

THE CINNAMINSON SEWERAGE AUTHORITY

Cinnaminson Township Municipal Building
1621 Riverton Road, Cinnaminson, New Jersey 08077

Part One - Rules and Rates

Part Two - Construction Regulations

Part Three- Inspection and Testing

Authority Members

Robert O'Connor, Chairman
Richard Strobel, Vice Chairwoman
James Wujcik, Treasurer
Frank Szymkowski, Chairman of Construction
John Conville, Member

CHANGE RECORD

REV	DATE	DESCRIPTION
	1/1/75	Original
A	5/8/1998	Revised format. Revised contents editorially. Reference to cast iron for new construction deleted.
B	9/15/2020	Added amendment to Section II, F, 5. Allowing abatement of charges to align with NJ American Water policies. Added amendment to Section II, 6. Require ratepayer to notify CSA of any change of use of property.
C	6/14/2021	Amended Part One, Section IB, Schedule 1 Connection Fees per annual recalculation effective December 1, 2021.
D	6/14/2021	Amended Part One, Section IB, 4, Multi-commercial or Combination Users, effective September 1, 2021.
E	11/10/2022	Amended Part One, Section I,B, Summer Rate, Second Meter rules effective September 1, 2022.

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RULES AND RATES

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PART ONE

RULES AND RATES

SECTIONS I THROUGH V

SECTION I

DEFINITIONS AND SCHEDULES

A. DEFINITIONS

Terms used throughout this document are defined in table I.

TABLE I. DEFINITION OF TERMS

TERM	DEFINITION
Authority	The Cinnaminson Sewerage Authority
Board	The CSA members, collectively
CSA	The Cinnaminson Sewerage Authority
Customer	The owner of the premises to be serviced
Domestic Sewage	The normal waterborne fluid wastes from residences, commercial establishments, institutions and bathrooms, water closets, lavatories and laundries
Non-Domestic	NEW DEFINITION TO BE SUPPLIED
Main	Authority owned or leased piping and appurtenances, in or along public highways and streets, or along privately owned rights-of-way, used for transmission or the collection of domestic sewage or industrial wastes from its customers.
Other than Residential Users	All users and connections other than residential, including but not in limitation, business, commercial, industry, restaurants, taverns, theaters, camps, churches, schools, etc.
Owner	The owner of the premises to be serviced

TABLE I. DEFINITION OF TERMS (CONTD)

Residential Users	<ul style="list-style-type: none">a. A building on a lot, designed and occupied exclusively as a residence for one family.b. Multiple - a building on a lot, designed and occupied exclusively as a residence for four or more families.c. Garden, High-Rise, Trailer Camp and Multiple Type - a multiple dwelling or group of multiple dwellings on a lot which is held and is designed to be held in a single ownership on which common yards and other common facilities and services may be provided, however, each dwelling unit shall have individual kitchen and bathroom facilities.d. Boarding House, Lodging House, Hotel or Motel - a dwelling having a common kitchen and used for the purpose of providing lodging or, both lodging and meals for pay or compensation of any kind, whether computed by day, week or month to persons occupying such dwelling other than members of a family.
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B. SCHEDULES OF RATES FOR SANITARY SEWER SERVICE

SCHEDULE 1 - CONNECTION FEES

Initial fees for the right to connect directly or indirectly to the Authority's sanitary sewer system include a connection charge or fee per unit, as well as fees for application, review, and inspection of work to be accomplished by the applicant in keeping with the Authority's rules and regulations.

1. Residential Dwelling Units (except condominiums) (effective December 1, 2021)

One family, two family, three family, garden apartment units,

high-rise apartment units and mobile homes:

CLASS	DESCRIPTION	FEE
I	A dwelling unit of 1,000 square feet or more* which has any number of bedrooms	\$5,900
II	A dwelling unit of 1,000 sq ft or less* which has no more than two bedrooms	\$4,425
III	A dwelling unit of 800 sq ft or less * which has no more than one bedroom	\$3,933
IV	Boarding house, nursing home, or motel (per unit)**	\$2,950

* Living area is defined as gross area within a dwelling unit, including hallways, storage areas, laundry and utility rooms, physically located within the owned or rented area of the sewer user.

** In cases where dormitory-style sleeping quarters are provided, the total number of dwelling units shall be determined by the total authorized occupancy of the facility divided by two(2).

2. Condominiums

In cases of condominium ownership, each unit, whether residential or nonresidential, shall be considered a separate entity for connection fee purposes.

3. Nonresidential Units

Non-residential users shall pay a connection charge based on the estimated daily average sewage flow in gpd (gallons per day) times \$19.67.

4. Affordable Housing Projects

Connection fees to be charged to public housing authorities and to non-profits organizations building affordable housing projects and to any other affordable housing, including housing units in inclusionary projects, shall be assessed according to the rates or credits and under such circumstances as are set forth in N.J.S.A. 40:14A-8.3.

TABLE II. ESTIMATED WATER CONSUMPTION

STRUCTURE	UNIT OF MEASUREMENT	GALLONS PER DAY
RESTAURANTS (INCLUDING WASHROOMS & TURNOVER)		
AVERAGE	SEAT	35
BAR/COCKTAIL LOUNGE	SEAT	20
CURB SERVICE/DRIVE-IN	CAR SPACE	50
FAST FOOD RESTAURANT	SEAT	15
24 HR SERVICE RESTAURANT	SEAT	50
CLUBS		
BATHHOUSE W/SHOWER	PERSON	25
BATHHOUSE W/O SHOWER	PERSON	10
NONRESIDENTIAL	MEMBER	35
RACQUET	COURT HOUR	80
RESIDENTIAL	MEMBER	75

TABLE II. ESTIMATED WATER CONSUMPTION (CONTD)

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STRUCTURE	UNIT OF MEASUREMENT	GALLONS PER DAY
INSTITUTIONS (INCLUDES STAFF)		
Hospitals	BED	175
Other	BED	125
SCHOOLS (INCLUDES STAFF)		
BOARDING	STUDENT	75
NO SHOWER OR CAFETERIA	STUDENT	10
WITH CAFETERIA	STUDENT	15
WITH CAFETERIA/SHOWERS	STUDENT	20
WITH CAFETERIA/SHOWERS/LAVATORY	STUDENT	25
AUTOMOBILE SERVICE STATIONS		
FILLING POSITION	EACH	125
MINI-MARKET	SQ. FT.	0.10 0
SERVICE BAY	PER BAY	50
MISCELLANEOUS		
ASSEMBLY HALL, CHURCH (WORSHIP AREA ONLY), THEATER (INDOOR OR DINNER), SPORTS STADIUM	SEAT	3
BOWLING ALLEY	ALLEY	200
CATERING/BANQUET HALL	PERSON	20
FACTORY/WAREHOUSE	EMPLOYEE	25**
FACTORY/WAREHOUSE W/SHOWERS	EMPLOYEE	40**

TABLE II. ESTIMATED WATER CONSUMPTION (CONTD)

STRUCTURE	UNIT OF MEASUREMENT	GALLONS PER DAY
FAIR GROUNDS (BASED UPON AVERAGE ATTENDANCE)	PERSON	5
VISITOR CENTER	VISITOR	5

*GROSS AREA **ADD PROCESS WASTEWATER *** RESTROOM ONLY

Special situations and industrial processes using water will be assessed on an individual basis.

4. Time of Connection

Connection must be made within twelve (12) months of the date the fee is paid and the application approved. The application will expire after 12 months but can be renewed for additional one-month periods upon payment of any increase in the amount of the connection fee over the fee paid at the time of original approval and compliance with any change in the regulations governing connections.

5. General Provisions

A. Applicants may appeal the amount of the connection fee determined from the estimates made by the engineer or the Authority. Upon being notified in writing by the engineer or the CSA of the fee so fixed, the applicant will be afforded a hearing by the Authority within ten (10) days after such written determination. The Authority, after furnishing written notice to the applicant of the time and place of the hearing, will consider the matter at the first regular meeting occurring not more than forty (40) days after receipt

of the written determination and at least five (5) days after receipt by the applicant of such notice sent by certified mail, return receipt requested, to the address given by the applicant in the application for service.

- B. Connection fees, which are one-time initial service charges for the right to connect, are an integral part of the Authority rate schedule. The supplemental charges in schedules 2 through 7 are required to maintain, improve, and operate the Authority's sanitary sewerage facilities.
- C. New Jersey state statute 40:14-8(b) of the Sewerage Authorities Law requires every Authority at the end of its fiscal year to set its connection fees or tapping fees for the ensuing year at an amount equal to the actual cost of the physical connection plus the total sum paid to date by the Authority for its system less the amount of any gifts, contributions or subsidies divided by the total number of units serviced by the Authority.
- D. Each year after the computations by the Authority's auditor have been completed to January 31st of the following year, the end of the Authority's previous fiscal year, a public meeting is held to detail the revised connection charges for adoption for the period following January 31st. The new schedule will be available in the offices of the Authority for inspection.
- E. Industrial and commercial connection fees should not be less than the residential fee.
- F. In addition to the foregoing, multiple units, commercial and industrial users shall:
 - 1. Pay initial connection charges in accordance with the CSA schedule estimated by the Authority on the

basis of expected gallonage. Connection charges shall be paid prior to construction. The applicant shall furnish supporting data pertaining to type of installation, estimated water consumption, etc.

2. Notify prospective tenants to secure clearance before occupancy, unless the tenant is known and cleared by the Authority for occupancy upon completion of construction. This will enable the Authority to make the necessary adjustment in customers' charges from that which was estimated to that which should be charged, based on actual expected use.

SCHEDULE 2 - APPLICATION, REVIEW AND INSPECTION FEES

All applicable forms and applications must be approved by the Authority's chairman of construction. Should the owner's application be approved, the property owner or owner's representative applying for approval of the connection to the Cinnaminson sanitary sewer system shall agree:

To pay an initial filing fee of \$40.00 plus a \$5.00 garbage disposal fee when applying for a single residence connection, and upon approval of the application, a connection fee of \$5,900 and an inspection fee of \$100 (if applicable) for a simple lateral connection.

or

To pay an initial filing fee of \$40.00 plus a preliminary engineering and legal review fee of \$1,000.00 at the time of application for multiple units, commercial and industrial connections. After preliminary review, the Authority's engineer will provide an estimate of total fees to be paid before initiating construction. Residential shall be a \$500.00 review fee.

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Total fees include the following:

A review fee of 4% of the Authority engineer's estimated cost of construction

An construction inspection fee of 6% of the Authority engineer's estimated cost of construction

The cost of having a drafter transfer "as-built" data to the Authority's master drawings

The cost of having the Authority engineer verify "as-built" data supplied by the applicant

A portion of interest earned on a deposit made for inspection and professional fees, or for performance or maintenance guarantee requirements, will be retained by The Cinnaminson Sewerage Authority in accordance with the following:

33-1/3% will be retained if the interest on a deposit in excess of \$5,000 exceeds \$100 in any year.

100% will be retained (a) if the interest earned does not exceed \$100 in any year, or (b) where the initial deposit did not exceed \$5000.

A certificate of occupancy will not be issued unless this adjustment is made.

The applicant has the right to appeal to the full board for a review of connection charges. If favorably received, the Board will authorize a time use period of one to two years, depending upon the type of installation.

At the end of the time use period, the charges will be adjusted on the basis of actual use. It should be noted that the charges may increase or decrease as a result of the review.

Industrial and commercial establishments applying for sanitary

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sewer service, in addition to making written application, shall furnish a detailed description of the type and size of buildings, the nature of the business to be conducted in each structure, the number and type of fixtures to be served, and the type, volume and chemical characteristics of the waste to be discharged.

The plans of such applicants also shall show:

The boundaries of the property

The location within the property of the structures to be served.

The location and profile of the services, with respect to finished grade.

Details of the proposed connections to the sewer system, and arrangements and details of meter installation (if required). (Refer to section IV, with respect to admissibility of industrial waste)

Checks shall be made payable to:

The Cinnaminson Sewerage Authority

SCHEDULE 3 - QUARTERLY CHARGES FOR SANITARY SEWER SERVICE

A. METERED SERVICES

1. SINGLE FAMILY RESIDENTIAL USERS

The minimum quarterly charge for all single-family residential dwellings is \$60.00, with a minimum allowance of 10,000 gallons.

2. MULTIPLE DWELLING UNITS - RESIDENTIAL USERS

The minimum quarterly charge for multi-unit residential users served through a single water meter is the product of the number of units and the minimum quarterly charges as

established in this rate schedule. The minimum water allowance will be determined in the same manner, using an allowance of 10,000 gallons per unit.

Dwelling units that do not contain separate and private bathroom and kitchen facilities, such as hotel, motel, boarding house, and lodging house rooms shall, for billing purposes, be considered as half units and therefore the minimum quarterly charges, minimum usage allowance and excess water consumption will be computed accordingly.

3. SINGLE COMMERCIAL AND INDUSTRIAL USERS

All other classes of single users shall be subject to the minimum quarterly water charges in table III.

TABLE III. MINIMUM QUARTERLY WATER CHARGES

SIZE OF WATER METER (INCHES)	MINIMUM QUARTERLY WATER CHARGE (DOLLARS)	WATER ALLOWANCE FOR MINIMUM CHARGE (THOUSANDS OF GALLONS)
5/8 - 3/4	119.00	15
1	168.00	22
1-1/4	238.00	30
1-1/2	336.00	45
2	445.00	60
3	743.00	100
4	1158.00	150
6	1851.00	250
8	3704.00	500
10	5613.00	750

4. MULTI-COMMERCIAL OR COMBINATION USERS

A multi-commercial user or combined commercial and

residential user which is not serviced through an individual water meter to each unit but which is serviced through a single water meter to each building as set forth in Table III of this rate schedule plus any consumption in excess of the quarterly water allowance. (Approved 6/14/21, Resolution No. 2021-2022-21; effective as of 9/1/2021 billing cycle.)

B. EXCESS WATER CONSUMPTION CHARGES

Consumption in excess of the water allowance within the quarter for the minimum quarterly charge will be billed \$6.60 per 1,000 gallons.

C. UNMETERED SERVICE - RESIDENTIAL

1. SINGLE UNIT

The minimum quarterly charge for a single-family residential unit with unmetered private water supply is \$60.00 per quarter.

2. MULTI-UNIT

The minimum quarterly charge for multi-unit unmetered residential users is determined by multiplying the number of units by the minimum quarterly charge established for the single unmetered residential unit.

D. SWIM CLUBS AND OTHER SPECIAL USERS

Rates are generally established after review by the Authority engineer and approved by the Authority on an individual basis. Charges are based upon anticipated and/or actual use and are made equitable with rates for other users.

E. SUMMER RATE - RESIDENTIAL USERS

To compensate the residential user for that portion of the excess usage during the summer months which is used for the watering of lawns, gardens etc., the sewer bill will be capped

at 52 thousand gallons.

In lieu of the receiving the summer cap, residents may install a second meter to register outside water usage and to be given credit for this usage on their quarterly sewer bill. After installation of this meter the Authority must be notified, and CSA personnel must inspect the installed meter and verify starting numbers.

The resident is responsible for installation, repairs, and maintenance so that the meter is recording properly and readily accessible to CSA personnel for readings. Credit for outside usage will be given on readings from second meters only. If customers install or replace a second meter, the touch pad must be clearly marked "second meter". The second meter must also allow visual reading of the meter from the exterior of the building. After installation of the meter, the Authority must be notified of the installation and location of the meter, and touch pad. Authority personnel will inspect the meter to verify starting numbers and compliance with this rule. If a customer installs a non-compliant meter, they shall **not** receive a credit.

Readings from secondary meters must be taken once per year and submitted prior to the due date. Failure to do so will result in the loss of credit. Residents may self-report readings in accordance with CSA policy as may be determined & published by the Authority. Accounts with no readings/credit for two consecutive years will be automatically removed from the program. Credit for second meters cannot exceed the amount charged for excess usage for the reporting period.

A charge of 10.00 will be assessed for each meter reading. A charge of \$20.00 will be assessed for annual readings that require an appointment for an indoor, in-person reading.

SCHEDULE 4 - GARBAGE DISPOSAL UNIT CHARGES

A. SINGLE AND MULTIPLE RESIDENTIAL UNITS

All dwelling units containing domestic-type garbage disposal units will be charged an extra \$5.00 per quarter over and above the basic minimum quarterly charge.

B. COMMERCIAL AND INDUSTRIAL UNITS

No commercial or industrial garbage disposal units or grinders will be permitted without written permission from the Authority. The charge for such units shall be determined as a surcharge to the normal metered service charge upon recommendation of the Authority engineer.

The engineer shall compute the surcharge on the basis of the sewage load imposed on the system in comparison with a domestic garbage disposal unit operating in a single family residential unit. The Authority specifically reserves the right to refuse service to such units if it is in the best interest of the sewer system.

SCHEDULE 5 - SURCHARGE FOR TREATMENT OF INDUSTRIAL WASTE

The quarterly service charge for sewer service for the collection and treatment of industrial waste discharged into the Authority's system is based upon the water consumption computed in schedule 3 and products of the surcharge or premium charge as determined as a strength factor in accordance with the following formula:

$$\begin{aligned} & \frac{(\text{BOD}^* \text{ in mg/l})}{300} \quad \times \quad 33 \\ & \frac{(\text{TSS}^* \text{ in mg/l})}{300} \quad \times \quad 33 \\ & \frac{(\text{Oil \& Grease}^* \text{ in mg/l})}{100} \quad \times \quad 34 \end{aligned}$$

= Surcharge Percentage

* Where the actual concentrations are less than 300 mg/l for BOD or TSS or 100 mg/l for oil and grease, the value in the parentheses shall be equal to "1".

SCHEDULE 6 - PARTIAL SERVICE CHARGES

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Schedule of rates for residential, commercial or industrial users using only partial service from the Authority

Instances where the Authority does not provide the only sewerage service for the premises or, if, in the opinion of the user, the water meter reading does not fairly reflect the quantity of sewage discharged into the Authority's system, then the user may install, at his own expense and upon approval of the installation by the Authority, additional water or sewage meters as necessary to determine accurately the amount of water discharged to the sewer system.

The charge for sewer service will be in accordance with the rate schedule for the applicable user.

SCHEDULE 7 - DISCONNECTION AND RECONNECTION CHARGES

Should it be necessary to seal an existing lateral connection to the Cinnaminson Sewerage Authority collector mains due to renovations, reconstruction, etc., and/or non-occupancy for an indefinite period of time, the owner, lessor or designated representative may officially request an Authority representative to witness application of a seal in accordance with accepted procedures.

If, during this period, the Authority is reimbursed quarterly with the minimum user charge in effect at the time, the applicant may reopen the line upon payment of applicable filing and inspection fees and following inspection of the connection by the Authority's representative.

Should the use of the property be other than the original one, the connection charge will be computed in accordance with the existing schedule of rates. Credit will be given for the computed connection charge applicable to the original installation connection, provided that the new computed charge is in excess thereof.

If, however, after proper sealing of the lateral has been

accomplished, the Authority is not reimbursed quarterly with the minimum use charge in effect at the time, the applicant will be charged the filing fee plus a connection charge in accordance with existing rates for a new installation.

SCHEDULE 8 - WASTEWATER DISCHARGE REGULATION FEES

A. APPLICATION FEES

A user shall pay an application fee for any industrial discharge permit submitted to the Authority. The application fee includes administrative expenses, initial application engineering reviews, facility inspections and permit writing and issuance. The application fee schedule is as follows.

<u>APPLICATION FEES</u>	<u>ORIGINAL APPL/PERMIT</u>
<u>SIGNIFICANT</u>	<u>INDUSTRIAL</u>
	\$250.00
\$300.00	

B. PERMIT FEES

A user shall pay an annual permit fee prior to the time that the permit is issued. The permit fee includes administrative expenses, reviews of discharge monitoring reports and inspections as may be required. The permit fee is calculated as follows:

Industrial/Commercial User	\$50.00/per year
Significant Industrial User	\$50.00/per year

C. SAMPLING INSPECTION FEES

A user shall pay a sampling inspection fee upon presentation of a bill from the Authority. The sampling inspection fee includes administrative expenses and expenses for inspection of a sampling event by an independent certified laboratory. The

sampling inspection fee is \$25.00 per sampling event.

SECTION II

GENERAL CONDITIONS

A. APPLICATIONS FOR SERVICE

1. Sewer service connections will be considered upon written application signed at the Authority office by the property owner or his properly authorized agent. Blank forms for all applications, prepared for their respective services, will be furnished by the Authority. All applications must receive the approval of the Authority before connection is made for each class of service furnished.

2. Application for service will not be accepted by the Authority until the applicant has paid, or made satisfactory arrangements to pay, all arrears and charges due for any premises now or heretofore owned by him.

3. The accepted application shall constitute a contract between the Authority and the applicant, obliging the applicant to pay the authority its rates as established from time to time and to comply with its rules and regulations.

4. Applications for service connections may be accepted subject to there being existing mains in streets or rights-of-way abutting the premises to be served.

5. When a prospective customer has made application for a new service or has applied for the reinstatement of an existing service, it is assumed that the piping and fixtures on the premises are in good condition.

6. A new application must be made and approved by the authority upon any change in ownership or use of the property or in the service, as described in the application. The Authority has the right, upon five days'

notice, to discontinue the service until such new Application has been made and approved. Although property may be occupied or leased to a tenant and the tenant may have paid the sewer bills, the owner of the property is responsible for payment of any sewer bills not paid by the tenant. It is the owner's responsibility to provide the authority with written notice of a change in use of the property that would result in a new user classification. Reimbursement to the owner for any overbilling prior to receipt of such notice is limited to a period of 90 days.

7. Industrial and commercial establishments making application for sanitary sewer service, in addition to making written application for such service, shall comply with the provisions of schedule 2 (Application, Review and Inspection fees).

B. DEPOSITS FOR TEMPORARY SERVICE OR DELINQUENT ACCOUNTS

1. Deposits may be required from customers taking service for less than thirty days, in an amount equal to the estimated gross bill for such temporary period, plus the cost of making and discontinuing such service. Deposits may be required from any other customer who becomes habitually delinquent, provided that in no instance will deposits be required in excess of the estimated gross bill for any single billing period plus one month with a minimum of \$50.00.

2. Any customer having paid a deposit shall pay bills for sewer service rendered, in accordance with the rules of the Authority, and the deposit shall not be considered as payment on account of a bill during the time the customer is receiving service.

3. Deposits shall be returned to the depositor at final settlement, if all outstanding sewer fees have been paid. The Authority shall have the right to apply the deposit against outstanding bills at final settlement.

4. No interest will be paid on deposits.

C. BILLS AND PAYMENTS

1. Bills are payable at the administration office of the Authority.

2. Regular readings of a private water or sewage meter, or a meter supplied by the public water agency, will be used to compute sewer charges. Bills will be rendered as soon as practicable after the reading of the respective meters. All bills are due and payable upon presentation or delivery.

3. All customers connected to the sewer system will be billed and shall pay, in each quarter, the minimum charge plus any excess amount due over the minimum allowance.

D. DISPUTED BILLS

Payment of any disputed bill, within the meaning of these rules, shall be made within thirty days following presentation of the bill. Payment of any disputed bill which is withheld beyond the period herein mentioned shall be subject to penalty unless the dispute is terminated substantially in favor of the customer and payment of the agreed amount is made within ten days thereafter.

E. TERMINATION OF SERVICE

1. Sewer service will not be considered subject to owner shut-off. Requests for termination of sewer service will be permitted only in cases of demolition, fire, flooding, or by order of the Board of Health for vacating the building serviced for health reasons.

The owner will be responsible for payment of a sewer rental charge at the minimum rates established by the Authority during the time the property or structure is

vacant. Except during the period that the premises are uninhabitable for the above stated reasons.

2. Service may be discontinued by the Authority for any of the following reasons:

- a. Misrepresentation in an application
- b. Discharge of detrimental waste water into the Authority's system
- c. Discharge of waste water from any other property or purpose than that described in the application
- d. Neglecting to make or renew deposits, or for non-payment of any charge accruing under the application
- e. Denial of reasonable access to the property for purposes of inspection or for reading meters
- f. Making, or refusing to sever, any cross connection between a pipe or fixture carrying metered water, and a pipe or fixture carrying water from any other source
- g. Violation of any CSA rules

3. No plumber, owner, tenant or other unauthorized person shall disconnect or remove the sewer connection without the written consent of the Authority.

F. RESTORATION OF SERVICE

1. Sewer service will be restored after proper application if the conditions under which such service was discontinued are corrected, and upon the payment of all charges provided in the rate schedule and rules of the Authority.

2. Where a sewer connection was installed previously and

service is desired, a proper application shall be signed by the owner and the tenant.

3. Where sewer service has been turned off because of a violation of the authority's rules or, for non-payment of a bill, a charge of \$100.00, payable in advance, shall be made for restoring the original connection.

4. If a bill remains unpaid after the end of the month in which it was presented, it will be considered delinquent. Payments made by mail will be credited as received on the date upon which payment was received in the Authority's office.

When a sewer bill is classified as delinquent, interest will be charged on the unpaid balance at the rate of 1.5% per month until all charges are paid.

5. No abatement on meter bills will be made for leaks, or for water wasted by damaged or defective fixtures except that the Authority shall grant a residential user a reduction in user's sewer bill for water entering the sewer system due to damaged or defective fixtures, to the extent of the number of gallons reduction allowed to user by New Jersey Water Company and upon presentation of proof of repairs to user's damaged or defective fixtures. Users are only eligible for such an abatement one time in any five-year period.

6. Following standard legal procedures authorized for collection of delinquent accounts due the Authority, if a bill remains unpaid at the end of the Authority's fiscal year, the customer will be notified by the Authority that a tax lien will be initiated against the property.

To avoid the tax lien, the customer must remit the charges plus interest and penalties immediately to the Authority's office in the township building. Settlement must be in cash, cashier's check or United States Postal Money Order

for the full amount due the Cinnaminson Sewerage Authority.

7. Any house sold in the Township of Cinnaminson must be inspected by the Authority and, if in compliance with township ordinance 1992-12, will be given a compliance certificate. A charge of \$50.00 shall be paid by the seller at the time of inspection.

G. OPERATING RESPONSIBILITY

1. It is agreed by the parties receiving service that the Authority does not assume any liability as insurer of property or person and that the Authority does not guarantee any special service, capacity or facility, other than that permitted by the ordinary and changing operating conditions of the Authority as the same exists from day to day. It is further agreed by the parties receiving service that the Authority shall be free and exempt from any and all claims for injury to any persons or property by reason of failure to provide collection or treatment capacity.

2. The Authority has the right to reserve sufficient capacity in its facilities to adequately collect and treat sewage from all existing and contracted customers. The Authority may further restrict or regulate the quantity of waste water discharged by the customer in case of scarcity of capacity, or whenever the public welfare may so require.

3. As necessity may arise in the event of breakdown, emergency or, for any other unavoidable reason or cause, the Authority has the right to cut off the sewer service temporarily in order to make necessary repairs, connections, etc. The Authority will use all reasonable and practical measures to notify the customer of such discontinuance of service. In such cases, the Authority will not be liable for any damage or inconvenience experienced by the customer, or any claim against it at any time for interruption of service.

When the service is to be temporarily interrupted, notice will be given, where practicable, to all customers affected by the temporary service interruption, stating the probable duration of the interruption and also the purpose of the interruption.

4. The properly identified authorized agents of the Authority have the right to access to the premises served, at all reasonable hours, for the purposes of reading meters, examining fixtures and pipes, observing the manner of use and discharge of water and, for any other purpose which is proper and necessary in the conduct of the Authority's business.

5. Complaints with respect to the character of service furnished, or the reading or the meters, or of the bills rendered must be made at the Authority's office either orally or in writing, and a record of such complaint will be kept by the Authority, noting the name and address of the complainant, the date, the nature of the complaint and the remedy.

6. No agent or employee of the Authority is authorized to bind it by any promise, agreement or representation not provided for in these rules. The Authority reserves the right to change, take from or add to, the foregoing rules and regulations.

7. A service fee of \$10.00, plus any bank fees will be charged to the customer for a returned check for the first time.

A second returned check and subsequent returned checks will result in a \$20.00 service fee for each plus any bank fees.

SECTION III

MAIN COLLECTION LINE EXTENSIONS

A. GENERAL PROVISIONS

The property owner or owner's representative applying for approval of a main collection line extension to the Cinnaminson sanitary sewer system shall agree:

1. To comply with the provisions of the CSA rules and regulations and rate schedule described herein, including the latest revisions on file in the office of the Authority.
2. To convey by deed to the Cinnaminson Sewerage Authority easements to all areas on the preliminary plan showing sanitary sewer lines and all rights to the sewer system.
3. To pay all legal and engineering fees for the securing of easements whether secured by the applicant or the Authority and for all charges incurred to expedite approval of the application.
4. To post a performance bond for the cost of construction as estimated by the Authority's engineer. The bond shall be written by a company acceptable to the Authority and shall have policyholder surplus equal to ten (10) times the project bond. The bonding company shall have an A.M. Best Company A rating.
5. To furnish six (6) copies of plans along with the application in triplicate. Plans are to be corrected and updated per advice of the Authority and/or the Authority's engineer and six (6) revised copies submitted until approval is obtained
6. To furnish a list of all plans and other material, documentation, etc., submitted with the application
7. To furnish six (6) copies of an itemized list and a description of the proposed sewer construction and

appurtenances indicated on the plans as well as the estimated cost

8. To notify the Authority when construction is to begin

9. To notify the Authority at least 48 hours in advance when inspection may be made by our representative before work is covered. Failure to do so may require undue expense on the part of the applicant to excavate in order for proper inspection to be made.

10. To provide three (3) sets of "as-built" drawings upon completion of construction. When all requirements have been met, and "as-built" drawings have been received and approved by the Authority's engineer, the Authority will notify the Applicant that the performance bond will be released upon receipt of a two (2) year maintenance bond in an amount equal to 10% of construction cost, with a minimum of \$1,000.00.

11. To submit applications to the NJ DEP for permission to construct and operate the proposed extension of the sewerage system

12. To provide, at his own expense, all necessary information indicated on Form M 7200-Rules and Regulations for the Preparation and Submission of Plans for Sewer Systems and Wastewater Treatment Plants)

13. To pay, in cases where a pumping station will be required to transport sewage from a proposed subdivision, the projected five-year maintenance costs prior to acceptance of the pump station by the Authority. The projected five-year maintenance costs will be calculated by the Authority's engineer and will include labor, power and fuel, chemicals, maintenance and supplies, administrative expenses and insurance.

B. SPECIFIC PROVISIONS

1. Extensions to Serve Existing Structures

These extensions serve existing structures with occupancy of permanent or established character. The Authority may, depending upon its financial resources, extend its mains to serve new bonafide customers, other than to serve subdivisions, tracts, housing projects, industrial developments or organized service districts.

The Authority may, depending upon its findings and the restrictions directed by its bond indenture, participate financially in extension of its mains to serve customers where the required total length of main extension from the nearest distribution main or sanitary sewer main is not in excess of sixty-five (65) feet per service connection of each type.

2. Extensions to Serve Planned Structures

These extensions are for structures not yet built or where the erection or occupancy of the structures to be served is speculative. This category includes new subdivisions, tracts or ground to be developed, new housing projects, industrial development or organized service districts and the like.

a. The applicant for such service shall advance to the Authority before construction is commenced that portion of the cost for the first sixty-five feet of the main extension per service connection not covered by the Authority. Additionally, the applicant shall advance such extension above the sixty-five feet per service connections, including the cost of the service connections and the cost of increasing the size or capacity of the Authority's existing mains or any other facilities used or necessary for supplying the proposed extension, which excess cost shall be reimbursed in the manner hereinafter provided.

b. The applicant shall advance to the Authority before construction is commenced, the estimated reasonable cost of installation of the main from the nearest existing main at least equal in size to the main required to service such development, including necessary service stubs or service pipe lines, fittings, valves and housing thereto, manholes and all other appurtenances.

If, in the opinion of the Authority, additional facilities are required specifically to provide additional treatment or collection capacity, as a result of the service requested, the cost of such facilities may be included in advance.

C. The developer shall contract directly for the performance of all work by reliable established contractors. Prior to commencement of work, all contractors and subcontractors to be employed must be approved by the Authority and a performance bond posted equal to 20 percent of the Authority engineer's estimated cost.

Upon completion of all work and prior to acceptance of lines and appurtenances by the Authority, the developer shall post a two-year maintenance bond in an amount equal to ten percent (10%) of the construction cost-with a minimum of \$1,000.00. The developer shall reimburse the Authority for all legal and engineering fees charged by its consultants in the preparation of contracts, bonds, plans, specifications, supervision, resident inspection and, all work incidental to the construction engaged in by the developer.

In addition to the developer's obligation to provide the two year maintenance bond prior to acceptance, the Authority may request that the developer execute

a five (5) year pump station maintenance agreement subject to the terms and conditions established by the Authority and its professional staff.

3. DAMAGE CLAIMS

a. In all contracts for general or special sewer service, it is expressly understood and agreed that no claims will be made against the Authority for damage to life or property, by reason of the breaking of any service pipe or appliance within the customer's premises, unless caused by the negligence of the Authority or its employees, nor for any damage done due to the failure of the sewerage capacity for any cause beyond the control of the Authority.

b. No service will be furnished to any premises where any possibility exists of the commingling of storm water and sanitary waste; nor will the Authority permit its mains or service pipes to be connected in any way to any piping, tank, vat or other apparatus containing liquids, chemical or any other matter which may flow back into the Authority's service pipes or mains, consequently endangering the treatment process.

FORMER SECTION V

INDUSTRIAL WASTE

Former section V is hereby repealed in its entirety and the Cinnaminson Sewerage Authority wastewater discharge regulations are adopted herewith and hereby amend, supplement and replace the provisions of said SECTION V.

SECTION IV

USER SERVICE CONNECTIONS

A. OWNER'S SERVICE LINE

1. The owner shall make the physical connections to the

Authority's main as well as furnish, install and maintain the service line from the main to the structure. All service lines remain the sole responsibility of the owner. The applicant shall pay a charge for each connection to be installed as prescribed in schedule I Connection Fees.

2. In addition to the charges in schedule I, the owner also shall pay the cost of any permits and restore all street paving, curbs, and sidewalks.

B. SIZE AND KIND OF SERVICE LATERAL

The Authority reserves the right to determine the size and kind of service lateral from the main to the curb lines, from the curb line to the property to be served, or from the main in a right-of-way to the property to be served. Laterals of all sizes shall be constructed in accordance with the Authority's specifications.

The service Lateral from the main to the building shall be:

Furnished, installed and maintained by the owner of the property

Laid in a straight line from the point of connection at the main to the structure

- At least four feet (48 in.) below the surface of the ground when final grading of the property has been completed.

The service lateral between the main and vent installed and maintained by the owner shall be installed by a contractor approved by the Authority and, shall be inspected and approved by the Authority's Inspector prior to backfilling the trench. Otherwise, any construction not approved shall be immediately removed and reconstructed in an approved manner.

C. SEPARATE TRENCH

No service lateral shall be laid in the same trench with any gas pipe, water service or any other facility of any public utility company or within three feet (3') of any open excavation, vault, meter pit. The location shall not be in conflict with any sidewalk or driveway running at right angles to the front of the building.

D. RENEWAL OF SERVICE LATERAL

Where renewal of the service lateral from the main to the structure is found to be necessary, the owner shall renew the service in the location previously used unless another location is approved by the Authority.

E. MAINTENANCE BY CUSTOMER

1. All connections, service laterals and fixtures furnished by the customer shall be maintained by him in good order. All leaks in the service lateral or any fixture for the premises served must be repaired immediately by the owner or occupant of the premises.

The customer shall notify the Authority of the party engaged by said customer to do any maintenance work on the customer's service lateral prior to the work being commenced and, said party shall not backfill any trench until the work has been inspected and approved by the Authority's representative. Any work not acceptable shall be immediately removed and replaced by work which is acceptable.

2. The Authority will in no way be responsible for maintaining any portion of the service lateral or for damage done by sewage escaping

The customer shall, at all times, comply with applicable municipal regulations with respect thereto and, make changes therein required, by reason of changes of grade,

relocation of mains or otherwise.

F. PROPERTY SERVED BY SINGLE SERVICE LATERAL

A service lateral shall not serve more than one property, but any such property, upon proper application by the owner, may be served by two or more service laterals, each of which, for billing purposes, shall be considered as one customer account.

G. SINGLE SERVICE LATERAL WITH TWO OR MORE CUSTOMERS

Where two or more customers are served through a single service lateral, any violation of the rules of the Authority with respect to either or any of said customers shall be deemed a violation applicable to all and, unless said violation is corrected after reasonable notice, the Authority may take such action as may be taken for a single customer, except that such action will not be taken until an innocent customer, who has not violated the Authority's rules, has been given a reasonable opportunity to connect his pipe to a separately controlled service lateral.

H. PROHIBITED CONNECTIONS

Under no circumstances shall any of the following be connected to the sanitary sewers, either directly or indirectly:

1. Floor drain, area drain or yard drain
2. Rain conductor or downspout
3. Grease pit
4. Air conditioning equipment
5. Storm water inlets or catch basins
6. Drains from any piece of equipment or manufacturing process, except where specifically authorized under the provisions of section IV - Industrial Waste.

I. SPECIAL CONNECTIONS

Service laterals to public buildings, churches, apartment houses, commercial establishments and industrial establishments shall be installed to conform to detailed plans and specifications submitted to the Authority by the applicant and, only after review and approval of those plans and specifications by the Authority.

PART TWO

CONSTRUCTION REGULATIONS

SECTIONS VI TO XV

PART TWO
SECTION VI
STATEMENT OF PURPOSE

The purpose of this part of the rules and rates document is to set forth rules, regulations and standards to guide developers and builders in Cinnaminson Township, so as to promote the public health, safety, convenience and general welfare of the municipality. These rules and specifications will be administered by the CSA to ensure orderly growth, development and construction of the sanitary sewer system, so as to provide the best possible sewerage collection and treatment facilities in accordance with the requirements of the Department of Environmental Protection of the State of New Jersey, and The Cinnaminson Sewerage Authority.

These detailed specifications are the regularly adopted rules and regulations of The Cinnaminson Sewerage Authority. They supersede and complement all prior rules, regulations, and standards. Alleged conflict between any of the articles or paragraphs of these rules, regulations and standards will be subject to interpretation by the Authority. The Authority's interpretation and ruling will be final.

SECTION VII

SANITARY SEWER SYSTEM SPECIFICATION

A. GENERAL CONDITIONS

1. A sanitary sewer system consists of a wastewater treatment plant and a network of pipes, manholes and lift stations necessary to collect and transport wastewater from its origin to the point of treatment.
2. This specification delineates both general and detailed

requirements for construction of sanitary sewer lines, manholes, accessories and other appurtenances under the jurisdiction of the CSA.

3. These regulations are administered by the CSA and are minimum requirements. They are intended to apply to the usual and not the exceptional conditions and are subject to amendment. The Cinnaminson Sewerage Authority reserves the right to specify more or less stringent requirements in any case as in their judgement may be in the best interest of the community or for environmental protection.
4. It is advisable that the customer prepare preliminary reports and plans for any proposed sanitary sewer construction or development before proceeding with detailed design, and, upon payment of applicable filing fees, present them to the CSA office for the purpose of review and discussion of the proposal.

If possible at the next regular meeting, the CSA will make comments and/or provide the pertinent instructions applicable to these plans. The CSA also will provide the forms and information necessary to obtain approval for the construction of new sanitary sewer facilities and for obtaining wastewater treatment services. Plans must be approved by the CSA engineer before proceeding with construction.

5. The CSA recognizes the fact that questions may arise during the planning, construction and/or testing phases of sanitary sewerage systems that may or may not be covered by the specifications, rules and regulations. In these cases, the CSA will clarify the meaning of the specifications and provide direction for the developer, builder or contractor as necessary to meet CSA requirements.
6. Contracts or agreements between contractor and owner or developer will have **no** bearing on CSA requirements for acceptable construction.

B. SANITARY SEWER LINES

1. The maximum length of any line between manholes shall not exceed four hundred (400) feet.
2. A manhole shall be constructed at any point where the line changes direction or grade. No curved lines will be permitted.
3. A drop manhole shall be constructed where the invert of the influent and effluent lines of the manhole differ by twenty-four (24) inches or more.
4. Force mains shall not be tied directly into a gravity manhole. A collector manhole which provides for energy dissipation shall be constructed adjacent to the gravity manhole and the force main terminated in the collector manhole. Effluent from the collector manhole shall flow by gravity into the manhole which is part of the gravity system,
5. Sanitary sewer mains shall not be installed under curbs or sidewalks.
6. No underdrains, conduits and/or cables of any nature shall be installed in the same trench with sanitary sewerage.
7. Ductile iron pipe shall be used where the sanitary main is installed at a depth of less than thirty-six (36) inches and, at all stream crossings or along any streams where the distance to the embankment is less than ten (10) feet.
8. Sewers and water mains generally shall be separated by at least ten (10) feet horizontally. If such lateral separation is not possible, the pipes shall be in separate trenches with the sewer at least eighteen (18) inches below the bottom of the water main, or such other separation approved by the CSA.

In general, the vertical separation at a crossing of sewer and water line shall be at least eighteen (18) inches. Where this is not possible, the sewer shall be constructed of ductile iron pipe using mechanical or slip-on joints, or other approved protection, for a distance of at least ten (10) feet on either side of the crossing.

9. Any sewer line within one hundred (100) feet of a water supply well, or a below-grade reservoir, shall be made of steel, reinforced concrete, cast iron or other suitable material, shall be properly protected and of completely watertight construction.
10. Where a new sanitary line is constructed and tied into an active manhole, the new line shall be plugged, and shall remain plugged until all testing has been completed on the new sanitary sewer main and all associated lines. The plug shall not be removed without the approval of the CSA or its authorized representative.
11. All sanitary sewer laterals scheduled for connection to a specific sewer main shall be connected and extended to the curb line before any acceptance testing is performed on that line.
12. Neither repair clamps nor saddles shall be used on new sanitary sewer lines within the jurisdiction of the CSA. These items are to be used only in case of emergency and then only with the prior approval of the CSA.

SECTION VIII

MATERIALS

A. BUY AMERICAN

All materials used in construction of sewer mains and appurtenances shall be made in America, if at all possible.

B. Ductile Iron Pipe and Fittings for Gravity Mains

1. Ductile iron pipe shall be centrifugally cast in conformance with AWWA C-151, and shall be manufactured in eighteen foot (18') or twenty foot (20') nominal lengths.
2. Ductile iron pipe shall be Pressure Class 350 for pipe sizes four inch (4") through twelve inch (12") and Pressure Class 250 for pipe sizes fourteen inch (14") through twenty-four inch (24").
3. Due to the corrosive nature of sewage, cement lining of ductile iron pipe is prohibited for sewer service installations. A bituminous material, at least 1 mil thick and conforming to the requirements for seal coating within AWWA C104, shall be applied. The exterior of buried pipe shall be likewise coated. Other coatings may be applied if prior approval is obtained.
4. Ductile iron joints shall be push-on type conforming to AWWA C151 with gaskets conforming to AWWA C111.
5. Ductile iron pipe fittings shall be push-on type, conforming to AWWA C110 with a minimum pressure rating of 250 psi.

C. PVC GRAVITY SEWER PIPE AND FITTINGS

All PVC gravity sewer pipe and fittings shall comply with ASTM D-3034, SDR 35 or, for sizes 18" through 27", ASTM F-679

- D. Joint design: ASTM D-3212, push-on type joint using an elastomeric ring gasket. Infiltration shall not exceed 50 gallons/inch diameter/mile/day.
- E. Joint material: Elastomeric ring rubber gasket, ASTM D-3212.
- F. Primers and adhesives used shall be as specified by the

manufacturer.

G. MATERIAL CERTIFICATION

1. Prior written approval of the CSA is required before any other type of material is used.
2. Since specific construction methods are required for the proper installation of PVC pipe, the specifications below will apply.

a. ASTM:

- (1) D-3034: Type PSM Polyvinyl Chloride Sewer Pipe and Fittings.
- (2) D-3212: Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals.

b. Manufacturer's literature and recommendations:

- (1) Submit manufacturer's descriptive literature for all materials to be used.
- (2) Submit pipe manufacturer's recommended method of gasket installation.
- (3) Submit the above for the CSA engineer's approval.
- (4) Submit manufacturer's certified letter stating that pipe or joint material ordered meets requirements of this document. Letter shall indicate compliance with appropriate ASTM designations listed.
- (5) Submit two (2) copies prior to installing materials.

c. Storage of Materials:

- (1) Store materials to prevent physical damage.
 - (2) Store pipe and fittings off ground to prevent dirt and debris from entering.
 - (3) Store flexible gasket materials and joint primer or adhesive compounds, in a cool dry place. Keep rubber gaskets clean, away from oil, grease, excessive heat, and out of direct rays of sun.
- d. Handling of materials:
- (1) Protect materials during transportation and installation to avoid physical damage.
 - (2) Use extra care in cold weather when flexibility and impact resistance of PVC pipe is reduced.
 - (3) Do not install out-of-round pipe.
 - (4) Unload pipe to prevent abrasion.
 - (5) Do not drag or push pipe when handling or distributing on project site.
- e. Contractor shall check pipe for following information which shall be clearly marked on each pipe section:
- (1) Pipe type and SDR number
 - (2) Nominal pipe size
 - (3) The PVC cell classification, for example 12454-B
 - (4) Name or trademark of manufacturer
 - (5) The ASTM Specification designation
- f. The contractor shall check fittings for the following markings.

- (1) The ASTM specification designation
 - (2) Manufacturer's name or trademark
 - (3) Nominal size
 - (4) The material designation (PVC, PSM)
- g. The contractor shall inspect the pipe for defects prior to placement in the trench. The pipe and fittings shall be free of visible cracks, holes, foreign inclusions or other injurious defects.
- h. The contractor shall ensure that all materials are the type specified and not defective. Unmarked pipe, or pipe and materials not meeting specifications shall be removed from the site as directed by the engineer.

SECTION IX

MINIMUM GRADES AND VELOCITY OF FLOW

All sewers shall be constructed of materials acceptable to the CSA and shall be designed with a hydraulic slope that will result in a mean velocity of not less than two (2) feet per second when flowing either full or half full.

This is based on Knutter's or Manning's formulas where $N=0.010$ for PVC pipe and 0.013 for all other materials. The fall in feet per 100 feet of sewer shall be not less than the following:

TABLE VII. FALL PER HUNDRED FEET OF PIPE

Pipe Diameter (in.)	Fall in Feet	
	PVC	All other Material

8	0.30	0.40
10	0.20	0.29
12	0.15	0.22
14	0.12	0.17
15	0.010	0.16
16	0.09	0.14
18	0.075	0.12
20	0.065	0.10
21	0.06	0.095
24	0.05	0.80

Grades producing velocities in excess of 10 feet per second are not recommended.

The minimum size of sewer mains shall be 8 inches.

SECTION X

EXCAVATION REGULATIONS

A. GOVERNING AUTHORITIES

When trenching or boring in or along state, city, borough, town, county and/or township highways, the contractor shall be governed by the conditions, restrictions and regulations of the New Jersey State Highway Department, the Burlington County Commissioners, Cinnaminson Municipal Officials and/or the Cinnaminson Township Commissioners. These regulations shall be in addition to those set forth in this specification.

B. EXCAVATION - GENERAL

1. Excavation shall not be carried below the required level, except where unstable soil is encountered.

Whenever excavation has been made below the required level, it shall be replaced with 3/4" crushed stone, coarse aggregate no. 57 or equivalent, and shall be tamped thoroughly. The Engineer shall determine the depth of removal of unstable soil encountered.

2. Excavation for manholes and other structures shall have a minimum 12 inch, maximum 24 inch clearance on all sides. Pipe trench width shall be equal to the outside diameter plus 2 feet, unless otherwise specified by the Engineer. Rocks and boulders in the trench and within 6 inches of the pipe shall be removed. Excavations shall be confined within the narrowest possible limit and made as nearly as possible in a vertical line. Any sheathing, shoring, bracing and timbering required to produce the desired result shall be installed as hereinafter specified. Preliminary excavation shall be made only to a depth of 3 inches above the final depth of any trench or other excavations. The remaining depth shall be carefully excavated, shaped, and formed with hand tools immediately preceding the laying of pipe or placing concrete. Trench bottoms shall be accurately formed to receive and support the bottom of the barrel of the pipe. Additional excavation shall be made in pipe trenches at the pipe joints, and to prevent any possibility of a pipe resting on the bell rather than the barrel.

C. GRADING

Ground adjacent to the excavations shall be graded to prevent water from running in. The contractor shall remove any water accumulating in excavations by pumping or other suitable means.

D. BRACING, SHORING AND SHEETING

The contractor shall do all bracing, shoring and sheeting necessary to prevent failure of the banks of the excavation, and to protect the work, workers, public under and above

ground utilities and structures, pavements and public and private property. No bracing, shoring or sheeting shall be placed below the bottom of the pipe or structure unless approved by the Engineer. Shoring, sheeting and bracing of any kind shall be withdrawn as backfilling proceeds, except that the Engineer may require such bracing to be left in place if it has been placed below the bottom of any structure or pipe, or if he deems it necessary to protect adjacent structures, utilities or property.

E. DEWATERING

The contractor shall provide, install and operate an adequate wellpoint system for dewatering where necessary to stabilize trench bottoms and banks or other excavations, or where necessary to protect the work, workers, public, under and above ground utilities and structures, pavements and public or private property. The wellpoint system or portions thereof shall be removed by the contractor upon backfilling and the holes remaining from the points shall be backfilled and tamped thoroughly.

F. KEEPING TRENCH DRY

Groundwater which gathers in the trenches from any source whatsoever must be pumped or bailed to provide a dry trench during the pipe laying process. No water shall be permitted to flow through open pipe joints or pipe during construction. All water pumped from the trenches shall be disposed of in a manner satisfactory to the Authority's inspector.

G. EXCAVATION FOR PVC PIPE

1. Dig trenches to the uniform width required for the particular item to be installed, sufficiently wide to provide ample working room.
 - a. Maximum trench width to a point one foot above the outside top of pipe shall be the pipe outer diameter plus sixteen inches.

- b. Maximum trench width at ground surface shall be as required for depth of pipe.
2. Excavate trenches to the depth indicated or required. Carry the depth of trenches for piping to establish the indicated flow lines and invert elevations.
3. Trenches for pipes shall not be opened for more than the number of linear feet of pipe that can be placed and backfilled in one day.
4. Grub roots and stumps within six inches of the outside surface of pipe bottom and sides to minimum depth of six inches below bottom of trench.
5. Install pipe bedding of material approved for initial backfill in accordance with the details shown on the plans and as specified herein.

H. BLASTING

No blasting will be allowed unless justification and procedures for blasting are approved by the CSA Engineer.

SECTION XI

SEWER LINE INSTALLATION

A. PIPE LAYING - GENERAL

Once the trench has been established at the proper depth and grade and the bottom of the trench has been satisfactorily stabilized, the pipe and associated items shall be installed. All sanitary sewer lines and appurtenances shall be installed in the presence of the CSA inspector.

The builder and/or contractor is responsible for notifying the CSA engineer forty-eight (48) hours in advance, that the inspection will be required at a specific time and place.

Should the contractor neglect to notify the CSA engineer that inspection is required, and proceed without inspection, all work performed without inspection will be considered unacceptable.

B. LOWERING PIPE INTO TRENCH

All sanitary sewer pipe shall be gently lowered into the trench by means of ropes or cables. Under no circumstances or for any reason shall pipe be dropped into the trench area.

Each section of pipe shall be visually inspected by contractor personnel for physical defects and the internal area cleared of any foreign material such as mud or stones just before installation.

C. BEDDING PIPE

Care shall be taken to bed the pipe properly on a stable bottom. Where required, varying amounts of stone must be used to stabilize the area under the pipe. Grading of the trench bottom must be such that the bottom of the pipe, for its entire length, is resting on stable material (stoned bottom or virgin soil) which will result in even loading along the pipe after the trench is backfilled, and during the earth settling process. Where this material, in the opinion of the CSA inspector, is unsuitable, the area around the pipe must be filled with stone or select fill up to the springline.

At no time shall stone be scraped up from along the sides of the trench and piled along the sides of the pipe. The practice of pyramiding stone along a sewer line is unacceptable and will result in the affected lines being classified as unacceptable by the CSA inspector.

D. MATING PIPE

Pipe mating must be inspected during construction to ensure

that the gasket is not damaged and that the pipe is properly seated to provide a water-tight joint.

E. FITTINGS

All sanitary sewer lines must be installed in accordance with approved drawings and all fittings are to be installed when the sanitary main is constructed. Saddles and repair clamps are not acceptable on new lines and shall be used only with prior approval of the CSA or their engineer and shall be installed in strict accordance with their instructions. If and when saddles are approved, they will be of the strap-on type. No bolt-on saddles will be permitted.

F. BACK FILLING

In back filling the sewer trenches, only loose, fine earth, free from stone, shall be used up to a point one foot above the outside top of the sewer pipe. In rock trenches, if sufficient earth cannot be obtained to completely fill the trenches, small pieces of rock may be used. However, the space between the walls, two feet (2') above the top of the pipe, shall be filled with loose, fine earth, free from stone and hand tamped in separate layers of not more than one foot (1') in depth. Each layer shall be covered with six to ten inches (6" to 10") of earth. No rock larger than 12" in size will be permitted to backfill.

G. TAMPING

The space between the outside of the pipe and the walls of the trench shall be backfilled and hand tamped with loose fine earth free from stone to a depth of one foot (1') above the top of the pipe. From this point on, the material shall be deposited in layers not exceeding eighteen inches (18") in thickness and mechanically tamped compactly in a manner satisfactory to the engineer.

SECTION XII

PVC PIPE INSTALLATION

A. INSTALLATION

1. Lay pipe only in the presence of the engineer. The engineer may order removal and relaying of pipe not so laid.
2. Fine grade the trench bottom so that pipe is supported for its full length.
3. Lay pipe in accordance with lines and grades shown on the plans. Face the socket end of the pipe in the direction the pipe is being laid.
4. Do not lay pipe on unsuitable material, in a wet trench, or in the same trench with another pipe or utility.
5. Lower pipe into the trench with ropes, machinery, or other means approved by the engineer.

B. PIPE JOINING - GENERAL PROCEDURE

1. DO NOT USE EXCAVATING EQUIPMENT TO SHOVE PIPE SECTIONS TOGETHER.
2. Hold pipe securely and in proper alignment while joining sections.
3. Do not disturb previously made joints. Check completed piping to confirm that the joints are intact. Ensure placement of backfill over the pipe without disturbing pipe position.
4. Do not allow earth, stones, or other debris to enter the pipe or fittings.
5. Joint materials shall be used and piping sections joined in strict accordance with the manufacturer's printed instructions as approved by the engineer.

C. BACKFILL AND COMPACTION

1. Initial backfill

- a. Initial backfill material shall be stone crushed to conform to AASHTO designation M 45-70 (ASTM 448-54), size 8, 1/8" to 3/8" (2.36 mm to 9.25 mm), clean, free flowing and meeting all ASTM C-33 requirements for quality and soundness.
- b. Initial backfill shall cover the pipe to a depth of 12 inches.
- c. Backfill material shall be placed under the pipe haunch to provide adequate side support. The material shall be installed to cover the entire width of the trench and shall be tamped and rodded to ensure full contact with the pipe at the haunch and up to the spring line.
- d. Little or no tamping of the initial backfill should be done directly over the pipe.

2. Final backfill

- a. See also section XI - Sewer Line Installation for Excavating, Back filling and Grading.
- b. Reference CSA 1 in the Addendum.

SECTION XIII

MANHOLE CONSTRUCTION

Manhole construction details are provided on drawings CSA 1 through 5, and are included as a part of these specifications. Manholes may be constructed of precast concrete, brick or block. Concrete bases under manholes must extend six (6) inches beyond the manhole diameter.

A. GENERAL REQUIREMENTS

1. The downstream side of the manhole must be vertical (flat side) and the ladder must be installed on this side just to the left of the channel.
2. All castings shall be set in cement and pointed to eliminate any chance of infiltration.
3. Manhole channels shall be constructed of concrete to a depth of 80% of the pipe size. The width of the channel must be equal to that of the pipe it is servicing.
4. Ladders shall be installed on the downstream side of the manhole just to the left of the channel. The ladder location in all cases shall be the flat side of the manhole.
5. The absolute maximum horizontal offset of ladder rungs shall be two (2) inches from the ladder centerline from the top of the manhole to the bottom.
6. Ladder rungs shall not protrude in excess of one and one half (1-1/2) inches beyond the rung above or below.
7. Optimum spacing between rungs shall be twelve (12) inches and shall not exceed fourteen (14) inches.
8. Pipe terminating in manholes shall be trimmed to within one and one half (1-1/2) inches of the manhole wall.
9. Ladder rungs shall be fabricated of polypropylene or aluminum, conforming to the current ASTM specification C-478.

B. CONCRETE BLOCK MANHOLES (Drawing CSA 3)

1. All block manholes shall be constructed on a concrete base eight (8) inches thick for manholes nine (9) feet or less in depth and twelve (12) inches thick for those with a

depth of more than nine (9) feet.

2. Double block construction is required for manholes more than nine (9) feet in depth below the nine-foot level.
3. The manhole must be constructed completely of barrel block. The cone portion of the manhole must be constructed using the proper block for each course, since the interior must be smooth and devoid of protruding edges or corners.
4. The interior of block manholes must have the joints rubbed or pointed.
5. The complete exterior of the manhole must be pargeted to a thickness of one-half (1/2) inch to prevent infiltration. A two coat bitumastic coat also shall be applied.
6. Mortar shall be a 1:2 cement-sand mortar mix.

B. DROP MANHOLES (Drawing CSA 2)

1. Drop manholes shall have a concrete base extending at least six (6) inches beyond the manhole diameter and the drop shall be made of brick or concrete.
2. No inside drops are permitted in manholes.

C. PRECAST CONCRETE MANHOLES (Drawing CSA 3)

1. A minimum of eight (8) inches of stone shall be installed under all precast manholes, or manhole bases.
2. Rubber gaskets shall be installed between manhole sections.
3. Joints between manhole sections and lift holes shall be filled with non-shrink grout.
4. Precast concrete spacers shall be installed under all

manhole castings to allow for subsequent rim adjustment. The additional height resulting from the four courses of brick must be taken into consideration when ordering manholes.

6. Precast concrete spacers should be used for installation of a precast manhole. Where additional courses are required to attain the proper grade, another precast section shall be used.
7. Flat tops for precast manholes are permitted only after prior written approval by the CSA.
8. Precast manholes for PVC pipe installation with connection ports shall have a flexible boot or sleeve precast into their walls.

D. AIR RELIEF MANHOLES

Refer to Cinnaminson Sewerage Authority Drawing CSA 4 for construction details,

E. BLOW-OFF AND CLEAN-OUT MANHOLES

Refer to Cinnaminson Sewerage Authority Drawing CSA 5 for construction details.

SECTION XIV

LATERALS

A. GENERAL

1. Laterals shall be connected to the main by means of a wye connection only. Standard lateral connection shall be five (5) inches in diameter if cast iron or six (6) inches in diameter if PVC.

Where larger pipe sizes are desired for service laterals, written approval from the CSA is required before they are

scheduled for installation. All service laterals shall be laid with the same care prescribed for sewer mains, including installation of stone in the trench bottom, where necessary, to establish a stable base under the pipe.

2. The standard sewer service lateral shall be constructed of ductile iron or PVC. If the owner or builder desires to use pipe of a material other than the two specified, he must obtain prior written approval of the CSA.
3. All laterals shall be installed at a constant grade and in a straight line. A cleanout shall be constructed just behind the curb line and at any point where it is necessary to change the direction of the lateral. No trap is needed so long as there is a vent on the building.
4. Cleanouts are required every fifty (50) feet on long laterals. For cleanout and lateral construction details, see drawing CSA 1 which is part of this specification. Minimum depth for a sanitary sewer lateral is four (4) feet.
5. Connections of the ductile iron saddle type installed in the main sewer line shall be made in a smooth, round hole, machine-drilled into the top quarter of the main sewer pipe. The fitting shall be such that no protrusion of the fitting into the main sewer pipe shall result.
6. The fitting shall conform to the contour of the sanitary sewer and shall be specifically designed to fit the particular size main sewer pipe into which the connection is made with one-eighth inch (1/8") clearance between the outside of the fitting and the hole.
7. A clearance of one eighth of an inch (1/8") shall be allowed between the shoulder of the fitting and the face of the main sewer pipe during installation. All voids shall be completely filled with joint material.

Joint material shall be completely waterproof and capable of withstanding the stresses normally encountered in construction or maintenance. The entire connection shall be encased in concrete.

B. PVC Laterals

PVC laterals shall be installed with push-on type joints using an elastomeric ring gasket; sizes 6" commercial, 4" residential). The saddle must be cemented to the main. There shall be no glued fittings. All joints shall be rubber. Schedule 40 pipe can be used so long as Fernco fittings are used for joints.

SECTION XV

PUMPING STATIONS

A. GENERAL

1. Construction of the pumping station and appurtenances shall meet all Federal and State safety standards. These standards shall include OSHA and NFPA 820 requirements.
2. Raw sewage shall be screened before pumping unless special pumping equipment approved by the CSA is used. A winch shall be provided to remove the trash basket for cleaning.
3. A pressure transducer level control system shall be provided to control the pump lead/lag alternation and provide high and low level alarms via a 4-20 mA signal.
4. An auxiliary power source or sources shall be provided for electrically driven pumps, unless an alternate method is approved by the CSA.
5. Automatic audible alarms that operate independently of station power and are compatible with the Authority's existing alarm monitoring system shall be installed. The alarms shall warn of high water and power failure. The

alarm system shall be connected by a dedicated telephone line to the CSA main treatment plant. All pump stations constructed after Authority has installed a radio frequency based telemetry system shall be compatible with such system.

6. Pumping stations shall be accessible by motor vehicle and shall not be subject to flooding.
7. Adequate light and ventilation shall be provided at all pumping stations. Where operation or maintenance duties are required in enclosed areas or pits, forced ventilation by suitable means shall be provided with sufficient capacity to produce at least twelve (12) air changes per hour. Explosion-proof equipment shall be used.
8. Adequate fresh water facilities shall be provided to permit routine wash down and cleaning operations at all pumping stations. Where a domestic water service connection is provided to a pumping station, the water supply shall be properly protected by a backflow prevention device suitable for high hazard areas. No connections between fresh water and sewage pumps or pipes are permitted.
9. An odor control system, as approved by the Authority, shall be installed.

B. PUMPS

1. Pumping station capacity should be compatible with the ultimate capacity of the influent sewer. At least two (2) pumps, each designed to handle peak flows (2.5 x average flows) for ten (10) years after initial installation, shall be provided.

If more than two (2) pumps are provided, their capacities shall be such that, upon failure of the pump with the largest capacity, the others will handle peak flows. Where

ejectors are provided as the method of raising sewage, two (2) compressor units are required, and they shall be so interconnected that the second unit will commence operation in the event of failure of the one in use. Submerged pumps for raw sewage will be considered for small (less than 50 gpm) pump stations.

A means of flow measurement is required. Shutoff valves shall be provided on suction and discharge piping, which shall be flanged or otherwise removable, and check valves shall be provided on discharges.

2. Special repair tools and accessories required for maintenance shall be provided. Complete operation and maintenance training will be required for all equipment.
3. Force main velocities shall not be less than two (2) ft./second at normal pumping rates. Properly designed air relief valves shall be provided on the high points of the force main and cleanout (blowoff) manholes at all low points along the main. Refer to drawings CSA 4 and 5 for details.
4. The standard pumps selected by the CSA for use in lift stations are Gorman-Rupp Solid Handling, Fairbanks Morse, or an approved equal.

C. DRY AND WET WELLS

1. Dry and wet wells shall be completely separated and shall be provided with adequate ventilation and drainage and means of entrance and exit.
2. Dry wells shall provide sufficient space and accessibility for the repair and removal of pumps. Provision shall be made for the removal, if necessary, of pumps and motors.
3. The capacity of a wet well should be designed to ensure that the retention time at the average dry weather flow rate does not exceed ten (10) minutes.

4. Floors of wet wells shall slope at least fifty-five degrees (55°) toward pump suction to prevent accumulation of solids.
5. Dry wells are to be provided with a sump pump and a flood alarm.
6. Dry wells and wet wells shall be provided with explosion-proof lighting.

D. TRASH BASKET

A trash basket and guide rails constructed of either aluminum or stainless steel shall be provided in the wet well. A mechanical means, such as a winch, must be provided so the basket can be removed from the wet well for cleaning.

E. ELECTRICAL EQUIPMENT

1. Electric motors shall be located so as to be protected from flooding.
2. Electric motors and electrical power equipment should not be installed in subsurface chambers. Where installation in such location is necessary, the motors and equipment shall be of the explosion-proof and damp proof type. Ventilation shall be provided in accordance with NFPA 820.
3. All electrical equipment and work shall comply with Fire Underwriter's regulations and the National Electrical Code for the location involved.

F. STANDBY EMERGENCY POWER ENGINE/GENERATOR

1. General
 - a. Standby power for Authority facilities shall be provided by an engine generator which consists of a natural gas engine coupled to a single bearing generator, all

mounted on a common base of fabricated structural steel. Operations shall be fully automatic upon normal source power failure.

- b. If natural gas is not available at the site, a diesel engine shall be provided.
- c. Unit shall be 3 phase, 60 hertz, and be capable of delivering sufficient power to sequentially start and continuously run all equipment at the pump station site. Loads shall be calculated based on future conditions.
- d. All equipment available from the manufacturer for sound attenuation purposes shall be incorporated in the generator package.
- e. Automatic starting and stopping of the plant and switching of the load shall be provided by an automatic load transfer switch.
- f. The engine/generator unit shall be housed in a weatherproof, insulated aluminum (Alloy 6061-T6, 0.04" thick) or 16 gauge painted steel housing with removable side panels.
- g. The engine/generator control console shall be mounted on the generating set in a weatherproof housing.
- h. If a diesel engine/generator unit is approved, it shall have a skid mounted fuel tank (minimum 75 gallon or 12 hours continuous operation).
- i. The electric generating equipment shall meet all requirements of NFPA 110.

2. Engine

- a. The engine shall be heavy duty, water cooled, full spark

ignition, gas arranged for direct connection to an alternating current diesel generator.

- b. The engine shall meet specifications when operating on 905 BTU/cubic foot natural gas. The maximum output capacity shall not be less than BHP required to deliver rated KW at rated RPM, corrected to 29.61 inches Hg and 177°F. The engine shall not exceed 1,800 RPM at normal full load operation.
- c. The engine governor shall maintain isochronous frequency regulation from no load to full rated load. Steady-state operating band shall be $\pm 0.25\%$. The governor shall be capable of remote speed adjustment.
- d. The engine shall be equipped with a gear driven water pump having the capability of pumping against a head pressure of fifty-seven feet (57').
- e. The engine shall have a gear-type lubricating oil pump and the oil shall be continuously filtered and cleaned. Filters shall be accessible, easily removed and cleaned, and shall be equipped with a spring-loaded, bypass valve. The engine shall have a suitable water-cooled lubrication oil cooler.
- f. The engine shall be provided with one or more dry type air cleaners of sufficient capacity to effectively protect the working parts of the engine from dust and grit.
- g. The engine shall be provided with a set of flexible connections as recommended by the engine manufacturer.
- h. Supply initial charge of lubricating oil.
- i. The flexible natural gas lines to the engine shall be explosion-proof.

3. Engine Starting System

- a. The engine shall be equipped with an automatic electric starting system of sufficient capacity to crank the engine at a speed which will allow for full start of the engine. The starting pinion shall be so arranged as to disengage automatically when the engine starts. Provide a tank-type jacket water heaters of sufficient capacity to maintain jacket water at the proper temperature (90° F in ambient temperature of 20° F) for quick emergency start. A storage battery shall be furnished having a sufficient capacity for cranking the engine for at least sixty (60) seconds at firing speed in an ambient temperature of 30°F. Automatic controls shall be furnished to provide automatic cranking of the diesel engine when failure of the normal power supply actuates an initiating device. The equipment shall be designed to prevent excessive cranking.
- b. A trickle charger shall be provided to provide continuous taper charging of the engine starting batteries. Charger shall include: Automatic AC line compensation, surge suppressors, overload protection and DC voltage regulation, silicon diode full-wave rectifier, power failure relay with remote indication terminals, DC ammeter and voltmeter, fused AC input and DC output. DC output shall be not less than 10 amperes. DC voltage shall match batteries. AC input shall be 120 V, single-phase, 60 cycles.
- c. Appropriate safety devices and automatic engine shutdown shall be provided for high water temperature, low oil pressure, overspeed, and engine overcrank with individual visual indication and reset mode.

4. Generator

- a. The generator shall be revolving field, engine driven, direct connected, permanent magnet type with amortisseur winding, rated for continuous service.

- b. Insulation shall be Class F or better in accordance with NEMA standards. The temperature rise shall be in accordance with NEMA standards for continuous duty at all output ratings.
- c. Fast acting fuses or other protective devices shall be incorporated where failure of regulator or exciter components could result in damage to the generator field or exciter windings.
- d. The generator and exciter shall conform to all applicable NEMA standards.

5. Control Panel

- a. A generator control panel of the dead-front, fully enclosed generator mounted type in NEMA 4 enclosure shall be furnished.
- b. The panel must be designed in such a way as to readily accept control wiring conduit terminations and required wiring without interfering with its proper functioning or vibration isolation design. The panel shall contain, but not be limited to, the following equipment.
 - 1) Voltmeter, 3½", 2% accuracy.
 - 2) Ammeter, 3½", 2% accuracy.
 - 3) Ammeter phase selector switch.
 - 4) Frequency meter, 3½", dial type.
 - 5) Automatic starting controls.
 - 6) Panel illumination lights and switch.
 - 7) Voltage level adjustment rheostat.
 - 8) Engine oil pressure gauge.

- 9) Engine water temperature gauge.
- 10) Dry contacts for the safety shutdowns, individually wired to separate terminal strips for remote indication of each individual alarm.
- 11) Fault indicators (red lights) for low oil pressure, high water temperature, overspeed and overcrank. Alarm lights shall be of the "press to test" type.
- 12) Four position function switch marked **AUTO**, **MANUAL**, **OFF/RESET**, and **STOP**, with necessary control relays, adjustable 0-60 second cranking limit control and circuits to shut down engine in event of low lube oil pressure, high water temperature, overcrank and overspeed.
- 13) Indicating lamp to light when selector switch is in the "off" position.
- 14) Governor raise/lower switch.
- 15) Clock indicating hours of operation.
- 16) Alarm horn with on-off switch to sound on engine fault shutdown, indicating lamps to illuminate on each of the aforementioned engine fault shutdown indications and pre-alarm indications.
- 17) Auxiliary contacts for louver control and other accessories as required.
- 18) Pre-alarm module for low lube oil pressure shutdown, pre-low lube oil shutdown, high water temperature shutdown, pre-high water temperature shutdown, overcrank shutdown, overspeed shutdown, low jacket water temperature alarm, low battery

voltage alarm, generator set running and associated warning horns and lights in conformance with NFPA 99 requirements.

- 19) All required dry contacts for remote reporting of alarms.

6. Sound Attenuation

Pump stations are to be located a minimum of 200' from nearest residential property line, and noise levels are to be not greater than 60 dBA when measured at any residential property line. Only approved sound attenuation methods shall be used. Compliance shall be determined in conformance with NJDEP "Procedures for the Determination of Noise from Stationary Sources".

7. Appurtenances

- a. Paint: Woodland Green oil and heat resistant paint shall be applied over thoroughly cleaned and prime coated surfaces.
- b. Mechanical Governor: Capable of maintaining engine speed within five percent (5%) of synchronous speed from no-load to full-load.
- c. Sufficient spare parts for six (6) months operation.
 - 1) Oil filters.
 - 2) Gas filters.
 - 3) Fuses.
- d. Auto Transfer Switch:
 - 1) The auto transfer switch shall include all necessary relays and component parts, together with U. L. listed and tested interlocked

contactor. Switch shall conform with U. L. 1008.

- 2) The auto transfer switch shall perform as follows:
 - a) Automatically start the plant upon power line outage. Provide time delay start to avoid nuisance start-ups.
 - b) Disconnect the normal circuits from the main line and transfer them to the emergency plant's output. Provide timer delay transfer to allow the engine-generator set to stabilize before application of load.
 - c) Transfer the load back to the main line upon power return. Provide time delay retransfer to allow:
 - (1) Normal power to stabilize before retransfer.
 - (2) Staggered retransfer.
 - (3) Unloaded running for cool down before shutdown.
 - d) Retransfer of the load from emergency source to the normal source if the emergency source fails when normal source is available.
 - e) Control mode status indicators to allow operator to determine if controls are properly sequencing.
 - f) **NORMAL** and **EMERGENCY** indicator lamps.

- g) Selector switch with **TEST, NORMAL** and **RETRANSFER** positions.
- h) Exerciser clock.
- I) Battery charger for generator set.

8. Testing/Startup

- a. Minimum two (2) hour full load test. Testing procedures shall be as described in NFPA 110 under installation acceptance.
- b. Five (5) copies of generator/engine set operations and maintenance manuals, complete in all respects.
- c. Warranty on all parts comprising the complete standby electric power system for a period of five (5) years or 1,500 operating hours, whichever occurs first, from the date of initial startup. Multiple warranties will not be acceptable.
- d. The standby electric generating system, including all components, shall be tested, shipped and warranted by one source of supply who shall take full responsibility for warranty, supply of parts and servicing.
- e. Safety Signs:
 - 1) Danger - Diesel Fuel, #93-95-242 (3" x 5") (if applicable).
 - 2) Danger - Equipment Starts Automatically, #93-95-386 (3" x 5").
 - 3) Danger - 480 or 240 Volts, #93-95-233 (3" x 5").

G. LANDSCAPING

Provide landscaping to effectively screen the pump station site from adjacent properties.

H. FENCING

Provide eight foot (8') high, nine (9) gauge, chain link fence with a minimum twelve foot (12') wide sliding gate and three foot (3') wide pedestrian gate. Fencing shall completely enclose the pump station site. Color to be Woodland Green and fence to have one inch (1") vinyl bonded mesh with heavy duty, industrial frame and posts.

I. LIGHTING

Provide low brightness type, horizontally mounted fixtures with a maximum mounting height of twelve feet (12'). Provide a average minimum one foot (1') candle illumination over the entire site. Spillover illumination shall be minimized to no more than 0.25 foot candles.

J. FORCE MAIN CONSTRUCTION

1. Construction of a force sanitary sewer main is necessary wherever a lift station is required. The length of the main is dependent upon the distance to the nearest gravity manhole or wastewater treatment plant. The size of the line is dependent upon the quantity of sewage to be pumped from the lift station to its destination. Velocity in the force main shall be at least equal to 3 feet/second and less than 10 feet/second.

2. Pipe and fittings used in construction of forced mains shall be ductile iron unless prior approval is obtained in writing from the CSA permitting the use of other material. Cement lining is not allowed.

3. Force mains shall be laid as closely as possible with a constant grade. Where this is not possible, low and/or high points in the line may result.
4. Cleanout manholes must be constructed at all low points while air relief manholes are required at the high points. These units shall be constructed in accordance with drawings CSA 5 and 6 provided as an addendum to this document.
5. The contractor shall supply all equipment, tools, and personnel to perform the necessary tests. The contractor also shall provide personnel as required to assist the CSA inspector during his visual inspection. The CSA inspector must be present at all times during pressure testing of a force main.
6. Odor control facilities may be required by the Authority to force mains that retain sewage within the line for excessively long periods as determined by the engineer.

PART THREE

INSPECTION AND TESTING

SECTIONS XVI TO XIX

SECTION XVI

INSPECTIONS

A. GENERAL

1. The Cinnaminson Sewerage Authority requires that a representative inspect all sanitary sewer lines and appurtenances connected to the CSA system. Inspection will be initiated when construction begins and continue until all construction has been completed and accepted by the CSA.
2. The CSA engineer shall be notified forty-eight (48) hours in advance that inspection is required. The request for inspection is the direct responsibility of the developer or builder and, should they neglect to request same, all work accomplished without inspection will be automatically considered unacceptable.

Extreme care should be taken to avoid this situation. since all construction not accessible for complete visual inspection must be reestablished in such a manner as to permit visual inspection before it will be accepted.

B. INSPECTION DURING CONSTRUCTION

1. All materials used during construction shall meet the minimum requirements of the CSA and shall be in accordance with approved drawings.
2. All construction shall be accomplished in accordance with approved drawings and CSA specifications, rules and regulations.
3. All permits and easements shall have been obtained prior to initiating construction.
4. Trenches shall be dug and maintained in accordance with

the requirements of this specification and in addition to the requirements of state safety rules and regulations.

5. All State and Federal safety rules and regulations shall be observed by contractor personnel.
6. Bedding of pipe and appurtenances shall be in accordance with procedures prescribed in this specification.
7. Workmanship in general shall meet the requirements of the CSA and any additional requirements of other interested agencies imposed upon the CSA.
8. All materials used in the construction of sanitary sewage collection or treatment facilities shall be protected prior to, during and after construction.
9. Care shall be exercised during construction to avoid the possibility of water or foreign matter entering active sewer lines.
10. All lines shall be laid at the prescribed grades and free of foreign material.
11. Joints shall be made in the prescribed manner for the particular pipe or fittings being used.
12. All lateral construction shall be in accordance with that prescribed in this specification.
13. All manholes, wet wells, pump stations and appurtenances shall be constructed in accordance with requirements of this specification.
14. All material used for backfill shall be acceptable to the CSA and as required by physical location.
15. Roads that were out of service or damaged during construction shall be restored to service or repaired.

16. The construction area shall be cleaned up and restored after construction has been completed. Clean-up includes anything that is a direct or indirect result of the construction.
17. Where necessary, proper signs, barricades, flashers, etc., shall be displayed, or a flag person properly utilized to meet safety requirements.
18. During construction, water shall not be pumped or diverted in such a manner as to damage surrounding or downstream properties. Damage to trees, shrubs or plant life shall be avoided during construction of sanitary lines or systems.

C. INSPECTION AFTER CONSTRUCTION

1. All sanitary sewer construction that connect to the existing sanitary sewage system for which the CSA has responsibility is required to meet minimum inspection and test requirements specified by the CSA.
2. Although visual inspection is performed by the CSA representative during sanitary sewer construction, additional inspection and testing must be performed prior to integration of new construction and the active system. The additional tests and inspections are generally performed prior to completion of road, curb and sidewalk construction and are referred to as preliminary inspection. Final inspection does not take place until all construction has been completed on a specific section or a complete development.
3. Whether final inspection and/or test is performed by section or complete development, is dependent upon the manner in which it was bonded.
4. Once final inspection has been completed and the CSA has accepted the new construction, the performance bond will be released upon receipt of a two (2) year maintenance

bond. The maintenance bond will be released in full at the end of the two-year period, provided that none of this money was required by the CSA to perform maintenance on the subject collector lines or system.

5. A CSA inspector must be present to inspect any repairs performed on a sanitary sewer line if this line is to be considered acceptable.

D. RETESTING AND REINSPECTION

Retesting and reinspection may be performed on sanitary lines at any time when, in the opinion of the CSA engineer, damage inflicted on the sanitary sewer system during construction is of such magnitude that retesting and reinspection are deemed necessary.

E. MAIN AND MANHOLE INSPECTION

After construction has been completed on a sanitary sewer line, preliminary inspection may be requested by the contractor. Preliminary inspection shall consist of a general visual observation of pipe terminations in manholes, backfilling of manholes, rim elevations on manholes, manhole channel construction, sealing and finishing of manholes and general inspection to ensure that there is no infiltration occurring in the manhole.

SECTION XVII

TESTING

MAIN TESTING

All sanitary mains are required to pass a lamp test to ensure that there are no bends in the line that exceed allowable limits, and a pressure test to ensure that there will be neither infiltration nor exfiltration.

A. LAMP TEST

If a light of sufficient intensity is directed down a pipe from one end or the other, at least eighty percent (80%) of the pipe opening must be visible when viewing the pipe from the opposite end with the line of sight being the centerline of the pipe. Lines that do not meet this requirement are considered unacceptable.

A line that has a bend with a radius less than allowed must be dug up and relaid.

Any lines containing foreign material will be rejected and must be cleaned. The line must be clean before the lamp test is satisfied.

B. PRESSURE TEST

1. Pressure tests are performed to ensure that there will not be any water infiltration into the lines being tested in amounts greater than that allowed by the CSA (one hundred (100) gallons per inch diameter of pipe, per mile of pipe over a twenty-four (24) hour period). There are two methods of performing this test; with air pressure and with water pressure. Direct water infiltration testing is not accepted by the CSA because there is seldom water around the complete pipe or in sufficient amounts above the pipe to provide the head pressure required for testing.
2. Prior to performing infiltration tests, all fittings must be installed and all laterals completed to just behind the curb line. In addition, all trenches must have been backfilled and rough graded.

C. LOW PRESSURE AIR TESTING

1. The CSA inspector is to be present at all times during this test, However, the contractor is responsible for all operation and testing. The inspector will observe the test and, in accordance with requirements, determine whether the line has failed or passed. The inspector's

determination will be predicated upon CSA requirements and tables provided herein.

2. The pressure gauge being used must have minimum divisions of 10 psi and an accuracy of ± 0.04 psi. Cleaning of the pipe immediately prior to testing is recommended. The contractor shall furnish test plugs, an air compressor, a test gauge, a stop watch, personnel and a supervisor.
3. After all lines and equipment have been properly connected and plugs installed, air shall be slowly introduced into the plugged pipe under test. This will continue until the pressure reaches 5.0 psig. At least two (2) minutes shall be allowed for temperature and pressure stabilization.
4. During the stabilization period, pressure should not decrease below 3.5 psig. If this should occur, it is an indication that the line is faulty and must be repaired.

When the line pressure stabilizes between 5.0 and 3.5 psig, the line is ready for acceptance testing. Table IV below should be reviewed and the test time determined after which the stop watch should be started or a timer set, noting the gauge pressure at this time.

After the test period has elapsed, the gauge pressure must be read again. The total pressure loss must not exceed 0.5 psig if the line is to be acceptable. Should the pressure loss be more than 0.5 psig during the test period, the leak must be located and repaired.

5. Prior to digging up or disturbing any pipe, it is advisable to use a soap solution to determine that there are no leaks at connections or around the pipe plugs.

TABLE IV. ALLOWABLE TEST TIME

Pipe Size	Time	Pipe	Time
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(in.)			Size (in.)		
	Min.	Sec.		Min.	Sec.
6"	2	15	36	17	-
7	3	18	42	19	50
8	3	57	48	22	40
10	4	43	54	25	30
12	5	40	60	28	20
15	7	5	66	31	10
18	8	30	72	34	-
21	9	50	84	39	40
27	12	45	108	51	-
30	14	10			

D. SUPPLEMENT FOR PVC SEWER LINES

1. Deflection testing: Maximum allowable pipe deflection (reduction in vertical inside diameter) shall be 7-1/2 percent.
 - a. Deflection tests shall be successfully performed on the complete installation by means of the following prior to the acceptance of construction.
 - (1) "Go-No-Go" mandrel properly sized
 - (2) Calibrated television
2. Lamp test:
 - a. The CSA engineer will lamp test all installed pipe between manholes. Sewer lines shall meet the following standards to pass the lamping inspection.
 - (1) Barrel of pipe shall have no vertical deflection

(not to be confused with the deflection test), and at least seventyfive percent of barrel shall be visible in the horizontal direction.

- (2) Pipe not meeting this requirement shall be relaid and the amp test repeated until compliance is achieved, at no additional cost to the owner.

3. Air testing

- a. Air testing shall conform to the requirements of section 01671 "Testing of Sanitary Sewer Systems" except as herein modified.
- b. The minimum time duration for a low pressure exfiltration pressure drop between two consecutive manholes shall not be less than shown in table V below.

TABLE V. MINIMUM DURATION FOR AIR TEST PRESSURE DROP

Pipe Size		Time (Min.)
In.	mm	
4	100	2-1/2
6	150	4
8	200	5
10	225	6-1/2
12	305	7-1/2
15	380	9-1/2

- c. The prescribed drop shall not exceed 0.5 psi from 3.5 to 3.0 psi in excess of the groundwater pressure above the top of the sewer.

E. WATER PRESSURE TESTING

1. The water and standpipe method also can be used to determine exfiltration rates and is accepted by the CSA. This method is more involved and requires considerably more time than the air pressure test.

2. Leakage rate is based upon one hundred (100) gallons per mile of pipe, per inch of pipe, per twenty-four (24) hour period.

F. MEASUREMENT OF WATER TEST EXFILTRATION

1. The actual exfiltration or leakage from the sewer line can be measured by recording the water level drop over a given period of time in a standpipe placed and connected in the upstream manhole. The measured drop in the time period can be converted by calculation to leakage rate in terms of gallons per inch of pipe diameter per mile per day. To aid in determining the leakage rates for standpipes having various diameters, there are examples given in this section under the heading DETERMINATION OF LEAKAGE RATES.

2. The length of sewer line (field measurement) to be tested is determined by the CSA engineer. The line under test should be adequate in length to permit measurable testing, but within the limit of available water volume.

3. All service laterals, stubs and fittings into the sewer line being tested should be properly capped or plugged and carefully braced to resist the thrust developed by internal water pressure. In preparing the blocking of plugs or end caps, it is extremely important to recognize that the 5 to 10 feet of the head in the standpipe will exert considerable thrust against the plugs or caps. For example: a ten foot head will generate a total force of 122 pounds against a six inch

plug.

Further consideration must be given to the fact that higher pressure will be developed in the downstream portion of the line due to its lower elevation in relation to the upstream portion.

4. A tapped plumber's type plug is inserted and tightened in the inlet pipe of the downstream manhole to which the water supply connection is made for filling the pipe.
5. The upper manhole is plugged and securely tightened for connection to the standpipe. The standpipe is then placed in this manhole and connected to the tapped plug. The standpipe must be capable of handling from five (5) to ten (10) feet of water head to determine the tightness and soundness of the sewer line as specified and directed by the CSA engineer,
6. Water is introduced into the line at the downstream (lower) manhole until the standpipe in the upstream manhole has been completely filled. By filling the line from the lowest level, air in the line is easily pushed ahead and finally dispelled through the standpipe at the upper end of the test section.

Care should be taken to minimize entrapped air which will give distorted test results. The rate of drop in the standpipe may be quite rapid until the air has been expelled.

7. After filling with water, the line must be allowed to stand for at least several hours before beginning the test. During this time, some water absorption into the manhole structures and asbestos cement sewer pipe will take place. After the water absorption has been stabilized, the water level in the standpipe is checked and water added if necessary.
8. The test is now ready to begin. The drop in the

- standpipe is measured and recorded over a fifteen (15) minute period. To verify the first results, a second fifteen (15) minute test is suggested. This will also verify whether a stable condition exists in the line.
9. The measured drops in the typical standpipe manhole assembly are converted to leakage in terms of gallons per inch diameter per mile per day. This is the acceptable method of recording leakage.
 10. In exfiltration testing, the maximum internal pressure in any part of the system under test should not exceed 10.83 psi, or twenty-five (25) feet of head.

G. DETERMINATION OF LEAKAGE RATES

For both infiltration and exfiltration tests, the volume of leakage is measured or calculated for a specific period of time, then converted to gallons per inch of pipe diameter per mile per day. The following example will illustrate conversion procedure:

EXAMPLE OF EXFILTRATION TEST BY THE STANDPIPE METHOD

Tests are conducted between two manholes three hundred feet (300') apart, connected by one eight inch (8") sewer pipe. The standpipe is three inches (3") in diameter. Time of test: fifteen (15) minutes.

Test Results: Measured drop in standpipe during test ten (10) inches.

Calculation of Leakage: The first step required is to determine the volume of the standpipe and relate it in terms of gallons per inch of drop. This step is simplified by table below from which the required gallons per inch of drop can be read directly. From the table, a one inch drop in a three inch diameter standpipe gives a 0.031 gallon loss for the fifteen (15) minute test period. Therefore, a ten inch drop during the fifteen minute test period would be:

$$10 \times 0.031 = 0.31 \text{ gallons/fifteen minutes}$$

$$10 \times 0.31 \times 4 = 1.24 \text{ gallons/hour}$$

$$1.24 \times 24 = 29.76 \text{ gallons/day}$$

Next, convert gallons per day to gallons per mile per day:

$$29.76 \text{ gals/day} \times \frac{5,280 \text{ ft./mi.}}{300 \text{ ft. (testline)}} = 523.8 \text{ gals/mile/day}$$

Then convert gallons per mile per day to gallons per inch of pipe diameter per mile per day:

$$\frac{523.8 \text{ gals/mile/day}}{8 \text{ (pipe diameter in inches)}} = 65.5 \text{ gals/inch dia/mile/day}$$

STANDPIPE OR MANHOLE DIA. (IN.)	GALLONS PER INCH OF DROP IN STANDPIPE
3"	0.031
4"	0.054
6"	0.122
8"	0.218

SECTION XVII

FORCE MAIN REGULATIONS

A. THRUST BLOCKS

1. Thrust blocks shall be installed or lines rodded at all bends with radii exceeding ten (10) degrees, and at all valves, tees and plugs. This is to prevent movement of the lines or appurtenances under pressure.

2. The following are requirements governing construction of thrust blocks:

- a. All thrust blocks shall be constructed of poured concrete with a minimum twenty-eight (28) day compression strength of 4000 psi.
- b. The bearing area of the thrust blocks shall be poured against undisturbed soil and the area shall be sufficient to prevent any movement when lines are tested and again when they are put into operation. Thrust block size will vary with the size of the line and the soil bearing properties of the soil. In making this calculation, 150 psig shall be assumed as the internal line pressure.

B. FORCE MAIN TESTING

The CSA engineer shall be notified forty-eight (48) hours in advance of installation of force mains and appurtenances. This will allow the engineer sufficient time to schedule an inspector for the job during the construction phase.

C. POST-CONSTRUCTION INSPECTION AND TEST

1. Once construction has been completed on the force main and its appurtenances, the contractor may request preliminary inspection and test.
2. A visual inspection of all terminations and manholes will be performed to ensure that construction on the force main system meets all the drawing and specifications requirements and in addition, all clean-up work has been completed.
3. Testing of a force main is very important and must be performed before the line can be placed in service. The pressure test is performed with water and the pressure applied to the force main must be equal to 150% of the

maximum pump discharge head. This is the pressure required to lift the water from the pump site to its destination which could be a gravity manhole, a water treatment plant, a holding tank or, some similar item. The minimum test pressure shall be 50 psi.

4. Each section of pipe shall be filled slowly with water. Before the specified test pressure is applied, all air shall be expelled from the pipe through blowoffs or taps that may be required for release of air at the highest points.
5. When the test pressure has been reached, the amount of makeup water to maintain the test pressure for 2 hours shall be measured.
6. Installed pipe will not be accepted if the amount of leakage exceeds 12 gallons per day per inch of pipe diameter per mile of pipe.
7. Where sections of pipeline fail to meet this requirement, they shall be repaired, again maintained under pressure for 2 hours and retested as necessary until these requirements are satisfied.
8. Any visible pipe leakage, regardless of the amount, shall be eliminated immediately and the pipe retested.
9. Calculations to determine loss per inch of pipe per day per mile shall be made as follows:

SECTION XIX

MINIMUM REQUIREMENTS FOR RECORD DRAWINGS

A. GENERAL

1. Submittals shall consist of using the approved drawing set with the design information distinguished from the corresponding as-built information. Methods such as circling the design information or drawing a thin line through it. The design and as-built information shall be legible.
2. Each submittal shall consist of three blue-line copies of each drawing included in the as-built transmittal.
3. If the alignment of the water main, sewer main or force main has been revised significantly during construction, the alignment shall be shown on the drawings.
4. Copies of required easements/agreements, as filed at the county court house, shall be submitted, attached to the plan. The plan shall show each easement and reference the filed deed book and page of the recorded easement.
5. The alignment of utility mains/structures within easements shall be verified,

B. WATER MAINS

1. Pipe diameter, material and lengths shall be noted. Lengths shall be measured between centers of tees/valves.
2. Approximate elevations of the top of pipe shall be provided at valves and where pipe is installed with other than four feet of cover.
3. All hydrant locations shall be shown.
4. All valve sizes shall be shown.
5. All valves and blowoffs shall be located using three tie-

down dimensions from a permanent object; catch basin, manhole, hydrant, road centerline, etc.

6. All curb stops for water service shall be located by indicating the distance behind the curb and distance as measured along the centerline of the road from the nearest downstream sanitary manhole. Each shutoff shall be identified clearly as to the townhouse, condominium, house, office, store etc. that it services.

C. SEWER MAINS

1. Manhole rim elevations shall be provided.
2. Invert elevation of all pipes penetrating each manhole shall be provided.
3. Pipe lengths measured from manhole center to manhole center shall be provided.
4. Pipe slopes shall be indicated.
5. Pipe diameter and material shall be indicated.
6. The as-built length from each lateral connection to the downstream manhole shall be provided in the form of stationing (+73, +97 etc.). The distance from the curb to the first cleanout also shall be provided.
7. Each lateral shall be clearly identified as to the townhouse, condominium, house, office, store etc. that it services.

D. FORCE MAINS

1. The as-built pipe length between bends shall be provided.
2. As-built pipe diameter and pipe material shall be provided.

3. All cleanmouts and valves shall be located using two tie-down dimensions.

E. PUMP STATIONS

1. As-built drawings which highlight any changes from the original design, as approved, including type, location, size and orientation of structures or equipment shall be submitted.
2. Six copies of manufacturers' operation and maintenance information for all installed equipment shall be submitted.

F. PLAN CERTIFICATION

A licensed New Jersey Professional Land Surveyor shall certify the accuracy of the plan in representing "visible" site conditions at the time of survey. Credit also should be given to the sources of information used to represent non-visible, e.g., underground conditions.

SECTION XX

CHANGING RATES, RULES AND REGULATIONS

The Cinnaminson Sewerage Authority reserves the right to change or amend these rates, rules and regulations as required to meet its responsibilities to the citizens of Cinnaminson for providing efficient, safe and cost-effective service.