

**MUNICIPAL SEWER
OF
KENNEDY TOWNSHIP**

ALLEGHENY COUNTY, PENNSYLVANIA

**SPECIFICATIONS
FOR
SANITARY SEWER PIPE LINES AND APPURTENANCES**

APPENDIX 7

MUNICIPAL SEWER OF KENNEDY TOWNSHIP

Specifications for Construction of Sanitary Sewer Pipe Lines and Appurtenances

Introduction

These specifications, which cover requirements for construction of all of the Township's standard sewer line facilities, are intended for, and apply to all such projects, whether directly contracted with a Contractor(s) by the Township, or contracted directly through the auspices of a land developer (which, in turn, employs a construction contractor(s)).

Inspection of Construction Work

All work performed in connection with the extension, modification or improvement of public wastewater facilities within the Township shall be required to conform with all rules and regulations and shall be inspected during construction by an authorized representative of the Township. All completed work shall be required to meet the approval of the Township's Engineer and shall be changed, modified, replaced, removed or otherwise corrected by the Contractor to such extent as directed by the Township's Engineer.

The work will be periodically or continuously inspected during its progress and when substantially completed, shall be inspected jointly, by the Township's Engineer and the Contractor, when a punch-list of uncompleted or corrective work will be prepared. After all punch-list items have been taken care of to the satisfaction of the Township's Engineer, the work will be declared complete and the 18-month maintenance bond period shall simultaneously commence. During the term of the maintenance bond, the Contractor shall return when and as required to reconcile any problems resulting from construction, such as mechanical malfunctions, trench settlement, pavement failure, surface restorations, drainage, etc. In addition, a maintenance bond inspection shall be made by the Township's Engineer at a date between six and twelve months following the date of declaration of completion of construction. The Contractor will be notified in advance of that inspection date and may participate therein.

Construction Record Drawings

The Contractor shall retain one reasonably clean set of drawings of the proposed improvements at the job, on which he shall note changes in pipeline alignments and elevations and any other changes from the preconstruction approved plans. He shall also reference the locations of the ends of sewer service laterals so that the same may be uncovered and connected at future times. The set of prints on which such field information is recorded shall be turned over to the Developer's Engineer for transposing that information onto the original drawings. When completed, Engineer/Developer must submit three (3) sets of the Construction Record Drawings to Kennedy Township before any Building Permits can be issued.

Rights-of-Way

The alignment and location of the proposed pipelines and appurtenances is shown on the plans on which street, highway and/or other acquired rights-of-way limits have also been superimposed. No pipeline shall be relocated outside of the street or other right-of-way within which it is shown without obtaining the formal written approval for such change from the Township. Where a special pipeline right-of-way is obtained through private property, the minimum permanent width for operation and maintenance purposes shall be 20 feet; the width of the temporary right-of-way obtained through such private properties for initial pipeline installation and construction purposes shall be 40 feet; 10 feet of which shall be located adjacent to and on the outside of both limits of the permanent right-of-way. The minimum distance between the center of any longitudinal pipeline and the right-of-way limit line shall be 5 feet. All construction activities shall be confined within the 40 feet wide construction right-of-way.

The pipeline construction Contractor shall, however, make his own arrangements for office space, materials storage yards, change trailers, sanitary facilities, utility services, debris disposal sites, and for ingress and egress to any location along the pipeline project for which the Contractor desires or requires use and for which the Township has obtained no such right-of-way.

Proposed pipelines and appurtenances may also encroach upon right-of-way occupied by pipelines or other facilities owned, operated and/or maintained by other utility companies. It shall be the responsibility of the Contractor to notify the appropriate representatives of those agencies in advance of performing any work therein and to conduct all construction activities in accordance with the respective regulations appertaining thereto.

The juxtaposition of water and sewer lines proposed to be constructed in connection with land development projects shall be such that regardless of the sequencing of various utility line construction (gas, power, telephone, water, storm sewer, sanitary sewers, etc.) no pipeline shall be aligned longitudinally, along either the water or sanitary sewer lines, any closer than three feet. It is imperative that such minimum distance be obtained along all sanitary sewer and water lines to provide space required for future maintenance and/or repairs.

In accordance with the regulations of the Pennsylvania Department of Environmental Resources, the separation between water and sewer pipelines shall be as is shown in SD-2

Control of Pipe Line Elevations and Alignments

The elevations of all Township facilities shown on record drawings and on plans and profiles of proposed work are on the Datum of the United States Geological Survey. The Contractor shall confirm the elevation of all existing facilities to which proposed facilities will connect, as well as the profile of the existing and/or finished (in the case of land development projects) ground lines, prior to commencement of construction, to confirm compatibility.

All sewer lines shall be required to be constructed, and the elevations and alignment shall be controlled by the use of laser equipment.

The Contractor shall employ competent field survey personnel as may be required to control grades and/or alignment of proposed facilities and to assist the Township's Engineer or Inspector by obtaining information during construction progress and for purposes of preparing construction record drawings.

Traffic Warning Signs, Barricades, Lights and Control

Where pipe lines and/or other facilities are constructed along State Highways and/or Township Streets and where construction activities may otherwise impede normal vehicular traffic patterns on said highways or streets, the control of traffic shall be accomplished in accordance with the details set forth in Publication 203A of the Pennsylvania Department of Transportation, the title of which is "Short Term Work Zone Traffic Control Guide". The position of work zone signs, erection of signs, sizes of signs, details and configuration of signs, traffic channelizing, tapered lengths/spacing, cones, drums, vertical panels, lighting devices, arrow boards and all flagging conduct and activities shall conform to the details described therein. The location and configuration of traffic control methods shall conform to those graphically illustrated on the appertaining Table 5 and Figures 5 through 23 shown in the publication. The Contractor shall submit a traffic control plan and procedure (conforming to the above-referenced Publication 203A) to the Township's Engineer for approval, prior to commencing with field construction.

Exploratory Excavations

Some of the proposed pipe lines and appurtenant structures are somewhat flexible with respect to alignment. Therefore, in those existing streets, roadways, berms or other areas expected to have a number of underground utility lines, where there are large trees which may be saved by realignment, and where the Township's Engineer so directs, the Contractor shall make appropriate exploratory excavations for the purpose of locating said lines. The Township's Engineer will then confer with the Contractor regarding the method of construction proposed to be used for performing the contract work in said areas, and realignment of the proposed pipe lines or appurtenances appears possible and/or reasonable without conflicting with the terms set forth elsewhere in these specifications, said alignment adjustments shall be made.

Existing Utility Lines - Location, Protection and Hazards

The plans show those underground water lines, gas lines, electric lines, cable TV lines, telephone lines, sanitary sewers, combined sewers, storm drains, conduits, and other similar utility lines and appurtenances for which such location information was either made available to the designer, or was observed in the field. Neither the number of such underground facilities nor their respective types, sizes and/or locations can be assured or guaranteed and it is, therefore, the responsibility of the Contractor to obtain such additional information as is required to properly complete the work in compliance with the specifications, and to contact the owners of the various utilities in the area

prior to starting and during performance of the work in accordance with PA Act No. 287.

The approximate location of many power and telephone poles and guy poles along the route of the work is shown on the drawings and the overhead lines supported by all such poles shall be observed and located by the Contractor prior to commencement of the work.

The Contractor shall be completely and solely responsible for any and all property damages, bodily injuries, financial losses and interruption of service that result from or are attributable to his construction activities, and which affect water lines, gas lines, electric lines, telephone lines, drain lines, sanitary and storm sewer lines, and all appurtenances and service facilities connected thereto. Restoration of all such disturbed facilities shall be accomplished immediately after incurrence thereto.

Water, sewer, gas, power and telephone service to dwellings or places of business shall be maintained with a minimum of interruption throughout the construction of the contract work. No such service shall be intentionally interrupted without the approval of the respective utility company concerned, and without first giving due warning to the occupants of said dwelling or business establishment.

In some cases, it may be found that existing pipelines are in a location where construction of the proposed work cannot reasonably proceed until the utility has been relocated. The Contractor shall make all necessary subsurface investigations and shall locate such utility mains far enough in advance of the trenching work so that work progress is not unnecessarily interrupted.

Attention is directed to the fact that much of the proposed work is in close proximity to overhead power lines which transmit electric current at high voltages and which, if disturbed or contacted during construction, would be hazardous to construction personnel and/or other persons. The Contractor shall, therefore, properly protect such wires, pole supports or other power line appurtenances to avoid disturbances to those facilities and shall operate all machinery and conduct all other construction activities in a manner which will assure protection of all construction personnel and other persons against said hazards. Work in the vicinity of the existing underground gas lines and appurtenances is also hazardous because, under certain conditions, such materials are flammable and/or explosive and the Contractor shall avoid disturbance and/or displacement of those facilities and shall provide all temporary and permanent supports and other required protection to prevent exposure of same to construction personnel and/or other persons. Where such lines are exposed during construction and leakage is detected, sewer construction work in those areas shall be immediately suspended, the owner of the pipeline shall be immediately advised of the condition, and the sewer construction work shall not resume until all repairs have been properly completed.

The construction activities required to be performed in the conduct of the work may necessitate the interconnection, interception, surveying, inspection, removal, replacement and repair of certain existing manholes, sewer pipes and

appurtenances. Said manholes, sewer pipes and appurtenances are conveying all wastes and runoff discharged to and infiltrating into the public sewer system within the area served, which wastes may contain and/or generate toxic, noxious, oxygen depleting or other liquid or gaseous substances harmful to human beings. The Contractor shall, therefore, thoroughly instruct all of his personnel and those of any subcontractor or materialman involved in such work so that appropriate and complete safety work practices are observed at all times. The Contractor shall also provide all personnel with all tools, clothing and other devices necessary for such safe practice, including appropriate waterproof clothing, respirators, protective glasses, mechanical air blowing equipment to ventilate manholes and other chambers, explosive atmosphere detectors, ladders, safety harnesses, etc. No work shall be performed under any unsafe conditions and if same is detected at any time, the Contractor shall suspend operations immediately, and not resume his activities until remedial measures have been taken or until the unsafe situation has otherwise been completely overcome.

Clearing and Grubbing

Certain work to be performed will require clearing. The Contractor shall cut, clear and remove all brush, sapling, scrub and other wild growth along the route of the pipelines. No trees shall be cut, however, without the specific approval and prior designation for cutting by the Township's Engineer. It is the intent of these specifications to minimize the removal of trees, and therefore, only those which will positively prevent the application of reasonable construction methods and procedures will be permitted to be removed. Brush, scrub growth, stumps, saplings, and tree limbs and trunks so directed to be cut and removed, shall be placed into piles and shall be burned or otherwise destroyed or completely removed from the site of the work. No such debris shall be included in any backfill and as part of the clean-up work shall be required to be removed and transported away from the site.

The locations where burning may be accomplished and the controls applicable to that activity shall require the written approval of the Township Fire Chief. Burning shall be conducted under guard at all times and the Contractor shall exercise every reasonable precaution to prevent fires from causing unnecessary smoke nuisance and/or other hazards. When, in the opinion of the Township's Engineer, weather conditions are not conducive to non-nuisance or non-hazardous burning, those operations shall be suspended until conditions satisfactorily improve. No burning may be performed in the vicinity of underground gas lines or overhead power lines.

Open Excavation and Backfill

Except where jacking, boring or tunneling is indicated on the plans and/or profiles, pipe lines and appurtenances may be constructed by the open trench excavation method. All excavation shall be unclassified and no extra payment shall be made for hand excavation or for the removal of any rock, boulders, stumps, tree roots, shale, muck, masonry, curbing, paving or other natural or man-made materials.

The width of all trenches shall not exceed the outside diameter of the pipe, plus two feet, from the bottom of the respective pipe trench to a horizontal plane located one foot above the top of the pipe. That section of the trench is identified as the pipe zone and its configuration is graphically illustrated on Drawing SD 1. In the event that the Contractor's construction methods/activities result in a trench wider than the pipe diameter plus two feet within that pipe zone, he shall install concrete bedding or encasement or shall make such other provisions as may be directed by the Engineer to protect and assure the structural integrity of the pipe.

All ductile iron pipe and reinforced concrete culvert pipe may be installed directly on exposed trench bottoms, where no rock or other unyielding material or where no soft unstable conditions exist. Where the exposed trench bottom consists of rock or other unyielding material, the trench shall be overcut a minimum of 4 inches and the ductile iron or reinforced concrete culvert pipe shall be installed on bedding material which is specified later within this manual. When soft and/or unstable trench bottoms are exposed, they shall also be overcut and stabilized to the satisfaction of the Authority's Engineer with the same bedding material before the pipe is installed. Trench bottoms shall be overcut at joints where pipe bells will occur to assure that all pipe barrels are continuously supported for the entire barrel lengths.

All polyvinyl chloride pipe shall, regardless of the character of the exposed trench bottom, be installed on a bedding material at least 6 inches in thickness--except where concrete cradle and/or encasement is required.

The excavation material from the trench may be stored along its alignment on rights-of-way obtained for construction purposes. It may not, however, prohibit traffic flows along the streets and roadways, access to private properties, or access to existing utility lines by the respective utility companies. The temporary storage of excavated material shall not obstruct or alter the flow of surface water runoff to the detriment of the operation of existing surface water drainage facilities and ditches and shall be placed at a location which will not superimpose excessive loading on the trench walls and/or the sheeting, shoring or bracing installed within the trenches.

At all locations along ductile iron or reinforced concrete pipelines, the backfill material placed in the pipe zone (that is, the material located above the top of the trench bottom or bedding material to an elevation located one foot above the top of the pipe) shall be selected excavated material which shall be thoroughly compacted and placed in such a manner to avoid disturbance or displacement of the pipe, and other appurtenances. The pipe zone material shall contain no rocks or hard shale which have a maximum dimension exceeding two inches. Pipe barrels shall be continuously supported on trench bottoms for their entire length and no rocks, bricks, on edges or other point supports will be permitted. Bedding material shall be used, where necessary, to compensate for irregular trench bottoms and provide such continuous support.

At all locations along polyvinyl chloride pipelines the backfill material placed within the pipe zone to an elevation of one foot above the top of the pipe shall be the same as that material specified hereinafter for the bedding of the pipe.

Backfill material placed in trenches above the pipe zone, where such trenches are located within Township Streets or State Highways shall consist (for the entire trench width and depth) of material conforming to the requirements specified for bedding. Backfill material in trenches above the pipe zone in traveled ways, road shoulders or berms, and at all other locations where trench settlement must be avoided, shall be excavated material placed in lifts not exceeding eight inches in thickness and shall be thoroughly and mechanically compacted by the use of vibratory or reciprocating tamping equipment -- for the full depth of trench. At other locations along the alignment of the pipes where trench settlement is not of concern and where designated by the Authority's representative during construction progress, backfill above the pipe zone may be loosely placed by machine, mounded over the trench and after settlement has satisfactorily occurred and subject to a time approved by the Township's representative on the site, the excess material shall be leveled and blended with the slope of adjacent ground surfaces in a manner which does not adversely impede the flow of surface water or otherwise have a deleterious affect on the finished landscape.

No material shall be used for backfill at any location which, in the opinion of the Township's representative, is too wet, frozen, mucky or contains debris, tree stumps or an excessive amount of rocks.

All excess excavated material resulting from the construction of the pipelines and appurtenances shall be disposed at a location and in a manner which shall be the Contractor's responsibility to determine.

Where necessary to maintain the required trench configuration in the pipe zone, in confined areas where trench walls above the pipe zone cannot be sloped, or for the protection and safety of construction personnel, sheeting, shoring and/or bracing shall be installed in accordance with the requirements of the appertaining regulatory agencies. Said sheeting, shoring, and/or bracing shall be designed by the Contractor and shall be adequate to withstand the loads to be imposed during the construction operations. Its placement and removal shall be carefully performed to avoid displacement or disturbance of the entrenched pipe. All trench supports shall also be required to provide complete safety to construction personnel working within. Trench boxes may be utilized; however their design, fabrication, structural adequacy, handling, placement and removal shall be the responsibility of the Contractor.

Trenches at any and all locations where pedestrian or vehicular traffic hazards would result, shall not be left open during nonconstruction hours, unless they are suitably covered with a steel plate which is adequately anchored and reinforced to sustain pedestrian and/or vehicular traffic loads which may be imposed.

All structure excavations and open trenches shall be constructed in accordance with the regulations set forth under Subpart P, "Excavation, Trenching and Shoring" published as a part of the Safety and Health Regulations for construction by the U.S. Department of Labor, as amended, as the same pertain to the shape of trenches, trench side-wall supports, the construction methods employed, the general protection requirements, the general excavation

requirements, the general trenching requirements and the minimum requirements for trench shoring. All sheeting, shoring and/or trench boxes shall be designed by the respective Contractor for the conditions encountered. Methods of installation shall be compatible with assuring the protection against disturbance of adjacent facilities and/or grounds and the safety of construction and other personnel.

The Contractor shall schedule construction activities and provide all required equipment and personnel such that the backfilling of trenches located along or crossing streets, street berms, roadways, driveways and other traveled ways, results in resumption of normal traffic patterns reasonably soon after pipe construction.

Blasting

When rock, hard shale or other unyielding material is encountered in the trenches and/or structural excavation operations and cannot reasonably be moved by the machines on the job, it shall be fractured by predrilling and blasting, in a manner which will enable the Contractor to remove the material and complete the excavation in accordance with the specified trench widths and/or shapes, and in a manner that will produce the least practicable disturbance to adjacent subsurface material and which will avoid disturbance or displacement whatsoever to existing above ground and underground structures and pipe lines. All blasting shall be done by licensed blasters and shall be performed in accordance with all applicable Federal, State and local laws, rules and regulations regarding registration, transportation, storage, handling and otherwise using explosives. Blasting permits are required to be obtained in advance from the Township of Kennedy.

The Contractor shall have a plan of his proposed blasting procedures prior to commencing with same and shall continually adjust his operations when materials of varying and/or different characteristics are encountered in order to obtain specified and desired trench or other structural excavation shapes. Hole spacing, size and loading; offset benching; ignition sequencing; type of equipment utilized and all other procedures and operations shall be especially adapted at each location in order to produce relatively smooth, unshattered and completely safe back slopes and/or trench walls, and in order to assure protection of all personnel employed in connection with the work and other persons.

At the beginning of the blasting operations in any particular area, a short test line of holes shall be used for the purpose of determining optimum spacing, sizing and loading of the holes in order to ascertain best practicable and safe procedures.

Dewatering

All excavation shall be dewatered thoroughly in advance of the installation of any of the construction work. No facilities shall be constructed in any excavation where water flows or is pooled or where groundwater infiltration or surface water inflow is not immediately removed. Where dewatering does occur, the Contractor shall conduct those operations in a manner which complies with

regulations on the subject of Soil Erosion and Sedimentation Control as promulgated by the Pennsylvania Department of Environmental Resources. No such discharges shall be permitted to erode or otherwise adversely affect any public or private property and all such discharges shall be trapped, settled, rough-filtered, retained and/or checked (depending upon the clarity, turbidity and concentration of suspended solids within such discharges).

Minimizing Water Pollution from Soil Erosion

All Contractors shall conduct their activities and shall program trenching and restoration operations in such a manner as to minimize pollution of the ditches, streams and creeks and their tributaries from erosion of the freshly excavated and/or backfilled material during periods of excavation and surface water runoff. The Contractor shall reduce the area and duration of exposure of all erodible soils by the greatest extent practicable and to that end, hydromulching, reseeding and other specified surface restoration shall be required to closely follow backfilling operations. Where the Township's Engineer so directs in the field, sediment traps, hay bales, and/or other means to retard runoff rates shall be installed; similar holding basins or other sediment trap arrangements shall also be required to be installed at the discharge of dewatering pumps. Discretion shall be exercised in selecting the number and location for encroachments during construction both in and along the creeks such that a minimum of stream disturbance and erosion pollution results.

Prior to earthmoving activities the Contractor shall install the necessary erosion protection devices required.

During construction, there shall be no discharge of petroleum products from construction equipment into ditches, streams, creeks, storm sewers or on ground surfaces and water removed during the trench dewatering operation shall be free of suspended material and/or mud, or shall be pumped to sediment trap before conveyance to the stream.

Dust and Mud Control on Streets and Other Traveled Ways

Dust control palliatives shall be utilized where and when necessary to satisfactorily maintain roads, streets, berms and other traveled ways for vehicular traffic. In addition, the accumulation of mud and/or dirt from the excavation, backfill and trenching operations shall be cleaned off the surfaces of traveled ways by machines and/or hand labor as frequently as is necessary to properly maintain the roadway in a condition satisfactory to the Township's Engineer.

Bedding and Specially Graded Backfill Material

All pipeline bedding material, all material placed within the pipe zone of trenches in which PVC pipe is constructed and all material placed above the trench bottom and below the concrete trench slab (where trenches cross or are located within Township Streets or State Roads) shall be cleaned and washed crushed limestone or river gravel conforming to the 1B gradation and classification of the Pennsylvania Department of Transportation.

Compaction Testing

The Contractor is informed that in those areas where the excavated material is utilized as backfill that the Township desires that the compacted backfill achieve a density of 95% as determined by the Standard Method A, Proctor Test. Tests will be performed to assure that such compacted densities prevail, at the discretion and expense of the Contractor. Generally, one such test shall be performed on each 200 lineal feet of trench so backfilled and compacted by the Contractor. In the event that the placed backfill does not comply with the 95% density requirement, the work shall be re-excavated and recompacted and the costs of the subsequent retesting after replacement shall be the Contractor's responsibility.

Pavement Removal and Restoration

All roads, driveways, streets, traveled ways, berm, sidewalks, etc. disturbed during construction shall be reconstructed as nearly as possible by the Contractor to their original condition, unless noted otherwise.

Sewer Pipe

Service sewers shall be installed as indicated on the applicable supplemental detail drawings and shall be 6 inches diameter. All service sewer pipe and fittings and all collector or interceptor sewer pipe fittings 15 inches diameter and smaller, unless otherwise indicated on the plans and profiles shall be extruded polyvinyl chloride conforming to ASTM D3033 or ASTM D3034, SDR-35. Flexible elastomeric seals shall be provided conforming to ASTM D3212 and ASTM F477. A 2" x 2" x 4" stake shall be driven in the backfill at the end-location of all service sewers.

Assembly of PVC Sewer Pipe

Pipe joints shall be carefully lowered into the excavated trenches to avoid damage to the pipe barrel and the bell and spigot pipe ends. All rubber gaskets shall be examined to assure there is no apparent damage during handling and shipment. Both the bell and spigot ends shall be wiped clean with a reasonably dry cloth. The spigot end of the pipe shall then be lubricated by application of a suitable grease-like product which will not adversely affect either the gasket or pipe wall. The entire circumference of the spigot shall be coated with a cloth, sponge or glove and the lubricated spigot shall be inserted into the bell. The pipe shall be shoved home by hand or by use of a bar and block. A representative of the pipe manufacturer shall spend a reasonable amount of time on the job site (at the beginning of the work) demonstrating pipe laying techniques and instructing the Contractor's personnel on proper construction methods.

Manholes

Manholes constructed on Township pipelines shall be either fabricated of precast concrete in accordance with the requirements of ASTM C478 or glass fiber-reinforced polyester in accordance with the requirements of ASTM D3753. The manhole structures may be furnished with prefabricated base sections or the

bases may be cast-in-place of reinforced concrete as shown on the appertaining Supplemental Detail Drawings.

Manholes greater than five feet deep may be furnished with eccentric cone top sections or may be furnished with flat-slab tops per SD-6 ; manholes less than five feet deep are required to be constructed with the flat-slab top sections. Manhole barrel sections shall be sealed with bitumastic materials placed in the field, as manufactured by Concrete Sealants, Inc. Two rings of said material shall be installed -- one on the inside of the joint in the groove and the other on the outside of the tongue.

Manholes furnished with prefabricated base sections shall be installed on 6 inch minimum thickness crushed stone or washed gravel conforming to the requirements of "Bedding and Specially Graded Backfill Material" as specified elsewhere herein. Said material shall also be placed in the bottom of the manhole excavation -- between the limits of the influent and effluent pipe trenches -- to an elevation one foot above the top of the connecting pipes. In other words, all sewer pipe connections to manholes shall be completely supported (to the bottom of the excavation) on bedding and shall be enveloped in the same material to an elevation located one foot above the top of the pipe.

Manholes where the largest connecting sewer is 18 inch diameter or less shall have a 4 feet diameter barrel section where any connecting sewer exceeds 18" diameter, manhole barrel sections shall be 5 feet diameter.

All manholes shall be provided with steps located 12 inch ~~on~~ center, which shall conform, in general, to the configuration shown on SD 9 . The steps shall be deformed steel encapsulated with injection-molded polypropylene.

Frames and covers shall be fabricated of ASTM A48 cast iron and shall be free of babbles and other sand or air imperfections. Contact surfaces shall be machined and matches and covers shall be inscribed with SAN-SEWER. Grade adjustments shall be accomplished with precast concrete rings and/or cast iron paving rings.

Invert channels shall be smooth and accurately shaped to a semi-circular bottom conforming to the inside of the adjacent sewer section. Inverts may be formed directly in the concrete of the structure base, or where reinforced concrete culvert pipe is used, may be built up of mortar or may be constructed by laying full section of sewer pipe straight through the structure and breaking out the top half after the base is constructed. Where necessary, invert channels in manhole bottoms shall be shaped and smoothed with cement mortar. The size and depth of the inverts will vary to suit the size of the pipe used and shall have a height of at least 6 inches higher than the springline or to the top of the inlet pipe, whichever is higher.

Changes in grade shall be made gradually and evenly. Changes in the direction of the sewer and entering branch or branches shall have a true curve of as large a radius as the size of the structure will permit. Changes in pipe sizes shall be made gradually and evenly by dropping the invert in the manhole a distance equal to the difference in diameter of the pipe entering and leaving the manhole. Elevations shown on the plans indicate invert elevations of the center

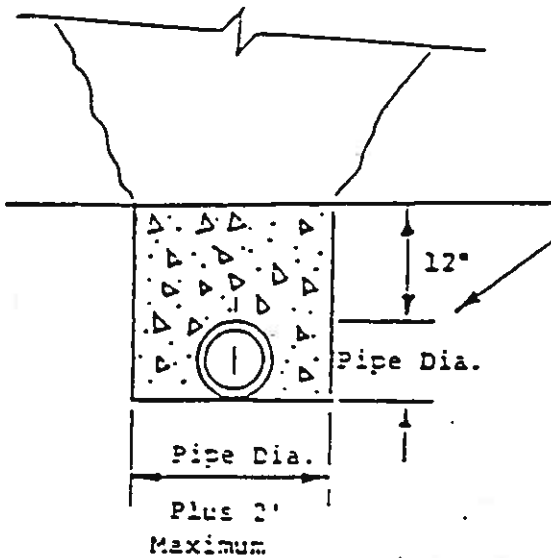
of manhole unless indicated otherwise. No manhole bottoms which result in collection of solids or in pooling of wastewater will be accepted. Gradients in manholes which accommodate smooth gravity flows must be provided.

All prefabricated manhole bases/barrels shall, where pipes connect, be furnished with resilient and/or flexible connectors to accommodate the respective pipe diameters per SD-5.

All manholes shall also be furnished with manhole inserts or inflow protectors which shall be fabricated to fit the specified frames and covers. Said inserts shall be fabricated of a material which will not corrode or otherwise be adversely affected by the sewerage atmosphere and shall be provided with a gas relief valve. They shall be similar to the sewer guard model manufactured by F.R.W. Industries and shall be installed per the manufacturer's recommendation.

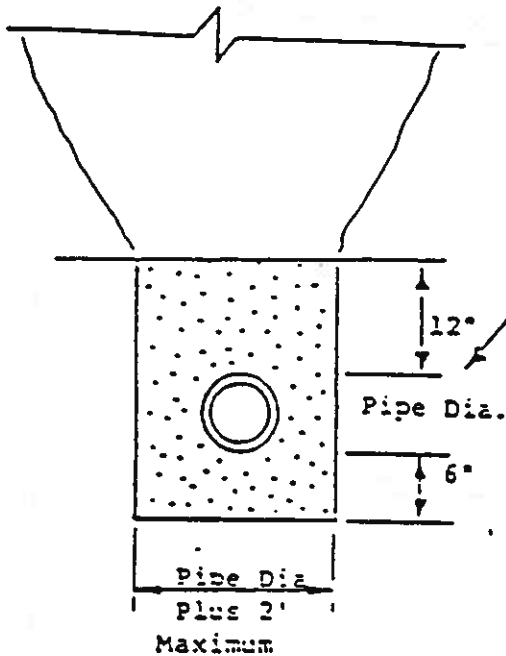
Sewer Drop Connections

Where drop connections are indicated on the plans and profiles they shall be installed in accordance with the details shown on SD-4 . In general, drop connections should be avoided except for extreme changes in elevations and in any event will not be approved for application on sewer pipes greater than 15 inch diameter.



Ductile Iron and Reinforced Concrete Culvert Pipe on Non-Rock Trench Bottoms

Bell Holes Shall be Excavated to Assure Continuous Pipe Barrel Support for Full Length of Pipe Sections. Trench Sidewalls Shall be Plumb Within Pipe Zone,



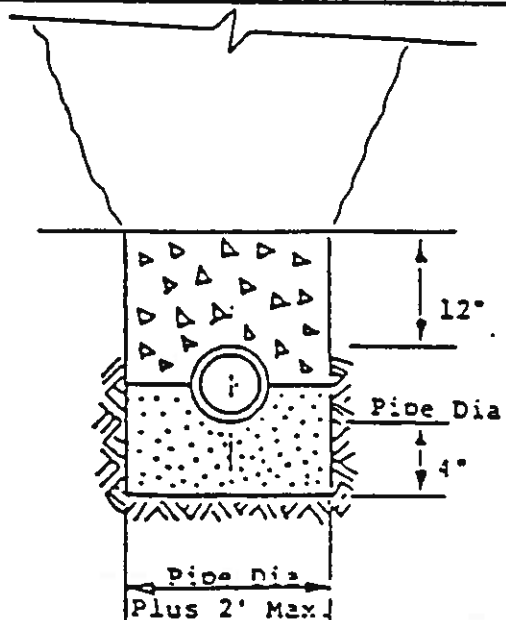
PVC Pipe at All Locations



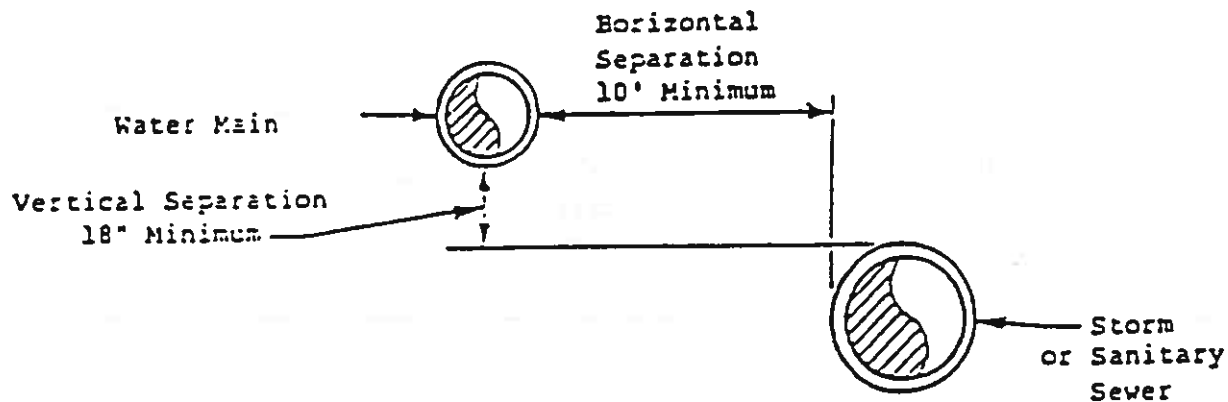
Selected Excavated Material Mechanically Compacted - Maximum Size Rocks - 3"



1B Crushed Stone or Washed Gravel



Ductile Iron and Reinforced Concrete Culvert Pipe on Rock Trench Bottoms



NOTE:

1. When the horizontal separation of the watermain and sewerline is less than 10', the vertical separation between the top (Crown) of the Sewerline and the bottom (invert) of the watermain shall be at least 18". Water line shall be encased in concrete where sewer/water line crossings occur and, where conditions prevent an 18" vertical separation.

Water Service - Road Crossing to be Installed by Developer in a Conduit
Consult WVWA

(Future) Pavement

Water Service Near Side-Tap and Copper to Curb Box Installed by the Westview Water Authority

Residential Premises
by Owner
4" or 6" bv Home Owner

Residential Premises
Curb Box
Owner
4" or 6" bv Home Owner

6" Service Lateral to R/W by the Developer

Water Service - Up to 1-1/2" - Tap and Copper to Curb Box Installed by the WVWA
Larger Than 1-1/2" Installed by the Owner - Fire Line Must be A Separate Connection Installed by the Owner

Residential Premises
By Owner
By Developer

Service
Fire
Min. 6" bv
Owner

Commercial or Industrial Premises

San. Service - Min. 6" Must Enter Into a Manhole by Owner or Developer

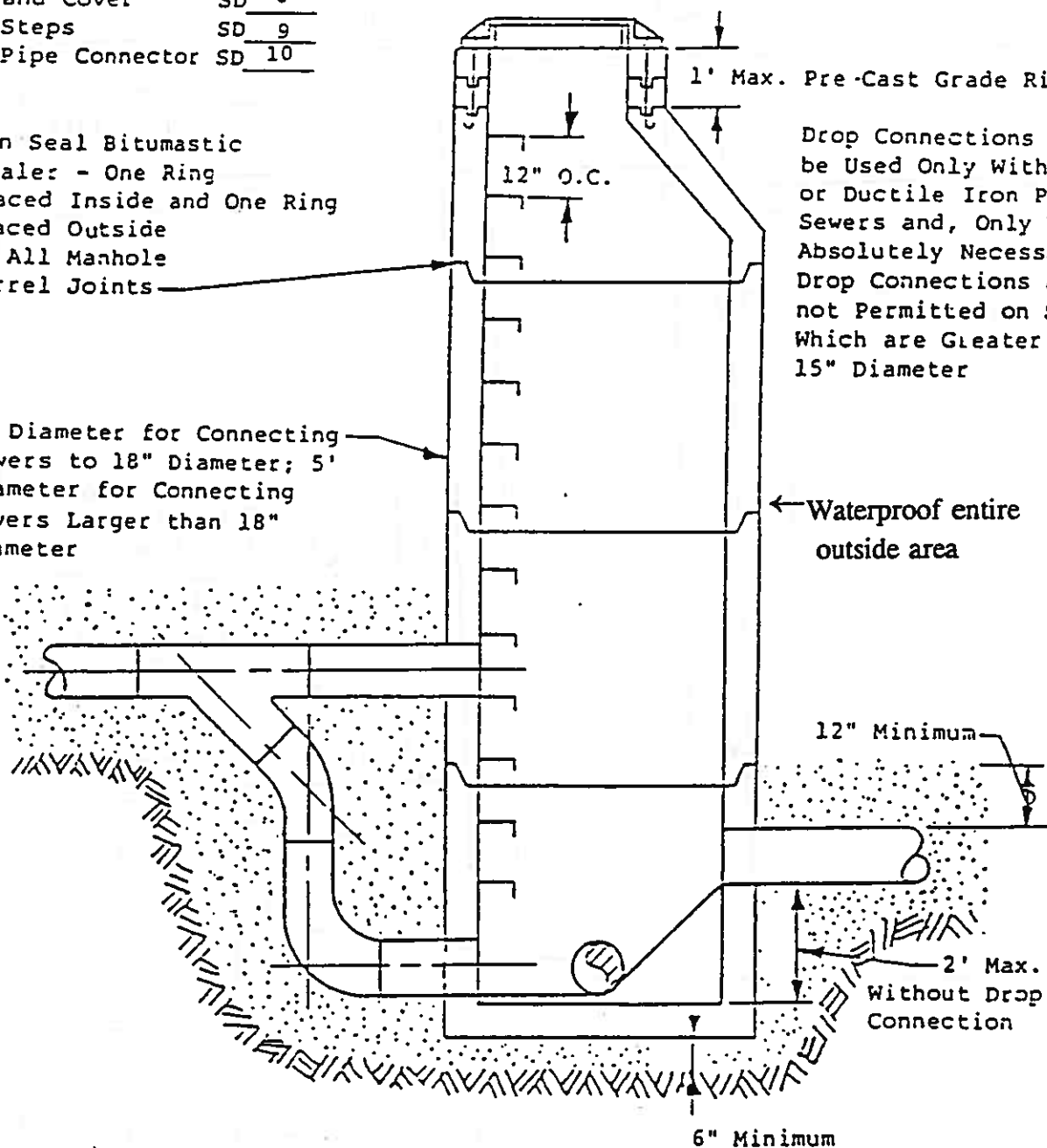
Manhole Barrel Shall be Pre-Cast Concrete ASTM C478 or Glass Fiber Reinforced ASTM D3753. For Connecting Pipes 18" Diameter or Less, the Manhole Barrel Shall be 4' Diameter; where there are larger connecting Pipes the Diameter Shall Be 5'.

Reference Details

Top of Manhole	SD 7
Manhole Frame and Cover	SD 8
Steps	SD 9
Pipe Connector	SD 10

Con Seal Bitumastic Sealer - One Ring Placed Inside and One Ring Placed Outside At All Manhole Barrel Joints

4' Diameter for Connecting Sewers to 18" Diameter; 5' Diameter for Connecting Sewers Larger than 18" Diameter



Drop Connections are to be Used Only With PVC or Ductile Iron Pipe Sewers and, Only Where Absolutely Necessary. Drop Connections are not Permitted on Sewers Which are Greater than 15" Diameter

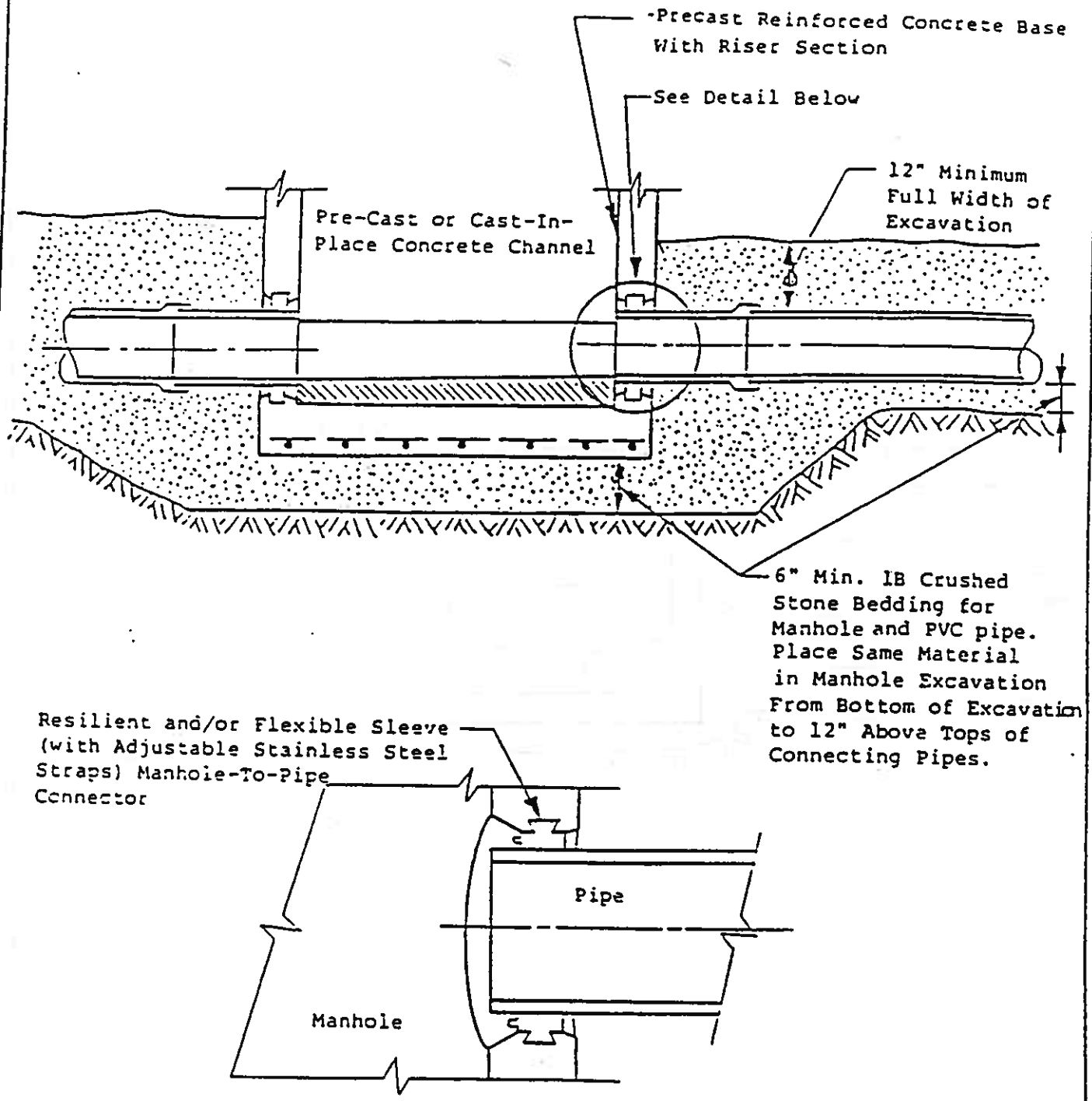
Waterproof entire outside area

12" Minimum

2' Max. Without Drop Connection

6" Minimum

Support Manhole Structure and All Piping Connections on a Minimum of 6" Thickness 1B Bedding Material. Encapsulate All Pipes Within Manhole Excavation in the Same Material to an Elevation of 12" above the Top of Pipes.



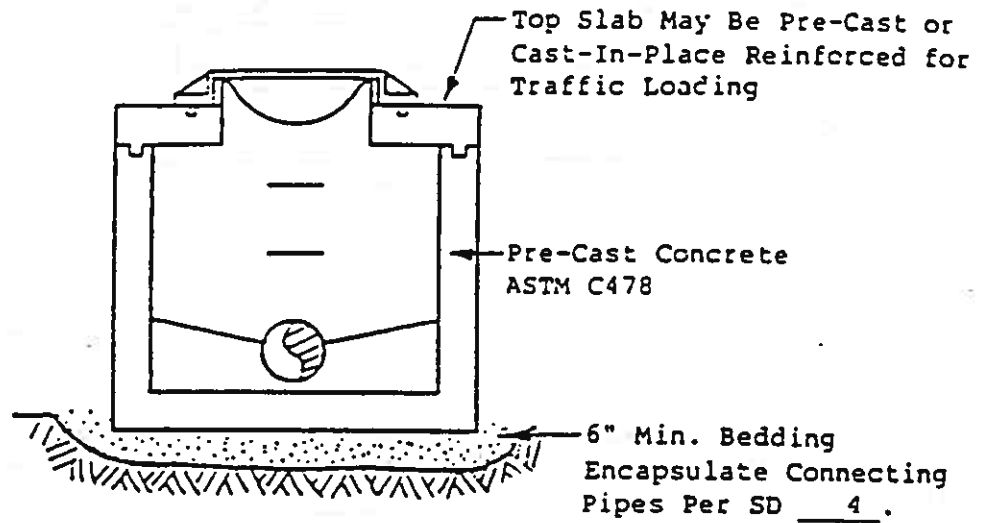
Reference
Details

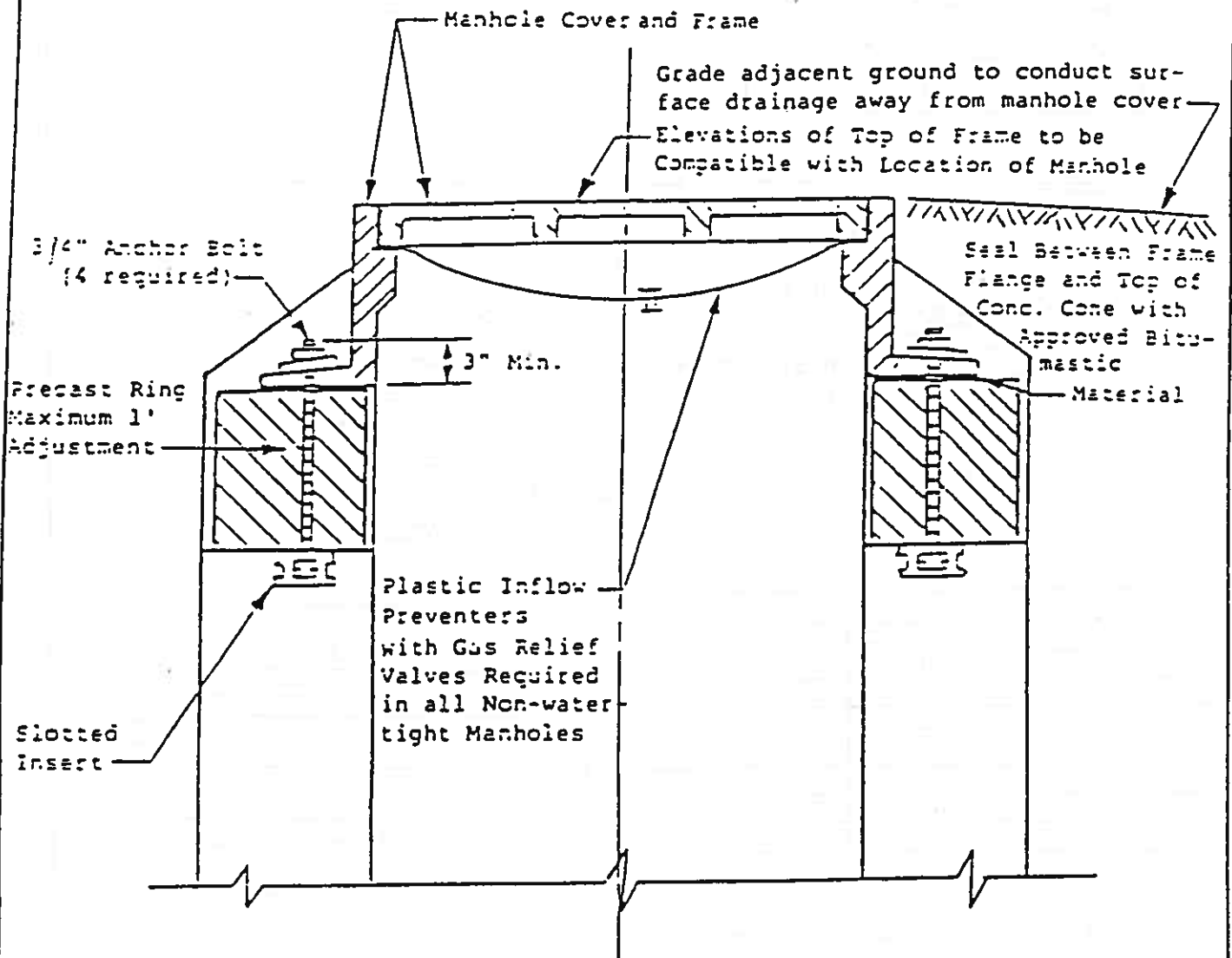
Top of Manhole SD 7

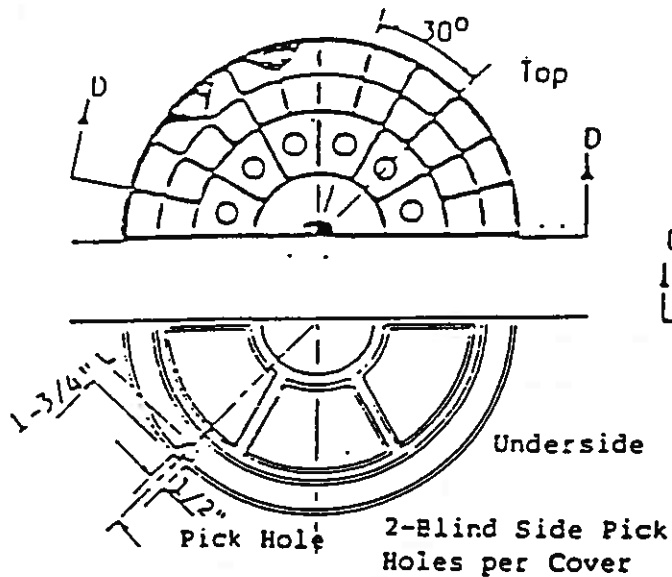
Manhole Frame &
Cover SD 8

Steps SD 9

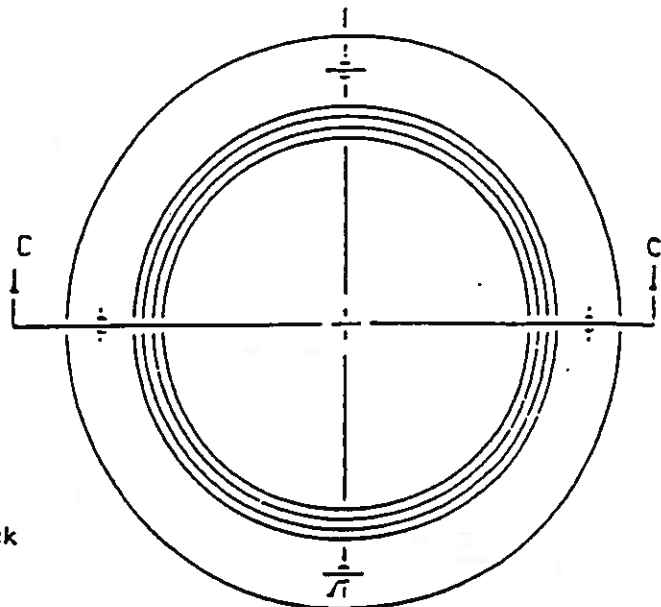
Pipe Connector SD 10







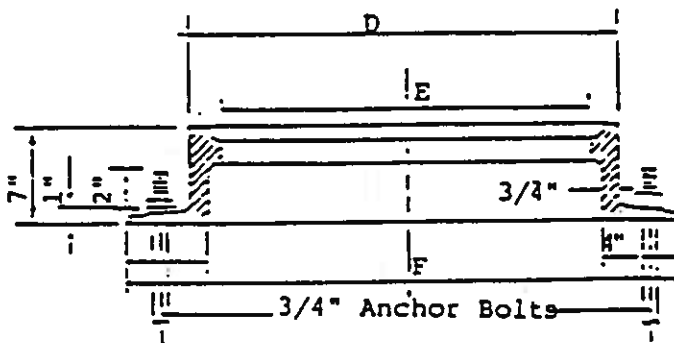
COVER PLAN



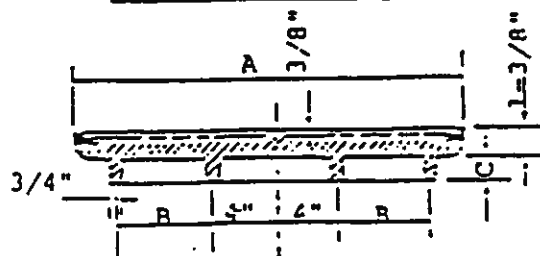
4-7/8" Bolt Holes/
(typical)

FRAME PLAN

Size of Covers and Frames				
Dim	Type A	Type B	Type C	Type D
Opng	22	27	30	36
A	23-3/4	28-3/4	31-3/4	37-3/4
B	5-1/8	7-5/8	9-1/8	12-1/8
C	1-5/8	2	2	2-1/2
D	26	31	24	40
E	22	27	30	36
F	32-1/2	37-1/2	40-1/2	46-1/2

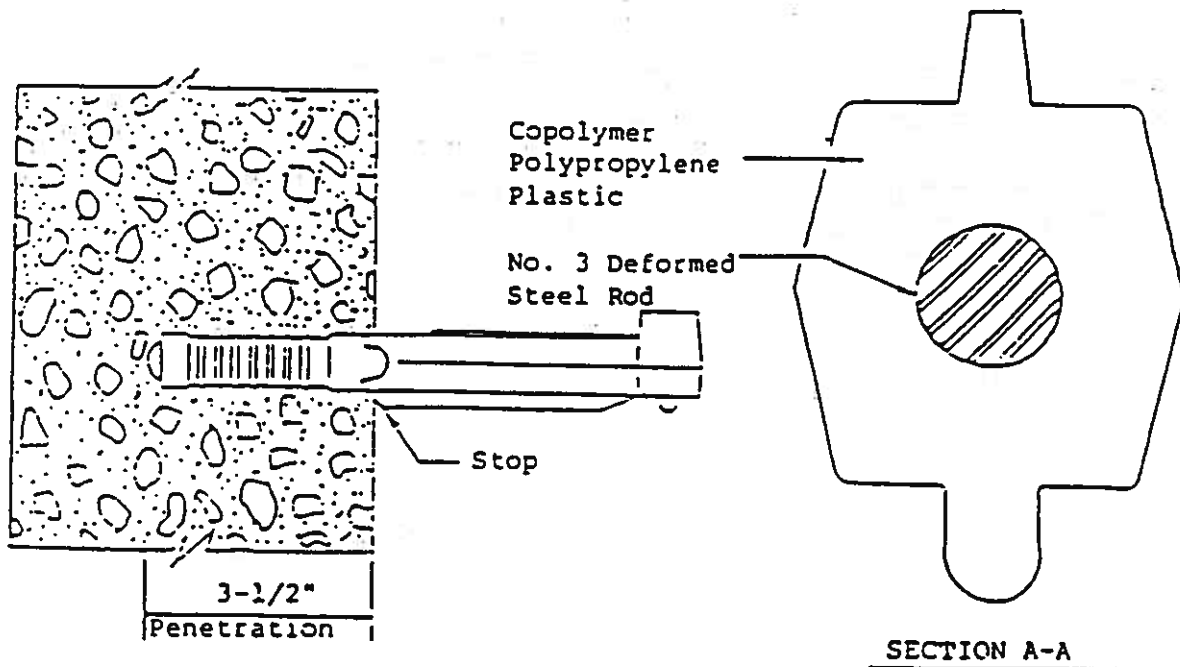
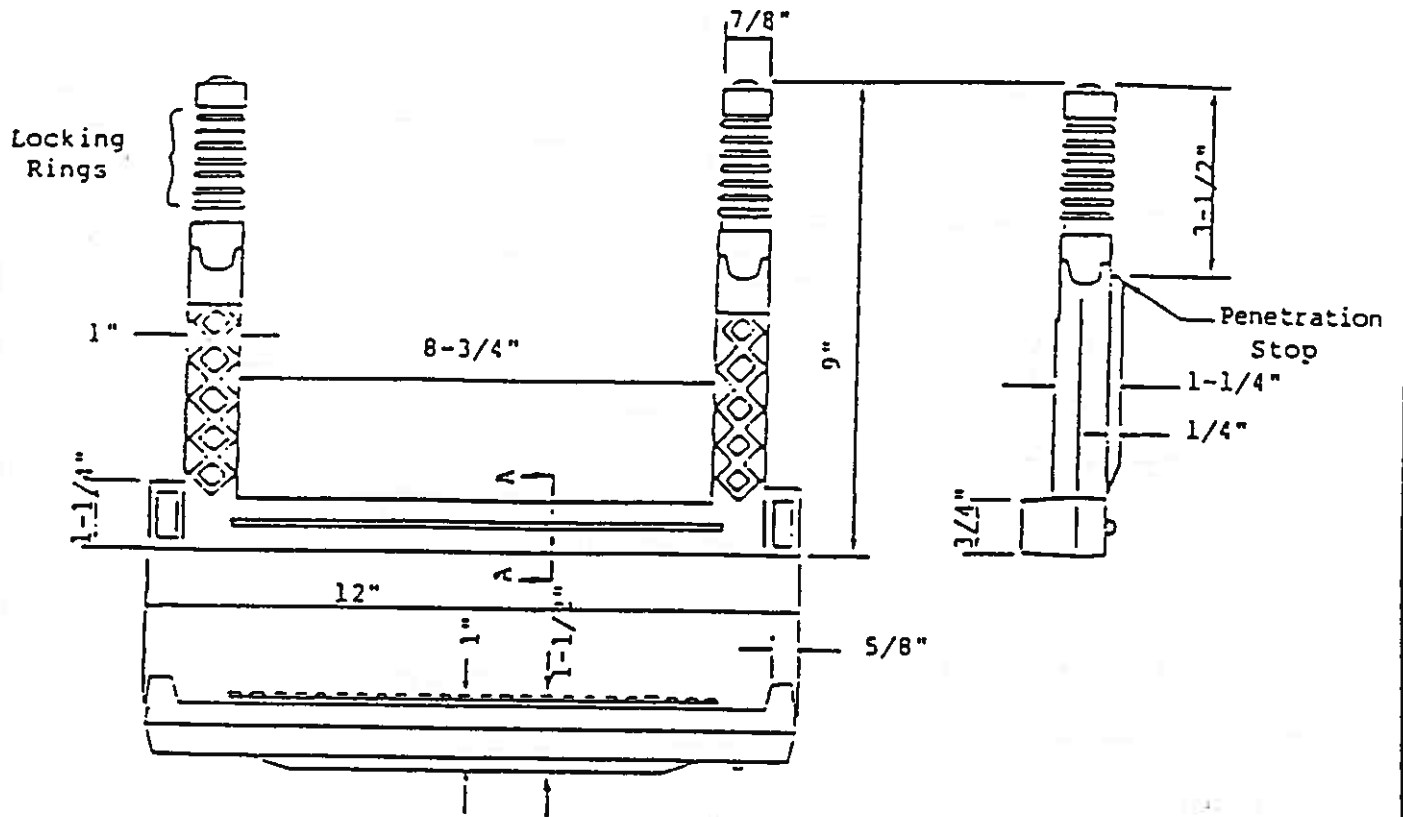


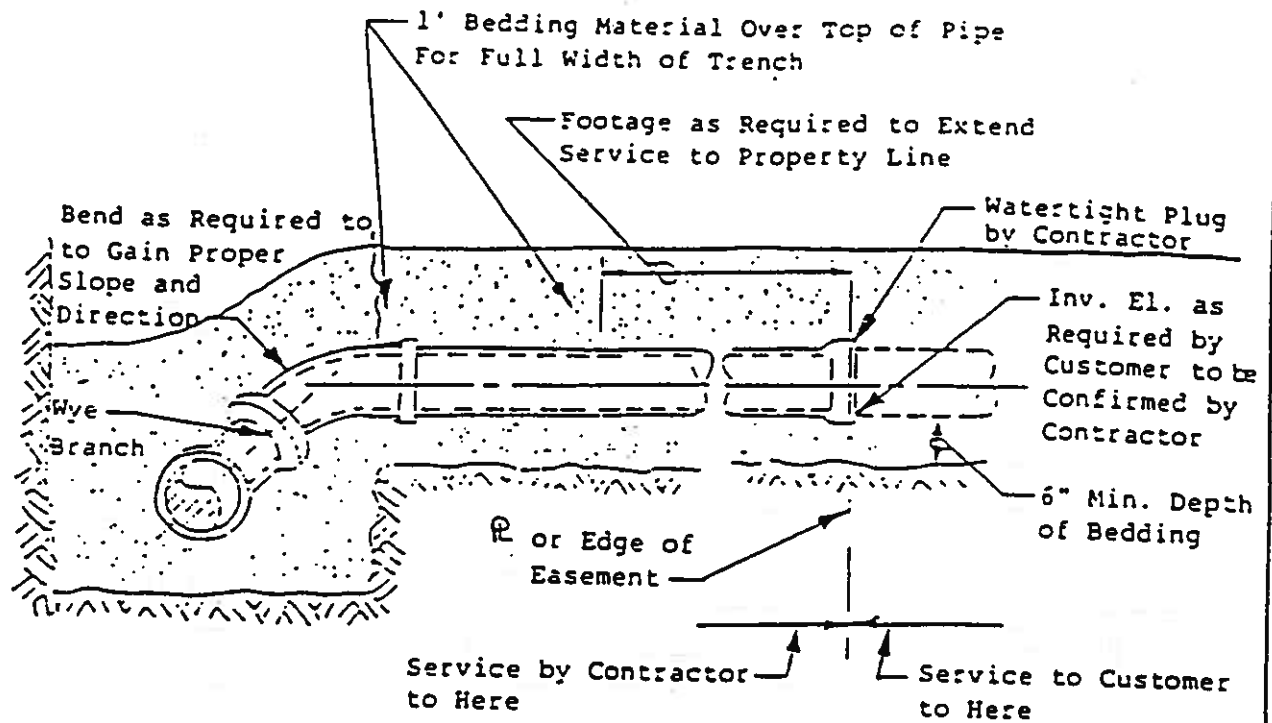
SECTION C - C



SECTION D - D

1. Water Tight Manhole, Frame and Cover Where Required Shall Be:
Allegh. Foundry Co., Frame 299
Cover 110, Seal 300
2. Standard Manhole, Frame and Cover Shall Be Allegh. Foundry Co. or Approved Equal
Frame 109, Cover 110
3. All Manhole Covers And Frames to be Type B Unless Otherwise Noted
4. Covers Shall be Cast with the Words SAN-SEWER

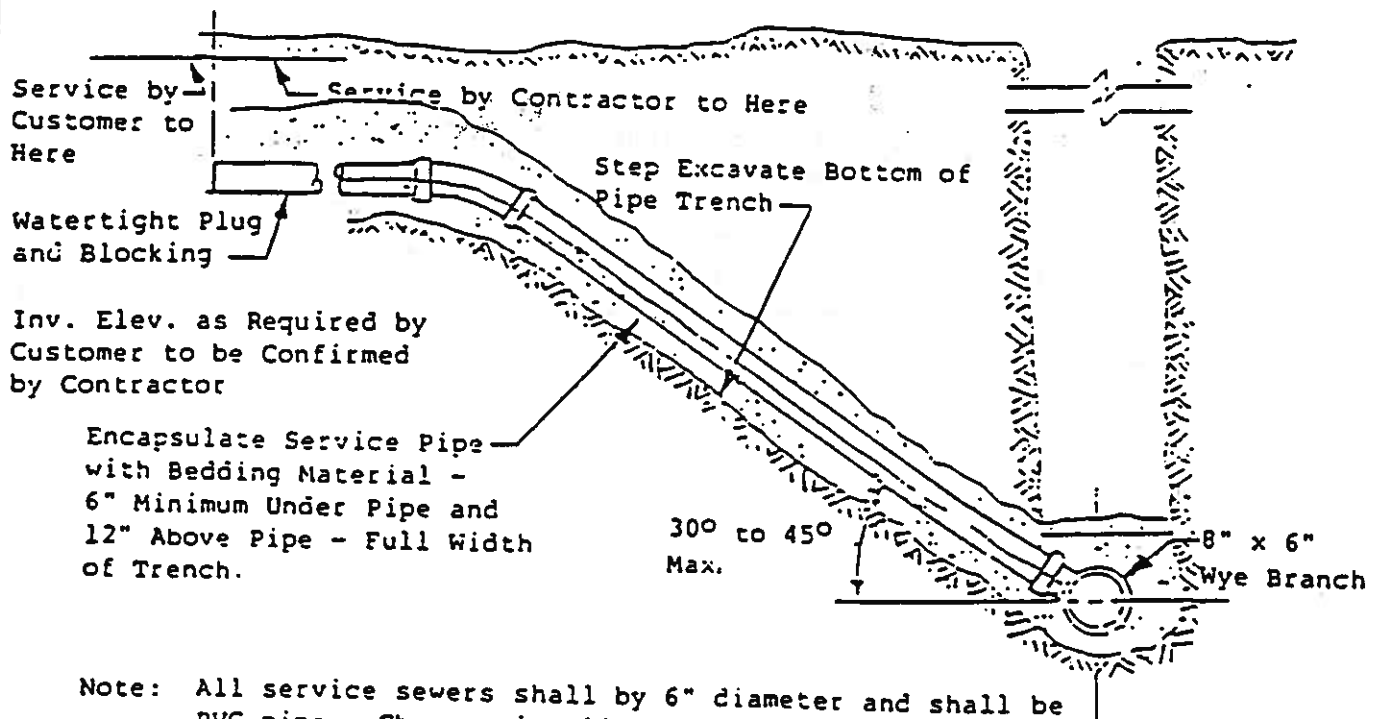




Note: Where main sewer is in private property -- footage of lateral pipe will extend to edge of sewer right-of-way.

Type I

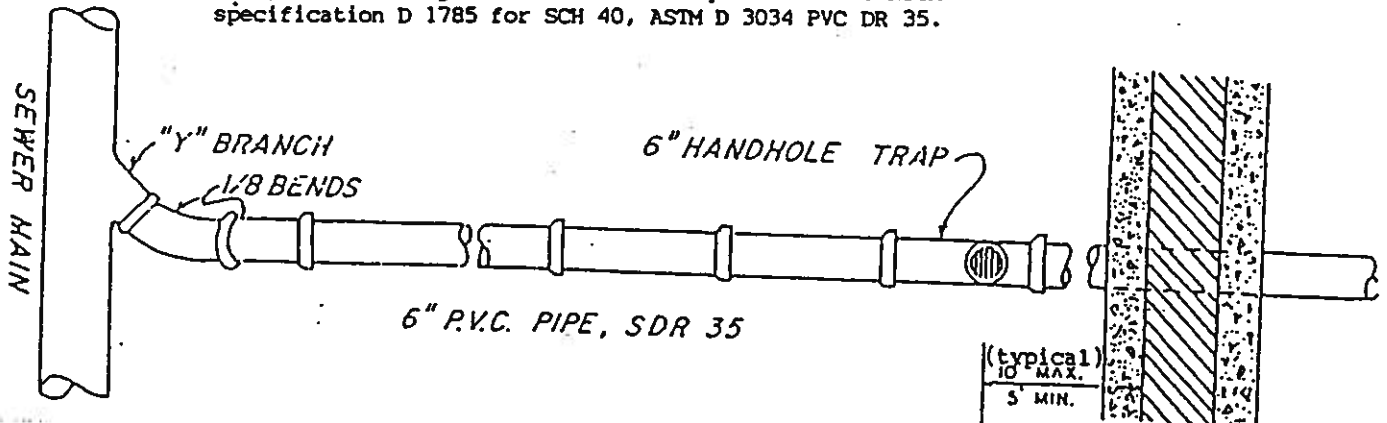
R or Easement



Note: All service sewers shall be 6" diameter and shall be PVC pipe. Changes in alignment and connections to main sewer shall be accomplished with prefabricated fittings.

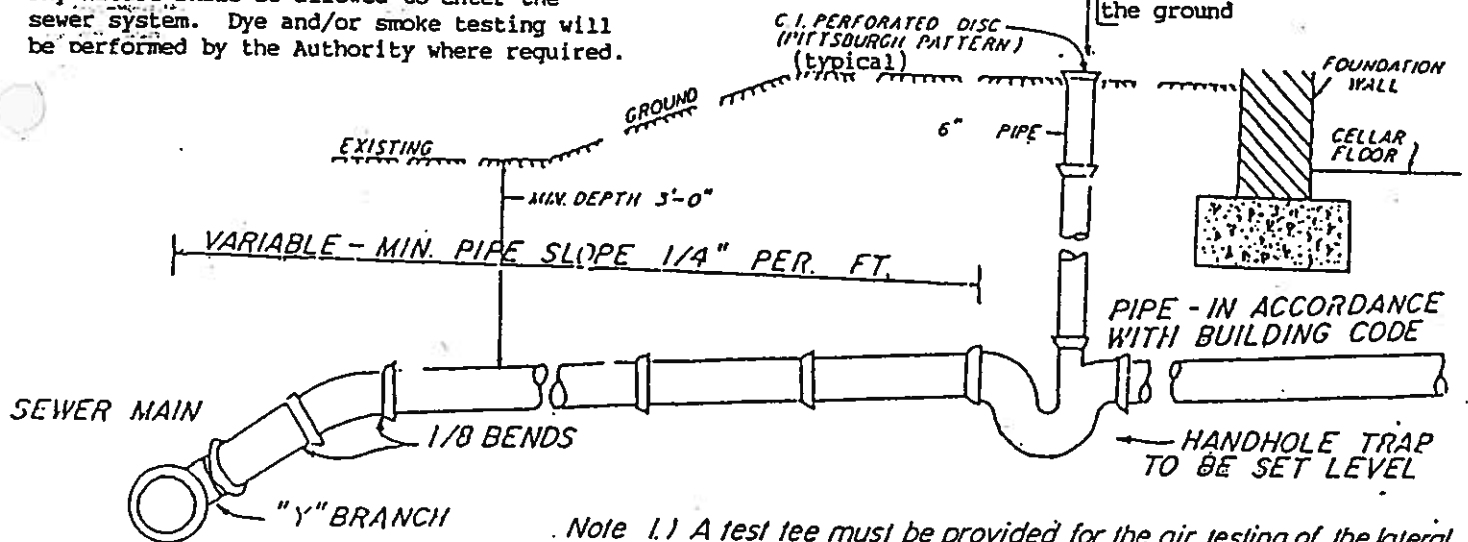
Type II

* Pipe and fittings shall meet the requirements of ASTM specification D 1785 for SCH 40, ASTM D 3034 PVC DR 35.



* No roof, storm, cellar seepage, surface water or ground water of any nature shall be allowed to enter the sewer system. Dye and/or smoke testing will be performed by the Authority where required.

PLAN VIEW

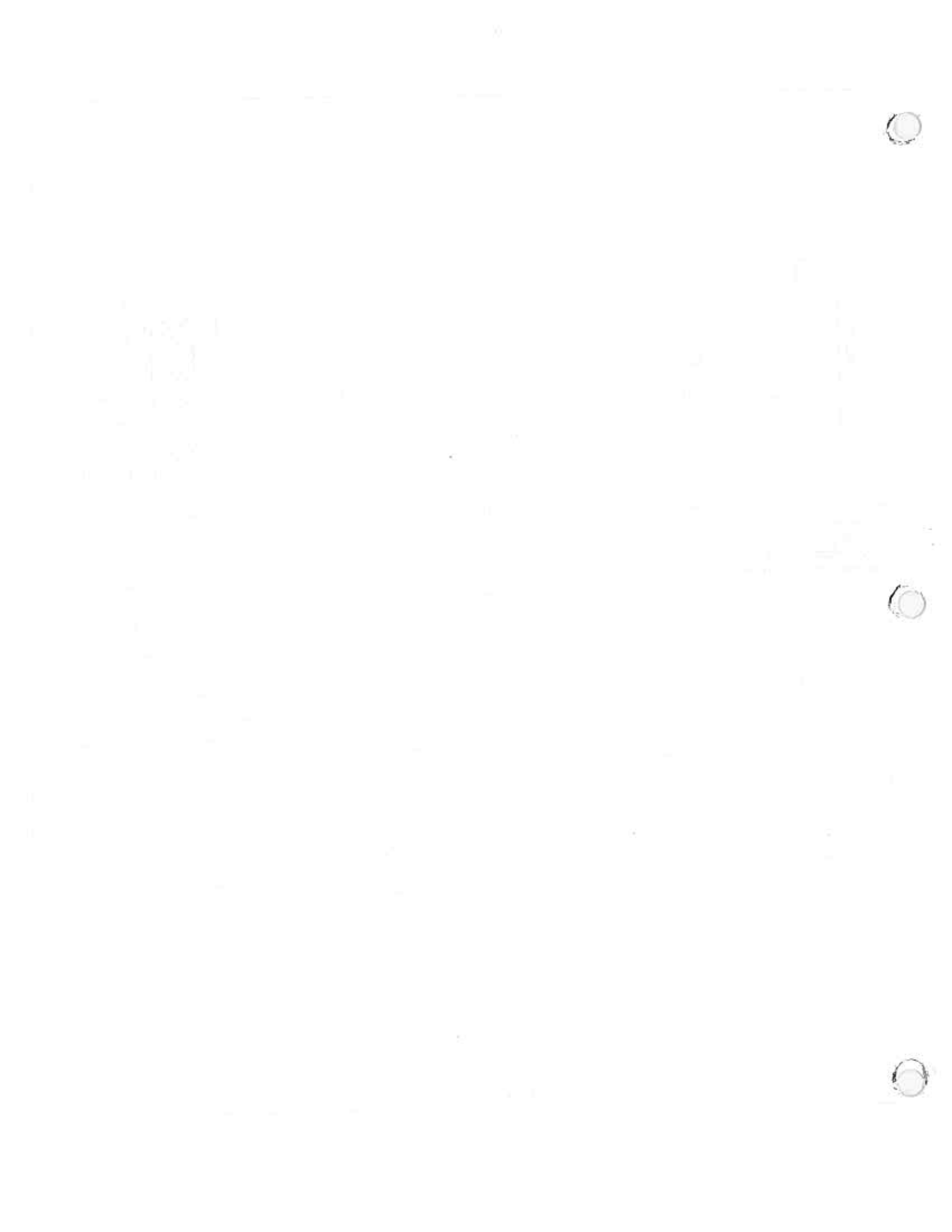


- Note 1.) A test tee must be provided for the air testing of the lateral.
 2.) No storm water is permitted to be connected to the lateral.
 3.) Lateral must be inspected and approved by the authority prior to backfill.

PROFILE

SANITARY SEWER LATERAL DETAILS
 N.T.S.

F.D.C.
 and Associates
 Consulting Engineers
 914 Beaver Grade Road
 Coraopolis, PA 15108
 (412) 264-3353



APPENDIX 1
DRAFTING STANDARDS FOR PLANS FOR RECORDING

The following are the administrative regulations of the recorder of deeds for the preparation of plans for recording.

1. All plats or plans shall be drawn on either new linen tracing cloth or mylar. Sephia paper, vellum or reverse-printed mylars will not be accepted. For recording purposes, the best quality mylars are wash-off or fixed line mylars.
2. Standard size sheets of drafting material should be used. The actual reproducible area of drawing on a sheet shall not be smaller than 17 inches by 22 inches and shall not be larger than 22 inches by 34 inches.
3. All plats or plans shall be drawn with waterproof black India ink.
4. All dedications, acknowledgements, certifications, approvals, etc. shall be made with waterproof black India ink or a varotyping process which will enable adequate reproduction.
5. All signatures and dates shall be made with permanent black ink using a felt tipped pen.
6. All plans shall be drawn to a scale no smaller than 100 feet to the inch.
7. All condominium floor plans shall be drawn to a scale no smaller than one-eighth inch to the foot.
8. All plats and plans shall be of sufficient size, within the parameters set forth in regulation 2 above, to clearly show all dimensions, notations and other printed matter with sufficient legibility and clarity to permit adequate reproduction.

**APPENDIX 2
REQUIRED CERTIFICATIONS**

The certifications shown below must be placed on the plan for recording.

1. **OWNER'S ADOPTION AND DEDICATION.** Slightly different forms are required for individual owners, partnerships, and corporations. If an individual with power of attorney signs on behalf of an owner, the volume and page number in which the power of attorney is recorded must be shown. Signatures must be witnessed.

- A. To be used for individual owner or owners. All owners must sign, or the certification may be repeated for multiple owners.

(I/we), owner(s) or beneficial owner(s)* of the land shown on the (Name of plan), hereby adopt this plan as (my/our) (plan of lots or land development) and irrevocably dedicate all streets and other property identified for dedication on the plan to the (municipality). This adoption and dedication shall be binding upon (my/our) heirs, executors, and assigns.

Signature of witness

Signature of owner(s)

Date

- B. To be used for partnerships. A general partner must sign.

The (Name of partnership), (owner or beneficial owner)* of the land shown on the (name of plan) hereby adopts this plan as its (plan of lots or land development) and irrevocably dedicates all streets and other property identified for dedication on the plan to the (municipality). This adoption and dedication shall be binding upon the partnership and upon its heirs, executors, and assigns.

Signature of witness

Signature of general partner

Date

- C. To be used for corporations. A corporate officer must sign, and another officer must witness. The corporate seal must be affixed.

By a resolution approved on the _____ day of _____, 19____, the Board of Directors of the (Name of corporation), incorporated in the state of (Name of state), (owner or beneficial owner*) of the land shown on the (Name of plan) adopted this plan as its (plan of lots or land development) and irrevocably dedicated all streets and other property identified for dedication on the plan to the (municipality). This adoption and dedication shall be binding upon the corporation and upon its successors and assigns.

(Seal)

Name of Corporation

Signature and title of officer witnessing

Signature and title of authorized officer

Date

* Landowner is defined in the Municipalities Planning Code as "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." Developer is defined as "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." An applicant is a "landowner or developer...who has filed an application for development, including his heirs, successors, and assigns." Thus, the adoption and dedication clause may be executed by any person or entity who falls within the MPC definition of landowner or developer.

2. ACKNOWLEDGEMENT OF NOTARY PUBLIC

The owner's adoption and dedication must be acknowledged by a notary public. The black notary stamp must be affixed. The following certifications indicate the slightly different language that may be used to acknowledge individual, partnership, and corporate adoptions and dedications.

A. Acknowledgement of individual owner's adoption and dedication.

Before me, the undersigned Notary Public in and for the Commonwealth of Pennsylvania and County of Allegheny, personally appeared the above named (Name of owner(s)), and acknowledged the foregoing adoption and dedication to be (his, her, their) act.

Witness my hand and notarial seal this _____ day of _____
19____.

My commission expires the _____ day of _____,
19____.

(Seal)

Notary Public

B. Acknowledgement of partnership adoption and dedication

Before me, the undersigned Notary Public in and for the Commonwealth of Pennsylvania and County of Allegheny, personally appeared the above named (Name of general partner), a partner in the firm of name of firm, and acknowledged the foregoing adoption and dedication to be the act of the partnership.

Witness my hand and notarial seal this _____ day of _____,
19____.

My commission expires the _____ day of _____, 19____.

(Seal)

Notary Public

C. Acknowledgement of corporate adoption and dedication

Before me, the undersigned Notary Public in and for the Commonwealth of Pennsylvania and County of Allegheny, personally appeared (Name and title of officer) of the (Name of corporation), who stated that (he/she) is authorized to execute the above adoption and dedication on behalf of the corporation and was present at the meeting at which the action of the corporation was taken to adopt the plan and dedicate public property contained therein to the (Name of municipality).

Witness my hand and notarial seal this _____ day of _____, 19____.

My commission expires the _____ day of _____, 19____.

(Seal)

Notary Public

3. **CERTIFICATION OF TITLE AND CONCURRENCE OF MORTGAGEE WHERE APPLICABLE**

The deed book volume and page numbers in which the title to all of the property contained in the plan is recorded must be noted on the plan for recording and certified by the signature of the owner. If there is no mortgage or encumbrance against the property, a statement to that effect is included. If there is a mortgage or encumbrance, the mortgagee must consent to the recording of the plan. Signatures must be witnessed.

A. Certification of title and no mortgage

(I/we) hereby certify that the title to the property contained in the (Name of subdivision or land development) is in the name of _____ and is recorded in deed book volume _____, page _____. (I/we) further certify that there is no mortgage, lien, or other encumbrance against this property.

Witness

Owner

B. Certification of title with mortgage and consent of mortgagee

(I/we) hereby certify that the title to the property contained in the (Name of subdivision or land development) is in the name of _____ and is recorded in deed book volume _____, page _____.

Witness

Owner

(Name of mortgagee), mortgagee of the property contained in the (Name of subdivision or land development) consents to the recording of said plan and to the dedications and all other matters appearing on the plan.

Witness

Name, title, and mortgagee

4. **SURVEYOR'S CERTIFICATION**

Every plan for recording must be prepared by or under the supervision of a registered surveyor, who must certify the accuracy of the survey and affix his seal.

I certify that, to the best of my knowledge, the survey and plan shown hereon are correct and accurate to the standards required.

Date

Name

(Seal)

Registration number

5. **MUNICIPAL ENGINEER'S CERTIFICATION**

The engineer for the municipality in which the plan is located must certify that the plan meets the requirements of all applicable municipal ordinances. This is required whether the plan is located in a municipality which has a subdivision and land development ordinance or a municipality in which the county has approval authority. In the latter case, the "applicable" ordinances will not include the subdivision and land development regulations, but may include zoning, storm water management, flood plain, grading, etc.

8. REQUIRED MUNICIPAL AND COUNTY REVIEW AND APPROVAL STATEMENTS

The number and wording of required review and approval statements will vary based on whether a municipal subdivision and land development ordinance has been enacted, and on whom the ordinance designates as the approval authority for subdivisions and land developments. The following situations are possible:

- A. Municipal ordinance is in effect. Governing body is designated as approval authority. Municipal planning agency reviews. County planning agency reviews.

Reviewed by the Planning Commission of the Township of Kennedy on this _____ day of _____ 19____.

Secretary

Chairperson

Approved by the Board of Commissioners of the Township of Kennedy by resolution on this _____ day of _____, 19____.

Secretary

Chairperson/president

(Seal)

Reviewed by the Allegheny County Department of Economic Development on this _____ day of _____ 19____.

(Seal)

Director

- B. Municipal ordinance is in effect. Municipal Planning Agency approves plans. County Planning Agency reviews plans.

Approved by the Planning Commission of the Township of Kennedy on this _____ day of _____ 19____.

Secretary

Chairperson

Reviewed by Allegheny County Department of Economic Development on this
_____ day of _____ 19____.

(Seal)

Director

I, _____, a Registered Professional Engineer for the Township of Kennedy, do hereby certify that this plan meets all requirements of the applicable ordinances of the Township of Kennedy, except as departures have been authorized by the appropriate officials of the Township.

Date

Name

(Seal)

Registration Number

6. MUNICIPAL DECLARATIONS

- A. No acceptance of dedication. A declaration must be placed on any plan that shows dedication of streets or other property to the municipality that the dedication imposes no responsibility upon the municipality for acceptance of the dedication, or for the improvement or maintenance of any dedicated facility until the dedication is accepted by ordinance.

The Board of Commissioners of the Township of Kennedy gives notice that, in approving this plan for recording, the Township of Kennedy has not accepted dedication of any streets, land or public facilities and has no obligation to improve or maintain such streets, land or facilities.

Secretary or Manager

Head of governing body

- B. No building permits without approved sewage facilities. Although sewage facilities should be approved by the time of recording, this declaration clarifies that buildings may not be constructed without approval of sewage facilities. The municipal secretary or manager may sign this declaration.

The Township of Kennedy agrees not to issue building permits until the "Planning Module for Land Development" has been approved in accordance with the regulations of the Pennsylvania Department of Environmental Protection.

Date

Authorized township official

7. OTHER REQUIRED STATEMENTS

- A. For plans where sewage facilities are not required. If a non-building waiver of sewage facilities requirements has been approved, the following statement must be placed on the plan for recording.

As of the date of this plan's approval by the approving authority, no development of any land contained in this subdivision or land development for any purpose requiring sanitary sewage facilities is planned. No portion of this property has been approved by the municipality or the Department of Environmental Resources for the installation of sewage disposal facilities. No sewage permit will be issued for the installation, construction, connection to or use of any sewage collection, conveyance, treatment, or disposal system unless the municipality and the DER have both approved sewage facilities planning for the property included in this plan in accordance with the Pennsylvania Sewage Facilities Act (35 P.S. Sections 750.1 et. seq.) and regulations promulgated thereunder. Prior to the transfer of any lot or property included in this plan, any purchaser should contact appropriate officials of the municipality, which is charged with administering the Sewage Facilities Act, to determine what sewage facilities planning is required and the procedure and requirements for obtaining appropriate permits or approvals.

- B. For plans requiring access to state highways. Section 508(6) of the Municipalities Planning Code requires that no plat requiring access to a highway under the jurisdiction of the Department of Transportation shall be finally approved unless the plat contains the following statement:

A highway occupancy permit is required pursuant to Section 420 of the act of June 1, 1945 (P. L. 1242, No. 428), known as the "State Highway Law" before driveway access to a State highway is permitted.

- C. Plans requiring easements for public and private utilities shall be finally approved unless the plat contains the following statements.

EASEMENTS

The Property Owner may use the surface areas in the various easements for farming, parking and similar purposes; however, no structure of any kind may be erected thereon.