CHAPTER 22

SUBDIVISION AND LAND DEVELOPMENT

Part 1

General Provisions

§101. Purpose
§102. Word Usage and Definitions
§103. Application Procedure and Approval Process
§104. Plan Requirements
§105. Permits
§106. Laws and Regulations
§107. Control Work
§108. Dedication of Public Improvements

Part 2

Design Criteria

§201. Streets and Roadways
§202. Stormwater Management
§203. Sanitary Sewers
§204. Water Systems
§205. Curbs and Sidewalks
§206. Driveways
§207. Off-Street Parking
§208. Fire Lanes
§209. Interior Drives and Interior Streets

Part 3

Construction Standards

§301. Excavation and Embankment
§302. Excavation and Backfill
§303. Storm Sewers and Drainage Structures
§304. Sanitary Sewers and Appurtenances
§305. Water Mains and Appurtenances
§306. Crushed Aggregate Base Course
§308. Plain Cement Concrete Curb
§309. Cement Concrete Sidewalks

Part 4

Administration

§401. Modifications
§402. Amendment
§403. Remedies and Enforcement
§404. Challenges and Appeals
§405. Conflicts

Appendix
Part 1
General Provisions

§101. Purpose.
1. General. The purpose of these standards is:
   A. To assist in the orderly, efficient, and integrated development of land in accordance with the New Holland Borough Comprehensive Plan.
   B. To facilitate the movement of traffic.
   C. To ensure coordination and conformance of subdivision and land development plans with the public improvement plans of the Borough.
   D. To provide for the proper extension of community service and facilities at minimum cost and maximum convenience.
   E. To ensure equitable handling of all subdivision and land development plans by providing uniform standards and procedures.
   F. To promote the general health, safety, and welfare of the residents of the Borough.
   G. To establish design criteria for public improvements.
   H. To establish standards for materials and methods used in construction of public improvements.
2. These standards shall be used in all development within the Borough.
3. Development shall include subdivisions, land development, residential construction, commercial construction, and industrial construction.
4. The Borough of New Holland will not accept any public improvements which do not conform to these standards.
   (Ord. 393, 4/3/1990, §101)

§102. Word Usage and Definitions.
1. Word Usage. Unless otherwise expressly stated, the terms as set forth shall, for the purpose of these specifications, have the meaning indicated. Words in the singular include the plural, and words in the plural include the singular. The word "person" includes a corporation, unincorporated association, and a partnership, as well as an individual. The word "building" shall be construed as if followed by the words "or part thereof." The word "watercourse" includes "drain", and "stream." The words "shall" and "will" are mandatory; the word "may" is permissive.
2. Definitions.
   A. In cases where definitions do not appear below and there arises disagreement as to meaning, the definition which will govern shall be that derived from the American Heritage Dictionary of the English Language.
B. Abbreviations used mean the following:

AASHO - American Association of State Highway Officials.
ACI - American Concrete Institute.
AISC - American Institute of Steel Construction.
ANSI - American National Standards Institute.
AWWA - American Water Works Association.

C. Unless otherwise expressly stated, the following words shall, for the purpose of these specifications, have the meanings herein indicated:

ACCELERATED EROSION - the removal of the surface of the land through the combined action of man's activities and natural processes at a rate greater than would occur from natural processes alone.

ACCELERATION LANE - the portion of roadway adjoining the traveled way constructed for the purpose of enabling a vehicle entering a roadway to increase its speed to a rate at which it can safely merge with traffic.

ACCESS - a private drive, street, or other means of passage of vehicles between the highway and abutting property, including acceleration and deceleration lanes and such drainage structures as may be necessary for the proper construction and maintenance thereof.

ACCESSORY BUILDING - a building subordinate to the principal building on a lot and used for purposes customarily incidental to those of the principal building.

ACCESSORY USE - a use subordinate to the principal use of land or of a building on a lot and customarily incidental thereto.

AREA, NET - the entire area of a tract exclusive of existing public rights of way whether interior or exterior, but including interior parking areas and access lanes, sidewalks, parks, playgrounds, and common open space. [Ord. 427]

AGENT - any person, other than the developer, who, acting for the developer, submits to the Borough subdivision or land development plans for the purpose of obtaining approval thereof.

ALLEY - a minor right-of-way providing secondary vehicular access to the side or rear of two (2) or more properties.

ALTERATIONS - any change in the supporting members of a building or structure, such as bearing walls, columns, beams or girders, joists or rafters, or enclosing walls on any modification thereof, whether by change on any side or in height, or the moving of such building from one location or position to another.

APPLICANT - a landowner or developer, as hereinafter defined, who has filed an application for development, including his heirs, successors, and assigns.
APPLICATION - a form available at the Borough Office containing a checklist of plan requirements and other general information used for administrative purposes to aid in the review of the subdivision, land development plan, or improvements.

ANTECEDENT CONDITIONS - the specified characteristics of the land surface (e.g., meadow) prior to a proposed disturbance or prior to a rainfall event (e.g., amount of moisture in the soil); the basis for calculating increases in runoff attributable to the disturbance or storms which must be controlled.

AUTHORITY - New Holland Borough Authority, acting directly or through any agent, officer, or employee duly authorized to act for the said party in the execution of the work required by the contract.

AUTHORITY ENGINEER - the person or organization duly employed by the Authority as consultant and authorized to inspect the results of the performance of the work under contract by the contractor, acting directly or through properly authorized agents, engineers, assistants, inspectors, or other representatives, acting severally within the scope of the particular duties entrusted to them. The word "engineer" shall include the officers, agents, and employees of the engineer. In cases where the Authority does not employ a consultant, the word "Authority" is substituted for "engineer" throughout these specifications.

BLOCK - an area of land bounded by streets. [Ord. 427]

BOROUGH - Borough of New Holland, Lancaster County, Pennsylvania.

BOROUGH COUNCIL - the governing body of the Borough of New Holland as provided for and as defined by the Borough Code.

BOROUGH ENGINEER - the person or organization duly employed by the Borough as consultant and authorized to inspect the results of the performance of the work under contract by the contractor, acting directly or through properly authorized agents, engineers, assistants, inspectors, or other representatives, acting severally within the scope of the particular duties entrusted to them. The word "engineer" shall include the officers, agents, and employees of the engineer. In cases where the Borough does not employ a consultant, the word "Borough" is substituted for "engineer" throughout these specifications.

BUILDING - any combination of materials forming any structure which is erected on the ground and permanently affixed thereto, designed, intended, or arranged for the housing, shelter, storage, having enclosing walls and roof, or enclosure of persons, animals, or property of any kind.

BUILDING AREA - the total of areas taken on a horizontal plane at the main grade level of the principal building and all accessory buildings, exclusive of uncovered porches, terraces, and steps.

BUILDING COVERAGE - that percentage of a lot area which is covered by buildings.

BUILDING HEIGHT - a building's vertical measurement from the mean level of the ground abutting the building to a point midway between
the highest and lowest points of the roof.

BUILDING LINE - the actual line of that face of the building nearest an adjacent right-of-way or street line. This face includes sun parlors and covered porches, whether enclosed or unenclosed, but does not include steps.

CARTWAY - the surface of a street or alley available for vehicular traffic.

CERTIFICATE OF USE AND OCCUPANCY - a certificate issued and enforced by the Zoning Officer upon completion of the construction of a new building or upon a change or conversion of the structure or use of a building, which certifies compliance with all requirements and regulations as provided herein, and with all other requirements herein incorporated by reference.

CLEAR SIGHT DISTANCE - a line of unobstructed vision from a point four and one-half (4 1/2) feet above the centerline of a street to the nearest point at the top of an object four (4) inches high on the same centerline.

CLEAR SIGHT TRIANGLE - an area of unobstructed vision at street intersections defined by lines of sight between points at a given distance from the intersection of street centerlines.

COMMON OPEN SPACE - a parcel or parcels of land or an area of water or a combination of land and water within a development site and intended for the use or enjoyment of its residents, not including streets, off-street parking areas, and areas set aside for public facilities.

COMMUNITY UTILITY - for purposes of these specifications, the term "community utility" shall refer to a building, structure, or use or extension thereof which is operated, owned, or maintained by a public utility corporation, municipality, or municipal authority or which is privately owned and approved by the Pennsylvania Public Utility Commission for the purpose of providing public sewage disposal and/or treatment; public water supply, storage, and or treatment; or for the purpose of providing the transmission of energy or telephone service.

CONTRACT - the written agreement executed by and between the developer and contractor, covering the performance of the work and the furnishing of labor, materials, and service in the construction of improvements.

CONTRACTOR - party of the second part or second party to the contract, acting directly or through his authorized lawful agents, legal representatives, superintendents, or employees, appointed to act for said part in the performance of the work under contract. [Ord. 427]

COUNCIL - Borough Council.

CROSSWALK - a right-of-way, municipally or privately owned, intended to furnish access for pedestrians.

CUL-DE-SAC - a minor street originating at a through street at one end and terminating at the other end with a vehicular turnaround.
CURBLINE - a line formed by the face of the existing curb or, in its absence, the proposed curb along which curbing is or may be located.

CUT - an excavation. The difference between a point on the original ground and a designated point of a lower elevation on the final grade. Also, the material removed in excavation.

DECELERATION LANE - the portion of the roadway adjoining the traveled way constructed for the purpose of enabling a vehicle that is exiting a roadway to slow to a safe speed after it has left the mainstream of traffic.

DBH - the diameter of a tree at breast height, usually measured three and one-half (3.5) feet from the ground surface.

DETENTION BASIN - a structure designed to retard surface runoff for a period of time sufficient to cause the deposition of sediment and to reduce the velocity and volume of surface flows leaving a site, thus preventing further erosion.

DEVELOPER - any landowner, agent of such landowner, or tenant with the permission of such landowner who makes or causes to be made a subdivision of land or a land development, or who intends to develop for residential or other purposes a certain tract of land situated within the Borough.

DIVERSION TERRACE - channel or ditch, together with a ridge, constructed across a sloping land surface on the contour or with predetermined grades to intercept and divert surface runoff before it gains sufficient volume and velocity to create harmful erosion.

DIVIDED HIGHWAY - a highway divided into two (2) or more roadways and so constructed as to impede vehicular traffic between the roadways by providing an intervening space, physical barrier, or clearly indicated dividing section.

DOUBLE FRONTAGE LOT - a lot with front and rear street frontage.

DRAINAGE EASEMENT - a right-of-way granted to use private land to facilitate the flow of water as deemed necessary by the Borough within which the owner shall erect no permanent structures, but may use the land in any other way not inconsistent with the grantee's rights.

DRAINAGE FACILITY - any ditch, gutter, pipe, culvert, storm sewer, or other structure designed, intended, or constructed for the purpose of diverting surface waters from or carrying surface waters off streets, public rights-of-way, parks, recreational areas, or any part of any subdivision, land development, or contiguous land areas.

DRAWINGS or PLANS - collectively, all of the drawings or plans (or reproductions of them) pertaining to the construction of the project and attached to the contract or otherwise made a part thereof; such supplementary drawings as may be issued from time to time in order to elucidate or clarify said contract drawings or to show details which are not shown thereon.

DRIVEWAY - every entrance or exit used by vehicular traffic to or from properties abutting a highway.
DRIVEWAY WIDTH - the narrowest width of a driveway measured perpendicular to the centerline of the driveway.

EARTHMOVING ACTIVITY - land disturbance activity resulting in the movement of earth or stripping of vegetative cover from the earth.

EASEMENT - a right of way granted for limited use of land for public, quasi-public, or private purpose.

EGRESS - the exit of vehicular traffic from abutting properties to a highway.

EQUIPMENT - all machinery and equipment, together with the necessary supplies for upkeep and maintenance, and also tools and apparatus necessary for the proper construction and completion of the work.

EROSION - the removal of surface materials by the action of natural elements.

EXCAVATION - an act by which earth, sand, gravel, rock, or any other similar material is dug into, cut, quarried, uncovered, removed, displaced, relocated, or bulldozed and shall include the conditions resulting therefrom.

FILL - any act by which earth, sand, gravel, rock, or any other material placed, pushed, dumped, pulled, transported, or moved to a new location above the natural surface of the ground or on top of the stripped surface, and shall include the conditions resulting therefrom. The difference in elevation between a point on the original ground and a designated point of higher elevation on the final grade. The material used to make a fill. [Ord. 427]

FLOODPLAIN - the area along a natural watercourse which is periodically overflowed by water therefrom.

FRONTAGE WIDTH - the distance along the right-of-way line in front of an abutting property.

GROUND WATER RECHARGE - replenishment of geologic structures and rock or soil interstices which have the capacity to store water.

HALF or PARTIAL STREET - a street, generally parallel and adjacent to a property line, having a right-of-way width less than normally required for a satisfactory improvement and use of the street.

HIGH VOLUME DRIVEWAY - a driveway used or expected to be used by more than one thousand five hundred (1,500) vehicles per day.

HIGHWAY - a highway or bridge on the system of Borough or State highways and bridges, including the entire width between right-of-way lines, over which the Borough or State has assumed or has been legislatively given jurisdiction.

IMPERVIOUS SURFACES - materials which are impenetrable and thus unable to absorb liquids.

IMPROVEMENTS - those physical additions and changes to the land that may be necessary to produce usable and desirable development.

IMPROVEMENTS AGREEMENT - a list of improvements prepared by the
Borough Engineer, which the developer agrees to install as a prerequisite to final plan approval.

INFILTRATION STRUCTURE - a structure designed to direct the flow of rain into storage in geologic structures, such as French drains Dutch drains, seepage pits.

INGRESS - entry of vehicular traffic from abutting properties to a highway.

INSPECTION - the examination of the work performed by the contractor to ascertain its conformity with these specifications.

INTERIOR STREETS - private streets which provide vehicular movement between two (2) public streets. Public street standards shall not apply to interior streets. [Ord. 570]

INTERIOR DRIVES - private drives which provide vehicular movement between a street or interior street and a tract of land containing any use other than one single family dwelling unit or farm. Public street standards shall not apply to interior drives. [Ord. 570]

INTERMEDIATE ISLAND - the section of right-of-way between driveways from the pavement edge or curb to the property line.

JOINT-USE DRIVEWAY - a driveway shared by and constructed to provide access to two (2) or three (3) properties.

LAND DEVELOPMENT - any of the following activities:

1. The improvements of one (1) lot or two (2) or more contiguous lots, tracts or parcels of land for any purpose involving:

   (a) A group of two (2) or more residential or nonresidential buildings, whether proposed initially or cumulatively, or a single nonresidential building on a lot or lots regardless of the number of occupants or tenure; or,

   (b) The division or allocation of land or space, whether initially or cumulatively, between or among two (2) or more existing or prospective occupants by means of, or for the purpose of streets, common areas, leaseholds, condominiums, building groups or other features;

2. A subdivision of land.

3. "Land development" does not include development which involves:

   (a) The conversion of an existing single family detached dwelling or single family semi-detached dwelling into not more than three (3) residential units, unless such units are intended to be a condominium;

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

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

[Ord. 427]

LANDOWNER - the legal or beneficial owner or owners of land, including the holder of an option or contract to purchase (whether or not such option or contract is subject to any condition), a lessee if he is authorized under the lease to exercise the rights of the landowner, or other person having a proprietary interest in land, shall be deemed to be a landowner for the purposes of these specifications.

LIMITED ACCESS HIGHWAY - a highway to which owners or occupants of abutting lands and other persons have no legal right of access except at points and in the manner determined by the Borough or State.

LOT - a designated parcel, tract or area of land established by a plan, whether preliminary or final, or otherwise established as permitted by law and to be used, developed, or built upon as a unit.

LOT AREA - the area of land included within the title lines of a lot except that area within the title lines set aside as right-of-way for a street.

LOT COVERAGE - that percentage of a lot area which is covered by impervious materials, including buildings, structures, sidewalks, driveways, and parking lots.

LOT LINE - any line dividing one lot from another or from a street right-of-way.

LOT WIDTH - the width measured at the setback line between side lot lines and parallel to the front lot line.

LOW VOLUME DRIVEWAY - a driveway used or expected to be used by more than twenty-five (25) but less than seven hundred fifty (750) vehicles per day.

MEDIAN - any structure or area which separates the paved traveled ways for opposing directions of traffic.

LOW VOLUME DRIVEWAY - a driveway used or expected to be used by more than seven hundred fifty (750) but less than one thousand five hundred (1,500) vehicles per day.

MEDIAN VOLUME DRIVEWAY - a driveway used or expected to be used by not more than twenty-five (25) vehicles per day.

MEDIAN VOLUME DRIVEWAY - a residential or other driveway which is used or expected to be used by not more than twenty-five (25) vehicles per day.

MINIMUM USE DRIVEWAY - a residential or other driveway which is used or expected to be used by not more than twenty-five (25) vehicles per day.

PARKING LOT - an off-street surfaced area designed solely for the parking of motor vehicles, including driveways, passageways, and maneuvering space appurtenant thereto.

PARKING LOT - an off-street surfaced area designed solely for the parking of motor vehicles, including driveways, passageways, and maneuvering space appurtenant thereto.

PAVED AREA - when required under these specifications, that amount of land required for the location of adequate parking space, driveways, or other access roads. In the computation of such, the actual building area shall be excluded.
PAVEMENT EDGE - the edge of the main traveled portion of any highway, exclusive of shoulder.

PEAK DISCHARGE - the maximum rate of flow of water at a given point and time resulting from a predetermined storm.

PERSON - the word "person" includes an individual, corporation, partnership, incorporator's association, or any other similar entity.

[Text continued on p. 243]
PLAN, PRELIMINARY - a tentative subdivision or land development plan, in lesser detail than the final plan, indicating the approximate proposed layout of the area to be subdivided and/or developed as a basis for consideration prior to preparation of the final plan.

PLAN, FINAL - a complete and exact subdivision or land development plan prepared by official recording as required by statute, to define property rights, proposed streets, and other public improvements.

PLAN, SKETCH - an informal plan, not necessarily to exact scale, indicating salient existing features of a tract and its surroundings and general layout of the proposed subdivision or land development.

PLANNING COMMISSION - the Planning Commission of the Borough of New Holland.

PLANTING STRIP - the unpaved portion of a street right-of-way.

PRIVATE - any activity limited to members of an organization or to persons specifically invited, where no advertisement of inducement has been made to the general public.

PROJECT - all the necessary performance, services, and materials required for the satisfactory completion of the work under contract as described in the specifications and shown on the drawings.

PROPERTY LINE CLEARANCE - the distance measured along the pavement edge or curb between the property frontage boundary line and the near edge of the driveway.

PUBLIC - any use in which the general public is involved.

PUBLIC SEWERAGE SYSTEM - a sewage disposal and treatment facility complying with all of the requirements and duly approved by the Department of Environmental Resources, and owned and operated by a municipality, municipal authority, or public utility as defined and regulated by the Pennsylvania Public Utility Commission.

PUBLIC WATER SERVICE - the supplying of safe, palatable, and potable water in sufficient quantities for the proposed use, including fire protection. Said water to be supplied by, and only by, a municipality or municipal authority.

PUBLICATION 43 - a Pennsylvania Department of Transportation publication, sometimes called "Bulletin 43," containing requirements for the maintenance and protection of traffic on construction projects.

PUBLICATION 68 - a Pennsylvania Department of Transportation publication containing regulations governing the design, location, and operation of all official traffic signs, signals, and markings on and along the highways.

PUBLICATION 90 - a Pennsylvania Department of Transportation publication containing requirements for work area traffic control during highway maintenance operations and utility work.

RETENTION BASIN - a reservoir, formed from soil or other material, which is designed to retain permanently a certain amount of storm water from a catchment area and which also may be designed to detain
temporarily additional storm water runoff from the catchment area. Retention basins also may receive fresh water from year round streams. Retention basins always contain water, and thus may be considered man-made lakes or ponds.

REVERSE FRONTAGE LOT - a lot extending between an arterial or collector street and a local street, and having frontage on both, with vehicular access solely from the local street.

RIGHT-OFF-WAY - a strip of land granted for public or private use.

ROADWAY - that portion of a highway improved, designed, or ordinarily used for vehicular travel, exclusive of the sidewalk or shoulder.

RUNOFF - the surface water discharge or rate of discharge of a given watershed after a fall of rain or snow that does not enter the soil, but runs off the surface of the land.

RUNOFF FROM A FULLY DEVELOPED AREA UPSTREAM - the surface water runoff that can be reasonably anticipated upon maximum development of that area of the watershed located upstream from the subject tract, as permitted by prevailing zoning or comprehensive plan.

SEDIMENT - solid material, both mineral and organic, that is in suspension, is being transported, or has been moved from its site of origin by water.

SEDIMENTATION - the process by which mineral or organic matter is accumulated or deposited by moving wind, water, or gravity. Once this matter is deposited (or remains suspended in water), is usually referred to as "sediment."

SETBACK - the lateral distance between the right-of-way line and the roadside building, liquid fuel pump island, display stand, or other object, which will result in space for vehicles to stop or park between such object and the right-of-way line.

SETBACK LINE - a line parallel to and at a prescribed distance from a public or private street as specified in the Zoning Ordinance [Chapter 27], which determines an area within which no structure may be erected; the minimum front yard requirement.

SHOULDER - the portion of the roadway, contiguous to the traffic lanes, for accommodation of stopped vehicles, for emergency use, and for lateral support of base and surface courses and pavements.

SHOULDER LINE - the intersection of the shoulder slope with the side slope or ditch slope.

SIDEWALK - a paved walkway, continuous for a reasonable distance and an integral part of the highway, constructed solely for the use by pedestrians.

SINGLE AND SEPARATE OWNERSHIP - the ownership of a lot by one (1) or more persons, which ownership is separate and distinct from that of any adjoining property.

SLOPE - the face of an embankment or cut section; any ground whose surface makes an angle with the plane of the horizon. Slopes are usually expressed in a percentage based upon vertical difference.
in feet per one hundred (100) feet of horizontal distance.

SOIL STABILIZATION - chemical or structural treatment of a mass of soil to increase or maintain its stability or otherwise improve its engineering properties.

SPECIFICATIONS - collectively, all of the definitions, descriptions, directions, provisions, requirements, terms, and stipulations contained in these specifications, and all written supplements thereto.

STABILIZED MATERIAL - any aggregate such as aggregate cement, aggregate bituminous, or lime pozzolan, placed in such a manner as to provide a smooth, stable, all-weather surface not subject to undue raveling.

STOPPING SIGHT DISTANCE - the distance required by a driver traveling at a given speed to stop the vehicle after an object on the roadway becomes visible to the driver.

STREET - a street, avenue, boulevard, road, highway, freeway, parkway, lane, alley, viaduct, and any other strip of land including the entire right-of-way used or intended to be used by vehicular traffic or pedestrians whether public or private.

STREET, PRIVATE - those streets not offered for dedication.

STREET CENTERLINE - the center of the surveyed street right-of-way, or where not surveyed, the center of the traveled cartway.

STREET LINE - a street line is the right-of-way line of a public street or the cartway line of a private street.

SUBCONTRACTOR - a person, firm, or corporation having a direct contract with the contractor to perform part of the latter's contract; such as one who installs or furnishes and installs equipment forming a permanent part of the contract work, or who furnishes labor for work required by contract in accordance with the plans and specifications. This term does not include individual workmen furnishing labor only, nor one who merely furnishes material not worked to a special design.

SUBDIVIDER - the owner of a subdivision or the authorized agent of the owner.

SUBDIVISION - the division or redivision of a lot, tract, or parcel of land by any means into two (2) or more lots, tracts, parcels, or other divisions of land including changes in existing lot lines for the purpose, whether immediate or future, of lease, partition by the court for distribution to heirs or devisees, transfer of ownership or building or lot development; provided, however, that the subdivision by lease of land for agricultural purposes into parcels of more than ten (10) acres, not involving any new street or easement of access or any residential dwelling, shall be exempted.

SUBDIVISION, MINOR - a subdivision of land of not more than three (3) lots, not involving a planned development, any new street or the extension of any off-tract improvements.

SUBDIVISION, MAJOR - any subdivision not classified as a minor
subdivision.

SUPPLEMENT - an amendment to a permit issued by the Borough.

SWALE - a low lying stretch of land which gathers or carries surface water runoff.

TOP SOIL - surface soils and subsurface soils which presumably are fertile soils and soil material, ordinarily rich in organic matter or human debris. Topsoil is usually found in the uppermost soil layer called the A Horizon.

TRAVELED WAY - the portion of the roadway for the movement of vehicles, exclusive of shoulders and auxiliary lanes.

TRAFFIC CONTROL DEVICE - any sign, signal, marking, or device placed or erected for the purpose of regulating, warning, or guiding vehicular traffic or pedestrians or both.

TURNING RADIUS - the radius of an arc which approximates the turning path of the exterior corner of a vehicle.

VEHICLE - every device in or by which any person or property is or may be transported or drawn upon a highway. The term includes special mobile equipment as defined in the Vehicle Code.

WATERCOURSE - a permanent stream, intermittent stream, river, brook, creek, channel, or ditch for water, including both natural and man-made.

YARD - the unobstructed open space around a building or structure on the same lot.

YARD, FRONT - an open, unoccupied space on the same lot with a building or structure, extending the full width of the building or structure projected to the side lines of the lot. The depth of the front yard shall be measured between the street line and the front line of the building or structure nearest thereto.

YARD, REAR - an open, unoccupied space on the same lot with a building or structure, extending the full width of the building or structure projected to the side lines of the lot. The depth of the rear yard shall be measured between the rear line of the lot and the rear line of the building or structure nearest thereto.

YARD, SIDE - an open, unoccupied space on the same lot with a building or structure, situated between the building or structure and the side line of the lot and extending from the front yard to the rear yard. Any lot line not a rear line or a front line shall be deemed a side line. A building or structure shall not extend into the required side yard.

ZONING PERMIT - a permit stating that the purpose for which a building or land is to be used is in conformity with the uses permitted in and all other requirements of the Zoning Ordinance [Chapter 27] for the district in which it is located or is to be located.

ZONING OFFICER - the duly constituted municipal official designated to administer and enforce the Zoning Ordinance [Chapter 27] in accordance with its literal terms.

1. Compliance with Procedures.

A. In order to discharge the duties imposed by law, the Borough Council of the Borough of New Holland has adopted the following procedures, which shall be observed by all subdividers and land developers. No subdivision or land development shall be permitted within the Borough of New Holland unless a plan for such subdivision or land development has been prepared and approved in accordance with the provisions of this Chapter.

B. All plans and surveys shall be prepared in accordance with the Act of May 23, 1945 (P.L. 913, No. 367), known as the “Professional Engineers Registration Law.”

2. General Procedures.

A. Classification of Subdivision and Land Development. Whenever any subdivision of land or land development is proposed, and before any permit for the erection of a structure in such proposed subdivision or land development shall be granted, the developer, or his authorized agent, shall apply for and secure approval of such proposed subdivision or land development in accordance with the following procedure, which includes basically two (2) steps for a minor subdivision or land development and three (3) steps for a major subdivision or land development.

(1) Minor Subdivision or Land Development.
   (a) Final Plan.

[Ord. 427]

(2) Major Subdivision or Land Development.
   (a) Sketch Plan.
   (b) Preliminary Plan.
   (c) Final Plan.

B. Official Submission Dates.

(1) For the purpose of these regulations, for both major and minor subdivisions and land development plans, the plans shall not be deemed to have been submitted and Council shall not be required to accept any incomplete submission, and the same shall be refused as incomplete by Council if any insufficient number of copies of any required attachments, plans, or applications are not submitted or if the requisite fee is not paid in full. If Council holds any portion of the submission, pending receipt of the balance thereof, the same shall not be deemed to have been received by the Secretary for any purpose until the date and time of the submission of the last item required to be submitted.

(2) Upon receipt of the complete subdivision or land development application, plans and requisite approvals and the
number of copies mandated hereunder, together with the appropriate fee in full, the Secretary shall note the date and time of submittal, and shall also note the date and time of the next Planning Commission or Borough Council meeting, whichever first occurs, which said meeting date shall for purposes of computation of time and all other relevant purposes be deemed the date of submittal.

   A. Scope and Authority.
      (1) The submission of a sketch plan is not mandatory and is intended to facilitate the review and approval of preliminary and/or final plans. Developers are strongly urged to submit a sketch plan in sufficient detail for a determination to be made by Borough Council concerning the classification of the proposed subdivision or land development.
      (2) In any event, all subdivisions and land developments for which sketch plans have not been submitted in sufficient detail to enable such classification shall be deemed major subdivisions or land developments, and shall be required to comply with all preliminary and final plan requirements of these regulations. The submission of a sketch plan shall not preclude the applicant from proceeding with preliminary and final plan application as required prior to the approval of the sketch plan by Borough Council.

   B. Discussion of Plan Contents. Before preparing the sketch plan for a subdivision or land development, the applicant should discuss with the Planning Commission the procedure for adoption of a subdivision or land development plan and the requirements as to general layout of streets and for reservations of land, street improvements, drainage, sewerage, fire protection, and similar matters, as well as the availability of existing services. The Planning Commission may also advise the applicant, where appropriate, to discuss the proposed subdivision or land development with those officials who must eventually approve these aspects of the plan coming within their jurisdiction.

   C. Application Procedure and Requirements. No formal sketch plan application is required. However, prior to developing land, an owner of the land, or his representative, may file an application for approval of a sketch plan. The application should be in conformance with the following:
      (1) Be made on forms available at the Borough Office.
      (2) Include all contiguous holdings of the owner, including land in the "same ownership," as defined herein, with an indication of the portion which is proposed to be subdivided, accompanied by an affidavit of ownership, which should include the dates the respective holdings of land were acquired, together with the book and page of each conveyance to the present owner as recorded in the County Recorder of Deed's office. The affidavit should advise as to the legal owner of the property, the contract owner of the property, and the date the contract of sale was executed. If the applicant is the equitable owner, or agent of the record owner, a statement from the record owner should be
(22, §103(3), cont'd)

submitted which authorizes the submission of the application.

(3) Be accompanied by a minimum of ten (10) copies of the sketch plan as described in these regulations and complying in all respects with these regulations.

(4) Be presented to the Borough Secretary in duplicate.

(5) Include an address and telephone number of an agent who shall be authorized to receive all notices required by these regulations.

D. Classifications. Tentative classification of the sketch plan shall be made at this time by the Planning Commission as to whether the subdivision or land development is a major or minor subdivision or land development as defined in these regulations. Subsequent to classification of the subdivision or land development by the Planning Commission, the Borough Council shall place the matter on its next available regular meeting agenda for formal approval of the sketch plan classification and any waivers of the provisions of this Chapter. Subsequent to such approval by Borough Council, the applicant may proceed directly to the filing of an application for approval of a final subdivision or land development plan as provided in these regulations. If classified as a major subdivision or land development, the applicant must first file an application for approval of a preliminary plan, as provided in these regulations, before filing for final plan approval.

E. Study of Sketch Plan. The Planning Commission shall consider the sketch plan and shall submit its recommendation to Borough Council at its next regular meeting following the completion of the Planning Commission's review. The recommendations of the Planning Commission shall:

(1) Recommend the appropriate classification of the proposed subdivision or land development.

(2) Identify plan submittals and site improvements which may be required by this Chapter.

(3) Recommend any appropriate waivers to the provisions of this Chapter.

F. Substance of Planning Commission Review. The Planning Commission shall study the sketch plan, taking into consideration the requirements of this Chapter and the best use of the land being subdivided. Particular attention will be given to the arrangement, location, and width of streets, their relation to the topography of the land, sewage disposal, drainage, retention of storm water, lot sizes and arrangement, natural features, the further development of adjoining lands as yet unsubdivided, and the requirements of the Official Map and Comprehensive Plan as adopted by the Borough.

G. Approval of Sketch Plan. After reviewing and discussing the sketch plan and recommendations of the Planning Commission, Borough Council will advise the applicant of the specific changes or additions, if any, it will require in the layout, and the character and extent of required improvements and reservations which it will require as a prerequisite to the approval of the subdivision plan or
land development. Council may require additional changes as a result of further study of the subdivision or land development in final form. Said approval shall constitute authorization to prepare and submit a final plan in the case of a minor subdivision or land development and authorize appropriate waivers to the provisions of these regulations.


A. Application Procedure and Requirements. The applicant shall submit to the Borough two (2) copies of the prescribed application. The application shall:

(1) Be made on forms available at the Borough Office together with the appropriate filing fee.

(2) Be accompanied by twelve (12) copies of the preliminary plan and six (6) copies of the required accompanying material as described in these regulations.

(3) Be presented to the Borough Secretary.

(4) The preliminary plan with supporting data prepared in accordance with the requirements set forth in Article V of the Act and subsection (A), above, shall be submitted in twelve (12) copies.

(5) The Borough shall review the application to determine if all application and plan requirements are submitted and accompanied by the required filing fee before such plan is accepted for formal filing.

(6) The ninety (90) day period for approval begins on the date of the first regular meeting of the Planning Commission following the date on which the application is filed, provided that should this next regular meeting occur more than thirty (30) days following the filing date, the ninety (90) day period shall be measured from the thirtieth (30th) day following the date on which the application has been filed.

B. Preliminary Plan Approval.

(1) If the preliminary plan does not include the total land area held by the developer, a sketch plan shall be submitted for all areas which could be available for future subdivision or land development.

(2) The review by the Borough Engineer shall include an examination of the content of the plan to be certain that all information required by this Chapter is presented in the plan submitted, an investigation of the plan to be certain that all Borough ordinances are complied with, and an examination of the engineering feasibility of the various schemes presented for the location, alignment, and grade of streets, stormwater drainage, sanitary sewers and water supply. The Borough Engineer shall confer with the developer to the extent necessary to obtain conformity of the plan with these regulations and to comment upon the matter subject of his review. The Borough Engineer shall forward his comments on the plan to the Planning Commission within twenty (20) days from the date of plan submission.
(3) Upon receipt of the comments of the Borough Engineer and the Lancaster County Planning Commission, the Planning Commission shall, at its next scheduled public meeting, examine the plan with particular emphasis on determining the suitability of the plan for the development of the site and its relationship to the harmonious extension of streets and utilities, arrangement and density of housing or other uses, and compatibility of the plan with the Comprehensive Plan for the Borough. The comments and recommendations of the Planning Commission, along with the comments of the Borough Engineer and the Lancaster County Planning Commission, shall be forwarded to Council within five (5) days after completion of the Planning Commission's review.

(4) During the course of the Planning Commission's review of the plan and prior to any action by Borough Council within the required ninety (90) day period, the plan may be revised by the applicant. Such revision shall be made on twelve (12) copies of the plan which shall note the dates of any revisions. Where any revision is substantive, the applicant shall sign a statement withdrawing any previously submitted plan from consideration and a new ninety (90) day time period for formal review and notification shall commence from the date of submission of the revised plan. The revised plan shall be submitted to the Planning Commission not later than ten (10) working days prior to the regularly scheduled meeting of the Planning Commission.

(5) Council may, before acting on the plan, arrange for a public hearing thereon after giving such notice as Council may deem desirable in each case.

(6) In acting on the preliminary plan, Council shall review the plan and the comments of the Borough Engineer, the Planning Commission, and the Lancaster County Planning Commission and the comments from public hearings, if any, to determine its conformance to this Chapter. Council may alter any plan and specify changes of modification therein which it deems necessary, and may make its final approval subject to such alterations, changes, or modifications. In the case of subdivisions of three (3) lots or less with frontage on a paved street, Council may approve the plan as a final plan, and authorize the preparation of copies for recording.

(a) The decision shall be in writing and communicated to the applicant personally or mailed to him at his last known address not later than fifteen (15) days following the decision.

(b) When the application is not approved in terms as filed, the decision shall specify the defects found in the application and describe the requirements which have not been met and shall, in each case, cite the provisions of the ordinances or regulations relied upon.

(c) Failure of Borough to render a decision and communicate it to the applicant within ninety (90) days from the official filing date shall be deemed an approval of the application in terms as presented, unless the applicant has
agreed in writing to an extension of time or change in the prescribed manner of presentation of communication of the decision; in which case, failure to meet the extended time or change in manner of presentation of communication shall have like effect.

(d) Approval of the preliminary plan shall constitute approval of the development as to the character and intensity, the arrangement and approximate dimensions of streets, lots and other planned features, but shall not authorize the sale of lots, the lease of land, buildings or portions of buildings, or the development of land.

5. Final Plan.

A. Application Procedure and Requirements. Within one (1) year following the approval of the sketch plan in the case of a minor subdivision or land development, or of the preliminary plan in the case of a major subdivision or land development, the applicant, if he wishes to proceed with the subdivision or land development, shall file with Borough Council an application for final plan approval. The ninety (90) day period for approval also applies to final plan submission. See §103(4)(A)(6). Unless an extension of time has been granted by Borough Council upon written request, a plan submitted after the one (1) year period shall be considered a new preliminary plan, and shall be required to comply with all preliminary plan application procedures and requirements of this Chapter. The application shall be in conformance with the following:

1. Be made on forms available at the Borough Office together with the appropriate filing fee.

2. Be accompanied by twelve (12) copies of the final plan and six (6) copies of the required accompanying material as described in these regulations.

3. Comply in all respects with the sketch plan or preliminary plan, depending upon the classification of the subdivision or land development.

4. Be presented to the Borough Secretary.

5. The plan may not be submitted until the Department of Environmental Resources and all other proper reviewing authorities have finally approved the supplement or revision of the Borough sewage facilities plan. The final plan and application shall be accompanied by the following:

   a. The water quality management permit issued by the Department of Environmental Resources.

   b. The approval of the soil conservation service or the permit issued by the Department of Environmental Resources as appropriate for sedimentation and erosion control.

   c. The approved supplement or revision to the Borough sewage facilities plan.

   d. All other necessary prior approvals of the Borough
of New Holland and any and every other government body, agency, or authority.

(6) The final plan with supporting data prepared in accordance with the requirements set forth in Article V of the Act and subsection (A), above, shall be submitted in sixteen (16) copies.

(7) Borough Council shall review the application to determine if all application and plan requirements are submitted and accompanied by the required filing fee before such plan is accepted for formal filing.

B. Final Plan Approval. No final plan shall be signed by the Borough for recording in the office of the Lancaster County Recorder of Deeds unless all improvements required by this Chapter have been installed or necessary security is posted. The final plan as submitted may provide for development of the premises in stages or by sections. The final plan may request approval of one (1) or more of such stages or sections. However, all such final plans shall comply with the preliminary plan of the entire premises as approved by Council.

(1) The review by the Borough Engineer shall include an examination of the content of the plan to be certain that all information required by this Section and by Council in its review of the preliminary plan are presented in the plan submitted, an investigation of the plan to be certain that all Borough ordinances are complied with, and an examination of the engineering feasibility of the final designs presented for the location, alignment and grade of streets, stormwater drainage, sanitary sewers and water supply. The Borough Engineer shall forward his comments on the plan to the Planning Commission within twenty (20) days.

(2) During the course of the Planning Commission's review of the plan and prior to any action by Borough Council within the required ninety (90) day period, the plan may be revised by the applicant. Such revision shall be made on twelve (12) copies of the plan which shall note the dates of any revisions. Where any revision is substantive, the applicant shall sign a statement withdrawing any previously submitted plan from consideration and a new ninety (90) day time period for formal review and notification shall commence from the date of submission of the revised plan. The revised plans shall be submitted to the Planning Commission not later than ten (10) working days prior to the regularly scheduled meeting of the Planning Commission.

(3) Upon receipt of the comments of the Borough Engineer and the Lancaster County Planning Commission, the Planning Commission shall, at its next scheduled public meeting, review the plan and within five (5) days submit in writing to the Council its recommendations for the approval or disapproval of the plan and the reasons therefor.

(4) Upon the Planning Commission's recommendation for approval of the final plan, the Borough Engineer shall estimate
the cost of all public improvements.

(5) Upon receipt of the recommendation of the Planning Commission, Council shall review the final plan at the next scheduled public meeting or at a special meeting for that purpose and shall approve or disapprove the plan.

(a) The decision shall be in writing and communicated to the applicant personally or mailed to him at his last known address not later than fifteen (15) days following the decision.

(b) When the application is not approved in terms as filed, the decision shall specify the defects found in the application and describe the requirements which have not been met and shall, in each case, cite the provisions of the ordinance or regulations relied upon.

(c) Failure of the Borough to render a decision and communicate it to the applicant within ninety (90) days from the official filing date shall be deemed an approval of the application in terms as presented, unless the applicant has agreed in writing to an extension of time or change in the prescribed manner of presentation of communication of the decision; failure to meet the extended time or change in manner of presentation of communication shall have like effect.

(d) Approval of the final plan shall constitute approval of the development as to the character and intensity, the arrangement and approximate dimension of streets, lots, and other planned features, but shall not authorize the sale of lots, the lease of land, buildings or portions of buildings, or the development of land.

(6) Every final approval of a plan shall be subject to the following conditions:

(a) The owner shall agree in writing, in a form to be approved or prepared by the Solicitor of the Borough, that he will layout the roads, streets, lanes, or alleys and construct all of the improvements, including necessary grading, paving, curbs, gutters, sidewalks, streetlights on steel poles, fire hydrants, water mains, street signs, storm sewers and sanitary sewers where these improvements are shown on the final plan or the application submitted to the Borough, or where these improvements are required as a condition of the approval of the plan by Council, within the time or times therein specified.

(b) The owner shall assure the Borough by means of a proper guaranty, in the form of a bond or deposit of funds or securities in escrow sufficient to cover the cost of the aforesaid improvements as estimated by the Borough Engineer, that said improvements shall subsequently be installed by the owner. The bond shall be furnished under such conditions and form and surety as shall be approved by Council to guarantee and secure the completion of the said streets and
improvements. In lieu of a bond, the owner may deposit cash or securities with the Borough or a bank or trust company or a construction mortgagee (if such construction mortgagee will reserve or segregate a sufficient amount necessary from the construction funds for the payment of the cost of such improvements) to guarantee and secure completion of the improvements, upon an escrow agreement to be prepared and approved by the Borough Solicitor and approved by Council. The escrow agent for the deposit of such cash or securities shall be designated and selected or approved by Council.

(c) The owner shall agree, if requested, to tender a deed of dedication to the Borough for such streets and any and all easements for sanitary sewers or storm sewers and improvements thereto, including street paving, curbs, sidewalks, sanitary and storm sewers, manholes, inlets, pumping stations, and other appurtenances as shall be constructed as public improvements and as are required for the promotion of public welfare, after all streets, curbs, sidewalks, and sewers are completed and such completion is certified as satisfactory by the Borough Engineer. Council may require that the owner supply a title insurance certificate from a reputable company before any property is accepted for the Borough.

(7) Upon completion of necessary reviews of final plans, the developer shall present clear, reproducible copies of all final plans for formal approval by Council. Two (2) black-on-white prints of the plans which are submitted for approval shall be supplied to the Borough. [Ord. 427]

(8) After final approval, the plan shall be recorded by the developer in the Office of the Recorder of Deeds of Lancaster County within ninety (90) days. One (1) copy of the recorded plan shall be returned for the Borough Secretary's file within fifteen (15) days after recording.

(9) The Borough shall have the right to approve any plan subject to conditions. The failure of the applicant to either accept or reject such conditions within ten (10) days of the date of approval of such plan shall result in an automatic recision of such approval. The Borough shall render a written decision supporting any conditions within fifteen (15) days of the date of action by the Borough approving such plan subject to conditions.

6. Waiver or Modification of Plan Requirements. When an entire tract of land is divided into not more than three (3) lots with frontage on a paved street of sufficient width and none of the lots are intended for further subdivision, the Planning Commission and Borough Council may waive the requirements for separate submittal of a final plan upon written application of the subdivider. The plan must include a statement that none of the lots are intended for further subdivision as well as a plan to scale providing all of the boundary dimensions of the tract and of the proposed lots, the location of proposed buildings if any, the width of abutting streets and any other information the Planning Commission or Council may acquire. Waivers or
modifications will not be granted for Sections of this Chapter pertaining to mandatory requirements of any Act 167 Stormwater Management Plan governing the Borough of New Holland. [Ord. 460]

7. Fees.

A. To defray a portion of the expenses of plan review, fees shall payable to the Borough at the time of filing the plan, which fees shall be as established or amended from time to time by resolution or ordinance of Borough Council.

B. The developer shall pay the reasonable and necessary charges incurred by the Borough for professional consultants or engineers, in the review of any plan, and reporting on such plan to the Borough. Such review fee shall be based upon a schedule established by ordinance or resolution adopted by the Borough.

C. The Borough Engineer shall prepare an estimate of the cost of plan review, necessary tests, and inspections. The developer shall deposit in escrow amounts equal to these estimates in separate accounts if required by the Borough. One (1) account shall be established for plan review and another for tests and inspections.

8. Submittal of Plans to Other Agencies. The developer shall be responsible for submitting plans to the following agencies:

A. Lancaster County Planning Commission.

B. Pennsylvania Department of Environmental Resources.

C. Pennsylvania Department of Transportation.

D. Lancaster County Conservation District.

9. Waivers and Modifications. The Borough may grant waivers or modifications of maximum standards as established pursuant to this Chapter when literal enforcement will exact undo hardship because of peculiar conditions pertaining to the land in question, provided that such modifications will not be contrary to the public interest and that the purpose and intent. of the Chapter is observed. All requests for a modification or waiver shall be in writing and shall accompany and be a part of the original application. Any such requests shall state in full the grounds and facts of unreasonableness or hardship on which the request is based, the provision or provisions of the Chapter involved and the minimum modification necessary. Waivers or modifications will not be granted for Sections of this Chapter pertaining to mandatory requirements of any Act 167 Stormwater Management Plan governing the Borough of New Holland. [Ord. 460]


§104. Plan Requirements.
1. **Subdivision Sketch Plan.** The subdivision sketch plan shall be submitted by the subdivider as a basis for informal discussion with the Borough Planning Commission and Borough Council.

A. Data furnished in a sketch plan shall be at the discretion of the developer. For fullest usefulness, it is suggested that a sketch should include the following information:

   1. An application together with the appropriate filing fee.
   2. Tract boundary.
   3. A location map depicting the use of adjoining properties.

[Text continued on following page.]
(4) North point.
(5) Streets on and adjacent to the tract.
(6) Topographical and physical features both natural and man-made which may affect the development of the site.
(7) Proposed general street layout.
(8) Proposed general lot layout.
(9) In the case of a land development plan, the approximate location of all existing and proposed buildings, parking compounds, and other planned features should be shown.
(10) Proposed method of water supply and sewage disposal.
(11) Soil types.
(12) Zoning applicable to the tract.

B. A sketch plan need not be to exact scale nor are precise dimensions required.

2. Preliminary Plan. In addition to an application and required filing fee, the following materials shall be submitted for consideration as the preliminary plan:

A. The preliminary plan in the form of a map or series of maps may be either black and white or blue and white prints.

(1) Drafting Standards.
   (a) The plan shall be clearly and legibly drawn at a scale of fifty (50) feet to the inch.
   (b) Dimensions shall be in feet and decimals; bearings shall be in degrees, minutes, and seconds. Lot line descriptions shall read in a clockwise direction.
   (c) The survey shall not have an error of closure greater than one (1) foot in ten thousand (10,000) feet.
   (d) The sheet size shall be no smaller than eighteen by twenty-two (18 x 22) inches and no larger than thirty by forty-two (30 x 42) inches. If the plan is prepared in two (2) or more sections, a key map showing the location of the sections shall be placed on each sheet. If more than one (1) sheet is necessary, each sheet shall be the same size and numbered to show the relationship to the total number of sheets in the plan (e.g., Sheet 1 of 5).
   (e) Plans shall be legible in every detail.

(2) Location and Identification.
   (a) The proposed project name or identifying title.
   (b) The municipality in which the project is to be located. (If the tract of land is located in the vicinity of a municipal boundary line, the location of the boundary shall be shown.)
   (c) The name and address of the owner of the tract (or
his authorized agent), the developer/subdivider, and the firm that prepared the plans.

(d) The file or project number assigned by the firm that prepared the plan, the plan date, and the date(s) of all plan revisions.

(e) A north arrow, a graphic scale, and a written scale.

(f) The entire existing tract boundary with bearings and distances. (If a landowner is going to retain a single lot with a lot area in excess of ten (10) acres, the boundary of that lot may be identified as a deed plotting and may be drawn at any legible scale; if the retained lot has a lot area of ten (10) or less acres, it must be described to the accuracy requirements of this Section.)

(g) The total acreage of the entire existing tract.

(h) The district and lot size and/or density requirements of the prevailing zoning ordinance.

(i) The location of existing lot line markers along the perimeter of the entire existing tract.

(j) A location map, drawn to scale, relating the subdivision to at least two (2) intersections of road centerlines, including the approximate distance to the intersection of the centerlines of the nearest improved street intersection.

(3) Existing Features.

(a) Existing contours at a minimum vertical interval of two (2) feet for land with average natural slope of four (4%) percent or less and at a minimum vertical interval of five (5) feet for more steeply sloping land. Contours shall be accompanied by the location of bench mark and a notation indicating the datum used. Contours plotted from the United States Geodetic Survey will not be accepted.

(b) The names and plan book record numbers of all previously recorded plans for adjacent properties.

(c) Within two hundred (200) feet of the subject tract, the location of all existing legal rights-of-way for public or private streets or drives, railroads, public or private sewer mains, aqueducts, water mains and feeders, fire hydrants, electric transmission lines, gas transmission lines, oil transmission lines, watercourses, and other features.

(d) Within the subject tract, the locations, names, and dimensions of existing streets and alleys, locations and sizes of existing sanitary sewers and storm drains, domestic water locations, locations and sizes of utilities, all buildings, floodplains, watercourses including floodplains, and approximate locations of all tree masses. [Ord. 427]
(4) Plan Information.

(a) The layout of streets, alleys, and sidewalks including cartway and right-of-way widths.

(b) The layout of lots, with approximate dimensions.

(c) Block and lot numbers in consecutive order (e.g., Block "A," Lots 1 through 10; Block "B," Lots 11 through 22).

(d) In the case of land developments, the location and configuration of proposed buildings, parking compounds, streets, access drives, driveways, and all other significant planned facilities.

(e) Total number of lots, units of occupancy, density, and proposed land use (if a multiple land use is proposed, an indication of the location of each land use).

(f) Easements.

(g) Building setback lines, with distances from the street centerline.

(h) Identification of buildings to be demolished.

(i) Typical street cross-section for each proposed street and typical cross-section for any existing street which will be improved as part of the application. Each cross-section shall include the entire right-of-way width.

(j) A statement on the plan indicating any proposed zoning amendment or variance, if applicable.

(k) A statement on the plan indicating any existing or proposed waivers granted by the Borough.

(l) Proposed street names.

(5) Certificates, Notifications, and Reports.

(a) Where the preliminary plan covers only a part of the entire landholdings, a sketch of the future street system of the unsubmitted part shall be furnished. The street system of the submitted part will be considered in light of adjustments and connections with future streets in the part not submitted.

(b) Where the land included in the subject application has an electric transmission line, a gas pipeline, or a petroleum or petroleum products transmission line located within the tract, the application shall be accompanied by a letter from the owner or lessee of such right-of-way stating any conditions on the use of the land and the minimum building setback and/or right-of-way lines. This requirement may also be satisfied by submitting a copy of the recorded agreement.

(c) Certificate, signature and seal of the surveyor, to the effect that the survey and/or plan are correct.
B. Where on-site sewage disposal facilities are anticipated, the developer shall submit a statement with regard to the suitability of the soil to absorb sewage wastes. Where, in the opinion of the Borough Engineer, doubt exists as to the ability of the soil to absorb such waste, Council may require further examinations.

C. A statement of proposed improvements, including streets, curbs, gutters, and sidewalks, including a typical cross-sectional diagram of proposed street construction and including the means of water supply and sanitary drainage to be provided.

D. A statement or certificate indicating that the plans are or are not in conformity with engineering, zoning, building, sanitation and other applicable Borough ordinances and regulations and if they are not so conforming, the reasons for requesting an exception.

E. All storm drainage calculations when deemed appropriate.

F. Tentative profiles along the centerline of each proposed street shown on the preliminary plan. Such profiles shall show natural and finished grades at a ten to one (10 to 1) horizontal to vertical scale.

G. Tentative profiles of all proposed storm sewers and sanitary sewers.

H. When connection to public water and/or sewer facilities is proposed, obtain assurance of the availability of such service. This assurance shall be in the form of a letter signed by a responsible officer of the company or authority concerned, indicating their ability and willingness to make such service available.

I. A draft of any proposed covenants to run with the land.

J. A tentative timetable for the proposed sequence of development for the subdivision or land development. The timetable may be in letter form, indicating the order in which activities will occur.

K. A planning module for land development as required by the Pennsylvania Sewerage Facilities Act.

L. A preliminary conservation/soil erosion and sedimentation control plan.

3. Final Plan. Final plans for the subdivision of land or land development shall conform in all important details with preliminary plans as reviewed by Council, and any conditions specified at the completion of review of preliminary plans shall be incorporated in the final plans. In addition to an application and required filing fee, the following shall be submitted by the developer:

A. The plans submitted for review for final approval shall be clear and legible black-on-white or blue-on-white prints of the drawings. Upon completion of review and for signature by Borough Council, clear reproducible copies of all plans shall be submitted. Space shall be provided for signature by Council on the face of the plans.

B. Final plans shall be on sheets not larger than twenty-four by
thirty-six (24 X 36) inches overall. It is recommended as far as practicable, final plan sheets be of the following overall sizes: eighteen by twenty-two (18 x 22) inches or twenty-four by thirty-six (24 x 36) inches. Where necessary to avoid sheets larger than the maximum size prescribed above, final plans shall be drawn in two (2) or more sections, accompanied by a key diagram showing relative location of the sections. The scale shall be not more than fifty (50) feet to the inch. All dimensions shall be shown in feet and hundredths of a foot.

C. Final plans shall include the following information:

(1) **Drafting Standards.** The same standards shall be required for a final plan as specified for a preliminary plan.

(2) **Location and Identification.** The same standards shall be required for a final plan as specified for a preliminary plan.

(3) **Existing Procedures.**

   (a) Existing contours, if a preliminary plan was required and the contours identified with the preliminary plan were altered, at a minimum vertical interval of two (2) feet for land with average natural slope of four (4%) percent or less, and a minimum vertical interval of five (5) feet for more steeply sloping land. Contours shall be accompanied by the location of the bench mark and a notation indicating the datum used. Contours platted from the United States Geodetic Survey will not be accepted. This information may be provided on separate sheets and is not subject to recording with the final plans.

   (b) The names of all immediately adjacent landowners and the names and plan book record numbers of all previously recorded plans for adjacent projects.

   (c) Within and immediately contiguous to the subject tract, the locations, names, and dimensions of existing streets and alleys, the locations and sizes of existing storm drainage facilities, floodplains, and all buildings.

(4) **Plan Information.**

   (a) Complete description of the centerline and the right-of-way line for all new streets. This description shall include distances and bearings with curve segments comprised of radius, tangent, arc, and chord.

   (b) Lot lines, with accurate bearings and distances, and lot areas for all parcels. Curve segments shall be comprised of arc, chord, bearing, and distance. Along existing street rights-of-way, the description may utilize the existing deed lines or road centerlines; along all proposed street rights-of-way, the description shall be prepared to the right-of-way lines.

   (c) Block and lot numbers in consecutive order (e.g., Block "A", Lots 1 through 10; Block "B", Lots 11 through 22).
(d) In the case of land development plans, the location and configuration of proposed buildings, parking compounds, streets, access drives, driveways, and all other significant facilities.

(e) Total number of lots, units of occupancy, density, and proposed land use; (if multiple land use is proposed, an indication of the location of each land use).

(f) Easements.

(g) Building setback lines, with distances from the street centerline.

(h) Identification of buildings to be demolished.

(i) Typical street cross-section for each proposed street and a typical cross-section for any existing street which will be improved as part of the application. Each cross-section shall include the entire right-of-way width.

(j) Final vertical alignment for each proposed street system.

(k) Complete curve data for all street centerline and street right-of-way line curves included in the plan, including radius, tangent, arc, and chord. Curve segments included in lot descriptions shall be comprised of arc, chord, bearing, and distance. At street intersections, tangent distance shall be included.

(l) Source of title to the land included within the subject application, as shown by the books of the Lancaster County Recorder of Deeds.

(m) Final street names.

(n) Location and material of all permanent monuments and lot lines markers, including a note that all monuments and lot line markers are set or indicating when they will be set.

(o) In the case of land development plans, a grading plan. The grading plan shall include finished grades and ground floor elevations. This information may be provided on separate sheets and is not subject to recording with the final plans.

(p) Identification of any waivers granted by the Borough.

(q) Identification of any lands to be dedicated or reserved for public, semi-public, or community use.

(5) Certificates.

(a) Certificate, signature, and seal of the engineer, surveyor, or landscape architect to the effect that the survey and/or plan are correct.

(b) A statement, duly acknowledged before an officer authorized to take acknowledgment of deeds and signed by the
landowner, to the effect that the subdivision or land development shown on the plan is the act and the deed of the owner, that all those signing are all the owners of the property shown on the survey and plan, and that they desire the same to be recorded as such. This must be dated following the last change or revision to said plan.

(c) A certificate of dedication of streets and other public property.

(d) Certificate of notification to be signed by the local municipal officials.

(e) A certificate to accommodate the Lancaster County Recorder of Deeds information.

(f) A note to be placed on the plan indicating any area that is not to be offered for dedication, if applicable.

D. Plan and profile sheets for all proposed streets. Such profiles shall show at least the following information, properly labeled:

1. Existing (natural) and proposed finished grades along the centerline and at the right-of-way line for both sides of each proposed street.

2. The length of all vertical curves.

3. Existing and proposed storm sewer mains, manholes, inlets, and culverts.

4. Existing and proposed sanitary sewer main and manholes.

5. All profiles shall show pipe crossings, storm sewers, sanitary sewers, water mains, and any other underground utility crossings.

6. Profiles shall extend to points of connection with existing lines.

7. The profile sheets shall be drawn at a ten to one (10 to 1) horizontal to vertical scale.

E. Plan and profiles showing the location, size, and invert elevations of existing and proposed sanitary sewer mains and manholes, storm sewer mains, manholes, inlets and culverts, in addition to the location of or proposed watermains and fire hydrants. This data may be shown on the final plan.

F. Restrictions required by the Borough which will run with the land and become covenants in the deeds of land shown on the drawing, subject to the approval of the Borough Solicitor.

G. All covenants running with the land governing the reservation and maintenance of dedicated or undedicated land or open spaces, subject to the approval of the Borough Solicitor.

H. Where lot sizes or number of dwelling units are based on public water and/or public sewer facilities, assurance acceptable to Borough Council that such facilities will be installed.
I. A general landscaping plan, in the case of land development, showing the location, size, and type of planting material to be installed on the site.

J. A conservation/erosion and sediment control plan.

K. Such certificates of approval by proper authorities as required by the Borough Council, including certificates approving the water supply system and sanitary sewer system of the subdivision or land development.

L. An approved plan for location and type of street lights to be installed if proposed.

M. An approved land planning module as required by the Pennsylvania Sewerage Facilities Act.

N. A statement of the type or types of structures to be erected, together with sketches of typical lot layouts indicating front, side, and rear yards, and a summary table of the number of structures and dwelling units proposed.

O. Evidence that the plans are in conformity with zoning, building, sanitation, and other applicable Borough ordinances and regulations. In any instance where such plans do not conform evidence shall be presented that an exception has been officially authorized.

P. One (1) of the following for guaranteeing improvements:

(1) A certificate from the developer, signed by the Borough Council, that all improvements, installations, and as-built plans in the subdivision or land development required by this Chapter have been made or installed in accordance with specifications; or,

(2) A bond, certified check, or other security, or guarantee satisfactory to Borough Council, and the Borough Solicitor, which shall:

(a) Be made payable to or inure to the benefit of the Borough;

(b) Be in an amount determined by the Borough to be sufficient to complete the improvements and installation and cost of preparing as-built plans in compliance with this Chapter.

(c) In the case of a bond, it shall also:

1) Be with surety satisfactory to the Borough.

2) Be in form, sufficiency, and execution acceptable to the Borough.

(d) The bond, certified check, or other securities or guarantee, shall specify the time for the completion of the required improvements. Such time shall be satisfactory to the Borough. When the improvements have been completed and approved by the Borough, the guarantee shall be released and returned. As the required improvements progress and are
approved by the Borough, a portion of the bond, monies or other security commensurate with the cost of the improvements may be released and returned.

(e) In the event that cash or its equivalent is deposited as an improvement guarantee, it shall be held in an escrow fund.

Q. Whenever a developer proposes to establish a street which is not offered for dedication to public use, Borough Council shall require the developer to submit a letter to the Borough stating such fact. There shall also be a note placed on the plan to the effect that the street is not offered for dedication to the public use and an identification of the party or parties responsible for such maintenance.

4. Modification of Requirements. The above requirements for preliminary and final plans and for supporting data may be modified by Council as warranted by special circumstances.

5. As Built Plan. The as built plan and profile sheets shall be drawn at the same scale as the final plan and profile sheets certified to by the owner of record and approved by the Borough Engineer, and shall indicate the actual location, dimensions, and/or elevations of all completed improvements including, but not limited to:
   A. Concrete monuments and iron pins.
   B. Cartway edges or top of curbs for both sides of each street.
   C. Sanitary sewer main, manholes, and laterals.
   D. Storm sewers, mains, manholes, inlets, and culverts.
   E. Water lines and fire hydrants.
   F. Street lights when applicable.
   G. Electrical and all other underground utilities.
   H. Permanent sedimentation control structures or basins.
   I. Landscaping and planting material where applicable.
   J. All easements.

   A. The conservation/soil erosion and sedimentation control plan which may be required to accompany the preliminary and shall accompany final subdivision or land development plans shall be clearly and legibly drawn to the same scale as that of the preliminary and final plans and may be in the form of a transparent overlay for the preliminary and final plans.
   B. The conservation/soil erosion and sedimentation control plan shall show the total tract boundaries of the property being subdivided or developed, and shall show:
      (1) Contour lines at vertical intervals of not more than two (2) feet.
      (2) Location and elevation to which contour elevations
refer; where reasonably practicable, datum used shall be a known, established bench mark.

(3) All existing water courses, flood hazard areas, tree masses, trees over four (4) inch caliper not part of a tree mass, and other significant natural features within the proposed development.

(4) Location and results of soil percolation tests whenever on-site disposal of sewage is planned.

C. The developer shall employ available measures for control of erosion and sedimentation and shall meet as a minimum the standards and specifications of the USDA Soil Conservation Service as then adapted for use by the Lancaster County Soil and Water Conservation District, copies of which are available from the District or as herein specified.

D. The developer shall submit data including proposed dates where relevant, to indicate that the subdivision or land development will be carried out in compliance with the following principles:

(1) The smallest practicable area of land should be exposed any one (1) time during development of construction.

(2) When land is exposed during development or construction, the exposure should be limited to the shortest practicable period of time.

(3) Temporary ditches, dikes, vegetation and/or mulching should be used to protect critical areas exposed during development or construction.

(4) Sediment basins (debris basins, desilting basins, or silt traps) should be installed and maintained to remove sediment from runoff waters from land undergoing development.

(5) Provisions should be made to accommodate effectively the released runoff caused by changed soil and surface conditions during and after development or construction.

(6) Permanent vegetation and erosion control structures should be installed as soon as practicable during construction activities.

(7) Wherever feasible, natural vegetation should be retained and protected, and natural grade alterations kept to a minimum.


§105. Permits.

1. General.

A. All work shall comply with local codes, regulations, and rules of authorities having jurisdiction. Such certification shall be provided upon completion of the work, and shall be delivered to the Borough.

B. The contractor or developer shall obtain and pay for all
permits, licenses, or other privileges necessary to complete the work. Application and payment shall be made for any necessary and required inspections, fees, fines, and costs in connection with the performance of the contract.

C. Where regulations of the National Board of Fire Underwriters, or a similar agency has jurisdiction, the contractor or developer shall file the necessary applications prior to starting the job and shall pay all fees for maintaining constant certified bi-weekly inspections by the applicable agency. Certification of these bi-weekly inspections shall be filed with the Borough.

D. If the Pennsylvania Department of Transportation requires any of their personnel to be on hand during the construction of the work, payment for such personnel shall be borne by the contractor or developer.

E. Where work is to be done by the contractor in placing any pipe or other construction under railroad tracks, or within the right-of-way of any railroad company, the contractor shall be governed by the requirements of the railroad company involved, and shall consult with the officials thereof relative to the installation. If the railroad company requires any of their personnel to be on hand during the construction of the work, payment for such personnel shall be borne by the contractor or developer.


A. The following permits shall be obtained from and are required by the Borough of New Holland:

(1) Building permit.
(2) Highway occupancy permit for installation of utilities in Borough streets, roads, highways, and public land.
(3) Sanitary sewer connection permit.
(4) Water connection permit.

B. Application for permits shall be submitted to the Borough Secretary on forms approved by the Borough and shall be accompanied by the following:

(1) The appropriate permit application fees.
(2) Four (4) sets of plans and specifications showing details of the proposed work.

(Ord. 393, 4/3/1990, §105)

§106. Laws and Regulations.

1. Observance of Laws. The contractor at all times shall observe and comply with all Federal and State laws and regulations, and local bylaws, ordinances, and regulations in any manner affecting the conduct of the work or applying to employees on the project, as well as all safety precautions and orders or decrees which have been promulgated or enacted, or which may be promulgated or enacted, by any legal bodies or tribunals having authority or jurisdiction over the work, materials, equipment, employees, or the contract; such observance and compliance shall be solely and without

(22, §105(1), cont'd)
qualification the responsibility of the contractor without reliance on superintendence or direction by the Borough or engineer. The duty of enforcement of all of said laws, ordinances, regulations, orders, or decrees lies with the body or agency promulgating them, not with the Borough or engineer.

2. Regulations of the Department of Labor and Industry. Special attention is drawn to the regulations of the Pennsylvania Department of Labor and Industry relating to wage scales, trenches and excavations, tunnel construction, equipment, materials, labor, safety, sanitation, and other regulations on which the contractor shall be fully informed and with which he shall fully comply. Observance of and compliance with said regulations shall be solely and without qualification the responsibility of the contractor, without reliance or superintendence of or direction by the Borough or Engineer. The duty of enforcing such laws and regulations lies with the said Department, not with the Borough or engineer.

3. Sanitary Conveniences. Sanitary conveniences complying with the regulations of the Pennsylvania Department of Health or other bodies having jurisdiction therewith, shall be provided for the use of the workmen and their exclusive use strictly enforced. At the completion of the work, temporary conveniences provided under this Section shall be removed, the pits shall be disinfected, and then backfilled with earth.

4. Safety Requirements.

A. The contractor shall furnish, erect, and maintain at closures, intersections, and throughout the project, all necessary approved barricades, suitable and sufficient red lights, torches, approved reflectors, danger signals, warning, and closure signs, provide a sufficient number of watchmen and take all necessary and legal precautions for the protection of the work and safety of the public. All barricades, danger signals, warning signs, and obstructions shall be illuminated at night and all lights shall be kept burning from sunset until sunrise. All materials and safety devices (i.e., barricades, flashing warning lights, torches, reflectors, and signs) which the contractor provides for the purpose of protecting the work and the safety of the public and for maintaining and protecting traffic must conform to the requirements specified in §901 of the current edition of the Commonwealth of Pennsylvania Department of Transportation Specification Form 408, and to the requirements specified in the current edition of Bulletin 42 which complements §901.

B. If and when the use of explosives is necessary for the prosecution of the work, the contractor shall observe the utmost care, so as not to endanger life or property. All explosives shall be stored in a secure and safe manner in strict conformity to all State and local regulations, and all such storage shall be clearly marked "DANGEROUS EXPLOSIVES," and shall be in care of a competent watchman at all times.

C. The safety provisions of applicable laws and regulations of the Pennsylvania Department of Labor and Industry, and building and construction codes shall be observed. Machinery, equipment, and other hazards shall be guarded in accordance with the safety provisions of the "Manual of Accident Prevention in Construction" published by the
Associated General Contractors of America, to the extent that such provisions are not in contradiction of applicable State and local laws. Observance of and compliance with said regulations shall be solely and without qualification the responsibility of the contractor, without any responsibility whatsoever on the part of the Borough or engineer. The duty of enforcing such laws and regulations lies with the said Department, not with the Borough or engineer.

D. The provisions of the "Occupational Safety and Health Act of 1970" of the U.S. Department of Labor shall be complied with in the performance of all work. Observance of and compliance with said act shall be solely and without qualification the responsibility of the contractor, without reliance or superintendence of or direction by the Borough or engineer. The duty of enforcement of the provisions of the act lies with the U.S. Department of Labor, not with the Borough or engineer.

5. Prevention of Environmental Pollution and Preservation of Public Natural Resources. The contractor shall adhere to the provisions of the Pennsylvania Act. No. 247 of 1972 relating to the prevention of environmental pollution and the preservation of public natural resources.


§107. Control of Work.

1. Authority of the Engineer.

A. General.

(1) The work shall be subject at all times to the inspection of the Engineer or his authorized assistants, who shall have free access and every facility afforded them for inspection. To prevent all disputes and litigation, the engineer shall determine the amount of quantity of the several kinds of work and the quality of materials which are to be paid for under the contract; he shall determine all questions in relation to the project and the construction thereof, and decide every question which may arise relative to the performance of the work covered by the contract on the part of the contractor.

(2) Any doubt as to the meaning of these specifications and the drawings, or any obscurity as to the wording or intent of them, will be explained by the engineer, and all directions and explanations requisite or necessary to complete, explain, or make definite any of the provisions of these specifications and drawings and give them due effect, will be given by the engineer in writing.

B. Authority to Suspend Work. The engineer shall have the authority to suspend the work, wholly or in part, due to the failure on the part of the contractor to carry out orders given, or to perform any provisions of the contract; or due to unforeseen conditions which had not been provided for in estimating the contract time required for
the completion of the work. In any event, the contractor will be notified in writing of the action to be undertaken and the justification therefore.

2. Drawings.

A. Drawings will show details of all lines, grades, typical cross-sections of the roadway, location, and design of all structures and related quantities appearing in the proposal. The contractor shall keep one (1) set of drawings available on the work at all times.

B. The drawings shall be supplemented by such working drawings as are necessary to adequately control the work. Working drawings for structures shall be furnished to the contractor and shall consist of such detailed drawings as may be required to adequately control the work. They shall include stress sheets, shop, erection, falsework, and cofferdam drawings, bending diagrams for reinforcing steel, or any other supplementary drawings or similar data required of the contractor. All working drawings must be approved by the engineer and such approval shall not operate to relieve the contractor of any of his responsibility under the contract for the successful completion of the work.

3. Conformity with Drawings and Specifications.

A. General. The contractor shall, within reasonably close conformity, perform all items of work in accordance with the following requirements:

1. Construct all subbase, base, and surface courses, pavements, structures, and other work to the lines, grades, dimensions, and details shown and/or indicated on the drawings, cross-sections, and standard drawings.

2. Comply with the gradation, physical, and chemical requirements for all materials.

3. Observe and fulfill all instructions, procedures, methods, and controls specified and/or outlined in the specifications, supplemental specifications, special provisions, and contract.

B. Determination by the Engineer.

1. The engineer will determine the limits of reasonably close conformity, in each individual case, and his judgment shall be final and conclusive.

2. In the event the engineer finds the materials or the finished product in which the materials are used not within reasonably close conformity with the drawings and specifications, but that reasonably acceptable work has been produced, he shall then make a determination if the work shall be accepted and remain in place.

3. In the event the engineer finds the materials or the finished in which the materials are used or the work performed are not within reasonably close conformity with the drawings and specifications, and have resulted in an inferior or unsatisfactory product, the work shall be removed and replaced, or
4. Coordination of Drawings and Specifications.

A. The contractor shall perform the work in accordance with the intent of the drawings and specifications, and shall not take advantage of any error on or omission in the drawings or discrepancy between the drawings and specifications. In the event the contractor discovers such an error or omission, he shall immediately notify the engineer. When required, the engineer will make such corrections and interpretations deemed necessary for the fulfillment of the drawings and specifications. Where dimensions on the drawings are given or can be computed, scaled measurements shall not be used.

B. Should any special provisions and/or special notes on the drawings conflict with any of the provisions of these specifications, the special provisions stated in the proposal form and/or notes on the drawings shall govern.

C. Any modifications of or change in the drawings and/or specifications required to up-date, adjust, accept, or fully complete the work contemplated by the contract will be determined and ordered by the engineer.

5. Responsibility of Contractor.

A. General.

(1) The contractor shall keep the contact under his own control and it shall be his responsibility to see that the work is properly supervised and carried on faithfully and efficiently. The contractor shall supervise the work personally or shall have a competent superintendent or representative who shall be on the project at all times to receive orders and directions from the engineer, and who shall be vested with full authority by the contractor to execute such orders without delay and make arrangements for all necessary materials, equipment, and labor.

(2) At all times, the contractor shall keep on the project a copy of the drawings, a copy of the specifications, and a copy of the contract.

B. Work not Under the Supervision of the Borough. The contractor's attention is directed to any work which must necessarily be done and which will not be performed under the supervision of the Borough. He shall investigate such matters fully and satisfy himself as to the performance of such work so he can anticipate its execution and completion, and shall not make claim or hold the Borough liable for his failure to anticipate the time of performance and completion of such work.

6. Public or Private Facilities and Structures on the Project.

A. Facilities and Structures Interfering with Contractor's Operations.

(1) The contractor is required to fully inform himself concerning the location of public or private facilities and structures on, under, or over the project which may or may not require relocation, adjustment, and/or reconstruction, and which
may interfere with his operation, and it shall be assumed that he
has prepared his bid and entered into the contract in full under-
standing of the conditions to be encountered and his responsi-
bility in connection therewith. It shall be the duty of the
contractor to inform all public service companies, individuals,
and others owning or controlling any facilities or structures
within the limits of the project which may have to be relocated,
adjusted, or reconstructed, of his plan of operations, and shall
give due notice to the responsible party in sufficient time to
organize and perform such work in conjunction with or in advance
of the contractor's operations.

(2) It shall be the responsibility of the contractor to
make proper arrangements with the owners of facilities and
structures on, under, or over the project, or to take requisite
action for the relocation, adjustment, or reconstruction of such
facilities and structures which may be required by the construc-
tion. The contractor shall cooperate with the owners of faciliti-
es and structures on, under, or over the project by arranging
and performing his work in and around such facilities and struc-
tures, without additional compensation, to facilitate their
relocation, preservation, or reconstruction. The work of the
contractor shall be arranged and performed in accordance with
good engineering and construction practices.

B. Damage to Facilities and Structures by Contractor. Any
facility or structure or portion thereof damaged by the contractor
shall be repaired or replaced at his expense. Any facility or struc-
ture or portion thereof, disturbed by the contractor after it has been
reset by the owner or lessee shall be reset by the contractor at his
expense.

7. Engineering Stakes; For Construction of Curbs Along Existing
Public Streets.

A. The engineer will furnish and place stakes, offset from the
centerline and will furnish the contractor with a grade sheet showing
the horizontal and vertical measurements from said stakes to the
centerline and grade of the roadway as planned, including adjusted
alignment and warped grades as directed to meet conditions.

B. The contractor shall employ a qualified surveyor or engineer
to perform such work in the use of the drawings, cross-sections, and
specifications, and establishment of lines and grades as may be
required. He shall assume full responsibility for all dimensions and
elevations taken therefrom and the setting of lines and grades
resulting thereto.

C. The contractor shall furnish all templates and other
materials, shall place such additional stakes and markers necessary
for control and guidance of his construction operations. He shall
also furnish the inspector with such assistance as may be required for
checking all lines, grades, and measurements established (by the
contractor) and necessary in the prosecution of the work. Such
checking by the inspector shall not relieve the contractor of his
responsibility to perform all work in accordance with the drawings,
specifications, and the lines and grades.
D. The contractor shall be responsible for preserving and maintaining all survey points, line, structure, culvert, slope, grade, and other stakes as placed, and if any of these surveying controls are carelessly or wilfully disturbed or destroyed by the contractor's operations, the cost for replacement shall be charged against the contractor.

8. Authority and Duties of the Inspector-In-Charge.

A. As the direct representative of the engineer, the inspector-in-charge has immediate charge of the engineering details, and is responsible for the satisfactory completion of the project.

B. In case any dispute arises between the contractor and the inspector-in-charge as to materials furnished or the manner of performing the work, the inspector-in-charge shall have authority to reject materials or suspend the work until the question at issue can be referred to and be decided by the engineer. A rejection of materials or suspension of work shall be confirmed by written notice from the inspector-in-charge to the contractor.

9. Duties of the Inspector. Duly authorized inspectors, who shall perform their duties under the direction of the engineer or his authorized assistants, will be assigned to the project or parts thereof. The contractor shall execute his work under the observation and subject to examination of an inspector or inspectors, and shall carry out such work during the approved working hours of the day, unless specifically directed otherwise, and shall afford every facility for inspecting the materials and work at all times. When work is performed during other than daylight hours, by permission of the engineer, sufficient artificial lighting shall be provided to assure proper inspection and workmanship. The inspector is not authorized to revoke, alter, enlarge, relax, or release any requirements of these specifications, the supplemental specifications, and special provisions, nor to approve or accept any portion of the work, nor to issue instructions contrary to the drawings and specifications.

10. Inspection of Work.

A. The work at all times shall be subject to the direction of the Engineer or his authorized assistants, who shall have free access to the work and be furnished by the contractor with every reasonable facility for ascertaining whether the work being performed, or which has been completed, is in accordance with the requirements of the drawings, specifications, and contract, to the extent of uncovering, testing, or removing portions of finished work, except as otherwise provided. The contractor shall provide all labor and equipment necessary for such examination.

B. Should the work thus exposed or examined prove unsatisfactory, it shall be removed and replaced promptly by the contractor.

C. When any unit of government or political subdivisions, or any public or private corporation, is to pay a portion of the cost of the work covered by the contract, its respective representatives shall have the right to inspect the work. Such inspection shall in no sense make any unit of government or political subdivision, or any public or private corporation, a party to this contract and shall in no way
interfere with the rights of either party hereunder.

11. Defective Work and Materials. When any work and/or material does not meet, within reasonably close conformity, the requirements of the drawings and specifications, such work and/or material shall be declared defective, and shall be removed and replaced, or at the option of the engineer, may be satisfactorily corrected, by and at the expense of the contractor.

12. Maintenance During Construction. The contractor shall maintain the work during construction and until the project is accepted. This maintenance shall constitute continuous and effective work prosecuted day by day, with adequate equipment and forces to the end that the roadway or structures are kept in satisfactory condition at all times.


A. Preliminary Approval. The source of supply of all materials shall be approved by the engineer before delivery is started. Representative preliminary sample of the materials, of the kind and quality herein described, shall be submitted, when indicated or directed, for examination, or test, and written approval of the quality of such samples shall be received by the contractor prior to obtaining materials from the respective sources of supply. If it is found that materials from previously approved sources of supply do not produce specified products, the contractor shall furnish materials from other approved sources.

B. Inspection.

(1) All materials shall be inspected and meet specification requirements before being stored for use on the project. Questionable materials, pending laboratory acceptance, shall not be unloaded and incorporated with materials previously accepted as meeting these specifications. When the grading and the quality of materials delivered to the project do not conform to the grading or quality as inspected and tested, or otherwise do not conform to the specifications, the Borough reserves the right to reject them at the site of the work. The contractor shall furnish all necessary assistance to the inspection in obtaining samples as required.

(2) The contractor shall permit any designated representative of the engineer to inspect any and all materials being used or desired to be used, at any time before, during, or after its preparation, or while being used during the progress of the work or after the work has been completed. The contractor shall furnish or arrange with producers or manufacturers to provide all necessary material, labor, tools, and equipment for such inspection.

(3) It is understood that such inspections and tests, if made at any point other than the point of incorporation in the work, in no way shall be considered as a guarantee of acceptance of such material nor of continued acceptance of material presumed to be similar to that upon which inspections and tests have been made, and that inspections and testing performed by the State shall not relieve the contractor or his suppliers of
responsibility for quality control.


A. Materials will be accepted on the basis of inspection and testing and/or certification as directed by the Engineer. All material shall be approved prior to incorporation in the work.

B. All tests of samples of materials shall be made by the engineer, unless otherwise specified at the laboratory or such other places as maybe designated by the engineer, in accordance with methods described in "Standard Specifications for Highway Materials and Methods of Sampling and Testing of the American Association of State Highway Officials, and supplements thereto; or, provided the required method is not described therein, the tests shall be made in accordance with "Standards and Tentatives of the American Society for Testing and Materials," or other testing procedures adopted by the Borough. Samples shall meet all tests as required under these specifications to the satisfaction of the engineer.

C. When tests are made at places other than the laboratory, the contractor or producer shall provide the necessary personnel to assist in collecting and transporting samples to the site of the test and for the verification of the accuracy of all scales, measures, and testing equipment.

15. Unacceptable Materials. All materials not conforming to the requirements of the specifications, whether in place or not, shall be rejected. Such material(s) shall be removed promptly from the site of work, unless otherwise directed by the Engineer. No rejected material, the defects of which have been corrected, shall be returned to the site of the work until such time as approval for its use has been given by the Engineer.

16. ACT 287 (1974)/ACT 172 (1986). The contractor shall comply with the provisions of Act No. 287 (1974) and Act No. 172 (1986), of the Commonwealth of Pennsylvania. No construction activities in the vicinity of underground utilities shall commence until these Acts have been complied with.

17. Cost of Tests and Inspections. The developer shall reimburse the Borough for all costs incurred for inspections and tests. These costs must be reimbursed before the Borough will accept dedication of public improvements.

(Ord. 393, 4/3/1990, §107)

§108. Dedication of Public Improvements.

1. General. The offer of dedication and acceptance of public improvements will be in accordance with the Pennsylvania Municipalities Planning Code (Act 247).

2. As Built Plan. After final plan approval and upon completion of all required improvements, the developer shall submit an as built plan showing the location, dimension, and elevation of all improvements. In addition, the plan shall indicate that the resultant grading, drainage structures, and/or drainage systems and erosion and sediment control practices (including vegetative measures) are in substantial conformance
with the previously approved drawings and specifications. The plan shall note all deviation from the previously approved drawings. One (1) reproducible and four (4) copies of the plan shall be submitted to the Borough.

3. Release from Improvement Bond.

A. When the developer has completed all the required improvements, and has submitted the as built plan, he shall notify the Borough Council in writing, by certified or registered mail, and shall also send a copy of the letter to the Borough Engineer. The Borough Council shall, within ten (10) days after receipt of such letter, authorize the Borough Engineer to inspect the required improvements. The Borough Engineer shall promptly file a report, in writing, with the Borough Council, and shall mail a copy of the report to the developer by certified or registered mail. The report shall be made and mailed within thirty (30) days after receipt by the Borough Engineer of the aforesaid authorization from Council. The Borough Council shall then indicate approval or rejection of said improvements, either in whole or in part; and if not approved, state reasons for the rejection. The Borough Council shall immediately notify the developer in writing, by certified or registered mail, of its actions.

B. If the Borough Council or the Borough Engineer fails to comply with the time limitation provisions contained herein, all improvements will be deemed to have been approved; and the developer shall be released from all liability pursuant to its performance guaranty bond or other security agreement.

C. If any portion of said improvements are not approved or are rejected by the Borough Council, the developer shall proceed to complete or correct the same; and, upon completion, the same procedure of notification outlined herein shall be followed.

D. Nothing herein, however, shall be construed in limitation of the developer's right to contest or question, by legal proceedings or otherwise, any determination of the Borough Council.

E. In the event any improvements which may be required have not been installed as provided in these regulations or in accordance with the approved final plan, the Borough Council has 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 Borough Council 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 monies necessary to complete the remainder of the improvements. All of the proceeds resulting from the security of any legal or equitable action brought against the developer shall be used solely for the installation of the improvements covered by such security and not for any other purpose.

4. Acceptance of Improvements. Every street, park, or other improvement shown on a subdivision plan and which is recorded on the subdivision plan, shall be deemed to be a private street, park, or improvement until
such time as the same has been offered for dedication to the Borough and accepted by ordinance or resolution, or by deed of dedication accepted by Council.

5. Guaranty. Council shall require that an eighteen (18) month guaranty, in the form of financial security, be provided from the date of acceptance of all public improvements to be dedicated to the Borough. The security shall be furnished under such conditions and form and with surety as shall be approved by Council to guarantee the maintenance of all streets, storm drainage system, sanitary sewers, and other public improvements for eighteen (18) months and shall be in an amount equal to fifteen percent (15%) of the cost of such improvements.

(Ord. 393, 4/3/1990, §108)
EXHIBIT A

PARKING LOT REQUIREMENTS

NINETY-DEGREE PARKING — TWO WAY

SIXTY-DEGREE PARKING

FORTY-FIVE DEGREE PARKING
§201. Streets and Roadways.

1. Application of Standards.
   A. The following subdivision and land development principles, standards, and requirements shall be applied by the Planning Commission and/or Council in evaluating plans for proposed developments.
   B. The standards and requirements outlined herein shall be considered minimum standards and requirements for the promotion of public health, safety, morals, and general welfare.
   C. Where literal compliance with the standards herein specified is clearly impractical, the Planning Commission may recommend, and Council may modify or adjust the standards to permit reasonable utilization of property while securing substantial conformance with the objectives of this Chapter.

2. General Standards.
   A. Land shall be developed in conformance with the Comprehensive Plan, Zoning Ordinance [Chapter 27], and other ordinances and regulations in effect in the Borough.
   B. The design of subdivisions and land developments shall preserve, insofar as possible, the natural terrain, natural drainage, existing topsoil, and trees.
   C. Land subject to hazards to life, health, or property, such as may arise from fire, floods, disease, or other causes, shall not be developed for building purposes unless such hazards have been eliminated or unless the plan shall show adequate safeguards against them, which shall be approved by the appropriate regulatory agencies.
   D. All portions of a tract being developed shall be taken up in streets, public lands, or other proposed uses so that remnants of land-locked areas shall not be created.
   E. Lot lines shall, where possible, follow Borough boundary lines rather than cross them.
   F. Proposed residential, commercial, or industrial subdivisions coordinated with existing nearby neighborhood and use patterns so that the community as a whole may develop harmoniously, and the proposed development shall be properly coordinated in terms of Borough and community services and facilities.
   G. The layout or arrangement of all streets in and bordering a subdivision or land development shall be coordinated with existing streets within the Borough.

   A. All blocks in a subdivision shall have a minimum length of five hundred (500) feet and a maximum length of sixteen hundred
blocks subdivided into lots shall be two (2) lot depths in width, except lots along a major thoroughfare which front on an interior street.

E. In commercial or residential land development areas, the block layout shall conform, with due consideration of site conditions, to the best possible layout to serve the public, to permit efficient traffic circulation and the parking of cars, to make delivery and pick up efficient, and to reinforce the best design of the units in the commercial or residential area.

C. The block layout in industrial areas shall be governed by the most efficient arrangement of space for present use and future expansion, with due regard for worker and customer access and parking.

D. In large blocks with interior parks and playgrounds, in exceptionally long blocks where access to a school or shopping center is necessary, or where cross streets are impractical or unnecessary, a cross-walk with a minimum right-of-way of twelve (12) feet and five (5) feet of paving included therein may be required by Council.

E. Residential blocks shall be of sufficient depth to accommodate two (2) tiers of lots, except where reverse-frontage lots bordering a major traffic street are used.

4. Lot and Lot Size.

A. Lot dimensions and areas shall not be less than specified by provisions of the Zoning Ordinance [Chapter 27] and shall further conform to the following requirement designed to abate health hazards:

(1) Where both or either water supply and sanitary sewage disposal are provided by individual on-lot facilities, Council may require that the subdivider provide a registered professional engineer or a qualified sanitarian to make such tests as are necessary to determine the adequacy of the proposed facilities in relation to the proposed lot size and existing grade and soil conditions. In all such cases, a certificate by the registered professional engineer or qualified sanitarian that the proposed facilities are adequate shall be prerequisite to final approval of the plan.

B. Lots shall conform to the Zoning Ordinance [Chapter 27].

C. All lots shall abut on a public street, or shall have access to an approved private street. In general, side lot lines shall be at right angles or radial to street lines. If, after subdividing, there exist remnants of land, they shall be included in the area of proposed or existing lots.

D. Double frontage lots are prohibited.

E. Reverse-frontage lots are prohibited, except where employed to prevent vehicular access to major traffic streets. Reverse-frontage lots may be required to provide separation of residential development from major traffic arteries or to overcome specific disadvantages of topography and orientation. A planting screen easement of at least ten (10) feet, and across which there shall be no right of access, shall be provided along the line of lots abutting
such a traffic artery.

F. House numbers shall be assigned to each lot by the Borough Secretary. [Ord. 427]

5. Access. Access shall be provided for all lots and portions of the tract in the subdivision and to adjacent unsubdivided territory. Where the proposed lots may be resubdivided, or a portion of a tract is not subdivided into building lots, adequate provision shall be made for adequate future access requirements. Streets giving access shall be improved to the limits of the subdivision. Remnants, reserve strips, and land-locked areas shall not be created.

6. Restriction of Access.

A. Where a subdivision borders on or contains an existing or proposed collector or arterial street, the Council may require that access to such streets be limited by one (1) of the following means:

(1) The subdivision or lots so as to back onto the primary arterial or collector and front onto a parallel local street; no access shall be provided from the primary arterial or collector and screening approved by Council shall be provided in a strip of land along the property line of such lots adjoining the collector or arterial.

(2) A series of cul-de-sacs, U-shaped streets, or short loops entered from and designed generally at right angles to such a parallel street, with the rear lines of their terminal lots backing onto the arterial or collector.

(3) A marginal access or service road (separated from the primary arterial or collector by a planting or grass strip and having access thereto at suitable points).

7. Street Systems.

A. The location and width of all streets shall conform to the Comprehensive Plan, the Zoning Ordinance [Chapter 27], and the official map or to such parts thereof as may have been adopted by the Borough.

B. Proposed streets shall further conform to such County and State highway plans as have been prepared, adopted, and/or filed as prescribed by law.

C. Streets shall be logically related to the topography so as to produce reasonable grades, satisfactory drainage, and suitable building sites.

D. Residential streets shall be laid out as to discourage through traffic; however, the arrangement of streets shall provide for the continuation of existing or platted streets and proper access to adjoining undeveloped tracts suitable for future development.

E. New streets shall be provided through to the boundary lines of the development with temporary easements for turnarounds when the subdivision or land development adjoins unsubdivided acreage; however, no such streets are required when it is shown to the satisfaction of Council to be poor or unnecessary design or that such a requirement...
would not further the objectives of this Chapter.

F. Streets that are extensions of or obviously in alignment with existing streets shall bear the names of the existing streets. Street names shall not be repeated and all street names shall be subject to the approval of appropriate local authorities.

G. If land or lots resulting from original subdivision or land development are large enough to permit re-subdivision or land development, or if a portion of the tract is not developed, adequate street rights-of-way to permit further subdivision or land development shall be provided as necessary.

H. Where a subdivision or land development abuts or contains an existing or proposed major traffic street or arterial highway, Council may request dedication of additional right-of-way to provide the minimum right-of-way specified in §201(12), and marginal access streets, rear service alleys, reverse-frontage lots, or such other treatment as will provide protection for abutting properties, reduction in the number of intersections with the major street, and separation of local and through traffic.

I. New half or partial streets shall not be permitted except where essential to reasonable development of a tract in conformance with the other requirements and standards of this Chapter and where, in addition, satisfactory assurance for dedication of the remaining part of the street can be secured.

J. Wherever a tract to be developed borders an existing half or partial street, the other part of the street shall be plotted within such tract.

8. Cul-De-Sacs and Turn-Arounds.

A. Dead end streets shall be prohibited, except where designed as temporary turn-arounds, to permit future street extension into adjoining tracts, or when designed as cul-de-sacs.

B. All cul-de-sacs, whether permanently or temporarily designed as such, shall not exceed five hundred (500) feet in length. Permanent cul-de-sac streets must be provided with a paved turn-around with a minimum radius of fifty (50) feet to the outside curb and of sixty (60) feet to the street right of way line.

C. Any street dead-ended for either access to an adjoining property or for authorized stage development, which is greater than one (1) lot in depth, shall be provided with a temporary all-weather turn-around within the subdivision or land development, and the use of such turn-around shall be guaranteed to the public until such time as the street is extended. The temporary turn-around shall be circular with a minimum cartway radius of twenty-five (25) feet and shall remain completely within the right of way.

D. All non-through streets shall be provided with an authorized sign stating that no outlet exists.


A. Private streets are prohibited within subdivisions, unless adequate off-street parking is shown to exist and proper maintenance
of all improvements is guaranteed by the developer.

B. Streets providing circulation between adjacent land developments (existing or proposed) shall be public streets and shall be connected directly to another public street. All other streets within a land development are permitted to remain private.

C. There shall be a note on each preliminary and final plan indicating those streets that are not intended for dedication.

D. There shall be a note on each preliminary and final plan indicating that private streets will have off-street parking.

E. Private streets shall adhere to all design standards of a public street.

F. Private streets shall not be offered for dedication unless they meet all public street design standards.

10. Streets - General Requirements.

A. Streets shall be finish graded to the full width of the right of way, surfaced, and improved to the grades and dimensions shown on the plans, profiles, and cross-sections submitted by the developer and approved by Council.

B. Maximum slopes of banks measured perpendicular to the centerline of the street shall be two to one (2:1) in fill areas and two to one (2:1) in cut areas.

C. Prior to placing the street surface, adequate sub-surface drainage for the streets and all sub-surface utilities as acceptable to Council shall be provided or installed by the developer. Public utilities are required to be placed underground in compliance with Public Utility Commission Law of 1970, I.D. 99, dated July 8, 1970, or as may be subsequently amended.

D. Whenever standards for required street improvements are not specified by Council, the applicable standard requirements of the Pennsylvania Department of Transportation's "Guidelines for Design of Local Roads and Streets" shall govern, and all work shall be performed in the manner prescribed in the standard specifications for road construction of said Department for the type of construction under consideration.

E. Street name signs, as well as other appropriate street signs, shall be provided. Their design shall be approved by Council.

F. Streets shall be plotted to conform with land forms to reduce excessive cuts and fills.

G. Continuation of existing streets shall be known by the same name. Names for new streets shall not duplicate or closely resemble names of existing streets.

11. Street Classification and Design. Streets shall be designed according to their probable function and shall be laid out to preserve the integrity of their design. Streets shall be classified by function as follows:

A. Local Residential. Streets providing direct access to
residential structures, intended primarily to serve only the properties along them, and laid out to discourage through traffic.

B. Feeder Streets. Streets, which in addition to serving abutting properties, intercept minor streets, connect them with community facilities, and are intended primarily to serve neighborhood traffic.

C. Connector or Secondary Streets. Streets which provide the principal means of internal traffic circulation in the Borough and the principal connections to the regional arterial highway network.

D. Arterial or Major Streets. Streets serving large volumes of traffic and intended primarily for regional and commuter traffic.

12. Street Widths.

A. Minimum street widths and design requirements for proposed streets are as follows:

<table>
<thead>
<tr>
<th>Street Type</th>
<th>Assumed Traffic and Parking Requirements</th>
<th>Right-of-Way Width</th>
<th>Cartway Width</th>
<th>Grading Width</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential Street</td>
<td>2 traffic lanes (10')</td>
<td>55'</td>
<td>36'</td>
<td>Full width</td>
</tr>
<tr>
<td></td>
<td>2 parking lanes (8')</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feeder Street</td>
<td>2 traffic lanes (11')</td>
<td>60'</td>
<td>38'</td>
<td>Full width</td>
</tr>
<tr>
<td></td>
<td>2 parking lanes (8')</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Connector Street</td>
<td>2 traffic lanes (12')</td>
<td>80'</td>
<td>40'</td>
<td>Full width</td>
</tr>
<tr>
<td></td>
<td>2 parking lanes (8')</td>
<td></td>
<td>min.</td>
<td></td>
</tr>
<tr>
<td>Arterial Street</td>
<td>divided highway, Standards of State</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4-6 lanes (12' or more)</td>
<td></td>
<td></td>
<td>Department of Transportation</td>
</tr>
</tbody>
</table>

B. Additional right-of-way and cartway widths may be required by the Council for the following purposes:

1. To promote public safety and convenience.
2. To provide parking space in commercial districts and in areas of high-density residential development.

C. Short extensions of existing streets with lesser right-of-way and/or cartway widths than prescribed above may be permitted; provided, however, that no section of the new right-of-way less than forty (40) feet in width shall be permitted.

D. When a development fronts on an existing road having a right-of-way of less than the minimum width required in this Section, an ultimate right-of-way line shall be established. The distance of this ultimate right-of-way line from the centerline of the existing right-of-way shall be one-half (1/2) the width of the required minimum right-of-way.

13. Street Alignment.

A. The minimum radius of the centerline for horizontal curves on
arterial and connector streets shall be six hundred (600) feet; for feeder streets, three hundred (300) feet; and for residential streets, one hundred and fifty (150) feet. Proper super-elevation shall be provided for curves on arterial and connector streets.

B. There shall be a tangent of at least one hundred (100) feet between reverse curves for all streets.

C. Proper sight distance shall be provided with respect to both horizontal and vertical alignment. Measured along the centerline, four (4) feet above grade, this shall be five hundred (500) feet for arterial and connector streets, three hundred (300) feet for feeder streets, and two hundred (200) feet for residential streets.

14. Street Intersections

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

B. Right angle intersections shall be used whenever possible. The minimum angle of intersection of the street centerlines shall not be less than seventy-five (75) degrees.

C. Street curb intersections shall be rounded by a tangential arc with a minimum radius of twenty (20) feet for residential streets and thirty (30) feet for other streets.

D. Radius corners shall be provided on the property line substantially concentric with the curb radius.

E. There shall be provided and maintained at all intersections clear sight triangles of seventy-five (75) feet, measured along the centerline from the point of intersection. These shall be indicated on all plans. No building or obstruction that would obscure the vision of a motorist shall be permitted in this area.

F. Intersections involving arterial with connector streets shall not be located less than one thousand (1,000) feet apart on the same side of the street measured from centerline to centerline, along the centerline of the major street.

G. Two (2) streets intersecting from opposite sides shall intersect at their centerlines or their centerlines shall be off-set at least two hundred (200) feet.

15. Alleys. Alleys shall not be permitted in residential developments. Common service drives for commercial and industrial establishments shall be required where other suitable provisions for service are not made. Each such drive shall not be less than twenty-four (24) feet in width and shall be curbed and paved for the full width. No part of any structure may be located within twenty (20) feet of the centerline of a common service driveway.

16. Street Grades

A. The minimum grade on all streets or driveways shall be one (1%) percent.

B. Centerline grades shall not exceed the following:

(1) Residential and Feeder Streets: Eight (8%) percent.
(2) Connector and Arterial Streets: Five (5%) percent.

(3) Private Driveways: Sixteen (16%) percent.

C. Vertical curves shall be used in changes of grade exceeding one (1%) percent. To provide proper sight distances, the minimum length (in feet) of vertical curves shall be as follows: for arterials, eighty-five (85) times the algebraic difference in grade; for connectors and feeders, fifty (55) times the algebraic difference in grade; for residential streets, thirty (30) times the algebraic difference in grade.

D. The through street shall be approached by side streets in accordance with the standards. Where the grade of the side street exceeds six (6%) percent, there shall be a leveling area with a minimum length of seventy-five (75) feet (measured from the intersection of the centerlines), within which no grade shall exceed a maximum of four (4%) percent.

E. No cul-de-sac, turn-around, or temporary turn-around shall have a grade which exceeds four (4%) percent.

F. No private drive shall have a grade which exceeds eight (8%) percent for a distance of twenty (20) feet measured along its centerline from the right of way of the intersecting street.

17. Cartway Design. The typical section of the road shall be prepared to meet the following minimum standards:

A. Crushed aggregate base course shall be a minimum thickness of eight (8) inches. Upon written request to and upon approval of Borough Council, a five (5) inch thick bituminous concrete base course on a three (3) inch subbase may be used.

B. Pavement shall consist of a minimum of three (3) inches of binder course and one and one-half (1 1/2) inches of wearing surface. Material shall be equal or superior to Pennsylvania Department of Transportation Specifications for Bituminous Surface Course ID-2. [Ord. 480]

C. Where soil conditions warrant, Council may direct the placing of granular material as subbase along with provision of subgrade drains. Depth and quality of subbase shall be as directed by the Borough Engineer.

D. The crown of a road shall be provided at a slope of one-fourth (1/4) inch to one (1) foot.

E. Curbing shall be on all minor, collector, and marginal access streets, and as required by Council on major traffic streets. Where no curb is provided, there shall be a minimum of six (6) feet of stabilized shoulder on collector or arterial streets.

F. Sidewalks shall be on both sides of the street. Where required, sidewalk width shall not be less than five (5) feet. Greater width may be required in high density residential developments and commercial areas. Sidewalks shall be located about a foot from the edge of the property lines and three (3) or more feet from the curb line in order to provide a planting strip between sidewalk and street. Where rigid adherence to these limits would produce awkward grades or require the unnecessary removal of trees, the Planning
Commission may recommend a modification of these requirements to obtain the best particular arrangement. Among the purposes of these requirements are to protect pedestrians from hazards and splashing, provide snow storage space, and some clearance for property line fences and retaining walls.

G. Small ornamental trees may be planted in the space between the curb and the sidewalk. Planting of forest trees, such as the larger species of maple, oak, sycamore, etc., shall not be permitted in the street right-of-way. In the event a Borough Shade Tree Commission is established, plans for street planting shall be subject to the approval of that Commission.

H. Cuts and fills shall be made at a maximum slope of two (2) feet horizontal to one (1) foot vertical. Where curbing or retaining walls are used to control slopes, a sketch showing details of the construction shall be submitted to the Borough Engineer.

I. Cartway design for State highways shall meet the requirements of the Pennsylvania Department of Transportation.

J. Underground utilities shall be put in place, connected, and approved before the streets are constructed and before any person is permitted to occupy any building to be served by such utilities.

18. Land Development Parking Compound Design. The typical section of any common parking area within a land development shall be prepared to meet the following minimum standards:

A. Crushed aggregate base course with a minimum thickness of six (6) inches, as specified in the Pennsylvania Department of Transportation Specifications, Form 408, and its latest revisions.

B. Pavement shall consist of a minimum of one and one-half (1-1/2) inches of binder course and one (1) inch wearing surface. Material shall be equal or superior to Pennsylvania Department of Transportation Specifications for Bituminous Surface Course ID-2A and shall be applied in accordance with the Pennsylvania Department of Transportation Specifications, Form 408, and its latest revisions.

C. The minimum grade in all parking areas shall be one (1%) percent.

19. Monuments and Markers.

A. Sufficient concrete monument locations must be shown on the final plan to define the exact location of all streets and to enable the re-establishment of all street lines. In general, they shall be set on the street line on one (1) side of the street at the beginning and ending of all curves and at those points on the curve at the street intersections necessary to establish the actual intersection. Sufficient concrete monument locations describing the perimeter of the tract shall be established by the Engineer and/or the Planning Commission at the time of approval of the preliminary plan and shall be placed by the applicant.

B. Markers shall be set at locations shown on the final plan as follows:

(1) At all points lot lines intersect curves, either front
or rear.

(2) At all angles in property lines of lots.

(3) At all other lot corners.

C. Monuments shall be of concrete or stone with a minimum of six (6) inches by six (6) inches by thirty (30) inches or as approved by the Engineer. Concrete monuments shall be permanently marked on top; stone monuments shall be marked on top with a proper inscription. Markers shall consist of iron pipes or steel bars at least thirty (30) inches long, and not less than three-quarters (3/4) inches in diameter.

D. Monuments and markers shall be placed so that the scored or marked point shall coincide exactly with the intersection of lines to be marked, and shall be set so that the top of the monument or marker is level with the surface of the surrounding ground.

20. Easements.

A. When easements are required for utilities, they shall be a minimum of twenty (20) feet wide and shall, to the fullest extent possible, be centered on or be adjacent to rear or side lot lines. Local utility companies shall be consulted by the developer when locating easements. Stormwater easements are to be used only for storm water conveyance.  

B. Where a subdivision or land development is traversed by a water course, drainage way, channel, stream, or wetlands there shall be provided a drainage easement conforming substantially with the line of such water course, drainage way, channel, stream, or wetlands and of such width as will be adequate to preserve the unimpeded flow of natural drainage, or for the purpose of widening, deepening, relocating, improving, or protecting such drainage facilities or for the purpose of installing a storm water sewer.  


A. The minimum distance from a natural gas line to a dwelling unit shall be as required by the applicable transmission or distributing company, or as may be required by the applicable regulations issued by the Department of Transportation under the Natural Gas Pipe Line Safety Act of 1968, as amended, whichever is greater.

B. When any petroleum or petroleum products transmission line traverses a subdivision or land development, the developer shall confer with the applicable transmission or distribution company to determine the minimum distance which shall be required between each proposed dwelling unit and the petroleum or petroleum products transmission lines.

(Ord. 393, 4/3/1990, §201; as amended by Ord. 427, 12/28/1993; and by Ord. 480, 8/7/2001, §1)

1. **Applicability.** This Part shall only apply to New Holland Borough and permanent stormwater management facilities constructed as part of any of the regulated activities listed in this Section. Stormwater management and erosion and sedimentation control during construction activities are specifically not regulated by this Part, but shall continue to be regulated under Chapter 102 of the Pennsylvania Clean Streams Law. The following activities are defined as "regulated activities" and shall be regulated by this Part:

A. Land development.

B. Subdivision.

C. Construction of new or additional impervious or semipervious surfaces (i.e. driveways, parking lots, etc.).

D. Construction of new buildings or additions to existing buildings.

E. Diversion or piping of any natural or manmade stream canal.

F. Installation of stormwater management facilities or appurtenances thereto.

2. **Exemptions.** For any of the activities regulated by this Part, the final approval of subdivision and/or land development plans, the issuance of any building or occupancy permit, or the commencement of any land disturbance activities may not proceed until the developer, or his or her agent, has received written approval of a drainage plan from the Borough of New Holland. The following activities shall be exempt from the requirements of this Part:

A. Any regulated activity that meets the exemption criteria in appendix to this Part is exempt from the drainage plan preparation provisions of this Part. This criteria shall apply to the total development, even if development is to take place in phases. December 1, 1998, shall be the starting point from which to consider tracts as "parent tracts" in which future subdivision and respective impervious area computations shall be cumulatively considered. Exemptions shall not relieve the applicant from providing adequate stormwater management to meet the purposes of this Part.

B. Land disturbance associated with existing one and two family dwellings subject to conditions as described in subsection (A) of this Section.

C. Use of land for gardening for home consumption.

D. Agriculture when operated in accordance with a conservation plan or erosion and sedimentation control plan found adequate by the Conservation District. The agricultural activities such as growing crops, rotating crops, tilling of soil and grazing animals and other such activities are specifically exempt from complying with the requirements of this Part.
E. Forest management operations which are following the Department of Environmental Resources' management practices contained in its publication "Soil Erosion and Sedimentation Control Guidelines for Forestry," and are operating under an erosion and sedimentation control plan.

No exemption shall be provided for regulated activities as defined in §202(1)(E) and (1)(F) of this Part.


A. The management of storm water on the site, both during and upon completion of the disturbances associated with the proposed subdivision or land development, shall be accomplished in accordance with the standards and criteria of this subsection. The design of any temporary or permanent facilities and structures and the utilization of any natural drainage systems shall be in full compliance with these terms and the interpretations of the Borough. At the time of application for a building permit for any approved lot created by a subdivision under terms of this Chapter, issuance of the permit shall be conditioned upon adherence to the terms of this subsection.

B. In order to prevent accelerated erosion and resulting sedimentation, land disturbance activities relating to an approved subdivision or land development shall be conducted only in conformity with the following principles:

   (1) There shall be no increase in discharge of sediment or other solid materials from the site as a result of storm water runoff.

   (2) Erosion and sedimentation devices such as temporary vegetation/mulch, temporary detention basins, diversion terraces, rock filter berms, or hay bales (in areas of minimum flows) appropriate to the scale of the operations shall be installed concurrent with earthmoving activities and whenever a situation is created which would contribute to increased erosion.

   (3) No earthmoving or stripping of vegetation will be conducted in areas of, greater than thirty-three (33%) slope unless specific approval is obtained from the Borough.

   (4) Earthmoving and the addition of fill shall be minimized where possible and practicable to preserve desirable natural features and the topography of the site. Changes in grade and topography and other earthmoving shall be in accordance with the storm and surface drainage plan prepared by the applicant and approved by the Borough.

   (5) Stripping of vegetation, regrading, or other development shall be done in such a way that will minimize erosion.

   (6) To the maximum extent practicable, mature healthy trees of at least six (6) inches DBH and other significant existing
vegetation shall be retained and protected. Such trees shall not be removed except as provided on the approved subdivision or land development plan. The filling of soil over the roots of trees to be preserved is prohibited. (The roots are presumed to extend out from the tree as far as the tree's branches extend outward.)

(7) Land disturbance shall be limited to the actual construction site and an access strip. The amount of disturbed area and the duration of exposure shall be kept to a practical minimum.

(8) The permanent (final) vegetative and structural erosion control and drainage measures shall be installed as directed by the Borough.

(9) Sediment in runoff water shall be trapped and removed through means approved by the Engineer to assure adequate capacity in the basins or traps.

(10) Procedures for protecting soils or geologic structures with water supply potential from contamination by surface water or other disruption by construction activity shall be established in consultation with the engineer and such areas shall include, at minimum, those underlain by carbonate limestone formations.

(11) Stormwater runoff from a project site shall flow directly into a natural watercourse or into an existing storm sewer system, or onto adjacent properties in an approved manner similar to the runoff characteristics of the predevelopment flow, but in any event, a concentrated discharge of stormwater may not occur unless into a natural watercourse or easement. [Ord. 427]

(12) Stormwater runoff shall not be transferred from one (1) watershed to another unless the watersheds are subwatersheds of a common watershed which join together within the perimeter of the property, or the effect of the transfer does not alter the peak discharge onto adjacent lands, or drainage easements from the affected landowners are provided. (Ord. 427)

(13) The stormwater management system shall be designed to assure no increase in the one hundred (100) year flood elevations or velocities. [Ord. 427]

C. All subdivision and land development activities involving an increase in impervious cover for any watershed discharging from the project site shall be conducted in conformance with the following performance standards:

(1) **Mill Creek Watershed**.

    (a) For all regulated activities within the Mill Creek Watershed as defined by the Lancaster County Act 167 Mill Creek Watershed Stormwater Management Plan, post-development rate of runoff from any regulated activity shall not exceed
fifty (50) percent of the peak rates of runoff prior to development for the 2, 10, 25, 50 and 100 year storm events.

(b) For all areas not included in the Mill Creek Watershed, all storms up to and including a 10 year storm shall not exceed the peak rates of runoff prior to development from a 2 year storm. Peak rate of runoff for any storms of greater than 10 year frequency up to an including a 100 year storm shall not exceed the peak rates of runoff from the site of such storms before development, including 25, 50 and 100 year storms.

(2) In establishing the conditions for calculating runoff originating on the site prior to development, the following assumptions shall apply:

(a) Woodland shall be used as the prior condition for those portions of the site having trees of greater than six (6) inches DBH or where such trees existed within eighteen (18) months of application.

(b) Meadow shall be used for all other areas, including areas which are presently covered by impervious surfaces.

(c) Average antecedent moisture conditions.

(d) A Type II distribution storm.

(3) In establishing the conditions for calculating off-site runoff, the following assumptions shall apply:

(a) Any agricultural area, including fallow fields, shall be considered cultivated fields in winter or poor land cover conditions.

(b) Any non-agricultural area shall utilize actual land use, assuming winter or poor land cover conditions.

(c) Average antecedent moisture conditions.

(d) A Type II distribution storm.

(4) The methods of computation used to determine peak discharge and runoff shall be:


(b) The Rational Method of \( Q = C \times I \times A \) where \( Q \) is the peak discharge of the watershed in cubic feet per second, \( C \) is the coefficient of runoff, \( I \) is the intensity of rainfall in
inches per hour, and A is the area of the watershed in acres; or,

(c) Any other method approved by the Borough. If the Soil-Cover-Complex Method is used, storm water runoff shall be based on the following twenty-four (24) hour storm events:

<table>
<thead>
<tr>
<th>Storm Event</th>
<th>Inches of Rainfall</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 years</td>
<td>3.2</td>
</tr>
<tr>
<td>10 years</td>
<td>5.0</td>
</tr>
<tr>
<td>25 years</td>
<td>5.6</td>
</tr>
<tr>
<td>50 years</td>
<td>6.3</td>
</tr>
<tr>
<td>100 years</td>
<td>7.2</td>
</tr>
</tbody>
</table>

If the Rational Method is used, the Harrisburg, Pennsylvania Rainfall Intensity - Duration - Frequency Chart shown in the Pennsylvania Department of Transportation, Design Manual, Part 2, August 1981, shall be used to determine the rainfall intensity in inches per hour.

(5) Time of concentration for runoff calculations shall be determined utilizing the USDA Soil Conservation Service method as set forth in the latest edition of Urban Hydrology for Small Watersheds, Technical Release No. 55 as published by SCS, with sheet flow limited to a maximum length of one hundred fifty (150) feet.

(6) All plans and designs for stormwater management facilities shall be reviewed by the Borough Engineer. All plans for erosion and sedimentation and storm water management shall conform to the plan content requirements of Pennsylvania Department of Environmental Resources' Soil Erosion and Sedimentation Control Manual.

D. Storm sewers, culverts, bridges, and related installations shall be provided:

(1) To permit unimpeded flow of natural watercourses. Such flow may be redirected as required, subject to the approval of the Department of Environmental Resources.

(2) To insure adequate drainage of all low points along the line of streets.

(3) To intercept storm water runoff along streets at intervals reasonably related to the extent and grade of the area drained, and to prevent substantial flow of water across intersections or flooded intersections.
(4) To insure adequate and unimpeded flow of storm water under driveways in, near, or across natural watercourses or drainage swales. Suitable pipes or other waterway openings shall be provided as necessary.

(5) Any drainage facility crossing a State highway shall conform to all applicable Pennsylvania Department of Transportation design standards.

4. Design Standards; Water Carrying Facilities.

A. All storm sewer pipes, culverts and bridges (excluding detention and retention basin outfall structures) conveying water originating only from within the boundaries of the project site shall be designed for a twenty-five (25) year storm event. All storm sewer pipes, culverts and bridges (excluding detention and retention basin outfall structures) conveying water originating from off-site shall be designed for a fifty (50) year storm event. Drainage easements shall be provided to contain and convey the one hundred (100) year frequency flood throughout the project site. Easements shall begin at the furthest upstream property line of the proposed development in a watershed.

B. Where, in the judgment of the Borough, the quantity of storm water runoff will cause detrimental downstream impact, quantity will be a consideration in the method of storm water management.

C. Storm sewers, as required, shall be placed immediately in front of the curb, when parallel to the street within the right-of-way. When located in undedicated land, they shall be placed within an easement not less than twenty (20) feet wide as approved by the Borough. Open ditches per se shall be avoided but properly designed, graded, and turfed drainage swales shall be permitted in lieu of storm sewers in commercial and industrial areas and, where approved by the Borough, in residential areas. Such swales shall be designed not only to carry the required discharge without erosion but also to increase the time of concentration, reduce the peak discharge and velocity, and permit the water to percolate into the soil.

D. Storm sewer pipes and culverts shall be installed on sufficient slopes to provide a minimum velocity of three (3) feet per second when flowing full.

E. All storm sewer pipe and culverts shall be laid to a minimum depth or one (1) foot from finished subgrade to the crown of pipe in paved areas and one (1) foot from finished grade to the crown of pipe in grassed areas.

F. Manholes, inlets, headwalls and endwalls proposed for dedication or located along streets shall conform to the requirements of the Pennsylvania Department of Transportation, Bureau of Design, Standards for Roadway Construction, Publication No. 72, in effect at the time the design is submitted, as modified by the adopted Borough construction standards.
G. Headwalls and endwalls shall be used where storm water runoff enters or leaves the storm sewer horizontally from a natural or man-made channel.

H. Inlets shall be placed on both sides of the street at low spots, at a maximum of six hundred (600) feet apart along a storm sewer pipe or culvert, at points of abrupt changes in the horizontal or vertical directions of storm sewers, and at points where the flow in gutters exceeds three (3) inches. Inlets shall normally be along the curb line at or beyond the curb radius points. For the purpose of inlet location at corners, the depth of flow shall be considered for each gutter. At intersections, the depth of flow across the through streets (proposed and existing) shall not exceed one (1) inch for the twenty-five (25) year storm event. Inlets shall be depressed two (2) inches below the grade of the gutter or ground surface. Manholes may be substituted for inlets at locations where inlets are not required to handle surface runoff. Inlets shall not be placed in areas other than streets and parking lots, unless otherwise approved by the Borough.

I. Drainage facilities for drainage areas in excess of one-half (1/2) square mile (three hundred twenty (320) acres) shall conform to the requirements of, and be approved by the Pennsylvania Department of Environmental Resources, Division of Dams and Encroachments.

J. A five (5) minute storm duration shall be used if this does not result in a maximum expected discharge that exceeds the capability of thirty (30) inch pipe. If a five (5) minute storm duration results in a pipe size exceeding thirty (30) inches, the time of concentration approach shall be used in determining storm duration.

K. Flow velocities from any storm sewer may not result in a deflection of the receiving channel.

L. Energy dissipators shall be placed at the outlets of all storm sewer pipes, culverts, and bridges where flow velocities exceed maximum permitted channel velocities.

M. The following conditions shall be met for all swales:

(1) Capacities and velocities shall be computed using the Manning equation. The design parameters shall be as follows:

(a) For vegetated swales, two (2) design considerations shall be met: (1) the first shall consider channel velocity and stability based upon a low degree of retardance ("n" of .03); (2) the second shall consider channel capacity based upon a high degree of retardance (.05). All vegetated swales shall have a minimum slope of one (1) percent unless otherwise approved by the Borough.

(b) The "n" factors to be used for paved or rip-rap swales or gutters shall be based upon accepted engineering design practices as approved by the Borough.
(2) All swales shall be designed to concentrate low flows to minimize siltation and meandering.

N. Storm sewers shall have a minimum diameter of eighteen (18) inches and shall be made of reinforced concrete culvert pipe (R.C.P.), aluminized steel or polyethylene pipe.

O. Stormwater roof drains shall not discharge water directly over a sidewalk or into any sanitary sewer line.

P. Two (2) sets of storm water calculations shall be submitted to the Borough for review.

Q. All stormwater structures smaller than forty-eight (48) inches equivalent diameter which discharge from residential lots to a street or from a street to residential lots shall extend from the street right-of-way a minimum distance of two-thirds (2/3) the length of the longest adjacent lot dimension.

R. Prior to dedication of any project areas, the developer shall submit record surveys of all drainage easements and basins to the boundaries of their respective easements.

S. Culverts shall be provided with wing walls and constructed for width of the right of way. The cartway area over the bridge shall be twenty-four (24) inches wider, on either side, than the road connecting with the bridge, or if the character of the road is expected to change for future planning, the cartway of the bridge shall be made to anticipate this condition. On either side of the bridge cartway, the bridge railing must be set back from the edge of the final cartway and this area may be used to place sidewalks, present or future.

5. **Detention or Retention Basins.**

A. Retention basins may only be used with specific Borough approval.

B. Basins shall be installed prior to any earthmoving or land disturbances which they will serve. The phasing of their construction be noted in the narrative and on the plan.

C. Whenever a basin will be located in an area underlain by limestone, a geological evaluation of the proposed location will be conducted to determine susceptibility to sinkhole formations. The design of all facilities over limestone formations shall include measures to prevent ground water contamination and, where necessary, sinkhole formation. Soils used for the construction of basins shall have low-erodibility factors ("K" factors).

D. Energy dissipators and/or level spreaders shall be installed at points where pipes or drainage ways discharge to or from basins. Generally, outlet pipes designed to carry the pre-development, two (2) year storm flow will be permitted to discharge to a stream with only an dissipator. Storms of a ten (10) year or greater intensity should be
spread across floodplains by level spreaders; rock material found on the site is suggested for their construction.

E. The maximum water depth shall not exceed six (6) feet, unless approved by a waiver granted by the Borough.

F. The minimum top width of all dams shall be five (5) feet.

G. The side slopes shall not be less than three (3) horizontal to one (1) vertical for non-residential sites, and four (4) horizontal to one (1) vertical for residential sites.

H. All basins shall be structurally sound and shall be constructed of sound and durable materials. The completed structure and the foundation of all basins shall be stable under all probable conditions of operation. An emergency spillway shall be provided for the basin and shall be capable of discharging the one hundred (100) year peak rate of runoff which enters the basin after development, in a manner which will not damage the integrity of the facility and will not create a downstream hazard. Where practical, the emergency spillway shall be constructed in undisturbed ground.

I. All basins shall include an outlet structure to permit draining the basin to a completely dry position within twenty-four (24) hours following the end of the design, rainfall.

J. A cutoff trench of relatively impervious material shall be provided within all basin embankments.

K. All structures passing through basin embankments shall have properly spaced concrete cutoff collars and "0-ring" rubber gaskets.

L. All discharge control devices and piping with appurtenances shall be made of reinforced concrete and stainless steel.

M. Minimum slope within a basin shall be one (1%) percent positive grade from the low flow channel.

N. Low flow channels shall be provided from each water carrying facility to the outlet structure. Low flow channels shall be one (1%) percent minimum slope unless approved otherwise by the Borough.

O. Tile fields may be required to aid in draining the bottom of a basin if swampy and/or unmaintainable conditions are known to exist.

P. Design storms for the computation of detention basin volumes shall be a duration sufficient to maximize the required volumes, up to a maximum twenty-four (24) hour storm.

Q. Design storms for the computation of retention basins (where approved) volumes shall be based upon a twenty-four (24) hour storm.

R. Outlet structures within basins in or adjacent to residential areas shall have childproof, non-clogging trash racks over all design
openings less than eighteen (18) inches in diameter, except those openings designed to carry perennial stream flows.

   S. Temporary and permanent grasses or stabilization measures shall be established on the sides of all earthen basins within fifteen days of initial construction.

   T. Notwithstanding the above, all requirements of the Pennsylvania Department of Environmental Resources and/or the Soil Conservation Service, U.S.D.A., shall be met, and evidence of approvals by those agencies shall be submitted to the Borough.

   U. Retention or detention of stormwater may be accomplished by one (1) or more of the following facilities in place of or in conjunction with basins:

   (1) Parking lot storage.
   (2) Sub-surface disposal.
   (3) Permanent pool, ponds, or lakes, designed with detention storage.
   (4) Roof top storage with proper design of the building to carry the additional load.


   A. All subdivision and land developments are required to comply with Chapter 102 of the Rules and Regulations of the Pennsylvania Clean Streams Law as enacted by the Department of Environmental Resources.

   B. The developer shall be responsible for submission of the erosion and sedimentation control plan to the Lancaster County Conservation District for determination of the plan's compliance with Chapter 102. Conservation District approval of the Plan must be made before the Borough will make final plan approval. On projects disturbing more than twenty-five (25) acres of land, an earth disturbance permit must be secured from the Department of Environmental Resources. No permits from the Borough will be issued or any earthmoving begun until the earth disturbance permit is issued.

   C. The erosion and sedimentation control plan must be available on site at all times and be fully implemented. The site must be open for inspections by the Department of Environmental Resources and the District.

(Ord. 393, 4/3/1990, §202; as amended by Ord. 427, 12/28/1993; and by Ord. 460, 12/1/1998, §§1, 2, 5)

§203. Sanitary Sewer.
1. **General.** Sanitary sewer systems shall be designed in accordance with the rules and regulations of the Pennsylvania Department of Environmental Resources.

2. **Pipe.** All pipe sewers up to and including sixteen (16) inches in diameter shall be of extra strength vitrified clay pipe. Pipe sewers larger than sixteen (16) inches in diameter shall be of reinforced concrete pipe. Pipe sewer shall be of cast iron pipe or ductile iron pipe in locations where required by the engineer because of prevailing conditions or where required by utility companies or governmental bodies. Only one (1) type of pipe shall be used for all sewers of a particular project.

3. **Minimum Depth of Cover.** Minimum depth of cover for all pipe sewers shall be five (5) feet.

[Text continued on following page.]
4. Laterals. Laterals shall be constructed of the same material as the sewer lines and shall have a minimum diameter of six (6) inches on new construction. Laterals shall be connected to the main sewer by means of a wye branch. Laterals shall extend from the main sewer to the right-of-way line.

5. Service Lines.

A. Each improved property shall have its own individual service line. Each side of a double house having a solid vertical partition wall shall be considered a separate property requiring individual sewer connections.

B. Where premises in single ownership consist of more than one (1) building, the Borough reserves the right to determine, under the circumstances of each case, whether each separate building must have its individual sewer connection or whether all buildings together may use a single connection.

C. All service lines shall be installed with a minimum grade of two (2%) percent. A straight alignment shall be maintained where possible. A minimum cover of three (3) feet shall be maintained to prevent crushing and freezing, unless the Borough's consulting engineer approves a lesser minimum cover.

D. A main or intercepting trap shall be placed between the terminus of the lateral and the building and vented with a suitable sidewalk vent pipe or cowl type vent. The trap shall consist of a double plug cast iron trap, cast iron service tee with a double riser. The vent pipe shall be located on the house side of the trap.

E. Unless otherwise authorized by the Borough or its representative, cleanouts shall be provided in each house connection and at intervals to permit complete rodding with a one hundred (100) foot long auger or tape. Cleanouts shall be constructed using a wye fitting in the run of the pipe with a forty-five (45) degree bend and riser to the ground surface. The riser pipe shall be provided with a standard four (4) inch screw type ferrule.

F. Where the service line is to be placed in a trench more than ten (10) feet deep, the line shall be constructed of vitrified clay pipe, Class 2400 asbestos cement pipe, or cast iron pipe as the Borough may direct.

G. Where the service line is to be placed under a drive or other roadway and the depth is less than four (4) feet, the line shall rest on a bed of crushed stone, or on a concrete cradle, or it shall be constructed of extra strength pipe as the Borough may direct.

H. Service lines for all service stations, garages, or other establishments storing, using, or dispensing gasoline, kerosene, benzine, or similar solvents shall be constructed of cast iron pipe with chemically resistant joints.

I. No hotel, restaurant, boarding house, or public eating place shall connect to the sewer system without first installing grease traps, of a type and size approved by the Borough, on the service lines at a location approved by the Borough.
J. No service station, garage, factory building, or commercial establishments which handles oils, petroleum, or similar products, or which washes cars, trucks, or other types of machinery, shall connect to the sewer system without first installing grease and sand traps, of a size and type approved by the Borough, on the service lines or at a location approved by the Borough.


A. Test each manhole by the following method:

(1) Provide tools, materials (including water), equipment and instruments necessary to conduct manhole testing specified herein.

(a) Vacuum Testing Equipment.

1) Use vacuum apparatus equipped with necessary piping, control valves and gauges to control air removal rate from manhole and to monitor vacuum.

2) Provide an extra vacuum gauge of known accuracy to frequently check test equipment and apparatus.

3) Vacuum testing equipment and associated testing apparatus subject to engineer's approval.

4) Provide seal place connections for inserting in manhole frame.

(2) Prior to testing manholes, thoroughly clean such and seal openings, both to complete satisfaction of the engineer. Seal openings using properly sized plugs.

(3) Perform testing with frames installed. The joint between the manhole and the manhole frame shall be included in the test.

(4) The contractor may elect to make a test prior to backfilling for his own purposes; however, the tests of the manholes for acceptance shall be conducted after the backfilling has been completed.

B. Vacuum Test Procedure.

(1) Perform vacuum testing in accordance with the testing equipment manufacturer's written instructions.

(2) Draw a vacuum of ten (10) inches of mercury and close the valves.

(3) Consider manhole acceptable when vacuum does not drop below nine (9) inches of mercury for the following manhole sizes and times:

(a) Four (4) foot diameter - sixty (60) seconds.

(b) Five (5) foot diameter - seventy-five (75) seconds.

(c) Six (6) foot diameter - ninety (90) seconds.
§204. Water System.

1. General. Water systems shall be designed in accordance with the following criteria where special design criteria are required, the applicant should consult with the Borough prior to preparation and submission of plans. If the water to the premises is not supplied by private wells, the applicant must present evidence to the Planning Commission that the subdivision or development is to be supplied by a certified public utility, bona fide cooperative association of lot owners, or by a municipal corporation, authority or utility.

2. Water Demand.

A. Water demands shall be computed using the following criteria:

   (1) Domestic Water Demand.

      (a) Average Daily Demand. One (100) gallons per capita per day based on three (3.0) persons per living unit.

      (b) Maximum Daily Demand. Two (2.0) times average daily demand.

      (c) Maximum Hourly Demand. Four (4.0) times average daily demand.

   (2) Industrial or special water demands shall be established for each installation.

   (3) Fire Demands.

      (a) Industrial or High Value Construction. Four thousand (4,000) gpm for a duration of four (4) hours. [Ord. 427]

      (b) High Density Residential and Commercial (includes townhouses, apartments, and condominiums). Two thousand six hundred (2,600) gpm for a duration of two (2) hours.

      (c) Low-Density Single-Family. One thousand five hundred (1,500) gpm for a duration of two (2) hours.

3. Water Pressures.

   A. General. Water pressure should normally be maintained in the range from thirty-five (35) pounds per square inch (psi) to one hundred (100) psi at ground elevation. The required minimum pressure at ground elevation shall be thirty (30) psi during maximum hourly flows and twenty (20) psi during fire flows.

   B. Design Pressure. The design pressure for equipment and materials shall be at least equal to the maximum working pressure plus a surge allowance of fifty (50%) percent of maximum working pressure, unless specified otherwise.

   C. Pressure Regulating Valves. When pressures exceed one hundred (100) psi, the applicant shall, at his own expense, install and maintain on the house side of the meter pressure regulating valves meeting Authority specifications.
D. Fire Demands. Where only hose streams are required, fire flow requirements shall be satisfied while maintaining twenty (20) psi residual pressure at hydrants in the immediate vicinity of the fire. Where automatic sprinkler systems are involved, residual pressures must be adequate for their proper operation.

4. Size of Mains.

A. The minimum size of all mains shall be eight (8) inch diameter. Adequacy of mains shall be based on a total flow requirement of fire demand plus maximum daily demand plus special requirements.

B. Fire hydrant branches shall be not less than six (6) inch diameter no longer than necessary. The maximum permissible length is fifty (50) feet, except in special instances.

5. Location of Mains.

A. Mains shall normally be located within the right-of-way lines of public streets. If it is necessary to locate a main on private property, the applicant shall provide a water main easement in the name of the Borough. The easement shall consist of a twenty (20) foot wide permanent easement centered on the pipeline and an additional 20-foot wide temporary construction easement.

B. Distribution main networks shall be looped and dead-end mains shall be avoided. When dead-end mains cannot be avoided, blowoff connections or hydrants shall be provided at the main ends.

C. Distribution mains shall be located a minimum of fifteen (15) feet from nearest structure. Any exceptions to this clearance must be approved by the Borough.

D. Water main installation near sewers shall conform to the Pennsylvania Department of Environmental Resources Water Supply Manual. Water mains shall be laid at least ten (10) feet, horizontally, from any existing or proposed drain or sewer line. If local conditions prevent a horizontal separation of ten (10) feet, the water main shall be laid in a separate trench, or on an undisturbed earth shelf located on one (1) side of the sewer, such that the bottom of the water main is at least eighteen (18) inches above the top of the sewer. When it is impossible to obtain the horizontal and vertical separation stipulated above, both the water main and the sewer should be constructed of pressure pipe utilizing push-on joints, mechanical joints, or similar joints employing a rubber gasket to obtain a seal. Both the water main and the sewer shall be pressure-tested before backfilling to assure watertightness.

E. When a water main crosses a sewer or storm drain, the bottom of the water main shall preferably be installed eighteen (18) inches above the top of the drain or sewer, and this vertical separation shall extend at least ten (10) feet horizontally on each side of the sewer. If a water main must cross under a sewer or drain, a full-length of water main pipe shall be centered under the sewer, the vertical separation shall be a minimum eighteen (18) inches, and the sewer pipe shall be encased in concrete for a minimum of ten (10) feet on each side of the crossing.
F. Water mains shall always cross above sewer force mains with a minimum vertical separation of eighteen (18) inches, and the sewer force main shall be encased in concrete for at least ten (10) feet on each side of the crossing.

G. No water pipe shall pass through, or come into contact with, any part of a sewer manhole.

H. There shall be no physical connection between the distribution system or house plumbing and any pipes, pumps, hydrants, or tanks which are, or may be, supplied from any water supply not approved by the Borough.

I. The minimum depth of backfill over pipes shall be four (4) feet, or forty-eight (48) inches. When the minimum depth of cover cannot be provided, insulated construction approved by the Borough shall be employed.

6. Location of Valves.

A. Generally, a minimum of three (3) valves shall be used at crosses and two (2) valves at tees. The Borough reserves the right, however, to require the installation of four (4) valves at each cross and three (3) valves at each tee. Valves shall be placed at least every one thousand two hundred (1200) feet on arterial mains and minor distributors, or at other selected points throughout the distribution system.

B. All water mains shall extend at least forty (40) feet beyond each valve located on a dead-end main.

C. A valve shall be installed on each hydrant branch pipe between the main and the hydrant and near the end of any main which may be extended in the future.

D. In dead-end mains, a blow-off valve and pipe or a fire hydrant shall be installed for flushing the line.

7. Fire Hydrants.

A. Fire hydrants will be required and will normally be installed at the applicant's expense. They must be installed with the approval of the Borough.

B. The following hydrant spacing guidelines shall apply:

(1) In low-density single family residential areas, all parts of an existing or proposed building shall be within three hundred (300) feet of a hydrant.

(2) In high-density residential or common commercial areas, each entire unit shall be within three (300) feet of one (1) hydrant and five hundred (500) feet of a second hydrant.

(3) In industrial areas, hydrants should be spaced according to the latest requirements of the Insurance Services Office.

(4) Generally, a hydrant should be placed at each street intersection, and intermediate hydrants should be installed if the distance between intersections is excessive.
(5) In checking distances between hydrants and buildings, measurements should be made along public streets, except where private entrances or parking areas are available for access.

C. Hydrants shall be located in a manner to provide complete accessibility and so that the possibility of damage from vehicles or injury to pedestrians will be minimized. When placed behind the curb, the hydrant barrel shall be set so that no portion of the pumper or hose nozzle cap will be less than twenty-four (24) inches from the gutter face of the curb. When set in the lawn space between the curb and the sidewalk or between the curb and the property line, no portion of the hydrant or nozzle shall be within six (6) inches of the sidewalk.

D. All hydrant locations shall be reviewed and approved by the New Holland Volunteer Fire Company.

8. Cathodic Protection. Water mains installed near utilities having cathodic protection shall themselves be protected. The method of protection, which may include insulating couplings, polyethylene encasement, electrical connectors, test stations, and other facilities, shall be subject to Borough approval.


A. The minimum size of the service connection shall be three-quarters (3/4) inch. Service connections shall be adequate to handle the flow requirements.

B. Service connections shall be connected to the main with corporation cocks. Curb stops and curb boxes shall be placed six (6) inches behind back face of curb. Where flow requirements require large service lines, a tee fitting should be installed in the main for the service connection and the curb stop shall be replaced with a valve. The maximum size of a curb stop shall be two (2) inches. Tapping valves and tees shall be used on existing four (4) inch mains when the connection is over one (1) inch, over one and one-half (1-1/2) inch on six (6) inch mains, and over two (2) inches on eight (8) inch mains.

10. Water Meters.

A. The Borough shall determine the size of meter to be installed but in no case shall the meter be more than one (1) commercial size below the size of the service line. Where two (2) or three (3) consumers receive their supply through a single meter, the meter size shall be at least three-quarter (3/4) inch, and when four (4) or more customers receive their supply through a single meter, the size shall be at least one (1) inch, but not less than that required to meet the water demand requirements of §204(2).

B. Borough will furnish and set meters and connections free of charge. The meter and connection shall remain the property of the Borough, and access to same for reading of the meter, inspection, testing, repairs, etc., must be permitted at all reasonable times by the consumer.

C. The Borough shall determine the location of all meters. In event the Borough decides that the meter is to be placed within the
building, the consumer will provide, free of charge and expense to the Borough, an easy and accessible place, with a stop and waste cock on the inlet side and the immediate outlet side of the meter, all of which shall be of a type approved by the Borough. If the Borough decides that the meter is to be placed outside of the building, it must be placed in an approved meter box furnished by the Borough at the expense of the consumer, and it must have suitable stop and waste valves approved by the Borough. Meters over two (2) inches shall have an approved in-line strainer installed at the consumer’s expense.

D. A bypass line shall be provided around any meters exceeding one (1) inch or larger, along with the proper valvinas and fittings, as may be deemed necessary by the Superintendent of Public Works, such bypass lines to be as follows:

1. One and one-half (1-1/2) inch meter: Three-quarter (3/4) inch bypass.
2. Two (2) inch meter: One (1) inch bypass.
3. Three (3) inch meter: One (1) inch bypass.
4. Four (4) inch meter: Two (2) inch bypass.
5. Six (6) inch meter: Two (2) inch bypass.

The bypass shall have a valve which shall be appropriately sealed by the Borough and shall never be opened unless by authorization of the Superintendent of Public Works or his agents.

E. In the event any water line is used for the property electrical service ground, the customer shall provide an approved ground bridge around the meter installation.

§205. Curbs and Sidewalks.

1. Curbs.

A. Curbing shall be provided on all minor, collector and marginal access streets and as required by Council on major traffic streets. Where no curb is provided, there shall be a stabilized shoulder provided with a minimum width of six (6) feet.

B. Curbs shall be provided on all new streets and parking compounds located within a land development.

C. In areas where curb is not used, satisfactory provision must be made to avoid erosion.

D. Curbs shall be constructed to the dimensions shown in the Appendix.

E. Curbing shall be constructed in ten (10) foot lengths. A premolded expansion material having a minimum thickness of one-fourth (1/4) inch shall be placed between sections of curved curb and at intervals of not more than one hundred (100) feet. Intermediate joints between ten (10) foot sections shall be formed of two (2) layers of single-ply bituminous paper.

F. The depressed curb at driveways shall be no higher than one
and one-half (1-1/2) inch above the street surface. The length of this depressed curb shall not exceed thirty-five (35) feet without a safety island. This safety island shall not be less than fifteen (15) feet in length. Pipes or grates or other constructions shall not be placed in the gutter to form a driveway ramp. Depressed curb for driveways shall be designed to meet the requirements of §206 “Driveways.”

G. Excavations shall be made to the required depth, and the material upon which the curb is to be constructed shall be compacted to a firm, even surface. A layer of crushed stone not less than four (4) inches thick shall be placed under the curb.

H. Standard rolled curb shall be permitted by permission of the Council in lieu of standard straight curb, provided, however, that no such installation shall be permitted unless all curb on both sides of the complete block will be of rolled curb construction.

I. The standard rolled curb sections shall be constructed in such a manner as to insure uniformity and continuity of the invert curb flow line and shall be constructed on a compacted layer of three-quarter (3/4) inch or #57 crushed stone, four (4) inches in depth.

J. All standard rolled curb shall be cut completely through or scored to a depth of at least two (2) inches every ten (10) feet of length and one-quarter (1/4) inch minimum expansion joint, filled with material suitable for that purpose, shall be provided every sixty (60) feet length.

K. The standard rolled curb shall continue unchanged across the entrance to any driveway.

L. Standard slant curb shall be permitted by permission of Borough Council in lieu of standard straight curb, or standard rolled curb, provided, however, that no such installation shall be permitted unless all curb on both sides of the complete block will be of slant curb construction. Slant curbing shall be constructed to dimensions and specifications as set forth in the Appendix attached hereto and made a part hereof. Except as set forth in the Appendix attached hereto, standard slant curb shall be constructed in accordance with the provisions of subsections .1.I, .J, and .K. [Ord. 482]

2. Sidewalks.

A. Sidewalks shall be required on both sides of new streets in subdivisions or land developments.

B. Sidewalks shall be required in any subdivision or land development.

C. The paved portion of every sidewalk shall be in conformity with Ord. 356, 11/4/1986 [Chapter 21, Part 1]. The area between curb and sidewalk shall be twenty four (24) inches in width unless an exception is granted by Council. Sidewalks shall have a pitch of one-quarter (1/4) inch per foot upward from the edge nearest the cartway. The top surface of all such sidewalks shall represent a true plane within one-quarter (1/4) inch per ten (10) feet. All such sidewalks shall be at least four (4) inches thick and shall be constructed upon a firmly compacted base of three-quarter (3/4) inch or 2B crushed stone
four (4) inches in depth, as shown on the drawing “Curb and Sidewalk Standard.” [Ord. 427]

D. All sidewalks shall be scored one-half (1/2) inch in width and depth cross the width dimension of such sidewalk every five (5) feet. Such sidewalks shall be completely cut through where sidewalk joins driveway and at a distance not to exceed fifty (50) feet to provide an expansion joint which shall be filled with material suitable for that purpose. A preformed expansion material having a minimum thickness of one-fourth (1/4) inch shall be placed between sidewalk where it abuts curbing and other structures.

E. All sidewalks in driveways shall be at least five (5) inches thick reinforced with six inch by six inch (6" x 6") No. 10 wire mesh in residential areas and six inch by six inch (6" x 6") No. 6 wire mesh in commercial and manufacturing areas.

F. The unpaved width within the sidewalk lines shall be kept approved by Council. Nothing herein shall be construed to prohibit the leaving of a reasonable unpaved area necessary for their growth.

§205. Sidewalks.

1. General.

A. Access driveways onto Borough highways or highways which are to be dedicated to the Borough shall conform to the requirements of this Section. A building permit shall be obtained from the Borough before construction commences.

B. Access driveways onto highways controlled by the Pennsylvania Department of Transportation shall comply with Department regulations. A highway occupancy permit should be obtained prior to issuance of any building permits and a copy should be presented to the Borough.

2. General Driveway Requirements.

A. All driveways shall be located, designed, constructed and maintained in such a manner as not to interfere or be inconsistent with the design, maintenance and drainage of the highway.

B. General Location Restrictions. Access driveways will be permitted at locations in which:

(1) Sight distance is adequate to safely allow each permitted movement to be made into or out of the access driveway.

(2) The free movement of normal highway traffic is not impaired.

(3) The driveway will not create a hazard.

(4) The driveway will not create an area of undue traffic congestion on the highway.

C. Specific Location Restrictions.

(1) Access driveways shall not be located at interchanges, ramp areas, or locations that would interfere with the placement
and proper functioning of highway signs, signals, detectors, lighting or other devices that affect traffic control.

(2) The location of a driveway near a signalized intersection may include a requirement that the permittee provide, in cooperation with the Borough, new or relocated detectors, signal heads, controller, and the like, for the control of traffic movements from the driveway.

(3) Access to a property which abuts two (2) or more intersecting streets or highways may be restricted to only that roadway which can more safely accommodate its traffic.

(4) The Borough may require the permittee to locate an access driveway directly across from a highway, local road or access driveway on the opposite side of the roadway if it is judged that offset driveways will not permit left turns to be made safely or that access across the roadway from one (1) access to the other will create a safety hazard.

D. **Number of Driveways.** The number and locations of entrances which may be granted will be based on usage, interior and exterior traffic patterns and current design policy of the Borough.

(1) Normally, only one (1) driveway will be permitted for a residential property and not more than two (2) driveways will be permitted for a non-residential property.

(2) If the property frontage exceeds six hundred (600) feet, the permit may authorize an additional driveway.

(3) Regardless of frontage, a development may be restricted to a single entrance/exit driveway, served by an internal collector road separated from the traveled way.

E. **Approaches to Driveways.** Driveway approaches shall conform to the following standards:

(1) The location and angle of an access driveway approach in relation to the highway intersection shall be such that a vehicle entering or leaving the driveway may do so in an orderly and safe manner and with a minimum of interference to highway traffic.

(2) Where the access driveway approach and highway pavement meet, flaring of the approach may be necessary to allow safe, easy turning of vehicular traffic.

(3) Where the highway is curbed, driveway approaches shall be installed one and one-half (1/2) inches above the adjacent highway or gutter grade to maintain proper drainage. See Figure 5, Appendix V.

F. **Future Additional Driveways.**

(1) If the Borough anticipates that a property may be subdivided and that such subdivision will result in an unacceptable number or arrangement of driveways or both, the Borough may require the property owner to enter into an access covenant prior to issuance of a permit.
(2) The access covenant will restrict access to the approved locations regardless of whether the land is later subdivided or conveyed to other persons, or both.

(3) The access covenant shall become a part of the permit, which shall be recorded in the County Office of the Recorder of Deeds.

G. **Use of Highway Prohibited.**

[Text continued on p. 309]
(1) No part of the right-of-way shall be used for servicing vehicles, displays or conducting business. The area between the edge of the pavement and the right-of-way line shall be kept clear of all buildings, sales exhibits, business signs, vehicles, service equipment and similar items.

(2) Improvements on private property adjacent to the right-of-way shall be so located that parking, stopping and maneuvering of vehicles on the right-of-way will not be necessary in order for vehicles or patrons to be served. New liquid fuel pump islands installed in service stations adjacent to the highway shall be located at least twelve (12) feet outside the right-of-way, in order for a driveway permit to be issued. See Figure 11 and Figure 12, Appendix 5.

3. Driveway Design Requirements.

A. General.

(1) The ability of a driveway to safely and efficiently function as an integral component of a highway system requires that its design and construction be based on the amount and type of traffic that it is expected to serve and the type and character of roadway which it accesses. This Section separates driveways into four (4) classifications, based on the amount of traffic they are expected to serve. A description of each classification and typical examples of land uses normally associated with each follows:

(a) Minimum use driveway, see Figure 7, Appendix V. A driveway normally used by not more than twenty-five (25) vehicles per day such as:

1) Single family dwellings, duplex houses; or,
2) Apartments with five (5) units or less.

(b) Low volume driveway, see Figure 8, Appendix V. A driveway normally used by more than twenty-five (25) vehicles per day but less than seven hundred fifty (750) vehicles per day, such as:

1) Office buildings;
2) Elementary and junior high schools; or,
3) Car washes.

(c) Medium volume driveway, see Figures 9, 11, 12, Appendix V. A driveway normally used by more than seven hundred fifty (750) vehicles but less than one thousand five hundred (1,500) vehicles a day, which does not normally require traffic signalization, such as:

1) Motels;
2) Fast food restaurants; or,
3) Service stations and small shopping centers or plazas.

(d) High volume driveway, see Figure 10, Appendix V.
A driveway normally used by more than one thousand five hundred (1,500) vehicles per day, which often requires traffic signalization, such as:

1) Large shopping centers; or
2) Multi-building apartments or office complexes.

(2) The design features described in this Section and illustrated in the attendant figures are to be used by the applicant in designing the driveway plans which accompany the application. Dimensions shall be selected from the range of values shown on the appropriate figure, unless site conditions warrant a deviation. The Borough may require design details which are more stringent than those specified in this Section to insure the safe and efficient operation of any proposed driveway.

(3) Figures 7, 8 and 9, Appendix V, show two (2) sets of design values. The applicant shall design his driveway using the values appropriate for the posted speed of the roadway being accessed.

P. Angle of Access Driveway Approach.

(1) Access driveway approaches used for two (2) way operation shall be positioned at right angles, that is, ninety (90) degrees, to the highway or as near thereto as site conditions permit, except as authorized in Figure 11, Appendix V.

(2) When two (2) access driveways are constructed on the same property frontage and used for one (1) way operation, each of these driveways may be placed at an angle less than a right angle, but not less than forty-five (45) degrees to the highway, except that along divided highways where no openings are allowed in the median, the minimum angle of an exit driveway may be thirty (30) degrees, as shown in Figure 12, Appendix V. Signs which designate the appropriate one-way travel designation shall be provided. [Ord. 427]

C. Driveways Adjacent to Intersections. Driveways serving properties located adjacent to a highway intersection are subject to the following:

(1) There shall be a minimum ten (10) foot tangent distance between intersecting highway radius and the radius of the first permitted driveway.

(2) The distance from the edge of pavement of the intersecting highway to the radius of the first permitted driveway shall be a minimum of twenty (20) feet on curbed highways and thirty (30) feet on uncurbed highways.

(3) Paragraphs A and B of this subsection may be waived only if the intersecting highway radius extends along the property frontage to the extent that compliance is physically impossible.

D. Property Line Clearance. Except for joint-use driveways, no portion of any access shall be located outside of the property frontage boundary line.
E. Multiple Driveways. Multiple driveways serving the same property must be separated by a minimum distance of fifteen (15) feet measured along the right-of-way line and twenty (20) feet measured along the shoulder, ditch line or curb. When the distance between multiple driveways is fifty (50) feet or less measured along the shoulder or ditch line, the area between shall be clearly defined by permanent curbing. This curb shall be placed in line with existing curb or two (2) feet back of the shoulder or ditch line on uncurbed highways. It shall be extended around the driveway radii to the right-of-way line.

F. Site Requirements.

(1) All nonresidential buildings shall be located a sufficient distance from the right-of-way line to provide ample driving area and parking off the right-of-way to prevent storage of vehicles on the access driveways and to prevent the backup and turning of vehicles on the highway pavement.

(2) The radii of internal curves shall be as large as possible to allow a direct movement from the highway into a proper position to obtain service or parking without any interference to other vehicles attempting the same maneuver.

(3) Applications for driveways providing access to drive-in-service developments shall, when requested, include information relative to the amount of storage provided between the service facility and the right-of-way, the number of service operations anticipated during peak periods and the hours and days of operation.

(4) The area between the right-of-way line adjacent to and on both sides of a driveway shall be used as a clear zone to provide a physical barrier between the traveled way and activity on private property. This area shall remain free of any obstructions which may interfere with a clear line of vision for entering or exiting vehicles.

G. Curbing.

(1) The permit may require the installation of curbing wherever it is required to control access or drainage, or both. All curbing must be permanent curbing.

(2) Where property abutting the right-of-way line could be used as a parking area, the permit may require curbing, permanent guard rail or fencing to be constructed along the right-of-way line in order to prohibit vehicle encroachment upon the sidewalk or shoulder area.

(3) If, in the opinion of the Borough, there is a high probability that vehicles would otherwise utilize a portion of the property frontage other than the approved driveway to gain access to the property, the permit may require curbing or other physical barriers to be constructed.

(4) When curb exists adjacent to the proposed driveway, the line and grade of the existing curb shall be matched, unless otherwise authorized by the permit.
H. Sight Distance.

(1) Access driveways shall be located at a point within the property frontage limits which provides at least the minimum sight distance listed in the appropriate following table:

**TABLE 1**

SAFE SIGHT DISTANCE FOR PASSENGER CARS AND SINGLE UNIT TRUCKS EXITING FROM DRIVEWAYS ONTO TWO-LANE ROADS

<table>
<thead>
<tr>
<th>Posted Speed</th>
<th>Safe Sight Distance - Left (1)</th>
<th>Safe Sight Distance - Right (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 MPH</td>
<td>250 Feet</td>
<td>195 Feet</td>
</tr>
<tr>
<td>35</td>
<td>440</td>
<td>350</td>
</tr>
<tr>
<td>45</td>
<td>635</td>
<td>570</td>
</tr>
<tr>
<td>55</td>
<td>845</td>
<td>875</td>
</tr>
</tbody>
</table>

(1) Measured from a vehicle ten (10) feet back of the pavement edge.

**TABLE 2**

SAFE SIGHT DISTANCE FOR BUSES AND COMBINATIONS EXITING FROM DRIVEWAYS ONTO TWO-LANE ROADS

<table>
<thead>
<tr>
<th>Posted Speed</th>
<th>Safe Sight Distance - Left (1)</th>
<th>Safe Sight Distance - Right (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 MPH</td>
<td>400 Feet</td>
<td>300 Feet</td>
</tr>
<tr>
<td>35</td>
<td>675</td>
<td>625</td>
</tr>
<tr>
<td>45</td>
<td>1225</td>
<td>1225</td>
</tr>
<tr>
<td>55</td>
<td>2050</td>
<td>2050</td>
</tr>
</tbody>
</table>

(1) Measured from a vehicle ten (10) feet back of the pavement edge.

**TABLE 3**

SAFE SIGHT DISTANCE FOR PASSENGER CARS AND SINGLE UNIT TRUCKS EXITING FROM DRIVEWAYS ONTO FOUR AND SIX-LANE ROADS

<table>
<thead>
<tr>
<th>Posted Speed</th>
<th>Safe Sight Distance - Left (1)</th>
<th>Safe Sight Distance - Right (2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 MPH</td>
<td>175 Feet</td>
<td>195 Feet</td>
</tr>
<tr>
<td>35</td>
<td>300</td>
<td>350</td>
</tr>
<tr>
<td>45</td>
<td>500</td>
<td>570</td>
</tr>
<tr>
<td>55</td>
<td>785</td>
<td>875</td>
</tr>
</tbody>
</table>

(1) Measured from a vehicle ten (10) feet back of the pavement edge to a vehicle in the outside lane.
(2) Measured from a vehicle ten (10) feet back of the pavement edge to a vehicle approaching in the median lane.

**TABLE 4**

SAFE SIGHT DISTANCE FOR BUSES AND COMBINATIONS EXITING FROM DRIVeways ONTO FOUR AND SIX-LANE ROADS

<table>
<thead>
<tr>
<th>Posted Speed</th>
<th>Safe Sight Distance - Left (1)</th>
<th>Safe Sight Distance - Right(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 MPH</td>
<td>300 Feet</td>
<td>300 Feet</td>
</tr>
<tr>
<td>35</td>
<td>625</td>
<td>625</td>
</tr>
<tr>
<td>45</td>
<td>1225</td>
<td>1225</td>
</tr>
<tr>
<td>55</td>
<td>2050</td>
<td>2050</td>
</tr>
</tbody>
</table>

(1) Measured from a vehicle ten (10) feet back of the pavement edge to a vehicle in the outside lane.

(2) Measured from a vehicle ten (10) feet back of the pavement edge to a vehicle approaching in the median lane.

**TABLE 5**

SAFE SIGHT DISTANCE FOR PASSENGER CARS AND SINGLE UNIT TRUCKS ENTERING DRIVeways BY LEFT TURNS

<table>
<thead>
<tr>
<th>Posted Speed</th>
<th>Safe Sight Distance in Feet (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2-Lane</td>
</tr>
<tr>
<td>25 MPH</td>
<td>190</td>
</tr>
<tr>
<td>35</td>
<td>300</td>
</tr>
<tr>
<td>45</td>
<td>445</td>
</tr>
<tr>
<td>55</td>
<td>610</td>
</tr>
</tbody>
</table>

(1) Measured from the point where a left-turning vehicle stops to a vehicle in the outside lane.

**TABLE 6**

SAFE SIGHT DISTANCE FOR BUSES AND COMBINATIONS ENTERING DRIVeways BY LEFT TURNS

<table>
<thead>
<tr>
<th>Posted Speed</th>
<th>Safe Sight Distance in Feet (1)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2-Lane</td>
</tr>
<tr>
<td>25 MPH</td>
<td>380</td>
</tr>
<tr>
<td>35</td>
<td>485</td>
</tr>
<tr>
<td>45</td>
<td>690</td>
</tr>
<tr>
<td>55</td>
<td>905</td>
</tr>
</tbody>
</table>

(1) Measured from the point where a left-turning vehicle stops to a vehicle in the outside lane.
(2) In using Tables 1 through 6, the following additional requirements shall apply:

(a) Tables 2, 4 and 6 shall be used in lieu of Tables 1 and 5 only when combination traffic exceeds five (5%) percent of the total traffic using the proposed driveway.

(b) Posted speeds shall be used unless operating speeds vary from the posted speed by more than ten (10) miles per hour, in which case, the Borough may require that operating speeds be used.

(c) The sight distances in Tables 1 through 4 apply only when highway grades are zero to three (3%) percent, either up or down.

1) When the highway grade in the section to be used for acceleration, after leaving the driveway, ascends at three (3%) to five (5%) percent, the sight distance in the direction of approaching ascending traffic may be increased by a factor of 1.4.

2) When the highway grade ascends at greater than five (5%) percent, sight distance may be increased by a factor of 1.7.

3) When the highway grade in the section to be used for acceleration after leaving the driveway descends at three (3%) to five (5%) percent, sight distance in the direction of approaching descending highway traffic may be reduced by a factor of 0.6.

4) When the road descends at greater than five (5%) percent, sight distance may be reduced by a factor of 0.5.

(d) The sight distance values in Table 1 through 6 are desirable for safe operation of the driveway. Sight distance values less than desirable will be accepted only if it is impossible to achieve the desirable value by locating the driveway at any point within the property frontage boundaries. The minimum acceptable sight distance values shall be computed from the following formula:

\[ SSSD = 1.47 \frac{Vt + V^2}{30(\pm g)} \]

SSSD = Minimum safe stopping sight distance (feet).

\( V \) = Velocity of vehicle (miles per hour).

\( t \) = Perception time of motorist (average = 2.5 seconds).

\( f \) = Wet friction of pavement (average = 0.30).

\( g \) = Percent grade of roadway divided by 100.

(3) If sight distance requirements as specified in this Section cannot be met, the Borough may:
(a) Prohibit left turns by exiting vehicles;
(b) Restrict turning movements to right turns in and out of a driveway;
(c) Require installation of a right turn acceleration lane or deceleration lane;
(d) Require installation of a separate left turn standby lane;
(e) Alter the horizontal or vertical geometry of the roadway; or,
(f) Deny access to the highway.

I. Grades of Access Driveway.

(1) All driveways shall be constructed so as not to impair drainage within the right-of-way, alter the stability of the improved area or change the drainage of adjacent areas.

(2) Where a drainage ditch or swale exists, the permittee shall install adequate pipe under the driveway in accordance with §202. Drainage pipe installed under driveways shall be at least fifteen (15) inches in diameter.

(3) The side slopes for driveway embankments within the right-of-way shall not be steeper than ten to one (10 to 1). See Figure 6, Appendix V.

(4) Grade requirements in uncurbed shoulders within the right-of-way shall conform to Figure 1, Appendix V.

(5) Grade requirements where curbs and sidewalks are present.

(a) The driveway approaches shall be installed one and one-half (1 1/2) inch above the adjacent roadway or the gutter grade to maintain proper drainage. See Figure 5, Appendix V.

(b) The difference between the cross slope of the roadway and the upward grade of the driveway approach shall not exceed eight (8%) percent.

(c) When a planted area exists in front of the sidewalk, one (1) of the following three (3) cases shall apply:

1) When the grass strip between the curb and the sidewalk is wide enough to maintain an eight (8%) percent maximum driveway approach grade, construct the driveway as shown on Figure 2, Appendix V.

2) If the driveway grade would exceed eight (8%) percent, depress the outer edge of the sidewalk and maintain a maximum sidewalk cross slope of six (6%) percent. This will enable the driveway slope to stay within the eight (8%) percent slope limit. See Figure 3, Appendix V.
3) If the sidewalk cross slope would exceed six (6%) percent, as indicated in subsection (2) of this subsection, depress the entire sidewalk. The amount of depression shall not exceed one and one-half (1 1/2) inches at the inner edge of the sidewalk. The longitudinal slope of the sidewalk shall not exceed two (2) inches per foot. See Figure 3, Appendix V.

(d) When the sidewalk is directly against the back of the curb and the sidewalk is at least five (5) feet wide, the curb shall be sloped as shown in Figure 5 of Appendix V. This will eliminate the need for depressing the back edge of the sidewalk. For sidewalks narrower than five (5) feet, the curb will be sloped and the back edge of the sidewalk will be depressed (maximum one and one-half (1 1/2) inch) to maintain an eight (8%) percent maximum grade on the driveway. The longitudinal grade of the sidewalk shall not exceed two (2) inches per foot.

J. Auxiliary Lanes.

(1) Acceleration and Deceleration Lanes. The combination of highway speed, volumes, location and arrangement of driveways and intersections may require the installation of an acceleration or deceleration lane, or both, to serve a proposed low, medium or high volume driveway. When required by the permit, a speed change lane of sufficient length and width shall be constructed to allow vehicles to safely decelerate or accelerate when entering or leaving the property.

(2) Left Turn Standby Lanes. The permit may require the installation of a left turn standby lane to separate and protect left turning vehicles from through traffic if failure to do so would result in an undue hazard to the traveling public.

(3) Where the width of the highway right-of-way is insufficient to permit the construction of a needed auxiliary lane, the permittee shall provide any necessary additional right-of-way.

(4) When required, auxiliary lanes shall be constructed, at no cost to the Borough, in accordance with the roadway construction standards.

(5) If an auxiliary lane must be located in front of another person's property, the applicant shall be required to secure the approval of the other person or indemnify the Borough against any action which the other person may bring against the Borough.

K. Access Driveway Pavement. Minimum use driveways shall be constructed with a minimum of six (6) inches of stone base and two (2) inches of bituminous concrete between the traveled way and the right-of-way line. Low, medium and high volume driveways shall be constructed with a minimum if eight (8) inches of stone base and two and one-half (2) inches of bituminous concrete.

L. Driveways Relative to Ramps. Ramps are intended to provide
access from one (1) roadway or roadway system to another with a minimum amount of conflict or interference from other traffic. To insure the integrity of this intended function, no access driveway will be permitted on a ramp or within fifty (50) feet of the intersection of the edge of pavement of the ramp or its speed change lane with the edge of pavement of the intersection roadway. Exceptions will be considered only if the enforcement of this subsection will result in the prohibition of reasonable access from adjacent property to the highway system.

M. Median Openings.

(1) The removal of a portion of a median divisor along a divided highway to provide access to and from traffic in both directions will not be permitted unless it is determined that the operating characteristics of the highway system will be improved by such action.

(2) A left turn standby lane shall be installed to separate and protect left turning vehicles whenever a median opening is permitted.

N. Shoulder Upgrading. Where the existing shoulder on either side of a proposed low medium or high volume driveway is not adequate to allow its use by turning vehicles, the permittee shall upgrade the shoulder area for a minimum of one hundred (100) feet on either side of the driveway. The type of shoulder to be installed will be specified by the permit, in accordance with the volume and type of traffic expected to use the driveway.

O. Traffic Control Devices.

(1) Nonelectrically Powered Devices. The permittee shall, at its own expense, install and maintain all nonelectrically powered traffic control devices, as specified in the permit, which are required to provide for the safe and orderly movement of vehicular or pedestrian traffic, or both. These devices shall include, but not be limited to, any required regulatory, warning or guide signs, delineators and pavement markings.

(2) Electrically Powered Devices.

(a) When power operated devices, including traffic signals, are required for proper traffic control, a traffic signal permit shall be obtained in addition to the occupancy permit. The permit to own and operate a traffic control device shall be requested by the Borough and will be issued to the Borough by the Department of Transportation.

(b) Applications for driveways which include traffic signal control shall be accompanied by the following additional information:

1) An engineering study in sufficient detail to allow determination of the need for signal control and the adequacy of its design and operation.

2) Location of traffic signal heads, poles, controller and detectors.
3) Phasing and timing diagrams.

4. Driveway Layout Illustrations. Figures 7 through 12, Appendix V, illustrate and supplement the minimum design requirements described in this Section. Although site conditions may not allow strict adherence to the dimensions shown in these illustrations, every effort shall be made to design and construct the safest and most efficient access onto the Borough highway.


§207. Off-Street Parking.

1. General. Off-street parking shall be required in accordance with the provisions of this Section and the Borough Zoning Ordinance [Chapter 27] as a condition precedent to the occupancy of any buildings or use so as to alleviate traffic congestion on streets. These facilities shall be provided whenever:

A. A building is constructed or a new use is established;

B. The use of an existing building is changed to a use requiring more parking facilities; and,

C. An existing building or use is altered or enlarged so as to increase the amount of parking space required.

2. General Design Requirements.

A. All parking spaces shall have an approved paved surface with a minimum of six (6) inch stone base and two (2) inch bituminous concrete surface course.

B. Parking lots shall be graded to a minimum slope of one (1) percent to provide for drainage. Adequately sized inlets and storm sewers shall be provided to discharge storm water in accordance with a plan to be approved by the Borough.

C. Parking lots shall be graded to a maximum slope of six (6) percent.

D. In the design of parking lots, the minimum required stall depth, stall width, and driveway width shall be as shown on Exhibit "A" of this Section.

E. Appropriate bumper guards or curbing shall be provided as required by the Borough in order to clearly define parking spaces or limits of paved areas and to prevent vehicles from projecting into required yards or right of way.

F. All parking lots shall be adequately marked and maintained for the purpose of defining parking stalls and driveways.

G. All parking spaces shall be on the same lot as the principal building or use except when permitted elsewhere by Council.

H. A parking space for one (1) vehicle shall be equal to at least three hundred and fifty (350) square feet for purposes of computing car spaces including stalls and driveways, and shall have a stall of at least ten (10) feet by eighteen (18) feet in size.

I. Automotive vehicles or trailers of any kind or type without
current license plates shall not be parked or stored on any residen-
tially zoned property other than in completely enclosed buildings.

J. No major recreational equipment shall be parked or stored on
any lot of less than one (1) acre in a residential district except in
a car port or enclosed building or behind the nearest portion of a
building to a street; provided, however, that such equipment may be
parked anywhere on residential premises for a period not to exceed
twenty-four (24) hours during loading or unloading. No such equipment
shall be used for living, sleeping, or housekeeping purposes when parked
or stored on residential lots, or in any location not approved for such
use. For purposes of these regulations, major recreational equipment
is defined as including boats and boat trailers, travel trailers, pick-
up campers or coaches (designed to be mounted on automotive vehicles),
motorized dwellings, tent trailers, and the like, and cases or boxes
used for transporting recreational equipment, whether occupied by such
equipment or not.

K. In residential districts, parking lots shall not be located
closer than five (5) feet to any property line or street right-of-way.

L. In commercial districts, no parking shall be permitted closer
than ten (10) feet to any property line or forty (40) feet to any street
right-of-way.

M. In industrial districts no parking shall be permitted closer
than ten (10) feet to any property line or forty (40) feet to any street
right-of-way.

(Ord. 393, 4/3/1990, §207)

§208. Fire Lanes.

1. General.

A. The fire marshall, in conjunction with the engineer, shall
designate the exact locations of emergency fire lanes in all new public,
commercial, industrial, institutional and multi-family residential
developments in the Borough of New Holland.

B. All new development plans involving public, commercial,
industrial, institutional and multi-family residential developments
shall include lanes designated for emergency fire equipment and shall
be constructed in accordance with the provisions of this Section. All
such plans shall be subject to the review of both the fire marshall and
the Borough.

C. All emergency fire lanes shall be maintained by the owner and
shall be kept free of vehicles and all other structures, materials and
equipment which would interfere with the ppa of fire equipment.

D. All emergency fire lanes shall be kept clear of snow and ice
accumulations by the owner.

2. Design Standards.

A. The base course shall be of crushed aggregate with a minimum
thickness of eight (8) inches, as specified in the Pennsylvania
Department of Transportation Specifications, Form 408, and its latest
revisions.

B. Pavement shall consist of a minimum of one and one-half (1 1/2) inches of binder course and one (1) inch of wearing surface. Material shall be equal or superior to the Pennsylvania Department of Transportation specifications for bituminous surface course ID-2A and shall be applied in accordance with the Pennsylvania Department of Transportation Specifications, Form 408, and its latest revisions.

C. As an alternate, the emergency fire lane may be constructed of six (6) inches of granular material as subbase, four (4) inches of compacted aggregate bituminous base course and one and one-half (1 1/2) inches of wearing course. The type and installation of road material shall be equal or superior to that required in the Pennsylvania Department of Transportation Specifications, Form 408, and its latest revisions.

D. Where soil conditions warrant, the Borough may direct the placing of granular material as subbase along with provision of subbase drains. Depth and quality of the subbase shall be as directed by the engineer.

E. The minimum wearing surface grade of emergency fire lanes shall be one (1%) percent. Curbs shall be equivalent to plain cement concrete curb. Where no curb is provided, there shall be a minimum of six (6) feet of stabilized shoulder provided.

F. Cuts and fills shall be made at a maximum slope of two (2) feet horizontal to one (1) foot vertical. Where curbing or retaining walls are used to control slopes, a sketch showing details of the construction shall be submitted to the engineer.

G. The minimum width for emergency fire lanes measured from edge of pavement to edge of pavement shall be fourteen and one-half (14 1/2) feet.

H. The minimum curb radius for emergency fire lanes on curves shall be forty-seven and one-half (47 1/2) feet. Measurement shall always be along the pavement side edge of the curb.

I. No signs or other structures shall protrude to within four (4) feet of the emergency fire lane pavement edge.

J. There shall be no trees or other plantings whose branches, trunks or any other parts protrude to within four (4) feet of the emergency fire lane pavement edge.

K. No aerial transmission lines of any kind shall be located within twenty (20) feet of the emergency fire lane.

(Ord. 393, 4/3/1990, §208)

§209. Interior Drives and Interior Streets. Interior drives are private drives, which provide vehicular movement between a street and a tract of land containing any use other than one single-family dwelling unit or farm. Interior streets are private streets, which provide vehicular movement between two public streets. Interior drives and/or interior streets shall conform to the following:
A. The vertical curve length of interior drives and interior streets shall be a minimum length of fifteen (15) times the algebraic difference in grade for the intersecting tangents.

B. The horizontal alignments of interior drives and interior streets shall be measured along the center line. Horizontal curves shall be used at all angle changes in excess of two (2) degrees. All curves shall be tangential arcs. The minimum horizontal curve radius shall be fifty (50) feet. A tangent is not required between horizontal curves.

C. All interior drive and interior street intersections shall be:

1. Subject to approval of the Pennsylvania Department of Transportation when intersecting a State route. Copies of highway occupancy permits from the Pennsylvania Department of Transportation shall be submitted for all proposed intersections with a State route prior to final plan approval.

2. Set back fifty (50) feet from the intersection of any street right-of-way lines and three hundred (300) feet from the center line of a signalized intersection to the centerline of the interior drive or interior street.

3. Set back from any side and/or rear property lines for interior drives and interior streets shall be a minimum of fifteen (15) feet. Interior drives are permitted to cross setbacks.

4. Located in relationship to interior drive and interior street intersections on adjacent properties to provide safe and efficient movement of vehicles.

5. Located directly across from any intersecting street, driveway, interior street or interior drive on the opposite side of the street, where applicable.

6. Designed with right-angle intersections whenever possible. No interior drive or interior street intersection shall utilize an angle less than seventy-five (75) degrees, unless turning movement restrictions are imposed.

7. Rounded by a tangential arc with a minimum radius of ten (10) feet. The Borough may require a larger radius where large vehicle turning movements are anticipated.

8. At stop controlled intersections where an interior street intersects a public street safe stopping distance, per PennDOT standards, and clear sight triangles shall be provided in accordance with this Section.

D. Interior drives and interior streets shall not be required to provide curbing, sidewalks or shoulders.

E. Interior drive and interior street cul-de-sacs shall not have a maximum or minimum length. Interior drive cul-de-sacs which do not terminate in a parking compound shall be provided at the terminus with a paved turnaround adequate for passenger vehicles.

F. Interior drive and interior street grade profiles within fifty (50) feet of the street right-of-way shall conform to standards outlined in Title 67 of the Pa.Code, Chapter 441.
G. The maximum grade profile of an interior drive shall be sixteen (16) percent.

H. The maximum grade profile of an interior street shall be eight (8) percent.

I. The minimum grade profile of an interior street and interior drive shall be one (1) percent.

J. An access easement shall be provided for interior streets. The access easement shall extend one (1) foot behind the back of curb or one (1) foot beyond the edge of pavement for interior streets that are not curbed.

K. Interior Drive and Interior Street Width Requirements.

<table>
<thead>
<tr>
<th>Function</th>
<th>Interior Drive Min. Cartway Width (ft.)</th>
<th>Interior Street Min. Cartway Width (ft.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>One-way Traffic, no parking</td>
<td>9</td>
<td>12</td>
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<tr>
<td>Two-way Traffic, no parking</td>
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<td>22</td>
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<tr>
<td>One-way Traffic, parallel parking on one side</td>
<td>16</td>
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<td>Two-way Traffic, parallel parking on one side</td>
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<tr>
<td>Two-way Traffic, parallel parking on two sides</td>
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</table>

(Order 393, 4/3/1990; as added by Ord. 570, 7/1/2014, §2)
Part 3
Construction Standards

§301. Excavation and Embankment.

1. Scope. The work covered by this Section shall include the furnishing of all equipment, materials, labor and all else necessary to complete all excavation, embankment, subgrade and grading for the construction of improvements. In addition to these specifications, Form 408 specifications of the Commonwealth of Pennsylvania, Department of Transportation, shall apply.

2. Excavation.

A. General. Excavation shall include all excavation, as hereinafter limited and defined, and the satisfactory use of all suitable excavated materials, which may be necessary for the construction and preparation of the roadway, embankments, subgrade, shoulders, intersecting roads or streets, driveways, approaches, ditches, structures, stream channels, railroad roadbeds, the stabilization of slopes or base areas, required backfilling, and other incidental construction or related work.

B. Excavation.

(1) Excavation shall include the satisfactory disposal of all unsuitable and surplus materials, the removal, storing, and rehandling of suitable excavation, as required, for the placement of suitable material below subgrade elevation; and the removal, storing, and rehandling, as necessary, of existing bituminous and base course materials and its placement as a surface layer on shoulder, approach, and driveway areas, as directed; also, the furnishing, placing, and/or removal of any bracing and shoring, including bailing and/or pumping of water, incidental to the work, as herein described.

(2) It shall include other excavation and work incidental thereto.

(3) During construction, the roadway shall be kept shaped and drained at all times.

C. Removal of Existing Bases and Pavements.

(1) Where the existing rigid base course or pavement does not require removal, it may be broken in place as directed and shall not be removed.

(2) Where the surface of an existing non-rigid road conforms approximately to the proposed subgrade elevation, or where an embankment is to be made over the old road, the surface of the former road shall be scarified uniformly to a depth of not less than four (4) inches so as to permit satisfactory reshaping, binding, and compaction of the subgrade or binding of the initial layer of embankment.

(3) No concrete base course or pavement shall be broken by the weight-dropping method where this operation may damage a public or private facility or inconvenience or jeopardize the
safety of the public.

(4) Where the existing rigid base course or pavement is required to be removed, it shall be broken and utilized in embankments as random material.

D. Slopes.

(1) Slopes shall be trimmed neatly to the lines and rate of slope indicated on the original or revised drawings and/or cross-sections, or as established by the engineer, and the work left in a neat and acceptable condition.

(2) However, the slopes in cuts may be varied during construction by the engineer, according to the type of material encountered, in order to obtain satisfactory stability. The excavated material shall be removed by a method which will permit the revised slope lines to be neatly and acceptably trimmed to meet the existing conditions.

(3) It shall be the responsibility of the contractor to remove slide material and to bench and flatten slopes as may be necessary to obtain the planned width of roadway and stability of slopes at any locations directed by the engineer.

E. Excavation Beyond Established Slope Lines. The contractor shall determine the widths and depths to be excavated in accordance with the drawings and cross-sections. In no case shall the contractor remove or excavate any material beyond the original or revised slope lines as indicated on the drawings and/or cross-sections without the written approval of the engineer.

F. Stream Channels.

(1) Excavation of stream channels, with or without sub-channels, shall not be performed until directed. When excavation of a channel having a designed bottom width of eight (8) feet or more is completed in accordance with the drawings or as required, and upon written request of the contractor, the engineer will make an inspection of the excavation and when it is found to be satisfactory, the engineer shall cause it to be cross-sectioned and such measurements shall be used as the basis for current and final payments of the excavation involved.

(2) The contractor shall perform all stream channel excavation in an orderly and systematic manner to prevent, control, and abate water pollution.

G. Topsoil.

(1) All topsoil removed from the excavation or embankment areas will be classified as unsuitable material, unless otherwise directed.

(2) However, approved topsoil shall be stockpiled as required herein.

(3) When topsoil for designated area is shown on the drawings, the contractor shall stockpile all approved topsoil from the excavation. After this supply is exhausted, any
additional topsoil required to complete the work will be furnished.

H. Backfilling Around Structures. Concrete or masonry walls, extending above the elevation of the finished roadway or its appurtenances, shall be removed as required. Spaces excavated for, but not occupied by, structures shall be backfilled.

3. Embankment.

A. General. This work shall consist of the construction of embankment in accordance with these specifications and within reasonably close conformity to the lines and grades shown on the drawings and cross-sections or otherwise established by the engineer.

B. Materials. Material for embankment construction shall consist of all excavation on the project except such material as may be determined to be unsuitable by these specifications and, when required, will include approved common borrow excavation, foreign borrow excavation, and selected borrow excavation.

(1) Classification. For purposes of construction control, the excavation and borrow excavation used in this construction is further classified as follows:

(a) Soil. Soil shall include all earth materials having a maximum size that can be readily placed and compacted in loose eight (8) inch layers and of which more than thirty-five (35) percent shall pass the No. 200 sieve. Soil shall have a minimum dry weight density of ninety-five (95) pounds per cubic foot as determined in accordance with PTM No. 106, Method B, and a maximum liquid limit of sixty-five (65) as determined in accordance with ASSHTO Designation T 89. The plasticity index, as determined by ASSHTO Designation T 90 for soils having liquid limits of forty-one to sixty-five (41 to 65) inclusive, shall be not less than that determined by the formula - Liquid Limit minus thirty (30).

(b) Granular Material. Granular material shall include all natural or synthetic mineral aggregates having a maximum size that can be readily placed and compacted in loose eight (8) inch layers and of which thirty-five (35%) percent or less shall pass the No. 200 sieve.

(c) Shale. Shale shall include all rock-like minerals formed by the natural consolidation of mud, clay, silt, and fine sand and usually thinly laminated, comparatively soft and easily split, having a maximum size that can be readily placed and compacted in loose eight (8) inch layers.

(d) Rock. Rock shall include all igneous, metamorphic, and sedimentary rock which cannot be excavated without blasting or the use of rippers, and all boulders and detached stones having a maximum size that cannot be readily placed and compacted in loose eight (8) inch layers and which generally have insufficient fines to normally fill all the voids in each layer.
(e) Random Material. Random material shall include any combination of the above classifications and may include old concrete, brick, etc., from demolition having a maximum size that can be readily placed and compacted in loose eight (8) inch layers and which have been approved by the engineer.

C. Suitability of Material.

(1) Suitable Material. All material from excavation and/or borrow excavation shall meet the requirements of subsection (B). It shall be reasonably free of organic material, coal or coal blossom, and any other objectionable material considered unsuitable by the engineer for use in embankment construction.

(2) Frozen Material. Frozen material shall not be placed in embankments and, embankment material shall not be placed on material frozen to a depth of three (3) inches or more. If during construction the top of the embankment freezes to a depth of three (3) inches or more, the frozen material shall be removed before additional material is placed.

(3) Wet Material. Material containing moisture in excess of that percentage which will ensure satisfactory compaction shall not be placed in the embankment, and embankment material shall not be placed on material that has become unstable due to excessive moisture.

(4) Dry Material. Material containing insufficient moisture to obtain satisfactory compaction shall be moistened before compaction.


(a) Material from all classes of excavation which is unsuitable and any surplus of material not required in the construction of embankments, shoulders and approaches, or the widening of the roadway or the embankment slopes will be considered waste and shall, unless otherwise directed by the engineer, be disposed of by the contractor beyond the limits of the project.

(b) Suitable materials, including wet or frozen materials which would be suitable when dried or when thawed and dried, may be wasted by the Contractor for his convenience only with the written permission of the engineer, and subject to replacement in equivalent volume, at the expense of the contractor.

(c) In no case shall waste material be disposed of in the flood channel area of any stream.

D. Preparation of Foundation Area.

(1) The embankment foundation area shall be cleared and grubbed in accordance with §201.

(2) Existing depressions in embankment areas such as dikes, gullies, old stream channels, stump holes, or undercut sections, etc., shall be backfilled to the adjacent ground elevation in
the same manner as hereinafter specified for the formation of embankment prior to the initial layer of embankment.

(3) Embankment foundation areas, where undercutting is not directed, shall be plowed or scarified to a depth of at least eight (8) inches and then compacted to the density requirements herein specified. However, in inundated swamp, and other areas containing excessive moisture, or where field conditions warrant, the engineer may waive this requirement.

(4) Where the embankment foundation is situated in water or swamp areas or is saturated and/or unstable, the embankment shall be constructed with granular or random material or rock. In such areas, not less than high water level. Where rock embankment is to be constructed on saturated and/or unstable areas, a filter layer of granular material shall be placed at least three (3) feet in depth before constructing the rock embankment.

(5) Where embankment is to be constructed on a slope, the slope shall be benched to the width and depth shown on the drawings or as directed.

(6) The contractor will be permitted to construct, in layers, embankments having a maximum surface slope of ten to one (10 to 1) where required for the installation of transverse drainage and in the immediate vicinity thereof, as indicated on the standard drawings.

E. Placement and Compaction.

(1) Layers.

(a) All embankment material, other than rock and material for wet areas shall, unless otherwise directed by the engineer, be placed in uniform horizontal layers of not more than a loose eight (8) inch depth for the full width of the cross section. Material placed in wet areas may be end-dumped in water or to the elevation necessary to establish a satisfactory working platform.

(b) Each layer for its full width shall be compacted to not less than ninety-seven (97%) percent of the determined dry weight density, except that the material in the top three (3) feet of all embankments shall be compacted to not less than one hundred (100%) percent of the determined dry weight density. The dry weight density per cubic foot for the material being placed will be determined in the field in accordance with PTM No. 106, Method B. The in place density or compaction will be determined in accordance with PTM No. 112 or by the Department's nuclear method. When the material is too coarse to satisfactorily use these methods, compaction will be determined by the engineer based on non-movement of the material under the compaction equipment.

(c) Shale and random material containing an excessive quantity of large fragments shall be so placed that the coarser material is in the outside portions and the finer
material is in the central portions of the embankment effecting as nearly as possible a gradual transition in size. The large pieces shall then be broken down by the use of approved equipment until practically all voids are filled. Mixtures of shale and rock shall be placed in accordance with the requirements for placing shale.

(2) When a previously constructed embankment requires additional material to bring it to required elevation, the top of the embankment shall be thoroughly scarified before the required additional material is placed.

(3) Embankment material placed in areas inaccessible to the compaction equipment shall be placed in uniform loose layers not exceeding four (4) inches in depth and compacted by means of approved mechanical tampers to the density requirements herein specified.

(4) Embankment in areas back of bridge abutments and adjacent to structures under embankments shall be constructed with selected borrow excavation as shown on the standard drawings, unless otherwise specified. Rock may be used, provided it is placed and compacted in layers of twelve (12) inches or less.

(5) Rock.
   
   (a) Rock shall not be placed in embankments before the contractor has discussed his plans with and obtained the approval of the engineer for the related excavation and embankment operations.

   (b) Rock shall, in general, be placed to form the base of embankments for the full width of the cross-section. Rock shall also be placed on side slopes where required on the drawings, indicated on the cross-sections, or where directed. Excess rock disposed of on the side slopes of completed embankments need not be compacted when approved by the engineer.

   (c) Rock shall be placed in uniform loose layers not exceeding in depth the approximate average size of the larger rock, but limited to a maximum depth of thirty-six (36) inches. Oversize rock shall be reduced in size until it can be readily incorporated in a thirty-six (36) inch layer. However, rock shall not be dumped in final position, but shall be distributed by blading or dozing in a manner that will ensure proper placement in the embankment so that voids, pockets, and bridging will be reduced to a minimum. The top layers of all rock embankments shall be limited to a maximum depth of twelve (12) inches with all voids filled with smaller pieces, spals, or granular material.

   (d) Before rock is placed on compacted embankment constructed of other material, the top of the embankment shall be sloped from the centerline to the sides at the rate of approximately one (1) inch to the foot and the top of the embankment shall be thoroughly compacted. In no case shall
an embankment be benched for the placement of rock embankment or rock slopes.

(e) When rock and other embankment material are excavated at the same time, the rock shall be placed in the outside portion of the embankment and the other material shall be placed in the central portion of the embankment. During this construction, the elevations of both portions shall be substantially the same; but, the elevation of the layers of other material shall at all times be sufficiently above the rock layers to allow for satisfactory compaction of the layers of other material.

(f) All rock embankment shall be placed with care so that the larger pieces are well distributed and the voids filled to the extent that is practicable and so that rock placed on side slopes will within reasonably close conformity meet the lines shown on the drawings and cross-sections.

(g) Rock embankment shall not be placed in localized areas where bearing piles are to driven.

(6) During construction, the top layer of compacted embankment shall be kept shaped and drained at all times.

F. Slopes. Slopes shall be neatly trimmed to the lines shown on the drawings or as directed, and the finished work shall be left in a neat and acceptable condition.

G. Stability. The contractor shall be responsible for the stability of all embankments and shall replace all sections which, in the judgment of the engineer, have been damaged or displaced due to carelessness or negligence on the part of the contractor, to natural causes such as storms, floods, etc., shrinkage of embankment materials, and all reasons not attributable to unavoidable movement of the natural ground upon which the embankments is placed. Where unsuitable material has been placed in the embankment by the contractor, its removal and replacement with suitable material shall be at no expense to the Borough.

4. Subgrade.

A. General. This work shall consist of the preparation of the top surface of the roadbed to accommodate the placement of the pavement structure and shoulders or gutters in accordance with these specifications and within reasonably close conformity to the lines, grades, and widths shown on the drawings and cross-sections or otherwise directed.

B. Construction Requirements.

(1) General. The graded roadbed shall be formed to the established subgrade elevation and cross-section and compacted to the density requirements herein specified.

(2) Density Requirements.

(a) Subgrade shall be compacted to not less than one hundred (100%) percent of the determination dry weight
density. The dry weight density per cubic foot for the material in place will be determined in the field in accordance with PTM No. 106, Method B. The in-place density or compaction will be determined in accordance with PTM No. 112 or by the Department's nuclear method. When the material is too coarse to satisfactorily use these methods, compaction will be determined by the engineer based on non-movement of the material under the specified compaction equipment.

(b) The moisture content of subgrade material at the time of compaction shall be not more than two (2%) percentage points above the optimum moisture content, except that any subgrade which displays pronounced elasticity or deformation under construction equipment shall not have a moisture content greater than the optimum at the time compaction or at the time of placing the overlaying construction. When the specified stability cannot be obtained, the material in the area shall be excavated to a depth that when replaced and recompacted at a moisture content not exceeding optimum, the subgrade will have the required stability. Unsatisfactory material so remove from excavated areas will be classified as Class I excavation; in embankment areas, the material shall be removed at no expense to the Borough.

(3) Subgrade Requirements.

(a) In one (1) lane and two (2) lane width construction, the subgrade shall be completed as specified for not less than one thousand five hundred (1,500) linear feet, and progressively maintained, in advance of the succeeding operation. In intersection, approach, irregular, or isolated areas, the engineer may relax this requirement.

(b) It shall be the responsibility of the contractor to protect and maintain the subgrade at all times. In no case shall vehicles be permitted to travel over the subgrade in a single track. The contractor shall promptly and satisfactorily reshape and recompact or remove and replace any unsatisfactory areas prior to the placement of subbase, base course, or pavement.

(c) The subgrade shall be checked for crown and contour in the same manner as specified for checking the finished surface of base courses. However, where subgrade is constructed using an approved grading machine, which cuts the subgrade to the specified line and grade and is controlled automatically by taut lines erected on each side of the roadway, the templates for checking crown and contour will not be required.

(Ord. 393, 4/3/1990, §301)
A. The work covered by this Section shall include the furnishing of all equipment, materials, labor and all else necessary to complete all excavation, filling, backfilling, and grading for the construction of the improvements which shall include clearing and/or grubbing in the area of all natural obstructions and existing items which will interfere with the construction, except as may be provided for in these specifications and the plans.

B. All work within the limits of State highways shall be performed in accordance with the requirements of the Pennsylvania Department of Transportation, "Regulations Governing Occupancy of Highways by Utilities," 67 PA Code, Chapter 41.

C. In instances where proctor tests are required during the excavation and backfilling for sanitary sewers and appurtenances as defined in this Section, the costs of these tests shall be the responsibility of the contractor.

2. Preparation and Excavation of the Trench.

A. General. The contractor shall perform all excavation of every description and of whatever substances encountered to the lines and grades indicated on the drawings and specified herein, or as directed by the engineer. Excavation shall be made by open cut, unless written permission to excavate in tunnel or bore is given by the engineer or is specifically outlined in the specifications or shown on the construction drawings. In general, trenches may be excavated and backfilled either by machinery or by hand as the contractor may elect; provided, however, the contractor shall use hand excavation where necessary to protect existing structures, utilities, or private or public properties; and, provided, further, that backfilling shall be done by hand to the extent hereinafter specified. The contractor shall have no claim for extra compensation due to the fact that hand excavation, instead of machine excavation, may be made necessary from any cause whatever.

B. Stripping, Excavation and Backfill.

(1) The contractor shall remove all paving, sub-paving, curbing, gutters, brick, paving block, granite curbing, flagging or other similar materials, and grub and clear the surface over the area to be excavated. He shall properly store and preserve such materials that may be required for future use in restoring the surface. The contractor shall be responsible for any loss or damage to the said materials because of careless removal or neglectful or wasteful storage, disposal or use of the materials.

(2) All materials which may be removed, and all rock, earth and sand taken from the excavation shall be stored, if practical, in the roadway or such other suitable place and in such manner as the engineer shall approve. In case more materials are removed from any trench than can be backfilled over the completed pipe or stored in the street, leaving space for traffic, the excess materials shall be removed and stored at a suitable site provided by the contractor. The contractor shall, at his own expense, bring back as much of the approved materials so removed as may be required to properly refill the trench. When directed by the
engineer, the contractor shall furnish such other suitable materials as may be necessary to properly refill the trench at no additional cost to the owner.

(3) The contractor shall restore all shrubbery, fences, poles or other property and surface structures, removed or disturbed as a part of the work, to a condition equal to that before the work began, furnishing all labor and materials incidental thereto, without any additional cost to the owner. All items restored or replaced shall be maintained by the contractor under the terms of the maintenance bond without additional payment.

(4) The engineer may mark certain trees, shrubs, or other items that are not to be disturbed or damaged. In the event such items are disturbed or damaged, they shall be replaced or compensated for at the contractor's expense.

C. Width of Trench.

(1) Pipe trenches shall be sufficiently true in alignment to permit the pipe to be laid in the approximate center of the trench. The trench shall be wide enough to provide a free working space on each side of the pipe; however, the trench width at least twelve (12) inch above the top of the outside barrel of the pipe shall not exceed pay-line dimensions in the following table. Payment for the work shall be paid for trench widths not to exceed the pay-line dimensions in the following table:

MAXIMUM TRENCH PAY-LINE WIDTHS

<table>
<thead>
<tr>
<th>Nominal Pipe Diameter (Inches)</th>
<th>Crushed Stone Backfill (Width Inches)</th>
<th>Pavement Restoration and Reseeding (Width Inches)</th>
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</table>
(2) Manholes, Valve Pits, and other Structures. The pay-line shall be measured as one (1) foot outside the wall for excavation and eighteen (18) inches outside the wall for repaving.

(3) Where sheeting and shoring are used, the maximum allowable width of trench as shown in the preceding table shall be measured between the closest interior faces of the sheeting or shoring as placed. Whenever, for any reason, the maximum trench width is exceeded below the top of the pipe, the contractor may be ordered by the engineer to cradle or encase the pipe in concrete at the contractor's own expense in order to insure the structural integrity of the pipe.

(3) If the maximum width of trench specified above cannot be maintained, the contractor shall install temporary sheeting at his own cost and expense. Where sewers are to be constructed on rights-of-way or easements in open areas, the maximum width of trench at the top specified hereinbefore may be exceeded only if the construction is kept entirely within the limits of the right-of-way or easements and can be carried on without damage to adjoining property. The angle of slope shall be the angle at which the trench bank will stand without sliding and in no case shall the angle of slope be steeper than one-half (1/2) carried on without damage to adjoining property. The angle of slope shall be the angle at which the trench bank will stand without sliding and in no case shall the angle of slope be steeper than one-half (1/2) horizontal to one vertical. In locations other than rights-of-way or easements, the engineer may, as warranted by working conditions, and where permitted by the Pennsylvania Department of Labor and Industry requirements, waive the requirements that the maximum width of trench at the top shall not exceed the dimensions specified hereinbefore. If the maximum width requirement at the top is waived by the engineer, the Contractor will not be entitled to additional compensation beyond the specified trench widths.

(4) Where the engineer specifically requires the contractor in writing to excavate beyond the maximum allowable trench width, the contractor will be entitled to and will be reimbursed for the quantity of material excavated beyond the specified trench widths in accordance with the applicable unit prices contained in the proposal.

D. Length of Trench.

(1) No trench shall be opened more than one hundred (100) feet in advance of the pipe lines laid. The contractor shall limit all trench openings to a distance commensurate with all rules of safety.

(2) If the work is stopped either totally or partially, the contractor shall refill the trench and temporarily repave over the same at his expense and the trench shall not be opened until he is ready to proceed with the construction of the pipeline.

E. Pumping and Draining. The contractor shall remove by
pumping, draining, or otherwise, any water which may accumulate in the trenches and other excavations and shall build all dams and do all other work necessary to keep the trenches or other excavation as free from water as possible. Where it is impractical to completely drain the trench, special pipe or jointing materials may be authorized at no additional expense to the owner. While the pipe lines are being laid, the contractor shall have sufficient pumping machinery ready for immediate use. All surface waters shall be prevented from entering the open ditches or excavations by proper grading of the surface in the vicinity of the excavation.

F. Maintenance of Gutters. Contractor shall keep the gutters open at all times so that the flow of storm or other waters shall not be obstructed. If the material excavated from the trenches must temporarily extend over the gutters, it shall be the duty of the contractor to plank or bridge over the gutters, without extra compensation, so that the flow of water is not impeded. Erosion and sediment control shall be exercised in accordance with all applicable laws.

G. Maintenance of Traffic.

(1) Work shall be conducted so as to cause a minimum of inconvenience to pedestrian and vehicular traffic and to private and public properties along the line of work. It shall be the duty of the contractor, at all times to maintain crossings, walks, sidewalks, and other roadways open to traffic and in a satisfactory condition, and to keep all fire hydrants, water valves, fire alarm boxes, and letter boxes accessible for use. Whenever it is necessary to maintain pedestrian traffic over open trenches, a timber bridge at least three (3) feet in width and equipped with side railings shall be provided. When the excavated material will encroach upon sidewalks or private property, planking shall be placed in order to keep the sidewalk or private property clear of excavated material.

(2) In important thoroughfares, highways, or in narrow streets, the material excavated from the trench shall be removed from the site of the work at the contractor's own expense in order to provide suitable space for traffic. The contractor shall, at his own expense, bring back as much of the approved material as necessary to properly refill the trench; or he shall, at his own cost and expense, furnish such other suitable materials as may be necessary to properly refill the trench.

(3) When it is necessary to haul soft or wet materials over public streets, the contractor shall provide suitable vehicles and shall conform to all laws and ordinances relevant to such hauling.

(5) When working in other public rights-of-way, maintenance of traffic shall be as directed by the governing authority.

(6) No special payment will be made for traffic maintenance and protection.

H. Rock Excavation. Under this contract, all excavation shall be unclassified; that is, the removal of all material of any nature, kind, type or origin will be considered the same and shall be included in the unit pricing as indicated in the proposal.

I. Blasting and Explosives.

(1) The use of explosives shall be governed by the "Regulations for the Storage, Handling and the Use of Explosives" of the Pennsylvania Department of Labor and Industry.

(2) All blasts shall be properly matted and securely covered. The contractor shall be solely responsible for injury to persons or property located within or beyond the area or scope of the project that may result from his use of explosives.

(3) All blasting shall be done under the supervision of a competent blasting expert, and subject to the State, including Department of Labor and Industry, County, or local regulations for blasting. Whenever any pipe main or conduit is encountered in the trench, the right is reserved to direct that all material within five (5) feet of the same be removed by some method other than blasting.

(4) The contractor will be responsible for the depths to which all blasting is performed.

(5) Should any street paving adjoining any trench be damaged in consequence of the contractor's blasting operations, he shall immediately cease his blasting operations and repair the damaged street paving; also, he shall not again proceed with any blasting until he has submitted to and obtained approval from the engineer.

J. Braced and Sheeted Trenches.

(1) Open cut trenches shall be sheeted and braced as required by any governing Federal and State laws, and Borough ordinances, and may be necessary to protect life, property, or the work. The cost of furnishing, placing and removing the sheeting and bracing necessary to protect life, property or the work shall be included in the bid price for the pipe.

(2) The engineer reserves the right to order sheeting and bracing left in place for the protection of the finished work or adjacent property. Sheetling and bracing which have been ordered left in place by the engineer must be removed for a distance of three (3) feet below the established or existing grade, whichever is lower. Trench bracing, except that which must be left in place, may be removed when the backfilling has reached the respective levels of such bracing. Payment for sheeting and bracing ordered left in place by the engineer shall be paid for in accordance with the bid price for this unit, which shall

- 333 -
include the upper three feet or "cut-off" section of the sheeting.

K. Protection of Utilities, Property and Structures.

(1) The existence and location of underground utilities as indicated on the plans is presented merely to serve as a notification that such utilities do exist in the general proximity of the work. Any utilities not shown, or not located as shown, shall not be cause for the contractor to deny responsibility for their protection and/or repair during construction.

(2) The contractor shall be held liable to cause all utilities to be located prior to construction, and shall be held liable for any damage done by reason of breaking of water, sewer, gas, telephone, electrical, or other utility service.

(3) The contractor shall notify all utility companies in advance of construction and cooperate with agents of these companies during the progress of the work. Procedures for emergency action and repairs to utilities shall be established with the utility company prior to commencement of the work. During the course of his work, if the contractor shall damage any of the aforementioned utilities, he shall immediately follow the procedure of emergency action and repair as established.

(4) Whenever the contractor, during the progress of the excavation, shall uncover service pipes or lines, which because of injury or age are in poor condition, he shall immediately notify the proper authority in order that steps may be taken for replacement or repair. Locations of repairs, and the procedures of repairs that have been made shall be recorded by the contractor.

(5) The contractor shall, at his own expense, sustain in their places, and protect from direct or indirect injury, all pipes, conduits, tracks, walls, buildings, and other structures or property in the vicinity of his work, whether above or below the ground, or that may appear in the trench. He shall at all times have a sufficient quantity of timber and plank, chains, ropes, etc., on the ground and shall use them as necessary for sheeting his excavations and for sustaining or supporting any structures that are uncovered, undermined, endangered, threatened, or weakened.

(6) Pipes and underground conduits exposed as a result of the contractor's operations shall be adequately supported along their entire exposed length by timber or planking, installed in such manner that the anchorage of the supporting members will not be disturbed or weakened during the backfilling operation. Backfill of selected material shall be carefully rammed and tamped under and around the supports and all supports shall be left in place as a guard against breakage of the supported structure due to trench settlement. No additional payment will be due the contractor for material left in place nor for the labor of installing and maintaining supports.
(7) The contractor shall take all risks attending the presence or proximity of pipes, poles, power lines or wires, tracks, walls, buildings and other structures and property, of every kind and description, in or over his trenches, or in the vicinity of his work, whether above or below the surface of the ground; and he shall alone be responsible for all damages and assume all expense for direct or indirect injury, caused by his work, to any of them, or to any person or property by reason of them or by reason of injury to them, whether such structures are or are not shown on the drawings.

(8) Where necessary, in order to keep one (1) side of the street or roadway free from any obstruction or to keep the material piled alongside of the trench from falling on private property outside the right-of-way, a safe and suitable fence shall be placed alongside the trench.

(9) The cost of all work related to utility protection and repair shall be included in the bid price for lineal feet of pipe installed, or for the lump sum price of the contract. No separate payment will be made for utility location or repairs.

L. Tunneling and Jacking.

(1) Tunneling shall be used only when permitted by the engineer or required by the plans and specifications. Tunnels for the laying of pipe lines shall be of sufficient size to allow at all points the proper joining of pipes, and the proper compacting of the refill around them. Tunnels shall be timbered where and to such extent as may be necessary. Where rock is encountered in tunnel, it shall be fully taken out to the lines prescribed by the engineer without any additional payment. Methods of tunneling or jacking used as may affect the workmanship or quality of completed work or product shall be changed from time to time at the cost of the contractor, if, in the judgment of the engineer, conditions so require. Methods involving safety to person or property shall be the sole responsibility and liability of the contractor.

(2) Where sewers, service connections or other connections cross under existing conduits and can be built in tunnel or jacked, no additional compensation will be paid beyond the prices bid per lineal foot for furnishing and laying pipe.

(3) Where excavation for the sewer is made in tunnel, the prism of material removed shall conform as nearly as possible to the dimensions specified or shown. Tunnels in earth shall be properly braced and timbered in accordance with the most approved method of soft ground tunneling.

(4) Where ordinary timber lining is used, the space between such timber and the outer surface of the sewer shall be completely filled with selected earth or other approved material, rammed solidly between the sewer and the timber lining, or this space shall be filled with concrete if ordered by the engineer, and the contractor shall be paid therefor at the unit price bid for concrete for pipe cradles, anchors, bedding and encasements.
All voids between the timber lining and tunnel excavation shall be completely filled with Portland cement grout.

(5) Sewers or service connections may, at the volition of the contractor (subject to the approval of the engineer), be installed by jacking or by a combination of jacking and tunneling; however, no additional compensation will be paid for sewers or service connections installed at the contractor's volition by either of these methods beyond the prices bid per linear foot for furnishing and laying pipe.

M. Tunneling with Liner Plate.

(1) When permitted by the engineer, or required by the plans and specifications, pipe under roadways, railroads, structures, or other obstructions may be tunneled utilizing liner plates, or equal.

(2) The contractor shall familiarize himself with all procedures and requirements of the governing agency or company having jurisdiction over the roadway, railroad, structure, or obstruction involved, and shall furnish all materials, equipment, and work necessary to perform the work in accordance with these procedures and requirements.

(3) All carrier pipe in the tunnel shall be rigidly anchored into position. Ends of tunnels shall be bricked shut except that suitable drain opening shall be provided.

(4) All tunneling procedures and materials shall be submitted by the contractor to the engineer, and approved by the engineer, prior to commencement of the work.

N. Boring. When permitted by the engineer or required by the plans and specifications, pipe under roadways may be laid by boring to grade. The casing pipe shall be at least six (6) inches larger than the outside diameter of the pipe bell, or as required by the owner of the right-of-way or entity issuing the permit. Pipe sections shall be made up and inserted through the casing pipe. Both ends shall then be brought carefully to proper grade and wedged in place. Backfill shall be sand blown in until the annular space between the carrier pipe and the casing pipe is completely filled and compacted. All operations shall be subject to the approval of the engineer and governing authorities, or entity issuing permit.

3. Pipe Bedding and Trench Backfill.

A. Classification of Materials.

(1) Class 1. This material shall consist of sand, gravel, or crushed stone approved by the engineer containing no stones larger than two (2) inches in maximum dimension.

(2) Class 2. This material shall consist of excavated material approved by the engineer and containing no stones larger than two (2) inches in maximum dimension.

(3) Class 3. This material shall consist of excavated material approved by the engineer and containing no stones larger than eight (8) inches in maximum dimension. A maximum of twenty
(20%) of the backfill volume may be stones so long as the stones are evenly distributed within the material.

B. Bedding and Cradle. The trench shall be excavated to a depth of six (6) inches below the outside diameter of the pipe barrel, or deeper if so specified. The resultant subgrade shall be undisturbed, or compacted as approved by the engineer if disturbed. The bedding shall then be prepared by placing a thoroughly compacted Class 1 material in three (3) inch (uncompacted thickness) layers to pipe centerline. Bedding shall provide uniform and continuous bearing and support for the pipe at every point between bell holes. The cost of the Class 1 material shall be included in the unit price bid for the pipe.

C. Special Bedding.

(1) Concrete Cradle and Concrete Encasement. The trench shall be excavated to a depth of six (6) inches below the outside diameter of the barrel of pipes twenty-four (24) inches in diameter or less and nine (9) inches below the outside of the barrel of pipes larger than twenty-four (24) inches in diameter. All of this excavation may be done by machine. Quality of concrete and method of placement is specified elsewhere.

(2) Unstable Subgrade. Where the bottom of the trench at subgrade is found to be unstable or to include ashes, cinders, any type of refuse, vegetable, or other organic material, or large pieces or fragments of inorganic material, which, in the opinion of the engineer, should be removed, the contractor shall excavate and remove such unsuitable material to the width and depth recommended by the engineer. Before the pipe is laid, the subgrade shall be made by backfilling with Class 1 material in three (3) inch (uncompacted thickness) layers thoroughly tamped and the bedding prepared as hereinbefore specified. Sand, gravel, and crushed stone when used at the direction of the engineer to stabilize trench subgrade will be paid for in accordance with the unit price bid for crushed stone backfill at the trench pay-line width specified in subsection (C), exclusive of the ordinary bedding which shall be included in the unit price for pipe. No payment will be made for the additional excavation required to remove unstable material, since this cost is included in the unit price bid for crushed stone backfill.

(3) Special Foundations. Where the bottom of the trench at the subgrade is found to consist of material which is unstable to such a degree that, in the opinion of the engineer, it cannot be removed and replaced with an approved material thoroughly compacted in place to support the pipe properly, the contractor shall construct a foundation for the pipe, consisting of piling, timbers or other materials, in accordance with plans prepared by the engineer. Compensation for such additional work shall be in accordance with the general conditions of the contract.

(4) Excavation in Fill. When the pipe is laid in fill, the compacted embankment shall be brought to a height of at least nine (9) inches above the proposed top of the pipe before the trench is excavated.
D. Backfilling.

(1) Backfill Materials.
(a) General.
1) All backfill material shall be free from cinders, ashes, refuse, vegetable or organic material, boulders, rocks, or stone, or other material, which, in the opinion of the engineer, is unsuitable. Backfill material shall conform to the requirements established under "Classification of Material."

2) Backfilling shall not be done in freezing weather except by permission of the engineer, and it shall not be made with frozen material. No fill shall be made where the material already in the trench is frozen.

3) In State highways, all backfill shall be in accordance with the requirements of the Pennsylvania Department of Transportation "Regulations Governing Occupancy of Highways by Utilities," 67 PA Code, Chapter 41.

4) In improved Borough streets, all backfill shall be of of Class 1 material.
(b) Excavated Materials.
1) When the type of backfill material is not indicated on the drawings or specified, the contractor may backfill with excavated material, provided that such material consists of loam, clay, sand, gravel, or other materials which, in the opinion of the engineer, are suitable for backfilling.

2) Where excavated material is to be used for backfill and there is a deficiency due to a rejection of part thereof, the Contractor shall furnish the required amount of approved material at no additional cost.
(c) Sand, Gravel or Crushed Stone Backfill (Class I Material)
1) Where sand, gravel, or crushed stone backfill is not indicated on the drawings or specified herein, and in the opinion of the engineer should be used in any part of the work, the contractor shall furnish and backfill with sand, gravel, or crushed stone as directed. Payment shall be made in accordance with the unit price bid for crushed stone backfill. No extra compensation will be made for sand, gravel, or crushed stone required for the pipe bedding, or due to excavation made beyond the limits specified, or where used as special bedding at the discretion of the contractor.

2) All sand used for backfill shall be a natural
bank sand, graded from fine to coarse, not lumpy or frozen, and free from slag, ashes, rubbish or other material which, in the opinion of the engineer, is objectionable or deleterious.

3) Gravel used for backfill shall consist of natural bank gravel having durable particles graded from fine to coarse in a reasonably uniform combination with no boulders or stones larger than two (2) inches in size. It shall be free from slag, cinders, ashes, refuse or other deleterious or objectionable materials. It shall not contain excessive amounts of loam and clay and shall not be lumpy or frozen.

4) Crushed stone shall consist of the product obtained from crushing sound limestone or dolomite ledge rock and shall be free from excessive amounts of clay and other undesirable materials. All materials shall conform to Department of Transportation specifications for 2RC as called for on the drawings or in the proposal.

(2) Backfilling Methods.

(a) Backfilling beneath and to Centerline of Pipe; Class I Material.

1) All trenches shall be backfilled by hand, from the bottom of the trench to the centerline of the pipe with Class I material placed in layers of three (3) inches (uncompacted thickness) and compacting by tamping. Backfilling material shall be deposited in the trench for its full width on each side of the pipes and fittings simultaneously.

2) Where flexible conduits such as truss, acrylonitrile-butydlene-styrene (ABS), polyvinyl chloride (PVC), fiberglass, reinforced plastic mortar (RFP), ductile iron, steel, corrugated metal, or polyethylene are used, the backfill material shall be compacted to a minimum density of ninety (90) percent Proctor (ASTM D 1557).

(b) Backfill over Pipe; Class 2 Material.

1) From the centerline of the pipe and fittings to a depth of one and one-half (1 1/2) feet above the top of the pipe, the trench shall be backfilled by hand or by approved mechanical methods.

2) The contractor shall use special care in placing this portion of the backfill so as to avoid injuring or moving the pipe. The backfill shall be placed in six (6) inch layers (uncompacted thickness) and compacted by tamping. Backfill in this section of the trench shall be with Class 23 material unless otherwise specified.

(c) Backfill to Grade; Class 3 Material. From one and
one-half (1 1/2) feet above the top of the pipe to grade, the trench shall be backfilled by hand or by approved mechanical methods. Backfill in this section of the trench shall be Class 3 material subject to limitations specified and consolidated by being in eight (8) inch layers or other approved mechanical methods unless otherwise specified. Any consolidation method utilizing water, such as jetting or puddling shall not be permitted. Consolidation shall proceed from the center of the trench to the sides to prevent arching.


A. Allowable Removal of Pavement.

(1) The contractor shall remove pavement and road surfaces as part of the trench excavation, and the amount removed shall depend upon the width of trench specified for the installation of the pipe, fittings, manholes and/or other structures. The contractor shall use such methods, either chipping or sawing, as will assure the breaking of the pavement along straight lines. The face of the remaining pavement shall be approximately vertical.

(2) If the contractor removes or damages pavement or surfaces beyond the limits specified, such pavement and surfaces shall be replaced or repaired at the expense of the contractor.

B. Replacement of Structures by Contractor.

(1) The contractor shall restore (unless otherwise stipulated) all sidewalks, curbs, gutters, shrubbery, fences, poles, sod or other property and surface structures removed or disturbed as a part of the work to a condition equal to that before the work began, furnishing all labor and materials incidental thereto.

(2) Replacement of curbs, sidewalks, gutters and drainage structures shall be in full accordance with the materials and methods in the standard specifications of the Pennsylvania Department of Transportation, Form 408 (Latest Revision), unless otherwise specified or noted on the drawings.

C. Temporary Repaving.

(1) State Highways. All openings in improved surfaces of State highways must be repaired immediately with a temporary pavement consisting of a base course and a two (2) inch bituminous surface course in accordance with the requirements of the Pennsylvania Department of Transportation "Regulations Governing Occupancy of Highways by Utilities," 67 PA Code, Chapter 41, Section 4-1.8, paragraph (h)(2)(i), and maintained until permanent restoration is made. The cost of temporary paving shall be included in the bid price for restoration of permanent highway pavement.

(2) Borough Roads and Streets. Temporary paving shall consist of immediately repairing all openings in improved surfaces with either six (6) or eight (8) inches of No. 3A stone
base course, dusted and rolled, as described in the proposal and directed by the engineer, and two (2) inches of bituminous material. Street grade and surface shall be maintained until permanent restoration is made. Temporary paving and stone base course shall be paid for at the contract unit price bid unless specifically included as part of a lump sum item. Measurement for these items shall be for the actual width of pavement removed, except that in no case shall payment be made for more than the widths indicated for pavement restoration as set forth in subsection (C) of these specifications.

D. Replacement of Permanent Pavement.

(1) General.

(a) The contractor shall restore all street paving and driveways, including subgrade and base courses, to the thickness and with materials as specified herein. This includes areas within the paylines as well as areas disturbed outside the paylines. Such restoration is for that area removed or broken in the prosecution of the work or that subsequently fails as a result thereof. The contractor shall meet the requirements of all specifications that have jurisdiction over the surfaces being repaired.

(b) Regardless of the thickness of existing base courses, no permanent paving shall be placed on any base less than six (6) inches thick crushed stone, or five (5) inches thick black base.

(2) Detailed Requirements. All permanent pavement shall be replaced in full accordance with the materials and methods in the standard specifications of the Pennsylvania Department of Transportation, Form 408, Latest Revision, and "Regulations Governing Occupancy of Highways by Utilities," 67 PA Code, Chapter 41, or other specifications that have jurisdiction.

(3) Payment.

(a) Replaced paving will be paid for by the square yard at contract unit prices bid for the items unless specifically included as part of a lump sum item.

(b) In computing quantities for payment, the actual width of pavement removed shall be used except that in no case shall payment be made for more than the payline width tabulated in subsection (C).

(4) Permits. The contractor shall obtain and pay for such local or other governmental permits as may be necessary for the opening of streets and roads, or shall satisfy himself that such permits have been obtained before prosecuting the work. He shall also satisfy himself as to any other requirements than those set forth that may affect the type, quality, and manner of restoration of the surfaces by reason of the jurisdiction of such governmental bodies.

(5) Time of Placement. No permanent pavement shall be restored unless and until, in the opinion of the engineer, the
condition of the backfill is such as to properly support the pavement. Such approval of the engineer does not in any way relieve the contractor of the responsibility for maintenance of the surface in accordance with the terms of the contract.

E. Cleaning Up.

(1) As work progresses on a daily basis, all areas shall be thoroughly cleaned of mud, dust and debris. Streets shall be swept and flushed after backfilling, and recleaned as mud, dust and debris related to the work again accumulates. Failure of the contractor to perform this work shall be cause for the engineer to order the work by others, and backcharge all costs to the contractor.

(2) All surplus materials furnished by the contractor and temporary structures shall be removed from the site by the contractor. All dirt, rubbish and excess earth from the excavation shall be disposed of by the contractor in a manner and place acceptable to all governing agencies. The construction site shall be left clean at the end of each working day to the satisfaction of the engineer. All surplus materials furnished by the owner and delivered to the site by the contractor shall be removed and delivered by the contractor to a location designated by the owner. All surplus materials furnished and delivered by the owner will be removed by the owner.

(3) In the execution of this work, the contractor shall conform to the requirements of laws relating to erosion and sediment control.

F. Restoration of Lawns, Meadows, and Cultivated Fields.

(1) Final restoration of all areas shall be performed in accordance with the specifications for the particular land use as herein defined, said land uses being determined by the engineer.

(2) Final restoration shall be performed no later than the start of the next planting season following construction. The planting season shall be as established by the U.S. Agricultural Service for the area of construction.

(3) Topsoil shall be free from subsoil, brush, weeds, or other litter, clay lumps and stones, but may contain decaying vegetable matter present in good topsoil.

(4) Precautions shall be exercised as necessary to conform with laws relating to erosion and sediment control.

(5) Seed shall be not more than two (2) years old. Germination tests of seeds shall be made not more than six (6) months prior to seeding. Seed which has become wet, moldy or otherwise damaged shall not be used.

(6) All seed mixtures shall be submitted to the engineer for approval prior to seeding.

(7) The contractor shall be responsible to produce a stand of grass in all seeded or sodded areas. Erosion, drought, or any other condition encountered shall not relieve the contractor of
this requirement.

G. Land Use Classifications.

(1) Lawns.

(a) All disturbed areas, whether inside or outside the paylines shall receive a minimum of six (6) inches of topsoil, and the surface hand raked, stones removed and natural drainage features provided and/or restored prior to the application of seed. The Contractor shall improve all disturbed areas to a condition equal to or better than prior to construction.

(b) The seed mixture shall be equivalent to the following:

- Red Fescue  40%
- Common Kentucky Bluegrass  50%
- Annual Ryegrass  10%

(c) The seed shall be sown with approved seeding procedures at the rate of four (4) pounds per one thousand (1,000) square feet.

(d) Measurement and payment for this item will be based on the area of seeding actually placed except in no case shall payments be made for measurements exceeding the payline widths contained in subsection (c) of these specifications.

(2) Sod.

(a) Sodding shall consist of a grass equivalent to the seeding specified for that particular land use.

(b) Measurement and payment for this item will be based on the area of seeding actually placed except in no case shall payment be made for measurements exceeding the payline widths contained in subsection (C) of these specifications.

(3) Pasture and Meadow Grass.

(a) Prior to construction, the full depth of the existing topsoil, but no less than six (6) inches, shall be stripped from all areas anticipated to be disturbed, and shall be stockpiled during construction. Upon completion of the construction, all topsoil removed shall be replaced. As the final class of material is applied, bringing the area to finished grade, the depth of topsoil replaced shall not be less than the depth removed.

(b) The seed mixture shall be equivalent to the following:

- Timothy  18%
- Orchard Grass (Pennlate or Pennmeade)  46%
- Kentucky Bluegrass  18%
(c) The seed shall be sown with approved seeding procedure at the rate of twenty-two (22) to twenty-five (25) pounds per acre.

(d) Measurement and payment for this item will be based on the area of seeding actually placed except in no case shall payments be made for measurements exceeding the payline widths contained in subsection (c) of these specifications.

(4) Cultivated Fields.

(a) Prior to construction, the full depth of the existing topsoil, but no less than ten (10) inches, shall be stripped from the area of the anticipated trench, and shall be stockpiled during construction.

(b) Upon completion of construction, the entire disturbed area shall be cleaned of all rubbish, stones, and other objects over two (2) inches in maximum dimension, and all crushed stone related to the construction operations.

(c) All disturbed and traveled areas relevant to the work shall be scarified to a depth of ten (10) inches.

(d) All the topsoil removed shall be replaced, and the entire disturbed and traveled areas graded to the original grade. The depth of the topsoil replaced shall not be less than the depth removed.

(e) Measurement and payment for this item will be passed on the actual areas of restoration except in no case shall payments be made for measurements exceeding the payline widths contained in subsection (C) of these specifications.

H. Maintenance During Construction.

(1) During construction, the surfaces of all roads, streets, driveways, and all other areas in active usage, shall be regularly maintained on a daily basis to produce a safe, desirable, and convenient condition.

(2) All accumulated dust, mud, stones and debris caused by the work, or related to the work, shall be removed on a daily basis.

(3) The following conditions existing as a result of the work shall be corrected as follows:

(a) All abrupt depressions (chuckholes) over three-fourths (3/4) inch in depth shall be repaired and leveled within two (2) hours of observance or notification of its existence.

(b) If twenty-five (25%) percent or more of any given area of the excavated area of the street surface contains abrupt depressions (chuckholes) of any magnitude, they shall be repaired and leveled within two (2) hours of observance or notification of its existence.
(c) All settlement over two (2) inches in depth shall be brought to grade within two (2) hours of observance or notification of its existence.

(d) Any subnormal or dangerous condition caused by the work, on any surface, shall be repaired or corrected within two (2) hours of observance or notification of its existence. If repairs or corrections are not made within this period, the owner shall cause to have the work completed with the resulting cost subtracted from the contractor's next monthly payment request. Any such costs shall be deemed a reduction in the total amount due the contractor under the contract and no subsequent reimbursement shall be made to the contractor by the owner for these costs. There will be no payment made for maintenance work.

(Ord. 393, 4/3/1990, §302)

§303. Storm Sewers and Drainage Structures.

1. The work covered by this specification consists of furnishing all plant, labor, equipment, appliances and materials and in performing all operations in connection with the construction of storm sewers, drainage pipes, gutters, ditches, manholes, inlets, catch basins, headwalls, cleanout structures and furnishing all tests required, complete, in accordance with specifications, applicable drawings and contract documents.

2. Excavation and Backfilling. This work shall be performed in strict accordance with the applicable portions of §302, "Excavation and Backfill."


A. Corrugated galvanized metal pipe shall conform to A.A.S.H.T.O. specification M-6 (latest Revision). Bituminous coating, where called for on the drawings, or in the proposal, shall consist of asphalt cement having a thickness of five hundredths (0.05) inch measured at the crest of the corrugations on the inside and outside surface of the pipe. The asphalt for coating shall conform to the requirements of A.A.S.H.T.O. Designation M-190. Fully paved pipe, where called for on the drawings, or in the proposal, shall consist of asphalt cement applied on the inside of the pipe for the full circumference. The pavement shall have a minimum thickness of one hundredth twenty-five thousandths (0.125) inch measured on the crest of the corrugations at the center line.

B. Pipe connecting bands for corrugated metal pipe shall be of the universal dimpled type, one (1) or two (2) pieces, depending on the internal diameter. Bands shall be of the angle bolt type.

C. Reinforced Concrete Gravity Sewer Pipe.

(1) Materials.

(a) Regular Cast Reinforced Concrete Gravity Sewer Pipe. Reinforced concrete gravity sewer pipe shall conform to A.S.T.M. Designation C-76 (latest revision) for the class
or strength designated. No lifting holes shall be permitted.

(b) **Centrifugally Cast Reinforced Concrete Gravity Sewer Pipe.** Pipe shall be designed for the external loadings or classes as indicated on the plans or elsewhere in the specifications. Pipe shall be manufactured without lift holes. Pipe shall have a straight outside wall with a minimum length of eight (8) feet. Pipe shall be centrifugally cast.

1) Concrete shall develop an average strength of six thousand (6,000) pounds per square inch at twenty-eight (28) days as determined by test on cores cut from pipe wall or standard vibrated test cylinders in accordance with A.S.T.M. Specifications C-39 and C-42. Cement shall conform to A.S.T.M. Specification C-150, Type I. Fine aggregate shall be clean, hard, durable, uncoated particles of material or prepared sand. Water shall be clean and free from deleterious amounts of acids, alkalis or organic materials. Coarse aggregate shall be of hard, durable particles crushed or uncrushed gravel. A minimum of six (6) bags of cement shall be used for each cubic yard of concrete. Concrete shall be steam or water cured.

2) Steel reinforcement shall be of wire conforming to A.S.T.M. Specification A-82, A-185 and A-15. Reinforcement shall consist of one (1) or more cages of welded wire hoops, helically wound steel rods, wire, or welded fabric properly spaced and supported with longitudinal reinforcing of sufficient strength to maintain the circumferential steel rigidly in position. Steel reinforcement requirements shall be sufficient to provide the strengths specified.

(2) Joints. Joints shall be as required by the specifications or indicated on the plans and shall conform to the latest revision of the following specifications:

(a) Concrete-rubber gasket joints shall conform to A.S.T.M. specification C-361. Pipe ends shall be formed against machined rings and adequately reinforced to resist tension caused by compression of the gasket. This joint may be used only when specifically called for on the plans or in the proposal.

(b) Steel end ring and rubber joint shall conform to A.W.W.A. C-302. The interior surfaces of the steel joints shall be protected with concrete mortar or plastic material. The exterior of the joint shall be protected with concrete mortar or preformed plastic joint sealing material such as Ram-Nek as manufactured by K. T. Snyder Co., MAS-STIK as manufactured by Concrete Product Supply Co., or approved equal. The interior surfaces of the steel and rings or pipes twenty-four (24) inches in diameter and less shall be galvanized.
D. Precast Reinforced Concrete Manholes.

(1) Precast Reinforced Concrete Manholes Risers and Tops.

(a) Precast reinforced concrete manhole risers and tops shall conform to A.S.T.M. specification C-478 (latest revision) and shall be of watertight construction. Joints between manhole sections shall be provided with preformed plastic joint sealing material such as Ram-Nek as manufactured by K. T. Snyder Co., MAS-STIK as manufactured by Concrete Products Supply Co., or approved equal. The preformed joint sealer shall be protected by a removable two-piece wrapper and shall be applied in strict accordance with the manufacturer's recommendations.


(c) Manholes shall be constructed in accordance with the standard details in the specifications. Shop drawings shall be submitted for approval.

(d) Precast bases shall be the Flex-Loc base manufactured by York Concrete or equal.

(e) Manhole steps shall be grouted in place using a non-shrink, non-metallic grout.

(f) The utilization of polypropylene inserts to secure the manhole steps shall not be permitted, nor shall the use of epoxy to secure the steps.

(2) Brick. Brick for manholes shall be new, whole, common brick furnished in accordance with A.S.T.M. Specification C-62, Grade SW.

(3) Mortar. Mortar for jointing and plastering the outside of brick manholes shall consist of one (1) part Portland cement and two (2) parts fine sand. For brick-work (except construction of invert channels), lime may be added to the mortar in amount of not more than twenty-five (25%) percent of the volume of the cement. Sand shall be clean and sharp and conform to A.S.T.M. Specification C-144. Hydrated lime shall conform to A.S.T.M. Specification C-6. Retempered mortar or mortar which has been mixed for more than forty-five (45) minutes shall not be used.

(4) Water. Mixing water for mortar and concrete shall be clean and free from oil, acid, alkali, sewage or other deleterious substances.

(5) Cement. Portland cement shall conform to A.S.T.M. Specification C-150 Type I. Where specifically authorized or required, high early strength (Type 3) shall be used.

(6) Concrete. Concrete shall have a compressive strength of not less than three thousand (3,000) psi after twenty-eight (28) days (tests to be in accordance with A.S.T.M. Specification C-39, latest revision). Aggregates shall be of quality, and
proportions as approved by the engineer after submission of test results on the design mix. Each cubic yard of concrete shall contain no less than six (6) bags of Portland Cement. Slump of concrete shall not exceed four (4) inches. Ready mixed concrete shall conform to A.S.T.M. Specification C-94 (latest revision).

(7) **Steel.** Reinforcing steel shall be clean and free from rust, scale or coatings that will reduce bond.

(8) **Manhole Frame and Cover.**

(a) Manhole frame and cover shall be of soft gray iron equal in design to Frame Pattern No. 107 and Cover Pattern No. 108, as manufactured by the Allegheny Foundry Co., Pittsburgh, Pennsylvania, fully machined for tight fit. The words "STORM SEWER" shall be cast in the center of each manhole cover.

(b) Frames and covers shall be securely attached to the top of the manhole by the use of four (4) three-quarters (3/4) inch expanding anchor bolts and sealed with Ram-Nek, plastic joint sealing material.

(9) **Manhole Steps.**

(a) Manhole steps shall be constructed of alloy 6-61-T6 and shall have a minimum diameter of three-fourths (3/4) inch. The distance between rungs shall be twelve (12) inches. The rungs shall have a drop front to prevent side slippage, and shall have a minimum clear rung width of twelve (12) inches. The steps shall be protected from dissimilar materials in accordance with ASTM-C-478, latest revision.

(b) Manhole steps shall be positioned in the manhole in such a manner so as to permit easy entrance and exit from the manhole and so as not to conflict with any influent sewers. [Ord. 427]

E. **Inlets, Catch Basins and Endwalls.** Unless otherwise specified, all materials and labor shall be in accordance with the Pennsylvania Department of Transportation Form 408.

4. **Manholes.**

A. **General.**

(1) Unless otherwise noted, manholes shall be constructed of precast concrete with cast iron frames and covers at the locations shown on the drawings or as directed by the engineer and in accordance with the construction details. The invert channels shall be smooth and semicircular in shape conforming to the inside of the adjacent sewer section. Changes in direction of flow shall be with a smooth curve of as large a radius as the size of the manhole will permit. Changes in size and grade of channels shall be made gradually and evenly. The invert channels may be formed indirectly in the concrete of the manhole base, may be built up with brick and cement grout, may be half tile laid in concrete, or may be constructed by laying full section sewer pipe
through the manhole and breaking out the top half after the surrounding concrete has hardened. The floor of the manhole outside the channels shall be smooth and shall slope toward the channels not less than one inch per foot and not more than two (2) inches per foot.

(2) A minimum of one (1) layer and a maximum of three (3) layers of brick laid flat on the long dimension or concrete rings will be permitted to bring the manhole to required grade.

B. Brick Manholes.

(1) Brick manholes shall be constructed only where directed. Brick shall be laid radially in a full bed of mortar with interior joints not more than one-quarter (1/4) inch in width. Whole brick only shall be used, except to effect closures and to fill in the outside portion of the radial joints. Each 7th course shall be laid as "stretchers;" the intervening courses being composed of "headers." The upper portion of the manhole shall be drawn in equally and evenly as shown on the drawings to the diameter required to fit the iron ring.

(2) Brick manhole shall be thoroughly bonded to the barrel of the sewer and wall and base slab thoroughly bonded. All connections shall be made without projections or voids. When brickwork is completed, manholes shall be cleared of scaffolds and cleaned of surplus mortar or other foreign materials. The interior joints shall be pointed and the entire exterior surface plastered as called for in the drawings or as directed by the Engineer.

5. Inspection.

A. Shop Inspection. All materials furnished by the contractor shall be certified by the supplier for compliance with the pertinent specifications. Shop inspections and testing may be required. The cost of shop testing shall be borne by the supplier or the contractor.

B. Field Inspection. All pipe and appurtenances shall be furnished and installed and tested for defects in material and/or workmanship in the manner specified and in the presence of and as approved by the engineer.

C. Disposition of Defective Material. Material found during the progress of the work, either before or after installation, to have cracks, flaws or other defects will be rejected by the Engineer. All defective materials furnished by the contractor shall be promptly removed by him from the site.


A. Replacement of Damaged Material. The contractor shall replace, at his own expense, all material furnished by him and found defective in manufacture or damaged in handling after delivery by the manufacturer. This shall include the furnishing of all materials and labor required for replacement of installed material. Any material furnished by the owner that becomes damaged after acceptance by the contractor shall be replaced by the contractor at his own expense.
B. Responsibility for Safe Storage. The contractor shall be responsible for the safe storage of material furnished by or to him, and accepted by him, and intended for the work until it has been incorporated in the completed project. The interior of all pipe, fittings and other accessories shall be kept free from dirt and foreign matter at all times. All equipment and materials subject to damage from freezing shall be drained and stored in a manner which will protect them.

C. Hauling.

(1) All materials furnished by the contractor shall be delivered and distributed at the site by the contractor. Materials furnished by the owner shall be picked by the contractor at points designated and hauled to and distributed at the site.

(2) Pipe, fittings, items of equipment, and other materials of construction shall be loaded and unloaded by lifting with hoists or skidding so as to avoid shock or damage. Under no circumstances shall such materials be dropped. Materials handled on skidways shall not be skidded or rolled against materials already on the ground.

D. At Site of Work. In distributing the material at the site of the work, each piece shall be unloaded opposite or near the place where it is to be laid in the trench, or as otherwise directed by the Engineer. Under no circumstances should lawns, grass plots or other private property be used for this purpose without the consent of the property owner.

7. Laying Pipe.

A. General. All pipe shall be laid to a uniform line and grade between manholes, socket ends upgrade, with a firm and even bearing along the barrel of the pipe, close joints and smooth invert. The spigot end of the pipe is to be centered in, shoved tight and secured against the bell or socket of the previously laid pipe. The interior of each pipe shall be cleaned of all excess joint and foreign material before the next pipe is laid. The pipe shall be laid in the backfill materials as specified. Pipe laying shall commence at the lowest point and proceed upgrade. At the close of each day's work, and at such other times when pipe is not being laid, the open end of the pipe shall be protected with a close fitting stopper.

B. Construction Control.

(1) The contractor shall provide at least three (3) grade boards in advance of pipe laying at all times at intervals not exceeding fifty (50) feet and stretch a line parallel with the grade line. From this line, the trench and every pipe laid shall be tested as to grade and alignment. Base lines and controlling elevations established for the construction of the work shall be preserved and kept uncovered so that they can be examined at any time.

(2) The use of laser equipment shall be permitted. Grade boards as specified will not be required if a laser is used.
(3) Regardless of control used, the contractor shall provide alternative verification of grade as work progresses. Pipe not laid to proper line and grade will be removed and reconstructed at the contractor's expense.

C. Variations.

(1) The Engineer reserves the right to vary the line and/or grade from that shown on the drawings for pipe lines and manholes when such changes may be necessary or advantageous. No claims will be allowed for changes in location or grade except as such changes are made after trenching has been done. Payment for all variances shall be in accordance with the unit pricing as indicated in the proposal and all excavation shall be unclassified.

(2) Predrilling and blasting performed prior to initial excavation and before receipt of approved cut sheets will be permitted but at the sole risk of the contractor.

D. Handling of Sewer Line Materials into Trench. Proper implements, tools and facilities satisfactory to the engineer shall be provided and used by the contractor for the safe and convenient prosecution of the work. All pipe, fittings, jointing materials, etc., shall be carefully lowered into the trench piece by piece by means of a derrick, ropes, or other suitable tools or equipment, in such a manner as to prevent damage to sewer line materials and/or workmen. Under no circumstances shall such materials be dropped or dumped into the trench.

E. Pipe Clearance in Rocks.

(1) Ledge rock, boulders and large stones shall be removed to provide a clearance of at least six (6) inches below and on each side of all pipe and fittings for pipes twenty-four (24) inches in diameter or less, and nine (9) inches for pipes larger than twenty-four (24) inches in diameter.

(2) The specific minimum clearances are the minimum clear distances which will be permitted between any part of the pipe and/or fitting being laid and any part, projection or point of such rock, boulder or stone.

F. Pipes at Manholes or Other Rigid Structures. Pipe directly connected to or supported by rigid structures, shall not have a length beyond the rigid support in excess of that shown on the following:

<table>
<thead>
<tr>
<th>Pipe Size</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>6&quot; to 8&quot;</td>
<td>5'0&quot;</td>
</tr>
<tr>
<td>10&quot; to 16&quot;</td>
<td>6'6&quot;</td>
</tr>
<tr>
<td>18&quot; and larger</td>
<td>13'0&quot;</td>
</tr>
</tbody>
</table>

G. Concrete Cradle and Encasement.

(1) Preparation. Prior to the formation of the cradle or encasement, temporary supports consisting of timber wedges and solid concrete bricks or cap blocks shall be used to support the pipe in place. Temporary supports shall have minimum dimensions and shall support the pipe at not more than two (2) locations,
one (1) at the bottom of the barrel of the pipe adjacent to the
shoulder of the socket and the other near the spigot end.

(2) Placing.

(a) After jointing of the pipe has been completed,
cement shall be uniformly poured beneath and on both sides
of the pipe. Placement shall be done by the use of suitable
equipment. The concrete shall be wet enough during
placement to permit its flow, without excessive prodding, to
all required points around the pipe surface. The width of
cradle shall be such as to fill completely the trench width.
In case of extremely wide trenches, concrete encasement may
be confined above the top of the pipe to a narrower width,
but in no case shall it be less than the width of trench
required for the size of pipe being used.

(b) Before depositing concrete, the space within the
limits of the pour shall have been cleared of all debris and
water. Water shall not be allowed to rise adjacent to, or
flow over, concrete deposited for less than twenty-four (24)
hours. Concrete shall be protected from the direct rays of
the sun and kept moist, by a method acceptable to the
engineer, for a period of seven (7) days or until
backfilling is begun. In no case shall backfilling begin
within twenty-four (24) hours of the time of placing and the
Engineer shall have strict control of the rate of
backfilling.

8. Tests. After the mains have been laid and backfill placed to a
depth of one and one-half (1-1/2) feet above the top of the pipe, a light
will be flashed between manholes or manhole locations to determine whether
the alignment of the sewer is true and whether any pipe has been displaced,
broken or otherwise damaged subsequent to laying. This test will again be
conducted before final acceptance of the sewer. Each section (manhole to
manhole) of sewer shall show a good light circle throughout its length and
any and all defects shall be corrected by the contractor, to the
satisfaction of the engineer, before the work shall proceed and before
acceptance of and/or payment therefor shall be made.


A. Rip rap shall be hard, sound, angular quarry stones weighing
from twenty (20) to four hundred (400) pounds each, of which at least
sixty (60%) shall weigh more than one hundred (100) pounds.

B. The stones shall be placed with their beds at right angles to
the slope, the larger stones shall be used in the bottom courses and
the smaller stones at the top. The stones shall be laid in close
contact so as to break joints, and in such a manner that the weight of
the stone is carried by the earth and not by the adjacent stones. The
spaces between stones shall be filled with spalls securely rammed into
place. The finished work shall present an even, tight and reasonably
smooth surface conforming to the contour shown on the drawings.


§304. Sanitary Sewers and Appurtances.
1. **Scope.** The work covered by this specification consists in furnishing all plant, labor, equipment, appliances and materials, and in performing all operations in connection with the furnishing and installation of sanitary sewers, trunk sewers, interceptors, force mains, sewer service lines, manholes, cleanout structures, joint materials, pipe plugs (stoppers) and appurtenances and furnishing all tests required, complete in accordance with the specifications, applicable drawings and contract documents.

2. **Abbreviations.** Abbreviations used in these specifications are defined as follows:

   ANSI - American National Standards Institute.

3. **Gravity Sewer Pipe Materials and Joints.**

   A. **Vitrified Clay Sewer Pipe and Fittings.**

   (1) **Materials.** Vitrified clay sewer pipe and fittings shall conform to the latest revision of the following specifications:

<table>
<thead>
<tr>
<th>Materials</th>
<th>Specification Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Strength Clay Sewer Pipe</td>
<td>A.S.T.M. C 700-78a</td>
</tr>
<tr>
<td>Extra Strength Clay Pipe (all sizes)</td>
<td>A.S.T.M. C 700-78A</td>
</tr>
<tr>
<td>Extra &amp; Standard Strength Perforated Clay Pipe</td>
<td>A.S.T.M. C 700-78a</td>
</tr>
<tr>
<td>Testing Clay Pipe</td>
<td>A.S.T.M. C 301-78c</td>
</tr>
</tbody>
</table>

   (2) **Joints.** Vitrified clay pipe joints shall be Type III joint conforming to A.S.T.M. Specification C-425 (latest revision) for compression joints for vitrified clay bell and spigot pipe, using rubber gasket.

   B. **Polyvinyl Chloride Pipe (PVC).**

   (1) **Pipe.** Type PSM SDR-35, A.S.T.M. D 3034.

   (2) **Fittings.** Conforming to same applicable A.S.T.M. specification requirements for pipe.

   (3) **Joints.** Push-on elastomeric ring gasket, A.S.T.M. D 3212; and A.S.T.M. F 447 for material specifications.

   C. **Reinforced Concrete Gravity Sewer Pipe.**

   (1) **Material.**

   (a) **Regular Cast Reinforced Concrete Gravity Sewer Pipe.** Reinforced concrete gravity sewer pipe shall conform to A.S.T.M. Designation C-76 (latest revision) for the class or strength designated. No lifting holes shall be permitted.
(b) Centrifugally Cast Reinforced Concrete Gravity Sewer Pipe. Pipe shall be designed for the external loadings or classes as indicated on the plans or elsewhere in the specifications. Pipe shall be manufactured without lift holes. Pipe shall have a straight outside wall with a minimum length of eight (8) feet. Pipe shall be centrifugally cast.

1) Concrete shall develop an average strength of six thousand (6,000) pounds per square inch at twenty-eight (28) days as determined by tests on cores cut from pipe wall or standard vibrated test cylinders in accordance with A.S.T.M. Specifications C-39 and C-42. Cement shall conform to A.S.T.M. Specification C-150, Type II. Fine aggregate shall be clean, hard, durable, uncoated particles of material or prepared sand. Water shall be clean and free from deleterious amounts of acids, alkalis or organic materials. Coarse aggregate shall be of hard, durable particles crushed or uncrushed gravel. A minimum of six (6) bags of cement shall be used for each cubic yard of concrete. Concrete shall be steam or water cured.

2) Steel reinforcement shall be of wire conforming to A.S.T.M. Specifications A-82, A-185 and A-615. Reinforcement shall consist of one (1) or more cages of welded wire hoops, helically wound steel rods, wire, or welded fabric properly spaced and supported with longitudinal reinforcing sufficient strength to maintain the circumferential steel rigidly in position. Steel reinforcements requirements shall be sufficient to provide the strengths specified.

(2) Joints. Joints shall be as required by the specifications or as indicated on the plans and shall conform to the latest revision of the following specifications:

(a) Concrete-rubber gasket joints shall conform to A.S.T.M. Specification C-361. Pipe ends shall be formed against machined rings and adequately reinforced to resist tension caused by compression of the gasket. This joint may be used only when specifically called for on the plans or in the proposal.

(b) Steel end ring and rubber joint shall conform to A.W.W.A. C-302. The interior surfaces of the steel joints shall be protected with concrete mortar or plastic material. The exterior of the joint shall be protected with concrete mortar or preformed plastic joint sealing material such as Ram-Nek as manufactured by K. T. Snyder Co., MAS-STIK as manufactured by Concrete Product Supply Co., or approved equal. The interior surfaces of the steel end rings or pipes twenty-four (24) inches in diameter and less shall be galvanized.

(3) Line Location Tape.
(22, §304(3), cont'd)

(a) A metallic tape designating "Buried Sewer Line" shall be placed above all sewer lines.

(b) The tape shall be placed not less than eighteen (18) inches nor more than twenty-four (24) from the top of the road or ground surface.

4. Pressure Sewer Pipe.
   A. Cast Iron Pipe.
      (1) Material.
         (a) Cast iron pipe shall be cast iron in full accord with ANSI Specifications A21.1, A.W.W.A. Specification C 101-67 (latest revision), or ductile iron in full accord with ANSI Specification A21.51 (latest revision) for the material class or pressure designated. Cement mortar linings shall be in accordance with ANSI Specification A21.4 (latest revision).
         (b) All cast iron pipe and fittings shall be coated inside and outside with a bituminous coating of either coal tar or asphalt base, at least one (1) mil thick, unless cement mortar lined.
      (2) Joints and Fittings.
         (a) Pipe joints shall be a type which employs a single elongated grooved rubber gasket to effect the joint seal or mechanical joints in full accord with ANSI Specification A21.11 (latest revision).
         (b) All fittings shall be of the same classification or rating as the pipelines in which they are installed.
   B. Steel Pressure Pipe.
      (1) Material. Steel pressure sewer pipe shall conform to A.W.W.A. Standard C-202. Interior lining shall be coal-tar enamel in accordance with A.W.W.A. Standard C-203 or cement mortar in accordance with A.W.W.A. Standard C-0205. Exterior coating shall be coal-tar enameled with asbestos felt wrap in accordance with A.W.W.A. Standard C-203.
      (2) Joints. Joints shall be bell and spigot type with O-ring gasket, or approved sleeve type couplings with rubber gaskets.

5. Precast Reinforced Concrete Manhole.
   A. Precast Reinforced Concrete Manhole Riser and Tops.
      (1) Precast reinforced concrete manhole risers and tops shall conform to A.S.T.M. Specification C-478 (latest revision) and shall be of watertight construction. Joints between manhole sections shall be provided with preformed plastic joint sealing material such as Ram-Nek as manufactured by K. T. Snyder Co., MAS-STIK as manufactured by Concrete Products Supply Co., or approved equal. The preformed joint sealer shall be protected by a removal two-piece wrapper and shall be applied in strict

(2) Manholes shall be constructed in accordance with the standard details in the specifications. Shop drawings shall be submitted for approval.

(3) Precast bases shall be the Flex-Loc base manufactured by York Concrete or equal.

(4) Manhole steps shall be grouted in place using a non-shrink non-metallic grout.

(5) The utilization of polypropylene inserts to secure the manhole steps shall not be permitted, nor shall the use of epoxy to secure the steps.

E. Brick. Brick for manholes shall be new, whole, common brick, furnished in accordance with A.S.T.M. Specification C-32, Grade MS.

C. Mortar. Mortar for jointing and plastering the outside of brick manholes shall consist of one (1) part Portland Cement and two (2) parts fine sand. For brickwork (except construction of invert channels), lime may be added to the mortar in amount of not more than twenty-five (25%) percent of the volume of the cement. Sand shall be clean and sharp and conform to A.S.T.M. Specification C-144. Hydrated lime shall conform to A.S.T.M. Specification C-6. Retempered mortar or mortar which has been mixed for more than forty-five (45) minutes shall not be used.

D. Water. Mixing water for mortar and concrete shall be clean and free from oil, acid, alkali, sewage or other deleterious substances.

E. Cement. Portland cement shall conform to A.S.T.M. Specification C-150, Type I. Where specifically authorized or required, high early strength (Type 3) shall be used.

F. Concrete. Concrete shall have a compressive strength of not less than four thousand five hundred (4,500) psi after twenty-eight (28) days (tests to be in accordance with A.S.T.M. Specification C-39 (latest revision)). Aggregates shall be of quality, gradation and proportions as approved by the engineer after submission of test results on the design mix. Each cubic yard of concrete shall contain no less than six (6) bags of Portland cement. Slump of concrete shall not exceed four (4) inches. Ready-mixed concrete shall conform to A.S.T.M. Specification C-94 (latest revision).

G. Steel. Reinforcing steel shall be clean and free from rust, scale or coatings that will reduce bond.

H. Frame and Cover. Manhole frame and cover shall be of soft gray iron equal in design to Frame Pattern No. 107 and Cover Pattern No. 108, as manufactured by the Allegheny Foundry Co., Pittsburgh, Pennsylvania; Neenah Foundry Co. of Neenah, Wisconsin, or approved equal, machined and having the words "SANITARY SEWER" or other approved designation, cast appropriately in the center of the cover.
I. Watertight Manhole Frame and Cover.

(1) Watertight manhole shall be of soft gray iron similar in design to Frame Pattern No. 299 and Cover Pattern No. 110, as manufactured by the Allegheny Foundry Co., Pittsburgh, Pennsylvania; Nenah Foundry Co. of Neenah, Wisconsin, or approved equal, and having the words "Sanitary Sewer" or other approved designation, cast appropriately in the center of the cover.

(2) Watertight frames and covers shall be securely attached to the top of the manhole by the use of anchor bolts made of stainless steel or bronze, as shown on the detail sheet of the plans, to prevent flotation by flood waters, or uplift if the inside of the manhole is surcharged, and to prevent leakage between the frame and the concrete.

J. Manhole Steps.

(1) Manhole steps shall be constructed of alloy 6061-T6 and shall have a minimum diameter of three-fourths (3/4) inch. The distance between rungs shall be twelve (12) inches. The rungs shall have a drop front to prevent side slipage, and shall have a minimum clear rung width of twelve (12) inches. The steps shall be protected from dissimilar materials in accordance with ASTM-C-478, latest revision.

(2) Manhole steps shall be positioned in the manhole in such a manner so as to permit easy entrance and exit from the manhole and so as not to conflict with any influent sewers.

6. Inspection.

A. Shop Inspection. All materials furnished by the contractor shall be inspected by the supplier for compliance with the pertinent specifications. Shop inspections and testing may be required. The cost of shop testing shall be borne by the supplier or the contractor.

B. Field Inspection. All pipe and appurtenances shall be furnished and installed and tested for defects in material and/or workmanship in the manner specified and in the presence of and as approved by the Engineer.

C. Disposition of Defective Material. All material found during the progress of the work, either before or after installation, to have cracks, flaws or other defects will be rejected by the engineer. All defective materials furnished by the contractor shall be promptly removed from the site.


A. Replacement of Damaged Material. The contractor shall replace, at his own expense, all material furnished by him and found defective in manufacture or damaged in handling after delivery by the manufacturer. This shall include the furnishing of all materials and labor required for replacement of installed material. Any material furnished by the owner that becomes damaged after acceptance by the contractor shall be replaced by the contractor at his own expense.

B. Responsibility for Safe Storage. The contractor shall be responsible for the safe storage of material furnished by or to him,
and accepted by him, and intended for the work, until it has been incorporated in the completed project. The interior of all pipe, fittings and other accessories shall be kept free from dirt and foreign matter at all times. All equipment and materials subject to damage from freezing shall be drained and stored in a manner which will protect them.

C. Hauling.

(1) All materials furnished by the contractor shall be delivered and distributed at the site by the contractor. Materials furnished by the owner shall be picked by the contractor at points designated and hauled to and distributed at the site.

(2) Pipe fittings, items of equipment, and other materials of construction shall be loaded and unloaded by lifting with hoists or skidding so as to avoid shock or damage. Under no circumstances shall such materials be dropped. Materials handled on skidways shall not be skidded or rolled against materials already on the ground.

D. At Site of Work. In distributing the material at the site of the work, each piece shall be unloaded opposite or near the place where it is to be laid in the trench, or as otherwise directed by the engineer. Under no circumstances should lawns, grass plots or other private property be used for this purpose without the consent of the property owner.

8. Laying Pipe.

A. General. All pipe shall be laid to a uniform line and grade between manholes, socket ends upgrade, with a firm and even bearing along the barrel of the pipe, close joints and smooth invert. The spigot end of the pipe is to be centered in, shoved tight and secured against the bell or socket of the previously laid pipe. The interior of each pipe shall be cleaned of all excess joint and foreign material before the next pipe is laid. The pipe shall be laid in the backfill materials as specified. Pipe laying shall commence at the lowest point and proceed upgrade. At the close of each day's work, and at such other times when pipe is not being laid, the open end of the pipe shall be protected with a close fitting stopper.

B. Construction Control.

(1) The contractor shall provide at least three (3) grade boards in advance of pipe laying at all times at intervals not exceeding fifty (50) feet and stretch a line parallel with the grade line. From this line, the trench and every pipe laid shall be twisted as to grade and alignment. Base line and controlling elevations established for the construction of the work shall be preserved and kept uncovered so that they can be examined at any time.

(2) The use of laser equipment shall be permitted. Grade boards as specified will not be required if a laser is used.

(3) Regardless of control used, the contractor shall provide alternative verification of grade as work progresses. Pipe not laid to proper line and grade will be removed and
reconstructed at the contractor's expense.

(4) During the installation of a force main, the pipe shall be laid at a constantly increasing grade to each high point, air release manhole, or point of discharge, as shown on the contract drawings. The contractor shall provide sufficient construction control to assure that there are no sags or loss in grade in the force main which could tend to accumulate air other than at the high points shown on the drawings. Failure to comply with this requirement shall necessitate the contractor take remedial steps to correct this situation. All such costs shall be borne by the contractor.

C. Variations.

(1) The engineer reserves the right to vary the line and/or grade front that shown on the drawings for pipe lines and manholes when such changes may be necessary or advantageous. No claims will be allowed for changes in location or grade except as such changes are made after trenching has been done. Payment for all variances shall be in accordance with the unit pricing as indicated in the proposal and all excavation shall be unclassified.

(2) Predrilling and blasting performed prior to initial excavation and before receipt of approved cut sheets will be permitted but at the sole risk of the contractor.

D. Handling of Sewer Line Materials Into Trench. Proper implements, tools and facilities satisfactory to the engineer shall be provided and used by the contractor for the safe and convenient prosecution of the work. All pipe, fittings, jointing materials, etc., shall be carefully lowered into the trench piece by piece by means of a derrick, ropes, or other suitable tools or equipment, in such a manner as to prevent damage to sewer line materials and/or workmen. Under no circumstances shall such materials be dropped or dumped into the trench.

E. Pipe Clearance in Rocks.

(1) Ledge rock, boulders and large stones shall be removed to provide a clearance of at least six (6) inches below and on each side of all pipe and fittings for pipes twenty-four (24) inches in diameter or less, and nine (9) inches for pipes larger than twenty-four (24) inches in diameter.

(2) The specified minimum clearances are the minimum clear distances which will be permitted between any part of the pipe and/or fitting being laid and any part, projection or point of such rock, boulder or stone.

F. Pipes at Manholes or Other Rigid Structures. Any size pipe directly connected to or supported by rigid structures, shall not have a length beyond the rigid support in excess of five (5) feet. This length reduces the possibility of shearing the pipe if the structure settles after construction.

G. Concrete Cradle and Encasement.
(1) Preparation. Prior to the formation of the cradle or encasement, temporary supports consisting of timber wedges and solid concrete blocks or cap blocks shall be used to support the pipe in place. Temporary supports shall have minimum dimensions and shall support the pipe at not more than two (2) locations, one (1) at the bottom of the barrel of the pipe adjacent to the shoulder of the socket and the other near the spigot end.

(2) Joints.

(a) After jointing of the pipe has been completed, concrete shall be uniformly poured beneath and on both sides of the pipe. Placement shall be done by the use of suitable equipment. The concrete shall be wet enough during placement to permit its flow, without excessive prodding, to all required points around the pipe surface. The width of cradle shall be such as to fill completely the trench width. In case of extremely wide trenches, concrete encasement may be confined the top of the pipe to a narrower width, but in no case shall it be than the width of trench required for the size of pipe being used.

(b) Before depositing concrete, the space within the limits of the pour shall have been cleared of all debris and water. Water not be allowed to rise adjacent to or flow over, concrete deposited for less than twenty-four (24) hours. Concrete shall be protected from the direct rays of the sun and kept moist, by a method acceptable to the engineer, for a period of seven (7) days or until backfilling is begun. In no case shall backfilling begin within twenty-four (24) hours of the time of placing and the Engineer shall have strict control of the rate of backfilling.


A. General.

(1) Unless otherwise noted, manholes shall be constructed of precast concrete with cast iron frames and covers at the locations shown on the drawings or as directed by the engineer and in accordance with the construction details. The invert channels shall be smooth and semicircular in shape conforming to the inside of the adjacent sewer section. Changes in direction of flow shall be with a smooth curve of as large a radius as the size of the manhole will permit. Changes in size and grade of the channels shall be made gradually and evenly. The invert channels may be formed directly in the concrete of the manhole base, may be built up with brick and cement grout, may be half tile laid in concrete, or may be constructed by laying full section sewer pipe through the manhole and breaking out the top half after the surrounding concrete has hardened. The floor of the manhole outside the channels shall be smooth and shall slope toward the channels not less than one inch per foot and not more than two (2) inches per foot.

(2) Pipe and fittings used for making drop connections
shall be of the same type as the pipe and fittings used to construct the sewer line.

(3) A minimum of one (1) layer and a maximum of three (3) layers of brick laid flat on the long dimension or concrete rings will be permitted to bring the manhole to required grade.

B. Brick Manholes.

(1) Brick manholes shall be constructed only where directed. Brick shall be laid radially in a full bed of mortar with interior joints not more than one-quarter (1/4) inch in width. Whole brick only shall be used, except to effect closures and to fill in the outside portion of the radial joints. Each seventh (7th) course shall be laid as "stretchers," the intervening courses being composed of "headers." The upper portion of the manhole shall be drawn in equally and evenly as shown on the drawings to the diameter required to fit the iron ring.

(2) Brick manholes shall be thoroughly bonded to the barrel of the sewer and wall and base slab thoroughly bonded. All connections shall be made without projections or voids. When brickwork is completed, manholes shall be cleared of scaffolds and cleaned of surplus mortar or other foreign materials. The interior joints shall be pointed and the entire exterior surface plastered as called for by the drawings or as directed by the engineer. The interior joints shall be pointed and the entire exterior surface plastered with mortar to a thickness of one-half (1/2) inch.


A. Fittings, (Wye branches, risers and bends) and service pipe shall be furnished and installed in strict accordance with these specifications and any and all practices and precautions required for the street sewers are equally applicable to the house connections from the sewer to the right-of-way line, or to a location designated by the engineer. The contractor shall place a two inches by two inches (2 x 2) wooden marker at the end of each sewer lateral. The marker shall be one (1) piece and may not be constructed from two (2) or more smaller pieces. The marker shall extend from the lateral invert to twelve (12) inches above grade.

B. The contractor shall submit to the engineer, on a monthly basis, all as-built information which shall include: manhole run, station, length from centerline of sewer, invert elevation at the termination point of lateral and address or property owner's name for whom the lateral is provided.

C. If rock is encountered during the installation of the lateral, the contractor shall extend the lateral to the required distance as specified elsewhere in these specifications, and he shall provide a minimum "rock-free" distance of one (1) foot beyond the end of the lateral. No lateral shall be "butted" against rock.


A. Alignment. After the mains have been laid and backfill
placed to a depth of one and one-half (1-1/2) feet above the top of the pipe, a light will be flashed between manholes or manhole locations to determine whether the alignment of the sewer is true and whether any pipe has been displaced, broken or otherwise damaged subsequent to laying. This test will again be conducted before final acceptance of the sewer. Each section (manhole to manhole) of sewer shall show a good light circle throughout its length and any and all defects all be corrected by the contractor, to the satisfaction of the engineer, before the work shall proceed and before acceptance of and/or payment therefor shall be made. Also, a mandrel with a diameter of ninety-five (95%) of the inside diameter of the pipe must be manually pulled through the pipe section to assure proper alignment and that there is no debris in the pipe to cause obstructions.

B. Leakage Test.

(1) Air Testing.

(a) The contractor shall test each section of sewer between manholes and all laterals to the limit of this contract using low pressure air. Testing shall not be performed for acceptance of the pipe by the owner until all backfilling has been completed. The contractor may, at his option, test the section of sewer for his own purposes, prior to completion of backfilling; however, the requirements of this subsection shall not be deemed to be completed until the lines have been tested after the backfilling has been completed and trench settlement has been minimized. The costs of any testing incurred prior to authorization from the engineer after backfilling has been completed shall be borne by the contractor.

(b) A minimum period of two (2) minutes shall be provided to allow equilibrium of the air temperature with pipe wall before test readings shall commence. The rate of air loss shall be determined by measuring the time interval required for the average internal pressure to decrease by one (1.0) psig.

(c) The initial test pressure to be developed in the sewer and laterals shall be determined as follows:

1) For depths six (6) feet or less, the internal pressure shall not be less than six (6.0) psig.

2) For depths greater than six (6) feet, the internal pressure in psig shall be calculated as the sum of three and one-half (3.5) plus the maximum height in feet divided by two and three tenths (2.3) between the invert of the sewer and the existing ground surface in the section of sewer to be tested. (For example, if the maximum height is determined to be ninety-two (92) feet, the added pressure would be four (4.0) psig. The initial test pressure in the sewer would then be seven and one-half (7.5) psig. The allowable drop would be to six and one-half (6.5) psig within the time indicated elsewhere in this subsection).
3) In no case shall the test pressure in the sewers or laterals be greater than the maximum internal differential joint pressure recommended by the manufacturer of the pipe.

(d) The pipe shall be considered acceptable if the air loss rate does not exceed 0.0030 cubic feet per minute per square foot of internal pipe surface when tested at the initial pressure previously defined in this subsection. The time for the air pressure to decrease one (1.0) psig shall not be less than the time indicated in the following table:

<table>
<thead>
<tr>
<th>Pipe Diameter</th>
<th>Minutes</th>
<th>Seconds</th>
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<tbody>
<tr>
<td>6&quot;</td>
<td>2</td>
<td>55</td>
</tr>
<tr>
<td>8&quot;</td>
<td>3</td>
<td>57</td>
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<tr>
<td>10&quot;</td>
<td>4</td>
<td>43</td>
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<tr>
<td>12&quot;</td>
<td>5</td>
<td>40</td>
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<tr>
<td>15&quot;</td>
<td>7</td>
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<tr>
<td>18&quot;</td>
<td>8</td>
<td>30</td>
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<tr>
<td>21&quot;</td>
<td>9</td>
<td>50</td>
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<td>24&quot;</td>
<td>11</td>
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<td>27&quot;</td>
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<td>30&quot;</td>
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<td>42&quot;</td>
<td>19</td>
<td>50</td>
</tr>
<tr>
<td>48&quot;</td>
<td>22</td>
<td>40</td>
</tr>
</tbody>
</table>

(e) If the above rates of leakage are exceeded, the contractor shall, at his expense, determine source of leakage and make all necessary corrections and retest.

(f) The contractor shall submit to the engineer for approval the detailed test procedure and list of test equipment he proposes to use prior to testing.

(2) Infiltration.

(a) After the air testing described in the preceding subsection has been completed by the contractor, regardless of any indications of the test results made by the engineer or the owner, the engineer and owner reserve the right to perform field investigations, prior to final written acceptance of each sewer run by the owner and/or during the maintenance period specified elsewhere in these specifications, to establish the leakage of groundwater into the sewer and laterals constructed under this contract. The cost of these investigations shall be borne by the owner.

(b) Should the leakage exceed one hundred (100) gallons per day per inch diameter per mile of pipe for any section, the contractor shall, at the direction of the engineer or owner, and at no cost to the owner, perform any additional testing or corrective work required to reduce the infiltration in each manhole run from those lines installed by the contractor to less than one hundred (100) gallons per day per inch diameter per mile of pipe. This leakage applies to each manhole run separately and should not be
construed to mean total leakage in the total system. The scope of this corrective work shall include, but not be limited to, cleaning, televising and testing the sewer and laterals to the limits installed by the contractor, to include testing and grouting of joints, excavation and replacement of faulty or damaged portions of the work, and all final restoration.

(3) Manhole Testing.

(a) The contractor shall conduct exfiltration tests on all manholes. The contractor shall furnish all labor, materials, water, tools, equipment and accessories necessary to perform the required tests. All tests shall be made in the presence of and to the complete satisfaction of the engineer.

(b) The manhole shall be thoroughly cleaned and all openings sealed to the satisfaction of the engineer. All pipe openings in the base and the walls shall be plugged with plugs properly designed to provide a watertight seal.

(c) After the manhole has been properly cleaned and sealed, it shall be completely filled with water. In order to make allowance for the amount of water which will be absorbed by the manhole, the manhole to be tested shall be completely filled with water for a period of 12 hours prior to commencement of the test.

(d) At the time of commencement of the test, the manhole shall be filled with water to a point level with the top of the top manhole section. The amount of exfiltration shall be determined from the loss in water level converted into gallons per day. The manhole being tested shall be considered "acceptable" when there is no perceptible loss in water level.

(e) If any manhole fails to meet the exfiltration requirements specified hereinbefore, the contractor shall determine at his own expense the source or sources of leakage. The contractor shall repair or replace all defective material and/or workmanship and shall conduct such additional retests as required to demonstrate that the manhole meets the requirements, at his own expense and at no additional cost to the owner. All materials and methods used to repair the manholes shall meet with the approval of the engineer.

(4) Hydrostatic Tests for Force Mains.

(a) Pressure Test. After the pipe has been laid and backfilled as specified, all newly laid pipe, or any valved section thereof, shall be subjected to a hydrostatic pressure of one hundred (100) pounds per square inch, or fifty (50%) in excess of the normal working pressure, whichever is greater.

(b) Duration of Pressure Tests. The duration of each
pressure test shall be at least four (4) hours.

(c) Procedure. Each section of pipe shall be slowly filled with water and the specified test pressure, based on the elevation of the lowest point of the line or section under test and corrected to the elevation of the test gage, shall be applied by means of a pump connected to the pipe in a manner satisfactory to the engineer. The pump, pipe connections, and all necessary apparatus, including gauges, shall be furnished by the contractor. The contractor will make all taps into the pipe, and furnish all necessary assistance for conducting the tests.

(d) Expelling Air Before Test. Before applying the specified test pressure, all air shall be expelled from the pipe.

(e) Examination Under Pressure. Any cracks or defective pipes, fittings, or valves discovered in consequence of this pressure test, shall be removed and replaced by the contractor with sound material, and the test shall be repeated until satisfactory to the engineer.

(f) Leakage Test.

1) A leakage test shall be conducted after the pressure test has been satisfactorily completed. The contractor will furnish the gage and all necessary assistance to conduct the test. The duration of each leakage test shall be two (2) hours, and during the test the main shall be subjected to the pressure stated in subsection (4)(a).

2) Leakage is defined as the quantity of water to be supplied into the newly laid pipe, or any valved section thereof, necessary to maintain the specified leakage test pressure after the pipe has been filled with water and the air expelled.

3) No pipe installation will be accepted until the leakage is less than ten (10.0) U. S. gallons per twenty-four (24) hours per mile of pipe per inch nominal diameter. The allowable leakage shall be independent of the pipe laying length and the number of joints per mile.

(g) Variation from Permissible Leakage. Should any test of pipe laid disclose leakage greater than that specified in subsection (4)(f), the contractor shall, at his own expense, locate and repair the defective joints until the leakage is within the specified allowance.

(h) Time for Making Test.

1) Asbestos cement pipe shall be filled with water a minimum of twenty-four (24) hours prior to making any leakage tests. All other pipe may be subjected to hydrostatic pressure and inspected and tested for leakage at any convenient time after the
trench has been backfilled except at the joints, in accordance with the specifications. The leakage allowance for all mains shall be that specified in subsection (4)(f).

2) Where any section of a main is provided with concrete reaction backing, the hydrostatic pressure test shall not be made until at least five (5) days have elapsed after the concrete reaction backing was installed. If high early strength cement is used in the concrete reaction backing, the hydrostatic pressure test shall not be made until at least two (2) days have elapsed.

(5) Acceptance.

(a) Observation of successful testing of manholes, sewers or force mains by the engineer does not constitute acceptance of the system or any portion thereof. Upon completion of any determined portion of a total system, and successful testing thereof, the engineer may recommend final acceptance to the owner. Only upon final inspection by the owner or engineer, and upon written acceptance for same will the system or portion thereof be considered substantially completed. Upon such acceptance, the warranty period as specified for the manholes, sewers or force mains will commence.

(b) If, during this final inspection, any irregularities are observed, the condition must be corrected at the contractor's expense prior to acceptance.

12. Service Lines.

A. Soil pipe or waste pipe which runs through building or foundation walls shall be at least service weight cast iron. Service lines shall be constructed of one (1) of the following types of pipes:

(1) Vitrified clay sewer pipe at least six (6) inches in internal diameter and conforming to A.S.T.M. Designation C-13, C-261, or C0462 for standard strength or A.S.T.M. Designation C-200, C-278, or C-463 for extra strength.

(2) Asbestos cement building sewer pipe at least four inches (4) in internal diameter which has been auto-clave cured.

(3) Medium or service weight cast iron soil pipe at least four inches (4) in internal diameter conforming to A.S.T.M. Designation A-74, or the standards of the Cast Iron Soil Pipe Institute.

B. Jointing materials for the various types of pipe shall be as follows:

(1) Vitrified clay pipe shall have joints which conform to A.S.T.M. Specification C-425 (latest revision for joints using materials having resilient properties). Repairs or Connections to existing pipes shall be made with jute or hemp packing and hot poured bituminous joint compound.
(2) Asbestos cement pipe shall have joints consisting of rubber rings and asbestos cement sleeve.

(3) Cast iron soil pipe shall have approved pre-moulded rubber joints made with bell and spigot ends. Portland cement joints will not be permitted.

C. Where the service line and the lateral sewer are both of the same size pipe, connections shall be made by properly joining the bell end of the service line with the lateral sewer.

D. If the service line and lateral sewer are of unlike materials, the connection shall be made with a fitting of PVC elastomeric point seal ring suitable for the type and size of pipe to be connected. Projecting the smaller pipe into the larger and sealing with grout or mastic will in no circumstances be permitted.

E. All connections to sewers shall be made at the terminus of the lateral unless the Borough specifically authorizes otherwise.

F. Whenever no sewer connections has previously been constructed, the connection to the sewer main and the construction of the lateral sewer from the sewer main to the curb line shall be made by the Borough unless specific authorization otherwise is given by the Borough. All expenses incurred for this work shall be the responsibility of the property owner.

G. Whenever there is no wye branch present in the existing sewer, the connection shall be made by carefully cutting a hole in the top of the main sewer and inserting an approved wye saddle or tee saddle therein. After the saddle has been placed in position, the space between the saddle and main sewer shall be carefully caulked and clamped with stainless steel band bolted with stainless steel bronze bolts, or glued with a suitable thermosetting polyplastic joint material. A collar of hot poured bituminous joint compound or a suitable thermosetting polyplastic joint sealer shall be applied and formed around the said joint to make it water tight. In no circumstances shall the pipe inserted into the opening protrude into the main sewer.

H. Each service line shall be subjected to a test prior to approval by the Borough. The test shall be witnessed by an agent of the Borough and the service line shall not be deemed acceptable until said service line has satisfactorily passed the test hereinafter described. All costs of testing and any subsequent test(s), including equipment, material, water or labor required shall be the responsibility of the owner.

I. The service line shall be tested by plugging the sewer line at the point of connection with the Borough's system and at the point of connection with the building waste pipe, unless an alternative procedure is accepted by the Borough. All risers, vents, plugs, and cleanouts should be adequately blocked, plugged, or supported to withstand the pressure associated with the test. The test shall be made by either air or water. In either case, the test shall be designed to provide residual pressure of three and one-half (3.5) psi throughout the length of the service line.
J. The air test shall be made by attaching an air compressor testing apparatus to any suitable opening and after closing and supporting all other inlets and outlets to the service line, forcing air into the service line until there is a uniform gauge pressure of three and one-half (3.5) psi. The service line shall be deemed acceptable if this pressure is maintained for fifteen (15) minutes without the introduction of additional air.

K. The water test shall be made using a vertical standpipe at a point or points along the length of the service line. The service line shall be deemed acceptable if the loss of water as measured in the standpipe over a period of two (2) hours does not exceed twelve hundredths (0.12) gallons per foot for four (4) inch line and seventeen hundredths (.17) gallons per foot for a six (6) inch line. Care must be taken that the pressures generated by the test do not exceed the pipe manufacturer's recommendations.

(Ord. 393, 4/3/1990, §304)

§305. Water Mains and Appurtenances.

1. Scope. The work covered by this specification consists of furnishing all equipment, labor, and material, and in performing all operations in connection with the furnishing and installation of water mains, valves, fire hydrants, manholes, joint materials, water services and appurtenances, and in performing all tests required, complete, in accordance with the specifications, applicable drawings and contract documents.

2. Abbreviations.

   A.S.T.M. - American Society for Testing Materials
   A.W.W.A. - American Water Works Association


   A. Ductile Iron Pipe and Fittings.


      (2) Ductile iron fittings shall be in full accordance with the standard specification set forth in the ANSI A21.10 or A.W.W.A. Specification C110, latest edition. Gray-iron fittings may be substituted for ductile iron but must have a working pressure rating of two hundred fifty (250) psi.

      (3) Joints shall be of the push-on type or mechanical joint type in full accordance with ANSI A21.11 or A.W.W.A. C111 Specifications, latest edition.

      (4) Cement mortar linings shall be in full accord with ANSI
Specification A21.4 or A.W.W.A. C104, latest edition, except the thickness of linings should not be less than the following:

- 3" through 12" : 1/8"
- 14" through 24" : 3/16"

**B. Ductile Iron Flanged Pipe and Fittings.**

(1) Flanged pipe shall meet the requirements of the A.W.W.A. Specifications C151 and C150 for thickness and diameter and shall be the size and strength shown on the plans. Flanges and fittings shall conform to ANSI/A.W.W.A. C110 practice for the class and pressure shown on the plans.

(2) Joints. Flanges shall conform to A.S.A. Specification B-16.1 (latest revision). Gaskets eight (8) inch round and smaller shall be one-sixteenth (1/16) inch thick, over eight (8) inch round they shall be three-thirty-seconds (3/32) inch thick. Bolts shall be tightened to distribute the bolt stress evenly and bring the pipe into alignment.

**C. Galvanized Wrought Iron Pipe and Fittings.** Wrought iron pipe shall conform to A.S.T.M specification A-72 (latest revision). Fittings shall be malleable iron screw type. All pipe and fittings shall be galvanized to meet the requirements of A.S.T.M. specification A-153 (Latest Revision).

**D. Valves and Hydrants.**

(1) Gate Valves shall be iron body, resilient-seated, two hundred (200) psi working pressure rating with joint ends as called for on the plans. All buried valves shall be non-rising stem type with "O" ring seals. The ring seal plate shall be fitted with at least two (2) "O" rings. The design of the valve and seal plate shall be such that the seal plate can be fitted with new "O" rings while the valve is under pressure in the fully open position. Valves shall be equipped with a two (2) inch square operating nut and adjustable cast iron valve boxes and covers as herein specified. Gate valves shall open counter-clockwise. Gate valves shall be manufactured in accordance with the latest revision of A.W.W.A. Specification C-509 as minimum requirement. Valves shall be supplied by Kennedy Valve or Mueller.

(2) Check Valves shall be standard iron body swing type with straightaway passages for full pipe area. Valves shall be bronze mounted with a self-adjusting rubber or leather-faced discs. Valves shall be either plain type or equipped with outside lever and shall have joint ends as called for on the plans.

(3) **Hydrants.**

(a) Hydrants shall be cast iron body, fully bronze mounted, suitable for a working pressure of one hundred fifty (150) pounds per square inch, and shall be in accordance with the latest specifications of the A.W.W.A. Hydrants shall be constructed in manner permitting withdrawal of internal working parts without disturbing the
barrel or casing. Valve, when shut, shall be reasonably tight when upper portion of barrel is broken off. Valve opening shall be at least five and one-quarter (5.25) inches in diameter, with net area of waterway at smallest, with valves wide open, not less than one hundred twenty (120%) of valve opening. Each hydrant shall be tested to a hydrostatic pressure of three hundred (300) pounds per square inch with valve in both open and closed positions.

(b) The standpipe shall be connected to the groundline either by a frangible coupling or by flanges with frangible cast iron bolts. The main valve rod at the ground line shall be connected employing a frangible coupling. Hydrants shall be provided with an "0" ring type seal plate. The seal plate shall be fitted with at least two (2) "0" rings. The lower "0" ring shall serve as the pressure seal and the upper "0" ring as a combined dirt and moisture seal.

(c) The direction of opening shall be cast on head of hydrant. Nose nipples shall be bronze or non-corrosive metal, and threads shall be in accordance with specifications of the local fire marshall. Nipple caps shall be securely chained to the barrel.

(d) Each hydrant shall have two (2) hose connections and one (1) pumper connection in accordance with size and thread specifications for the Borough of New Holland, Pennsylvania. These specifications are on file with Kennedy Valve.

(e) Hydrants shall be painted one (1) coat of red lead paint and two (2) finishing coats of an approved paint of color directed by the Engineer. Hydrants shall be American Darling B62B Traffic Model.

(4) Air release valves shall be installed where called for on the plans. The work shall include the complete assembly with tap, shutoff valve, blow-off, air valve, piping with fittings, and union, all complete and ready for operation. Air valves shall be of a type having a special stainless steel float enclosed in the valve body with an attached lever for opening and closing the air discharge port. The design of the float and lever shall be such as to insure opening the valve port under maximum internal pressure. The assembly shall not leak nor the valve stick under service conditions.

(5) Valve boxes shall be adjustable roadway type constructed of cast iron with a five and one-quarter (5 1/4) inch shaft provided with screw type or sliding type extension pieces and either round or oval detachable base. Box shall have a plug lid fitting into a recessed seat. The lid shall have the word "WATER" cast on the top surface. All parts of the box shall be of tough gray iron, free from cold shuts and blow holes and shall be painted with black bituminous paint. Valve boxes shall be set at or above the surface of the adjoining ground or roadway.

E. Tapping Sleeves and Valves. Tapping sleeves shall be
cast-iron and have mechanical joint ends. Valves shall be of the sizes shown on the drawings and shall be designed to operate at a working pressure of two hundred (200) psi unless otherwise specified. The valves shall be inside screw, iron body, resilient-seated with flanged inlet and mechanical joint outlet and two (2) inch square operating nuts. Valves shall open to the left and be manufactured in accordance with A.W.W.A. C-509.

F. Brick for manholes shall be new, whole, common brick, furnished in accordance with A.S.T.M. Specification C-32, Grade MS.

G. Mortar for jointing and plastering the outside of brick manholes shall consist of one (1) part Portland cement and two (2) parts fine sand. For brickwork, lime may be added to the mortar in an amount of not more than twenty-five (25%) percent of the volume of the cement. Sand shall be clean and sharp and conform to A.S.T.M. Specification C-144. Hydrated lime shall conform to A.S.T.M. Specification C-6. Retempered mortar or mortar which has been mixed for more than forty-five (45) minutes shall not be used.

H. Mixing water for mortar and concrete shall be clean and free from oil, acid, alkali, sewage, or other deleterious substances.

I. Portland cement shall conform to A.S.T.M. Specification C-150, Type I. Where specifically authorized or required, high early strength (Type 3) shall be used.

J. Concrete shall have a compressive strength of not less than four thousand five hundred (4,500) psi after twenty-eight (28) days (tests to be in accordance with standard method of compression tests of A.S.T.M.). Aggregates shall be of quality, gradation and proportions as approved by the engineer after submission of test results on the design mix. Each cubic yard of concrete shall contain no less than six (6) bags of Portland cement.

K. Reinforcing steel shall be deformed, A.S.T.M. A15, Grade 60. Metal shall be clean and free from rust, scale or coatings that will reduce bond.

L. Cast iron shall be of soft gray iron, true to pattern, smooth and straight and free from defects impairing strength, durability or appearance. Castings shall conform to Federal Specification QQ-1-65A and A.S.T.M. A-48 (latest revision).

M. Manhole frame and cover shall be of soft gray iron equal in design to Frame Pattern No. 107 and Cover Pattern No. 108, as manufactured by the Allegheny Foundry Co., Pittsburgh, Pennsylvania, or approved equivalent. Manhole frame and cover shall be approved by the engineer and shall have the word "WATER" cast in the center.

4. Inspection.

A. Shop Inspection. All materials furnished by the contractor are subject, at the discretion of the owner, to inspection and approval at the plant of the manufacturer. Shop inspections to be made at the expense of the owner.

B. Field Inspection. All pipe and appurtenances shall be furnished, installed and tested for defects in material and/or
workmanship in the manner specified and in the presence of and as approved by the engineer.

C.Disposition of Defective Material. All materials found during the progress of the work to have cracks, flaws or other defects will be rejected by the engineer. All defective materials furnished by the contractor shall be promptly removed by him from the site at his own expense.

5. Handling of Material.

A. Replacement of Damaged Material. The contractor shall replace at his own expense all material furnished by him and found defective in manufacture or damaged in handling after delivery by the manufacturer. This shall include the furnishing of all materials and labor required for replacement of installed material. Any material furnished by the owner that becomes damaged after acceptance by the contractor shall be replaced by the contractor at his own expense.

B. Responsibility for Safe Storage. The contractor shall be responsible for the safe storage of material furnished by or to him, and accepted by him, and intended for the work, until it has been incorporated in the completed project. The interior of all pipe, fittings and other accessories shall be kept free from dirt and foreign matter at all times. All equipment and materials subject to damage from freezing shall be drained and stored in a manner which will protect them.

C. Hauling.

(1) All materials furnished by the contractor shall be delivered and distributed at the site by the contractor. Materials furnished by the owner shall be picked up by the contractor at points designated and hauled to and distributed at the site.

(2) Pipe, fittings, valves, hydrants, items of equipment and other materials of construction shall be loaded and unloaded by lifting with hoists or skidding so as to avoid shock or damage. Under no circumstances shall such materials be dropped. Materials handled on skidways shall not be skidded or rolled against materials already on the ground.

D. At Site of Work. In distributing the material at the site of the work, each piece shall be unloaded opposite or near the place where it is to be laid in the trench.

E. Care of Pipe Coating and Lining. Pipe shall be so handled so that the coating and lining will not be damaged. If however, any part of the coating or lining is damaged, the repair shall be made by the contractor at his expense in a manner satisfactory to the engineer.

6. Alignment and Grade.

A. General. The water main shall be laid and maintained to the required lines and grades with fittings, valves and hydrants at the required locations; spigots centered in bells; and all valves and hydrant stems plumb.

B. Caution in Excavation. The contractor shall proceed with
caution in the excavation and preparation of the trench so that the exact location of underground structures, both known and unknown, may be determined, and he shall be held responsible for the repair of such structures when broken or otherwise damaged because of carelessness on his part.

C. Subsurface Explorations. Whenever, in the opinion of the engineer, it is necessary to explore and excavate to determine the location of existing underground structures, the contractor shall make explorations and excavations for such purposes. If the contractor is required to perform additional work in making the explorations and excavations, extra compensation will be allowed for such additional work.

D. Depth of Pipe. All pipe shall be laid to the depth shown on the contract drawings or a minimum four (4) feet from grade to the crown of pipe.

7. Installation.

A. Handling of Water Main Material into Trench. Proper implements, tools, and facilities satisfactory to the engineer shall be provided and used by the contractor for the safe and convenient prosecution of the work. All pipe, fittings, valves and hydrants shall be carefully lowered into the trench piece by piece by means of a derrick, ropes, or other suitable tools or equipment, in such a manner as to prevent damage to water main materials and protective coatings and linings. Under no circumstances shall water main materials be dropped or dumped into the trench.

B. Hammer Test. The pipe fittings shall be inspected for defects and while suspended above grade, be rung with a light hammer to detect cracks.

C. Cleaning Pipe and Fittings. All lumps, blisters and excess coal tar coating shall be removed from the bell and spigot end of each pipe, and the outside of the spigot and the inside of the bell shall be wire-brushed and wiped clean and dry and free from oil and grease before the pipe is laid.

D. Laying Pipe.

(1) Every precaution shall be taken to prevent foreign material from entering the pipe while it is being placed in the line. If the pipe-laying crew cannot put the pipe into the trench and in place without getting into it, the engineer may require that before lowering the pipe into the trench, a heavy, tightly woven canvas bag of suitable size shall be placed over each end and left there until the connection is to be made into the adjacent pipe. During laying operations, no debris, tools, clothing or other materials shall be placed in the pipe.

(2) After placing a length of pipe in the trench, the spigot end shall be centered in the bell or coupling and the pipe forced home and brought to correct line and grade. The pipe shall be secured in place with approved backfill material tamped under it except at the joints. Pipe and fittings which do not allow a sufficient and uniform space for joints shall be removed.
and replaced with pipe and fittings of proper dimensions to
insure such uniform space.

(3) Precautions shall be taken to prevent dirt from
entering the joint space.

(4) At times when pipe laying is not in process, the open
ends of pipe shall be closed by a watertight lug or other means
approved by the engineer. Lead joints which cannot be poured
shall be caulked with packing to make them as watertight as
possible. This provision shall apply during the noon hour as
well as overnight. If water is in the trench, the seal shall
remain in place until the trench is pumped completely dry.

E. Cutting Pipe. The cutting of pipe for inserting valves,
fitting or closure pieces shall be done in a neat and workmanlike
manner, without damage to the pipe, so as to leave a smooth end at
right angles to the axis of the pipe.

F. Bell Ends to Face Direction of Laying. Bell and spigot pipe
shall be laid with bell ends facing in the direction of laying, unless
directed otherwise by the engineer.

G. Permissible Deflection of Joints. Wherever it is necessary
to deflect pipe from a straight line, either in the vertical or
horizontal plane, to avoid obstruction or plumb stems, or where long
radius curves are permitted, the amount of deflection allowed shall
not exceed that the recommended by the manufacturer, and shall be
approved by the Engineer.

H. Unsuitable Conditions for Laying Pipe. No pipe shall be laid
in water or when, in the opinion of the engineer, trench conditions
are unsuitable.

I. The plans of cross connections between new mains and existing
mains as shown on plans have been prepared from all available
information; however, should the existing mains when exposed vary in
size from that shown on the plans, the contractor shall provide the
necessary fitting for the cross connection and install the same at the
price bid. By reason of said changes should any surplus remain after
the completion of the contract, these fittings will be paid for at
cost to the contractor and become the property of the owner.

J. Variations. The engineer reserves the right to vary the line
and/or grade from that shown on the drawings for the pipe lines and
manholes and to vary the location of fittings, valves and hydrants
when such changes may be necessary or advantageous. No claims for
extra work will be allowed for changes in location or grade except as
such changes are made after trenching has been done.

K. Marking Line Locations. This shall be done by the following
method: there shall be placed a continuous metallic tape material
designating "Buried Water Line" vertically above water line and at a
depth of no less than eighteen (18) inches or no more than twenty-four
(24) below the surface of roadway or natural grade surface.

A. Ductile-Iron Pipe and Fittings.
(1) **Mechanical Joints.**

(a) The spigot end of the pipe shall be centrally located in the bell so that the rubber gasket is evenly seated.

(b) All loose rust or foreign matter shall be removed from the inside surfaces of the bell and the outside surface of the spigot prior to assembly. Bolts shall be tightened uniformly with a ratchet wrench so as to effect the joint seal. The normal range of bolt torques to be applied to standard cast iron bolts are:

<table>
<thead>
<tr>
<th>Size (Inches)</th>
<th>Torque (Ft. Lbs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5/8</td>
<td>40 - 60</td>
</tr>
<tr>
<td>3/4</td>
<td>60 - 90</td>
</tr>
<tr>
<td>1</td>
<td>70 - 100</td>
</tr>
<tr>
<td>1 1/4</td>
<td>90-120</td>
</tr>
</tbody>
</table>

If effective sealing is not attained at the maximum torque indicated above, the joint shall be disassembled and reassembled after thorough cleaning.

(2) **Single Rubber Gasket.** The joint shall be assembled as recommended by the manufacturer so as to effect the joint seal.

B. **Ductile-Iron Flanged Pipe and Fittings.** Gaskets shall be cut in a neat and workmanlike manner and all bolts shall be tightened to distribute the bolt stress evenly and bring the pipe into alignment.

C. **Galvanized Wrought Iron Pipe and Fittings.** Threads shall be neatly cut with sharp tools, and the jointing procedure shall conform with the best practice. Before jointing, all scale shall be removed from pipe by some suitable means, such as pounding. After cutting, all pipe shall be reamed. All pipe shall be screwed together with application of an approved compound applied to all threads; and after a joint has been screwed tight, it shall not be backed off unless the threads are recleaned and new compound applied. This application shall be neatly made, and all compound and dirt wiped off the inside of each joint.

9. **Setting Fittings and Valves.**

A. **General.** Valves, fittings, plugs and caps shall be set and jointed to pipe in the manner heretofore specified for cleaning, laying and jointing pipe.

B. **Location of Valves.** Valves in water mains shall, where possible, be located on the street property lines extended unless shown otherwise on the plans.

C. **Valve Boxes and Valve Pits.**

(1) A cast iron valve box or masonry pit shall be provided for every valve as shown on the plans. A valve box shall be provided for every valve which has no gearing or mechanism or in which the gearing or operating mechanism is fully protected with a cast iron grease case. The valve box shall not transmit shock or stress to the valve and shall be centered and plumb over the
wrench nut of the valve, with the box cover flush with the surface of the finished pavement or such other level as may be directed.

(2) A masonry valve pit shall be provided for every valve which has exposed gearing or operating mechanism. The valve nut shall be readily accessible for operation through the opening in the manhole which shall be set flush with the surface of the finished pavement or such other level as may be specified. Pits shall be constructed to permit minor valve repairs and afford protection to the valve and pipe from impact where they pass through the pit walls.

D. Drainage of Mains.

(1) Mains shall be drained through drainage branches or blowoffs to dry wells from which the water can be pumped.

(2) Drainage branches, blowoffs, air vents, and appurtenances shall be provided with gate valves and shall be located and installed as shown on the plans.

(3) Drainage branches or blowoffs shall not be connected to any sewer submerged in any other manner that will permit back siphonage of polluted water into the distribution system.

E. Dead Ends. All dead ends on new mains shall be closed with cast iron plugs or caps, with or without a blowoff cock, as shown on the drawings.

10. Setting Hydrants.

A. Location.

(1) Hydrants shall be located as shown on the plans or as directed by the engineer in a manner to provide complete accessibility and so that the possibility of damage from vehicles or injury to pedestrians will be minimized.

(2) When placed behind the curb, the hydrant barrel shall be set so that no portion of the pumper or hose nozzle cap will be less than six (6) inches or more than twelve (12) inches from the gutter face of the curb.

(3) When set in the lawn space between the curb and sidewalk, or between the sidewalk and the property line, no portion of the hydrant or nozzle cap shall be within six (6) inches of the sidewalk.

B. Position. All hydrants shall stand plumb and shall have their nozzles parallel with or at right angles to the curb, with the pumper nozzle facing the curb, except that hydrants having two (2) hose nozzles ninety (90) degrees apart shall be set with each nozzle facing the curb at an angle of forty-five (45) degrees. Hydrants shall be set to the established grade, with the nozzles at least twelve (12) inches above the ground, as shown or as directed by the Engineer.

C. Connection to Main. Each hydrant shall be connected to the main with a six (6) inch cast iron branch controlled by an independent
six (6) inch gate valve except as otherwise directed.

D. Hydrant Drainage in Pervious Soil. Wherever a hydrant is set in soil that is pervious, drainage shall be provided at the base of the hydrant by placing coarse gravel or crushed stone mixed with coarse sand, from the bottom of the trench to at least six (6) inches above the waste opening in the hydrant to a distance of one (1) foot around the elbow.

E. Hydrant Drainage in Impervious Soil. Wherever a hydrant is set in clay or other impervious soil, a drainage pit two (2) feet in diameter and three (3) feet deep shall be excavated below each hydrant and filled compactly with coarse gravel or crushed stone mixed with coarse sand, under and around the elbow of the hydrant and to a level of six (6) inches above the waste opening.

11. Anchorage.

A. Anchorage for Hydrants. The bowl of each hydrant shall be well braced against unexcavated earth at the end of the trench with stone slabs or concrete backing, or it shall be tied to rods or clamps, as shown or directed by the engineer.

B. Anchorage for Plugs, Caps, Tees and Bends. All plugs, caps, tees and bends deflecting twenty-two and one-half (22-1/2) degrees or more on mains six (6) inches in diameter or larger shall be provided with a reaction backing, or movement shall be prevented by attaching suitable metal rods or clamps as shown on the plans or directed by the engineer.

C. Reaction Backing. Reaction backing shall be concrete of a mix not leaner than one (1) cement; two and one-half (2 1/2) sand; five (5) stone; and having a compressive strength of not less than two thousand (2,000) psi, at twenty-eight (28) days. Backing shall be placed between solid ground and the fitting to be anchored; the area of bearing on the pipe and on the ground in each instance shall be as shown on the plans or directed by the engineer. The backing shall, unless otherwise shown or directed, be so placed that the pipe and fitting joints will be accessible for repair.

D. Metal Harness. Metal harness of tie rods or clamps of adequate strength to prevent movement may be used instead of concrete backing when directed by the Engineer. Steel rods or clamps shall be galvanized or otherwise rustproof treated, or shall be painted as directed by the Engineer.

12. Concrete Cradle and Encasement.

A. Preparation. Prior to the formation of the cradle or encasement, temporary supports consisting of solid concrete bricks or cap blocks shall be used to support the pipe in place. Temporary supports shall have minimum dimensions and shall support the pipe at not more than two (2) locations, one (1) at the bottom of the barrel of the pipe adjacent to the shoulder of the socket, and the other near the spigot end.

B. Placing.

(1) After jointing of the pipe has been completed, concrete
masonry shall be uniformly poured beneath and on both sides of the pipe. Placement shall be done by the use of suitable equipment.

(2) The concrete shall be wet enough during placement to permit its flow, without excessive prodding, to all required points around the pipe surface. The width of cradle shall be such as to fill completely the trench width. In case of extremely wide trenches, concrete encasement may be confined above the top of the pipe to a narrower width, but in no case shall it be less than the width of trench required for the size of pipe being used.

(3) Before depositing concrete, the space within the limits of the pour shall have been cleared of all debris and water. Water shall not be allowed to rise adjacent to or flow over concrete deposited for less than twenty-four (24) hours. Concrete shall be protected from the direct rays of the sun and kept moist by a method acceptable to the engineer for a period of seven (7) days or until backfilling is begun. In no case shall backfilling begin within thirty-six (36) hours of the time of placing and the engineer shall have strict control of the rate of backfilling.

13. Blowoff Connection. Blowoff connections shall be installed where called for on drawings. Unless otherwise shown on the drawings or specified, each blowoff shall consist of a gate valve and box of the same size as the water main, a reducer where necessary, four (4) inches bend drilled for drainage, piece of four (4) inches pipe rising to the surface and a valve box telescoped over the riser pipe. Blowoffs shall not be connected to any sewer, submerged in any other manner, that will permit back siphonage in the distribution system.


A. General. Manholes shall be constructed of brick, with cast iron frames and covers, in the locations shown on the drawings or as directed by the engineer and in accordance with the construction details.

B. Concrete and mortar shall conform to the requirements hereinbefore specified.

C. Brickwork. Brick shall be laid radially in a full bed of mortar with interior joints not more than one-quarter (1/4) inch in width. Whole brick only shall be used, except to effect closures and to fill in the outside portion of the radial joints. Each seventh (7th) course shall be laid as "stretchers," and intervening courses being composed of "headers." The upper portion of the manhole shall be drawn in equally and evenly as shown on the drawings to the diameter required to fit the iron ring.

D. Frames, Covers and Steps. Cast iron frames and covers and manhole steps shall conform to the drawings in all essentials of design. Standard castings differing in nonessential details and approved by the engineer will be acceptable. Frames and covers shall be machined to produce a tight, rattle-proof fit. The frames and covers shall be set that the top of the cover will be flush with or
higher than finished grade as directed by the engineer. Steps when shown on drawings or specified shall be furnished and set as manhole construction progresses.

15. Hydrostatic Test.

A. Leakage Test.

(1) After the pipe has been laid and backfilled as specified, all newly laid pipe, or any valved section thereof, shall be subjected to a pressure of one hundred fifty (150) pounds per square inch, or fifty (50%) percent in excess of the normal working pressure, whichever is greater, in accordance with A.W.W.A. Specification C-600.

(2) Leakage is defined as the quantity of water to be supplied into the newly laid pipe, or any valved section thereof, necessary to maintain the specified leakage test pressure after the pipe has been filled with water and the air expelled.

(3) No pipe installation will be accepted until the leakage is less than the number of gallons per hour as determined by the formula:

\[
L = \frac{SDV}{133,200P}
\]

in which "L" equals the allowable leakage in gallons per hour; "S" is the length of pipeline tested in feet; "D" is the nominal diameter of the pipe, in inches and "P" is the average test pressure during the leakage test, in pounds per square inch gauge. (The allowable leakage according to the formula is equivalent to eleven and sixty-five hundredths (11.65) U.S. gallons per twenty-four (24) hours per mile of pipe per inch nominal diameter, evaluated on a pressure basis of one hundred fifty (150) psi).

B. Duration of Test. The duration of the test under pressure shall be two (2) hours.

C. Procedure. Each valved section shall be slowly filled with water and the specified test pressure, based on the elevation of the lowest point of the line or section under test and corrected to the elevation of the test gage, shall be applied by means of a pump connected to the pipe in a manner satisfactory to the Engineer. The pump, pipe connections, and all necessary apparatus, including gauges, shall be furnished by the contractor. The contractor will make all taps into the pipe, and furnish all necessary assistance for conducting the tests.

D. Expelling Air Before Test. Before applying the specified test pressure, all air shall be expelled from the pipe. If hydrants or blowoffs are not available at high places, the contractor shall make the necessary taps at points of highest elevation before the test is made and insert the plugs after the test has been completed.

E. Variation from Permissible Leakage. Should any test of pipe
laid disclose leakage greater than that specified in subsection (A), the contractor shall, at his own expense, locate, repair, and replace the defective joints, pipe or fittings until the leakage is within the specified allowance.

F. Time for Making Test.

(1) All pipe may be subjected to hydrostatic pressure and inspected and tested for leakage at any convenient time after the trench has been partially backfilled except at the joints in accordance with the specifications. The leakage allowance for all mains shall be that specified in subsection (A).

(2) Where any section of a main is provided with concrete reaction backing, the hydrostatic pressure test shall not be made until at least five (5) days have elapsed after the concrete reaction backing was installed. If high early strength cement is used in the concrete reaction backing, the hydrostatic pressure test shall not be made until at least two (2) days have elapsed.


A. Preliminary Flushing. Prior to sterilization, the lines shall be flushed as thoroughly as possible with the water pressure and outlets available. Flushing shall be done after the line leakage test has been made.

B. Chlorination of Completed Line.

(1) Before being placed in service, the entire line shall be chlorinated in accordance with A.W.W.A. Specification C-651. Chlorine may be applied by the following methods: Liquid chlorine and calcium hypochlorite granules, sodium hypochlorite solution and calcium hypochlorite tablets.

(2) The chlorinating agent shall be applied at the beginning of the section adjacent to the feeder connection and shall be injected through a corporation cock, hydrant, or other connection insuring treatment of entire line.

(3) Water shall be fed slowly into new line with chlorine applied in amounts to produce a dosage of forty (40) to fifty (50) p.p.m. Mains previously filled shall be treated to a concentrated dosage at intervals along the line and retained for a period of eight (8) hours or more. A residual of not less than five (5) p.p.m. shall be produced in all parts of the line.

(4) During the chlorination process, all valves and accessories shall be operated.

(5) After chlorination, the water shall be flushed from the line at its extremities until the replacement water tests are equal chemically and bacteriologically to those of the permanent source of supply.

C. Liquid Chlorine. Chlorine gas–water mixture shall be applied by means of a solution feed chlorinating device. Chlorine gas shall be fed directly from a chlorine cylinder equipped with suitable device for regulating the rate of flow and the effective diffusion of gas.
within the pipe.

D. Calcium Hypochlorite. Calcium hypochlorite shall be comparable to commercial products known as H.T.H., perchloren, and maxochlor, a solution consisting of five (5%) percent of powder to ninety-five (95%) of water by weight, should be prepared. The calcium hypochlorite and water mixture, first made into a paste and then thinned to a slurry, shall be injected or pumped into the newly laid line under the conditions specified hereinbefore.

E. Final Flushing. Following chlorination all treated water shall be thoroughly flushed from the line, at its extremities, until the replacement water throughout its length, upon test, be proved comparable to the quality of water in the existing distribution system.

F. Bacteriological Tests. Chlorination of the completed line and the necessary bacteriological tests shall be done at the expense of the contractor as part of the construction contract. No separate or extra payments will be made for performing any of this work.

17. Water Service Lines.
A. Materials.

(1) Copper Water Tube.
   (a) This material shall be supplied in conformance with the latest revision of A.S.T.M. Specification B 88, "Type K" or Federal Specification WW-T-799 "Type K" and shall be used on all lines from main to meter.
   (c) In no case shall tubing smaller than three-quarters (3/4) inch trade size be used.

(2) Cast Iron Pipe.
   (a) Cast iron pipe used for water service is subject to the same service as the adjacent mains and therefore the specifications for cast iron pipe lines shall apply to cast iron services.

(3) Service Line Fittings.
   (a) Threads for underground service line fittings shall be in full accord with A.W.W.A. Standard Specification C-800, latest revision.
   (b) Corporation cocks shall be of the size shown on the plans or directed by the engineer. Inlet thread shall be Mueller with compression or packed joints as approved by the Borough.
   (c) Curb stops shall be ground key type for use with copper water service. Make shall be Mueller or Ford.
   (d) Curb boxes shall be telescopic extension type with
stationary road. Pattern shall be approved by local water superintendent. The boxes and lids shall be metal and coated with bituminous enamel.

B. Installation. All services over three-quarter (3/4) inch shall be of type as called for on the plans. To avoid cutting or excavating under the roadway, all services under four (4) inches shall be bored with an auger or pushed through a drive pipe. (The drive pipe may be removed when the service is installed). Where rock or other obstructions are encountered, the location of the service line may be moved as much as is necessary with the engineer's approval; but the service lines must be extended along the roadway so as to place the curb boxes at the proper locations. Should it be impossible to push or drive any service line under the roadway, the contractor shall make such excavations as necessary with approval of the Engineer. All excavations or paving encountered in laying a service line shall be paid for at the price bid for these items in laying the pipe line. All services branches shall be delivered in a straight line ninety (90) degrees off main to curb stop at curb unless absolutely impossible and permission is obtained in writing from the Borough.

(Ord. 393, 4/3/1990, §305)

§306. Crushed Aggregate Base Course.

1. Scope. This work shall consist of constructing a stone base course in accordance with these specifications and within reasonably close conformity to the lines, grades, width, and depth shown on the drawings and as specified.

2. Materials. The coarse material shall be Type A, or better, stone meeting the requirements of Pennsylvania Department of Transportation Specifications Form 408, latest revision for No. 3, No. 4, No. 2RC and No. 2A Aggregate.

3. Construction Requirements.

A. General. Before the crushed aggregate base course is placed, concrete curb or roadway shoulders shall be constructed.

B. Shoulders. Shoulders shall be constructed as specified. This work will not be considered as completed shoulders until they have been finish-rolled and trimmed after completion of the pavement. When rolling a single-layer base course or the top layer of multi-layer base course, the roller wheel shall overlap the shoulder area for a distance of at least six (6) inches.


(1) The contractor shall furnish and use approved templates of required length and cut to the required crown of the finished surface of the base course, for checking the crown and contour thereof. The templates shall be equipped with metal or other approved vertical extensions attached to each end, so that the bottom of the template will be at the elevation of the top of the loose aggregate. At least three (3) such templates shall be furnished, and used at intervals of not more than twenty-five (25) feet.
(2) String lines, for controlling the finished elevation of the proposed base course, shall be furnished with ample supports and offset along each side of the base course, and shall be maintained until all irregularities have been satisfactorily corrected.

(3) Approved straightedges ten (10) feet in length shall also be furnished and used for testing longitudinal irregularities in the surface of the base course.

D. Replacement Areas. Where base course is provided for replacement of existing pavement, the areas of replacement will be marked by the engineer and shall be removed to neat lines by approved methods.

E. Miscellaneous.

(1) Base course in areas where spreading and compacting with mechanical equipment is impracticable may be spread and compacted by any method approved by the engineer.

(2) No material shall be placed adjacent to structures or railway tracks until they have been set to the required grade and alignment.

(3) Base course material placed on existing pavement as on overlay or build-up shall be constructed in compacted layers as herein specified.

(4) Calcium chloride shall be used only when and as directed. If, at any time, subgrade or subbase materials become churned-up or mixed with the base course, the contractor shall dig out and remove the mixture, reshape and recompact the subgrade and/or subbase, and reconstruct the unsatisfactory base course areas to meet specification requirements.

F. Initial Layer. Prior to placing the No. 3 or No. 4 aggregate an initial layer of 2RC or 2A material shall be spread uniformly over the subgrade as a bed and filler. The initial layer shall be spread to a depth of one (1) inch.

G. Second Layer. The second layer shall consist of No. 4 aggregate placed to a depth of eight (8) inches in one (1) layer. If No. 3 aggregate is used, the aggregate shall be placed in two (2) four (4) inch layers.

H. Spreading Coarse Material.

(1) The coarse material shall be spread uniformly on the initial layer of fine material by approved mechanical stone spreaders to the full width of the base unless otherwise specified for part-width construction. Spreaders shall be adjusted to spread the loose material to obtain a layer of the required depth after compaction. In areas inaccessible to spreading equipment, the material may be spread directly from trucks provided the distribution is satisfactory to the engineer. All segregated material shall be removed and replaced with well graded material. The coarse material shall not be spread for a distance of more than an average day's work ahead of choking and compacting.
(2) After each layer of material has been spread, it shall be checked with approved templates and straightedges, and all irregularities shall be satisfactorily corrected prior to rolling.

I. Compacting Coarse Material.

(1) The coarse material shall be rolled and thoroughly compacted with an approved three (3) wheel roller. The rolling shall begin at the sides and progress to the center, except on superelevated curves where the rolling shall begin on the low side and progress to the high side.

(2) The rolling shall be parallel with the centerline of the roadway, uniformly lapped each preceding track, covering the entire surface with the rear wheels and continuing until the material does not creep or wave ahead of the roller wheels.

J. Application of Final Layer. A final layer of 2RC or 2A stone shall be placed on the second layer after it is completed. The final layer shall be compacted as specified in subsection (I).

K. Surface Tolerance. After the base course has been completed as specified, the surface smoothness shall be checked with approved templates and straightedges, as specified. Any surface irregularities that exceed inch under a template or straightedge shall be remedied to the satisfaction of the engineer by loosening the surface and removing or adding material as required, after which the entire area, including the surrounding surface, shall be rolled until it is satisfactorily compacted.

L. Tests for Depth of Finished Base Course.

(1) During the progress of the work, the depth of the base course will be determined by the engineer and unsatisfactory work shall be repaired, corrected, or replaced. The Borough will not be liable for payment for any excess depth of base course.

(2) The initial layer of fine material placed as a bed and filler will be measured and considered as part of the base course in determining the compacted depth of the finished course.

(3) The depth will be determined by cutting or digging holes to the full depth of the completed base course. One (1) depth measurement shall be made for each three thousand (3,000) square yards, or less, or completed base course. Any section in which the depth is one-half (1/2) inch or more deficient in specified depth, shall be removed and satisfactorily replaced at no expense to the Borough.

(4) All tests holes shall be cut or dug, backfilled with similar material, and satisfactorily compacted by and at the expense of the contractor. This operation shall be under the direct supervision of the inspector who will check the depth for record purpose.

M. Maintenance and Traffic.

(1) The contractor shall maintain the completed base course, until the placement of the surface course.
(2) No traffic shall be allowed on the base course other than necessary local traffic and that developing from the operation of essential construction equipment, unless otherwise directed by the engineer. Any defects which may develop in the construction of the base course or any damage caused by the operation of local or job traffic is the responsibility of the contractor and shall be immediately repaired or replaced at no expense to the Borough.

4. Alternate Base Courses. Materials and construction requirements for bituminous concrete base course and aggregate-lime Pozzolan base course shall conform to Pennsylvania Department of Transportation Specifications, Form 406, latest revision.

(Ord. 393, 4/3/1990, §306)

§307. Surface Course.

1. Scope. This work shall consist of two (2) courses of bituminous mixture constructed on the prepared foundation in accordance with these specifications, the specific requirements of the type under contract, and within reasonably close conformity to the lines, grades, width, and depth shown on the drawings.

2. Materials. Materials shall meet the specifications Form 408, latest revisions, of the Pennsylvania Department of Transportation for ID-2 plant mix material.

3. Approval of Job-Mix Formula. Approval of job-mix formula shall meet the requirement of Form 408, latest revision.

4. Uniformity of Material. Uniformity of material shall meet the requirements of Form 408, latest revision.

5. Construction Requirements.

A. Weather Limitations.

(1) The placing of bituminous concrete shall terminate between October 15 and October 31 and shall not be resumed prior to April 1 to April 15, unless otherwise approved by the engineer, in writing, based upon weather and/or traffic conditions at the location of the project.

(2) When the air temperature falls below fifty (50°F) degrees, extra precautions shall be taken in drying the aggregate, controlling the temperature of the delivered material, and compacting the mixture. Bituminous concrete shall not be placed on wet surfaces; nor when the air temperature is forty (40°F) degrees Fahrenheit or lower; nor when the temperature of the pavement, base, or binder on which it is to be placed, is forty (40°F) degrees Fahrenheit or lower.

(3) Limited tonnage en route to the project when work is terminated for the day because of weather conditions may be placed with the approval of the engineer.

B. Bituminous Mixing Plant. All plants manufacturing bituminous concrete shall meet the requirements of Pennsylvania Department of Transportation Specifications Form 408, latest revision.
C. Preparation of Mixtures. Preparation of mixtures shall meet the requirements of Pennsylvania Department of Transportation specifications Form 408, latest revision.

D. Hauling Equipment. The binder course and wearing material shall be hauled to the work in tight vehicles. Vehicles shall be previously cleaned of all foreign material and be free of any petroleum oils, volatiles, or other solvents which may adversely affect the bituminous concrete. Approved covers of sufficient size and quality to protect the entire load, under all conditions, shall be provided. When necessary, provisions shall be made for proper insulation of the vehicle to insure that the mixture is delivered at the correct laying temperature, free from lumps of chilled material. The dispatching of the vehicles shall be arranged so that all material delivered shall be placed and rolled during daylight hours, unless mitigating circumstances require the work to be performed otherwise.

E. Bituminous Pavers.

(1) Bituminous pavers shall be self-contained, power-propelled units, provided with an activated screed or strike-off assembly, heated if necessary, and capable of spreading and finishing courses of bituminous plant mix material in lane widths applicable to the specified typical section and depth(s) shown on the drawings. The paver shall be capable of being operated at forward speeds consistent with satisfactory laying of the mixture. Pavers used for shoulders and similar construction shall be capable of spreading and finishing courses of bituminous plant mix material in widths shown on the drawings.

(2) The paver shall be equipped with a receiving hopper having sufficient capacity for a uniform spreading operation. The hopper shall be equipped with a distribution system to place the mixture uniformly in front of the screed.

(3) The screed or strike-off assembly shall effectively produce a finished surface of the required evenness and texture without tearing, shoving, or gouging the mixture.

(4) Equipment causing tracks or leaving indented areas not corrected by the scheduled operation, or producing flushing or other permanent blemishes, or failing to produce a satisfactory surface shall not be used. Blade graders or drags will not be permitted.

F. Rollers. Rollers shall be of the steel-wheel and pneumatic-tire types.

G. Conditioning of Existing Surface and Structures.

(1) The contractor shall remove and dispose of all fatty and other unsuitable materials from the surface of existing pavement. He shall also remove and dispose of excess joint sealer and crack filler from rigid pavements, and shall seal open joints and cracks with Class J-1 bituminous material to within one-quarter (1/4) inch of the surface of the existing pavement and immediately cover with a light coating of approved dry sand. Open cracks more than one (1) inch wide shall be filled with a
suitable fine bituminous concrete mixture.

(2) All depressions of one (1) inch or more in depth shall be patched with binder or wearing material as directed, then thoroughly compacted ahead of surfacing operations.

(3) Prior to the arrival of the binder course mixture, the base shall be cleaned of all loose and foreign materials.

(4) The vertical surface of curbs, structures, gutters, and existing paving in contact with bituminous mixtures, shall be painted with a uniform coating of bituminous material of the class and type designated for the surface course.

(5) A prime coat shall be applied when indicated on the drawing or specified in the proposal.

(6) A tack coat shall be applied to existing concrete, brick, or block pavements or concrete base courses.

(7) A tack coat shall not be applied to new bituminous base courses or existing bituminous pavements unless indicated on the drawings or specified in the proposal. However, a tack coat shall be applied to a new bituminous base course or binder course when, in the opinion of the engineer, the condition of the surface is unsatisfactory for the direct placement of the succeeding operation.

H. Spreading and Finishing.

(1) The temperature of the binder or wearing course mixture when laid shall not vary more than fifteen (15°F) degrees Fahrenheit from the temperature of the completed mixture at the plant.

(2) When unforeseen delays in paving are encountered, a limited tonnage may be placed provided the temperature of the mixture at the time does not vary more than twenty-five (25°F) degrees Fahrenheit from the mixed temperature. Samples of the compacted pavement in which it is used shall comply with the specified density requirements. If the density requirements are not met, the faulty paving shall be removed and replaced.

(3) The mixture shall be spread or struck off by mechanical spreading and finishing equipment for the entire width or for such partial-width lanes as may be practical. The screed assembly shall be operated to provide a binder course or wearing course of the required depth.

(4) When the production of the mixture can be maintained and, when practical, pavers shall be used in echelon to place the surface courses in adjacent lanes.

(5) On areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing equipment impracticable the mixture shall be placed and screened by hand tools to give the required compacted depth.

(6) Adjacent to flush curbs, gutters, liners, and structures, the surface mixture shall be placed uniformly high so
that, when compacted, it will be slightly above the edge of the abutting structure.

(7) When the wearing course is placed adjacent to curbs to form a bituminous gutter and before the surface has cooled, it shall be sealed with hot bituminous material of the class and type designated for the surface course for a distance of twelve (12) inches from the curb. The sealing material shall be evenly applied to the surface by means of squeegees immediately after final rolling and sealed with hot irons to completely fill the surface voids and provide a watertight joint along the curb. Excess bituminous material shall be removed from the wearing course.

I. Compaction.

(1) Immediately after the bituminous mixture has been spread, struck off, and surface irregularities adjusted, it shall be thoroughly and uniformly compacted by rolling.

(2) The surface shall be rolled when the mixture is in the proper condition and when the rolling does not cause undue displacement, cracking, or shoving.

(3) The number, weight, and type of rollers furnished shall be sufficient to obtain the required compaction while the mixture is in a workable condition. The sequence of rolling operations and the selection of roller types shall provide the specified pavement density.

(4) The rollers shall be normally operated so that the breakdown rolling is performed with a three (3) wheel or tandem roller, the intermediate rolling with a pneumatic-tired roller, and the finish rolling with a tandem roller. When an approved vibratory roller is used for breakdown rolling in the vibratory mode, intermediate rolling with a pneumatic-tired roller will not be required. When the vibratory roller is used for finish rolling, it shall be used in the static mode. Rolling shall progress continuously until the specified density, ninety-five (95%) percent of the corresponding daily plant Marshall density, has been attained. Finish rolling shall continue until all roller marks are eliminated.

(5) Unless otherwise directed, rolling shall start longitudinally at the sides and gradually progress toward the center of the pavement, except on superelevated curves, where the rolling shall begin on the low side and progress to the high side, overlapping on successive trips by at least (1/2) the width of pneumatic-tired rollers and tandem rollers and uniformly lapping each preceding track or covering the entire surface with the rear wheels when three (3) wheel rollers are used.

(6) The motion of the rollers shall be slow enough at all times to avoid displacement of the hot mixture and any displacement resulting from reversing the direction of the rollers, or from any other cause, shall be satisfactorily corrected.
(7) The wheels of steel-wheel rollers shall be kept moist and clean to prevent adhesion of the fresh material, but an excess of water will not be permitted. Pneumatic-tired roller wheels shall be kept clean by an approved method to prevent adhesion of the fresh material.

(8) When either the binder or wearing course fails to comply with the density requirements herein specified, additional compaction may be applied, when permitted and as directed, to attain the required density. If satisfactory density cannot be attained, the contractor shall be required to remove and replace any affected area.

(9) Immediately after placing the binder or wearing course, the exposed outer edges shall be rounded or beveled with an approved mechanical edger or approved hand tools to avoid a sharp, ragged, open, or unfinished appearance. Adequate precaution shall be taken to prevent a breakdown of the edges. Should breakdowns occur, they shall be immediately repaired.

(10) All irregularities in the binder course shall be remedied before the wearing course is placed. Insofar as practical, no traffic shall be permitted on the binder course, and all binder becoming coated with any foreign material shall be satisfactorily cleaned and treated as specified in subsection (G). If the binder course cannot be satisfactorily cleaned, it shall be removed and replaced.

(11) When required for the wearing course, complete transverse and longitudinal rolling and two (2) diagonal rollings, approximately at right angles to each other, shall be performed.

(12) For a distance of eight (8) inches around all structures, adjacent to curbing, gutters, railway tracks, and all other locations inaccessible to rollers, the compaction shall be effected with hot iron tampers weighing not less than twenty-five (25) pounds and having a bearing area not exceeding forty-eight (48) square inches, or with mechanical vibrating hand tampers, when approved.

(13) Any mixture that becomes loose and broken, mixed with dirt, or is in any way defective shall be removed and replaced with fresh hot mixture, which shall be compacted to conform with the surrounding area. Any area showing an excess or deficiency of bituminous material shall be removed and replaced.

J. Joints.

(1) Longitudinal Joints.

(a) The longitudinal joint in one (1) layer shall offset the previous joint in the layer immediately below by approximately six (6) inches; however, the joint in the top layer shall be at the centerline of the pavement if the roadway comprises two (2) lane width, or at lane lines, if the roadway is more than two (2) lanes in width.

(b) Satisfactory longitudinal joints shall be obtained
for both binder and wearing courses in the following manner:
The material in abutting lanes shall be tightly crowded against the vertical face of previously placed lanes. The paver shall be operated so that, in spreading, the material overlaps the edge of the lane previously placed by approximately three (3) inches. To assure a true line, the machine shall closely follow lines or markings placed for this purpose. The depth of the uncompacted mixture being placed adjacent to a previously compacted lane shall be kept uniformly high to provide for the required cross section after compaction. The depth of the overlapped material shall be kept uniform, so that rolling will not result in an irregular, rough joint. Before rolling, the coarse aggregate in the material overlapping the joint shall be carefully broomed onto the surface of the unrolled lane, leaving behind only the fine portion of the mixture which shall be tightly pressed into the compacted lane at the time the joint is rolled. The brooming shall not be delayed but shall be done directly after the material has been spread by the paver.

(c) Where practical, only short sections normally less than twenty-five (25) feet in length shall be left where the abutting lane is not placed the same day. Where the abutting lane is not placed the same day, or when the abutting lane has cooled to less than one hundred fifty (150°F) degrees, or where the abutting joint is distorted during the day's work by traffic or from any other cause, the edge of the lane shall be carefully trimmed to line as required and either painted with a very thin coating of bituminous material of the class and type designated for the surface course or heated with an infrared heater.

(d) Infrared Heater.

1) Where the abutting lane is not placed during the same day, or where the temperature in the abutting lane has cooled to less than one hundred fifty (150°F) degrees, an approved infrared heater may be used in constructing longitudinal joints. The heater shall be so constructed and mounted on the spreading and finishing equipment that adjustment of the applied heat can be readily accomplished.

2) The heater shall be capable of uniformly heating the material in that portion of the joint against which the additional lane is being placed, to a temperature within twenty-five (25°F) degrees Fahrenheit of laying temperature for the particular binder or wearing course being placed.

3) Provision shall be made for automatically turning on the heater when the spreading and finishing equipment is started and turning it off when it is stopped. Residual heat, after the heater has been shut off, shall not be sufficient to damage the bitumen in
the joint material. There shall be positive windproof ignition on each generator, and the generators shall be so arranged that if one (1) of the ignition points fails to operate, the others will act to re-ignite the generator. The ignition system shall be in operation all the time the joint heater is in use, to preclude the possibility of the heater or gas pilots being put out of action by gusts of wind or the suction generated by passing traffic.

4) There shall be no bypass around the automatic shut off to permit non-automatic operation of the heater. However, a switch which will allow the operator to override the automatic system will be approved for warming up the heater before starting or during long delays in operation. This switch shall be designed to activate the equipment only while being held in place by the operator during the "warmup" period.

5) When a heater is used, painting of the vertical face of the joint with bituminous cement will not be required. If the edge of the lane is distorted by traffic or from any other cause, it shall be carefully trimmed to line.

(2) Transverse Joints.

(a) Transverse joints, in both binder and wearing courses, shall be carefully constructed, sawing of joints is permitted, and thoroughly compacted to provide a smooth riding surface. Joints shall be straight-edged to assure smoothness. If the line of joint is formed with a bulkhead, it shall form a straight line and vertical face. The joint face then will not have to be trimmed before fresh material is placed against it to complete the joint. If a bulkhead is not used to form the joint and the roller is permitted to roll over the end of the new material, the line of joint shall be located back of the rounded edge a sufficient distance and trimmed to provide a true surface and cross section. In either case, the joint face shall be painted with a very thin coating of bituminous material of the class and type designated for the surface course before the fresh material is placed against it. To obtain thorough compaction of these joints, cross rolling may be required.

(b) Infrared Heater. An approved infrared heater be used, as specified for longitudinal joints.

K. Pavement Samples.

(1) Unless otherwise directed, density and record samples, each approximating a twelve (12) inch by twelve (12) inch slab, shall be cut from the completed binder course and wearing course, utilizing a power-driven, water-cooled, abrasive, circular saw in accordance with the requirements of this subsection or by drilling to obtain cores of a minimum diameter of eight (8) inches for record samples and a minimum of four (4) inches for
density samples.

(2) All holes resulting from sampling shall be backfilled with acceptable material and satisfactorily compacted. All materials, equipment, tools, labor, and work incidental to the sampling and backfilling of the resulting holes shall be furnished by the contractor at no expense to the Borough.

(3) Density Samples.

(a) At each location designated by the Engineer, prior preparation shall be made by placing a suitable material on the underlying course to prevent adhesion of the sample. At least one sample representing each day's production of binder course and/or wearing course shall be sawed or drilled from the surface. Before removal from the surface, the slab samples shall be cut into sections as directed, to provide specimens of a suitable size for testing, and care shall be taken that the samples are not compressed, bent, or distorted in any way during cutting, handling, transporting or storage. The samples shall be accurately identified and delivered for testing to the plant laboratory by the contractor. The samples, immediately after delivery, shall be tested for density at the plant laboratory. Each test shall consist of the average of the results obtained on at least two (2) specimens of the required size taken from each slab sample. The density shall be reported as field density, computed and reported as percent of Marshall plant density, based on the average of the Marshall plant densities obtained during the corresponding day's production.

(b) Density may also be determined in accordance with PTM No. 402.

(c) When unsatisfactory compaction is indicated by tests, check samples shall be taken, to provide samples of either the binder or wearing course which are suitable for testing. Check samples of wearing course shall be removed by sawing or core drilling through both the wearing and binder courses, and preparing the samples for testing by sawing off the underlying binder course.

(4) Record Samples.

(a) At random locations selected by the Engineer, samples shall be cut or drilled from the completed binder course and wearing course as outlined in subsection (j). However, at least one (1) sample shall be taken from the binder course and one (1) sample from the wearing course on projects where the tonnage being placed is ten thousand (10,000) or less, and at least two (2) samples of binder course and two (2) samples of wearing course on projects where the tonnage being placed is over ten thousand (10,000). These samples shall be accurately identified and delivered for testing to the Bureau of Materials, Testing and Research.

(b) As indicated, these samples are for record
purposes and will not necessarily be used to accept or reject the completed work. The cutting, core drilling and removal of these samples shall be under the direct supervision of the materials engineer.

L. Surface Tolerance. For the purpose of determining the surface tolerance, the finished surface shall be tested with a ten foot straightedge. The straightedge shall be held in successive positions parallel to the road centerline in contact with the surface, and the whole area checked from one side to the other as necessary. Advance along the pavement shall be in successive stages of not more than the length of the straightedge. Any irregularities which vary from the testing edge of the straightedge between any two contacts with the surface by more than three-sixteenths (3/16) inch shall be satisfactorily corrected. Irregularities which may develop before the completion of rolling shall be remedied by loosening the surface mixture and removing or adding material as required. Should any irregularities or defects remain after the final compaction, the surface course shall be promptly removed and sufficient new material laid to form a true and even surface, or otherwise satisfactorily corrected. All minor surface projections, joints, and minor honeycombed surfaces shall be ironed smoothly to grade, as may be directed.

M. Tests for Depth of Surface Courses.

(1) The Borough will not be liable for payment for any excess in depth of binder and wearing courses. Before final acceptance of the project, or during the progress of the work, the depth of the binder and wearing course will be determined by the engineer, and unsatisfactory work shall be repaired, replaced, or corrected.

(2) The depth of the courses shall be controlled by the weight per square yard. The quantity of material placed shall be adjusted on the basis of the following combined tests, in order that the required depth is secured.

(3) After initial compaction, preliminary tests as an aid for controlling the depth, shall be made by inserting a flat blade, correctly graduated, through the material to the top of the base. These tests shall consist of at least 5 measurements for each one hundred (100) square yards.

(4) After final compaction, a series consisting of three holes, each approximately three inches square, may be required to be cut through the surface course to the top of the base. Each series shall represent not more than one thousand (1,000) square yards. The first series shall be cut, one at the center and one near each edge; and the second series, one at the center and one at each quarter point. The series shall be alternated and continued throughout the length of the project.

(5) Surface courses deficient more than one-fourth (1/4) inch from the specified depth shall be removed and replaced to the correct depth, or otherwise satisfactorily corrected.
(6) When tests show that the pavement is uniformly more than one-eights (1/8) inch deficient in depth in three (3) or more adjoining sections, these sections shall be removed and replaced to the correct depth, or otherwise satisfactorily corrected.

(7) The checking of depth and cutting of test holes, also refilling and compaction with acceptable materials, shall be done by and at the expense of the contractor under the direct supervision of the inspector.

N. Protection of Surface Courses.

(1) Vehicular traffic or loads shall not be permitted on the newly completed surface course until adequate stability and adhesion have been attained and the material has cooled sufficiently to prevent distortion of loss of fines.

(2) The contractor shall maintain the surface courses.


A. General. This work shall consist of constructing a binder course of hot-mixed, hot-laid bituminous concrete on a prepared surface in accordance with these specifications and within reasonably close conformity to the lines, grades, width, and depth shown on the drawings and as specified.

B. Materials. Materials shall conform to the requirements of Pennsylvania Department of Transportation Specifications Form 408, latest revision.


A. General. This work shall consist of constructing a wearing course of hot-mixed, hot-laid asphalt concrete on a prepared surface in accordance with these specifications and within reasonably close conformity to the lines, grades, width, and depth shown on the drawings and as specified.

B. Materials. Materials shall conform to the requirements of Pennsylvania Department of Transportation Specifications Form 408, latest revision.

(Ord. 393, 4/3/1990, §307)

§308. Plain Cement Concrete Curb.

1. Scope.

A. This work shall consist of constructing a plain cement concrete curb in accordance with these specifications and within reasonably close conformity to the lines and grades shown on the drawings or established by the Engineer.

B. This curb shall conform to the details shown on the standard drawings.


A. Cement Concrete. Cement concrete shall be Class A with a minimum design strength of three thousand three hundred (3300) psi at
B. Premoulded Expansion Joint Filler. Material shall meet the requirements of Pennsylvania Department of Transportation Specifications Form 408, latest revision.

C. Curing and Protecting Covers. Material shall meet the requirements of Pennsylvania Department of Transportation Specifications Form 408, latest revision.

D. Concrete Curing Compound.

(1) Liquid Membrane-Forming Curing Compound, Type I, Clear or Translucent. This compound shall meet the requirements of A.A.S.H.T.O Designation M 148 for Type I, Clear or Translucent, and shall contain a fugitive dye.

(2) Liquid Membrane-Forming Curing Compound, Type 2, White Pigmented. This compound shall meet the requirements of A.A.S.H.T.O. Designation M 14B for Type 2, White Pigmented. The film forming portion of the vehicle for the compound shall be a resin base only, and shall have a total solids content of not less than forty (40%) percent by weight.

E. Concrete Admixtures.

(1) Air-Entraining Admixture for Concrete.

(a) The air-entraining admixture shall be an approved type and brand from an approved source and shall not contain chlorides.

(b) Air-entraining admixture may be shipped and delivered either in drums or in bulk.

(c) Each drum shall have attached to it by the manufacturer the brand and type, the manufacturer's batch or lot number, the date of manufacture and a statement certifying the admixture to meet the requirements of this Section and the requirements of A.A.S.H.T.O. Designation M 154. This certification shall be positively affixed to the drum.

(d) The bill of lading, the way-bill or delivery ticket accompanying each bulk shipment shall bear the same information and certification, either on the face or the reverse side of the form, and shall also show the exact amount of the shipment.

(e) All air-entraining admixture shall be subject to sampling and testing at any time.

(f) Each approved source shall furnish the Bureau of Materials, Testing and Research a notarized certification on Form TR 4143 of each type and class of air-entraining admixture shipped for Department use during the preceding six (6) months. These affidavits shall be due on May 1 and November 1 of each year. They shall indicate that all manufacturing processes, testing and shipping have been controlled to provide a material in full compliance with the
(2) Accelerating Admixture for Concrete. The admixture for acceleration the setting time of fresh concrete shall be calcium chloride.

(3) Retarding Admixture for Concrete.

(a) The retarding admixture shall be an approved type and brand from an approved source and shall not contain chlorides, nor any other chemical in any way injurious to concrete or steel.

(b) Retarding admixture may be shipped and delivered in either drums or in bulk.

(c) Each drum shall have attached to it by the manufacturer the brand and type, the manufacturer's batch or lot number, the date of manufacture and a statement certifying the admixture to meet the requirements of this section and the requirements of A.A.S.H.T.O. Designation M 194. This certification shall be positively affixed to the drum.

(d) The bill of lading, the way-bill or delivery ticket accompanying each bulk shipment shall bear the same information and certification, either on the face or reverse side of the form, and shall also show the exact amount of the shipment.

(e) All retarding admixture shall be subject to sampling and testing at any time.

(f) Each approved source shall furnish the Bureau of Materials, Testing and Research a notarized certification of Form TR 4143 for each type and class of retarding admixture shipped for Department use during the preceding six (6) months. These affidavits shall be due on May 1, and November 1 of each year. They shall certify that all manufacturing processes, testing and shipping have been controlled to provide a material in full compliance with the specifications at all times.

F. Bituminous Paper. Bituminous paper shall be paper impregnated with asphalt or tar, meeting the following requirements:

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3. Construction Requirements.

A. Forms.

(1) Forms for the curb shall be of metal, except wood forms may be used on sharp curves and short tangent sections when approved by the engineer. Forms shall be straight, free from warp, and of sufficient strength when staked to resist the
pressure of the concrete without springing. At least three (3) stakes shall be provided for each ten (10) feet of form. Metal forms shall be of approved section and shall have a flat surface on top and wood forms shall be nominal two (2) inch surfaced planks. These forms shall be of a depth equal to the depth of the curb, designed to permit secure fastening of the face and back forms at the tops. These fastenings shall be constructed in a manner that will not obstruct satisfactory finishing and edging of the top of the curb but will permit removal of the inside or face forms. The outside or back forms shall be straight from top to bottom. The inside of the face forms shall have a batter from the top of the curb to the finished surface line of the pavement, as indicated on the standard drawings, and shall be straight from this line to the bottom.

(2) All forms and templates shall be thoroughly cleaned and treated with an approved material as required, to prevent the concrete from adhering thereto. Oil, bituminous paper, or other material which will adhere to or discolor the concrete shall not be used. The forms shall be accurately set to line and grade in a manner to prevent settlement or displacement.

B. Excavation. Excavation shall be made to the required depth, and the material upon which the curb is to be constructed shall be compacted to a firm, even surface.

C. Placing and Finishing Concrete. The concrete shall be placed in the forms in horizontal layers not to exceed five (5) inches, and spaded sufficiently to eliminate all voids. An approved vibrator may be used when permitted by the Engineer. Where indicated or directed, drainage openings shall be made through the curb at the elevation and of the size required. The curb shall be depressed as indicated or directed. The top surface of the curb shall be finished true to line and grade in a smooth, neat, and even manner by means of wood floats, and the edges of the face and back shall be rounded to a radius of not more than three-quarters (3/4) of an inch and one-quarter (1/4) of an inch, respectively, while the concrete is still plastic.

D. Curb Machine.

(1) Plain cement concrete curb may be placed with a self-propelled machine consisting of a hopper, power-driven screw or screws and a metering device.

(2) Concrete shall be uniformly fed to the machine and after extension, the concrete will maintain the shape of the section without slumping.

E. Joints.

(1) Contraction joints shall be spaced in uniform lengths or sections of ten (10) feet maximum, except where shorter sections are necessary for closures or curves, but no section shall be less than four (4) feet.

(2) Contraction joints may be either hand-formed or sawed joints. They shall be three-sixteenth (3/16) inch wide and two (2) inches deep. Sawing of joints shall be done as soon as
practicable after the concrete has set sufficiently to preclude raveling during the sawing and before any shrinkage cracking occurs in the concrete. The saw cut depth may be decreased at the edge adjacent to the pavement to obtain a maximum depth that will avoid damage to the pavement. Construction joints shall have tooled edges.

(3) The one-quarter (1/4) inch premoulded expansion joint material shall be cut to conform to the cross sectional area and be placed at structures and at the end of a day's work.

F. Removal of Forms.

(1) The forms shall not be removed within twelve (12) hours after the concrete has been placed. No rubbing to correct irregularities will be permitted until the full curing period has elapsed. Any irregular surface shall be corrected by rubbing with a carborundum stone. Brush finishing or plastering will not be permitted and all rejected curb shall be promptly removed and replaced at no expense to the Department.

(2) After the forms are removed, minor defects shall be filled with mortar composed of one (1) part of cement and two (2) parts of fine aggregate.

G. Curbing. The curb shall be cured and protected with either membrane or water curing.

H. Backfilling.

(1) As soon as possible after the removal of forms, the spaces in front and back of the curb shall be backfilled with approved material in layers of not more than four (4) inches in depth, which shall be thoroughly compacted mechanically to the required elevation and cross section. The layers shall be placed by alternating between the front and back of the curb.

(2) The areas back of raised curbs shall be constructed and completed as shown on the drawings and/or cross sections. The engineer may permit the use of a five (5) to eight (8) ton roller in these areas.

(Ord. 393, 4/3/1990, §308)

§309. Cement Concrete Sidewalks.

1. Scope. This work shall consist of constructing cement concrete sidewalks in accordance with these Specifications and within reasonably close conformity to the lines, grades, and dimensions shown on the drawings or established by the engineer.


A. Cement Concrete. Cement concrete shall be Class A with a minimum design strength of three thousand three hundred (3300) psi at twenty-eight (28) days.

B. Premoulded Expansion Joint Filler. Same as §308(2)(B).

C. Curing and Protecting Covers. Same as §308(2)(C).
D. Concrete Curing Compound. Same as §308(2)(D).

E. Concrete Admixtures. Same as §308(2)(E).

3. Construction Requirements.

A. Preparation of Foundation. The foundation for the bed shall be formed at a depth of eight (8) inches below and parallel with the finished surface of the sidewalk, unless otherwise indicated on the drawings or specified. Unsuitable material shall be removed and replaced with approved material and the foundation shall be thoroughly compacted and finished to a firm, even surface.

B. Placing Aggregate for Bed.

(1) The approved aggregated shall be spread on the prepared foundation to form a compacted bed four (4) inches in depth, unless otherwise indicated on the drawings or specified. This material shall be thoroughly compacted.

(2) Satisfactory outlets for draining the bed shall be provided.

C. Forms. Forms shall be of wood or metal, straight, free from warp, and of sufficient strength when staked to resist the pressure of the concrete without springing. If wood, they shall be nominal two (2) inch planks surfaced on the inside and the top; or if of metal, they shall be of approved section. Forms shall have a depth equal to the depth of the concrete, and shall be thoroughly cleaned and oiled before concrete is placed against them. Forms that are worn, bent, or damaged shall not be used.

D. Joints.

(1) Contraction joints shall be spaced in uniform lengths or sections of five (5) feet. Contraction joints may be either hand-formed or sawed joints. They shall be done as soon as practicable after the concrete has set sufficiently to preclude raveling during the sawing and before any shrinkage cracking occurs in the concrete. The saw cut depth may be decreased at the edge adjacent to a curb or structure to obtain a maximum depth that will avoid damage to them.

(2) Construction joints shall have tooled edges. The one-quarter (1/4) inch premoulded expansion joint material shall be cut to conform to the cross sectional area and be placed at structures and at the end of a day’s work. The joints shall be sealed.

(3) Where existing light standards, poles, fire hydrants, and similar structures are within the limits of the sidewalk area, the concrete around such structures shall be scored in a block eight (8) inches wider than the maximum dimension of the structure at the sidewalk elevation. Prior to placing the concrete around such structures, premoulded expansion joint filler, one-quarter (1/4) of an inch in thickness, shall be placed around the structure for the full depth of the concrete in the sidewalk.

E. Placing Concrete. The concrete shall be proportioned, mixed
and placed. The concrete shall be four (4) inches in depth unless otherwise indicated on the drawings or specified. The concrete shall be struck off, finished, and tested. Unless otherwise directed an edger having a one-quarter (1/4) inch radius shall be used for edging all joints. The concrete shall be cured and protected.

F. Removal of Forms. Side forms shall not be removed within twelve (12) hours after the concrete has been placed. After removal of the forms, minor honeycombed areas shall be filled with mortar composed of one (1) part of cement and two (2) parts of fine aggregate. Major honeycombed areas will be considered as defective work, and shall be removed and replaced at no expense to the Borough.

G. Backfilling. After the concrete has cured for a period of not less than seventy-two (72) hours, the spaces adjacent to the sidewalk shall be backfilled with approved material in layers of not more than four (4) inches in depth, which shall be thoroughly compacted mechanically to the required elevation and cross section.

(Ord. 393, 4/3/1990, §309)
§401. Modifications.

1. The provisions of this Chapter are the minimum standards for the protection of the public welfare.

2. If any mandatory provision of this Chapter is shown by the applicant, to the satisfaction of the Borough Council at a scheduled public meeting, to be unreasonable and to cause unique and undue hardship as it applies to his proposed subdivision or land development, the Borough Council, upon obtaining the comments and recommendations of the Planning Commission, may grant a modification in writing to such applicant for such mandatory modification in writing to such applicant for such mandatory provision, so that substantial justice may be done and the public interest secured; provided that such modification will not have the effect of nullifying the intent and purpose of this Chapter.

3. All requests for a modification shall be in writing and shall accompany and be a 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 this Chapter involved and the minimum modification necessary.

4. The Borough Council shall keep a written record of all action on all modification requests.

5. In granting modifications, the Borough Council may impose conditions as will, in its judgment, secure substantially the objectives of the standards or requirements so modified.

(Ord. 393, 4/3/1990, §401)

§402. Amendment.

1. The Borough Council may, from time to time, amend this Chapter by appropriate action taken at scheduled public meeting, but before voting on the enactment of such amendment, the Borough Council shall hold a public hearing thereon pursuant to public notice.

2. The public notice shall state the time and place of the hearing and shall include a brief summary setting forth the principal provisions of the proposed amendment and a reference to the place within the Borough where copies of the proposed amendment may be secured or examined. Such notice shall be published once each week for two (2) successive weeks in a newspaper of general circulation in the Borough. The first publication shall be not more than thirty (30) days and the second publication shall not be less than seven (7) days from the date of the hearing.

3. In the case of a proposed amendment other than that prepared by the Planning Commission, the Borough Council shall submit each such amendment to the Planning Commission for recommendations at least thirty (30) days prior to the date fixed for the public hearing on such proposed amendment.

4. Upon approval and enactment of an amendment to this Chapter, a certified copy of such amendment shall be filed with the Lancaster County
§403. Remedies and Enforcement.

1. In addition to all other remedies as may be provided by law, the Borough may institute and maintain appropriate actions at law or in equity to restrain, correct or abate violations of this Chapter, to prevent unlawful construction, to recover damages and to prevent illegal occupancy of a building, structure, or premises. The Borough may, in its discretion, 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 Chapter, or any prior subdivision or land development ordinance, such authority to deny permits or approvals to apply to the following applicant:

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

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

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

D. 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 vendee or lessee has actual or constructive knowledge of the violation.

Any person, partnership, or corporation who or which has violated the provisions of this Chapter shall, upon being found liable therefor in a civil enforcement proceeding commenced by the Borough, pay a judgment of not more than five hundred ($500.00) dollars plus all court costs, including reasonable attorney fees incurred by the Borough as a result thereof. 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 this Chapter to have believed that there was no such violation, in which event there shall be deemed to have been only one (1) such violation until the fifth (5th) 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.

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

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

(Ord. 393, 4/3/1990, §404)

§404. Challenge and Appeal. The decision of the Borough Council with respect to the approval or disapproval of plans may be appealed directly to

§405. Conflicts. Whenever there is a difference between the minimum applicable standards specified herein and those included in other applicable Borough regulations, the more stringent requirement shall apply. (Ord. 393, 4/3/1990, §406)
RESIDENTIAL STREET

MAX. SLOPE → 2

50' RIGHT-OF-WAY

36' CARTWAY

MIN. SLOPE = 3/8"/FT.
MAX. SLOPE = 1"/FT.

MIN. SLOPE = 3/8"/FT.
MAX. SLOPE = 1"/FT.

FEEDER STREET

MAX. SLOPE → 2

60' RIGHT-OF-WAY

38' CARTWAY

CONNECTOR STREET

80' RIGHT-OF-WAY

40' CARTWAY

TYPICAL ROAD SECTION

CRUSHED AGGREGATE BASE

1" WEARING COURSE 1D-2A

1 1/2" BINDER COURSE 1D-2A

1"-2A OR 2-RC

4" CRUSHED AGGREGATE

ALT. 5" BCBC

6" AGGREGATE - LIME - POZZOLAN

E:

ALL MIN. & MAX. SLOPES BETWEEN CURB LINE & RIGHT-OF-WAY SHALL BE AS SHOWN FOR "LOCAL STREET."

BOROUGH OF NEW HOLLAND

TYPICAL ROAD SECTIONS

- 407 -
WIDTH SPECIFIED BY COUNCIL OR ORDINANCE

SLOPE DOWN \( \frac{1}{4} \)" PER FOOT

4" LAYER OF PA. NO. 57 CRUSHED STONE

TYPICAL SIDEWALK

STANDARD STRAIGHT CURB

STANDARD ROLLED CURB

NOTE: \( \Theta \frac{1}{2} " \times 12 " \) REBARS

BOROUGH OF NEW HOLLAND
NEW HOLLAND, PA.

SIDEWALK AND CURB STANDARDS

SCALE: FULL
DATE: 12/22/86

TRENT STROUP
CONCRETE SLANT CURB DETAIL

NOTE:
1. Expansion joints shall consist of 1/8" thick preformed expansion joint filler material. Expansion joints shall be located at all structures at the end of the work day and at intervals of 100 feet. Cut material to conform with cross sectional area of curb.
2. Construction joints shall consist of a 3" deep, 3/4" wide saw cut and be placed at uniform lengths of 20 foot intervals maximum and 4 foot intervals minimum.
BEDDING

CONCRETE ENCASEMENT

CONCRETE CRADLE

CLASS 1 MATERIAL

CLASS 2 MATERIAL

CLASS 3 MATERIAL

CONCRETE (3000 PSI @ 28 DAYS)

'A' 6" FOR PIPES 24" DIA. OR LESS
9" FOR PIPES OVER 24" DIA.
<table>
<thead>
<tr>
<th>PIPE DIA. INCHES</th>
<th>TRENCH PAYMENT WIDTH - INCHES</th>
<th>CONC. CRADLE QUANTITY - CU. YD./L.F.</th>
<th>CONC. ENCASEMENT QUANTITY - CU. YD./L.F.</th>
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</thead>
<tbody>
<tr>
<td>6</td>
<td>24</td>
<td>0.052</td>
<td>0.104</td>
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<tr>
<td>8</td>
<td>24</td>
<td>0.056</td>
<td>0.111</td>
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<tr>
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<td>12</td>
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<td>0.078</td>
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<tr>
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<td>0.328</td>
<td>0.655</td>
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<td>42</td>
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<td>0.800</td>
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<tr>
<td>48</td>
<td>84</td>
<td>0.480</td>
<td>0.960</td>
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<tr>
<td>54</td>
<td>90</td>
<td>0.537</td>
<td>1.074</td>
</tr>
<tr>
<td>60</td>
<td>96</td>
<td>0.600</td>
<td>1.200</td>
</tr>
<tr>
<td>66</td>
<td>106</td>
<td>0.700</td>
<td>1.400</td>
</tr>
</tbody>
</table>
PAVEMENT RESTORATION DETAIL

TRENCH PAV WIDTH

TEMPORARY AND PERMANENT PAVEMENT RESTORATION

PAY WIDTH

SEAL EDGE WITH AC-70

1 1/2" ID-2 WEARING COURSE

6" BCBC

VARIES

CLASS 1 BACKFILL

TRENCH PAV WIDTH

NO SCALE
TEMPORARY AND PERMANENT PAVEMENT RESTORATION

PAY WIDTH

SEAL EDGE WITH AC-20

PAVEMENT RESTORATION IN ACCORDANCE WITH PENNDOT REQUIREMENTS

TEMPORARY

PAY WIDTH

VARIIES

CLASS 1 BACKFILL

TRENCH PAY WIDTH

PAVEMENT RESTORATION DETAIL

NO SCALE
NOTES:

1.) ADJUST TO GRADE WITH BRICK OR CONCRETE GRADING RINGS.

2.) MECHANICALLY VIBRATED PRECAST CONCRETE, RISER AND TOP SHALL CONFORM TO A.S.T.M. SPEC. C-478.

3.) BASE SHALL EXTEND ABOVE PIPE AND BE PROVIDED WITH A KEY TO RECEIVE BOTTOM SECTION OF MANHOLE.

4.) CHANNEL SHELF SHALL BE FORMED WHEN BASE IS POURED. PRECAST CONC. BASE MAY BE USED ONLY WHEN APPROVED BY THE ENGINEER.

PLAN
CAST IRON FRAME AND COVER

SEAL ALL JOINTS WITH "RAMNEK"

BRING DROP ENCASMENT TO CENTERLINE OF PIPE

PRECAST CONCRETE MANHOLE DETAIL

NO SCALE
MECHANICALLY VIBRATED PRECAST CONCRETE, RISER AND TOP SHALL CONFORM TO A.S.T.M. SPEC. C-478

PLAN

8" TO 24" SEWER

41-0" I.D.
2 FT. DIA. CAST IRON FRAME AND COVER

GRADE RINGS AS REQ'D

SEAL ALL JOINTS WITH "RAMNEK"

BASE SHALL EXTEND ABOVE PIPE AND BE PROVIDED WITH A KEY TO RECEIVE BOTTOM SECTION OF MANHOLE

CHANNEL SHELF SHALL BE FORMED WHEN BASE IS POURED. PRECAST BASE MAY BE USED ONLY WHEN APPROVED BY THE ENGINEER

SECTION

SHALLOW MANHOLE DETAIL

NO SCALE
VENT & TRAP LOCATION ON LATERALS

NO SCALE
24" DIA. C.I. MANHOLE FRAME AND COVER, PATTERN AS APPD. BY THE ENG.

FIN. GRADE OR PAVING SURFACE

FIN. GRADE @ OPEN FIELD INSTALLATION

.80° RETURN BEND

AL. MH RUNGS 12" O.C.

4'-0" DIA. PRECAST MANHOLE SECTION W/ PRECAST CONC. FLAT TOP

2" AIR RELEASE VALVE

2" GATE VALVE

2" CRUSHED AGGR.

CONC. GROUT

2" TAPPING SADDLE

SEAL ALL JOINTS WITH "RAMNECK"

8" WATER MAIN

6" TYP.

8" WATER MAIN

2" TAPPING SADDLE

SEAL ALL JOINTS WITH "RAMNECK"

AIR RELEASE VALVE & MANHOLE DETAIL

NO SCALE
FACE OF CURB OR EDGE OF CARTWAY 12"

LIMIT OF CONTRACT

FINISHED GRADE

SERVICE BOX

3/4" TYPE K COPPER TUBING UNLESS OTHERWISE NOTED, AND SHALL BE BEDDED W/ TYPE A, CEMENT CONCRETE SAND (PENNDOT FORM 408) CONTAINING NO SLAG, 6" BELOW 4 18" ABOVE SERVICE TUBING.

METER AND WATER SERVICE TO BE SUPPLIED BY APPLICANT

WATER MAIN, 3'-6" MIN. COVER

BRASS CORPORATION STOP AND COUPLING NUT

GROUND KEY CURB STOP AND DRAIN

STD. DOMESTIC SERVICE INSTALLATION

NO SCALE
INSTALL FACE OF STEAMER OUTLET BEHIND BACK EDGE OF CURB. MAX. DISTANCE BACK SHALL BE 6".

12" MIN. 18" MAX.

(2) - 3/4" TIE RODS

FIRE HYDRANT SETTING DETAIL
NO SCALE
(2) - 3/4" TIE RODS, TYP. EA. END.
ATTACH TO FIRST FULL PIPE
LENGTH, 20' MAX.

UNDISTURBED EARTH

CONCRETE THRUST BLOCK

PLAN

DIM. "A"

MIN.
DESIGN BASED ON: \( P = 150 \text{ PSI} \), \( \theta = 30^\circ \), \( W = 100 \text{ lb/ft} \), \( C_S = 0 \)

**SECTION**

**HORZ. RESTRAINT THRUST BLOCKING DETAIL — ELBOWS**

**NO SCALE**
DESIGN BASED ON: P = 150 PSI, \( \theta = 30^\circ \), \( W = 100 \text{ lb/CF} \), \( C_s = 0 \)

- PROVIDE (2) 3/4" TIE RODS, ATTACH TO FIRST FULL PIPE LENGTH, 20' MAX.
- VARIES WITH PIPE SIZE
- CONCRETE THRUST BLOCK
- TEE
- UNDISTURBED EARTH
- 2' 0" MIN.

PLAN
DESIGN BASED ON: P = 150 PSI, $\phi = 30^\circ$, $w = 100$ lb/CF, $C_s = 0$
1. Bars wrapped around 45° ELB. and embedded into conc. as shown. Bars to have ASPH. coating.

2. (2) - 1" Tie rods, conn. to next full pipe length. FT. MAX. (TYP. both sides of ELB.)

3. Conc. thrust block, MIN. width

4. 3" CLR.

5. 45° ELBOWS

6. Vertical restraint thrust blocking detail

7. No scale
* The shoulder slope usually varies from 1/2"/ft. (4%) to 3/4"/ft. (6%). However the shoulder slope should be maintained when constructing the driveway.

For grade changes greater than those shown in Figure 1, vertical curves at least 10 feet long shall be constructed and length "A" shall be increased.

Grades ($G_2$) shall be limited to 15% for minimum use-driveways and from five to eight percent for low, medium or high volume driveways within the right-of-way.

<table>
<thead>
<tr>
<th>Maximum Grade Change (D)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Desirable</td>
</tr>
<tr>
<td>High Volume Driveway</td>
</tr>
<tr>
<td>Medium Volume Driveway</td>
</tr>
<tr>
<td>Low Volume Driveway</td>
</tr>
</tbody>
</table>

Where grades ($G_2$) exceeds 10% parking shall be provided at the bottom of grade ($G_2$).

Figure 1
FIGURE 2
NOTE: The L distance should be adequate to accommodate turning vehicles.

FIGURE 3
NOTE: The L distance should be adequate to accommodate turning vehicles.
NOTE: The L distance should be adequate to accommodate turning vehicles.

Figure 4

Figure 5

Section A-A of Figure 4
**MINIMUM USE DRIVEWAY**

Figure 7
Where the roadway slope is 3:1 or flatter, the driveway embankment slope within the roadway R/W shall be 10:1 or flatter. Where the roadway slope is steeper than 3:1, guardrail is usually installed at the top of the roadway slope, and steeper slopes are permissible on the driveway within the R/W.
LOW VOLUME DRIVEWAY

Figure 8

<table>
<thead>
<tr>
<th></th>
<th>SINGLE UNIT TRUCKS &amp; PASSENGER CARS</th>
<th>BUSES &amp; COMBINATION TRUCKS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>W- One Way</strong></td>
<td>Min. 10' Max. 20'</td>
<td>Min. 12' Max. 20'</td>
</tr>
<tr>
<td><strong>W- Two Way</strong></td>
<td>Min. 20' Max. 24'</td>
<td>Min. 22' Max. 24'</td>
</tr>
<tr>
<td><strong>R</strong></td>
<td>Min. 10' Max. 15'</td>
<td>Min. 15' Max. 25'</td>
</tr>
</tbody>
</table>

R = Radius
TWO WAY ENTRANCE WITH MEDIAN DIVIDER

ROADWAY

TWO WAY ENTRANCE - SEPARATED DRIVEWAYS

MEDIUM VOLUME DRIVEWAY

Figure 9

- 434 -
Note: D — 10' Preferred, 4' Min.
R = Radius

- Raised channelization with mountable curb unless pedestrian usage requires barrier curbs.
Figure 11

FUEL STATION DRIVEWAY-UNDIVIDED ROADWAY
Intermediate island, 20' or less in length, measured along the shoulder line, shall be defined by permanent curbing.
GRATING, REFER TO PENN DOT "ROADWAY CONST. STANDARDS", RC-34, FOR DETAILS

CAST IN PLACE CONC. TOP

3, 3.5, 5"

2.5 MIN.

GROUT CHANNEL

W8 x 15

3" MIN. (TYP)

4" TYP.

SECTION

CONC. BASE

HOOK ALL ENDS

PIPE SIZE VARIES

CONCRETE, SOLID CEMENT BLK., OR BRICK WALLS

#8 @ 8" E.W.

SPECIAL TYPE C INLET DETAIL

ONE DIRECTIONAL - NO SCALE
**SPECIAL TYPE C INLET**

**PLAN**

- **VARIES - TO SUIT PIPE (G'MAX.)**
- **8"**

- **PENN DOT TYPE M TOP CONFIGURATION**

- **GRATING NOT SHOWN**

- **45 1/4"**

- **VARIABLES - TO SUIT PIPE (G'MAX.)**

- **EXTRA # 8 4 FT. LG.**

- **8" VARYING TO SUIT PIPE (G'MAX.)**

- **TOP CONFIGURATION**
GROUT CI-HANNIEL CONCRETE BASE

SECTION

PIPE SIZE VARIES

CAST IN PLACE CONC. TOP

4" MAX.

CONCRETE, SOLID CEMENT BLK., OR BRICK WALLS

GROUT CHANNEL

CONCRETE BASE
GRATING, REFER TO PENN DOT "ROADWAY CONST. STANDARDS," RC-34, FOR DETAILS

CAST IN PLACE CONC. TOP

GROUT CHANNEL

PIECE SIZE VARIES

CONC. BASE

W8 x 15

HOOK ALL ENDS

#8 @ 8" E.W.

4" MAX.

8" MIN.

9"

VARY

4" TYP.

3" MIN. (TYP.)

SECTION

SPECIAL TYPE M INLET DETAIL

ONE DIRECTIONAL - NO SCALE
NOTES:

CONCRETE SHALL BE
CLASS "B"

EXPOSED EDGES SHALL
BE CHAMFERED ONE
(1) INCH.

L = 2.5 d + 12"
2:1 SLOPE

2 - #4 REINF. BARS

2" CLR.

SIDE ELEVATION

FRONT ELEVATION

STANDARD TYPE D ENDWALL DETAIL

NO SCALE