall consist of crushed aggregate of a type specified in the latest edition of the PENNDOT Manual Form 408 rolled to a minimum thickness of 8 inches. The base for all other streets, including but not limited to arterial streets and collector and special collector streets, shall consist of crushed aggregate of a type specified in the latest edition of the PENNDOT Manual Form 408 rolled to a minimum thickness of 6 inches. No base shall be covered until it is inspected and given final written approval by the Board of Supervisors or its designated representative.

5.11.C.8.a. All street paving must conform to the following specifications, with the exception that the specifications for a street to be dedicated to the Township shall conform to the specifications contained in any other Township Ordinance should such Ordinance have more stringent specifications. Where another standard applies, the plan shall note that the street will be paved to such standard.

5.11.C.8. Street Improvements.

5.11.C.7.d. All new streets shall be graded to the right-of-way line. Cut and fill slopes within right-of-ways shall not exceed 3:1. If 3:1 slopes are proposed and the height of such slope is proposed to be in excess of five (5) feet, a non-maintenance vegetative cover shall be proposed. The proposed vegetation shall be approved by the Township.

5.11.C.7.c. The grade within the diameter of a turnaround at the terminus of a permanent cul-de-sac shall not exceed 5%.

5.11.C.7.b. Where the approaching grade exceeds 7% on any or all streets at a four-way street intersection, or the terminating street at a three-way intersection, a leveling area shall be provided on the street(s) with such excessive grade. Such leveling area(s) shall have a maximum grade of 5% for a minimum length of 75 feet measured from the intersection of the centerlines.

5.11.C.7.a. Vertical curves shall be used in changes in grade, exceeding 1%. The minimum lengths (in feet) of crest vertical curves shall be 20 times the algebraic difference in grade and the minimum length (in feet) of sag curves shall be 30 times the algebraic difference in grade. For example, if a 3% upgrade is followed by a 4% downgrade, the algebraic difference in grade is $7+3-(-4)=7$; the minimum length of the vertical curve would then be 140 feet $[20 \times 7 = 140]$. All the cut and fill banks shall be a maximum of 3:1 slope.

5.11.C.7. Vertical Alignments - Vertical street alignments shall be measured along the centerline. The minimum grade of all streets shall be 0.75% and the maximum grade shall be 10%; except for collector streets which shall be a maximum 8% grade.

5.11.C.10.b. Where the subdivision or land development is situated only on one side of an existing street, the developer shall improve the side of the street abutting the subdivision or land

5.11.C.10.a. Where the subdivision or land development abuts an existing Township or state street, the developer shall dedicate additional right-of-way to the Township or State, as applicable, to the extent necessary to increase the right-of-way width of the existing street to create a right-of-way width which is equivalent to the right-of-way width for new streets of the same classification established by this Ordinance. The developer shall improve the existing street to the cartway width established for new streets of the same classification set forth in this Ordinance. A developer shall install curbs, sidewalks, pavement widening, stormwater management facilities, and all other necessary or appropriate improvements in accordance with Township Ordinances. Notwithstanding the foregoing, the developer shall also improve State streets in accordance with the requirements of the PENNDOT and any conditions which the PENNDOT may impose upon its granting of a highway occupancy permit.

5.11.C.10. Improvement of Existing Streets and Intersections. Where a subdivision or land development abuts an existing Township and/or State street or will have a traffic impact on an existing Township and/or State street or intersection as indicated by the traffic impact study performed under the provisions of this Ordinance, the developer shall make the following improvements:

5.11.C.9. Extension of Existing Streets. The extension of existing streets which are presently constructed with a cartway different from the standards of this Chapter shall be provided with a transition area, the design of which is subject to Township approval.

5.11.C.8.f. For any non-residential subdivision or land development in which at least fifty (50) truck trips per day will be generated, the structural design of any roads shall be performed by an Engineer in accordance with current engineering standards. The design standards referred to herein, however, shall be the minimum standards utilized. In all cases, intersections of new roads, streets, driveways and access drives shall be constructed of reinforced concrete cement, in accordance with PennDOT design standards, for a distance of at least seventy-five feet (75') in each direction along the existing or proposed Township road from the intersection.

5.11.C.8.e. Wherever street improvements occur along or adjacent to a project site and result in a widened cartway width, a paved transition area shall be provided. The minimum length (in feet) of the transition area shall be calculated based on the offset distance from the edge of the existing cartway to the edge of the widened cartway times 15. For example, if the existing lane width is 10 feet and the proposed lane width is 14 feet, the paved transition would be 60 feet ((14-10)x15=60). The pavement section for all transition areas shall be the same as that required for any street widening.

5.11.C.8.d. All work procedures for the paving of streets shall conform to the requirements of the latest edition of the PENNDOT Manual Form 408.

inches in thickness, and the upper of which (wearing course) shall be a bituminous surface (ID-2A) rolled down to 1 1/2 inch in thickness. All finished streets must maintain a 1/4 inch per foot crown for each lane of travel except on superelevations and shall conform with the horizontal and vertical alignment of the plan as approved.

5.11.C.10.e. When the Township determines that the required improvements are not feasible at the present time, the developer shall deposit funds with the Township in the amount of 110% of the cost of the improvements computed in accordance with the provision of §509 of the Municipalities Planning Code. Such funds shall be maintained by the Township in a general account

5.11.C.10.d. The developer shall bear all costs and expenses in connection with the improvements required by this subsection. If the developer requires the Township to submit any permit applications or requests for approvals in the name of the Township, the developer shall reimburse the Township for all costs and expenses incurred by the Township in connection with its review of the application and submission of the application to PENNDOT or other governmental agency.

5.11.C.10.c. Where the traffic impact study indicates that improvements are necessary or advisable to existing Township and/or State streets and/or intersections within the traffic impact study area in order: (a) to assure adequate, safe and convenient access to each lot and/or structure and/or parking compound proposed as part of the development of the tract; (b) to accommodate the traffic due to the proposed development; (c) to provide for a level of service and delay for the design year, or years for phased projects, with the development which is at least equivalent to the projected level of service and delay for the design year(s) without the proposed subdivision or development; and/or, (d) to preserve the existing convenience of access to or ability to exit from abutting properties which gain access from the existing street, the developer shall install all such indicated improvements. The developer shall install additional traffic lanes, traffic dividers, traffic control devices, traffic signals and other measures as appropriate to ensure that the development of the tract does not adversely impact the existing street system and/or access to or the ability to exit from properties gaining access from an affected street. If the traffic impact study indicates that improvements must be made to a State street, the developer shall also take all action necessary to obtain any PENNDOT permits and/or approvals to install the necessary street widening and/or traffic signals or traffic control devices. If the traffic impact study recommends installation of traffic signals or traffic signal modifications, the developer shall prepare all studies and submit all necessary applications to enable the installation of the traffic signal or modifications at their cost and expense. If the traffic impact study indicates that traffic control devices or regulations including, but not limited to, stop intersections, speed limit reductions or parking prohibitions, are required, the developer shall prepare all studies necessary to justify imposition of such regulations in accordance with PENNDOT regulations and shall pay all costs associated with the preparation and enactment of an ordinance to establish such regulations.

development and, if the traffic impact study demonstrates that improvement of the entire cartway width is necessary for adequate, safe and convenient access to the proposed subdivision or land development, shall improve both sides of the street. If the Township requires the developer to improve only the side of the street abutting the subdivision or land development, the developer shall, in addition to all other required improvements, install 1 1/2 inches of ID-2A pavement overlay from the centerline of the existing cartway to the limits of the improved cartway width. For single family residential subdivisions of ten (10) lots or less (fronting on one road) with lots sizes all one (1) acre or larger, a waiver from specific requirements of Section 5.11.C.10 may be requested. Such request must, at a minimum, include justification as to why the specific improvements are not necessary, and that not making such improvements will not result in any negative impact on the road system due to the proposed development.

to be used for traffic improvements. The developer may request a modification to reduce the amount of funds to be deposited with the Township under this provision. In order to warrant the granting of such modification, the developer shall make application to the Township in accordance with the provisions of this Ordinance. The developer shall establish the particular circumstances which are applicable to the development and shall demonstrate good cause for such modification. The Township Engineer shall make a recommendation to the Township Planning Commission and Board of Supervisors whether or not and to what extent such requested modification should be granted.

5.11.C.11. Specific Traffic Control and Access Requirements. The following specific traffic control and access requirements shall be met for developments which produce 100 peak hour directional trips:

5.11.C.11.a. If any traffic signals are to be installed, the distance between any new and/or existing signals shall be at least 1,000 feet unless it can be demonstrated that adjacent traffic signals can operate sufficiently at lesser distances.

5.11.C.11.b. Design of proposed development access points shall take into consideration the horizontal and vertical grades of the existing road network in the traffic impact study area to permit safe and convenient access to the site as defined in the latest PENNDOT standards and regulations. All modifications required to meet these regulations will be the responsibility of the developer.

5.11.C.11.c. The developer shall demonstrate by using the latest PENNDOT standards and regulations that the proposed use will not create traffic patterns and movements which will jeopardize the traveling public.

5.11.C.11.c.(i) Stacking of sufficient length shall be provided in all traffic lanes on the site and off the site on adjacent roadways to insure that there shall be no blockage of through traffic. The design and length of the stacking lanes shall be justified and supported by the queuing analysis required as part of the traffic impact study.

5.11.C.11.c.(ii) Street and/or access drives to and within the site shall be designed in a manner that blockage of through traffic by vehicles attempting to enter or exit on these streets or access drives will not occur.

5.11.C.11.c.(iii) Acceleration, deceleration and turning lanes shall be of sufficient lengths to accomplish their intended use.

5.11.C.11.d. If reduction of the speed limit, installation of traffic control devices, limitation of parking or turning movements or similar measures are required to mitigate traffic impacts upon Township or State highways, the applicant shall present traffic studies performed in accordance with PENNDOT regulations and Publication No. 201, Engineering and Traffic Study Regulations. The erection or the installation of such traffic control devices shall be in accordance with Title 67, Chapter 211, Official Traffic Control Devices, of PENNDOT regulations. If the enactment of an ordinance is necessary to effectuate the traffic regulations or the installation of the traffic control device, the applicant shall reimburse the Township for all expenses in the preparation and enactment of the necessary ordinance.

5.11.C.11.e. No street shall be located in a manner which would limit access to or exiting from abutting properties gaining access from the existing street with which a proposed street will intersect unless the developer provides such lots with alternate access from the proposed street system in a manner acceptable to each affected lot owner. It shall be the burden of the applicant to demonstrate that such access is acceptable to all owners of an affected lot. For the purpose of this provision, limitation of access shall include the limitation of turning movements into or exiting the abutting property or properties gaining access from the existing street, whether by traffic regulations, installation of barriers to prevent turning movements, installation of additional traffic lanes in front of a property, or difficulties or delays resulting from increased traffic flows.

5.11.C.11.f. Where new intersections are being established to serve as access to the proposed development, these intersections must be designed to at least operate at Level of Service C or better.

5.11.C.11.g. For access points to the proposed development and any major intersections where traffic signal control may be required or is being proposed, a traffic signal warrant analysis shall be performed in accordance with the requirements of PennDOT's Publication 201. A left turn lane shall be provided and an analysis shall be completed to determine the type of signal phasing required.

5.11.C.11.h. Emergency traffic signal preemption shall be addressed and provided as required.

5.11.C.11.i. Additional left and right turning lanes shall be provided to address the existing roadway site conditions and access to the proposed development.

5.11.C.11.j. An agreement between the Township and developer shall be provided with regard to operating expenses and maintenance of proposed traffic signals.

5.11.C.11.k. Additional through lanes and lane transitions of sufficient length shall be provided to allow smooth traffic flow to existing traffic lanes thus minimizing congestion, delays and or blockage of through traffic within the proposed improvement area. The design and length should be justified and supported by the queuing analysis required as part of the traffic impact study.

5.11.C.11.l. Sidewalks shall be provided along the property frontage and within the development.

5.11.C.12. Street Construction Specifications.

5.11.C.12.a. Streets must be surfaced to the grades and dimensions drawn on plans, profiles, and cross-sections submitted by the developer and approved by the Township. Before paving the street surface, the developer must install required utilities and provide subsurface drainage for the streets in accordance with the Stormwater Management Requirements herein.

5.11.C.12.b. The construction of all streets shall comply with current Township standards and specifications as provided in a corresponding Appendix of this Ordinance and based on the construction standards in PENNDOT, Form 408.

5.11.C.12.c. The Township shall determine if a collector or arterial street is required as direct result of the construction of the development, in which case the developer is responsible for paving the additional width required for such streets.

5.11.C.13. Street Intersections.

5.11.C.13.a. Multiple intersections involving the junction of more than two streets are prohibited.

5.11.C.13.b. The distance between the centerline of streets opening onto the opposite sides of existing or proposed streets shall be no less than 150 feet between centerline of the street being intersected.

5.11.C.13.c. The distance between the centerline of streets intersecting a collector or local street shall be no less than 300 feet measured along the centerline of the street being intersected.

5.11.C.13.d. Intersections with arterial streets shall be located not closer than 1,000 feet, measured from centerline to centerline, along the centerline of the arterial street being intersected.

5.11.C.13.e. Right angle intersections shall be used whenever possible. No street shall intersect another at an angle of less than 75°.

5.11.C.13.f. The cartway edge at street intersections shall be rounded by tangential arc with a minimum radius of 20 feet for local streets and 30 feet for intersections involving major streets. The right-of-way radii at intersections shall be substantially concentric with the edge of the cartway.

5.11.C.13.g. Where appropriate, the Board of Supervisors may require additional traffic lanes to facilitate turning movements at existing or proposed street intersections within or bordering the site. These additional lanes, including acceleration/deceleration lanes and lane transition areas, shall be provided in accordance with the latest PENNDOT standards and regulations.

5.11.C.13.h. Where curbs and sidewalks are required or provided, clearly marked crosswalks shall be provided at all intersections. Crosswalks may also be required by the Board of Supervisors at other locations to promote the convenience and safety of pedestrian traffic. The design of crosswalks and the materials used shall be consistent with the PENNDOT 408 Specifications.

5.11.C.14. Sight Distance at Street Intersections.

5.11.C.14.a. There shall be provided and maintained at all intersections a clear sight triangle easement or dedicated right-of-way which shall include the area on each street corner that is bounded by a line of sight triangle between points from the intersection of the street centerlines for the distance shown in the corresponding Appendix. Clear sight triangles shall be indicated on all plans, and a note shall be provided on the plans which states that no structures, landscaping or grading may be constructed, installed or performed within the area of the clear sight triangle which would obscure the vision of motorists. Deeds to lots which contain clear sight triangles shall provide that no structure, landscaping or grading shall be erected, installed or performed within the area of the clear sight triangle which will obscure the vision of motorists.

5.11.C.14.b. Proper sight distance shall be provided with respect to both horizontal and vertical road alignments at all intersections. The sight distance shall be measured from a line 10 feet back from the edge of the roadway of the intersected street perpendicular to the centerline of the intersecting street. The sight distance shall be determined by the design speed of the road and the grade of the intersected street in accordance with current PENNDOT regulations and publications.

5.11.C.14.c. All streets intersecting a State route shall be subject to the approval of the PENNDOT. The minimum sight distance requirements for such intersections shall be provided based on current PENNDOT standards and regulations.

5.11.C.14.d. Lot Access.

5.11.C.14.d.(i) The Board of Supervisors may disapprove any point of ingress or egress to any lot, tract, parcel or development from any Township road when the proposed ingress or egress would create unsafe conditions, or result in substandard circulation and impaired vehicle movement.

5.11.C.14.d.(ii) The Board of Supervisors may require the applicant to provide ingress and egress to a particular lot or tract through the remainder of the property or other properties over which the applicant has control.

5.11.C.14.d.(iii) In recommending approval of ingress or egress from any State road or highway, the Board of Supervisors can only recommend those access points that are not in conflict with safety standards of the PENNDOT. A highway occupancy permit is required for each access point onto a State road or highway.

5.11.C.15. Future Access Strips. Future access strips are rights-of-way reserved for future street improvements. They shall be designed in conformance with the design requirements of a street, and the contiguous parcels must contain proper setbacks and sight distances.

5.11.C.16. Emergency Access Requirements. All subdivisions or land developments containing 50 or more dwelling units or nonresidential buildings containing 20,000 or greater square feet of gross floor area shall be provided with at least two separate and distinct means of access for the subdivision or land development.

5.11.C.16.a. Access may be provided through the location of two or more public or private streets, each of which intersects with an existing public street. Such public or private streets shall meet all the requirements of this Ordinance concerning design and construction.

All subdivisions shall be designed and serviced with adequate utilities, including electricity, telephone and gas service. The developer shall be responsible to cooperate with the utility companies to insure installation of the necessary utilities. All utilities shall be underground, except where developments are exempted by the Pennsylvania Public Utility Commission. Where required,

SECTION 5.13 UTILITIES, CURBS AND SIDEWALKS

The top of the monument box shall be set at the finished grade upon completion of the grading of the street.

shall be identified by steel pins.

Sufficient monuments shall be set to ensure that reliable survey points are available for all parts of the subdivision. At least one (1) monument shall be placed for every two (2) lots or every two hundred (200) feet of streets, whichever requirement is less. The monument shall consist of either a cast iron box inside of which shall be placed a 3/4 inch steel pin three (3) feet in length, with the top of the pin set to serve as the survey point, or 4" square x 30" in length concrete containing an iron bar for strength and drill hole for line, set level with finished grade. All lot corners and changes in direction shall be identified by steel pins.

SECTION 5.12 MONUMENTS

5.11.C.16.c.(iv) The emergency access may be located so that access is gained from an adjacent tract. For example, a subdivision or land development adjoining a parking lot of another use may provide emergency access through a point with a break chain. Applicants with plans indicating emergency access through an adjoining private tract shall provide evidence that the adjoining property owner has consented to such emergency access location.

access with an existing public street.

5.11.C.16.c.(iii) The emergency access may be located so that access to the subdivision or land development is gained from a public street at a location unsuitable for regular

5.11.C.16.c.(ii) The emergency access shall be accessible to the providers of emergency services within the Township. Applicants proposing to provide emergency access shall submit evidence of such approval.

5.11.C.16.c.(i) The emergency access shall be improved so that emergency vehicles may safely transverse it and shall be indicated on the plans.

emergency access shall be provided.

5.11.C.16.c. If the applicant is unable to provide access to the subdivision or land development through two or more public or private streets, each of which intersects with an existing public street, or two or more driveways which intersect with one or more existing public streets, an

5.11.C.16.b. Access for a land development may be provided through two or more driveways into the land development. Such driveways shall be separated by a distance of at least 150 feet and shall comply with all requirements of this Ordinance.

the developer shall obtain a letter from the utility company confirming that service may be extended to the development.

When required by the municipality, the developer shall provide a street lighting duct system, in accordance with the specifications of the appropriate public utility.

In areas where public water lines are available, fire hydrants shall be installed by the developer. Fire hydrants shall be located no more than 1000 feet apart and within 500 feet of any dwelling or inhabited structure. The nearest fire protection unit may be contacted for input regarding the design and placement of a fire hydrant network.

5.13.A. Curbs and Gutters

Curbs and gutters shall be installed by the developer when the mean lot width is 100 feet or less, or when any non-residential development is proposed, or when residential development which is not solely single-family detached residential is proposed, or when lot sizes are less than one (1) acre in area.

Curbs and gutters shall be installed on each side of all new streets in subdivisions or land developments, along all existing street abutting a subdivision or land development, and along all new parking compounds in land developments by the developer in accordance with the following specifications:

5.13.A.1. Curbs (vertical only), gutters, shall be constructed according to the specifications set forth in Section 641, Type A, C, and D, "Plain Cement Concrete Curb Gutter", in the Pennsylvania Department of Transportation Specifications, 1970 as amended, and must conform to all Americans With Disabilities requirements. Slant-type or mountable curbs may be permitted by the Township when density of driveways would dictate. Such request must be submitted in writing, along with complete details of such curbs for review and approval by the Township Engineer, Planning Commission and Board of Supervisors.

5.13.A.2. Vertical curbs shall be not less than six (6) inches wide at the top and seven (7) inches wide at the bottom. The overall depth of the curb shall be not less than twenty-two (22) inches. The curb shall rest on a six (6) inch crushed stone base.

5.13.A.3. The cross sections of gutters shall be constructed in accordance with the details shown on approved drawings.

5.13.A.4. Curbs and gutters shall be set and finished to the lines and grades given on the approved drawings.

5.13.A.5. The developer shall notify the Township a minimum of twenty-four (24) hours in advance of the start of construction.

Sidewalks shall be installed by the developer when the mean lot width is 100 feet or less, or when any non-residential development is proposed, or when residential development which is not solely single-family detached residential is proposed, or when lot sizes are less than one (1) acre in area.

Sidewalks shall be installed on each side of all new streets in subdivisions or land developments, along all existing street abutting a subdivision or land development, and along all new parking compounds in land developments by the developer in accordance with the following specifications:

5.13.B.1. Sidewalks shall be within the right-of-way of the street and shall extend in width from the right-of-way line toward the curb line.

5.13.B.2. Sidewalks shall be four (4) feet wide in single-family residential developments.

5.13.B.3. Sidewalks shall be five (5) feet wide in multi-family developments.

5.13.B.4. Sidewalks shall be ten (10) feet wide in commercial developments, unless justification is provided to warrant a lesser width.

5.13.B.5. Sidewalks shall be constructed according to the specifications as set forth in Section 676 "Cement Concrete Sidewalks", in the Pennsylvania Department of Transportation Specification, 1970, as amended, and must conform to all Americans With Disabilities requirements.

5.13.B.6. The developer shall notify the Township a minimum of twenty-four (24) hours in advance of the start of construction.

SECTION 5.14 REQUIRED IMPROVEMENTS

The land improvements required to be completed by the developer of a subdivision or land development, as set forth in this Ordinance, shall be designed and installed in accordance with this Ordinance and other codes of the municipality. The improvements shall be of such size and capacities as are required for the development of the proposed subdivision and of extra sizes as may be necessary to serve nearby land which is an integral part of the neighborhood service or drainage areas.

The developer shall be required to extend the improvements to serve adjoining unsubdivided land. Procedures for providing any necessary extra-size and general standards for pro-rating costs shall be coordinated with the municipality and shall be in accordance with the following:

5.14.A. Extra-Size Improvements - The developer shall be required to pay for a part of the materials or construction of streets, sewers or water lines which are determined by the Planning Commission according to the standards set forth in this Ordinance to be in excess of the size required for the development of the subdivision and the integral neighborhood, service, or drainage area.

If a storm sewer in excess of 18 inches, or a sanitary sewer in excess of 8 inches or a water main in excess of 6 inches is required, but each less in size than the sewer trunk lines or water mains which are to be constructed and financed on a regional basis, the municipality shall construct the extra size utility and require a deposit in advance from the developer for the cost of the utility he is required to install and his portion of other costs which the municipality may assess against the benefited property owners of the service or drainage area.

5.14.B. Extensions to Boundaries - The developer shall be required to extend the improvements to the boundary of the proposed subdivision to serve adjoining unsplit land; however, where the municipality determines that a connecting street is necessary for the future subdividing of adjoining land, but the present construction of pavement and/or utilities therein are not warranted, the municipality may require the dedication of land, the pavement intersections constructed, utilities extended at least three (3) feet beyond the pavement, and connections provided and made available for future extensions by other developers.

5.14.C. Prorating Costs - In making determinations for prorating costs for the construction of extra-size improvements, the Planning Commission shall consider in addition to the standards set forth in this Ordinance and other regulations of the municipality the following conditions:

5.14.C.1. The relative location and size of the proposed subdivision,

5.14.C.2. The traffic estimated to be generated by the development in relation to present streets,

5.14.C.3. The natural drainage area for sewers and the service area for water,

5.14.C.4. The development benefits that will accrue to the subdivision,

5.14.C.5. The sequence of land and utility developments in the vicinity, and

5.14.C.6. Any other condition it may find pertinent.

SECTION 5.15 COMPLETION OF IMPROVEMENTS OR GUARANTEE THEREOF PREREQUISITE TO FINAL PLAN APPROVAL

5.15.A. Performance Guarantee in Lieu of Installation - No plat shall be finally approved unless the streets shown on such plan have been improved to a mud-free or otherwise permanently passable condition, or improved as may be required by the subdivision and land development ordinance and any walkways, curbs, gutters, street lights, fire hydrants, shade trees, water mains, sanitary sewers, storm sewers, storm water management facilities and other improvements as may be required by the subdivision and land development ordinance have been installed in accordance with this Ordinance. In lieu of the completion of any improvement required as a condition for the final approval of a plat, the subdivider or developer shall deposit with the municipality a fiscal security in an amount sufficient to cover the costs of any improvements or common amenities including, but not limited to roads, storm water detention and/or retention basins and other related recreational facilities, open space improvements, or buffer or screen plantings which may be required. The developer shall be required to provide notification of expiration of security a minimum of thirty days prior to such expiration.

5.15.B. Type Guarantee - Without limitations as to other types of financial security which the municipality may approve, which approval shall not be unreasonably withheld, Federal or Commonwealth chartered lending institutions shall be deemed acceptable financial security for the purpose of this Section. Such financial security shall be posted with a bonding company or Federal or Commonwealth chartered lending institution chosen by the party posting the financial security, provided said bonding company or lending institution is authorized to conduct such business within the Commonwealth. Such bond, or other security shall provide for, and secure to the public, the completion of any improvements which may be required on or before the date fixed in the formal action of approval or accompanying agreement for completion of the improvements.

5.15.C. Amount of Guarantee - The amount of financial security to be posted for the completion of the required improvements shall be equal to one hundred and ten percent (110%) of the cost of completion estimated as of ninety (90) days following the date scheduled for completion by the developer. Annually the Township may adjust the amount of the financial security by comparing the actual cost of the improvements which have been completed and the estimated cost for the completion of the remaining improvements as of the expiration of the ninetieth (90th) day after either the original date scheduled for completion or rescheduled date of completion.

Subsequent to said adjustment, the Municipality may require the developer to post additional security in order to assure that the financial security equals said one hundred and ten percent (110%). Any additional security shall be posted by the developer in accordance with this subsection.

The amount of financial security required shall be based upon an estimate of the cost of completion of the required improvements, submitted by an applicant or developer and prepared by a professional engineer licensed as such in this Commonwealth and certified by such engineer to be a fair and reasonable estimate of such cost. The Township Engineer shall review and approve the cost estimate or, for good cause, refuse to accept the estimate, in which case he shall calculate an accurate cost estimate of the required site improvements. If the applicant or developer and the Township Engineer are unable to agree upon an estimate, then the estimate shall be recalculated and certified by another professional engineer licensed as such in this Commonwealth and chosen mutually by the Township and the applicant or the developer. The estimate certified by the third engineer shall be presumed fair and reasonable and shall be the final estimate. In the event that a third engineer is chosen, fees for the services of said engineer shall be paid equally by the Township and the applicant or developer."

If the party posting the financial security requires more than one (1) year from the date of posting of the financial security to complete the required improvements, the amount of financial security may be increased by an additional ten (10) percent for each one year period beyond the first anniversary date from posting of financial security or to an amount not exceeding one hundred and ten percent (110%) of the cost of completing the required improvements as reestablished on or about the expiration of the preceding one (1) year period by using the above bidding procedure.

Any financial guarantee other than a cash escrow shall state on its face, certified by the issuing financial institution, that the issuing financial institution agrees that the financial guarantee shall be irrevocable and shall not be allowed to expire, be withdrawn, or reduced in amount without at least

ninety (90) days written notice to the Township, until the financial guarantee is released by the Township. A developer who fails to complete the improvements within the allotted time specified in the financial guarantee shall, at least thirty (30) days in advance of the guarantee expiration date, renew or resubmit a financial guarantee. Failure to keep a financial guarantee in effect until the completion and approval of all improvements shall be a violation of this Ordinance.

5.15.D. Progressive Installation - In the case where development is projected over a period of years, the Planning Commission may authorize submission of final plats by sections or stages of development subject to such requirements or guarantees and to improvements in future sections or stages of development as it finds essential for the protection of any finally approved section of the development.

5.15.E. Release from Guarantee - As the work of installing the required improvements proceeds, the party posting the financial security may request the release, from time to time, of such portions of the financial security necessary for payment to the contractor or contractors performing the work. Any such requests shall be made in writing to the municipal governing body, or Planning Commission where applicable, and within forty-five (45) days of receipt of such request the applicable Township Engineer, shall certify, in writing, to his employers whether or not such portion of the work upon the improvements has been completed in accordance with the approved plat. When the improvements are certified to be in accordance with the approved plat, the municipality shall authorize release by the bonding company or lending institution of an amount as estimated by the Township Engineer fairly representing the value of the improvements completed. If the municipality fails to act within said forty-five (45) day period, the release of funds shall be deemed to have been approved as requested. The municipality may, prior to final release at the time of completion and certification by its engineer, require retention of ten percent (10%) of the estimated cost of the aforesaid improvement. The applicant shall assume the necessary expense incurred for the inspection of improvements. Such inspection costs shall be based upon a schedule established and amended from time to time as deemed necessary.

5.15.F. Maintenance Guarantee - Where the municipality accepts dedication of all or some of the required improvements following completion, the municipality may require the posting of financial security to secure structural integrity of said improvements as well as the functioning of said improvements in accordance with the design and specifications depicted on the final plat for a term not to exceed eighteen (18) months from the date of acceptance of dedication.

Said financial security shall be of the same type as otherwise required in this Section with regard to installation of such improvements. The amount of financial security shall not exceed fifteen (15) percent of the actual costs of installation of said improvements.

5.15.G. Remedies to Effect Completion of Improvements - In the event that any required improvements have not been installed as provided in this Ordinance or in accordance with the approved final plat, the municipality is hereby granted the power to enforce any corporate bond, or other security by appropriate legal and equitable remedies. If proceeds of such bond, or other security are insufficient to pay the cost of installing or making repairs or corrections to all the improvements covered by said security, the municipality may, at its option, install part of such improvements in all or part of the subdivision or land development and may institute appropriate legal or equitable action to recover the moneys necessary to complete the remainder of the improvements. All of the proceeds,

5.18.E. Actual horizontal location of floodplain by elevation and dimension from property line.

indicated by dimension.

5.18.D. Actual horizontal location of cartway centerline versus right-of-way centerline should be

5.18.C. Actual cul-de-sac radius.

5.18.B. Actual location of all iron pins or drill holes in curbs for all individual lot lines.

roadway shall be monumented at the above referenced points.

5.18.A. Actual location of all concrete monuments and/or markers which were found or set at all angle breaks, points of curvature and tangents around the perimeter of the total tract. When the outside perimeter of a tract falls within or along an existing road right-of-way, then the right-of-way of that

the following:

Prior to the final release of the financial security by the Supervisors, and prior to acceptance of dedication of any improvements, easements or rights-of-way, the developer shall provide the Township with one mylar and two prints of the as-constructed plan, prepared and certified by a Professional Engineer or Land Surveyor, at the same size and scale of the approved plans, showing

SECTION 5.18 AS-CONSTRUCTED (AS-BUILTS) PLANS

A building or zoning permit may be issued and building construction started only after the approval of the final plat. Occupancy shall not be permitted prior to the completion of streets, storm water management facilities and other improvements necessary for the reasonable use of the building, unless written authorization is granted by the Planning Commission where improvements have been guaranteed by valid bond or other security.

SECTION 5.17 BUILDING CONSTRUCTION AND OCCUPANCY

The developer agrees to indemnify and save harmless the municipality against and from any and all loss, cost, damage, liability, and expense, including counsel fees, account of damage to property of, or injury to or death of, the parties hereto or third person, caused by, growing out of, or in any way whatsoever attributable to the construction of said improvements and the use of the street or other improvements delineated on the subdivision plat during construction. The developer further agrees, but without limiting its liability to indemnify the municipality to carry liability insurance contracts with a reliable insurance company acceptable to the Township, covering the period of said construction in the sum of \$1,000,000 for injury to or death of person(s), and in the sum of \$300,000 for damage to or destruction of property, which insurance contracts shall include the municipality as an additional insured.

SECTION 5.16 INSURANCE

whether resulting from the security or from any legal or equitable action brought against the developer, or both, shall be used solely for the installation of the improvements covered by such security, and not for any other municipal purpose. Failure to properly install the required improvements shall also constitute a violation of this Ordinance, punishable as provided by Section 8.06 of this Ordinance.

5.19.C.3. When requested by the applicant, the Township will perform a "procedural review" of the draft traffic impact study report. This review will be limited to insuring the proper procedures have been used and adequate documentation has been provided in accordance with the requirements of these guidelines. This "procedural review" is intended to provide the study preparer with guidance on

roadway(s).

5.19.C.2. The conduct of the traffic impact study must be in cooperation with and coordinated with the appropriate local and State officials. Of special importance is the need to work closely with the involved officials in determining the improvements which are to be implemented on the affected

5.19.C.1. If a traffic impact study is required for a proposed subdivision or development in accordance with Section 403.C.8 herein, it shall be the responsibility of the applicant to ensure the study is conducted and a final report submitted in accordance with these guidelines. The traffic impact study and final report shall be prepared under the supervision of a qualified and experienced transportation engineer with specific training in traffic and transportation engineering.

5.19.C. Traffic Study and Report Required to be Submitted with Preliminary Plans:

5.19.B. The Township encourages the developer to present a draft traffic impact study to the Township prior to the preliminary plan.

5.19.A. The number of vehicle trips shall be computed based upon all phases of the development, and the required traffic impact study shall be completed and submitted with the first phase. Failure to submit the required study with the first phase of development, when subsequent phases are planned, shall constitute a violation of this Ordinance and the Township may avail itself of any and all remedies provided by the Municipalities Planning Code, including the refusal to issue any permits or approvals necessary for further development of the tract.

SECTION 5.19 TRAFFIC IMPACT STUDIES

5.18.H.4. A table showing the stage/storage/discharge curve for the constructed conditions.

5.18.H.3. Actual elevation of the embankment and emergency spillway.

5.18.H.2. Actual outlet structure details including type, size and inverts of outlet pipes.

5.18.H.1. Actual contours of the detention basin.

5.18.H. Retention and Detention basin.

5.18.G. Actual horizontal and vertical location of stormwater management facilities including type and size drainage pipes.

5.18.F. Actual horizontal location and cross section of swales and accompanying easements.

the adequacy of the study in meeting the requirements of these guidelines and will not address the adequacy or appropriateness of the recommended improvements.

5.19.C.4. The traffic impact study (TIS) shall be conducted using currently accepted traffic engineering practices and procedures. The use of computer programs to conduct the required analyses is acceptable; provided, the programs reflect the most current provisions of the analysis procedure upon which they are based. Recommended geometric or traffic operations improvements must meet or exceed all applicable PENNDOT and local minimum design criteria.

5.19.C.5. The TIS engineer shall be responsible for the collection of all information and data required to support the TIS effort. At the developer's request, the Township will make available appropriate information and data which will assist in the TIS effort. When additional traffic counts are required for the TIS, the engineer shall collect such data to include average daily traffic (ADT) volumes and peak hour turning movement volumes on an average week day, as well as on Saturday or Sunday, if required, as defined in PennDOT's Publication 201. Traffic data may not be older than 3 years.

5.19.C.6. The procedures and requirements outlined in these guidelines are intended to provide a basic framework for the conduct of TIS. Additions or modifications to this framework may be made provided such changes are approved by the Township.

5.19.C.7. The limits for the study area should be based upon engineering judgment and a knowledge of the existing traffic conditions in the vicinity of the proposed subdivision or development. The area must be of sufficient size to include the key roadway corridors and critical intersections which may be impacted by the proposed site traffic. Designation of the study area boundaries shall be a cooperative effort between the TIS engineer, Township and PENNDOT. In those instances where agreement cannot be reached on the boundaries, the Township will establish the boundaries to be used for the TIS. Designation of the future design year(s) as the basis for the study will be made by the Township dependent on the timing and/or phasing of the proposed project. The design year is the anticipated opening of a development assuming full build out and occupancy.

5.19.C.8. Existing and proposed land uses in the study area must be considered in the TIS. This consideration must include not only the current/proposed zoning of the various tracts within the study area, but also the specific use of the development site. Where the current/proposed land use of the site is being modified, an analysis of the proposed changes should be made to determine the extent to which traffic volumes for the site will be modified.

5.19.C.9. Characteristics of the study area roadway network, intersections and the proposed site access point(s), to include geometrics and traffic control need to be identified as part of the TIS. Included in this proposed site access point(s). In addition, all committed roadway and traffic operational improvements to the study area network, which will occur during the designated time period on which the TIS is based, are to be identified. Committed improvements are those improvements within the study area which are proposed and for which funds have been allocated to be installed by other developers and/or governmental agencies.

5.19.C.10. The study area roadway network is to be analyzed for safety and capacity sufficiency for three separate conditions: existing network conditions, future network conditions

without the proposed development and future network conditions with the proposed development. For each of the three conditions the following analyses shall be completed:

5.19.C.10.a. Average daily traffic (ADT) volumes and turning movement volumes for all critical intersections within the study area shall be determined for the AM peak hour, PM peak hour and the proposed development peak hour, which may be Saturday or Sunday, if other than either the AM or PM peak hour of the network.

5.19.C.10.b. The effectiveness of the traffic control (i.e., stop signs or traffic signals) at all critical intersections shall be evaluated by approach in terms of vehicle stops and delays.

5.19.C.10.c. Gap studies shall be conducted at the proposed site access points to evaluate the need for signal control, turn prohibitions or additional site access points to reduce the left turn volume to and from the site driveway(s).

5.19.C.10.d. Queue length analyses shall be completed to evaluate the potential for a backup of traffic from controlled intersections which could impact other intersections including access points to the proposed development.

5.19.C.10.e. Accident history within the past 5 years on the streets adjacent to the proposed development and at intersections within the study area.

5.19.C.10.f. Existing non-motorized vehicle travel patterns shall be studied. Proposed improvements shall accommodate these patterns in such a manner to provide safe and convenient travel patterns for non-motorized vehicles during and after construction of the proposed development.

5.19.C.10.g. An analysis of the volume and capacity of the network and all critical intersections shall be conducted utilizing the most current "Highway Capacity Manual" procedures. Levels of service shall be determined and documented.

5.19.C.11. The analysis of the existing roadway and intersection conditions in the study area shall be based upon the current geometric conditions and traffic control operations. This analysis shall serve as a basis for determining the current adequacy of the roadway network and to document any deficiencies.

5.19.C.12. The analysis of the future conditions without the proposed subdivision or development shall document the adequacy of the study area network to accommodate traffic in the design year(s) without the proposed development. This analysis must include a full consideration of all committed roadway improvements to the study area network when determining the expected levels of service.

5.19.C.13. For the analysis of the future conditions with the proposed subdivision or development, one of the key factors shall be the total projected site generated traffic and its distribution on the study area network. The study preparer must fully document the methodology which is used to complete this effort and provide sufficient information such that the Township can verify the results. In addition, care must be taken to ensure that adequate consideration is given to

that portion of the already projected future network traffic which shall utilize the proposed development access points.

5.19.D. Improvement Recommendations:

5.19.D.1. The overall goal of this Section will be to detail necessary improvements to the study area roadway network which shall provide for a level of service and delay for the design year or years and delay for the design year(s) without the proposed subdivision or development. Based upon a comparison of the traffic analysis for the future conditions with and without the proposed subdivision or development, roadway and traffic operational improvements which shall support this goal are to be identified and analyzed. These improvements may include both on-site and off-site roadway and traffic operational changes as determined by the preceding analyses.

5.19.D.2. In developing the proposed improvements, the study preparer is to consider the following:

5.19.D.2.a. All highway capacity evaluations shall consider not only the overall intersection level of service and delay but also evaluate each approach and movement to identify any substandard values which need to be improved.

5.19.D.2.b. The improvements shall provide an estimated delay which shall be no worse than the delay for the design year without the proposed subdivision or development.

5.19.D.2.c. Where new intersections are being established to serve as access to the proposed development, these intersections must be designed to at least operate at Level of Service C or better.

5.19.D.2.d. For access points to the proposed development, which are not proposed to be controlled by a traffic signal, an analysis shall be completed to determine the design details for a separate left turn lane on the adjoining highway.

5.19.D.2.e. For access points to the proposed development and any major intersection, where traffic signal control may be required or is being proposed, a traffic signal warrant analysis shall be performed in accordance with the requirements of PENNDOT's Publication 201. A left turn lane shall be provided and an analysis shall be completed to determine the type of signal phasing required. The final recommended study area network with proposed improvements shall also be subjected to all the traffic analyses which are required under the previous sections of these guidelines. These analyses shall serve to determine the "adequacy" of the improvements. If the improvements are determined to be inadequate additional improvements shall be recommended and assigned for implementation by the developer.

5.19.E. Final Report:

5.19.E.1. General:

5.19.E.1.a. A final report must be prepared to document the results of the traffic impact study and the recommended improvements to accommodate the projected traffic due to the proposed subdivision or development. Since this report will be reviewed by Township officials with varying levels of technical expertise, the report must be presented in a format and context which can be understood by both technical and non-technical parties.

5.19.E.1.b. The presentation of data and analyses results should, preferably, be accomplished on either schematic diagrams of the study area, or through the use of charts and/or tables. All sources of data and methodologies which were used in the TIS (including computer programs) must be properly reference and documented. Any modifications to the referenced procedures must be properly documented to enable a review of the appropriateness of the modification.

5.19.E.2. Contents - The final report shall include the following:

5.19.E.2.a. Executive summary which provides a concise description of the study area, results of the traffic analyses and any recommended improvements.

5.19.E.2.b. Description of the proposed subdivision or development site to include a map showing the site's location in regards to the region and the area roadway network.

5.19.E.2.c. Schematic diagram/map of the designated study area showing all major highways and critical intersections.

5.19.E.2.d. Results of the traffic analyses for the three traffic conditions. At a minimum, the following data must be shown for each of the three conditions:

5.19.E.2.d.(i) ADT and intersection turning movement counts.

5.19.E.2.d.(ii) Levels of service and delay.

5.19.E.2.d.(iii) Projected traffic distribution and network assignment for the proposed site.

5.19.E.2.e Recommended improvements to the study area network to include preliminary cost estimates, proposed implementation schedule and expected levels of service and delay for the recommended network.

5.19.E.3. Review Procedures - Three copies of the final TIS report shall be submitted for review and approval with the preliminary plan application. Reports which do not contain the required information or indicate that the study was not done in accordance with the requirements of these guidelines shall be returned to the applicant for correction and resubmission.

5.19.F. Contribution in Lieu of Preparation of Studies: If a developer believes that the preparation of traffic study and report required herein is not warranted, he/she may request the Board of Supervisors to waive the preparation of such study and report and shall make a contribution of the estimated sum

Angle of Parking	Traffic	Minimum Width (Feet) one-way Minimum Width (Feet) two-way Traffic
90 Degrees	25	25
60 Degrees	20	22
45 Degrees	18	22
30 Degrees	11	22
Parallel	11	22

indicated in the following table:

5.20.A.3. Interior drives between rows of parking spaces shall have the minimum widths

5.20.A.2. Parking spaces shall be guarded by curbs or other protective devices, which are arranged so that parked cars cannot project into the streets, yards or walkways.

5.20.A.1. Parking facilities shall not be permitted within 10 feet of a side or rear property line unless formal arrangements, satisfactory to the Township, have been made for the establishment of a common parking facility.

5.20.A. Parking Areas. Off-street vehicular parking facilities shall be provided in accordance with the regulations set forth in the Zoning Ordinance, which regulations are incorporated herein by reference. Vehicular parking facilities for land uses other than detached single-family residences shall be designed in accordance with the following provisions:

SECTION 5.20 VEHICULAR PARKING FACILITIES

final plan by the Township.

5.19.F.4. All contributions in lieu of preparation of studies shall be paid prior to approval of the

Solicitor.

5.19.F.3. The developer shall enter into an agreement with the Township setting forth the contribution in lieu of preparation of studies to be paid, and the studies to be paid and the studies to be waived by the Township. All such agreements shall be in a form satisfactory to the Township

5.19.F.2. This contribution in lieu of preparation of studies provided for herein shall be in addition to all charges imposed by the Township, a Municipal Authority, or other authorized agency for water and/or sewer tapping and connection fees and shall be in addition to all other review, inspection and other fees or charges, and all sums otherwise agreed to be paid by the developer.

5.19.F.1. The developer of any commercial, industrial or institutional subdivision or land development shall provide the Township with a certification of the usable building floor area to be constructed for the purpose of determining the contribution in lieu of preparation of studies.

necessary to defray the costs of improvements which would be recommended by such studies. The minimum contribution shall be \$350 per dwelling unit or residential lot in a residential subdivision or land development or \$1.50 per square foot of usable building floor area in a commercial, industrial or institutional subdivision or land development.

5.20.A.13.a. Speed bumps, constructed as part of access drives or parking lots, shall be marked with permanent, yellow diagonal stripes.

5.20.A.13. Speed Bumps.

5.20.A.12. Buffer planting shall be provided where parking compounds are adjacent to residential properties. The buffer planting area shall be at least 15 feet wide. The buffer planting shall consist of a completely planted visual barrier composed of evergreen vegetation arranged to form both a low-level and a high-level screen between grade and to a height of at least eight (8) feet.

5.20.A.11. Parking lots shall be provided with adequate facilities to collect and convey stormwater in accordance with the Stormwater Management Requirements herein.

5.20.A.10. Every parking lot shall be connected to a street by means of an access drive. This access drive shall be at least 12 feet wide for each travel lane.

5.20.A.9. All parking lots shall be constructed and maintained with a paved surface of concrete or bituminous materials, or another dust-free surface, approved by the Board of Supervisors.

5.20.A.8. All parking areas shall provide for sufficient handicapped accessibility in the design of sidewalks, ramps, curbs and related facilities including the number of specific handicapped parking spaces in accordance with applicable Federal, State or local regulations.

5.20.A.7. Parking areas, main entrances, exits, streets and pedestrian areas shall be provided with lights such that the areas are illuminated to the standards as indicated in the corresponding Appendix.

5.20.A.6. All parking lots shall be adequately marked and maintained for the purpose of defining parking spaces and interior drives. As a minimum, the lines of all parking spaces and interior drives (including directional arrows, etc.) shall be solid white and 4 inches in width. Painted lines, arrows and dividers shall be provided and maintained to control parking, when necessary to direct vehicular circulation. Parking areas for over 30 vehicles shall be divided by permanent raised curbing that clearly defines parking spaces from designated access lanes.

5.20.A.5. All dead end parking lots shall be designed to provide sufficient back-up area for all end stalls.

5.20.A.4. Not less than a 4 foot radius of curvature shall be permitted for horizontal curves in parking areas.

5.20.A.3.b. The following lists required minimum space sizes in feet: Standard car spaces: Parallel-23 by 8 Nonparallel-19 by 9

5.20.A.3.a. Interior drives in areas where there is no parking permitted shall be at least 11 feet wide for each lane of traffic.

5.21.A. For every proposed residential subdivision or land development in which at least twenty-five (25) lots or dwelling units are proposed, initially or cumulatively as of the effective date of this Ordinance, the developer shall set aside one (1) contiguous acre of Prime Open Space, as herein defined, for every twenty-five (25) lots or units proposed. The amount of Prime Open Space shall be pro-rated, and shall be rounded up to the nearest half-acre (e.g. a subdivision with 29 lots would require 1.5 acres of Prime Open Space, a subdivision with 65 dwelling units would require 3.0 acres of Prime Open Space). All Prime Open Space shall be contiguous and shall be accessible to all lots or units within the development without having to walk in streets (not including street cross-walks). For every subdivision proposing less than twenty-five (25) lots or units, section 5.21.B. shall be followed.

5.21.B. In lieu of setting aside Prime Open Space, the developer shall contribute to the Township the sum of five hundred dollars (\$500.00) per lot or dwelling unit proposed over two (2) lots or dwelling units, to be used in accordance with the Township Recreation Plan and the provisions of the Pennsylvania Municipalities Planning Code. Should the Planning Commission and the Board of Supervisors determine that the subdivision or land development would better be served by existing open space or recreational facilities and not by Prime Open Space within the subdivision or land development, the Planning Commission may recommend, and the Board of Supervisors may require, that the fees in lieu of Prime Open Space be contributed as stated herein. Such contribution shall be submitted prior to Final Plan approval.

SECTION 5.21 PRIME OPEN SPACE AND RECREATION

or buffering required in this or other Township ordinances.

triangles. The interior landscaping requirements shall be in addition to any other landscape screening elevation. No vegetation shall be allowed which will obstruct safe sight distances or clear sight least two inches (2") in caliper, and shall have a clear trunk at least five (5) feet above finished grade each 300 square feet or fraction thereof of required interior landscaping area. These trees shall be at consist of ground cover, shrubs, and trees. There shall be at least one (1) shade tree provided for parking lot perimeter as described in this section shall be counted. The interior landscaping shall not be included in calculating the interior landscaping area, and only the vegetated areas inside the spaced and located throughout the parking lot. Artificial vegetation and areas covered by stone shall curbed areas. Interior landscaping shall consist of vegetated areas only, and shall be uniformly parking lot shall be counted, including all parking spaces and access drives, aisles, islands and For the purpose of computing the total area of a parking lot, all areas within the perimeter of the effective date of this ordinance, 5% of the total area of the lot shall be devoted to interior landscaping.

5.20.A.14. In any parking lot containing 20 or more parking spaces cumulatively from the

inches.

5.20.A.13.d. In no case shall the overall height (or depth) of speed bumps exceed 3

having speed bumps.

5.20.A.13.c. There shall be a warning sign posted at each entrance to a parking area

pavement and shall be designed to restrain motor vehicle speed.

5.20.A.13.b. The speed bumps shall be in the form of mounds or depressions in the

5.21.C. Prime Open Space shall be defined as land in which at least 75% of the area would meet all of the following standards:

5.21.C.1. Less than 8% slope

5.21.C.2. Not a wetland

5.21.C.3. Not within the 100 year flood plain

5.21.D. The Planning Commission may, on a case by case, non-precedential basis, modify these standards depending on the developer's proposed use and improvements for such space.

SECTION 5.22 ENVIRONMENTAL IMPACT ASSESSMENT REPORTS

5.22.A. For every proposed residential subdivision involving 25 or more dwelling units or land development involving 25,000 square feet or more of gross floor area, or where deemed necessary by the Township Planning Commission or Township Board of Supervisors, an Environmental Impact Assessment (EIA) report shall be submitted with the Preliminary Plan. The gross floor area for the purposes of this section shall exclude the gross floor area of buildings used for the housing and raising of animals for agricultural purposes as defined in the Bethel Township Zoning Ordinance. Said reports shall be prepared by a qualified consultant(s). These assessments shall be in addition to any and all other assessments required by this or any other Township ordinances, or any other agency having appropriate jurisdiction.

5.22.B. Reports shall include maps, narratives, pictures and any other information necessary to adequately evaluate and address the potential impact that the proposed development may have on the items described. Such reports shall be prepared for the following:

5.22.B.1. Current and past uses of the property, including any encumbrances.

5.22.B.2. Historic resources associated with the property.

5.22.B.3. Visual resources associated with the property.

5.22.B.4. Community facility needs, such as recreation, emergency services, schools, etc.

5.22.B.5. Utility needs.

5.22.B.6. Transportation needs.

5.22.B.7. Population characteristics.

5.22.B.8. Air and water quality, light and noise levels, vibration, glare and heat, fire and

explosion, dust, vapors, gases and smoke, fumes, toxic materials, electrical interference, radioactive materials.

5.22.B. In making its evaluation, the Board of Supervisors and/or the Planning Commission may request additional information deemed necessary to adequately assess potential environmental impacts.

-- END CHAPTER 5 --

CHAPTER 6 - PLANNED RESIDENTIAL/CLUSTER DEVELOPMENTS

-- RESERVED --

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SECTION 7.01 INTENT

CHAPTER 7 - FLOOD PLAIN MANAGEMENT

The purpose of the regulations set forth in this Ordinance is to monitor the subdivision and/or development of flood plain areas in order to promote and protect the general health, welfare, and safety of the community; to require that each subdivision lot in flood plain areas be provided with a safe building site with adequate access; to insure that public facilities which serve such lots or development be designed and installed to preclude flood damage; and to protect individuals from purchasing lands which are unsuitable for development because of flood plain lands. The subsequent sections shall be considered requirements supplemental to those procedures and standards specified elsewhere in the Subdivision and Land Development Ordinance, municipal zoning ordinances, and any other applicable ordinances and codes.

SECTION 7.02 DEFINITIONS OF TERMS UTILIZED IN THIS CHAPTER

7.02.A. Building - A structure which has a roof supported by columns, piers, or walls, which is intended for the shelter, housing, or enclosure of persons, animals, or chattel or which is to house a use of a commercial or manufacturing activity.

7.02.B. Development - Any man-made change to improved or unimproved real estate, including, but not limited to buildings, mobile homes, or other structures, mining, dredging, filling, grading, paving, excavation, or drilling operations.

7.02.C. Flood Plain - (1) a relatively flat or low area adjoining a river, stream, or watercourse which is subject to partial or complete inundation by water, (2) an area subject to the unusual and rapid accumulation of runoff of surface water from any source.

7.02.D. Floodway - That portion of the one hundred (100) year flood plain including the channel of a river or other watercourse and adjacent land areas which are required to carry and discharge the one hundred (100) year flood where the activities permitted elsewhere in the flood plain district will not cumulatively increase the water surface elevation more than one (1) foot at any given point. Detailed studies of the Regulatory Flood by the Federal Insurance Administrator provide specific flood profiles and allow for the delineation of floodway and flood fringe areas within the bounds of the flood plain. For those areas where no floodway has been identified by the Flood Insurance Study, the floodway may be identified by other available studies or sources of information provided by a registered professional engineer.

7.02.E. Regulatory Flood - The flood which has been selected to serve as the basis upon which the flood plain management provisions of this and other ordinances have been prepared; for purpose of this Ordinance, the one hundred (100) year flood, as defined by the Federal Insurance Administrator.

7.02.F. Regulatory Flood Elevation - The 100 year flood elevation based upon the information contained in the Official Flood Insurance Study.

7.02.G. Structure - A man-made object usually assembled of interdependent parts or components which is designed to have a more or less fixed location, whether or not permanently attached at that location.

SECTION 7.03 APPLICATIONS PROCEDURES AND PLAT REQUIREMENTS

The following procedures shall be required in addition to those specified otherwise in these regulations.

7.03.A. Pre-Application Procedures

7.03.A.1. It is suggested that prospective developers consult the Pennsylvania Department of Environmental Protection concerning soil suitability when on-site sewage disposal facilities are proposed.

7.03.A.2. Prospective developers shall consult the County Conservation District representative concerning erosion and sediment control and the probable effect of geologic conditions on the proposed development. Concurrently, a determination should be made as to whether or not any flood hazards either exist or will be created as a result of the proposed subdivision or development.

7.03.B. Preliminary Plan Requirements

The following information shall be required as part of the Preliminary Plan when a subdivision is in a flood plain area and shall be prepared by a registered surveyor or professional engineer:

7.03.B.1. A map illustrating the location of the proposed subdivision or land development with respect to the municipality's flood plain areas including information on, but not limited to, Regulatory Flood Elevations, boundaries of flood plain areas, proposed lots and sites, fill, and flood or erosion protective facilities.

7.03.B.2. Where the subdivision or land development lies partially or completely in the flood plain area or where the subdivision borders on the flood plain area, the preliminary plan map shall include detailed information giving the location and elevation or proposed roads, public utilities, and building lots. All such maps shall also show contours at intervals of two (2) feet and identify accurately the boundaries of the flood plain area.

7.03.C. Final Plan Requirements

The following information shall be required as part of the Final Plan and shall be prepared by a registered engineer or surveyor:

7.03.C.1. All information required for submission of the Preliminary Plan plus any changes required by the Planning Commission and/or the municipal governing body.

7.03.C.2. A map showing the exact location and elevation of all proposed buildings, structures, roads, and public utilities to be constructed in flood plain areas. All such maps shall show contours at intervals of two (2) feet and identify accurately the boundaries of the flood plain area.

The design standards and improvements specified herein shall be considered requirements in addition to those of Chapter 5 and otherwise listed in this Ordinance.

7.04.A. General

7.04.A.1. Where not prohibited by this or any other laws or ordinances, land located in flood plain areas may be platted for development with the provisions that the developer construct all buildings and structures to preclude flood damage in accordance with this and any other laws and ordinances regulating such development.

7.04.A.2. Building sites for residences or any other type of dwellings or accommodations and building sites for structures or buildings other than residential uses shall be permitted in the flood plain only when in compliance with appropriate municipal zoning ordinances, and any other applicable regulations.

7.04.A.3. If the documentation provided to the Planning Commission indicates that only a part of a proposed plat can be safely developed, they shall limit development to that part and shall require that development proceed consistent with this documentation.

7.04.A.4. When a developer does not intend to develop the plat himself and the Planning Commission receives documentation that additional controls are required to insure safe development, they shall require the developer to impose appropriate deed restrictions on the land. Such deed restrictions shall be inserted in every deed and noted on every recorded plat.

7.04.A.5. Lots which are within the flood plain shall be subject to the following:

7.04.A.5.a. Any lots created or revised shall have not more than 50% of their area within the flood plain, except that large lots may be exempted provided a minimum 1 acre are of said lot is outside the flood plain.

7.04.A.5.b. Lot access to a public road shall not be restricted or prevented by flood plain areas.

7.04.B. Excavation and Grading

Where any excavation or grading is proposed or where any existing trees, shrubs, or other vegetative cover will be removed, the developer shall consult the County Conservation District representative concerning plans for erosion and sediment control and to also obtain a report on the soil characteristics of the site so that determination can be made as to the type and degree of development the site may accommodate. Before undertaking any excavation or grading, the developer shall obtain a Grading and Excavation Permit if such is required by the municipality.

7.04.C. Drainage Facilities

Storm drainage facilities shall be designed to convey the flow of surface water without damage to persons or property. The system shall insure drainage at all points along streets, and provide positive drainage away from buildings and on-site disposal sites.

Plans shall be subject to the approval of the Planning Commission. The Planning Commission may also require a primarily underground system to accommodate frequent floods and a secondary surface system to accommodate larger, less frequent floods. Drainage plans shall be designed to prevent the discharge of excess runoff onto adjacent properties.

7.04.D. Streets

The finished excavation of proposed streets shall be no more than two (2) feet below the Regulatory Flood Elevation. The Planning Commission may require, where necessary, profiles and elevations of streets to determine compliance with this requirement. Drainage openings shall be sufficient to discharge flood flows without unduly increasing flood heights.

7.04.E. Sewer Facilities

All sanitary sewer systems located in flood plain areas, whether public or private, shall be floodproofed to a point two (2) feet above the Regulatory Flood Elevation.

7.04.E.1. The Planning Commission may prohibit installation of sewage disposal facilities

requiring soil absorption systems where such systems will not function due to high ground water, flooding, or unsuitable soil characteristics. The Planning Commission may require that the developer note on the face of the plat and in any deed of conveyance that soil absorption fields are prohibited in designated areas.

7.04.E.2. The Planning Commission may prescribe adequate methods for waste disposal. If a

sanitary sewer system is located on or within 1000 feet of the proposed subdivision and/or land development, the Planning Commission shall require the developer to provide sewage facilities to connect to this system where practical, and shall prescribe the procedures to be followed by the developer in connecting to the system.

7.04.F. Water Facilities

All water systems located in flood plain areas, whether public or private, shall be floodproofed to a point two (2) feet above the Regulatory Flood Elevation. If there is an existing public water supply system on or near the subdivision, the Planning Commission shall require the developer to connect to this system where practical, and shall prescribe the procedures to be followed by the developer in connecting to the system.

7.04.G. Other Public and/or Private Utilities and Facilities

All other public and/or private utilities and facilities shall be elevated or floodproofed to a point two (2) feet above the Regulatory Flood Elevation.

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-- END CHAPTER 7 --

The grant of a permit or approval of a subdivision and/or land development plan in the identified flood plain area shall not constitute a representation guarantee, or warranty of any kind by the municipality or by any official or employee thereof of the practicability or safety of the proposed use, and shall create no liability upon the municipality, its officials or employees.

SECTION 7.06 MUNICIPAL LIABILITY

7.05.A. The developer enters into an agreement with the municipality guaranteeing that improvements will be installed in accordance with the plans, specifications, and schedules approved by the municipality prior to plat approval. This agreement shall also guarantee that no lot will be sold or building constructed in any flood plain area prior to completion of all protective works or measures planned for such lot and necessary access to facilities; and

7.05.B. The developer provides a fiscal surety to guarantee performance of this agreement and completion of the improvements as planned. The surety may include a certified check, escrow account, irrevocable letter of credit or other bond acceptable to the municipality. The procedural requirements of Section 5.15 of this Ordinance shall apply to any such bonding proposal.

No final plat shall be approved by the Planning Commission until the improvements required by this Ordinance are completed in a satisfactory manner and approved by the Planning Commission. In lieu of such construction, approval may be granted prior to completion providing:

SECTION 7.05 PERFORMANCE GUARANTEE

8.01.C. Enforcement remedies - Any person, partnership or corporation who or which has violated the provisions of this ordinance 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 attorneys fees incurred by the Township as a result thereof. No judgment shall commence or be imposed, levied or be 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

As an additional condition for issuance 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.

8.01.B.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.

8.01.B.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 action.

8.01.B.2. The vendee or lessee of the owner of record at any time of such violation without regard as to whether such vendee or lessee had actual or constructive knowledge of the violation.

8.01.B.1. The owner/owners of record at the time of violation.

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 this ordinance. This authority to deny such a permit or approval shall apply to any of the following applicants:

8.01.B. Preventive Remedies - 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 the 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.

8.01.A. Penalties - No lot in a subdivision or land development shall be leased or sold, no permit as required under any Township Ordinance to erect any building or structure upon land in a subdivision or land development shall be issued, and no building or structure shall be erected in a subdivision or land development until a recorded plan of such subdivision or land development shall have been approved and properly recorded and until improvements have been either constructed or guaranteed.

SECTION 8.01 ADMINISTRATION, ENFORCEMENT AND PENALTIES

CHAPTER 8 - ADMINISTRATION, FEES AND PENALTIES

8.04.A. Fee Procedures - Each subdivision or land development plan application shall be accompanied by the required review fee as established and adopted by resolution from time to time by the Board of Supervisors. Fees shall be payable at the time of plan submission (unless otherwise

SECTION 8.04 FEES

and rules. Appeals from a decision or the absence of a decision under this ordinance shall be based on the provisions of the relevant provisions of the Municipalities Planning Code and other relevant statutes

SECTION 8.03 APPEALS

8.02.D. The Township Supervisors shall keep written record of all requests for modification.

The minimum modification necessary. application for development. The request shall state in full the grounds and facts of unreasonableness or hardship on which the request is based, the provision or provisions of the ordinance involved and

8.02.C. All requests for modification shall be in writing and shall accompany and be part of the application for development. The request shall state in full the grounds and facts of unreasonableness or hardship on which the request is based, the provision or provisions of the ordinance involved and

8.02.B. The Board of Supervisors or Township Planning Commission, as outlined in Section 8.02.A may grant a waiver of the requirements of one or more provisions of this ordinance, if the literal enforcement will exact undue hardship because of peculiar conditions pertaining to the land in question, provided that such waiver will not be contrary to the public interest and that the purpose and intent of the ordinance is observed.

SECTION 8.02 WAIVERS

8.02.A. The Planning Commission shall review all waiver requests, and shall: Grant or deny such request if this authority is specifically granted to the Planning Commission herein, or; make recommendations to the Board of Supervisors on such requests. Unless otherwise specified herein, the Board of Supervisors shall have the sole authority to grant or deny a waiver request.

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. 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.

Judgment pursuant to the rules of civil procedures. 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 been believed that there was non 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.

All ordinances or parts of ordinances which are inconsistent herewith are hereby repealed.

SECTION 8.07 REPEALER

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 this Ordinance as a whole or any other part thereof.

SECTION 8.06 VALIDITY

Amendments to this Ordinance shall become effective only after a public hearing held pursuant to public notice as defined in the Municipalities Planning Code. In the case of an amendment other than that prepared by the Planning Commission, the Township Supervisors shall submit each such amendment to the Township Planning Commission for recommendations at least thirty (30) days prior to the date fixed for the public hearing on the proposed amendment. At least thirty (30) days prior to the hearing on the amendment, the Township shall submit the proposed amendment to the Berks County Planning Commission for recommendations.

SECTION 8.05 AMENDMENTS

8.04.D. Documentation showing that the plans have been recorded, including as a minimum a copy of a complete set of plans with all signatures, stamps, seals and recording information must be provided before any permits will be issued by the Township.

8.04.C. County Fees - All required County Plan review fees shall be paid at the time of plan submission to the Township.

8.04.B. Township Fees - Fees for review, processing and approval of subdivision and land development plans by the Planning Commission shall be payable to Bethel Township at the time of application, in accordance with the adopted fee schedule. In addition to the fees required for submission of the plans, it is anticipated that additional expenses will be incurred by the Township in processing the preliminary and/or final plans which are submitted or which may be required to be submitted under the Bethel Township Subdivision and Land Development Ordinance, either for engineering, legal or other professional consultant expenses. If the fees are not sufficient to cover these expenses incurred in the review of said plans, the Township secretary shall notify the person submitting the plans for review of the additional expense and shall request payment of the same. All payment requested by the Township for engineering, legal or other professional expense shall be the actual cost of the services incurred by the Township. These services shall be billed at the normal established rate for engineering or legal services provided to the Township. The return of fees not used shall not be refunded unless and until the provisions of Section 8.04.D. have been complied with.

There shall be no refund or credit of fees or a portion of any fee should the subdivider or developer withdraw the plan during the review process or fail to receive plan approval.

8.04.A. Township Fees - Fees for review, processing and approval of subdivision and land development plans by the Planning Commission shall be payable to Bethel Township at the time of application, in accordance with the adopted fee schedule. In addition to the fees required for submission of the plans, it is anticipated that additional expenses will be incurred by the Township in processing the preliminary and/or final plans which are submitted or which may be required to be submitted under the Bethel Township Subdivision and Land Development Ordinance, either for engineering, legal or other professional consultant expenses. If the fees are not sufficient to cover these expenses incurred in the review of said plans, the Township secretary shall notify the person submitting the plans for review of the additional expense and shall request payment of the same. All payment requested by the Township for engineering, legal or other professional expense shall be the actual cost of the services incurred by the Township. These services shall be billed at the normal established rate for engineering or legal services provided to the Township. The return of fees not used shall not be refunded unless and until the provisions of Section 8.04.D. have been complied with.

SECTION 8.08 EFFECTIVE DATE

This Subdivision and Land Development Ordinance shall become effective on the fifth day after adoption.

Adopted this 19th day of July, 1999.

ATTEST:

SIGNED: Board of Supervisors
Bethel Township

John J. Brown
Supervisor

Mark D. Deit
Supervisor

James W. Johnson
Supervisor

Mary Kaeber
Township Secretary

APPENDIX
Storm Water Management Requirements

SECTION 1. APPLICABLE REGULATIONS: Where applicable, storm water management facilities shall comply with the requirements of Chapter 105 of Title 25, or any Successor Title or Chapter of Rules and Regulations of the Pennsylvania Department of Environmental Protection, as set forth in the Pennsylvania Code and any and all other State and Federal Regulations which may apply. Approval of a storm water management plan by the Township of Bethel shall not be construed as an indication that the plan complies with the standards of any agency of the Commonwealth of Pennsylvania. Storm water management plans which involve a State highway shall be subject to the approval of the Pennsylvania Department of Transportation.

SECTION 2. STORM WATER CALCULATIONS AND PLAN AND REPORT REQUIREMENTS.

2.(a) A plan indicating the pre-developed drainage areas and time of concentration flow paths used shall be submitted. This plan shall indicate the pre-developed contours of the site in such detail as to be field verified, and shall show all existing stormwater facilities within 200 feet of the property being developed.

2.(b) A plan indicating the post-developed drainage areas, time of concentration flow paths, and all drainage facilities shall be submitted. This plan shall indicate the post-developed drainage areas, time of concentration flow paths, and all drainage facilities, including plan and profile views of the facilities. This plan shall indicate the post-developed contours of the site. All facilities shall be labeled in an easily understandable manner consistent with the storm water management report.

2.(c) A storm water management report including all assumptions, methods, references, and calculations for all storm water drainage facilities shall be submitted.

2.(d) The methodology for calculating storm water runoff shall be either the Soil Cover Complex Method or the Rational method.

2.(e) Runoff coefficients utilized in all calculations shall be those as shown in this Appendix.

2.(f) For pre-development computations, all runoff coefficients shall be based on actual land use assuming summer or good land cover conditions.

2.(g) For post-development computations, all runoff coefficients for cultivated land and fallowed fields shall be based on a winter or poor land cover condition.

2.(h) Pre-developed runoff shall be calculated for the 2, 10, 25, 50 and 100 year storm events.

2.(i) Post-developed runoff rates shall be restricted as follows for each pre-developed drainage area:
-The post-developed 10 year storm event peak discharge shall not exceed the pre-developed 2 year storm event peak discharge.
-The post-developed peak discharge for the 10, 25, 50, and 100 year storm events shall not exceed the peak discharge for the corresponding pre-developed storm events. In order to achieve

- 3.(h) All storm sewer crossings of streets shall be perpendicular to the street centerline.
- 3.(g) All stormwater facilities and appurtenances shall be in accordance with PennDOT Form 408, as amended, and in accordance with the requirements of PennDOT's Standards for Roadway Construction, as amended.
- 3.(f) Changes in horizontal or vertical direction of pipes shall be accomplished by installing an inlet, manhole or junction box.
- 3.(e) All pipes shall have a minimum diameter of 15 inches, and a minimum slope of 0.35%. The crown of the pipe shall be at least 12" below the subgrade elevation.
- 3.(d) All storm water pipes to be maintained by the Township shall be reinforced cement concrete pipe.
- 3.(c) All stormwater conveyance facilities shall, however, be designed such that the runoff from the 100 year storm event will be able to be conveyed within defined facilities without causing any damage to the public and private property.
- 3.(b) All storm water conveyance facilities that convey offsite stormwater through the project site shall be designed based on the 50 year storm event peak discharge to the facility.
- 3.(a) All storm water conveyance facilities that service drainage areas within the project site shall be designed based on the 25 year storm event peak discharge to the facility.

SECTION 3. SWALES, PIPES, CULVERTS AND OTHER CONVEYANCE FACILITIES

- 2.(k) When storm drainage will be directed into an adjacent municipality, all provisions for accommodating such storm drainage shall be submitted to the governing body of that municipality for review.
- 2.(j) Stormwater runoff shall discharge to an existing watercourse with defined bed and barriers or an existing storm drainage system. Stormwater shall not be concentrated onto adjacent properties such that the velocity of the flow for a 25 year storm event peak discharge would be increased beyond that existing prior to subdivision, land development or the commencement of land disturbance activities unless written approval is given by the adjacent property owners to the proposed discharge of surface runoff and the written agreements are approved by the Township. Calculations shall be provided indicating pre and post developed 25 year peak discharge velocities for all receiving stormwater facilities.
- The post developed 25 year storm event peak discharge shall not exceed the capacity of the receiving storm water facilities. Calculations shall be provided indicating pre and post developed 25 year peak discharge for all receiving stormwater facilities.
- this, it is recommended that methods be considered that will direct runoff from impervious areas to pervious areas or infiltration trenches, that will retain/detain the runoff, or, by some other means suitable to the Township Engineer, reduce the post-developed runoff rate to the pre-developed runoff rate as required.

- 4.(c) Basins shall be designed with an emergency spillway, located in virgin ground, capable of handling the entire 100 year post-developed flow assuming all other outlet facilities are completely blocked. The emergency spillway water discharge elevation shall be at an elevation at least one foot above the top of the basin.
- 4.(b) All swales, pipes, culverts and other conveyance facilities associated with a basin shall fall under the jurisdiction of Section 12 of this Ordinance.
- 4.(a) Retention/detention facilities shall be designed such that the post- to pre - development requirements set forth herein are met.

SECTION 4. BASINS

- 3.(o) When drainage swales are traversed by driveways or other crossings, design and construction details of the crossings shall be provided, and calculations indicating that the swales will continue to function in accordance with the swale design shall be provided.
- 3.(n) Storm water velocities at pipe outlets shall be calculated. Outlet protection consisting of a riprap apron or other suitable control measure shall be provided in accordance with the Pennsylvania DEP Soil Erosion and Sedimentation Control Manual.
- 3.(m) The capacities of swales and open channels shall be computed from the Manning Equation. Verification that the velocity in the swale does not exceed the permissible velocity for the design swale lining shall be provided. The Pennsylvania DEP Soil Erosion and Sedimentation Control Manual shall be utilized for this purpose. Swales within Township rights-of-way shall be designed such that they can be maintained with existing Township equipment and resources. All such swale linings and configurations shall be subject to review and approval by the Board of Supervisors. Rip-rap lined swales within Township rights-of-way shall be avoided, but may be allowed if specifically approved by the Board of Supervisors.
- 3.(l) Endwalls and endsections shall be used where stormwater runoff discharges from a stormwater pipe or culvert. Outlets shall be protected with grating of sufficient sizing to prevent the entrance of a 6" diameter or larger sphere.
- 3.(k) Where headwalls are utilized, protective grating shall be provided in a manner similar to the detail provided herein.
- 3.(j) Inlets shall be utilized at all inlet ends of pipes within street right-of-ways. Inlets shall also be placed on both sides of the street at low points, at a maximum of 600 feet apart, and at points where the flow in gutters exceeds 3 inches. Inlet capacity information shall be provided for all inlets. All inlets shall have bicycle-proof inlet grates.
- 3.(i) Trench excavations within street right-of-way areas shall be backfilled with suitable stone aggregate materials from the bottom of the trench to the subgrade elevation; all other areas shall be backfilled with suitable stone aggregate materials from the bottom of the trench to the pipe spring line elevation.

5.(b) When any stormwater management facility is located on an individual lot, and when maintenance thereof is the responsibility of that landowner, a description of the facility or systems and the terms of the required maintenance shall be incorporated on a plat of the property. The plat shall be recorded with the Berks County Recorder of Deeds. In addition, the Township may require as a condition of approval that any deed conveying any interest in such lot contain language indicating that the conveyance is subject to an express covenant by the grantee that the grantee will maintain the stormwater management facility.

5.(a) All plans shall clearly indicate on the plan(s) to be recorded the ownership and maintenance responsibility of all storm water facilities.

SECTION 5. MAINTENANCE

4.(n) Drainage easements, with complete dimensions, shall be provided, at a minimum, corresponding to the 100 year water elevation.

4.(m) Properly spaced and sized concrete cutoff collars or factory welded anti-seep collars shall be provided.

4.(l) A cutoff trench of impervious material shall be provided.

4.(k) Maximum side slopes of detention basins shall be 3 horizontally to 1 vertical.

4.(j) Minimum grades for turf areas inside detention basins shall be one (1) percent and basin bottoms shall include low flow channels.

4.(i) Determination of the need for protection around the perimeter of basins shall be the responsibility of the applicant, and shall be subject to review by the Township.

4.(h) Minimum top width of embankments shall be 3 feet.

4.(g) Maximum water depth shall not exceed 6 feet.

4.(f) Pond retention times shall not exceed 24 hours after the end of the design storm events.

4.(e) Compaction requirements and berm material requirements for the impoundment embankment shall be provided to demonstrate that the embankment will be structurally sound under all probable operating conditions.

4.(d) The top of the berm shall be at least 12" above the peak water elevation for the 100 year storm event.

below the top of the basin berm, and the emergency spillway elevation shall be at least six inches above the highest principal outlet.

5.(c) Maintenance of natural drainage ways: All natural streams, channels, swales, drainage systems and/or areas of surface water concentration shall be maintained in their existing condition unless an alteration is approved by the municipality. All encroachment activities shall comply with the requirements of Chapter 104 (Water Obstructions and Encroachments) of Title 25, Rules and Regulations of the Pennsylvania Department of Environmental Protection, or any successor provision.

5.(d) There shall be provided a drainage easement that conforms substantially with the line of any pond, lake, watercourse, drainage way, channel, storm drainage system, or stream of such width as will be adequate to preserve the unimpeded flow of drainage and to provide for widening, deepening, relocation, improving or protecting such features or drainage facilities. Minimum easement width shall Township may require a greater easement when necessary. Bearings and distances shall be provided for the boundaries of easements.

5.(e) Storm water facilities to be maintained by non-municipal entities shall be provided with adequate easements accessible from public roads over which the Township shall have right of access to correct or maintain such facilities if necessary in the public interest. In such cases, the lot owner will be responsible for all costs of the Township of Bethel. Responsibility of such privately maintained facilities shall be conspicuously noted on the plan to be recorded. Areas within easements shall be kept as lawn or in natural condition to allow maintenance and entrance, and shall not be altered in any way from the approved design and shall be maintained to retain the design capacity.

5.(f) If the Township determines at any time that any permanent stormwater management control facility has been eliminated, altered or improperly maintained, the owner or private entity which owns the property shall be advised of corrective measures required and given a reasonable period of time to take necessary action. If such action is not taken by the property owner, the Township may cause the work to be done and charge all costs against the property in accordance with applicable law.

SECTION 6. PRESUBMISSION The Township Engineer shall be afforded the opportunity to review the proposed methodology prior to official submission of the storm water management report, especially where non-conventional methods are proposed. (i.e., infiltration trenches, retention ponds, etc.).

SECTION 7. SCHEDULE OF INSPECTIONS The Municipal Engineer shall inspect all phases of development of the site, and shall be notified of the commencement of such work at least 5 business days prior to beginning. It is the responsibility of the owner, subdivider, developer or his agent to notify the Municipal Engineer 24 hours in advance of the completion of each identified phase of development.

Any portion of the work which does not comply with the approved plan must be corrected by the developer. No work may proceed on any subdivision or land development or building construction until the required corrections have been made.
If at any state of the work, the Township or its Engineer determines that the soil or other conditions are not as stated or shown on the plan, it may refuse to approve further work and the Township or its designee may revoke existing approvals until a revised plan is submitted and approved.

Soil Group	A		B		C		D						
Slope (%)	0-2	2-6	0-2	2-6	0-2	2-6	0-2	2-6					
Cultivated Land	Winter	48	60	75	62	73	82	68	78	90	77	88	95
	Summer	35	54	58	48	65	55	65	57	73	64	69	79
Fallowed Fields	Poor	45	54	65	56	73	63	73	64	81	69	77	87
	Good	30	44	48	43	55	48	50	48	54	63	60	68
Forest/Woodland		30	40	43	42	50	45	50	50	53	50	56	61
Grass Areas	Good	35	51	53	48	63	56	73	59	75	62	63	79
	Average	45	53	58	52	65	60	75	63	75	65	69	82
Poor	48	55	57	56	67	77	66	85	74	85	73	81	90
Imperious		98	98	98	98	98	98	98	98	98	98	98	98

RUNOFF CURVE NUMBERS "CN" FOR SCS METHOD

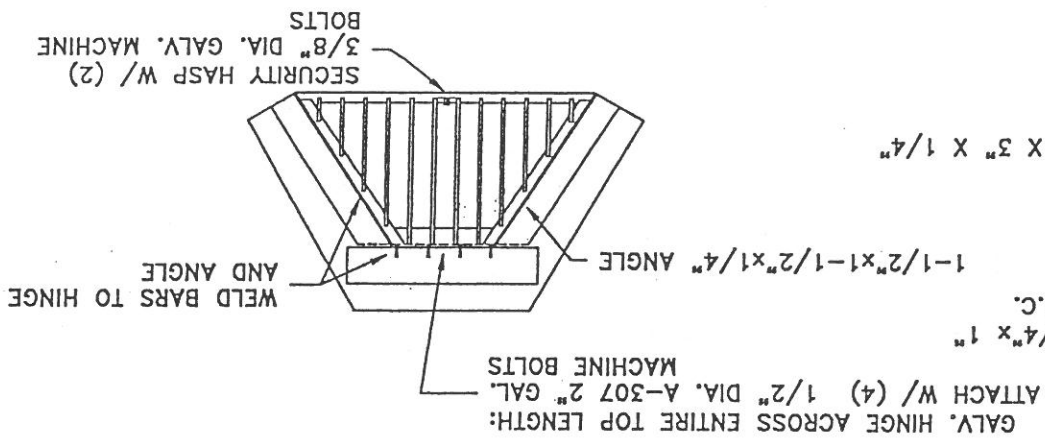
Soil Group	A		B		C		D						
Slope (%)	0-2	2-6	0-2	2-6	0-2	2-6	0-2	2-6					
Cultivated Land	Winter	0.14	0.23	0.34	0.21	0.32	0.41	0.27	0.37	0.48	0.34	0.45	0.56
	Summer	0.10	0.16	0.22	0.14	0.20	0.28	0.19	0.26	0.33	0.23	0.29	0.38
Fallowed Fields	Poor	0.12	0.19	0.29	0.17	0.25	0.34	0.23	0.33	0.40	0.27	0.35	0.45
	Good	0.08	0.13	0.16	0.11	0.15	0.21	0.14	0.19	0.26	0.18	0.23	0.31
Forest/Woodland		0.08	0.11	0.14	0.10	0.14	0.18	0.12	0.16	0.20	0.15	0.20	0.25
Grass Areas	Good	0.10	0.16	0.20	0.14	0.19	0.26	0.18	0.22	0.30	0.21	0.25	0.35
	Average	0.12	0.18	0.22	0.16	0.21	0.28	0.20	0.25	0.34	0.24	0.29	0.41
Poor	0.14	0.21	0.30	0.18	0.28	0.37	0.25	0.35	0.44	0.30	0.40	0.50	
Imperious		0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Stone Covered		0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85

RUNOFF COEFFICIENTS "c" FOR RATIONAL METHOD

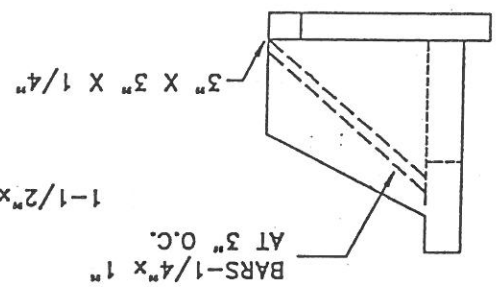
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HEADWALL TRASH RACK DETAIL

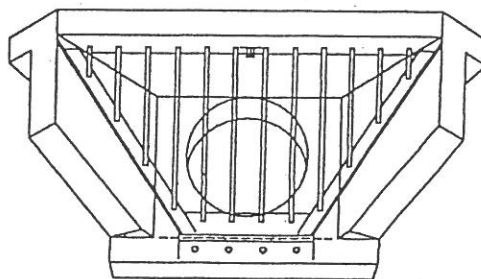
-PLAN VIEW-



-SIDE VIEW-



-ISOMETRIC-



APPENDIX

Illumination of streets, parking areas, and pedestrian ways shall be provided as specified in the following table:

ILLUMINATION GUIDELINES FOR STREET, PARKING, AND PEDESTRIAN AREAS

A.

Street Illumination		Area Classification		
Street Hierarchy	Lux Footcandles	Commercial	Intermediate	Residential
Collector	13	1.2	0.9	6
Minor-Residential	10	0.9	0.6	4
Subcollector	6	0.6	0.4	4
Local				0.4

B.
Parking Illumination (Open Parking Facilities)

Illumination Objective		Level of Activity			
		Vehicular Traffic Lux Footcandles	Pedestrian Safety Lux Footcandles	Pedestrian Security Lux Footcandles	
Low activity	5	0.5	0.2	9	0.8
Medium activity	11	1	0.6	22	2
High activity	22	2	0.9	43	4

C.
Pedestrian Way Illumination

Minimum Average Level	Average Levels for Special Pedestrian Security
Mounting Heights 3 to 5 meters (9 to 15 feet)	Mounting Heights 5 to 10 meters (15 to 30 feet)
Walkways & Bikeway	Lux Footcandles
Classification	Lux Footcandles

Sidewalks (Roadside) and Type A Bikeways:

Commercial Areas	10	0.9	22	2.0	43	4.0
Intermediate	6	0.6	11	1.0	22	2.0
Residential Areas	2	0.2	4	0.4	9	0.8

Walkways Distant From Roadways and Type B Bikeways:

Park Walkways and Bikeways	5	0.5	6	0.6	11	1.0
Pedestrian Tunnels	43	4.0	54	5.0	--	--
Pedestrian Overpasses	3	0.3	4	0.4	--	--
Pedestrian Stairways	6	0.6	9	0.8	--	--

ILLUMINATION GUIDELINES FOR STREET, PARKING, AND PEDESTRIAN AREAS

IES Lighting Handbook definitions:

I. Area classification.

1. Commercial

That portion of a municipality in a business development where ordinarily there are large numbers of pedestrians during business hours.

2. Intermediate

That portion of a municipality often characterized by a moderately heavy nighttime pedestrian activity such as in blocks having libraries, community recreation centers, large apartment buildings or neighborhood retail stores.

3. Residential

A residential development, or a mixture of residential and commercial establishments, characterized by a few pedestrians at night. This definition includes areas with single family homes, townhouses and/or small apartment buildings.

II. Activity level.

1. High activity

Major league athletic events, major cultural or civic events, and major regional shopping centers.

2. Medium activity

Fast food facilities, area shopping centers, hospital parking areas, transportation parking (airports, etc.), cultural, civic or recreational events, and residential complex parking.

3. Low activity

Local merchant parking, industrial employee parking, educational facility parking.

III. Bikeway classification

1. Type A bikeway - a strip within or adjacent to a public roadway or shoulder, used for bicycle travel.

2. Type B bikeway - an improved strip identified for public bicycle travel and located away from a roadway or its adjacent sidewalk system.

Source: Illuminating Engineering Society of North America, IES Lighting Handbook (New York, NY: IES, 1981)