

**Delgado Community College
Purchasing Department
501 City Park Avenue, Bldg. 37
New Orleans, Louisiana 70119
(504) 762-3027**

Invitation to Bid

Bid Name:

Term Contract #132 – Plumbing Systems Maintenance

Due by & to be opened on:

June 18, 2020 at 2:00PM CST

Contact Person:

**Tracey Sheffield
Purchasing Director
(504) 762-3029**

NAME OF COMPANY

ADDRESS

CITY, STATE, ZIP

PHONE NUMBER

FAX NUMBER

EMAIL

SIGNATURE OF COMPANY REPRESENTATIVE

NAME (PRINTED) & TITLE OF COMPANY REPRESENTATIVE

*** This form must be completed and submitted with your bid*

I. GENERAL INFORMATION

1. Any questions regarding this Invitation to Bid shall be in writing and shall be addressed to Tracey Sheffield at the following address:

Delgado Community College
O'Keefe Administration Building
501 City Park Avenue, Building 37
New Orleans, La 70119
Email: tsheff@dcc.edu
Fax: (504) 762-3089

Any additional information resulting from such inquiries shall be distributed to all bidders via addenda. The College will not be responsible for any other explanation of the documents.

Sealed bids may be submitted by mail or in person. Mailed bids and hand carried bids shall go to the address in item #1. If hand carried, Bids are to be delivered to the attendant at the front desk. Do not leave on counter unattended. The bid name and number shall be on the outside of the packaging, including express mail. Please note that express mail or USPS carriers may not deliver directly to 501 City Park Avenue. The bidder/proposer is solely responsible for ensuring that its courier service provider makes inside deliveries to 501 City Park Avenue.

3. Each bidder is solely responsible for the accuracy and completeness of its bid. Errors or omissions may be grounds for rejection, or may be interpreted in favor of the College.

4. Each bidder is solely responsible for the timely delivery of its bid. Delgado Community College will not be responsible for any delays in the delivery of bids, whether delayed in the mail, or for any reason whatsoever.

5. Only the issue of a purchase order or a signed acceptance of a proposal constitutes acceptance on the part of the College.

6. Assuming there is no prompt payment discount provision, payment will be made within 30 days from receipt of products in satisfactory condition, or within 30 days from receipt of invoice, whichever is later.

7. Proposer or bidder, contractor, etc. certifies, by signing and submitting a proposal for \$25,000 or more, that their company, any subcontractors, or principals are not suspended or debarred by the General Services Administration (GSA) in accordance with the requirements in OMB Circular A-133. (A list of parties who have been suspended or debarred may be viewed via the internet at www.epls.gov .)

I. BID FORM

Service Contract No: 40006-132

MAINTENANCE OF PLUMBIING SYSTEMS

Outside Hourly Labor Rates

Item No.	Labor Category	Straight Time	Overtime	Holiday	Urgent
1.	Plumber	\$ _____	\$ _____	\$ _____	\$ _____
2.	Operator	\$ _____	\$ _____	\$ _____	\$ _____
3.	Helper	\$ _____	\$ _____	\$ _____	\$ _____

Inside Hourly Labor Rates

Item No.	Labor Category	Straight Time	Overtime	Holiday	Urgent
4.	Plumber	\$ _____	\$ _____	\$ _____	\$ _____
5.	Operator	\$ _____	\$ _____	\$ _____	\$ _____
6.	Helper	\$ _____	\$ _____	\$ _____	\$ _____

Equipment Rental

Note: Pickup, delivery and any attachments are included in price of rental equipment

	Description	Hourly	Daily	Weekly	
7.	Bucket Truck	\$ _____	\$ _____	\$ _____	
8.	Backhoe	\$ _____	\$ _____	\$ _____	
9.	Mid -Sized Excavator	\$ _____	\$ _____	\$ _____	
10.	WaterJet Truck	\$ _____	\$ _____	\$ _____	
11.	Vacuum Truck	\$ _____	\$ _____	\$ _____	
12.	4"Diaphram Pump	\$ _____	\$ _____	\$ _____	
13.	4"Centrifugal Pump	\$ _____	\$ _____	\$ _____	

MAINTENANCE OF PLUMBIING SYSTEMS

ADDITIONAL MATERIAL

ITEM NO.	DESCRIPTION	UNIT	AMOUNT
Ductile Pipe (Steel)			
14.	12"	\$/ft.	\$ _____
15.	8"	\$/ft.	\$ _____
16.	6"	\$/ft.	\$ _____
17.	4"	\$/ft.	\$ _____
C-900			
18.	12"	\$/ft.	\$ _____
19.	8"	\$/ft.	\$ _____
20.	6"	\$/ft.	\$ _____
21.	4"	\$/ft.	\$ _____
Cast Iron			
22.	12"	\$/ft.	\$ _____
23.	8"	\$/ft.	\$ _____
24.	6"	\$/ft.	\$ _____
25.	4"	\$/ft.	\$ _____
26.	3"	\$/ft.	\$ _____
Galvanized			
27.	2 1/2"	\$/ft.	\$ _____
28.	2"	\$/ft.	\$ _____
29.	1"	\$/ft.	\$ _____
30.	3/4"	\$/ft.	\$ _____
Copper			
31.	2 1/2"	\$/ft.	\$ _____
32.	2"	\$/ft.	\$ _____
33.	1"	\$/ft.	\$ _____

MAINTENANCE OF PLUMBIING SYSTEMS

ADDITIONAL MATERIAL

ITEM NO.	DESCRIPTION	UNIT	AMOUNT
34.	¾"	\$/ft.	\$ _____
Gas – PE (Polyethylene)			
35.	3"	\$/ft.	\$ _____
36.	2"	\$/ft.	\$ _____
Retaining Collar with All Thread Rods			
37.	12"	\$/Each	\$ _____
38.	8"	\$/Each	\$ _____
39.	6"	\$/Each	\$ _____
40.	4"	\$/Each	\$ _____
Approved Backfill (Per attached specifications)			
41.	Backfill	\$/Yard	\$ _____

Hourly Rates

42.	Experienced technician plus vehicle with all tools equipment and material required to accomplish the task and services described in these specifications	First Hour Charge: \$ _____ Minimum Charge: \$ _____ Hourly Rate After the First Hour: \$ _____
43.	Experienced technician plus vehicle with video equipment required to accomplish the task and services described in these specifications	First Hour Charge: \$ _____ Minimum Charge: \$ _____ Hourly Rate After the First Hour: \$ _____

Materials

44.	Percentage Discount off MSRP	_____	
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Materials:

Material pricing must show MSRP (list) price and final discounted price which must match the discount on the bid form. All invoices submitted must include a cost breakdown sheet before payment is rendered. Materials are limited at \$5000 per job or may be procured by competitive process.

Materials used for each project shall meet all code requirements necessary to complete the project and be of good quality. The College expects the contractor to use sensible purchasing practices to procure good quality materials at the most competitive price points. The College reserves the right to purchase any materials required and provide to the contractor.

Contractor is responsible to supply all necessary tools and for the transportation of personnel and equipment required to complete any project.

Note 1: OVERTIME RATE will be used for work done outside of the hours of 8:00am – 4:30pm Monday through Friday.

Note 2: HOLIDAY RATE will be used if work is done on any recognized State or Federal Holiday. The rate is allowable and does not depend if Delgado is open or closed on these recognized Holidays.

Note 3: URGENT RATE will be used for work done where the College requires the Contractor to be on-site within two (2) hours from the time the College Representative makes initial contact with the Contractor.

Note 4: Travel time is included in labor rates. Delgado does not pay any additional and/or separate travel time. Labor rates start when contractor is on site.

Note 5: Contractor is required to show cost breakdown for parts/materials.

Note 6: The % off MSRP List price is the same for all parts/materials, regardless of where the parts/materials are procured from.

Note 7: All deliveries shall be made FOB (Free on Board) Destination to the College unless otherwise specified by the College. All freight charges are to be clearly state on the bid form. The College will not be responsible for freight charges not clearly stated as part of the bid”.

Note 8: The College reserves the right to procure any parts/materials and provide them to the contractor.

Addendum No: _____ Dated: _____	Addendum No: _____ Dated: _____
Addendum No: _____ Dated: _____	

Bidder declares and represents that he; a) has carefully examined the Bidding Documents, b) has a clear understanding of the Bidding Documents, c) has not received, relied on, or based his bid on any verbal instructions contrary to the Bidding Documents, d) has personally inspected and is familiar with the project site, and hereby proposes to provide all labor, materials, tools, appliances and facilities as required to perform, in a workmanlike manner, all work and services under this contract, all in accordance with the Bidding Documents as prepared by the College Purchasing Office and Facility Services.

By signing below, the Bidder agrees that he/she complies with all bid requirements, instructions, specifications, terms and conditions and special conditions as stated in the bid.

Signature _____

Title _____

Company _____

**Bid must be submitted on this form*

II. INSTRUCTIONS & REQUIREMENTS FOR BIDDERS

Delgado Community College is seeking bids to provide maintenance of plumbing systems in multiple buildings on the following Campuses:

City Park Campus 615 City Park Ave New Orleans, LA 70119	West Bank Campus 2600 General Meyer Ave New Orleans, LA 70114	Charity School of Nursing 450 South Claiborne Ave New Orleans, LA 70112
East Jefferson Technical 5200 Blair Drive Metairie, LA 70001	Sidney Collier Campus 3727 Louisa Street New Orleans, LA 70126	Marine Fire School 13200 Old Gentilly Road New Orleans, LA 70129
River City Campus 709 Churchill Parkway Avondale, LA 70094		

Additional locations may be added to the contract.

QUALIFICATIONS

Vendors/Contractors Bidding this contract shall have at least ten (10) years of experience as a contractor in the field of Plumbing Maintenance, and shall be required to perform the work set forth in the specifications. Each vendor shall present documentation verifying their experience in Plumbing Maintenance. Bidder must complete **Attachment B, References Form** and submit with their bid. Vendor is required to be licensed and certified by Louisiana State Licensing Board for the installation, repair and replacement of plumbing systems at a minimum a Category VI, Mechanical Work. Service personnel shall be qualified by training. The Vendor shall be required to provide at the College's request proof of training of Service Personnel.

PRE-BID/JOBSITE VISIT:

A **non-mandatory pre-bid jobsite visit** is scheduled on **Thursday June 4th, 2020 at 10:00AM CST** at the City Park Campus. Bidders are to meet in the front of Building 10 at Delgado Community College's City Park Campus located at 615 City Park Avenue, New Orleans, LA 70119. Provisions of site inspection are included. Although not required, it is strongly recommended that bidders attend the jobsite visit to ascertain the scope of the work to be performed.

Everyone attending any pre-bid meeting and/or jobsite visit must wear protective face masks while on Campus, follow all recommended social distancing measures and may be subject to a temperature check.

ADDENDA:

Any questions arising from the specifications or the pre-bid conference must be addressed in writing to the individual indicated in Section I, General Information, and will be answered via an Addendum. All questions must be submitted no later than **June 8th, 2020 by 12:00PM CST**. A final 48-hour period after the issuance of the Addendum will be granted for questions which are directly related only to the answers provided in the Addendum.

Any interpretation, correction or change of the Bidding Documents will be made by addendum. Interpretations, corrections or changes of the Bidding Documents made in any other manner will not be binding, and Bidders shall not rely upon such interpretations, corrections and changes. The Bidder must acknowledge all issued addenda in the space provided on the Bid Form. Failure to acknowledge addenda will render the bid informal and will cause its rejection.

Bid Documents and Addenda may be downloaded from
<https://wwwcfprd.doa.louisiana.gov/osp/lapac/dspBid.cfm?search=department&term=39>

BID SUBMITTAL:

Bids must be sealed with the **Bidder's name, license number (if applicable) along with the name and number of the bid clearly written on the front of the** envelope and are to be delivered to the person and location in Section I, General Information by the date and time stated on the title page. Bids received without this information or after the due date and time will be automatically disqualified.

In accordance with R.S. 37:2163A, Contractors' License number in the appropriate classification(s) must appear on the bid envelope submitted on all projects in the amount of \$50,000 or more (and \$1.00 or more if hazardous materials are involved).

Bids must be submitted on the forms furnished for this purpose and must be filled out in ink or typewritten and signed in ink. Do not erase, correct, or write over any prices or figures necessary for this proposal. If any corrections are necessary, each must be initialed by bidder. Failure to comply with the above requirements will cause your bid to be disqualified.

Effective August 15, 1997, in accordance with L.R.S. 39:1594 (Act 121), the person signing the bid must be:

- a) A current corporate officer, partnership member or other individual specifically authorized to submit a bid as reflected in the appropriate records on file with the Secretary of State; or
- b) An individual authorized to bind the vendor as reflected by an accompanying corporate resolution, certificate, or affidavit.

By signing the bid, the bidder certifies compliance with the above.

MODIFICATION OR WITHDRAWAL OF BID:

A bid may not be modified, withdrawn, or canceled by the Bidder for a period of thirty (30) calendar days for the period following the time and bid date designated for the receipt of bids, and Bidder so agrees in submitting his bid, except in accordance with R.S. 39:1594,F.

Prior to the time and date designated for receipt of bids, bids submitted early may be modified or withdrawn only by notice to Delgado Community College Purchasing Office at the place and prior to the time designated for receipt of bids.

Withdrawn bids may be resubmitted up to the time designated for the receipt of bids provided that they are then fully in conformance with these Instructions to Bidders.

BIDDER REPRESENTATION:

By signing and submitting a bid, Bidder acknowledges that he/she has visited the site, read and understands the Bidding Documents and his bid is made in accordance therewith.

The Bidder is advised to carefully consider all College physical features and activities and occupancies by faculty, staff and students, and to plan activities so as not to disrupt the normal operations and activities of the College except as expressly permitted by the College in writing. The Bidder shall be especially aware of existing electric, gas, water, telephone and/or other utilities and facilities which may be in the way of or adjacent to the Work, and shall take appropriate action to protect these utilities during the Work. Every effort has been made to accurately show all pertinent surface and subsurface features accurately. For self-assurance, the Bidder may examine available drawings and documents related to College premises. Such examinations may be made only in the offices of the College Facility Services as part of the Non-Mandatory Pre-Bid Conference.

The Bidder agrees that his/her bid is based solely upon the materials, systems and equipment described in the Bidding Documents as advertised and as modified by addenda. The bid submitted is not based on any verbal instructions contrary to the Bidding Documents and addenda.

INSURANCE:

Bidders are to comply with the insurance requirements as stated in Section V of the bid. The provided **indemnification form** (see Attachment A) must be completed and submitted with your bid. Failure to comply with these requirements will result in disqualification of your bid.

The successful bidder will be responsible for ensuring that Delgado receives the required **insurance certificate** after the notice of award (as per terms and conditions) in a timely manner in order to meet the required work expectancy timeframe. No work may commence until a proper certificate is received.

END OF SECTION III

III. TERMS AND CONDITIONS

GENERAL TERMS & CONDITIONS:

- A response to a bid invitation is our only indication of your interest in college business. Failure to respond to six (6) consecutive bid invitations may cause your name to be removed from the bidders' list.
- Bid openings are subject to any in place Executive Order or revised statute as it pertains to the current pandemic.
- No information will be given out as to opinions concerning the ultimate outcome while consideration of the award is in progress.
- Effective September 1, 1991, in accordance with Act 1029 of the 1991 Regular Legislative Session, Delgado Community College will not be responsible for any sales tax, either state or local.
- Delgado Community College reserves the right to reject any and all bids and to waive any informality.
- It shall be distinctly agreed and understood that the price quoted must be a firm price, and not be subject to change at time of the shipment of goods or delivery of services.
- All shipping, handling, materials, labor or any other charges necessary to compete this job must be included in amount bid. Items not listed but necessary for completion of the job shall be furnished as part of the bid. Additional costs disclosed later will be at the expense of the vendor.
- All deliveries shall be made FOB Destination to the College unless otherwise specified by the College. All freight charges are to be included in the unit price. The College will not be responsible for freight charges not clearly stated as a part of this bid.
- The College reserves the right to award the above items separately, grouped, or on an all-or-none basis, and to reject any or all bids and to waive any informalities including technicalities in specifications that preclude competition.
- The College shall have the right to reject any or all bids not accompanied by any data required by the Bidding Documents or a bid in any way incomplete or irregular.
- The Bid will be awarded on the basis of the lowest total cost as determined by the College.
- List of distributors: The Vendor signing the bid shall be designated as the Prime Vendor on any contract/agreement resulting from this bid. If additional Vendors are authorized to receive orders for items covered under this proposal, the Vendor must submit, with bid, a list of those additional authorized distributors.
- Bidder must be a Louisiana licensed contractor who is licensed to perform the work as outlined in the specifications. The Bidder must be fully qualified under any State or local licensing law for Contractors in effect at the time and at the location of the work before submitting his bid. The Contractor shall be responsible for determining that all of his Sub-bidders or prospective Subcontractors are duly licensed in accordance with law.
- Bidder must be able to provide a project timeline if requested by Delgado Community College

- If item(s) or services bid do not fully comply with specifications, including brand and/or product number or work, bidder must state in what respect the item(s)/services or work deviate. Failure to note exceptions on the bid form will not relieve the successful bidder from supplying the actual products or services requested.

CONTRACT TERM & AGREEMENT:

The term of the agreement will be from the date of award through June 30, 2021, with the option to renew for up to two (2) twelve (12) month periods if mutually agreeable. Contract extensions may not exceed thirty-six (36) months total.

Escalation Clause; Prior to any renewal term, the contractor may request a price increase for that renewal term based on documented increase costs. The price increase may not be greater than the Consumer Price Index (All Urban Consumers, Current Series) average increase for the prior 12 months. The College reserves the right to approve or disapprove the price increase.

The Form of Agreement between the College and Contractor for the work set forth herein will be the issuance of a purchase order.

ADDITIONAL SITES:

The College reserves the right to add or subtract sites to this contract during the course of the agreement. The College will request the addition/subtraction from the Vendor/Contractor, and a price will be negotiated and agreed upon at that time.

PAYMENTS:

Contractor will be paid after work is satisfactorily completed and upon recommendation of the College Representative.

Payment for services shall be made to the Contractor once a month after receipt by the College of an invoice (or invoices) by which the Bidder certifies, and the College agrees, that all the invoiced work was performed in accordance with the specifications. Invoices will not be paid prior to 30 days from receipt of invoice or completion of services/receipt of project.

All invoices should be submitted to the College's Office of Accounts Payable and clearly indicate the Purchase Order Number assigned by the Delgado Purchasing office. Invoices must be accompanied by a service ticket(s) or reference the service ticket(s) if the ticket(s) was already submitted to Facilities & Planning. The service ticket must reference who requested the work, why the work was needed, and what work was performed. Lump sum invoices will not be processed. All work must be itemized and include a breakdown per the unit pricing and material markup, if applicable, per the bid.

INSURANCE:

Vendor compliance with the attached insurance and indemnification requirements is mandatory. A completed copy of the ***indemnification agreement*** (*Attachment A*) must be submitted with the bid. Failure to do so will result in immediate disqualification of the bid. Upon award, a certificate of insurance must be submitted to Delgado Community College, delineating Delgado Community College as the certificate holder prior to the commencement of any work.

TERMINATION OF AGREEMENT:

- **Termination of this agreement for cause** – DCC may terminate this agreement for cause based upon the failure of Contractor to comply with the terms and/or conditions of the Agreement, or failure to fulfill its performance obligations pursuant to this agreement, provided that DCC shall give the Contractor written notice specifying the Contractor’s failure. If within thirty (30) days after receipt of such notice, the Contractor shall not have corrected such failure or, in the case of failure which cannot be corrected in thirty (30) days, have begun in good faith to correct such failure and thereafter proceeded diligently to complete such correction, then DCC may, at its option, place the Contractor in default and the Agreement shall terminate on the date specified in such notice.

The Contractor may exercise any rights available to it under Louisiana law to terminate for cause upon the failure of DCC to comply with the terms and conditions of this agreement, provided that the Contractor shall give DCC written notice specifying the DCC’s failure and a reasonable opportunity for DCC to cure the defect.

- **Termination for non-appropriation of funds** - The continuance of this contract is contingent upon the appropriation of funds to fulfill the requirements of the contract by the legislature. If the legislature fails to appropriate sufficient monies to provide for the continuation of the contract, or if such appropriation is reduced by the veto of the Governor or by any means provided in the appropriations act or Title 39 of the Louisiana Revised Statutes of 1950 to prevent the total appropriation for the year from exceeding revenues for that year, or for any other lawful purpose, and the effect of such reduction is to provide insufficient monies for the continuation of the contract, the contract shall terminate on the date of the beginning of the first fiscal year for which funds are not appropriated.
- **Termination for Convenience** - The College may terminate the Contract at any time by giving thirty (30) days written notice to the Contractor. The Contractor shall be entitled to payment for work performed (monthly charges to be prorated) to the extent work has been performed satisfactorily.

If, for any reason, the Contractor desires to terminate the Contract, he may do so upon giving written notice of sixty (60) days to the College. Contractor shall perform all work satisfactorily as contracted until the determined termination date

- **Cancellation Conditions** - In any of the following cases, the College shall have the right to immediately cancel the contract agreement due to:
The interruption of operation in any of the contacted facilities or the College beyond its control; failure of the Contractor to maintain a satisfactory performance bond or adequate insurance coverage; wherever the contractor is guilty of misrepresentation; wherever the contract agreement was obtained by fraud, collusion, conspiracy, or other unlawful means, or the contract agreement conflicts with any statutory and constitutional provision of the State of Louisiana or the United States. In case of default by the Contractor, the College reserves the right to purchase any or all items or services in default on open market, charging the Contractor with any excessive costs. Until these excessive costs are paid to the College, the Contractor shall not do business with the College again.
- **Implementation of Termination** - The Contractor shall terminate all work under the Contract to the extent and on the date specified in the Notice of Termination or reduction of work and until such date shall, continue to perform all work required in the specification and be compensated for such work.

In the event of termination or reduction in the scope of work by the College, the College shall pay the Contractor for all work satisfactorily performed up to the effective date of termination or reduction in the scope of work, in accordance with the prices included in Contractor’s bid less all partial payments made

on account prior to the effective date of termination or reduction in the scope of work.

Upon termination as above, the Contract Administrator shall make final determination of the amount due the Contractor for work performed.

INQUIRIES, INTERPRETATION OR CORRECTION TO BIDDING

Any questions arising from either the specifications and/or jobsite visit must be addressed in writing and will be answered via an Addendum.

Any interpretation, correction or change of the Bidding Documents will be made by addendum. Interpretations, corrections or changes of the Bidding Documents made in any other manner will not be binding, and Bidders shall not rely upon such interpretations, corrections and changes.

DISCRIMINATORY PRACTICES:

Delgado Community College of the State of Louisiana is an equal opportunity employer and looks to its contractors, subcontractors, vendors, and suppliers to take affirmative action to effect this commitment in its operations.

Both the College and the bidder shall abide by the requirements of Title VII of the Civil Rights Act of 1964, and shall not discriminate against employees or applicants due to race, color, religion, sex, handicap or national origin. Furthermore, both parties shall take affirmative action to provide for positive posture in employing and upgrading persons without regard to race, color, religion, sex, handicap, or national origin, and shall take affirmative action as provided in the Vietnam Era Veteran's Readjustment Act of 1974. Both parties shall abide by the requirements of Title VI of the Civil Rights Act of 1964 and the Vocational Rehabilitation Act of 1974 to insure that services are delivered without discrimination due to race, color national origin or handicap. Both parties shall comply with the requirements of the Americans with Disabilities Act of 1990 which bans discrimination in employment or in delivery of services on the basis of sexual orientation.

SUBCONTRACTORS:

All subcontractors must be identified and approved in writing in advance by the College. Contractor shall promptly pay all laborers, materialmen, subcontractors and suppliers for work performed pursuant to this contract.

It is the Contractor's responsibility to ensure that his subcontractors are properly licensed and insured and adhere to all rules and responsibilities as outlined in the bid documents.

SUBSTITUTIONS AND EQUIVALENTS:

SERVICES: Any materials, products and equipment described in the Bidding Documents establish a standard of required function, dimension, appearance and quality to be met by any proposed substitution.

No substitution will be considered unless written request for approval has been submitted by the Contractor and has been received by the College Representative prior to beginning work.

Each such request shall include the name of the material or equipment for which it is to be substituted and a complete description of the proposed substitute including model numbers, drawings, cuts, performance and test data and any other information necessary for an evaluation. A statement setting forth any changes in other materials, equipment or work that incorporation of the substitute would require shall be included.

It shall be the responsibility of the Contractor to include in his request all changes required to the work if the proposed substitute is used. Approval, if granted, is given contingent upon Contractor being responsible for any costs which may be necessary to modify the space or facilities needed to accommodate the materials and equipment approved.

If the College approves a proposed substitution, such approval will be set forth in writing. Contractor shall not rely upon approvals made in any other manner.

MATERIALS: Any manufacturer's names, trade names, brand names, or catalog numbers used in the specifications for material purchase are for the purpose of describing and establishing general quality levels. Such references are not intended to be restrictive. Bids will be considered for any brand that meets or exceeds the quality of the specifications listed for any item.

Vendor must state the brand/model he or she is bidding on each item. It shall be the sole responsibility of the Vendor to prove equivalency. Vendor shall submit with the bid all illustrations, drawings, descriptive literature, and specifications necessary to determine equivalency. Failure to do so will eliminate your bid from consideration. The decision of the College as to equivalency shall be final.

If a vendor wishes to submit an alternate bid in addition to the brand/model requested, he or she may submit one (1) alternate bid. The alternate bid must be a separate submission, must be clearly marked as an alternate, and must include all applicable forms (i.e., jobsite visit). In addition, a separate, signed cover sheet must be submitted with the alternate. **Applicable if materials are being purchased in addition to the services requested in the bid.*

END OF SECTION IV

V. INSURANCE REQUIREMENTS FOR VENDORS

The Contractor/Vendor shall purchase and maintain for the duration of the contract/work insurance against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the work hereunder by the Contractor/Vendor, its agents, representatives, employees or subcontractors.

A. MINIMUM SCOPE AND LIMITS OF INSURANCE

1. Workers Compensation

Workers Compensation insurance shall be in compliance with the Workers Compensations law of the State of Louisiana. Employers Liability is included with a minimum limit of \$500,000 per accident/per disaster/per employee. If work is to be performed over water and involves maritime exposure, applicable LHWCA, Jones Act, or other maritime law coverage shall be included and the Employers Liability increased to a minimum of \$1,000,000.

2. Commercial General Liability

Commercial General Liability insurance, including Personal and Advertising Injury Liability, shall have a minimum limit per occurrence of \$1,000,000 and a minimum general aggregate of \$2,000,000. The Insurance Services office (ISO) Commercial General Liability occurrence coverage form CG 00 01 (current form approved for use in Louisiana), or equivalent, is to be used in the policy. Claims made form is unacceptable.

3. Automobile Liability

Automobile Liability Insurance shall have a minimum combined single limit per occurrence of \$1,000,000. ISO form number CA 00 01 (current form approved for use in Louisiana), or equivalent, is to be used in the policy. This insurance shall include third-party bodily injury and property damage liability for owned, hired and non-owned automobiles.

B. DEDUCTIBLES AND SELF-INSURED RETENTIONS

Any deductibles or self-insured retentions must be declared to and accepted by the Agency. The Contractor/Vendor shall be responsible for all deductibles and self-insured retentions.

C. OTHER INSURANCE PROVISIONS

The policies are to contain, or be endorsed to contain the following provisions:

1. General Liability and Automobile Liability Coverage's

- a. The Agency, its officers, agents, employees and volunteers shall be named as an additional insured as regards to negligence by the contractor/vendor. ISO Form CG 20 10 (current form approved for use on Louisiana), or equivalent, is to be used when applicable. The coverage shall contain no special limitations on the scope of protection to the Agency.
- b. The Contractor's/Vendor's insurance shall be primary as respects to the Agency, its officers, agents, employees and volunteers. Any insurance or self-insurance maintained by the Agency shall be excess and non-contributory of the Contractor's insurance.
- c. The Contractor's/Vendor's insurance shall apply separately to each insured against whom claim is made or suit brought, except with respect to the policy limits.

2. Workers Compensation and Employers Liability Coverage

The insurer shall agree to waive all rights of subrogation against the Agency, its officers, agents, employees and volunteers for losses arising from work performed by the Contractor for the Agency.

3. All Coverages

- a. Coverage/Vendor shall not be cancelled, suspended, or violated by either party (the Contractor/Vendor or the insurer) or reduced in coverage or in limits except after 30 days written notice has been given to the Agency. Ten-day written notice of cancellation is acceptable for non-payment of premium. Notifications shall comply with the standard cancellation provisions in the Contractor's/Vendor's policy.
- b. Neither the acceptance of the completed work nor the payment thereof shall release the Contractor/Vendor from the obligations of the insurance requirements or the indemnification agreement.
- c. The insurance companies issuing the policies shall have no recourse against the Agency for payment of premiums or for assessments under any form of the policies.
- d. Any failure of the Contractor/Vendor to comply with reporting provisions of the policy shall not affect coverage provided to the Agency, its officers, agents, employees and volunteers.

D. ACCEPTABILITY OF INSURERS

All required insurance shall be provided by a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located. Insurance shall be placed with insurers with an A.M. Best's rating of **A-: VI or higher**. This rating requirement may be waived for workers compensations only.

If at any time an insurer issuing any such policy does not meet the minimum A.M Best rating, the Contractor/Vendor shall obtain a policy with an insurer that meets the A.M Best rating and shall submit another Certificate of Insurance as required in the contract.

E. VERIFICATION OF COVERAGE

Contractor/Vendor shall furnish the Agency with Certificates of Insurance reflecting proof of required coverage. The Certificates for each insurance policy are to be signed by a person authorized by that insurer to bind coverage on its behalf. The Certificates are to be received and approved by the Agency before work commences and upon any contract renewal thereafter.

In addition to the Certificates, Contractor/Vendor shall submit the declarations page and cancellation provision endorsement for each insurance policy. The Agency reserves the right to request complete certified copies of all required insurance policies at any time.

Upon failure of the Contractor/Vendor to furnish, deliver and maintain such insurance as above provided, this contract, at the election of the Agency, may be suspended, discontinued or terminated. Failure of the Contractor/Vendor to purchase and/or maintain any required insurance shall not relieve the Contractor/Vendor from any liability or indemnification under the contract.

F. SUBCONTRACTORS

Contractor/Vendor shall include all subcontractors and as insureds under its policies OR shall be responsible for verifying and maintaining the Certificates provided by each subcontractor. Subcontractors shall be subject to all of the requirements stated herein. The Agency reserves the right to request copies of subcontractor's Certificates at any time.

G. WORKERS COMPENSATION INDEMNITY

In the event the Contractor/Vendor is not required to provide or elects not to provide workers compensation coverage, the parties hereby agree that Contractor/Vendor, its owners, agents and employees will have no cause of action against, and it will not assert a claim against the State of Louisiana, its departments, agencies, agents and employer, whether pursuant to the Louisiana Workers Compensation Act, or otherwise under any

circumstance. The parties also hereby agree that the State of Louisiana, its departments, agencies, agents, and employees shall in no circumstance be, or considered as, the employer or statutory employer of the Contractor/Vendor, its owners, agents and employees. The parties further agree that the Contractor/Vendor is a wholly independent contractor and is exclusively responsible for its employees, owners, and agents. Contractor/Vendor hereby agrees to protect, defend, indemnify and hold the State of Louisiana, its departments, agencies, agents and employees harmless from any such assertion or claim that may arise from the performance of this contract.

H. INDEMNIFICATION/HOLD HARMLESS AGREEMENT

Contractor/Vendor agrees to protect, defend, indemnify, save and hold harmless, the State of Louisiana, all State Departments, Agencies, Boards and Commissions, its officers, agents servants, employees and volunteers, from and against any and all claims, damages, expenses, and liability arising out of injury or death to any person or the damage, loss or destruction of any property which may occur, or in any way grow out of, any act or omission of the Contractor/Vendor, its agents, servants, and employees, or any and all costs, expenses and/or attorney fees incurred by the Contractor/Vendor as a result of any claims, demands, suits or causes of action, except those claims, demands suits, or causes of action arising out of the negligence of the State of Louisiana, all State Departments, Agencies, Boards, Commissions, its officers, agents, servants, employees and volunteers.

Contractor/Vendor agrees to investigate, handle, respond to, provide defense for and defend any such claims, demands, suits, or causes of action at its sole expense and agrees to bear all other costs and expenses related thereto, even if the claims, demands, suits, or causes of action are groundless, false or fraudulent.

END OF SECTION V

ATTACHMENT A: INDEMNICATION AGREEMENT

_____ **{Contractor/Vendor/Lessee}** agrees to protect, defend, indemnify, save and hold harmless the State of Louisiana, all State departments, Agencies, Boards and Commissions, its officers, agents, servants, employees, and volunteers, from and against any and all claims, demands, expense and liability arising out of injury or death to any person or the damage, loss or destruction of any property which may occur or in any way grow out of any act or omission of

_____ **{Contractor/Vendor/Lessee}** its agents, servants, and employees, or any and all costs, expense and/or attorney fees incurred by

_____ **{Contractor/Vendor/Lessee}** as a result of any claims, demands, suits and/or causes of action except those claims, demands, suits and/or causes of action arising out of the negligence of the State of Louisiana, all State Departments, Agencies, Boards, Commissions, its officers, agents, servants, employees and volunteers. _____

{Contractors/Vendor/Lessee} agrees to investigate, handle, respond to, provide defense for and defend any such claims, demands, suits, or causes of action at its sole expense and agrees to bear all other costs and expenses related thereto, even if the claims, demands, suites, or causes of action are groundless, false or fraudulent.

Accepted by:

Company Name

Signature

Title

Date Accepted

Is certificate of insurance attached? _____ YES _____ NO

****This form must be completed and submitted with your bid**

ATTACHMENT B: REFERENCE FORM

_____	_____
(Company Name)	(Facility Type)
_____	_____
(Address)	(Phone Number)

(Contract Administrator)	

_____	_____
(Company Name)	(Facility Type)
_____	_____
(Address)	(Phone Number)

(Contract Administrator)	

_____	_____
(Company Name)	(Facility Type)
_____	_____
(Address)	(Phone Number)

(Contract Administrator)	

****Form must be completed and submitted with the bid***

VI. TECHNICAL SPECIFICATIONS

SECTION 01000

GENERAL CONDITIONS

The general conditions of these Specifications, including amendments and additions thereto, apply to each and every heading included in these Specifications with the same force as though repeated in full under each heading respectively.

1.1 SCOPE

This contract provides for annual Maintenance of the Plumbing Systems. Contractor shall provide for the timely and efficient removal of stoppage in the existing College underground sewer system and the replacement or repair of any plumbing components. The extent of the work will be established by the College on an as needed basis. Expected work is of the type and complexity associated with a large College.

All work shall meet Uniform Plumbing Code (UPC), National Fire Protection Association (NFPA), and National Association of Plumbing, Heating and Cooling Contractors (PHCC) code requirements. The work shall also meet College Standards.

All work will be coordinated with the contractor and College Representative prior to the work beginning.

Standard (Non-Urgent Projects):

For all Standard (Non-Urgent) Projects, a written estimate shall be provided by the contractor for each project to the College Representative before work begins. The written estimate shall include separate labor, equipment rental and material costs to complete the project which must match rates as bid in response to these Specifications. The College Representative will approve this written estimate in writing, by fax or email, before the work begins.

The College Representative reserves the right to separately bid out standard projects.

Urgent Projects:

Urgent Projects are those that are deemed by the College to be any projects where the contractor must be on-site within two (2) hours from the time the College Representative first (1st) contacts the contractor.

For Urgent Projects, the contractor should give a written estimate for the work to be completed to the College Representative, if time permits. However, if time does not permit, an oral estimate by the contractor is acceptable for Urgent Projects **ONLY**. The College Representative may allow work to begin with only an oral approval to proceed based on information available at the time. However, **all oral estimates** shall be followed up in writing the first (1st) work day after approval to proceed is given by the College Representative.

Pricing Model:

In order to determine the lowest responsive, responsible bidder, bids will be tabulated based on the below model.

Service Contract No: 40006-132

MAINTENANCE OF PLUMBING SYSTEMS					
<u>Outside Hourly Labor Rates</u>					
Item No.	Labor Category	Straight Time	Overtime	Holiday	Urgent
1.	Plumber	3%	1%	1%	1%
2.	Operator	2%	1%	1%	1%
3.	Helper	3%	1%	1%	1%

<u>Inside Hourly Labor Rates</u>					
Item No.	Labor Category	Straight Time	Overtime	Holiday	Urgent
4.	Plumber	3%	1%	1%	1%
5.	Operator	2%	1%	1%	1%
6.	Helper	3%	1%	1%	1%

<u>Equipment Rental</u>					
Note: Pickup, delivery and any attachments are included in price of rental equipment					
	Description	Hourly	Daily	Weekly	
7.	Bucket Truck	1%	2%	1%	
8.	Backhoe	1%	2%	1%	
9.	Mid -Sized Excavator	1%	2%	1%	
10.	WaterJet Truck	1%	2%	1%	
11.	Vacuum Truck	1%	2%	1%	
12.	4"Diaphram Pump	1%	2%	1%	
13.	4"Centrifugal Pump	1%	2%	1%	

MAINTENANCE OF PLUMBING SYSTEMS			
ADDITIONAL MATERIAL			
ITEM NO.	DESCRIPTION	UNIT	AMOUNT
Ductile Pipe (Steel)			
14.	12"	\$/ft.	1%
15.	8"	\$/ft.	1%
16.	6"	\$/ft.	1%
17.	4"	\$/ft.	1%
C-900			
18.	12"	\$/ft.	1%
19.	8"	\$/ft.	1%
20.	6"	\$/ft.	1%
21.	4"	\$/ft.	1%
Cast Iron			
22.	12"	\$/ft.	1%
23.	8"	\$/ft.	1%
24.	6"	\$/ft.	1%
25.	4"	\$/ft.	1%
26.	3"	\$/ft.	1%
Galvanized			
27.	2 1/2"	\$/ft.	1%
28.	2"	\$/ft.	1%
29.	1"	\$/ft.	1%
30.	3/4"	\$/ft.	1%
Copper			
31.	2 1/2"	\$/ft.	1%
32.	2"	\$/ft.	1%
33.	1"	\$/ft.	1%
34.	3/4"	\$/ft.	1%
Gas – PE (Polyethylene)			
35.	3"	\$/ft.	1%

MAINTENANCE OF PLUMBING SYSTEMS

ADDITIONAL MATERIAL

ITEM NO.	DESCRIPTION	UNIT	AMOUNT
36.	2"	\$/ft.	1%
Retaining Collar with All Thread Rods			
37.	12"	\$/Each	1%
38.	8"	\$/Each	1%
39.	6"	\$/Each	1%
40.	4"	\$/Each	1%
Approved Backfill (Per attached specifications)			
41.	Backfill	\$/Yard	2%

MAINTENANCE OF PLUMBING SYSTEMS

42.	Experienced technician plus vehicle with all tools equipment and material required to accomplish the task and services described in these specifications	First Hour Charge: 2% Minimum Charge: 2% Hourly Rate After the First Hour: 2%
43.	Experienced technician plus vehicle with video equipment required to accomplish the task and services described in these specifications	First Hour Charge: 1% Minimum Charge: 1% Hourly Rate After the First Hour: 1%

Materials

44.	Percentage Discount off MSRP	_____
-----	------------------------------	-------

Materials:

Material pricing must show MSRP (list) price and final discounted price which must match the discount on the bid form. All invoices submitted must include a cost breakdown sheet before payment is rendered.

Materials used for each project shall meet all code requirements necessary to complete the project and be of good quality. The College expects the contractor to use sensible purchasing practices to procure good quality materials at the most competitive price points. The College reserves the right to purchase any materials required and provide to the contractor.

Contractor is responsible to supply all necessary tools and for the transportation of personnel and equipment required to complete any project.

1.2 NON-MANDATORY SITE INVESTIGATION

It is recommended that prospective bidders visit the site to make measurements, review existing conditions, and if required, review the Building Plans on file in the Facility Services Office if the prospect warrants same. A thorough understanding of the project per these Technical Specifications and/or accompanying drawings is imperative. Opportunity for the site visit and inspection is provided in Section III "INSTRUCTIONS & REQUIREMENTS FOR BIDDERS.

1.3 REVIEW OF DOCUMENTS

The Contractor shall carefully study and compare the field conditions, Drawings and Specifications and shall at once report to the College Representative errors, inconsistencies or omissions discovered.

1.4 PROJECT MEETINGS

If called by the College Representative, a Pre-Service Conference between the Contractor, his on-site representative and the College Representative will be held in order to clarify and direct College policy and specific items of concern as pertain to the Contract. Progress meetings will be scheduled at the discretion of the College Representative.

1.5 COORDINATION

Coordinate service schedule with the College Representative so as not to interfere with the ongoing operation of the College. If for any reason, shut down of utilities is required on this project, it is imperative that the College Representative be consulted.

1.6 TRAFFIC CONTROL

Coordinate the schedule of delivery vehicles which will interfere with normal campus traffic. When deliveries are made from the street curb, provide sufficient properly attired and equipped flagmen to safely control and maintain the flow of traffic. It is the policy of the Delgado Community College to provide full access to all disabled individuals in all areas possible. Because of this commitment, contractors, vendors or servicing agencies are cautioned to insure that their staff is made aware of this commitment. When parking on the campus of this College, it shall be the responsibility of the contractor, vendor or servicing agency to insure that no sidewalks or access ways are blocked at any time. If temporary blocking is required, the Contractor shall assume the responsibility for the safe transit of all disabled persons.

1.7 PROTECTION

Protect adjacent buildings and building elements from damage during site work. Protect the site, including trees, shrubs, vegetation, and lawn areas; where damage does occur, restore to original condition replacing damaged vegetation and lawn with equal size and species. Store construction materials with care; distribute the weight to not endanger the building structure.

1.8 SAFETY

Provide sufficient signs continuous barricades to identify the work site and restrict entry. Where necessary, equip barricades with warning lights for night use. Provide measures necessary to ensure and maintain security at the work site; protect from theft, vandalism, personal injury, and property damage. Erect and maintain temporary enclosures and barriers to prevent unauthorized access to the site. Provide fire protection equipment during the construction period, including not less than two (2) ten (10) pound capacity multipurpose A-B-C dry chemical extinguishers (10A:40BC). Where indicated on the Drawings, provide a temporary fence to isolate the construction site and restrict unauthorized entry. Use chain link fence material, 6'-0 minimum height, on steel or wood posts spaced a 6'-0 maximum and embedded 2'-6 minimum below existing grade; include personnel and/or equipment access gates. Coordinate fence installation with underground utilities - see 1.11; before installation, confirm fence location and layout with the College Representative.

1.9 WARRANTY

Warranty all workmanship and material for a period of one (1) year from date of acceptance. During this period, the College will notify the Contractor of any discrepancy for prompt correction at no expense to the College. At the discretion and initiation of the College Representative, a one-year warranty review meeting with the Contractor will be held to review warranty items which remain incomplete.

1.10 TEMPORARY UTILITIES

The Contractor may use reasonable amounts of the utility services available to the site at no charge from the-College. The College will not provide utility service beyond that existing. Coordinate tie-in and disconnect to the existing utilities with the College Representative. Locate temporary facilities so as not to interfere with the College's use of the Project site and/or surrounding areas. Relocate non-complying facilities at no expense to the College.

1.11 TEMPORARY SANITARY FACILITIES

Existing facilities in the building may be used by construction personnel during work on this project.

END OF SECTION

SECTION 02300

BACKFILL

1.0 BACKFILL AND COMPACTION

A. BACKFILL MATERIALS

1. Approved native material (Section 3.0)

B. GENERAL

1. Placement and compaction of backfill material shall not damage or displace the pipe.
2. Remove shoring or cages in such a manner as to allow proper compaction and to prevent trench walls from collapsing.
3. Place backfill in lifts suitable to the soil type and compaction equipment being used as determined by the College Representative
4. Import granular fill shall be used for backfill where specified on the construction drawings or contract documents, where native soils are unsuitable or where there is insufficient approved native backfill available.
5. Deficiencies in the quantities of approved native backfill material which are the result of the contractor's operation shall be replaced with imported granular fill at no additional cost to the Owner.
6. Trenches shall be backfilled to a depth to allow for surface restoration in accordance with Section 4.0.

2.0 IMPORTED GRANULAR FILL

- A. If the material excavated from the trench is unsuitable for backfill, the Contractor shall import granular fill.
- B. Imported granular fill shall consist of well graded granular material, with not more than 8% passing the 0.075 mm (.029 inches) sieve, which contains no stones larger than 150 mm (5.9 inches) diameter and contains no stumps, roots, organic or other deleterious material.
- C. All imported granular fill shall require approval by the College Representative prior to placement.

3.0 APPROVED NATIVE BACKFILL

- A. Approved native backfill shall be soils native to the excavation and suitable for backfilling to the required compaction densities as determined by the College Representative.
- B. The maximum size rock in approved native backfill shall be 200 mm (7.87 inches) in any dimension.

- C. Approved native backfill material placed within 600 mm (2 feet approximate) of the finished surface shall have a maximum rock size of 75 mm (2.9 inches) measured in any dimension.
- D. Unsuitable native materials, i.e. rock, clay or silt may be mixed with granular material for use as approved native backfill if approved by the College Representative. In no case shall the silt and clay content exceed 30% by volume.

4.0 SURFACE RESTORATION

A. GENERAL

- 1. Surface restoration shall be completed immediately following the backfilling operation.
- 2. Restore all disturbed surfaces to a condition equal to or better than the condition that existed prior to construction to the satisfaction of the College Representative unless otherwise specified.
- 3. Repair any damage to adjacent lands or improvements.
- 4. Damage to paved surfaces shall be seal coated, patched or replaced in an approved manner to the satisfaction of the College Representative.
- 5. Damage to graveled surfaces shall be restored by scarifying, re-grading and compacting the surface, or if required, re-gravelling the surface with base gravel or approved equivalent to the satisfaction of the College Representative.

B. LANDSCAPED AREAS

- 1. Top soil, shrubs, small trees, fences and other items removed prior to, or during construction shall be replaced to the satisfaction of the College.
- 2. Replacement shrubs, trees and plants shall be planted at a suitable time of the year in accordance with good horticultural practice to provide a maximum assurance of survival.
- 3. During the maintenance period, any trees, shrubs or plants which show signs of dying as a result of the contractor's operation shall be replaced with new plantings of a similar variety, age and size at no extra cost to the College.

END SECTION

SECTION 02530

SANITARY SEWERAGE

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. This Section includes sanitary sewerage cleaning due to blockage and plumbing work.

It is the intent of these specifications to provide timely and efficient services of plumbing and cleaning to the College's existing sanitary sewer.

- B. **DESCRIPTION OF THE WORK**

The contractor shall provide 24 hour on-call cleaning service including the labor, equipment, supervision, and where requested by the College Representative, the materials necessary and reasonably incidental to cleaning of the existing sanitary sewer on all Delgado Campuses listed above. All work performed shall be done in accordance with these specifications.

- C. **RELATED SECTIONS**

GENERAL CONDITIONS.....SECTION 01000

1.3 PERFORMANCE REQUIREMENTS

- A. The designated sewer manhole sections shall be cleaned using hydraulically propelled, high-velocity jet, or mechanically powered equipment. The equipment shall be capable of removing dirt, grease, rocks, sand, and other materials and obstructions from the sewer lines and manholes. If cleaning of an entire sewer section cannot be successfully performed from one manhole, the equipment shall be set up on the other manhole and cleaning again attempted. If, again, successful cleaning cannot be performed or the equipment fails to traverse the entire manhole section, it will be assumed that a major blockage exists and the cleaning effort shall be abandoned.
- B. Existing flows shall not be interrupted for periods longer than one hour. The Contractor shall take necessary precautions to prevent sewage backup and shall be responsible if damage results from. Sewage diverted during cleaning operations shall be returned to the sanitary system and not discharged into the streams or storm drain system.
- C. During all cleaning and preparation operations, all necessary precautions shall be taken to protect the sewer from damage. During these operations, precautions shall be also taken to insure that no damage is caused to public or private property adjacent to or served by the sewer or its branches. Any damage cause to public or private property as a result of such

cleaning and preparation operations shall be restored to preexisting conditions by the Contractor at no additional costs to the College.

- D. Satisfactory precautions shall be taken in the use of cleaning equipment. When hydraulically propelled cleaning tools (which depend upon water pressure to provide their cleaning force) or tools which retard the flow in the sewer line are used, precautions shall be taken to insure that the water pressure created does not damage or cause flooding of public or private property being served by the sewer. When possible, the flow of sewage in the sewer shall be utilized to provide the necessary pressure for hydraulic cleaning devices. When additional water from fire hydrants is necessary to avoid delay in normal work procedures, the water shall be conserved and not used unnecessarily. Access to fire hydrants for the purpose of fire protection on campus shall be maintained at all times.
- E. All sludge, dirt, sand, rocks, grease, roots, and other solid or semisolid waste material resulting from the cleaning operation shall be removed at the downstream manhole of the section being cleaned. When hydraulic cleaning equipment is used, a suitable dam or weir shall be placed in the downstream manhole to trap all such materials. Passing material from manhole section to manhole section, which could cause line stoppages, accumulations of sand in wet wells, or damage pumping equipment, shall not be permitted.
- F. Under no circumstances shall sludge or other debris removed during these operations be dumped or spilled into streets, ditches, storm drains or other sanitary sewers. All solids or semisolids resulting from the cleaning operations shall be removed from the site and disposed of.

1.04 SUBMITTALS

A. BROCHURES, CUT SHEETS, AND TECHNICAL DATA

Submit technical data including Material Safety Data Sheets (MSDS) on each chemical agent used in this work. Maintain one (1) copy of each MSDS at the work site.

PART 3 - EXECUTION

3.01 NOTIFICATION

The contractor shall be contacted by the College Representative to identify the extent and location of the blockage.

3.02 COORDINATION

The College shall supply a knowledgeable person for locating the route of the sewer line in order to save time, or have sewer line routes available at Central Plant.

3.03 EQUIPMENT

- A. General: The Contractor shall bring equipment to the work site capable of cleaning and unstopping pipe between 4" and 24" in diameter. The selection of equipment shall be made by the College Representative.

B. Specific:

1. Cable auger equipment capable of handling sewer lines 4" to 8" in diameter.
2. Water jet, 0 – 2000 psi at 1 – 35 gal/minute equipped with a minimum of 600 gallons of water and 400 feet of hose. The Contractor shall carry his own water supply or have fire hydrant adaptors along with 200 feet of water hose.
3. The Contractor shall provide and use if deemed necessary by the College Representative a video camera and monitor to be used in the sewer line after cleaning.

3.04 SCHEDULE

The contractor shall respond and start work on the project within 4 hours of notice.

The Contractor shall certify that backup equipment is available and can be delivered to the site within 24 hours.

3.05 RECORDS

Provide for endorsement by the College Representative daily itemized work sheets with manpower, equipment and materials.

3.06 ACCEPTANCE

- A. Acceptance of sewer line cleaning in areas where television inspection is not performed, the College may require the Contractor to pull a double squeegee (with each squeegee the same diameter as the sewer) through each manhole section as evidence of adequate cleaning.

When television inspection is utilized acceptance of sewer line cleaning shall be made upon the successful completion of the television inspection and shall be to the satisfaction of the College. If the television inspection shows the cleaning to be unsatisfactory, the Contractor shall be required to re-clean and re-inspect the sewer line until the cleaning is shown to be satisfactory.

- B. In addition, on all sewer lines which have sags or dips to an extent that the television camera lens becomes submerged for 3 or more feet during the television inspection, the Contractor shall pull double squeegee and/or sponges through the line in order to remove the water from the dips or sags. Water removal through squeegees and/or sponges shall be performed until the television camera lens will no longer be submerged. This requirement may be waived by the Owner if the water in which the camera lens is submerged, is clear enough to allow the identification of pipe defects, cracks, holes and location of service connections.

END OF SECTION

SECTION 15400

PLUMBING SYSTEMS

PART 1 - GENERAL

1.01 DESCRIPTION

Domestic water, sewer and fuel gas systems, including piping, equipment and all necessary accessories as designated in this section.

1.02 RELATED WORK

- A. Section 15050, BASIC METHODS AND REQUIREMENTS (MECHANICAL).
- B. Pipe Insulation: Section 15250, INSULATION.

1.03 SUBMITTALS

- A. Manufacturer's Literature and Data:
 - 1. Piping.
 - 2. Valves.
 - 3. Floor Drains.
 - 4. Roof Drains.
 - 5. Backflow Preventers.
 - 6. Water Meter.
 - 7. Strainers.
 - 8. Pressure Gages.
 - 9. Grease Removal Unit.
 - 10. Hot Water Temperature Maintenance Heat Tracing.
 - 11. Pressure Reducing Valves.
 - 12. Cleanouts.
 - 13. All items listed in Part 2 - Products.
- B. Detailed shop drawing of clamping device and extensions when required in connection with the waterproofing membrane or the floor drain.

1.04 APPLICABLE PUBLICATIONS

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.
- B. Federal Specifications (Fed. Spec.):
 - L-T-1512A Tape, Pressure Sensitive Adhesive, Pipe Wrapping
 - A-A-1427C Sodium Hypochlorite Solution
 - A-A-59617 Unions, Brass or Bronze Threaded, Pipe Connections and Solder-Joint Tube Connections

C. American National Standards Institute (ANSI):

D. American Society of Mechanical Engineers (ASME): (Copyrighted Society)

A112.1.1M-91	Floor Drains ANSI/ASME
A13.1-96	Scheme for Identification of Piping Systems
B16.3-98	Malleable Iron Threaded Fittings ANSI/ASME
B16.4-98	Cast Iron Threaded Fittings Classes 125 and 250 ANSI/ASME
B16.9-01	Factory-Made Wrought Steel Buttwelding Fittings ANSI/ASME
B16.11-01	Forged Steel Fittings, Socket-Welding and Threaded ANSI/ASME
B16.12-98	Cast Iron Threaded Drainage Fittings ANSI/ASME
B16.15-85(R 1994)	Cast Bronze Threaded Fittings ANSI/ASME
B16.18-01	Cast Copper Alloy Solder-Joint Pressure Fittings ANSI/ASME
B16.22-01	Wrought Copper and Copper Alloy Solder Joint Pressure Fittings ANSI/ASME
B31.8-01	Gas Transmission and Distribution Piping Systems ANSI/ASME
B40.1-01	Gauges-Pressure Indicating Dial Type-Elastic Element ANSI/ASME

D. American Society for Testing and Materials (ASTM):

A47-99	Ferritic Malleable Iron Castings Revision 1989
A53-02	Pipe, Steel, Black And Hot-Dipped, Zinc-coated Welded and Seamless
A74-03	Cast Iron Soil Pipe and Fittings
A183-83(R1998)	Carbon Steel Track Bolts and Nuts
A312-03	Seamless and Welded Austenitic Stainless Steel Pipe
A536-84(R1999) E1	Ductile Iron Castings
A733-03	Welded and Seamless Carbon Steel and Austenitic Stainless Steel Pipe Nipples
B32-03	Solder Metal
B61-02	Steam or Bronze Castings
B62-02	Composition Bronze or Ounce Metal Castings
B75-99(Rev A)	Seamless Copper Tube
B88-03	Seamless Copper Water Tube
B306-02	Copper Drainage Tube (DWV)
B584-00	Copper Alloy Sand Castings for General Applications Revision A
B687-99	Brass, Copper, and Chromium-Plated Pipe Nipples
C564-03	Rubber Gaskets for Cast Iron Soil Pipe and Fittings
D2000-01	Rubber Products in Automotive Applications
D4101-03b	Propylene Plastic Injection and Extrusion Materials
D2447-93	Polyethylene (PE) Plastic Pipe, Schedule 40 and 80, Based on Outside Diameter
D2564-94	Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings
D2665-94 Revision A	Poly (Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings
D4101-03b	Propylene Plastic Injection and Extrusion Materials

E1120 Standard Specification for Liquid Chlorine
E1229 Standard Specification for Calcium Hypochlorite

E. American Water Works Association (AWWA):

C110-03/ A21.10-03 Ductile Iron and Gray Iron Fittings - 75 mm thru 1200 mm (3 inch thru 48 inches) for Water and other liquids AWWA/ ANSI
C151-00/ A21.51-02 Ductile-Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined Molds, for Water or Other Liquids AWWA/ ANSI
C203-02 Coal-Tar Protective Coatings and Linings for Steel Water Pipelines - Enamel and Tape - Hot Applied AWWA/ ANSI
C651-99 Disinfecting Water Mains
C701-02 Cold Water Meters-Turbine Type, for Customer Service AWWA/ ANSI

F. National Fire Protection Association (NFPA):
54-92 National Fuel Gas Code

G. American Welding Society (AWS):

A5.8-92 Filler Metals for Brazing

H. National Association of Plumbing - Heating - Cooling Contractors (PHCC):

National Standard Plumbing Code - 1996

I. Cast Iron Soil Pipe Institute (CISPI):
301-04 Hubless Cast Iron Soil and Fittings

J. International Association of Plumbing and Mechanical Officials (IAPMO):
Uniform Plumbing Code - 2000
IS6-93 Installation Standard

K. Manufacturers Standardization Society of the Valve and Fittings Industry, Inc. (MSS):

SP-67-02 Butterfly Valve of the Single flange Type (Lug Wafer)
SP-70-98 Cast Iron Gate Valves, Flanged and Threaded Ends.
SP-72-99 Ball Valves With Flanged or Butt Welding For General Purpose
SP-80-03 Bronze Gate, Globe, Angle and Check Valves.
SP-110-96 Ball Valve Threaded, Socket Welding, Solder Joint, Grooved and Flared Ends

L. American Society of Sanitary Engineers (ASSE):

1001-02 Pipe Applied Atmospheric Type Vacuum Breakers
1013-99 Reduced Pressure Principle Backflow Preventers
1015-99 Double Check Backflow Prevention Assembly
1018-01 Performance for trap seal primer valve-water supply fed
1020-04 Vacuum Breakers, Anti-Siphon, Pressure Type

M. Plumbing and Drainage Institute (PDI):

PDI WH-201

Water Hammer Arrestor

PART 2 – PRODUCTS

2.01 SANITARY, WASTE, STORM WATER DRAIN AND VENT PIPING

- A. Cast Iron Soil Pipe and Fittings: Used for pipe buried in or in contact with earth and for extension of pipe to a distance of approximately 1500 mm (5 feet) outside of building walls and interior waste and vent piping above grade. Pipe shall be bell and spigot, modified hub, or plain end (no-hub) as required by selected jointing method:
1. Material, (Pipe and Fittings): ASTM A74, C1SP1-301, Service Class.
 2. Joints: Provide any one of the following types to suit pipe furnished.
 - a. Lead and oakum and caulked by hand.
 - b. Double seal, compression-type molded neoprene gasket. Gaskets shall suit class of pipe being jointed.
 - c. Mechanical: Meet the requirements and criteria for pressure, leak, deflection and shear tests as outlined in Factory Mutual No. 1680 for Class 1 couplings.
 - 1) Stainless steel clamp type coupling of elastomeric sealing sleeve, ASTM C564 and a Series 300 stainless steel shield and clamp assembly. Sealing sleeve with center-stop to prevent contact between pipes/fittings being joined shall be marked ASTM C564.
 - 2) Cast Iron coupling with neoprene gasket and stainless steel bolts and nuts.
 - d. Mechanical Grooved Couplings: Shall consist of ductile iron (ASTM A536, Grade 65-45-12), or malleable iron (ASTM A47, Grade 32510) housings, a pressure responsive elastomeric gasket (ASTM D2000), and steel track head bolts shall be for use on pipe and fittings grooved to the manufacturer's specifications. Couplings and fittings to be of the same manufacturer.
 - e. Adapters: Where service weight pipe is connected to extra heavy pipe and extra heavy fittings of chair carriers. Provide adapters or similar system to make tight leak proof joints.
- B. Steel Pipe and Fittings: May be used for vent piping and storm water piping above grade.
1. Pipe Galvanized: ASTM A53, standard weight.
 2. Fittings:
 - a. Soil, Waste and Drain Piping: Cast iron, ANSI B16.12, threaded, galvanized.
 - b. Sanitary and Exhaust Vent Piping: Malleable iron, ANSI B16.3, or cast iron, ANSI B16.4. All piping shall be of the same kind. Couplings of vent piping may be standard couplings furnished with pipe.
 - c. Unions: Tucker connection or equivalent type throughout.
 - d. Mechanical Grooved Couplings: Shall consist of ductile iron (ASTM A536, Grade 65-45-12), or malleable iron (ASTM A47, Grade 32510) housings, a pressure responsive

elastomeric gasket (ASTM D2000), and steel track head bolts shall be for use on pipe and fittings grooved to the manufacturer's specifications, couplings and fittings to be of the same manufacturer.

- C. Copper Tube, (DWV): May be used for piping above ground, except for urinal drains.
 - 1. Tube: ASTM B306.
 - 2. Fittings:
 - a. Solder type.
 - b. Grooved fittings, 50 to 150 mm (2 to 6 inch) wrought copper conforming to ASTM B75 C12200, 125 to 150 mm (5 to 6 inch) bronze casting conforming to ASTM B584, CDA 844(81-3-7-9). Mechanical grooved couplings, ductile iron, ASTM A536 (Grade 65-45-12), or malleable iron, ASTM A47 (Grade 32510) housings, with EPDM gasket, steel track head bolts, ASTM A183, coated with copper colored alkyd enamel.
 - 3. Joints: ASTM B32, 50/50, special alloy, lead free. Solder using non-corrosive flux.
- D. Polyvinyl Chloride (PVC): Schedule 40 shall not be used where waste temperature may exceed 60°C (140°F), such as mechanical equipment rooms, and kitchen, SPD, and sterilizer areas. In nursing homes, restrict PVC to patient toilet areas and use other specified material for trunk sewer. PVC shall not be used in waste risers due to higher noise than other specified material.
 - 1. Pipe: Shall be manufactured from Type I normal impact resins in conformance with ASTM D2665 and ASTM B16.12.
 - 2. Fittings:
 - a. Solvent Welded Socket Type: Use solvent cement, ASTM D2564.
 - b. Threaded Type: Molded threads only. Use tape or lubricant specifically intended for use with PVC plastic pipe.

2.02 CHEMICAL RESISTANT WASTE AND VENT PIPING

- A. General: The material includes connecting fittings in stacks or mains.
- B. Cast Iron: Acid resistant, close grained, cast iron pipe containing not less than 14.25 percent silicon:
 - 1. Mechanical Joint: Stainless steel coupling, Series 300. Install couplings over one-piece, sleeve type gaskets. Gaskets shall be either of the following:
 - a. Sintered polytetrafluoroethyl surrounded with neoprene.
 - b. Inner layer of fluorocarbon resin, middle layer of fluorocarbon resin impregnated glass cloth, and outer wrap of neoprene.
 - 2. Bell and Spigot Joint.

- C. Glass: Pre-stressed heat and chemical resistant borosilicate glass pipe and fittings.
- D. Polypropylene Plastic: ASTM D4101, Schedule 40, flame retardant. Pipe shall meet tolerances in accordance with ASTM D2447-93. Join pipe and fittings by heat fusion or mechanical joint in accordance with ASTM D2657 must conform to National Sanitation Foundation requirements for corrosive waste service. Short turn elbows and sanitary tees are prohibited. Use standard DWV pattern for fittings. Mechanical joint fittings 38 thru 50 mm (1 1/2 thru 2 inches) shall be used for above grade vent piping and under counters within cabinet space.
- E. Stainless Steel: Type AISI 316L, high-grade austenitic stainless steel, chemically descaled for enhanced corrosion resistance and matt silver finish. Furnish pipe and fittings with EPDM gasketed hub and spigot push-fit connection. Use conversion couplings where connections are made to other piping materials. Gasket exceptions:
 - 1. Highly Corrosive Acids and Solvents or Elevated Temperatures: FPM gasket.
 - 2. Petroleum Products Present: NBR gasket.

2.03 SILVER RECOVERY PIPING

Polyvinyl Chloride (PVC): ASTM D2665, solvent welded joints.

2.04 WATER SERVICE CONNECTIONS TO BUILDINGS

- A. From inside face of exterior wall to a distance of approximately 1500 mm (5 feet) outside of building and underground inside building, material selected shall be the same for the size specified.
- B. Seventy five millimeters (3 inch) Diameter and Over: Ductile iron, AWWA C151, 850 kPa (125 pounds) water steam pressure (WSP), exterior bituminous coating cement lined. Provide flanged and anchored connection to interior piping.
- C. Under 75 mm (3 inch) Diameter: Copper tubing, ASTM B88, Type K, seamless, annealed. Fittings as specified under Article, INTERIOR DOMESTIC WATER PIPING. Use brazing alloys, AWS A5.8, Classification BCuP.
- D. Flexible Expansion Joint: Ductile iron with ball joints rated for 1725 kPa (250 psi) working pressure conforming to ANSI/AWWA A21.53/C153, capable of deflecting a minimum of 30 degrees and expanding simultaneously to the amount shown on the drawings. Flexible expansion joint shall have the expansion capability designed as an integral part of the ductile iron ball castings. Pressure containing parts shall be lined with a minimum of 15 mils of fusion bonded epoxy conforming to the applicable requirements of ANSI/AWWA C213 and shall be factory holiday tested with a 1500 volt spark test. Flexible expansion joint shall have flanged connections conforming to ANSI/AWWA A21.11/C110. Bolts and nuts shall be 316 stainless steel and gaskets shall be neoprene.

2.05 INTERIOR DOMESTIC WATER PIPING

- A. Pipe: Copper tube, ASTM B88, Type K or L, drawn. For pipe 150 mm (6 inches) and larger, stainless, steel ASTM A312, schedule 10 may be used.
- B. Fittings for Copper Tube:
 - 1. Wrought copper or bronze castings conforming to ANSI B16.18 and B16.22. Unions shall be bronze, MSS SP72 & SP 110, Solder or braze joints.
 - 2. Grooved fittings, 50 to 150 mm (2 to 6 inch) wrought copper ASTM B75 C12200, 125 to 150 mm (5 to 6 inch) bronze casting ASTM B584, CDA 844. Mechanical grooved couplings, ductile iron, ASTM A536 (Grade 65-45-12), or malleable iron, ASTM A47 (Grade 32510) housing, with EPDM gasket, steel track head bolts, ASTM A183, coated with copper colored alkyd enamel.
 - 3. Mechanically formed tee connection: Form mechanically extracted collars in a continuous operation by drilling pilot hole and drawing out tube surface to form collar, having a height of not less than three times the thickness of tube wall. Adjustable collaring device shall insure proper tolerance and complete uniformity of the joint. Notch and dimple joining branch tube in a single process to provide free flow where the branch tube penetrates the fitting. Braze joints.
- C. Fittings for Stainless Steel:
 - 1. Stainless steel butt-welded fittings, Type 316, Schedule 10, conforming to ANSI B16.9.
 - 2. Grooved fittings, stainless steel, Type 316, Schedule 10, conforming to ASTM A403. Segmentally fabricated fittings are not allowed. Mechanical grooved couplings, ductile iron, ASTM A536 (Grade 65-45-12), or Malleable iron, ASTM A47 (Grade 32510) housing, with EPDM gasket, steel track head bolts, ASTM A183, coated with copper colored alkyd enamel.
- D. Adapters: Provide adapters for joining screwed pipe to copper tubing.
- E. Solder: ASTM B32 Composition Sb5 HA or HB. Provide non-corrosive flux.
- F. Brazing alloy: AWS A5.8, Classification BCuP.
- G. Reagent Grade Water Piping and Dialysis Water Piping:
 - 1. Polypropylene, ASTM D4101, Schedule 80 pressure pipe with dimensions in conformance with ASTM D2447, but without additions of modifiers, plasticizers, colorants, stabilizers or lubricants. This virgin un-plasticized pipe and fittings shall transport 10 megohm water with no loss of purity. Provide socket fusion joints.
 - 2. Polyethylene, food and medical grade, capable of transporting 10 megohm water with no loss of purity. Process to be by continuous compression molding without the addition of fillers, polymer modifiers or processing aids. Uniform color with no cracks, flaws, blisters or other imperfections in appearance. Provide heat fusion butt welded joints. In accordance with manufacturer's recommendations, provide continuous channel support under all horizontal piping.

2.06 FUEL GAS SERVICE CONNECTIONS TO BUILDING

- A. From inside face of exterior wall to a distance of approximately 1500 mm (5 feet) outside of building, use coated piping.
- B. Pipe: Black steel, ASTM A53, Schedule 40. Shop-applied pipe coating shall be one of the following types:
 - 1. Coal Tar Enamel Coating: Exterior of pipe and fittings shall be cleaned, primed with Type B primer and coated with hot-applied coal tar enamel with bonded layer of felt wrap in accordance with AWWA C203. Asbestos felt shall not be used; felt material shall be fibrous glass mat as specified in Appendix Section A2.1 of AWWA C203.
 - 2. Adhesive-thermoplastic Resin Coating: Fed. Spec. L-C-530, Type I.
 - 3. Thermosetting Epoxy Coating: Fed. Spec. L-C-530, Type II.
 - 4. Field-applied plastic tape material used on pipe joints and for repairing damaged areas of shop-applied coatings, Fed. Spec. L-T-1512, Type I, 10 mils nominal thickness for pipe joints, and Type II, 20 mils nominal thickness for coating repairs.
- C. Fittings:
 - 1. Butt weld fittings, wrought steel, ANSI B16.9.
 - 2. Socket weld and threaded fittings forged steel, ANSI B16.11.
 - 3. Grooved End: Ductile iron (ASTM A536, Grade 65-45-12), malleable iron (ASTM A47, Grade 32510), or steel (ASTM A53, Type F or Type E or S, Grade B).
- D. Joints: Welded, ANSI B31.8.
- E. Earthquake Valve:
 - Valve: Cast from aluminum, ANSI Z21.70.
 - Valve actuator: Actuated by one stainless steel ball, incorporated with a bubble level, vertically mounted and have a single step manual reset level.
 - Operating ambient temperature range: minus 40°C (minus 40°F) to 65.5°C (150°F)
 - Maximum allowable pressure: 414 Kpa (60 psi).

2.07 FUEL GAS PIPING

- A. Pipe: Black steel, ASTM A53, Schedule 40.
- B. Nipples: Steel, ASTM A733, Schedule 40.
- C. Fittings:
 - 1. Steel Welded: Schedule 40
 - a. Up to 100 mm (4 inch), ANSI B16.11, Socket welded.
 - b. Over 100 mm (4 inch), ANSI B16.9, Butt welded.
 - 2. Malleable Iron, Threaded: ANSI B16.3.
 - 3. Grooved End: Ductile iron (ASTM A536, Grade 65-45-12), malleable iron (ASTM A47, Grade 32510), or steel (ASTM A53, Type F or Type E or S, Grade B)

- D. Joints: Provide welded or threaded joints.

2.08 EXPOSED WATER, WASTE, FUEL AND MEDICAL GAS PIPING

- A. Finished Room: Use full iron pipe size chrome plated brass piping for exposed water, waste, fuel gas, medical and laboratory gas piping connecting fixtures, casework, cabinets, equipment and reagent racks when not concealed by apron including those furnished by the Government or specified in other sections.
1. Pipe: Fed. Spec. WW-P-351, standard weight.
 2. Fittings: ANSI B16.15 cast bronze threaded fittings with chrome finish, (125 and 250).
 3. Nipples: ASTM B 687, Chromium-plated.
 4. Unions: Mss SP-72, SP-110, Brass or Bronze with chrome finish. Unions 65 mm (2-1/2 inches) and larger shall be flange type with approved gaskets.
 5. Valves: Mss SP-72, SP-110, Brass or bronze with chrome finish.
- B. Unfinished Rooms, Mechanical Rooms and Kitchens: Chrome-plated brass piping is not required.

2.09 ETO WATER PIPING

Stainless steel, ASTM A312, Schedule 10 with stainless steel butt welded fittings.

2.10 PUMPED WASTE, DRAIN AND SEWAGE PIPING

- A. Pipe: Copper tube, ASTM B88, Type K or L, drawn. For pipe 100 mm (4 inches) and larger, galvanized steel ASTM A53, seamless, standard weight may be used.
- B. Fittings for Copper Tube:
1. Wrought copper or bronze castings conforming to ANSI B16.18 and B16.22. Unions shall be bronze, Mss SP-72, SP-110. Solder or braze joints.
 2. Grooved fittings, 65 mm to 100 mm (2-1/2 to 4 inch) wrought copper ASTM A75 C12200, 125 to 150 mm (5 to 6 inch) bronze castings ASTM B584, CDA 844. Mechanical grooved couplings, ductile iron, ASTM A536 (Grade 65-45-12), malleable iron, ASTM A47 (Grade 32510) housing, with EPDM gasket, steel track head bolts, ASTM A183, coated with colored alkyd enamel.
- C. Adapters: Provide adapters for joining screwed pipe to copper tubing.
- D. Solder: ASTM B32 Composition Sb5. Provide non-corrosive flux.

2.11 TRAP PRIMER WATER PIPING

- A. Pipe: Copper tube, ASTM B88, type K, hard drawn.
- B. Fittings: Bronze castings conforming to ANSI B16.18 Solder joints.
- C. Solder: ASTM B32 composition Sb5. Provide non-corrosive flux.

2.12 VALVES

- A. Asbestos packing is prohibited.
- B. Shut-off:
 - 1. Cold, Hot and Recirculating Hot Water:
 - a. Fifty millimeter (2 inches) and smaller:
 - 1) Ball, Mss SP-72, SP-110, Type II, Class 125, Style 1, three piece or double union end construction, full ported, full flow, with solder end connections, 2750 kPa (400 psi) WOG, MSS-SP-67.
 - b. Less than 100 mm (4 inches): Butterfly, iron body, aluminum bronze disc, 416 stainless steel stem, EPDM seat, wafer design, lever operator to six 150 mm (6 inch) size, , 1375 kPa (200 pound) WOG, Fed. Spec WW-V-1967.
 - c. One hundred millimeters (4 inches) and larger:
 - 1) Gate, MSS-SP-70, wedge disc, class 125, cast iron body with bronze trim, flanged, gear operated and crank for 200 mm (8 inches) and above.
 - 2) Grooved end butterfly valves with ductile iron body and disc core ASTM A536. Disc rubber coated with compatible material for intended service, maximum working pressure 2050 kPa (300 pounds psi) grooved ends for connection with mechanical grooved couplings.
 - 2. Reagent Grade Water: Shall be ball type of same material as used for pipe.
- C. Balancing:
 - 1. Hot Water Recirculating, 50 mm (2 inches) and smaller: Combination type, calibrated, bronze with bronze disc, equipped with readout valves with integral check valve, indexing position pointer and calibrated name plate, internal EPT O-ring seals and factory molded insulating enclosures.
 - 2. Larger than 50 mm (2 inches): Combination balancing and shut-off, non-lubricated eccentric plug type with cast iron or semi-steel body, electroless nickel plated cast iron plug, with resilient facing suitable for continuous water service up to 80 °C (180 °F), bronze bearings, 1200 kPa (175 pound) WOG rating and an adjustable open position memory stop and lever.
- D. Check:
 - 1. Less than 100 mm (3 inches) and smaller): Bronze body and trim, swing type, MSS-SP-80, 850 kPa (125 pound) WSP.
 - 2. Larger than 100 mm (4 inches and larger):
 - a. Iron body, bronze trim, swing type, vertical or horizontal installation, flange connections, 1375 kPa (200 pound) WOG.
 - b. Ductile iron (ASTM A536) or malleable iron (ASTM A47) body, stainless steel or aluminum bronze trim, dual disc, spring loaded, non-slamming design with grooved ends for connection with mechanical grooved couplings. Consult manufacturer for appropriate elastomeric seal for intended service. Maximum working pressure 3450 kPa (500 pounds psi), depending on size.

E. Globe:

1. Eighty millimeters (3 inches) or smaller: Bronze body and bonnet, MSS-SP-80, 850 kPa (125 pound) WSP. Disk shall be free to swivel on the stem. Composition seating surface disk construction may be substituted for all metal disk construction. Packing shall be a woven non-asbestos material, impregnated with not less than 25 percent, by weight, tetrafluoroethylene resin.
2. Larger than 80 mm (3 inches): Similar to above, except with cast iron body and bronze trim.

2.13 WATER PRESSURE REDUCING VALVE AND CONNECTIONS

- A. Single-seated, for dead end service for 200 to 850 kPa (30 to 125 pounds) range on low pressure side. Composition diaphragm and stainless steel springs, bronze body with threaded connections for sizes 15 to 55 mm (1/2 to 2 inch), cast iron or semi-steel body with brass or bronze trimmings and flanged connections for sizes 15 to 50 mm (2-1/2 to 4 inch).
- B. Operation: Diaphragm and spring to act directly on valve stem. Delivered pressure shall vary not more than one kPa for each 10 kPa (one pound for each 10 pounds) variation on inlet pressure.
- C. Setting: Entering water pressure, discharge pressure, capacity, size, and related measurements shall be as shown on the drawings.
- D. Connections Valves and Strainers: Install shut off valve on each side of reducing valve and full sized bypass with globe valve. Install strainer on inlet side of, and same size as pressure reducing valve. Install pressure gage on low pressure side of line.

2.14 AIR PRESSURE REDUCING VALVE AND CONNECTIONS

Under seventy-five millimeters (3 inches), bronze body and trim, 75 mm (3 inches) and over, cast-iron body with bronze trim. Single seated, for dead end service for 200 to 1025 kPa (30 to 150 pounds) range on low pressure side. Composition diaphragm and bronze spring to act directly on valve stem. Delivered pressure shall not vary more than one kPa for each 10 kPa (one pound for each 10 pounds) variation in inlet pressure.

2.15 BACKWATER VALVE

Flap type, hinged or pivoted, with revolving disc. Cast iron body with cleanout of sufficient size to permit removal of interior parts. Hinge, pivot, disc and seat shall be nonferrous metal. Normal position of disc shall be slightly open. Extend the cleanout to the finished floor and fit with threaded countersunk plug. Provide clamping device wherever the cleanout extends through the membrane waterproofing.

2.16 CLEANOUTS

- A. Same size as the pipe, up to 100 mm (4 inches); not less than 100 mm (4 inches) for larger pipe. Cleanouts for chemical waste drain pipe shall be of same material as the pipe. Cleanouts shall be easily accessible and shall be gastight and watertight. Provide a minimum clearance of 600 mm (24 inches) for the rodding.

- B. In Floors: Floor cleanouts shall have cast iron body and frame with square adjustable scoriated secured nickel bronze top. Unit shall be vertically adjustable for a minimum of 50 mm (2 inches). When a waterproof membrane is used in the floor system, provide clamping collars on the cleanouts. Cleanouts shall consist of "Y" fittings and 3 mm (1/8 inch) bends with brass or bronze screw plugs. Cleanouts in the resilient tile floors, quarry tile and ceramic tile floors shall be provided with square top covers recessed for tile insertion. In the carpeted areas, provide carpet cleanout markers. Provide two way cleanouts where indicated on drawings.
- C. Provide cleanouts at or near the base of the vertical stacks with the cleanout plug located approximately 600 mm (24 inches) above the floor. If there are no fixtures installed on the lowest floor, the cleanout shall be installed at the base of the stack. Extend the cleanouts to the wall access cover. Cleanout shall consist of sanitary tees. Furnish nickel-bronze square frame and stainless steel cover with minimum opening of 150 by 150 mm (6 by 6 inches) at each wall cleanout. Where the piping is concealed, a fixture trap or a fixture with integral trap, readily removable without disturbing concealed roughing work, shall be accepted as a cleanout equivalent providing the opening to be used as a cleanout opening is the size required by the NPHCC National Standard Plumbing Code.
- D. In horizontal runs above grade, cleanouts shall consist of cast brass tapered screw plug in fitting or caulked/no hub cast iron ferrule. Plain end (no-hub) piping in interstitial space or above ceiling may use plain end (no-hub) blind plug and clamp.

2.17 FLOOR DRAINS

- A. ANSI A112.21.1. Provide a caulking flange for connection to cast iron pipe, screwed or no hub outlets for connection to steel pipe, and side outlet when shown. Provide membrane clamp and extensions if required, where installed in connection with waterproof membrane. Puncturing membrane other than for drain opening will not be permitted. Double drainage pattern floor drains shall have integral seepage pan for embedding into floor construction, and weep holes to provide adequate drainage from pan to drain pipe. For drains not installed in connection with a waterproof membrane, provide a 2.2 kg (16-ounce) soft copper membrane, 600 mm (24 inches) square.
- B. Type B: Galvanized cast iron with medium duty nickel bronze grate, double drainage pattern, clamping device, without sediment bucket but with secondary strainer in bottom. One hundred seventy five millimeters (seven inch) minimum square grate.
- C. Type C: Cast iron body, double drainage pattern, clamping device, light duty square or round nickel bronze adjustable strainer and grate with vandal proof screws. One hundred fifty millimeter (6 inch) minimum square grate.
- D. Type D: Cast iron drain with flange, integral reversible clamping device, seepage openings and 175 mm (7 inch) diameter or square satin nickel bronze or satin bronze strainer with 100 mm (4 inch) flange for synthetic covering.
- E. Type E: Heavy, cast iron body, double drainage pattern, heavy non-tilting // nickel bronze // ductile iron // grate not less than 300 mm (12 inches) square, removable sediment bucket. Clearance between body and bucket shall be ample for free flow of waste water for traffic use ductile iron grate.

- F. Type F: Cast iron drain with flange, integral reversible clamping device, seepage openings and a 225 mm (9 inch) two-piece satin nickel-bronze or satin bronze strainer for use with seamless vinyl floors.
- G. Type G: Cast iron body, shallow type with double drainage flange with removable, perforated aluminum sediment bucket with all interior exposed surfaces provided with acid resistant porcelain enamel finish and clamping device. Frame and grate, shall be nickel bronze. Grate shall be approximately 200 mm (8 inches) in diameter. Space between body of drain and basket to be ample for free flow of waste water.
- H. Type H: Cast iron body, double drainage pattern, without sediment bucket but with loose set nickel bronze grate, secondary strainer, and integral clamping collar; 300 mm (12 inches) in diameter or 300 mm (12 inches) square and approximately 150 mm (6 inches) deep.
- I. Type I: Cast iron body, wide flange for seamless floor, double drainage pattern, with all interior exposed surfaces provided with acid resistant enamel finish, clamping device, secured nickel bronze rim, aluminum enameled finish sediment basket, perforated with not less than 19 300 square mm (30 square inches) of free area, approximately 100 mm (4 inches) deep, and be provided with grips for easy handling; loose-set, nickel bronze grate approximately 300 mm (12 inches) square and of sufficient strength to support pedestrian traffic. Provide ample space between body of drain and sediment basket for free flow of waste liquids.
- J. Type J: Flushing Rim Drain. Heavy cast iron body, double drainage pattern with flushing rim and clamping device. Nickel bronze grate approximately 275 mm (11 inches) in diameter, flush with floor. Attach deep-seal P-trap to drain. Body and trap shall have pipe taps for water supply connections.
1. Drain Flange: Flange for synthetic flooring.
 2. Flush Valve: Large diaphragm flushometer, exposed, side oscillating handle, see detail shown on drawings.
- K. Type K: Flushing Rim Drain. Heavy cast iron body, double drainage pattern with flushing rim and clamping device. Solid bronze gasketed grate approximately 275 mm (11 inches) in diameter, flush with floor. Attach deep-seal P-trap to drain. Body and trap shall have pipe taps for water supply connections.
1. Drain Flange: Flange for synthetic flooring.
 2. Flush Valve: Large diaphragm flushometer, exposed, side oscillating handle, see detail shown on drawing.
- L. Type L: Flushing Rim Drain. Heavy cast iron body, double drainage pattern with flushing rim and clamping device. Solid bronze gasketed grate approximately 275 mm (11 inches) in diameter, with 50 mm (2 inch) length of 20 mm (3/4 inch) brass pipe brazed or threaded into the center of the solid grate, pipe shall be threaded and provide brass cap with inter gasket (neoprene) to provide a gas tight installation. Attach deep-seal P-trap to drain. Body and trap shall have pipe taps for water supply connections.
1. Drain Flange: Flange for synthetic flooring.

2. Cystoscopy Rooms:

- a. Flush Valve: Large diaphragm flushometer, solenoid operated with a single-circuit timer. Mount in valve cabinet.
- b. Operation: Valve solenoid shall be cycled by a single-circuit timer set to operate flush valve at five minute intervals. Timer shall be electrically connected to an "on-off" toggle switch installed in connection with light switch and be provided with pilot light. Timer and flush valve shall operate only when timer/valve switch is in the "on" position.
- c. Valve Cabinets:
 - 1) General: Sheet metal not lighter than 1.6 mm thick (16 gauge), size as required, rigidly assembled with joints welded, and punched or drilled for passage of required pipes and services. Provide anchors for fastening cabinet in place. Front shall be flush with wall finish and shall have flush fitting, hinged doors, with latch. Door shall be arranged to not offer any obstruction when open.
 - 2) Doors and Trim: Flush with front of cabinet, constructed of not lighter than number 2.7 mm thick (12 gauge) steel. Doors shall open through 180 degrees and be provided with two butt hinges or continuous hinge. Latch shall be provided by manufacture of cabinet.
 - 3) Painting: Prime and finish painting is specified under Section 09900, PAINTING.

M. Type M: Cast iron body, nickel bronze adjustable funnel strainer and clamping device. Funnel strainer shall consist of a perforated floor-level square or round grate and funnel extension. Minimum dimensions as follows:

1. Area of strainer and collar - 23 000 square mm (36 square inches).
2. Height of funnel - 95 mm (3-3/4 inches).
3. Diameter of lower portion of funnel - 50 mm (2 inches).
4. Diameter of top portion of funnel - 100 mm (4 inches).
5. Provide paper collars for construction purposes.

N. Type N: Cast iron body, wide flange for seamless floors, double drainage pattern, with all interior exposed surfaces provided with acid resistant enamel finish, clamping device, secured nickel bronze rim, aluminum enameled finish sediment basket, perforated with not less than 9 000 square mm (14 square inches) of free area, approximately 50 mm (2 inches) deep, and be provided with grips for easy handling; loose-set, nickel bronze grate approximately 200 mm (8 inches) round and of sufficient strength to support pedestrian traffic. Provide ample space between body of drain and sediment basket for free flow of waste liquids.

O. Type O: Cast iron body, double drainage pattern, clamping device, less grate and sediment basket but with dome type secondary strainer. Three hundred millimeter 300 mm (12 inches) in diameter or 300 mm (12 inches) square and approximately 150 mm (6 inches) deep. Interior exposed surfaces and rim to have acid resisting, enamel finish.

P. Type P: Cast iron body, double drainage pattern, with all interior exposed surfaces provided with acid resistant enamel finish, clamping device, secured nickel bronze rim, aluminum enameled finish sediment basket, perforated with not less than 27 000 mm² (42 square inches) of free area, approximately 100 mm (4 inches) deep, and be provided with grips for

easy handling; loose-set, nickel bronze grate approximately 300 mm² (12 inches square) and of sufficient strength to support pedestrian traffic. Provide ample space between body of drain and sediment basket for free flow of waste liquids.

- Q. Type R: Cast iron body, double drainage pattern and clamping device, less grate and sediment basket but with dome type secondary strainer. Two hundred millimeter (8 inches) in diameter or 200 mm (8 inches) square and approximately 150 mm (6 inches) deep. Interior exposed surfaces and rim to have acid resisting finish.
- R. Type S: Sanitary Floor Sink: Type 304 stainless steel, 300 mm (12 inches) square, 200 mm (8 inches deep), polished interior, double drainage flange with weep holes, internal dome strainer, heavy duty non-tilting loose set grate. Provide clamping device.
- S. Type T: Funnel Type Chemical Resistant Floor Drain and "P" Trap: Double drainage pattern with integral seepage pan for embedding in floor and weep holes to provide adequate drainage from pan to drain pipe. Floor drain shall be polypropylene, flame retardant, Schedule 40 or 80. Provide outlet of floor drain suitable for properly jointing perforated or slotted floor-level grate and funnel extension. Minimum dimensions as follows:
 - 1. Height of funnel - 95 mm (3-3/4 inches).
 - 2. Diameter of lower portion of funnel - 50 mm (2 inches).
 - 3. Diameter of top portion of funnel - 100 mm (4 inches).
- T. Type V: Floor drain with oval funnel and cast iron body. Funnel strainer shall consist of a slotted cast iron floor-level grate funnel extension. Minimum dimensions as follows:
 - 1. Area of strainer and collar - 23 000 Square mm (36 square inches).
 - 2. Height of funnel - 95 mm (3-7/8 inches).
 - 3. Funnel size - 90 by 225 mm (3-1/2 by 9 inches).
- U. Open Sight Drains (OSD): Shall be cast iron, constructed as shown by detail.
- V. Type X: Chemical resistant floor drain and "P" trap. Double drainage pattern with integral seepage pan for embedding in floor and weep holes to provide adequate drainage from pan to drain pipe. Floor drain shall be polypropylene, flame retardant, Schedule 40 or 80. Provide outlet of floor drain suitable for properly joining a perforated or slotted floor level grate.
- W. Type Y: For parking decks Heavy: galvanized cast iron body with double drainage pattern, heavy duty polished bronze grate not less than 225 mm (9 inches) in diameter, seepage pan and combination membrane flashing clamp, heavy duty support flange, under deck clamp and vandal proof grate.\

2.18 ROOF DRAINS AND CONNECTIONS

- A. Roof Drains: Cast iron with clamping device for making watertight connection. Free openings through strainer shall be twice area of drain outlet. For roof drains not installed in connection with a waterproof membrane, provide a soft copper membrane 300 mm (12 inches) in diameter greater than outside diameter of drain collar. Provide an integral gravel stop for drains installed on roofs having built-up roofing covered with gravel or slag. Provide integral no-hub, soil pipe gasket or threaded outlet connection.

1. Flat Roofs: Beehive or dome shaped strainer with integral flange not less than 300 mm (12 inches) in diameter. For insulated roofs, provide a roof drain with an adjustable drainage collar, which can be raised or lowered to meet required insulation heights, sump receiver and deck clamp. Bottom section shall serve as roof drain during construction before insulation is installed.
 2. Canopy Roofs: Beehive or dome shaped strainer with the integral flange not larger than 200 mm (8 inches) in diameter. For insulated roof provide a roof drain with an adjustable drainage collar, which can be raised or lowered to meet the required insulation heights, sump receiver and deck clamp. Bottom section shall serve as roof drain during construction before insulation is installed.
 3. Promenade Decks: Same as for canopy roofs, except decks shall have flat, round, loose, non-slip bronze grate set in square, non-slip, bronze frame.
 4. Portico Roofs and Gutters: Horizontal angle type drain with flat bottom and horizontal outlet at the same elevation as the pipe to which it is connected. Strainer shall be removable angle grate type.
 5. Protective Roof Membrane Insulation Assembly: Perforated stainless steel extension filter, non-puncturing clamp ring, large sump with extra wide roof flange and deck clamp.
 - a. Non-pedestrian Roofs: Large polypropylene or aluminum locking dome.
 - b. Pedestrian Roof: Bronze promenade top 350 mm (14 inches) square set in square secured frame support collar.
- B. Expansion Joints: Heavy cast iron with cast brass or copper expansion sleeve having smooth bearing surface working freely against a packing ring held in place and under pressure of a bolted gland ring, forming a water and air tight flexible joint. Asbestos packing is prohibited.
- C. Interior Downspouts: Provide an expansion joint, specified above, at top of run on straight, vertical runs of downspout piping 12 m (40 feet) long or more.
- D. Downspout Nozzle: The nozzle fitting shall be of brass, unfinished, with internal pipe thread for connection to downspout.

2.19 TRAPS

Provide on all sanitary branch waste connections from fixtures or equipment not provided with traps. Exposed brass shall be polished brass chromium plated with nipple and set screw escutcheons. Concealed traps may be rough cast brass or same material as pipe connected to. Slip joints not permitted on sewer side of trap. Traps shall correspond to fittings on cast iron soil pipe or steel pipe respectively, and size shall be as required by connected service or fixture.

2.20 TRAP PRIMERS

- A. Trap Primer (TP-1): Electronic type.
1. Controller: Programmable, solid state, 6 zone, minimum adjustable run time of 1 minute for each zone, 12 hour program battery backup, 120VAC to 24VAC internal transformer, fuse protected circuitry, UL listed, 120VAC input-24VAC output, constructed of enameled steel or plastic, equal to Toro Model Vision.
 2. Solenoid Valve: Brass body, Buna "N" seats, normally closed, 125 psi rated, 24VAC, equal to ASCO model 8210.

3. Control Wiring: Control wiring to be copper in accordance with NEC 1990, Article 725 and not less than 18 gauge. All wiring shall be in conduit and in accordance with division 16 of the specifications.
- B. Trap Primer (TP-2): Hydraulic.
1. Fifteen millimeter (1/2 inch) Inlet/ fifteen millimeter (1/2 inch) Outlet fully automatic, all brass trap primer valve, activated by a drop in building water pressure, no adjustment required. Model for one (1) to four (4) traps with distribution unit, may be located anywhere in an active cold water line, as indicated on the drawings or as required by code. ASSE Standard 1018. Omit distribution unit when serving a single trap.

2.21 HAIR INTERCEPTOR

Provide on beauty and barber case lavatories in lieu of P-traps. Shall be chromium plated cast brass with top slip joint inlet, 40 mm (1-1/2 inch) slip outlet and screwed, gasketed watertight cover in bottom. Provide interceptor with removable, perforated, cylindrical screen of corrosion resisting metal or brass.

2.22 BACKFLOW PREVENTERS

- A. Provide a backflow prevention device at any point in the plumbing system where the potable water supply comes in contact with a potential source of contamination. Device shall be certified by the American Society of Sanitary Engineers. Listed below is a partial list of connection to the potable water system which shall be protected against backflow or back siphonage.
- B. Reduced Pressure Backflow Preventer: ASSE 1013.
1. Deionizers.
 2. Sterilizers.
 3. Stills.
 4. Dialysis, Deionized or Reverse Osmosis Water Systems.
 5. Water make-up to heating systems, cooling tower, chilled water system, and generators.
 6. Water service entrance from loop system.
- C. Pressure Type: ASSE 1020
1. Water make-up to heating systems, cooling tower, chilled water system, and generators.
 2. Dental equipment.
 3. Print washer.
- D. Atmospheric Vacuum Breaker: ASSE 1001 =
1. Hose bibs and sinks w/threaded outlets.
 2. Disposers.
 3. Showers (telephone type).
 4. Hydrotherapy units.
 5. Autopsy - on each hot and cold water outlet at each table or sink.
 6. All kitchen equipment, if not protected by air gap.

7. Ventilating hoods w/washdown system.
8. Film processor.
9. Detergent system.
10. Dental equipment.
11. Fume hoods.
12. Glassware washers.

E. Double Check Detector Backflow Prevention Assembly: Fire service. ASSE 1015.

2.23 WATER METER

Turbine type, Class II, AWWA C701) Register shall indicate in liters (U.S. gallons).

2.24 WATERPROOFING

- A. Provide at points where pipes pass through membrane waterproofed floors or walls in contact with earth.
- B. Floors: Provide cast iron stack sleeve with flashing device and a underdeck clamp. After stack is passed through sleeve, provide a waterproofed caulked joint at top hub.

2.25 STRAINERS

- A. Provide on high pressure side of pressure reducing valves, on suction side of pumps, on inlet side of indicating and control instruments and equipment subject to sediment damage and where shown on drawings. Strainer element shall be removable without disconnection of piping.
- B. Gas Lines: "Y" type with removable mesh lined brass strainer sleeve.
- C. Water: Basket or "Y" type with easily removable cover and brass strainer basket.
- D. Body: Smaller than 80 mm (3 inches), brass or bronze; 80 mm (3 inches) and larger, cast iron or semi-steel.

2.26 PRESSURE GAUGES FOR WATER AND SEWAGE USAGE

ANSI B40.1 all metal case 114 mm (4-1/2 inches) diameter, bottom connected throughout, graduated as required for service, and identity labeled. Range shall be 1375 kPa (0 to psi) gauge.

2.27 DIELECTRIC FITTINGS

Provide dielectric couplings or unions between ferrous and non-ferrous pipe.

2.28 STERILIZATION CHEMICALS

- A. Liquid Chlorine: ASTM E1120.
- B. Hypochlorite: ASTM E1229, or Fed. Spec. AA-1427C, grade B.

2.29 GREASE/OIL REMOVAL UNIT

- A. Unit: Welded stainless steel, automatic self-cleaning interceptor, rotating gear wheel assembly for automatic grease/oil removal, a flow control device, self-regulating electric immersion heater, a programmable 24 hour time control, quick release stainless steel lid clamps, a gasketed and fully removable stainless steel lid, a separate grease/oil collection container and an internal strainer basket for collection of solids and sediment.
- B. Grease/Oil Collection Container High Level Alarm Probe and Light: Alarm probe shall be constructed of stainless steel and other corrosion resistant materials, utilize 120 VAC radio frequency balanced impedance bridge circuit and shall be provided fully calibrated and ready to use. Alarm light shall operate on 120 VAC and shall be actuated by the output relay on the alarm probe. Alarm light shall be located as shown on drawing.
- C. Internal Pump and Heater Hose: Integral pump drive sprocket mating with the unit gear wheel, capable of pumping grease/oils to 4.6 m (15 feet) head with a hose length of 15 m (50 feet). Heated hose assembly shall have an I.D. of 15 mm (1/2-inch) teflon pipe, a 120 VAC self-regulating heating element, fibrous glass thermal insulation and black PVC jacket.//
- D. Pit Sump Pump: Constructed of epoxy coated cast iron housing, polypropylene base and polycarbonate cover. Pump controlled automatically with mercury float switch. Pump with 3 m (10 feet) long power cord, thermal overheat protection, screened intake, non-clog pumping head and impeller and 40 mm (1-1/2-inch) FNPT discharge. Pump capacity of 2800 ml/S (45 gpm) at 1500 mm (5 feet) head pressure and 224 W (0.3 HP) at 120 VAC.//
- E. Grease/Oil Collection Container: Constructed of corrosive resistant materials, lid, and minimum 208 L (55 gallon) capacity.

2.30 HOT WATER TEMPERATURE MAINTENANCE HEAT TRACING

Electric heat tracing, automatic self-regulating type, UL listed, tinned copper braid shield, able to crossover itself without overheating, parallel circuit design able to be cut to any length at job site and shall be corrosive and chemical resistant. Heat tracing shall maintain hot water temperature as scheduled on drawings. Heat tracing shall be complete with power connection kits, splice kits, tee kits, end seal kits and accessories required for a complete operable system. See Schedule for capacity.

2.31 GAS SHUT-OFF VALVE FOR // KITCHEN // LABORATORY AREAS //

- A. Master gas control valve:
 - 1. Bronze body, packless, single Buna 'N' seat, explosion proof, solenoid operated, normally closed, UL listed, automatic reset, 0 psi operating pressure differential, 80-90 volts DC.
- B. Control station:
 - 1. Push-button station mounted in 2-gang box, key operated, normally open switch and a normally closed push-button mounted in a stainless steel faceplate for flush installation inscribed with "GAS VALVE CONTROL" on top, "OPEN" over keyhold, "CLOSE" over push-

- button, 120 volt.
- C. Relay panel:
1. Momentary contact operated relay and rectifier mounted in NEMA Type 1 enclosure, 2 pole normally open, 3 wire control, with 120 volt coil. Interconnect with the ventilator hood fire protection system. When the hood sprinklers activate the main gas solenoid valve shall be closed by the flow switch located in the kitchen ventilator hood control panel.

2.32 GAS EQUIPMENT CONNECTORS

Flexible connectors with teflon core, interlocked galvanized steel protective casing, AGA certified design.

2.33 WATER HAMMER ARRESTER

Closed copper tube chamber with permanently sealed 410 kPa (60 psig) air charge above a Double O-ring piston. Two high heat Buna-N O-rings pressure packed and lubricated with FDA approved Dow Corning No. 11 silicone compound. All units shall be designed in accordance with ASSE 1010 for sealed wall installations without an access panel. Size and install in accordance with Plumbing and Drainage Institute requirements (PDI WH 201). Unit shall be as manufactured by Precision Plumbing Products Inc., Watts or Sioux Chief. Provide water hammer arrestors at all solenoid valves, at all groups of two or more flush valves, at all quick opening or closing valves, and at all medical washing equipment.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. General: Comply with the PHCC National Standard Plumbing Code and the following:
1. Install branch piping for water, waste and fuel gas, from the respective piping systems and connect to all fixtures, valves, cocks, outlets, casework, cabinets and equipment, including those furnished by the Government or specified in other sections.
 2. Install piping for reagent racks. Neatly group, rack and locate piping as required by the equipment.
 3. Pipe shall be round and straight. Cutting shall be done with proper tools. Pipe, except for plastic and glass, shall be reamed to full size after cutting.
 4. All pipe runs shall be laid out to avoid interference with other work.
 5. Install valves with stem in horizontal position whenever possible. All valves shall be easily accessible. Install valve in each water connection to fixture.
 6. Install union and shut-off valve on pressure piping at connections to equipment.
 7. All gravity waste drain lines inside the building with vertical drops over 6 m (20 feet) shall be provided with joint restraint on the vertical drop and horizontal offset or branch below the vertical drop. Joint restraint shall be accomplished by threaded, soldered, lead and oakum or grooved joints or a combination of pipe clamps and tie-rods as detailed in NFPA 24. Vertical joint restraint shall be provided from the fitting at the bottom of the vertical drop through every joint up to the riser clamp at the floor penetration of the floor above. Horizontal joint restraint shall be provided from the same fitting at the bottom of the vertical drop through every joint on the horizontal offset or branch for a minimum of 18 m (60 feet) or to anchoring point from the building structure. Joint restraint below ground shall be accomplished by thrust blocks

- detailed in NFPA 24.
8. Pipe Hangers, Supports and Accessories:
 - a. All piping shall be supported per of the National Standard Plumbing Code, Chapter No. 8.
 9. Shop Painting and Plating: Hangers, supports, rods, inserts and accessories used for Pipe supports shall be shop coated with red lead or zinc Chromate primer paint. Electroplated copper hanger rods, hangers and accessories may be used with copper tubing
 10. Floor, Wall and Ceiling Plates, Supports, Hangers:
 - a. Solid or split unplated cast iron.
 - b. All plates shall be provided with set screws.
 - c. Pipe Hangers: Height adjustable clevis type.
 - d. Adjustable Floor Rests and Base Flanges Steel.
 - e. Concrete Inserts: "Universal" or continuous slotted type.
 - f. Hanger Rods: Mild, low carbon steel, fully threaded or Threaded at each end with two removable nuts at each end for positioning rod and hanger and locking each in place.
 - g. Riser Clamps: Malleable iron or steel.
 - h. Rollers: Cast iron.
 - i. Self-drilling type expansion shields shall be "Phillips" type, with case hardened steel expander plugs.
 - j. Hangers and supports utilized with insulated pipe and tubing shall have 180 degree (min.) metal protection shield Centered on and welded to the hanger and support. The shield shall be 4 inches in length and be 16 gauge steel. The shield shall be sized for the insulation.
 - k. Miscellaneous Materials: As specified, required, directed or as noted on the drawings for proper installation of hangers, supports and accessories. If the vertical distance exceeds 6 m (20 feet) for cast iron pipe additional support shall be provided in the center of that span. Provide all necessary auxiliary steel to provide that support.
 11. Install cast escutcheon with set screw at each wall, floor and ceiling penetration in exposed finished locations and within cabinets and millwork.
 12. Backflow prevention device shall be installed in an accessible location, 5 (five) feet above finish floor.
 13. Penetrations:
 - a. Fire Stopping: Where pipes pass through fire partitions, fire walls, smoke partitions, or floors, install a fire stop that provides an effective barrier against the spread of fire, smoke and gases as specified. Completely fill and seal clearances between raceways and openings with the fire stopping materials.
 - b. Waterproofing: At floor penetrations, completely seal clearances around the pipe and make watertight with sealant as specified
- B. Piping shall conform to the following:
1. Waste, Storm Water Drain and Vent Drain to main stacks:

Pipe Size	Minimum Pitch
80 mm (3 inches) and smaller	1 : 50 (1/4" to the foot).

80 mm (4 inches) and larger	1 : 100 (1/8" to the foot).
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2. Exhaust Vent: Extend separately through roof. Sanitary vents shall not connect to exhaust vents.
3. Chemical Resistant Waste and Vent and Silver Recovery:
 - a. Where waste lines from fixtures are shown on plans to be chemical resistant, vents shall also be chemical resistant.
 - b. PVC Pipe: Storage and installation shall comply with ASTM D2665.
 - c. Glass Piping: Installation shall be as recommended by manufacturer. Pitch shall be 1: 50 (1/4 inch per foot), minimum.
 - d. Silver recovery pitch shall be 1: 200 (0.5 percent), minimum.
 - e. Mechanical Joint Polypropylene Pipe: This joint requires pre-grooved pipe or cutting of a groove in each pipe section using a rotation cutting tool. Pitch shall be 6 mm (1/4 inch per foot) minimum. Do not install below grade. Do not install within 23 m (75 feet) of hot water appliances (autoclaves, dishwashers, sterilizers and similar equipment).
 - f. Silicon cast iron pipe with bell and spigot joints and heat fusion polypropylene pipe may be used below grade under building.
 - g. Do not install stainless steel mechanical joints below grade.
 - h. Stainless Steel Piping: Join and support piping system per manufacturer's recommendations.
4. Domestic Water:
 - a. Where possible, grade all lines to facilitate drainage. Provide drain valves at bottom of risers. All unnecessary traps in circulating lines shall be avoided.
 - b. Connect branch lines at bottom of main serving fixtures below and pitch down so that main may be drained through fixture. Connect branch lines to top of main serving only fixtures located on floor above.
5. Fuel Gas:
 - a. Entire fuel gas piping installation shall be in accordance with requirements of NFPA 54.
 - b. Install fuel gas piping with plugged drip pockets at low points.
 - c. Install automatic shutoff valve (earthquake valve) on medical center side of meter. Valve shall positively shut off supply of gas in case of pressure failure, remain shut off until manually reopened, and be provided with outside adjustment for reset.

3.02 TESTS

- A. General: Test system either in its entirety or in sections.
- B. Soil, Waste, Storm Water Drain, Vent, and Silver Recovery Systems: Conduct before trenches are backfilled or fixtures are connected. Conduct water test or air test, as directed.
 1. Water Test: If entire system is tested, tightly close all openings in pipes except highest opening, and fill system with water to point of overflow. If system is tested in sections, tightly plug each opening except highest opening of section under test, fill each section with water and test with at least a 3 m (10 foot) head of water. In testing successive sections, test at

least upper 3 m (10 feet) of next preceding section so that each joint or pipe except upper most 3 m (10 feet) of system has been submitted to a test of at least a 3 m (10 foot) head of water. Keep water in system, or in portion under test, for at least 15 minutes before inspection starts. System shall then be tight at all joints.

2. Air Test: Maintain air pressure of 35 kPa (5 psi) gage for at least 15 minutes without leakage. Use force pump and mercury column gage.
3. Final Tests: Either one of the following tests may be used.
 - a. Smoke Test: After fixtures are permanently connected and traps are filled with water, fill entire drainage and vent systems with smoke under pressure of 1.3 kPa (one inch of water) with a smoke machine. Chemical smoke is prohibited.
 - b. Peppermint Test: Introduce (two ounces) of peppermint into each line or stack.
- C. Potable Water System: Test after installation of piping and domestic water heaters, but before piping is concealed, before covering is applied, and before plumbing fixtures are connected. Fill systems with water and maintain hydrostatic pressure of 690 kPa (100 psi) gage for two hours. No decrease in pressure is allowed. Provide a pressure gage with a shutoff and bleeder valve at the highest point of the piping being tested.
- D. Reagent Grade Water Systems: Fill system with water and maintain hydrostatic pressure of 690 kPa (100 psi) gage during inspection and prove tight.
- E. Fuel Gas System: NFPA 54.
- F. All Other Piping Tests: Test new installed piping under 1 1/2 times actual operating conditions and prove tight.
- G. Heat Tracing Systems Testing: Continuity test heat tracing systems and test insulation resistance. Continuity test each cable by applying 12 or 24 VCD to bus wires at the power connection kit and checking voltage drop at the ends of each branch of the circuit. Voltage drop shall not be less than 75 % of the applied voltage. For insulation resistance test (Megger Test) of each cable, use a megometer. Megger Test at 2500 VDC each cable system two times. Perform first Megger Test after cable is installed, but prior to the installation of insulation. Minimum Megger readings shall be 20 megohms, regardless of heater length. If Megger reading is less than 20 megohms, locate the fault and correct or replace cable. Manufacturer's representative of the tracing shall supervise tests. Submit "test Certificates of Approval" for all tests, including test values of each circuit, signature of manufacturer's representative, and manufacturer's representative's approval of test results.

3.03 STERILIZATION

- A. After tests have been successfully completed, thoroughly flush and sterilize the interior domestic water distribution system in accordance with AWWA C651.
- B. Use either liquid chlorine or hypochlorite for sterilization.

END OF SECTION

SECTION 15410

PLUMBING FIXTURES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes plumbing fixtures and related components.

1.2 DEFINITIONS

- A. Accessible Fixture: Plumbing fixture that can be approached, entered, and used by people with disabilities.

1.3 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Regulatory Requirements: Comply with requirements in ICC A117.1, "Accessible and Usable Buildings and Facilities"; **Public Law 90-480, "Architectural Barriers Act"; and Public Law 101-336, "Americans with Disabilities Act";**] about plumbing fixtures for people with disabilities.
- C. Regulatory Requirements: Comply with requirements in U.S. Architectural & Transportation Barriers Compliance Board's "Uniform Federal Accessibility Standards (UFAS), 1985-494-187" about plumbing fixtures for people with disabilities.
- D. Regulatory Requirements: Comply with requirements in Public Law 102-486, "Energy Policy Act," about water flow and consumption rates for plumbing fixtures.
- E. NSF Standard: Comply with NSF 61, "Drinking Water System Components--Health Effects," for fixture materials that will be in contact with potable water.
- F. Select combinations of fixtures and trim, faucets, fittings, and other components that are compatible.
- G. Comply with the following applicable standards and other requirements specified for plumbing fixtures:
 - 1. Enameled, Cast-Iron Fixtures: ASME A112.19.1M.
 - 2. Hand Sinks: NSF 2 construction.
 - 3. Vitreous-China Fixtures: ASME A112.19.2M.
 - 4. Water-Closet, Flush Valve, Tank Trim: ASME A112.19.5.
 - 5. Water-Closet, Flushometer Tank Trim: ASSE 1037.

- H. Comply with the following applicable standards and other requirements specified for lavatory and sinks faucets:
1. Backflow Protection Devices for Faucets with Side Spray: ASME A112.18.3M.
 2. Backflow Protection Devices for Faucets with Hose-Thread Outlet: ASME A112.18.3M.
 3. Diverter Valves for Faucets with Hose Spray: ASSE 1025.
 4. Faucet Hose: ASTM D 3901.
 5. Faucets: ASME A112.18.1M.
 6. Hose-Connection Vacuum Breakers: ASSE 1011.
 7. Hose-Coupling Threads: ASME B1.20.7.
 8. Integral, Atmospheric Vacuum Breakers: ASSE 1001.
 9. NSF Materials: NSF 61.
 10. Pipe Threads: ASME B1.20.1.
 11. Supply and Drain Fittings: ASME A112.18.1M.
- I. Comply with the following applicable standards and other requirements specified for shower faucets:
1. Backflow Protection Devices for Hand-Held Showers: ASME A112.18.3M.
 2. Combination, Pressure-Equalizing and Thermostatic-Control Anti-scald Faucets: ASSE 1016.
 3. Faucets: ASME A112.18.1M.
 4. Hand-Held Showers: ASSE 1014.
 5. High-Temperature-Limit Controls for Thermal-Shock-Preventing Devices: ASTM F 445.
 6. Hose-Coupling Threads: ASME B1.20.7.
 7. Manual-Control Anti-scald Faucets: ASTM F 444.
 8. Pipe Threads: ASME B1.20.1.
 9. Pressure-Equalizing-Control Anti-scald Faucets: ASTM F 444 and ASSE 1016.
 10. Sensor-Actuated Faucets and Electrical Devices: UL 1951.
 11. Thermostatic-Control Anti-scald Faucets: ASTM F 444 and ASSE 1016.
- J. Comply with the following applicable standards and other requirements specified for miscellaneous fittings:
1. Atmospheric Vacuum Breakers: ASSE 1001.
 2. Brass and Copper Supplies: ASME A112.18.1M.
 3. Manual-Operation Flushometers: ASSE 1037.
 4. Plastic Tubular Fittings and Piping: ASTM F 409.
 5. Sensor-Operation Flushometers: ASSE 1037 and UL 1951.
 6. Tubular Brass Drainage Fittings and Piping: ASME A112.18.1M.
- K. Comply with the following applicable standards and other requirements specified for miscellaneous components:
1. Disposers: ASSE 1008 and UL 430.
 2. Floor Drains: ASME A112.21.1M.
 3. Grab Bars: ASTM F 446.
 4. Hose-Coupling Threads: ASME B1.20.7.

5. Hot-Water Dispensers: ASSE 1023 and UL 499.
6. Off-Floor Fixture Supports: ASME A112.6.1M.
7. Pipe Threads: ASME B1.20.1.
8. Plastic Shower Receptors: ANSI Z124.2.
9. Plastic Toilet Seats: ANSI Z124.5.
10. Supply and Drain Protective Shielding Guards: ICC A117.1.

EXECUTION

1.4 FIXTURE INSTALLATION

- A. Assemble fixtures, trim, fittings, and other components according to manufacturers' written instructions.
- B. For wall-hanging fixtures, install off-floor supports affixed to building substrate.
 1. Use carrier supports with waste fitting and seal for back-outlet fixtures.
 2. Use carrier supports without waste fitting for fixtures with tubular waste piping.
 3. Use chair-type carrier supports with rectangular steel uprights for accessible fixtures.
- C. Install back-outlet, wall-hanging fixtures onto waste fitting seals and attach to supports.
- D. Install floor-mounting fixtures on closet flanges or other attachments to piping or building substrate.
- E. Install wall-hanging fixtures with tubular waste piping attached to supports.
- F. Install floor-mounting, back-outlet water closets attached to building floor substrate and wall bracket and onto waste fitting seals.
- G. Install counter-mounting fixtures in and attached to casework.
- H. Install fixtures level and plumb according to manufacturers' written instructions and roughing-in drawings.
- I. Install water-supply piping with stop on each supply to each fixture to be connected to water distribution piping. Attach supplies to supports or substrate within pipe spaces behind fixtures. Install stops in locations where they can be easily reached for operation.
 1. Exception: Use ball, gate, or globe valve if stops are not specified with fixture.
- J. Install trap and tubular waste piping on drain outlet of each fixture to be directly connected to sanitary drainage system.
- K. Install tubular waste piping on drain outlet of each fixture to be indirectly connected to drainage system.

- L. Install flushometer valves for accessible water closets and urinals with handle mounted on wide side of compartment. Install other actuators in locations that are easy for people with disabilities to reach.
- M. Install tanks for accessible, tank-type water closets with lever handle mounted on wide side of compartment.
- N. Install toilet seats on water closets.
- O. Install faucet-spout fittings with specified flow rates and patterns in faucet spouts if faucets are not available with required rates and patterns. Include adapters if required.
- P. Install water-supply, flow-control fittings with specified flow rates in fixture supplies at stop valves.
- Q. Install faucet, flow-control fittings with specified flow rates and patterns in faucet spouts if faucets are not available with required rates and patterns. Include adapters if required.
- R. Install shower, flow-control fittings with specified maximum flow rates in shower arms.
- S. Install traps on fixture outlets.
 - 1. Exception: Omit trap on fixtures with integral traps.
- T. Install disposer in outlet of sinks indicated to have disposer. Install switch where indicated or in wall adjacent to sink if location is not indicated.
- U. Install hot-water dispenser in back top surface of sink or in counter with spout over sink.
- V. Install escutcheons at piping wall ceiling penetrations in exposed, finished locations and within cabinets and millwork. Use deep-pattern escutcheons if required to conceal protruding fittings.
- W. Set **shower receptors and service basins** in leveling bed of cement grout.
- X. Seal joints between fixtures and walls, floors, and counters using sanitary-type, one-part, mildew-resistant, silicone sealant. Match sealant color to fixture color.

1.5 CONNECTIONS

- A. Connect water supplies from water distribution piping to fixtures.
- B. Connect drain piping from fixtures to drainage piping.
- C. Supply and Waste Connections to Plumbing Fixtures: Connect fixtures with water supplies, stops, risers, traps, and waste piping. Use size fittings required to match fixtures. Connect to plumbing piping.
- D. Supply and Waste Connections to Fixtures and Equipment Specified in Other Sections: Connect fixtures and equipment with water supplies, stops, risers, traps, and waste piping

specified. Use size fittings required to match fixtures and equipment. Connect to plumbing piping.

1.6 PROTECTION

- A. Provide protective covering for installed fixtures and fittings.
- B. Do not allow use of fixtures for temporary facilities unless approved in writing by Owner.

END OF SECTION

SECTION 15430

EMERGENCY PLUMBING REPAIR

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes emergency underground plumbing repair.

It is the intent of these specifications to provide timely and efficient emergency services of plumbing to the College's existing underground plumbing network.

B. DESCRIPTION OF THE WORK

The contractor shall provide 24 hour on-call repair service including the labor, equipment, supervision, and where requested by the College Representative, the materials necessary and reasonably incidental to repairing the existing plumbing system on all Delgado's Campuses as specified. All work performed shall be done in accordance with these specifications.

C. RELATED SECTIONS

GENERAL
CONDITIONS.....01000

1.3 DEFINITIONS

- A. ABS: Acrylonitrile-butadiene-styrene plastic.
- B. EPDM: Ethylene-propylene-diene-monomer rubber.
- C. PE: Polyethylene plastic.

1.4 PERFORMANCE REQUIREMENTS

- A. Gravity-Flow, Non-pressure-Piping Pressure Ratings: At least equal to system test pressure.

- B. Force-Main Pressure Ratings: At least equal to system operating pressure, but not less than 150 psig.

1.5 SUBMITTALS

A. BROCHURES, CUT SHEETS, AND TECHNICAL DATA

Submit technical data including Material Safety Data Sheets (MSDS) on each chemical agent used in this work. Maintain one (1) copy of each MSDS at the work site.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Do not store plastic structures, pipe, and fittings in direct sunlight.
- B. Protect pipe, pipe fittings, and seals from dirt and damage.

1.7 PROJECT CONDITIONS

- A. Site Information: Research utility records, and verify existing utility locations with the College Representative prior to proceeding with the work. A complete understanding of the project per these technical specifications and/or accompanying drawings is imperative.
- B. Locate existing structures and piping to be closed and abandoned.
- C. Existing Utilities: Do not interrupt utilities serving facilities occupied by the College unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
 - 1. Notify the College Representative not less than 4 hours in advance of proposed utility interruptions.
 - 2. Do not proceed with utility interruptions without the College Representative's written permission.

PART 3 - EXECUTION

3.1 NOTIFICATION

The contractor shall be contacted by the College Representative to identify the extent and location of the blockage.

3.2 COORDINATION

The College shall supply a knowledgeable person for locating the route of the water or sewer line in order to save time, or have drawings available at Facility Services.

3.3 EQUIPMENT

- A. General: The Contractor shall bring equipment to the work site capable of repairing pipe between 1/2" and 12" in diameter. The selection of equipment shall be made by the Contractor.
- B. Specific:

1. Backhoe, front excavator, 4", and 6" diaphragm pump, 4" and 6" centrifugal pump.
2. Water jet, 0 – 2000 psi at 1 – 35 gal/minute equipped with a minimum of 600 gallons of water and 400 feet of hose. The Contractor shall carry his own water supply or have fire hydrant adaptors along with 200 feet of water hose.
3. The Contractor shall carry and use if deemed necessary by the College Representative a video camera and monitor to be used in the sewer line before and after repair.

3.4 SCHEDULE

In an emergency, the contractor shall be able to respond and start work on the project within a 4 hour notice.

3.5 RECORDS

Provide for endorsement by the College Representative daily itemized work sheets with manpower, equipment and materials.

3.6 PIPING APPLICATIONS

- A. General: Include watertight joints.

3.7 SPECIAL PIPE COUPLING AND FITTING APPLICATIONS

- A. Special Pipe Couplings: Use where required to join piping and no other appropriate method is specified. Do not use instead of specified joining methods.

1. Use the following pipe couplings for non-pressure applications:
 - a. Sleeve type to join piping, of same size, or with small difference in OD.
 - b. Increaser/reducer-pattern, sleeve type to join piping of different sizes.
 - c. Bushing type to join piping of different sizes where annular space between smaller piping's OD and larger piping's ID permits installation.
2. Use pressure-type pipe couplings for force-main joints. Include PE film, pipe encasement.

- B. Special Pipe Fittings: Use where indicated. Include PE film, pipe encasement.

3.8 INSTALLATION, GENERAL

- A. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions for using lubricants, cements, and other installation requirements. Maintain swab or drag in line, and pull past each joint as it is completed.
- B. Use proper size increasers, reducers, and couplings where different sizes or materials of pipes and fittings are connected. Reducing size of piping in direction of flow is prohibited.

- C. Install gravity-flow piping and connect to building's sanitary drains, of sizes and in locations indicated. Terminate piping as required.
 - 1. Install piping pitched down in direction of flow, at minimum slope of 2 percent, unless otherwise indicated.
 - 2. Install piping with 36-inch minimum cover.
- D. Install ductile-iron, force-main piping according to AWWA C600.
- E. Install PVC force-main piping according to AWWA M23.

3.9 PIPE JOINT CONSTRUCTION AND INSTALLATION

- A. General: Join and install pipe and fittings according to manufacturer's recommendations and plumbing codes.
- B. ABS Pipe and Fittings: As follows:
 - 1. Join pipe and gasketed fittings with gaskets according to ASTM D 2321.
 - 2. Install according to ASTM D 2321.
- C. PVC Pressure Pipe and Fittings: Join and install according to AWWA M23.
- D. PVC Sewer Pipe and Fittings: As follows:
 - 1. Join pipe and gasketed fittings with gaskets according to ASTM D 2321.
 - 2. Join profile sewer pipe fittings with gaskets according to ASTM D 2321 and manufacturer's written instructions.
 - 3. Install according to ASTM D 2321.

3.10 CLOSING ABANDONED SANITARY SEWERAGE SYSTEMS

- A. Abandoned Piping: Close open ends of abandoned underground piping indicated to remain in place. Include closures strong enough to withstand hydrostatic and earth pressures that may result after ends of abandoned piping have been closed. Use either procedure below:
 - 1. Close open ends of piping with at least 8-inch thick, brick masonry bulkheads.
 - 2. Close open ends of piping with threaded metal caps, plastic plugs, or other acceptable methods suitable for size and type of material being closed. Do not use wood plugs.

3.11 FIELD QUALITY CONTROL

- A. Clear interior of piping and structures of dirt and superfluous material as work progresses. Maintain swab or drag in piping, and pull past each joint as it is completed.
- B. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24 inches of backfill is in place, and again at completion of Project.
 - 1. Submit separate reports for each system inspection.

2. Defects requiring correction include the following:
 - a. Alignment: Less than full diameter of inside of pipe is visible between structures.
 - b. Deflection: Flexible piping with deflection that prevents passage of ball or cylinder of size not less than 92.5 percent of piping diameter.
 - c. Crushed, broken, cracked, or otherwise damaged piping.
 - d. Infiltration: Water leakage into piping.
 - e. Exfiltration: Water leakage from or around piping.
 3. Replace defective piping using new materials, and repeat inspections until defects are within allowances specified.
 4. Re-inspect and repeat procedure until results are satisfactory.
- C. Test new piping systems, and parts of existing systems that have been altered, extended, or repaired, for leaks and defects.
1. Do not enclose, cover, or put into service before inspection and approval.
 2. Test completed piping systems according to authorities having jurisdiction.
 3. Submit separate reports for each test.

END OF SECTION

SECTION 15430a

OVERFLOW PLUMBING

1.1 SUMMARY

- A. Repair Includes the Following Plumbing Specialties:
1. Backflow preventers.
 2. Water regulators.
 3. Thermostatic water mixing and water tempering valves.
 4. Strainers.
 5. Hose stations.
 6. Trap seal primer valves.
 7. Drain valves.
 8. Backwater valves.
 9. Miscellaneous piping specialties.
 10. Cleanouts.
 11. Grease, oil, and solids interceptors.

1.2 PERFORMANCE REQUIREMENTS

- A. Minimum Working-Pressure Ratings:
1. Domestic Water Piping: **125 psig**.
 2. Sanitary Waste and Vent Piping: 10-foot head of water (30 kPa).
 3. Storm Drainage Piping: 10-foot head of water (30 kPa).
 4. Force-Main Piping: **100 psig**.

1.3 QUALITY ASSURANCE

- A. Quality Standard for Plastic Domestic Water Piping Components: NSF 14.
- B. Quality Standard for Potable Domestic Water Plumbing Specialties: NSF 61.

1.4 PRODUCTS

- A. Backflow Preventers:
1. Pipe-applied, atmospheric-type vacuum breakers.
 2. Hose-connection vacuum breakers.
 3. Intermediate atmospheric-vent backflow preventers.
 4. Reduced-pressure-principle backflow preventers.
 5. Double-check backflow prevention assemblies.
 6. Dual-check-valve-type backflow preventers for continuous pressure.
 7. Dual-check-valve-type backflow preventer for carbonated beverage dispensers.
 8. Laboratory faucet vacuum breakers.

- 9. Reduced-pressure detector assembly backflow preventers.
 - 10. Double-check detector assembly backflow preventers.
 - 11. Hose-connection backflow preventers.
 - 12. Back-siphonage backflow vacuum breakers.
- B. Thermostatic Water Mixing Valves: Manifold assemblies.
 - C. Water Tempering Valves: System and limited volume.
 - D. Strainers: Y-pattern, T-pattern and drainage basket.
 - E. Outlet Boxes: ice maker.
 - F. Washer-supply outlets.
 - G. Hose Stations: Mixing valve and single valve.
 - H. Drain Valves: Gate and stop and waste.
 - I. Backwater Valves: Horizontal, closed-position, check and drain outlet valves.
- J. Sleeve penetration systems.
- K. Cleanouts, ASME A112.36.2M, ASME A112.3.1
 - 1. Application: Floor cleanout, Wall cleanout and for installation in exposed piping.
 - 2. Body or Ferrule Material: Cast iron.
 - 3. Closure: Brass plug.
 - 4. Frame and Cover Material and Finish: Nickel-bronze, copper alloy.
 - 5. Top Loading Classification: Extra Heavy.
 - L. Floor Drains, ASME A112.21.1M with ASME A112.14.1, backwater valve.
 - 1. Application: Area drain and Floor drain.
 - 2. Body Material: Gray iron.
 - 3. Exposed Surfaces and Interior Lining: Acid-resistant enamel.
 - 4. Top of Body and Strainer Finish: Nickel bronze or Stainless steel.
 - 5. Top Loading Classification: Extra Heavy-Duty.
 - M. Trench Drains, ASME A112.21.1M.
 - 1. Body Material: Gray iron.
 - 2. Grate Material: Gray iron.
 - 3. Top Loading Classification: Extra Heavy-Duty.
 - N. Plastic Floor Drains: ASME A112.21.1M, except for material and top loading classification.
 - 1. Material: ABS or PVC.
 - 2. Top of Body and Strainer Finish: Nickel bronze.
 - O. Roof Drains, ASME A112.21.2M and ASME A112.3.1.

1. Application: Roof drain, Canopy drain, Scupper drain, and Balcony drain.
2. Body Material: Cast iron.
3. Combination Flashing Ring and Gravel Stop: Required.
4. Extension Collars: Required.
5. Underdeck Clamp: Required.

P. Grease Interceptors: PDI-G101.

1. Plumbing and Drainage Institute Seal: Required.
2. Body Material: Cast iron or steel.
3. Interior Lining: Corrosion-resistant enamel
4. Mounting; Recessed, flush with floor
5. Operation: Semiautomatic, manual draw off.

Q. PDI-G101, except for grease retention capacity.

1. Body Material: Steel.
2. Interior Separation Device: Screens.
3. Heater: Not required.
4. Mounting: Above floor.
5. Operation: Automatic recovery.
6. Power Requirement: 120-V ac.

END OF SECTION

SECTION 15445

SEWAGE PUMPS

PART 2 - GENERAL

2.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

2.2 SUMMARY

- A. This Section includes sewage pumps for the building sanitary drainage systems.

2.3 QUALITY ASSURANCE

- A. Product Options: Drawings indicate size, profiles, connections, and dimensional requirements of pumps and are based on specific manufacturer types and models indicated. Other manufacturers' pumps with equal performance characteristics may be considered.
- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction.

PART 3 - PRODUCTS

No products supplied

PART 4 - EXECUTION

4.1 EXAMINATION

- A. Examine roughing-in of plumbing piping systems to verify actual locations of piping connections before pump installation.

4.2 EARTHWORK

- A. Excavating, trenching, and backfilling are specified in Section 02300 – Backfill.

4.3 CONCRETE

- A. Install concrete bases of dimensions indicated for sewage pumps.

4.4 INSTALLATION

- A. Install pumps and arrange to provide access for maintenance, including removal of motors, impellers, couplings, and accessories.
- B. Support piping so weight of piping is not supported by pumps.
- C. Wet-Pit-Mounted, Vertical Sewage Pumps: Suspend pumps from basin covers. Make direct connections to sanitary drainage piping.
- D. Submersible Sewage Pumps: Set pumps on basin floor. Make direct connections to sanitary drainage piping.
 - 1. Anchor quick-disconnect systems to bottom of basins and basin sidewalls or covers. Install pumps so pump and discharge pipe disconnecting flanges make positive seals when pumps are dropped into place.
- E. Sewage Pump Basins: Install basins and connect to drainage and vent piping. Brace interior of basins according to manufacturer's written instructions to prevent distortion or collapse during concrete placement. Set basin cover and fasten to basin top flange. Install cover so top surface is flush with finished floor.
- F. Packaged Pump Units: Install and make direct connections to drainage and vent piping.

4.5 CONNECTIONS

- A. Sanitary drainage and vent piping installation requirements are specified in Division 15 Section "Drainage and Vent Piping." Drawings indicate general arrangement of piping and specialties. The following are specific connection requirements:
 - 1. Install discharge pipe sizes equal to or greater than diameter of pump nozzles, and connect to sanitary drainage piping.
 - 2. Install swing check valve and gate or ball valve on each sewage pump discharge. Include spring-loaded or weighted-lever check valves for piping NPS 2-1/2 and larger.
 - 3. Install swing check valve and gate or ball valve on each automatic, packaged pump discharge.
- B. Install electrical connections for power, controls, and devices.
- C. Ground equipment.
 - 1. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

ADJUSTING

- D. Pump Controls: Set pump controls for automatic start, stop, and alarm operation as required for system application.

4.6 COMMISSIONING

- A. Final Checks before Starting: Perform the following preventive maintenance operations:
 - 1. Lubricate bearings.
 - 2. Disconnect couplings and check motors for proper direction of rotation.
 - 3. Verify that each pump is free to rotate by hand. Do not operate pump if it is bound or drags, until cause of trouble is determined and corrected.
 - 4. Verify that pump controls are correct for required application.
- B. Starting procedure for pumps with shutoff power not exceeding safe motor power is as follows:
 - 1. Start motors.
 - 2. Open discharge valves slowly.
 - 3. Check general mechanical operation of pumps and motors.

END OF SECTION

END OF BID DOCUMENTS