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RICHLAND TOWNSHIP MUNICIPAL AUTHORITY

**DEVELOPERS HANDBOOK FOR WATERLINE CONSTRUCTION
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Richland Township Municipal Authority
Developers Handbook for Waterline Construction

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DEVELOPERS HANDBOOK FOR WATERLINE CONSTRUCTION

INTRODUCTION

The Developers Handbook is provided by the Richland Township Municipal Authority of Allegheny County for the sole purpose of assisting developers through the process of extending waterlines within the Authority's service area. A Procedural Flow Diagram has been provided in order to ease the developers understanding of the service request process. The Handbook contains three sections: Rules and Regulations, Developers Agreement, and Construction Specifications. The user should become familiar with the entire Handbook before entering into the service request process. Furthermore, no sections of the Handbook should be utilized separately.

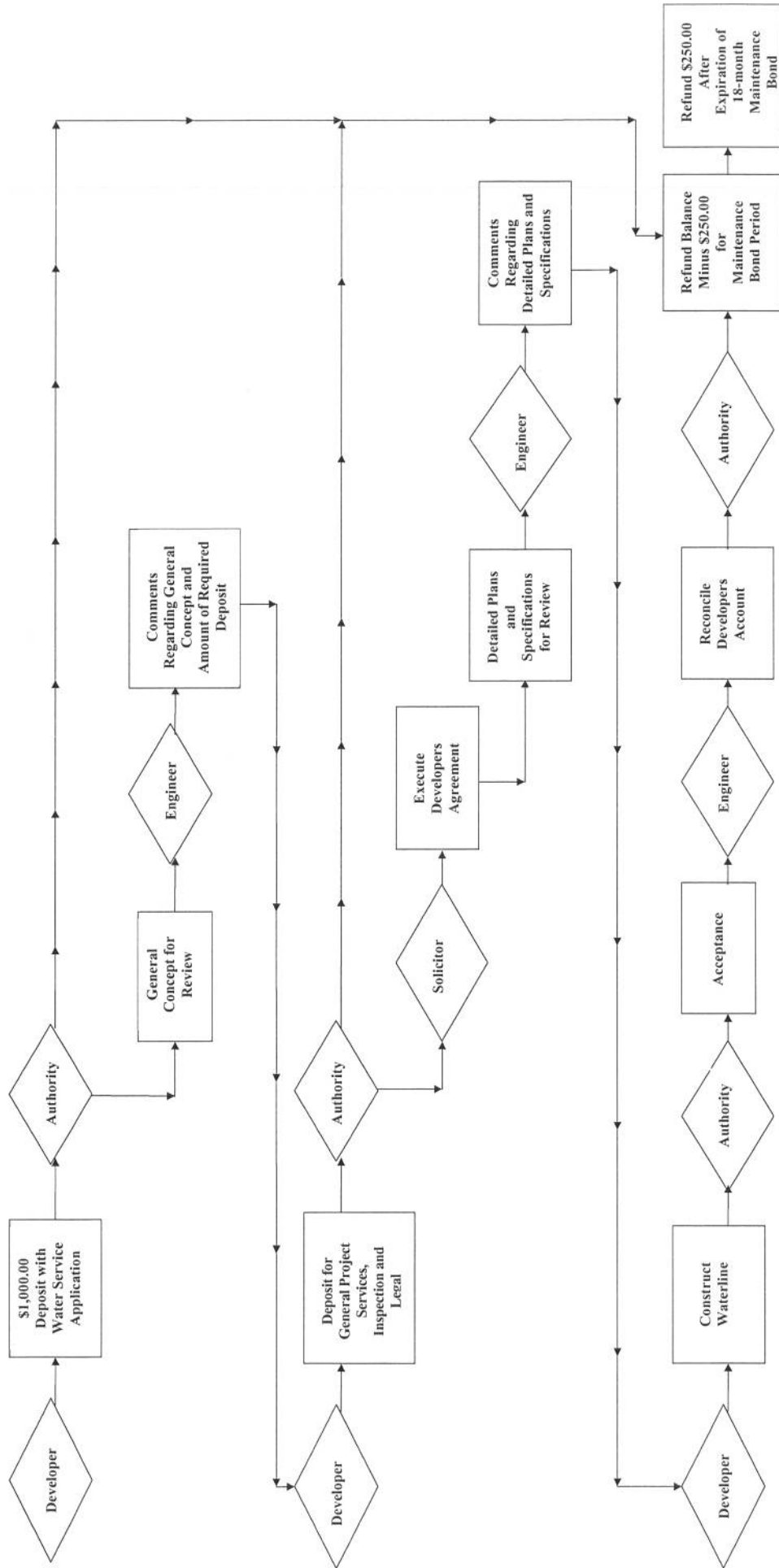
Rules and Regulations for Waterline Extensions:

This is the section of the Authority's Rules and Regulations pertaining to waterline extensions. This section of the Handbook covers administrative, legal, and regulatory aspects of the service request process. This section also outlines drawing quality, fiscal responsibility, and the developers agreement.

General Specifications for Waterline Construction and Standard Details

This section covers the Authority's construction requirements. These Specifications should be used as a guideline for preparation of construction contract documents.

PROCEDURAL FLOW DIAGRAM FOR WATERLINE EXTENSIONS
 Richland Township Municipal Authority of Allegheny County



**RULES AND REGULATIONS
FOR WATERLINE EXTENSIONS**

WATERLINE EXTENSIONS AND ADDITIONAL FACILITIES

GENERAL: No water extension from existing Authority lines shall be installed, no distribution systems and/or pumping or storage facilities shall be constructed or other such work done, without approval first having been obtained from the Authority and where required a permit obtained from the Pennsylvania Department of Environmental Protection (DEP), and written applications on the forms furnished by the Authority shall have been submitted, requesting approval thereof and the appropriate agreements fully executed. The work shall be in accordance with these Rules and Regulations, requirements of the Township and other applicable requirements. Any work in areas other than the Township of Richland shall be in accordance with these Rules and Regulations and any higher standards as established by the municipal subdivision in which the work is located. All such facilities shall be conveyed at no cost to the Authority.

Prior to any detailed concept or design work occurring the applicant shall deposit \$1,000.00 with the Authority and a copy of the property deed indicating applicant ownership of lands to be developed.

The applicant shall meet with the Authority Engineer to discuss water service, technical and administrative concepts, Authority's Rules and Regulations and to determine the required additional deposit to be made with the Authority. No work shall be commenced by the Authority until an initial deposit has been completed with the Authority.

The applicant must prepare, at their cost, all Contract Plans and Specifications, Right-of-Way Plans, Contract Documents, Reports and other material, and shall prepare and file any applications relative thereto, and shall pay all fees.

LIMIT OF EXTENSION: The extension of a water line includes the entire quantity of pipe and appurtenant facilities required to make a complete installation from the end of the existing Authority system to and across ½ the frontage of the last property for which the applicant has requested service or of sufficient length such that a perpendicular service connection to the last property is feasible, whichever is the greater distance.

APPLICATIONS FOR APPROVAL OF EXTENSIONS AND OTHER WORK AND GENERAL REQUIREMENTS RELATIVE THERETO: Written request must be submitted for the purpose of requesting approval of a water line extension, distribution system, pumping/storage facilities, and/or other work, and the obtaining or furnishing water service therefrom. All such requests shall be subject to the terms and conditions set forth herein and the requirements of the municipal subdivision in which the work will be constructed. The applicant will be required to execute an agreement prepared by the Authority Solicitor. This agreement, together with the Rules and Regulations of the Authority and the requirements of the municipal subdivision, shall regulate and control the construction of all facilities and water service therefrom.

All requests for waterline extensions must be accompanied by plans, specifications, and a report describing the system in detail. The plans must be stamped with the seal of a Pennsylvania Registered Professional Engineer and must be submitted in triplicate. A review submission must

be made to the Authority. A final submission must be made and the plans must be approved by the Department of Environmental Resources, and by all other agencies, including Labor and Industry, etc., as required.

Subsequent to completion of the work, the applicant shall submit as-built plans to the Authority. No service will be furnished until these plans are submitted. As-Built plans shall consist of one (1) set of blueprints and one (1) set of reproducible mylars.

The plans shall be prepared on mylar sheets 24 by 36 inches in size, with a 1 inch border on the left hand side and a 1/2 inch border on all other sides. A 3 by 5 inch title box shall be located in the right-hand corner.

RESPONSIBILITY FOR COST: The entire cost of all work shall be borne by the applicant except, if approved, for the difference in the cost of facilities required for the proposed use and the cost of more adequate facilities that will permit additional service for other areas, the difference to be determined by the Authority's Engineer in accordance with Act 203 of 1990 as amended from time to time of any successor statute.

The cost of such work shall, as a minimum, include the following:

- a. The cost of all water lines, of the size required for the project, none to be less than 8 inches in size unless otherwise approved by the Authority, and of all other appurtenances.
- b. The cost of connections to existing waterlines.
- c. The cost of all grading, landscaping, fencing, and other work if required and approved.
- d. The cost of all land and rights-of-way, the rights-of-way and land to be conveyed to the Authority.
- e. The payment of a minimum of 10% of the total construction costs to defray all legal, engineering and overhead costs, if the project is to be designed and constructed by the Authority. All such costs must be borne by the applicant. If the project is designed and constructed by the applicant, the applicant must pay in advance the Authority costs involved in the review of the Contract Plans and Specifications, field work, legal work, administrative and such other costs in connection with the project. The Authority will determine the amount of estimated advanced costs.
- f. The cost of a resident engineer or inspectors furnished by the Authority to supervise and/or inspect construction of the project or projects, such costs to be the per diem rate currently in effect, plus mileage costs and expenses.
- g. The payment of all tapping, and other fees.

PAYMENT OF COST: After the initial deposit, the applicant shall deposit with the Authority, prior to the commencement of any work, a sum of money sufficient to pay all estimated costs of work to be performed by the Authority. If the Authority approves the construction by the applicant, through a qualified Contractor, the monies to be deposited shall be sufficient only to cover the cost of engineering, legal and overhead, which costs shall not be less than 10% of the estimated total costs and at no time shall the balance of such deposit be less than \$1,000.00.

FINANCIAL SECURITY: When the Authority accepts dedication of the waterline extension following completion, the Developer shall post financial security to secure the structural integrity and functioning thereof in accordance with the design and specifications as depicted on the plans therefore, for a period of eighteen (18) month from the date of acceptance of dedication. Said financial security shall be in the amount of 15% of the actual cost of installation of said improvements. Said financial security may be in the form of cash, a maintenance bond posted with a bonding company authorized to conduct business in the Commonwealth of Pennsylvania, and /or federal or Commonwealth chartered lending institution irrevocable letters of credit and/or restrictive or escrow accounts in such lending institutions.

AGREEMENT: The Applicant shall enter into an agreement with the Authority, prior to the review of construction documents or the execution of any work - the agreement to contain such pertinent conditions as the following:

- a. The cost of all work to be borne by the Authority, except as otherwise indicated.
- b. The materials and workmanship are to be in accordance with the requirements of the Authority.
- c. The highway, streets, alleys, and lanes in which water lines extensions are to be located must be dedicated to public use, the lines and grades thereof established, and the rough grading completed.
- d. The ownership of all installations shall be conveyed to and vested in the Authority except as otherwise indicated.
- e. The Authority is to have the right to make further extensions beyond or laterally from the main extensions. Arrangements for connections to the waterlines constructed by the Applicant will be defined in the agreement.
- f. The payment of refunds to the owner for additional new customers to be subject to such conditions as set forth herein, or as agreed upon, and to a limiting number of years. No refunds are to be made unless from monies received from other consumers for the privilege of obtaining services from the extension covered by the agreement.
- g. Such other related requirements.

COMPLIANCE WITH DESIGN AND CONSTRUCTION STANDARDS: All work shall be in accordance with the General Specifications for Waterline Construction and other requirements of the Authority and the Department of Environmental Resources.

GENERAL PLANS: In the case of a phased Subdivision, the applicant shall submit a general plan on a scale not smaller than 300 feet to 1 inch and, preferably, not larger than 100 feet to 1 inch, covering the entire area of the water district - and of any extension of any modification of any water system. In the case of a phased development all future waterline locations should be indicated. Approval of the site plan by the municipal subdivision in which the project is located must be indicated on a site plan (Erosion and Control, etc.).

These plans must show the boundary line of the municipality or water district to be provided waterlines; all existing and proposed streets, watercourses, and other salient topographic features; contour lines for intervals of not less than 5 nor more than 10 feet; and the surface elevations at street intersections and at points where changes of slope occur. The plans must show clearly the locations of all existing and proposed utilities.

In all cases, the plans must clearly show the size of the waterline, the character of the pipe material, the grades, the elevation at all points, the location of all appurtenances, and such other data.

DETAILED PLANS: The applicant shall submit detailed plans accompanying the general plans. The waterline plans shall consist of plan and profile. All topographic features, rights-of-way, property ownership, utility lines, service connections, construction details, etc. shall be shown on the contract drawings. The plan scale shall be 1"=50' and the vertical scale shall be 1"=10'.

All stream crossings shall be indicated. The applicant shall obtain all required stream crossing permits. The applicant shall also obtain all permits and approvals from the appropriate agencies relative to soil and erosion control. A soil and erosion control plan shall be a part of the contract documents.

Particular attention shall be given to any pumping station, pressure reducing, storage tanks or any such facilities. Regardless of the project scope, it is mandatory the applicant hold a predesign meeting with the Authority and its Engineer. In the case of such facility design, the Authority's Engineer at the expense of the applicant will prepare a preliminary design report to be followed by the applicant in the detailed design drawings for the facilities.

Construction specifications prepared in a bound 8 1/2" x 11" booklet shall be submitted with the plans. The text shall be clear and in typed format. All aspects of construction/materials shall be addressed in the specifications. Construction specifications shall be in conformance with the Authority's General Specifications for Waterline Construction.

All construction documents must be submitted to the Authority for review and approval. The Authority reserves the right to make modifications as required to the construction documents. Final approval drawings must bear the design engineer's stamp of the approval. The review signature of the Authority Engineer and Township representative shall also appear on each drawing.

The submitted Construction documents must comply, at a minimum, with the following standards:

- a. 24 x 36 inch paper with 1 inch border, signed and sealed by a Pennsylvania Professional Engineer.
- b. Plan and Profile on same sheet. Plan at minimum scale of 1"=50' and profile at 1"=50' horizontal and 1"=10' vertical.
- c. Indicate all utilities and compliance with Act 287.
- d. All topographic features with existing and proposed grades at contours no less than 5' foot intervals.
- e. All proposed and existing property lines.
- f. Separate plan for recording right-of-way, streets, etc. that will be filed with the County.
- g. In the case of a subdivision, a master plan of the water utilities showing phased build out.
- h. In the case of a subdivision, a master plan of lots shall be provided to the Authority.
- i. If a facility (tank, pump stations, etc.), contract documents must comply, at a minimum with the requirements of PADER. Drawings shall consist of grading plan, layout, outside piping, flow diagram, hydraulic profile, erosion and sedimentation control plan, mechanical plans, sections and details, architectural plans, sections and details, structural plans, sections and details, electrical plans and single line and control diagrams.

REPORT: The application shall be accompanied by an Engineer's report giving a full description of the proposed system and setting forth the basis of design, prepared in accordance with DER requirements.

The report must include a statement and description of the extent of area which it is proposed to include within the system at the present time, and in the future; the estimated present and future population to be served; the estimated rates or volume of water to be provided for; and such other data and information. Planning Modules, where required, shall be submitted with the report.

Where private fire service, large water demands, high flow rates, etc., exist in the opinion of the Authority special facilities may be required. In special cases the Authority will provide at the applicant access to the system to conduct hydraulic tests to ascertain existing conditions.

**GENERAL SPECIFICATIONS FOR
WATERLINE CONSTRUCTION
AND STANDARD DETAILS**

**RICHLAND TOWNSHIP MUNICIPAL AUTHORITY
OF ALLEGHENY COUNTY**

**GENERAL SPECIFICATION
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SPECIFICATIONS FOR WATERLINE CONSTRUCTION

INTRODUCTION: These General Specifications are to be utilized by the Applicant in the preparation of his construction documents for the extension/modification of Authority waterlines. The Applicant shall review the documents and revise them as required to conform with the specifics of the project. These General Specifications are to be used in conjunction with the Rules and Regulations of the Authority and with the terms and conditions of the Agreement between the Applicant and the Authority.

It is expressly understood that the Authority views all persons, firms, etc. working for the Applicant as being the Applicant.

ADMINISTRATIVE REQUIREMENTS: In addition to adherence to the construction specifications contained herein, the applicant shall also submit the following administrative items prior to project acceptance:

- a. Certificate of Insurance
- b. Shop Submittals (5 sets)
- c. Additional Developer's Deposit (as required)
- d. Contractor Information Form
- e. Maintenance Security
- f. Release of Liens
- g. As-built drawings on mylars and in the latest version of AutoCAD format on a CD-ROM.

INSPECTION OF CONSTRUCTION WORK: All work performed in connection with the extension, modification or improvement of public water facilities shall be required to conform with all Authority Rules and Regulations and shall be inspected during construction by an authorized representative of the Authority. All completed work shall be required to meet the approval of the Authority's engineer and shall be changed, modified, replaced, removed or otherwise corrected by the Contractor to such extent as directed by the Authority's engineer.

The work will be periodically or continually inspected during its progress and when substantially completed, shall be inspected jointly, by the Authority's engineer, Authority 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 Authority's engineer, the work will be declared complete and, upon acceptance of the dedication of such line extension by the Authority, the eighteen (18) month maintenance period shall commence. During the term of the maintenance period the Contractor shall return when and as required to reconcile any problems resulting from construction, such as water line leakage, mechanical malfunction, drainage, restoration, etc. In addition a maintenance bond inspection shall be made by the Authority at a date between twelve and eighteen 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.

AS BUILT 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 pipe line alignments and elevations and any other changes from the pre-construction approved plans. He shall also reference the locations of the ends of water service lines so that the same may be uncovered and connected at future times. In addition, the Contractor shall provide details of valve clusters, fittings, etc., on the as-built drawings showing reference distances from permanent features. The set of prints on which such field information is recorded shall be utilized for transposing that information onto the original drawings.

RIGHTS-OF-WAY: The Authority or land developer, whichever the case may be, will have, prior to commencement of construction, acquired the necessary rights-of-way where the line is located; however, if the contractor desires ingress or egress to the proposed pipeline location from other than public roads or streets, it shall be his responsibility to make the necessary arrangements, with the respective property owners involved. The contractor shall make every effort possible to confine his construction activities to the limits of rights-of-way and is advised that he shall be solely responsible for any activities outside of the right-of-way limits. The Authority or land developer, whichever the case may be, shall obtain and pay for all permits required to construct pipelines within roads or highways.

LINE AND GRADE: The drawings indicate certain bench marks and topographical features on which the location and construction of the proposed pipeline shall be based. The contractor shall provide any and all additional field surveying required to control either line and/or grade and to assure installation of the facilities according to plans, profiles, and details shown and described on the drawings. Inasmuch as the waterline will operate under pressure, exact control of gradient will not be required, however, pipes shall be installed along the alignment and at the elevations indicated on the drawings.

CLEARING AND GRUBBING: The areas along the alignment of the proposed waterline shall be cleared and grubbed to the extent necessary to accommodate the trenching, pipe laying, and backfilling operations; however, the area is not to exceed the limitations of rights-of-way. No trees shall be cut and/or destroyed unless absolutely necessary. Trees in lawn and/or landscaped areas shall not be removed without the consent of the Authority. The contractor shall make such arrangements as may be necessary for the removal and disposition of the various brush, trees, and other debris as is necessary.

No such materials shall be included with trench backfill, and prior to completion of all contract work, all materials shall be cleaned up, transported and removed from the site.

EXCAVATION AND BACKFILL: All pipeline and appurtenances shall be constructed by the open trench excavation method except where boring is called for on the contract drawings. 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, driveway surfacing or other natural or man-made materials.

Exploratory excavations shall be made at the commencement of construction to identify the elevations and/or configurations of the existing water lines to which connection of proposed

pipes are indicated. After exposure at those critical locations or connections, the contractor shall submit changes in alignment or gradient which may require additional work or material to the Engineer for approval before proceeding with the work.

The width of the 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 pipe. In the event that the contractor's 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 the structural integrity of the pipe.

Where the trench bottom contains satisfactory material the pipe shall be laid on the flat bottom with holes for bells provided to insure that the pipe shall lie flat and be supported for its full length.

Where excavation exposes the bottom of proposed trenches where rock, very soft or other unsatisfactory pipe foundation materials exist, the contractor will be directed to overcut (in the case of rock) or stabilize/overcut (in the case of soft material). The pipe shall be supported on bedding material with a minimum thickness of 6" below the bottom of the pipe barrel; said material shall also be placed on the sides of the pipe and to a horizontal plane located one foot above the top of pipe, identified as the pipe zone with the exception of backfill provisions under pavement areas as described hereinafter. Proper pipe restraint shall be employed where unstable material is encountered during construction.

The excavated material from the trench may be stored along its alignment of rights-of-way obtained for construction purposes. It may not, however, impede traffic flow 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 also not obstruct or alter the flow of surface water runoff to the detriment of the operation of existing surface water drainage facilities and ditches.

Backfill material utilized for restoration of open trenches excavated through permanent pavements, curbs, driveways or where such structures are undercut by the excavation, and roadway shoulder areas, shall consist of PennDOT approved 2RC or 2A material for the entire backfill to the subgrade of the structure onto the roadway shoulder finish grade. It shall be thoroughly compacted in 6" lifts for the full depth of the trench. The material placed in the pipe zone shall be carefully compacted to avoid displacement of the pipeline, valves, fittings and appurtenances.

At locations outside the pavement areas or roadway shoulder along the pipeline, the backfill material for the full trench depth, shall be selected excavated material which shall be thoroughly compacted and placed in such a manner to avoid disturbance or displacement of the pipe, valves and/or other appurtenances. The backfill material shall contain no rocks or hard shale which have a maximum dimension exceeding two inches. The backfill material may be placed by machine and mounded over the trench width. After settlement has satisfactorily occurred and subject to a

time approved by the Authority's representative on the site, the surface shall be restored as required hereinafter for lawns and other improved or cultivated areas.

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

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

No more than one hundred feet of trench shall be opened at any one time.

Blasting will not be permitted.

EXPLORATORY EXCAVATIONS: The exact location and condition of the existing water lines to which connections are to be made may vary in some respects from the arrangements indicated on the Drawings. Therefore, in those areas where such connections are to be made the contractor shall make appropriate exploratory excavations for the purpose of locating said lines and confirm the materials to be furnished and installed. The Authority's representative will then confer with the contractor regarding the method of construction proposed to be used for performing the contract work in said areas and, if realignment of the proposed pipelines or appurtenances appears possible and/or reasonable without conflicting with the terms set forth elsewhere, said alignment shall be made.

WARNING SIGNS, LIGHTS AND BARRICADES: Among streets and at such other locations, a minimum of one lane traffic shall be maintained at all times during construction of this project in order to accommodate traffic as well as emergency fire, ambulance and similar vehicular traffic. Suitable and adequate barricades shall be erected and properly maintained by the applicant at all times during the course of construction work to clearly and properly caution and protect traffic and pedestrians from open excavations, unstable filled areas, obstructions and other hazards directly or indirectly resulting from the construction activities. Warning signs, barricades and handrails shall be erected and a sufficient number of high intensity warning lights shall be appropriately located for use at night and at other times when visibility is poor.

Where pipe lines and/or other facilities are constructed along State Highways, Township streets, and where construction activities may otherwise impede normal vehicular traffic patterns on said 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".

No open excavations will be allowed overnight. It is mandatory that excavations be closed prior to the completion of the working day and that the roadways be free and accessible to travel. The contractor is required to maintain the level of the trench with the sub-base material until such time as paving is completed. The applicant shall coordinate providing two days advance notification to residents in these areas affected by construction.

DEWATERING: All trenches shall be dewatered thoroughly in advance of the pipe installation construction activities. The dewatering operation may be accomplished by the use of pumps, well-points, wells or any combination of those systems, but in any event, the pipeline shall be constructed in a trench which will be required to be free of ground, surface or any other source of water inflow and/or infiltration. The proposed water pipeline may not be used for dewatering purposes under any circumstances and particular care shall be exercised to keep open pipe ends sealed with plugs which are fabricated for that purpose and to prohibit the entrance of any extraneous water. Where dewatering pumps are required to be used sufficient discharge hose and other appurtenances shall be provided so that the water is discharged into storm drains, creeks, streams or other suitable water courses intended for such purposes.

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, storm drains, conduits and other similar utility lines and appurtenances for which said 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 of 1972 and As Amended by PA Act 187 of 1996 known as the Underground Utility Line Protection Act.

The approximate location of many power and telephone 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 and liable 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 damaged or disturbed facilities shall be accomplished immediately after incurrence thereto.

Water, sewer, gas , electric, and telephone service to dwellings or places of business shall be maintained with a minimum of interruption throughout the construction of the 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.

Much of the proposed work may be 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 disturbance 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 applicant 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, water line construction work in those areas shall be immediately suspended, the Authority shall be immediately advised of the condition, and the work shall not resume until all repairs have been properly completed.

DUCTILE IRON WATER PIPE: All pipe to be furnished shall be Ductile Iron Pipe, centrifugally cast in metal molds or sand-lined molds, for water or other liquids as described in the specifications published by the American Water Works Association ANSI/AWWA C151/A21.51. Fittings shall conform to the applicable provisions of ANSI/AWWA/C110. The pipe shall be thickness Class 52 and furnished in 18 or 20 ft. lengths. Joints shall generally be of the push-on type; however, the joints at the fire hydrant assemblies shall be restrained and shall be of the mechanical type. All fittings shall also be fitted with mechanical joint couplings. The manufacturer shall furnish a sworn statement that the inspection and all of the specified tests have been made and that the results comply with the above stated specification standards.

All pipe and fittings shall be coated and shall be provided with a double cement lining in accordance with the latest revision of the ANSI/AWWA/C104/A21.4 specification.

The push-on type joints shall be of the single rubber gasket type molded to be positioned in an annular recess in the pipe or fitting and shall compress radially to form a positive seal and shall be shaped so that the gasket is locked in place against displacement. Joints shall conform to those provisions set forth in the ANSI/AWWA/C111/A21.11 specifications, which are applicable to the push-on type. All lubricants and gaskets and any required special tools for construction of the pipeline shall be furnished by the pipe manufacturer. All necessary accessories including lock ring, bolts, etc., shall be furnished and installed to accommodate the restrained and mechanical joints.

Pipe and fittings shall be similar and equal to those products manufactured by Atlantic States Cast Iron Pipe Co., Clow Corporation, American Cast Iron Pipe Company or U.S. Pipe and Foundry Company.

INSTALLATION OF THE DUCTILE IRON WATER PIPE: All pipe, valves and hydrants shall be installed in accordance with the alignments, profiles and elevations indicated on the drawings. Exploratory excavation at critical points of crossing and/or possible conflict with other utilities shall be made prior to laying any pipe.

The push-on type ductile iron pipe, fittings and accessories shall be furnished and installed in general accordance with the applicable provisions of Standard ANSI/AWWA/C600 of the latest revision. The trench bottom shall be true and even and bell holes no larger than that required to make connections of the joints shall be provided. Pipe plugs shall be used at all times to protect the pipeline from the entrance of extraneous water, animals, or other foreign material. Joints shall be deflected as required to conform with the alignments shown on the drawings, but in no event shall deflection angles exceed five degrees. Concrete thrust restraints shall be installed at all significant changes in pipeline alignment and wherever pipe fittings are designated; concrete thrust blocks shall be cast in place in the trenches per the details and configurations shown on SD-02. If necessary, the pipe shall be cut in the field to accommodate the alignment and/or the locations of fittings shown on the Drawings. Retainer glands shall be installed where specified by the Authority. Field-Lok gaskets are required where waterline installation occurs within fill areas or where unstable material exists.

Where waterline is to be constructed in areas where corrosive materials may exist, the pipe shall be encapsulated with polywrap prior to burial.

Care shall be exercised to properly install the gate valves and boxes and the hydrants so that they are readily accessible at the respective elevations of existing ground. The hydrants shall be located in the field where directed by the Authority's representative. Detectable marking tape shall be installed a distance of 2 feet above the top of the pipe. The tape shall contain the wording "Caution Buried Water Line Below".

After completion of all pipe installation and after sterilization has been accomplished in accordance with procedures outlined for disinfection of the pipe lines, the lines shall be flushed so that all dirt and debris and the sterilization solution will be thoroughly cleaned out of the pipes. Flushing shall be accomplished at a time satisfactory to the Authority and the flushing water shall be conveyed to ditches or creeks in such a manner as to avoid traffic or other hazards, and erosion of public or private properties.

GATE VALVES: All valves shall be furnished with mechanical joints, as indicated and shall conform to the specifications set forth in the ANSI/AWWA C509 standard of the latest revision. The valves shall be installed in the vertical position and at the bury and locations shown on the Drawings. Valves shall be cast iron or ductile iron body, resilient seat, open counterclockwise, with 2" square operating nut, designed for a working pressure of 250 psi. Valves shall be Mueller Catalog No. A 2360-20, Kennedy Catalog No. 1571X or equal. Each valve shall be equipped with a screw type cast iron valve box and cover indicating "Water Service." Lengths of the boxes shall be compatible with the depths of the respective valve installations as shown on the drawings.

HYDROSTATIC TESTING: After the pipeline has been properly constructed and flushed, a hydrostatic test shall be conducted at a pressure of a minimum 150 pounds per square inch at any point of testing. The time period of said test shall not be less than two hours and the pressure shall not vary by more than plus or minus 5 psi during the duration of the test. All air shall be completely expelled from the section of line to be tested prior to application of the test pressure.

No section of pipeline will be accepted if, as a result of the aforementioned hydrostatic test, leakage is greater than an amount determined by the following formula:

$$L = \frac{SD(P)^5}{133,200}$$

- L: Allowable leakage, gallons per hour
- S: Length of pipe, tested, feet
- D: Diameter of pipe, inches
- P: Average test pressure, pounds per square inch

At a test pressure of 150 psi, the above formula results in an allowable leakage of 0.74 gallons per hour per 1000 feet for 8" diameter pipe, 0.55 gph per 1000 feet of 6" diameter pipe.

If the testing of any section of line discloses leakage greater than that amount, the applicant shall, locate the problem and make all necessary repairs and retest until the pipeline conforms with the specified allowance. Any and all visible leaks which are detected shall also be repaired, regardless of the amount of leakage.

DISINFECTION: All pipelines constructed shall be disinfected in accordance with the "tablet method" as stipulated in ANSI/AWWA C651-99 attached as Exhibit A in these Standard Specifications. The tablets shall be attached to the inside and at the top of the installed pipes by using an adhesive similar or equal to Permatex No. 1.

The pipeline shall be isolated from the existing system and shall, when the sterilization operation commences, be slowly filled with water at a rate where velocities shall not exceed one foot per second. After the pipeline has been completely filled and all air has been expelled, the water shall be permitted to remain in the pipe for a period of not less than 48 hours. The pipeline shall be flushed clean. The Authority will test the water and if the tests indicate poor water quality the applicant will be required to repeat disinfection of the water line at no cost to the Authority. Improper disposal of highly chlorinated water resulting in environmental damage and consequential fines will be the sole responsibility of the Contractor performing the testing.

All bacteriological testing shall be performed in accordance the AWWA C651-99. All bacteriological testing shall be coordinated with the Authority and shall be at the Contractor's expense.

THRUST RESTRAINTS: Concrete blocks shall be cast in place in accordance with the configurations shown on SD-02. Such blocks shall be required to be poured, after installation of the adjacent piping at all fittings installed along the pipeline. The concrete to be used may conform with mix proportions of water, cement, and fine and coarse aggregates utilized locally, however, it shall have a minimum compressive strength of 3,500 pounds per square inch and a maximum slump of five inches. The concrete shall be placed such that it is supported against undisturbed earth along the excavated trench wall and the trench bottom and shall be thoroughly worked and vibrated to insure complete contact with the walls of the fittings being restrained. No trench backfill shall be placed at the locations of the thrust blocks until twenty-four hours after placement, and/or until the Authority's representative on the site has inspected the installation. Retainer glands shall be installed where specified by the Authority.

ROADS, WALKWAYS, PAVING AND SURFACE RESTORATION: It is intended that all surfaces occupied, disturbed, damaged or used to accommodate or perform construction work or for access to any part of the site shall be restored, as nearly as is practicable, to the condition existing prior to construction. Signs, drain pipes, curbs, storm ditches and any and all other existing public or private property items shall, where necessary be temporarily removed so that the work can be performed; said items shall, as soon as possible be properly replaced at a location and in accordance with the requirements of the respective owners. Driveway drain pipes shall conform to the specifications and requirements of the municipal subdivision in which the work is performed and shall be a minimum of 12 inches in diameter, galvanized corrugated metal pipe. When necessary to temporarily remove mail boxes so that the work can be performed, the mail box shall be restored in the shortest time to the requirements of the U.S. Postal Services and at the original location together with unrestricted access. When necessary to temporarily remove property pins, they shall be accurately restored to the same location through survey or some other means approved by the property owner.

The contractor shall confine his material storage, excavation, topsoil storage and other work within the rights-of-way provided except when by written agreement between the applicant and the owner of the property through which the right-of-way passes, permission is granted to occupy areas beyond that designated.

When working on public or private highways, streets and alleys, the applicant shall confine his operations as required by the Authorities having jurisdiction.

The contractor shall make his own arrangements with private individuals relative to storing materials or equipment on private lands.

Where the construction work is across, along or through right-of-ways, roadways, streets or alleys, belonging to the State, County, Township or utility companies, the regulations and stipulations set up and required by those agencies shall be observed and all work shall be in conformance with the requirements set forth by that agency. Any and all permits required for opening roadways or streets shall be obtained by the applicant at his own expense. The cost of all inspection required by those Agencies shall be borne by the applicant. The expense of said permits and inspection shall be paid by the applicant even though the permits and inspection agreements may be issued to, or be between the Authority of the road or utility and the

Authority. If the Authority is billed for these permits, or inspection services, the applicant shall reimburse the Authority at the time the bills are paid.

For bituminous paving on State roads, all materials and methods of construction shall comply with the requirements of Pennsylvania Department of Highways Form 408. Section numbers listed in this specification refers to the section of that document.

BORING AND CASING: Where boring is employed, the contractor shall be responsible for construction to true line and grade and shall be held fully responsible for protecting against surface subsidence, damage or disturbance to adjacent property and facilities due to his construction operations and shall rectify resultant subsidence, damage or disturbance to the satisfaction of the Engineer.

All sheeting, shoring, bracing, lining, etc., required for construction of shafts, portals, etc., shall be furnished and installed by the applicant and shall conform to the requirements set forth under "Open Excavation". All work relative to the installation of waterlines by the boring method shall be performed in accordance with the regulations set forth under Subpart S, "Tunnels and Shafts, Caissons, Cofferdams and Compressed Air" published as part of the Safety and Health Regulations for Construction by the U. S. Department of Labor.

Where possible, boring operations shall be conducted from the high end of the pipe. The pipe shall at all times follow immediately behind the boring auger at a distance no greater than 2 feet. The method of augering the entire hole and then pushing the pipe through will not be permitted.

All steel carrier or casing pipe required for the installation of waterlines by the boring method shall be black steel pipe conforming to the specifications set forth under ASTM Designation A-53. All joints shall be welded. For eight inch diameter waterlines, the casing diameter shall be 16" inches.

The water pipe within casings shall be securely blocked with timber skids or other spacing method approved by the Authority and its engineer. Timber skids shall be pressure treated with Wolman preservative chemicals or creosote conforming to ASSHO M133 and shall be properly sized to accommodate the two pipes. Notches shall be provided where strapping will be installed. Steel strapping shall comply with ASTM A36 specifications. See SD-09.

TOWNSHIP ROAD AND BERM PAVING: All paving and/or berm areas disturbed or damaged as a result of the waterline construction or by other activities of the applicant shall be replaced in a manner to equal or exceed the quality of the existing surfaces and, to the satisfaction of the Authority. The paving and berm restoration shall conform strictly to the standards of Richland Township for pavement work.

All paving removed, damaged or destroyed during the construction of this work shall be replaced by one of the following methods at least equivalent to that existing before construction. Where damage is within two feet of the curb or edge of roadway, replacement shall be to that curb. The contractor shall guarantee all paving replaced against defect and settlement for a period of eighteen months after the date of the final estimate.

All non-rigid bituminous surface paving shall be restored by neatly and uniformly cutting the edges and placing a base course and a surface course over the trench fill in accordance with requirements of Richland Township's Construction Detail Standards No. 2 and No. 3, where applicable, included with the Standard Detail drawings of this document.

RESTORATION AND SEEDING: In lawns and gardens, and in other improved areas (except for streets, roadways, and traveled ways), the top of the backfill material shall be placed to an elevation approximately 4" below the finished ground surface. Commercial topsoil shall then be obtained from a local garden supplier for locations where existing top soil quantities are inadequate, and shall be placed and lightly rolled in the top 4" of all excavated areas and other places where construction equipment and activities have caused damage to the ground surface. The contractor shall reseed all areas disturbed by construction after the topsoil has been properly distributed. The entire area shall then be properly tilled and hand-raked to a smooth, even grade. All seeded areas shall be kept constantly wet to a depth of 3" for 10 days immediately after seeding. All areas which do not show a prompt catch of grass shall then be reseeded as required. In any event, the applicant shall insure a good final stand of grass as specified above and he shall maintain the seeded areas until the lawn as such is free from bare spots and off-color areas and until final acceptance of the entire project.

All lawns and other improved or cultivated areas shall be restored by properly rolling, tilling and hand raking the area disturbed during construction and an application of an approved fertilizer at a rate of 30 lbs. per 1000 square feet shall be made. Grass seed of an approved variety shall be sown by a feeder on a calm day in accordance with suppliers' directions at a rate of not less than 7 lbs. per 1000 square feet. The area shall then be completely covered with peat moss, mushroom manure, or other approved mulch material. The applicant shall be responsible restoration of all settlements and for properly preparing the topsoil, applying fertilizer and mulch and planting the seed, but will not be required to water those restored areas.

DISPOSAL OF EXCESS MATERIAL: All excess materials resulting from either and/or both the open excavation and the tunneling, boring and/or jacking operation, which materials are not replaced as backfill, shall be hauled from the site of the work and shall be disposed as determined by the applicant.

SHEETING, SHORING AND/OR BRACING: All open trenches for construction of the pipeline shall be constructed in accordance with the provisions of the Occupational Safety and Health Act Regulations, as the same pertain to the shape of trenches above the pipe zone, 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. Those excavations for the proposed access pits for performance of the tunneling, boring and/or jacking operation shall be similarly constructed except that all such access pits

shall be continuously sheeted with steel and/or timber which shall be adequately braced with waling or other supports from the respective pit bottoms to the tops. All sheeting and/or shoring shall be designed by the applicant for the conditions encountered and shall be structurally adequate to withstand the loads to be imposed. 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 persons.

Trenches, pits and/or any other excavated and/or backfilled areas where pedestrian or traffic hazards may result during construction or non-construction hours, all be covered with anchored steel plates adequately reinforced for loads which may be sustained and shall be distinctively and clearly marked, barricaded, lighted and detoured to identify the respective hazards.

FIRE HYDRANTS: The fire hydrants shall be manufactured in accordance with the Specifications of the American Water Works Association C502, latest revision and shall be Super Centurion 250 Fire Hydrants as manufactured by the Mueller Company or Kennedy K 81A.

The hydrants shall be of the compression type and shall open counter-clockwise. The hydrants shall have an internal diameter of standpipe of at least 6 inches and 5-1/4 inch valve opening, shall have a 6 inch mechanical joint connection and shall be designed for a 4 foot 6 inch bury; that is the 6 inch inlet pipe shall have at least 4 feet of cover. The hydrant shall have two 2-1/2 inch hose nozzles and one 4 1/2" steamer nozzle opening with threads the same as those on the existing fire hydrants. The applicant shall be held responsible for threads matching the existing hydrants in the municipality in which the hydrant is located (National Standard Threads required in Richland Township). Hydrant painting shall be as selected by the Authority. Installation shall be as shown in the Supplemental Details SD-01 of this document.

The hydrants shall be furnished with safety flanges for protection in case of collision. All bearings shall be fully bronze mounted and the hydrant shall be constructed so that all working parts can be removed without disturbing the barrel of the hydrants or making any excavation. The hydrants shall be designed so as to be frost-proof and be provided with drains which close when the hydrant is opened and open promptly when the hydrant is closed.

Each hydrant shall be subjected to a hydrostatic test of at least 400 pounds prior to shipment and shall be suitable for operating pressures of 200 pounds. The hydrant shall be given on shop coat of lead chromate primer and two coats of approved paint, the color to be chosen by the Authority.

BLOW-OFF ASSEMBLY: A blow-off assembly of the size and type indicated on the contract drawings and in accordance with the supplemental details SD-07 and/or SD-08 shall be installed at locations indicated on the drawings.

DUST AND MUD CONTROL: Dust control palliatives shall be utilized where and when necessary to maintain roads, berms and other traveled ways. In addition, the accumulation of mud and/or dirt from the excavation, backfill or trenching operations shall be cleaned off the pavements by machine and/or by hand labor as frequently as is necessary in order to properly maintain the street and highways.

CONTRACTOR'S OFFICE FACILITIES: The contractor shall provide and make his own arrangements for his field office facilities, change trailers, storage areas, sanitary facilities, etc.

CLEAN-UP: Clean-up work shall reasonably follow the installation of the pipe and appurtenances. After all work has been completed, thorough cleaning of the surface of the ground of all disturbed and occupied areas shall be done to the satisfaction of the Authority's representative on the site.

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 creeks and ponds from erosion of the freshly excavated and/or backfilled material during periods of excavation and surface water runoff. Applicant 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 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 of encroachments during construction both in and along the creeks and ponds such that a minimum of disturbance and erosion pollution results.

EROSION AND SEDIMENTATION CONTROL DURING EARTH MOVING ACTIVITIES: The detailed requirements pertaining to trenching and other earth moving activities are set forth elsewhere in the Specifications. Earth work will consist of trenching for new pipelines.

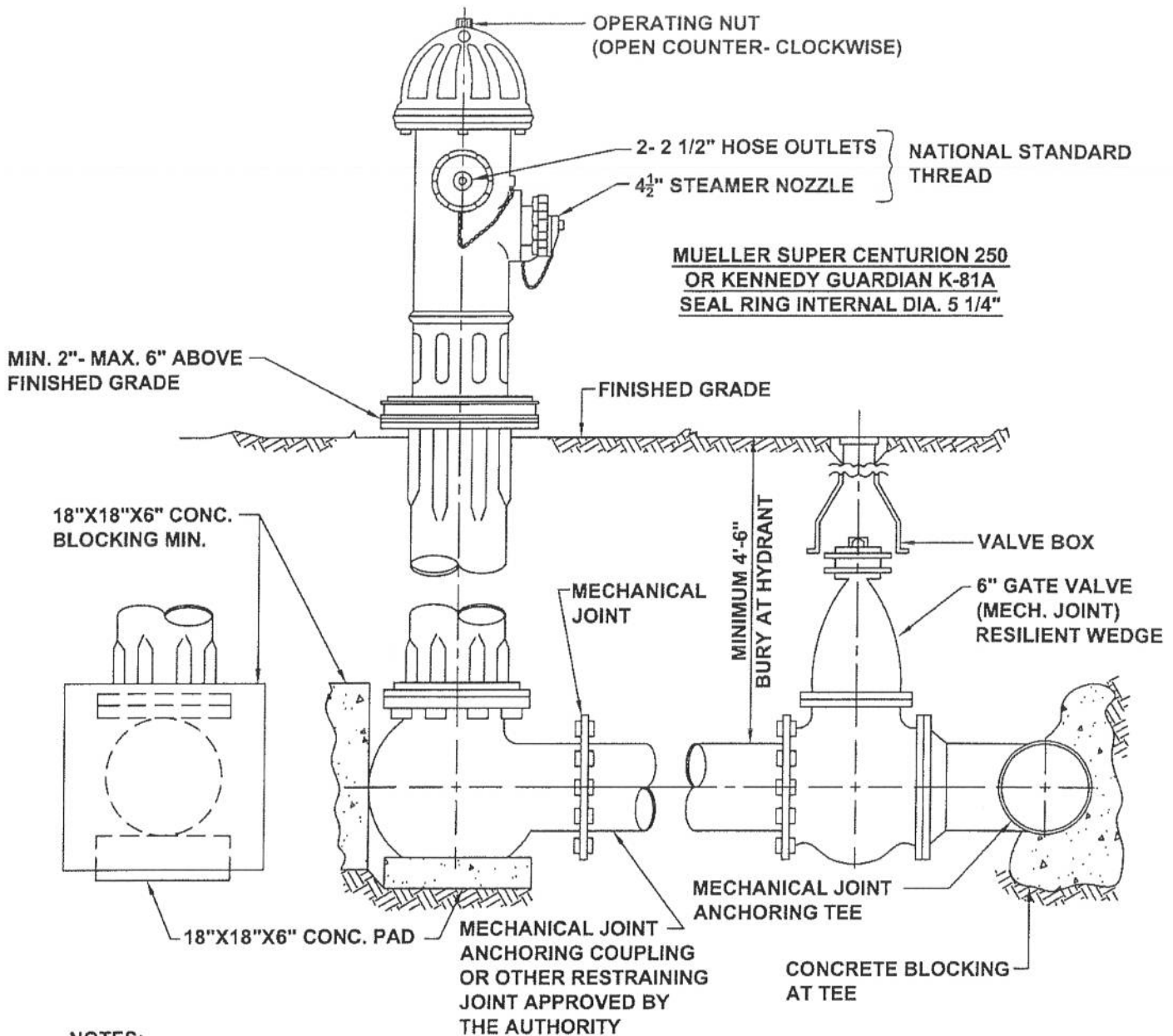
Prior to earth moving activities, the contractor shall install the necessary erosion protection devices required as required by the Pennsylvania Department of Environmental Protection or their representative for adequate erosion and sedimentation control.

GENERAL REQUIREMENTS RELATING TO CONSTRUCTION MATERIALS: The contractor shall submit shop drawings to the engineer for approval of all proposed pipe, joints, gaskets, valves, hydrants and appurtenances prior to the fabrication and delivery of those products.

At delivery of the materials, the applicant shall deliver to the Authority three (3) sets of bound Operation and Maintenance Manuals, where required, for the materials. The manual shall include a complete part list and a name of all the various components making up the material item. A complete section on the maintenance and care of all material shall be included with the manual.

COORDINATION OF WORK WITH THE AUTHORITY: This contractor shall also coordinate its activities with those of the Authority to assure connection to the correct existing waterline and connection with the existing pipe lines at times which are compatible with system operations. Connections to existing pipe lines will be with transition sleeves with tees and other appurtenances. Shut down of waterlines must be coordinated with the Authority at least 48 hours in advance. The contractor is not permitted to operate any valve in the Authority's system.

STANDARD DETAILS

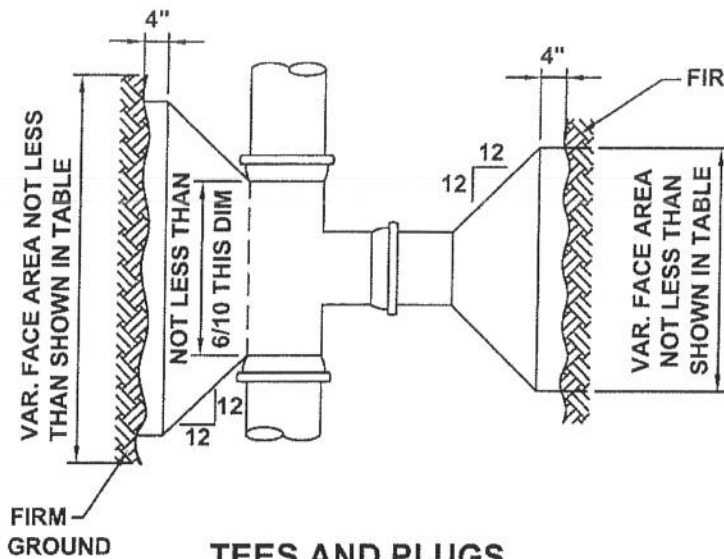


NOTES:

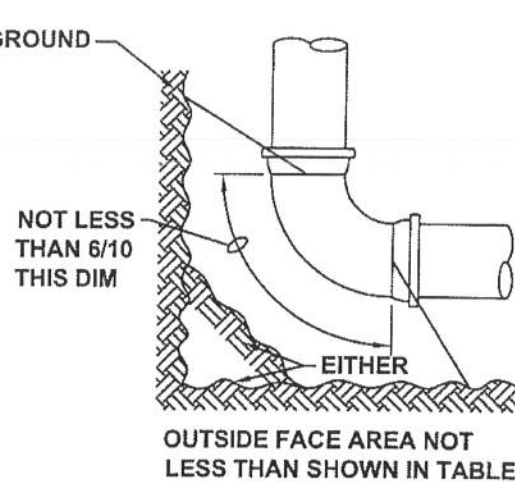
1. IN THE INSTALLATION OF ALL FIRE HYDRANTS IN SLOPING AREAS THE CONTRACTOR SHALL EXCAVATE AROUND ALL SIDES OF THE HYDRANT FOR A DISTANCE OF AT LEAST 18" AND CONSTRUCT SUPPORT MEASURES IN THE EXCAVATED AREA TO PREVENT EARTH FROM MOVING INTO THE AREA.
2. CONTRACTOR SHALL INSTALL 12 CUBIC FEET OF 3/4" BROKEN STONE OR GRAVEL AROUND THE BASE OF HYDRANT AND COVER THE AGGREGATE WITH 40 MIL. POLYTHYLENE.
3. ALL HYDRANTS PLACED IN EXCAVATED AREAS SHALL BE PROTECTED AND BE MADE COMPLETELY ACCESSIBLE.
4. HYDRANTS SHALL BE PRIME COATED AND RECEIVE TWO FINISH COATS OF PAINT. PAINT SHALL BE EQUAL TO PPG 97-602 SAFETY YELLOW. CAPS AND BONNETS SHALL BE PAINTED WHITE.

REVISED 3/05

RICHLAND TOWNSHIP MUNICIPAL AUTHORITY OF ALLEGHENY COUNTY		FIRE HYDRANT INSTALLATION
Not to scale	March 2005	Standard Detail SD-01



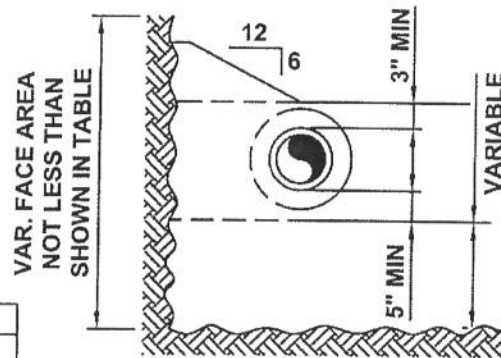
TEES AND PLUGS



BENDS

NOTES:

1. ALL TEES, WYES, CROSSES, PLUGS, AND BENDS OF 10° OR MORE SHALL BE BLOCKED AGAINST FIRM EARTH WITH CONCRETE.
2. EARTH PRESSURE FIGURED AT 4000 PSI. IF EARTH ENCOUNTERED WILL NOT WITHSTAND THIS PRESSURE THE AREA OF THE BLOCK MUST BE INCREASED PROPORTIONATELY.



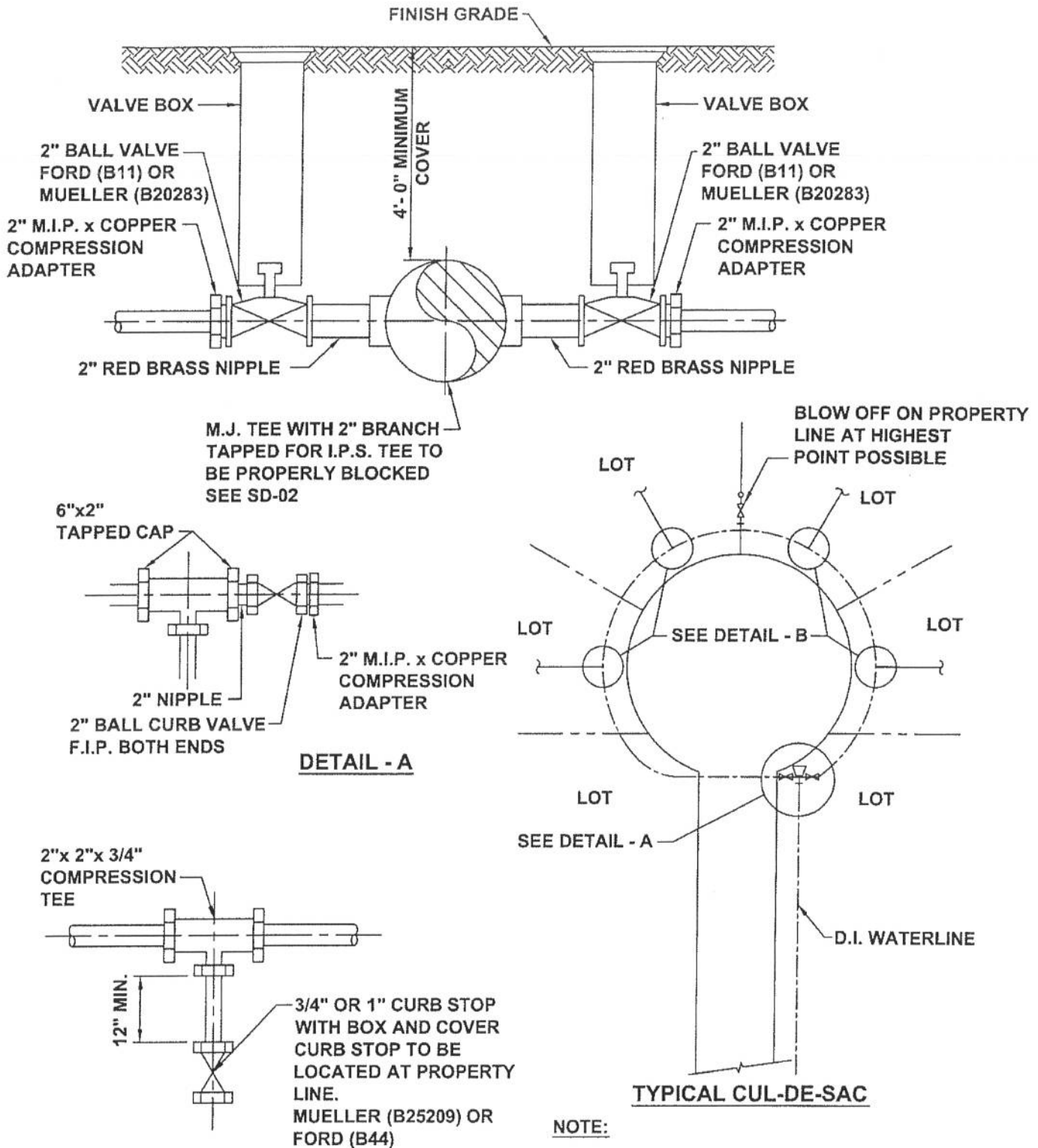
TEES WYES AND BENDS

PIPE SIZE (IN)	AREA* (SQ IN)	TOTAL FORCE (LBS)	AREA OF BLOCK IN SQUARE FEET				
			TEES & PLUGS	90° BENDS	45° BENDS	22½° BENDS	11¼° BENDS
4	19	4275	1.1	1.5	1.0	1.0	1.0
6	38	8550	2.2	3.0	1.6	1.0	1.0
8	65	14625	3.7	5.2	2.8	1.4	1.0
10	97	21825	5.5	7.7	4.2	2.1	1.1
12	137	30825	7.7	10.9	5.9	3.0	1.5
14	184	41400	10.4	14.6	7.9	4.0	2.1
16	238	53550	13.4	18.9	10.3	5.2	2.7
18	299	67275	16.8	23.8	12.9	6.6	3.4
20	367	82575	20.7	29.2	15.8	8.1	4.1
24	523	117675	29.4	41.6	22.5	11.5	5.9
30	805	96600	24.2	34.2	18.5	9.4	4.8
36	1152	138240	34.6	48.9	26.5	13.5	6.9

* BASED ON PIPE O.D. AND ROUNDED TO THE NEXT HIGHEST EVEN INCH.

CALCULATIONS ARE BASED ON 225 PSI PRESSURE OR 150 PSI WORKING PRESSURE PLUS 50% INCREASE FOR WATER HAMMER FOR SIZES 4" TO 24" INCLUSIVE. FOR SIZES 30" & 36" THE TABLE IS BASED ON 120 PSI PRESSURE OR 75 PSI WORKING PRESSURE PLUS 50% WATER HAMMER.

RICHLAND TOWNSHIP MUNICIPAL AUTHORITY OF ALLEGHENY COUNTY		CONCRETE THRUST BLOCKING
Not to scale	March 2005	Standard Detail SD-02



Revised- MAY 2005

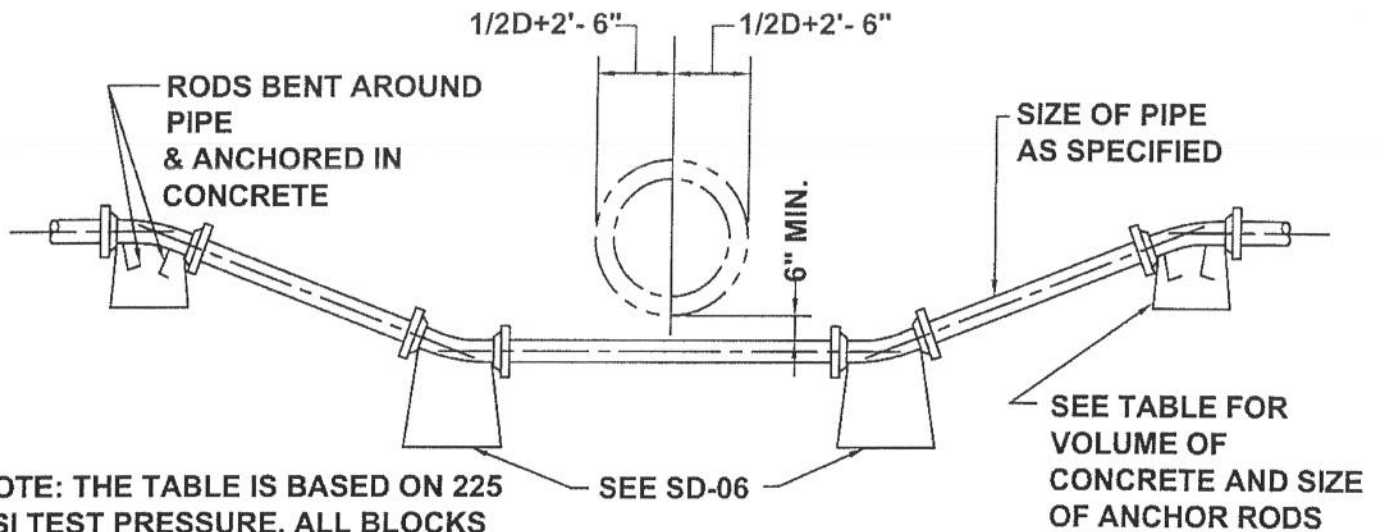
**RICHLAND TOWNSHIP
MUNICIPAL AUTHORITY
OF ALLEGHENY COUNTY**

**CUL-DE-SAC LOOP
INSTALLATION**

Not to scale

March 2005

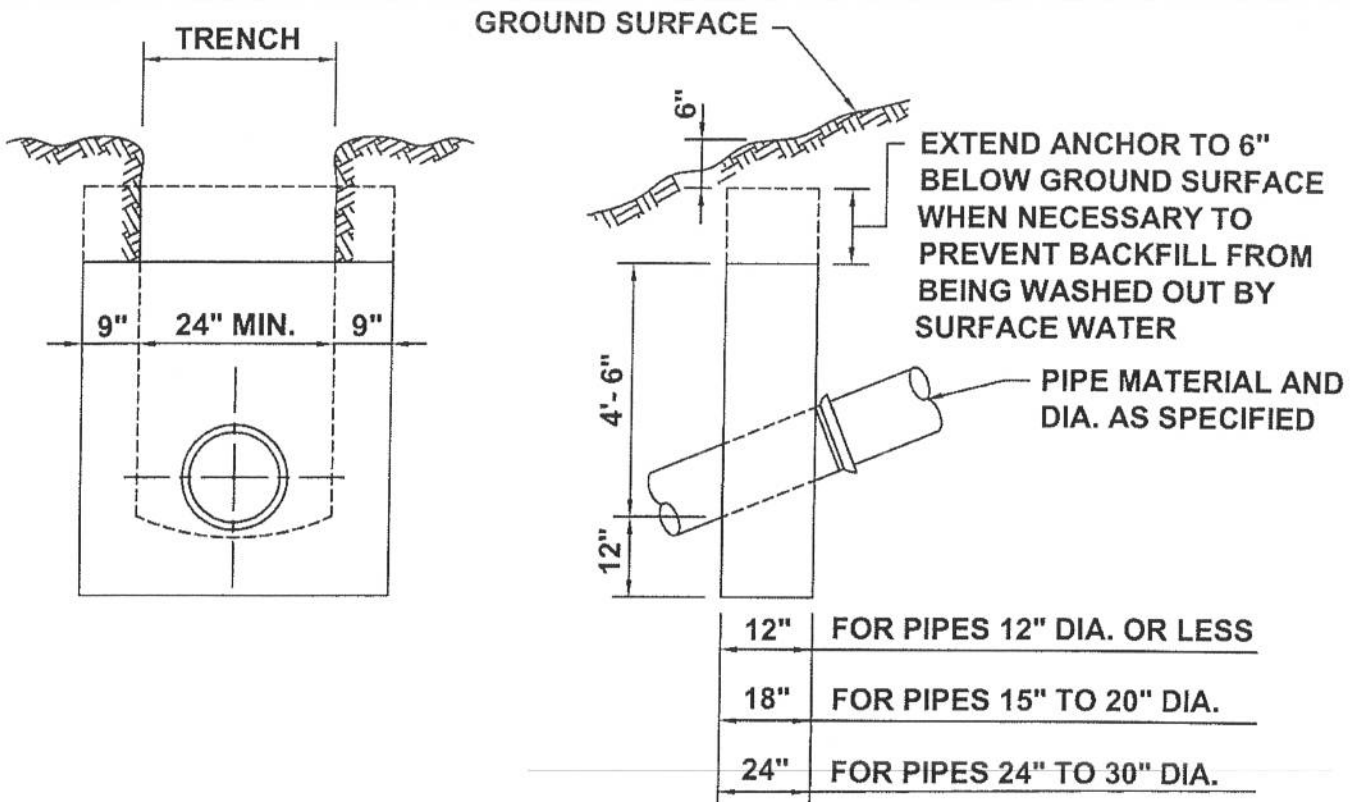
Standard Detail SD-03



NOTE: THE TABLE IS BASED ON 225 PSI TEST PRESSURE. ALL BLOCKS HAVING LENGTH OF 3'-0" OR MORE TO BE REINFORCED WITH #4 @ 6" PLACED 3" FROM TOP OF BLOCK.

PIPE SIZE	TOTAL FORCE (lbs)	VOLUME IN CUBIC FEET			SIZE AND NO. OF ANCHOR RODS		
		45 DEGREE BENDS	22 1/2 DEGREE BENDS	11 1/4 DEGREE BENDS	45 DEGREE BENDS	22 1/2 DEGREE BENDS	11 1/4 DEGREE BENDS
4	4275	22.7	11.6	5.9	1-#4	1-#4	1-#4
6	8550	45.5	23.3	11.9	2-#4	1-#4	1-#4
8	14625	77.8	39.6	20.3	2-#4	2-#4	1-#4
10	21825	116.1	59.1	30.3	2-#4	2-#4	2-#4
12	30825	164.0	83.5	42.8	2-#5	2-#4	2-#4
14	41400	220.2	112.1	57.5	2-#6	2-#4	2-#4
16	53550	284.9	145.0	73.4	2-#7	2-#5	2-#4
18	67275	357.9	182.2	93.4	2-#7	2-#5	2-#4
20	82575	439.2	223.6	114.7	2-#8	2-#6	2-#4
24	117675	626.0	318.7	183.4	2-#9	2-#7	2-#5

RICHLAND TOWNSHIP MUNICIPAL AUTHORITY OF ALLEGHENY COUNTY		CONCRETE ANCHORS AND METHOD OF LAYING WATER LINES UNDER OBSTRUCTIONS
Not to scale	March 2005	Standard Detail SD-04

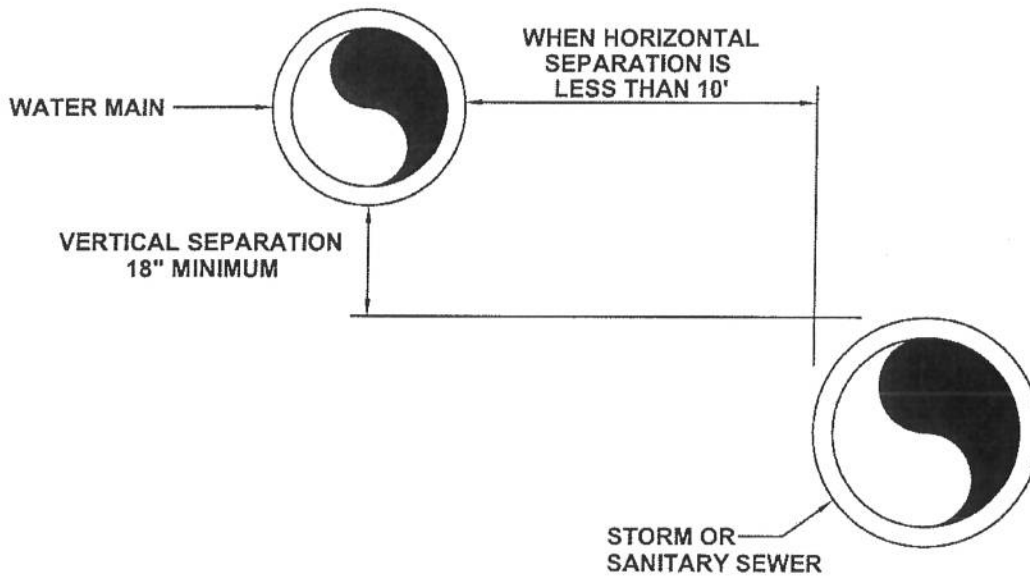


CONCRETE ANCHORS FOR PIPES ON STEEP GRADES

PROVIDE NO ANCHORS ON GRADES LESS THAN 20 % UNLESS NOTED
 PROVIDE ANCHORS 36' C-C ON GRADES BETWEEN 20 % AND 34%
 PROVIDE ANCHORS 24' C-C ON GRADES BETWEEN 34 % AND 50%
 PROVIDE ANCHORS 16' C-C ON GRADES BETWEEN 50 % AND 70%

FOR CONDITIONS OTHER THAN SHOWN HEREON ANCHORS SHALL BE PROVIDED AS REQUIRED BY THE CONTRACT PLANS OR ORDERED IN THE FIELD BY THE OWNER'S REPRESENTATIVE.

RICHLAND TOWNSHIP MUNICIPAL AUTHORITY OF ALLEGHENY COUNTY		CONCRETE ANCHOR CONSTRUCTION
Not to scale	March 2005	Standard Detail SD-05

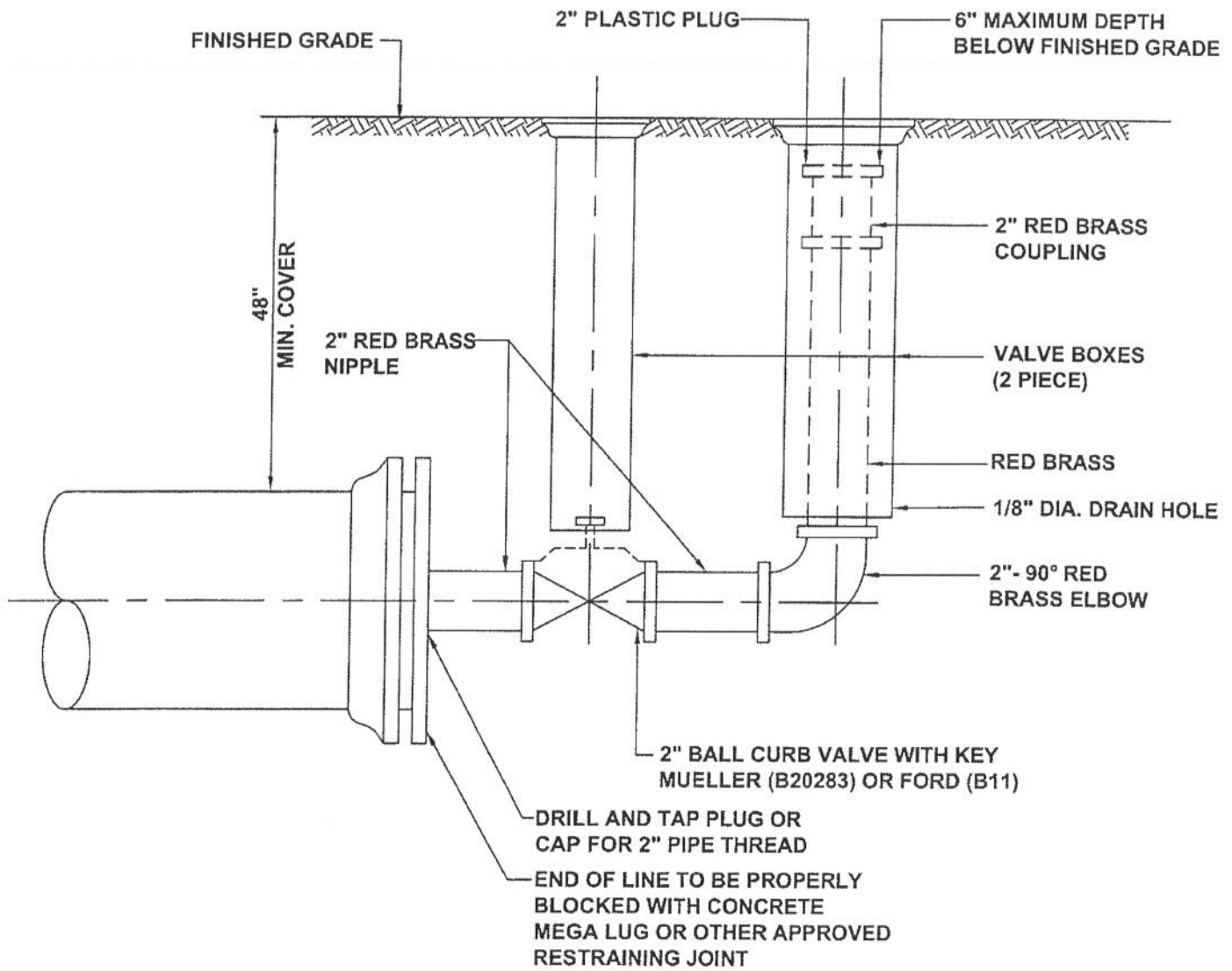


NOTES:

1. WHEN THE HORIZONTAL SEPARATION OF THE WATER MAIN AND SEWER LINE IS LESS THAN 10', THE VERTICAL SEPARATION BETWEEN THE TOP (CROWN) OF THE SEWER LINE AND THE BOTTOM (INVERT) OF THE WATER MAIN SHALL BE AT LEAST 18". SEWER LINE SHALL BE ENCASED IN CONCRETE WHERE SEWER/ WATER LINE CROSSINGS OCCUR AND WHERE CONDITIONS PREVENT AN 18" VERTICAL SEPARATION.

2. THERE SHALL BE AT LEAST A 10' HORIZONTAL SEPARATION BETWEEN WATER MAINS AND SANITARY SEWER FORCE MAINS. FORCE MAINS CROSSING WATER MAINS SHALL BE LAID TO PROVIDE A MINIMUM VERTICAL DISTANCE OF 18" BETWEEN THE OUTSIDE OF THE FORCE MAIN AND THE OUTSIDE OF THE WATER MAIN.

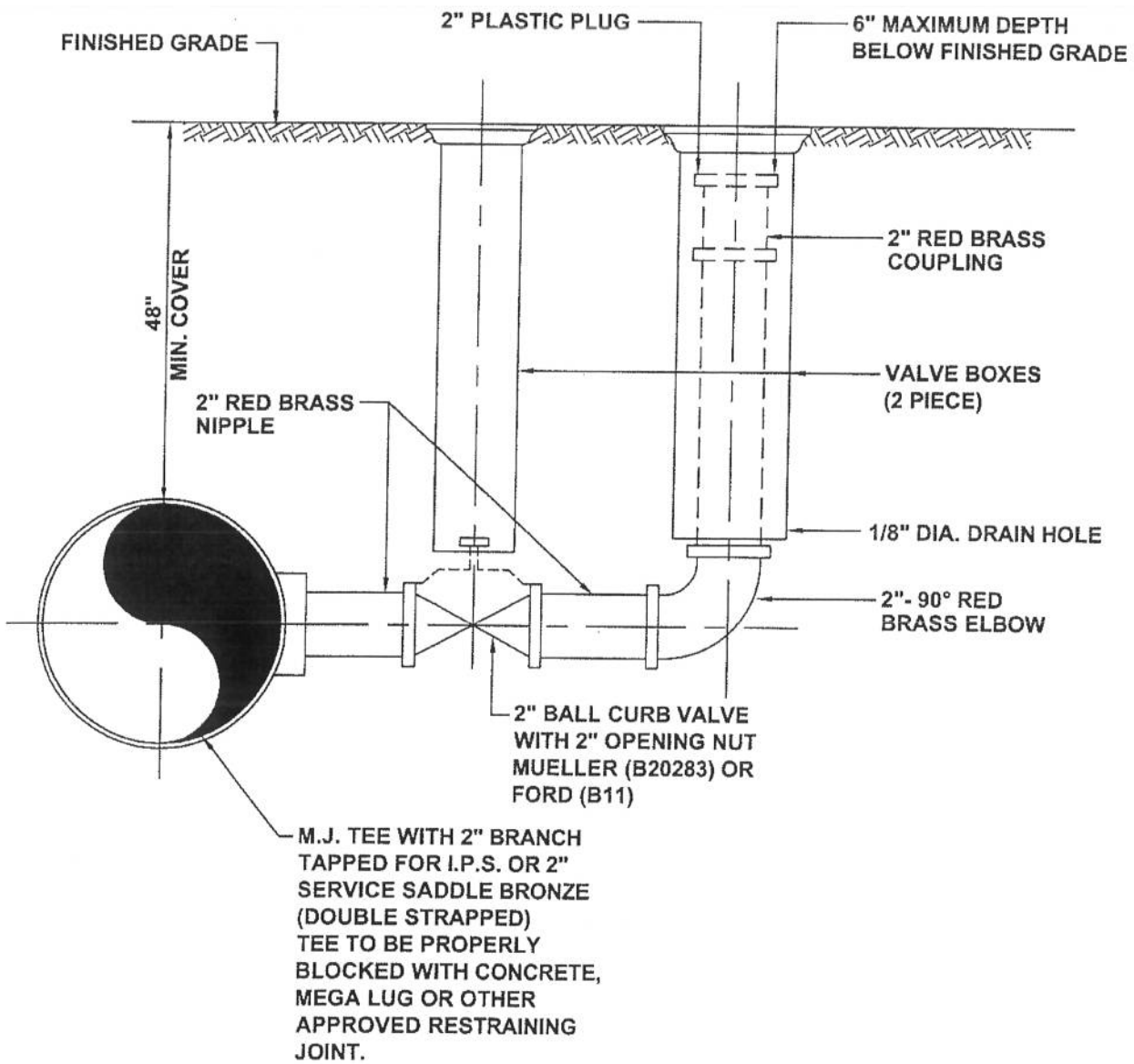
RICHLAND TOWNSHIP MUNICIPAL AUTHORITY OF ALLEGHENY COUNTY		MINIMUM DISTANCE BETWEEN WATER AND SEWER LINES
Not to scale	March 2005	Standard Detail SD-06



NOTE:

1. ALL PIPE AND FITTINGS TO BE RED BRASS.
2. PLACE 2 CUBIC FEET OF STONE UNDER DRAIN HOLE.

RICHLAND TOWNSHIP MUNICIPAL AUTHORITY OF ALLEGHENY COUNTY		END BLOW OFF
Not to scale	March 2005	Standard Detail SD-07



NOTES:

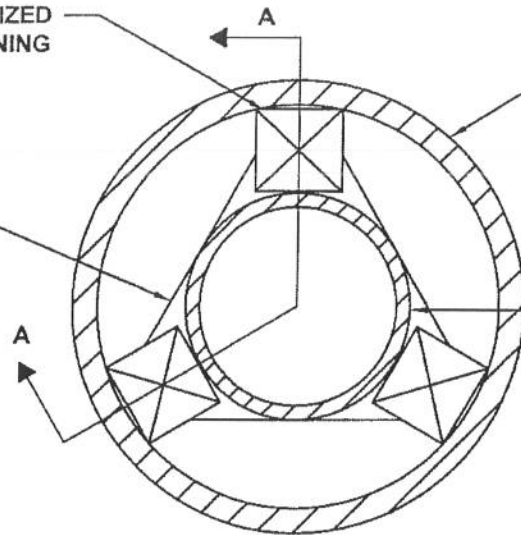
1. ALL PIPE AND FITTINGS TO BE RED BRASS.
2. PLACE 2 CUBIC FEET OF STONE UNDER DRAIN HOLE.

Revised- MAY 2005

RICHLAND TOWNSHIP MUNICIPAL AUTHORITY OF ALLEGHENY COUNTY		SIDE BLOW OFF
Not to scale	March 2005	Standard Detail SD-08

4"X4" WOLMANIZED WOOD SKIDS SIZED TO ACCOMMODATE ANNULAR OPENING

STAINLESS STEEL BANDS



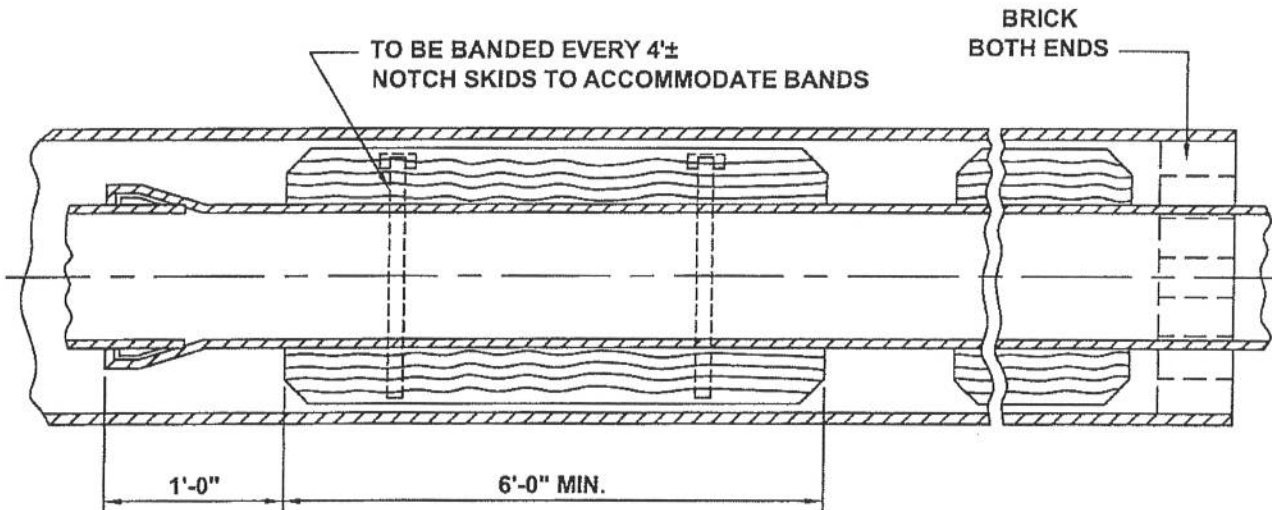
STEEL CASING PIPE
ASTM A53

D.I. OR PVC
CARRIER PIPE

**WALL THICKNESS OF STEEL
CASING PIPE**

DIA. (IN.)	THK. (IN.)
24 OR LESS	1/4
28 AND 32	3/8
42 AND LARGER	1/2

END VIEW

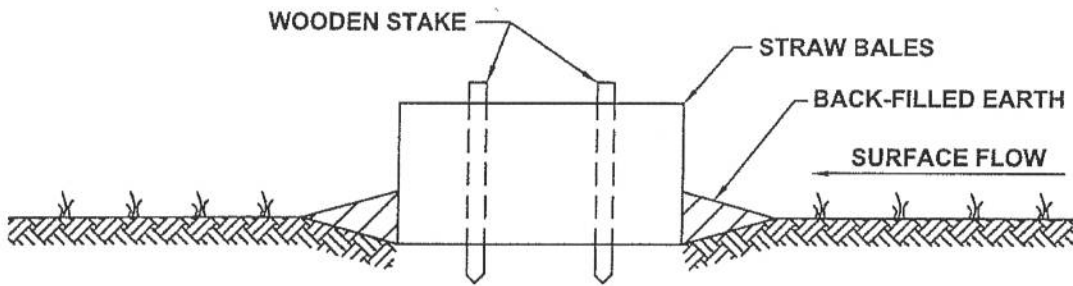
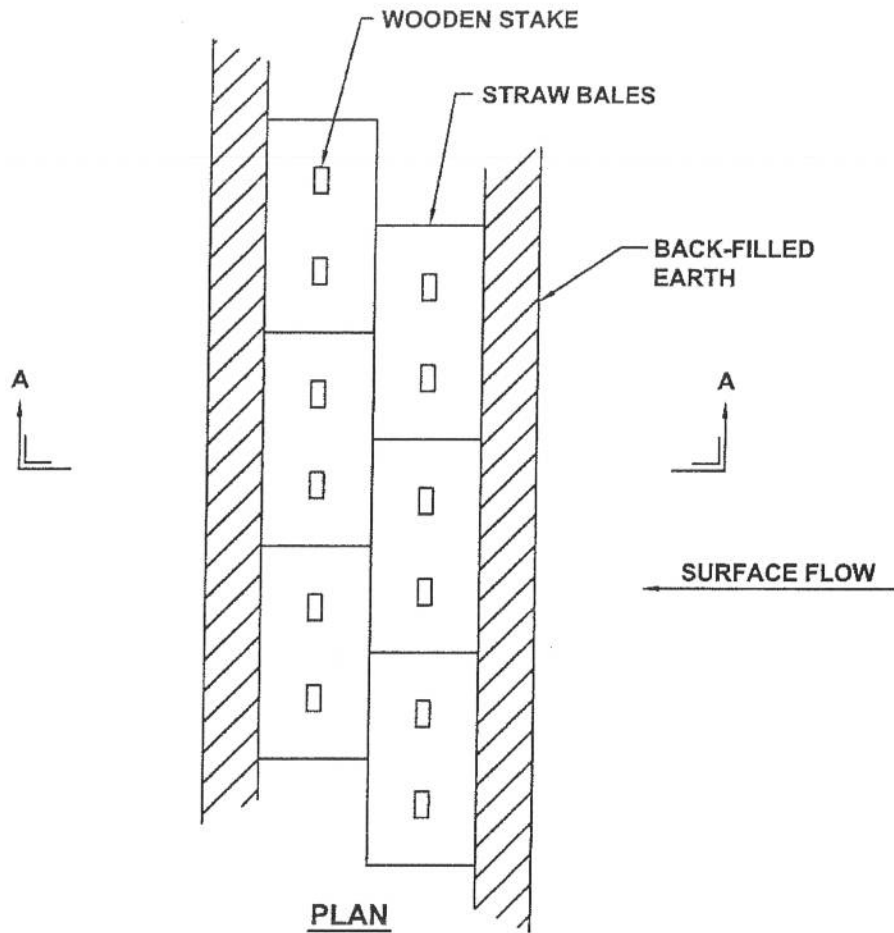


2 SETS OF SKIDS REQUIRED PER 20 LINEAL FEET PIPE LENGTH
2 SETS OF SKIDS REQUIRED PER 13 LINEAL FEET PIPE LENGTH

SECTION A - A

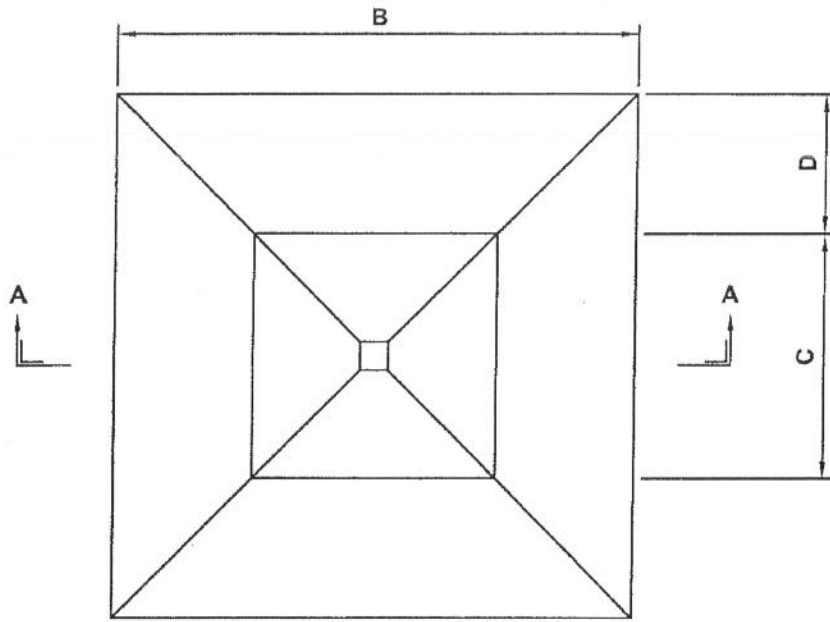
NOTE: PIPELINE CASING SPACERS AS MANUFACTURED BY CASCADE WATERWORKS MFG. CO. OR OTHER APPROVED MANUFACTURER, MAY BE SUBSTITUTED FOR THE ABOVE.

<p>RICHLAND TOWNSHIP MUNICIPAL AUTHORITY OF ALLEGHENY COUNTY</p>		<p>STEEL CASING AND D.I. OR PVC CARRIER PIPE INSTALLED BY BORING</p>
<p>Not to scale</p>	<p>March 2005</p>	<p>Standard Detail SD-09</p>

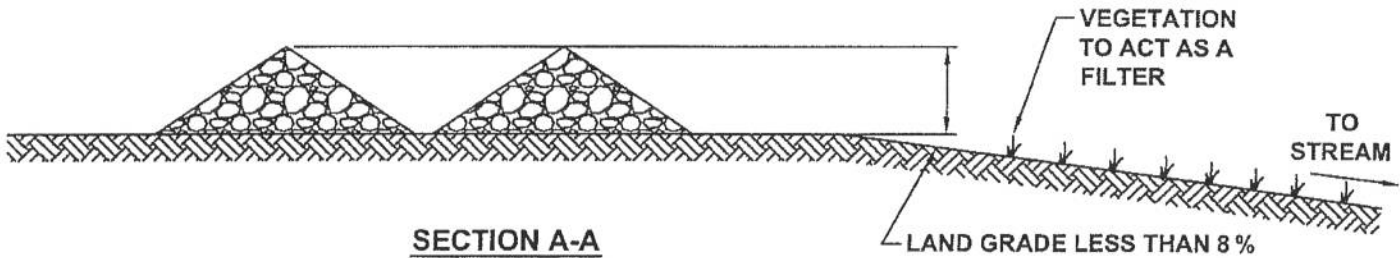


SECTION A-A

<p>RICHLAND TOWNSHIP MUNICIPAL AUTHORITY OF ALLEGHENY COUNTY</p>		<p>STRAW BALE BARRIER FOR EROSION & SEDIMENTARY CONTROL</p>
<p>Not to scale</p>	<p>March 2005</p>	<p>Standard Detail SD-10</p>



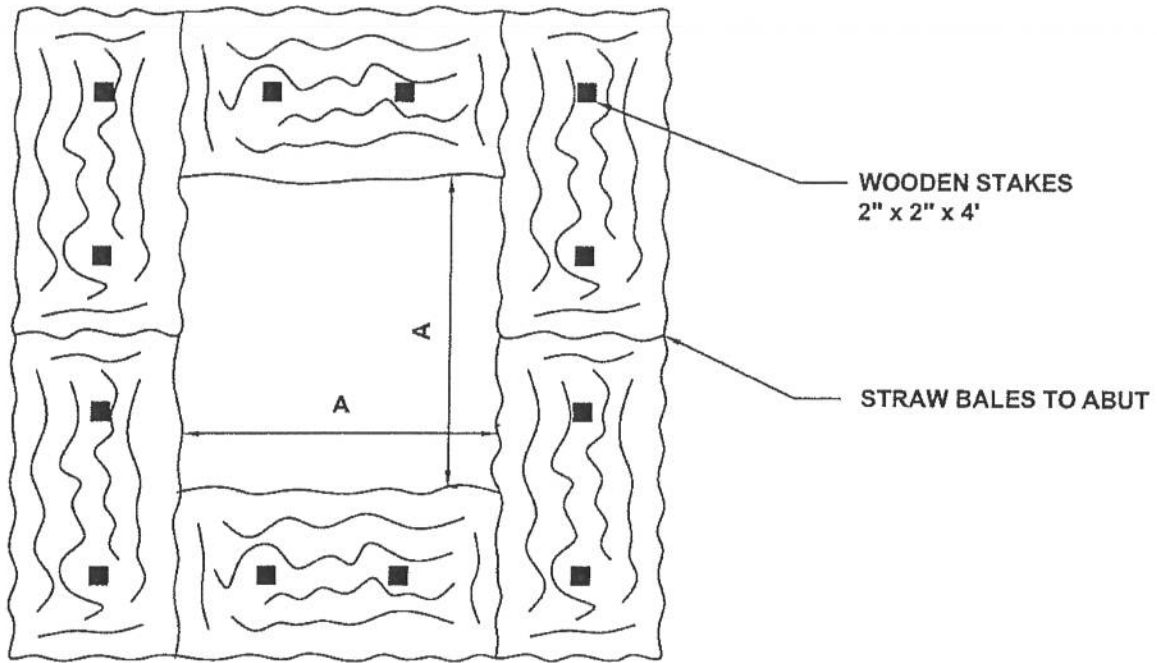
PLAN



SECTION A-A

TRAP SIZE NO.	DIMENSIONS (FT)				PUMP DISCHARGE CAPACITY (GPM)
	A	B	C	D	
1	2	12	6	3	1000
2	3	18	9	4.5	2000
3	4	24	12	6	4000

RICHLAND TOWNSHIP MUNICIPAL AUTHORITY OF ALLEGHENY COUNTY		TEMPORARY SEDIMENTATION TRAP
Not to scale	March 2005	Standard Detail SD-11



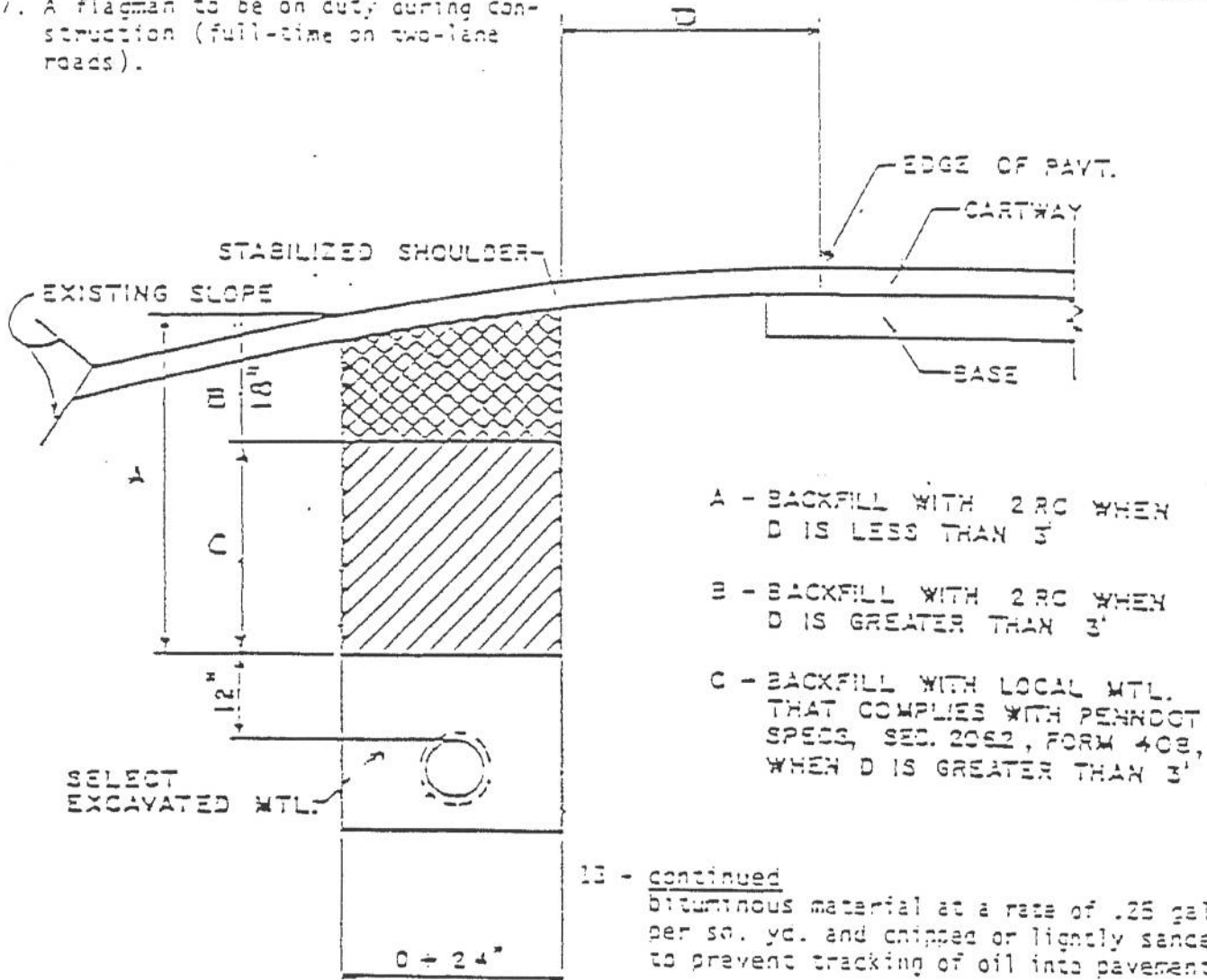
TRAP SIZE	DIMENSION A	PUMP DISCHARGE CAPACITY (GPM)
1	15 FT	1000
2	15 FT	2000

NOTE: TO BE USED FOR DEWATERING EXCAVATIONS PRIOR TO CONSTRUCTION INSTALLATION ACTIVITIES.

RICHLAND TOWNSHIP MUNICIPAL AUTHORITY OF ALLEGHENY COUNTY		STRAW BALE TEMPORARY SEDIMENTATION TRAP
Not to scale	March 2005	Standard Detail SD-12

Notes:

1. All openings must be backfilled at the end of each working day.
2. No dirt permitted on improved surface of the road, unless removed at the end of each day.
3. Any disturbance to old ground must be re-seeded and mulched.
4. If opening is closer than 3' to the edge of the pavement, all excavated material replaced with 2RC stone must be hauled off project.
5. All stabilized shoulder material to be replaced in kind.
6. All replaced materials shall conform to Highway Specifications Form 408 dated 1975.
7. A flagman to be on duty during construction (full-time on two-lane roads).



8. Traffic to be maintained at all times.
9. All necessary safety precautions to be strictly enforced.
10. All safety precautions shall conform to Specifications of Pennsylvania Department of Transportation, Bulletin 43, dated 1977.
11. Work performed in accordance with the General Provisions and Specifications, Title 67, Chapter 469.
12. All lines will be installed below all highway cross pipes unless noted otherwise on plans.
13. Existing shoulder disturbed during construction shall be graded, rolled, and penetrated with RT-22 or MC-30.

CONSTRUCTION STANDARDS

PIPE TRENCH REPLACEMENT DETAIL
FOR SHOULDERS ALONG
TOWNSHIP STREETS

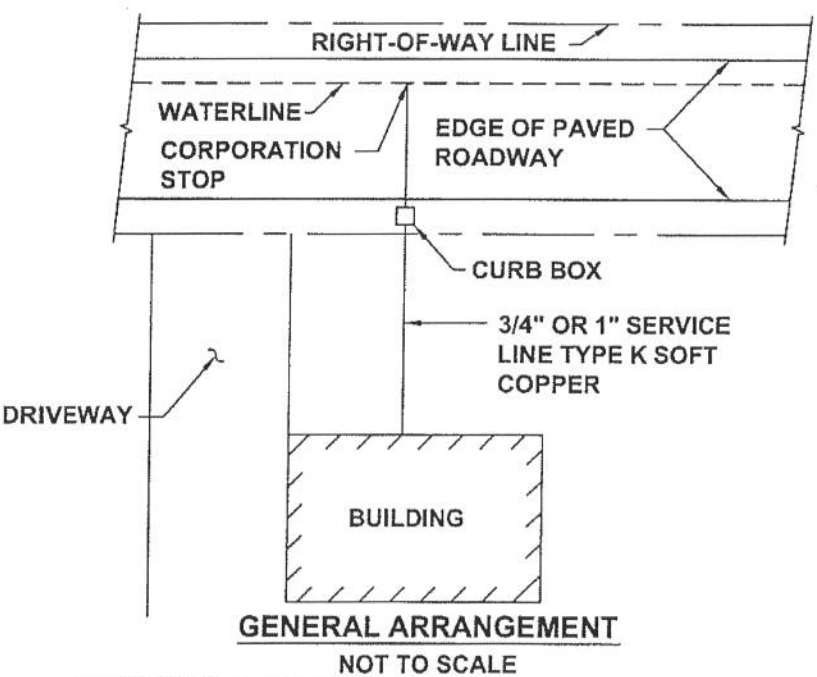
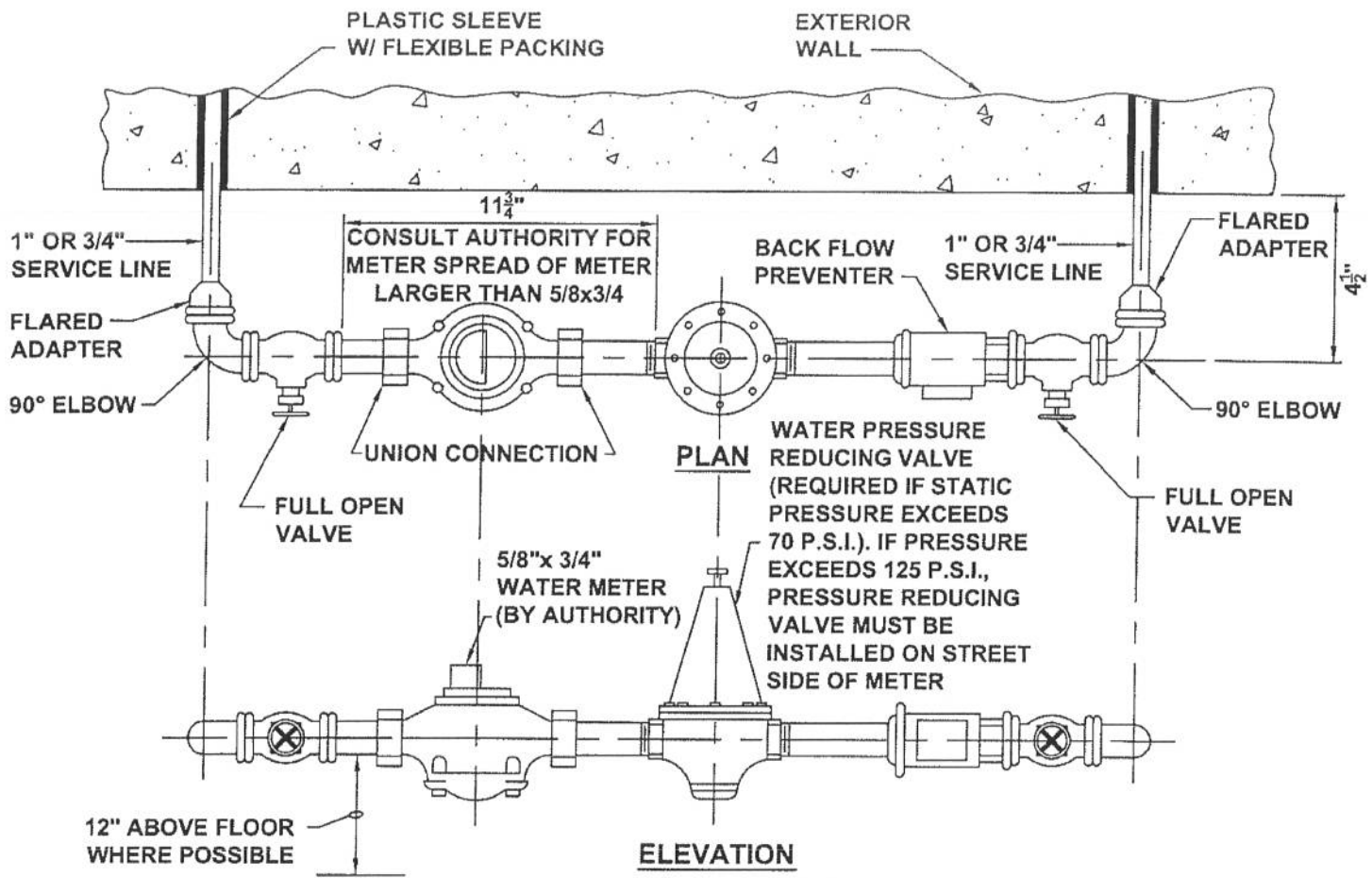
SD-13

(continued above)

IV-54

DRAWN BY
SCALE: NONE

PLAN NO
DATE: 8-24-77



NOTES:

PRESSURE REDUCING VALVE SHALL BE WATTS NO. U50, OR EQUAL.

BACK FLOW PREVENTER SHALL BE DUAL CHECK VALVE TYPE, WATTS NO. 7, OR EQUAL.

SERVICE LINE CONNECTION FROM WATERLINE TO CURB BOX SHALL BE INSTALLED BY THE AUTHORITY.

WATER SERVICE LINE EXTENSION FROM CURB BOX TO METER SHALL BE INSTALLED BY SKILLED WORKMEN AT COST OF CUSTOMER IN ACCORDANCE WITH RULES AND REGULATIONS AND STANDARD SPECIFICATIONS OF THE AUTHORITY.

ALL NON-RESIDENTIAL CUSTOMERS SHALL HAVE A TESTABLE BACKFLOW PREVENTER INSTALLED. TYPE OF BACKFLOW PREVENTER SHALL BE APPROVED BY AUTHORITY

Revised- MAY 2005

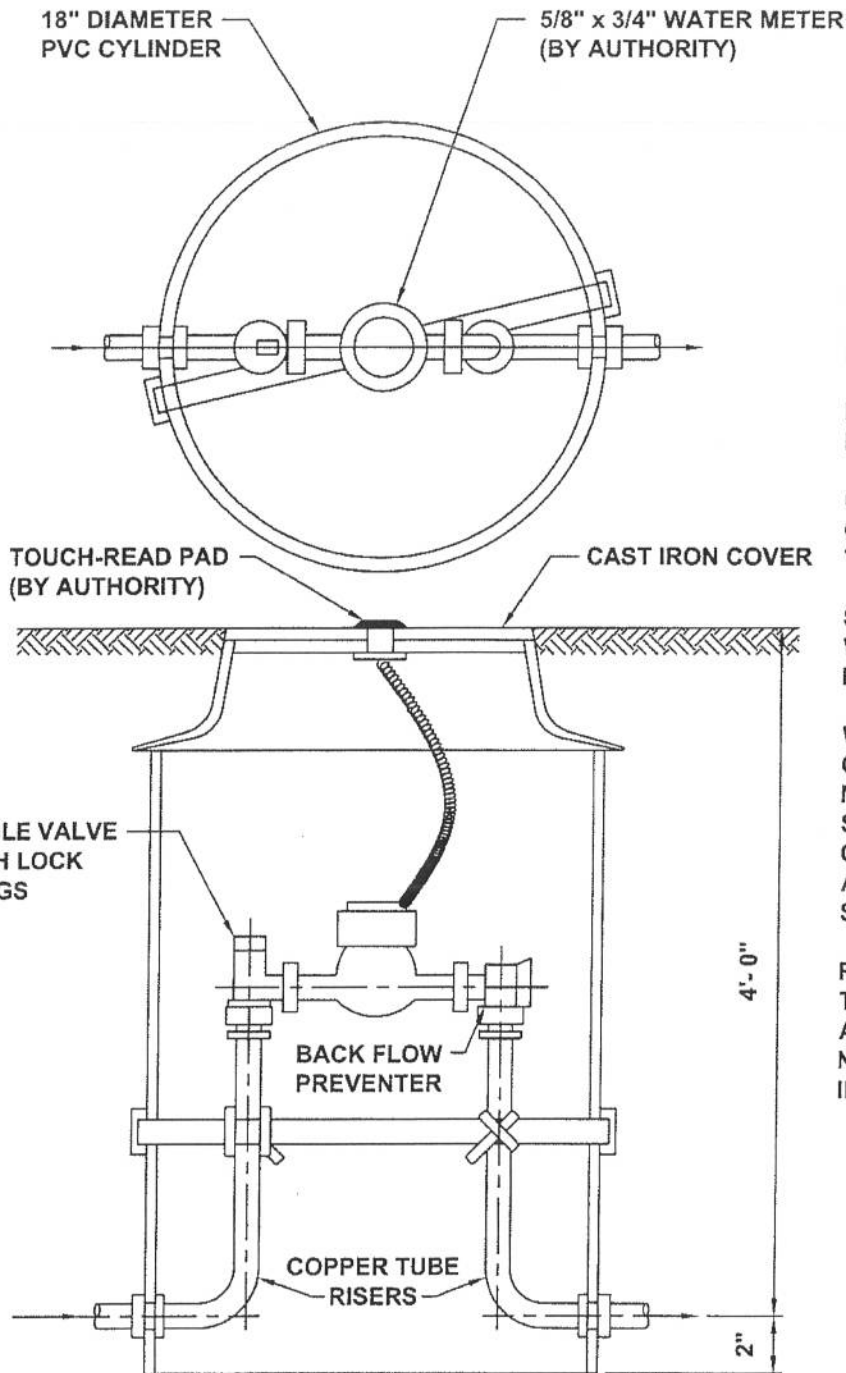
RICHLAND TOWNSHIP MUNICIPAL AUTHORITY OF ALLEGHENY COUNTY		WATER SERVICE LINE EXTENSION AND SERVICE CONNECTION INSTALLATION
Not to scale	March 2005	Standard Detail SD-14

CONDENSED INSTALLATION STANDARDS

1. General – Service line extension includes connection of service line to curb stop, service line from curb stop to point within structure housing meter, full open valve same size as service line, pressure regulator (where static pressure is more than 70 psi), a dual check valve, or if required by Authority, a reduced pressure zone backflow preventer, and a full open valve. The meter, meter spuds, remote readout system and interconnection wires shall be furnished and installed by the Authority.

NOTE: When static pressure exceeds 125 psi, the pressure-reducing valve MUST be installed on the street side of the meter.

2. Size – Minimum size service is $\frac{3}{4}$ inch diameter.
3. Materials – Lines to be Type K soft copper tubing per Fed. Spec. WW-T-799, with mechanical coupling joints or double cement lined ductile iron pipe per ASA No. H21-6, and with push on or mechanical joints per ASA 21.11.
4. Installation – Lay in straight line at right angles to street, with a minimum of 42 inches cover. Bottom of trench shall be excavated to conform to curvature of pipe and afford uniform bearing service. Do not lay on rock, but excavate a minimum of 6" below the bottom of the pipe and backfill with select earth or clay, well tamped; provide polyethylene wrap if corrosive soil is encountered; do not install joint within 5 feet of structure wall. Where $\frac{3}{4}$ " and 1" service lines are less than 100 feet, no couplings will be permitted.
5. Meter Pits – Required on all service line extensions 200 feet in length or greater. Must be purchased from Authority. See SD-15 for typical installation.
6. Water Pressure Reducing Valve – Suitable for a maximum line pressure of 300 psi with a delivery pressure of 40-55 psi.
7. Inspection – Line to remain uncovered until after inspection and observation of hydrostatic testing by Authority; no loss due to leakage is permitted. Notify the Authority (24 hours in advance) of name, location, and time when work will be ready for inspection. Allegheny County Plumbing Division must be contacted when public water is connected to your system.



NOTES:

WHERE STATIC PRESSURE EXCEEDS 80 PSI, WATTS NO. U50, OR EQUAL, PRESSURE REDUCING VALVE SHALL BE INSTALLED.

BACK FLOW PREVENTER SHALL BE ANGLE CHECK TYPE, FOR NO. HA31-323, OR EQUAL.

METER PIT SHALL BE FORD 18" DIAMETER PLASTIC 4 FT. PIT SETTER, OR EQUAL

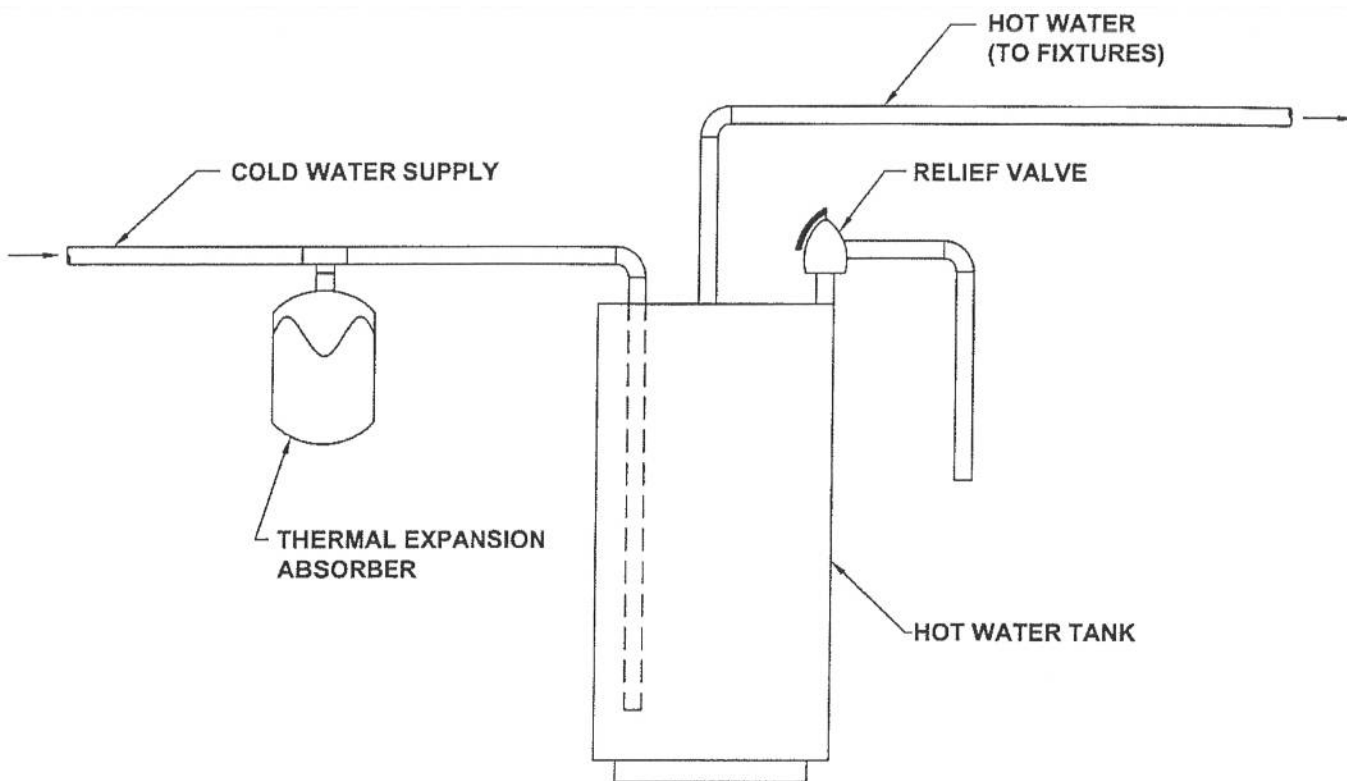
CAST IRON COVER SHALL BE FORD NO. C-3, OR EQUAL, WITH PROVISION FOR TOUCH READ PAD INSTALLATION.

SERVICE LINE CONNECTION FROM WATERLINE TO CURB BOX SHALL BE INSTALLED BY THE AUTHORITY.

WATER SERVICE LINE EXTENSION FROM CURB BOX TO BUILDING, INCLUDING THE METER PIT, SHALL BE INSTALLED BY SKILLED WORKMAN AT THE COST OF THE CUSTOMER IN ACCORDANCE WITH RULES AND REGULATIONS AND DETAILED SPECIFICATIONS OF THE AUTHORITY.

PIPING ARRANGEMENT SET FORTH IN THIS DETAIL SHALL BE UTILIZED FOR ALL MOBILE HOME SERVICES AND WHERE NOT PRACTICAL TO INSTALL METER INSIDE OF BUILDING.

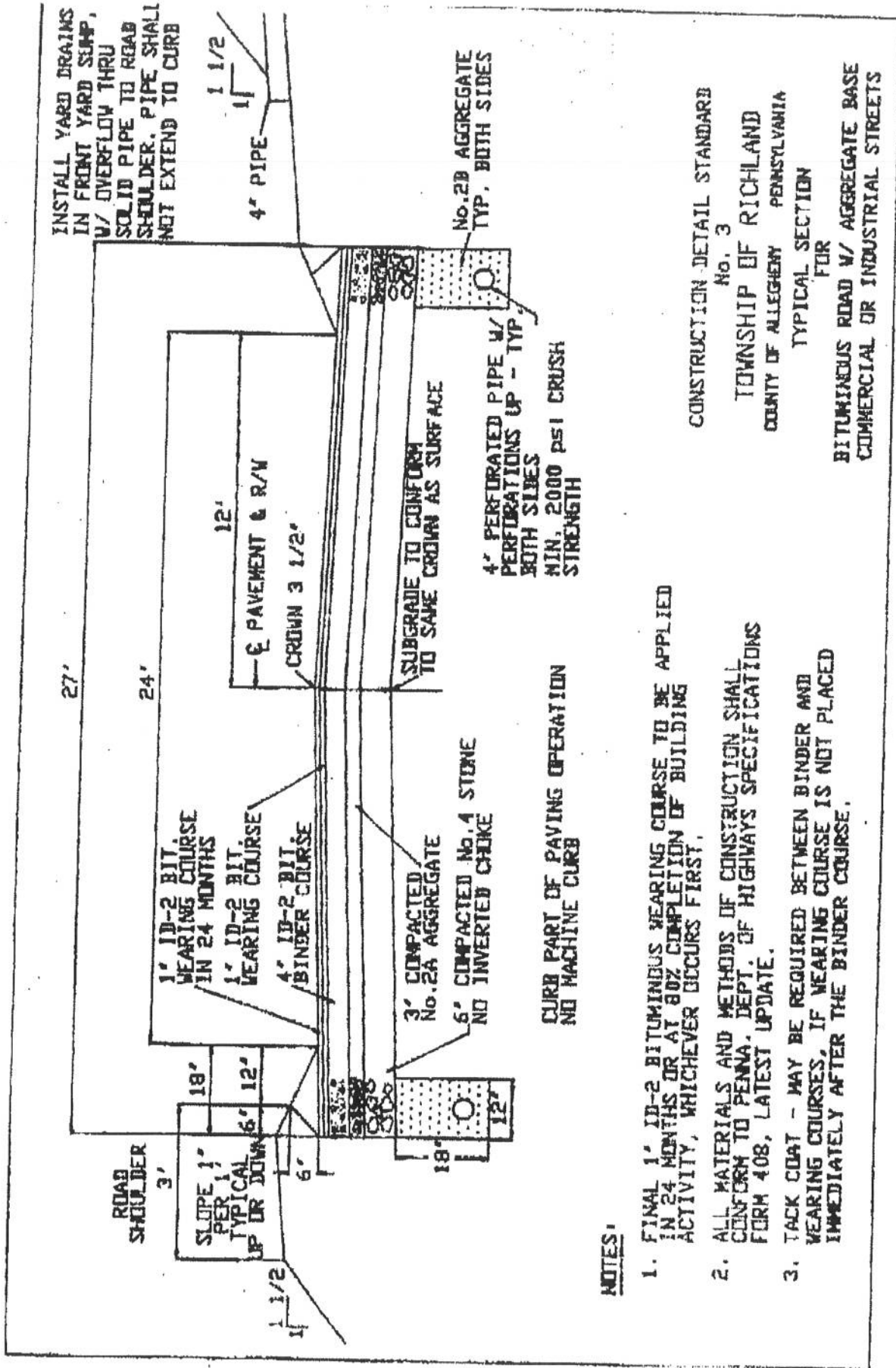
RICHLAND TOWNSHIP MUNICIPAL AUTHORITY OF ALLEGHENY COUNTY		OUTSIDE METER PIT INSTALLATION
Not to scale	March 2005	Standard Detail SD-15



EXPLANATION:

DURING NORMAL WATER USAGE, HOT WATER IS DRAWN FROM THE TANK AND IS REPLACED BY COLD WATER. THE COLD WATER IS THEN HEATED CAUSING THERMAL EXPANSION TO OCCUR. PRESSURE INCREASES UNTIL THE RELIEF VALVE OPENS AND THE EXPANDED WATER IS EXPELLED FROM THE TANK. THE INSTALLATION OF A THERMAL EXPANSION ABSORBER WILL ELIMINATE THIS PROBLEM. THE THERMAL EXPANSION ABSORBER IS A DIAPHRAGM-TYPE, PRE-PRESSURIZED, EXPANSION TANK. THE DIAPHRAGM IS FILLED WITH AIR. AS THE WATER EXPANDS, THE AIR IN THE DIAPHRAGM COMPRESSES MAINTAINING A LOWER SYSTEM PRESSURE. RELIEF VALVES NEAR WASH TUB/ TOILETS ALSO ACCEPTABLE (REFER TO ALLEGHENY COUNTY PLUMBING CODE FOR OTHER ACCEPTABLE RELIEF)

RICHLAND TOWNSHIP MUNICIPAL AUTHORITY OF ALLEGHENY COUNTY		THERMAL EXPANSION ABSORBER
Not to scale	March 2005	Standard Detail SD-16



INSTALL YARD DRAINS
IN FRONT YARD SUMP,
W/ OVERFLOW THRU
SOLID PIPE TO ROAD
SHOULDER. PIPE SHALL
NOT EXTEND TO CURB



SUBGRADE TO CONFORM
TO SAME CROWN AS SURFACE

4' PERFORATED PIPE W/
PERFORATIONS UP - TYP.
MIN. 2000 PSI CRUSH
STRENGTH

No. 2B AGGREGATE
TYP. BOTH SIDES

CURB PART OF PAVING OPERATION
NO MACHINE CURB

NOTES:

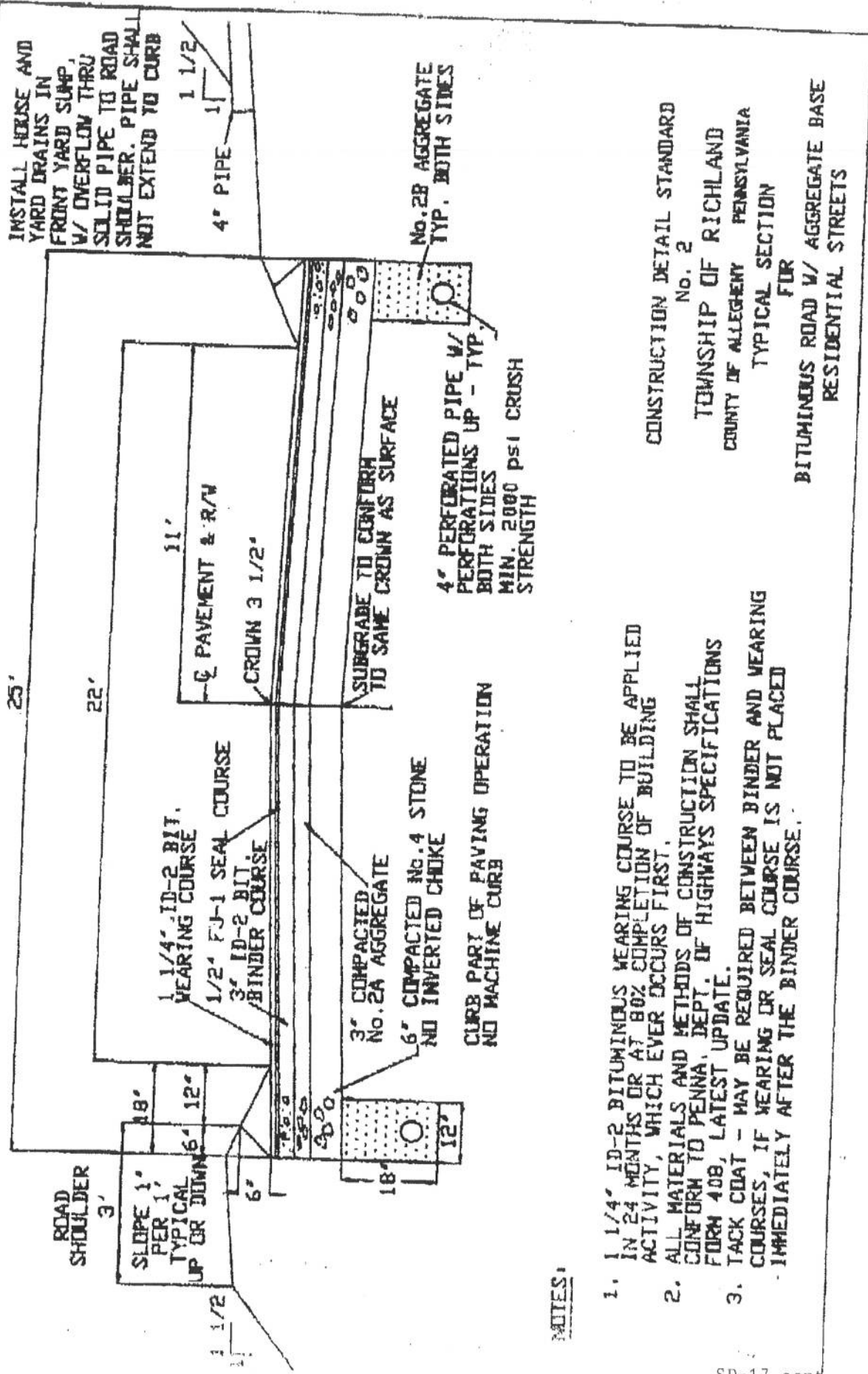
1. FINAL 1' ID-2 BITUMINOUS WEARING COURSE TO BE APPLIED IN 24 MONTHS OR AT 80% COMPLETION OF BUILDING ACTIVITY, WHICHEVER OCCURS FIRST.
2. ALL MATERIALS AND METHODS OF CONSTRUCTION SHALL CONFORM TO PENNA. DEPT. OF HIGHWAYS SPECIFICATIONS FORM 408, LATEST UPDATE.
3. TACK COAT - MAY BE REQUIRED BETWEEN BINDER AND WEARING COURSES, IF WEARING COURSE IS NOT PLACED IMMEDIATELY AFTER THE BINDER COURSE.

CONSTRUCTION DETAIL STANDARD
No. 3

TOWNSHIP OF RICHLAND
COUNTY OF ALLEGHENY PENNSYLVANIA

TYPICAL SECTION
FOR

BITUMINOUS ROAD W/ AGGREGATE BASE
COMMERCIAL OR INDUSTRIAL STREETS



NOTES:

1. 1 1/4" ID-2 BITUMINOUS WEARING COURSE TO BE APPLIED IN 24 MONTHS OR AT 80% COMPLETION OF BUILDING ACTIVITY, WHICH EVER OCCURS FIRST.
2. ALL MATERIALS AND METHODS OF CONSTRUCTION SHALL CONFORM TO PENNA. DEPT. OF HIGHWAYS SPECIFICATIONS FORM 408, LATEST UPDATE.
3. TACK COAT - MAY BE REQUIRED BETWEEN BINDER AND WEARING COURSES, IF WEARING OR SEAL COURSE IS NOT PLACED IMMEDIATELY AFTER THE BINDER COURSE.

**RICHLAND TOWNSHIP
ROADWAY STANDARDS**

Applicable to All Local and Minor Residential Streets within the Township

Right-of-Way	-	50' minimum
Minimum Cartway Width	-	22' inside curbs, 25' back to back of curbs - paving to be centered on right-of-way
Berms	-	3' wide, graded, each side, 1" per 1' min/max slope
Curbs	-	18" asphalt wedge - 6" high at maximum, back 6" tapered - reinforced concrete curb and gutter, may be considered by Township
Curb Radii at Intersections	-	15' minimum
Minimum Grade	-	1%
Maximum Grade	-	12% (for not more than 1200')
Minimum Sight Distance	-	200'
Dead Ends	-	All dead ends to terminate in a cul-de-sac with 90' paved diameter, 100' right-of-way diameter
Street Signs	-	To be placed at all intersections

Applicable to Collector Streets

Right-of-Way	-	50' minimum
Minimum Cartway Width	-	22' inside curbs, 25' back to back of curbs - paving to be centered on right-of-way
Berms	-	3' wide, graded, each side, 1" per 1' min/max slope
Curbs	-	18" asphalt wedge - 6" high at maximum, back 6" tapered - reinforced concrete curb and gutter, may be considered by Township
Curb Radii at Intersections	-	20' minimum
Minimum Grade	-	1%
Maximum Grade	-	8%
Minimum Sight Distance	-	300'
Street Signs	-	To be placed at all intersections

January 7, 1992

SD-17 cont.