

*Township of Manalapan  
Monmouth County  
New Jersey*

**RULES AND REGULATIONS  
GOVERNING APPLICATIONS FOR PERMITS  
DESIGN AND CONSTRUCTION OF  
WATER SUPPLY SYSTEMS  
IN RESIDENTIAL AND NON-RESIDENTIAL  
DEVELOPMENTS  
IN THE  
TOWNSHIP OF MANALAPAN  
MONMOUTH COUNTY  
NEW JERSEY**

**DECEMBER 1998**

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**MANALAPAN TOWNSHIP  
WATER SUPPLY SYSTEMS**

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## ARTICLE 1 - GENERAL

### 1.1. Purpose

The Township of Manalapan has established a policy of fostering and promoting, by all reasonable means, the provision and distribution of an adequate supply of water for public and private use in the Township. The policy, expressed herein, is affected by certain restrictions on the availability of water within the Township.

#### 1.1.1 Franchise Area

The Township has been divided into two water franchise areas. These are designated as:

- 1) Gordon's Corner Water Company Franchise Area;
- 2) Manalapan Township Franchise Area.

These areas are depicted on a Manalapan Township Water Franchise Area Map appended to these Rules and Regulations.

##### 1.1.1.1 Gordon's Corner Water Company Franchise Area

The northern portion of the Township is designated as the Gordon's Corner Water Company Franchise Area. All applications for water service within that area shall be submitted to the Gordon's Corner Water Company. Applications, permits, fees, construction details, etc., shall be in conformance with the Rules and Regulations of the Gordon's Corner Water Company, and with all applicable provisions of the New Jersey Department of Environmental Protection (NJDEP).

##### 1.1.1.2 Manalapan Township Franchise Area

The southern portion of the Township is designated as the Manalapan Township Franchise Area, within which are four noncontiguous areas designated as the Water Service Area. All consumers within the Franchise Area, but outside of the Water Service Area, are served by individually owned and maintained potable water wells, except for the Manalapan - Englishtown School. For the foreseeable future, except as modified in these Rules and Regulations, the area within the Franchise Area, but outside of the Service Area, will continue to be dependent upon individually owned and maintained potable water wells.

In order to utilize the Township's existing system effectively, and to regulate expanded demand in a manner that will not tax available water resources beyond a safe and reasonable level, the Township Water Service Area was created.

No extension of the water system outside the Service Area will be permitted, except as described in these Rules and Regulations.

Extension of the water system within the Water Service Area will be permitted only upon engineering analysis to assure that there will be an adequate supply for ordinary consumption and for fire protection, and that efficient rates will be available to customers.

### 1.1.2 Water System Capacity

The Manalapan Township Franchise Area Water Supply capacity is derived from two sources:

1. Water Allocation Diversion Permit
2. Purchase of bulk water from United Water Matchaponix (UWMX).

#### 1.1.2.1. Water Allocation Diversion Permit

Manalapan Township has a permit to divert water from the Old Bridge Aquifer through two (2) wells at the Lamb Lane Water Treatment Plant. The Township also has a permit to divert water from the Englishtown Aquifer at some future time. The Water Allocation Diversion Permit imposes the following limitations:

Maximum pumping rate:	1,000 gpm
Maximum monthly diversion:	8,000,000 gallons
Maximum annual diversion:	61,000,000 gallons
Maximum annual diversion from Old Bridge Aquifer:	23,194,000 gallons

#### 1.1.2.2 United Water Matchaponix

The Township has an agreement to purchase bulk potable water from United Water Matchaponix for service to various developments within the Township's designated Service Area. The Agreement contains minimum and maximum purchase provisions and must be amended for each new development in order to assure adequate capacity for service.

### 1.1.3 Water Supply Sources

#### 1.1.3.1 Lamb Lane Treatment Plant

The existing Lamb Lane Treatment Plant currently furnishes water service to 181 customers at three (3) single-family residential developments. They are:

Windswept Knolls  
Manalapan Woods  
Sweetmans 3

Treated potable water is transported through the Township's existing water distribution system. The existing treatment and delivery systems are sufficient to meet current average, peak and total flows for its current customers. The Old Bridge Aquifer, however, has been designated as "threatened" within the NJDEP Regional Aquifer Area I. Therefore delivery of water from this source must be maintained at its 1983 rate (23.194 million gallons per year, or 63,500 gallons per day). Consequently, expansion of the Township's service capacity would require plant expansion.

Recognizing that there is a limitation on its ability to readily meet short-term expansion needs, the Township has entered into a water supply agreement with United Water Matchaponix. Said agreement will require modifications for future applications for system expansions as to the availability of water supply.

### 1.2 Township Municipal Offices

The principal office and place of business of the Township is located at: Manalapan Township Municipal Building, 120 Rt. 522, Manalapan New Jersey 07726.



Personnel will be available for processing applications from Monday to Friday, between the hours of 9:00 a.m. to 4:00 p.m., prevailing time, except during the hours of 12:00 a.m. and 1:00 p.m., and except for holidays recognized by the Township.

Applications for connections to existing facilities, review of plans, permit application and payment of fees shall be submitted to the Township. Concurrently, copies of all plans, specifications, reports, etc., shall be submitted to the Water Engineer's Office.

### 1.3 Final Approvals of Township Required

No plans calling for the construction of any premises, building or structure within the Township's Water Service Area shall be given development approval, conceptual, preliminary or final, unless such approvals shall be made specifically contingent upon and subject to receipt of final approval by the Township of the location, design and construction of water facilities.

No construction of any premises, building or structure shall commence prior to receipt of final approval by the Township of the location, design and construction of water facilities.

All applications are subject to review and official action by the Township Committee who schedules and advertises regular meetings to be held at least once each month. The Water Engineer shall notify the Township of all applications which are complete and shall supply a written report with comments and recommendations. The Township shall not be required to take action on any application until such application is deemed complete by the Water Engineer and any deficiencies are corrected to his/her satisfaction. The time within which the Township shall act upon an application shall commence upon the date that the applicant supplies a complete application, as determined by the Water Engineer, together with all applicable fees and supporting documentation.

Township approval will be conditioned upon formal verification of sufficiency of water supply by United Water Matchaponix, a subsidiary of United Water Mid-Atlantic.

### 1.4 Conditions Requiring Township Approval

All developers shall be required to obtain approvals for their developments from the Township subject to the following:

#### 1.4.1 Minor Subdivision

Any developer of a project classified as a minor subdivision by the Manalapan Township Planning Board or Zoning Board of Adjustment which does not require the extension of the water system shall be subject to waiver from making formal application to the Township or to United Water Mid-Atlantic as specified in Article 1.3. If the developer plans to connect to an existing water line, he/she must apply for connection to the Township's existing facilities, which will be operated by United Water Mid-Atlantic under a Partnership Agreement with the Township.

#### 1.4.2 Subdivision Connection Required

Subdivisions shall be connected to an existing Public Water Supply System, if service is available within the following distances:

<u>Number of Units</u>	<u>Distance</u>
1	200 feet

**Number of Units**

**Distance**

2	400 feet
3	600 feet
4	800 feet
5-15	1,000 feet
16 +	one mile

If an Applicant/Developer should seek waiver of the requirement to connect a development of 16 or more units to an existing public water supply system within one mile, adequate justification satisfactory to the Township must be furnished.

For developments of 16 or more units which are further than one mile from an existing Public Water Supply System, Water Supply Strategy will be determined on a case-by-case basis.

**1.5 Existing Water System Remote**

In the event that the applicant's lands are deemed by the Township to be too remote from an existing Township water main, then one of the following methods of water supply will be required as determined by the Township:

1. Dry water distribution system for future use, and, in lieu of water supply system, individual water supply wells on each lot.
2. Individual water supply well system with a cash payment in lieu of actual construction.

**1.6 Definitions**

As used in these Rules and Regulations, unless a different meaning clearly appears from the context, the following words shall have the following meaning:

**Abbreviations** - The following abbreviations have been utilized throughout these Rules and Regulations.

ANSI	- American National Standards Institute
ASA	- American Standards Association
ASTM	- American Society for Testing Materials
AWWA	- American Water Works Association
DIP	- Ductile Iron Pipe
NJDEP	- New Jersey Department of Environmental Protection
PCCP	- Prestressed Concrete Cylinder Pipe
PVCP	- Polyvinyl Chloride Pipe

**Agreement** - means "Partnership Agreement for Operation, Maintenance and Management Services for the Township of Manalapan's Water System"

**Applicant** - means property owner or property owners, or if owned by a company, a proper official of said company, or an authorized agent of the owner certified to the Township as such, making application to the Township for review and approval of plans for water and/or connections to the Township's water system.

**Contractor** - means the contractor performing the work or related work for the applicant (may include the developer).

- Developer - means the legal or beneficial owner or owners of a lot or of any land proposed to be included in a development including the holder of an option to purchase or other person having an enforceable proprietary interest in such land.
- Development - means the division of a parcel of land into two or more parcels; the construction, reconstruction, conversion, structural alteration, relocation or enlargement of any building or other structure; or any change in use of any building or structure.
- Easement - means the right to use the land of another for a specific purpose not inconsistent with the general property right of the owner.
- Individual Water Supply System - means the water supply system neither connected to the Township's system or that of a private water company with an approved franchise area within the confines of the Township. This shall also include private individual wells.
- Master Plan - means the plan for providing water distribution, supply, and storage facilities for the Township prepared by the Water Engineer together with any supplements, amendments, alterations, or additions thereto or hereafter in existence, as approved by the Township and by United Water Mid-Atlantic.
- Safe Drinking Water Act - means regulations promulgated by the New Jersey Department of Environmental Protection as N.J.A.C. 7:10-1 et seq.
- Service Connection - means that portion of the water system conveying water from the distribution main to the individual service unit, including service pipe, corporation stop, curb stop, curb box, meter and remote readout.
- Statewide Site Improvement Standards - means Residential Site Improvement Standards, New Jersey Department of Community Affairs, N.J.A.C. 5:21-1 et. seq.
- Street - means any and all dedicated streets, avenues, alleys, lanes, highways, and roads accepted or unaccepted by the Township, County or State.
- Township - means Township of Manalapan in the County of Monmouth, New Jersey.
- Unit - means the following:
- A. Residential dwelling with kitchen facilities shall include:
    - 1. single family dwelling
    - 2. multiple family dwelling (each unit)
    - 3. mobile home (does not include transient or campgrounds)
  - B. Residential dwelling without kitchen facilities shall include for each unit:
    - 1. Hotel
    - 2. Motel
    - 3. Boarding House
    - 4. Cottage

5. Tourist Cabin

C. Churches, fraternal organizations, service organizations, public buildings and schools:

A unit shall consist of actual or estimated water consumption up to 75,000 gallons per year. If consumption exceeds 75,000 gallons per year, the number of units shall be calculated by dividing it by 75,000 and rounding up to the next highest integer. Each separate church, fraternal organization, service organization, public building, school or establishment shall in the minimum equal one (1) unit.

D. Commercial (All uses as set forth above with the exception of industrial uses):

A unit shall consist of actual or estimated water consumption up to 75,000 gallons per year. If consumption exceeds 75,000 gallons per year, the number of units shall be calculated by dividing it by 75,000 and rounding up to the next highest integer. Each separate establishment shall in the minimum equal one (1) unit.

E. Industrial (All uses not covered as set forth above):

A unit shall consist of actual or estimated water consumption up to 75,000 gallons per year. If consumption exceeds 75,000 gallons per year, the number of units shall be calculated by dividing it by 75,000 and rounding up to the next highest integer. Each separate industrial establishment shall in the minimum equal one (1) unit.

UWMA - means United Water Mid-Atlantic

UWMX - means United Water Matchaponix

Water Engineer - means the engineer appointed and authorized by the Township to review permit applications, to recommend actions to the Township, and to monitor construction.

## ARTICLE 2 - APPLICATIONS

### 2.1 General

The Township hereby adopts a three level system for the approval of water applications. The three levels are conceptual, preliminary and final. Applications shall conform with the instructions set forth below. In appropriate circumstances, the Township may, in its sole discretion, waive a step in the application process or permit review of more than one step in the application process simultaneously.

Approved applications shall become null and void after a two-year period from the date of approval if no subsequent application is submitted or no construction takes place during the two-year period. In order to request an extension of time for a given application, the applicant must refile and pay the necessary fees. Extensions shall be limited to a one-year period of time with a maximum of three extensions, all of which will be at the sole discretion of the Township. Extensions of time shall not be considered automatic.

Upon approval of an application by the Township, a copy of the approval resolution will be furnished to the applicant.

No application shall be considered unless a professional engineer, licensed in the State of New Jersey is in responsible charge of the planning and design of the proposed water supply facilities and his/her seal is affixed to the plans, calculations and specifications.

No application for a subsequent phase will be process until the previous phase has been approved.

Once an application number has been assigned to a project by the Township, that number must appear on all future correspondence, checks, bonds, etc. Failure to comply will result in the return of the material to the Applicant without processing.

## 2.2 Application for Conceptual Review

An application for conceptual review of the proposed subdivision, site plan, or other development of land that is within the Township Franchise Area shall be submitted to the Township for ruling on whether an individual or comprehensive water supply system is required. This application shall be filed with the Township for any development within Manalapan Township except when expressly waived by the Township or specifically exempted pursuant these Rules and Regulation. If water service is to be provided by a private water company with a bona fide franchise area within the Township, an application to the Township will not be required. Application forms may be obtained from the Township. A sample form is included in these Rules and Regulations as Exhibit "A".

In addition to the application for water service, the applicant shall furnish a copy of any applications submitted to the Township Planning Board or Zoning Board of Adjustment for subdivision, site plan, or other development approval, including plot plans, a general location plan, and sketch plan showing street and lots and a tax lot and block number, the location of the nearest existing water main, the general layout and location of the proposed water supply main or well, and the general layout and location of the proposed sewerage disposal system. In addition to the above, a detailed estimate of the water usage for the conceptual site shall be submitted with the application.

If the applicant's proposal is for an individual supply well, additional data as required by the Township shall be submitted with the application. A fee in accordance with the Township's fee schedule shall accompany the application. An applicant will not be given consideration before filing the application, together with the fee, with the Township.

A minimum of four weeks shall be allowed for the review of the conceptual application and for action by the Township. The Township reserves the right to request additional information before taking final action on the conceptual application.

The granting of conceptual approval shall in no way grant any vested rights to the applicant to guarantee a supply of water, nor shall the granting of conceptual approval be deemed a recommendation on the part of the Township of any Planning Board or Board of Adjustment application.

## 2.3 Application for Preliminary Approval of Plans and Specifications

If water lines are required, the applicant must submit an application for preliminary approval on the form, included herewith as Exhibit "B", together with supporting data described below. Application forms may be obtained from the Township.

To receive consideration, the application must be accompanied by the proper fee for review of the application. The fee shall be in accordance with the Township's fee schedule. The application shall be accompanied by the following supporting data:

- Engineer's report;
- General map of the entire project;
- Plans and specifications for all proposed water lines and appurtenances.

Application for preliminary approval must be submitted at least 30 days prior to the date upon which action by the Township is desired. Applications are to be signed by the Applicant, as defined herein. If signed by an authorized agent, the application shall be accompanied by a certified copy of the authorization. Supporting data accompanying the application shall include the following:

### 2.3.1 Engineer's Report

A complete engineer's report setting forth the basis for design shall be submitted to the Township for each project. It shall include:

- a. A description of geographic area to be served;
- b. Existing and future population of areas to be served;
- c. Terrain data in sufficient detail to establish general topographic features of an area to be served, 2' contour intervals minimum;
- d. Intended use for the proposed realty improvements;
- e. The estimated daily flow, peak flow and fire flow requirements;
- f. Description of materials to be used, including specifications and class;
- g. A preliminary cost estimate based on unit prices acceptable to the Water Engineer;
- h. Justification for water main sizing (should be based on hydrant flow test).
- i. Any other factors which would affect design and use of the water system.
- j. All requirements necessary to obtain any required NJDEP permits.

### 2.3.2 General Map of the Entire Project

A map of the entire project area shall be furnished showing existing and proposed water mains, valves, fire hydrants and other utilities.

### 2.3.3 Plans for all Proposed Water Lines

Plans shall be of uniform size, 24" x 36", with a 1/2" border on top, bottom and right side, and a 2" border on the left side for binding purposes. Plans shall not be drawn to a scale no smaller than 1" = 50'. Two (2) sets of plans shall be submitted. The plans shall show the following:

2.3.3.1 Details: Plans shall show existing and proposed and final contours at 2' intervals. All existing and proposed streets and surface elevations at all breaks in grade and street intersections; tributary areas with population per acre; the true or magnetic meridian, boundary line, title data, and scale. Any area for which water is to be supplied shall be indicated clearly. All sheets shall be numbered. All easements required for the installation of water mains shall be shown on the plans.

2.3.3.2. Symbols: Water lines to be built now and to be constructed later shall be shown by solid and dash lines, respectively. Existing water mains shall be shown by special designation.

All topographical symbols and conventions shall be the same as those utilized by the U.S. Geological Survey.

- 2.3.3.3. Distance and Sizes: Distances between valves and fire hydrants, sizes, and materials shall be shown on the plans. House service connection locations shall be shown and detailed.
- 2.3.3.4. Easements: Plans for water systems shall show all easements. Utility easements shall be dedicated to the Township.
- 2.3.3.5. Hydrants: All fire hydrant locations must be approved by the Manalapan Township Board of Fire Commissioners. A copy of the approval letter and approved plans must be submitted with final applications.
- 2.3.3.6. Flushing Hydrants: All flushing hydrants (i.e. cul-de-sacs) must be clearly delineated on the plans.

## 2.4 Application for Final Approval of Plans and Specifications

Upon notification by the Township that preliminary approval has been given of the proposed water system with its appurtenances, the applicant shall file an application for final approval for plans and specifications with the Township to proceed with the construction. Application forms may be obtained from the Township. The form is included herewith as Exhibit "C".

A minimum of six weeks shall be allowed for the review of the final application and for action by the Township. It must be signed by the Applicant, as defined herein. If signed by an authorized agent, it shall be accompanied by a certified copy of the authorization.

Prior to final approval, the applicant will be required to pay the Township its cost for review.

The supporting data accompanying the application shall include the following:

### 2.4.1 Fee for Review

A certified check or cash in an amount in accordance with the Township's fee schedule.

### 2.4.2 Design Drawings

Four sets of plans and specifications shall be submitted with the applications along with a reproducible set of plans. Plans shall comply with the dimension requirements for preliminary application. Plan and profiles shall show all proposed water mains, fire hydrants, flushing hydrants, air release valves and manholes, valves, service connections, appurtenances, stream crossings and existing utilities, including water, gas, electric, telephone and sewer, structures and surface elevation. They shall be drawn to standard scales, and the scale shall be shown on each sheet. Drawings submitted at scales less than 1" = 50' shall not be accepted. Sheets should be numbered consecutively. Drawings shall conform to the size specified under the preliminary application process.

### 2.4.3 Details of Construction

Details of construction of fire hydrants, flushing hydrants, air release valves and manholes, valves, service connections, water mains and appurtenances shall accompany the plans. Details shall be drawn to standard scales to show clearly the nature of design. Standard details of the Township may be utilized and obtained from the Water Engineer.

#### 2.4.4 Technical Specifications

Complete specifications for the construction of the proposed water system and appurtenances shall accompany the plans. Specifications shall describe the materials to be used and methods of construction, e.g., class and type of pipe, bedding, joining, trench sheeting, dewatering, backfilling, etc.

#### 2.4.5 Estimate of Costs

A detailed estimate of the entire cost of construction shall be furnished. This estimate is to be based on unit prices acceptable to the Water Engineer. This estimate shall include costs of construction, rights-of-way acquisitions, testing and record drawings.

#### 2.4.6 Performance Bond

A performance bond on a form approved by the Township shall be furnished by a surety company authorized to do business in the State of New Jersey and approved by the Township in the amount of 120 percent of the total cost, (as defined in paragraph 2.4.5 immediately above, or as determined by the Township), of which 10 percent shall be posted in cash, guaranteeing complete construction within the time period to be specified by the Township, and further guaranteeing that said construction will be in accordance with the Rules and Regulations of the Township, the plans and specifications, engineer's report, and cost estimates as approved by the Township. A letter of Credit in lieu of performance bond may be accepted at the Township's discretion, provided that it must be in a form approved by the Township, contain an unconditional payment obligation for the issuer running solely to the Township, be issued by a bank authorized to do and doing business in New Jersey, have a term of at least one year with automatic renewal or extension provisions, and permit the Township to draw down at least 30 days prior to expiration if a substitute is not provided.

#### 2.4.7 Insurance Requirements

The developer must submit to the Township certificates of insurance satisfactory to the Township. Certificates of insurance must have the following minimum limits:

Bodily Injury and Liability     \$500,000 - \$1,000,000

Property Damage Liability     \$500,000 - \$1,000,000

Workman's Compensation required by the laws of the State of New Jersey.

The applicant shall name the Township, the Water Engineer and their agents as an additional insured, as well as agree and undertake to indemnify and save and hold harmless the Township, the Water Engineer and respective employees and agents in all manners pertaining to the construction.

#### 2.4.8 Other Data

Other data may be required by the Township, including but not limited to:

Additional copies of any data furnished with the application for tentative approval, if requested by the Township;

Any documents, reports, studies, applications, permits and/or permit applications, etc., which may be required by any other governmental unit or agency;



Proof that the applicant has obtained preliminary subdivision approval from the Planning Board or the Zoning Board of Adjustment of the Township of Manalapan.

## 2.5 Individual Service Connections

Individual service connections may be permitted by the Township for existing residential units that front on water mains as installed, or as required to be installed, within the Township's water franchise or service area.

Applicants shall execute the application form and follow the required procedures as outlined in Exhibit D and as indicated in Section 5 herein.

Water service connection to the Township's water mains shall not be permitted except as physically performed by the Township's contract operator, UWMA, with the applicant paying UWMA directly for all applicable charges.

Existing individual wells shall be disconnected from the house plumbing and, if not used for irrigation purposes, shall be abandoned in accordance with NJDEP requirements.

## 2.6 System Enhancement

In the event that an applicant's proposed facilities are inadequate to meet the present or future needs of the general area (as determined by the Township in its reasonable discretion or by reference to a Master Plan which has been or may hereafter be adopted by the Township, the applicant shall, at his initial expense, construct and install such system enhancements (including, without limitation, oversizing of lines, installation of pump station, looping lines, etc.) as shall be required by the Township.

To the extent that the applicant incurs costs in excess of those attendant to the costs necessary to service his property, the Township shall:

1. Provide reimbursement of additional reasonable costs for system enhancements, provided that such reimbursement shall be made solely by waiver of an appropriate amount of the developer's connection fees and shall not, under any circumstances, exceed the total amount of such connection fees.
2. Waive any increase in review and/or inspection fees occasioned by increase in total project costs due to mandated system enhancements.

The Township shall limit its participation in system enhancements with regard to pipe size as follows:

- a. Up to and including 16" in diameter, the Township agrees to pay the applicant the difference in material costs of the pipe, fittings and valves only over those materials costs associated with that size as required to service the applicant's proposed project.
- b. Over 16" in diameter, the Township agrees to pay the applicant the difference in the material costs, plus additional reasonable cost of installation.

The amount of connection fees to be waived and the reasonable costs for system enhancements shall be as determined by the Township.

All terms and conditions relative to system enhancements shall be memorialized in the Developer's Agreement to be executed by the Township and the Developer.

## 2.7 Township Review

Upon receipt of an application the Township shall:

1. Stamp date and assign an application number to each copy of the application;
2. Make copies of check(s) received and supply all original checks to the Township's Chief Financial Officer for deposit;
3. Transmit one complete application package (including application, copies of check(s), maps, etc.) to the Water Engineer.

Upon receipt of an application the Water Engineer shall:

1. Review copies of check(s) for correct and complete payment of all applicable fees and escrows;
2. Review the entire application for completeness;
3. Provide written notice of any deficiencies to the applicant with a copy thereof to the Township;
4. Upon satisfaction of all requirements and correction of all deficiencies, place the application on the Township's agenda for action and supply a report with recommendations noting any policy matters necessitating discussion prior to formal action.

## ARTICLE 3 - APPROVALS

### 3.1 General

Township approval is contingent upon certification by UWMX that there is adequate water supply to service the proposed extension to the water system.

The Applicant shall prepare forms for the Township's execution and shall, on behalf of the Township, make application to NJDEP for extension of water main extension and/or replacement, transmission main or interconnection not covered by a master permit. The procedure will conform to the most recent requirements of the Safe Drinking Water Act. The Applicant shall pay for all costs associated therewith.

If necessary, the Township may apply to NJDEP for additional water diversion rights. If well drilling permits are required, the Applicant shall make and pay for such application.

The Applicant shall obtain and pay for all other permits required by law, e.g., stream encroachment, wetlands, road opening, soil erosion, sediment control, road opening, etc.

The Applicant shall secure and pay for all easements, licenses or other forms of permit required to work on property of others.

### 3.2 Additional Pre-Construction Requirements

#### 3.2.1 Bonding

Performance bond shall be posted (see 2.4.6).

### 3.2.2 Insurance

Insurance certificates shall be furnished (see 2.4.7)

### 3.2.3 Developer's Agreements

A Developer's Agreement containing terms and conditions acceptable to the Township must be executed by the Township and the Developer. The terms and conditions of this agreement may be included in any Developer's Agreement for subdivision or site plan, provided the information is transmitted to the Township Attorney prior to the initial preparation of the subdivision or site plan Developer's Agreement. In the absence of such inclusion in the Developer's Agreement for subdivision or site plan, a separate Developer's Agreement shall be prepared at the Applicant's cost and expense in accordance with the schedule established in the Township Attorney's contract.

A Developer's Agreement relative to the provision of adequate water supply allocation and containing terms and conditions acceptable to UWMX must be executed by UWMX, the Developer and the Township.

### 3.2.4 Public or Private Utility Clearances

The Applicant or Developer shall furnish documentation of contact with and clearances from any applicable Public or Private Utility Companies.

### 3.2.5 Compliance with Conditions of Approval

All conditions of approval by the Township or any other Agencies of Jurisdiction shall have been satisfactorily addressed.

### 3.2.6 Escrow Deposit

The Applicant or Developer shall deposit and maintain with the Township a cash amount in accordance with the provisions of N.J.A.C. 40:55 D-53.

### 3.2.7 Applicant/Developer's Engineer's Certification – Permits and Approvals

The Applicant/Developer's engineer shall furnish a letter to the Township certifying that, to the best of his/her knowledge and belief, all necessary permits, approvals, and clearances have been obtained. The letter shall list all items obtained with permit numbers, dates, recording information, etc.

### 3.2.8 Certification of Compliance

The Township shall issue a certificate of compliance. It shall state the location and character of the work to be performed; the person granted permission of perform such work; the time within which the work must be performed.

### 3.2.9 Preconstruction Meeting

Subsequent to all of the above, and before commencing any construction, the developer, applicant, contractor for the developer, Water Engineer, Municipal Engineer, and Township personnel, shall hold a preconstruction meeting. All necessary catalog cuts, shop drawings, and construction schedules shall be provided to the Water Engineer for consideration.

### 3.3 Deviation from Approved Plans and Specifications

Any deviations from approved plans and specifications affecting location, profile, sizes, flow, material, methods of construction, capacity, and operation of any part or parts of the proposed or existing water system must be submitted in writing to the Township for approval prior to making such changes or deviations. Written approval must be obtained from the Township before the change or deviation is made.

### 3.4 Connection Fees to be Paid

The Applicant shall pay all connection fees prior to connection to the water system. The connection fee shall be determined by the number of units being serviced. One unit is designated by an annual consumption of 75,000 gallons per year. Each separate establishment shall, in the minimum, equal one (1) unit. (See definitions.)

The connection fee shall be based on an estimated water consumption. Should, at the end of the first full year of operations, the actual water consumption be observed to be less than the estimated water consumption, the Applicant will be refunded the difference. Consequently, if the actual water consumption should exceed the estimated amount, the Applicant will be required to submit any additional required fees.

## ARTICLE 4 - DETAILED INFORMATION ON DESIGN AND CONSTRUCTION OF WATER SYSTEMS

### 4.1 General

These Rules and Regulations are to be considered minimum requirements for the design and construction of water systems, except for limitations applied by law. Incorporated in these Rules and Regulations are the provisions of the Safe Drinking Water Act (N.J.A.C. 7:10) and the Statewide Site Improvement Standards (N.J.A.C. 5:21). The provisions of the latter shall prevail in connection with any applications for water service for residential development within the Manalapan Township Water Service Area.

Where both commercial and residential development are planned (mixed-use), the provisions of the Statewide Site Improvement Standards shall apply to the residential part(s) where such part(s) are discrete and separate from commercial parts.

### 4.2 Water Supply

All developments within the Manalapan Township Water Service Area, subject to available water supply allocation, shall be properly connected to an approved functioning public community water system prior to issuance of a Certificate of Occupancy.

### 4.3 Conformance with Master Plan

All developments shall comply with the requirements of the Township's Water Master Plan.

### 4.4 System Design and Placement

#### 4.4.1 General

System design and placement shall comply with these Rules and Regulations and, where and as applicable, the Safe Drinking Water Act, and the Statewide Site Improvement Act. Details of system design and placement will be subject to the review and requirements of the Water Engineer.

The system shall be designed to carry combined average daily demand plus fire demand. The Hazen-Williams formula shall be used for hydraulic calculations. A maximum "C" value of 120 will be allowed, and a lesser value may be required by the Water Engineer.

Pre-design discussion with the Water Engineer is encouraged.

#### 4.4.2 Looping

Distribution mains of the overall system shall be connected into loops so that the supply may be brought to the consumer from more than one direction. The Hardy-Cross (or equivalent) method shall be used to balance loops.

Dead-end lines in residential developments shall be permitted within the design of a looped system provided that there are no more than twenty (20) dwelling units permanently, nor more than fifty (50) dwelling units temporarily on a dead-end line. A hydrant or blow-off shall be installed at the terminus of all dead-end lines for flushing purposes.

#### 4.4.3. Distribution Mains

Distribution mains shall be a minimum diameter of eight inches (8") and shall be such as to maintain a minimum pressure of twenty (20) pounds per square inch (psi) at street level under all flow conditions - fire demand plus average daily demand. Distribution mains shall be designed contemplating total development within the Water Service Area.

Peak hour flows for residential development shall be based on the following:

<u>Total Houses Served</u>	<u>Peak Hourly Rates (GPM per house)</u>
5	8.0
10	5.0
50	3.0
100	2.0
250	1.3
500	0.8
750	0.7
1000 +	0.6

#### 4.4.4 Valving

Distribution mains shall be valved such that no more than one hydrant will be out of service as the result of a single water main break. They shall be located at each small branch off larger mains. Where eight (8) inch or larger mains intersect, there shall be a valve in each branch. At street intersections, valves shall be located near pipe intersections.

In residential areas, water mains shall be valved at a maximum spacing of one-quarter of a mile (or less, if required by hydrant spacing). In non-residential areas, water mains shall be valved in accordance with provisions of the Safe Drinking Water Act.

On sixteen (16) inch or larger mains, geared valves with suitable bypasses will be required.

#### 4.4.5 Fire Protection

##### 4.4.5.1 Fire Protection Design Criteria

Fire protection shall be designed pursuant to:

- a) ISO standard, fire suppression rating schedule; or
- b) "Manual of Water Supply Practices - Distribution System Requirements for Fire Protection," ISO method.

##### 4.4.5.2 Backflow Protection

Fire service or sprinkler lines shall be provided with a double check valve assembly to prevent backflow into the Township water system. One check valve shall be of the detector type and shall be Model DDC II or EDC III as manufactured by Hersey Products of North Carolina, or approved equal. Gate valves shall be installed at each side of the check valve assembly. Location of the installation shall be approved by the Water Engineer. The water meters for the assembly shall be furnished and paid for by the Applicant and approved by the Township.

##### 4.4.5.3 Hydrants

Hydrants shall be spaced to provide necessary fire flow. The average building area served by any individual hydrant shall not exceed 120,000 square feet.

Hydrants shall be located within 400 feet of any residence, as measured along street right-of-way. Hydrants shall be located on the high and low elevations of the water mains to act as air release or blow-offs. Flushing hydrants shall be installed at the terminus of all dead end lines or cul-de-sacs.

In non-residential areas, hydrant locations shall be sufficient to meet the requirements of Article 4.4.5.1 of these Rules and Regulations. All hydrant locations shall be approved by the Manalapan Fire Prevention Bureau.

#### 4.4.6 Storage Tanks

Storage tanks shall have a total effective capacity that, combined with pumping capacity, shall be at least equal to fire demand flow plus maximum day consumption, or meet the peak hour demand, whichever is greater.

High water levels in all elevated storage tanks shall be as required by the Water Engineer. The effective amount of water in all elevated tanks shall be that which is above elevation 258.0 (NGVD).

Storage tanks shall be designed to prevent over-topping. An altitude valve with a valve chamber and bypass piping shall be required.

Tanks shall be in accordance with the latest issue of AWWA D100, STANDARD FOR WELDED STEEL TANKS FOR WATER STORAGE. All roof welds shall be full penetration butt welds.

##### 4.4.7 Service Connections

A residential service connection shall consist of a corporation stop at the main, a curb stop and a water meter and remote readout. Water meters shall be consistent with requirements of

UWMA. When the meter is located outside a building, an additional shutoff valve shall be installed on the discharge side of the meter. When the meter is located inside a building, valving shall be in accordance with the Plumbing Subcode of the Uniform Construction Code (N.J.A.C. 5:23-3.15). Curb stops will be located pursuant to standards of the Township and direction of the Water Engineer.

A separate water connection shall be required for each unit of detached housing. Common water service connections may be allowed for multifamily housing, but only if the owner of the structure is the customer of record.

#### 4.4.8 Meter Chamber

Reinforced concrete meter chambers are to be designed, signed, and sealed by a New Jersey licensed Professional Engineer. The design shall be consistent with the standard water meter chamber plan attached to these Rules and Regulations. It shall contain appropriate control valves if and as necessary. At least one line control valve shall be included in a meter chamber. It shall also contain the following: dome exhaust fan, power panel, grab pipe, explosion proof light, pipe support, turbidimeter, turbidimeter control panel, chlorine analyzer, sump and pump with additional back-up sump pump, dehumidifier, pH analyzer, exhaust fan, victaullic coupling, aluminum ladder, 3' - 0" x 3' - 0" aluminum access hatch, telemetry panel (which panel shall be hooked up to all flow analyzers and meters), telco service, and an electric service and meter.

#### 4.4.9 Irrigation Systems

Irrigation systems shall not be installed whereby same are connected to the Township's water system, except by specific application and approval. All irrigation systems, if permitted, shall be provided with an above-grade backflow preventor that shall be metered and protected from freezing.

#### 4.5 Water Treatment

Treatment facilities shall be designed to meet peak supply demands and produce water treatment that is uniform and in conformance with the provisions of the Safe Drinking Water Act.

#### 4.6 Materials

##### 4.6.1 Pipe and Fittings

In residential development, pipe materials shall be cement-lined ductile iron, pre-stressed concrete cylinder pipe, or PVC pipe.

In non-residential development, pipe materials shall be cement-lined ductile iron or pre-stressed concrete cylinder pipe.

For bridge crossings or other special aerial installations, pipe material shall be steel.

All pipe fitting shall be cement lined ductile iron and shall use retainer glands.

##### 4.6.1.1 Ductile Iron Pipe

Ductile iron pipe, appurtenances and fittings shall comply with the latest revision of:

ANSI/AWWA C110/A21.10 (fittings)

ANSI/AWWA C111/A21.11 (rubber gasket joints)

ANSI/AWWA C115/A21.15 (flanged joints)

ANSI/AWWA C151/A21.51/A21.51 (pipe)

Ductile iron pipe shall be cement-mortar lined in accordance with ANSI/AWWA C150/A21.51. It shall be furnished in 18-20 feet nominal lengths. It shall have an exterior coal-tar, epoxy type coating.

In aggressive soils, ductile iron pipe shall be wrapped in polyethylene. Polyethylene pipe encasement for use with ductile iron pipe shall be polyethylene 8 mil. thick, either in tube or sheet form, with 2" wide polyethylene adhesive tape used to secure the film to the pipe.

Polyethylene encasement shall conform with the provisions of ANSI/AWWA C105/A21.5, latest edition.

Pipe thickness shall be determined in accordance with ANSI/AWWA C150/A21.50. The pipe shall be a minimum Thickness Class 52, except for grooved coupling pipe or pipe utilized in any river, road or railway crossing, which shall be a minimum Thickness Class 56.

All buried ductile iron fittings shall have mechanical joints with retainer glands. All bolts, nuts, washers and other mounting hardware shall be tar-coated. Where directed by the Water Engineer, pipes will be designed without the need for thrust blocks, and shall conform with the standard detail for restrained pipe length as provided in the Appendix to these Rules and Regulations. The maximum joint deflection shall be one-half (1/2) that published by the joint manufacturer. All joints within manholes, structures, or as otherwise exposed shall be flanged type with full face, red rubber gaskets with one or more annular rings molded into the gasket to improve gasket performance. Flange joint gaskets shall be one-eighth inch (1/8") thick. Alternative joint types may be approved on a case-by-case basis at the sole discretion of the Water Engineer.

#### 4.6.1.2 Prestressed Concrete Cylinder Pipe and Fittings

Prestressed concrete cylinder pipe and fittings shall comply with the provisions of ANSI/AWWA C301, latest edition. Joints shall be of rubber and steel as specified therein.

Pipe design shall conform with the provisions of ANSI/AWWA C304, latest edition. Pipe design shall be performed by a licensed professional engineer of the State of New Jersey.

A sealed set of design documents shall be furnished to the Water Engineer. Acceptance of the design documents by the Water Engineer shall not transfer any level of responsibility for the adequacy of design to the Water Engineer.

#### 4.6.1.3 PVC Pipe

PVC pipe, appurtenances and fittings shall comply with the latest edition of ANSI/AWWA C900. Joints shall be elastomeric-gasket couplings. Solvent joints will not be permitted.

#### 4.6.1.4 Steel Pipe

Steel pipe shall be electrically butt-welded straight-seam or spiral-seam pipe or seamless pipe 6 inches in nominal diameter and larger and suitable for water service. The pipe shall conform comply with the provisions of ANSI/AWWA C200, latest edition. Steel fittings shall comply with the provision of ANSI/AWWA C208, latest edition.

Welding operations shall comply with the provisions of ANSI/AWWA C206, latest edition. The exterior coatings for the steel pipe shall comply with the provisions on Section 2 of ANSI/AWWA C203, latest edition. Interior cement mortar lining for pipe and fittings shall be twice the minimum thickness specified in and in full compliance with ANSI/AWWA



C205, latest edition. When required, interior and exterior of steel pipelines and fittings shall be coated with a liquid epoxy coating system in full compliance with ANSI/AWWA C210. Steel pipe shall have a minimum wall thickness of 0.1345 inches for nominal pipe diameters of 6 inches to 12 inches and 0.2500 inches for nominal pipe diameters from 14 to 36 inches.

Steel pipe shall be joined with welded or flanged connections, or as approved by the Water Engineer.

#### 4.6.1.5 Flexible Pipe Couplings

Flexible pipe couplings shall be Dresser Style 30 for joining pipes of the same outside diameter or Style 162 Transition Coupling for joining pipes of differing outside diameters or materials (or approved equal). In either case, the couplings shall be watertight against the line pressures. Restraining rods and harnesses, as required, shall also be installed by the contractor at the time of the coupling installation. Rods and nuts shall be coated with bituminous coating. The restraint system must be suitable to resist against a minimum pipeline pressure of 150 psi on an adjacent closed valve, regardless of the actual pipeline configuration. A minimum 50 percent factor of safety shall be utilized in all designs.

#### 4.6.2 Valves, Taps and Hydrants

##### 4.6.2.1 Resilient Seat Gate Valves

Gate valves for water service shall conform with all applicable provisions of ANSI/AWWA C509, latest edition.

Buried resilient seat gate valves shall have iron body, inside screw, epoxy coated inside and out, resilient seat, "O" ring seals and mechanical joint ends. All valves shall open counterclockwise, shall be set plumb, and shall be furnished with a 2-inch square operating nut. Valves shall be of the non-rising stem type and shall be "SUPER-SEAL RESILIENT SEAT NRS" (A-2370) as manufactured by the Mueller Company. All bolts, nuts, washers and other mounting hardware shall be tar-coated.

All valves up to 12" in diameter shall be supplied with mechanical joint ends (A-2370-20), shall be suitable for working pressures to 200 psi with a bubble-tight shutdown and shall be installed in the vertical position. Lubrication and O & M instructions and parts list shall be furnished in quadruplicate for each type of valve provided.

##### 4.6.2.2 Butterfly Valves (16") INCH OR LARGER MAINS, CEARED VALVES w/ SUTURE BYPASS WILL BE REQUIRED. 4.4.4

Butterfly valves shall not be allowed in distribution mains.

In other applications, pipes having diameters greater than twelve inches (12") will utilize butterfly valves, unless waived by the Water Engineer. Such applications may include (but are not limited to): meter pits; treatment plants; water towers; booster stations.

Valve bodies shall be constructed of cast iron ASTM A-126 Class B and shall have integrally cast mechanical joint ends. Two trunnions for shaft bearings shall be integral with each valve body.

Valve discs shall be constructed of cast iron ASTM A-126 Grade B with Ni-Cr edge (valves 6" through 20"). Larger sizes: Ductile iron with stainless steel seating edge (30" through 48" size), or cast iron with stainless steel seating edge (24" size only).

Shafts of all valves shall be turned, ground and polished. Valve shafts shall be constructed of 18-8 Type 304 stainless steel. Shaft diameters must meet minimum requirements established by ANSI/AWWA C504 for Class 150B.

Valve seats shall be a synthetic rubber compound. Valves 20" and smaller shall have bonded seats. Bonded seats must be simultaneously molded in, vulcanized and bonded to the body. Seat bond must withstand 75 lbs. under test procedure ASTM D429, Method B.

Valve seats on 24-inch diameter valves and larger shall be field adjustable and replaceable without dismantling operator, disc or shaft. Seats shall be retained in the valve body by mechanical means without use of metal retainers or other devices located in the flow stream.

Valves shall be fitted with sleeve-type bearings. Bearings shall be corrosion resistant and self-lubricating. Bearing load shall not exceed 1/5 of the compressive strength of the bearing or shaft material.

Valve operators shall conform to ANSI/AWWA C504.

Manual operators shall be of the traveling nut, self-locking type and shall be designed to hold the valve in any intermediate position between full open and fully closed without creeping or fluttering. Operators shall be equipped with mechanical stop-limiting devices to prevent overtravel of the disc in the open and closed positions. Operator housing, supports and connections to the valve shall have provisions for four-bolt mounting. Operators shall be equipped with a 2" square operating nut and shall be fully gasketed and grease packed for buried service. Valves shall close with a clockwise rotation of the nut.

Valve operator components shall withstand an input torque of 300 ft. lbs. at the extreme operator positions without damage. All surfaces of the valve shall be clean, dry and free from grease before painting. The valve interior and exterior surfaces except for seating shall be evenly coated with asphalt varnish in accordance with Federal Specification TT-C-494A and ANSI/AWWA C504.

Hydrostatic and leakage tests shall be conducted in strict accordance with ANSI/AWWA C504.

A valve position indicator shall be furnished for all valves for installation in a valve box. The valve indicator shall be hermetically sealed for installation inside a cast iron valve box and shall show valve-disc position, direction of rotation and number of turns from full open to full close. This indicator shall be provided by the valve manufacturer. In addition, the valve manufacturer shall provide suitably sized extension stems and AWWA Standard 2" operating nut to bring the nut to within 3' of the top of the valve box. The shaft shall be of adequate design to accept and transfer the required valve operating torques without undue strain and without deformation. The manufacturer (supplier) furnishing valves under the specification shall be prepared to show proof that the valves proposed meet the design requirements of ANSI/AWWA C504.

#### 4.6.2.3 Wet Taps

Where required by the Township, the contractor shall connect to existing water mains under system pressure utilizing tapping sleeves, valves and a water main drilling machine. Prior to ordering the sleeves, the contractor shall be responsible for determining the size and material of the water main to be connected to.

The tapping sleeves shall be of the split sleeve bolt-on type with mechanical joint end

connections. The mechanical joint connections shall be provided with totally confined end duck tipped gaskets to resist cold flow and creep. The sleeves shall be rated for working pressure of 200 psi. Prior to placing the sleeve onto the main to be drilled, the main shall be thoroughly cleaned down to the original pipe material in order to insure the water and pressure tight fit of the sleeve. The tapping sleeve shall be Mueller Company Model H-615. Prior to the tap begin made, the sleeve, after being installed, shall be subjected to a hydrostatic pressure test in accordance with the testing requirements specified in these Rules and Regulations.

The tapping valve shall be a non-rising stem resilient gate valve, as described in a previous section of these Rules and Regulations. The tapping valve shall have flanged to mechanical joint end connections. Valves shall comply with ANSI/AWWA C509, latest edition for resilient seated gate valves. The water main tapping shall be made by a drilling machine specifically designed for water main connections under pressure. Upon the attachment of the tapping sleeve and valve and drilling machine to the main, the entire assembly shall be pressure tested prior to making the cut. The pressure test shall be as required for pipelines as described in these Rules and Regulations. The drilling machine shall be air or gasoline motor operated. The use of manually operated drilling machines will not be permitted. The drilling machine shall be equipped with a tungsten-carbide tipped shell cutter and pilot drill.

The contractor shall provide competent and qualified personnel, completely familiar with the operation of the drilling machine, and thoroughly familiar with the operation of tapping water mains under pressure.

A concrete slab or firm stone bedding as may be required by the Water Engineer shall be poured under the body of the tapping valve AFTER the completion of the tapping operation in such a manner that will not affect any future work on the joints or of valve parts.

All equipment and materials shall be sterilized before installation.

#### 4.6.2.4 Fire Hydrant Assemblies

Fire Hydrants shall be Mueller Super Centurion A-423 breakaway hydrants. Each hydrant shall be connected to a distribution main with a six inch (6") cast iron branch controlled by a 6 inch (6") gate valve. Hydrants shall be three-way with two (2) two and one-half inch (2 1/2") nozzles and one (1) four and one-half inch (4 1/2") nozzle. Nozzles shall open to the left (counter-clockwise). Bury depth (grade to bottom of connecting pipe) shall be 5'-0".

Fire hydrants shall comply with the provisions of ANSI/AWWA C502, latest edition. Working pressure rating shall be 150 psi.

Hydrant locations shall be as specified elsewhere in these Rules and Regulations, and shall be approved by the Manalapan Township Fire Prevention Bureau. In locations where a blow-off is required, such as at dead ends or low points, and where the Fire Prevention Bureau has not located a fire hydrant, a flush hydrant shall be provided. Flush hydrants shall be Mueller Cat. No. A-411. Installation requirements shall be the same as for fire hydrants. Flush hydrants may be installed at the end of a main in a dead end street if a fire hydrant is not required by the Fire Prevention Bureau, and if, in the opinion of the Water Engineer, the line is not likely to be extended.

Fire hydrants shall be installed complete with auxiliary isolation resilient seat gate valve, six inch (6") mechanical joint elbow, adjustable cast iron valve box, six inch (6") tee off distribution main, thrust blocks, concrete blocks, clean one and one-half inch (1 1/2") crushed stone, polyethylene sheathing, granular backfill and all other material and labor

needed to install the hydrant assembly in accordance with standard hydrant detail attached to these Rules and Regulations. All bolts, nuts, washers, and other mounting hardware shall be tar-coated. Hydrant, valve stem and valve box shall be set plumb. Valve box shall be centered and installed so that the auxiliary valve can easily be operated from street level by use of proper valve wrench. Cover of valve box shall be one inch (1") above surrounding ground level in non-paved areas and flush to ground in paved areas.

Hydrants shall be placed so that the barrel shall be 24 inches from face of curb, with the four and one-half inch (4 1/2") pumper nozzle facing the street. The hydrant elbow shall be placed on a structural foundation as shown on the hydrant detail attached to these Rules and Regulations. The back side of the hydrant opposite the pipe connection shall be firmly braced against the vertical face of the trench by means of a poured concrete thrust block or other means approved by the Water Engineer to prevent the fittings from blowing off the line. Bracing shall be installed so as not to interfere with hydrant drains. The bottom of the ditch and lower part of the hydrant barrel shall be surrounded with coarse gravel so that water released from the standpipe by the drain valve may escape quickly.

Hydrant must be firmly supported underground all around the standpipe since the proper working of the safety breakable section depends on the unyielding support of the ground standpipe. Solid ground support shall be at ground level line mark of the hydrant barrel, resulting in center line of hose and pumper nozzles being eighteen inches (18") above grade. The backfill around the hydrant barrel, therefore, must be carefully and thoroughly compacted.

When a hydrant is ready for service, it shall be opened and closed to see that all parts are in working condition. After closing hydrant, the standpipe interior shall be inspected to make sure of proper drainage. UNTIL THE HYDRANTS AND ADJACENT PIPING HAS BEEN TESTED AND ACCEPTED, THE CONTRACTOR SHALL SECURELY COVER THE HYDRANTS WITH BURLAP TO CLEARLY INDICATE THAT THEY ARE NOT IN SERVICE.

#### 4.6.2.5 Water Meters - (Unit Services)

Water meters for residential use shall be Neptune T-10 (5/8" x 3/4"). Water meters for other uses shall be Neptune T-10, sizes to be determined by UWMA. Meters shall comply with the provisions of ANSI/AWWA C700, latest edition. Each water meter installation shall accommodate and include a Neptune Pro-Read, 2-wire, 3-board, unit for remote reading of the meter. Meters and remote reading devices shall be as manufactured by Schlumberger Industries Water Division. The remote unit shall be so located on the outside of the building as to be easily accessible to meter reading personnel.

The New Jersey distributor is:

SLC Meter  
407 Bloomfield Drive, Unit 3  
West Berlin, NJ 08901  
Telephone - (609) 719-0084

Assemblies shall consist of a roll-sealed register, a cast bronze maincase and a nutating disc measuring chamber. Meters shall have bronze bottom caps, and shall read in U.S. gallons.

#### 4.6.2.6 Water Meters (System Interconnections)

For any new interconnection between Manalapan Township's Water System and the UWMX system, a Neptune High performance turbine meter shall be installed. The meter

shall comply with the provisions of AWWA C701, latest edition. The meter will be sized by the Developer's Engineer, approved by the Water Engineer and be acceptable to UWMX, and shall be installed in a water meter chamber to be constructed in accordance with the conceptual Standard Water Meter Pit Plan of UWMX, a copy of which is attached to these Rules and Regulations. (See Section 4.4.8, Meter Chamber.)

The meter for any system interconnections will be furnished by the Developer and owned by UWMX. The meter and appurtenances shall not be subject to flooding or freezing. Meter chamber drainage must be designed to handle maximum relief valve discharge as indicated in the manufacturer's literature.

#### 4.6.2.7 Valve Boxes

All buried valve boxes shall be 2-piece sliding type cast iron valve boxes. Where valves are deeper than 4'-0" extension stems shall be provided to within a maximum of 3'-0" from the finished grade. All extension stems shall be of heavy duty construction, shall be coated with two (2) coats of asphaltum varnish, and shall be provided with a self-centering ring to maintain the stem in the center of the valve box. Each valve box shall be of sufficient length to allow a vertical adjustment of approximately 8 inches in either direction. Valve boxes shall be approved by the Water Engineer.

All valve boxes and extension stems shall be set plumb. All water main valve box covers shall have the word "water" and an arrow indicating the direction of valve opening cast on the cover. Concrete block shall be poured around all valve boxes not set in paved areas as shown on the detail sheet.

#### 4.6.2.8 Service Connections

Service connections shall be defined as the pipe and appurtenances between a distribution main and a street right-of-way line. Appurtenances will include a corporation stop at the distribution main, a curb stop and box located as shown in the details attached to these Rules and Regulations (or as directed by the Water Engineer), and sufficient pipe to reach beyond the street ROW line.

Pipe material for residential service connections may be type K copper or Polyethylene (PE) pressure pipe which complies with the provisions of ANSI/AWWA C901. Pipe material for commercial or industrial service connections shall be type K copper.

Corporation stops and valves shall be Mueller Company Series H-15000, with appropriate sizing, configuration and connection for the type of service pipe to be installed. They shall comply with the provisions of ANSI/AWWA C800, latest edition.

Curb valves and stops shall be Mueller Company figure H-15209, complying with ANSI/AWWA C800, latest edition. Service connections larger than 1 inch (1") up to and including two inch (2") shall be connected to the distribution main utilizing a double strap service clamp (DE2S Series), or approved equal. Service connections larger than two inches (2") shall be accomplished using a tee fitting in the distribution main.

Curb boxes shall be Mueller Company Figure No. H-10314 or H-10336, as required. Each curb box shall be furnished and installed with a compatible foot piece, as manufactured by Mueller Company.

Miscellaneous fittings required to make up the service connection shall comply with ANSI/AWWA C800, latest edition.

#### 4.7 Construction of Distribution System and Appurtenances

##### 4.7.1 General

The construction of water system facilities approved under these Rules and Regulations by a Contractor will be performed for and under contract with an Applicant and/or Developer (see definitions). The Township and the Water Engineer will monitor and observe the execution of the project, but in no way shall the Township or the Water Engineer supervise, direct or have control over Contractor's work, nor shall the Township or the Water Engineer have authority over or responsibility for the means, methods, techniques, sequences, or procedures of construction selected by the Contractor. Neither shall the Township or the Water Engineer have authority over safety precautions and programs incident to the Contractor's work in progress nor for any failure of Contractor to comply with laws and regulations applicable to Contractor's furnishing and performing the work. The Township and/or the Water Engineer will have the right and authority to monitor the Contractor's work for compliance with the plans and specifications, and to accept or reject work.

##### 4.7.2 Safety

It will be the Contractor's responsibility to ascertain and comply with any laws and regulations applicable to Contractor's performing and finishing the work. Contractor shall take all necessary precautions for safety of persons or property.

Contractor shall furnish the Township with a certification that an experienced foreman/superintendent trained in safety will be present at all times that construction activities are underway.

##### 4.7.3 Inspection, Unloading, Handling and Storage

All pipe materials and appurtenances are subject to inspection by the Township at the point of delivery. Such inspection does not relieve the Contractor of responsibility to inspect and accept materials, but the Township may reject materials which it finds to be defective or damaged.

Contractor shall be responsible for unloading materials in accordance with manufacture's published recommendations, and applicable ANSI/AWWA Specifications.

Pipe materials and appurtenances shall be handled with care to avoid damage in handling at the site.

Storage of materials shall be planned and executed in a manner consistent with public safety. Materials shall be kept safe from damage and free from dirt and foreign matter. Storage shall comply with applicable ANSI/AWWA Specifications.

##### 4.7.4 Alignment and Grade

###### 4.7.4.1 Pipe Placement

All pipe shall be laid and maintained at required lines and grades shown on the approved plans.

###### 4.7.4.2 Appurtenance Placement

Fittings, valves, air release valves and manholes, and hydrants shall be installed at required locations with valve and hydrant stems properly set. The axis of fittings shall align with the longitudinal axis of the pipe.

#### 4.7.4.3 Obstructions

It shall be the responsibility of the Contractor to provide adequate protection and maintenance of all underground and surface utility structures, drains, sewers, and other obstructions encountered in the progress of work. When the required grade or alignment of the pipe is obstructed by existing utility structures (such as conduits, ducts, pipes, branch connections to main sewers, or main drains), the obstruction shall be permanently supported, relocated, removed, reconstructed, or bypassed by the Contractor as provided in the specifications and in cooperation with the owners of such utility structures.

#### 4.7.5 Excavation

##### 4.7.5.1 Trench Preparation

The Contractor shall comply with all federal, state, and local regulations for the protection of workers and the safety of the general public.

Trench preparation shall proceed in advance of pipe installation only so far as can be backfilled the same day, to a 100 feet maximum distance.

The discharge from any trench dewatering pumps shall be conveyed to natural drainage channels, storm sewers, or proper reservoirs as approved by regulatory authorities having jurisdiction. Such discharge shall be in a manner that prevents property damage, erosion, or siltation.

Where necessary to prevent caving, trench excavations in unstable soils shall be adequately supported. Before sheeting is withdrawn, or trench boxes moved forward, they shall be raised, in place, just above the pipe crown to safely allow the constructor to completely fill any voids left in the pipe zone.

##### 4.7.5.2 Trench Construction

The trench width at the ground surface may vary with the trench depth, the nature of soils encountered, existence of any pavement, and the proximity of adjacent structures. The minimum clear width of an unsupported or supported trench measured at the centerline of the pipe shall be at least 18 inches or the pipe outside diameter plus 12 inches, whichever is greater. Where embedment compaction is required, the trench shall be wide enough to accommodate the compaction equipment. Whenever possible, the clear width of the trench at the top of the pipe should not exceed the pipe outside diameter plus 24 inches.

The trench shall be excavated to the depth that permits pipe to be laid at the elevations shown on the drawings with the required minimum depth of cover of ~~five~~<sup>four</sup> feet (5'). The depth of cover shall be measured from the finished grade or the surface of the permanent improvement to the top of the pipe barrel.

The trench bottom shall be constructed to provide a firm, stable, and uniform support for the full length of the pipe. Blocking shall not be used to change pipe grade or to intermittently support pipe across excavated sections. Bell holes at each joint shall be provided to permit the joint to be assembled and pipe to be supported properly.

Ledge rock, boulders, cobbles, and large stones shall be removed to provide at least 6 inches of embedment cushion on each side of and below all pipe and appurtenances. The excavation shall be sufficiently wide to enable proper placement of the embedment material specified. When excavation is completed, embedment material shall be placed, leveled, and compacted to provide a proper cushion for the pipe. Such embedment shall be dense

graded aggregate as specified by NJDOT.

If the trench passes over a sewer or other previous excavation, the trench bottom shall (1) be compacted to provide support equal to that of the undisturbed native soil or (2) conform to specific regulatory requirements that preclude damage to the existing installed facility.

Where an unstable subgrade condition exists that, in the opinion of the Township, cannot support the pipe, an alternative foundation shall be provided. At the discretion of the Township, an additional depth shall be excavated and refilled to pipe foundation grade with embedment material. Any part of the trench excavated below grade shall be backfilled to grade and compacted to the required density. Such embedment shall be dense graded aggregate as specified by NJDOT.

Where running or standing water occurs in the trench bottom or where the soil in the trench bottom displays a "quick" tendency, the water shall be removed by pumps. The trench shall be kept free from water during installation operations by suitable means, such as well points or pervious underdrain bedding, until the pipe has been installed and backfill placed and compacted to a sufficient height to prevent pipe flotation.

The Township reserves the right to require the Developer or Contractor to retain the services of a qualified geotechnical engineer to render a report with recommendations, to which the Contractor shall comply, as to unstable subgrade or groundwater conditions.

#### 4.7.5.3 Management of Excavated or Hazardous Material

Excavated material shall be placed in a manner that will not obstruct work or endanger personnel or the public. Excavated material shall not obstruct sidewalks or driveways for extended periods unless specifically permitted by the property owner. Hydrants under pressure, valve-pit covers, valve boxes, curb-stop boxes, fire and police call boxes, or other utility controls shall remain unobstructed and accessible. Gutters shall remain clear unless other satisfactory provisions have been made for street drainage. Natural water courses shall not be obstructed. Surplus excavated material shall be disposed of in a suitable manner.

Excess excavated or hazardous material shall be disposed of by the Contractor in a manner consistent with all applicable local, State and federal laws, rules and regulations. The Contractor will be responsible for determining the location and legal status of any disposal site(s), as well as the manner and routing of transportation of excess excavated material. Neither the Township nor the Water Engineer will participate in any way in arrangements for the disposal of excess excavated or hazardous material.

The Contractor is advised that disposal of excess excavated material in wetlands, stream corridors, and flood plains is strictly prohibited even if the permission of the property owner is obtained. Any violation of this restriction by the Contractor or any person employed by him will be brought to the immediate attention of the responsible regulatory agencies with a request that appropriate action be taken against the offending parties. Further, the Contractor will be required to remove the fill at its own expense and restore the area impacted.

The Contractor shall be aware that permitting agencies are concerned about the erosion by wind and water of excess excavated materials disposed of on private lands by contractors. When obtaining releases from private land owners, the Contractor shall include a statement from the land owner that he/she has been apprised by the Contractor of this need for erosion control and accepts complete responsibility for this implementation.



#### 4.7.6 Sheeting

Wherever necessary, for safety or to prevent disturbance, damage or settlement of adjacent structures, pipelines, utilities, improvements or pavement or in order to prevent damage to work from flooding or high groundwater, excavations shall be sheeted and braced. Any damage to new or existing structures occurring through settlement, water or earth pressure or other causes due to inadequate construction procedures of the Contractor shall be repaired by the Contractor at its own expense.

Sheeting and bracing will be required at all jacking and receiving pit locations.

All required sheeting and bracing systems shall be designed by a New Jersey licensed Professional Engineer whose services have been retained by the Contractor. Five copies of sealed design calculations shall be submitted to the Township for their information only prior to undertaking any sheeting operations. The design shall not be reviewed by the Water Engineer.

The Contractor shall be fully responsible for the adequacy of the sheeting and his construction procedures.

#### 4.7.7 Dewatering

The Contractor shall dewater all excavations promptly and continuously throughout the progress of the work. The Contractor shall protect uncompleted work from flooding during storms or from other causes. All pipelines or structures not stable against uplift during construction or prior to completion shall be thoroughly braced or otherwise protected.

All necessary precautions shall be taken to prevent disturbance of, and to properly drain, the areas upon which concrete is poured and upon which pipe is to be laid. All excavations adjacent to concrete structures shall be kept dry for one month after pouring of the concrete.

All water pumped and bailed from the trench or other excavation shall be conveyed in a proper manner through an approved settling basin and to a suitable point of discharge by the Contractor at his own expense.

Under no circumstances shall silt laden water be permitted to be discharged into any waterways, storm sewers, or sanitary sewers.

Clay cut-off collars shall be installed at a maximum spacing of 200 feet in order to preclude ground water migration.

Where work is to be performed below groundwater level, a well point dewatering system, as described under the appropriate subsection of this section, shall be used.

The Contractor shall be responsible for maintaining water service during dewatering operations to any residence or establishment served by individual wells which may be impacted upon by his dewatering operations. Dewatering operations shall be discontinued until such adequate water supply is provided to effected properties.

#### 4.7.8 Wellpoints and Deep Wells

The Contractor may be required to install a wellpoint and/or deep well dewatering system in order to protect the work from flooding and uplift resulting from high groundwater conditions. Groundwater lowering operations shall be conducted in strict accordance with NJDEP requirements, including applicable temporary water diversion permitting, and water shall be

discharged so as not to cause any soil erosion or sedimentation problems. Under no circumstances shall silt laden water be discharged into any waters of the State of New Jersey.

The Contractor shall comply with all requirements of the previous section relative to dewatering.

#### 4.7.9 Backfill

Backfill in areas of structures, pavement or pipelines shall be clean granular select fill as approved by the Water Engineer. In other areas which require backfill, the on-site material may be suitable providing it is dry and free from construction debris, rubbish, organic material and rock where its greatest dimension exceeds four (4) inches. Prior to placement of backfill material, the subgrade shall be compacted as detailed in other subsections of this section.

Backfill shall not be placed on ground that is frozen, nor shall backfill material be permitted to freeze during placing and compaction.

The Water Engineer reserves the right to make such selection of the material for various portions of the backfill as may be required for the satisfactory execution of the work.

As soon as practical after the pipe, concrete or masonry has been placed and has acquired satisfactory strength as determined by the Water Engineer, the backfilling shall begin and be expeditiously completed.

No trench or other excavation shall be backfilled until the structure or pipeline in it has been examined and approved. Immediately after examination and approval, the trench or other excavation shall be carefully backfilled and compacted with the suitable excavation or imported backfill material. Whenever the Water Engineer deems the excavated material unsuitable for backfilling, the Contractor shall furnish and install acceptable material from off-site.

In trench areas suitable material shall be used to fill evenly on both sides of the pipe and carefully tamped or rammed with a tool having a face about 2 inches x 5 inches and weighing 5 to 7 pounds so as not to disturb the pipe joints and, at the same time, thoroughly compacting the material around the pipe up to a depth one foot above the top of the pipe. After such depth the trench shall be compacted in the same manner as designated around structures.

All sheeting shall be withdrawn unless otherwise ordered in writing by the Water Engineer before more than 6 inches of earth is placed above the top of pipe. As the trench is refilled, the sheeting shall be removed in such a manner as to avoid the caving of the trench. The void left by the sheeting shall be carefully refilled by ramming or as otherwise directed.

Fill material shall be spread in uniform horizontal layers not exceeding twelve inches in thickness and shall be compacted in a manner as described under the appropriate subsection.

All work performed in paved areas or future paved areas shall be done in accordance with the requirements of the agencies having jurisdiction and compacted in accordance with Section 4.7.10.

The Township retains the right to conduct an analyses on any backfill material and to reject same, if, in its sole opinion, said material is unsuitable or not properly compacted.

#### 4.7.10 Compaction

All backfill within existing or proposed roadway or pavement areas shall be spread in uniform horizontal layers not exceeding twelve inches in thickness and shall be compacted using

approved mechanical compaction equipment to achieve 95 percent of its Modified Proctor Density as determined by ASTM Designation D-1557, latest revision.

#### 4.7.11 Jackings and Borings

All jacking pits and receiving pits shall be designed by a New Jersey licensed professional engineer. Five copies of the signed and sealed plans shall be submitted to the Township for information only, not for review by the Water Engineer.

#### 4.7.12 PVCP Installation

##### 4.7.12.1 Material Inspection

Pipe and appurtenances shall be inspected by the Township for defects prior to installation in the trench. Any defective, damaged, or unsound material shall be rejected.

##### 4.7.12.2 Precautions

Proper equipment, tools, and facilities shall be provided and used by the Contractor for the safe execution of work. All pipe and appurtenances shall be lowered carefully into the trench using suitable equipment and methods to prevent material damage or personnel injury. Under no circumstances shall pipe or appurtenances be rolled, dropped, or dumped into the trench.

##### 4.7.12.3 Pipe Laying

Before lowering the pipe into position in the trench, all dirt and foreign matter that cannot be removed by normal flushing shall be cleaned by mechanical means. The Township shall determine when such mechanical cleaning is required. During laying operations, no debris, hand tools, clothing, or other materials shall be placed in the pipe. Pipe shall be kept clean during and after laying.

As each length of pipe is placed in the trench, the joint shall be assembled and the pipe brought to required line and grade.

The pipe and joint shall be uniformly supported and secured in place with the specified embedment material. The pipe shall be laid with the bell end pointing in the direction of work progress.

When laying operations are interrupted or terminated at the end of a day, pipe ends shall be sealed temporarily to prevent the entry of water, debris, small animals, and similar types of contamination. Precautions shall be taken to prevent flotation of the sealed pipe during work stoppages.

If PVCP is used, both magnetic locator tape and advanced warning tape shall be placed in the backfill immediately over the top of the pipe at a depth of two feet (advance warning) and four feet (magnetic) below the pavement or ground surface.

##### 4.7.12.4 Pipe Joining

Circular saws, hand saws, or similar equipment may be used for cutting PVC pipe. When pipe is cut in the field, the cut shall provide a smooth end at a right angle to the longitudinal axis of the pipe. Pipe spigot ends shall be deburred, beveled, and re-marked with insertion line. For optimal performance, the length and angle of field bevels should match the factory bevels. To ensure the proper engagement of the sealing gasket with the

PVC pipe spigot when connecting to certain shallow-depth bells, such as those on some cast-iron fittings and valves, the factory bevel shall be cut off to form a deburred, square-cut end with only a slight outer bevel.

The sealing surface of the pipe spigot end, the pipe bell, the coupler or fitting, and the elastomeric gaskets shall be cleaned immediately before assembly. Factory-installed gaskets should not be removed for cleaning. The joint shall be free of dirt, sand, grit, grease, or any foreign material. When assembling gasketed joints, an approved lubricant shall be applied as specified by the pipe manufacturer. Damage to the gasket(s) may result from the use of improper lubricants.

If joints are to be assembled in cold-weather conditions, factory-installed gaskets may be removed and taken to a heated truck cab or shelter to restore the gasket's flexibility prior to joint assembly. Not all factory-installed gaskets are field removable. Gasket removal shall only be permitted with the consent of the pipe manufacturer.

All gasketed joints shall be the push-on type. PVC pressure pipe shall be assembled using the following types of joints:

- a) Gasketed bell joints - Integral with the pipe or fitting (ANSI/AWWA C900, ANSI/AWWA C905, and ANSI/AWWA C907).
- b) Gasketed coupling - A double-gasketed coupling (ANSI/AWWA C900, ANSI/AWWA C905, ANSI/AWWA C907, and ANSI/AWWA C219).
- c) Mechanical joint - Any of several joint designs that have gaskets and bolts manufactured in accordance with ANSI/AWWA C110/A21.10, ANSI/AWWA C111/A21.11, and ANSI/AWWA C153/A21.53.

Joints shall be assembled under conditions that ensure clean mating and sealing surfaces by using proper equipment, materials, and procedures in accordance with recommendations published by the manufacturer.

The integral bell gasketed joint and the gasketed coupling joint shall be assembled by positioning the elastomeric gasket in the annular groove of the bell or coupling (if the gasket is not preinstalled at the factory) and inserting the spigot end of the pipe into the bell or coupling. To assure compatibility, only gaskets supplied by the particular pipe and fittings manufacturer(s) shall be used in the pipes and fittings, respectively. Gaskets and sealing surfaces shall be clean prior to lubrication and assembly. An approved lubricant shall be applied in accordance with the pipe manufacturer's published recommendations. Application of a non-approved lubricant or too much lubricant can result in a pipeline that is difficult to disinfect and may cause temporary taste or odor problems.

The mechanical joint shall be assembled in accordance with the fittings manufacturer's published recommendations. Pipe spigot bevels may require shortening for use with mechanical joints or fitting joints.

#### 4.7.12.5 Pipe Bending

If permitted in the approved plans, PVC pressure pipe may accommodate longitudinal bending with the following limitations. The Contractor shall block or brace pipe joints to ensure that bending of PVC pressure pipe does not result in axial deflection in the gasketed or mechanical joints that exceeds the manufacturer's published limits. Excessive axial-joint deflection may result in damaging stresses or leakage. The longitudinal bending in the PVC pipe barrel shall not result in a bending radius less than the minimum limits established in Table 1.

The bending of PVC pipe barrels larger than 12 inches (300 mm) nominal diameter is not recommended due to the forces required. The curved alignment of pipelines larger than nominal 12 inches (300 mm) in diameter shall be determined by the pipe manufacturer's published axial-joint deflection limits or as otherwise specified by the Township.

**Table 1 Allowable Bending for PVC Pressure Pipe\***

Nominal Size		Minimum Bending Radius	
<i>in.</i>	<i>(mm)</i>	<i>ft.</i>	<i>(m)</i>
4	(100)	100	(30.5)
6	(150)	144	(43.9)
8	(200)	189	(57.6)
10	(250)	231	(70.4)
12	(300)	275	(83.8)

\*ANSI/AWWA C900 PVC pipe with cast iron (CI) outside diameters.

#### 4.7.12.6 Thrust Restraint

Reaction or thrust restraint shall be provided for each dead end, valve, bend, T-connector, and hydrant; at reducers or fittings otherwise unrestrained; and where changes in pipe diameters or directions occur. The size and shape of concrete thrust blocks shall be as specified by the Township. The length of restrained joint piping and details of joint restraint glands, clamps, friction slabs, or other anchors shall be as specified by the Township. All mechanical joint fittings shall use restraint glands and thrust restraint. Restraining mechanisms for PVC pipe and fittings shall be tested and pressure rated in accordance with UNI-B-13

#### 4.7.12.7 Backfill

Trench backfill above the pipe shall conform with the Township's specifications. If PVCP is used, both tracing wire or tape and warning tape shall be used. The tracing tape shall be placed immediately above the initial backfill material, directly over the pipe and the locator tape shall be placed two feet below the trench surface.

The initial backfill material immediately above the top of the pipe shall be free or refuse, cobbles, boulders, large rocks or stones, frozen soil, or other similarly unsuitable material.

When imported or special backfill material is not required, the excavated native soil may be used, provided that such material consists of loam, sand, clay, or other friable material that is considered suitable by the Township.

After the embedment material has been placed, initial backfill material shall be placed to a depth of 12 inches over the top of the pipe in a manner that will fill the remaining voids and avoid damage to the pipe. The tracing tape shall then be placed.

The balance of the backfill shall contain no stones or rocks larger than 8 inches, frozen material, or debris. Backfilling shall follow pipe-laying as closely as possible. In general, backfilling should be no further than 100 feet behind pipe-laying. Backfill shall be mounded in unpaved areas to allow for future settlement.

Trenches under pavement, sidewalks, or roads shall be backfilled and compacted in layers to the density specified by the Township or to the density required by the appropriate governmental jurisdiction.

Trenches in locations other than surfaced areas shall be backfilled to the density of the adjacent soils.

Additional backfill material shall be supplied by the Contractor if needed to backfill trenches completely or to fill depressions caused by subsequent settlement.

Newly installed pipelines are normally tested after backfilling. If pressure and leakage testing are conducted before completion of backfilling or with pipe joints exposed for examination, sufficient backfill material shall be placed over the pipe barrel between the joints to prevent movement, and due consideration shall be given to restraining thrust forces. In particular, pipes connected to restrained-joints, which derive their stability from the interaction of the pipe and soil, should be backfilled prior to testing.

#### 4.7.13 DIP Installation

##### 4.7.13.1 Material Inspections

All pipe, fittings, valves, hydrants, and other appurtenances shall be inspected by the Township prior to installation. Defective materials shall be rejected.

All lumps, blisters, and excess coating shall be removed from the socket and plain ends of each pipe, and the outside of the plain end and the inside of the bell shall be wiped clean and dry and be free from dirt, sand, grit, or any foreign materials before the pipe is laid.

Foreign materials shall be prevented from entering the pipe while it is being placed in the trench. No debris, tools, clothing, or other materials shall be placed in the pipe at any time.

##### 4.7.13.2 Precautions

Proper implements, tools, and facilities shall be provided and used for the safe and convenient performance of the work. All pipe, fittings, valves, and hydrants shall be lowered carefully into the trench by means of a backhoe, a crane, ropes, or other suitable tools or equipment, in such a manner as to prevent damage to water main materials and protective coatings and linings. Under no circumstances shall water main materials be dropped or dumped into the trench. Where practical, the trench should be dewatered prior to installation of the pipe.

##### 4.7.13.3 Pipe Laying

As each length of pipe is placed in the trench, the joint shall be assembled and the pipe brought to correct line and grade. The pipe shall be secured in place with approved backfill material.

It is common practice to lay pipe with the bells facing the direction in which work is progressing; however, it is not mandatory. For example, when the main is being laid on a slope, the pipe is frequently laid with the bells facing uphill for ease of installation. The direction of the bells is not functionally related to the direction of flow within the main.

At times when pipe-laying is not in progress, the open ends of pipe shall be closed by a watertight plug or other means as specified. The plug shall be fitted with a means for

venting. When practical, the plug shall remain in place until the trench is pumped completely dry. Care must be taken to prevent pipe flotation, if the trench fills with water.

Prior to removal of the plug for extending the line or for any other reason, air and/or water pressure in the line shall be released.

The laying conditions for ductile-iron pipe shall be completed in accordance with ANSI/AWWA C150/A21.50 and with the approved details.

For any installation requiring polyethylene encasement for corrosion protection of ductile-iron pipe, the encasement shall be installed in accordance with ANSI/AWWA C105/A21.5.

#### 4.7.13.4 Pipe Joining

Special transition couplings and/or gaskets are required for joining different types of pipe. Such transition devices are available. When ordering, the actual outside diameter of the pipe should be given. Push on joints and mechanical joints shall be assembled as specified in ANSI/AWWA C600, latest edition.

When it is necessary to deflect pipe from a straight line in either the horizontal or vertical plane, the amount of joint deflection shall not exceed that shown in Tables 4 or 5 of ANSI/AWWA C600, latest edition. The deflections listed are maximum deflections and should not be exceeded. For design purposes, deflection should be limited to 80 percent of the values shown.

Cutting pipe for insertion of valves, fittings, or closure pieces shall be done in conformance with all safety recommendations of the manufacturer of the cutting equipment. Cutting shall be done in a safe, workmanlike manner without creating damage to the pipe or cement-mortar lining.

Existing gray-iron pipe may be cut using a hydraulic squeeze cutter, abrasive pipe saw, rotary wheelcutter, guillotine pipe saw, or milling wheel saw.

Ductile-iron pipe may be cut using an abrasive pipe saw, rotary wheel-cutter, guillotine pipe saw, milling wheel saw, or oxyacetylene torch if recommended by the pipe manufacturer.

Cut ends and rough edges shall be ground smooth, and, for push-on joint connections, the cut end shall be beveled by methods recommended by the manufacturer.

ANSI/AWWA C151/A21.51 requires factory gauging of the spigot end to ensure that the outside diameter of each spigot end falls within the tolerances stipulated in the standard.

Accordingly, pipes selected for cutting should be field-gauged. A mechanical-joint (MG) gland inserted over the barrel might serve as a convenient indicator for this purposes.

#### 4.7.13.5 Backfill

All backfill material shall be free from cinders, ashes, refuse, vegetable or organic material, boulders, rocks or stones, frozen soil, or other unsuitable material.

From one foot above the top of the pipe to the subgrade of the pavement, material containing stones up to four inches in their greatest dimension may be used, unless otherwise specified.

When the type of backfill material is not indicated on the plans or is not specified, the excavated material may be used, provided that such material is dry and consists of loam,

clay, sand, gravel, or other suitable materials.

If excavated material is indicated on the drawings or specified for backfill, and there is a deficiency due to a rejection of a part of that material, the required amount of sand, gravel, or other approved material shall be provided.

When special backfill compaction procedures are required, they shall be accomplished in accordance with project specifications or applicable federal, State, and local regulations. Newly installed pipelines are normally tested after backfilling. When unusual conditions require that pressure and leakage testing be accomplished before completion of backfilling or with pipe joints accessible for examination, sufficient backfill material shall be placed over the pipe barrel between the joints to prevent movement, and due consideration shall be given to restraining thrust forces during the testing. In particular, restrained-joint systems, which derive their stability from the interaction of the pipe and soil, should be backfilled prior to testing.

If any adverse soil conditions are encountered, polyethylene encasement shall be used. When polyethylene encasement is used, any damage that occurs to the wrap shall be repaired in accordance with ANSI/AWWA C105/A21.5

#### 4.7.14 PCCP Installation

##### 4.7.14.1 Material Inspection

PCCP shall be inspected at the plant before shipping, and a report of inspection shall be furnished to the Water Engineer. Before unloading, the Contractor shall inspect pipe for damage occurring in transit, and shall note any on the delivery ticket.

After unloading, the Township will inspect the pipe, fittings and appurtenances prior to installation. Defective materials will be rejected.

##### 4.7.14.2 Precautions

Cranes of proper capacity using steel cable, bell stings, or specially designed devices can load or unload any size of pipe. Reasonable care should be taken to prevent bumping pipe and causing possible damage to pipe ends and coating.

Before pipe is lowered into trench, both end rings should be thoroughly cleaned and carefully checked to make sure no damage has been inflicted during field handling operations. The bell should be smooth and free from burrs and deformations. Before the gasket is installed, it should be thoroughly lubricated with vegetable soap supplied by the manufacturer. The bell of the pipe in place should also be cleaned and lubricated with vegetable soap.

#### APPROXIMATE QUANTITIES OF GASKET LUBRICANT FOR JOINTS

Pipe Size (Inches)	Pounds per Joint
24	0.21
30	0.25
36	0.29
42	0.35
48	0.44



APPROXIMATE QUANTITIES OF  
GASKET LUBRICANT FOR JOINTS  
(cont'd)

Pipe Size (Inches)	Pounds per Joint
54	0.50
60	0.59
66	0.66
72	0.74
78	0.81
84	0.96
90	1.11
96	1.25
102	1.48
108	1.70

**NOTE:** The vegetable soap to be used for the lubrication of the joint components shall be purchased from the pipe manufacturer.

#### 4.7.14.3 Pipe Laying

Before lowering the pipe into position in the trench, all dirt and foreign matter that cannot be removed by normal flushing shall be cleaned by mechanical means. The Township shall determine when such mechanical cleaning is required. During laying operations, no debris, hand tools, clothing, or other materials shall be placed in the pipe. Pipe shall be kept clean during and after laying.

After the pipe has been lowered into the trench, the lubricated gasket should be stretched and settled evenly around the spigot groove with the help of the cylindrical stem of a screwdriver. Run the screwdriver around the spigot for one complete turn in one direction and one turn in the opposite direction.

It is a good practice to place the joint diaper (if required) around the bell of the pipe already laid prior to the installation of the adjacent pipe. The diaper can later be slipped forward to cover the joint recess after the pipe has been laid.

#### Installation with Backhoe

When the weight of the pipe is not too great, a backhoe may be the most efficient machine with which to install pipe because both excavation and installation may be accomplished with the same piece of equipment. Only sufficient trench to accommodate one section of pipe must be dug in advance. A double hook and cable shall be attached to the back of the bucket. The machine shall lift the pipe by means of a cable laying sling placed around the mid portion of the pipe.

After the pipe has been lowered into the trench, the lubricated gasket should be stretched and settled evenly around the spigot groove with the help of the cylindrical stem of a screwdriver. Run a screwdriver around the spigot for one complete turn in one direction and one turn in the opposite direction.

#### Installation with Crane

When a crane is used for installation, an extended length of trench is usually excavated in

advance (maximum 100 feet). Lowering of the pipe and entry of the spigot into the flare of the bell takes place in the same fashion as with the backhoe. Again, the gasket must be thoroughly checked before bringing the pipe "home". There are two recommended methods for making the actual jointing:

- 1) Place a deadman three joints back within the line already installed. Place adequate support at crown and invert inside the seat of the bell of the pipe being installed. Connect the two with cables and ratchet hoist, and pull the spigot into the bell.
- 2) Place a cable choker sling around the last pipe installed and attached it with a ratchet hoist to the laying sling of the pipe begin installed. Then pull the spigot into the bell of the pipe installed.

After pipe installation and initial (one foot above top outside diameter) backfill – place tracing tape prior to completing backfill.

#### 4.7.14.4 Pipe Joining

Keeping the pipe clear of the trench bottom and aligned with the pipe to which it will be joined, guide the pipe into the flare of the bell that is in place, while keeping both in position.

After the gasket has been checked, it is important to give uniform push all around the joint. If additional force is required, move the sling closer to the bell of the pipe being installed.

Place the diaper around the joint recess, fastening it in place with either the wire or the steel strapping stitched into its edges. Mix a 1:2 mortar grout of sufficient liquid consistency to flow easily and pour it into the joint recess beneath the diaper. To assist the flow and to assure complete filling of the entire recess completely around the pipe, rod the joint recess with a stiff-wire curved to the radius of the pipe. Close the joint recess at the top with a stiffer mix of the same material.

When required, the inside joint recess of pipes 24" in diameter and larger should be filled with a 1:3 mortar mix. This mortar must be troweled flush with the interior pipe surface and all excess removed from the pipe.

#### APPROXIMATE QUANTITIES OF MORTAR FOR INTERIOR JOINT OPENING

<u>Pipe Size</u>	<u>Volume of Grout per Joint (cubic feet)</u>
24"	0.02
30"	0.03
36"	0.03
42"	0.04
48"	0.05
54"	0.07
60"	0.08
66"	0.09
72"	0.11
78"	0.12

APPROXIMATE QUANTITIES OF MORTAR  
FOR INTERIOR JOINT OPENING  
(cont'd)

<u>Pipe Size</u>	<u>Volume of Grout per Joint (cubic feet)</u>
84"	0.14
90"	0.15
96"	0.17
102"	0.19
108"	0.20

APPROXIMATE QUANTITIES OF MORTAR  
FOR EXTERIOR JOINT OPENING

<u>Pipe Size</u>	<u>Volume of Grout per Joint (cubic feet)</u>
24"	0.20
30"	0.24
36"	0.37
42"	0.42
48"	0.46
54"	0.54
60"	0.60
66"	0.65
72"	0.71
78"	0.77
84"	0.82
90"	0.87
96"	0.93
102"	1.04
108"	1.08
114"	1.15
120"	1.20
126"	1.27
132"	1.33
138"	1.39
144"	1.45

**NOTE:** It is recommended that a mix consisting of 1 part cement and 2 parts sand be used.

**4.7.14.5** Pipe Bending

Pipe bending is not permitted. PCCP shall be laid in straight lines, utilizing fittings for deflection.

**4.7.14.6** Backfill

All backfill material shall be free from cinders, ashes, refuse, vegetable or organic material, boulders, rocks or stones, frozen soil, or other unsuitable material.

At one foot above the top of the pipe, place tracing wire or tape. From this point to the subgrade of the pavement, material containing stones up to four inches in their greatest

*win*

Taper

dimension may be used, unless otherwise specified. At two feet from finished grade, place warning tape.

When the type of backfill material is not indicated on the plans or is not specified, the excavated material may be used, provided that such material is dry and consists of loam, clay, sand, gravel, or other suitable materials.

If excavated material is indicated on the drawings or specified for backfill, and there is a deficiency due to a rejection of a part of that material, the required amount of

sand, gravel, or other approved material shall be provided.

When special backfill compaction procedures are required, they shall be accomplished in accordance with project specifications or applicable federal, state, and local regulations.

Newly installed pipelines are normally tested after backfilling. When unusual conditions require that pressure and leakage testing be accomplished before completion of backfilling or with pipe joints accessible for examination, sufficient backfill material shall be placed over the pipe barrel between the joints to prevent movement, and due consideration shall be given to restraining thrust forces during the testing. In particular, restrained-joint systems, which derive their stability from the interaction of the pipe and soil, should be backfilled prior to testing.

#### 4.7.15 Flushing

All mains shall be flushed thoroughly with water after backfilling is complete. All dirt, rubbish and debris shall be removed from the mains. The contractor shall furnish and install all temporary piping, valves, corporations, fittings, pumps, hose and appurtenances which may be necessary to properly flush the pipeline.

Flushing operations shall be conducted in strict conformance with NJDEP requirements and water shall be discharged so as not to cause any soil erosion or sedimentation problems or to cause any adverse impacts on any natural waterway.

The Contractor shall obtain permission from the Water Engineer when he/she wishes to obtain flushing water from the Township's water system. Hydrants or valves shall be operated by Township or UWMA personnel only. Under no circumstances shall the Contractor operate any valve or hydrant whether or not those facilities have been accepted by the Township. Flushing operations shall be conducted at the sole convenience of the Township and only after 48 hours advance notice to the Township.

#### 4.7.16 Testing and Disinfection

The Contractor shall provide all labor and equipment necessary to perform the testing of the pipelines. The test shall be performed in the presence and at the convenience of the Water Engineer.

The Contractor shall install corporations within the pipeline for the purpose of air release, pressurization, and disinfection for water mains. The Contractor shall fill the line (maximum length 2,000 feet) completely with water; all air shall be expelled and an exfiltration test made. The pipeline will be tested under a minimum hydrostatic pressure of 150 psi or 1.5 times the working pressure of the line, whichever is greater based on the lowest elevation of the pipeline. The maximum leakage permitted will be 11.65 gallons per inch diameter per mile per day while maintaining the test pressure with an allowable tolerance of 5 psi maximum. The duration of the test shall be 2 hours. The above maximum leakage value takes into account any leakage

across valves. In any case, any visible leaks shall be corrected, regardless of the overall leakage rate. Should the test indicate a leakage rate greater than that permitted, the contractor shall locate and repair or rebuild the defective portion of the main responsible for the leak.

The test shall then be repeated until it is found that the leakage is within the allowable limit. The Contractor shall furnish all water, hose, pumps, test plugs, measuring devices and all other items that may be required for test purposes. Upon successful testing of the pipeline, the corporations will be closed and capped with a threaded brass cap.

All tests must be witnessed by the Water Engineer or his representative before the pipeline will be accepted. THE CONTRACTOR IS CAUTIONED THAT A WATERTIGHT PIPELINE IS OF PRIME IMPORTANCE. Final acceptance shall not take place until the base pavement is in place. ✓

All finished water piping shall be thoroughly cleaned, flushed, and disinfected in accordance with the requirements of the latest edition of ANSI/AWWA C651 and the New Jersey Safe Drinking Water Act, except as herein otherwise noted. The continuous-feed method specified in Section 5.2.3 of ANSI/AWWA C651 shall be preferred. After the pipeline has been disinfected in accordance with the aforementioned specification, all chlorinated water shall be completely flushed from the new pipeline and appurtenances, specifically from all reaches of the line, until the water throughout the line is equal in chemical and bacteriological quality with the water in the existing mains, or as requested by the Water Engineer.

The installation of chlorine tablets within the pipeline during construction shall not be an acceptable method for providing disinfection of the mains.

The Contractor is responsible to provide all materials, equipment and labor to perform the flushing and disinfection of the new water lines as many times as necessary if the initial treatment is not adequate and until tests show the waterline meets the aforementioned requirements. Heavily chlorinated waters must first be neutralized prior to discharge in accordance with federal, State and local regulations.

Following the completion of the flushing and disinfection procedures, samples shall be taken and analyzed by the Township. Bacteriologic testing shall be conducted at the sole convenience of the Township and only after 48 hours advance notice to the Township. No portion of the new system may be open to the existing system without first passing the bacteriologic testing.

#### 4.7.17 Approval

The Contractor shall submit to the Township, copies of Purchase Orders and Delivery Tickets or Invoices for all materials incorporated into the work.

In addition, the Contractor shall furnish Shop Drawings, Catalogs, Specification Sheets or other Manufacturer's Literature for all hydrants and gate valves he/she proposes to furnish. Pipe certifications from the manufacturer shall be provided to the Township.

#### 4.8 Construction of Wells

Wells which service more than one home shall be constructed and protected against possible contamination in accordance with the latest revision of the ANSI/AWWA A-100, latest edition the New Jersey Safe Drinking Water Act and all requirements of the NJDEP Bureau of Water Allocation. Well casings should be welded and made up with threaded couplings, and its protective casing shall have tight joints throughout its entire length.

A gamma ray log and an electric log shall be provided for each well. The flow from the well

shall be an average over a 48-hour period and shall not be less than 300 gpm with a drawdown of not less than 15 feet above the top of the screen or pump, whichever is higher. Static readings of the well shall be taken every three hours for twelve hours prior to starting the test. During the test, one hour will be permitted for adjustment of equipment during each eight hour period except that the pumping shall be continuous during the final eight hours.

Test water level readings shall be taken at the following time intervals:

- 6 readings every 5 minutes for 30 minutes
- 3 readings every 10 minutes for 30 minutes
- 4 readings every 15 minutes for 60 minutes
- 2 readings every 30 minutes for 60 minutes
- 1 readings every 60 minutes for remaining test time

The area of influence of the well shall be determined by at least one observation well. Also, observation shall be made at all existing wells within a 1000 foot radius regardless of well depth.

Wells shall be at an elevation higher than the maximum flood level and high enough to permit drainage away from the facilities. All wells, treatment plants and above ground appurtenances shall be located at least 500 feet from any possible source of contamination and shall be enclosed with a six foot high chain link fence. They shall be provided with a double gate entrance for pedestrian and truck use.

The maximum pumping permitted from each well field shall be taken at fifty (50%) percent of the normal capacity of the well as determined from the aforementioned 48-hour test.

Emergency electrical power shall be provided via generator with an automatic transfer switch.

Wells and generator shall be enclosed in a masonry structure in conformance with local architecture and shall be equipped with facilities for disinfection utilizing sodium hypochlorite solution. Should additional treatment measures be required in order for the water quality to conform a Safe Drinking Water Standards, suitable treatment works must also be constructed.

#### 4.9 Construction of Treatment Plants

No general rules can be formulated for the design of treatment plants and each case will be considered individually based upon the raw water quality. The type and method of treatment must be approved by the NJDEP.

Treatment plant plans and specifications must include provisions for lawns, shrubbery, paved roads and sidewalks. Plants shall be architecturally compatible with the environment.

The entire property must be surrounded by a six-foot chain link fence.

Separate gates must be provided for pedestrian and truck use.

Detailed estimates of operating and maintenance costs of the proposed treatment plant must be submitted with the engineer's estimate.

Emergency electrical power shall be provided via generator with automatic transfer switch.

All water shall be chlorinated before it enters the distribution system and shall have a minimum residual of 0.2 ppm chlorine throughout the system.

connected to a single service line or connection without the consent of the Township in writing. Separate properties shall not be connected to a common connection, either in a common driveway, private road, or otherwise without consent in writing of the Township.

The Applicant shall supply the plumbing in accordance with the local plumbing codes and shall provide and install the meter and remote reading device (meter and remote readout specifications are found in Article 4.6.2.5 of these Rules and Regulations).

### 5.3 Ownership/Responsibility

An individual Applicant or property owner, or their agent, shall be responsible for making application, and paying the applicable fees, to UWMA, who is the only authorized agency that is permitted by the Township to make the physical connection to the Township's existing water mains, including the curb stop and box, which will be placed one (1') foot inside the curb line.

Developers of multiple properties shall furnish and install both the mains and individual services, including the curb stop, all of which shall be inspected by, and at the convenience of, a representative of the Township. Upon completion and acceptance of said facilities, same shall become the property of the Township, who will assume the responsibility for future maintenance thereof.

That portion of the service line from the water main to and including the curb shut-off shall be inspected by, and at the convenience of, a representative of the Township. Upon completion and acceptance, same shall become the property of the Township, who will assume the responsibility for future maintenance thereof.

That portion of the service line from the curb shut-off to the structure shall be furnished and installed by the Applicant or their agent and shall be inspected by the Plumbing Inspector of the Township. Upon completion and acceptance, said portion of the service line shall be and shall remain the sole responsibility of the property owner.

All connections, service lines and fixtures shall be maintained by the customer in good order, and meters owned by the Township and on the property of the customer, shall be protected properly and cared for by said customer. All leaks in the service or any other pipe or fixture in or upon the premises supplied, must be repaired immediately by the owner or occupant of the premises. The customer shall be responsible for notifying the Township of the party engaged by said customer to do any maintenance work on the customer's service line, prior to work being commenced, and said party shall not backfill any trench until the work had been inspected and approved by the Township's representative. Any work not acceptable shall be immediately removed and replaced by work which is acceptable.

The Township shall in no event be responsible for maintaining any portion of the service line owned by the customer, or for damage done by water escaping therefrom; or from lines of fixtures on the customer's property; and the customer shall at all times comply with applicable municipal regulations with respect thereto.

The owner shall obtain and pay for the required road opening permits, plumbing permits, and all other applicable permits, and shall comply with all applicable regulations and conditions pertaining thereto.

### 5.4 Right of Access

The Township, shall have a right of access to any customer's premises and to all equipment and property of the Township at reasonable times for the purpose of reading meters or inspecting, repairing or replacing equipment used in connection with the supplying of water services, or

for the removal of equipment or property. The customer shall obtain for the Township all necessary permission from tenants or others needed for access to equipment or property. Customers shall not permit access to meters or other Township property except by authorized employees of the Township, UWMA or other authorized State or local inspectors.

## ARTICLE 6 - INSPECTION OF WATER SYSTEMS DURING THE COURSE OF CONSTRUCTION

### 6.1 General

All construction of water systems shall be the Water Engineer, either directly or through trained observers under his/her supervision. The Water Engineer shall inspect for general compliance with the approved plans and specifications. He/she shall notify the Township to have the work discontinued in the event of non-compliance.

The applicant shall give 48 hours notice to the Township prior to construction or testing of water systems at all times during the construction of his project.

The Applicant shall submit a progress report at the end of each month, together with the cost of construction to the end of the month.

The Applicant shall also furnish the name of the occupant, the street address and lot and block number of every connection made during the month.

No house service connections shall be made to a street main whether pressure tested or not, unless witnessed by a Township representative.

When a section of water main has been previously pressure-tested, then all individual or house connections made after the initial test shall be individually pressure tested.

### 6.2 Testing and Disinfection

The Contractor shall furnish all labor, material and equipment necessary for testing.

Testing and disinfection shall be as detailed in these Rules and Regulations.

### 6.3 Shop Drawings

Shop drawings shall be submitted to the Water Engineer for review prior to start of construction. The Contractor shall submit to the Water Engineer five copies of detailed shop drawings, guaranteed test curves, and manufacturer's specifications for all equipment, tools, electrical, HVAC and furnishings to be supplied. Detailed shop drawings shall also be submitted for all piping, duct work, miscellaneous metal, reinforced plastic, structural steel, reinforcing steel and all other fabricated items. A minimum of four weeks shall be allowed for the Water Engineer's review.

Shop drawings shall not be smaller in size than 8-1/2 x 11 inches, nor larger than 36x24 inches. Reproductions of the design engineer's drawings will not be acceptable as shop drawings. Before submitting shop drawings, the Contractor shall check and sign all drawings noting thereon any deviation from approved plans and specifications.

Following his review, the Water Engineer shall return two copies to the Contractor. If shop drawings are checked "Revise and Resubmit" or "Rejected" by the Engineer, the Contractor shall resubmit five copies of the revised shop drawings, of which two shall be returned to the Contractor by the Engineer.



The Contractor shall be responsible for furnishing subcontractors and other contractors with approved shop drawings as required. No shop drawings shall be used for construction, ordering, fabrication, etc., unless marked "No Exception Taken" or "Exception Taken as Noted" by the Water Engineer. Should the Contractor desire more than two copies of the approved shop drawings, he/she shall prepare the required additional copies of drawings, identical to those approved by the Water Engineer and shall submit them to the Water Engineer, who shall then mark these additional copies as reviewed and return them to the Contractor for his distribution.

All shop drawings shall be stamped by the Contractor certifying as to his/her review and approval thereof. The stamp shall bear the following information:

APPROVED FOR CONTRACT REQUIREMENTS

The Contractor's signature below indicates that he/she has checked the drawing with the approved drawings and specifications and found it to meet all requirements of same, including dimensions, and that the Contractor's guarantee fully applies to the specified material or equipment.

BY \_\_\_\_\_  
Signature/Contractor

Data shall include dimensions, detailed drawings and manufacturer's specifications for all items.

When required by the specifications, the Contractor shall furnish samples of materials, finishes or other items proposed to be used in the work. All materials, finishes and workmanship incorporated in the work shall be similar and equal to the approved samples. The Water Engineer shall retain such samples until final acceptance of the project and shall return only those samples specifically requested.

**6.4 Operating and Maintenance Instructions**

For all water facilities other than pipe, the Contractor shall furnish four complete sets of operating and maintenance instructions covering and including all shop drawings, manuals and the operation and maintenance of the heating, ventilating and air conditioning, plumbing, electrical, automatic controls, process equipment and instrumentation. Manuals shall be bound and include the following:

1. Manufacturer's descriptive literature;
2. Maintenance instruction, including recommended lubricants and spare parts;
3. Parts listed;
4. "As installed" control diagrams, including color coded point to point and ladder wiring diagrams or tagging numbers for all electrical motor controller connections and interlock connections with other mechanical equipment;
5. Step-by-step operating instructions for each piece of equipment and system, including preparation for starting, shutdown and draining;
6. Performance data.

Each item of equipment is to be identified by a permanently attached nameplate made of brass or other corrosion resistant metal with incised letters and bearing the following information:

- a. Manufacturer's name and address;
- b. Serial and mode numbers;
- c. Rated capacity;
- d. Temperature, pressure or other limitations.

## ARTICLE 7 - RECORD DRAWINGS

After construction, and before operation of the system and final acceptance by the Township, the Applicant shall furnish the Township record drawings on computer disk and on mylar in ink, and four sets of prints of each drawing showing the water lines, valves, fire hydrants, connections and all other facilities constructed. Record drawings shall be signed and sealed by a Professional Engineer licensed in the State of New Jersey. If record drawings are related to property lines, they must be signed and sealed by a Professional Land Surveyor licensed in the State of New Jersey.

### 7.1 Distribution System

Record drawings shall be with full detail setting forth the location of each service, cross, bend and tee connection to adjacent mains, hydrant, valve, air release valve, blow-offs, etc. Record drawings shall show length of each service from the main to curb box. All locations shall be via triangulation off permanent physical features which are clearly evident at least 3 feet above ground. Trees and other plantings will not be acceptable for location purposes. Permanent property monuments shall be acceptable as a reference point for triangulation purposes. Record drawings shall be at a maximum scale of 1" = 50'. Profile drawings shall be provided to ensure that minimum coverage above the main is provided.

### 7.2 Pump Stations, Treatment Facilities, Etc.

Applicant's engineer shall keep accurate, detailed records of construction work indicating actual, in place locations of piping, structures and equipment. This includes electrical and mechanical equipment, detailed wiring diagrams, HVAC, controls and alarms, etc. Record drawings shall show elevations, grades and exact locations of all facilities. Said record drawings shall be at a maximum scale of 1" = 30'.

## ARTICLE 8 - USE OF THE WATER SYSTEM

### 8.1 Use of Water System by the Township

During the construction and before final acceptance, the Township shall have the right to use any portion of the water system as completed without waiving their right to order correction of any defects.

### 8.2 Illegal Use of System

No person or persons shall in any manner, without permission, connect or disconnect or tamper or interfere with any property of the Township such as pipes or conduits, meters, hydrants, valves, instruments or other accessories or property.

Use of the active portion of the water system for construction, flushing of sewers, and the like is strictly prohibited without the expressed permission of the Township. No one other than the Township or their agents may operate any valves within or immediately adjacent to the Township's water system.

### 8.3 Water Use

A hydrant meter must be acquired from the Township prior to temporary use of water from any fire hydrants for construction or other approved purposes. A deposit for use of a hydrant meter in accordance with the Rate Schedule must be paid to the Township and the charge for water usage shall be in accordance with UWMX current water rates. No unmetered hydrant may be used and only with prior approval from the Township may the meter be transferred to another

hydrant.

#### 8.4 Charges for Temporary Water Use

There shall be a minimum charge of \$25.00 payable to the Township for the following services. Charges shall be dictated by UWMA Rate Schedule.

1. Turn-off or turn-on water;
2. Seasonal turn-off or turn-on water;
3. Final meter reading;
4. Sprinkler installation;
5. If meter installation is requested, and service is not ready for meter installation for any reason, a fee will be charged for each and every time the meter installation is requested.

#### 8.5 Violations and Penalties

Any person, firm or corporation violating the provisions of these Rules and Regulations or any succeeding ordinances or resolutions pertaining to this subject matter which might be enacted or adopted shall be punished by a fine not exceeding one thousand (\$1,000.00) dollars per violation, or by imprisonment for a period not to exceed 90 days or both. Each and every day that any violation continues shall be deemed to be and shall be a separate offense, separately punishable as aforesaid.

### ARTICLE 9 - ACCEPTANCE OF NEW WATER SYSTEM BY THE TOWNSHIP

After satisfactory completion of all structures proposed and upon certification of the Applicant's engineer and approval by the Water Engineer as to the completion of construction and compliance with the pressure and bacteria testing requirements, the following actions shall be taken:

#### 9.1 Applicant's Actions

1. Give title to all lands, easements, water facilities and system;
2. Post a maintenance bond equal to 15 percent of the performance bond, guaranteeing the satisfactory performance of the system for a period of two years from the date of release of the performance bond. The effective date of the bond shall be the date of the resolution of the Township releasing the performance bond and accepting the maintenance bond;
3. Furnish record drawings in a form acceptable to the Water Engineer;
4. Furnish operation and maintenance instructions in a form acceptable to the Water Engineer;
5. Pay all applicable and/or outstanding fees.

#### 9.2 Township's Subsequent Actions

1. Release Applicant from the performance bond;
2. Accept the title to all lands, easements, water facilities and system and accept the maintenance bond;
3. Turn over operation and maintenance of the system to UWMA.

#### 9.3 Checklist

All of the following shall be submitted to the Township for review and approval prior to release of the performance bond (see Exhibit H):

1. Copy of deed to the overall subdivision or site;
2. The copy of the subdivision map, site plan and/or condominium plat;

3. Easements for all lines on property (private), together with subdivision maps showing easements thereon;
4. Metes and bounds description of easements;
5. Title policies for fee titles and easements;
6. All surveys for plant site and easements;
7. Affidavits of Title for land, easements and equipment and a recitation thereon that everything conveyed to the Township has been paid for in full;
8. Bill of Sale for all equipment and lines;
9. Releases from the following: materialmen; suppliers; contractors; laborers; lending institutions;
10. Certificate listing all users connected to the system, including the following: name and address of property owner, together with lot and block number; date connected; place connected; plumbing permits authorized in connection.
11. Record drawings and operation and maintenance instructions;
12. All warranties from manufacturers of equipment;
13. Assignment to the Township for all performance and maintenance bonds;
14. Maintenance bond from developer to Township;
15. Corporate resolution authorizing conveyance as above; and
16. All of the above to be conveyed to the Township free and clear of all liens, encumbrances and debts.

## ARTICLE 10 - FEE SCHEDULE

### 10.1 Application Reviews and Construction Services

The following fees shall be submitted to the Township for application review and construction services:

- |   |  |
|---|--|
| 10.1.1 Conceptual Application   | a. \$30.00 per equipment unit (minimum \$1,000.00)<br><br>b. For projects within approved franchise areas, serviced by other water companies- \$500.00 |
| 10.1.2 Preliminary Application  | 2% of Construction Cost (minimum of \$1,000.00)  |
| 10.1.3 Final Application  | 2% of Construction Cost (minimum of \$1,000.00)  |
| 10.1.4 Construction Services<br>(Deposit)   | 5% of Construction Cost  |
| 10.1.5 Resolution Preparation Fee<br>for Bond Acceptance,<br>Reduction and/or Release | \$150.00 Each  |

If any of the fees above are exceeded during the review or construction phases, additional monies will be obtained from the Applicant to cover the actual cost of services.

### 10.2 Connection Fees

The Township has established and shall from time to time revise an ordinance fixing fees to be paid by the Applicant.

### 10.3 User Fees

The Township has established and shall from time to time revise a schedule of service charges

and/or user fees by ordinance which must be paid by the property owner at prevailing rates as and when due. Although a property owner may require a tenant or other person to pay such fees on his behalf, responsibility for timely payment in full rests with the property owner and the Township's acceptance of payment from tenants or others shall not constitute a waiver of the property owner's responsibility.

#### ARTICLE 11 - COMPLIANCE WITH RULES AND REGULATIONS

The Applicant shall comply with all of the Rules and Regulations as set forth herein. Failure to do so will result in a work-stoppage directive by the Township.

#### ARTICLE 12 - OTHER ORDINANCES, RESOLUTIONS AND RULES AND REGULATIONS

Any other ordinances, resolutions, rules and regulations heretofore adopted by the Township which are inconsistent with this resolution and hereby rescinded.

The Township may, from time to time, adjust its rate schedule, any revision of which will take precedence over the rates and fees set forth herein, if applicable.

#### ARTICLE 13 - RESOLUTION IN EFFECT

This resolution shall take effect immediately, and a copy at all times shall be kept on file at the office and of the Township and shall at all reasonable times be open to public inspection.

#### ARTICLE 14 - TOWNSHIP'S OBLIGATION FOR FIRE FIGHTING

The Township is not under a contractual obligation with any of its users to provide and maintain an adequate water pressure in its system for fire fighting.

## EXHIBITS

# Township of Manalapan, Monmouth County, New Jersey

Conceptual Application No. \_\_\_\_\_

Filed \_\_\_\_\_

## APPLICATION FOR REVIEW OF CONCEPTUAL PLANS FOR SUBDIVISION OR OTHER DEVELOPMENT IN THE TOWNSHIP OF MANALAPAN, COUNTY OF MONMOUTH, STATE OF NEW JERSEY.

Application is hereby made for review of conceptual plans of proposed site development for ruling on whether individual or comprehensive water system is required for water service.

1. Applicant's Name: \_\_\_\_\_

Address: \_\_\_\_\_

City/State \_\_\_\_\_ Zip Code \_\_\_\_\_ Telephone \_\_\_\_\_

2. Name and Address of present owner, if other than Applicant:

Address: \_\_\_\_\_

City/State \_\_\_\_\_ Zip Code \_\_\_\_\_ Telephone \_\_\_\_\_

3. Interest of Applicant, if other than Owner: \_\_\_\_\_

4. Date classified as major subdivision by the Planning Board \_\_\_\_\_

5. Location of Subdivision: \_\_\_\_\_

Neighborhood or section map

Street

tax map block

lot numbers

6. Number of proposed lots to be served \_\_\_\_\_

7. Area of entire tract \_\_\_\_\_

Area of portion of tract being served \_\_\_\_\_

# *Township of Manalapan, Monmouth County, New Jersey*

## **CHECKLIST FOR APPLICATIONS FOR CONNECTION TO WATER SYSTEM**

### **CONCEPTUAL APPLICATION**

\_\_\_\_\_ Designed and sealed by a New Jersey licensed Professional Engineer

\_\_\_\_\_ Application filed in duplicate

\_\_\_\_\_ Copy of any application to the Township Planning Board or Board of Adjustment for subdivision/site plan approval, or proof that the proposed project has been filed with the Township Planning Board or Board of Adjustment.

\_\_\_\_\_ Plot plan; general location plan; sketch plan showing streets, lots & blocks; tax map lot and block number(s).

\_\_\_\_\_ Location of nearest water main.

\_\_\_\_\_ General layout and location of the proposed water system.

\_\_\_\_\_ Detailed estimate of water usage for the proposed development.

\_\_\_\_\_ If well(s) required, additional data as required by the Township.

\_\_\_\_\_ Fee - in accordance with fee schedule.



# Township of Manalapan, Monmouth County, New Jersey

Preliminary Application No. \_\_\_\_\_

Filed \_\_\_\_\_

## APPLICATION FOR PRELIMINARY APPROVAL OF WATER SYSTEM AND APPURTENANCES

Application is hereby made for Preliminary Approval for the plans for a water system and appurtenances.

1. Applicant's Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
City/State \_\_\_\_\_ Zip Code \_\_\_\_\_ Telephone \_\_\_\_\_
2. Name and Address of present owner, if other than Applicant:  
Address: \_\_\_\_\_  
City/State \_\_\_\_\_ Zip Code \_\_\_\_\_ Telephone \_\_\_\_\_
3. Interest of Applicant, if other than Owner: \_\_\_\_\_  
\_\_\_\_\_
4. Date classified as major subdivision by the Planning Board \_\_\_\_\_
5. Location of Subdivision: \_\_\_\_\_  
Neighborhood or section map  
\_\_\_\_\_  
Street \_\_\_\_\_ tax map block \_\_\_\_\_ lot numbers \_\_\_\_\_
6. Number of proposed lots to be served \_\_\_\_\_
7. Area of entire tract \_\_\_\_\_  
Area of portion of tract being served \_\_\_\_\_
8. Development Plans
  - a. Sell lots only (Yes or no) \_\_\_\_\_
  - b. Construction of houses for sale? \_\_\_\_\_
  - c. Other \_\_\_\_\_
9. Professional Engineer designing Preliminary Plan  
Name: \_\_\_\_\_ License Number \_\_\_\_\_  
Address: \_\_\_\_\_  
Tel. \_\_\_\_\_

10. Does Applicant or Owner agree to convey by deed to the Township of Manalapan easements to all areas on the plan showing water facilities and all rights to the water system? \_\_\_\_\_

11. Describe proposal for water service. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

12. Will Applicant post water system Performance and Maintenance Bonds ? \_\_\_\_\_

13. List plans and other materials accompanying application, with number of each.

ITEM	NUMBER
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

14. Attach two (2) prints of your preliminary plan.

Signature of Applicant \_\_\_\_\_ Date \_\_\_\_\_

Printed Name of Applicant \_\_\_\_\_

Make all checks payable to THE TOWNSHIP OF MANALAPAN

\_\_\_\_\_  
**Do not write below this line**

Date received and fee collected: \_\_\_\_\_ \$ \_\_\_\_\_  
Date Fee

# Township of Manalapan, Monmouth County, New Jersey

## CHECKLIST FOR APPLICATIONS FOR CONNECTION TO WATER SYSTEM

### PRELIMINARY APPLICATION-GENERAL

\_\_\_\_\_ Designed and sealed by a New Jersey licensed Professional Engineer

\_\_\_\_\_ Application filed in duplicate

\_\_\_\_\_ Fee - in accordance with fee schedule

\_\_\_\_\_ General Map of Entire Project

\_\_\_\_\_ Plans for all proposed water lines and appurtenances

\_\_\_\_\_ Date that application is filed with Township (minimum 30 days before action by  
Township)

\_\_\_\_\_ Approval by Manalapan Township Board of Fire Commissioners

\_\_\_\_\_ If authorized agent, certified copy of authorization included

### PRELIMINARY APPLICATION-ENGINEERS REPORT GUIDELINE

\_\_\_\_\_ Description of geographic area to be served

\_\_\_\_\_ Existing and future population of areas to be served

\_\_\_\_\_ Terrain data in sufficient detail to establish general topographic features of an area to  
be served, 2 ft. contour intervals (minimum)

\_\_\_\_\_ Intended use for proposed realty improvements

\_\_\_\_\_ Estimated daily flow, peak flow, and fire flow requirements

\_\_\_\_\_ Justification for water main sizing which should be based on hydrant flow test(s) and  
computer modeling

\_\_\_\_\_ Any other factors which would affect design and use of water system

\_\_\_\_\_ Impacts on existing facilities, including main sizes, necessity for storage or booster  
pumping station, etc.

\_\_\_\_\_ Description of materials to be used, including specifications and class

\_\_\_\_\_ Cost estimate based upon unit costs acceptable to the Water Engineer

### PRELIMINARY APPLICATION - GENERAL MAP GUIDELINE

\_\_\_\_\_ Entire Project Area

\_\_\_\_\_ Existing water mains

**CHECKLIST FOR APPLICATIONS FOR  
CONNECTION TO WATER SYSTEM**  
(cont'd)

**PRELIMINARY APPLICATION - GENERAL MAP GUIDELINE**  
(cont'd)

\_\_\_\_\_ Existing valves  
\_\_\_\_\_ Existing hydrants  
\_\_\_\_\_ Existing utilities (other)  
\_\_\_\_\_ Proposed water main  
\_\_\_\_\_ Proposed Valves (all types)  
\_\_\_\_\_ Proposed hydrants  
\_\_\_\_\_ Proposed utilities (other)

**PRELIMINARY APPLICATION- DETAILED PLANS GUIDELINE**

\_\_\_\_\_ 24"x36", 1/2" border top, bottom & right, 2" border left  
\_\_\_\_\_ 1" = 50' scale (min)  
\_\_\_\_\_ Existing contours, 2' intervals  
\_\_\_\_\_ Proposed contours, 2' intervals  
\_\_\_\_\_ Proposed streets  
\_\_\_\_\_ Surface elevations of all breaks in grade and street intersections  
\_\_\_\_\_ Tributary areas with population per acre  
\_\_\_\_\_ True or magnetic meridian indicated  
\_\_\_\_\_ Property lines  
\_\_\_\_\_ Title block information  
\_\_\_\_\_ Scale  
\_\_\_\_\_ Proposed easements (to be dedicated to Township)  
\_\_\_\_\_ Differentiation between proposed lines to be constructed now and those to be  
constructed later  
\_\_\_\_\_ Distances between valves  
\_\_\_\_\_ Distances between hydrants  
\_\_\_\_\_ Water main sizes and materials  
\_\_\_\_\_ All associated construction materials (thrust blocks, etc.)  
\_\_\_\_\_ Service connection locations and details

# Township of Manalapan, Monmouth County, New Jersey

Final Application No. \_\_\_\_\_

Filed \_\_\_\_\_

## APPLICATION FOR FINAL APPROVAL OF WATER SYSTEM AND APPURTENANCES

Application is hereby made for Final Approval for the plans and specifications for a water system and appurtenances.

1. Applicant's Name: \_\_\_\_\_

Address: \_\_\_\_\_

City/State \_\_\_\_\_ Zip Code \_\_\_\_\_ Telephone \_\_\_\_\_

2. Name and Address of present owner, if other than Applicant:

Address: \_\_\_\_\_

City/State \_\_\_\_\_ Zip Code \_\_\_\_\_ Telephone \_\_\_\_\_

3. Conceptual Application No. \_\_\_\_\_ Approved (date) \_\_\_\_\_

4. Preliminary Application No. \_\_\_\_\_ Approved (date) \_\_\_\_\_

5. Does the Final Plan follow exactly the Preliminary Plan in regard to details and area covered?  
\_\_\_\_\_. If not, indicate material changes:

\_\_\_\_\_

6. Number of lots proposed for final approval \_\_\_\_\_

7. List plans and other materials accompanying application, with number of each.

ITEM

NUMBER

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

8. Development Plans

a. Sell lots only (Yes or no) \_\_\_\_\_

b. Construction of houses for sale? \_\_\_\_\_

c. Other \_\_\_\_\_

\_\_\_\_\_

9. Professional Engineer designing Final Plan

Name: \_\_\_\_\_ License Number \_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_ Tel. \_\_\_\_\_

10. Does Applicant or Owner agree to convey by deed to the Township of Manalapan easements to all areas on the plan showing water facilities and all rights to the water system? \_\_\_\_\_

11. Will Applicant post water system Performance and Maintenance Bonds ? \_\_\_\_\_

13. Attach two (2) prints of your final plan.

Signature of Applicant \_\_\_\_\_ Date \_\_\_\_\_

Printed Name of Applicant \_\_\_\_\_

Make all checks payable to THE TOWNSHIP OF MANALAPAN

---

**Do not write below this line**

Date received and fee collected: \_\_\_\_\_ \$ \_\_\_\_\_  
Date Fee

# *Township of Manalapan, Monmouth County, New Jersey*

## **CHECKLIST FOR APPLICATIONS FOR CONNECTION TO WATER SYSTEM**

### **FINAL APPLICATION-GENERAL**

- \_\_\_\_\_ Designed and sealed by a New Jersey licensed Professional Engineer
- \_\_\_\_\_ Application filed in duplicate
- \_\_\_\_\_ Fee - in accordance with fee schedule (certified check or cash)
- \_\_\_\_\_ Water system plans (4 prints; 1 reproducible; and disk)
- \_\_\_\_\_ Construction details
- \_\_\_\_\_ Technical specifications for construction of proposed water system and appurtenances
- \_\_\_\_\_ Cost estimate for construction of entire system based on unit costs acceptable to the Water Engineer
- \_\_\_\_\_ Performance bond conforming with the Rules and Regulations
- \_\_\_\_\_ Additional copies of any data furnished during preliminary review (if requested by Township)
- \_\_\_\_\_ Copies of documents, applications, etc. required by any other agency
- \_\_\_\_\_ Proof that preliminary subdivision/site plan approval has been granted by the Township
- \_\_\_\_\_ Statement of system adequacy for future needs of the area
- \_\_\_\_\_ Developer's agreement with Township, general development
- \_\_\_\_\_ Separate developer's agreement with Township for water system
- \_\_\_\_\_ Water allocation agreement with UWMX
- \_\_\_\_\_ Insurance requirements addressed

### **FINAL APPLICATION-SUPPORTING MATERIALS**

#### **1. PLAN AND PROFILE GUIDELINES**

- \_\_\_\_\_ Water mains
- \_\_\_\_\_ Fire hydrants
- \_\_\_\_\_ Service connections
- \_\_\_\_\_ Appurtenances
- \_\_\_\_\_ Stream crossings
- \_\_\_\_\_ Existing utilities shown (water, gas, electric, tel., cable, storm, san)

**CHECKLIST FOR APPLICATIONS FOR  
CONNECTION TO WATER SYSTEM**  
(cont'd)

**1. PLAN AND PROFILE GUIDELINES** (continued)

- \_\_\_\_\_ Utility crossings/conflicts detailed
- \_\_\_\_\_ Structures and surface elevations shown
- \_\_\_\_\_ Drawn to standard scales
- \_\_\_\_\_ Scale on each sheet (min 1" = 50')
- \_\_\_\_\_ Sheets numbered consecutively
- \_\_\_\_\_ 24"x36", 1/2" border top, bottom & right, 2" border left

**2. CONSTRUCTION DETAIL GUIDELINES**

- \_\_\_\_\_ Fire hydrants
- \_\_\_\_\_ Flush hydrants
- \_\_\_\_\_ Valves & valve boxes (all types)
- \_\_\_\_\_ Service connections
- \_\_\_\_\_ Air release manholes
- \_\_\_\_\_ Meter chambers
- \_\_\_\_\_ Trench details
- \_\_\_\_\_ Sheeting, shoring details
- \_\_\_\_\_ Restoration details

**3. CONSTRUCTION SPECIFICATION GUIDELINES**

- \_\_\_\_\_ Purpose is to describe materials and methods of construction
- \_\_\_\_\_ Ductile Iron Pipe
- \_\_\_\_\_ Polyvinyl Chloride Pipe
- \_\_\_\_\_ Prestressed Concrete Cylinder Pipe
- \_\_\_\_\_ Steel Pipe
- \_\_\_\_\_ Fittings
- \_\_\_\_\_ Valves, all types
- \_\_\_\_\_ Hydrants
- \_\_\_\_\_ Tapping sleeve and valve
- \_\_\_\_\_ Polyethylene encasement (DIP wrap)



**CHECKLIST FOR APPLICATIONS FOR  
CONNECTION TO WATER SYSTEM**

(cont'd)

**3. CONSTRUCTION SPECIFICATION GUIDELINES** (cont'd)

- \_\_\_\_\_ Service connections
- \_\_\_\_\_ Corporation stop
- \_\_\_\_\_ Curb valve stop
- \_\_\_\_\_ Miscellaneous service fittings
- \_\_\_\_\_ Pipe
- \_\_\_\_\_ Electrical tape for future detection purposes
- \_\_\_\_\_ Meters greater than 1"

**4. CONSTRUCTION COST GUIDELINES**

- \_\_\_\_\_ Costs of construction- detailed breakdown
- \_\_\_\_\_ Unit costs acceptable to Water Engineer
- \_\_\_\_\_ Right of way/easement expense
- \_\_\_\_\_ Inspection
- \_\_\_\_\_ Record drawings

**5. PERFORMANCE BOND GUIDELINES**

- \_\_\_\_\_ Form approve by Township
- \_\_\_\_\_ Bond amount = 120% of approved construction cost estimate
- \_\_\_\_\_ Within the time period
- \_\_\_\_\_ In accordance with these Rules and Regulations, plans, specifications, engineer's report and approved cost estimate

**6. INSURANCE REQUIREMENT GUIDELINES**

- \_\_\_\_\_ \$500,000-\$1,000,000 minimum for bodily injury and liability
- \_\_\_\_\_ \$500,000-\$1,000,000 minimum for property damage liability
- \_\_\_\_\_ Workers compensation in accordance w/laws of State of NJ
- \_\_\_\_\_ Manalapan Township and Water Engineer named as additional insured



**State of New Jersey**  
**DEPARTMENT OF ENVIRONMENTAL PROTECTION**  
**BUREAU OF SAFE DRINKING WATER**  
CN 426, TRENTON, N.J. 08625-0426



*Standard Application Form to*  
**Construct/Modify/Operate Public Water Works Facilities**

1. *Applicant/Owner* \_\_\_\_\_  
*Permanent Legal Address* \_\_\_\_\_  
*City/Town* \_\_\_\_\_ *State* \_\_\_\_\_ *Zip Code* \_\_\_\_\_  
*Name of Public Water System* \_\_\_\_\_  
*PWS ID Number* \_\_\_\_\_  
*Telephone ( )* \_\_\_\_\_ *Fax Number ( )* \_\_\_\_\_

2. *Location of Work Site* \_\_\_\_\_  
*Name of Facility, if applicable* \_\_\_\_\_  
*Address (Street/Road)* \_\_\_\_\_  
*Lot No.* \_\_\_\_\_ *Block No.* \_\_\_\_\_  
*Municipality* \_\_\_\_\_ *County* \_\_\_\_\_

3. *Application is for approval of the following (check one or more as applicable):*  
a. ☐ *New Public Water System* ☐ *Modification(s) to an existing Public Water System*  
b. ☐ *New Source of Water Supply* ☐ *Surface* ☐ *Ground*  
c. ☐ *New Water Treatment Plant* ☐ *Modification(s) to an Existing Water Treatment Plant*  
d. ☐ *Water Main* ☐ *Pump Station* ☐ *Storage Tank*  
e. ☐ *Other* \_\_\_\_\_

*Brief description of above:*

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

*New Jersey Licensed Professional Engineer responsible for the preparation of plans, specifications and engineer's report.*

*Name* \_\_\_\_\_  
*Name of Firm, if employee* \_\_\_\_\_  
*Address (street/road)* \_\_\_\_\_  
*City/Town* \_\_\_\_\_ *State* \_\_\_\_\_ *Zip Code* \_\_\_\_\_  
*Telephone ( )* \_\_\_\_\_ *Fax Number ( )* \_\_\_\_\_

**Estimated construction cost of project and applicable fees:**

- a. \$ \_\_\_\_\_ total estimated construction cost of the project including land, legal, and engineering.  
b. \$ \_\_\_\_\_ cost of construction (only).  
c. \$ \_\_\_\_\_ fee is attached pursuant to N.J.A.C. 7:10-15 and is based on the amount in item b.

I certify under penalty of law that the information provided in this document is true, accurate and complete. I am aware that there are significant civil and criminal penalties for submitting false, inaccurate or incomplete information.

\_\_\_\_\_  
TYPE: Name and Date

\_\_\_\_\_  
Signature of Applicant/Owner

\_\_\_\_\_  
TYPE: Position

**PROPER CONSTRUCTION AND OPERATION CLAUSE**

I, \_\_\_\_\_ agree that the works will be properly constructed and operated in accordance with the engineering plans and specifications, as approved, and the conditions under which approval is granted by the State Department of Environmental Protection.

\_\_\_\_\_  
Signature of Applicant/Owner

**8. STATEMENT OF PREPARER OF PLANS, SPECIFICATIONS, AND ENGINEER'S REPORT**

I hereby certify that the engineering plans, specifications and engineer's report applicable to this project comply with the current rules and regulations of the State Department of Environmental Protection with the exceptions as noted.

\_\_\_\_\_  
TYPE: Name and Date

\_\_\_\_\_  
Signature of Engineer

\_\_\_\_\_  
TYPE: Position, Name of Firm

PROFESSIONAL ENGINEERS  
EMBOSSSED SEAL

**Township of Manalapan**  
**Individual Water Service Connection Application Procedures**

1. Resident is noticed by the Municipality that a water main or a water main and service exists in front of their property and that they shall connect to said line following the procedures as contained herein.
2. Upon notification and prior to applying for the plumbing permit, the application as attached hereto is to be executed by the homeowner or by their plumber. The original of the completed application is to be forwarded to United Water Mid Atlantic, 111 Howard Boulevard, Suite 203, Mt. Arlington, NJ 07856-1315, Attention: New Accounts (1-888-770-6030). This particular application then initiates the appropriate billings and collections account and, if applicable, addresses the fees associated with the installation of the service connection. A copy as executed by United Water Mid Atlantic shall be furnished by United Water Mid Atlantic to both the property owner and to the Township Construction Department.
3. If a service connection does not already exist, same must be installed from the main to the property line with a shutoff. Said installation shall ONLY be performed by United Water Mid Atlantic or their designated representatives, to whom the homeowner shall pay the required fees, including those required for the applicable road opening permit (Municipal, County or State).
4. After United Water Mid Atlantic assignment of the appropriate billing account, the individual homeowner contacts the Township Construction Department to secure a plumbing permit and pay the associated fee. Permits shall not be issued until steps 2, 3 and 5 are completed.
5. At the time of plumbing permit application, the individual homeowner pays a water connection fee to the Township as per current Municipal ordinance (currently \$350.00).
6. The homeowner or their plumber will purchase and install the appropriate water meter with outside remote readout. The water meter shall be a Neptune T-10 (5/8" x 3/4"). The water meter assembly shall consist of a rolled-sealed register, a cast bronze main case and nutating disc measuring chamber. Meter shall have bronze caps and shall read in US gallons. Each water meter shall accommodate and include a Neptune Pro-Read, 2-wire, 3-board, unit for remote reading of the meter. Meters and remote reading devices shall be as manufactured by Schlumberger Industries Water Division. The New Jersey distributor is SLC Meter, 407 Bloomfield Drive, Unit 3, West Berlin, NJ 08901, (609) 719-0084. The remote unit shall be so located on the outside of the building as to be easily accessible to meter reading personnel.
7. If the individual property is serviced by a well system, the well SHALL BE DISCONNECTED from the house plumbing and said disconnection shall be observed by the Township Plumbing Inspector. Thereafter, the homeowner has the ability to either utilize the well for irrigation purposes or other non-potable water purposes, or to abandon the well. If the well is to be utilized, all local and State codes for cross-connections shall be complied with, including the filing of a NJDEP water allocation permit for a change of use. If the well is elected to be abandoned, same shall be in conformance with the requirements of NJDEP (including the filing of a NJDEP well abandonment form as executed by a licensed well driller) and the Municipal Health Department.
8. Once all the plumbing appurtenances have been completely installed, the Township Construction Department must be contacted for final inspection and approval. Upon obtaining same, the Township Construction Department will contact United Water MidAtlantic [Mr. John Snidenback (732) 446-5102] for the execution of the initial meter reading.
9. If there is a change of ownership, it is the current resident's (seller) responsibility to notice United Water Mid Atlantic and it is the proposed purchaser's responsibility to secure a new account from United Water Mid Atlantic using the form as enclosed herein. Executed copies shall be furnished to the Township Construction Department prior to the issuance of a C.O.



United Water Mid-Atlantic, Inc.  
111 Howard Blvd. Suite 203  
Mount Arlington, NJ 07856-1315  
telephone 1 888 770 6030 facsimile 201 770 6565

# United Water Manalapan Application for Water Service

The acceptance of this application is subject to examination of the premises to be supplied. It is agreed that water services will be furnished in accordance with the rules and regulations of the company as approved by the Board of Public Utility Commissioners of the State of New Jersey. Installation of this service is subject to the availability of an existing main in the street in front of the premises to be supplied.  
(please print)

Service number	Route number	Book number	Account number
<b>Work to be done</b>			
New service	Premises to be supplied		
St. Impt.	Location		
Enlargement	Lot number	Block number	Municipality
Renewal-replacement	Meter location		
St. Impt. to be connected	Customer		
	Business address		
	Telephone (H) (W)		
	<b>Size and description of building</b>	<b>Charges</b>	
	Stories	Building rate	
Mtl. to be used inside	Frontage	Meter couplings	
Permit number	Depth	Check valve	
Stamp service number	Type of construction	Street opening permit	
Tapped-ext.		Total \$	
Staked by	Type of pipe to be used (minimum inside diameter 3/4")	Date paid	Sales invoice number
	Size of meter	Payment received by	

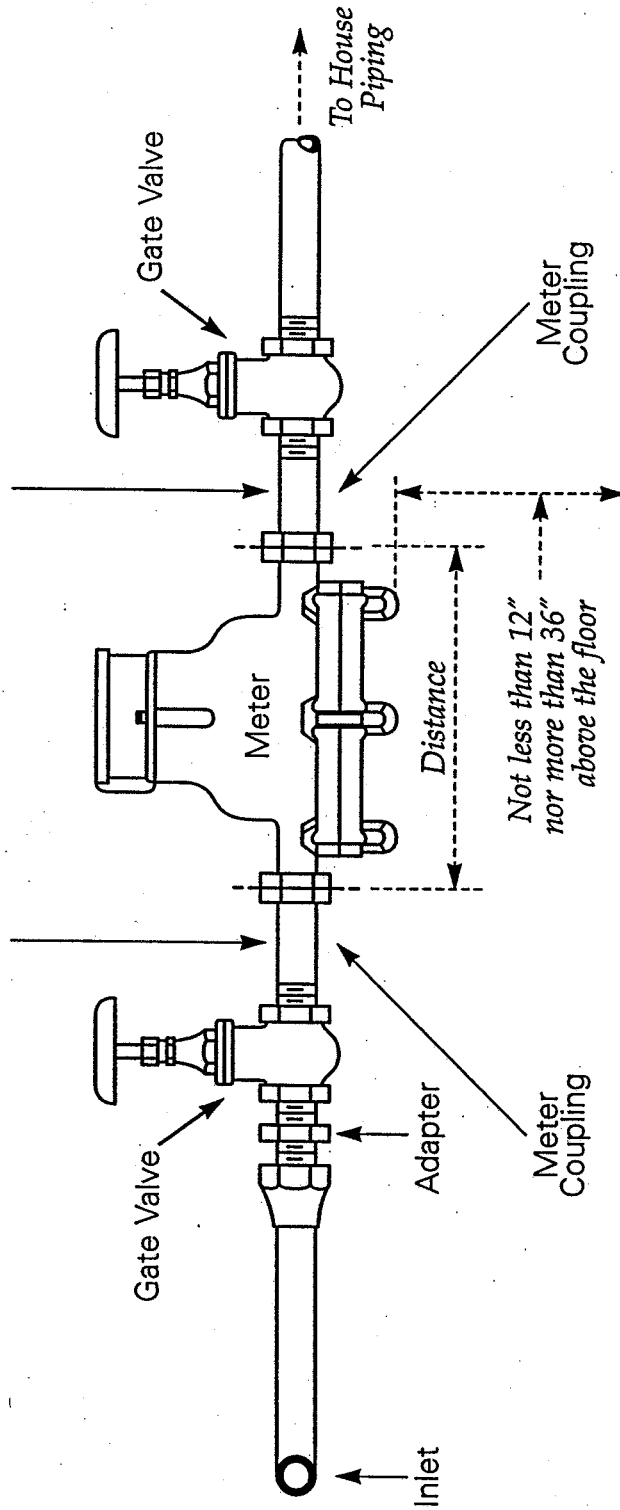
Customer agrees to pay all charges for service provided in accordance with the rate of the Company as approved by the Board of Public Utility Commissioners of the State of New Jersey.

Signature (Owner, Lessee, Agent)	Name of plumber
Street address	Street address
City, State, Zip	City, State, Zip
Application received by	Date

# United Water Manalapan Meter Setting

Where a pressure regulator is required,  
it shall be set between  
the inlet gate valve & the meter

Where a check valve is required,  
it shall be set between  
the outlet gate valve & the meter



Size of meter	Distance	Gate valve specifications
5/8"	7-1/2"	• Bronze body
3/4"	9"	• Solid wedge with rising stem
1"	10-3/4"	• 200 # working water pressure

**Note:** We call your attention to the fact that meters may not be set in crawl spaces or in other places where access for reading and maintenance is restricted. Meters must be set near the point of entrance of the connecting pipe into the building; between 12" and 18" from the floor; and must be so situated that they will be protected from freezing and other externally caused damage. Should you have any questions regarding the meter setting, our Meter Superintendent will be glad to review the matter with you.

## Schedule B

### Manalapan Township Service Line Connection

- I. Work will be done in both Monmouth County and Manalapan Twp. Roadways  
As Per attached Specification and Drawings.

#### INSTALLATION OF SERVICES

Installation of 1", 2", 4", 6", and 8" Service lines by open trench method, to include transporting all materials to the job site; installation of the tap on the main using a corporation stop; and installation of the specified size of pipe between the tap and the curb stop w/ buffalo box @ property line.( 2' - 35'). This item does not include installation of the meter set (coupling or meter), any asphalt or concrete removal, or any surface repair as may be required.

Home Service Line Connections: K copper

Installation of 1" service line                      Tap each    \$575.00    Line per foot    \$20.00

Installation of 2" service line                      Tap each    \$750.00    Line per foot    \$22.00

Commercial and/or Fire Service Line: Class 52 ductile pipe

Installation of 4" service line                      Tap each    \$3,400.00    Line per foot    \$25.00  
(Tapping Sleeve & Valve)

Installation of 6" service line                      Tap each    \$5,000.00    Line per foot    \$27.50  
(Tapping Sleeve & Valve)

Installation of 8" service line                      Tap each    \$6,000.00    Line per foot    \$32.00  
(Tapping Sleeve & Valve)

Miscellaneous Costs:

Saw cutting:    Per linear foot \$17.50    Per inch depth    \$2.50

Fill:

Bank run:

Crushed rock clean 3/4"

Gravel base 3/4"

Per cubic yard \$17.50 delivered

Per ton    \$31.00 delivered

Per ton    \$31.00 delivered

## SURFACE REMOVAL AND REPAIR

### II. Removal of asphalt and/or concrete pavement, to include cutting pavement as required and disposing of all materials which cannot be utilized in trench backfilling operations.

1.	Removal of 2-inch thick asphalt pavement	\$ 2.50	Sq. Ft.	
2.	Removal of 3-inch thick asphalt pavement	\$ 2.50	Sq. Ft.	
3.	Removal of 4-inch thick asphalt pavement	\$ 2.50	Sq. Ft.	
4.	Removal of 6-inch thick asphalt pavement	\$ 3.50	Sq. Ft.	
5.	Removal of 8-inch thick asphalt pavement	\$ 4.50	Sq. Ft.	
6.	Removal of 2-inch thick asphalt pavement with 4-inch thick concrete underlay	\$ 9.25	Sq. Ft.	
7.	Removal of 2-inch thick asphalt pavement with 6-inch thick concrete underlay	\$10.50	Sq. Ft.	
8.	Removal of 4-inch thick asphalt pavement with 4-inch thick concrete underlay	\$ 9.25	Sq. Ft.	
9.	Removal of 4-inch thick asphalt pavement with 6-inch thick concrete underlay	\$10.50	Sq. Ft.	
10.	Removal of 6-inch thick asphalt pavement with 4-inch thick concrete underlay	\$10.50	Sq. Ft.	
11.	Removal of 6-inch thick asphalt pavement with 6-inch thick concrete underlay	\$11.50	Sq. Ft.	
12.	Removal of 5-inch thick asphalt pavement	\$ 3.50	Sq. Ft.	

### III. Removal of concrete curb and gutter, concrete sidewalks, and concrete driveways, to include cutting concrete as required and disposing of all materials removed.

1.	Removal of concrete curb and gutter	\$11.50	Linear Ft.	
2.	Removal of concrete sidewalk	\$ 2.50	Sq. Ft.	
3.	Removal of concrete driveway	\$ 3.50	Sq. Ft.	

### IV. Furnish and install asphalt pavement. Required crushed rock or gravel base and leveling courses to be paid for under separate bid item.



**A. TOP COAT**

1.	Installation of 2-inch thick asphalt pavement	\$1.25	Sq. Ft.	
2.	Installation of 3-inch thick asphalt pavement	\$1.75	Sq. Ft.	
3.	Installation of 4-inch thick asphalt pavement	\$2.50	Sq. Ft.	
4.	Installation of 5-inch thick asphalt pavement	\$3.00	Sq. Ft.	
5.	Installation of 6-inch thick asphalt pavement	\$3.50	Sq. Ft.	

**B. BASE COAT**

1.	Installation of 2-inch thick asphalt pavement	\$0.95	Sq. Ft.	
2.	Installation of 3-inch thick asphalt pavement	\$1.45	Sq. Ft.	
3.	Installation of 4-inch thick asphalt pavement	\$1.90	Sq. Ft.	
4.	Installation of 5-inch thick asphalt pavement	\$2.40	Sq. Ft.	
5.	Installation of 6-inch thick asphalt pavement	\$2.90	Sq. Ft.	

**C. MILLING**

1.	Top coat to be installed after one year period of base coat installation as per county requirements	\$1.15	Sq. Ft.	
		\$1.15	Per inch	

**V. Furnish and install pavement with concrete base.**

1.	Installation of 2-inch thick asphalt pavement with 6-inch concrete base	\$ 9.25	Sq. Ft.	
2.	Installation of 3-inch thick asphalt pavement with 6-inch concrete base	\$ 9.75	Sq. Ft.	
3.	Installation of 4-inch thick asphalt pavement with 6-inch concrete base	\$10.50	Sq. Ft.	
4.	Installation of 6-inch thick asphalt pavement with 6-inch concrete base	\$11.50	Sq. Ft.	

**VI. Furnish and install concrete curb and gutter, concrete sidewalks, to include  
required crushed rock or gravel base and leveling courses.**

1.	Installation of concrete curb and gutter	\$17.25	Linear Ft.	
2.	Installation of concrete sidewalk	\$ 4.50	Sq. Ft.	
3.	Installation of concrete driveway	\$ 7.00	Sq. Ft.	

VII. Furnish and install temporary asphalt pavement repair	<u>\$1.15</u>	Sq. Ft.	<u>          </u>
VIII. Furnish and install gravel surface repair	<u>\$1.75</u>	Cu. Ft.	<u>          </u>
IX. Replace 2-inch layer of top soil and furnish and sow grass seed	<u>\$1.15</u>	Sq. Ft.	<u>          </u>
X. Furnish and install grass sod	<u>\$1.15</u>	Sq. Ft.	<u>          </u>

# *Township of Manalapan, Monmouth County, New Jersey*

## **CHECKLIST - PRE-CONSTRUCTION**

- \_\_\_\_\_ NJDEP approvals for water system, stream crossings, wetland crossing
- \_\_\_\_\_ Permits to construct water lines and associated appurtenances/structures within the
- \_\_\_\_\_ right-of-way limits of State, County, or Municipal Roads, or railroads
- \_\_\_\_\_ Performance bond posted with Township
- \_\_\_\_\_ Construction service fees posted with Township
- \_\_\_\_\_ Insurance certificate(s) posted with Township (naming Township and Water Engineer
- \_\_\_\_\_ as additional insureds)
- \_\_\_\_\_ Conformance with all conditions of approval
- \_\_\_\_\_ Developer's Agreement (general) acceptance and execution by Township
- \_\_\_\_\_ Developer's Agreement (water) acceptance and execution by Township
- \_\_\_\_\_ Water Allocation Agreement acceptance and execution by UWMX and Township
- \_\_\_\_\_ Three additional sets of final approved plans for use by Water Engineer's field
- \_\_\_\_\_ representative
- \_\_\_\_\_ Clearances and approvals from public or private utilities
- \_\_\_\_\_ Submission of all catalogue cuts, shop drawings and construction schedules to the Water
- \_\_\_\_\_ Engineer for consideration
- \_\_\_\_\_ Pre-construction conference with Township and Water Engineer

# *Township of Manalapan, Monmouth County, New Jersey*

## **CHECKLIST - PRE-OPERATION OF WATER SYSTEM**

- \_\_\_\_\_ Construction of water system, appurtenances and associated structures completed and accepted
- \_\_\_\_\_ Minimum cover provided on all lines in accordance with Rules and Regulations, plans and specifications
- \_\_\_\_\_ Pressure test witnessed by and acceptable to the Water Engineer
- \_\_\_\_\_ Lines flushed by United Water Mid-Atlantic personnel
- \_\_\_\_\_ Bacteria test(s) performed by and acceptable to the Township
- \_\_\_\_\_ Certification from Applicant's engineer certifying that the water facilities are constructed in substantial conformance with the approved plans, and the Township's Rules and Regulations.
- \_\_\_\_\_ Operations and Maintenance manuals, if applicable (see separate checklist)

# *Township of Manalapan, Monmouth County, New Jersey*

## **CHECKLIST - OPERATING AND MAINTENANCE MANUALS**

\_\_\_\_\_ Manufacturers' descriptive literature

\_\_\_\_\_ Maintenance instructions, including recommended lubricants and spare parts

\_\_\_\_\_ Parts lists

\_\_\_\_\_ As-installed control diagrams, including color coded wiring diagrams or tagging numbers for all electrical motor controller connections and interlock connections with other mechanical equipment

\_\_\_\_\_ Step-by-step operating instructions for each piece of equipment and system, including preparation for starting, shutdown and draining

\_\_\_\_\_ Performance data

\_\_\_\_\_ Each item of equipment is to be identified by a permanently attached nameplate made of brass or other corrosion resistant metal with incised letters and bearing the following information:

\_\_\_\_\_ Manufacturer's name and address

\_\_\_\_\_ Serial and model numbers

\_\_\_\_\_ Rated capacity

\_\_\_\_\_ Temperature, pressure or other limitations

# *Township of Manalapan, Monmouth County, New Jersey*

## **CHECKLIST - RELEASE OF PERFORMANCE BOND**

\_\_\_\_\_ Deed(s)

\_\_\_\_\_ Copy of subdivision/site plan

\_\_\_\_\_ Easements for all lines/appurtenances on private property, and map delineating easements

\_\_\_\_\_ Metes and bounds descriptions

\_\_\_\_\_ Warranties on equipment

\_\_\_\_\_ Title policies for fee titles and easements

\_\_\_\_\_ Surveys for plant site and easements

\_\_\_\_\_ Bill of sale for equipment and lines

\_\_\_\_\_ Release from the following: materialmen; suppliers; contractors; subcontractors; laborers; lending institutions

\_\_\_\_\_ Affidavit of title for land, easements, and equipment and a recitation thereon that everything conveyed to the Township has been paid for in full.

\_\_\_\_\_ Assignment to the Township for all performance and maintenance bonds

\_\_\_\_\_ Certificate listing all users connected to the system, including the following: names and addresses of property owner, together with lot and block number; date connected; place connected; plumbing units authorized in connection

\_\_\_\_\_ Record plans (4 sets of prints, one mylar set, disk)

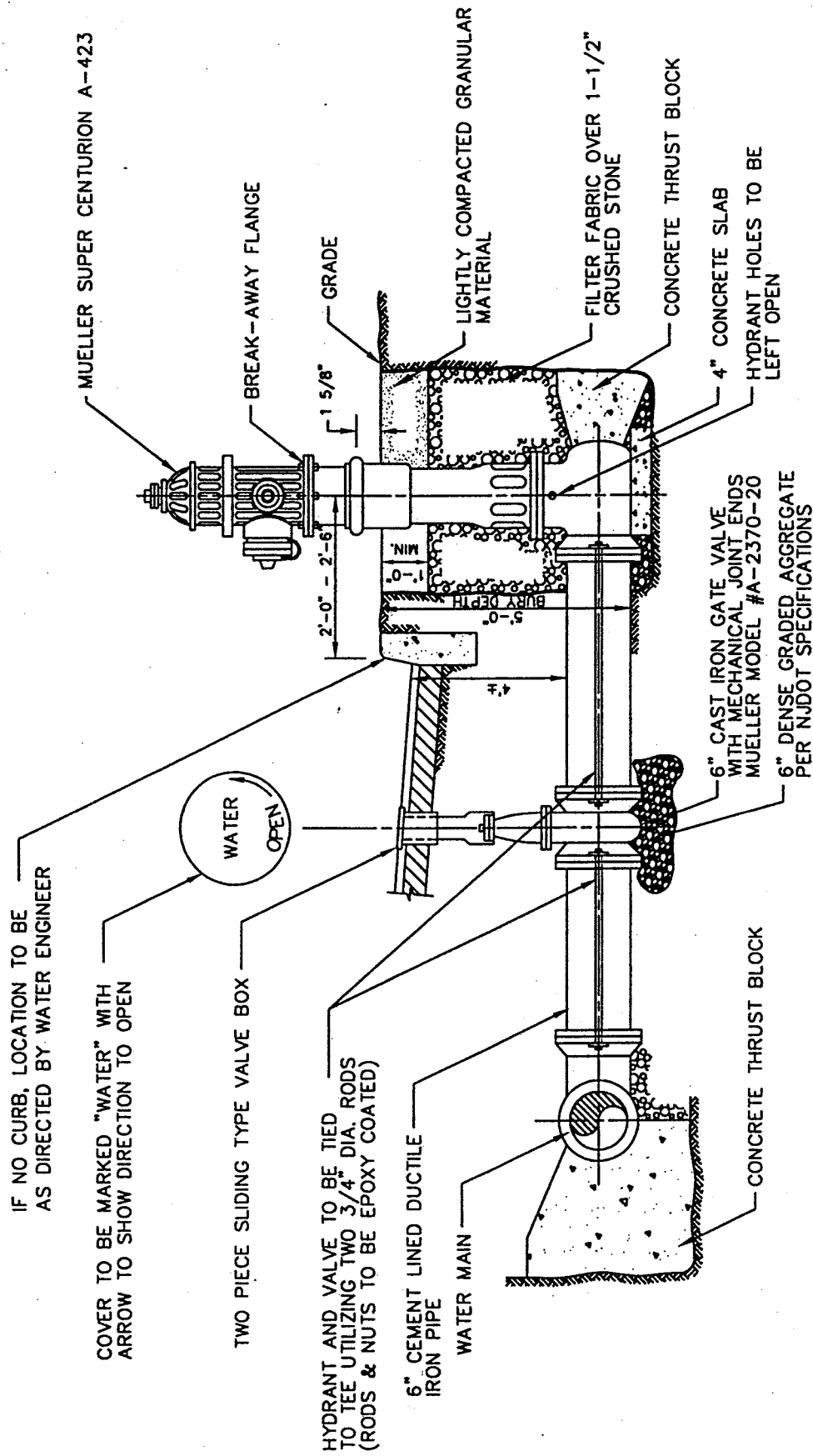
\_\_\_\_\_ Maintenance bond from developer to Township

\_\_\_\_\_ All of the above to be conveyed to the Township free and clear of liens, encumbrances and debts

\_\_\_\_\_ Corporate resolution authorizing conveyances described above

**EXHIBIT I**

**CONSTRUCTION DETAILS**



# HYDRANT ASSEMBLY DETAIL

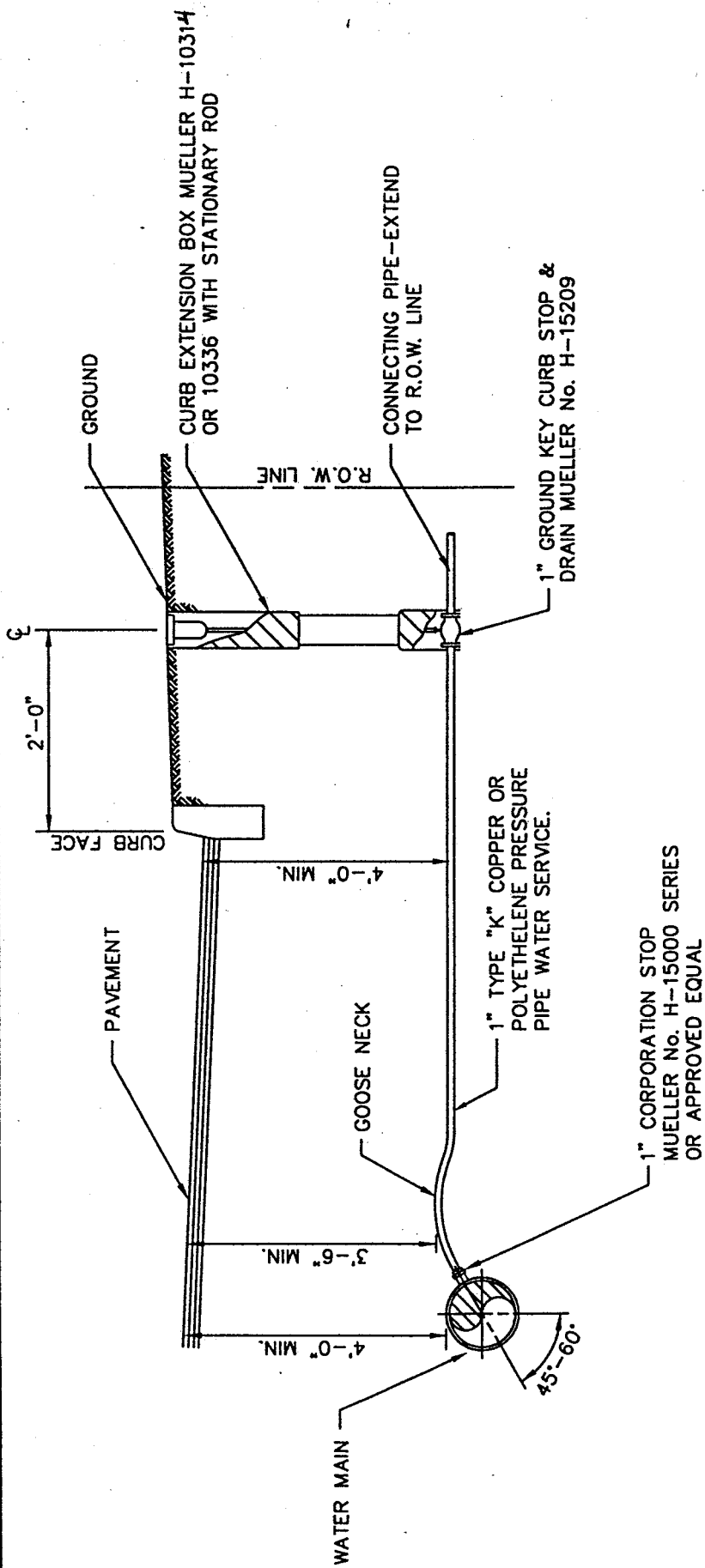
N.T.S.

TOWNSHIP OF MANALAPAN  
MONMOUTH COUNTY, NEW JERSEY  
STANDARD DETAIL  
HYDRANT ASSEMBLY DETAIL

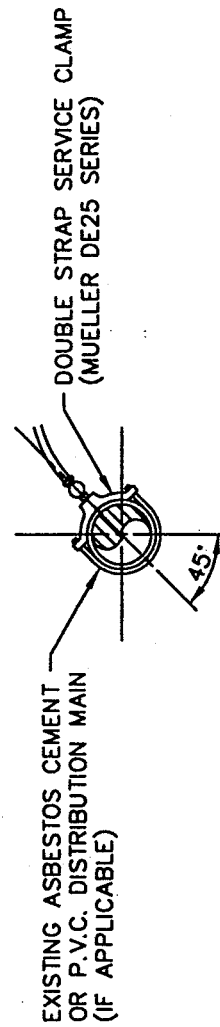


NOT TO SCALE





SERVICE CONNECTIONS-1" DIA.



SERVICE CONNECTIONS-1" TO 2" DIA.

## WATER SERVICE CONNECTION DETAIL

NOT TO SCALE

N.T.S.

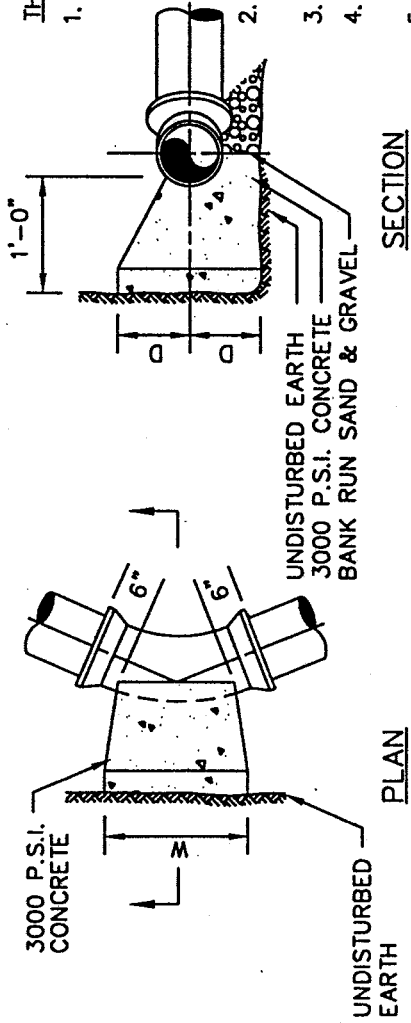
TOWNSHIP OF MANALAPAN  
MONMOUTH COUNTY, NEW JERSEY

STANDARD DETAIL

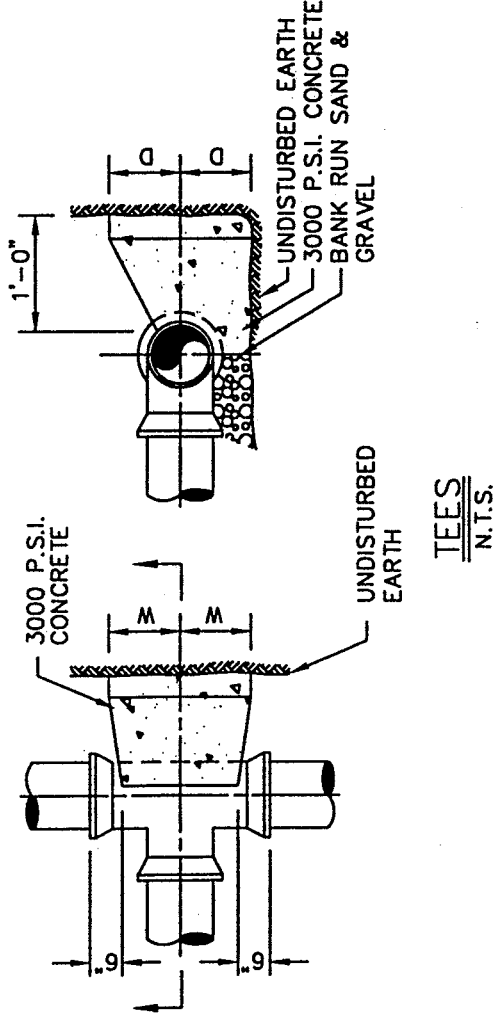
WATER SERVICE CONNECTION DETAIL



CONSULTING AND MUNICIPAL ENGINEERS



**BENDS**  
N.T.S.



**THRUST BLOCK NOTES:**

1. BEARING AREAS SHOWN ARE BASED ON 2000 P.S.F. ALLOWABLE BEARING PRESSURE, WHERE SOILS ARE ENCOUNTERED WITH A POORER BEARING CAPACITY. THE CONTRACTOR SHALL INCREASE THE BEARING AREA AS MAY BE DIRECTED BY THE ENGINEER OR STRAP THE JOINTS IN A MANNER APPROVED BY THE ENGINEER.
2. ALL THRUST BLOCKS SHALL BE POURED DIRECTLY AGAINST THE UNDISTURBED EARTH.
3. NO JOINTS SHALL BE COVERED WITH CONCRETE.
4. CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3000 P.S.I.
5. ALL THRUST BLOCKS FOR VERTICAL BENDS SHALL INCLUDE STRAPS TO SECURE FITTING TO BLOCK AND CONCRETE QUANTITY SHALL BE INCREASED IN SIZE AS DIRECTED BY THE ENGINEER.
6. ALL THRUST BLOCKS WERE DESIGNED FOR 100 P.S.I. NORMAL OPERATING PRESSURE. THE THRUST BLOCKS FOR HIGH PRESSURE LINES, IF ANY SHALL BE INCREASED IN SIZE AS DIRECTED BY THE ENGINEER.

**THRUST BLOCK SCHEDULE**

DESCRIPTION OF FITTINGS	MINIMUM DIMENSIONS (IN FEET)	DIAMETER OF PIPE				
		6"	8"	10"	12"	14"
TEES	W	1.25	1.50	1.75	2.00	2.25
	D	1.25	2.00	2.25	2.50	2.75
90° BENDS	W	2.00	3.00	3.50	4.00	4.50
	D	1.50	2.00	2.25	2.50	3.00
45° BENDS	W	1.50	2.00	2.50	3.00	3.50
	D	1.00	1.25	1.75	2.00	2.50
22 1/2° BENDS	W	1.50	1.50	2.00	2.50	3.00
	D	1.00	1.00	1.50	1.50	2.00
11 1/4° BENDS	W	1.00	1.25	1.50	1.50	2.00
	D	1.00	1.00	1.25	1.25	1.50
CAPS	W	1.25	1.50	1.75	2.00	2.25
	D	1.25	2.00	2.25	2.50	2.75

NOTE : ALL W&D DIMENSIONS  
IN FEET

TOWNSHIP OF MANALAPAN  
MONMOUTH COUNTY, NEW JERSEY

STANDARD DETAIL  
THRUST BLOCKS



NOT TO SCALE

# **RESTRAINED PIPE LENGTH NOTES**

1. RESTRAINED LENGTHS SHOWN ARE FOR CLASS 52 D.I.P. DESIGNED FOR 100 psi NORMAL OPERATING PRESSURE. RESTRAINED LENGTHS FOR HIGHER PRESSURES SHALL BE INCREASED AS DIRECTED BY UTILITY ENGINEER.
2. RESTRAINED LENGTHS FOR VERTICAL BENDS SHALL BE INCREASED AS DIRECTED BY UTILITY ENGINEER.
3. PIPE SHALL BE RESTRAINED BY THE USE OF MECHANICAL JOINTS WITH RETAINER GLANDS OR AS APPROVED BY THE UTILITY ENGINEER.

TOWNSHIP OF MANALAPAN  
MONMOUTH COUNTY, NEW JERSEY

## **STANDARD DETAIL RESTRAINED PIPE LENGTHS**



RESTRAINED LENGTH EACH WAY										
DESCRIPTION OF FITTINGS	DIAMETER OF PIPE									
	6"	8"	10"	12"	14"	16"	18"	20"	24"	
90° BENDS, TEES & CROSSES	28	36	43	51	58	64	71	78	90	
45° BENDS	12	15	18	21	24	27	30	32	38	
22 1/2° BENDS	6	7	9	10	12	13	14	16	18	
11 1/4° BENDS	3	4	5	5	6	7	7	8	9	
CAPS & PLUGS	28	36	43	51	58	64	71	78	90	

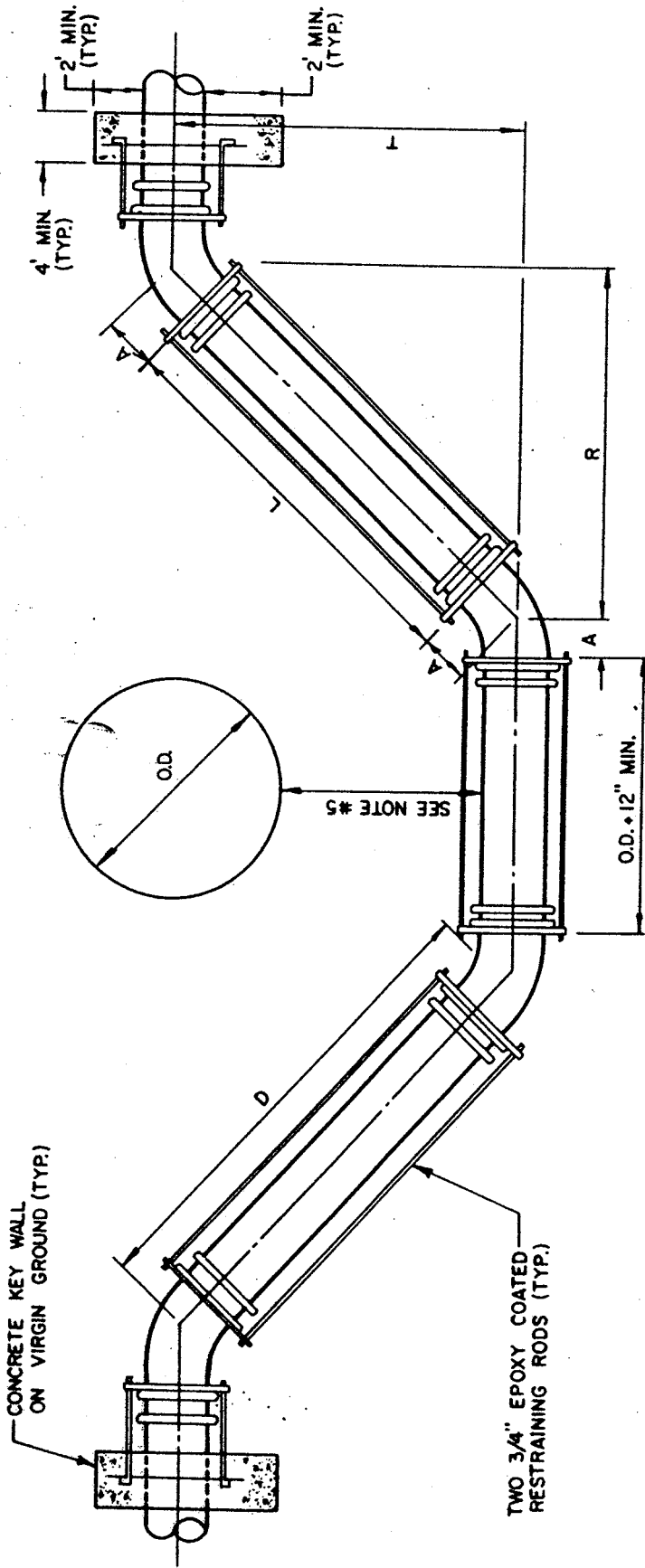
NOTE: ALL RESTRAINED LENGTHS IN FEET.

RESTRAINED LENGTH* EACH WAY										
DESCRIPTION OF FITTINGS	DIAMETER OF PIPE									
	6"	8"	10"	12"	14"	16"	18"	20"	24"	
90° BENDS, TEES & CROSSES	34	43	52	61	70	78	86	94	109	
45° BENDS	14	16	22	25	29	32	36	39	46	
22 1/2° BENDS	7	9	11	12	14	16	17	19	22	
11 1/4° BENDS	4	5	5	6	7	8	9	10	11	
CAPS & PLUGS	34	43	52	61	70	78	86	94	109	

NOTE: ALL RESTRAINED LENGTHS IN FEET.

\* PIPE WITH POLYETHYLENE ENCASUREMENT

FOR ALTERNATE LOOP ABOVE OBSTRUCTION,  
SEE NOTE 1



MECHANICAL JOINTS				
ANGLE	D	R	L	
45°	D = T x 1.414	R = T x 1.00	L = D - 2A*	
22 1/2°	D = T x 2.613	R = T x 2.414	L = D - 2A*	
11 1/4°	D = T x 3.216	R = T x 5.027	L = D - 2A*	

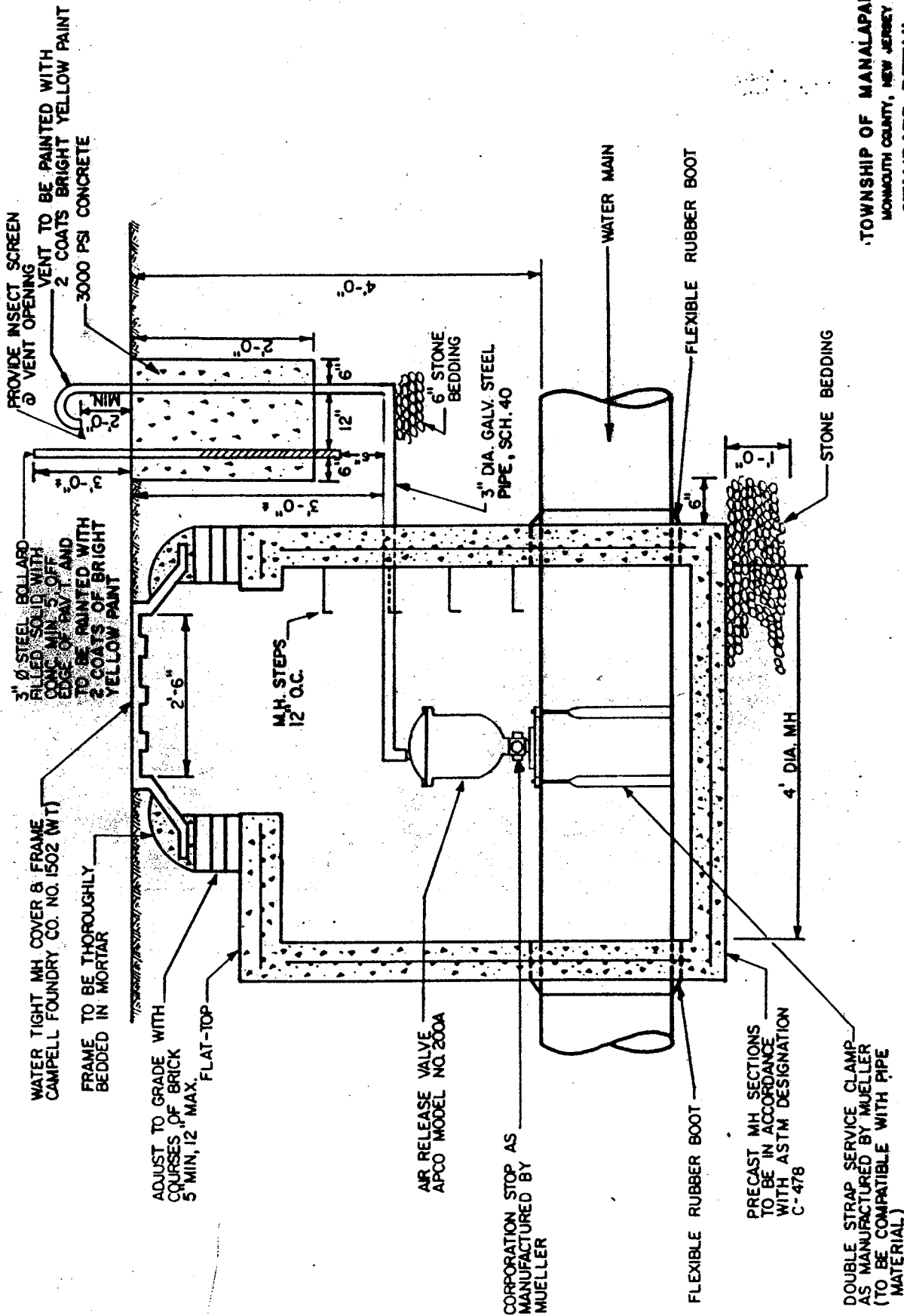
NOTES:

1. WATER MAIN MAY BE LOOPED ABOVE OBSTRUCTION IF 4' MINIMUM COVER IS MAINTAINED ABOVE MAIN.
2. WATER MAIN LOOP SHALL BE DUCTILE IRON CEMENT LINED PIPE, CLASS 52. ALL JOINTS SHALL BE RESTRAINED MECHANICAL JOINTS FOR LOOPING ASSEMBLY.
3. CONCRETE THRUST BLOCKS SHALL BE PROVIDED AT ALL BENDS AND OTHER POINTS OF PIPE DIRECTION CHANGE.
4. MINIMUM VERTICAL CLEARANCE BETWEEN SANITARY SEWER AND WATER MAIN SHALL BE 18" MINIMUM. CLEARANCE BETWEEN WATER MAIN AND OTHER OBSTRUCTION SHALL BE 6". CONCRETE ENCASE SEWER 10" EITHER SIDE IF ABOVE WATER MAIN.
5. THE ROSS OR RETAINER GLANDS MAY BE UTILIZED TO RESTRAIN PIPE JOINTS. DETAILS OF THE ROSS ASSEMBLY SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL. THE ROSS SHALL BE SUFFICIENT TO RESTRAIN THE THRUST DEVELOPED AT 160 PSI WORKING PRESSURE.

TOWNSHIP OF MANALAPAN  
MONMOUTH COUNTY, NEW JERSEY  
STANDARD DETAIL  
LOOPING WATER MAIN



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# **AIR RELEASE MANHOLE** N.T.S.

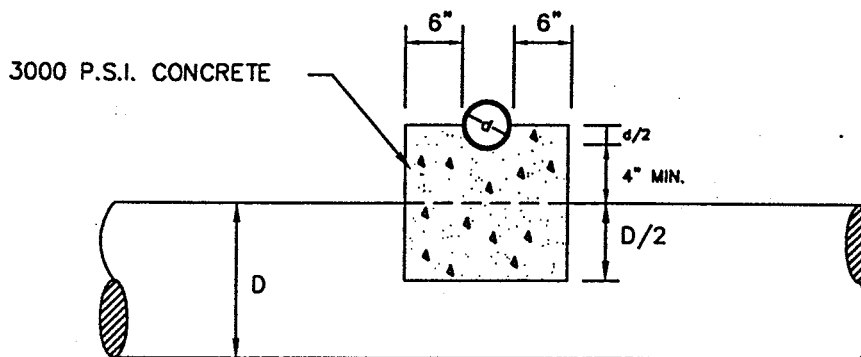
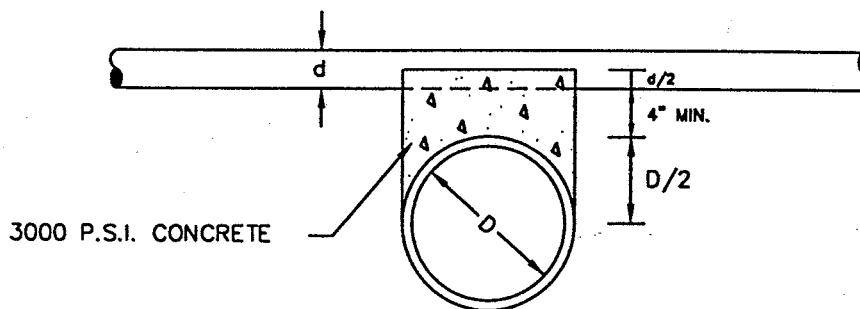
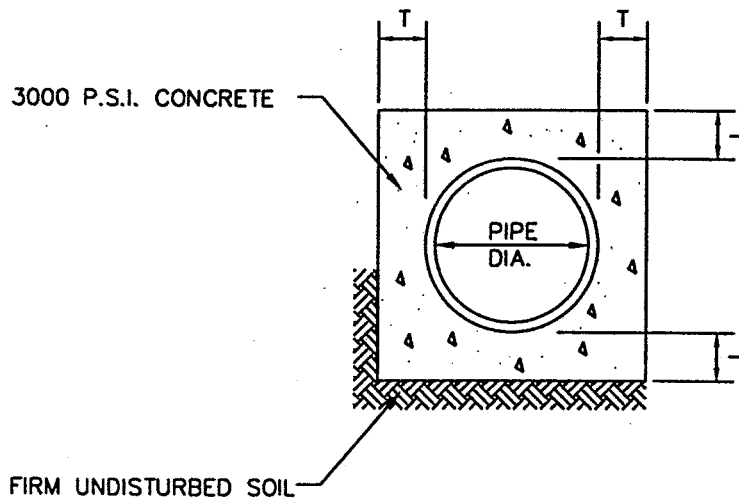
TOWNSHIP OF MANALAPAN  
MORRIS COUNTY, NEW JERSEY  
**STANDARD DETAIL**  
**AIR RELEASE MANHOLE**



CONSULTING AND MUNICIPAL ENGINEERS

NOT TO SCALE

DIMENSIONS														
DIA.	6"	8"	10"	12"	15"	18"	21"	24"	27"	30"	36"	42"	48"	54"
T	6"	6"	6"	6"	6"	6"	6"	6"	6"	7"	8"	9"	10"	12"



# CONCRETE ENCASEMENT & CRADLE DETAIL

N.T.S.

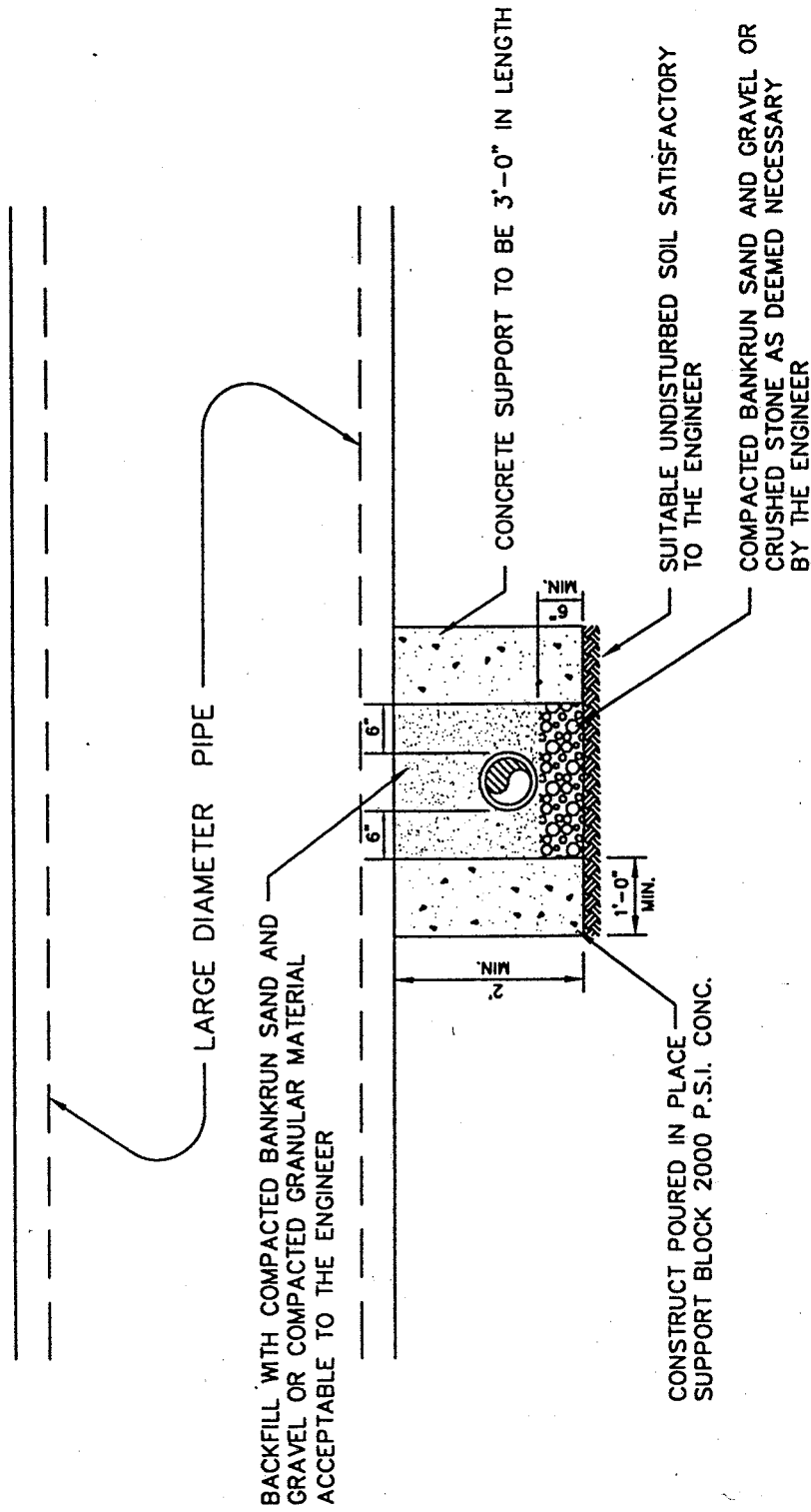
TOWNSHIP OF MANALAPAN  
MONMOUTH COUNTY, NEW JERSEY

STANDARD DETAIL  
CONCRETE ENCASEMENT & CRADLE DETAIL

NOT TO SCALE



CONSULTING AND MUNICIPAL ENGINEERS



## CONCRETE SUPPORT BLOCK DETAIL

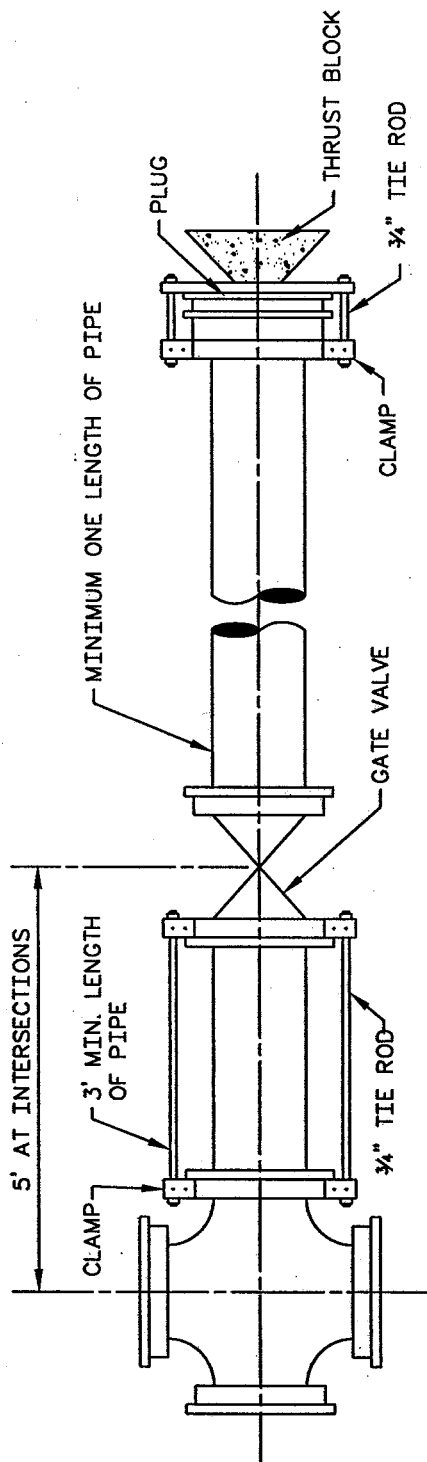
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TOWNSHIP OF MANALAPAN  
MONMOUTH COUNTY, NEW JERSEY

STANDARD DETAIL  
CONCRETE SUPPORT BLOCK DETAIL



NOT TO SCALE



TYPICAL STUB FOR FUTURE CONNECTION

AND

TYPICAL VALVE PLACEMENT AT INTERSECTIONS

N.T.S.

TOWNSHIP OF MANALAPAN  
MONMOUTH COUNTY, NEW JERSEY

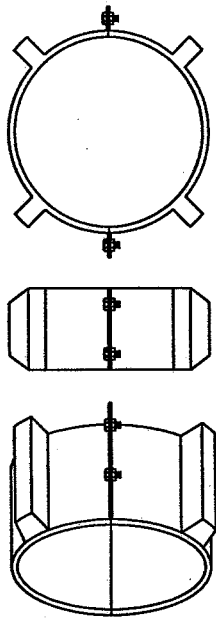
STANDARD DETAIL

TYPICAL STUB & TYPICAL  
VALVE PLACEMENT AT INTERSECTIONS



CONSULTING AND MUNICIPAL ENGINEERS





DETAIL OF CASING SPACER

R.O.W. WIDTH + 10' ON EITHER SIDE

RIGHT OF WAY WIDTH

12' MAXIMUM SPACING BETWEEN SPACERS

CASING SPACERS OT BE SPACED 1' FROM EACH SIDE OF ANY JOINTS IN CARRIER PIPING

CARRIER PIPE SHALL BE DIP CLASS 56

5.5' MIN

1.5'

CARRIER PIPE

CASING PIPE TO BE 35,000 P.S.I. STEEL

CASING SPACER (TYP.)

TRACK LIVE LOAD INFLUENCE LINE

RUBBER END SEAL SEAL (SEE SPECS. TYP.)

CASING SPACERS AND END SEALS SHALL BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS

# TYPICAL CASING/CARRIER PIPE DETAIL

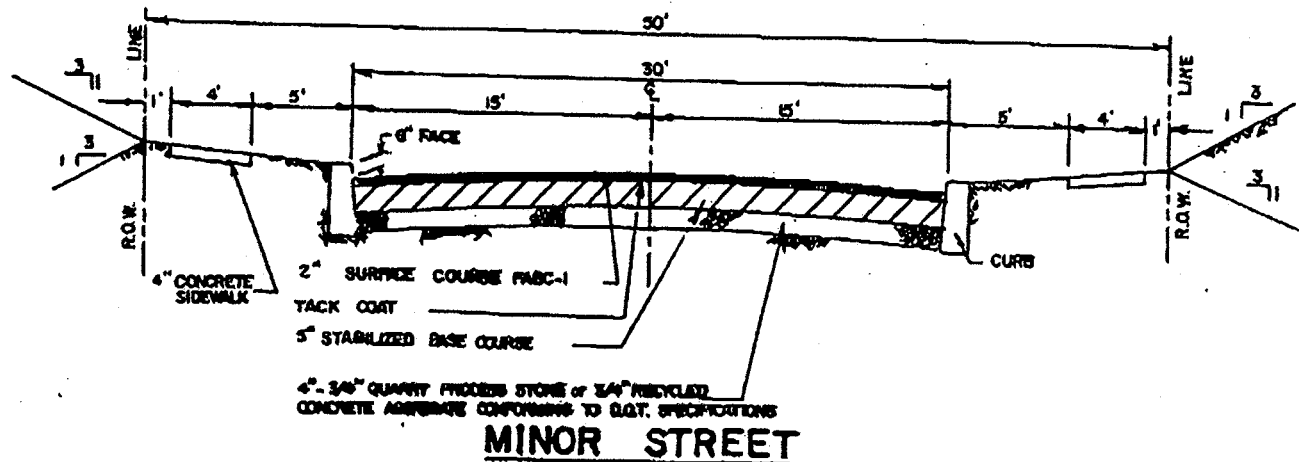
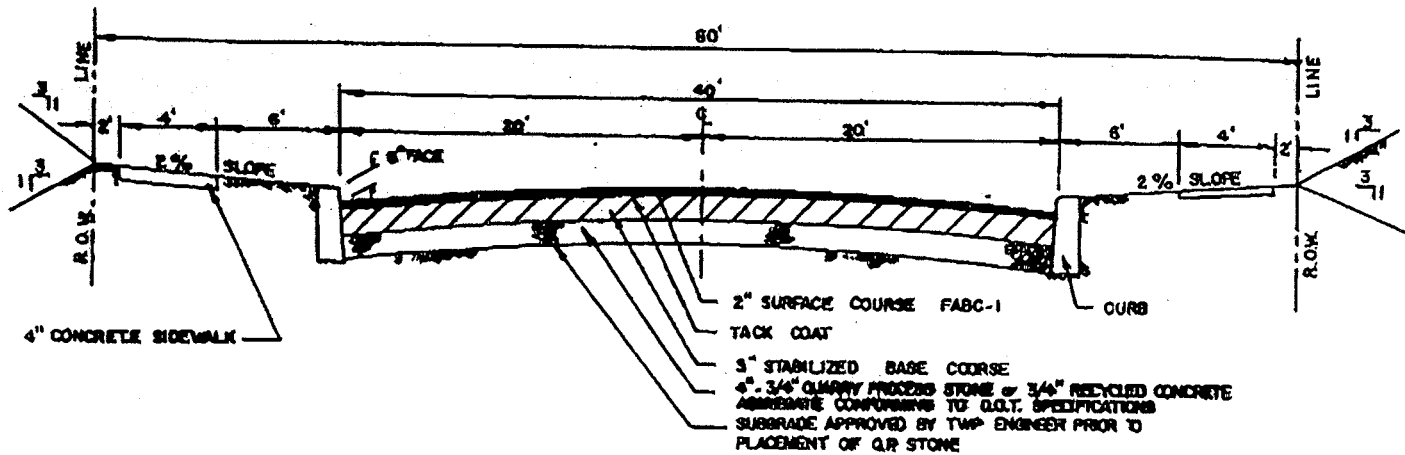
N.T.S.

TOWNSHIP OF MANALAPAN  
MONMOUTH COUNTY, NEW JERSEY

STANDARD DETAIL  
TYPICAL CASING/CARRIER  
PIPE DETAIL



CONSULTING AND MUNICIPAL ENGINEERS



**NOTE:**

- 1) ALL UNDERGROUND STORM SEWERS, SANITARY SEWERS, UTILITY MAINS, SERVICES &/OR WIRING TO BE INSTALLED PRIOR TO ROADWAY BASE COURSE PAVING
- 2) ALL IMPROVEMENTS TO BE CONSTRUCTED IN ACCORDANCE WITH TOWNSHIP ORDINANCES 20-8.1

**TYPICAL ROADWAY SECTIONS**

**DETAILS FOR NEW CONSTRUCTION IN MANALAPAN TOWNSHIP**

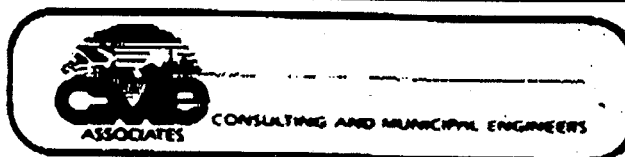
Prepared By:  
**JOHN ALLGAI, P.E. & L.S.**  
 New Jersey License No. 2302  
 TOWNSHIP ENGINEER

YEAR:  
 1988

SCALE:  
 NTS.

FILE No.  
 MAN 86

DWG. No.  
 R-2



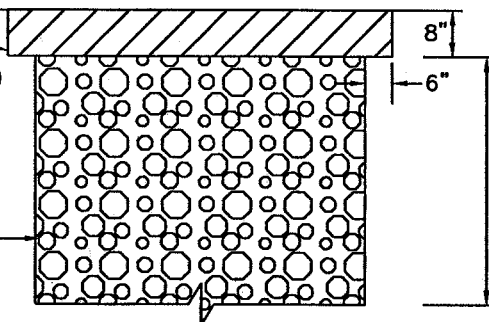
MAN-86 3X L.B.

EXISTING PAVEMENT  
SURFACE

8" BITUMINOUS  
STABILIZED BASE  
COURSE, NJDOT MIX (I-2)  
(MINIMUM)

SAWCUT TO OBTAIN  
NEAT EDGE

COMPACTED BACKFILL  
PER SPECIFICATIONS



EXISTING PAVEMENT  
THICKNESS VARIES

MIN. 5' DENSE GRADED AGGREGATE  
BASE COURSE OR AS REQUIRED

= STANDARD DETAIL =

## TEMPORARY TRENCH REPAIR

N.T.S.

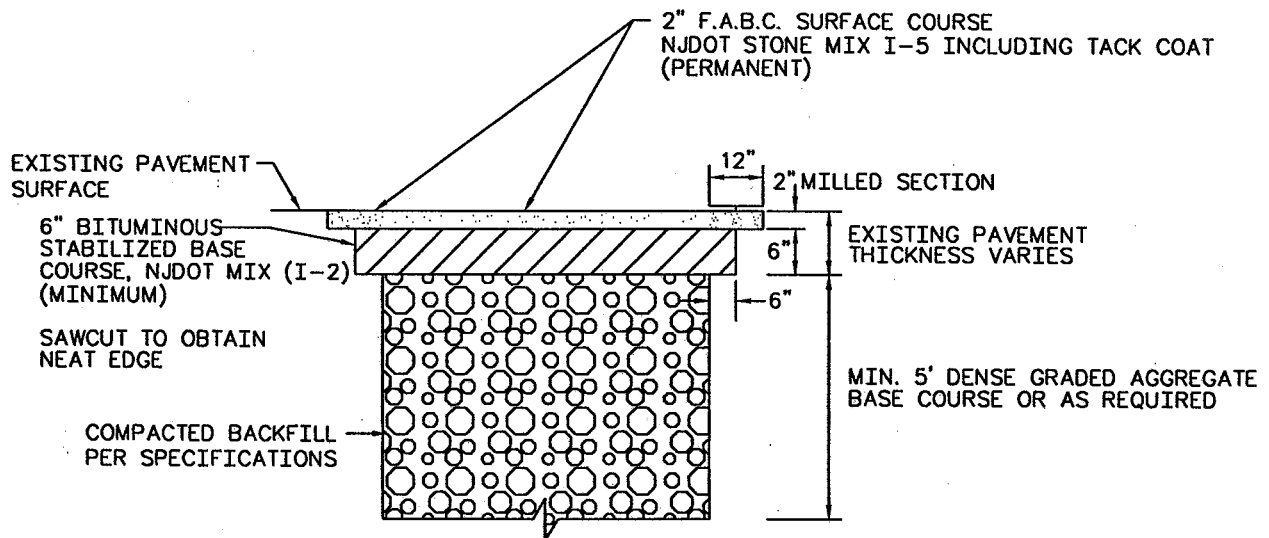
TOWNSHIP OF MANALAPAN  
MONMOUTH COUNTY, NEW JERSEY  
STANDARD DETAIL

TEMPORARY TRENCH REPAIR



CONSULTING AND MUNICIPAL ENGINEERS

NOT TO SCALE



= STANDARD DETAIL =

## PERMANENT ROADWAY TRENCH REPAIR

N.T.S.

TOWNSHIP OF MANALAPAN  
MONMOUTH COUNTY, NEW JERSEY  
STANDARD DETAIL  
MUNICIPAL ROADWAY TRENCH  
OR PAVEMENT REPAIR



CONSULTING AND MUNICIPAL ENGINEERS

NOT TO SCALE

ROADWAY SURFACE AS REQUIRED  
BY THE APPLICABLE AGENCY

COMPACTED GRANULAR BACKFILL  
MECHANICALLY TAMPED IN 12"  
LAYERS (WITHIN ROADWAYS, 95% OF  
MODIFIED PROCTOR DENSITY)

SIDE SLOPES IN ACCORDANCE WITH  
APPLICABLE REQUIREMENTS OF O.S.H.A.  
AND OTHER GOVERNMENTAL REGULATIONS

COMPACTED GRANULAR SELECT BACKFILL  
HAND TAMPED IN 6" LAYERS

WATER PIPE

EMBEDMENT MATERIAL-DENSE GRADED  
AGGREGATE PER NJDOT SPECIFICATIONS

SPRINGLINE

SUITABLE BEARING SOIL

NOTES:

1. EXCAVATIONS IN EXISTING PAVED ROADWAYS SHALL BE COORDINATED WITH THE TOWNSHIP OF MANALAPAN, MONMOUTH COUNTY OR N.J.D.O.T. AND ALL EXCAVATION SHALL BE PAVED WITH TEMPORARY BITUMINOUS PAVEMENT FROM THE DATE OF ORIGINAL EXCAVATION UNTIL PERMANENT PAVEMENT IS INSTALLED.
2. AT SURFACE, W MAY VARY.  
AT TOP OF PIPE, W (MAX.) = PIPE O. D. + 24"  
AT SPRINGLINE OF PIPE, W = PIPE O.D. + 12", 18" MIN.

## TYPICAL PIPE TRENCH & BEDDING DETAIL

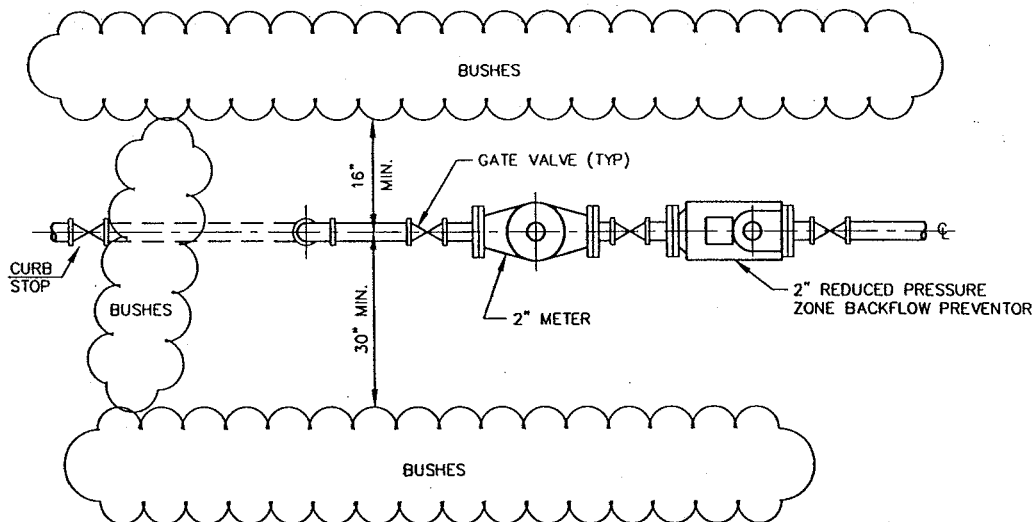
N.T.S.

TOWNSHIP OF MANALAPAN  
MONMOUTH COUNTY, NEW JERSEY

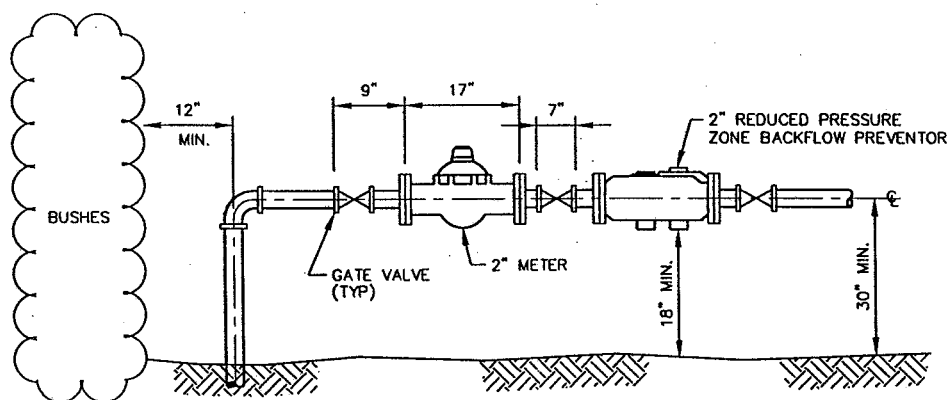
STANDARD DETAIL  
TRENCH & BEDDING DETAIL



NOT TO SCALE



**PLAN**  
N.T.S.



**SECTION**  
N.T.S.

**NOTES:**

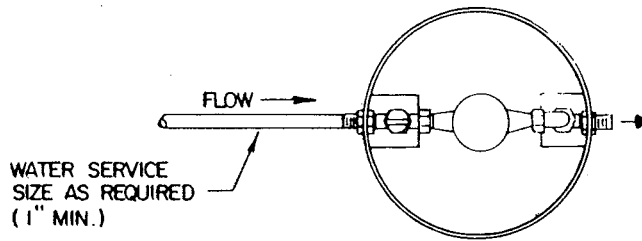
1. METER SUPPLIED BY DEVELOPER AND OWNED BY THE TOWNSHIP SHALL BE NEPTUNE T-10.
2. CHECK ALL LOCAL CODES.
3. METER MAY BE INSTALLED INSIDE VAULT, RPZ MUST BE ABOVE GRADE. ( SEE VAULT DETAIL )
4. LINE DRAINS TO BE PROVIDED ( NOT SHOWN )

TOWNSHIP OF MANALAPAN  
MONMOUTH COUNTY, NEW JERSEY

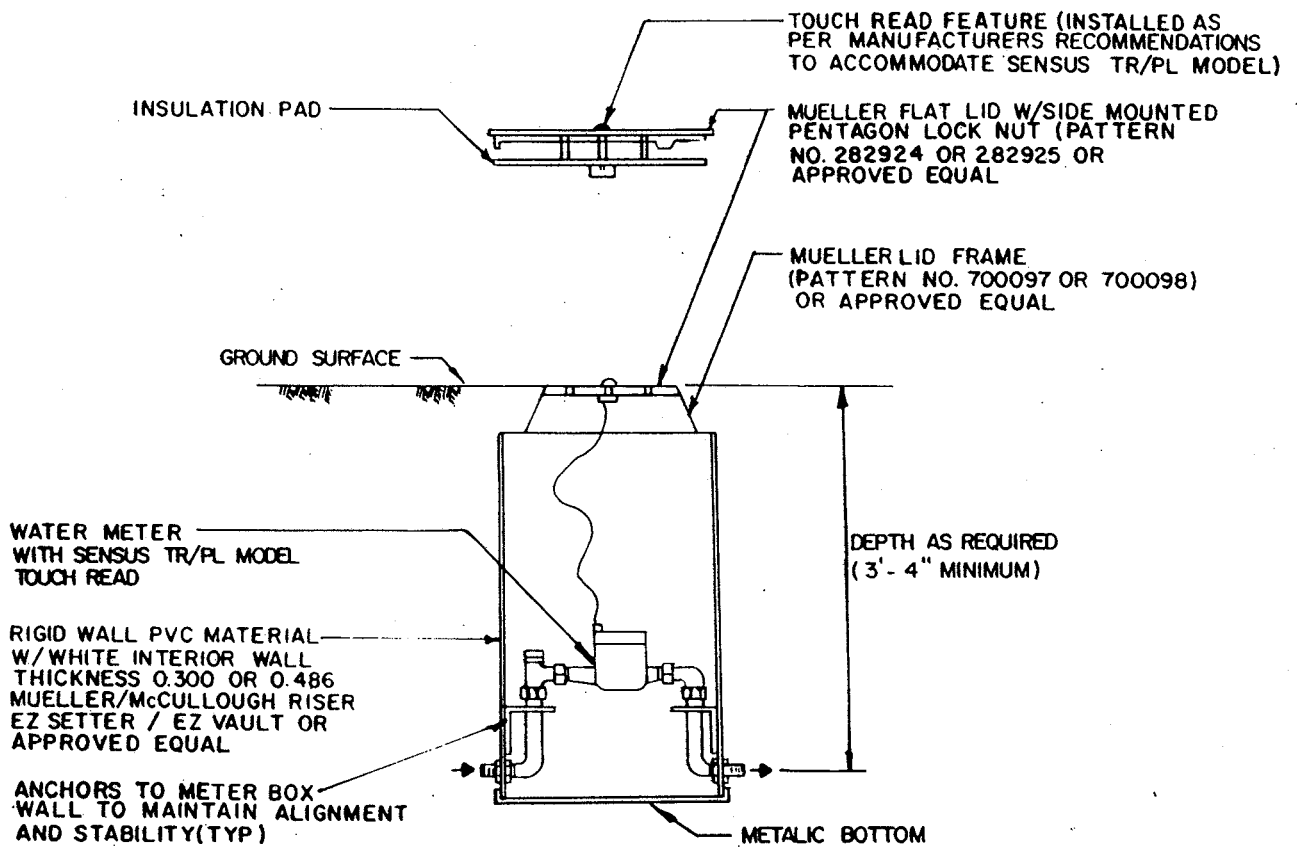
**STANDARD DETAIL  
LAWN SPRINKLER SET-UP**



CONSULTING AND MUNICIPAL ENGINEERS



**PLAN**

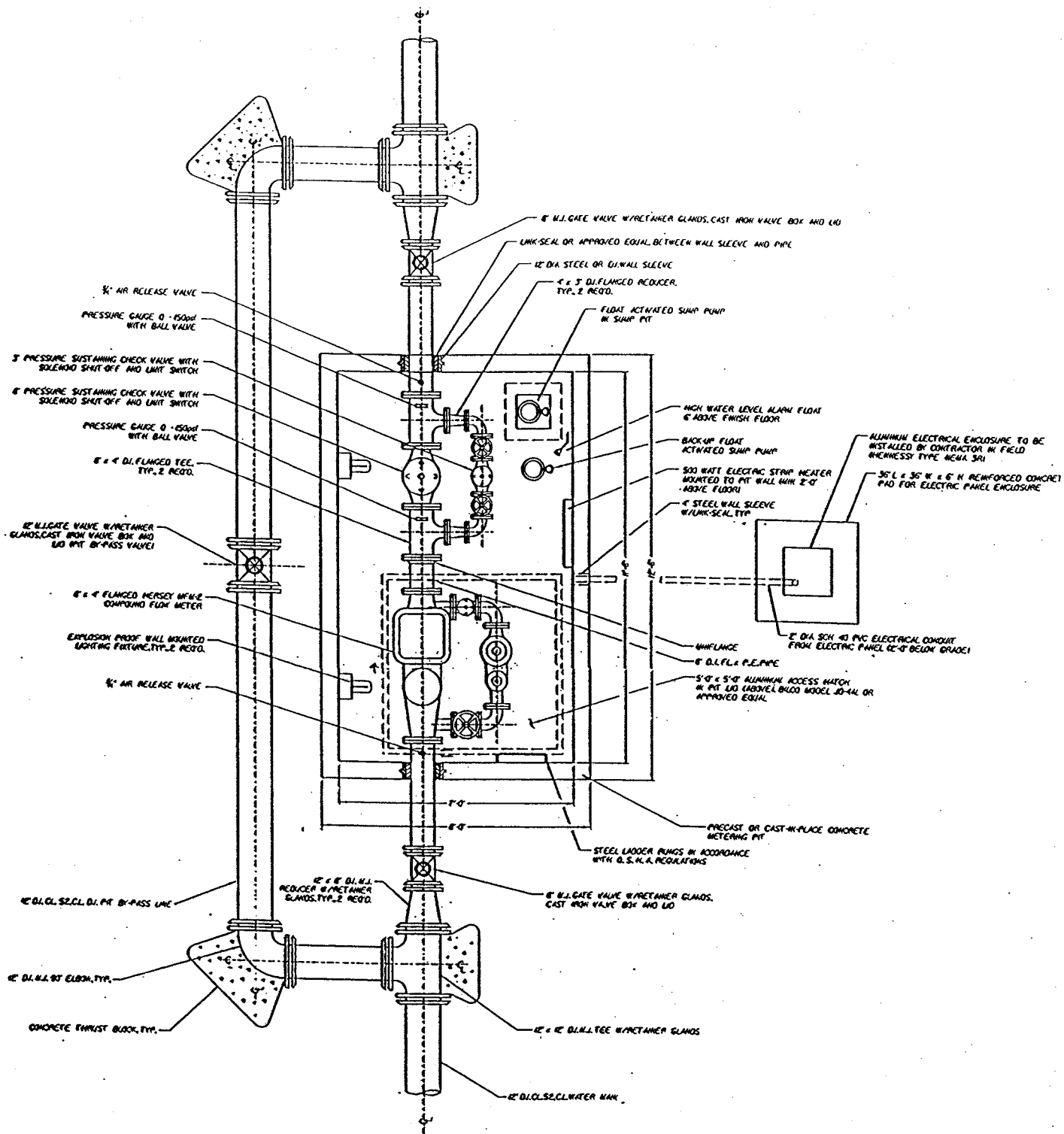


Not to Scale

TOWNSHIP OF MANALAPAN  
MONMOUTH COUNTY, NEW JERSEY  
**STANDARD DETAIL**  
**METER BOX**



CONSULTING AND MUNICIPAL ENGINEERS



TOWNSHIP OF MANALAPAN  
 MONMOUTH COUNTY, NEW JERSEY  
 STANDARD DETAIL  
 TYPICAL METER PIT DETAIL



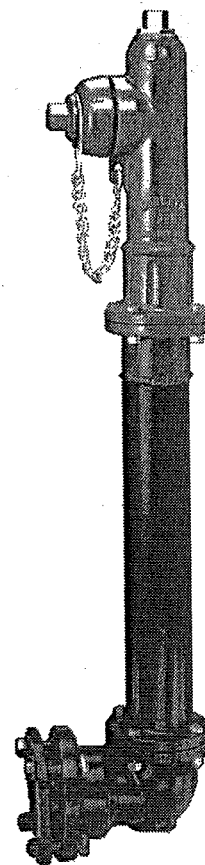
CONSULTING AND MUNICIPAL ENGINEERS



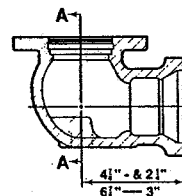
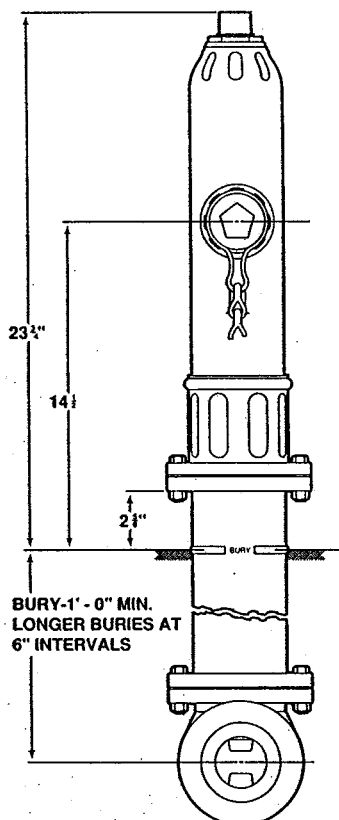
REV. 10-91



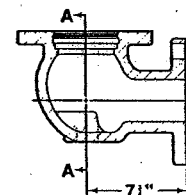
- ☐ Catalog numbers---  
A-411 2-1/8" main valve opening two way (two 1-1/2" hose nozzles)  
A-411 2-1/8" main valve opening one way (one 2-1/2" hose nozzle)
- ☐ Meets all applicable parts of ANSI/AWWA C502 Standard
- ☐ Post type dry barrel design
- ☐ Compression type main valve closes with pressure
- ☐ Operating nut available in wide variety of shapes and sizes
- ☐ Field replaceable hose nozzles
- ☐ Hose nozzles have large radius, full flow openings for low friction loss
- ☐ Contoured shoe is designed for full flow
- ☐ Dual bronze drain valves provide effective barrel drainage
- ☐ 150 psig (1034 kPa) maximum working pressure, 300 psig (2068 kPa) test pressure



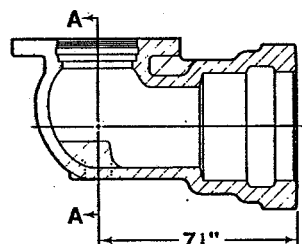
### Dimensions



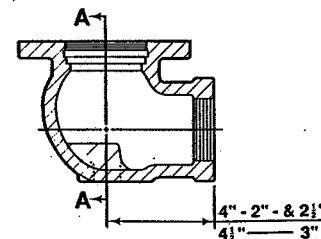
Mechanical joint



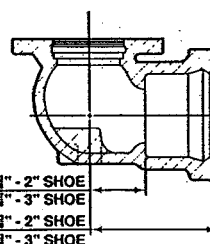
Flanged



A-C



Thread



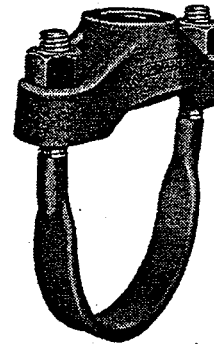
Hub

SEE PAGE 9.26 FOR ORDERING INSTRUCTIONS

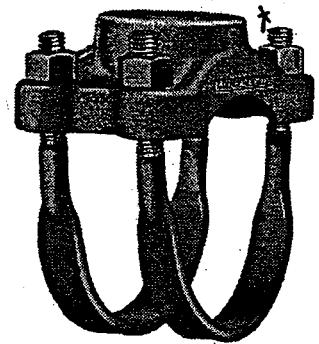
# DUCTILE IRON SERVICE SADDLES H-10400 AND H-10500 SERIES

**MUELLER® Ductile Iron Service Saddles for use on cast iron, ductile iron, steel and A-C pipe with AWWA I.P. thread tapping**

- ☐ Outlet tapped with AWWA I.P. thread
- ☐ Single strap design rated at 250 psig (1724 kPa) maximum working pressure
- ☐ Double strap design rated at 500 psig (3447 kPa) maximum working pressure
- ☐ Ductile iron body hot dipped zinc galvanized
- ☐ Flattened steel strap
- ☐ Rolled strap threads
- ☐ Neoprene sealing gasket
- ☐ Meets all applicable parts of ANSI/AWWA C800



Single strap design



Double strap design

## MUELLER Ductile Iron Service Saddles with AWWA iron pipe thread

Pipe O.D. range		Kind and size of pipe†			Single strap with I.P. thread							Double strap with I.P. thread						
Inch	mm	Steel	Cast iron or ductile iron	A-C	Catalog number	Size of tapping						Catalog number	Size of tapping					
						1/2"	3/4"	1"	1-1/4"	1-1/2"	2"		3/4"	1"	1-1/4"	1-1/2"	2"	
1.25-1.31	31.8-33.2	1"			H-10450	X	X	X										
1.66-1.77	42.2-44.9	1-1/4"	1-1/4"		H-10451	X	X	X										
1.90-2.00	48.3-50.8	1-1/2"	1-1/2"		H-10452	X	X	X										
2.25-2.50	57.2-63.5	2"	2"		H-10453	X	X	X	X			H-10496	X	X	X	X		
2.62-3.07	67.0-77.0	2-1/2"	2-1/2"		H-10454	X	X	X				H-10497	X	X	X	X		
3.18-3.50	80.8-88.9	3"			H-10455	X	X	X	X			H-10498	X	X	X	X	X	
3.56-4.00	91.0-101.0	3-1/2"	3"		H-10456		X	X	X	X		H-10499	X	X	X	X	X	
4.13-4.75	105.0-120.0	4"			H-10457	X	X	X	X	X	X	H-10500	X	X	X	X	X	
4.80-5.31	122.0-134.0	4-1/2"	4"	**	H-10458	X	X	X	X	X	X	H-10501	X	X	X	X	X	
5.43-6.03	138.0-153.0	5"	5"		H-10460	X	X	X				H-10503					X	
6.25-6.75	159.0-171.0	6"			H-10461	X	X	X	X	X	X	H-10504	X	X	X	X	X	
6.86-7.48	175.0-189.0		6"		H-10462		X	X	X	X	X	H-10505	X	X	X	X	X	
7.49-8.01	191.0-203.0	7"										H-10506					X	
8.29-8.78	211.0-223.0	8"			H-10465	X	X	X			X	H-10508	X	X		X	X	
8.79-9.54	224.0-242.0		8"		H-10466			X	X		X	H-10509	X	X	X	X	X	
10.07-11.52	256.0-292.0	10"	10"		H-10468		X		X		X	H-10512	X	X		X	X	
11.28-12.00	287.0-304.0		10"		H-10469							H-10513	X	X	X	X	X	
12.00-13.00	305.0-330.0	12"			H-10470							H-10514	X	X	X	X	X	
13.06-14.08	332.0-357.0		12"		H-10471						X	H-10515	X	X	X	X	X	
14.10-15.20	359.0-386.0											H-10516		X			X	

\* Important—carefully check the range of the saddle with the O.D. of the pipe being used.

\*\* The outside diameter of A-C pipe varies from manufacturer to manufacturer. To make certain you select the proper saddle: 1) Determine the O.D. of the pipe at the point of saddle installation; 2) From the pipe O.D. range column of the above chart, choose a saddle that has a pipe O.D. range that includes the determined pipe diameter.

† These service saddles are suitable for use on pipe meeting the following standards and specifications:

-Centrifugally cast pipe, classes 50-250 ANSI/AWWA C106/A21.6; ANSI/AWWA C108/A21.8 and Federal specification WW-P-421.

-Pit cast pipe, classes 50-250 ANSI/AWWA C102/A21.2.

-Ductile iron pipe, classes 50-56 ANSI/AWWA C151/A21.51.

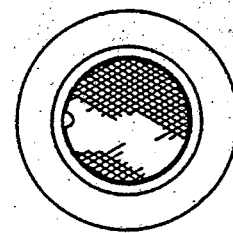
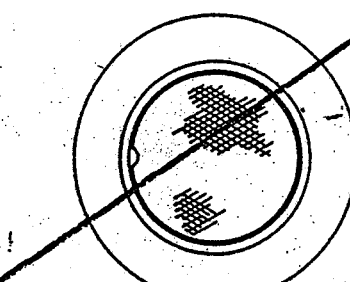
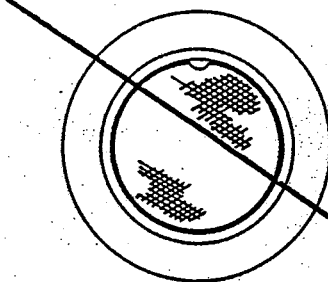
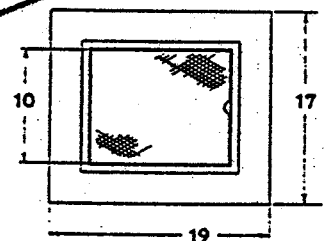
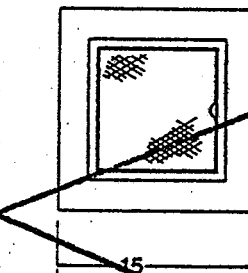
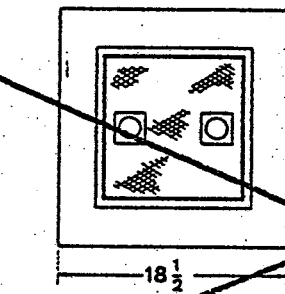
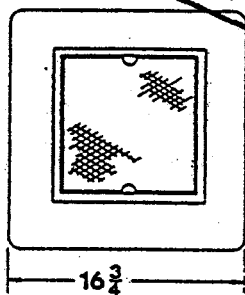
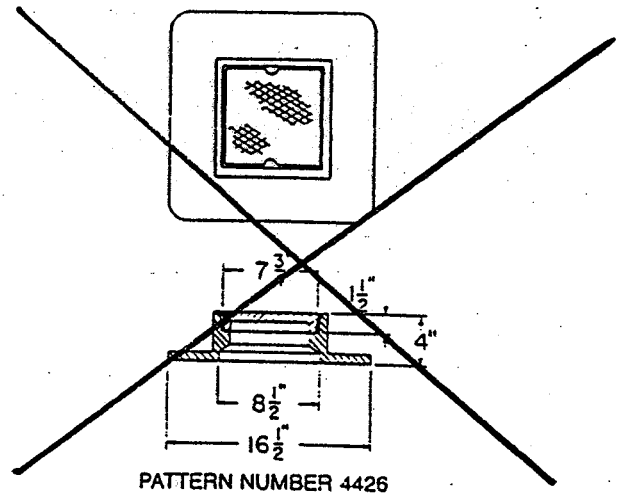
-Steel pipe, ANSI B36.10

These machines may be used with the service saddles illustrated on this page

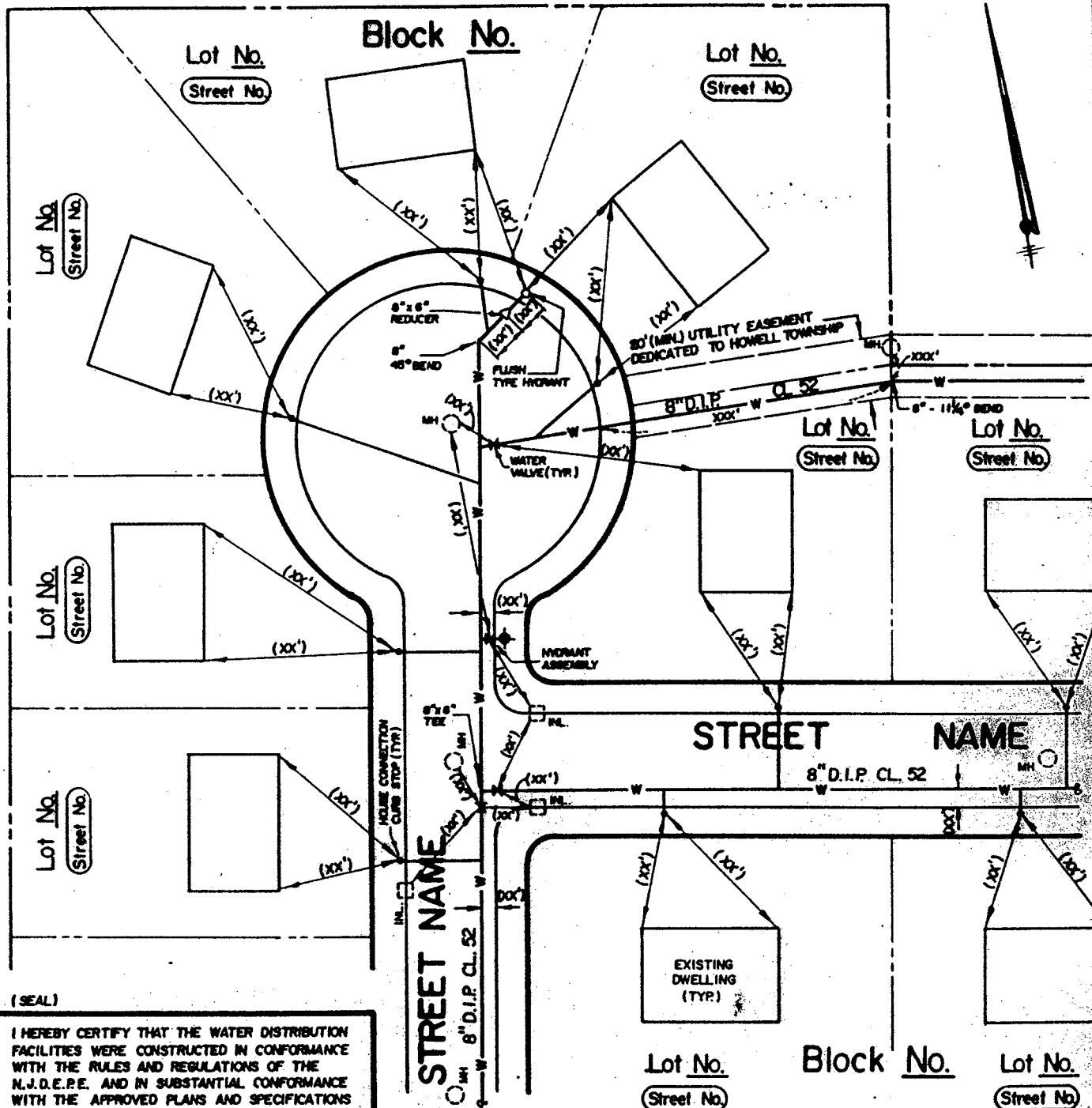
Machine	Service saddle Tap size						
	1/2"	5/8"	3/4"	1"	1-1/4"	1-1/2"	2"
E-5	X	X	X	X			
D-5		X	X	X	X	X	X

**TO ORDER SPECIFY QUANTITY, OUTLET TAPPING SIZE AND CATALOG NUMBER**

# Monument Box Inspection and Access Frames and Covers



Any curb stop boxes located in driveway aprons or sidewalks should be installed within a monument box. Campbell Foundry Pattern No. 4173 or approval equal should be utilized.



(SEAL)

I HEREBY CERTIFY THAT THE WATER DISTRIBUTION FACILITIES WERE CONSTRUCTED IN CONFORMANCE WITH THE RULES AND REGULATIONS OF THE N.J.D.E.P.E. AND IN SUBSTANTIAL CONFORMANCE WITH THE APPROVED PLANS AND SPECIFICATIONS

(ENGINEER) N.J. P.E. LICENSE No. \_\_\_\_\_

WATER DISTRIBUTION FACILITIES  
 RECORD DRAWING  
"DEVELOPMENT NAME"  
"SECTION NUMBER"  
 TOWNSHIP OF MANALAPAN  
 MONMOUTH COUNTY, NEW JERSEY  
 SCALE: 1" = 50' (Min.) DATE: \_\_\_\_\_

TOWNSHIP OF MANALAPAN  
 MONMOUTH COUNTY, NEW JERSEY  
 STANDARD RECORD DRAWING DETAIL



CONSULTING AND MUNICIPAL ENGINEERS

**EXHIBIT J**

**WATER SERVICE AREA MAP**

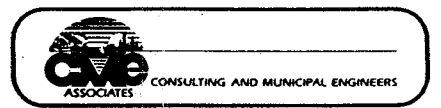
# TOWNSHIP OF MANALAPAN

Monmouth County, New Jersey

## WATER SERVICE AREA MAP

JUNE 1995

PREPARED BY:  
**JOHN H. ALLGAIR, P.E. & L.S.**  
NEW JERSEY LICENSE No. 12012



### EXISTING LEGEND

- DENOTES EXISTING 6" DIAMETER WATER MAIN
- DENOTES EXISTING 8" DIAMETER WATER MAIN
- DENOTES EXISTING 10" DIAMETER WATER MAIN
- DENOTES EXISTING 12" DIAMETER WATER MAIN
- DENOTES EXISTING 16" DIAMETER WATER MAIN
- DENOTES EXISTING WATER TREATMENT PLANT
- DENOTES EXISTING STANDPIPE
- DENOTES EXISTING FIRE HYDRANT
- DENOTES EXISTING WATER VALVE

