

ENGINEERING STANDARDS

Borough of Pennsburg

September 23, 1988

Engineering Standards
Borough of Pennsburg

Section 101. Paving.

The pavement of all streets and all commercial, industrial, and multi-family parking areas and driveways into and out of said parking areas shall be installed as shown on the final plan and in accordance with the following standards.

- 101.1 General: All paving shall be constructed both as to materials and methods, generally in conformance with applicable portions of the Pennsylvania Department of Transportation Specifications Form 408, current edition. Size and dimensions shall be set forth in these regulations.
- 101.2 Pavement Design: The pavement shall have a minimum total compacted depth of nine (9) inches, consisting of three (3) inches modified stone sub-base, five (5) inches of bituminous concrete base course and one and a half (1½) inch of bituminous surface course 1D-2A wearing (conforming to the Pennsylvania Department of Transportation Specifications Form 408).
- 101.3 Paving Cross-Section: All pavements, except where superelevated for curves, shall have a minimum slope from center of road to gutter line of one-quarter (1/4) inch per foot and a maximum slope of three-quarters (3/4) inch per foot.
- 101.4 Alternative Paving: Alternative paving specifications may be approved for roads, driveways, and parking lots not intended for dedication to the Borough in commercial, industrial, multi-family, and mobile home park areas.

Section 102. Radii of Pavement and Right-of-Way at Intersections.

Street intersections shall be rounded with tangential arcs at pavement edge (curb line) and right-of-way lines are listed below. Where two streets of different right-of-way width intersect, the radii of curvature for the widest street shall apply:

<u>Type of Street</u>	<u>Minimum Radius of arc at intersection of pavement edge or curb line (in feet)</u>	<u>Minimum Radius of arc at intersection of right-of-way line. (in feet)</u>
Primary	35 (or more as may be required)	20 (or more as may be required)
Secondary	35	20
Local Access	25	15

Section 103. Driveways and Parking Areas on a Lot Serving a Single Dwelling Unit.

The driveway and parking area shall have a thickness of not less than six (6) inches, and base of which shall consist of four (4) inches base course of 2A modified stone as compacted, and a surface which shall be two (2) inches compacted thickness of 1D-2A wearing course. The paving shall be constructed both as materials and workmanship in accordance with specifications and standards promulgated by the Pennsylvania Department of Transportation now in force or hereafter revised and on an approved firm subgrade.

Section 104. Construction Inspection.

The construction all driveways and parking areas will be subject to the inspection and approval of the Borough. The Borough shall be notified a minimum of forty-eight (48) hours in advance of construction. Failure to follow these rules and regulations will prevent use and occupancy of the structure until it can be proven that the driveway was constructed properly.

Section 105. Sidewalk Construction.

Sidewalks shall be constructed with four (4) inch thick concrete (minimum) so as to discharge drainage to the street, the grade of which shall not be less than one-fourth (1/4) inch per foot. The finished grade between the outside of the sidewalk to the curb line (edge of the cartway) shall never exceed a total vertical elevation change of one foot. All concrete sidewalks shall be constructed in accordance with the Pennsylvania Department of Transportation Specifications Form 408, current edition. The concrete apron in the driveway area shall be six (6) inches thick reinforced with wire six by six (inches) Number 9 wire (minimum). The wire shall be installed so that it is not closer than one-half (1/2) inch from the top or bottom surfaces of the driveways.

Section 106. Curb Construction.

All curbing shall be constructed both as materials and methods, generally in conformance with applicable portions of Pennsylvania Department of Transportation Specifications Form 408, current edition. Intersections where sidewalks are provided shall be provided with depressions for wheelchair use. The Borough County shall determine whether or not curbs are necessary to protect the public health, safety, and welfare and whether alternatives are available in all areas including industrial areas. In making said determination the Borough Council shall consider the recommendations of the Borough Engineer.

Section 107. Drainage.

107.1 General

- A. Blocks and Lots: Blocks and lots shall be graded to secure proper drainage away from buildings and to allow the collection of stormwater in catch basins. Minimum two (2) percent slopes away from structures shall be required.

- B. Design: All drainage provisions shall be of such design as to carry surface water to the nearest practical street, storm drain, retention basin, or natural water course. Where drainage swales are used they shall not be less than one (1) percent grade and not more than four (4) percent. The swales shall be sodded or planted as required and shall be of such shape and size to conform with specifications of the Borough Engineer.
- C. Construction: The subdivider shall construct and/or install such drainage structures and/or pipes which are necessary to prevent erosion damage and to satisfactorily carry off such surface waters to the nearest practical street, storm drain or natural water course, in accordance with current State Erosion Control and Sedimentation Regulations.
- D. Multi-Family or Non-Residential Areas: Roof drainage shall be conveyed by downspouts and other drainage facilities to a stormwater detention and control structure to minimize the effects of increased runoff.
- E. Natural Water Courses: Drainage easements shall be required along natural water courses to a minimum width of twenty (20) feet may be used for storm and sanitary sewers, and as open space. Where conditions warrant, such as in floodplains, additional width shall be required in such cases where stormwater conveyance requires a wider easement. Staged discharge or water surface profile studies for the design storm may be required to establish high water elevations.
- F. Easements and Dedication: Where stormwater or surface water will be gathered within the subdivision and land development and discharged or drained in volume over lands within or beyond the boundaries of the subdivision or land development, the subdivider, developer, or builder, shall reserve or obtain easements over all lands affected. The easements shall be adequate for such discharge or drainage and for carrying off of such water and for the maintenance, repair, and reconstruction of the same, including the right of passage over including vehicles, machinery and other equipment for such purposes, and which shall be of sufficient width for such passage and work. The subdivider, developer, or builder, shall convey easements to the Borough upon demand at no cost to the Borough.

107.2 Requirements and Calculations

- A. Storm Drains, Storm and Surface Drainage: All storm drains and drainage facilities such as gutters, catch basins, bridges and culverts shall be installed and the land graded for adequate drainage as shown on the grading plan submitted and approved with the preliminary plan.

B. When Required: Storm drains and appurtenances shall be required to be constructed by the subdivider to take surface water from the bottom of vertical grades, the grades of which slope on both sides towards the bottom, to lead water away from springs, and to avoid excessive use of cross gutters at street intersections and elsewhere.

1. Open watercourses will be permitted where they exist naturally and where, in the opinion of the departments affected, they will not interfere with public convenience or safety, but in fact will provide comparable or superior drainage capabilities of piped drainage.
2. When submitting a plan for approval involving the construction of storm drainage facilities the designer's computations shall be submitted in duplicate to facilitate the checking of design.
3. Design of storm drainage facilities shall be completed in accordance with accepted engineering practices subject to approval of the Borough Engineer.

Storm drainage facilities shall be designed so that the peak discharge of runoff after development for the design storm shall be no more than the peak flow before the development was undertaken.

C. Size and Grade: Storm drains shall be adequate for the anticipated runoff when the area is fully developed as permitted by zoning. They shall have a minimum internal diameter of eighteen (18) inches and a minimum grade of 0.5 percent ($\frac{1}{2}$ of 1%) unless otherwise approved by the Borough Engineer.

D. Change in Direction: Special curved storm drain sections may be used where abrupt changes are made in alignment in lieu of constructing manholes if the circumstances so warrant.

E. Manholes: Manholes shall be constructed at all changes in horizontal or vertical alignment; shall be spaced not more than three hundred (300) feet apart on pipe of twenty-four (24) inches internal diameter or less, and not more than five hundred (500) feet apart where larger sizes are installed. Inlets may be substituted for manholes where they will serve a useful purpose.

F. Inlets: Inlet spacing shall be so arranged that ninetyfive (95) percent of the gutter flow will be captured. No inlet smaller than Pennsylvania Department of Transportation Type C shall be used. If needed, the Borough Engineer may require doubling up of the Type C Inlets. Inlets at street intersections shall be placed on the tangent and not on the curved portions. The gutter adjacent to and immediately upgraded from the inlet shall be so warped as to direct the water into the inlet.

- G. Castings: Manhole and inlet castings, together with their covers or gratings shall conform to The Pennsylvania Department of Transportation (PennDOT) or Borough Standards, as may be in effect at the time of design of the sewer is submitted.
- H. Unnatural Drainage. Wherever construction stops or concentrates the natural flow of storm drainage in such a way to affect adjoining properties, approval of the owners should be obtained in writing and a copy filed with the Borough Secretary. Approval of plans by the Borough does not authorize or sanction drainage affecting adjoining properties.
- I. Drainage from Non-Natural Sources: Water originating from other than natural sources, such as air conditioning units, shall be discharged into natural watercourses on the property. It is desirable that the engineer seek to avoid the discharge of water under the sidewalk through the curb into the gutter.

107.3 Calculations of Runoff

- A. General: The quantity of runoff shall be computed using the Rational Formula or other method acceptable to the Borough Engineer. In all cases the quantity of runoff will be determined as if the upstream watershed was fully developed.
- B. Design Frequency: All stormwater facilities shall be designed to transport a ten-year frequency storm. Provision must be made to transport a 50-year frequency storm so that surface waters will not damage property of flood roads. All natural streams shall be provided with a 100-year floodway.
- C. Intensity-Duration-Frequency: The intensity-duration frequency relationship to be used in all stormwater computations shall be that of Philadelphia shown in the PennDOT Design Manual.
- D. The time of concentration shall consist of the inlet time plus the time of flow in the storm sewer from the most remote inlet to the point in question. The PennDOT Design Manual shall be used for this calculation.

107.4 Hydraulic Calculations: All calculations shall be based upon the PennDOT Design Manual. Runoff and hydraulic computations shall be submitted in a manner acceptable to the Borough Engineer. Inlet design data shall be submitted on a separate sheet.

107.5 Design Criteria

- A. Minimum internal pipe diameter shall be eighteen (18) inches.

- B. Maximum internal pipe diameter shall be sixty (60) inches. Open channels shall be used when a sixty (60) inch pipe is not capable of carrying the design storm. Open channels will not be permitted where a conduit equal to or less than sixty (60) inches in diameter can be constructed.
- C. Open channels should have a triangular or trapazoidal cross section. Side slopes shall be a minimum of three horizontal to one vertical.
- D. The minimum velocities in pipes shall be 2.5 feet per second, for open channels, two (2) feet per second.
- E. For unlined open channels a maximum velocity of eight (8) feet per second will be permitted. Where open channel velocities exceed four (4) feet per second, measures such as rip-rapping, cutting back side slopes, creating steps or groins, etc. shall be taken. Maximum velocities should be determined for each soil type encountered.
- F. Existing stream channels shall be maintained in their natural state. Only under unusual circumstances will it be permitted to line, straighten, or relocate an existing stream.
- G. Erosion control measures shall be taken where pipes or channels discharge. Pipes and channels shall be brought into the main channel at an angle of 60 degrees or less.
- H. The maximum permissible discharge velocity shall be four (4) feet per second. Acceptance energy dissipation devices shall be installed to bring discharge velocities down to this limit. Rip-rap will be necessary in the channel to reduce erosion twenty (20) feet downstream from the pipe discharge. Additional rip-rapping may be required by the Borough Engineer where erosion potential is great.
- I. Open ended influent pipes are to be avoided. Where they can not be avoided, safety facilities shall be constructed, acceptable to the Borough Engineer.

107.6 Design of Facilities

- A. All pipes material and its installation shall conform to PennDOT Specifications Form 408. All corrugated metal pipe shall be galvanized, full-coated, with a paved invert.
- B. Inlets, headwalls, manholes, etc. shall be as shown in PennDOT Standard Details for Roadways.
- C. Manholes shall be constructed at all changed in horizontal and vertical alignment. Manholes shall not be more than three hundred (300) feet apart where pipe sizes of twenty-four (24) inches are used, and not more than four hundred and fifty (450) feet apart where larger sizes are installed. Manhole frames and covers shall be good quality cast iron; covers shall be marked "STORM" and have a minimum weight of two hundred and twenty (220) pounds. Inlets may be substituted for manholes.

- D. Stormwater roof drains should be discharged to lawns and subsequently to drainage swales. Only where topography conditions prohibit, should roof drains discharge directly to the street. Roof drains will not be permitted to discharge onto parking areas in high density residential, commercial, shopping center or industrial districts.

107.7 Stormwater Retention

- A. Stormwater retention facilities will be required if one of the following conditions are met:
 - 1. Runoff from the development would exceed the capacity of downstream stormwater facilities.
 - 2. Runoff from the development would increase the peak runoff from the existing conditions. One single-family dwelling not requiring subdivision is exempt from this requirement.
 - 3. Runoff from a proposed parking facility or building would increase the peak runoff from the existing condition.
- B. The design criteria for the stormwater retention facility shall be agreed upon by the Borough Engineer. Developers are encouraged to investigate all measures to reduce and retain water. All reasonable methods will be considered.
- C. Basins or Other Retention/Detention Facilities:
 - 1. Facility design shall be in accordance with reservoir routing methods. The rational short-cut method is permitted if the contributing drainage area equals or is less than 0.2 square miles. In all other cases, completely developed hydrograph routing is required. Inflow hydrographs are to be developed from standard unit hydrographs published in T.R. 55, by the S.C.S., United States Department of Agriculture, and outflow hydrographs are to be developed for discharge structure performance curves.
 - 2. All facilities shall be designed with metered outlets. Low flow discharge shall be based on the equivalent of a two-year storm before development. Principal spillway shall be designed for equivalent release of a ten-year storm before development. Emergency spillway shall be designed for release of a 100-year peak flow or, if applicable, as required by the Department of Environmental Resources (DER).
 - 3. Facilities shall be designed to provide sufficient storage so that the rate of runoff from the site, when developed, will not exceed the runoff of the site before development.

4. Facilities shall be designed so that they return to normal condition within twelve (12) hours after the termination of the storm, unless the Borough Engineer finds that downstream conditions may warrant other design criteria for stormwater release.
5. When basins or ponds are used, the applicant shall demonstrate that they will be designed and protected to assure that public safety is maximized and that health problems are prevented.
6. If the facilities remain in private ownership, the applicant shall assure proper maintenance in the form of recorded deed restrictions, bonds, or escrows, as approved by the Borough Council.
7. If contributing drainage area exceed one hundred (100) acres, or greatest depth of water at maximum storage exceeds fifteen (15) feet, or the impounding capacity at maximum storage elevation exceeds fifty (50) acre-feet, an encroachment permit is required from DER.

107.8 Design Submission

- A. All plans showing the proposed storm sewer construction must be accompanied by a complete design submitted by the registered engineer.
- B. When subdivisions or land developments are submitted to the Borough for approval in sections, a complete storm sewer design for the proposed subdivision and land development shall be submitted. The proposed design must include the entire tract and not a portion.
- C. If only a section of a subdivision or land development is contemplated for construction, the applicant's engineer shall show how he proposes to handle stormwater from this section in order to prevent damage to adjacent properties. If temporary construction is required, the engineer shall include such structures in the plan submitted.
- D. In the event such temporary measures cannot insure protection to adjacent properties, then the main outfall line of the storm sewer shall be included as part of the construction for the proposed section.

Section 108. Utility Locations, Easements, and Rights-of-Way.

Widths and locations of easements and rights-of-way shall be determined by the Borough Engineer for all utilities, including stormwater facilities, and shall be governed by the requirements herein.

108.1 General Standards

- A. Building setback lines shall be measured from the nearest side of the right-of-way or easement to the proposed building.

- B. Nothing shall be permitted to be placed, planted, set or put within the areas of an easement unless it is a portable object. The area shall be kept as lawn.
 - C. The owner of any lot, upon written request by the Borough, and at the owner's sole expense, shall remove anything placed, planted, set or put, (with or without knowledge of this regulation) within the are of any easement.
 - D. To the fullest extent possible easements shall be adjacent to the rear or side lot lines.
- 108.2 No right-of-way nor easement for any purpose whatsoever shall be recited or described in any deed unless the same has been shown on the approved plan. Any error found in a deed shall be immediately corrected and re-recorded in the Office of the Recorder of Deeds for Montgomery County at Norristown, Pennsylvania, at the sole expense of the subdivider.
- 108.3 Utility Easements: A minimum width of twenty (20) feet shall be provided for common utilities and drainage when provided in undedicated land.
- 108.4 Public Utilities: All water, sewer and gas mains and other underground facilities shall be installed prior to street paving at locations approved by the Borough Engineer.
- 108.5 Underground Utilities: All water, sewer and gas mains shall be installed underground. All electric, telephone and communication services, both main and service lines, shall be provided by underground cables, installed in accordance with the prevailing standards and practices of the utility or other companies providing such services, except where it is demonstrated to the satisfaction of the Borough Council that underground installations herein required are not feasible because of physical conditions of the lands involved. All main underground cables which are within the right-of-way of a street shall be located as specified by the Borough Engineer.
- A. In order to promote and facilitate the undergrounding of utility distribution lines, a letter of endorsement shall be required from the suppliers of utility service (not limited to electrical, telephone, or cable television) of the developer's choice wherein the applicant acknowledges that underground utilities are feasible and shall be consummated as part of the improvement plan.
 - B. A statement relative to the intent of the developer to provide underground utility service shall be placed on the final plan requisite to final approval of such plan.
 - C. The provisions in this ordinance shall not be construed as to limit or interfere with the construction, installation, operation and maintenance of public utility structures or facilities which may hereafter be located within public easements or rights-of-way designated for such purposes.

- D. Light standards are to be placed as required by Ordinance. Power source for such standards shall be placed underground as required.
- E. Along arterial roads and major highways all new electrical service should be placed underground.

Section 109. Sanitary Sewers and On-Site Disposals.

109.1 Sewers: Whenever practicable sanitary sewers shall be installed and connected to the public sanitary sewer system following review of plans and approval by DER and/or Sewer Authority. In areas not presently served by public sanitary sewers, appropriate sewage disposal must be provided in accordance with the regulations of DER and in addition the installation and capping of sanitary sewer mains and house connections, may be required if studies by the Borough Council indicate that extension of public sanitary sewer to serve the property subdivided appears probable or necessary to protect public health.

- A. Sanitary sewers, with connection to each building in a subdivision or land development, shall be installed at the expense of the applicant or subdivider, and connected to the public sanitary sewer system.
- B. Sanitary sewers shall be constructed according to the Sewer Authority Regulations.

109.2 On-Site Disposal Systems: If public sewage disposal is not available, and the sewage treatment is on a project or individual lot basis, such private facilities must be installed by the subdivider, developer, or builder under the direct supervision of the Sewage Enforcement Officer of the Borough.

- A. The Sewage Enforcement Officer shall require percolation and/or appropriate tests, when warranted by soil conditions, in order to determine the size, extent, and nature of disposal facilities. Such tests shall be conducted for each lot proposed for development.
- B. After assuring that all requirements have been met, the Sewage Enforcement Officer shall issue a certificate of approval to the Borough Secretary as a requirement for final plan approval.
- C. In no instance shall a septic tank tile field or other effluent disseminating system be located nearer to a drilled well than one hundred (100) feet.
- D. All on-site disposal systems shall be designed to facilitate cleaning. Abandoned wells may not be used as cesspools; the tile disposal field shall be located in an unobstructed and unshaded area.

- E. On-site sewage disposal shall comply in all respects with DER regulations.

Section 110. Water Supply.

- 110.1 Where practicable, the subdivider shall provide central water service to each lot in a proposed subdivision.
- 110.2 Where no central water service is available and it would be an undue hardship for the subdivider to have central water service extended, the subdivider may on approval of the Borough Council be permitted to construct a well on each lot. All wells shall be constructed according to present rules and regulations, or any future amendments thereto of DER.
- 110.3 A circular area with a radius conforming to the rules and regulations of DER shall be shown around each well to denote clear space in which no on-site sewage system is to be located.
- 110.4 Where public water service is furnished the circles are not necessary, with the exceptions of those well(s) lying immediately adjacent to the subdivision. However, the usable area is limited by a clear zone surrounding the water service line to each house as required by DER.
- 110.5 Fire hydrants shall be located at accessible points throughout the subdivision when centralized water supply is available, and shall be located according to the Borough Engineer, Water Authority, or DER. The type and methods of construction to be employed in the installation of fire hydrants shall be accordance with current State regulations.

Section 111. Erosion and Sediment Control.

The requirements of this section shall apply when they are more stringent than those of the DER or when the DER has no jurisdiction.

111.1 General

- A. For qualifying tracts, no changes shall be made in the contour of the land; no grading, excavating, removal or destruction of the topsoil, trees or other vegetative cover of the land shall be commended until such time that a plan for minimizing erosion and sedimentation has been approved.
- B. No subdivision or land development plan shall be approved unless: (1) there has been a plan approved by the Borough Council that provides for minimizing erosion and sedimentation consistent with this section, and an improvement bond or other acceptable securities are deposited with the Borough in a form of an escrow guarantee which will insure installation and completion of the required improvements; or (2) has been a determination by the Borough Council that a plan for minimizing erosion and sedimentation is not necessary.

- C. The Borough Council, in its consideration of any preliminary plan of subdivision and land development shall condition its approval upon the execution of measures designed to prevent accelerated soil erosion and resulting sedimentation, as required by DER. All applicable regulations and permit requirements of said department as stipulated in its Soil Erosion and Sedimentation Control Manual shall be followed by all parties engaged in earthmoving activities. The manual is available at the office of the Montgomery County Conservation District, Norristown, Pennsylvania. The Borough Engineer shall assure compliance with appropriate specifications and requirements.

111.2 Performance Principles

- A. Any effective method of minimizing erosion and sedimentation can be included in the plan. Any questionable method should be discussed with the Borough Engineer prior to submission.
- B. No unfiltered stormwater coming from an area which has been disturbed shall be permitted onto an adjacent tract.

111.3 Responsibility

- A. Whenever sedimentation is caused by stripping vegetation, regrading or other development activity, it shall be the responsibility of the person, corporation, or other entity causing such sedimentation to remove it from all adjoining surfaces, drainage systems and watercourses and to repair any damage at his expense as quickly as possible.
- B. It is the responsibility of any person, corporation, or other entity doing any act on or across a stream, watercourse or swale or upon the floodplain or right-of-way thereof, to maintain, as nearly as possible, in its present state the stream, watercourse, swale, floodplain or right-of-way during the activity and to return it to its original or equal condition after such activity is completed.
- C. No person, corporation, or other entity shall block, impede the flow of, alter, construct any structure, or deposit any material or thing, or commit any act which will affect normal or flood flow in any stream or watercourse without having obtained prior approval from the Borough or DER whichever is applicable.

111.4 Compliance with Regulations and Procedures

- A. The Borough Council in its consideration of all preliminary plans of subdivision and land development shall condition its approval upon the execution of erosion and sediment control measures as contained in this Section.

- B. The installation and design of the required erosion and sediment control measures shall be in accordance with the standards and specifications on file with the Borough Engineer.
- C. Final plans for minimizing erosion and sedimentation as approved will be incorporated into the agreement and bond requirements as required under Article V of the Borough's Subdivision and Land Development Ordinance.
- D. The approval of plans and specifications for the control of erosion and sedimentation shall be concurrent with the approval of the final plans of subdivision or land development, and become a part thereof.
- E. At the time that a building permit is applied for a review shall be conducted by the Borough Engineer to insure conformance with the plan as approved. During the construction further consultative technical assistance will be furnished, if necessary, by the Borough Engineer and the Montgomery County Conservation District. During this development phase, the Borough Engineer shall inspect the development site and enforce compliance with the approved plans.
- F. Permission for clearing and grading prior to recording of plans may be obtained under temporary easements or other conditions satisfactory to the Borough.
- G. In the event the developer proceeds to clear and grade prior to recording plans, without satisfying conditions specified under subparagraph F., the Borough Council may revoke the approval of the preliminary plan.

Section 112. Bridges and Culverts.

- 112.1 Bridges and culverts shall be designed to meet current Pennsylvania Department of Transportation Standards to support expected loads and to carry expected flows. They shall be constructed to the full width of the right-of-way.
- 112.2 It is unlawful to construct any dam or other water obstruction, or to make any change in or addition to, any existing water obstruction, or in any manner change or diminish the course, current, or cross section of any stream or body of water, without first having made written application to and obtained consent or permit, in writing, from the Pennsylvania DER.
- 112.3 The following information is required: Drawing to include location plan; cross section of present bridge if one exists; profile of stream for a reasonable distance above and below bridge site, showing slopes of bed, normal water surface and flood water surface. If the bridge is on a skew, give the angle of the center

line of the bridge with the direction of the line of flow. In addition, the total drainage area above the bridge site; description of watershed; length of stream from source to bridge site and to the mouth; character of stream bed and banks; extent and depth of overflow during floods; effect of previous floods upon bridges, their span and clearance; whether bridge will be within backwater influence of parent stream.

- 112.4 When submitting a plan involving construction of bridge or culverts, there shall be submitted a complete set of structural computations.

Section 113. Survey Monuments.

113.1 Monuments shall be iron or magnetic pins encased in stone or concrete and located on the right-of-way lines as corners, angle points, beginning and end of curves, and as other required. Monuments shall be indicated on all plans. They shall be placed after a new street has been completed. The centerline of all new streets shall be marked with spikes and referenced to permanent monuments or structures. A certified copy of this referenced information shall be given to the Borough Engineer. Permanent reference monuments of case concrete or durable stone twenty (20) inches, by four (4) inches, by four (4) inches, with forty-five (45) degree beveled edges shall be set by the subdivider, developer, or builder, at all corners and angle points of the boundaries of the original tract to be subdivided and at all street intersections and intermediate points as may be required.

113.2 Staking Requirements: All lots shall be staked by the registered engineer or surveyor for the subdivider, builder, or developer, when final grading has been completed. This stake out shall be visible and completed before an owner or occupant moves into the property. All lot corner markers shall be permanently located and shall be at least a fiveeighths (5/8) inch metal pin with the minimum length of twenty-four (24) inches located in the ground to existing grade.

113.3 Bench Marks: The Borough elevations are based on the U.S.G.S. Datum. Location and elevation is available to all Engineers and Surveyors upon request to the Engineer's Office. All contours and elevations shown on plans must be based on this system.

Section 114. Driveway Crossings of Curbs and Sidewalks.

114.1 Driveways normally used by not more than 25 vehicles per day shall comply with the standards contained in the Pennsylvania Code, Title 67, Transportation, Chapter 441, Access to and Occupancy of Highways by Driveways and Local Roads, Section 441.8, (i), (5), Grade Requirements Where Curbs and Sidewalks are Present.

114.2 Driveways normally used by more than 25 vehicles per day shall comply with standards appropriate for their anticipated traffic volumes in conformance with accepted engineering standards and practices.

113.2 Lot Staking Requirements: All lots shall be staked by the registered surveyor for the sub divider, builder, or developer, when final grading has been completed. This stakeout shall be visible and shall be completed before an owner or occupant moves into the property or if the lot is to be sold undeveloped. All lot corner markers along a public road shall be concrete monuments (with metallic core). The remaining corner markers shall consist of at least (5/8) inch metal pin with a minimum length of (24) inches located in the ground to the existing grade. Concrete monuments shall be no less than 4 inches square on the top and minimum of 24 inches in depth and shall be set in the ground at the existing grade. All corner markers shall be set to a horizontal control of not less than one (1) part in ten thousand (10,000).

Section 115. Emergency Accessways.

- 115.1 Minimum cartway width shall be ten (10) feet.
- 115.2 When paved, pavement shall conform to Section 101.2, Pavement Design, herein.
- 115.3 When not paved the cartway shall be constructed of crushed stone of appropriate size, depth, and compaction to support the largest borough fire trucks under all weather conditions. The Borough Engineer shall determine compliance with this standard.

Borough of Pennsburg Traffic Signal Specifications

1. New signal installations shall be compatible with other signalized intersections in the Borough to facilitate future coordination of signalized intersections and to reduce long-term maintenance costs by standardizing with one manufacturer for traffic control equipment. All materials shall be new, manufactured within one (1) year prior to date of installation and approved for the intended use by the Pennsylvania Department of Transportation.
2. Controller assembly and cabinet shall be full-actuated eight-phase controller meeting or exceeding requirements of PennDOT Publication 408 Sections 952 and 1104 and NEMA TS-1 and TS-2 for a solid state actuated controller. All new cabinets should be installed as base mounted. The cabinet should be a large single door cabinet that protects internal equipment from rain, dust, vandalism and other conditions in an outdoor or otherwise harsh environment.
3. Battery Back-up/Uninterruptible Power System (UPS) shall be supplied and installed with all new controller assemblies. An exterior warning light shall be installed on the controller cabinet to indicate the Battery Back-up is engaged.
4. Alternative Power (Generator) Connector shall be supplied and installed with all new controller assemblies. A flange inlet receptacle shall be provided for the attachment of an alternative power source (emergency generator).
5. Inductance Loop Detection shall be supplied with all new signal installations. Saw cutting of curbs will not be permitted. Saw cuts across concrete joints shall have a ½-inch PVC sleeve installed to the proper depth that extends 4-inches in each direction from the joint. All 90° degree corners where loop wires turn shall be made as two (2) 135° cuts. Saw cuts shall be cleaned, dried and free from dust, grit, oil and moisture before placement of wire. Loop detector lead-in cable shall be compatible with detector amplifier transceiver units furnished.
6. Vehicular Signal Head Assemblies shall be provided with Red, Yellow, and Green L.E.D. indications, including L.E.D. arrows. Pedestrian signal heads shall be one-piece, symbolic (hand/man), L.E.D. white "man" and L.E.D. Portland Orange "hand" indications, in a die-cast housing with aluminum door as required.
7. Optical Emergency Vehicle Pre-emption shall be installed for all approaches to the intersection, unless otherwise directed by the Borough. Emergency Vehicle Pre-emption shall be actuated by a light emitting device and shall operate with a fail safe device for each direction. Equipment shall include the pre-emption receiver, flood light indicator, and pre-emption card contained in the controller cabinet and other incidental equipment and hardware.

8. Traffic Signal Supports shall include an extension for the installation of a luminaire mounting arm. Mounting height of the luminaire shall be 30 feet from the road surface. The foundation depth for each traffic signal mastarm shall be increased to support the installation of a luminaire arm.
9. Traffic Control Signs and Street Name Signs shall be installed as shown on the Traffic Signal Permit Plan and in accordance with PennDOT Publication 408, Sections 930 through 936 and 1103. Contractor shall install all mastarm mounted signs with a Kelly Bracket or Astro Bracket with a minimum of two (2) Z-Type brackets on the pipes that allow adjustment of the signs. All street name signs shall be installed with a minimum of three (3) Z-Type brackets. All banding for structure-mounted signs, except for pedestrian push-button signs, shall be 1/4-inch stainless steel banding. Pedestrian push-button signs may be 1/2-inch stainless steel banding. All post-mounted signs shall be installed on breakaway square signposts. Two posts shall be provided for any signs over 48" wide.

RESOLUTION NO. 9.5-03

A RESOLUTION OF PENNSBURG BOROUGH COUNCIL
AMENDING ITS BOROUGH ENGINEERING STANDARDS TO
PROVIDE FOR MINIMUM REQUIREMENTS FOR ALL
TRAFFIC SIGNALS LOCATED WITHIN PENNSBURG
BOROUGH.

WHEREAS, the Pennsburg Borough Subdivision and Land Development Ordinance refers to engineering design and construction standards as contained in the Borough document known as the Engineering Standards for Pennsburg Borough; and,

WHEREAS, Pennsburg Borough Council, by Resolution, from time to time, amends those Engineering Standards; and,

WHEREAS, Pennsburg Borough Council is desirous of amending those Standards to include certain minimum requirements for the construction and installation of traffic signals.

NOW, THEREFORE, BE IT AND IT IS HEREBY RESOLVED by the Pennsburg Borough Council as follows:

1. In addition to those Standards as set forth in the latest edition of the Commonwealth of Pennsylvania, Department of Transportation, Traffic Signal Design Handbook, Pennsburg Borough hereby approves and adopts the following minimum standards for all traffic signals constructed and installed within Pennsburg Borough, which requirements shall include the following:

1. Battery back-up with generator hook-up;
2. Approve pre-emption device;

3. Extended poles for street lights;
4. Control boxes mounted on separate poles.
5. New systems shall be compatible with other systems in the Borough.
6. All signal indicators shall be LED;
7. Street signs shall be included on all signal system poles; and
8. Detectors.

Attached hereto and incorporated herein and marked as Exhibit "A" are detailed specifications for all traffic signals within Pennsburg Borough.

2. Be it further resolved that these standards shall be incorporated into the Engineering Standards of Pennsburg Borough, as amended, and that all policies, Resolutions and Ordinances inconsistent with this Resolution are hereby repealed.

ENACTED AND RESOLVED this 20th day of October, 2003.

PENNSBURG BOROUGH COUNCIL

BY: Maiane L. Stevens
President

ATTEST: Jeanne W. Hopkins
Secretary

Approved this 20th day
of October, A.D., 2003.

Charles B. Sauer
Mayor