

22 Attachment 1

Borough of Rockledge

**APPENDIX "A"
ENGINEERING STANDARDS**

§101. Paving.

The pavement of all streets and all commercial, industrial and multifamily 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:

- A. General. All paving shall be constructed both as to materials and methods, in conformance with applicable portions of the Pennsylvania Department of Transportation (PennDOT) Specifications, Form 408, last revision edition.
- B. Pavement Design. Two pavement designs may be selected for the construction of roadways, drives or parking areas.
 - (1) The pavement shall have a minimum total compacted depth of 11 inches consisting of 8 inches of crushed aggregate base course. This shall be comprised of No. 4 stone choked with screenings. A minimum of 1 inch screenings shall be placed on the compacted subgrade prior to the installation of the No. 4 stone.
 - (2) The pavement shall have a minimum total compacted depth of 11 inches, consisting of 3 inches 2A modified stone subbase, 5 inches of bituminous concrete base course, 2 inches of ID-2A binder course and 1 inch of bituminous surface course ID-2A wearing (conforming to the PennDOT Specifications Form 408).
- C. Paving Cross-Section. All pavements, except where super-elevated for curves, shall have a minimum slope from center of road to gutter line of 1/4 inch per foot and a maximum slope of 3/4 inch per foot except in super-elevated sections as governed by AASHTO.
- D. Alternative Paving. Alternative paving specifications may be approved for roads, driveways and parking lots not intended for dedication to the Borough, in commercial, industrial, rural, multifamily and mobile home park areas. These approvals will be subject to Borough Council review and must be supported by a detailed engineering analysis.

(Ord. 203, 11/8/1948; as added by Ord. 590, 3/14/2005, §1)

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§102. Radii of Pavement and Right-of-Way at Intersection.

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

Type of Street	Minimum Radius of Arc at Intersection of Pavement Edge or Curb Line (In Feet)	Minimum Radius of Arc at Intersection of Right-of-Way line (In Feet)
Primary	35 (or more as may be required)	20 (or more as may be required)
Secondary	35	20
Local Access	25	15

- A. All radii specified herein must be increased if large trucks, fire trucks or other emergency vehicles would have difficulty with ingress or egress.

(Ord. 203, 11/8/1948; as added by Ord. 590, 3/14/2005, §1)

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

The driveway and parking area shall have a thickness or not less than 8 inches and base of which shall consist of 6 inches base course of 2A modified stone as compacted and a surface which shall be 2 inches compacted thickness of ID-2A (1 inch binder, 1 inch surface). The paving materials and workmanship shall be constructed in accordance with PennDOT Specifications, Form 408, latest revision.

(Ord. 203, 11/8/1948; as added by Ord. 590, 3/14/2005, §1)

§104. Construction Inspection.

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

(Ord. 203, 11/8/1948; as added by Ord. 590, 3/14/2005, §1)

§105. Sidewalk Construction.

Sidewalks shall be constructed with 4 inch thick class "A" cement concrete, 3,300 psi (minimum) so as to discharge drainage to the street, the grade of which shall be 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 1 foot. All concrete sidewalks shall be constructed in accordance with PennDOT Specifications, Form 408,

latest revision. The concrete apron in the driveway area shall be 6 inches thick reinforced with wire 6 inches by 6 inches, number 9 wire (minimum). The wire shall be installed so that it is not closer than 1/2 inch from the top or bottom surfaces of the concrete. Four inch thick sidewalk shall be bedded on 4 inches clean 2B stone. Six inch sidewalk and apron areas shall have a bedding of 6 inches of clean 2B stone.

(Ord. 203, 11/8/1948; as added by Ord. 590, 3/14/2005, §1)

§106. Curb Construction.

All curbing shall be constructed both as to materials and methods, in conformance with PennDOT Specifications, Form 408, latest revision. Intersections where sidewalks are provided shall be provided with depressions to meet the requirements of the ADA. The Council members shall determine whether or not curbs are necessary to protect the public health, safety and welfare and whether alternatives are available. In making said determination, the Council members shall consider the recommendations of the Planning Commission and Borough Engineer.

(Ord. 203, 11/8/1948; as added by Ord. 590, 3/14/2005, §1)

§107. Drainage.

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 2% slopes away from structures shall be required. Concrete curbs shall be installed in all residential streets, commercial and industrial developments.
- B. Design. All drainage provisions shall be of such design as to carry surface water to the nearest practical street, storm drain, detention basin or natural water course. Where drainage swales are used, they shall not be less than 1% grade. The swales shall be sodded or planted as required and shall be of such shape, size and slope to conform with specifications of the Borough Engineer.
- C. Construction. The developer 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 watercourse, in accordance with current State erosion control and sedimentation regulations.
- D. Multifamily or Nonresidential 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. No roof drains

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shall discharge directly to streets without approval of the Borough Engineer.

- E. Natural Watercourses. Drainage easements shall be required along natural watercourses with a minimum width of 20 feet and may be as open space. Where conditions warrant, such as in floodplains, additional width shall be required to convey a 100 year design storm. Staged discharge or water surface profile studies for the design storm will be required to establish high water elevations.
- F. Easements and Dedication. Where stormwater or surface water will be gathered within the subdivision of land and discharged or drained in volume over lands within or beyond the boundaries or 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 purposes and which shall be of sufficient width for such passage and work. The subdivider, developer or builder shall convey, at no cost to the Borough, easements to the Borough upon demand, at the completions and stabilization of all improvements.

2. Requirements and Calculations.

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

Stormwater management 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. Location. Wherever practicable, storm drains shall be located within the right-of-way of the street. They shall be protected by a cover of at least 24 inches.
 - D. Size and Grade. Storm drains shall be adequate for the anticipated runoff when the area is fully developed as permitted by zoning and capable of carrying a 25 year design storm. All areas of sumps shall be designed to convey a 100 year storm frequency. They shall have a minimum internal diameter of 18 inches and a minimum grade of 1/2 of 1% unless otherwise approved by the Borough Engineer.
 - E. Manholes. Manholes shall be constructed at all changes in horizontal or vertical alignment, shall be spaced not more than 300 feet apart on pipe of 24 inches internal diameter or less. Inlets shall be substituted for manholes where they will serve a useful purpose.
 - F. Inlets. Inlet spacing shall be so arranged that 95% of the gutter flow will be captured. No inlet smaller than PennDOT Type C Inlet shall be used. Double inlets spaced by 20 linear feet of pipe shall be required if adequate efficiency is not realized with the PennDOT Type C Inlet. Inlets at street intersections shall be placed on the tangent and not on the curved portions. The gutter adjacent to and immediately upgrade 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 PennDOT or Borough standards, as may be in effect at the time.
 - 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 copy filed with the Borough Manager. Approval of plans by the Borough does not authorize or sanction drainage affecting adjoining properties.
 - I. Drainage from Nonnatural Sources. Water originating from other than natural sources, such as air conditioning units, sump pumps or other dry weather flow, wherever practicable, shall be discharged into natural watercourses on the property. It is desirable that the discharge of water under the sidewalk through the curb into the gutter, be avoided.
3. Calculations of Runoff.

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- A. General. The quantity of runoff shall be computed using current accepted engineering practice.
 - B. Design Frequency. All stormwater facilities shall be designed to transport a 25 year frequency storm. Provision must be made to transport a 100 year frequency storm so that surface waters will not damage property or flood roads and that the 100 year frequency storm shall be transported to the appropriate stormwater management facility. All natural streams shall be provided with a 100 year floodway as calculated by accepted engineering practice.
 - C. Intensity-Duration-Frequency. The intensity-duration-frequency relationship to be used in all stormwater computations shall be that of Region 5 of the Field Manual of the PennDOT Storm Intensity-Duration-Frequency Charts, dated May, 1986, or latest revision.
 - 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.
4. Hydraulic Calculations. All calculations shall be based upon accepted engineering practice. 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, on the standard PennDOT design form.
 5. Design Criteria.
 - A. Minimum internal pipe diameter shall be 18 inches.
 - B. Open channels should have a triangular or trapezoidal cross section. Side slopes shall be a minimum of four horizontal to one vertical. Exceptions to these slopes must be approved by the Borough Engineer.
 - C. Permissible channel velocities, slopes and cover shall be in accordance with the Soil Conservation Service (SCS) Engineering Field Manual, Chapter 7, "Grassed Waterways and Outlets.
 - D. 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. The approval of the Pennsylvania Department of Environmental Protection (DEP) and SCS will be required.
 - E. Acceptable energy dissipation devices shall be installed to bring discharge velocities down to limits specified in the SCS Engineering Field Manual, Chapter 7. Gabions will be necessary in the channel to reduce erosion downstream from the pipe discharge. Additional rip rapping and/or gabions may be required by the Borough Engineer where erosion potential is great.

- F. Open-ended influent pipes are to have proper end treatments. Where they cannot be avoided, safety facilities shall be constructed, acceptable to the Borough Engineer to prevent access by small children.
6. Design Facilities.
- A. All pipe material, workmanship and its installation shall conform to PennDOT Specifications, Form 408. All pipe shall be reinforced concrete. Substitutions may be approved by the Borough Engineer.
 - B. Inlets, headwalls, manholes, etc., shall be as shown in PennDOT Standard Details for Roadways or as approved by the Borough Engineer.
 - C. Manholes shall be constructed at all changes in horizontal and vertical alignment. Manholes shall not be more than 300 feet apart where pipe sizes of 24 inches are used and not more than 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 220 pounds. Inlets may be substituted for manholes.
 - D. Stormwater 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.
7. Stormwater Detention.
- A. Stormwater detention 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 a proposed parking facility or building would increase the peak runoff from the existing condition.
 - B. The design criteria for the stormwater detention facility shall be agreed upon by the Borough Engineer. Developers are encouraged to investigate all measures to reduce and detain water for discharge at a delayed rate or groundwater recharge. All reasonable methods will be considered.
8. Design Submission.
- A. All plans showing the proposed storm sewer construction must be accompanied by a complete design submitted by a registered professional engineer.

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- 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 of said tract.
- 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 ensure 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.

(Ord. 203, 11/8/1948; as added by Ord. 590, 3/14/2005, §1)

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

Widths and locations and 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:

- A. General Standards.
 - (1) Easements and required front, side or rear yard may occupy the same area.
 - (2) Nothing shall be permitted to be placed, planted, set or put within the areas of an easement unless it is a portable or removable object. The area shall be kept as lawn.
 - (3) The owner of any lot, upon written request by the Borough, and at the owner's sole expense, shall remove any item placed, planted, set or put (with or without knowledge of these regulations) within the area of any easement.
 - (4) To the fullest extent possible, easements shall be adjacent to rear or side lot lines and occupying only a portion of one lot.
- B. 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 or developer. All re-recorded information shall be forwarded to the Borough for their records.

- C. Utility Easements. A minimum width of 20 feet shall be provided for common utilities and drainage provided in undedicated land for one use.
- D. 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.
- E. 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. All main underground cables which are within the right-of-way of a street shall be located as specified by the Borough Engineer.
 - (1) In order to promote and facilitate the underground installation 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), wherein the applicant acknowledges that underground utilities shall be installed as part of the improvement plan.
 - (2) A statement relative to the intent of the developer to provide underground utility service shall be placed on the final plan.
 - (3) The provisions of this Appendix 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.
 - (4) Light standards are to be placed as required by ordinance and as required by Rockledge Borough Council. Power source for such standards shall be placed underground as required.
 - (5) Along arterial roads and major highways, all new electrical service should be placed underground.

(Ord. 203, 11/8/1948; as added by Ord. 590, 3/14/2005, §1)

§109. Sanitary Sewers.

- 1. Sewers. Sanitary sewers shall be installed and connected to the Borough sanitary sewer system following review of plans and approval by.

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- 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 Borough sanitary sewer system.
- B. Sanitary sewers shall be constructed according to the applicable regulations.

(Ord. 203, 11/8/1948; as added by Ord. 590, 3/14/2005, §1)

§110. Water Supply.

- 1. The subdivider shall provide public water service to each lot in a proposed subdivision or land development.
- 2. Fire hydrants shall be located at points throughout the subdivision and land development as directed by the Rockledge Borough Water Department. The type and methods of construction to be employed in the fire hydrants, water distribution system and other appurtenances, shall be in accordance with the current Rockledge Borough Water Department specifications.

(Ord. 203, 11/8/1948; as added by Ord. 590, 3/14/2005, §1)

§111. Erosion and Sediment Control.

The requirements of this Section apply when they are more stringent than those of DEP or when DEP has no jurisdiction.

- A. General.
 - (1) 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 commenced until such time that a plan for minimizing erosion and sedimentation has been approved by Montgomery County Conservation District.
 - (2) No subdivision or land development plan shall be approved unless there has been a plan approved by the Council members that provides for minimizing erosion and sedimentation consistent with this Section and an improvement bond or other acceptable financial securities are deposited with the Borough in the form of an escrow guarantee which will ensure installation and completion of the required improvements.
 - (3) 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 the Pennsylvania Department of Environmental Protection. 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 earth moving activities. The manual is available at the Office of the Montgomery County Conservation District, Creamry, Pennsylvania. The Borough Engineer shall assure compliance with appropriate specifications and requirements.

B. Performance Principles.

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

C. Responsibility.

- (1) Whenever sedimentation is caused by stripping vegetation, regrading or other 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.
- (2) 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.
- (3) No person, corporation or other entity shall block, impeded 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 DEP, whichever is applicable.

D. Compliance with Regulations and Procedures.

- (1) 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.
- (2) The installation and design of the required erosion and sediment control measures shall be in accordance with the standards and specifications as previously set forth.

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- (3) Final plans for minimizing erosion and sedimentation as approved will be incorporated into the agreement and bond requirements as required under the Borough Subdivision and Land Development Ordinance [Chapter 22].
- (4) 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.
- (5) At the time that a building permit is applied for, a review shall be conducted by the Borough Engineer to ensure conformance with the plan as approved. During the construction phase, further 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.
- (6) Permission for clearing and grading prior to recording of plans may be obtained under temporary easements or other conditions satisfactory to Borough Council and Solicitor.

(Ord. 203, 11/8/1948; as added by Ord. 590, 3/14/2005, §1)

§112. Bridges and Culverts.

1. Bridges and culverts shall be designed to meet current PennDOT standards to support expected loads and to carry expected flows. They shall be constructed to full width of the planned right-of-way. Allowance for sidewalk must also be made, if required by the Borough.
2. Where County owned roads or bridges are involved, the County Department of Roads and Bridges must review and approve all proposals.
3. 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 DEP.
4. The following information is required:
 - A. Drawings, to include location plan.
 - B. Cross-section of present bridge, if one exists.
 - C. Profile of stream for a minimum distance of 500 feet above and below the bridge site showing slopes of the stream bed, normal water surface and flood

water surface. If the bridge is on a skew, give the angle of the centerline of the bridge with the direction of the line of flow. In addition, the total drainage area above the bridge site.

- D. Character of stream bed and banks.
 - E. Extent and depth of overflow during floods.
 - F. Effect of previous floods upon bridges, their span and clearance.
 - G. Whether bridge will be within backwater influence of parent stream.
5. When submitting a plan involving construction of bridges or culverts, there shall be submitted a complete set of structural computation and drawings. These drawings shall be signed and sealed by a registered professional engineer.

(Ord. 203, 11/8/1948; as added by Ord. 590, 3/14/2005, §1)

§113. Survey Monuments.

1. Street right-of-way reference monuments shall be concrete and located on the right-of-way lines at corners, angle points, beginning and end of curves and as otherwise required by the Borough Engineer. Monuments shall be indicated on the record plan. They shall be placed after all construction has been completed. The centerline of all new streets shall be marked with spikes (P.K. nails) 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 concrete, 20 inches by 4 inches by 4 inches with 45° beveled edges, shall be set by a registered land surveyor at all corners and angle points of the boundaries of the original tract to be subdivided and at all street intersections and intermediate or additional points as may be required.
2. Lot Pin Requirements. All lots shall have lot pins installed by the registered surveyor for the subdivider, builder or developer, when final grading has been completed. This stake out shall be visible and completed within 6 months of completion of grading. All lot corner markers shall be permanently located and shall be at least 5/8 inch metal pin with a minimum length of 18 inches. All pins shall have set reference stakes of wood with a minimum length of 24 inches and a surveyor's ribbon. Stakes shall be marked "Property Corner."
3. Bench Marks. The Borough elevations are based on the USGS Datum. Location and elevation is available to all engineers and surveyors upon request to the Engineer's office. All contours and elevations shown on the plan must be based on this system.

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4. Duration. These engineering standards shall remain in effect until further action by the Rockledge Borough Council.

(Ord. 203, 11/8/1948; as added by Ord. 590, 3/14/2005, §1)