WESTERN MONMOUTH UTILITIES AUTHORITY
RULES AND REGULATIONS
JUNE, 2015

MEMBERS OF THE AUTHORITY:

STEPHEN McENERY
GLEN MENDEZ
JOSEPH PERNICE
JEFF ROSEN

BRIAN J. VALENTINO, MPA, ICMA-CM
EXECUTIVE DIRECTOR

T&M Associates/CME Associates-Authority Engineers
DeCotis, Fitzpatrick & Cole, LLP-Authority Counsel
Samuel J. Klein & Company-Authority Auditor

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ADOPTING AMENDED RULES AND REGULATIONS

WHEREAS, the WMUA realizes the necessity of promulgating rules and regulations to be pursued in considering applications to be received from said property owners, subdividers and Developers for the installation of sanitary sewer systems and treatment plant, or the waiver thereof, and whereas the WMUA is cognizant that seldom do two (2) cases involve identical circumstances and that each application will be judged on its own facts; and

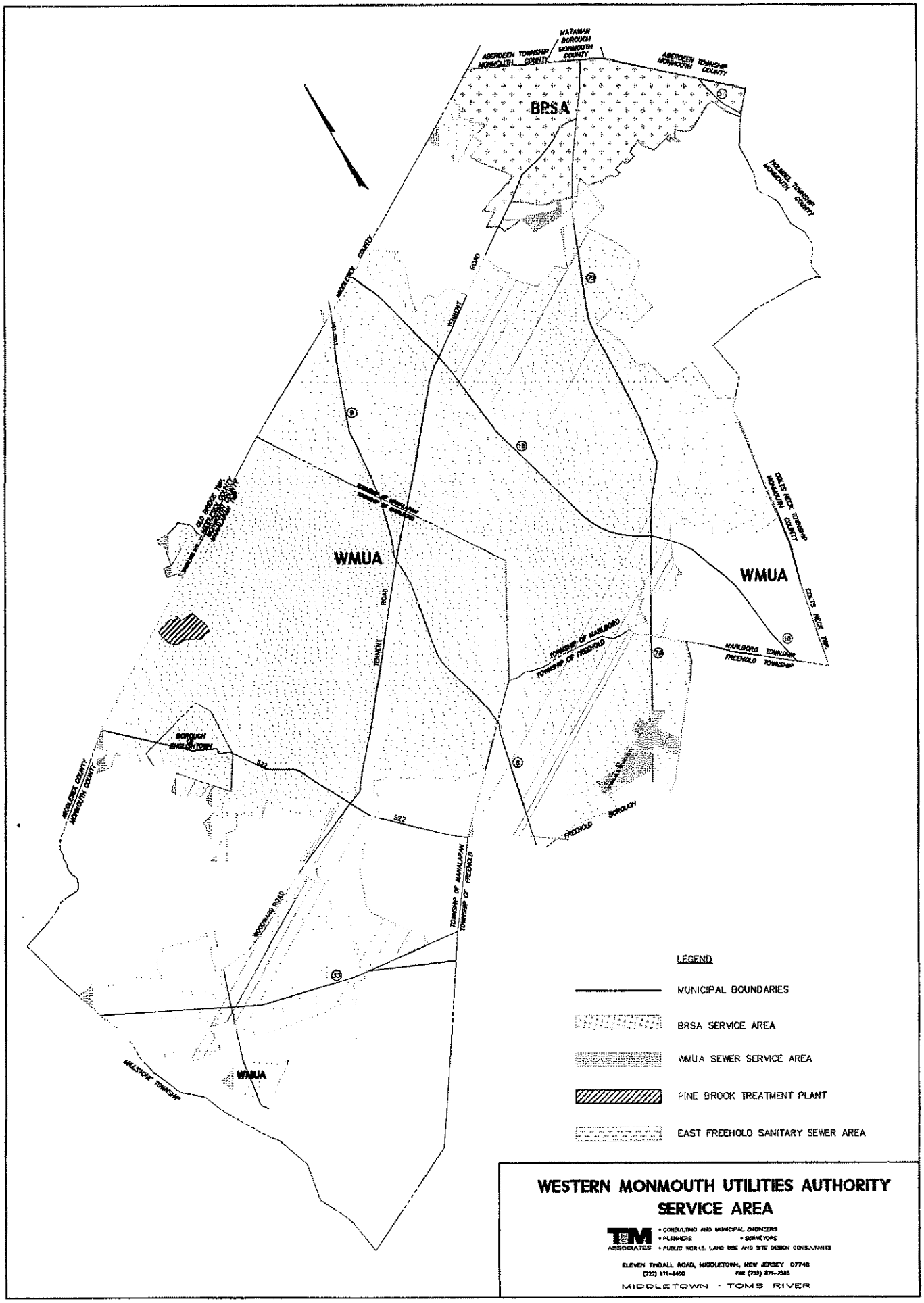
WHEREAS, the Authority must amend its Rules and Regulations periodically; these amended Rules and Regulations dated June 2015 include, but are not limited to, changes to 3 sheets of construction details, definitions, requirements for Developers building pump stations and changes to the Procedures/Applications process.

NOW, THEREFORE, BE IT RESOLVED by the Commissioners of the Western Monmouth Utilities Authority as follows:

1. The rules and regulations of the WMUA are amended as attached
2. The Clerk is hereby authorized to forward copies of this resolution, certified to be a true copy to:
   a) Brian Valentino, Executive Director
   b) George White, Collections Superintendent

DATE: JUNE 23, 2015

	Motion		Recorded Vote			
Commissioner	**1st**	**2nd**	**Aye**	**Nay**	**Abstain**	**Absent**
McENERY			X			
MENDEZ		X	X			
PERNICE	X		X			
ROSEN			X			



WESTERN MONMOUTH UTILITIES AUTHORITY
SERVICE AREA

TM ASSOCIATES
• CONSULTING AND MUNICIPAL ENGINEERS
• PLANNERS • SURVEYORS
• PUBLIC WORKS, LAND USE AND SITE DESIGN CONSULTANTS
ELEVEN TINDALL ROAD, MIDDLETOWN, NEW JERSEY 07748
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MIDDLETOWN · TOMS RIVER

2. Abbreviations and Definitions

A. *Abbreviations*

AASHTO	American Association of State Highway and Transportation Officials
ANSI	American National Standards Institute
ASA	American Standards Association
ASTM	American Society for Testing Materials
AWWA	American Water Works Association
BRSA	Bayshore Regional Sewerage Authority
DIP	Ductile Iron Pipe
EDCU	Equivalent Domestic Consumer Unit
NJDEP	New Jersey Department of Environmental Protection
NJDOT	New Jersey Department of Transportation
PVC	Polyvinyl Chloride
TWA	Treatment Works Approval
USEPA	United States Environmental Protection Agency
WMUA	Western Monmouth Utilities Authority
WQM	Water Quality Management

B. *Definitions*

Unless the context indicates otherwise, the meaning of terms used throughout these Rules and Regulations shall be as follows:

Applicant: Person or legal entity applying to the WMUA for approval for connection for sewer service. Applicant may also be used interchangeably with Developer, Subdivider, Owner, Property Owner, or Homeowner.

Applicant's Engineer: A Professional Engineer licensed in the State of New Jersey who is responsible for the planning and design of the Applicant's sewerage facilities.

Application: The application submitted by an Applicant for connection to the WMUA system.

As-built: Record drawing of sewer facility installation after construction.

BRSA: Bayshore Regional Sewerage Authority.

Building: Any structure heretofore or hereafter constructed and designed or used for dwelling or other use or occupancy by persons, either temporary or permanent.

Building Drain: That part of the lowest horizontal piping of the sanitary sewer system which receives the discharge from inside the building and conveys it to the building sewer or house connection beginning five (5) feet outside the inner face of the building wall.

Building Sewer: The extension from the building drain to the public sewer or other place of disposal. Also referred to as "House Connection."

Cash: Legal tender of the United Sates, certified check, or cashier's check made payable to the WMUA.

cBOD5: Five Day Carbonaceous Biochemical Oxygen Demand - the quantity of oxygen utilized in the carbonaceous biochemical oxidation of organic matter under standard laboratory procedure in five (5) days at 20°C, expressed in milligrams per liter.

Commissioners: Persons appointed by either the Township of Manalapan or Marlboro as the governing body of the Western Monmouth Utilities Authority. Also referred to as "WMUA Commissioners."

Complex Single-Lot Connection: A tie-in connection to the WMUA system requiring substantial professional review.

Contractor: Party or parties performing sewer facility construction. May include the Applicant, the Developer, or the Owner.

Customer Communities: Borough of Englishtown, a portion of the Township of Freehold, and those communities that have executed service agreements with the WMUA.

De Minimis Single-Lot Connection: A conventional tie-in connection to the WMUA system requiring little or no professional review.

Developer: Person performing site improvements on behalf of the Owner; see also "Applicant."

Development: Any improvement to a property which requires an extension to the sewer system, a connection to any portion of the existing system, or change in use that significantly increases the amount of sewage discharged or characteristic of the sewage.

Equivalent Domestic Consumer Unit (EDCU): An estimated measure of sewer usage for a structure. One (1) EDCU shall be equivalent to 300 gallons per day.

Escrow Account: Account created by the WMUA and funded by the Applicant to cover engineering and legal review, document preparation, and inspection costs.

Fixture Unit: Plumbing unit, including but not limited to, sink, toilet, urinal, fountain, tub, or shower.

Garbage: Solid wastes from the domestic and commercial preparation, cooking, and dispensing of food, and from the handling, storage, and sale of produce; "properly

shredded" garbage is garbage that has been shredded to such a degree that all particles will be carried freely under the flow conditions normally prevailing in public sewers, with no particle greater than one-half inch (1/2") in any dimension.

GPD: Gallons per day.

GPM: Gallons per minute.

Grease Trap/Interceptor: Device in which grease and oil present in sewage is separated from the sewage for removal and disposal.

Health Officer: Person duly licensed by the State of New Jersey and appointed to perform the duties of Health Officer pursuant to N.J.S.A. 26:1-1 *et seq.*

House Connection: See "Building Sewer."

Industrial Wastes: Liquid wastes from industrial and manufacturing processes, trade, or business as distinct from sanitary sewage.

Member Communities: Townships of Marlboro and Manalapan, respectively.

Municipality: Townships of Freehold, Marlboro, and Manalapan as well as all customer communities.

O&M Manual: Operations and Maintenance Manual.

Owner: Person or entity who has a fee interest in property which may be the subject of a WMUA Application for connection for sewer service. Also referred to as "Applicant," "Property Owner," or "Homeowner."

Person: Any individual, firm, legal entity, company, association, society, partnership, corporation or group.

pH: Negative logarithm of the hydrogen-ion concentration.

Planning Board: Municipal land use board established pursuant to N.J.S.A. 40:55D-23.

Plumbing Inspector: Person duly designated by a municipality as the plumbing inspector.

Private Sewer: Pipe or conduit that is not owned by the WMUA which carries wastewater, sewage or drainage water.

Prohibited Wastes: Wastes which are prohibited from being released into the WMUA system including, but not limited to, stormwater, groundwater, roof runoffs, subsurface drainage, air conditioner, non-chemically conditioned coolant water, condensate or

unpolluted industrial process waters.

Public Sewer: Any sewer, house connection between the cleanout and the street sewer, appurtenances thereto, installed or acquired by the WMUA in a public street or easement.

RTU: Remote terminal unit.

Sanitary Sewage: Liquid and intermixed solid wastes from homes or other structures, exclusive of industrial wastes or storm and surface waters and drainage.

Sanitary Sewer: Sewer which carries sanitary sewage and to which storm, surface, and ground waters are not intentionally admitted.

Sanitary Sewer Connection: Any sewer pipe, force main, structure or appurtenance used for the conveyance of domestic or industrial waste of a liquid nature, whether forced or by gravity, into the WMUA's sewage facilities which (1) conveys flow from no more than one building or residence, and/or (2) does not meet the requirements of a "Sanitary Sewer Extension."

Sanitary Sewer Extension: Any sewer pipe, force main, structure or appurtenance used for the conveyance of domestic or industrial waste of a liquid nature, whether forced or by gravity, which (1) will extend along an easement through two or more properties; or in front of two or more properties in a roadway or public right-of-way; (2) conveys flows from two or more buildings or residential units; or (3) conveys, or will convey, 8,000 gallons per day or more of sewage flow determined in accordance with the criteria specified in N.J.A.C. 7:14A-23.3. This includes all sewer lines from a single building if the building utilizes more than one sewer line to convey waste to the sewer system and the aggregate waste flow is 8,000 gallons per day or more.

Service Area: That area of which the WMUA provides sewer service and as depicted on page 4 of these Rules and Regulations.

Sewage: Combination of sanitary sewage and industrial wastes, together with such ground, surface, and storm waters as may be present which are carried off in sewers or drains.

Sewage Facilities: Collectively or individually, the system of pipes, manholes, pumping stations, force mains and the treatment plant that convey, treat, and discharge wastewater generated in the WMUA service area.

Sewage Treatment Plant: Arrangement of devices and structures used for treating sewage.

Sewerage Works: All facilities related to collection, pumpage, treatment, and disposal of sewage.

Sewer: Any pipe or main designed or used for collection or disposal of sewage.

Single-Lot Connection: Connection to the WMUA system of a single residential unit or commercial facility that does not require a NJDEP Treatment Works Approval Application.

Slug: Any discharge of water, sewage or industrial waste for a period of fifteen (15) minutes or longer which, in concentration of any given constituent, or, in quantity of flow, exceeds five (5) times the average twenty-four (24) hour concentration of flows during normal operation.

Storm Sewer: Sewer which carries storm and surface water, drainage, and unpolluted cooling waters, but excludes sewage and industrial wastes.

Suspended Solids: Solids that either float on the surface of, or are in suspension in, water, sewage or other liquids, and which are removable by laboratory filtering, as described in the current edition of "Standard Methods for the Examination of Water and Wastewater."

System: The entire WMUA system, including but not limited to, pump stations, force mains, gravity mains, connections, pipes, and manholes.

Watercourse: Channel in which a flow of water occurs, either continuously or intermittently.

Wastewater Management Plan (208): A document that provides twenty (20) year planning for wastewater and certain other water quality concerns and, in turn, defines a service area.

Watercloset Unit: Toilet or urinal.

WMUA Attorney: An attorney at law of the State of New Jersey, appointed by the WMUA as Legal Counsel and to provide legal services as required by the WMUA.

WMUA Engineer: A Professional Engineer licensed in the State of New Jersey, appointed by the WMUA and authorized to review and recommend approval of submissions and construction review of all applications for sewer service to the WMUA.

WMUA Sewer: A sewer installed by or for the WMUA in public streets or easements, includes the Building Sewer or House Connection to the cleanout or edge of right-of-way or easement.

Zoning Board: The municipal land use board established pursuant to N.J.S.A. 40:55D-69.

3. Procedures/Application Process

A. *Requirements*

1) The following Rules and Regulations shall apply to all Applications for sewer service submitted to the WMUA after the effective date as determined by a Resolution of the Commissioners of the WMUA. All Applications pending as of the date of approval of these Rules and Regulations shall be controlled by the Rules and Regulations in effect at the time the Application was filed.

2) WMUA approval of sewerage facilities is required for all developments including, but not limited to, residential buildings, schools, commercial buildings, industrial buildings, and all other structures, within the Service Area of the WMUA.

3) Any public agency requesting a reservation of capacity shall be permitted to request said reservation through an application to the WMUA. Typical projects shall include publicly-owned and operated long term health care facilities which have received a Certification of Need from the New Jersey Department of Health, a hospital, a fire or police station or a public school or expansion of an existing New Jersey accredited private school for primary, secondary or higher education. Any such reservation of capacity shall be for a period not to exceed two (2) years from date of WMUA approval, and shall be granted at the discretion of the WMUA.

4) All Applicants shall extend sewer lines or provide laterals to allow for gravity connections, if possible, for adjacent lots or properties owned by others as required by the WMUA. Cost sharing and/or reimbursement shall not be available unless specifically set forth in the approving Resolution and Developer's Agreement.

5) All sewerage facilities installed by an Applicant shall meet the standards and specifications of the WMUA, all applicable ordinances of the municipality within which the sewerage facilities are located, and all laws, rules, and regulations promulgated by Federal, State or County agencies having jurisdiction thereof.

6) Before submitting its Application for connection to the WMUA system, the Applicant or its representatives shall obtain a copy of the WMUA's Rules and Regulations, together with all application materials.

7) All Applicants for sewer service shall be filed, in duplicate, with the WMUA at 103 Pension Road, Manalapan, NJ 07726 and shall be date-stamped received. Said Applications are subject to review by the WMUA and its professionals who will make a determination as to completeness, among other things.

8) The WMUA shall act on all complete Applications within sixty (60) days from

the date the Application is certified complete by the WMUA Engineer.

9) General notes shall be included on the plans as indicated on the specific Standard Construction Details contained herein.

10) All Applicants shall submit a completed IRS form W-9 to the WMUA.

B. *Preliminary/Conceptual Review Process*

Before filing an Application to connect for sewer service with the WMUA, the Applicant shall initiate the Preliminary/Conceptual review process by communicating with the WMUA to discuss the project in general to determine feasibility, capacities and/or constraints.

The Preliminary/Conceptual review process will attempt to provide the Applicant with the following information:

a) Feasibility of connecting to the WMUA's existing system;
b) Requirement, if any, to amend the WMUA's Wastewater Management Plan;
c) Nearest connection points;
d) Off-site improvements required;
e) Cost-sharing agreements;
f) Capacity evaluations;
g) Acceptability of proposed wastewater discharge;
h) Projection on fees and time frames;
i) Possibility of dry line alternatives.

If the WMUA Engineer is satisfied that the WMUA system has sufficient capacity, the WMUA shall direct the Applicant to file the appropriate Application(s). If the WMUA Engineer believes that a capacity analysis is necessary to determine whether the WMUA system has sufficient capacity, the WMUA Engineer shall estimate the cost to complete that capacity analysis and the Applicant shall pay that amount to the WMUA, to be deposited in an Escrow Account to be created by the WMUA to pay for the cost of the capacity analysis. The Escrow Account shall be funded by cash, certified check, or other draft acceptable to the WMUA at its discretion. The foregoing notwithstanding, under no circumstances shall the WMUA or its professionals undertake formal review or consideration of any Application prior to the submission of an Application and payment of any required fees by the Applicant for review of said Application.

All Applications for the proposed development (commercial, industrial, public agency, educational, recreational, etc.; see definition for "Development") shall be submitted to the WMUA in duplicate and are subject to review and approval by the WMUA and its professionals. The standard Applications are located in the exhibits at the end of these Rules and Regulations.

All Applications shall be signed by the Owner or a duly authenticated agent thereof. If the Owner is a partnership, applications shall be signed by a general partner, or, in the case of a corporation, by an officer of the corporation.

Except for Single Lot Applications which are deemed *De Minimis* by the WMUA, no other Application shall be considered unless a New Jersey licensed Professional Engineer has exercised responsibility for the planning and design of the proposed sewerage facilities and has affixed his or her seal and signature on the Application submissions.

C. *Amendments to the Wastewater Management Plan*

Upon the written request of an Owner with a development located outside the WMUA Service Area, the WMUA may, but shall not be obligated to, file, at the Owner's sole expense, the appropriate application(s) with the NJDEP to amend the WMUA's Wastewater Management Plan to include the Owner's proposed connection(s) ("Amendment"). The WMUA may require that all estimated costs to prepare the Amendment application be placed into the Owner's Escrow Account, the rules of which are stated in Section 5 of these Rules and Regulations.

The specific requirements for the Amendment application are determined by the NJDEP following its review of an initial submission package, which consists of: (i) a Wastewater Management Plan Application Completeness Checklist; (ii) an Application form; (iii) the Wastewater Management Plan document; and (iv) an Environmental Assessment and Analysis document. Afterwards, the NJDEP schedules a pre-application meeting to discuss their findings and what additional information/analyses may be required of the applicant to allow for NJDEP's review of the proposed Amendment.

Once the NJDEP has completed its review of all of the Amendment application materials, a written decision will be issued by NJDEP (1) disapproving the Amendment application; (2) asking for additional information or other necessary changes to the Amendment application; or (3) approving the Amendment application.

If the NJDEP disapproves the Amendment application, the WMUA will advise the Owner that it will not be permitted to connect to the WMUA system. If the NJDEP approves the Amendment application, the WMUA shall direct the Owner to file the appropriate Application(s) with the WMUA to connect for sewer service. The WMUA shall not consider any Application, nor issue any Application Approval, until such time as the NJDEP approves the Amendment application.

D. *Single Lot Applications for Sewer Service*

A Single Lot Application shall be required when an Applicant wishes to connect to the WMUA system a single residential unit or commercial facility that does not require a NJDEP Treatment Works Approval Application pursuant to N.J.A.C. 7:14A. Prior to submitting a Single Lot Application, an Applicant shall initiate the Preliminary/Conceptual review process by communicating with the WMUA to discuss

the project in general to determine feasibility, capacities and/or constraints. The WMUA shall determine whether the Application is *De Minimis,* requiring a conventional tie-in to the WMUA system and minimal review, or Complex, requiring substantial review.

1. Application Fee

(a) *De Minimis* Applications

No application fee is required for a *De Minimis* Application. However, a connection fee for connection to the WMUA system is still required as set forth in the EDCU Schedule in Section 9.

(b) Complex Applications

No application fee is required for a Complex Application. However, the Applicant shall pay to the WMUA an amount of not less than $1,000, as determined by the WMUA at its discretion, to be deposited in an Escrow Account to be created by the WMUA to pay all eligible professional fees associated with the review of the Application as authorized by N.J.S.A. 40:14B-74, as the same may be amended from time to time. The Escrow Account shall be funded by cash, certified check, or other draft acceptable to the WMUA at its discretion. Professional review fees shall be paid from the Escrow Account by voucher and shall include engineer and legal review fees, document preparation fees, and inspection fees. If required by the WMUA, additional deposits into the Applicant's Escrow Account shall be made by the Applicant to meet professional review expenses within fifteen (15) days of the date of the request by the WMUA. The Application review process will not continue until such requirement is met. The Applicant is responsible for all eligible costs incurred by the WMUA on the Applicant's project. See Section 5 for more details on Escrow Accounts.

Upon receipt of any Single Lot Application, the WMUA shall assign the Application an Application number. Such Application number shall be referenced in all future correspondence between the Applicant and the WMUA.

If construction does not commence within two (2) years of the date of the Resolution by the WMUA Commissioners granting approval of a Single Lot Application, the approval shall automatically expire unless the WMUA Commissioners act, by Resolution, to extend the time period for commencement of construction.

2. Application Requirements

(a) *De Minimis* Applications

The Applicant shall submit a Single Lot Application to the WMUA which addresses the appropriate requirements and forms for *De Minimis* Applications as set forth in Exhibit B attached hereto. Subsequent to Approval by the WMUA, and prior to connection, the

Applicant shall pay the appropriate connection fee as set forth in the EDCU Schedule in Section 9.

(b) Complex Applications

The Applicant or a duly authorized agent shall submit a Single Lot Application to the WMUA which addresses the appropriate requirements and forms for Complex Applications as set forth in Exhibit B attached hereto.

Subsequent to Approval by the WMUA, and prior to connection, the Applicant shall pay the appropriate connection fee as set forth in the EDCU Schedule in Section 9. After the connection fee has been paid to the WMUA, the WMUA shall provide the Applicant with an original and one (1) copy a "building permit letter" which acknowledges the Application approval and payment of the connection fees. The Applicant shall keep the original building permit letter for its records and submit the copy to the Municipal Building Inspector when applying for a building/plumbing permit. The Municipal Building Inspector shall not issue a building/plumbing permit without being presented with a copy of the WMUA's building permit letter from the Applicant.

E. *All Other Applications for Sewer Service*

1. Escrow Account Requirement

Each Applicant shall pay to the WMUA an amount equal to $1,000 per EDCU or $10,000, whichever is greater, to be deposited in an Escrow Account to be created by the WMUA to pay all eligible professional fees associated with the review of the Application as authorized by N.J.S.A. 40:14B-74, as the same may be amended from time to time. The Escrow Account shall be funded by cash, certified check, or other draft acceptable to the WMUA at its discretion. Professional review fees shall be paid from the Escrow Account by voucher and shall include engineer and legal review fees, document preparation fees, and inspection fees. If required by the WMUA, additional deposits into the Applicant's Escrow Account shall be made by the Applicant to meet professional review expenses within fifteen (15) days of the date of the request by the WMUA. The Application review process will not continue until such requirement is met. The Applicant is responsible for all eligible costs incurred by the WMUA on the Applicant's project. See Section 5 for more details on Escrow Accounts.

2. Application Requirements

Upon receipt of an Application, the WMUA shall assign the Application a project number. Such project number shall be referenced in all future correspondence between the Applicant and the WMUA. The following shall be required as part of the Application submission:

1) All Applicants or a duly authorized agent shall submit a completed Application to the WMUA at 103 Pension Road, Manalapan, NJ 07726. See Exhibit B;

2) All Applicants shall comply with the Escrow Account Requirement as set forth in Section 3(E)(1) and Section 5;

3) All Applicants shall submit proof that the Applicant has made application to the appropriate municipal land use board for the required approval;

4) All Applicants shall submit a Sketch Plat;

5) All Applicants shall submit a General Location Plan showing relationships of the development to WMUA facilities and adjoining properties (within 200 feet radius), both developed and vacant; See Section 6(C);

6) All Applicants shall submit a General Map of Project: Two (2) paper copies; one (1) AutoCAD .DWG or .DXF file copy on diskette or CD, if available; See Section 6(C);

7) All Applicants shall submit a projected flow estimate in accordance with NJDEP flow criteria, number of proposed units and point of connection to the WMUA's existing wastewater collection and conveyance system;

8) All Applicants shall submit proof that the Applicant is the owner or has a possessory interest of a lot or of any land to be included in a proposed Developer's Agreement as required under N.J.S.A. 40:14B-72. These proofs may include, but are not limited to, a copy of the recorded deed, contract of sale, or option contract;

9) All Applicants shall submit proof that the Applicant has paid and is current with its municipal property taxes;

10) All Applicants shall submit an Applicant's Engineer's Report as set forth in Section 6(B);

11) All Applicants shall submit one (1) overall sanitary sewer map showing the entire proposed new service area on one (1) sheet; See Section 6(C);

12) All Applicants shall submit detailed Plans and Profiles for all proposed sewers, including a final development map of the subdivision/site plan showing block and lot numbers for each of the lots in a subdivision, house numbers and street names; See Section 6(C);

13) All Applicants shall submit Construction Details; See Section 6 and 7;

14) All Applicants shall submit a detailed Cost Estimate – Estimates should include a total for the entire project, a breakdown estimating each section (where applicable), and pumping station and force main installation (where applicable).

Standard prices to complete the Engineer's Estimate will be published on a yearly basis and shall be obtained by the Applicant from the WMUA at the time of submitting a Final Sewer Application;

15) All Applicants shall submit detailed Plans and Specifications for Pumping Stations/Treatment Facilities (if applicable); See Section 3(E)(7) and 3(E)(8);

16) All Applicants shall submit additional information and data, if requested by WMUA;

17) All Applicants shall submit soil boring and/or test pit results with site specific dewatering recommendations;

18) All Applicants shall submit an approved metes and bounds descriptions for all easements to be dedicated to the WMUA. In addition, all chord bearing information must be included with the description;

19) All Applicants shall submit a copy of the Flood Hazard Area Control Act Permit (formerly known as a Stream Encroachment Permit) (if applicable);

20) All Applicants shall submit TWA-1, [and] WQM-003 and WQM-006 Forms of the NJDEP, completed, for execution by the Executive Director and approval by the Commissioners, or its designee, and WMUA Engineer, and submission to the NJDEP;

a. Upon review and approval of same, the WMUA Engineer will submit the forms to the WMUA for signature. When the appropriate signatures and endorsements are received, the Applicant will submit this information on behalf of the WMUA to the NJDEP.
b. The WMUA may endorse NJDEP Forms prior to the granting of approval by the WMUA based upon the recommendation of the Commissioners, or its designee, and WMUA Engineer that said project is technically acceptable from an engineering perspective, and proof that the Applicant has made application to the appropriate municipal land use board for the required approval. Such proof is subject to the review by the WMUA Attorney.
c. If the TWA-1 application has not been approved by the NJDEP within two (2) years of submission, the WMUA shall require the Applicant to submit a new TWA-1 application to be executed by the Executive Director and approved by the Commissioners, or its designee, and WMUA Engineer.

3. Application Approval

Upon submission by the Applicant of an Application to the WMUA, the WMUA Engineer shall review all Application materials, certify the Application complete as appropriate, and provide an Engineer's Report either recommending or not

recommending approval by the WMUA. Such Engineer's Report shall contain reasons detailing the WMUA Engineer's decision.

If the WMUA Engineer does not certify the Application complete or does not recommend approval, the WMUA shall notify the Applicant as to the reasons for such decision.

If the WMUA Engineer recommends approval, the WMUA Commissioners shall act on the complete Application within sixty (60) days from the date of the WMUA Engineer's Report.

Upon the WMUA Commissioners granting approval of the Applicant's Application, construction on the project shall commence within two (2) years of the date of the resolution by the WMUA Commissioners granting approval. If construction does not commence within two (2) years of the date of such resolution, the approval will automatically expire unless the WMUA Commissioners act, by resolution, to extend the time period for commencement of construction. The Commissioners may also require an additional amount to be deposited into the Escrow Account to ensure the project will be completed.

4. Approval Subject to Conditions

The granting of an Application approval by the WMUA shall in no way operate as a guarantee by the WMUA of capacity to accept the flow of an Applicant. Only after approval has been granted by the WMUA, all applicable fees have been paid by the Applicant, and all Application conditions have been satisfied to the approval of the WMUA Commissioners, shall the WMUA guarantee capacity to accept the flow of an Applicant. Subject to the discretion of the WMUA Commissioners to refund Single Lot connection fees, connection fees are otherwise non re-fundable.

The WMUA may require the phasing of proposed development, based on the available capacity of the Pine Brook Sewage Treatment Plant, such that no more than one hundred and fifty (150) EDCUs are approved for any Application at any one time.

In no event shall an Application be approved or an the Applicant permitted to connect to the WMUA system until such time as all applicable professional fees, inspection fees, and connection fees have been paid to the WMUA and any applicable connection fees have been paid to the Customer Communities, if the Customer Communities require, by ordinance, a connection fee to be paid to them as well.

All application approvals shall be subject to and automatically conditioned upon issuance of appropriate permits by the NJDEP.

These Rules and Regulations shall be considered the minimum requirements for the protection of the public health, safety, and welfare. Any action taken by the WMUA under the terms of said Rules and Regulations shall give primary consideration to the

general health and welfare of the Townships of Manalapan and Marlboro and the Customer Communities. However, an Applicant may make written application to the WMUA for an opportunity to be heard with respect to any claim that a literal enforcement of these Rules and Regulations is impractical or will exact undue hardship upon the Application, in which event the WMUA may permit such variance as may be reasonable and within the general purpose and intent of these Rules and Regulations. The hearing with respect to such application shall take place within forty-five (45) days of the date upon which same was submitted to the WMUA and shall be heard by a majority of the Commissioners of the WMUA.

Should any Applicant make any changes in its plans subsequent to approval by the WMUA Engineer during the Application process, the said Applicant shall be required to pay additional engineer review fees for such review by the WMUA Engineer, which fee shall be as determined by the WMUA Engineer based upon the original fee.

If, during the review of a Applicant's plans, the WMUA Engineer determines that the plans do not take into consideration the requirements of the general area for future facilities and needs for providing wastewater treatment to the region, the Engineer shall cause the Applicant to modify its plans so as to include that which the Engineer deems necessary for such future wastewater facilities to be operative.

If, at any time, the Applicant fails to satisfy any condition(s) of Application approval, the WMUA reserves the right to file legal action in the appropriate jurisdiction seeking remedies, including, but not limited to, attorney fees and costs.

5. Additional Requirements

Upon receiving Approval from the WMUA, the following items must be completed and/or submitted before pursuing construction of the project:

(a) Developer's Agreement

A "Developer's Agreement" between the Applicant and the WMUA is required and shall be put in writing and approved in substance and form by the WMUA Attorney and WMUA Engineer. In addition, a "Supplemental Developer's Agreement" shall be required where there is to be additional construction not contemplated in the original Developer's Agreement. Where the Applicant intends to connect into a WMUA force main, an Agreement shall be signed providing indemnification to and releasing the WMUA, its employees, agents and contractors from any damages resulting from said connection (see Section 3(E)(5)(c)). After execution, the WMUA shall record the Developer's Agreement in the appropriate County Clerk's Office. Upon receipt of a recorded original, the WMUA shall forward a copy to the Applicant.

In the event that the Applicant does not comply with the Developer's Agreement, the WMUA shall withhold occupancy permit approvals until such time as the provisions of the Developer's Agreement are met. In addition, the WMUA may seek specific

performance of the Developer's Agreement and other remedies including, but not limited to, attorneys fees and costs.

(b) Deed Restriction

In the event a sewer connection requires the traversing of property not owned by the Applicant or traversing a public right-of-way before reaching a WMUA facility, a Deed Restriction shall be required. See Exhibit D for the standard WMUA Deed Restriction form language. The Deed Restriction shall provide a description of the off-site sewer line and declare that the Applicant, not the WMUA, shall be responsible to maintain, repair and upkeep the offsite sewer lateral connection from the building on the Property up to the WMUA's system, including, but not limited to, maintenance, operation and replacement of sanitary sewer facilities, grinder pump equipment and/or facilities.

Deed Restrictions shall be submitted to and approved as to form and content by both the WMUA Engineer and WMUA Attorney prior to recording the document with the appropriate County Clerk's Office.

(c) Hold Harmless and Indemnification Agreement

The following scenarios will require the Applicant to enter into a Hold Harmless and Indemnification Agreement with the WMUA:

1) Where an individual connector proposes to connect to a WMUA force main;
2) When an Applicant is required by the WMUA to temporarily operate a newly constructed pumping station prior to the WMUA taking ownership of the facility;
3) When an Applicant is required by the WMUA to operate a pumping station within the WMUA's service area and not transfer ownership to the WMUA.

Each Applicant shall enter into a Hold Harmless and Indemnification Agreement with the WMUA releasing the WMUA and its employees and agents from any claims or liabilities arising or which may arise in the foregoing scenarios. The Hold Harmless and Indemnification Agreement must be approved as to form and content by the WMUA Attorney and WMUA Engineer. See Exhibit E for the standard WMUA Hold Harmless and Indemnification Agreement form language.

(d) Easements/Transfers of Ownership

Easement(s) shall be in a form approved by the WMUA Engineer and WMUA Attorney and executed by the property owner and/or other parties of interest. The WMUA's policy is to use its own form of Deed of Easement, made a part of these Rules and Regulations in Exhibit C. Easements shall be required for all sanitary sewer lines excluding house connections or building sewers that are not within a public right-of-way. Upon approval of easement documentation by the WMUA Engineer and WMUA Attorney, the WMUA shall record the easement document with the appropriate County Clerk and provide the recorded copy to the Applicant. The cost of filing the easement shall be deducted from

the Applicant's Escrow Account. The Applicant shall obtain title insurance equal to the value of the easement or a minimum of $25,000 and provide a title commitment binder to the WMUA prior to the easement being recorded. Alternatively, the WMUA may require the Applicant, in the Application Approval Resolution adopted by the WMUA Commissioners, to deposit additional monies into the Applicant's Escrow Account to cover the costs of obtaining title insurance in the event the Applicant does not obtain title insurance within a reasonable time as determined by the WMUA Commissioners.

All required easements shall be dedicated to the WMUA and shall be clearly indicated on the drawings. Easements shall be unrestricted and shall have a minimum width of thirty (30) feet, fifteen (15) feet minimum on either side of the pipe. Greater widths may be permitted based upon the size and/or depth of the pipe. All easements shall be recorded with the appropriate County Clerk prior to the WMUA assuming ownership of the sewers.

In those circumstances where a pumping station is built by an Applicant and will be conveyed to the WMUA, a deed granting fee simple absolute title to the WMUA shall be required. The deed shall be in a form acceptable to the WMUA Engineer and WMUA Attorney and executed by the Property Owner and/or other parties in interest. The deed shall be filed by the Property Owner in the appropriate County Clerk's Office and the filed document shall be provided to the WMUA for its records. The title policy shall name the WMUA as an insured party as well as its agents and employees and shall be in an amount covering the land value of the pumping station lot as well as the estimated replacement cost of the improvements.

The title policies specified in the preceding paragraphs shall be in a form which is acceptable to the WMUA Attorney. No title exceptions shall be permitted which adversely affect the WMUA interest in the easement or pumping station lot.

All easements or deeds conveying title as specified in the above paragraphs and all title binders or commitments shall be conveyed to the WMUA prior to the initiation of construction, at which time the title binder or commitment equal to the value of the easement or a minimum of $25,000 shall also be furnished to the WMUA. The original and actual title policy as specified herein shall be furnished within a reasonable time thereafter, but in no instance later than the time that the last Certificate of Occupancy is released or before the release of the Performance Guarantee in the event the building is not constructed.

Property Owners must specifically reference the easement with the WMUA in all deeds to subsequent purchasers and mortgagees. Property Owners will be responsible for attorney fees and costs in the event the WMUA has to defend a claim of easement or foreclosure of its easement by a subsequent purchaser or mortgagee.

The WMUA may, but is not obligated to, permit an individual Homeowner to enter into an agreement to allow said Homeowner to construct a shed, fence, aboveground pool, or other minor structures on an existing WMUA easement. To be considered, the Owner

shall complete and submit to the WMUA a proposed Deed of Easement in a form consistent with Exhibit C.

(e) Performance and Maintenance Guarantees

The following performance and maintenance guarantees, the value of which shall include all construction, inspection, and other engineering costs as required under these Rules and Regulations and as approved by the WMUA Engineer, shall be submitted to and approved by the WMUA.

The construction of pumping stations and force mains requires separate performance guarantees and maintenance guarantees to be posted and accounts shall be maintained separately from any guarantees posted for the construction of gravity sewer mains.

Performance Guarantees – The Applicant shall provide the WMUA with a performance guarantee in an amount equivalent to one hundred and twenty percent (120%) of the total estimated cost of the project. The total estimated cost shall include the estimated construction costs plus administration costs. The return of the performance guarantees shall be conditioned upon the completion of the required sewer installations and appurtenances. The performance guarantee, as required herein, shall consist of ten percent (10%) cash or certified check, as a cash surety, which money shall be deposited in escrow with the WMUA. The remainder of the performance guarantee, in an amount equal to ninety (90%) percent, shall be in the form of a Performance Bond executed by a surety company authorized to issue such Performance Bonds in the State of New Jersey, or letter of credit, and be approved as to substance and form by the WMUA Attorney. The Applicant's Engineer shall prepare an estimate using the "Engineers Estimate" form found in the Appendix of these Rules and Regulations. Typical costs for the Applicant's Engineer's Estimate will be published yearly by the WMUA and can be obtained from the WMUA during the Application process. The typical costs listed on the estimate identify unit costs typical of publicly funded construction projects and should be used in the Applicant's Engineer's Estimate to be submitted and reviewed by the WMUA.

Upon substantial completion of all required utility improvements, and the connection of existing/new buildings to the WMUA system, the Applicant may make a written request to the WMUA, by certified mail, for a list of all uncompleted or unsatisfactorily completed improvements. The Applicant shall also send a copy of the request to the WMUA Engineer. The request made by the Applicant to the WMUA and WMUA Engineer shall indicate which improvements have been completed and which improvements remain uncompleted in the judgment of the Applicant. Thereupon, the WMUA Engineer shall inspect all improvements covered by Applicant's request and file a detailed list and report, in writing with the WMUA, and shall simultaneously send a copy of the report to the Applicant within forty-five (45) days after receipt of the Applicant's request.

The list prepared by the WMUA Engineer shall state the nature and extent of the incompleteness of each incomplete improvement or the nature and extent of, and remedy

for, the unsatisfactory state of each completed improvement determined to be unsatisfactory. The report shall identify each improvement determined to be complete and satisfactory together with a recommendation as to the amount of reduction to be made in the performance guarantee relating to the completed and satisfactory improvements.

The WMUA, by resolution, shall either approve the improvements determined to be complete and satisfactory by the WMUA Engineer, or reject any or all of these improvements upon the establishment, in the resolutions with causes for rejection, and shall approve and authorize the amount of reduction to be made in the performance guarantee relating to the improvements accepted. This resolution shall be adopted not later than forty-five (45) days after receipt of the list and report prepared by the WMUA Engineer. Upon adoption of the resolution by the WMUA, the Applicant shall be released from all liability pursuant to its performance guarantee, with respect to those approved improvements except for that portion adequately sufficient to secure completion or correction of the improvements not yet approved.

The cash portion of the performance guarantee on deposit with the WMUA shall be reduced in the same proportion as the original cash deposit bears to the full amount of the performance guarantee. The cash portion of the performance guarantee shall be reduced to a minimum value of $1,000.00, which shall be held by the WMUA and utilized at the time of the final inspection for the maintenance guarantee release (see Section 3(E)(5)(e) for Maintenance Bond requirements).

Prior to release of the performance guarantee, the WMUA, at the discretion of the Commissioners and WMUA Engineer, may require all sanitary sewer mains to be flushed jetted, or otherwise cleaned, then inspected by TV cameras with DVD discs and inspection logs provided to the WMUA. Said jetting and TV inspection will be witnessed by the WMUA Engineer or its representative and work shall be performed by a contractor specializing in said work according to generally acceptable standards. Additionally, a mandrel test shall be performed on all gravity lines installed by the Applicant as part of the Development to show that these gravity lines have not deflected. The cost associated with the TV inspection and the pulling of a mandrel through the installed gravity lines shall be determined by the WMUA and be borne by the Applicant.

With regard to a pumping station and/or force mains, the following procedures shall be followed for the release of performance guarantees and the subsequent transfer of ownership of the pumping station to the WMUA.

Upon commencement of operation of the pumping station and/or force main, the Applicant may request a reduction of the performance guarantee associated with the proposed pumping station and force main. The performance guarantee shall be reduced up to a maximum of eighty (80) percent of the performance guarantee. At this time, the WMUA Engineer shall generate a list of deficiencies if applicable. The Applicant shall be responsible for completing all deficiencies. Only after the WMUA Engineer has certified that all outstanding deficiencies are corrected, the WMUA, by way of a

resolution by the Commissioners, will commence the ninety (90) calendar day trial operational period as mentioned in Section 3(E)(7).

The WMUA shall provide an operator for the pumping station for a period of ninety (90) calendar days thereafter. The Applicant shall remain responsible for all costs related to the operation of the pumping station (utility costs, Bioxide purchase, repairs, etc.) during this time. All deficiencies identified by the WMUA's operating personnel and WMUA Engineer during this ninety (90) day period shall be corrected by the Applicant prior the conclusion of the trial period. If outstanding deficiencies remain at the conclusion of the trial period, ownership shall be transferred back to the Applicant. The Applicant will then be responsible for the operation of the pumping station by a licensed operator at the Applicant's expense. Only after the WMUA Engineer has certified that the outstanding deficiencies are corrected will the WMUA, by way of a resolution by the Commissioners, commence a new ninety (90) day trial operational period. This process will continue until no deficiencies remain at the end of the ninety (90) day trial period. At that time, the remaining amount of the performance guarantee will be released, and the WMUA will take ownership of the pumping station and be solely responsible for the operation of such. To the extent that any of the improvements shown on the subdivision plat or site plan will be dedicated to the WMUA, the WMUA, upon the release of the performance guarantee, shall accept dedication for the public use of sewer facilities, and other improvements shown on the subdivision plat or site plans approved by the WMUA, provided that such improvements have been inspected and received written approval from the WMUA Engineer. The WMUA may allow a release of the performance guarantee on its own initiative.

The foregoing paragraph does not in any way obviate the Applicant's requirement to convey an appropriate deed of easement or, in some circumstances, a deed granting fee simple title to a pumping station lot, nor does it obviate the requirement to furnish a title policy in favor of the WMUA, in the amount(s) specified in these Rules and Regulations, Section 3(E)(5)(d), insuring the WMUA's interest.

Maintenance Guarantees - As a condition of release from a performance guarantee, a maintenance guarantee shall be submitted in a sum equal to fifteen percent (15%) of the costs of the improvements. The WMUA reserves the right to waive or modify this condition of release. The maintenance guarantee shall be in an amount determined by the WMUA Engineer. The Applicant may provide some or the entire maintenance guarantee in cash. The remainder, if any, of the maintenance guarantee shall be in the form of a Maintenance Bond executed by a surety company authorized to issue such Maintenance Bonds in the State of New Jersey, or letter of credit, and be approved as to substance and form by the WMUA Attorney. The Maintenance Bond shall be posted upon completion of the improvements and before release of the performance guarantee by the WMUA and shall cover the maintenance by Applicant of all such improvements for a period of two (2) years, except where a longer period is required by some other Agency having jurisdiction thereof, and particularly shall guarantee the remedying of any defects in such improvements which occur or become evident during the period. In addition, the Applicant shall post $1,000.00 of the original cash surety from the Performance

Guarantee with the WMUA to cover the costs and fees relative to the final inspection for the maintenance bond release, which typically occurs before the two (2) year maintenance bond has expired.

When a NJDOT Road Opening/Utility Permit is required as part of the construction, a Maintenance Bond is required for a period of five (5) years in addition to the two (2) year bond required by WMUA.

Applicants will be responsible for attorney fees and costs in the event the WMUA has to pursue an Applicant who has not posted a valid maintenance guarantee with the WMUA.

(f) Insurance Requirements

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

Bodily Injury and Liability	$1,000,000
Property Damage Liability	$1,000,000
Automobile Liability	$1,000,000

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

The required certificates of insurance shall name the "WMUA, its engineers, consultants and employees" as additional insureds "with respect to any and all claims arising out of the work being performed by the Applicant under WMUA Project # _X_." The certificates of insurance must be approved as to form and content by the WMUA Attorney.

The WMUA may waive Automobile Liability and/or Workman's Compensation if the Applicant demonstrates to the satisfaction of the WMUA Commissioners that such requirement is not needed. At their discretion, the Commissioners may require that such insurance coverage be provided by the Applicant's contractors and/or subcontractors, if applicable.

The insurance requirement shall cease upon release of the performance guarantee.

(g) Cost Sharing/Reimbursement

Cost Sharing Agreements - An Applicant that is required by the WMUA, in its sole discretion, to make certain regional or sub-regional improvements may enter into a cost sharing agreement with the WMUA. Such an agreement shall indicate that the WMUA shall collect from each and every upstream future Applicant a pro-rata share of the total cost of the improvements and immediately transmit such pro-rata share to the original Applicant that constructed certain regional or sub-regional improvements. These cost

sharing agreements may provide for any costs associated with force mains, pumping stations, treatment facilities, and gravity mains above eight inches (8") in diameter. Any such agreements shall be subject to the following:

(a) All payments made by upstream Applicants shall be tendered to the WMUA who shall transmit such payments to the original Applicant that constructed certain regional or sub-regional improvements pursuant to the Cost Sharing Agreement.

(b) The decision to require Applicants to enter into a cost sharing agreement shall be within the full discretion of the Commissioners based upon the best interests of the WMUA and advice from the WMUA Engineer.

(c) Cost sharing agreements shall only be entered into in those situations where the Applicant is required to install improvements which are designed to serve a capacity which is greater than that required by the proposed development. Cost sharing agreements shall not be applicable to situations where an Applicant is required by the WMUA to extend sewer lines or provide laterals to allow for gravity connections for adjacent lots or properties owned by others.

(d) Each and every upstream Applicant who is tributary to the constructed regional or sub-regional improvements constructed by the original Applicant shall pay an amount based upon the anticipated percentage of capacity that said Applicant shall require in accordance with the following formula:

$$\frac{D}{T} \times C = C2$$

D = Amount of capacity in EDCUs that upstream Applicant shall require as determined by the WMUA Engineer.

T = Total capacity of sewer improvements in EDCUs as determined by the WMUA Engineer.

C = Total cost of installation of sewer improvements based upon paid invoices approved by the WMUA Engineer.

C2 = Cost upstream Applicant shall pay to the WMUA.

(e) The amounts to be paid by each upstream Applicant shall be remitted to the WMUA prior to the time of the posting of the performance guarantee and inspection fees with the WMUA with respect to the upstream development.

(f) In no event shall an original Applicant be entitled to recoup more than 100% of the cost of installation minus the cost of its pro-rata share.

(g) The costs which future upstream Applicants shall incur as a result of any cost sharing agreement shall be in addition to any connection fees which the WMUA

may charge pursuant to N.J.S.A. 40:14B-22 as well as the WMUA Rules and Regulations.

(h) The WMUA may include indemnification provisions in the cost sharing agreements which requires the Applicant who enters said agreement to indemnify and defend the WMUA in the event that the cost sharing agreement and/or any payments are subjected to legal challenge. Said agreements may also provide that any legal defense that the Applicant may provide to the WMUA shall be under the direct supervision and control of the WMUA Attorney and that any settlement decisions with respect to any such litigation shall be within the full discretion of the WMUA. In the event of a legal challenge, the Applicant who enters into a cost sharing agreement shall also indemnify the WMUA for all costs and legal fees associated therewith.

(i) Any Applicant wishing to enter a cost sharing agreement may be required by the WMUA to provide an appropriate Bond or Letter of Credit in the form and amounts required by the WMUA Attorney in order to protect the WMUA in the event that the cost sharing agreement and/or any payments are subject to legal challenge. Additionally, the Applicant shall be required to insure against such legal challenge by providing insurance or other surety in a form acceptable to the WMUA Attorney. In the event of a legal challenge, the Applicant who enters into a cost sharing agreement shall also indemnify the WMUA for all costs and legal fees associated therewith.

Reimbursement - As an alternative to the cost sharing provisions, the Applicant may be entitled to certain reimbursement for the oversizing of lines, additional excavation, increased capacity of pumping stations or the installation of additional lengths of sewer pipe (outside the project) and such additional expenses as may be required by the WMUA. Reimbursement shall not be applicable to situations where an Applicant is required by the WMUA to extend sewer lines or provide laterals to allow for gravity connections for adjacent lots or properties owned by others. The WMUA may directly reimburse the Applicant as described in the following sections.

Transmission Mains (Gravity Mains)

If the size of any gravity main, as shown by the Applicant's Engineer, and reviewed by the WMUA's Engineer, is inadequate for the future requirements of the area as shown on the current Wastewater Management Plan, or as otherwise determined by the WMUA, the Applicant shall install the larger size pipe if required to do so by the WMUA.

Up to and including pipe sixteen inches (16") in diameter, the WMUA shall pay the Applicant the differences in material cost of the pipe only as reflected in an actual invoice for same, as reviewed and approved by the WMUA Engineer.

If the pipe is over sixteen inches (16") in diameter, the WMUA shall pay the Applicant the difference in the material cost of the pipe plus the cost of the additional excavation as

reflected by the construction details contained herein and an actual invoice for same, as reviewed and approved by the WMUA Engineer.

As the minimum size gravity main under the WMUA and NJDEP Regulations is eight inches (8") in diameter, no reimbursement shall be provided where the size of the pipe which is required is eight inches (8") in diameter or less.

Pumping Stations

The WMUA desires a gravity collection system whenever possible. If the WMUA requires a pumping station of greater capacity than that required to serve the Applicant's project, the WMUA shall pay the Applicant the difference between the cost of the larger pumps, motors, piping, valves, and electrical work required in the station by the Applicant and that required by the Applicant's project. If additional wet well depth is required by the WMUA, the WMUA shall pay the additional cost of the excavation (dewatering excluded) and the structures.

In the event the Wastewater Management Plan provides for a gravity sewer to be constructed from the Applicant's land to an existing sewer, and the Applicant desires the substitution of a pumping station and a force main and the WMUA, in its discretion, agrees to said substitution, the Applicant shall pay to the WMUA, in addition to all other fees, the cost of power, labor, and maintenance of the pumping station capitalized at five percent (5%) over 40 years. Power costs can be accurately calculated using the flow, lift, and power costs. Labor and maintenance, based on the experience of the WMUA, will be set at $1,000 per year for each 100 gallons of sewage per minute pumped with the smallest pump out of service.

Treatment Facilities

If the project requires the installation or modification of wastewater treatment facilities, as determined by the WMUA Engineer, the Applicant shall perform all studies and shall pay all costs associated therewith, including professional review fees. If the WMUA requires a treatment facilities installation or modification of greater capacity than that required by the Applicant, the WMUA shall pay said Applicant the difference between the costs of the treatment facilities required by the Applicant and the treatment facilities as required by the WMUA.

(h) Payment of Inspection and Connection Fees

Inspection Fees - Once the WMUA has granted approval to the sanitary sewer project, and the aforementioned items above have been completed, the Applicant shall post with the WMUA a cash deposit for inspection fees in an amount equal to the greater of one-thousand dollars ($1,000) or five (5) percent of the estimated construction cost.

Total anticipated inspection fees are estimated at fifteen percent (15%) of estimated construction cost of all sanitary sewer improvements made by Applicant; it being

understood that the amount set forth above is subject to change and is to allow for the collection of an estimated amount of inspection fees and is in no way construed to be the actual total figure which may be paid by an Applicant for inspections. The actual figures to be paid shall be those amounts as charted by the WMUA Engineer in connection with the performance of the actual inspections.

Such amounts shall be placed in an Escrow Account with interest as required by law from which expenses will be paid by voucher.

Connection Fees - Prior to issuance of building permits by the Townships of Manalapan or Marlboro, and the Customer Communities, the Applicant shall pay connection charges for all EDCUs in the amount of the current rate per EDCU in accordance with the EDCU Schedule in these Rules and Regulations (Section 9). If an Applicant wishes to pay the foregoing connection fee in more than one (1) installment, a written request shall be made to the WMUA Commissioners. If a project is in different phases, connection fees may be paid in different phases with the approval of the Commissioners.

The connection fees in the amount of the current rate per EDCU shall be payable to the WMUA by the Applicant prior to application to the Municipal Construction Code Official for building permits for said lots, and in the case of existing dwellings, payment of the connection fees shall be payable by the Applicant (upon notification of sewer service to the Applicant) to the WMUA prior to application for a plumbing permit for the connection.

In the event the proposed connection is located in a Customer Community that requires a connection fee in addition to the WMUA connection fee, said connection fees shall be paid to both the WMUA and the Customer Community prior to the issuance of any building or plumbing permits to said Applicant.

In the event the proposed connection is located in the Bayshore Regional Sewerage Authority's (BRSA) service area, an additional connection fee must be paid to the BRSA prior to the connection with the WMUA. In that case, the applicable WMUA connection fee shall be 48.5% of the regular WMUA connection fee calculation, which reflects the required adjustment to remove debt service and capital costs for the WMUA's Pine Brook Sewage Treatment Plant. Details regarding the additional connection fee to be paid to BRSA can be obtained from BRSA directly.

(i) Grease Traps/Interceptors

The WMUA may, in its sole discretion, require that a Grease Trap/Interceptor be installed and maintained as part of said Application approval. The Applicant shall be responsible to install and maintain said Grease Trap(s)/Interceptor(s) in accordance with the WMUA Rules and Regulations and as are further explained in detail in Section 7(E) of these Rules and Regulations.

6. Privately Owned Sanitary Sewers

In the event that a sanitary sewer, extended lateral, or force main will be privately owned, the Applicant shall file a Deed Restriction for the property being serviced by the private system in a format approved by the WMUA Attorney stating that said sanitary sewer, extended lateral, or force main is privately-owned and not part of the WMUA system and is the sole responsibility of the Property Owner (See Section 3(E)(5)(b)). In addition to being responsible for maintenance and repairs, the Owner shall also be responsible for required mark-outs and permits, including but not limited to road opening permits. The WMUA shall be reimbursed for any and all expenses incurred in connection with WMUA's review and approval and inspection of any privately-owned sanitary sewer, extended lateral, or force main. The Owner shall submit as-built drawings to the WMUA Engineer for the privately-owned sanitary sewer, extended lateral, or force main, which drawings shall include a notation designating which sanitary sewers, extended laterals, or force mains are owned by the WMUA and which are owned privately. Tracer wire and testing ports shall be installed for all privately owned force mains.

7. Applicant-Operated Pumping Station(s)

Upon certification by the WMUA Engineer that a pumping station is substantially complete, the Applicant, upon written request to the WMUA, may commence operation of the pumping station. The request shall be made in writing and include copies of approvals from all inspection agencies and performance certifications of all equipment from the vendor.

The WMUA and such Applicant shall follow the following procedures for the start-up and private operation of a pumping station prior to the WMUA taking ownership:

(a) The Applicant shall request to start the operation of the pumping station. The WMUA Engineer and a WMUA employee will be on-site during the day of start-up to conduct an unofficial walk-through of the pumping stations. Visible deficiencies will be noted and relayed to the contractor and Applicant. An "un-official" punch-list will be generated based on the observations of the WMUA and WMUA Engineer. No training of the WMUA operating personnel shall take place at the initial start-up of the pumping station.

(b) Before the first connection to the WMUA system is approved, the Applicant shall enter into a Hold Harmless and Indemnification Agreement with the WMUA for the initial operation of the pumping station by a private operator. See Exhibit E for the standard WMUA Hold Harmless and Indemnification Agreement form language. The execution of the Hold Harmless and Indemnification Agreement will require a vote of approval by the majority of the Commissioners.

(c) The Applicant shall retain a New Jersey licensed operator for the pumping station. The operator must have, at a minimum, a Class 2 (C2) collection system operator's license issued by the State of New Jersey. The Applicant shall be

liable for the costs associated with the private operation of the pumping station. The operator shall submit a monthly status report summarizing the operations of the pumping station(s) by the tenth (10^{th}) of each month to the following address:

To: Collection System Superintendent
Western Monmouth Utilities Authority
103 Pension Road
Manalapan, New Jersey 07726

Cc: WMUA Engineer

The monthly report shall include the following information:

a. A summary of the operations for the pumping station(s);
b. Pump Hours (recorded each visit);
c. Generator Hours (recorded each visit);
d. All alarms received/responded to; Identify the cause and corrective measures taken;
e. Preventative Maintenance completed;
f. Bioxide usage (recorded each visit); Deliveries received;
g. Flow Totalizer reading (each visit).

(d) To determine the operation is to the satisfaction of the WMUA, the WMUA may conduct inspections of said pumping stations at any time while said pumping stations are privately operated

(e) The Operation and Maintenance Manuals shall be prepared by the Applicant and submitted, in accordance to Section 7.F.2(g), to the WMUA and the WMUA Engineer for review prior to the initial start-up of the pumping stations.

(f) The Applicant shall operate the pumping station(s) for a minimum period of time until 75% of the EDCUs attributed to the Application are connected to the WMUA.

(g) After the minimum number of connections has been met, if the Applicant wishes to have the WMUA assume the operation of the pumping station from the Applicant, the Applicant shall make a written to the WMUA to assume the operation of the pumping station. Training of the WMUA personnel shall take place at this time. A punch-list will be generated by WMUA personnel and WMUA Engineer and forwarded to the Applicant and contractor. Once the WMUA verifies that all deficiencies previously identified have been corrected, the WMUA may begin a ninety (90) day trial period of operation of the pumping station(s).

(h) Before the WMUA assumes ownership of a privately-owned pumping station, the Owner shall provide a cash or bond escrow, in favor of the WMUA, in an amount

equivalent to the net present value of the cost of power, labor, and maintenance of the pumping station to be borne by the WMUA to operate the pumping station, capitalized at five percent (5%) over forty (40) years. The total net present value of the above referenced costs shall be determined by the WMUA Engineer.

(i) Until such time as the WMUA assumes ownership of the pumping station(s), the WMUA shall withhold the authorization to issue a final Certificate of Occupancy for the Application.

(j) The WMUA may approve connections from surrounding properties not associated with the project into the collection systems tributary to the pumping station. The WMUA shall notify the Applicant of all applications that propose to discharge into the wastewater collection systems tributary to the pumping station. Once connected, the flow generated from these projects can be counted towards the flow necessary to start the ninety (90) day trial operational period.

8. Privately Owned Pumping Station(s)

All privately owned pumping station(s) discharging into the WMUA's collection system shall be operated by a New Jersey licensed operator. The operator shall have, at a minimum, a C2 Collection System Operator's license issued by the State of New Jersey. The Owner shall be solely responsible for obtaining a licensed operator for the pumping station. Prior to the startup of the pumping station, the Owner shall supply to the WMUA, in writing, the following contact information: the Owner of the property, the property manager, the operator of the pumping station, and emergency contact information. Prior to the startup of the pumping station, the Owner shall also enter into a Hold Harmless and Indemnification Agreement in a form acceptable to the WMUA. See Exhibit E for the standard WMUA Hold Harmless and Indemnification Agreement form language. Prior to the startup of the pumping station, the Owner shall also provide the WMUA with evidence of the existence of a maintenance agreement for the pumping station equipment, in a form acceptable to the WMUA, and which shall, at a minimum, cover the entire useful life of the pumping station equipment. In the event that the Owner fails to adequately maintain the pumping station equipment, as determined by the WMUA, the WMUA shall have the right, but not the obligation, to make all necessary repairs to the pumping station equipment and to demand reimbursement from the Owner. In the event that the WMUA exercises said right, it shall first notify the Owner in writing of its intent to make a repair and shall be entitled to charge the Owner for the full cost of the repair plus an "emergency fee" to undertake the repair on an emergent basis. The operator shall submit a monthly status report summarizing the operation of the pumping station(s) to the WMUA by the tenth (10^{th}) of each month to the following address:

To: Collection System Superintendent
Western Monmouth Utilities Authority
103 Pension Road
Manalapan, New Jersey 07726

The monthly report shall include the following information:

a. A summary of the operations for the pumping station(s);
b. Pump Hours (recorded each visit);
c. All alarms received/responded to; Identify the cause and corrective measures taken;
d. Bioxide usage (recorded each visit); Deliveries received;
e. Flow Totalizer reading (each visit).

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4. Construction Requirements

The WMUA or its authorized representative will make an inspection of all work. No construction shall be undertaken without notice of at least two (2) working days to the WMUA Engineer, and without prior approval of the drawings and specifications and prior satisfaction of the requirements in these Rules and Regulations. Work which is found faulty shall be removed and properly replaced on the orders of the WMUA Engineer. The WMUA Engineer may stop the work if it is not being properly performed. Costs of inspection and connection shall be charged as required by the Rules and Regulations of the WMUA (See Section 3(E)(5)(h)).

A. *Pre-Construction Conference*

After Application approval and when all Application requirements and conditions are complete, all Applicants shall attend, prior to the start of construction, a pre-construction conference with the WMUA. Each and every Applicant shall demonstrate to the satisfaction of the WMUA Engineer and WMUA Attorney that it has satisfied all approval requirements and conditions as described in Section 3(E).

B. *Permits and Fees*

The Applicant, at its own cost and expense, shall obtain all necessary permits for performing the work. All fees and charges of the Municipalities and the WMUA shall be paid in accordance with existing Municipal Ordinances and the WMUA Rules and Regulations. No work may be started unless all required fees have been paid, and performance guarantees have been submitted, and approved, and all required permits (Federal, State, County, and Municipal) obtained and copies provided to the WMUA.

For NJDOT Road Opening/Utility Permits, the Applicant and/or his Contractor shall pay all appropriate fees as required in order to obtain said permits. The form shall be executed with WMUA as the Applicant, however, the Applicant and/or his Contractor shall assume full and total liability/responsibility for compliance with any and all provisions of said Permit, including the five (5) year Maintenance Bond required by State law (as opposed to the two (2) year bond required by WMUA).

C. *Shop Drawings*

Prior to construction, each and every Applicant shall submit shop drawings for all material to be installed during construction. The WMUA Engineer must approve of all shop drawings before construction is to commence. Construction specifications and details identifying proper materials shall be submitted by the Applicant to the WMUA during the Application process.

D. *Record Drawings*

Record Drawings or "As-builts" plans as required herein shall be submitted to the WMUA after completion of the work and prior to the connection of the first EDCU and the release of the Performance Guarantee; said as-built plan must have the approval of the WMUA Engineer and shall contain all information as approved by the WMUA Engineer. The Applicant shall submit to the WMUA one (1) mylar and two (2) paper copies. The approved as-built drawing shall also be provided on diskette or compact disc in AutoCAD .DWG or DXF format.

1. Geographic Information Systems (GIS) Requirement

In addition to providing sanitary sewer as-built information in AutoCAD format, the WMUA will require that all sanitary sewers including, but not limited to, manholes, sewer mains, sewer laterals, cleanouts, pumping station(s), force mains, air release manholes, cleanout manholes, and flow meters be located by Global Positioning System (GPS) device with sub-meter accuracy and collected data imported into a Geographic Information System (GIS) program equal to ArcView GIS Version 9.1 or greater. Either geodatabase format or shape files are acceptable file formats. All relevant information regarding the sanitary sewer installation and accessories such as elevations (MH rim, pipe invert, pipe depth, etc.), pipe type, pipe diameter, slope, shall be included in the database structure of the GIS file.

2. Force Mains

The Applicant shall provide the WMUA with accurate as-built drawings of any force mains installed. To achieve the most accurate location of the force main, the WMUA will require the following process in preparing and finalizing as-built drawings for force mains:

After construction, the Applicant that installed the force main shall forward to the WMUA the record information prepared by the Applicant's engineer for the preparation of as-built drawings.

Once the as-built drawings are prepared, the Applicant (at its own expense) shall hire a third party to verify the location of the force main as shown on the as-built drawings utilizing the tracer wire and, if necessary, ground penetrating radar or similar technologies. This verification shall be performed in the presence of a representative of both the WMUA and the WMUA Engineer's office.

The Applicant shall provide the WMUA with a certification that the as-built drawing of the force main is accurate.

E. *Cleanout Inspection*

The first cleanout inspection may be performed after the following requirements have been met by the Applicant:

1) Record Drawings or "As-builts" showing all gravity and pressurized sewer downstream are to be submitted to the WMUA Engineer;

2) The newly installed gravity sewer has passed the tests required as listed in Section 7 of the Rules and Regulations;

3) The newly installed force main has passed the tests as required by Section XXX of the Rules and Regulations (if applicable);

4) The pump station is operated by either a licensed operator at the cost of the Applicant or the WMUA; subject to the conditions set for in Section XXX of the Rules and Regulations concerning the operation of the pump station(s) (if applicable).

5) All new curb cleanouts shall be marked with an "X" on the curb using a hand grinder.

6) WMUA shall be responsible for all curb cleanouts and laterals from the curb to the sewer main.

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5. Escrow Account, Billing, Record Keeping and Disputes

A. *Escrow Account*

The WMUA, upon receiving any amount of money from an Applicant greater than $5,000 for an Application for sewer services, shall deposit the money in a banking institution or savings and loan association in the State of New Jersey insured by an agency of the federal government, or in any other fund or depository (collectively, the "depository") approved for such deposits by the State, in an account bearing interest at a minimum at the rate currently paid by the institution or depository on time or savings deposits (the "Escrow Account"). The Applicant shall also submit an IRS form W-9 to the WMUA. In the event a W-9 is not submitted upon request, the Application process shall not continue until such requirement is met.

The money deposited shall be for engineer review fees, inspection fees, legal review fees, and any additional expenses that the WMUA incurs as a result of the Application. The money deposited, until repaid or applied to the purposes for which it is deposited, including the person's portion of the interest earned thereon, shall continue to be the property of the Applicant.

The Applicant shall be notified in writing of the name and address of the depository in which the Escrow Account is made and the amount of the deposit.

The Applicant shall pay all escrow fees and other charges in association with the Escrow Account. If the funds held in the Escrow Account are insufficient to enable the WMUA to perform required Application professional reviews or improvement inspections, the WMUA shall request from the Applicant the additional amount estimated to be required for the Escrow Account. In the event the Escrow Account is not replenished within fifteen (15) days of receipt of the WMUA request, the Application process shall not continue until such requirement is met.

B. *Records and Accounts*

The WMUA shall maintain records of all monies received from the Applicant in accordance with N.J.S.A. 40:14B-74.

C. *Interest Earnings*

All monies received from the Applicant, including but not limited to, inspection fees, performance guarantees, and maintenance guarantees, shall be deposited in accordance with and subject to the provisions of N.J.S.A. 40:14B-20.1.

D. *Close-Out Procedure*

Upon completion of an Application, the WMUA shall follow the close-out procedure as stated in N.J.S.A. 40:14B-74.

Upon the Applicant's request to release its Maintenance Bond, the WMUA may apply the Cash Surety to pay for any Applicant deficiencies and/or bills not paid provided that the WMUA has written authorization from the Applicant. The Applicant shall be aware that the balance remaining in the Cash Surety is the Applicant's property, but with the Applicant's permission, the balance may be used to pay for any Applicant deficiencies and/or bills not paid. Any balance remaining thereafter, including interest, shall be refunded to the Applicant.

The Applicant shall notify the WMUA in writing and the WMUA engineer whenever he disputes the charges made for service rendered in reviewing the applications for development, review, preparation of documents, and inspection of improvements. The disputed charges shall be specifically outlined in the correspondence including the dates, time and personnel in dispute. The WMUA, or its designee, shall within a thirty (30) day period attempt to remediate any disputed charges. If the matter is not resolved to the satisfaction of the Applicant he may appeal any charge to an Escrow Account or a deposit made by the WMUA or WMUA Engineer to the county construction board of appeals established under N.J.S.A. 52:27D-127.

E. *Hold-Harmless and Indemnification Agreement*

The Applicant shall indemnify the WMUA, its agents and employees, and hold it harmless from and against all liabilities, losses or damages incurred with respect to any action the WMUA may take with respect to the Escrow Account with the exception of liabilities, losses or damages solely caused by negligent acts, omissions, errors or willful misconduct by the WMUA.

F. *Notices*

All notices, certificates or other communications shall be delivered by hand or mailed by certified mail to the WMUA at the following address:

Executive Director
Western Monmouth Utilities Authority
103 Pension Road
Manalapan, New Jersey 07726

The WMUA may designate different or additional addresses, including electronic mail addresses, by notice in writing given to the Applicant or other parties.

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6. Sewer System Standards (General Specifications)

These Specifications are minimum acceptable standards for sanitary sewer systems in developments, subdivisions, and industrial and commercial projects lying within the jurisdictional area of the WMUA, or connecting to the WMUA system, including the connections from main sewers to the point of connection to the building outlet. Typical drawings are included to illustrate requirements and are of equal force and effect.

Drawings and specifications shall be submitted in advance for approval by the WMUA, in accordance with the WMUA procedures described in the preceding portion of this section. Drawings shall include plans, profiles, and details prepared by a Professional Engineer, licensed as such by the State of New Jersey. No deviation from these documents shall be permitted without prior approval of the WMUA Engineer. Ambiguities and inconsistencies in the specifications shall be referred to the Applicant's Engineer for clarification. Approval of the NJDEP is required, and approval of the WMUA is expressly conditioned thereon.

A. *Design Requirements*

Sewer system flow shall be one (1) directional, with no loops. Sewers shall be sloped in accordance with the minimum requirements of the NJDEP and shall coordinate with the overall WMUA system.

Sanitary sewer manholes, when located within the municipal right-of-way, shall be at or near the center line of the paved roadway, with a five-foot (5') minimum from the edge of the pavement. Sanitary sewer mains shall be a minimum of fifteen feet (15') from the right-of-way line. When sanitary sewer mains are located less than fifteen feet (15') from the right-of-way line, an easement shall be provided to maintain fifteen feet (15') clearance on either side of the sanitary sewer main.

All lots within the subdivision shall be sewered, and adjacent properties shall be taken into consideration when preparing the sewer layout. All sewers shall be extended to the development limits for future extension or access. All Applicants shall make provisions for connections from adjacent lots or properties owned by others as required by the WMUA.

All sanitary sewers must be designed on a separate storm/ sanitary system plan. All water from roofs, cellars, streets, and any other areas must be excluded. Use of the sanitary system for the discharge of sump pumps or foundation drains is strictly prohibited. No by-passes which allow raw sewage to be discharged from sewers shall be permitted.

All sanitary sewers shall be designed to carry four (4) times the average flow. The average sanitary sewage flow (which includes infiltration/ inflow) shall be three-hundred (300) GPD per EDCU.

Sewers and force mains shall be designed to flow with a minimum velocity of not less than two feet (2') per second and a maximum velocity of ten (10') feet per second at full flow based on Kutter's Formula with n = 0.010 for PVC pipe and n = 0.013 for other pipe material. Inverted siphons shall be designed for a minimum velocity of three (3) feet per second and a maximum velocity of six (6) feet per second.

Materials used in the construction of sewers, force mains, and outfalls shall be as follows:

Gravity sewers shall be reinforced concrete pipe, cement-lined ductile iron pipe or PVC sewer pipe.

Force mains shall be PVC, HDPE or cement-lined ductile iron pipe as required by the WMUA.

Inverted siphons shall be constructed of cement-lined ductile iron pipe or other approved material and shall consist of a minimum of two pipes with provisions for flushing. Flow control gates shall be provided in the chambers.

Material specifications and construction details are specified under this Section 7.0 of the Rules and Regulations.

B. *Applicant's Engineer's Report*

A complete engineer's report, setting forth the basis of design, shall be submitted to the WMUA with each Application.

The Applicant's Engineer's Report shall address, as necessary, flow from upstream areas and adjacent properties along with the ability of the downstream facilities to carry the flows proposed to be generated.

The standards as required by the NJDEP as provided in the New Jersey Administrative Code (N.J.A.C. 7:14A-23, et seq.) shall be used for said "Engineer's Report," so same may be included for submission to the NJDEP after Approval is granted by the WMUA.

For proposed commercial and/or industrial facilities, the Applicant's Engineer's Report shall include the number of plumbing fixtures per building and characteristics of proposed wastewater to be discharged into the WMUA's system.

All calculations performed as part of the design of the sanitary sewer shall be included in the Applicant's Engineer's Report as verification to the design.

C. *Design Drawing Requirements*

1. General Location Plan

This plan shall show the relationship of the development to WMUA facilities. Same is basically a "key map" and shall be drawn on a scale of 1" = 1000' to be consistent with the WMUA's Wastewater Management Plan.

2. General Map of Project

A general map of the entire project area shall be submitted on a single 24 inch (24") by 36 inch (36") sheet. A scale of 1" = 200' shall be used. Schematic plan of all proposed sewers shall be indicated on this plan and an index for all other plan sheets shall be shown.

If the general map was drafted using AutoCAD or a compatible computer design program, a copy of the general map in AutoCAD .DWG or .DXF format shall be submitted on a diskette or CD.

3. Plans and Profile

Plans shall be of uniform size, 24 inch (24") by 36 inch (36"), with a 1/2 inch (1/2") border on top, bottom, and right sides, and a two (2) inch border on the left side; the last one for binding. Four (4) sets of plans shall be submitted. The plans shall show the following:

1) Details - The plans shall show contours at two (2) foot interval minimum, all existing and proposed streets, and surface elevations at all breaks in grade and street intersections, the true or magnetic meridian, boundary line, title, date, and scale. Any area from which sewage is to be pumped shall be indicated clearly. All sheets shall be numbered.

2) Symbols - Sewers to be initially constructed and those to be constructed at a later date shall be shown by solid and dashed lines respectively. Existing sanitary sewers shall be shown by double solid lines. All topographical symbols and conventions shall be the same as the ones used by the United States Geological Survey.

3) Elevations - All permanent benchmarks of New Jersey Coast and Geodetic Survey shall be as shown. Elevations of street surfaces shall be placed outside the street lines. The elevations of sewer inverts, shown at street intersections, ends of lines, and at changes of grades, shall be written parallel with the sewer lines and between the street lines. The elevations of street surfaces shall be shown to the nearest 0.1 foot (0.1') and the sewer inverts to the nearest .01 foot (.01'). Sufficient benchmarks should be permanently established for the area. First floor and basement (if applicable) elevations shall also be shown.

4) Distances, Grades, and Sizes - The distances and stationing between manholes, grades in decimal, sewer sizes, and material shall be shown on the plans. Arrows shall show the direction of the flow.

5) Profiles - Profile sheets showing existing grades, proposed grades, proposed manholes, streams, proposed sanitary sewers and storm sewers, gradients, inverts, class of pipe, finished floor (or basement if applicable) elevations, underground utility crossings, etc., shall be shown.

6) Crossing Tabulation - A table showing the elevations and clearance distance at sanitary sewer and water or sanitary sewer and storm sewer crossings shall be shown on the plans. Sanitary sewers shall be separated from water mains by a distance of at least 10 feet horizontally. If such lateral separation is not possible, the pipes shall be in separate trenches with the sewer at least 18 inches below the bottom of the water main. Where appropriate separation from a water main is not possible, the sanitary sewer shall be encased in concrete, or constructed of ductile iron pipe using mechanical or slip-on joints for a distance of at least 10 feet on either side of the crossing. In addition, one full length of sewer pipe should be located so both joints will be as far from the water line as possible. Where a water main crosses under a sewer, adequate structural support for the sewer shall be provided. The WMUA may also require additional structural support for storm sewers crossing over sewer lines.

4. Construction Details

Construction Details shall be in accordance with those shown on "Construction Detail Sheets," as contained in the Appendix herein.

5. General Plan of Pumping Station(s)

The plans for the pumping station(s) shall include a general site plan showing boundaries, contours, proposed pumping station(s) with capacities, underground piping, and underground or overhead wires. The plans shall be drawn to scale, both in plan and elevation views.

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7. Construction Specifications

A. *Excavation and Earthwork*

1. Limits of Excavation

Excavation shall be made to approved grades and shall be of sufficient width for forming the pipe joints. Trench widths shall be selected so that the backfill will not exceed the safe load on the pipe. In all cases, the trench sides shall be vertical from the bottom to 12 inches above the top outside diameter of the pipe. In general, the widths of pipe trenches shall not be wider than the outside diameter of the pipe barrel plus two feet at the level of the top of the pipe, unless otherwise approved. Trench bottoms shall be trimmed by hand to provide firm bedding. Blasting for rock excavation will be permitted only on approval of methods and in compliance with applicable State and local regulations.

2. Trench Support

The Applicant shall furnish, put in place, and maintain such trench support as necessary to support the sides of the excavations and to prevent movement which could in any way injure the work or diminish the working spaces sufficiently to delay the work. Trench support shall be constructed as necessary for the protection of the work and for the safety of personnel and shall comply with the safety precautions outlined in the Code of Federal Regulations as required by the Federal Occupational and Safety Health Act of 1970 (OSHA) or latest edition. Sheeting shall be of a material that will not split while being driven. Sheeting and bracing shall conform to the requirements of the "Construction Safety Code" of the Bureau of Engineering and Safety of the New Jersey Department of Labor and Industry. The Applicant shall have sole responsibility for safety measures at the job site.

3. Dewatering

When groundwater elevations are noted to be more than two feet above the trench, such that it may result in groundwater levels above the pipe bed, the Applicant shall submit a dewatering plan prepared by a licensed dewatering contractor or New Jersey licensed Professional Engineer during shop print review for review and approval prior to construction.

The Applicant shall provide, operate, and maintain satisfactory facilities and equipment, including well points with which to collect and pump all water entering excavations or other parts of the work, to suitable places for disposal. All excavations shall be kept free of water to a point two feet below the inverts to prevent flooding and flotation until the work or structure to be built therein is completed and will not be damaged by the rising

water level. Water shall be discharged through pipe or gutters, or any other suitable artificial means to catch basins, watercourses or ditches in such a manner as to avoid interference with business, pedestrian, and vehicular traffic and so as to prevent damage to property. Necessary precautions to prevent siltation of streams and watercourses will be required. In no case shall water be permitted to rise into or flow through a completed sanitary sewer.

Dewatering facilities and operations shall comply with all State and Federal laws and regulations governing the activity, including but not limited to, noise control, and discharge of pumped water.

4. Foundation Material

Foundation material used for pipe and manhole bedding shall be NJDOT Type I-5 material or broken stone. NJDOT Type I-5 material shall be used under dry and suitable bedding conditions. The gradation of Type I-5 material is as follows:

U. S. Standard Sieve Size	Percent Finer By Weight
2"	100
3/4"	70 - 100
No. 4	30 - 80
No. 50	10 - 35
No. 200	5 - 12

Said materials shall be accurately leveled to required grades, and where required shall be compacted by tamping or other approved means.

Broken stone shall be used where wet or unsuitable bedding conditions exist, or when existing trench bottom is clay, and shall be clean, hard aggregate as approved by the Engineer. PVC pipe shall be placed on broken stone foundation in accordance with the standard detail. Stone shall be New Jersey Department of Transportation - Coarse Aggregate Size No. 57 and shall have the following gradation.

U. S. Standard Sieve Size	Percent Finer By Weight
1-1/2"	100
1"	95 - 100
1/2"	25 - 60
No. 4	0 - 10
No. 8	0 - 5

The stone bedding material shall be accurately leveled to required grades, and shall be compacted by tamping or other approved means. After compaction, the surface of the stone bedding material shall be roughly shaped to receive the pipe. Spaces shall be hollowed out to clear pipe bells so as to provide for maximum bearing.

Natural material may be used if it is determined it meets the aforementioned standards and is approved by the WMUA's Engineer.

5. Backfill

All backfill shall consist of a suitable selected and approved earth generally from storage of approved excavated soil, free from rejected organic matter, boggy or peaty material, humus or other unsuitable material such as silt, rubbish, waste, ashes or cinders. If sufficient suitable material for backfill is not available from the excavated material, as determined by the Engineer, the Applicant shall procure elsewhere a sufficient quantity of suitable material and shall furnish and place such material. No frozen earth shall be used for backfill, and all rocks larger than six (6) inches in the largest dimension shall be removed from acceptable earth and backfill. Unsuitable or excess backfill material shall be promptly removed from the site or spoiled where directed.

When sanitary sewer is installed in local municipality's existing right of way, the pipe trench shall be backfilled to existing/proposed grade with a select structural fill. Structural fill material shall be in accordance with current NJDOT standards. The Applicant shall provide to the WMUA's Engineer a ten (10) pound sample of the select fill to be used as backfill for approval a minimum of seven (7) days prior to construction.

When sanitary sewer is installed within existing state or county roads, the Applicant shall comply with the proper regulatory agency(s) requirements.

6. Placing and Compacting Backfill

Backfill shall be placed to the slopes, grades, and elevations required. Backfill shall be compacted, in an approved manner to a density at least equal to that of the adjacent undisturbed soil, so as to avoid future unequal settlement.

No backfill shall be placed until the structure has been inspected in place and approved. Backfilling shall be carried out as soon as possible after such approval. Trenches shall be backfilled under the pipe haunches, around the pipe and to a point at least twelve inches (12") over the top of the pipe. Material shall be placed in six inch thick (6") layers in a manner that will not disturb or damage the pipe.

Each layer shall be leveled and thoroughly compacted by tamping to ninety-five percent (95%) Modified Proctor Density as determined by latest ASTM Specification D-1556.

Where the material is sufficiently granular in nature to permit satisfactory drying and written approval is given by the WMUA Engineer, compaction of each layer by puddling or water jetting may be permitted. In all cases the filling shall be carried up evenly on both sides of the pipe.

In all improved streets, both existing and proposed, backfill between a plane twelve inches (12") above the top of the pipe and three feet (3') below the road surface shall be placed in successive 12 inch (12") layers. Each layer shall be thoroughly compacted by approved methods and devices to obtain ninety percent (90%) of its Modified Proctor Density in accordance with latest ASTM Specification D-1556. From this point to the bottom of the road surface, a minimum 95% Proctor Density is required. When the proposed sewer is installed in an existing street, the Applicant is responsible for providing a qualified soil technician onsite to perform compaction testing to verify proper compaction is achieved. Additionally, the Applicant is required to obtain the necessary road opening permits from the municipality and, during construction, provide for appropriate traffic control.

In easement rights-of-way and paper streets, backfill between a plane twelve inches (12") above the top of the pipe and the finished surface grade need not be placed in successive layers. However, backfill shall be compacted or consolidated to obtain ninety percent (90%) Modified Proctor density. Settlement shall be kept to a minimum and proper grade shall be restored if such settlement might occur.

B. *Pipe and Pipe Laying*

1. Ductile Iron Pipe

Ductile iron pipe shall be centrifugally cast in metal or sand-lined molds to latest ANSI/AWWA Designation A21.51/C-151 specifications. The joint shall be of a type that employs a single elongated grooved gasket to effect the joint seal, such as U.S. Pipe and Foundry Company's "Tyton Joint," James B. Clow and Sons, Inc., "Bell-Tite," or approved equal, conforming to latest ANSI/AWWA Designation A21.11/C-111. Pipe shall be furnished with flanges where connections to flange fittings are required and conform to latest ANSI/AWWA designation C115/A21.15. Flanged pipe shall be Class 53 (minimum). The outside of the ductile iron pipe shall be coated with a uniform thickness of hot applied coal tar coating and the inside shall be lined with cement in accordance with latest ANSI/AWWA Designation A 21.4/C-104.

Ductile iron pipe used for sanitary force main shall be Class 52.

2. Reinforced Concrete Pipe

Reinforced concrete pipe shall conform to the requirements of latest ASTM Designation C-76. Concrete pipe strength required shall be dependent on method of installation and depth of trench and shall be in accordance with the manufacturer's recommendation. Three (3)-edge bearing method tests for crushing strength shall be made as required by latest ASTM Designation C-76.

Joints shall conform to the latest requirements of ASTM Designation C-361.

All pipe and fittings shall receive, if required, protective lining consisting of two (2) shop coats of asphaltic paint equal to Inertol No. 49 as manufactured by Inertol Company, Inc. The total dry film thickness shall not be less than four (4) mils.

3. Plastic Pipe - PVC

Plastic pipe and fittings shall be polyvinyl chloride bell and plain end sewer pipe equal to that manufactured by CertainTeed Corporation. Plastic pipe and fittings shall conform to ASTM D3034 latest revision, with a wall thickness designation of SDR-35 (minimum) or shall conform to ASTM F679, F789, F794, or F949 with a designated pipe stiffness of PS-46. The average internal diameter shall be no less than the nominal diameter.

The plastic material from which the pipe and fittings are extruded shall be Class 12454-B in accordance with Specifications for Rigid Polyvinyl Chloride Compounds and chlorinated Polyvinyl Chloride Compounds, ASTM Designation D-1784, latest edition.

The pipe shall be capable of carrying a trench load equal to twenty-five feet (25') of cover. Under conditions of maximum cover, the pipe shall be adequate to maintain a factor of safety of two (2) against collapse.

Pipe joints shall be of the bell and spigot type conforming to latest ASTM F-477 and D-3212. Gaskets shall be lubricated with a product purchased from the pipe manufacturer.

Polyvinyl chloride pipe used for sanitary force main shall meet the requirements and standards set forth by AWWA C900 Class 200 for PVC pressure pipe.

4. High-Density Polyethylene (HDPE) Pipe

Pipe shall be manufactured from a PE 3408 resin listed with the Plastic Pipe Institute (PPI) as TR-4. The resin material shall meet the specifications of ASTM D3350-02 with a minimum cell classification of PE345464C. Pipe O.D. sizes 4" to 24" shall be available in both steel pipe sizes (IPS) and ductile iron pipe sizes (DIPS). Pipe O.D. sizes 26" to 54" shall be available in steel pipe sizes (IPS). Pipe shall have a manufacturing standard

of ASTM D3035 and be manufactured by an ISO 9001 certified manufacturer. The pipe shall contain no recycled compounds except those generated in the manufacturer's own plant from resin of the same specification from the same raw material. The pipe shall be homogeneous throughout and free of visible cracks, holes, foreign inclusions, voids, or other injurious defects.

Butt fusion fittings shall be in accordance with ASTM D3261 and shall be manufactured by injection molding, a combination of extrusion and machining, or fabricated from HDPE pipe conforming to this specification. All fittings shall be pressure rated to provide a working pressure rating no less than that of the pipe. Fabricated fittings shall be manufactured using a McElroy Datalogger to record fusion pressure and temperature. A graphic representation of the temperature and pressure data for all fusion joints made producing fittings shall be maintained as part of the quality control. The fitting shall be homogeneous throughout and free of visible cracks, holes, foreign inclusions, voids, or other injurious defects.

Electrofusion Fittings shall be PE3408 HDPE, Cell Classification of 345464C as determined by ASTM D3350-02 and be the same base resin as the pipe. Electrofusion Fittings shall have a manufacturing standard of ASTM F1055.

FLANGED AND MECHANICAL JOINT ADAPTERS: Flanged and Mechanical Joint Adapters shall be PE 3408 HDPE, Cell Classification of 345464C as determined by ASTM D3350-02 and be the same base resin as the pipe. Flanged and mechanical joint adapters shall have a manufacturing standard of ASTM D3216. All adapters shall be pressure rated to provide a working pressure rating no less than that of the pipe.

Mechanical restraint for HDPE may be provided by mechanical means separate from the mechanical joint gasket sealing gland. The restrainer shall provide wide, supportive contact around the full circumference of the pipe and be equal to the listed widths. Means of restraint shall be machined serrations on the inside surface of the restrainer equal to or greater than the listed serrations per inch and width. Loading of the restrainer shall be by a ductile iron follower that provides even circumferential loading over the entire restrainer. Design shall be such that restraint shall be increased with increases in line pressure.

Serrated restrainer shall be ductile iron ASTM A536-80 with a ductile iron follower; bolts and nuts shall be corrosive resistant, high strength alloy steel.

The restrainer shall have a pressure rating of, or equal to that of the pipe on which it is used or 150 PSI whichever is lesser. Restrainers shall be JCM Industries, Sur-Grip or approved equal.

Nominal Size	Restraint Width	Serrations per inch
4", 6"	1-1/2"	8
8" 10 & 12"	1-3/4"	8

Pipe stiffeners shall be used in conjunction with restrainers. The pipe stiffeners shall be designed to support the interior wall of the HDPE. The stiffeners shall support the pipe's end and control the "necking down" reaction to the pressure applied during normal installation. The pipe stiffeners shall be formed of 304 or 316 stainless steel to the HDPE manufacturers published average inside diameter of the specific size and DR of the HDPE. Stiffeners shall be by JCM Industries or approved equal.

5. Pipe Laying and Installation

All pipe and fittings shall be installed to the lines and elevations shown or ordered, and in accordance with the manufacturer's recommendations.

Suitable tools and equipment shall be used for proper handling, storing, and laying pipe, lifting hooks or bars shall not be inserted therein. Each pipe and fitting shall be checked for defects and injuries as laying proceeds. Imperfect pipe materials shall be rejected and removed from the work. Pipe found to be defective after laying shall be removed and replaced by undamaged material.

The interior of all pipe shall be cleaned of dirt, and other deleterious materials, and kept clean, as the next section of pipe is laid. During the progress of the work, the exposed ends of the pipes shall be provided with approved temporary covers fitted to the pipe, in order to prevent material from entering the pipe.

Where pipe must be cut to fit as closing pieces, such cuts shall be evenly and squarely made in a workmanlike manner with approved equipment. Injury to linings or coatings shall be satisfactorily repaired.

Where mechanical joint, Tyton, or Ring-Tite fittings are used, the Applicant shall furnish and install concrete thrust blocks, tie rods or other approved means for preventing movement. Joints must be thoroughly brushed with a wire brush to remove all loose rust or foreign material. Soapy water must be brushed over the joint surfaces and over the gasket. Bolts shall be tightened uniformly, using only torque-limiting wrenches to avoid over-stressing the bolts. Boltheads, nuts, and other unpainted surfaces shall be coated with two (2) heavy applications of black asphaltum varnish.

For HDPE pipe installation, the following techniques shall be followed:

1) Butt-Fusion - Sections of polyethylene pipe shall be joined into continuous lengths on the jobsite above ground. The joining method shall be the butt fusion method and shall be performed in strict accordance with the pipe manufacturer's recommendations. The butt fusion equipment used in the joining procedures should be capable of meeting all conditions recommended by the pipe manufacturer, including, but not limited to, temperature requirements of 400 degrees Fahrenheit, alignment, and an interfacial fusion pressure of 75 PSI. The butt fusion joining will produce a joint weld strength equal to or greater than the tensile strength of the pipe itself. All field welds shall be made with fusion equipment equipped with a McElroy Data Logger. Temperature, fusion pressure and a graphic representation of the fusion cycle shall be part of the quality control records.

2) Sidewall Fusion - Sidewall fusions for connections to outlet piping shall be performed in accordance with HDPE pipe and fitting manufacturer's specifications. The heating irons used for sidewall fusion shall have an inside diameter equal to the outside diameter of the HDPE pipe being fused. The size of the heating iron shall be ¼ inch larger than the size of the outlet branch being fused.

3) Mechanical - Bolted joining may be used where the butt fusion method cannot be used. Flange joining will be accomplished by using a HDPE flange adapter with a ductile iron back-up ring. Mechanical joint joining shall be accomplished using either a molded mechanical joint adapter or the combination of a Sur-Grip Restrainer and Pipe Stiffener as manufactured by JCM Industries, Inc. Either mechanical joint joining method shall have a ductile iron mechanical joint gland.

4) Other - Socket fusion, hot gas fusion, threading, solvents, and epoxies shall not be used to join HDPE pipe.

All pipe shall be laid on a layer of foundation material in accordance with approved details. Where concrete cradles are used to support the pipe, foundation material will not be required. No solid blocking will be permitted under pipe. Joints shall be made in accordance with the recommendations of the manufacturer, and shall be watertight.

6. Testing

(a) Low Pressure Air Test for Gravity Mains

After completing backfill of a section of wastewater line, the Applicant shall, at its expense, conduct a Line Acceptance Test using low pressure air. The Applicant shall furnish all labor, material and equipment necessary for the testing. The test shall conform

to the Uni-Bell Plastic Pipe Association Recommended Practice UNI-B-6, "Low Pressure Air Testing of Installed Sewer Pipe."

All pneumatic plugs shall be seal tested before being used in the actual test installation. One length of pipe shall be laid on the ground and sealed at both ends with the pneumatic plugs to be checked. Air shall be introduced into the plugs to 25 PSIG. The sealed pipe shall be pressurized to 5 PSIG. The plugs shall hold against this pressure without bracing and without movement of the plugs out of the pipe.

After a manhole to manhole reach of pipe has been backfilled and cleaned, and the pneumatic plugs are checked by the above procedure, the plugs shall be placed in the line at each manhole and inflated to 25 PSIG. Low pressure air shall be introduced into this sealed line until the internal air pressure reaches 4 PSIG greater than the average back pressure of any groundwater that may be over the pipe. At least two minutes shall be allowed for the air pressure to stabilize.

After the stabilization period (3.5 PSIG minimum pressure in the pipe) the air hose from the control panel to the air supply shall be disconnected. The portion of line being tested shall be termed "Acceptable" if the elapsed time in minutes for the pressure to decrease from 3.5 to 2.5 PSIG (greater than the average back pressure of any groundwater that may be over the pipe) is equal to or greater than the time shown in the referenced Recommended Practice UNI-B-6, "Low Pressure Air Testing of Installed Sewer Pipe" as shown in Table 1 taken from the UNI-B-6 specification.

In areas where groundwater is known to exist, the Applicant shall install a one-half inch diameter capped pipe nipple, approximately 10" long, through the manhole wall on top of one of the sewer lines entering the manhole. This shall be done at the time the sewer line is installed. Immediately prior to the performance of the Line Acceptance Test, the groundwater level shall be determined by removing the pipe cap, blowing air through the pipe nipple into the ground so as to clear it, and then connecting a clear plastic tube to the nipple. The hose shall be held vertically and a measurement of the height in feet of water over the invert of the pipe shall be taken after the water has stopped rising in this plastic tube. The height in feet shall be divided by 2.3 to establish the required air pressure in the sewer for the air test. (For example, if the height of water is 11-1/2 feet, then the additional air pressure required due to the presence of groundwater will be 5 PSIG. This increases the test pressure from 3.5 PSIG to 8.5 PSIG. The allowable drop of one pound and the timing remain the same.)

If the sewer line fails the air test, the Applicant shall, at its own expense, determine the source of leakage and shall then repair or replace all defective materials and/or workmanship.

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TABLE 1

MINIMUM SPECIFIED TIME REQUIRED FOR A 1.0 PSIG PRESSURE DROP FOR SIZE AND LENGTH OF PIPE INDICATED FOR Q = 0.0015

1 Pipe Diameter (in.)	2 Minimum Time (min:sec)	3 Length for Minimum Time (ft.)	4 Time for Longer Length (sec)	Specification Time for Length (L) Shown (min:sec)							
				100 ft	150 ft	200 ft	250 ft	300 ft	350 ft	400 ft	450 ft
4	3:46	597	.380 L	3:46	3:46	3:46	3:46	3:46	3:46	3:46	3:46
6	5:40	398	.854 L	5:40	5:40	5:40	5:40	5:40	5:40	5:42	6:24
8	7:34	298	1.520 L	7:34	7:34	7:34	7:34	7:36	8:52	10:08	11:24
10	9:26	239	2.374 L	9:26	9:26	9:26	9:53	11:52	13:51	15:49	17:48
12	11:20	199	3.418 L	11:20	11:20	11:24	14:15	17:05	19:56	22:47	25:38
15	14:10	159	5.342 L	14:10	14:10	17:48	22:15	26:42	31:09	35:36	40:04
18	17:00	133	7.692 L	17:00	19:13	25:38	32:03	38:27	44:52	51:16	57:41
21	19:50	114	10.470 L	19:50	26:10	34:54	43:37	52:21	61:00	69:48	78:31
24	22:40	99	13.674 L	22:47	34:11	45:34	56:58	68:22	79:46	91:10	102:33
27	25:30	88	17.306 L	28:51	43:16	57:41	72:07	86:32	100:57	115:22	129:48
30	28:20	80	21.366 L	35:37	53:25	71:13	89:02	106:50	124:38	142:26	160:15
33	31:10	72	25.852 L	43:05	64:38	86:10	107:43	129:16	150:43	172:21	193:53
36	34:00	66	30.768 L	51:17	76:55	102:34	128:12	153:50	179:29	205:07	230:46
42	39:48	57	41.883 L	69:48	104:42	139:37	174:30	209:24	244:19	279:13	314:07
48	45:34	50	54.705 L	91:10	136:45	182:21	227:55	273:31	319:06	364:42	410:17
54	51:02	44	69.236 L	115:24	173:05	230:47	288:29	346:11	403:53	461:34	519:16
60	56:40	40	85.486 L	142:28	213:41	284:55	356:09	427:23	498:37	569:50	641:04

Note: If there has been no leakage (zero psig drop) after one hour of testing, the test section shall be accepted and the test complete.

Source: Uni-Bell Plastic Pipe Association Recommended Practice UNI-B-6, "Low Pressure Air Testing of Installed Sewer Pipe."

(b) Testing for Vertical Deflection in Gravity Mains

All sanitary sewers from manhole to manhole shall be lamped for alignment. The Applicant's contractor shall pass a device through the pipe that will check for excessive vertical deflection. A pipe that has deflected more than 7% of its diameter has deflected excessively. The test shall be conducted a minimum of thirty (30) days after installation and only after all other utilities have been installed above the sanitary sewer and at a minimum the base course of the road has been laid.

The deflection device or mandrel for checking the deflection shall be provided by the Applicant's contractor. Details of the deflection device or mandrel shall be submitted to the WMUA's engineer for approval, prior to its use and shall be fabricated and based on the following table:

Pipe Size	Mandrel Size (in.)	I.D. (in.)	O.D. (in.)
8"	7.48	7.92	8.400
10"	9.40	9.90	10.500
12"	11.19	11.78	12.500
15"	13.70	14.42	15.000
18"	16.53	17.62	18.701
21"	19.60	20.78	22.047
24"	22.21	23.38	24.803

The deflection device shall be pulled through the sanitary sewer pipe using only the force of one (1) man without the aid of any devices other than the rope/chain attached to the deflection device.

Should any test section of the pipe fail to meet the testing criteria, the Applicant's contractor shall, at his own expense, locate and replace defective pipe section until specified criteria are met.

(c) Infiltration and Exfiltration Test

With approval of the WMUA Engineer, an Infiltration/Inflow test may be used in lieu of the low pressure air test. Upon completion of the sewer and manholes, and other appurtenances, the Applicant shall dewater the sewer and conduct a satisfactory test to measure infiltration for at least 24 hours. The Applicant shall construct such weirs or means of measurement as required to enable proper infiltration testing. The rate of infiltration shall not exceed 100 gallons per mile of sewer per 24 hours per inch diameter

of sewer. There shall be no gushing or spurting streams entering the sewer. The Applicant shall be held responsible for the satisfactory watertightness of the line and shall effect repairs to ensure same and then shall make additional tests of the infiltration until same conforms to the requirements given herein.

The tests shall be conducted on lengths of sewers of not to exceed 2,000 linear feet, unless otherwise determined by the WMUA Engineer. The rate of infiltration for each section shall not exceed the unit rates given above.

In the event that the groundwater level is lower than the top of the pipe, an exfiltration test shall be substituted for the infiltration test. It is the Applicant's responsibility to determine the groundwater elevations at the time of testing. Same can be accomplished by means of sight tubes within the manhole.

The exfiltration test shall be conducted between manholes. The pipe shall be filled with clean water and additional water introduced to raise the level two feet above the top of the pipe in the upstream manhole. The Applicant shall furnish all water required for exfiltration tests. The quantity of water to maintain this level is to be measured. The test shall be maintained for a four (4) hour period. The rate of exfiltration shall not exceed one-hundred (100) gallons per inch of pipe diameter per mile of sewer per twenty-four hours. The Applicant shall be held responsible for the satisfactory watertightness of the line and shall satisfactorily repair all joints or other parts not sufficiently watertight, and then shall make additional tests of the exfiltration, until the exfiltration conforms to the requirement given herein.

(d) Testing of Ductile Iron Force Mains

Pressure pipe shall be hydrostatically tested in accordance with latest AWWA Standard C-600, Section 4. All necessary plugs, caps or valves for testing shall be installed and suitably braced. The pipe shall be slowly filled with water and all air exhausted. After the pipe is entirely filled with water, the pressure shall be slowly increased to 150% of the operating pressure at the point of testing, but not less than 125% of the normal operating pressure at the highest point. The pressure shall be maintained at test pressure for two (2) hours, with leakage and pressure measurement made continuously during this time period. Any make-up water used shall be measured and the amount recorded. The Applicant shall supply outlets, valves, to make provision for expelling all air from the pipe prior to test. No installation will be accepted if the leakage is greater than that determined by the following formula:

$$L = \frac{SD\sqrt{P}}{133{,}200}$$

Where: L = Allowable leakage, in gallons per hour
S= Length of pipe tested, in feet
D= Nominal diameter of the pipe, in inches
P= Average test pressure during leakage test, in psi (gauge).

If the pressure cannot be maintained without the addition of excessive water, the leak or leaks shall be located and repaired. The hydrostatic test shall be repeated until leakage within the specified limit is achieved. All exposed pipe shall be thoroughly inspected during the test and any source of visible leakage, cracked or defective pipe or fittings replaced.

After leaks are repaired, the trench shall be backfilled. The Applicant shall make provisions for supplying water for the test.

All water from hydrostatic testing shall be disposed of by a method to be submitted to and approved by the WMUA Engineer.

(e) Testing of PVC Force Mains

PVC pressure pipe shall be hydrostatically tested in accordance with latest AWWA C-605 standards. All necessary plugs, caps or valves for testing shall be installed and suitably braced. The pipe shall be slowly filled with water and all air exhausted. After the pipe is entirely filled with water, the pressure shall be slowly increased to 150% of the operating pressure at the point of test, but not less than 125% of the normal operating pressure at the highest point. The pressure shall be maintained at test pressure for two (2) hours, with leakage and pressure measurement made continuously during this time period. Any make-up water used shall be measured and the amount recorded. The Applicant shall supply outlets, valves, to make provision for expelling all air from the pipe prior to test.

No installation will be accepted if the leakage is greater than that determined by the following formula:

$$L = \frac{ND\sqrt{P}}{7{,}400}$$

Where: L = Allowable leakage, in gallons per hour
N= Number of Joints in the length of pipeline tested
D= Nominal diameter of the pipe, in inches
P= Average test pressure during leakage test, in psi.

If the pressure cannot be maintained without the addition of excessive water, the leak or leaks shall be located and repaired. The hydrostatic test shall be repeated until leakage within the specified limit is achieved. All exposed pipe shall be thoroughly inspected during the test and any source of visible leakage, cracked or defective pipe or fittings replaced.

After leaks are repaired, the trench shall be backfilled. The Applicant shall make provisions for supplying water for the test.

All water from hydrostatic testing shall be disposed of by a method to be submitted to and approved by the WMUA Engineer.

(f) Testing of HDPE Force Mains

Gravity flow pipelines shall be tested to the requirements and specifications of ASTM F 1473. For continuous pressure systems where test pressure limiting components or devices have been isolated, or removed, or are not present in the test section, the maximum allowable test pressure is 1.5 times the system design pressure at the lowest elevation in the section under test. If the test pressure limiting device or component cannot be removed or isolated, then the limiting section or system test pressure is the maximum allowable test pressure for that device or component. For any test pressure between 1.0 and 1.5 times the system design pressure, the total test time including initial pressurization, initial expansion, and time at test pressure shall not exceed eight (8) hours.

(g) Video Inspection

Prior to release of the performance guarantee, the WMUA, at the discretion of the Commissioners and WMUA Engineer, may require all sanitary sewer mains to be flushed jetted, or otherwise cleaned, then inspected by TV cameras with VHS videotape or DVD discs provided to the WMUA. Said jetting and TV inspection will be witnessed by the WMUA Engineer or its representative and work shall be performed by a contractor specializing in said work according to generally acceptable standards. Additionally, a mandrel test shall be performed on all gravity lines installed by the Applicant as part of the Development to show that these gravity lines have not deflected. The cost associated with the TV inspection and the pulling of a mandrel through the installed gravity lines shall be determined by the WMUA and be borne by the Applicant.

C. *Manholes*

Manhole barrels shall be a minimum of four (4) feet in diameter when serving sewers 24-inches or less in diameter, and shall be a minimum of five (5) feet in diameter when serving sewers greater than 24-inches in diameter.

Manholes shall be precast concrete or concrete block. Precast concrete riser sections, bases, manhole cones or flat slab tops, shall conform to latest ASTM Designation C-478. Where manholes are precast, the base and first section shall be monolithically cast. Excavation and earthwork shall be as previously specified.

For all manholes, the Riser-Wrap® Heat-Shrink & Sealing System as manufactured by Pipeline Seal & Insulator, Inc. shall be provided. The Riser-Wrap shall be installed as per the manufactures requirements.

Concrete block shall be coated with two (2) coats of Portland cement mortar. Precast concrete or concrete block shall be sealed with two (2) coats of acceptable waterproofing tar, asphalt, polyplastic alloy, or epoxy paint.

Rubber "O" ring gaskets for joints shall conform to the requirements for rubber gaskets, as specified under the latest ASTM Designation C-443, and shall be made with round rubber gaskets and shall be installed in accordance with the manufacturer's recommendations. Joints shall be watertight.

Special details are provided on the Construction Detail Sheets for drop manholes with invert differences exceeding two feet (2') and for shallow manholes where the grade-to-invert depth is less than six feet, (6').

The channels of all manholes shall be formed to the same size and shape as the pipes they connect to, or as ordered. Changes in diameter shall be made gradually and evenly. Special care shall be taken to form channels that will provide the best hydraulic conditions for smooth flow; steel trowel finish shall be provided. Slopes shall be provided on the benches adjacent to the channels, or as ordered.

Manholes, prior to being placed in final location, shall have cast-in place flexible rubber manhole sleeve or boot for jointing sewer pipe to the manhole. PVC pipe to manhole seal shall be by a rubber gasket conforming to latest ASTM C-443, cast integrally in manhole wall. Gasket shall be "A-lok" rubber gasket, as manufactured by A-lok Corporation, or approved equal. Connection of PVC pipe to manhole by grouting shall not be permitted.

A flexible joint shall be placed within four feet (4') of the manhole wall, as shown on the construction detail sheets.

Between manholes, pipe shall be straight and at uniform grade. Spacing shall not exceed 400 feet.

1. Manhole Appurtenances

Manhole frames and covers shall be of the best quality close-drained gray iron casting conforming to the requirements of latest ASTM Designation A 48, Class 30B.

Frames and covers shall be machined to insure a non-clattering fit. Manhole frames shall be set to grade on a full bed of mortar. The castings shall be free from faults, sponginess, cracks, blowholes, and other defects affecting their strength.

Standard manhole frame and cover shall be Campbell Foundry Company Pattern No. 1203B with flow seal gasket.

Locking type frame and cover Campbell Foundry Company, Pattern No. 1487 with a flat neoprene gasket shall be provided on manholes located in easements. A watertight manhole frame and cover shall be used on manholes located within the 100 year flood boundary or in areas subject to street or surface flooding. Frame and cover shall be Pattern No. 6545 with a flat neoprene gasket as manufactured by Campbell Foundry Company. Cover shall be provided with non-penetrating pick holes.

At manholes located in easement areas frames shall be bolted to cone section of manhole.

Aluminum manhole rungs shall be extruded alloy of the step drop front design, equal to the Aluminum Company of America, Type 6061-T6. The rungs shall be installed in line vertically at twelve inch (12") vertical spacing.

Manhole rungs may also be constructed of copolymer polypropylene plastic with steel reinforcement equal to that manufactured by M.A. Industries, Inc., Peachtree City, GA.

2. Painting

Two (2) coats of asphaltic paint, Inertol No. 49, or equal shall be applied to the exterior of manholes. The total dry film thickness shall be not less than four (4) mils. Epoxy coatings provided by the manufacturer may be substituted for the asphaltic paint. The coatings shall be applied in accordance with the manufacturer's recommendations.

3. Existing Manhole Connection

Connections to existing manholes shall be made by coring an opening in the manhole wall with an approved core drilling machine. A flexible connector shall be installed in the cored opening. The connector shall be as manufactured by Link - Seal, or an approved equal. Channels shall be chipped and roughened, and then finished with cement mortar to provide the best hydraulic conditions for smooth flow. The existing manhole shall be rehabilitated by a cleaning and applying a water proofing system. The waterproofing shall consist of two (2) coats of "Sikagard 62" epoxy coating, manufactured by Sika Corporation, USA.

D. *Building Connections*

The WMUA's jurisdiction over sewer connections shall extend to the cleanout in any location acceptable to the WMUA. Connections from the cleanout to the building shall meet the applicable plumbing code.

1. Laterals

From the street sanitary sewer to the curb, the Applicant has the option of furnishing the following types of house connections:

1) 4 Inch (4") PVC pipe, minimum thickness of 0.180 inches (0.180")

2) 4 Inch (4") ductile iron pipe

Wye connections shall be used at the junction of the house connection and street sanitary sewer. Watertight plugs or caps shall be furnished at all dead ends. Plastic plugs will not be allowed unless mechanically fastened so as to permit infiltration/exfiltration tests.

Bends in house connection lines shall be made using standard fittings. A riser with cleanout at grade shall be used at the point terminating WMUA jurisdiction.

The Applicant shall mark the location of the end of each house connection in a suitable and approved permanent manner. Exact location and depth, referenced to a permanent marker shall be shown on as-built drawings for any temporary dead ends. Each location shall be checked by the WMUA's Engineer, and the final as-built drawings shall be submitted to the WMUA's Engineer for approval prior to final acceptance.

At locations where centerline of the house connection at the sewer main would be more than ten feet (10') below the surface, Applicant shall install deep house connection. Deep house connections shall be constructed in accordance with Standard Construction Details.

In the event a connection is proposed to one of the WMUA's Interceptor lines (greater than ten inches (10") in diameter), the connection shall be reviewed and approved by the WMUA Engineer. Additionally, before construction begins, the Applicant requesting the connection shall post a two (2) year maintenance bond for the connection into the Interceptor line in the amount of 15% of the total estimated cost of improvements for the project in a form acceptable to the WMUA Attorney.

No individual house connections shall be installed into an existing WMUA owned force main.

No gravity laterals shall be connected to any WMUA force mains.

No more than one (1) individual house connection shall be allowed into an existing WMUA owned manhole.

In the event that a proposed building requires the installation of a single ejector pump system to pump sewage up to an elevation that allows a connection into an existing or proposed gravity sanitary sewer, the force main for the ejector system shall terminate into a cleanout structure located one-foot (1') behind the curb such as a conventional connection. Flow from this point will be conveyed via a four inch (4") or six inch (6") diameter lateral to the sewer main located in the street or easement.

(a) Disconnection of Existing Lateral

When an Applicant proposes to disconnect an existing lateral connection from the WMUA's collection system, it shall first give the WMUA written notice. The WMUA shall have a WMUA employee present to inspect the disconnection, which shall terminate one foot (1') behind the curb. For the existing lateral connections to be properly abandoned, the Applicant or his contractor shall provide a cap that renders the remaining branch connection watertight. Any future re-connection into the WMUA's collection system shall conform to the current Rules and Regulations of the WMUA.

2. Cleanouts

PVC cleanout assembly shall be a minimum of Schedule 40 with solvent weld joints. Solvent cement used in PVC cleanouts shall conform to ASTM D 2564, latest addition. There shall be a transition coupling, as shown on the detail, between the SDR 35 lateral piping and the cleanout assembly. The use of a flexible adaptor for the transition coupling (Fernco) is prohibited. The cleanout plug shall be installed with non-setting pipe dope to facilitate testing and future removal of the plug.

In the event a sewer lateral and cleanout are located within an easement, the cleanout shall be located two feet (2') within the boundary of the easement and shall be provided with a monument box, Campbell pattern 4155 or approved equal.

E. *Special Structures*

Information on treatment plants, stream crossings or other special structures shall be submitted for approval in preliminary form, before detailed drawings are prepared, or equipment is ordered. Grease traps, sand traps or other special appurtenances may be required for special conditions. Advance approval of the New Jersey Department of Environmental Protection may be required.

1. Grease Traps/Interceptors

Grease, oil and sand interceptors (grease traps/interceptors) shall be provided when, in the opinion of the WMUA, they are necessary for the proper handling of liquid wastes containing grease in excessive amounts, or any flammable wastes, sand, or other ingredients harmful to or which result in increased operation and maintenance costs of the WMUA's sewage collection system or treatment plant facilities. When grease traps/interceptors are required by the WMUA, Applicants are required to bear additional responsibilities. Grease Traps/Interceptors must be used accordingly as required in this Section and Section 8(B) of the Rules and Regulations. Applicants shall pay a fee to the WMUA for each Grease Trap/Interceptor based on its size, type, and design as set forth in the Grease Traps/Interceptors Schedule (Section 9(B)).

The size and type of each Grease Trap/Interceptor shall be based on the expected volume and rate of discharge from each individual facility required to install such unit under these regulations. The design (size and type) of interceptors shall be in accordance with current edition of the National Plumbing Code Standards and shall be subject to approval from the WMUA.

Where applicable, as determined by WMUA, a water flow control device shall be installed along with the interceptor to ensure the capacity of the interceptor is not exceeded.

Grease Traps/Interceptors shall be installed in locations outside of the proposed facility that allow for the best operation (effectiveness) and are accessible for maintenance.

Interceptors shall be located to receive only wastewater containing harmful ingredients (i.e., grease, sand, oil, etc.) and shall be positioned so that the temperature of the wastewater is reduced to the maximum extent possible prior to discharge to the unit. No sanitary facilities shall be connected to the interceptors. Additionally, a sampling port shall be installed along the buildings lateral upstream of the downstream manhole or connection. A copy of the Operation and Maintenance manual for all grease traps/interceptors shall be submitted to the WMUA after approved by the municipality's plumbing code official.

(a) Maintenance Requirements for Grease Traps/Interceptors

Grease Traps/Interceptors shall be maintained in efficient operating condition by regular removal of accumulated grease, scum, oil, or other floating substances, and solids deposited on a scheduled determined by WMUA.

Owners or operators of the premises where grease traps/interceptors are located shall clean and maintain said grease trap/interceptor system in accordance with these Rules and Regulations. As a condition to Approval, Applicant shall provide proof, upon request by the WMUA, that the grease traps/interceptors are being maintained. Furthermore, grease traps/interceptors may be inspected without notice by the WMUA not less than twice annually. All maintenance and repair records shall be posted on the premises and available at all times to WMUA personnel. In addition, the WMUA may provide educational pamphlets and/or materials to Applicants.

F. *Pumping Station(s) and Force Mains*

The WMUA Engineer shall determine the appropriate collection system to be installed.

1. Pumping Station(s) Overview

Pumping station(s) may be of the dry well type or of the submersible pump type.

All raw sewage shall be screened before pumping. Comminutors may be approved in lieu of screens and shall be provided with acceptable by-pass.

A minimum of two (2) pumps shall be installed, each capable of handling the total peak flow for a minimum ten (10) year period. A third identical pump, or its cash equivalent as determined by the WMUA Engineer, shall be provided to the WMUA at its discretion and direction as a spare unit. If more than two pumps are used, their capacities shall be such that upon the failure of the largest pump, the remaining pumps will be capable of handling the peak flows. All pumps and equipment shall be constructed of materials that are compatible with design conditions, including explosion-proof and damp-proof construction where required and as determined by the WMUA Engineer. Shut off valves shall be provided on suction and discharge piping, and shall be flanged or otherwise removable. Check valves shall be provided on all discharge pipes.

Dry wells shall be deep enough to maintain a suction head at starting. The minimum internal dimensions of the dry well shall be ten feet (10') diameter by ten feet (10') high. The dry and wet wells shall be completely separate and shall be provided with adequate ventilation, lighting and drainage. Sufficient space shall be provided in the dry well for the repair and removal of pumps and motors. Where operational/maintenance duties are required in enclosed areas, forced ventilation shall be provided with a minimum capacity of 30 air changes per hour as required for intermittent ventilation. The size of the wet well shall be such that maximum pump cycle is ten minutes when flow is at the average dry weather rate. The wet well must also be large enough to allow five (5) minutes to elapse between successive pump starts. The floors of the wet well shall slope at least 45 degrees toward the pump suction. The pump suction shall terminate with a 90 degree flared elbow. The dry well shall be supplied with a sump pump, dehumidifier, heater, manlift, and pressure transducer for flow control. All steel pumping stations shall be provided with acceptable cathodic protection.

Submersible pumps shall be installed directly in the wet well. The design of the wet well shall be the same as in the dry well pumping station. Pumps shall be equipped with a guide rail pipe and lifting chain and winch system and ample size access floor doors to permit quick removal and reinstallation of the pumps for service and repair.

An auxiliary source of power shall be provided for electrically driven pumps. The auxiliary power shall be diesel or natural gas operated and shall be housed in a superstructure to conform to the neighborhood architecture. All diesel operated facilities shall be supplied with sufficient fuel storage for a twenty-four (24) hour operating period. Diesel fuel storage shall be stored aboveground.

All pumping stations shall be located in areas that are not subject to flooding and that are accessible by motor vehicle. Each pumping station must be on a lot or easement meeting minimum standards of applicable Municipal, County, State agencies, and the WMUA. The plans and specifications must include provisions for lawns, shrubbery, eight inch (8") thick paved drive and four inch (4") thick concrete walk. Proper drainage shall be provided on-site preventing any drainage across the access driveway that may result in ponding or freezing. The entire property must be surrounded by an eight (8) foot vinyl coated chain link fence with an entrance at least fifteen feet (15') in width.

In dry well pumping station(s) exceeding 1,000 gallons per minute, electrical motors and power equipment shall not be installed in subsurface chambers. The wall between the wet well and dry well shall extend to ground level and equipment shall be housed above ground. Superstructure shall conform to the neighborhood architecture and shall be vandal-proof.

The pumping station shall be provided with an alarm system compatible with the WMUA's existing Mission Monitoring System. The performance specification for this system can be obtained from the WMUA.

Adequate light, ventilation, heat, and fresh water supply with hose outlets shall be provided for all stations. No connections between freshwater and sewage pumps or pipes are permitted. Potable water supply shall be protected by an approved reduced pressure backflow prevention device.

Complete repair tools and accessories, or their cash equivalent as determined by the WMUA Engineer, shall be provided with the pumping station at the WMUA's discretion and direction. In the event that the WMUA requires repair tools and accessories (as opposed to their cash equivalent), such tools and accessories shall be capable of lasting for a period of not less than fifteen (15) years and shall include, but not be limited to, the following:

- Spare pump
- Pump parts for each size and type of pump:
    - Impeller
    - Seals and gaskets
    - Bearings
    - Wear rings
    - Hoisting cable
- Grinder parts
    - Motor
    - Cutters
    - Drive coupling and two inserts
- Sliding screen (used when grinder out for service)
- Level controller
- Fuses and indicator lights

Force main velocities shall be two feet per second (2 fps) minimum at the average pumping rate. Properly designed air release valves shall be provided on high points of the force main. The force main shall be provided with acceptable cleanout manholes.

Detailed operational costs of the pumping station must be submitted with the Applicant's Engineer's estimate.

The WMUA Engineer's review shall be limited to establishing that the design of the pumping station/force main submitted by the Applicant for review conforms to the minimum requirements of the WMUA as embodied in these Rules and Regulations. Problems encountered by the Applicant during the construction of any approved pumping station/force main shall be addressed by the Applicant's Engineer with any proposed modifications submitted to the WMUA Engineer for review and approval prior to their implementation.

2. Pumping Station Design Standards

Additional pumping station and force main design standards and data required to be submitted to the WMUA for review are provided below:

(a) General

1) Provide pump design report in accordance with NJDEP Statutes and/or Regulations, including, but not limited to, the following:

Average and peak flow
Potential future flow
Force main sizing
Static head, friction head, Total Dynamic Head (TDH)
System curve
Pump selection
Wet well sizing
Cycle time
Proposed on/off levels
Anti-flotation calculations
Structural calculations for manhole top slab
Odor control design

2) Provide soils information/report to include a full geotechnical report and analysis, foundation recommendations, expected ground water conditions, water table depths and seasonal high water depths.

3) Provide required OSHA safety and warning signage.

4) Pumping stations to be taken over and operated by the WMUA are to be on lot(s) owned by WMUA (fee simple title).

5) Prior to WMUA assuming responsibility for operation and maintenance, the following must be completed or supplied:

- Administrative requirements as outlined in WMUA Rules and Regulations
- Pumping station must operate successfully during the ninety (90) day trial period as outlined in Section 3(E)(7)
- Four (4) copies of O&M Manual (see outline) and as-builts (2 paper copies, 1 mylar)
- Testing of all equipment in presence of WMUA Engineer
- Instruction for operation and maintenance of all equipment in presence of WMUA personnel. Four (4) hours minimum training required. Scheduling of instruction shall be coordinated through the WMUA Engineer at least five (5) days prior to scheduled training date. Training shall not be performed the same day as the startup and testing of the station. Applicant is responsible for providing a schedule of training at least 48 hours in advance.

- Certification of the Backflow preventor which is to occur during the 90-day trial operation by the WMUA. The Applicant will be responsible for all costs related to this certification.

- Spare units, or their cash equivalent as determined by the WMUA Engineer, according to Section 7.F.1.

(b) Mechanical

1) Pumps may be dry pit or submersible and shall be capable of passing a 3 inch (3") solid. Impellers shall be epoxy coated.

2) Valve pit required to house force main discharge valves; provide appropriate drainage of pit. The valve pit shall be sufficiently sized to provide access for routine maintenance.

3) Gate valves shall be resilient seat type.

4) Provide pumping station by-pass connection in the manhole or in valve pit. Connection to include gate valve and blind flange.

5) Provide pressure gauge on pump discharge. Helicoid Gage Division of Bristol Babcock, Inc. – stainless steel; Zavoda Manufacturing Company – stainless steel diaphragm, seals, body, and hardware.

6) For pumping stations with a capacity greater than 250 GPM (Gallons per minute) - a magnetic flow meter with isolation valves shall be provided (Fischer and Porter or approved equal). Remote circular chart, totalizer must be provided by the same manufacturer.

7) Screening shall be by:

   - Stainless Steel trash basket up to 249 GPM pumps.
   - Comminutor over 250 GPM pumps.

8) Where odor control is required, provide for Bioxide injection at the wet well. Emergency eyewash and shower required when Bioxide is used. Bioxide spillage containment shall be provided.

9) Brackets, chains, etc., in wet well shall be stainless steel.

10) Provide davit at wet well, comminutor, and valve pit for equipment removal (Thern Model 5124E4 davit crane with electric wench with Model 524 Pedestal Base and WS25-zone SS wire rope and hook). Length of rope shall be sufficiently sized to lift equipment at maximum reach of davit.

11) Provide hoist at wet well and comminutor pit for personnel retrieval (DBI SALA or equal Model 3400108 winch with 8002003 davit arm, 8004032 fixed base).

12) Provide "ladder-up" device or grab bars for all underground utility structures.

All equipment shall be shown to scale on detail on design drawings. Verify working positions of cable or rope by manufacturer.

(c) Building

1) A building for generator and controls will be required.

2) A toilet will be required when flow is greater than 250 GPM or station is located in isolated area.

3) Building shall include a slop or utility sink.

4) Exterior finishes to be maintenance-free, i.e., vinyl siding, brick or decorative concrete block. Wrap any exposed wood in vinyl covered aluminum.

5) Roof shall have a minimum of 4:12 slope and utilize metal roofing shingles.

6) Concrete aprons required at all doors.

7) Potable water to site is required.

8) Provide floor drains where necessary.

9) When a Bioxide storage tank is provided indoors, the proper spill containment shall be provided around the tank with adequate floor drains. Aluminum grating shall be utilized in the containment area to allow the top of the containment curb to be flush with the top of grating.

10) A Backflow Preventor must be provided and certified acceptable by the local water company. It shall be installed according to the latest National Plumbing Code Standards. Backflow Preventor must be certified operational during the 90-day trial period of operation for the pumping station.

11) Provide non freeze hose bib or yard hydrant for washdown.

12) Provide architectural drawings, including: Floor plan, building elevations, building and/or wall sections; door, louver, lintel schedules; materials, including manufacturer and model number; interior water piping; dimensions and specifications.

(d) Electrical/Ventilation

1) Generator shall be housed in building. Generator shall be installed in a dedicated room acoustically treated as necessary to reduce noise in any other room below 80 dBA.

2) "Critical" grade muffler required, including exercise timer, incoming volt meter and ammeter.

   The installed emergency generator shall be designed with all necessary appurtenances to achieve federal, state, county and local regulatory agency requirements ordinances and standards associated emissions, measured at the exhaust stack.

   The installed emergency generator and appurtenant systems shall conform to all federal, state (N.J.A.C. 7:29), county and local regulatory agency requirements, ordinances and standards for noise, as measured at the pumping station property line with the generator operational.

   Generator shall be sized to start one pump while all others are running. Use of a day tank for fuel delivery is not acceptable.
   Maximum 20 % voltage dip

3) Storage tanks shall have secondary containment and shall be installed aboveground.

4) Calculations required:

   Generator sizing, fuel tank sizing, if applicable
   Louver sizing
   Fan sizing
   Duct sizing
   Heater sizing
   Service size
   Lighting analysis
   Fault Current Analysis

5) Forced ventilation is required for all wet wells and dry wells that are classified as a confined space. Ventilation shall occur with 30 air changes per hour intermittently or 12 air changes per hour continuously.

6) Lighting and ventilating to start automatically when hatches are open. For lighting provided within the wet well of a pumping station, a second manual switch shall be provided outside of the wet well hatch, elevated off the ground.

7) A telemetry system utilizing a Mission Control Monitoring System compatible

with existing plant system and satisfactory to the WMUA Engineer. Specifications are available from the WMUA.

8) Analog level sensor (pressure transducer) with high and low level alarms.

9) Single float emergency backup system with pump-down timer.

10) Heavy duty waterproof disconnects (knife switch), with fuses sized for the motors. One switch for each pump. Mounted atop the wet well surface slab and out of the way of the hatch opening.

11) Site lighting on a pole fixture mounted atop the wet well surface slab.

12) Security alarm for all doors and hatches.

13) Incandescent lighting shall not be used.

14) Site lighting is required (switchable with override timer and photocell).

15) Buildings shall be heated.

16) Locks shall be keyed as required by WMUA.

17) Electric services shall be 3-phase for stations with pumps larger than 3/4 HP.

18) Conduit in classified areas must be PVC coated RMC.

19) Transfer switch must have overlapping switched neutral.

20) Drawings to be provided:

One line diagram
Equipment layout (to scale)
Panel schedules
Equipment lists
Conduit layout
Alarm Riser Diagram

21) Provide non-resetable elapsed time meters for pumps and comminutors.

22) The following Alarms/Status indications are required to be reported from the pump station to the WMUA through the Mission Control Monitoring System (if applicable to design of the pump station):

- Generator Failure
- Normal Power Failure

- Pump Failure (separate alarm for each pump)
- Wetwell High Level
- Wetwell Low Level
- Security (Illegal Entry)
- Station Fire/High Temperature
- Common Alarm
- Comminutor Failure
- Control System Failure
- Flooded Pump Room
- Generator Run
- Pump Run (separate indication for each pump)

Note: Provisions shall be made to the generator such that the switch in the "off" position will generate a Generator Failure alarm.

(e) Site

1) Pumping station property shall be surrounded with 8-foot (8') high vinyl coated chain link fence with an entrance at least fifteen feet (15') in width.

2) Detailed grading and all utilities on pumping station lot shall be shown on the plans.

3) Unpaved areas to one foot outside fence shall be covered with six inches (6") of bluestone over weed control fabric.

4) Access drive shall be paved with six inch (6") base course and two-inch (2") surface course.

5) Access driveway (gate to gate) shall be sized for jet truck entry and turnaround. Utilize the AASHTO standards for a Single Unit Design Vehicle (30' long). Provide adequate space through the driveway to allow the vehicle to enter one gate and leave the other without turns or reversing.

6) Chambers to be set a minimum of six inch (6") above grade.

7) Pumping station site shall be landscaped and screened.

8) All drawings and details to be submitted to scale.

9) Property must be conveyed to the WMUA if the WMUA is to take over and operate the pump station.

(f) Force Main

1) DIP, PVC or HDPE shall be used for force mains.

2) Surface location markers and tracer wire are required. Tracer wire shall be insulated 10 gauge, 600 volt solid copper wire as manufactured by Tracer Wire Products, Inc. of Fresno, CA or approved equal.

3) When sanitary sewer force mains are installed within an easement or off the side of a roadway, its location shall be marked with flexible markers as manufactured by Flex Stake, Fort Myers, Florida or approved equal. The utility markers shall be provided in the color yellow and with labels designating the underground utility as a pressurized sewer or sanitary force main.

4) No more than one force main shall be connected to another force main.

5) No gravity laterals shall be connected to any WMUA force mains.

6) Owner shall be responsible for all maintenance and repairs associated with private pump station force mains. Owner shall also be responsible for required mark-outs and permits, including but not limited to road opening permits.

7) Air release or combination air vacuum release valves shall be provided at high points. Provide a minimum of one foot (1') clearance from the top of the air release valve to roof of the slab.

8) Cleanout manholes shall be provided at low points.

9) When designing the pump station and its force main, use a "C" factor of 135 for PVC pipe and 110 for DIP. A "C" factor of 135 shall be used for force mains designed with HDPE pipe.

10) All force mains shall be constructed as per standard specifications the Rules and Regulations.

(g) Operation and Maintenance (O&M) Manual

The following is to serve as a typical Table of Contents for a WMUA Pumping Station(s) O&M Manual. It represents the minimal items to be included in the manual and is not to serve as an exhaustive list. Similar information for any equipment installed in the pumping station(s) other than that listed is also required.

1.0 PUMPING STATION DESCRIPTION

1.1 Detailed design criteria, service area, population served, volume calculations, pump sizes, capacities, proposed future upgrades

1.2 Pumping station component/equipment, indicating manufacture name, model, capacity/rating

1.2.1 Pumps
1.2.2 Motors
1.2.3 Pressure/Transducer System
1.2.4 Valves
1.2.5 Heaters, Fans, Blowers
1.2.6 Backflow Prevention Devices
1.2.7 Odor Control System
1.2.8 Hoists/Winches
1.2.9 Force Main Pressure Gauge
1.2.10 Electrical System, Generator, Transfer Switch (include one-line diagram and ladder control diagram), Control Panels, PLC, Copy of Computer/PLC Program
1.2.11 Motor Control Center
1.2.12 Telemetry System

2.0 Four (4) copies of detailed O&M manuals, including system operation, parts list, troubleshooting recommendations, suggested preventive maintenance/ spare parts and warranties.

3.0 Complete set of as-built drawings, including force main (on and off-site), all utilities, plan and section drawings of the pumping station and valve chamber, and an as-built one line diagram.

4.0 Complete set of approved shop drawings

5.0 List of local vendors for equipment supplied

(1) All information must be contained within three (3) ring binder(s).

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8. Standards for Acceptable Wastes

A. *Prohibited Discharges*

1) No user shall discharge or cause to be discharged any stormwater, groundwater, roof runoffs, subsurface drainage, uncontaminated cooling water, non-chemically conditioned air conditioner coolant water, condensate or unpolluted industrial process waters to any WMUA sanitary sewer. No user shall connect the discharge pipe from any sump pump into the sanitary sewers of the WMUA.

   Disposal into the sewer system of any pollutant by any person or industry is unlawful except in compliance with Federal Standards promulgated pursuant to the Federal Water Pollution Control Act Amendments of 1972 (FWPCAA), 33 U.S.C.A. 1251, and any more stringent State and local standards.

2) No user shall discharge or cause to be discharged any of the following described waters or wastes to any WMUA sanitary sewer:

   a. Any gasoline, benzene, naphtha, fuel oil or other flammable or explosive liquid, solid or gas; or any liquid, solid or gas which by interaction with other substances may cause fire or explosion.

   b. Any waters or wastes containing toxic or poisonous solids, liquids or gases in sufficient quantity, either singly or by interaction with other wastes, to injure or interfere with any sewage treatment process, constitute a hazard to humans or animals, create a public nuisance, or create any hazard in the receiving waters of the sewage treatment plant, including, but not limited to, cyanides in excess of two (2) mg/l as cyanide in the wastes as discharged to the WMUA sanitary sewer.

   c. Any waters or wastes having a pH lower than 5.5 and higher than 9.0 or having any other corrosive property capable of causing damage or hazard to structures, equipment, and personnel of the WMUA's system.

   d. Any septic tank waste into manholes of the sewerage system without written consent of the WMUA.

   e. Soil or viscous substance in quantities or of such size capable of causing obstruction to the flow in sewers, or other interference with the proper operation of the WMUA's system, such as, but not limited to, ashes, cinders, sand, mud, straw, shavings, metals, glass, rags, feathers, tar, plastics, wood, un-ground garbage, whole blood, paunch manure, hair and fleshings, entrails, and paper dishes, cups, milk containers, etc., either whole or ground by garbage grinders.

3) No user shall discharge or cause to be discharged the following described substances, materials, waters or wastes if it appears likely in the opinion of the WMUA that such wastes can harm either the sewers, sewage treatment process or equipment, render the treatment plant sewage plant sludge quality unsuitable for disposal, have an adverse effect on the receiving stream, or can otherwise endanger life, limb, public property or constitute a nuisance. In forming its opinion as to the acceptability of these wastes, the WMUA shall give consideration to such factors as the quantities of subject wastes in relation to flows and velocities in the sewers, materials of construction of the sewers, nature of the sewage treatment process, capacity of the sewage treatment plant, degree of treatability of wastes in the sewage treatment plant, and other pertinent factors.

The following substances are prohibited:

a. Any liquid or vapor having a temperature higher than 150°F (65°C).

b. Any liquid or vapor having a flash point lower than 235 degrees as determined by the Tagliabue (Tag) closed cup method.

c. Any soluble oils; or any water or waste containing fats, wax, grease or oils, whether emulsified or not, in excess of 100 mg/l or containing substances which may solidify or become viscous at temperatures between 32°F and 150°F (0°C and 65°C).

d. Any garbage that has not been properly shredded. The installation and operation of any garbage grinder equipped with a motor of one half (1/2) horsepower or greater shall be subject to the review and approval of the WMUA.

e. Any waters or wastes containing strong acid, iron, pickling wastes or concentrated plating solutions whether neutralized or not.

f. Any waters or wastes containing iron, chromium, copper, zinc, lead, mercury, and similar objectionable or toxic substances; or wastes exerting an excessive chlorine requirement, to such degree that any such material received in the composite sewage at the sewage treatment works exceeds the limits established by the WMUA for such materials.

g. Any waters or wastes containing phenols or other taste or odor producing substances, in such concentrations, exceeding limits which may be established by the WMUA, as necessary, after treatment of the composite sewage, to meet the requirements of the State, Federal or other public agencies of jurisdiction for such discharge to the receiving waters.

h. Any radioactive wastes or isotopes of such half-life or concentration as may exceed limits established by the WMUA in compliance with applicable State or Federal regulations.

i. Any waters or wastes having a pH lower than 5.5 or in excess of 9.0.

j. Any waters or wastewater with total dissolved solids in excess of 500 mg/l.

k. Materials which exert or cause:

1. Unusual concentrations of inert suspended solids such as, but not limited to, Fullers earth, lime slurries, and lime residues, or of dissolved solids such as, but not limited to, sodium chloride and sodium sulfate.

2. Excessive discoloration such as, but not limited to, dye wastes and vegetables tanning solutions.

3. Unusual CBOD5, chemical oxygen demand or chlorine requirements in such quantities which, in the opinion of the WMUA, constitute a significant load on the sewage treatment works.

4. Unusual volume of flow of concentration of waste constituting "slugs" as defined herein.

l. Waters or wastes containing substances which are not amenable to treatment or reduction by the sewage treatment processes employed, or are amenable to treatment only to such degree that the sewage treatment plant effluent cannot meet the requirements of other agencies having jurisdiction over discharge to the receiving waters.

4) If any waters or wastes are discharged, or are proposed to be discharged to the WMUA's sewers, which waters contain the substances or possess the characteristics enumerated in Rules and Regulations Section XXXX and which in the judgment of the WMUA that the WMUA's system, processes, equipment or receiving waters or which otherwise create a hazard to life, public health or safety or constitute a public nuisance, the WMUA may:

a. Reject the wastes,

b. Require pretreatment to an acceptable condition prior to discharge to the WMUA's sanitary sewer,

c. Require control over the quantities and rates of discharge, and/or

d. Require payment of a surcharge to cover the added cost of handling and treating the wastes.

If the WMUA permits the pretreatment or equalization of waste flows, the design and installation of the plants and equipment shall be subject to the review and approval of the WMUA, and subject to the requirements of all applicable rules, regulations, ordinances and laws.

B. *Grease Traps/Interceptors*

Grease, oil and sand interceptors (grease traps/interceptors) shall be provided when, in the opinion of the WMUA, they are necessary for the proper handling of liquid wastes containing grease in excessive amounts, or any flammable wastes, sand, or other ingredients harmful to or which result in increased operation and maintenance costs of the WMUA's sewage collection system or treatment plant facilities. Applicants shall pay a fee to the WMUA for each Interceptor based on its size, type, and design. Such interceptors shall not be required for private living quarters or dwelling units. Design standards and maintenance requirements for interceptors can be found in section 7(E) in the Rules and Regulations.

Owners or operators of the premises where grease traps are located shall clean and maintain said grease trap system in accordance with these Rules and Regulations. As a condition to Approval, Applicant shall provide proof, upon request by the WMUA, that the grease traps are being maintained. Furthermore, grease traps may be inspected without notice by the WMUA not less than twice annually. All maintenance and repair records shall be posted on the premises.

In the event of a change in the type of service of an existing non-residential customer, to a type of service requiring the installation of a grease, oil and sand interceptor in accordance with the National Plumbing Code or local ordinance, the Applicant shall submit design drawings and technical specifications for the proposed interceptor to the WMUA for review and approval at the same time such documents are submitted to the local plumbing code official for review in order to obtain a certificate of occupancy.

If the WMUA grants approval to commercial space without knowledge of the tenant makeup, and the future non-residential tenant is a use which will require the installation and maintenance of an interceptor in accordance with the National Plumbing Code or local ordinance, design drawings, technical specifications and projected wastewater flows shall be submitted to the WMUA for review and approval prior to their installation. The fees associated with this review shall be determined by the WMUA, with these fees placed in escrow prior to the initiation of review activities.

C. *Additional Discharge Parameters*

1) Where preliminary treatment or flow equalizing facilities are provided for any

waters or wastes, they shall be maintained continuously in satisfactory and effective operation by the user at its expense.

2) When required by the WMUA, the Owner of any property serviced by a WMUA sanitary sewer carrying industrial wastes shall install a suitable control meter chamber together with such necessary meters and other appurtenances in the connecting sewer as shall, in the opinion of the WMUA, facilitate observation, sampling, and measurement of the wastes. Such meter chamber, when required, shall be accessibly and safely located, and shall be constructed in accordance with plans approved by the WMUA. The meter chamber shall be installed by the Owner at its sole cost and expense, and shall be turned over to, and become the property of, the WMUA, for maintenance and operation. The WMUA shall maintain and operate same.

3) All measurements, tests, and analyses of the characteristics of waters and wastes to which reference is made in these standards shall be determined in accordance with the latest edition of "Standard Method for the Examination of Water and Wastewater," published by the American Public Health Association, or as approved by NJDEP and USEPA, and shall be determined at the control meter chamber provided, or upon suitable samples taken at said meter chamber. In the event that no special meter chamber has been required, the control manhole shall be considered to the nearest downstream manhole in the WMUA's sanitary sewer to the point at which the user's sewer is connected.

   The WMUA and the agents of the NJDEP and USEPA shall have the right to enter the premises of all industrial, commercial or residential users for inspection and observation of on-site waste treatment facilities and the measuring, testing and the collection of samples from any component thereof, as well as the inspection of residential plumbing systems.

D. *Violations and Penalties*

1. Violations/Fines

In the event of any violation of the Rules and Regulations, or of any improper or unauthorized use of any portion of the WMUA sewer system by any user, the following penalties may be imposed upon the user in the discretion of the WMUA:

1) Discontinuation of sewer service at the property where the violation occurs, until the violation is corrected;

2) Violation of the Rules and Regulations, excepting Sections 7(E) and 8(B):

   A monetary penalty of up to fifty dollars ($50.00) per day for each violation or improper or unauthorized use. In the case of a continuing violation, each day of violation shall be deemed a separate violation. In the case of a violation involving more than

one property, each property involved shall be deemed a separate violation.

3) Violations of Sections 7(E) and 8(B) of the Rules and Regulations:

Pursuant to Section 7(E) and 8(B) of the Rules and Regulations, grease, oil and sand interceptors must be installed as deemed necessary by the WMUA. The release of grease or oil into the system in amount exceeding 100 mg/l shall result in the following monetary penalties:

101-200 mg/l = $100 per day
201-300 mg/l = $200 per day
301-400 mg/l = $300 per day
401-500 mg/l = $400 per day
501-600 mg/l = $500 per day

Fines shall increase at the rate of $100 per day for each additional 100 mg/l.

Pursuant to Section 7(E) and 8(B) of the Rules and Regulations, grease traps/interceptors must be maintained on a schedule to be determined by the WMUA, and records of maintenance must be kept by the user. Failure to perform maintenance or to keep maintenance records, or falsification of maintenance records shall be subject to a monetary penalty of up to $100.00 per violation. In the case of a continuing violation, each scheduled maintenance which is not performed, or each incident of falsification, shall be deemed a separate violation.

Pursuant to Section 7(E) and 8(B) of the Rules and Regulations, a grease trap/interceptor must be installed as deemed necessary by the WMUA and National Plumbing Code. A violation of this provision shall be subject to a monetary penalty of up to $200.00 per violation, in addition to any applicable fines.

All premises in which a grease trap/interceptor is located, or in which, in the opinion of the WMUA, a grease trap/interceptor should be installed, shall be available for inspection by the WMUA or its designated agent. A refusal to permit inspection of said premises by the owner or tenant of the premises shall be subject to a monetary penalty of up to $200.00 per violation. Each such refusal shall be deemed a separate violation.

In the case of continuing violation, each day of violation shall be deemed a separate violation. In the case of a violation involving

more than one property, each property involved shall be deemed and separate violation.

The penalties imposed in this section shall be cumulative to the penalties described in other sections of these Rules and Regulations and to the other remedies afforded to the WMUA by statute.

2. Payment of Fines

1) All fines shall be paid within fifteen (15) days from the date that the Owner is notified in writing of the violations charged and the fine to be imposed. In the event that any person wishes to contest the violation or the fine imposed, the person aggrieved must file with the WMUA within fifteen (15) days of receipt of notification of the violation and fine, a written notice that the violation and fine shall be contested. A hearing shall thereafter be scheduled before the WMUA at which time the Commissioners or its designee as well as the person aggrieved or its attorney, may present evidence regarding either the violation or the fine imposed. The fine, if any, imposed by the WMUA after the hearing shall be paid within fifteen (15) days after the person aggrieved receives written notice of the decision of the WMUA.

2) In the event that the fine is not paid as required under these Rules and Regulations, the WMUA shall have the discretion to terminate all sewer services to the user and to declare all agreements or contracts with the user null and void and of no force and effect.

E. *Revisions*

1) The Rules and Regulations set forth shall be reviewed by July 1st of each year and may be revised, amended or supplemented from time to time with approval by the Commissioners. Before enactment of any such changes, the WMUA shall give due notice to each industrial user allowing sufficient time for the users to express their views on the proposed changes.

2) Title II of the Federal Water Pollution Control Act Amendment of 1972, 33 U.S.C. 1251, does provide for:

   a. Consistence with requirements under National Pollutant Discharge Elimination System Permit treatment standards, pre-treatment for industrial wastes, etc.

It is expressly intended for WMUA users to meet all USEPA Grant requirements as set forth in the aforesaid Act.

9. Service Charge and Connection Charge (EDCU Schedule)

It is the policy of the WMUA to charge sewer service and connection fees for connection to its system following the rates set forth in the current WMUA rate schedule (EDCU Schedule). Every Property Owner connected to the WMUA system shall be required to pay a service charge in accordance with the current user rates and a connection charge in accordance with the current EDCU Schedule at the current rate. The WMUA Engineer shall attribute the appropriate amount of EDCUs to each Application. The connection charge shall be paid by the Property Owner to the WMUA before the issuance of a Building Permit and/or Certificate of Occupancy. In the case of an existing home which is to tie into the sanitary sewer, the connection charge shall be paid before the actual physical connection is made. Calculation of connection charges is based upon a formula in accordance with N.J.S.A. 40:14B-22. The connection charge shall be calculated annually after the end of each fiscal year by the WMUA's Director of Finance and verified by the WMUA's independent auditors or other independent verification agent and subject to a public hearing in accordance with N.J.S.A. 40:14B-23. Service charges will be reviewed by the WMUA in conjunction with the annual budget process or as needed. Changes in service charges will be made subject to a public hearing in accordance with the applicable statutes.

In the event that a Property Owner does not pay its service and/or connection charges when due, the WMUA reserves the right to enter upon such parcel and cause any connection or connections leading directly or indirectly to or from the utility system to be cut and shut off until such service charge and any subsequent service charge with regard to such parcel and all interest accrued thereon shall by fully paid to the WMUA.

Additionally, when a Property Owner does not pay its service and/or connection charges when due, a lien will be placed onto such parcel and be superior and paramount to the interest in such parcel of any Owner, lessee, tenant, mortgagee or other person except the lien of municipal taxes and shall be on a parity with and deemed equal to the lien on such parcel of the municipality where such parcel is situate for taxes thereon due in the same year and not paid when due. Applicants are advised that, pursuant to N.J.S.A. 40:14B-46, the WMUA may recover attorney's fees and costs in any action to recover unpaid service and/or connection charges.

In the event that the use of a property changes such that the total EDCU value for that property increases, the Property Owner shall pay the appropriate additional service charge for the revised number of EDCUs. The Property Owner shall also pay the appropriate additional connection charge for the revised number of EDCUs if a new physical connection is required. The additional service and/or connection charges assessed shall be those in effect at the time of the change of use. The following is a listing of the number of EDCUs per type of service:

For the purposes of the EDCU Schedule, fractional persons or students shall be considered as one (1) full person or student.

A. *EDCU Schedule*

Type of Service		EDCU
1.	Single Family Dwelling	1
2.	Apartments or Multi-Family Dwellings (each unit charge)	1
3.	Single Family Dwelling with "Mother-Daughter" Use	1.5
4.	Single Family Dwelling with Business Use	2
5.	Single Family Dwelling with Medical Office	2.5
6.	Single Family Dwelling with Dental Office	3
7.	Medical Office	1.5
	Medical Office Building with Surgical Suites	
	For each office or suite utilized by a separate owner or tenant in a building:	1.5
	Or, for first 4 fixture units or less:	1.5
	For each 2 additional fixture units: (whichever of the above is greater)	1
8.	Dental Office	
	For each office or suite utilized by a separate owner or tenant in a building:	2
9.	Laboratory (Medical or Dental)	1
10.	Service Station	1
11.	Service Station with Car Wash Facilities	2
12.	Diner, Tavern, Restaurant (for each seating capacity of 50 or part thereof)	3

13.	Seasonal Swim Club	6
	With Backwash:	8
14.	Health Club, Ice Skating Rink, Year Round Swimming Facility and other Recreational Facilities:	
	For first 4 fixture units or less:	1
	For each 2 additional fixture units:	1
15.	Schools: for each 28 students, faculty and staff or part thereof.	1
16.	House of Worship	1
17.	House of Worship with Annex:	
	For first 4 fixture units or less:	1
	For each 2 additional fixture units:	1
18.	Hospitals:	
	For each 5 beds:	3
19.	Nursing Homes /Assisted Living Facilities:	
	For each 5 beds:	2
20.	Municipal and Publicly-Owned Buildings:	
	For first 4 water-closet units or less:	1
	For each 2 additional water- closets or less:	1
21.	Supermarkets:	
	For the first 4 fixture units or less:	1
	For each 2 additional fixture units:	1
22.	Business (Commercial):	
	For each commercial unit utilized by a separate owner or tenant:	1

	Or for first 4 fixture units or less:	1
	For each 2 additional fixture units: (whichever of the above is greater):	1
23.	Business (Offices):	
	For each office or suite of offices utilized by a separate owner or tenant:	1
	Or for first 4 fixture units or less:	1
	For each 2 additional units: (whichever of the above is greater)	1
24.	Industrial Plants: For each 5 employees	1
25.	Laundromat: for each 2 washing machines:	1
26.	Theater: For each seating capacity of 100 or part thereof:	1
27.	Motel:	
	From 1 to 6 rooms:	1
	For each additional 6 rooms or portion thereof:	1
	Plus additional charge for first 4 fixture units located apart from the motel rooms:	1
	For each additional 2 fixture units or portion thereof:	1
	Other facilities which may be located on the property, such as restaurant, swimming pool, coffee shop, banquet hall or other commercial facility shall be charged additionally in accordance with the rates as established by the Rules and Regulations.	
28.	Factory (not discharging process or cooling water):	
	For each 16 employees or portion thereof:	1

	Or for first 4 fixture units or less:	1
	For each 2 additional fixture units: (whichever of the above is greater)	1
29.	Bulk Rates	1
30.	Mini-Markets	
	For the first 4 fixture units or less:	1
	For each 2 additional fixture units:	1

Such EDCU Schedule is subject to be amended, supplemented, or changed by the Commissioners. Any Applicant whose proposed use is not set forth in the aforementioned Schedule may make a written request to the WMUA Engineer and Commissioners for a determination of the correct EDCU.

B. *Grease Trap/Interceptor Schedule*

Size	Type	Design	Fee
TBD	TBD	TBD	TBD

(THIS SPACE INTENTIONALLY LEFT BLANK)

C. *General Terms*

1) Any existing structure within one-hundred (100) feet of WMUA sewerage facilities, which can be connected by a gravity sewer, shall be connected from the nearest point of connection to the WMUA system to the Applicant's property line.

2) The Owner is responsible for maintaining the house connection in a safe and watertight condition from the building to the point of connection with the WMUA cleanout. If the Owner fails to maintain the house connection, the WMUA reserves the right to disconnect the house connection. Reconnection of same would be at the Owner's expense.

3) No Owner shall disconnect a house connection to undertake construction or renovation activities without first notifying the WMUA to allow inspection of the disconnection. The WMUA shall provide the Applicant with an original and one (1) copy a "demolition permit letter" which acknowledges the proper disconnection. The Applicant shall keep the original demolition permit letter for its records and submit the copy to the Municipal Building Inspector when applying for a Building Permit. The Municipal Building Inspector shall not issue a Building Permit without being presented with a copy of the WMUA's demolition permit from the Owner.

4) No person shall make connection of roof downspouts, sump pumps, exterior foundation drains, area-way drains or other sources of surface runoff or ground water to a house connection or building drain which is in turn connected directly or indirectly to a facility of the WMUA.

5) A Certificate of Occupancy will not be issued by the Municipal Body until notified by the WMUA that connection fees have been paid and connection has been made and approved.

6) All owners of multiple units (commercial, residential or industrial) shall be obligated to pay all sewer charges.

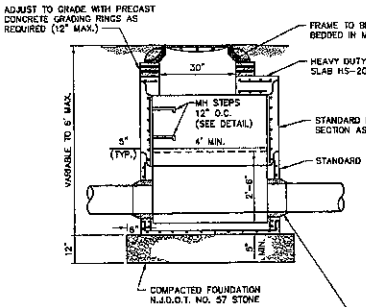
7) Should there be a need for the WMUA to redeposit a returned check the customer shall be charged an administration charge in the amount of twenty dollars ($20.00), which charge shall become part of the service charges of the said customer and shall be added to its outstanding bill at the time.

8) Pursuant to N.J.S.A. 40:14B-41 *et seq.*, the WMUA will furnish to the Tax Collector of the Townships of Manalapan, Marlboro, Freehold, Borough of Englishtown, and other municipalities where there are individual customers, a certified statement containing a list of properties, their respective owners, and the amount of charges and interest thereon which are in arrears and have become and remain liens against said properties.

The Tax Collector is requested and authorized to include said properties in the next tax sale and is authorized to do any and all things necessary and proper to effect enforcement of the WMUA's liens as the same would be done for the enforcement of Municipal Liens for real estate taxes.

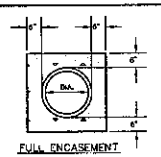
9) No connection will be permitted to the facilities of the WMUA until payment of all connection fees are paid in full to the WMUA and/or the Customer Communities, if they so require. In the event the proposed connection resides in the BRSA service area, a second connection fee must be paid to the BRSA prior to the connection with the WMUA. In that case, the applicable WMUA connection fee shall be 48.5% of the regular WMUA connection fee calculation, which reflects the required adjustment to remove debt service and capital costs for the WMUA's Pine Brook Sewage Treatment Plant. Details regarding the additional connection fee to be paid to BRSA can be obtained from BRSA directly.

10) In unique circumstances where the WMUA finds that the purpose behind the Municipal and County Utilities Authority Law, N.J.S.A. 40:14B-1, *et. seq.* are being furthered, the WMUA may consider a waiver of a portion of the total connection fees due for a particular project when it is deemed in the public interest to do so in order to alleviate pollution or such other condition which may be deleterious to the public health.



STANDARD SHALLOW MANHOLE

N.T.S.



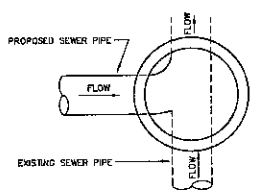
FULL ENCASEMENT

CONSTRUCTION NOTES:

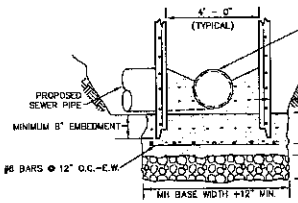
1. ENCASEMENT TO BE CONSTRUCTED WHEN VERTICAL CLEARANCE UNDER WATER SYSTEM OR STORM SEWER IS 18" OR LESS, OR WHEN HORIZONTAL CLEARANCE BETWEEN SANITARY SEWER AND WATER MAIN AT THE SAME ELEVATION IS LESS THAN 10'.
2. CONCRETE TO BE N.J.D.O.T. CLASS C.
3. FULL ENCASEMENT TO BE USED AT ALL TIMES UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
4. ENCASEMENT SHALL EXTEND A MINIMUM OF TEN FEET (10') ON EITHER SIDE OF CROSSING.

CONCRETE ENCASEMENT

N.T.S.



PLAN



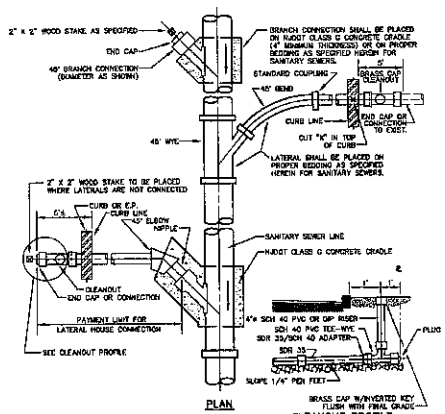
SECTION

CONSTRUCTION NOTES:

1. SEE PRECAST STANDARD MANHOLE DETAIL FOR TYPICAL INSTALLATION.
2. PRECAST MANHOLE SECTION TO BE IN ACCORDANCE WITH ASTM DESIGNATION C-478.

DOGHOUSE MANHOLE

N.T.S.



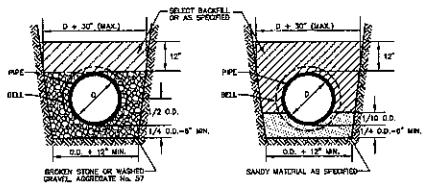
PLAN CLEANOUT PROFILE

CONSTRUCTION NOTES:

1. DETAIL SHOWS CONSTRUCTION OF A "BRANCH CONNECTION" AND OF TWO DIFFERENT TYPES OF "LATERAL HOUSE CONNECTION". TYPE OF CONNECTION IS AT CONTRACTOR'S OPTION.
2. SIZE OF LATERAL TO BE AS SHOWN ON THE PLANS OR AS DIRECTED, 4" MINIMUM.
3. CLEAN-OUTS IN DRIVEWAYS SHALL BE COVERED WITH A MONUMENT BOX - CAMPBELL PATTERN NO. 4155 OR EQUAL.

BRANCH AND LATERAL HOUSE CONNECTIONS

N.T.S.



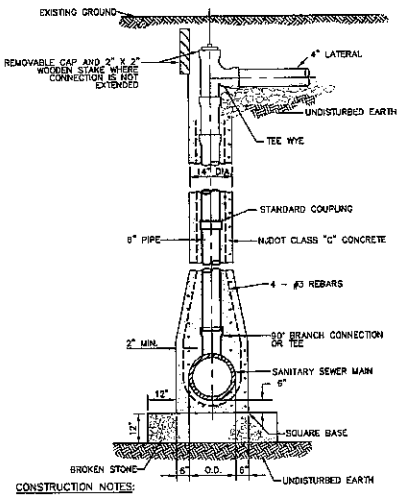
GRAVITY SEWER D.I. PIPE FOR DRY LOCATIONS

SANITARY SEWER PIPE BEDDING DETAIL

N.T.S.

GENERAL NOTES

1. THE DESIGNS HEREIN RENDERED ARE INTENDED TO COMPLY WITH THE NEW JERSEY STATE DEPARTMENT OF ENVIRONMENTAL PROTECTION (NJDEP). IN CASE OF UNINTENTIONAL DEVIATION AND/OR OMMISSIONS NJDEP AND REGULATIONS WILL CONTROL.
2. THE CONTRACTOR SHALL CALL FOR ALL UTILITIES TO BE MARKED OUT PRIOR TO THE START OF CONSTRUCTION TO INSURE THAT THEIR FACILITIES WILL NOT DETER THE COURSE OF CONSTRUCTION.
3. THE OWNER WILL SECURE ALL NECESSARY PERMITS FROM MUNICIPAL, COUNTY OR STATE AGENCIES PRIOR TO THE START OF CONSTRUCTION.
4. ALL WORK SHALL CONFORM TO THE ABOVE MENTIONED PERMITS INCLUDING BACKFILL, PAVEMENT REPAIR, AND CONSTRUCTION PROCEDURES.
5. ALL CONCRETE AS NOTED IN THE APPURTENANT DESIGNS SHALL BE 3,000 PSI AS SPECIFIED, OR AS SHOWN OTHERWISE.
6. ALL LATERAL LOCATIONS TO BE DETERMINED IN FIELD.
7. SANITARY SEWER MAINS TO BE AS SHOWN.
8. WMUA PORTION OF CONNECTION SHALL TERMINATE WITH CLEANOUT, BETWEEN CURB AND SIDEWALK OR ONE FOOT (1') OUTSIDE PROPERTY LINE.
9. ALL SANITARY SEWERS AND APPURTENANCES SHALL BE CONSTRUCTED IN COMPLIANCE WITH THE "RULES AND REGULATIONS" AND "STANDARD CONSTRUCTION DETAILS" OF THE WMUA.
10. ELEVATIONS INDICATED HEREON ARE BASED ON USC & GS DATUM (SHOW BENCH MARK REFERENCE AND ESTABLISHED BENCH MARK ON PROJECT).
11. ANY ADJUSTMENTS OR REPAIRS TO EXISTING SANITARY FACILITIES DAMAGED AS A RESULT OF THE CONTRACTORS OPERATIONS SHALL BE MADE AT THE CONTRACTORS EXPENSE AND SHALL BE SUBJECT TO REVIEW, INSPECTION, APPROVAL AND ACCEPTANCE BY THE AUTHORITY ENGINEER.

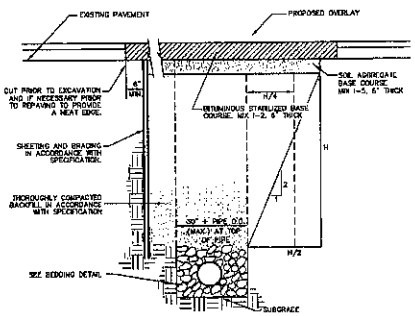


CONSTRUCTION NOTES:

1. TO BE USED IF AND WHERE DIRECTED BY ENGINEER, IF SEWER DEPTH IS TEN FEET OR MORE.
2. THIS IS A TYPICAL SCHEME FOR DEEP HOUSE CONNECTIONS. DEPENDING ON TYPE OF PIPE MATERIAL A COMPARABLE SCHEME SHALL BE USED AND THE CONTRACTOR SHALL SUBMIT DETAILED SHOP DRAWINGS FOR APPROVAL.
3. SIX INCH (6") CONNECTION SIMILAR; MAINTAIN MINIMUM CONCRETE ENCASEMENT SIX INCHES (6") THICK.
4. ONE (1) HOUSE PER DEEP HOUSE CONNECTION.

DEEP HOUSE CONNECTION

N.T.S.

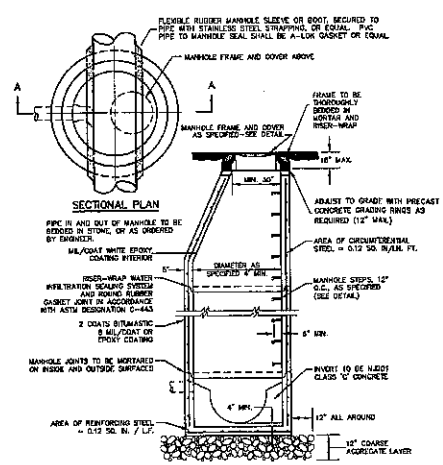


CONSTRUCTION NOTES:

1. AT MANHOLES BITUMINOUS STABILIZED BASE IS TO BE PLACED 6" BEYOND THE TRENCH LIMIT OR 6" BEYOND DAMAGED PAVEMENT BASE COURSE WHICHEVER IS GREATER.
2. SERVICE CONNECTION TRENCHES ARE TO BE REPAIRED AS ABOVE EXCEPT MAXIMUM OVERLAY PAY WIDTH SHALL BE 6'.
3. ANY SUPERFICIAL SURFACE DAMAGE CAUSED BY THE CONTRACTOR OUTSIDE THE LIMITS SHOWN, SHALL BE REPAIRED. WHEN THE EXISTING PAVEMENT IS DAMAGED BEYOND THE LIMITS SHOWN THE CONTRACTOR SHALL REMOVE THE DAMAGED PAVEMENT AND REPLACE WITH 6" STABILIZED BASE AS SHOWN ABOVE.

TRENCH AND TEMPORARY PAVEMENT REPAIR

N.T.S.

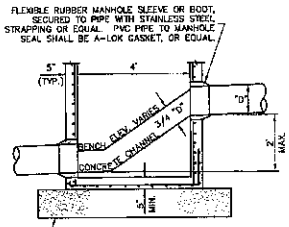


CONSTRUCTION NOTES:

1. PRECAST MANHOLE SECTIONS TO BE IN ACCORDANCE WITH LATEST ASTM DESIGNATION C-478, MINIMUM COMPRESSION STRENGTH TO BE 4000 PSI
2. FLEXIBLE RUBBER BOOT SHALL BE USED FOR CONNECTION OF PVC PIPE TO MANHOLE.
3. PRECAST CHANNELS SHALL NOT BE USED FOR BENDS GREATER THAN 45°. POURED CONCRETE LOW RADIUS CHANNELS SHALL BE CONSTRUCTED.
4. WHEN DESIGN CALLS FOR REGULAR OR LOCKING MANHOLE FRAME AND COVER, INSTALL CONE SECTION WITH 30" OPENING. FOR A WATERTIGHT FRAME AND COVER, INSTALL CONE SECTION WITH 24" OPENING.
5. RISER-WRAP WATER INFILTRATION SYSTEM TO BE INSTALLED AT ALL MANHOLE JOINTS AND FRAME BASE.

STANDARD PRECAST SANITARY MANHOLE

N.T.S.



CHUTE MANHOLE

N.T.S.

NO.	DATE	REVISIONS	BY	CHECKED
3	4/21/15	REVISED MH AND STR LING WELL DETAILS		

YOUR GOALS, OUR MISSION.
T&M ASSOCIATES
NEW JERSEY BOARD OF PROFESSIONAL ENGINEERS AND LAND SURVEYORS CERTIFICATE OF AUTHORIZATION 24GA27997400

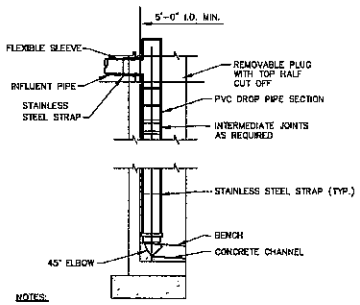
SO-1

WESTERN MONMOUTH UTILITIES AUTHORITY

STANDARD CONSTRUCTION DETAILS

KEITH W. HENDERSON, PE
WESTERN MONMOUTH UTILITIES AUTHORITY ENGINEER
LICENSED PROFESSIONAL ENGINEER
STATE OF NJ LICENSE No. 24GE03880400

SHEET 1 OF 3

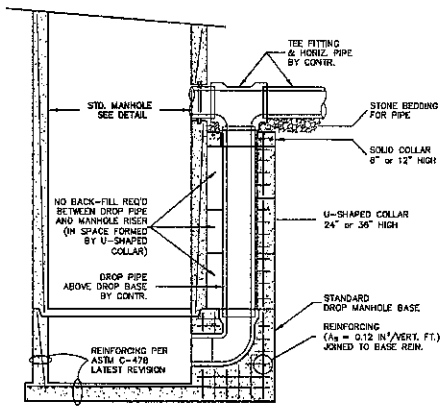


NOTES:

1. THE FIRST JOINT BELOW THE INFLUENT PIPE SHALL BE A RUBBER GASKET OR FRICTION-TYPE JOINT FOR EASE OF REMOVAL. ALL OTHER JOINTS SHALL BE SOLVENT CEMENT JOINTS.
2. FIRST STAINLESS STEEL STRAP TO BE PLACED WITHIN A MAX. DISTANCE OF 6" BELOW INLET PIPE INVERT. SECOND STRAP SHALL BE WITHIN 6" (MAX.) ABOVE FIRST INTERMEDIATE JOINT. REMAINING STRAPS SHALL BE A MAX. OF 3'-0" O.C. AND WITHIN 6" BELOW ANY REQUIRED INTERMEDIATE JOINTS. THE UPPER PVC DROP SECTION SHALL BE INSTALLED TO ALLOW FOR FUTURE REMOVAL WITHOUT REMOVING THE REMAINING SECTIONS.
3. DROP MANHOLE SHALL HAVE AN INSIDE DIAMETER OF 5 FEET.
4. DROP PIPE IS TO BE USED WHERE DIFFERENCE BETWEEN INLET INVERT AND LOWEST OUTLET INVERT IS TWO FEET (2') OR GREATER.
5. A LARGER DIAMETER DROP PIPE MAY BE REQUIRED AS DIRECTED BY AUTHORITY ENGINEER.

INTERIOR DROP CONNECTION

N.T.S.

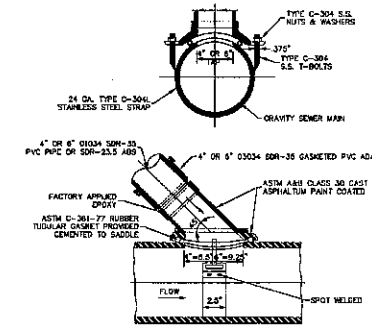


NOTES:

1. DROP PIPE TO BE USED IN ALL CASES WHERE THE DIFFERENCE BETWEEN INLET AND OUTLET INVERTS IS TWO (2) FEET OR GREATER.
2. SIZE OF DROP PIPE SHALL BE THE SAME AS MAIN LINE SEWER UNLESS OTHERWISE SPECIFIED.
3. DROP TO TERMINATE IN MANHOLE AT ELEVATION .75D ABOVE INVERT OR EFFLUENT PIPE WHERE D = DIAMETER OF PIPE.

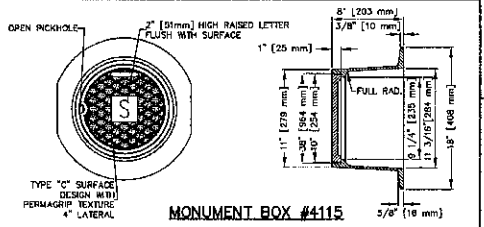
TYPICAL DROP CONNECTION

N.T.S.

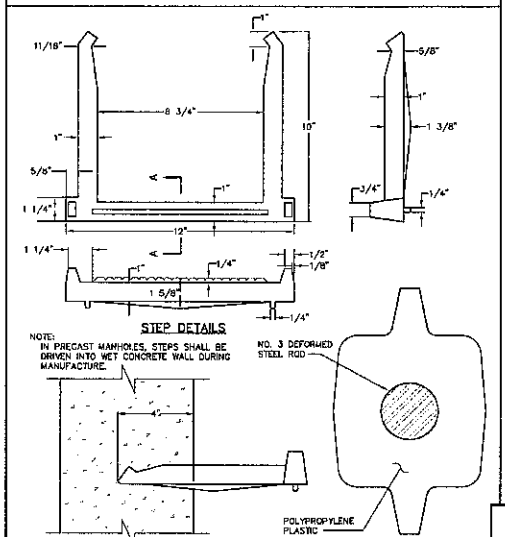


GENECO MODEL "EH" PIPE SADDLE

N.T.S.



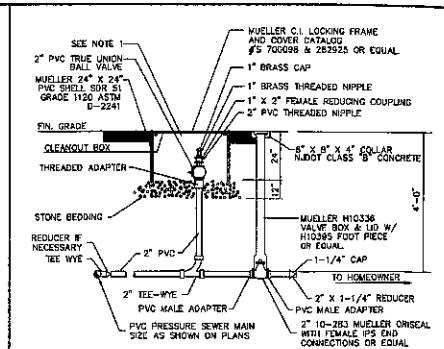
MONUMENT BOX #4115



STEP DETAILS

POLYPROPYLENE MANHOLE STEPS

N.T.S.

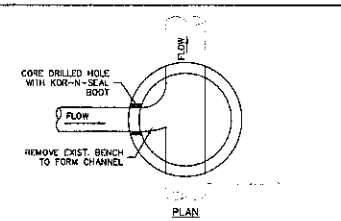


NOTES:

1. CLEANOUT VALVE AND APPURTENANCES SHALL BE PROTECTED FROM FREEZING INSIDE CLEANOUT BOX WITH WEATHER PROOF BLANKET INSULATION

PRESSURE SEWER CONNECTION AND CLEANOUT

N.T.S.



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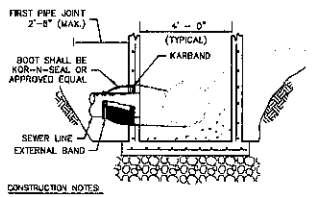
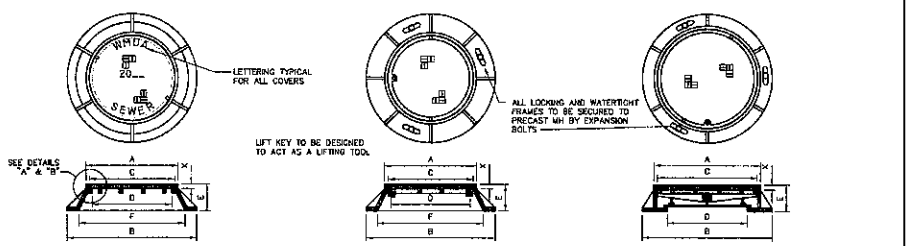


CONSTRUCTION NOTES:

1. A FLEXIBLE MANHOLE BOOT IS TO BE INSTALLED AT ALL MANHOLE AND PIPE CONNECTIONS.
2. FLEXIBLE BOOTS ARE TO BE INSTALLED ACCORDING TO MANUFACTURER'S SPECIFICATIONS.
3. RECONSTRUCT BENCH TO PROVIDE SMOOTH FLOW THROUGH MANHOLE.
4. ALL EXISTING MANHOLES SHALL BE REHABILITATED AS DETERMINED BY THE ENGINEER.

CONNECTION TO EXISTING MANHOLE

N.T.S.



STANDARD F. & C. #12038

ALL FRAMES & COVERS

MATERIAL - GRAY CAST IRON ASTM A48, CLASS 30B

BEARING SURFACE OF FRAME & COVER SHALL BE MILL MACHINED.

ALL TYPES OF COVERS SHALL BE LETTERED AS SHOWN ON STANDARD COVER. ALL LETTERING 1 1/2" BLOCK STYLE RAISED.

ALL COVERS SHALL HAVE TWO (2) NON-PENETRATING PICK HOLES.

CONTRACTOR TO PROVIDE CERTIFICATION THAT ALL FRAMES AND COVERS ARE AMERICAN MADE.

LOCKING F. & C. #1487

LOCKING FRAMES & COVERS

DROP LIFTING HANDLE SHALL BE GALVANIZED STEEL.

LOCK DEVICE SHALL BE BRONZE CAM LOCK.

FRAME OR COVER SHALL BE FURNISHED WITH A MACHINED GROOVE AND A NEOPRENE GASKET, AS SHOWN IN DETAIL "A" OR "B".

WATERTIGHT F. & C. #6545

WATERTIGHT FRAMES & COVERS

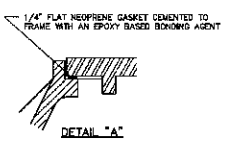
INTERLOCKING BAR SHALL BE DUCTILE IRON OR STEEL.

INNER COVER SHALL HAVE TWO LIFTING HANDLES CAST IN PLACE.

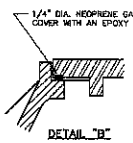
INNER COVER LOCKING DEVICE SHALL BE BRONZE OR BRASS.

DIMENSIONS:

	#1203 - #1487	#6545
A	27 3/4"	32"
B	30"	35"
C	25 3/4"	30"
D	24"	24"
E	4"	6"
F	32"	32"
K	1 3/8"	1 1/2"



DETAIL "A"



DETAIL "B"

STANDARD F&C

MANHOLE FRAMES SHALL BE FURNISHED WITH A MACHINED GROOVE TO ACCEPT A 1/4" FLAT NEOPRENE GASKET AS MANUFACTURED BY CAMPBELL FOUNDRY COMPANY OR EQUAL (SEE DETAIL "A"). AS AN OPTION, COVER MAY BE FURNISHED WITH A MACHINED GROVE TO ACCEPT A FLOW SEAL GASKET AS MANUFACTURED BY CAMPBELL FOUNDRY COMPANY OR EQUAL (SEE DETAIL "B").

TYPICAL MANHOLE FRAME AND COVER

N.T.S.

NO	DATE	REVISIONS	BY	CHECKED
1	4/20/15	REVISED MH AND SPLASHING WELL DETAILS		

T&M ASSOCIATES
YOUR GOALS. OUR MISSION.
11 TINDALL ROAD
MIDDLETOWN, NJ 07748
(732) 671-6400
FAX (732) 671-2345
NEW JERSEY BOARD OF PROFESSIONAL ENGINEERS AND LAND SURVEYORS
CERTIFICATE OF AUTHORIZATION
24GA27981500

DRAWING NO. SD-2

WESTERN MONMOUTH UTILITIES AUTHORITY

STANDARD CONSTRUCTION DETAILS

KEITH W. HENDERSON, PE
WESTERN MONMOUTH UTILITIES AUTHORITY ENGINEER
LICENSED PROFESSIONAL ENGINEER
STATE OF NJ LICENSE No. 24GE03089400

SHEET 2 OF 3

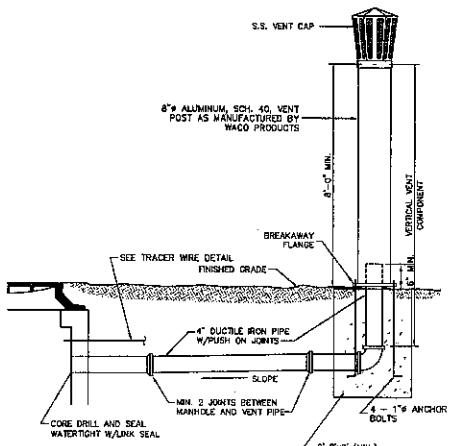
THRUST BLOCK TABLE

DIAMETER (d) OF PIPE (INCHES)	UP TO 22-1/2° BEND	UP TO 45° BEND	UP TO 90° BEND	TEES AND PLUGS	DEAD END TEE AND 90° BEND
CONTACT BEARING AREA OF THRUST BLOCK WITH UNDISTURBED EARTH (SQUARE FEET)					
4	1.0	1.2	2.1	1.5	A: 1.5 B: 0.6
6	1.2	2.4	4.5	3.3	A: 3.3 B: 1.2
8	2.1	4.2	8.1	5.7	A: 5.7 B: 2.4
10	3.3	6.6	12.5	8.7	A: 8.7 B: 3.8
12	5.1	9.6	18.0	12.6	A: 12.6 B: 5.4
16	8.7	17.4	32.1	22.6	A: 22.6 B: 9.6
20	13.8	27.5	50.1	35.4	A: 35.4 B: 14.7
24	19.8	39.6	72.0	51.0	A: 51.0 B: 21.6

CONSTRUCTION NOTES:

1. BEARING AREA FOR THRUST BLOCKS ARE BASED ON THE UNDISTURBED SOIL WITH BEARING CAPACITY OF 1500 LBS. PER SQUARE FOOT. FOR OTHER SOIL OF LESS BEARING CAPACITY, THE AREAS SHALL BE ADJUSTED ACCORDINGLY, (FIGURE 14, ASCE "PIPELINE DESIGN FOR WATER AND WASTEWATER, 1975").
2. ALL CONCRETE FOR THRUST BLOCKS SHALL BE H.D.OT, CLASS C.
3. DIMENSIONS OF THRUST BLOCKS SHALL BE APPROXIMATELY SQUARE, AND THE THRUST BLOCKS SHALL BE POURED FORM FITTING SUCH THAT THEY BEAR ON THE UNDISTURBED WALL OF THE TRENCH.
4. THE TABULATED CONTACT BEARING AREAS LISTED ARE FOR HORIZONTAL AND DOWNWARD THRUST ONLY, AND ARE NOT APPLICABLE FOR UPWARD THRUST. NOT TO SCALE
5. THRUST BLOCK SHALL BE USED AT ALL BENDS 11-1/4° OR GREATER.

FORCE MAIN THRUST BLOCK

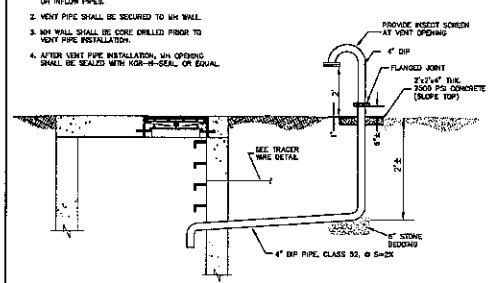


NOTE:

1. VERTICAL VENT LOCATION SHALL BE DETERMINED IN THE FIELD AND APPROVED BY THE ENGINEER.
2. TO BE INSTALLED IN RESIDENTIAL AREA AND/OR AS DIRECTED BY AUTHORITY ENGINEER.

MANHOLE VENT DETAIL (RESIDENTIAL)

N.T.S.

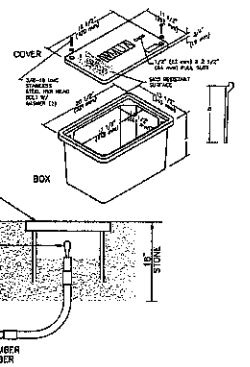


NOTES:

1. VENT PIPE SHALL NOT INTERFERE WITH MH STEPS OR INFLOW PIPES.
2. VENT PIPE SHALL BE SECURED TO MH WALL.
3. MH WALL SHALL BE CORE DRILLED PRIOR TO VENT PIPE INSTALLATION.
4. AFTER VENT PIPE INSTALLATION, MH OPENING SHALL BE SEALED WITH KOR-N-SEAL, OR EQUAL.

MANHOLE VENT DETAIL (OTHER)

N.T.S.

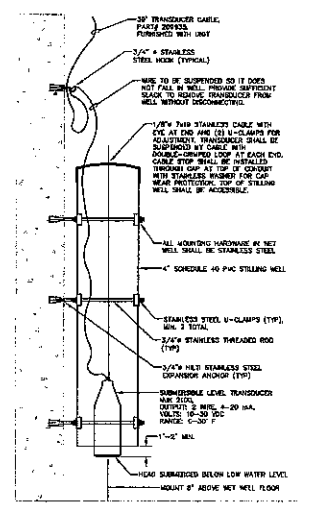


NOTES:

1. TRACER WIRE SHALL BE INSULATED 10 GAUGE, 600 VOLT SOLID COPPER WIRE MANUFACTURED BY TRACER WIRE PRODUCTS, INC. OF FRESNO, CA. OR APPROVED EQUAL.
2. INSTALL TRACER WIRE IN A PVC CONDUIT BETWEEN CHAMBER AND ENCLOSURE. THE PVC CONDUIT SHALL BE INSTALLED WITH BUSHINGS AT BOTH ENDS.
3. THE CONDUIT PENETRATION AT THE CHAMBER SHALL BE WATERTIGHT.
4. ANY SPLICES IN THE TRACER WIRE SHALL BE WATERTIGHT.
5. ENCLOSURE SHALL BE ADJACENT TO AIR RELEASE VENT OR OFF ROADWAY FOR CLEANOUT CHAMBERS.
6. TRACER WIRE CONNECTION PORTS ARE REQUIRED EVERY 2000 FEET.
7. PROVIDE ONE COIL (MIN. SIX FEET [6']) OF SLACK WIRE AT ENCLOSURE.

TRACER WIRE DETAIL

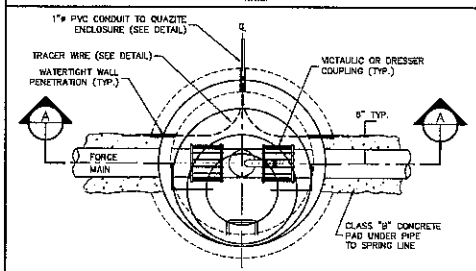
N.T.S.



ELEVATION

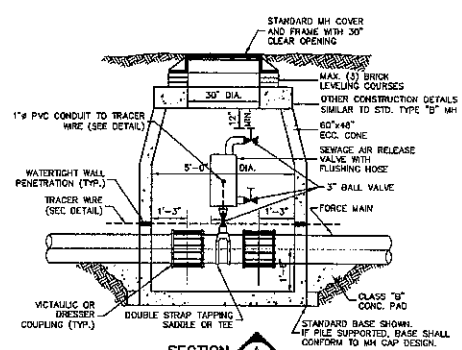
TRANSDUCER MOUNTING DETAIL

N.T.S.

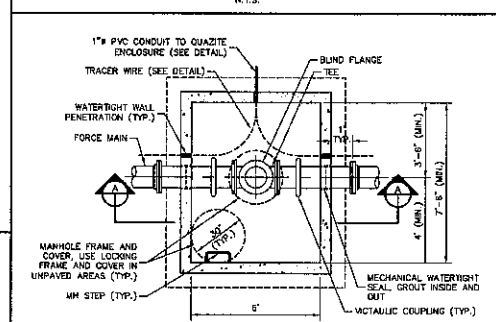


FORCE MAIN AIR RELEASE VALVE & MH DETAIL

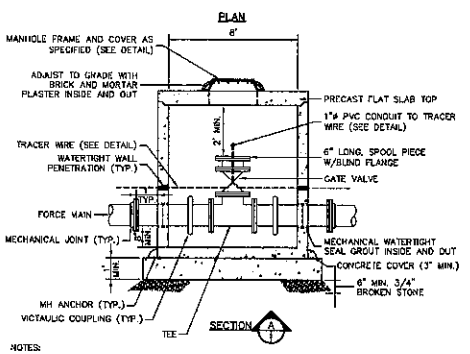
N.T.S.



SECTION



PLAN

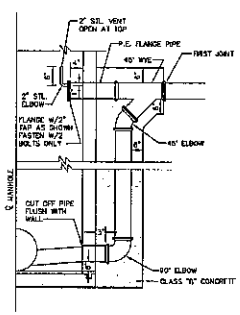


NOTES:

1. CONCRETE STRUCTURE TO BE DESIGNED FOR HS-20-44 LOADING WITH CONCRETE MINIMUM STRENGTH OF 4000 PSI. PRECAST WASTEWATER STRUCTURE TO BE DESIGNED IN ACCORDANCE WITH ASTM C-913.
2. CONTRACTOR SHALL END THE FORCE MAIN PRIOR TO AND AFTER THE CLEANOUT CHAMBER (IF PVC PIPE IS USED) WITH APPROVED PVC-D.I.P. ADAPTER WITH RESTRAINED JOINTS. ALL PIPING IN CLEANOUT CHAMBER TO BE D.I.P. (CL 200).

TYPICAL CLEANOUT CHAMBER DETAIL

N.T.S.



NOTES:

1. PIPE MATERIAL FOR DROP CONNECTION SHALL BE DUCTILE IRON UNLESS NOTED ON PLANS.
2. ALL PIPES & FITTINGS SHALL BE SAME DIA. AS FORCE MAIN DIA.

EXTERIOR FORCE MAIN DROP CONNECTION

N.T.S.

NO.	DATE	REVISIONS	BY	CHECKED
1	4/21/15	REVISED MH AND STILLING WELL DETAILS		

T&M ASSOCIATES
11 TINDALL ROAD
MIDDLETOWN, NJ 07748
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FAX: 732-671-7366
NEW JERSEY BOARD OF PROFESSIONAL ENGINEERS AND LAND SURVEYORS CERTIFICATE OF AUTHORIZATION 24GA27997500

WESTERN MONMOUTH UTILITIES AUTHORITY

STANDARD CONSTRUCTION DETAILS

KEITH W. HENDERSON, PE
WESTERN MONMOUTH UTILITIES AUTHORITY ENGINEER
LICENSED PROFESSIONAL ENGINEER
STATE OF NJ LICENSE No. 24GE03080400

SD-3

SHEET 3 OF 3