City of Dover

February 8, 2018

To Whom It May Concern:

The City of Dover will receive sealed proposals on March 7, 2018 at 2:00 p.m. local time to contract for **PUNCHEON RUN WASTEWATER PUMP STATION IMPROVEMENTS ENGINEERING DESIGN SUPPORT, RFP NUMBER 18-0023PW.** The proposal must be submitted in three paper copies and one electronic copy, in PDF format, on either a flash drive or a CD/DVD. The electronic copy must be included in the submission package.

All vendors must complete the Request for Proposal notice and email it to doverwhse@dover.de.us or fax it to (302) 736-7178 if they intend to bid. Any vendor not returning the form may not receive published addenda.

Your proposal is not revocable for ninety (90) days following the response deadline indicated above.

If you have questions concerning this Request for Proposal, they must be made in writing and addressed to the Acting Purchasing Manager, 710 William Street, Dover, DE 19904 or emailed to doverwhse@dover.de.us. **The deadline for questions will be February 22, 2018.** No questions will be accepted after that date. All questions will be compiled and answered in the form of an addendum which will be **published on or about February 28, 2018**.

All copies of any bids/proposals submitted in response to this request shall be considered the property of the City of Dover and shall not be returned to the bidder.

Conflict of Interest Clause:
Pursuant to Dover Code, Chapter 30, Section 30-33, No city employee or official may participate on behalf of the city in the review or disposition of any matter pending before the city in which he has a personal or private interest. No city employee or official shall benefit from any contract with the city, nor solicit any contract, and shall not enter into any contract with the city (other than an employment contract). No person who has served as a city employee or official shall represent or otherwise assist any private enterprise on any matter involving the city, for a period of two years after termination of his employment or elected or appointed status with the city, if he gave an opinion, conducted an investigation or otherwise was directly and materially responsible for such matter in the course of his official duties as a city employee or official. All parties hereto declare and affirm that no officer, member, or employee of the City, and no member of its governing body, and no other public official of the City who exercises any functions or responsibilities in the review or approval of the undertaking described in this contract, or the performing of services pursuant to this contract, shall participate in any decision

relating to this contract which affects his or her personal interest, or any corporation, partnership, or association in which he or she is directly or indirectly interested; nor shall any employee of the City, nor any member of its governing body, have any interest, direct or indirect, in this contract or the proceeds thereof.

Bids will be opened publicly at the time and place designated in this letter. The main purpose of the bid opening is to reveal the name(s) of the bidder(s), not to serve as a forum for determining the low bidder(s).

The contract shall be awarded within 90 days of the closing date to the bidder who is determined in writing to be most advantageous to the City. All prices must be held firm for a minimum of 90 days from the date of the bid opening. The bids, summaries, and tabulations shall not be open for public inspection until after receipt of a fully executed contract.

The City of Dover reserves the right to waive technicalities, to reject any or all bids, or any portion thereof, to advertise for new proposals, to proceed to do the work otherwise, or to abandon the work, if in the best interest of the City.

All bids are to be received by the Purchasing Office, 710 William Street, Dover, DE, 19904 no later than the 2:00 p.m. bid opening. All bids will be opened in the presence of the Procurement Manager or his/her designee. All bids shall become public record and shall be available for public inspection after it has been determined that there is no proprietary information contained within the bids. Any and all proprietary information contained within the proposal must be clearly marked. The cover must indicate that the proposal contains such information. **Copies** of the proposals will not be provided to competing vendors until after a contract has been awarded.

Minority, women, veteran, service disabled veteran, and individuals with disabilities owned vendor preference shall be three percent (3%) of the value of the award. **The vendor must identify qualification and claim to the preference on the submitted proposal documents. The vendor must provide authoritative proof of minority ownership such as identification in the certification directory maintained by the State of Delaware Office of Supplier Diversity to qualify for this preference.** This preference is to be considered as a stand-alone and cannot be added to any other preference that may be allowed. This preference shall not apply to subcontractors.

Local vendor preference shall be considered for materials, equipment, construction contracts, and utility contracts. Local vendor preference shall be three percent (3%) of the value of the award. The term local vendor is defined as a gradually increasing range with preference assigned as follows:

Rule 1: Vendor located within the city limits of the City of Dover.
Rule 2: Vendor located within Kent County, Delaware (applicable only if no vendor qualifies under rule 1)
Rule 3: Vendor located within the State of Delaware (applicable only if no vendor qualifies under rules 1 & 2)

In the event that no vendor qualifies under rules 1, 2, or 3, no local vendor preference will be awarded. **The vendor must identify qualification and claim to the preference on the submitted documents.** This preference is to be considered as stand alone and can not be added to any other preference that may be allowed.

A bid bond or certified check in the amount equivalent to ten percent (10%) of the proposal amount shall be required with each proposal. The check or bid bond of the bidder to whom the contract is awarded will be forfeited to the City of Dover as liquidated damages in case the contract is not executed within fifteen days after receiving official notification of award.

In the event the contractor does not fulfill its obligations under the terms and conditions of this contract, the City of Dover may contract for an equivalent product on the open market. Any difference in cost between the contract prices herein and the price of open market product shall be the responsibility of the contractor. Under no circumstances shall monies be due the contractor in the event open market products can be obtained below contract cost. Any monies charged to the contractor may be deducted from an open invoice.

Neither the contractor nor the City of Dover shall be held liable for non-performance under the terms and conditions of this contract due, but not limited to, government restriction, strike, flood, fire, or unforeseen catastrophe beyond either party's control. Each party shall notify the other in writing of any situation that may prevent performance under the terms and conditions of this contract.

Vendors must provide references to the City of Dover upon request. Vendor references may be checked to verify their ability to perform the contract requirements, the quality of work and the ability to meet obligations.

ENVELOPES MUST BE MARKED "PUNCHEON RUN WASTEWATER PUMP STATION IMPROVEMENTS ENGINEERING DESIGN SUPPORT, RFP NUMBER 18-0023PW, OPENING MARCH 7, 2018, 2:00 P.M." No faxed bid will be accepted. Failure to comply with the above format *may* result in disqualification of your bid.

The City of Dover shall have the right to reject any or all bids if deemed to be in the best interest of the City, such as but not limited to local vendor preference and minority vendor preference while awarding bids.

Sincerely,

B Wolfgang

Barry Wolfgang
Acting Contract and Procurement Manager
(302) 736-7795
Fax (302) 736-7178
bwolfgang@dover.de.us
www.cityofdover.com

City of Dover

REQUEST FOR PROPOSAL NOTICE

RFP Number: 18-0023PW RFP Opening: March 7, 2018, 2:00 p.m.

Description: Puncheon Run Wastewater Pump Station Improvements Engineering Design Support

If you are interested in the invitation to bid described above, you can download it in Adobe PDF format from our web site www.cityofdover.com/bid-procurement. Any amendments of other additional information related to this solicitation will be posted with the original document on the web site.

If you do not have internet access and want to receive this request for proposal, all subsequent amendments, or additional information on the bid package, please provide the requested information to:

The City of Dover
Purchasing Office
710 William Street
Dover, DE 19904
Fax: (302) 736-7178, attention Barry Wolfgang
Phone: (302) 736-7795
e-mail: doverwhse@dover.de.us

Please complete the following and return this form to Central Services:

Company: _____	Vendor Response /Request
Address _____	____ No bid at this time, please retain on bid list
_____	____ Please send complete Bid/RFP package
Contact: _____	____ I will download the Bid/RFP package
Phone _____	____ I intend to bid
Fax _____	____ I do not intend to bid
e-mail for ITB/RFP	Other:

CITY OF DOVER, DELAWARE

REQUEST FOR PROPOSALS

FOR

PUNCHEON RUN WASTEWATER PUMP STATION IMPROVEMENTS ENGINEERING DESIGN SUPPORT

RFP NUMBER
18-0023PW

March 2018

Issued By:

City of Dover
Purchasing Office
710 William Street
Dover, Delaware 19904
(302) 736-7795
Fax (302) 736-7178

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APPENDIX A

Puncheon Run Sewer Facilities Pump Station Plans (1983)

Puncheon Run Sewage Pumping Station Upgrades Plan (2005)

SECTION AFP

ADVERTISEMENT FOR PROPOSALS

Sealed proposals will be received on behalf of the City of Dover, (herein called the "Owner") at the City of Dover, City of Dover Procurement Office, 710 William Street, Dover, DE 19904 no later than 2:00 p.m. EST on Wednesday, March 7, 2018. Proposals will then be publicly opened and read aloud immediately thereafter for the following:

Puncheon Run Wastewater Pump Station Improvements Engineering Design Support
Proposal No.: 18-0023PW
Contract Duration: 90 Calendar Days

The City of Dover requests proposals from qualified, Delaware licensed engineering firms, to provide the following services: evaluation of the existing grit removal system at the pump station, recommendations for replacement or repair of the existing grit removal system, design work for the selected recommendation and preparation of construction documents. All requirements are described in the proposal documents entitled, **Puncheon Run Wastewater Pump Station Improvements Engineering Design Support, Request for Proposal, RFP No.:18-0023PW.**

The right is reserved, as the interests of the City of Dover may appear, to reject any and all proposals, to waive any information in proposals received, and to accept or reject any items of any proposal.

City of Dover, Delaware

By Barry Wolfgang
Acting Contract and Procurement Manager
City of Dover

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SECTION IFP

INVITATION FOR PROPOSALS

RFP NUMBER: 18-0023PW

Sealed Proposals, three (3) paper copies and one (1) electronic copy, will be received by the City of Dover, City of Dover Procurement Office, 710 William Street, Dover, DE no later than **2:00 P.M.** on **March 7, 2018** for the **Puncheon Run Wastewater Pump Station Improvements Engineering Design Support** at which time the proposals will be opened.

I. NAME OF SOLICITING GOVERNMENT

City of Dover, Delaware
City Hall – The Plaza
P.O. Box 475
Dover, Delaware 19903-0475

II. PURPOSE OF REQUEST

A. The City of Dover (City) requires the expertise of a consultant to provide the following services: evaluation of the existing grit removal system at the pump station, recommendations for replacement or repair of the existing grit removal system, cost estimates of the recommendations, design work for the City-selected recommendation and preparation of construction documents for the City of Dover Department of Public Works.

B. The City invites written proposals from qualified Delaware licensed engineering firms which are interested in providing services, as outlined below.

III. GENERAL CONDITIONS

A. The City is seeking proposals from experienced and qualified Delaware licensed engineering firms for entering into an agreement to perform a thorough evaluation of the existing operating conditions and existing grit removal system at the Puncheon Run pump station. The pump station is located at 1102 South Governors Avenue, just south of Lynnhaven Drive. Following the completion of the evaluation, recommendations shall be provided to City staff for grit removal system repair or replacement. Once a recommendation has been selected, a design and bid documents shall be created and advertised through the City of Dover. This contract will be solely for the above referenced project and the duration of the evaluation and bid documents and design shall be ninety (90) calendar days.

IV. SCOPE OF WORK

A. The City of Dover Department of Public Works has been experiencing operational issues with the existing grit removal system located within the Puncheon Run pump station

building at 1102 South Governors Avenue, Dover, DE.

B. The selected proposer shall provide a thorough evaluation of the existing operating conditions of the Puncheon Run pump station and existing grit removal system at the pump station to determine if repairs or a full replacement is needed to provide a fully operational and efficient grit removal system. Known components of the Grit Removal System are listed below and shown in Appendix A:

1. Muffin Monster mechanical grinder system (1 ½ hp)
2. Mechanical Grit collector (2 hp) with weir plate and rake
3. Grit Washer with dewatering auger and organics overflow
4. Grit Collection Dumpster

The evaluation of existing conditions shall include, but is not limited to the following:

1. Three (3) site visits:
   - To discuss existing conditions with City Staff
   - Dry weather wastewater flow evaluation
   - Wet weather wastewater flow evaluation

2. Evaluation of wastewater flow at pump station
   - Flow demands
   - Quantity and characteristics of grit, including particle size distribution
   - Organic content of wastewater flow

3. Evaluation of existing environmental conditions (floodplains, wetlands, etc.) and impacts (noise and odor control) at pump station

4. Limited survey of Puncheon Run wastewater pump station building and parcel

5. Communication with prospective grit removal vendors

C. Following the evaluation of the pump station and grit removal system, the selected proposer shall meet with selected City staff to review their findings, including recommendations.

Recommendations shall include but are not limited to the following for the specific grit removal system or repair:

1. Type of grit removal system or type of repair, including advantages and disadvantages
2. Potential adverse effects on downstream collection system and/or environment and noise and odor control
3. Head loss requirements
4. Grit removal efficiency
5. Itemized cost of construction
6. Footprint of grit removal system
7. Operations and Maintenance requirements (including associated costs)

D. After City staff and the selected proposer have come to a consensus on the replacement or repairs needed, the selected proposer shall create construction documents that

provide clear direction to a contractor on how to complete the project. These documents shall be created under the direction of a Delaware licensed Engineer.

E. Contingency Item #1: Proposal Procurement Process. The selected proposer shall assist the City of Dover with the proposal procurement process, including answering questions from potential contractors.

F. Contingency Item #2: Construction Administration Services. The selected proposer shall assist the City of Dover with engineering services during construction, which include:

1. Site visits at appropriate intervals during construction
2. Attend the pre-construction meeting and progress meetings
3. Review change order proposals and submittals
4. Assist the City of Dover in answering Requests for Information (RFIs) from the contractor.
5. Attend testing and start-up of installed equipment and conduct a final inspection

V. REQUIRED CONTENT OF PROPOSAL

A. Firm Identification. The following questionnaire has been provided by the City of Dover. Please complete in typewritten form. **Three (3) paper copies and one (1) electronic copy are to be submitted in the order outlined below.** Illustrated brochure(s) and professional records may be attached and submitted to augment the data included in this questionnaire. Attach additional sheets as required or desired.

1. Firm Name
2. Established Year, State
3. Former Firm Name(s), if any, and years in business
4. Home office business address and telephone number
5. Branch office business address and telephone numbers
6. Associates and Principals: Name, Title, Specialties (Attach Resumes)
7. Total personnel of firm:
    - Professional
    - Non-Professional
    - Other
9. Key personnel to be involved in the provision of these services: Name, Title, Specialties, Degree, Registration, Years of Experience (Attach Resumes)
10. What outside Associates and Consultants does your firm normally work with? Include:
    - Name and address
    - Specific service
    - Name of last joint project
11. Is it anticipated that your firm will sub-contract any aspect of the work outlined in the scope of work? (If so, please discuss the nature and extent of the

anticipated sub-contracting, including the use of local businesses.)

12. Please provide examples of similar grit removal improvement design projects that your firm has completed (minimum of two (2)). Include the following:

    - Client
    - Contact person and phone number
    - Services provided
    - Original estimate of project cost
    - Actual project cost
    - Original estimate of task of completion schedule, e.g., Study/Analysis of Needs Report, Project Design, Construction, etc.
    - Actual completion schedule

13. Discuss how your firm will respond quickly to City needs. How will you maintain close effective communications with City staff?

14. Provide a discussion of your firm's familiarity with typical problems which might arise with this type of project.

15. Document your firm's ability to provide a high quality service on schedule and within budget. Discuss the control systems you will utilize to effectively manage projects.

16. Provide a list of Municipal, State, and Federal references which can be contracted.

17. Proof of insurance, complying with the **Instructions to Bidders** Section, including the following documentation:

    - Certificate of Insurance
    - Declaration Page
    - Insurance policy documents

18. Discuss your firm's Affirmative Action and Equal Opportunity practices.

19. Please indicate if you are aware of any personal or organizational conflicts of interests. Provide an explanation of your firm's (or any sub-consultants that your firm is using in provision of these services) involvement in ongoing or pending litigation, claims, suits against the City of Dover, if any.

20. Provide and additional information which you feel may be pertinent to the provision of these services, but not specifically required elsewhere in the RFP.

B. Statement of Understanding. State your understanding of the scope of services presented in the RFP and your role in accomplishing the scope of services.

VI. COMPENSATION

A. The proposal should clearly state the lump sum, including all necessary permit costs to be charged for the proposed work and should be provided on the attached Proposal Form.

VI. SELECTION CRITERIA

A. In order to ascertain which proposal best meets the needs of the City, proposals will be independently evaluated, according to the following criteria, by two (2) or more qualified individuals of the City's staff:

	Factor	Point Range
A	Experience: Demonstrated experience with similar projects and history of achieving highest and best results among its peers.	0 to 15
B	Project Management: Project organization and management, including staffing, management control and sub-contractor utilization	0 to 10
C	Staff: Qualifications and utilization of the firm's employees assigned to the provision of these services, including previous work experience, technical management experience, education and training. In addition to project specific experience, the City will take into account any consultant experience in providing general municipal engineering in a support capacity (to other various government agencies).	0 to 15
D	Costs: Lump sum of service, including any and all permit costs.	0 to 30
E	Service Ability: Firm's ability to provide full spectrum of engineering services including personnel, managerial and other resources as and when required to meet the project's objectives.	0 to 15
F	Location: Geographical location in relation to the City of Dover	0 to 5

END OF SECTION

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SECTION IP

INSTRUCTIONS TO PROPOSERS

I. PROPOSAL SUBMISSION

A. All proposals should be delivered to:

Barry Wolfgang
Acting Contract and Procurement Manager
City of Dover Purchasing Office
710 William Street
Dover, Delaware 19904

B. Questions regarding scope of services or proposal process:

1. To ensure fair consideration for all proposers, communication to or with any department or departmental staff during the submission process, will be prohibited except as provided in the third paragraph below. Any communication between proposer and the City will be initiated by the appropriate staff member in order to obtain information or clarification needed to develop a proper, accurate evaluation of the proposal. Such communications initiated by a proposer may be grounds for disqualifying the offending proposer from consideration for award of the proposal and/or any future proposal.
2. Any questions relative to interpretation of the scope of services or the proposal process, shall be addressed as indicated below, in ample time before the period set for the receipt and opening of proposals.
3. Questions or comments should be directed **in writing** to:

Barry Wolfgang
Acting Contract and Procurement Manager
City of Dover Central Services Department
710 William Street
Dover, Delaware 19904
Facsimile Number: (302) 736-7178
E-mail address: doverwhse@dover.de.us

C. In order to be acceptable, **three (3) paper copies and one (1) electronic copy of the proposal must be submitted in a sealed envelope on the outside of which shall be plainly marked "Sealed Proposal: Puncheon Run Wastewater Pump Station Improvements Engineering Design Support, RFP Opening March 7, 2018 2:00 P.M. Proposal No.: 18-0023PW",** together with the name, address, and license number, if applicable, of the company submitting the proposal. Proposals will be received until **2:00 P.M.** or hand delivered no later than **2:00 P.M.** on **March 7, 2018**, at which time they will be publicly opened in the **City of Dover Central Services Department, 710 William Street, Dover, Delaware 19904**.

D. Proposers are fully responsible for the timely delivery of proposals. Late proposals will not be accepted and will be returned to the proposer unopened. Telegraph, telephone, facsimile machine, and electronic mail proposals will not be accepted under any circumstances.

E. In the event that personal interviews are deemed necessary, and your business is included among those selected for interview, you will be contacted in order to schedule a mutually agreeable date and time for the interview.

F. It is anticipated that a final decision on the business to be selected will be made within 30 days or upon approval by City Council, whichever occurs earlier. All proposers will subsequently be contacted and advised of the Department's decision.

II. TERMS AND CONDITIONS

A. The City reserves the right to reject any or all proposals, with or without cause, to waive technicalities, or to accept the proposal, which in its judgment best serves the interests of the City. The City further reserves the right to award the contract to the next most qualified proposer if the successful proposer does not execute a contract within thirty (30) days after being notified of the award of the proposal.

B. The City reserves the right to request clarification of information submitted and to request additional information from one or more proposers. All costs associated with the presentation of the proposal and any supplemental information shall be borne solely by the proposer, and shall not be passed on to the City under any circumstances.

C. Any proposal may be withdrawn until the date and time stated above for the opening of the proposals. Any proposals not so withdrawn shall constitute an irrevocable offer to sell to the City the services indicated for a period of ninety (90) days, or until one or more of the proposals have been accepted by the Department, whichever occurs earlier.

D. Any written agreement or contract resulting from the acceptance of a proposal shall be prepared on forms either supplied by or approved by the City, and shall contain, at a minimum, applicable provisions of this request for proposals. The City reserves the right to reject any agreement that does not conform to the request for proposals or any other City requirements for agreements and contracts. The following are representative of the provisions to be included within the contract documents:

1. Termination - If through any cause, the firm selected shall fail to fulfill the obligations agreed to in a timely and efficient manner, the City shall have the right to terminate the contract by specifying the date of termination in a written notice to the firm at least thirty (30) days before the termination date. In this event, the firm shall be entitled to just and equitable compensation for the work satisfactorily completed.

2. Assignment - the proposer shall not assign any interest in the contract, and shall not transfer any interest in the same without the prior written consent of the City.

3. Non-discrimination - The successful proposer must specify in the contract that the firm will not discriminate under the contract, against any person as provided in any federal, state, or local government laws and regulations.

4. Certificate of Insurance - the contractor selected must present proof of insurance

coverage of a nature and amount deemed adequate by the City, and be willing to execute a hold harmless indemnification for the City.

5. Publication of Information - No reports, information, or data given to or prepared by the firm under the contract shall be made available to any individual or organization by the firm without the prior written approval of the City. This provision shall only apply insofar as it does not conflict with the provisions of the Freedom of Information Act.

E. The successful proposer shall be required to enter into a contract with the City of Dover which shall reflect the services requested in the Invitation for Proposals, without delay upon notice of award of contract.

III. INSURANCE REQUIREMENTS

A. Policies Required. At all times during the term of this Project No. 18-0023PW, the Contractor shall keep in force and affect all insurance policies as described below:

1. Worker's Compensation and Employers' Liability Insurance. Statutory worker's compensation benefits and employers' liability insurance with a limit of liability no less than that required by Delaware law at the time of the application of this provision for each accident. This policy shall be endorsed to include a waiver of subrogation in favor of the City of Dover. The Contractor shall require subcontractors and others not protected under its insurance to obtain and maintain such insurance.

2. Commercial General Liability Insurance. Policy will be written to provide coverage for, but not limited to, the following: premises and operations, products and completed operations, personal injury, blanket contractual coverage, broad form property damage, independent contractor's coverage with Limits of liability not less than $1,000,000 general aggregate, $1,000,000 products/completed operations aggregate, $1,000,000 personal injury, $2,000,000 each occurrence.

3. Automobile Liability Insurance. Business automobile policy covering all owned, hired and non-owned private passenger autos and commercial vehicles. Limits of liability not less than $1,000,000 each occurrence, $1,000,000 aggregate.

4. Qualification; Priority; Contractors' Coverage. The insurer must be authorized to do business under the laws of the State of Delaware. Such insurance will be primary. All contractors and all of their subcontractors who perform work on behalf of Contractor shall be responsible for carrying, in full force and effect, worker's compensation and employer's liability, and automobile liability insurance coverage.

5. Certificate of Insurance; Other Requirements. At the execution of this Agreement and prior to each insurance policy expiration date during the term of this Agreement, Contractor will furnish the City of Dover with a Certificate of Insurance with the CITY named as an additional insured. The Certificate shall reference this Agreement and worker's compensation and property insurance waivers of subrogation required by this Agreement. City of Dover shall be given thirty (30)

calendar days' advance notice of cancellation or nonrenewal of insurance during the term of this Agreement.

6. Limits. The limits of liability set out in this Agreement may be increased by mutual consent of the parties, which consent will not be unreasonably withheld by either party, in the event of any factors or occurrences, including substantial increases in the level of jury verdicts or judgments or the passage of state, federal or other governmental compensation plans, or laws which would materially increase the City of Dover's exposure to risk.

7. Deductible/Self-insurance Retention Amounts. Contractor shall be fully responsible for any deductible or self-insured retention amounts contained in its insurance program or for any deficiencies in the amounts of insurance maintained.

IV. PROPOSAL PROCESS SCHEDULE

A. The City will use the following tentative timetable in the selection process:

Date	Event
Thursday, February 8, 2018 and Thursday, February 15, 2018	Publicly Advertise RFP #18-0023PW
Thursday, February 22, 2018	Deadline for submitting questions
Wednesday, February 28, 2018	Addendum issued/answers to proposers questions published
Wednesday, March 7, 2018	**Proposal Deadline to submit final proposals (Proposal Opening). (3 original copies by 2:00 pm)**
Friday, March 16, 2018	City Completes Evaluation of Proposals
Tuesday, April 10, 2018	City Issues Notice of Award
Tuesday, April 17, 2018	Contract Execution

END OF SECTION

PUNCHEON RUN WASTEWATER PUMP STATION IMPROVEMENTS
ENGINEERING DESIGN SUPPORT
CITY OF DOVER, DELAWARE

PROPOSAL FORM

Date:_____

Proposal of_____(hereinafter called "PROPOSER"), organized and existing under the laws of the State of Delaware doing business as _____*. To the City of Dover (hereinafter called "OWNER").

In compliance with the Invitation to Proposers, PROPOSER hereby proposes to perform all WORK for the Puncheon Run Wastewater Pump Station Improvements Engineering Design Support for the City of Dover, RFP No. 18-0023PW, in strict accordance with the SCOPE OF WORK, within the time set forth therein, and at the prices stated below. The PROPOSER has examined and fully understands the scope of work.

The PROPOSER declares that the attached documents therein referred to have been carefully examined and are understood. It is proposed and agreed if the Proposal is accepted to contract with the City of Dover the required work in the manner set forth in the documents.

*Corporation, Partnership, or Individual as applicable.

BIDDER acknowledges receipt of the following ADDENDUM (if applicable):

_____ _____

The PROPOSER declares that the only person, firm or corporation, or persons, firms or corporations, that has or have any interest in this proposal or in the Contract or Contracts proposed to be taken is or are the undersigned; that this proposal is made without any connection or collusion with any person, firm or corporation, making a proposal for the same work.

The proposer agrees that this proposal shall be good and may not be withdrawn for a period of 90 calendar days after the scheduled closing time for receiving proposals.

Upon receipt of written notice of the acceptance of this proposal, proposer will execute the formal contract attached within 10 days and deliver.

The names and addresses of all members of a firm or the names, addresses, and titles of every officer of a corporation as the case may be, must be given here by the member if the firm or by the officer or agent of the corporation who signs the Proposal.

Respectfully submitted:

_____	_____
Signature	Company Name
_____	_____
Title	Address
_____	_____
Date	Taxpayer ID Number
_____	_____
License Number (if applicable)	Telephone No.

SEAL – (If BID is by a corporation)

If a Partnership, state names and addresses of Partners here:

_____	_____
_____	_____
_____	_____

PUNCHEON RUN WASTEWATER PUMP STATION IMPROVEMENTS
ENGINEERING DESIGN SUPPORT
RFP NO.:18-0023PW
CITY OF DOVER, DELAWARE

PROPOSAL FORM

PROPOSAL ITEM	UNIT	COST
Services to be provided to complete the Scope of Work described in **IFP Section IV.A-D**, including permit costs	LS	
SUBTOTAL:		
CONTINGENCY ITEM	**UNIT**	**COST**
#1: Services to be provided to complete the Scope of Work described in **IFP Section IV.E**	LS	
#2: Services to be provided to complete the Scope of Work described in **IFP Section IV.F**	LS	
SUBTOTAL:		

GRAND TOTAL:

_____($_____)

CHECK THE APPROPRIATE BOXES:

REQUIRED CONTENT TO BE SUBMITTED WITH PROPOSAL	Yes	No
Firm Identification, as outlined per IFP, Section V.A		
Statement of Understanding, as outlined per IFP, Section V.B		
Proposer has attached proper information to satisfy the Selection Criteria, as outlined per IFP, Section VI.A		
Insurance Requirements, as outlined per IP, Section III.A		

_____
Contractor's Name

_____
Signature Title Date

END OF SECTION

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AGREEMENT FOR PROFESSIONAL SERVICES

THIS AGREEMENT is made as of the _____ day of _____ in the year 2018, between The City of Dover, a Delaware Municipal Corporation, whose address is 15 Loockerman Plaza, Dover, Delaware 19901 (hereinafter referred to as the CITY), and _____, whose address is, _____ (hereinafter referred to as the CONTRACTOR).

NOW, THEREFORE, in consideration of the mutual benefits accruing to the parties to this Agreement, and for other good and valuable considerations, the parties agree as follows:

1. SERVICES

The CONTRACTOR shall perform the following services: **SEE REQUEST FOR PROPOSAL FOR PUNCHEON RUN WASTEWATER PUMP STATION IMPROVEMENTS ENGINEERING DESIGN SUPPORT RFP NO.: 18-0023PW AND THE SUBMITTED PROPOSAL FORM.** Nothing herein shall limit the CITY's right to obtain proposals or services from other professionals for similar projects at any time the CITY so chooses.

2. INDEMNIFICATION

The CONTRACTOR, and any agent or subcontractor, shall defend, indemnify and hold harmless the CITY and its officials, officers, board members, council members, commissioners, representatives, employees, agents, and contractors, against any and all liability, costs, damages, fines, taxes, special charges by others, penalties, payments (including payments made under any Workers' Compensation Laws or under any plan for employees' disability and death benefits), and expenses (including reasonable attorney fees of the CITY and all other costs and expenses of litigation). Claims arising in any way, including any act, omission, failure, negligence or willful misconduct, in connection with the work, construction, maintenance, repair, presence, use, or operation by the CONTRACTOR, or the CONTRACTOR's officers, directors, employees, agents, and sub-contractors, shall be responsible for Claims. Such Claims include, but are not limited to, the following:

a. Intellectual property infringement, libel and slander, trespass, unauthorized use of television or radio broadcast programs and other program material, and infringement of patents;

b. Cost of work performed by the CITY that was necessitated by the CONTRACTOR's failure, or the failure of the CONTRACTOR's officers, directors, employees, agents, or sub-contractors, to perform work, or maintain CITY facilities in accordance with the requirements and specifications of this Agreement, or from any other work authorized under this Agreement;

c. Damage to property, injury to or death of any person arising out of the performance or nonperformance of any work or obligation undertaken by the CONTRACTOR, or CONTRACTOR's officers, directors, employees, agents, and sub-contractors, pursuant to this Agreement;

3. PROCEDURE FOR INDEMNIFICATION

a. The CITY shall give notice promptly to the CONTRACTOR of any claim or threatened claim, specifying the factual basis for such claim and the amount of the claim. If the claim relates to an action, suit or proceeding filed by a third party against the CITY, the notice shall be given to the CONTRACTOR by the CITY no later than ten (10) calendar days after written notice of the action, suit or proceeding was received by the CITY.

b. Failure to timely give the required notice will not relieve the CONTRACTOR from its obligation to indemnify the CITY unless the CITY is materially prejudiced by such failure.

c. The CITY will have the right at any time, by notice to the CONTRACTOR, to participate in or assume control of the defense of the claim with counsel of its choice, which counsel must be reasonably acceptable to the CONTRACTOR. The CONTRACTOR agrees to cooperate fully with the CITY. If the CITY so assumes control of the defense of any third-party claim, the CONTRACTOR shall have the right to participate in the defense at its own expense. If the CONTRACTOR does not so assume control or otherwise participate in the defense of any third-party claim, it shall be bound by the results obtained by the CITY with respect to the claim.

d. If the CITY assumes the defense of a third-party claim as described above, then in no event will the CITY admit any liability with respect to, or settle, compromise or discharge, any third-party claim without the CONTRACTOR's prior written consent, and the CONTRACTOR will agree to any settlement, compromise or discharge of any third-party claim which the CITY may recommend which releases the CITY completely from such claim.

e. Municipal Liability Limits. No provision of this Agreement is intended, or shall be construed, to be a waiver for any purpose by either entity of any applicable State limits on municipal liability.

f. Disclaimer. The CITY makes no express or implied warranties with regard to its structures, fixtures, materials, or other equipment, all of which are hereby disclaimed. The CITY makes no other express or implied warranties, except to the extent expressly set forth in this Agreement. The CITY expressly disclaims any implied warranties of merchantability or fitness for a particular purpose

g. Duty to Competent Supervision and Performance. The CONTRACTOR shall ensure that its employees, servants, agents, and subcontractors have the necessary qualifications, skill, knowledge, training, and experience to protect themselves, their fellow employees, employees of the CITY, and the general public, from harm or injury while performing work permitted pursuant to this Agreement. In addition, the CONTRACTOR shall furnish its employees, servants, agents, and subcontractors with competent supervision and sufficient and adequate tools and equipment for their work to be performed in a safe manner.

h. Duty to Inform. The CONTRACTOR further warrants that it understands the imminent dangers (INCLUDING SERIOUS BODILY INJURY OR DEATH FROM FALLING) inherent in the work necessary to perform the work expected under this agreement by the CONTRACTOR's employees, servants, agents, contractors or subcontractors, and accepts as its duty and sole responsibility to notify and inform the CONTRACTOR's employees, servants, agents, contractors or subcontractors of such dangers, and to keep them informed regarding same.

4. INSURANCE

a. Policies Required. At all times during the term of this Agreement, the CONTRACTOR shall keep in force and affect all insurance policies as described below:

b. Worker's Compensation and Employers' Liability Insurance. Statutory worker's compensation benefits and employers' liability insurance with a limit of liability no less than that required by Delaware law at the time of the application of this provision for each accident. This policy shall be endorsed to include a waiver of subrogation in favor of the City of Dover. The CONTRACTOR shall require subcontractors and others not protected under its insurance to obtain and maintain such insurance.

c. Commercial General Liability Insurance. Policy will be written to provide coverage for, but not limited to, the following: premises and operations, products and completed operations, personal injury, blanket contractual coverage, broad form property damage, independent contractor's coverage with limits of liability not less than $1,000,000 general aggregate, $1,000,000 products/completed operations aggregate, $1,000,000 personal injury, $2,000,000 each occurrence.

d. Automobile Liability Insurance. Business automobile policy covering all owned, hired and non-owned private passenger autos and commercial vehicles. Limits of liability not less than $1,000,000 each occurrence, $1,000,000 aggregate.

e. Qualification; Priority; Contractors' Coverage. The insurer must be authorized to do business under the laws of the State of Delaware. Such insurance will be primary. All contractors and all of their subcontractors who perform work on behalf of the CONTRACTOR shall be responsible for carrying, in full force and effect, worker's compensation and employer's liability, and automobile liability insurance coverage.

f. Certificate of Insurance; Other Requirements. At the execution of this Agreement and prior to each insurance policy expiration date during the term of this Agreement, the CONTRACTOR will furnish the CITY with a Certificate of Insurance with the CITY named as an additional insured. The Certificate shall reference this Agreement and worker's compensation and property insurance waivers of subrogation required by this Agreement. The CITY shall be given thirty (30) calendar days advance notice of cancellation or nonrenewal of insurance during the term of this Agreement.

g. Limits. The limits of liability set out in this Agreement may be increased by mutual consent of the parties, which consent will not be unreasonably withheld by either party, in the event of any factors or occurrences, including substantial increases in the level of jury verdicts or judgments or the passage of state, federal or other governmental compensation plans, or laws which would materially increase the CITY's exposure to risk.

h. Deductible/Self-insurance Retention Amounts. The CONTRACTOR shall be fully responsible for any deductible or self-insured retention amounts contained in its insurance program or for any deficiencies in the amounts of insurance maintained.

5. CODES, LAWS, AND REGULATIONS

The CONTRACTOR will comply with all applicable codes, laws, regulations, standards, and ordinances in force during the term of this Agreement.

6. PERMITS, LICENSES, AND FEES

The CONTRACTOR will obtain and pay for all permits and licenses required by law that are associated with the CONTRACTOR's performance of the Scope of Services.

7. ACCESS TO RECORDS

The CONTRACTOR will maintain accounting records, in accordance with generally accepted accounting principles and practices, to substantiate all invoiced amounts. Said records will be available for examination by the CITY during the CONTRACTOR's normal business hours. Said records will be maintained for a period of three (3) years after the date of the invoice.

8. CONTINGENT FEES PROHIBITED

The CONTRACTOR warrants that he or she has not employed or retained any company or person, other than a bona fide employee working solely for the CONTRACTOR, to solicit or secure this Agreement and that he or she has not paid or agreed to pay any person, company, corporation, individual, or firm, other than a bona fide employee working solely for the CONTRACTOR any fee, commission, percentage, gift, or other consideration contingent upon or resulting from the award or making of this Agreement. In the event of a breach of this provision, the CITY shall have the right to terminate this Agreement without further liability and at its discretion, deduct from the contract price, or otherwise recover, the full amount of any such fee, commission, percentage, gift or consideration paid in breach of this Agreement.

9. PAYMENT

It is understood and agreed by and between the parties hereto that this Contract is in the amount of _____ and _____ Dollars [$_____.___] as per the Proposal submitted by the Contractor on _____, 2018, and accepted by the City. All requests for payment shall be accompanied by supporting documentation which will include proof of the work performed in accordance to the Contract Documents and other CITY required supporting documentation. Any reimbursement for expenses shall include receipts or copies of the invoices. No other costs or services shall be billed to the CITY.

10. INDEPENDENT CONTRACTOR

The CONTRACTOR is an independent contractor and as such will be responsible for paying his own Federal income tax and self-employment tax, or any other taxes applicable to the compensation paid under this agreement.

11. ASSIGNMENT

Neither party shall have the power to assign any of the duties or rights or any claim arising out of or related to the Agreement, whether arising in tort, contract, or otherwise, without the written consent of the other party. These conditions and the entire Agreement are binding on the heirs, successors, and assigns of the parties hereto.

12. NO THIRD PARTY BENEFICIARIES

This Agreement gives no rights or benefits to anyone other than the CONTRACTOR and the CITY.

13. JURISDICTION

The laws of the State of Delaware shall govern the validity of this Agreement, its interpretation and performance, and any other claims related to it. In the event of any litigation arising under or construing this Agreement, venue shall lie only in Kent County, Delaware.

14. TERM AND TERMINATION

All or part of this Agreement may be terminated by the CITY for its convenience on thirty (30) days written notice to the CONTRACTOR. In such event, the CONTRACTOR will be entitled to compensation for services competently performed up to the date of termination. In the event of termination not the fault of the CONTRACTOR, the CONTRACTOR shall be compensated for with Reimbursable Expenses then due and all Termination Expenses.

15. CONTACT PERSON

The primary contact person under this Agreement for the CONTRACTOR shall be Name: _____, Phone No.:_____, Address:_____. The primary contact person under this Agreement for the CITY shall be Kate Mills, E.I.T., Department of Public Works.

16. APPROVAL OF SERVICE PERSONNEL

The CITY reserves the right to approve the contact person and the persons actually performing the services on behalf of the CONTRACTOR pursuant to this Agreement. If the CITY, in its sole discretion, is dissatisfied with the contact person or the person or persons actually performing the services on behalf of the CONTRACTOR pursuant to this Agreement, the CITY may require the CONTRACTOR assign a different person or persons be designated to be the contact person or to perform the services hereunder.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement on the respective dates under each signature.

(CONTRACTOR)	CITY OF DOVER
By: _____	By: Sharon J. Duca, P.E.
Title: _____	Title: Public Works Director / City Engineer
Signature: _____	Signature: _____
Date: _____	Date: _____

ATTACHMENT A

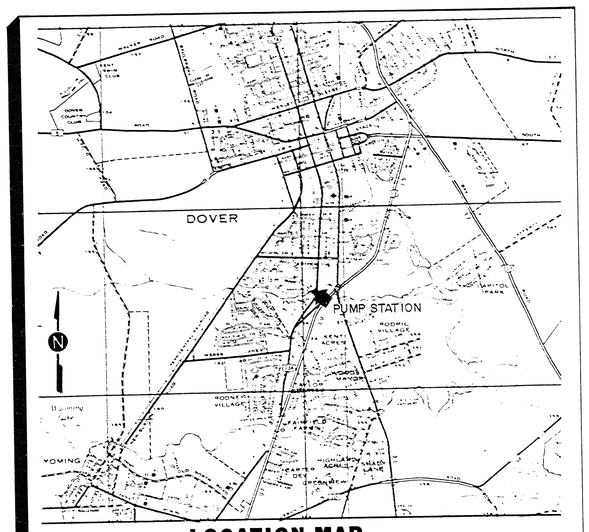
BASIS FOR PAYMENT

APPROVED
Department of
Natural Resources & Environmental Control
State of Delaware

By _____
DIVISION OF ENVIRONMENTAL CONTROL

CITY OF DOVER
KENT COUNTY, DELAWARE

PUNCHEON RUN SEWER FACILITIES PUMPING STATION



LOCATION MAP

CONTRACT No. 34-82-01
EPA PROJECT No. C-100126-02
FEB. 1983

NOTE: ORIGINAL PLANS SEPT. 1978
REVISIONS MAY 1982
JAN. 1983
FEB. 1983

APPROVED
Department of
Natural Resources & Environmental Control
State of Delaware
By Robert T. Quinn, P.E. 5/16/83
DIVISION OF ENVIRONMENTAL CONTROL

CITY OF DOVER

ALL DOCUMENTS INCLUDING DRAWINGS AND SPECIFICATIONS FURNISHED BY ENGINEER PURSUANT TO THIS AGREEMENT ARE INSTRUMENTS OF HIS SERVICES IN RESPECT OF THE PROJECT. THEY ARE NOT INTENDED OR REPRESENTED TO BE SUITABLE FOR REUSE BY OWNER OR OTHERS ON EXTENSIONS OF THE PROJECT OR ON ANY OTHER PROJECT. ANY REUSE WITHOUT SPECIFIC WRITTEN VERIFICATION OR ADAPTATION BY ENGINEER WILL BE AT OWNER'S SOLE RISK AND WITHOUT LIABILITY OR LEGAL EXPOSURE TO ENGINEER, AND OWNER SHALL INDEMNIFY AND HOLD HARMLESS ENGINEER FROM ALL CLAIMS, DAMAGES, LOSSES AND EXPENSES INCLUDING ATTORNEYS' FEES ARISING OUT OF OR RESULTING THEREFROM. ANY SUCH VERIFICATION OR ADAPTATION WILL ENTITLE ENGINEER TO FURTHER COMPENSATION AT RATES TO BE AGREED UPON BY OWNER AND ENGINEER.

NOTE:
REFER TO SPECIFICATIONS PRIOR TO CONSTRUCTION. PLANS AND SPECIFICATIONS MUST BE READ TOGETHER TO KNOW FULLY WHAT MUST BE BUILT.

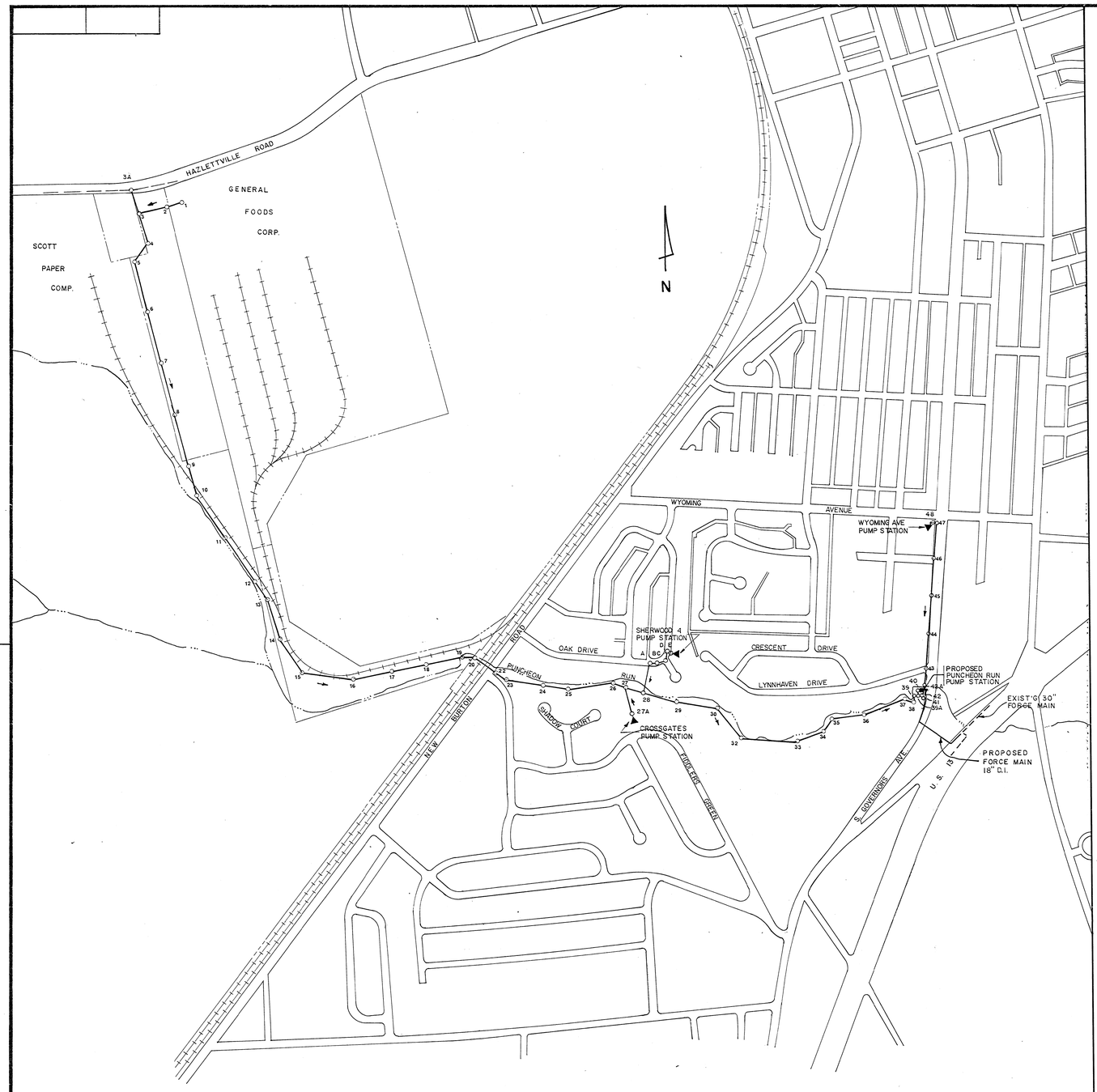
ROBERT T. QUINN
REGISTERED
NO. 3190
Robert T. Quinn

000015
SET NO. _____

Betz • Converse • Murdoch • Inc.
Potomac Group
VIENNA AND STAUNTON, VIRGINIA
BCM

Plan No. 100

86- Puncheon Run



PUMP STATION CONTRACT

GENERAL

100	Cover Sheet
101	Site Location Plan
102	Site Plan

ARCHITECTURAL

200	Architectural Floor Plan and Elevations
201	Sections and Details
202	Miscellaneous Details and Schedules

STRUCTURAL

300	Structural Plan and Section
301	Sectional Plan and Sections
302	Sections
303	Sections and Details
304	Standard Structural Details
305	Standard Structural Details
306	Standard Structural Details
307	Standard Structural Details

MECHANICAL

400	Pumping Station, Plans
401	Pumping Station, Plan and Sections
402	Pumping Station, Sections
403	Pumping Station, Sections
404	Pumping Station Details

HVAC

450	Heating, Ventilating and Plumbing - Plans and Details

ELECTRICAL

500	Electrical - Site Plan and Details
501	Electrical - Symbols and Abbreviations
502	Electrical - First Floor Plan
503	Electrical - Basement Plan
504	Electrical - Single Line Diagram

INSTRUMENTATION

550	Instrumentation and Control

INTERCEPTOR SEWER

608	Interceptor Sewer, Plan and Profile
610	Force Main, Plan and Profile
611	Soil, Erosion and Sedimentation Control Plan

Contractor shall notify Miss Utility 48 hours in advance of work in the vicinity of existing underground facilities by calling 800-282-8555.

Owners of underground facilities include:
Electrical, Water, and Sewer - City of Dover
Telephone - Diamond State Telephone Company
Gas - Chesapeake Utilities Corporation

REVISIONS		
DATE	DESCRIPTION	BY
5/20/82	UPDATE	PSW
2/83	Revised Sewer Alignment	JCO

DESIGN ENGR	FRM
DRAWN BY	KW
PROJECT ENG.	FRM
PROJECT MGR.	AJD
CHECKED BY	FRM
CHECKED BY	

ROBERT E. KLEIN REGISTERED NO. 8198 DELAWARE PROFESSIONAL ENGINEER

Betz • Converse • Murdoch • Inc.
Potomac Group
VIENNA AND STAUNTON, VIRGINIA

BCM

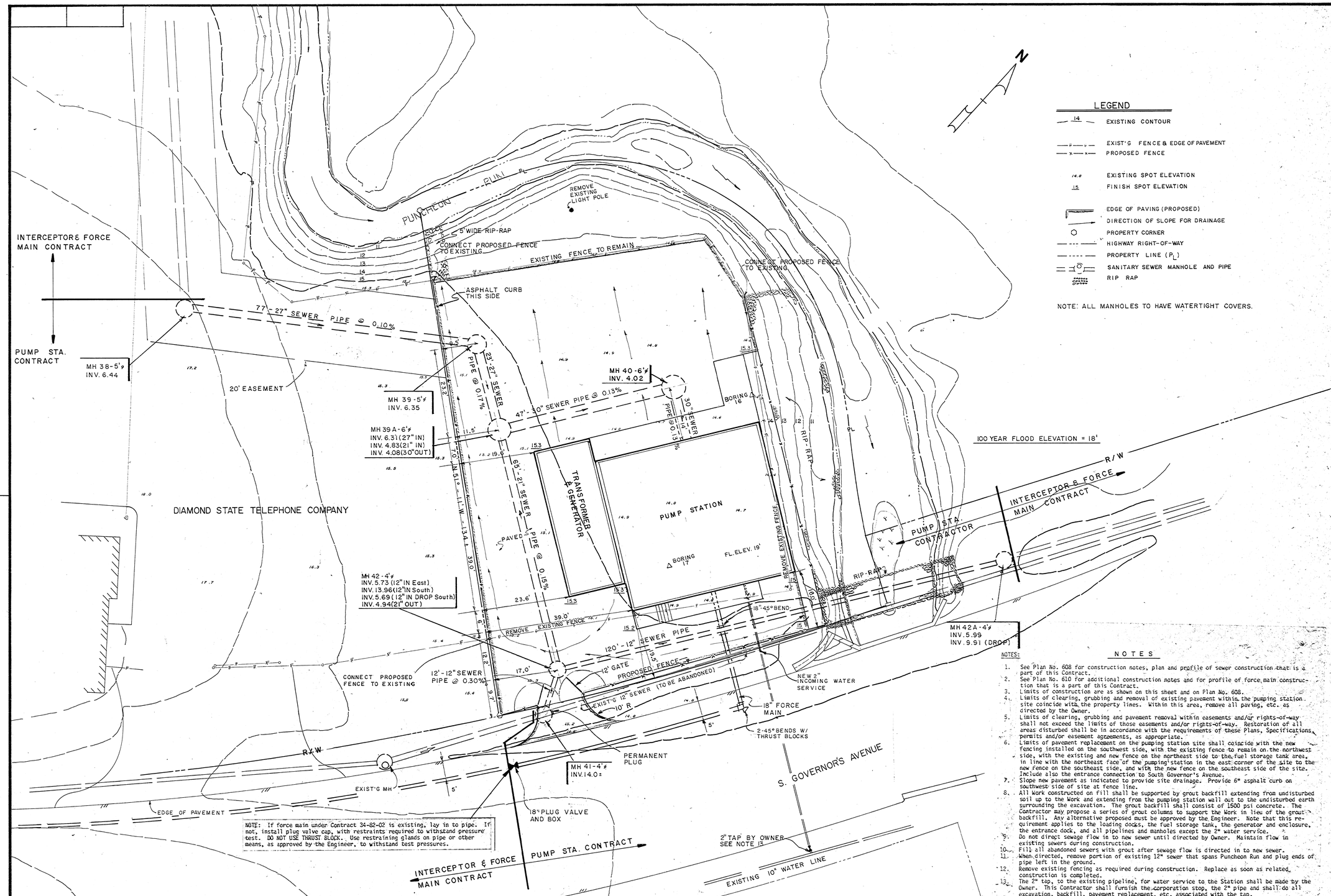
CITY OF DOVER
KENT COUNTY, DELAWARE

PUNCHEON RUN SEWER FACILITIES

SITE LOCATION PLAN

DATE: SEPT. 1978	FILE No.	W. O. No. 02-0034-03	PLAN No. 101

UPDATE: JAN. 1983



NOTE: If force main under Contract 34-82-02 is existing, lay in to pipe. If not, install plug valve cap, with restraints required to withstand pressure test. DO NOT USE THRUST BLOCK. Use restraining glands on pipe or other means, as approved by the Engineer, to withstand test pressures.

LEGEND

- EXISTING CONTOUR
- EXIST'G FENCE & EDGE OF PAVEMENT
- PROPOSED FENCE
- EXISTING SPOT ELEVATION
- FINISH SPOT ELEVATION
- EDGE OF PAVING (PROPOSED)
- DIRECTION OF SLOPE FOR DRAINAGE
- PROPERTY CORNER
- HIGHWAY RIGHT-OF-WAY
- PROPERTY LINE (P_L)
- SANITARY SEWER MANHOLE AND PIPE
- RIP RAP

NOTE: ALL MANHOLES TO HAVE WATERTIGHT COVERS.

NOTES

1. See Plan No. 608 for construction notes, plan and profile of sewer construction that is a part of this Contract.
2. See Plan No. 610 for additional construction notes and for profile of force main construction that is a part of this Contract.
3. Limits of construction are as shown on this sheet and on Plan No. 608.
4. Limits of clearing, grubbing and removal of existing pavement within the pumping station site coincide with the property lines. Within this area, remove all paving, etc. as directed by the Owner.
5. Limits of clearing, grubbing and pavement removal within easements and/or rights-of-way shall not exceed the limits of those easements and/or rights-of-way. Restoration of all areas disturbed shall be in accordance with the requirements of these Plans, Specifications, permits and/or easement agreements, as appropriate.
6. Limits of pavement replacement on the pumping station site shall coincide with the new fencing installed on the southwest side, with the existing fence to remain on the northwest side, with the existing and new fence on the northeast side to the fuel storage tank area, in line with the northeast face of the pumping station in the east corner of the site to the new fence on the southeast side, and with the new fence on the southeast side of the site. Include also the entrance connection to South Governor's Avenue.
7. Slope new pavement as indicated to provide site drainage. Provide 6" asphalt curb on southwest side of site at fence line.
8. All Work constructed on fill shall be supported by grout backfill extending from undisturbed soil up to the Work and extending from the pumping station wall out to the undisturbed earth surrounding the excavation. The grout backfill shall consist of 1500 psi concrete. The Contractor may propose a series of grout columns to support the Work in lieu of the grout backfill. Any alternative proposed must be approved by the Engineer. Note that this requirement applies to the loading docks, the fuel storage tank, the generator and enclosure, the entrance dock, and all pipelines and manholes except the 2" water service.
9. Do not direct sewage flow in to new sewer until directed by Owner. Maintain flow in existing sewers during construction.
10. Fill all abandoned sewers with grout after sewage flow is directed in to new sewer.
11. When directed, remove portion of existing 12" sewer that spans Puncheon Run and plug ends of pipe left in the ground.
12. Remove existing fencing as required during construction. Replace as soon as related construction is completed.
13. The 2" tap, to the existing pipeline, for water service to the Station shall be made by the Owner. This Contractor shall furnish the corporation stop, the 2" pipe and shall do all excavation, backfill, pavement replacement, etc. associated with the tap.

SCALE 1"=10'

REVISIONS		
DATE	DESCRIPTION	BY
5/20/82	PUMP STATION RELOCATED	PSW
1/83	GENERATOR MOVED & BUILDING ELIMINATED	TAH
2/83	VARIOUS CHANGES/NOTES ADDED	JCG

DESIGN ENGR.	FRM
DRAWN BY CAS	KW
PROJECT ENG.	FRM
PROJECT MGR.	AJD
CHECKED BY	FRM
CHECKED BY	

ROBERT W. HERRON REGISTERED PROFESSIONAL ENGINEER NO. 3498 STATE OF DELAWARE

Betz • Converse • Murdoch • Inc.
Potomac Group
VIENNA AND STAUNTON, VIRGINIA

BCM

CITY OF DOVER
KENT COUNTY, DELAWARE

PUNCHEON RUN SEWER FACILITIES

PUMPING STATION SITE PLAN

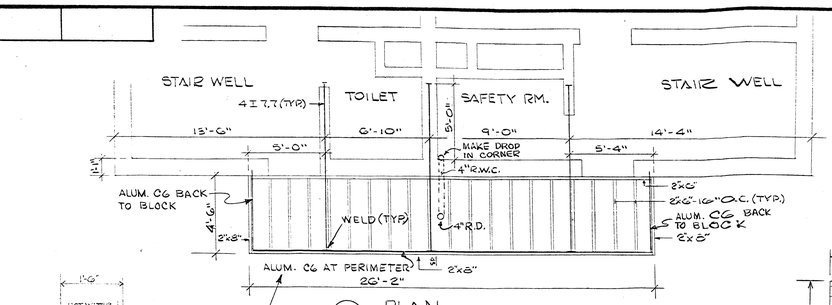
DATE: SEPT. 1978 | FILE No. | W.O. No. 02-0034-02 | PLAN No. 102

UPDATE: JAN. 1983

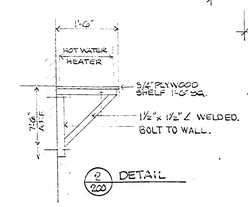
ABBREVIATIONS

AL-ALUM	- ALUMINUM	F.E.	- FIRE EXTINGUISHER	LND'G	- LANDING	R.D.	- ROOF DRAIN
BRG	- BEARING	FLDR	- FLOOR DRAIN			REINF.	- REINFORCING
		FLASH'G	- FLASHING	MAT.	- MATERIAL	R.W.C.	- RAIN WATER CONDUCTOR
CONC	- CONCRETE	FT.	- FOOT	M.O.	- MASONRY OPENING		
CONT	- CONTINUOUS	F.B.	- FLAT BAR	MIN.	- MINIMUM	R	- RISER
C.M.U.	- CONCRETE MASONRY UNIT			MAX.	- MAXIMUM	RM	- ROOM
CER.T.	- CERAMIC TILE	GRAT'G	- GRATING	MCC	- MOTOR CONTROL CENTER		
C.J.	- CONTROL JOINT	GR.	- GRADE			SQ	- SQUARE
DN	- DOWN	HT.	- HEIGHT	O.C.	- ON CENTER	TYP	- TYPICAL
E.W.	- EACH WAY	HVY	- HEAVY	PL.	- PLATE	THK	- THICK
EXP.JT	- EXPANSION JOINT	HDWR	- HARDWARE	P	- PAINT	W	- WIDE
EL.	- ELEVATION	INSUL.	- INSULATION				

NORTH

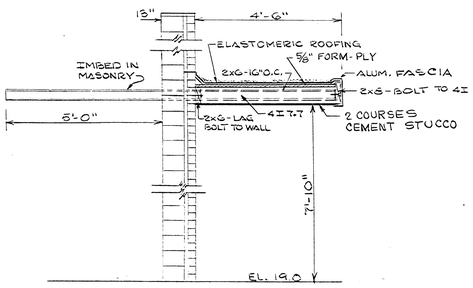


4/200 PLAN
1/4" = 1'-0"

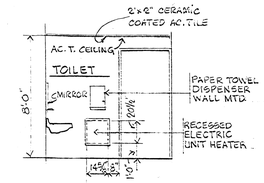


2/220 DETAIL

SEE DETAIL -1 SHEET 300

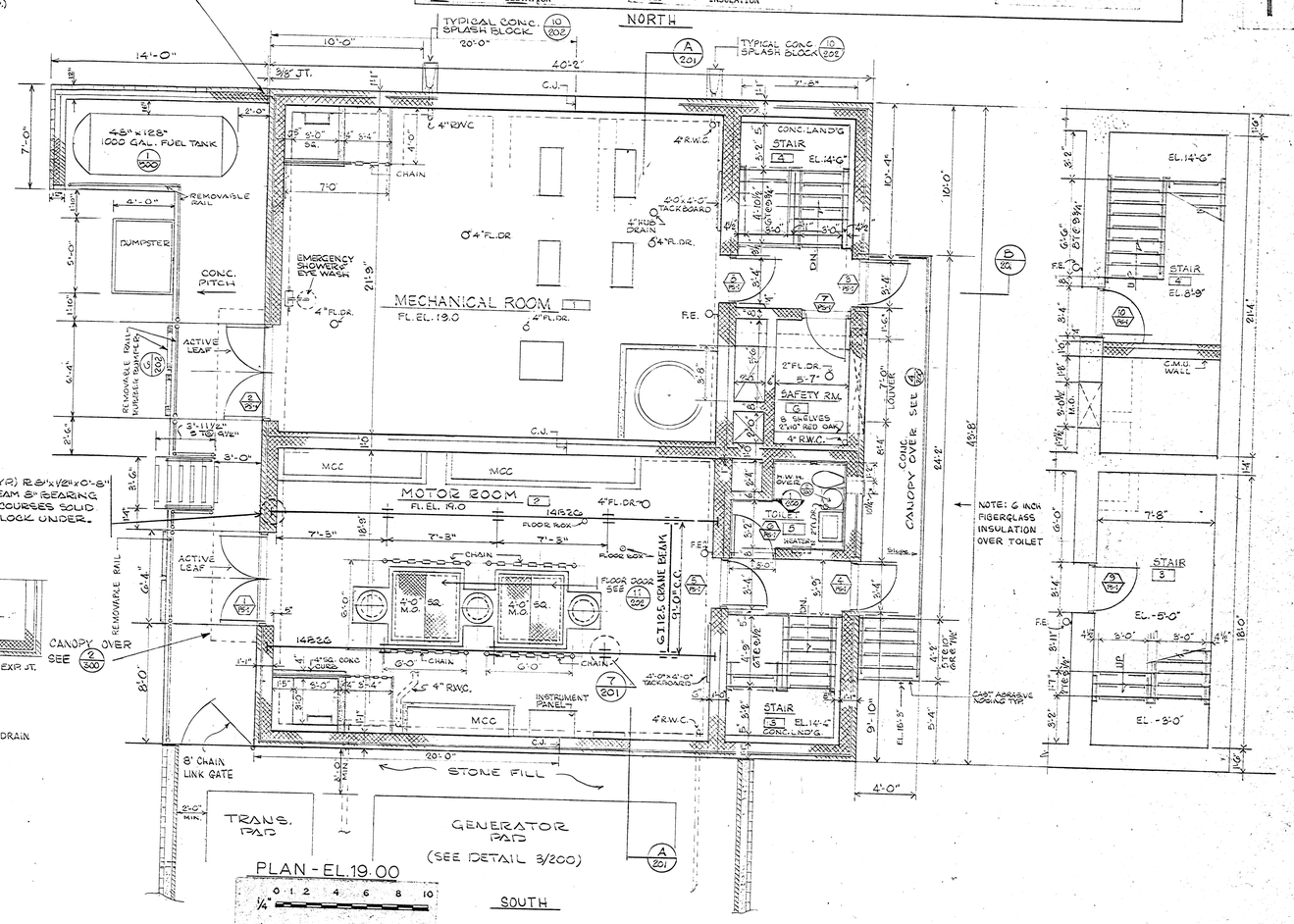


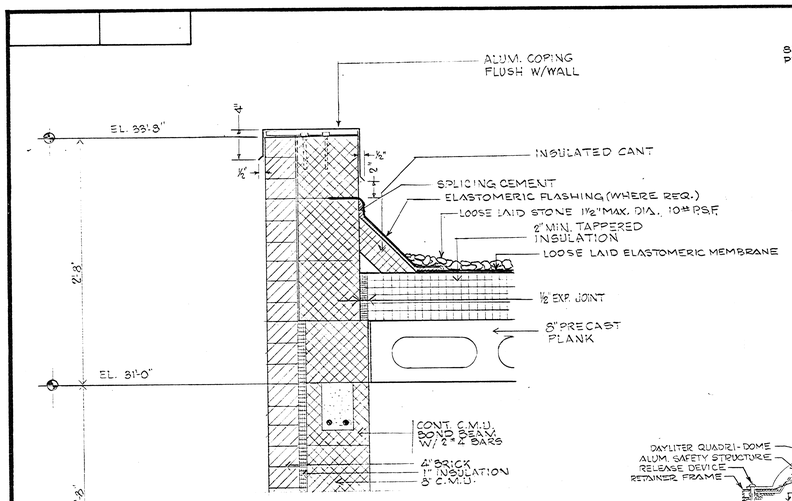
4/200 SECTION
1/2" = 1'-0"

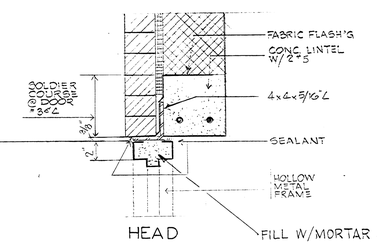


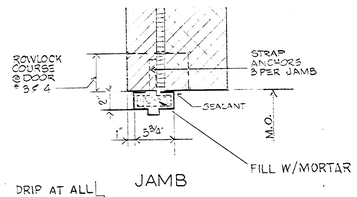
1/200 INTERIOR ELEVATION
1/4" 0 1 2 4 6

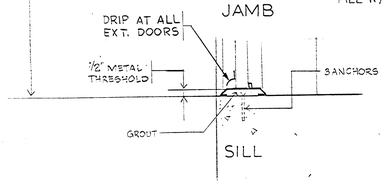
WALL ANCHORS - 2"x2" ∠ W/ ¼" x 1½" FLAT BARS @ 16" OC.

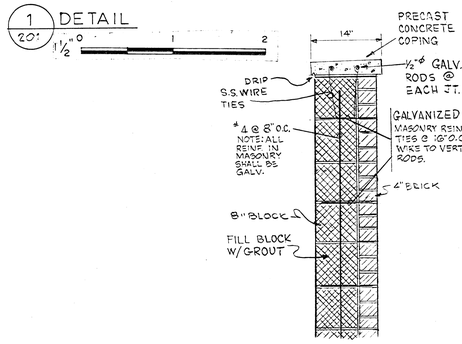

TYPICAL CONC. SPLASH BLOCK 10/202
20'-0"
14'-0"
10'-0"
3/8" JT.
40'-2"
C.J.
7'-2"
TYPICAL CONC SPLASH BLOCK 10/202
A/201
7'-0"
48"x128" 1000 GAL. FUEL TANK 1/200
2'-0"
C 4" R.W.C.
4" R.W.C.
CONC. LAND'G
STAIR 4
EL. 14'-6"
4'-0"
REMOVABLE RAIL
CHAIN
7'-0"
4'-0"
DUMPSTER
CONC. PITCH
EMERGENCY SHOWER & EYE WASH
4" FL. DR.
MECHANICAL ROOM 1
FL. EL. 19.0
4" FL. DR.
4'-0"x4'-0" TACKBOARD
4" HUB DRAIN
4" FL. DR.
ACTIVE LEAF
REMOVABLE BOLLARDS 6/202
2'-6"
3'-0"
C.J.
MCC
MCC
MOTOR ROOM 2
FL. EL. 19.0
4" FL. DR.
2" FL. DR.
5'-7"
SAFETY RM. 6
8 SHELVES 2"x10" RED OAK
4" R.W.C.
F.E.
7'-5"
7'-5"
7'-5"
CHAIN
FLOOR BOX
FLOOR BOX
FLOOR DOOR SEE 13/202
14B2G
4" SQ. COND. 4 WIRES
4" R.W.C.
INSTRUMENT PANEL
MCC
4'-0"x4'-0" TACKBOARD
4" R.W.C.
C.J.
8' CHAIN LINK GATE
20'-0"
STONE FILL
2'-0" MIN.
TRANS. PAD
GENERATOR PAD
(SEE DETAIL 3/200)
A/201
(TYP.) R 8"x12"x12"x0'-8" BEAM & BEARING 2 COURSES SOLID BLOCK UNDER.
G 12.5 CRANE BEAM
21'-0" C.C.
TOILET 5
FLR. DR.
HEATER
F.E.
5'-0"
5'-0"
5'-0"



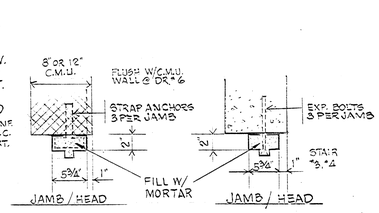








1 / 201 DETAIL
1½" 0 1 2

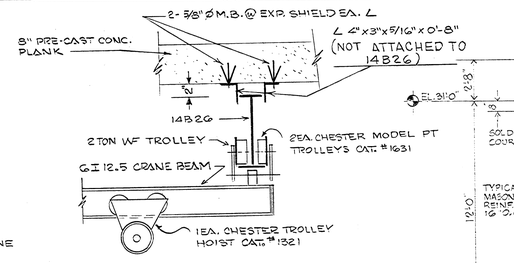


3 / 201 DETAIL

4 / 201 DETAIL

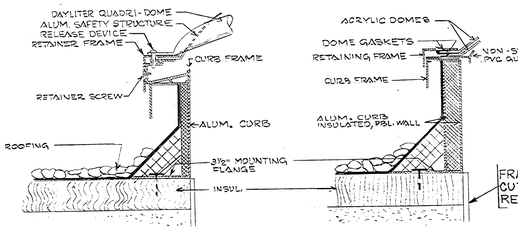
1" 0 1 2 3

5 / 201 DETAIL
1" 0 1 2 3

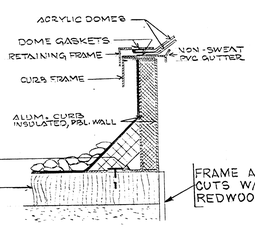


7 / 201 DETAIL
N.T.S.

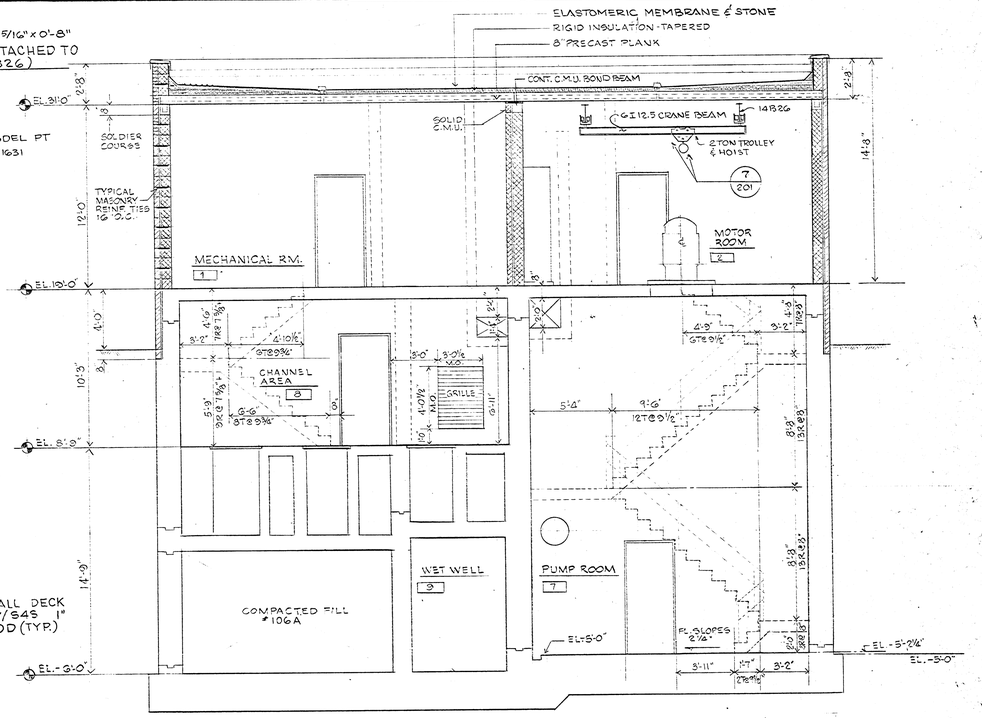
UNDERHUNG CRANE



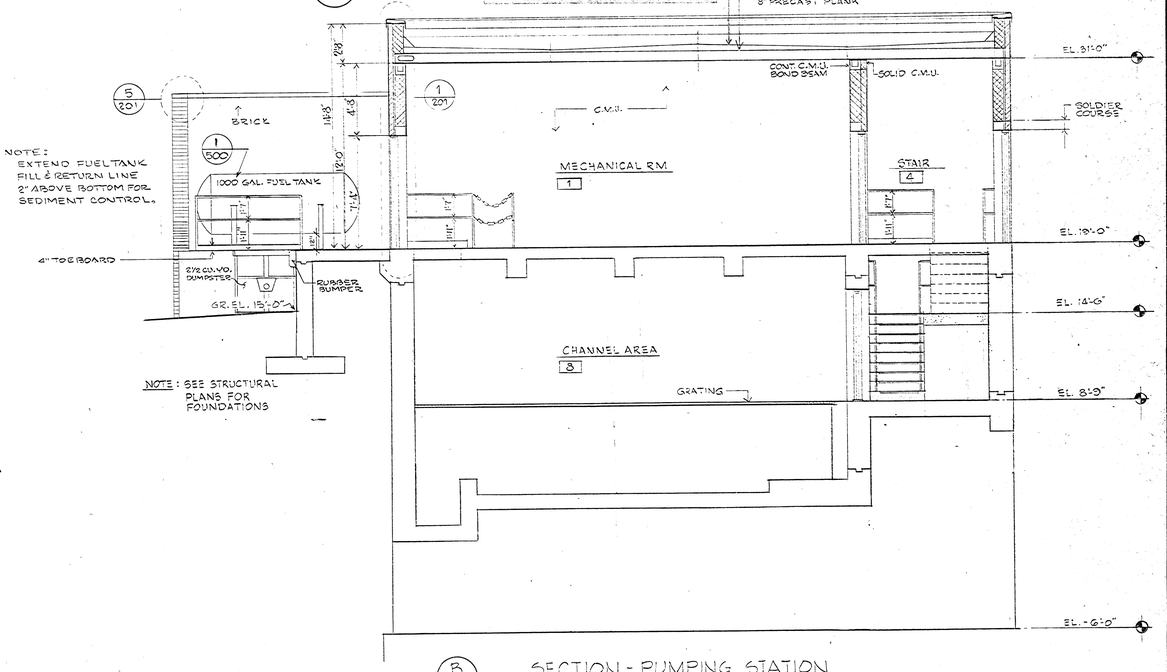
4'x4' EXPLOSION RELIEF VENT IN MECH. & MOTOR ROOM



2'x2' SKYLIGHTS @ STAIR CORRIDOR (2EA.)



A / 201 SECTION
1/4" 0 1 2 4 6 8 10



NOTE: EXTEND FUEL TANK FILL & RETURN LINE 2" ABOVE BOTTOM FOR SEDIMENT CONTROL.

NOTE: SEE STRUCTURAL PLANS FOR FOUNDATIONS

B / 201 SECTION - PUMPING STATION
1/4" 0 2 4 6 8 10

REVISIONS		
DATE	DESCRIPTION	BY
3 MAY 82	BREAK BETWEEN BUILDINGS (SEC. B)	SMT
9 DEC. 82	REV. ROOF, ADD SKYLIGHT DETAIL	RJS
12 DEC. 82	REV. CRANE & ADD DETAIL 7/201	RJS
11 JAN 83	REV. 5/201, BLOCK INSIDE OF WALL	PRS
2/83	VARIOUS CHANGES	JCO

DESIGN ENGR. EGT
DRAWN BY MG
PROJECT ENG.
PROJECT MGR. RJS
CHECKED BY EGT
CHECKED BY

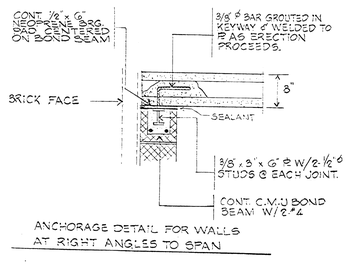
ROBERT E. HEISEY REGISTERED NO. 2196 PROFESSIONAL ENGINEER DELAWARE

Betz • Converse • Murdoch • Inc.
Potomac Group
VIENNA AND STAUNTON, VIRGINIA
BCM

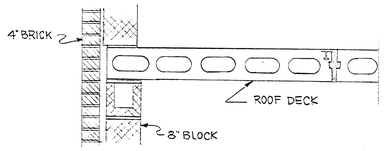
CITY OF DOVER
KENT COUNTY, DELAWARE
PUNCHEON RUN SEWER FACILITIES
PUMPING STATION
SECTIONS & DETAILS

DATE: SEPT. 1978 | FILE No. | W. O. No. 02-0034-03 | PLAN No. 201

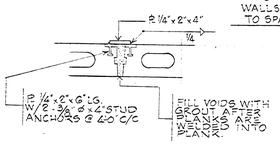
UPDATE: JAN. 1983



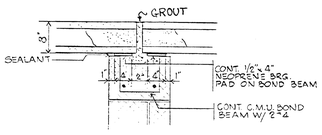
ANCHORAGE DETAIL FOR WALLS AT RIGHT ANGLES TO SPAN



ANCHORAGE DETAIL FOR WALLS PARALLEL TO SPAN (WITH PARAPET)

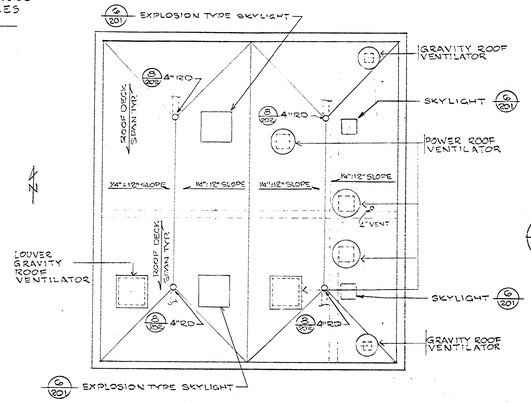


TYPICAL CONNECTION BETWEEN PLANKS



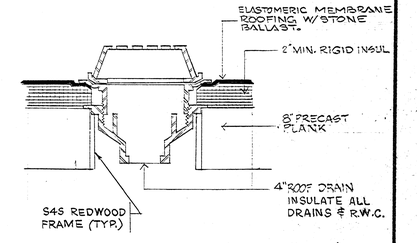
TYPICAL DETAIL FOR INSIDE WALLS AT RIGHT ANGLES TO SPAN

1 / 202 TYPICAL PRECAST PLANK TO WALL CONNECTIONS

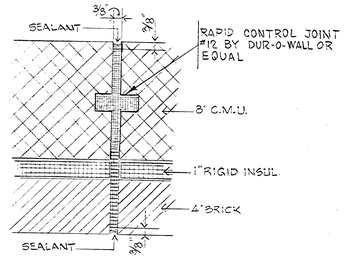


ROOF PLAN

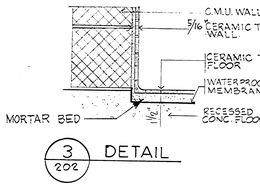
1/8" 0 2 4 8 12 16 20



8 / 202 TYPICAL ROOF DRAIN

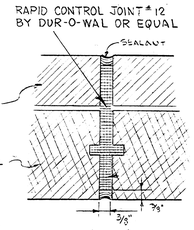


2 / 202 TYPICAL CONTROL JOINT

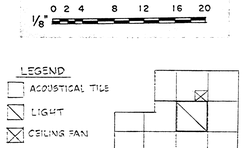


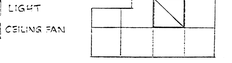
3 / 202 DETAIL

4 / 202 DETAIL



12 / 202 ENCLOSURE WALL CONTROL JOINT (TYP.)





ROOM FINISH SCHEDULE

NO	NAME	FLOOR	WALLS	CEILING	REMARKS
1	MECHANICAL RM.	CONC. *	C.M.U. P-2	PLANK P-2	
2	MOTOR RM.	*			
3	STAIR				
4	STAIR	↓	↓	↓	
5	TOILET	¼" CERAMIC TILE	5/16" CERAMIC TILE	2'x2' AC. TILE @ 10'-4"	RECESS FL. 1½" FOR CER. TILE
6	SAFETY RM.	CONC. *	C.M.U. P-2	PLANK P-2	
7	PUMP RM.	↓	CONC.	CONC.	
8	CHANNEL AREA	CONC. GRAT'G	↓	↓	■ CHANNELS - PAINT W/SYSTEM 9
9	WET WELL	CONC	↓	↓	■

PAINT P-1 ALL HOLLOW METAL DOORS & FRAMES BLACK - SHERWIN WILLIAMS - B 89-B-10

P-2 PAINT ALL INTERIOR CONCRETE WALLS & CEILING (PRE-CAST PLANK) WHITE - SHERWIN WILLIAMS - DOVER WHITE.

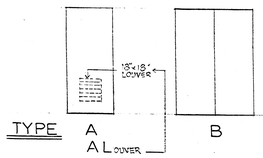
* CONC. W/ HARDENER - FRENCH GRAY

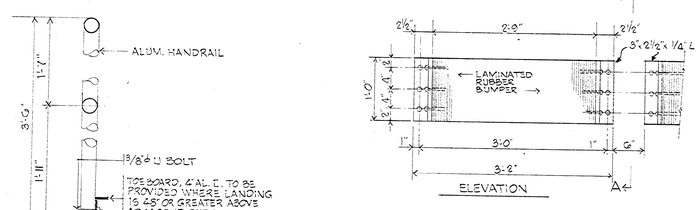
■ MEMBRANE WATERPROOFING ON WALL

DOOR SCHEDULE

NO	TYPE	HT.	WIDTH	THK.	MAT.	HEAD	JAMB	SILL	HDWR.	REMARKS
1	B	7'-2"	2@3'-0"	1¾"	H.M. ◣	1/201	1/201	1/201	1	PANIC ACTIVE LEAF
2	↓	↓	↓						1	↓
3	A Louver	7'-2"	3'-0"						2	PANIC
4						↓	↓	↓	2	↓
5	↓	↓	↓			3/201	3/201	1/201	3	PANIC "B" LABEL
6	A		2'-8"					4/202	4	
7			3'-0					1/201	5	
8						↓	↓	↓	3	PANIC "B" LABEL
9	↓	↓	↓	↓	↓	4/201	4/201	1/201	3	WEATHERSTRIP
10	↓	↓	↓	↓	↓	4/201	4/201	1/201	3	↓ ↓ ↓

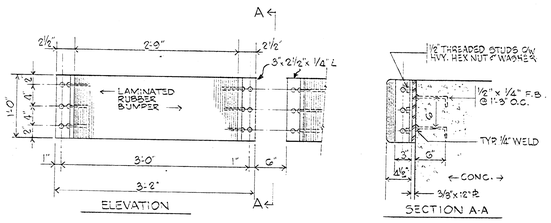
NOTE -- LIVE LOAD - 150 # PSF ◣ INSULATE ALL DOORS



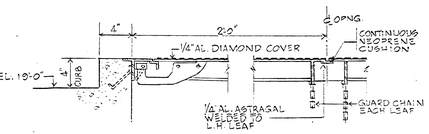


DETAIL @ CONC. LANDING

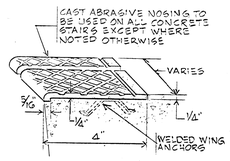
5 / 202 TYP. HANDRAIL



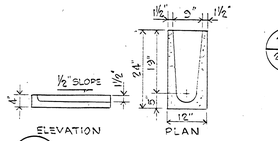
6 / 202 RUBBER DOCK BUMPER DETAIL



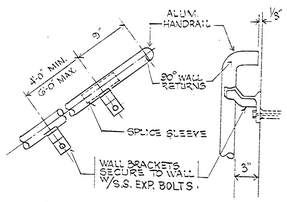
11 / 202 FLOOR DOOR DETAIL



7 / 202 TYPICAL NOSING FOR CONC. STAIRS & LND'G.



10 / 202 TYP. SPLASH BLOCK CONC.



9 / 202 TYP. WALL MTD. HANDRAIL

ALL DETAILS NOT TO SCALE EXCEPT AS NOTED

REVISIONS		
DATE	DESCRIPTION	BY
12-9-82	ADD ROOF DRAINS & SKYLIGHTS	TRS
1 JAN 83	REV. 12/202 ADD 4" BLOCK	TRS
2/83	VARIOUS CHANGES	JCO

DESIGN ENGR. GRAT	
DRAWN BY MG	
PROJECT ENG.	
PROJECT MGR. RGG	
CHECKED BY GRAT	
CHECKED BY	

ROBERT R. REEDY REGISTERED PROFESSIONAL ENGINEER DELAWARE NO. 3196

Betz • Converse • Murdoch • Inc.
Potomac Group
VIENNA AND STAUNTON, VIRGINIA

BCM

CITY OF DOVER
KENT COUNTY, DELAWARE

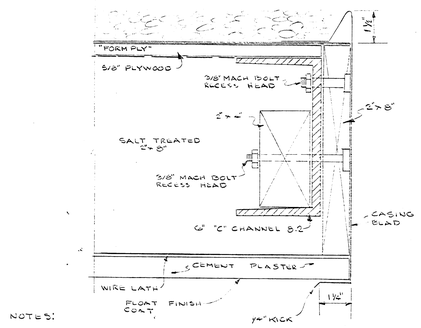
PUNCHEON RUN SEWER FACILITIES

PUMPING STATION

MISCELLANEOUS DETAILS & SCHEDULES

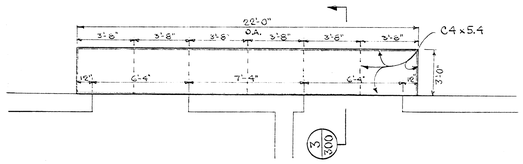
DATE: SEPT. 1978 | FILE No. | W. O. No. 02-0034-03 | PLAN No. 202

UPDATE: JAN. 1983

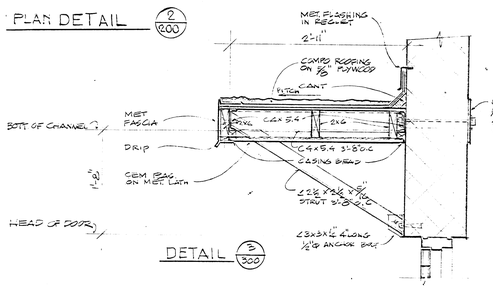


NOTES:
1. 2-COURSE CEMENT PLASTER
2. FLOAT FIN COURSE
3. 7/15 CONTROL JOINT @ 10'-0" ℄
4. GALVANIZED 3.4 3/8" RIB LATH ON 2 1/2"
5. EXPANDED CASING BEAD AROUND PERIMETER

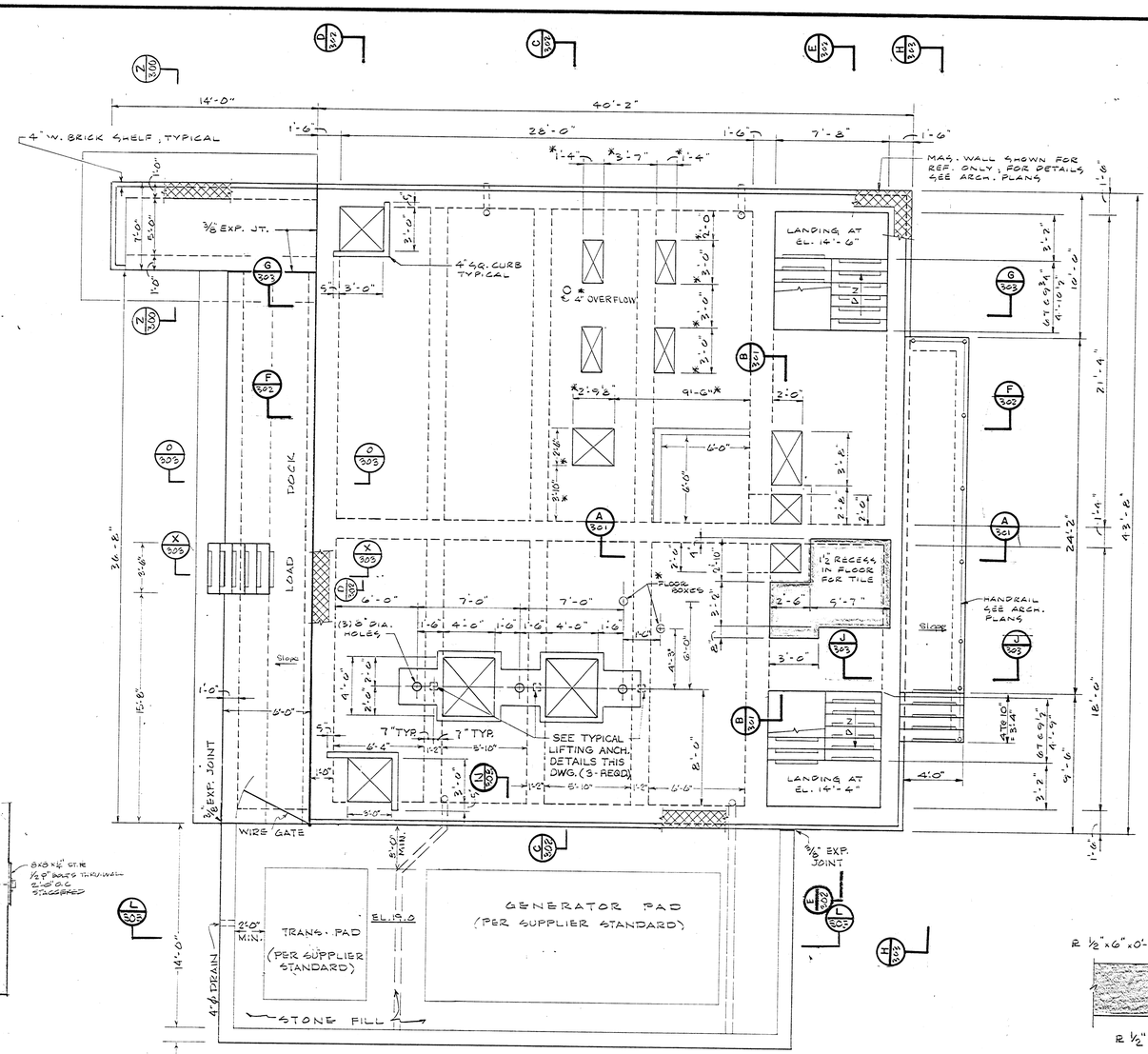
DETAIL 1/300



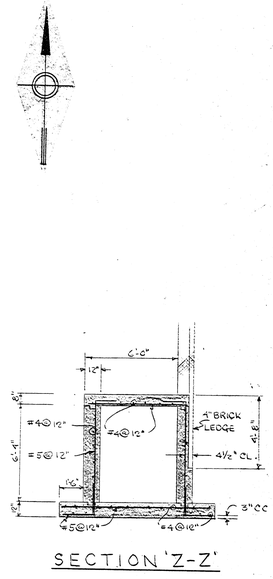
PLAN DETAIL 2/200



DETAIL 3/300

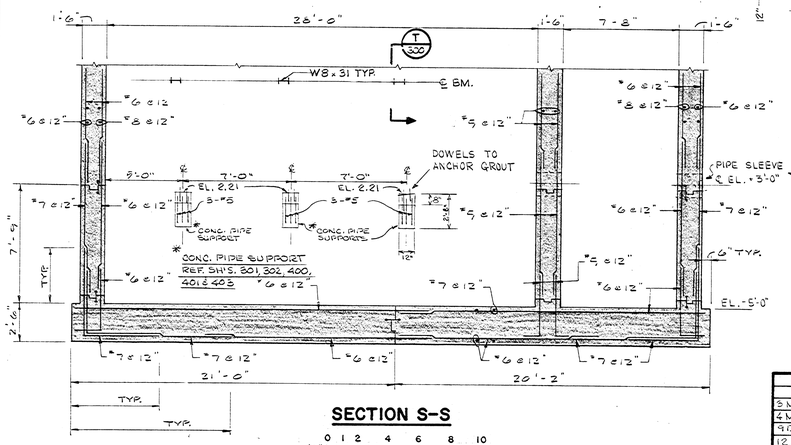


TOP PLAN 1/4" = 1'-0"

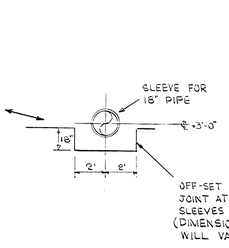


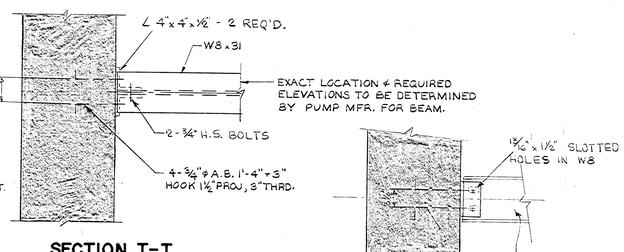
SECTION 'Z-Z'
1/2" = 1'-0"

* LOCATIONS SHOWN ARE APPROXIMATE. LOCATE BASED ON EQUIPMENT FURNISHED.

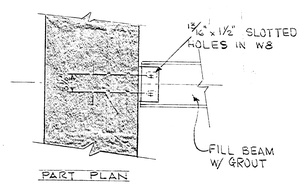


SECTION S-S
1/4" 0 1 2 4 6 8 10

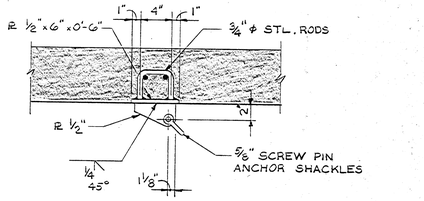


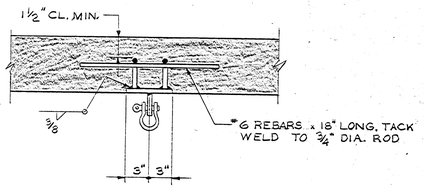


SECTION T-T
1" 0 1 2 3



PART PLAN





TYPICAL LIFTING ANCHOR DETAILS
N.T.S.

REVISIONS			DESIGN ENGR.
DATE	DESCRIPTION	BY	
3 MAY 82	BREAK BETWEEN BUILDINGS	SMT	DRAWN BY D.R.S.
4 MAY 82	ADD PART PLAN TO SECTION T-T	SMT	PROJECT ENG.
9 DEC 82	RELOC. GEN. PAD'G, ADD FLOOR BOXES	PDS	PROJECT MGR.
12 JAN 83	ADD 16" PIPE SUPPORTS	PDS	CHECKED BY
2/83	VARIOUS CHANGES	JOO	CHECKED BY

ROBERT G. HESSON REGISTERED No. 3196 DELAWARE

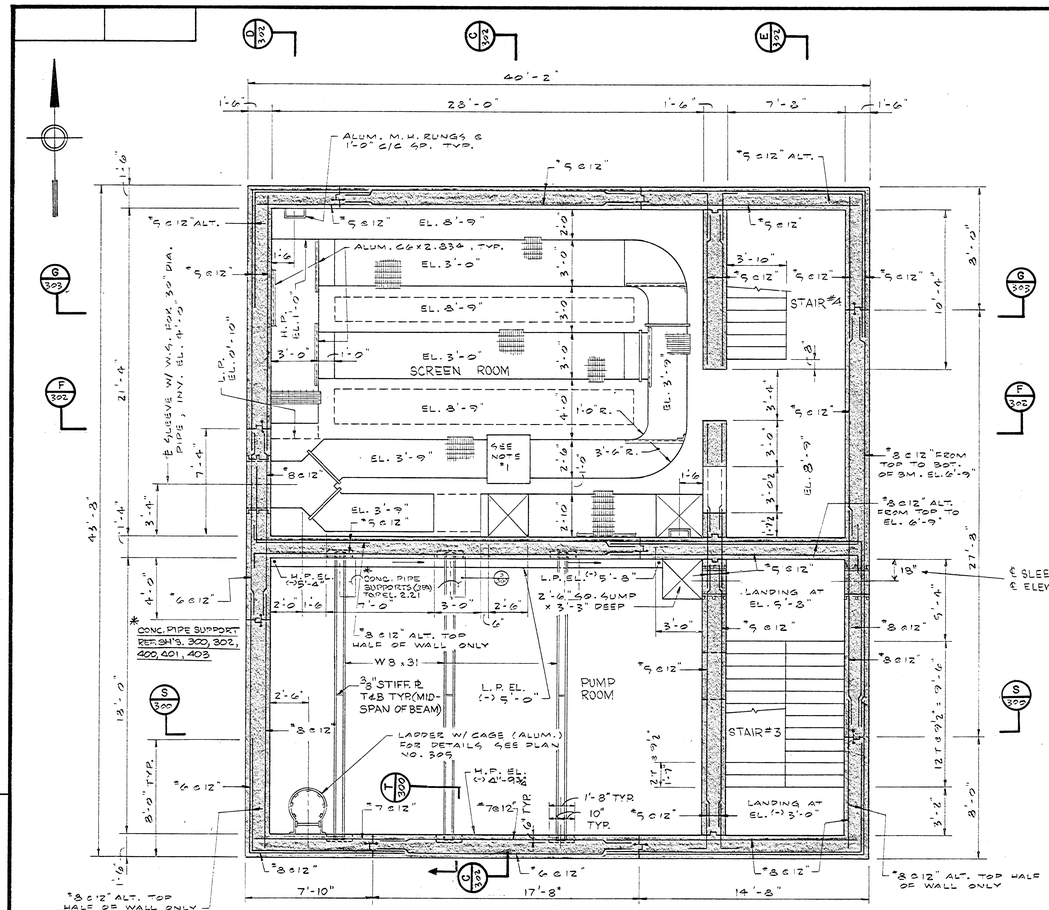
Betz • Converse • Murdoch • Inc.
Potomac Group
VIENNA AND STAUNTON, VIRGINIA

BCM

CITY OF DOVER
KENT COUNTY, DELAWARE
PUNCHEON RUN SEWER FACILITIES
PUMPING STATION
STRUCTURAL PLAN & SECTIONS

DATE: SEPT. 1978 | FILE No. | W.O. No. 02-0034-03 | PLAN No. 300

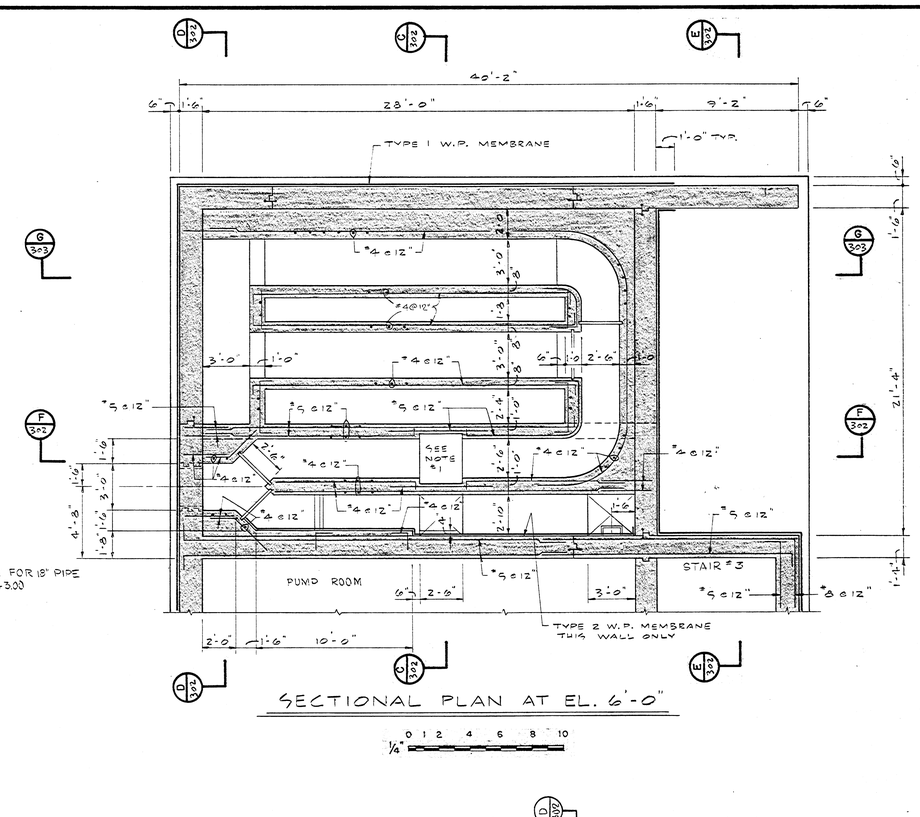
UPDATE: JAN. 1983



SECTIONAL PLAN AT EL. 12'-0"

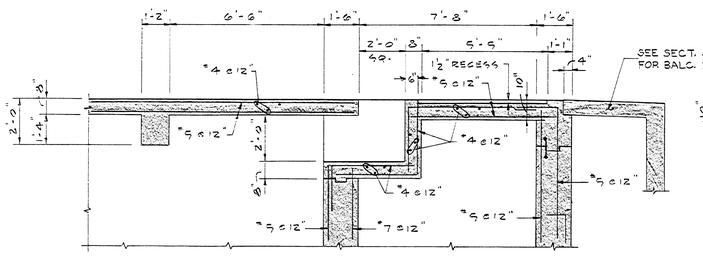
1/4" 0 1 2 4 6 8 10

NOTE 1. OPENING SIZE AND LOCATION OF BAR SCREEN TO BE VERIFIED FROM APPROVED VENDOR DRAWINGS.



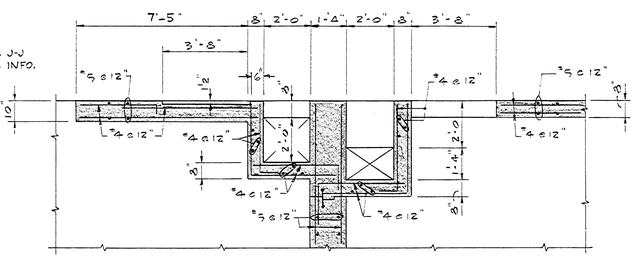
SECTIONAL PLAN AT EL. 6'-0"

1/4" 0 1 2 4 6 8 10



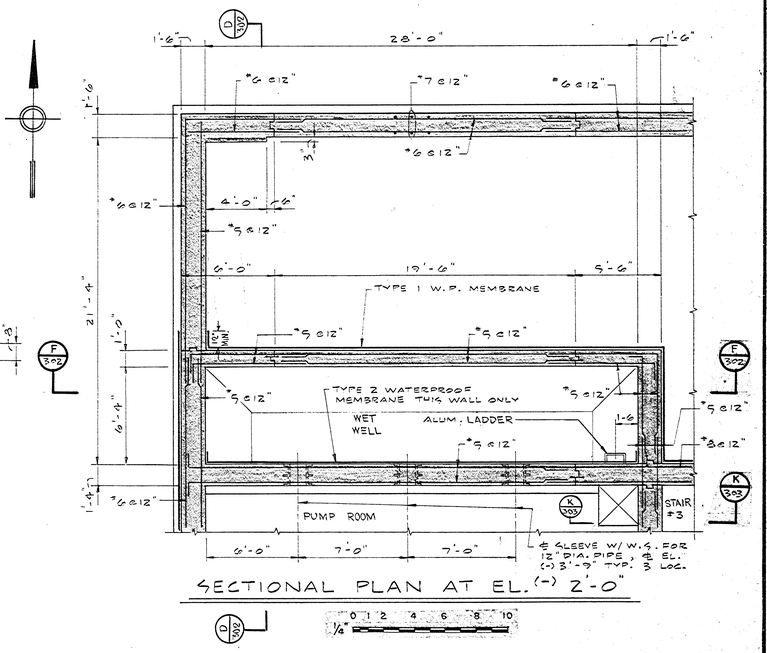
SECTION A-A

3/8" 0 1 2 3 4 5 6 7



SECTION B-B

3/8" 0 1 2 3 4 5 6 7



SECTIONAL PLAN AT EL. (-) 2'-0"

1/4" 0 1 2 4 6 8 10

REVISIONS			DESIGN ENGR.
DATE	DESCRIPTION	BY	
12 JAN. 83	ADD CONC PIPE SUPPORTS	BS	DRAWN BY D.R.S.
			PROJECT ENG.
			PROJECT MGR.
			CHECKED BY
			CHECKED BY

ROBERT H. REESE REGISTERED NO. 2196 DELAWARE

Betz • Converse • Murdoch • Inc.
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VIENNA AND STAUNTON, VIRGINIA
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CITY OF DOVER
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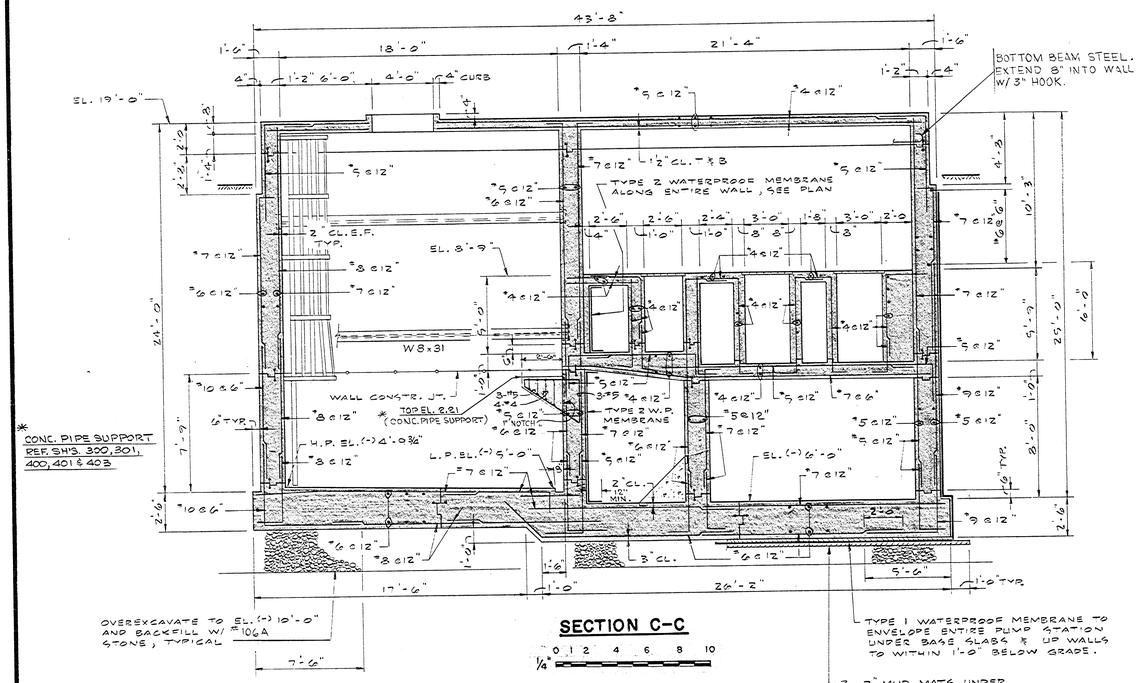
PUMPING STATION
SECTIONAL PLANS & SECTIONS

DATE: SEPT. 1978 | FILE No. | W.O. No. 82-0034-03 | PLAN No. 301

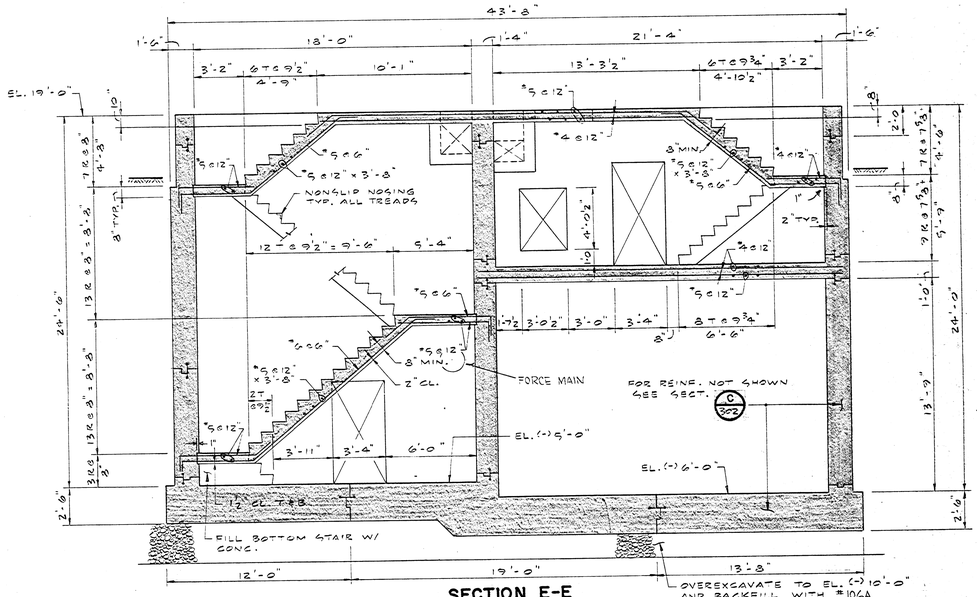
UPDATE: JAN. 1983



* CONC. PIPE SUPPORT REF. SHTS. 300, 301, 400, 401 & 403

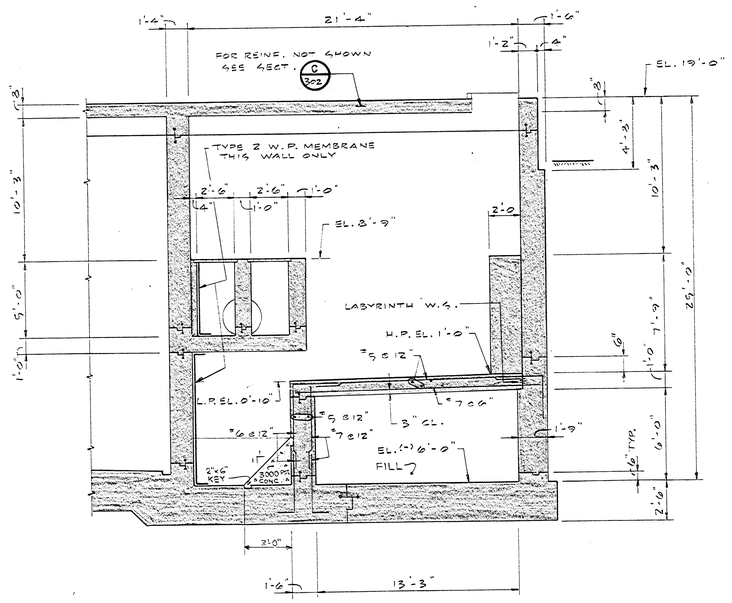
SECTION C-C

1/4" 0 1 2 4 6 8 10



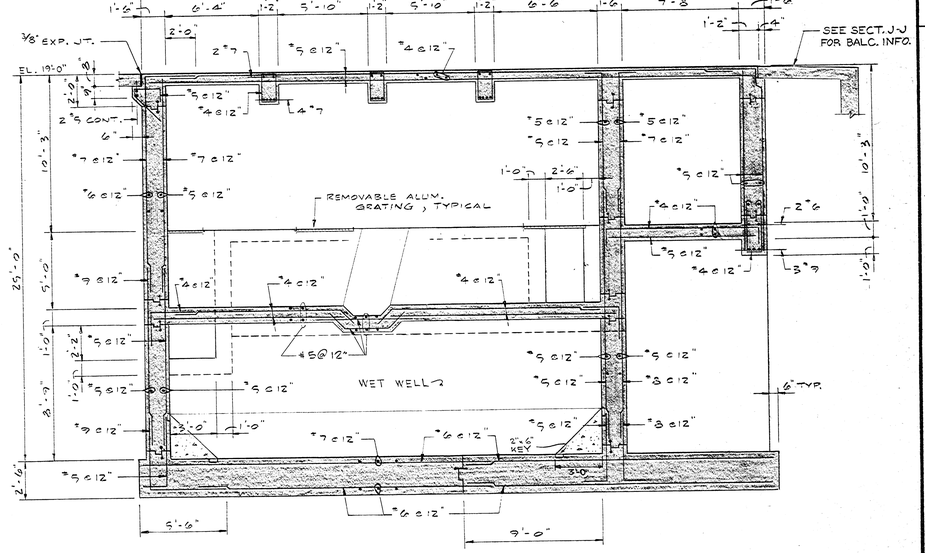
SECTION E-E

1/4" 0 1 2 4 6 8 10



SECTION D-D

1/4" 0 1 2 4 6 8 10



SECTION F-F

1/4" 0 1 2 4 6 8 10

REVISIONS		
DATE	DESCRIPTION	BY
12JAN 83	ADD PIPE SUPPORTS (CONC.)	DAS
2/83	VARIOUS CHANGES	JCO

DESIGN ENGR.
DRAWN BY D.R.S.
PROJECT ENG.
PROJECT MGR.
CHECKED BY
CHECKED BY

ROBERT E. REESE REGISTERED NO. 3196 DELAWARE

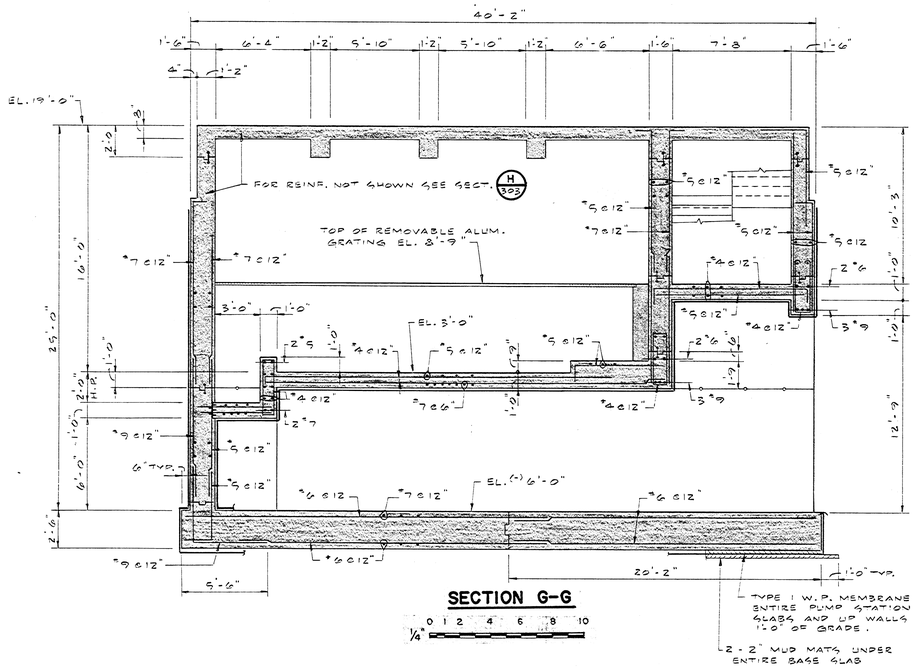
Betz • Converse • Murdoch • Inc.
Potomac Group
VIENNA AND STAUNTON, VIRGINIA

BCM

CITY OF DOVER
KENT COUNTY, DELAWARE
PUNCHEON RUN SEWER FACILITIES
PUMPING STATION
SECTIONS

DATE SEPT. 1978 | FILE No. | W.O. No. 02-0034-03 | PLAN No. 302

UPDATE: JAN. 1983

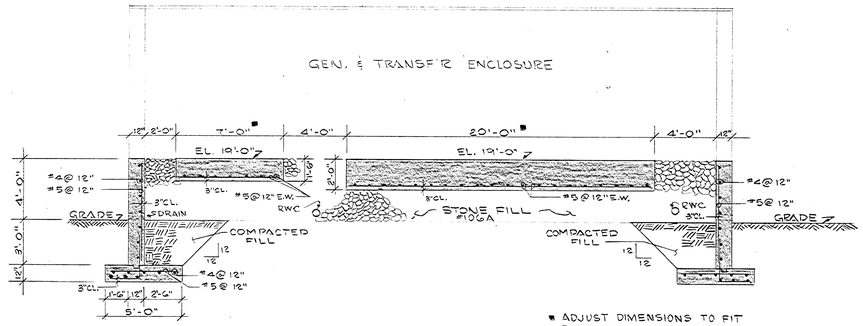


SECTION G-G

1/4" 0 1 2 4 6 8 10

TYPE I W.P. MEMBRANE TO ENVELOPE ENTIRE PUMP STATION UNDER BASE SLABS AND UP WALLS TO WITHIN 1'-0" OF GRADE.

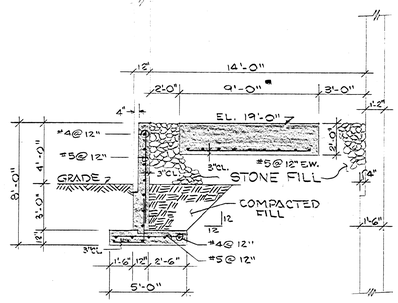
2'-2" MUD MATS UNDER ENTIRE BASE SLAB



* ADJUST DIMENSIONS TO FIT EQUIPMENT SUPPLIED. MINIMUMS SHOWN.

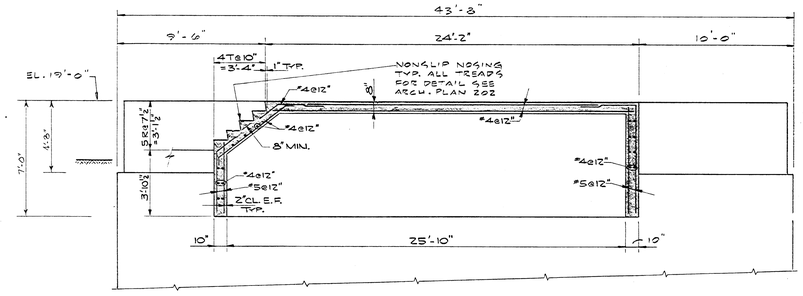
SECTION L-L

1/4" 0 1 2 4 6 8 10



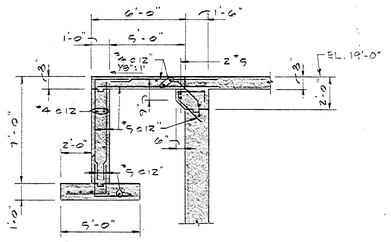
SECTION N-N

1/4" 0 1 2 4 6 8 10



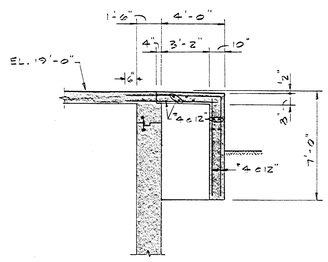
SECTION H-H

1/4" 0 1 2 4 6 8 10



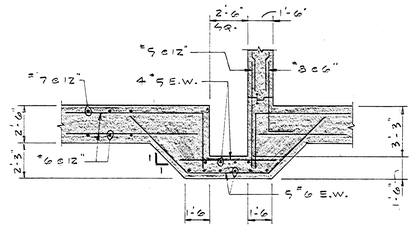
SECTION O-O

1/4" 0 1 2 4 6 8 10



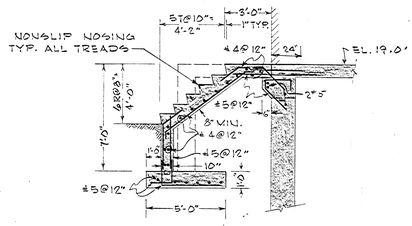
SECTION J-J

1/4" 0 1 2 4 6 8 10



SECTION K-K

1/4" 0 1 2 4 6 8 10



SECTION X-X

1/4" 0 1 2 4 6 8 10

REVISIONS		
DATE	DESCRIPTION	BY
4 MAY 82	ADD SECTION X-X	SMT
23 DEC 82	REV. SECTION X-X	SMT
2/83	VARIOUS CHANGES	JCO

DESIGN ENGR.
DRAWN BY D.R.S.
PROJECT ENG.
PROJECT MGR.
CHECKED BY
CHECKED BY

ROBERT E. REEDY REGISTERED NO. 3196 DELAWARE PROFESSIONAL ENGINEER

Betz • Converse • Murdoch • Inc.
Potomac Group
VIENNA AND STAUNTON VIRGINIA

BCM

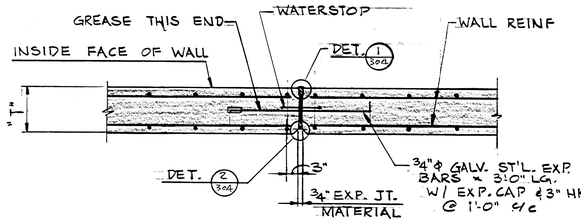
CITY OF DOVER
KENT COUNTY, DELAWARE

PUNCHEON RUN SEWER FACILITIES

PUMPING STATION
SECTIONS & DETAILS

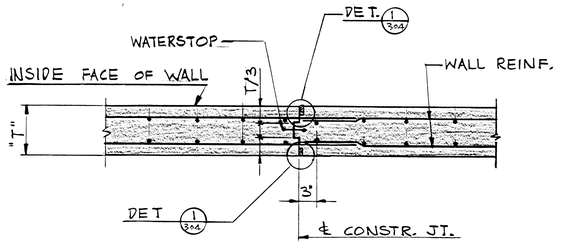
DATE: SEPT. 1978 | FILE No. | W.O. No. 02-0034-03 | PLAN No. 303

UPDATE: JAN. 1983



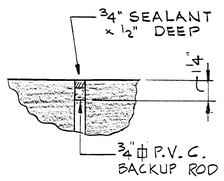
TYP. EXT. WALL EXP. JOINT

¾" 0 1 2 3 4

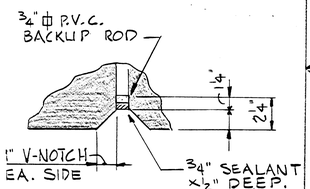


TYP. EXT. WALL CONSTR. JT.

¾" 0 1 2 3 4

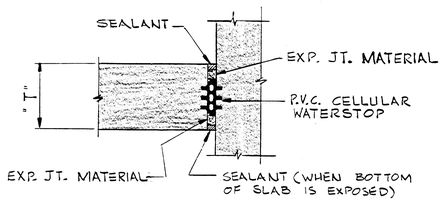


DETAIL 1



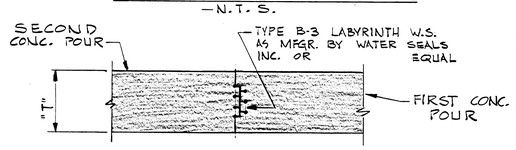
DETAIL 2

NOTE: FOR INTERIOR WALL JOINTS BOTH SIDES OF WALL ARE THE SAME AS THE INSIDE FACE OF EXTERIOR WALLS.



CELLULAR EXP. JT.

—N.T.S.



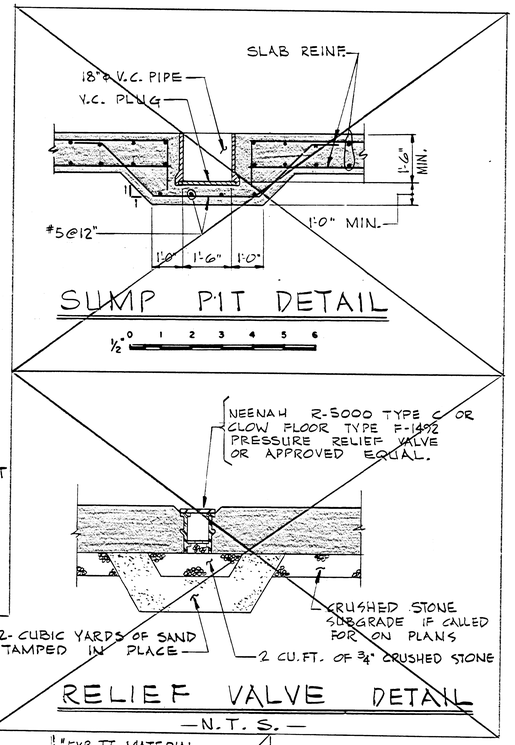
LABYRINTH CONSTR. JT.

—N.T.S.—

STD. BAR LAPS (UNLESS NOTED)		
BAR SIZE	TYP. BARS	TOP BARS *
#3	12"	14"
#4	14"	19"
#5	17"	24"
#6	20"	29"
#7	26"	36"
#8	34"	48"
#9	43"	60"
#10	55"	77"

F'c = 4000 P.S.I.
Fy = 40,000 P.S.I.

* BARS W/MORE THAN 12" CONCRETE BELOW BAR.

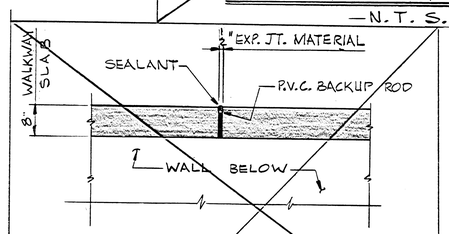


SUMP PIT DETAIL

½" 0 1 2 3 4 5 6

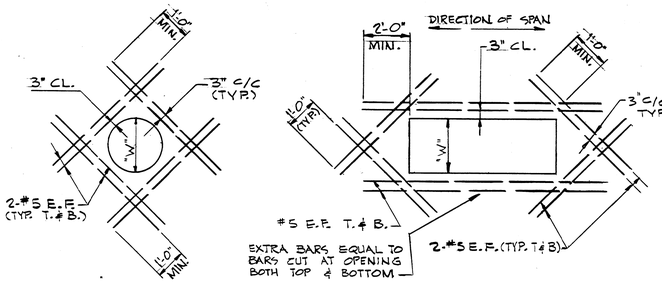
RELIEF VALVE DETAIL

—N.T.S.—



TANK WALKWAY EXP. JOINT DETAIL

—N.T.S.—

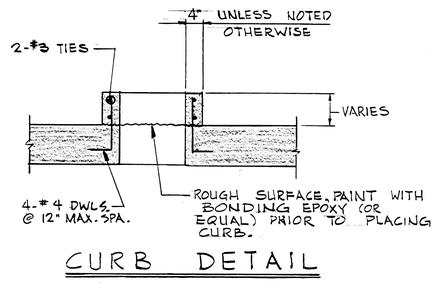


ADD. REINF. AR'ND. CONC. OPNGS.

½" 0 1 2 3 4 5 6

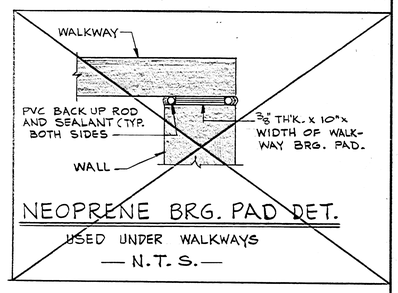
NOTE:
"W" = DIMENSION OF OPN'G. PERPENDICULAR TO PRINCIPAL BARS CUT, FOR CIRCULAR OPENINGS "W" = DIAMETER.

SEE MECH. & ARCH. PLANS FOR SLAB AND WALL OPENINGS NOT SHOWN ON STRUCTURAL PLANS.



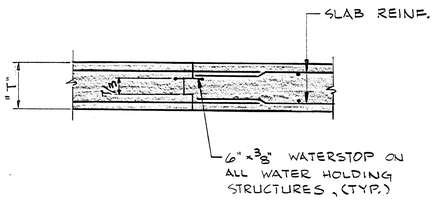
CURB DETAIL

¾" 0 1 2 3 4



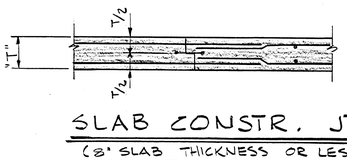
NEOPRENE BRG. PAD DET.

USED UNDER WALKWAYS
— N.T.S. —



SLAB CONSTR. JT.

(OVER 8" SLAB)
—N.T.S.—



SLAB CONSTR. JT.

(8" SLAB THICKNESS OR LESS)
—N.T.S.—

NOTE: DETAILS SHOWN ARE TYPICAL. SOME MAY NOT APPLY TO THIS PROJECT.

REVISIONS		
DATE	DESCRIPTION	BY
2/83	NOTED ADDED / DETAILS VOIDED	JCO

DESIGN ENGR.
DRAWN BY D.R.S.
PROJECT ENG.
PROJECT MGR.
CHECKED BY
CHECKED BY

ROBERT H. REESE REGISTERED NO. 3196 DELAWARE

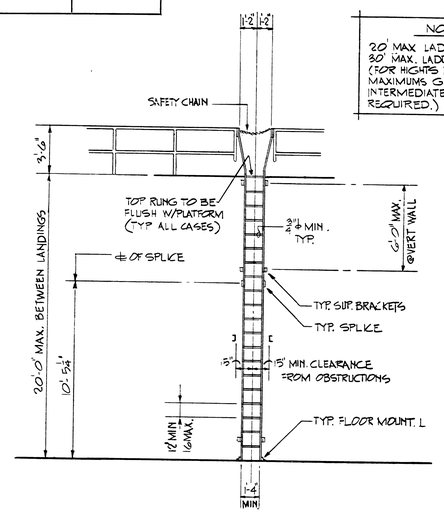
Betz • Converse • Murdoch • Inc.
Potomac Group
VIENNA AND STAUNTON VIRGINIA

BCM

CITY OF DOVER
KENT COUNTY, DELAWARE
PUNCHEON RUN SEWER FACILITIES
PUMPING STATION
STANDARD STRUCTURAL DETAILS

DATE: SEPT. 1978 | FILE No. | W.O. No. 02-0034-03 | PLAN No. 304

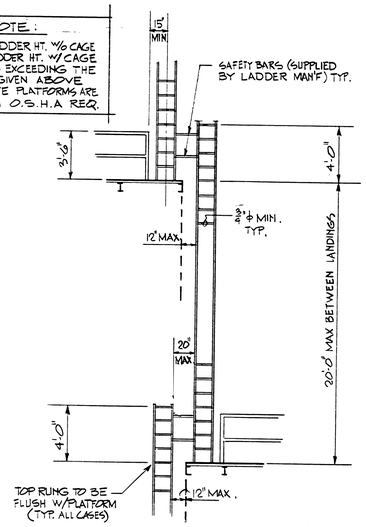
UPDATE: JAN. 1983



STRAIGHT LADDER

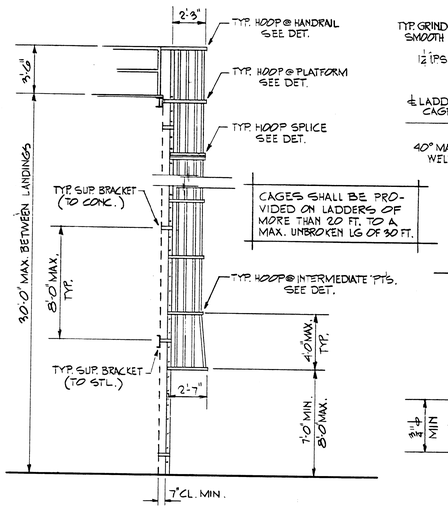
N.T.S.

NOTE:
20' MAX. LADDER HT. W/O CAGE
30' MAX. LADDER HT. W/ CAGE (FOR HIGHTS EXCEEDING THE MAXIMUMS GIVEN ABOVE INTERMEDIATE PLATFORMS ARE REQUIRED.) O.S.H.A REQ.



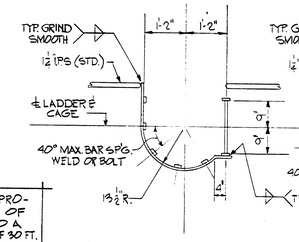
STAGGERED LADDERS

N.T.S.



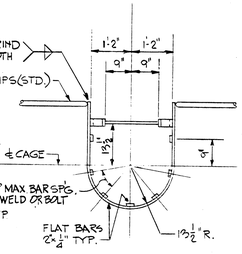
CAGED LADDER

N.T.S.



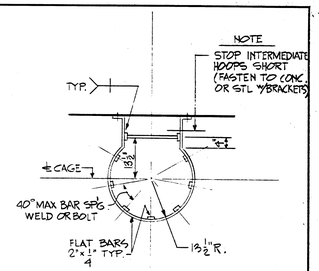
PLAN AT HANDRAIL

SIDE ACCESS N.T.S.



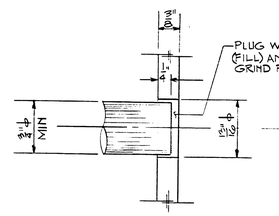
PLAN AT HANDRAIL

FRONT ACCESS N.T.S.



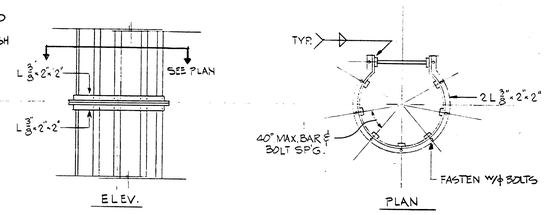
PLAN AT PLATFORM

FRONT ACCESS N.T.S.



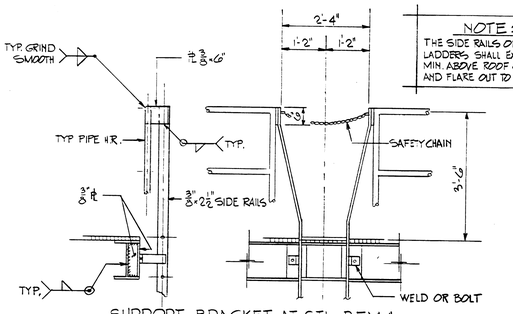
TYP. RUNG

N.T.S.

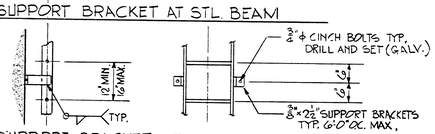


TYP. HOOP SPLICE

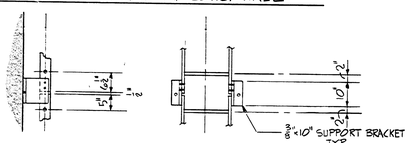
N.T.S.



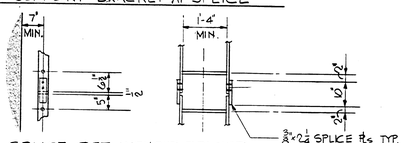
SUPPORT BRACKET AT STL. BEAM



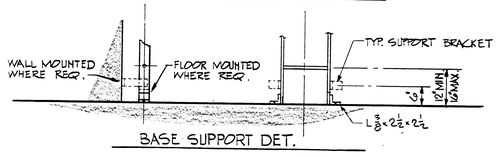
SUPPORT BRACKET AT CONC. WALL



SUPPORT BRACKET AT SPLICE



SPLICE DET. WITHOUT BRACKET



BASE SUPPORT DET.

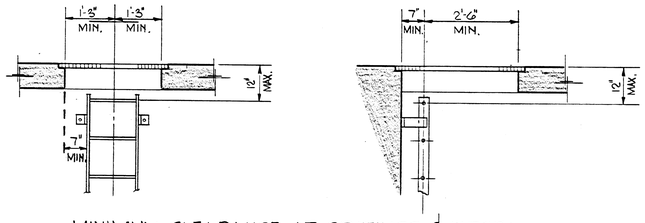
TYP. LADDER CONNECTIONS

N.T.S.

NOTE:
THE SIDE RAILS OF FIXED LADDERS SHALL EXT. 3'-6" MIN. ABOVE ROOF OR PLAT'M. AND FLARE OUT TO 2'-4 MIN.

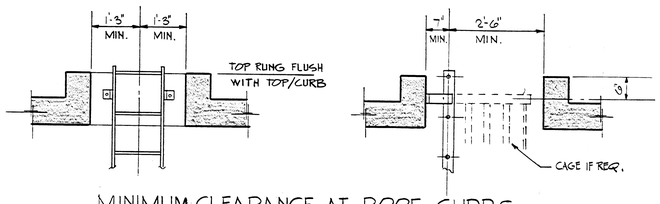
NOTE:
1. FOR LADDERS WITH AN UNSUPPORTED LENGTH OF UP TO 15'-0" INCL. USE SIDE RAILS. F.B. 3/8"x2½"
2. FOR LADDERS WITH AN UNSUPPORTED LENGTH GREATER THAN 15'-0" USE SIDE RAILS L 3½"x2½"x3/8"

3 MANHOLE STEPS ABOVE LADDER (TYP.)



MINIMUM CLEARANCE AT GRATINGS & HATCHES

N.T.S.



MINIMUM CLEARANCE AT ROOF CURBS

N.T.S.

REVISIONS		
DATE	DESCRIPTION	BY
2/83	M4 STEPS / GALV. BOLTS	JCD

DESIGN ENGR.
DRAWN BY D.R.S.
PROJECT ENG.
PROJECT MGR.
CHECKED BY
CHECKED BY

ROBERT W. HEREIT REGISTERED NO. 3106 PROFESSIONAL ENGINEER STATE OF DELAWARE

Betz • Converse • Murdoch • Inc.
Potomac Group
VIENNA AND STAUNTON VIRGINIA

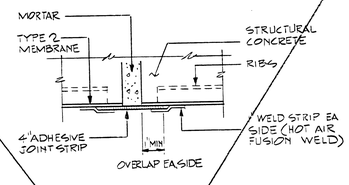
BCM

CITY OF DOVER
KENT COUNTY, DELAWARE
PUNCHEON RUN SEWER FACILITIES
PUMPING STATION
STANDARD STRUCTURAL DETAILS

DATE: SEPT. 1978 | FILE No. | W. O. No. 02-0034-03 | PLAN No. 305

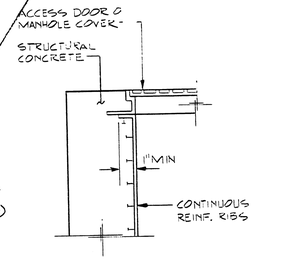
UPDATE: JAN. 1983

TYPE 2 MEMBRANE DETAILS



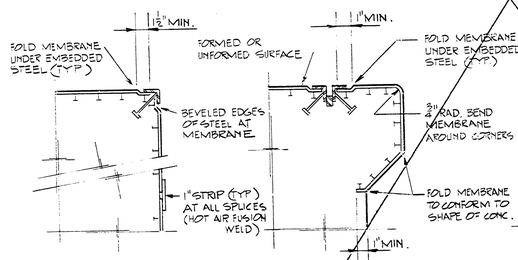
CONDITION @ FIELD JOINT

N.T.S.



CONDITION AROUND METAL FRAMES

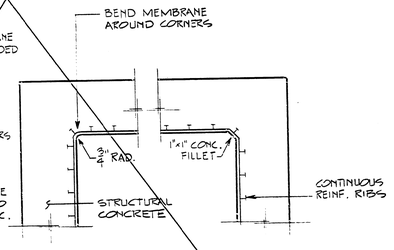
N.T.S



VERTICAL AND FLAT SURFACES — FLAT AND CURVED SURFACES

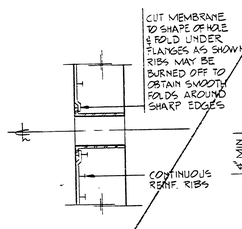
CONDITIONS @ TERMINATION POINTS AND @ CORNERS

N.T.S.



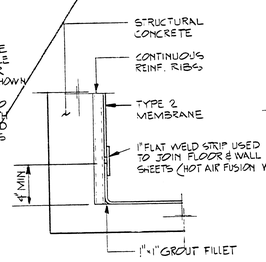
CONDITION @ RE-ENTRANT CORNERS

N.T.S



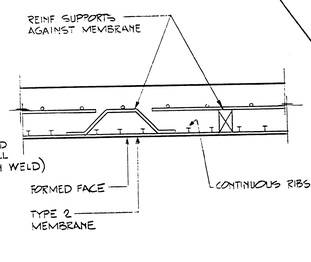
PIPE OR SLEEVE THROUGH LINING

N.T.S.



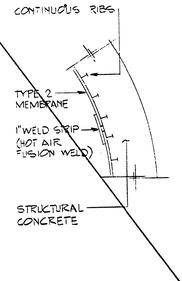
CONDITION @ CORNERS FLOOR TO WALL

N.T.S.



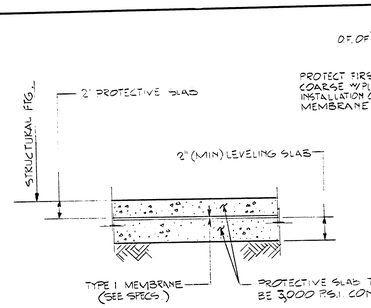
CONDITION @ UNDERSIDE OF SLABS OR FACE OF WALLS

N.T.S.



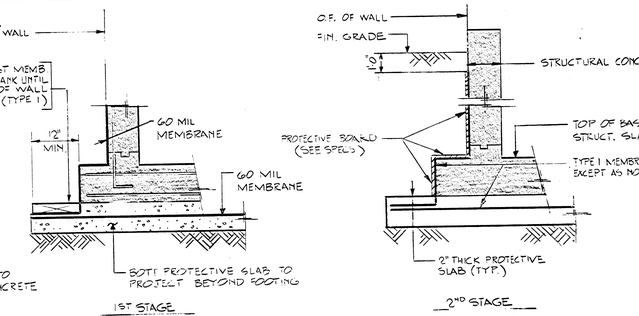
CONDITION @ CURVED SURFACES

N.T.S



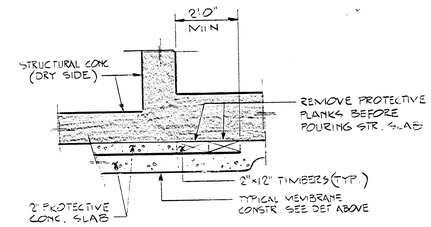
TYPICAL MEMBRANE CONSTRUCTION

N.T.S.



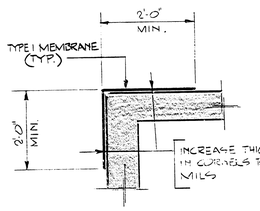
TYPICAL MEMBRANE CONSTRUCTION @ EXTERIOR WALLS

N.T.S



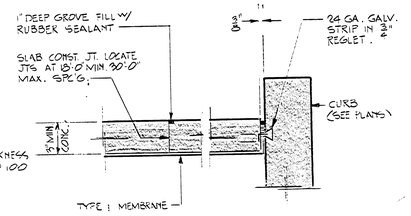
TERMINATION OF MEMBRANE UNDER ADJACENT SLABS

N.T.S.



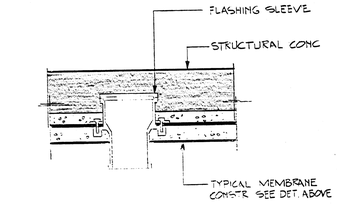
PLAN AT CORNERS

N.T.S



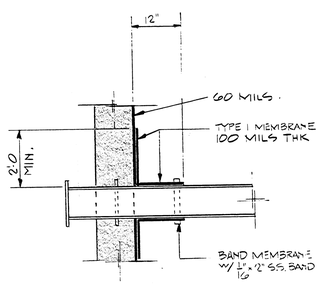
MEMBRANE PROTECTIVE SLAB ABOVE GRADE

N.T.S.



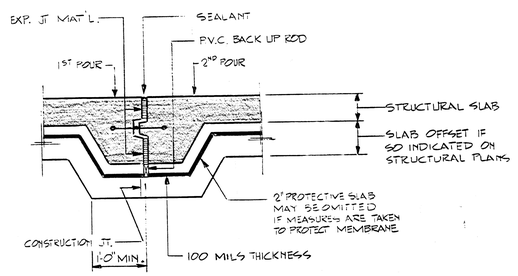
FLASHING FOR PIPES PENETRATING MEMBRANE

N.T.S.



FLASHING FOR PIPES THROUGH WALL AND MEMBRANE

N.T.S.



TYPICAL MEMBRANE AT EXPANSION JOINTS

N.T.S.

NOTE: DETAILS ARE TYPICAL. SOME SHOWN MAY NOT APPLY TO THIS PROJECT.

(TYPE 1) MEMBRANE DETAILS

REVISIONS		
DATE	DESCRIPTION	BY
2/83	DETAIL VOIDED / NOTE ADDED	JCO

DESIGN ENGR.
DRAWN BY D.R.S.
PROJECT ENG.
PROJECT MGR.
CHECKED BY
CHECKED BY

ROBERT R. REESE REGISTERED NO. 3190 PROFESSIONAL ENGINEER DELAWARE

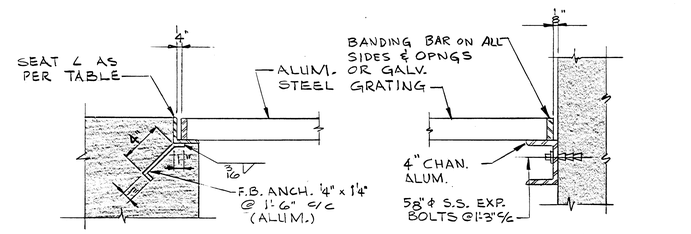
Betz • Converse • Murdoch • Inc.
Potomac Group
VIENNA AND STAUNTON, VIRGINIA

BCM

CITY OF DOVER
KENT COUNTY, DELAWARE
PUNCHEON RUN SEWER FACILITIES
PUMPING STATION
STANDARD STRUCTURAL DETAILS

DATE: SEPT. 1978 | FILE No. | W. O. No. 02-0034-03 | PLAN No. 306

UPDATE: JAN. 1983



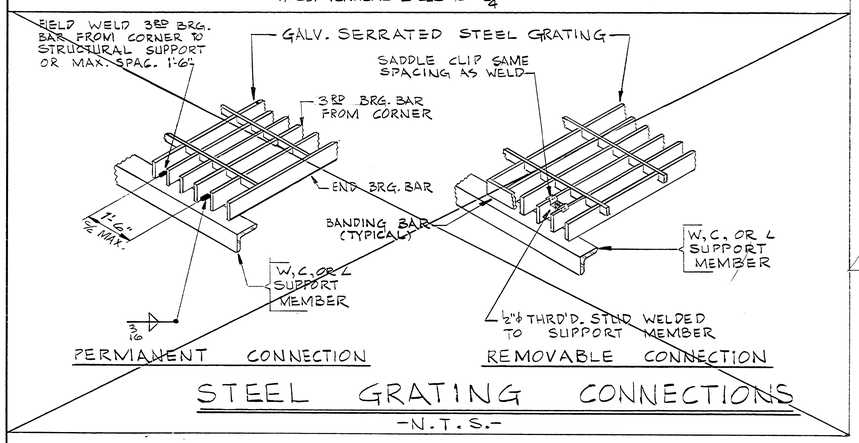
GRATING CONNECTION TO CONC. SUPPORT

—N.T.S.—

GRATING SIZE					
EXTRUDED ALUM. GRT'G.			SERRATED GALV. ST'L. GRT'G.		
SPAN	GRT'G. DEPTH	SEAT ∠ (ALUM.)	SPAN	GRT'G. DEPTH	SEAT ∠
0'-0" - 4'-0"	1¼"	1½" x 1½" x ¼"	0'-0" - 5'-0"	¼" x ⅛"	1½" x 1½" x ¼"
4'-0" - 5'-0"	1½"	1¾" x 1¾" x ¼"	5'-0" - 6'-0"	1½" x ⅛"	1¾" x 1¾" x ¼"
5'-0" - 7'-0"	2"	2½" x 2½" x ¼" *	6'-0" - 7'-0"	1¾" x 3/16"	2" x 2" x ¼"
7'-0" - 8'-0"	2¼"	2½" x 2½" x ¼"	7'-0" - 8'-0"	2" x 3/16"	2½" x 2½" x ¼" *

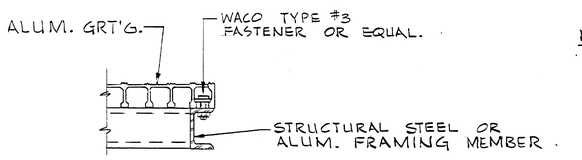
NOTE: PROVIDE BANDING BARS ON ALL SIDES AND AROUND ALL OPENINGS IN BOTH STEEL & ALUM. GRATINGS.

* CUT VERTICAL L LEG TO 2¼"



STEEL GRATING CONNECTIONS

—N.T.S.—

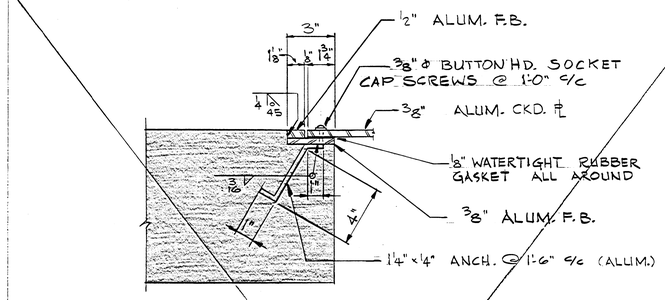


REMOVABLE CONNECTION

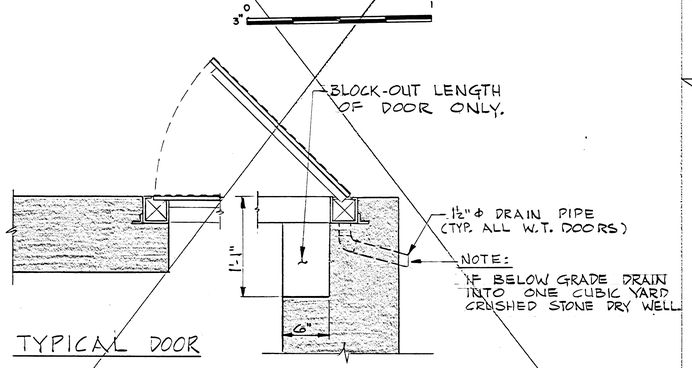
ALUM. GRATING FASTENER

—N.T.S.—

NOTE:
FOR ALUM. GRATING PERMANENT CONNECTION SEE STEEL GRATING PERMANENT CONNECTION.



WATERTIGHT COVER DETAIL



TYPICAL DOOR

AT STAIRS ONLY

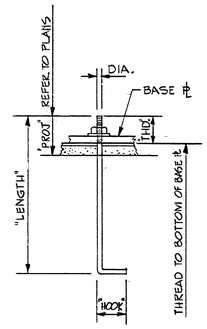
WATERTIGHT ACCESS DOOR

1½"0 1 2

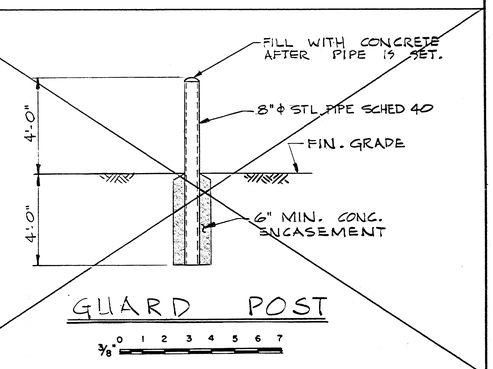
NOT IN CONTRACT

(A-307) TYP. ANCHOR BOLT SCHEDULE

BOLT DIA.	3000# CONC.	4000# CONC.	HOOK
	LENGTH	LENGTH	
½" ⊈	18"	18"	4"
⅝" ⊈	18"	18"	4"
¾" ⊈	24"	25"	4"
1" ⊈	30"	30"	6"
1¼" ⊈	47"	41"	6"
1½" ⊈	105"	92"	8"



NOTES:
1. FOR ⊈ HOLE DIA. ADD 5/16" DIA. TO BOLT DIA.



GUARD POST

EXPANSION BOLT DESIGN DATA

ANCHOR DIA.	MINIMUN EMBEDMENT	3000 P.S.I. CONC.		4000 P.S.I. CONC.	
		SHEAR	TENSION	SHEAR	TENSION
¼"	1¼"	300#	325#	300#	400#
⅜"	1¾"	700#	550#	850#	700#
½"	2¼"	900#	950#	1100#	1100#
⅝"	2¾"	1250#	1600#	1450#	1950#
¾"	3½"	1800#	2650#	2100#	3000#

NOTES:

1. DRILL HOLE OF SAME DIAMETER AS THE CONCRETE ANCHOR BOLT DIA.
2. MINIMUM EMBEDMENT GIVEN ABOVE SHALL BE PRODUCED AFTER THREE COMPLETE 360° TURNS OF THE NUT STARTING FROM A HAND TIGHT CONDITION.
3. FOR EDGE DISTANCES LESS THAN 6 INCHES OR S/S SPACING LESS THAN 12 INCHES THE ABOVE ALLOWABLE LOADS SHALL BE REDUCED BY 50%.
4. REFER TO SPECIFICATIONS FOR OTHER QUALIFICATIONS.
5. LOADS SHOWN ABOVE ARE ALLOWABLE WORKING LOADS. MINIMUM FACTOR OF SAFTY ON ULTIMATE VALUES SHALL BE 4.0

REVISIONS			DESIGN ENGR.
DATE	DESCRIPTION	BY	DRAWN BY D.R.S.
2/83	DETAILS VOIDED	JCO	PROJECT ENG.
			PROJECT MGR.
			CHECKED BY
			CHECKED BY

ROBERT R. REEDY REGISTERED NO. 3196 PROFESSIONAL ENGINEER DELAWARE

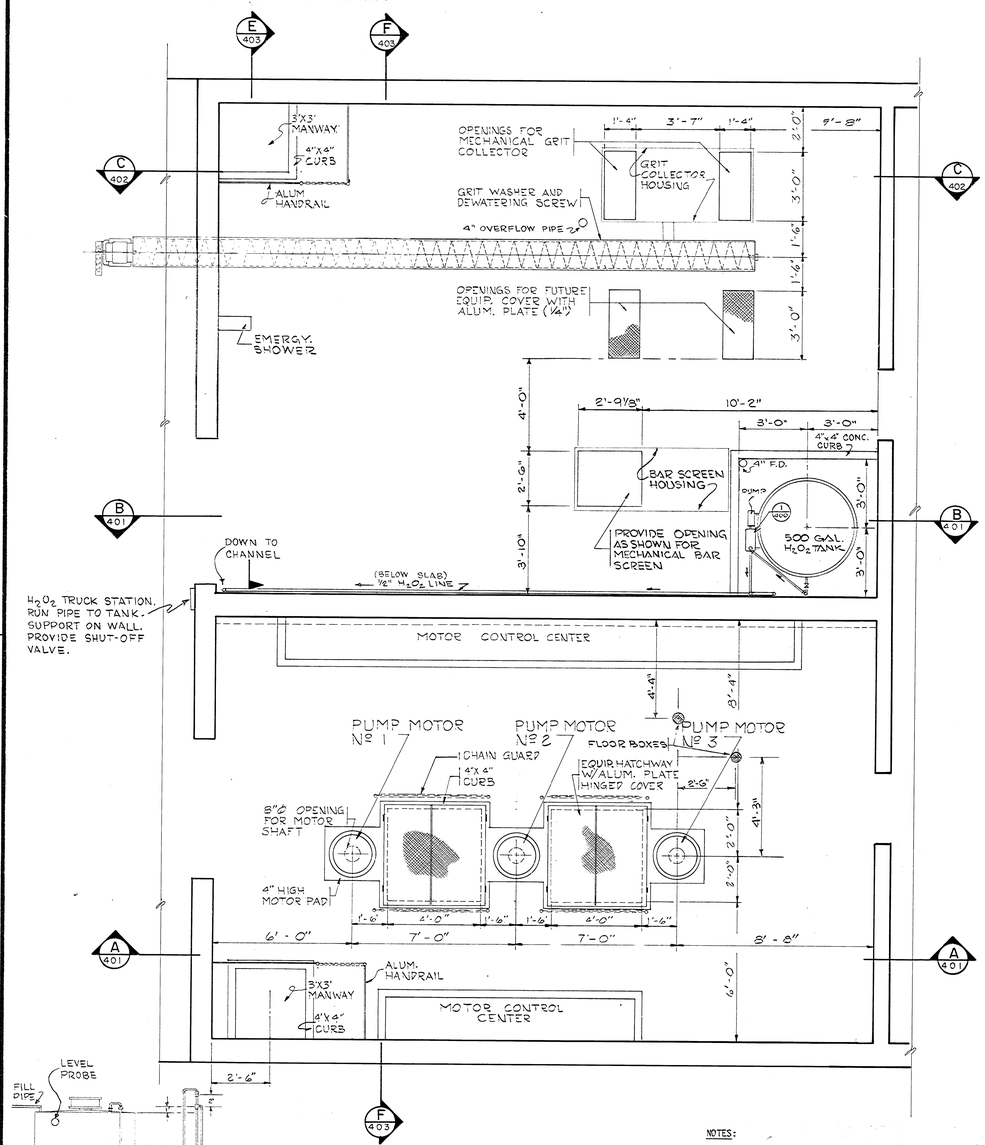
Betz • Converse • Murdoch • Inc.
Potomac Group
VIENNA AND STAUNTON VIRGINIA
BCM

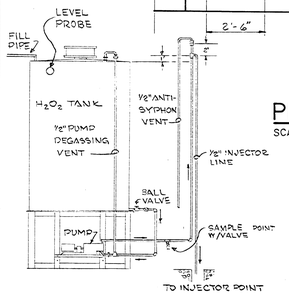
CITY OF DOVER
KENT COUNTY, DELAWARE
PUNCHEON RUN SEWER FACILITIES
PUMPING STATION
STANDARD STRUCTURAL DETAILS

DATE: SEPT. 1978 | FILE No. | W. O. No. 02-0034-03 | PLAN No. 307

UPDATE: JAN. 1983

NOTE:
FOR CONTINUATION OF LOADING DOCK AND STAIRWELL SEE ARCHITECTURAL AND STRUCTURAL DRAWINGS.

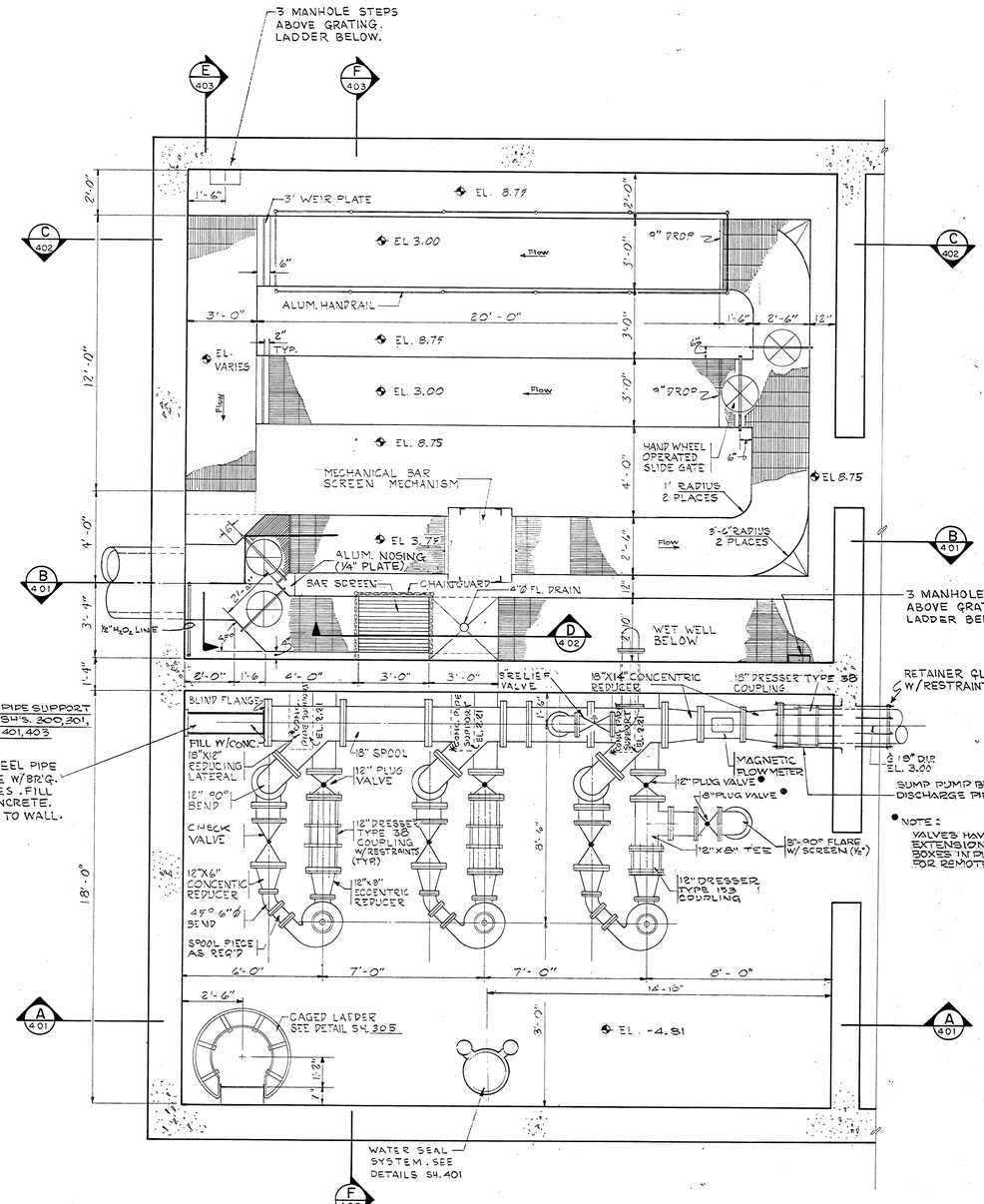




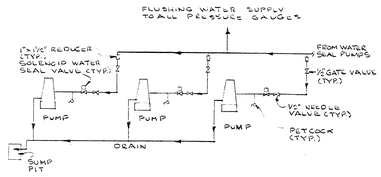
1/400 H_2O_2 PIPING SYS.
N.T.S.

PLAN AT ELEVATION 19.00
SCALE: 3/8" = 1'-0"

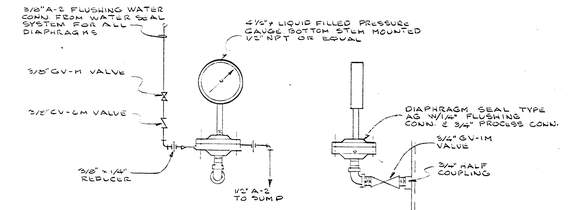
NOTES:
1. Location shown for floor boxes above are only approximate. Contractor to position boxes based on dimensions of valves, fittings and pumping equipment provided.
2. Provide bearing plates for pump motors if required to span shaft openings in floor.


3 MANHOLE STEPS ABOVE GRATING. LADDER BELOW.
E 403
F 403
C 402
B 401
A 401
D 402
2'-0"
1'-6"
3' WEIR PLATE
EL. 8.75
EL 3.00
Flow
9" PROP
3'-0"
6"
ALUM. HANDRAIL
3'-0"
20'-0"
1'-6"
2'-6"
12"
2" TYP.
EL. 8.75
EL. VARIES
EL. 3.00
Flow
9" PROP
12'-0"
EL. 8.75
HAND WHEEL OPERATED SLIDE GATE
6"
MECHANICAL BAR SCREEN MECHANISM
4'-0"
1' RADIUS 2 PLACES
EL 8.75
3'-6" RADIUS 2 PLACES
EL 3.75
ALUM. NOSING (1/4" PLATE)
CHAIN GUARD
BAR SCREEN
4"Ø FL. DRAIN
3'-9"
1/2" H_2O_2 LINE
45°
WET WELL BELOW
3 MANHOLE STEPS ABOVE GRATING. LADDER BELOW.
1'-4"
2'-0"
1'-6"
6'-0"
3'-0"
3'-0"
5" RELIEF VALVE
18"X14" CONCENTRIC REDUCER
18" PRESSER TYPE 38 COUPLING
RETAINER GLAND W/ RESTRAINTS
* CON. PIPE SUPPORT REF. SH'S. 300, 301, 302, 401, 403
8" STEEL PIPE BRACE W/ BR'G. PLATES. FILL W/ CONCRETE. BOLT TO WALL.
SLIDE GATE
SLIDE GATE
SLIDE GATE

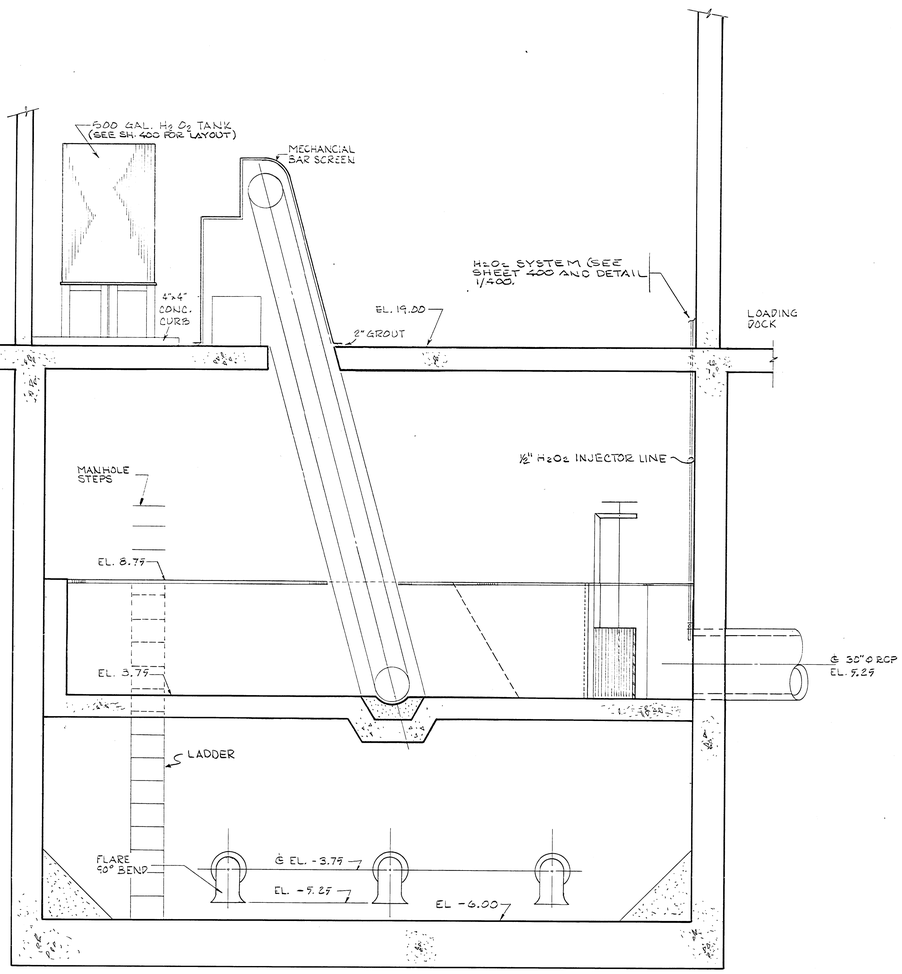
NOTE:
FOR CONTINUATION OF LOADING DOCK AND STAIRWELL, SEE ARCHITECTUAL AND STRUCTURL DRAWINGS



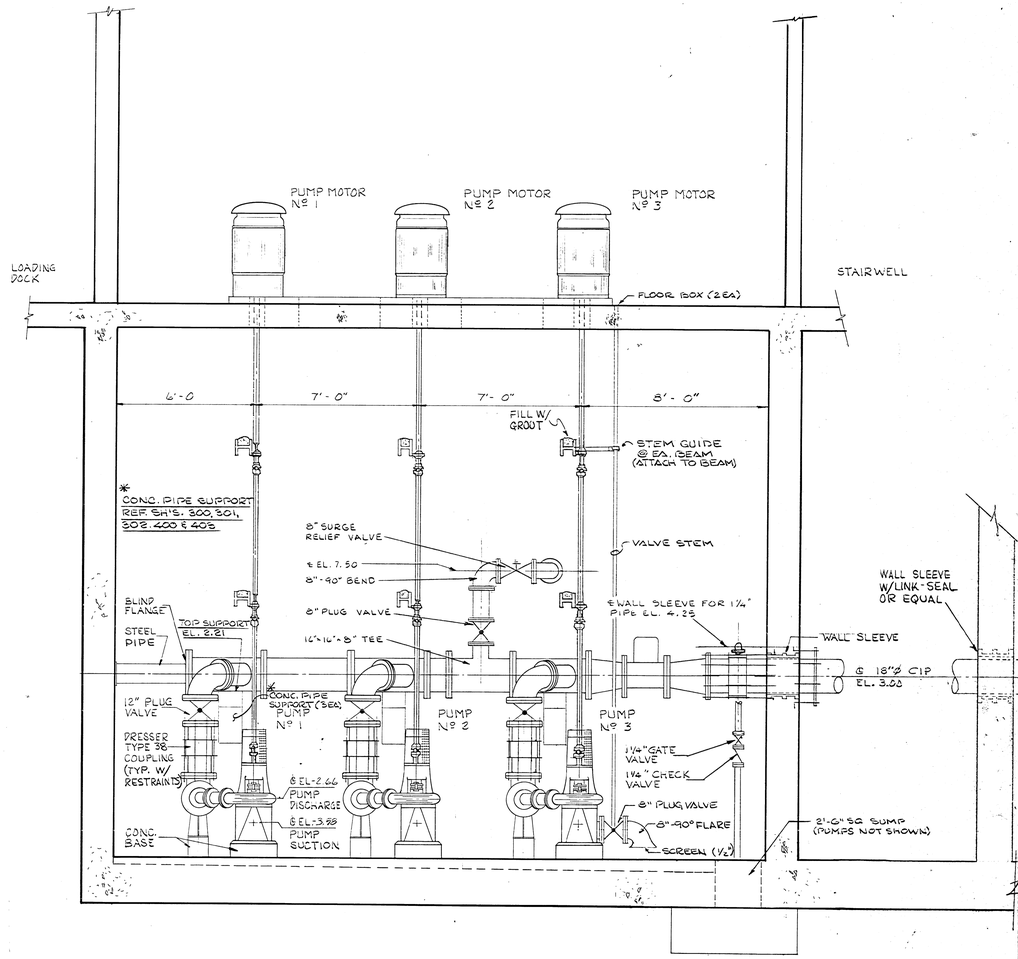
WATER SEAL DIAGRAM
NO SCALE



PRESSURE GAUGE DETAIL
NO SCALE



SECTION B
SCALE: 3/8" =1'-0" (400)



SECTION A
SCALE: 3/8" =1'-0" (400)

REVISIONS		
DATE	DESCRIPTION	BY
12-22-82	Reloc. Mech. Bar Screen H2O2 Tank	TDS
1-11-83	ELIM. 1ea. SUMP PUMP, ADD H2O2 SYS.	TDS
16 JAN 83	ADD CONC. PIPE SUPPORTS	TDS
2/83	VARIOUS CHANGES	JCO

DESIGN ENGR	FRM
DRAWN BY	KW
PROJECT ENG.	FRM
PROJECT MGR.	AJD
CHECKED BY	FRM
CHECKED BY	

ROBERT W. WEEKS REGISTERED NO. 3158 PROFESSIONAL ENGINEER STATE OF DELAWARE

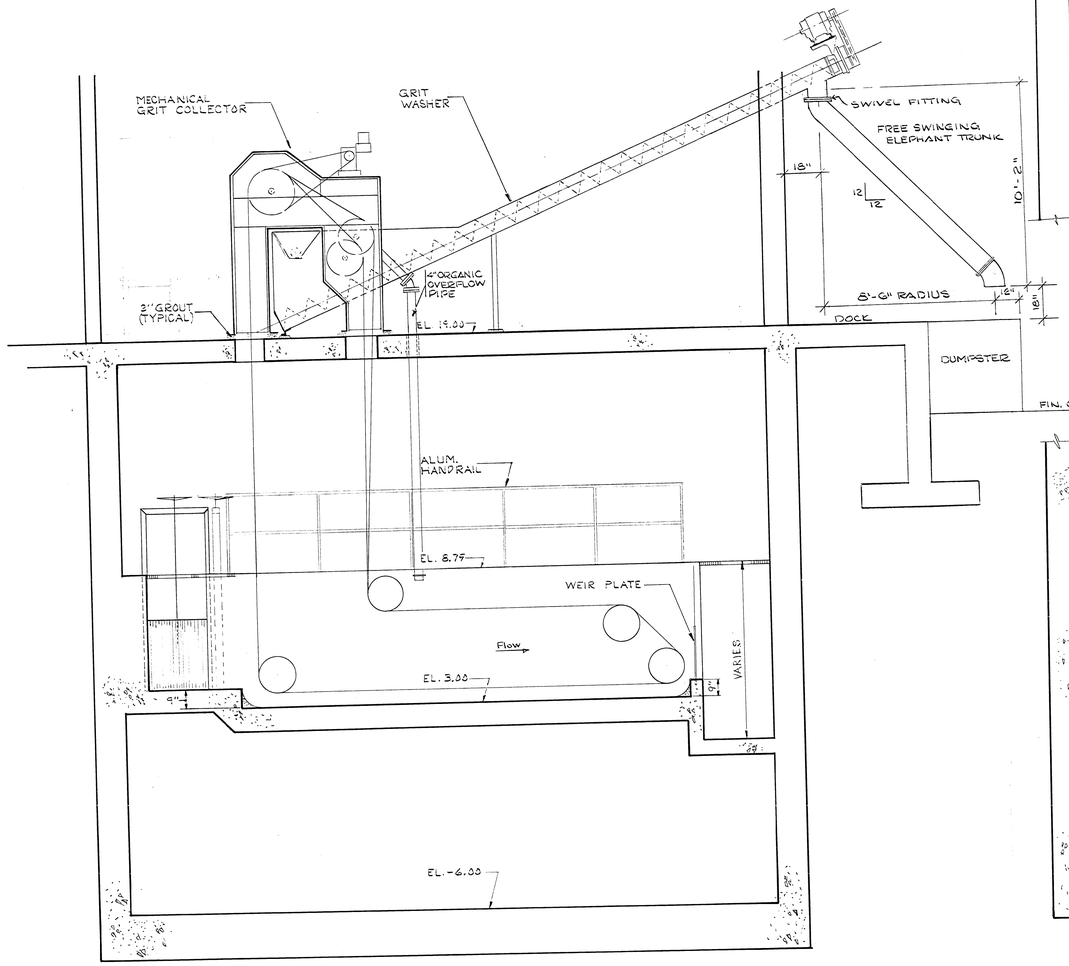
Betz • Converse • Murdoch • Inc.
Potomac Group
VIENNA AND STAUNTON VIRGINIA

BCM

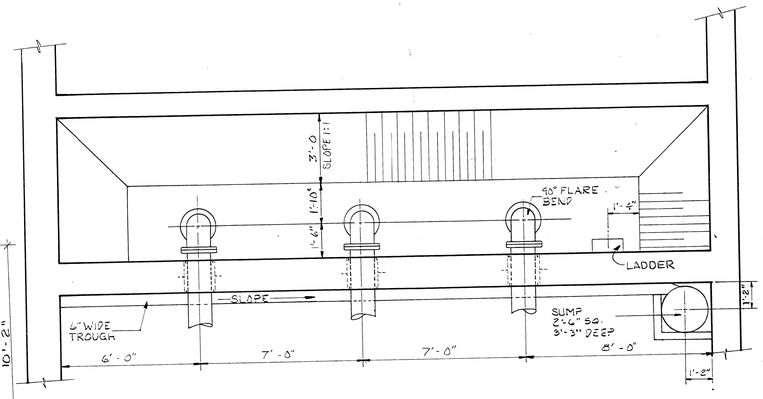
CITY OF DOVER
KENT COUNTY, DELAWARE
PUNCHEON RUN SEWER FACILITIES
PUMPING STATION
SECTIONS

DATE SEPT. 1978 | FILE No. | W.O. No. 02-0034-03 | PLAN No. 401

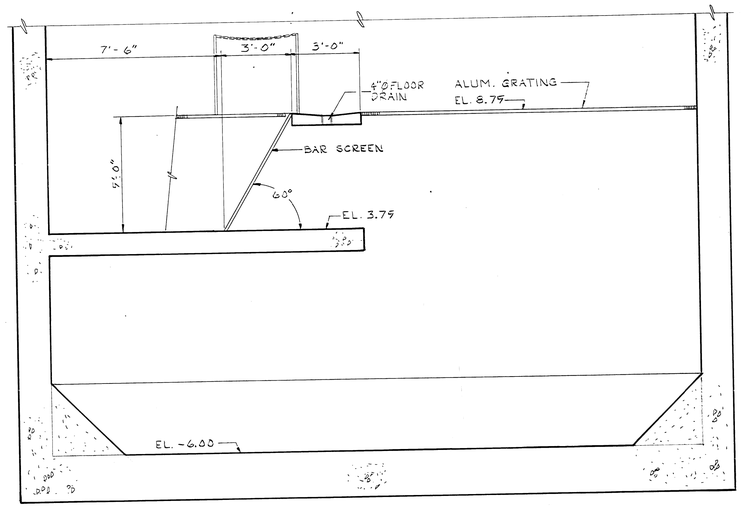
UPDATE: JAN. 1983



SECTION C
SCALE: 3/8" = 1'-0" (400)



PARTIAL PLAN
WET WELL
SCALE: 3/8" = 1'-0"



SECTION D
SCALE: 3/8" = 1'-0" (400)

REVISIONS		
DATE	DESCRIPTION	BY
12-22-82	RELOC. GRIT WASHER	RS
2/83	FIN. GRADE EL., LADDER, FLOW	JCO

DESIGN ENGR. FRM
DRAWN BY KW
PROJECT ENG. FRM
PROJECT MGR. AJD
CHECKED BY FRM
CHECKED BY

ROBERT C. HESSON REGISTERED PROFESSIONAL ENGINEER 20,310 DELAWARE

Betz • Converse • Murdoch • Inc.
Potomac Group
VIENNA AND STAUNTON, VIRGINIA

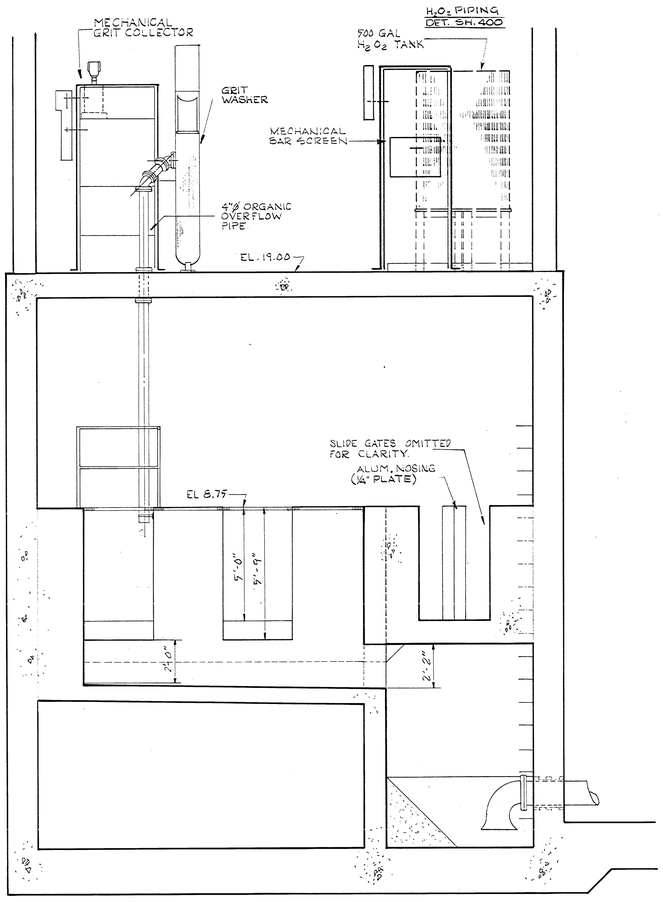
BCM

CITY OF DOVER
KENT COUNTY, DELAWARE

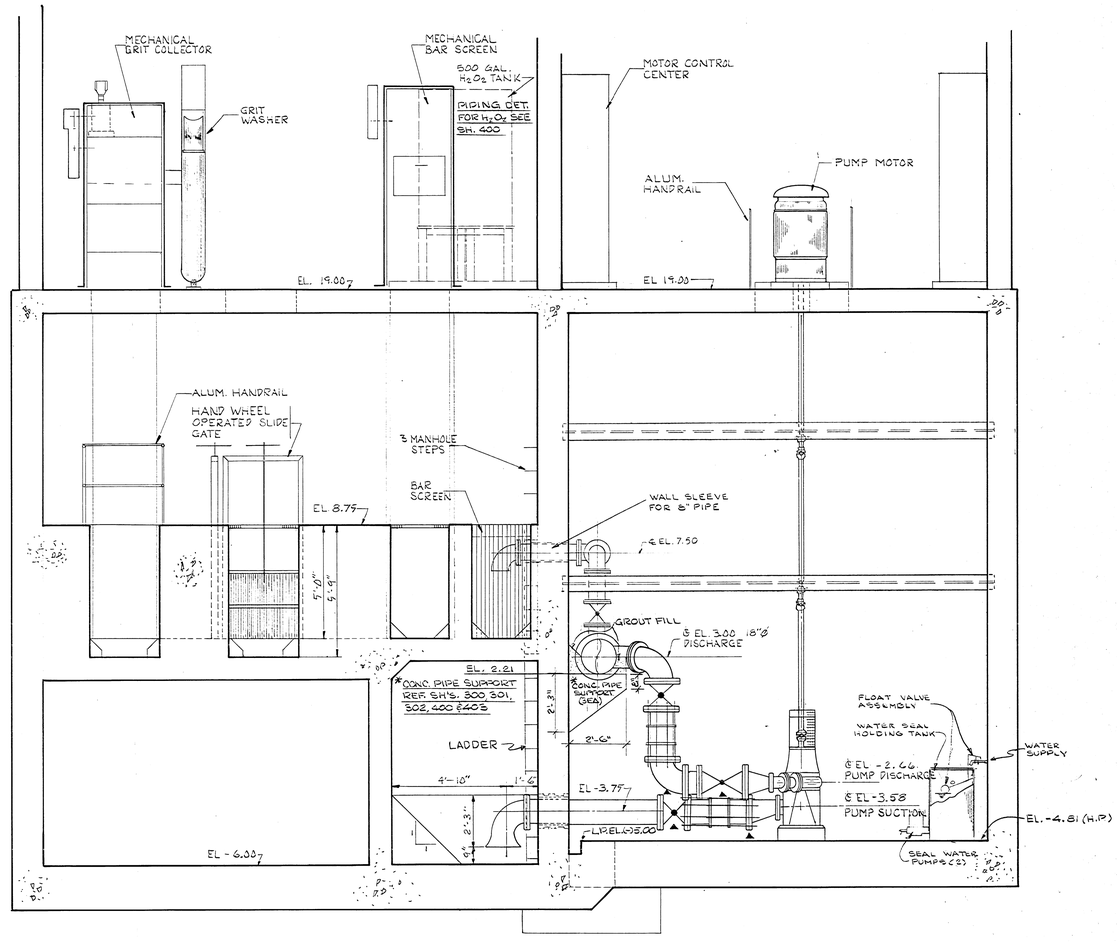
PUNCHEON RUN SEWER FACILITIES
PUMPING STATION
PLAN AND SECTIONS

DATE SEPT. 1978 | FILE No. | W. O. No. 02-0034-02 | PLAN No. 402

UPDATE: JAN. 1983



SECTION E
SCALE: 3/8" = 1'-0" 400



SECTION F
SCALE: 3/8" = 1'-0" 400

NOTE: PIPE SUPPORTS NOT SHOWN ABOVE. SUPPORT AT POINTS MARKED 'A' (PUMP SUCTION AND DISCHARGE PIPING)

REVISIONS		
DATE	DESCRIPTION	BY
12-21-82	REMOVE HOPPER, RELOC. H.C. TANK	PSS
12 JAN 83	CONC. PIPE SUPPORTS (ADDITION)	PSS
2/83	VARIOUS CHANGES	JCO

DESIGN ENGR.	FRM
DRAWN BY	KW
PROJECT ENG.	FRM
PROJECT MGR.	AJD
CHECKED BY	FRM
CHECKED BY	

ROBERT G. HESSER REGISTERED NO. 8198 PROFESSIONAL ENGINEER DELAWARE

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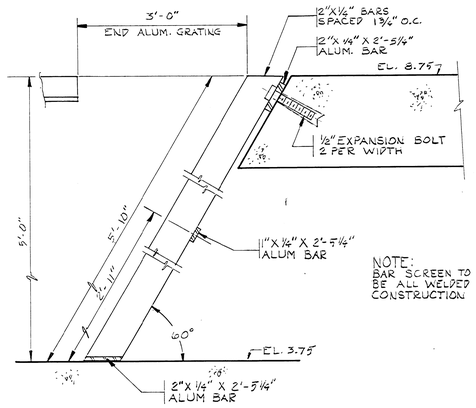
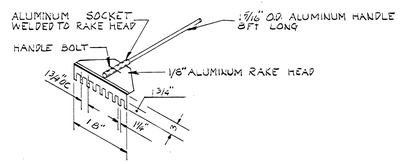
Potomac Group
VIENNA AND STAUNTON, VIRGINIA
BCM

CITY OF DOVER
KENT COUNTY, DELAWARE
PUNCHEON RUN SEWER FACILITIES
PUMPING STATION
SECTIONS

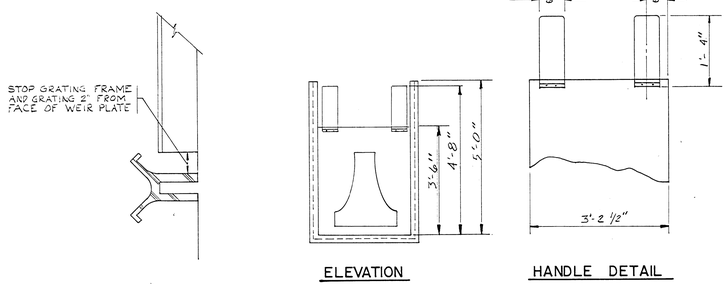
DATE: SEPT. 1978 | FILE No. | W. O. No. 02-0034-03 | PLAN No. 403
UPDATE: JAN. 1983



BAR SCREEN DETAIL



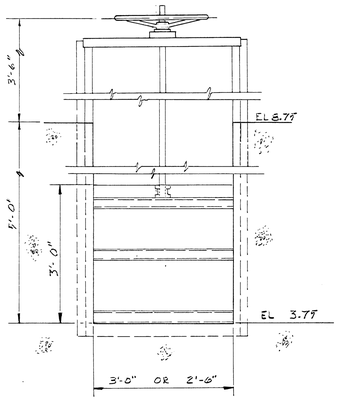
RAKE DETAIL



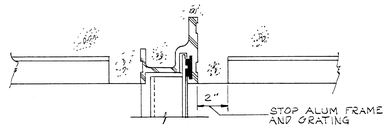
ELEVATION

HANDLE DETAIL

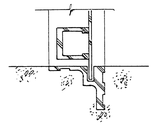
WEIR PLATE DETAIL



ELEVATION



GUIDE SECTION



SECTION RECESSED INVERT

SLIDE GATE DETAIL

REVISIONS		
DATE	DESCRIPTION	BY

DESIGN ENGR.	FRM
DRAWN BY	KW
PROJECT ENG.	FRM
PROJECT MGR.	AJD
CHECKED BY	FRM
CHECKED BY	

ROBERT L. REESMAN REGISTERED NO. 3198 PROFESSIONAL ENGINEER STATE OF DELAWARE

Betz • Converse • Murdoch • Inc.
Potomac Group
VIENNA AND STAUNTON VIRGINIA

BCM

CITY OF DOVER
KENT COUNTY, DELAWARE

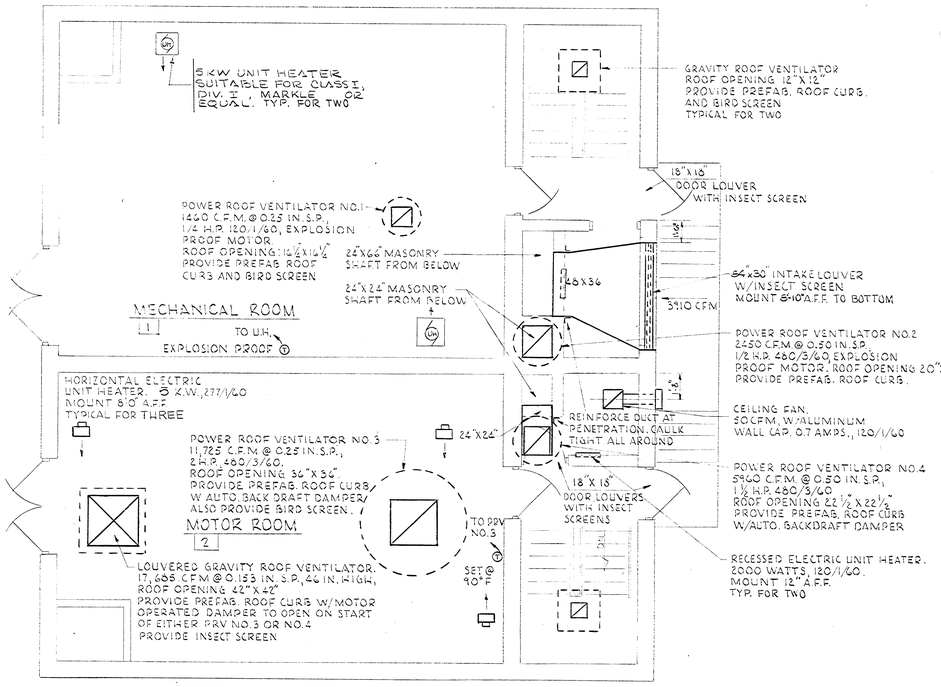
PUNCHEON RUN SEWER FACILITIES

PUMPING STATION DETAILS

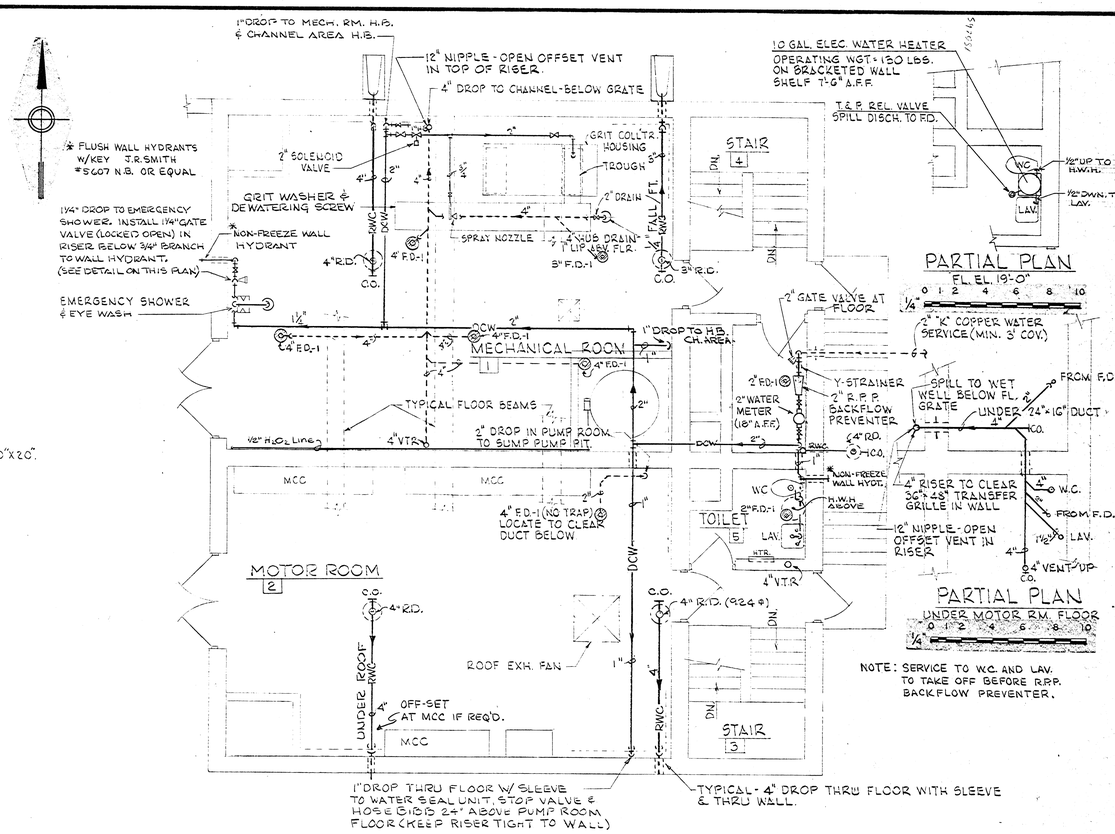
DATE: SEPT. 1978	FILE No.	W. O. No. 02-0034-03	PLAN No. 404

UPDATE: JAN. 1983

NOTE:
2 EA. 4'SQ. EXPLOSION TYPE SKYLIGHTS AND
2 EA. 2'SQ. DOME SKYLIGHTS. SEE DETAIL (6) C
AND ROOF PLAN SH. 202 FOR LOC.



PLAN - EL. 19'-0"
0 1' 2 4 6 8 10
1/4"



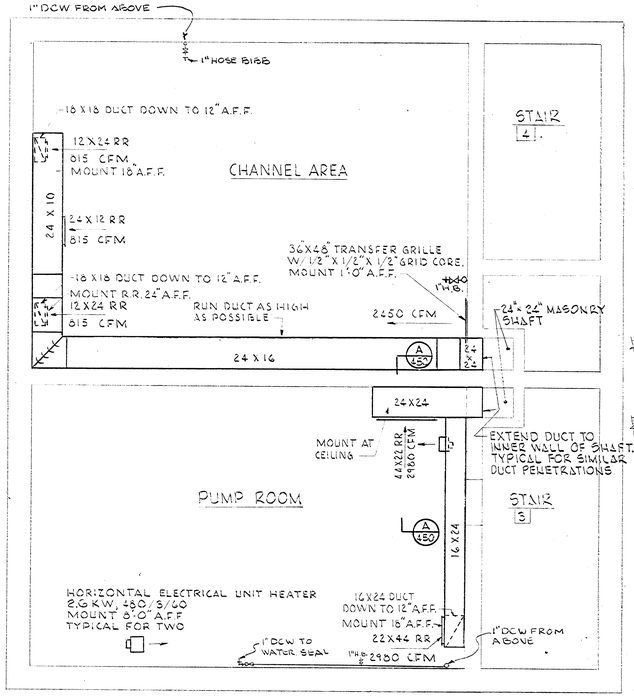
PARTIAL PLAN
FL. EL. 19'-0"
0 1 2 4 6 8 10
1/4"

PARTIAL PLAN
UNDER MOTOR RM. FLOOR
0 1 2 4 6 8 10
1/4"

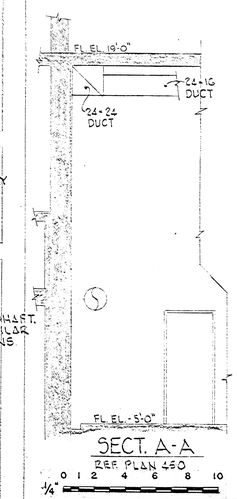
NOTE: SERVICE TO W.C. AND LAV. TO TAKE OFF BEFORE R.P.P. BACKFLOW PREVENTER.

PLAN - EL. 19'-0"
0 1 2 4 6 8 10
1/4"

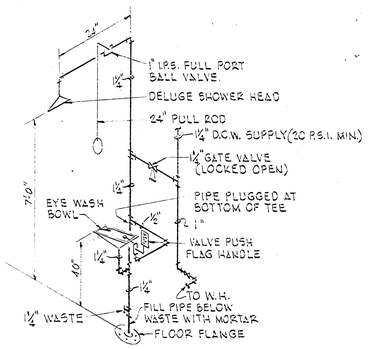
NOTE: THE SLEEVES OF PIPE PENETRATING WET WELL AREA SHALL BE GAS TIGHT.



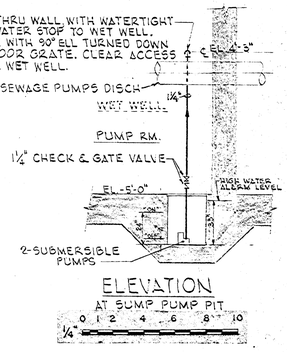
PLAN - EL. - 5'-0"
0 1 2 4 6 8 10
1/4"



SECT. A-A
REF PLAN 450
0 1 2 4 6 8 10
1/4"



DETAIL OF EMERGENCY SHOWER & EYE WASH
NOT TO SCALE



ELEVATION
AT SUMP PUMP PIT
0 1 2 4 6 8 10
1/4"

REVISIONS		
DATE	DESCRIPTION	BY
13 DEC. 82	ADD R.D. & H.B.	PBS
11 JAN 83	DELETE H.W. BOILER, MOVED H.W.H.,	
	DELETE ONE SUMP PUMP	PBS
2/83	VARIOUS CHANGES	JCO

DESIGN ENGR.	
DRAWN BY TA	WW
PROJECT ENG.	
PROJECT MGR.	
CHECKED BY	
CHECKED BY	

ROBERT W. BETZ REGISTERED NO. 3198 PROFESSIONAL ENGINEER

Betz • Converse • Murdoch • Inc.
Potomac Group
VIENNA AND STAUNTON, VIRGINIA
BCM

CITY OF DOVER
KENT COUNTY, DELAWARE

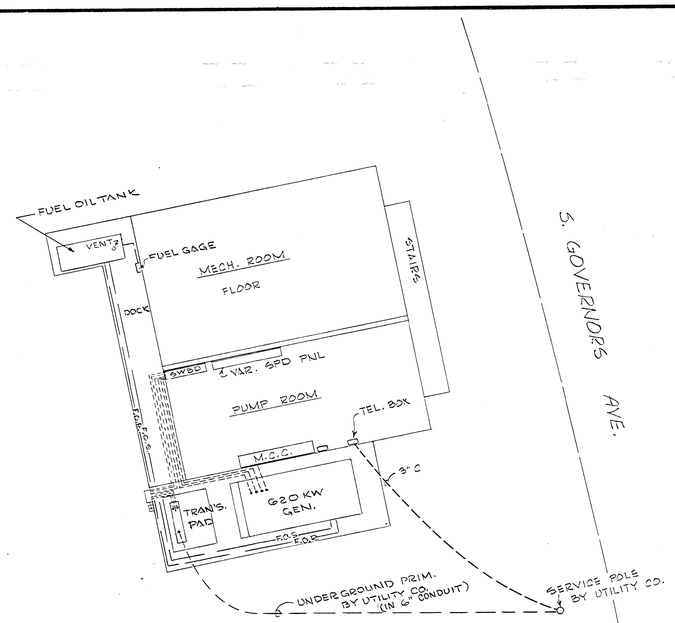
PUNCHEON RUN SEWER FACILITIES

PUMPING STATION

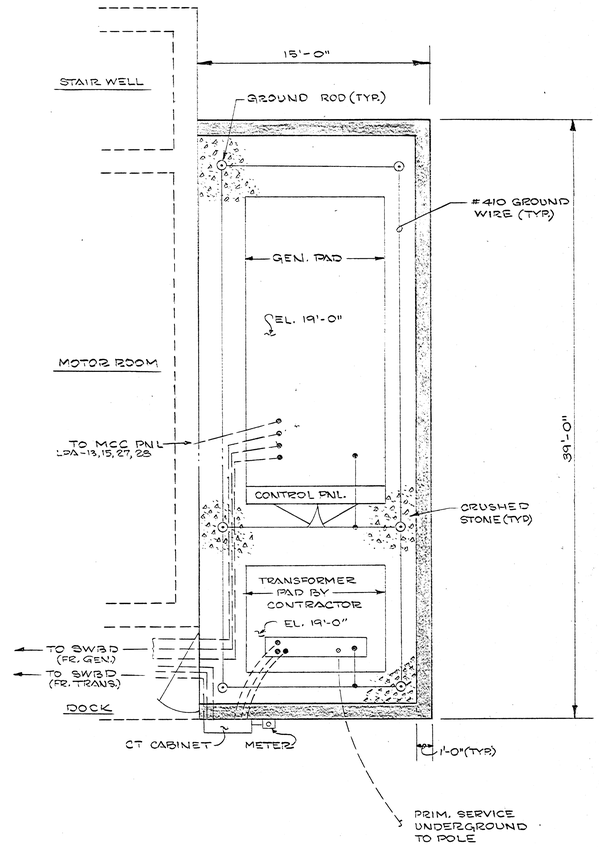
HEATING, VENTILATING & PLUMBING - PLANS & DETAILS

DATE: SEPT 1978 | FILE No. | W. O. No. 02-0034-03 | PLAN No. 450

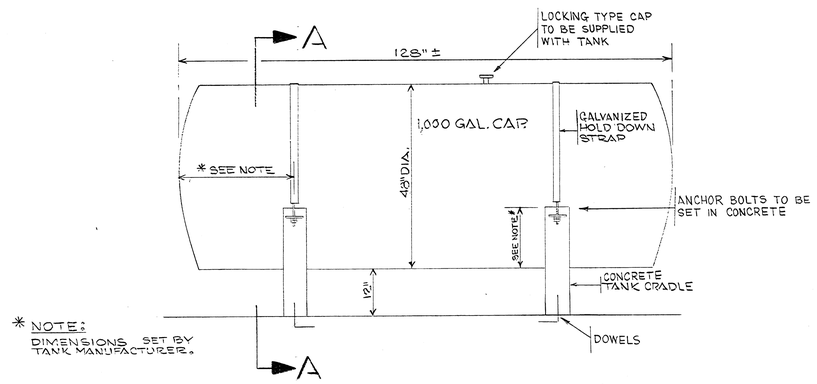
UPDATE! JAN. 1983



SITE PLAN
SCALE: 1"=10'

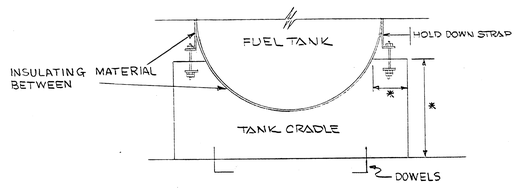


GEN. & TRANSF'R. AREA PLAN
SCALE: 1/4" = 1'-0"



* NOTE:
DIMENSIONS SET BY TANK MANUFACTURER.

(1/500) FUEL STORAGE TANK
SCALE: 3/4"=1'-0"



SECTION "A-A"
SCALE: 3/4"=1'-0"

REVISIONS		
DATE	DESCRIPTION	BY
4 MAY 82	REV. SITE PLAN & G.T.A. PLAN	BJT
22 DEC 82	MOVED GEN.	PRS
12 JAN 83	DETAIL FUEL TANK	PRS
2/83	NOTES ON FUEL TANK	JCO

DESIGN ENGR. DS
DRAWN BY RGS
PROJECT ENG.
PROJECT MGR. RCG
CHECKED BY
CHECKED BY

ROBERT E. REGER — REGISTERED — NO. 3106 — PROFESSIONAL ENGINEER — DELAWARE

Betz • Converse • Murdoch • Inc.
Potomac Group
VIENNA AND STAUNTON, VIRGINIA

BCM

CITY OF DOVER
KENT COUNTY, DELAWARE

PUNCHEON RUN SEWER FACILITIES
PUMPING STATION
ELECTRICAL-SITE PLAN & DETAILS

DATE: SEPT 1978 | FILE No. | W. O. No. 02-0034-03 | PLAN No. 500

UPDATE: JAN. 1983

GRAPHIC LIGHTING SYMBOLS

- FLUORESCENT LIGHTING FIXTURE
- INCANDESCENT OR HID LIGHTING FIXTURE
- EXIT LIGHT
- EMERGENCY LIGHTING UNIT- NO. OF LIGHTS AS INDICATED
- REMOTE EMERGENCY LIGHT
- SPOT OR FLOOD LIGHT
- WALL OR BRACKET MOUNTED INCANDESCENT OR HID LIGHTING FIXTURE WITH TYPE

GRAPHIC CIRCUITING & RACEWAY SYMBOLS

- LPB-3 — HOME RUN TO LIGHTING PANEL "B", CIRCUIT 3
- MCCB-4 — HOME RUN TO MCCB-4
- CONCEALED CONDUIT IN FINISHED AREA
  EXPOSED CONDUIT IN UNFINISHED AREA
- CONCEALED CONDUIT IN FLOOR OR UNDERGROUND

GRAPHIC TELEPHONE & COMMUNICATION SYMBOLS

- TELEPHONE OUTLET
  #1 INDICATES SWITCHBOARD
  #2 INDICATES DESK PHONE
  #3 INDICATES WALL PHONE
- TELEPHONE FLOOR OUTLET
- PAGING SYSTEM & INTERCOM
- (3) DESK-SET, MASTER STATION, (3) INDICATES MAXIMUM NUMBER OF CHANNELS
- [H] WALL-TYPE HAND SET
- [W.S.] WALL-SET WITH INTEGRAL SPEAKER
- (S) SPEAKER
- (T) TRUMPET
- (S) CEILING SPEAKER
- JUNCTION BOX; TERMINALS, COUPLING DEVICES

GRAPHIC WIRING DEVICE SYMBOLS

- S_3 TOGGLE TYPE WALL SWITCH- SINGLE-MTD. 4'6" UNLESS OTHERWISE NOTED
  POLE (FLUSH MTD)
  NO. INDICATE 2 POLE, OR 4 WAY
- $S_{(P)}$ SWITCH WITH PILOT LIGHT
- S_D DOOR SWITCH
- S_K KEY OPERATED SWITCH
- S SURFACE MOUNTED SWITCH, RECEPTACLE, CLOCK, ETC.
- RECEPTACLE - DUPLEX - MTD. 1'-6" A.F.F. UNLESS OTHERWISE NOTED
- RECEPTACLE - SINGLE - MTD. 1'-6" A.F.F UNLESS OTHERWISE NOTED
- RECEPTACLE AND CLOCK
- (C) CLOCK OUTLET
- W.P. WEATHER PROOF
- E.P. EXPLOSION PROOF
- W.T. WATER TIGHT
- (J) [J] JUNCTION OR PULL BOX
- FLOOR DUPLEX RECEPTABLE OUTLET
- FLOOR SINGLE RECEPTABLE OUTLET
- S_T SWITCH WITH THERMAL OVERLOAD
- G F I GROUND FAULT INTERRUPTER

GRAPHIC MOTOR CONTROL SYMBOLS

- (PS) PRESSURE SWITCH
- (LS) LIMIT SWITCH
- (F) FLOAT OR LEVEL SWITCH
- [C] PUSH BUTTON STATION - START/STOP
- (T) THERMOSTAT
- (TC)[ ] HAND-OFF-AUTO. CONTROL STATION & REPEATING CYCLE TIMER
- DISCONNECT SWITCH
- HAND-OFF-AUTO SWITCH
- START-STOP L/O PUSH BUTTON
- STOP L/O
- MOTOR STARTER
- PANELBOARD (LP OR PP)
- (S) ELECTRIC MOTOR - NO. INDICATES H.P.

SINGLE LINE & SCHEMATIC WIRING SYMBOLS

- (M) MOTOR CONTACTOR COIL
- (GEN) GEN= GENERATOR
- POWER TRANSFORMER
- CIRCUIT BREAKER
- GROUND
- FUSE
- (A) AMMETER
- [AS] AMMETER SWITCH
- (V) VOLTMETER
- [VS] VOLTMETER SWITCH
- (PF) POWER FACTOR METER
- (W) WATTMETER
- (REC) RECORDING METER
- CURRENT TRANSFORMER
- POTENTIAL TRANSFORMER
- CAPACITOR
- O.L. THERMAL OVERLOAD
- SWITCH
- FUSED CUTOUT SWITCH
- PRESSURE SWITCH
- FLOAT SWITCH
- SELECTOR SWITCH
- LIMIT SWITCH
- TEMPERATURE SWITCH
- FLOW SWITCH
- (G) INDICATING LAMP (LETTER DENOTES COLOR)
- (RCT) REPEATING CYCLE TIMER

T.C. TIMING RELAY
T.C.= TIMED CLOSING
T.O.= TIMED OPENING

T.D.O.E. RELAY OR SOLENOID COIL
R. = RELAY
SC.= SOLENOID COIL
TDOE = TIME DELAY ON ENERGIZING
TDOD = TIME DELAY ON DE-ENERGIZING

ABBREVIATIONS

∠	ANGLE	MECH.	MECHANICAL
A/C	AIR CONDITIONER	MOD	MOTOR OPERATED DAMPER
AUX.	AUXILIARY	MOT.	MOTOR
AFF	ABOVE FINISHED FLOOR	NC	NORMALLY CLOSED
ATC	AUTOMATIC TEMPERATURE CONTROL	NO	NORMALLY OPEN
BATT.	BATTERY	PRIM.	PRIMARY
		PNL.	PANEL
		PWR.	POWER
C or CDT	CONDUIT	RECP.	RECEPTACLE
CUH	CABINET UNIT HEATER	STP	SHIELDED TWISTED PAIR
℄	CENTER LINE	SEC.	SECONDARY
		STD.	STANDARD
CIR.	CIRCUIT	SHLD.	SHIELDED
CU	CONDENSING UNIT	TRANS'R.	TRANSFORMER
CONT.	CONTROL	TEL.	TELEPHONE
CONV.	CONVEYOR	TYP.	TYPICAL
DIST.	DISTRIBUTION	TLCP	TRUCK LOADING CONTROL PANEL
DH.	DEHUMIDIFIER	U.G.	UNDERGROUND
DISC.	DISCONNECT	UH	UNIT HEATER
EWH	ELECTRIC WATER HEATER	XMTR.	TRANSMITTER
ERC	ELECTRIC REHEAT COIL	INCAND.	INCANDESCENT
EUH	ELECTRIC UNIT HEATER		
EWC	ELECTRIC WATER COOLER		
EF	EXHAUST FAN		
FDR.	FEEDER		
FLD. LT.	FLOOD LIGHT		
FLEX.	FLEXIBLE		
FIXT.	FIXTURE		
GRD.	GROUND		
GEN.	GENERATOR		
GALV.	GALVANIZED		
HID	HIGH INTENSITY DISCHARGE		
HTR.	HEATER		
INST.	INSTRUMENT		
LP	LIGHTING PANEL		
LA	LIGHTNING ARRESTER		
MAINT.	MAINTENANCE		
MTD.	MOUNTED		
MCC	MOTOR CONTROL CENTER		

REVISIONS		
DATE	DESCRIPTION	BY
2/83	ADDED GFI	JCO

DESIGN ENGR. DF
DRAWN BY
PROJECT ENG.
PROJECT MGR. RCG
CHECKED BY
CHECKED BY

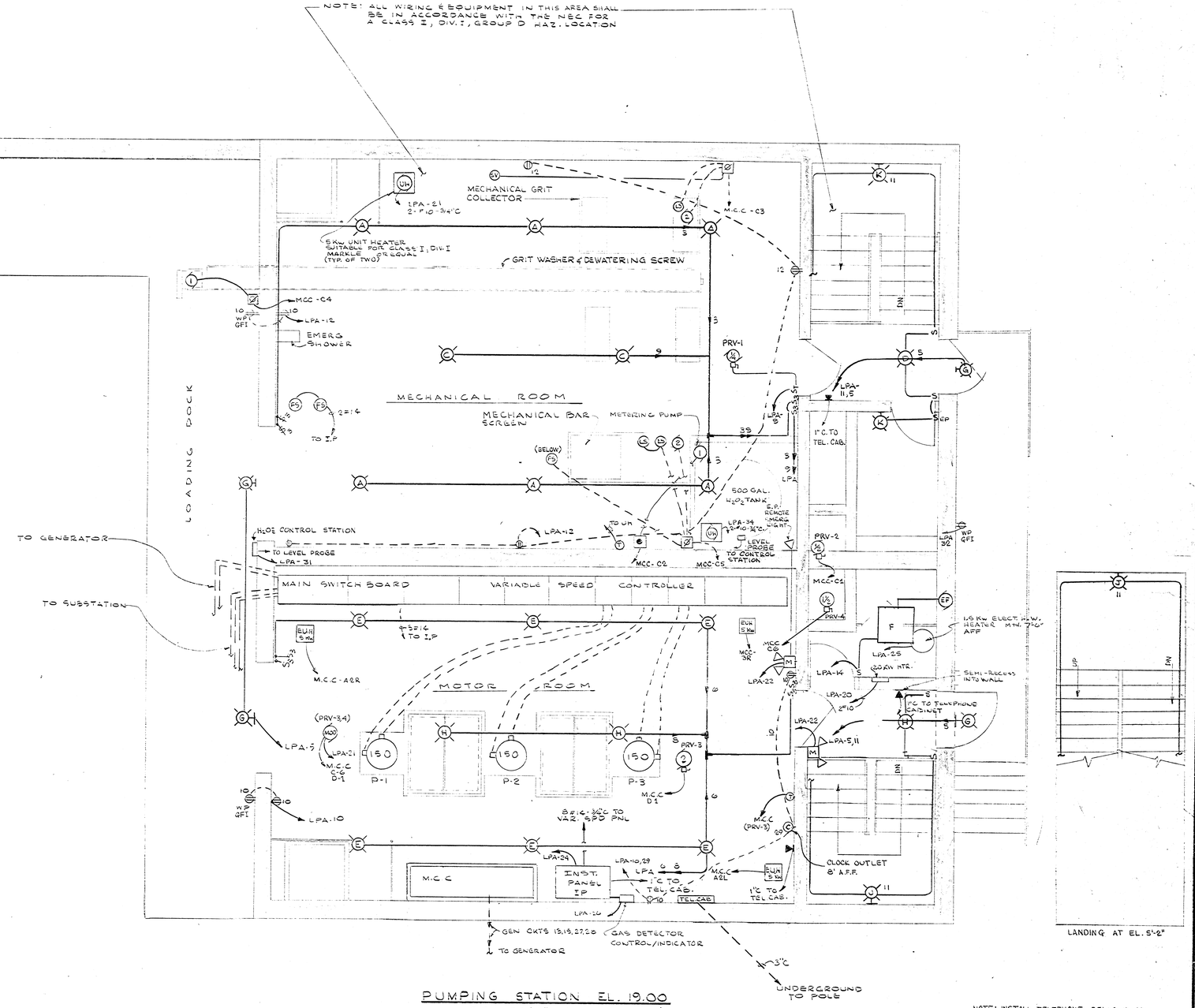
ROBERT G. REESE REGISTERED NO. 8196 PROFESSIONAL ENGINEER

Betz • Converse • Murdoch • Inc.
Potomac Group
VIENNA AND STAUNTON VIRGINIA
BCM

CITY OF DOVER
KENT COUNTY, DELAWARE
PUNCHEON RUN SEWER FACILITIES
PUMPING STATION
ELECTRICAL - SYMBOLS & ABBREVIATIONS

DATE SEPT 1978 | FILE No | W O No 02-0034-03 | PLAN No. 501

UPDATE: JAN. 1985



PUMPING STATION EL. 19.00

SCALE: 3/8" = 1'-0"

NOTE: INSTALL TELEPHONE BELLS IN ALL ROOMS ON ALL LEVELS. USE CLASS I, DIV. I, GROUP D WIRING AND EQUIPMENT.

REVISIONS		
DATE	DESCRIPTION	BY
2/83	VARIOUS CHANGES	JOO

DESIGN ENGR. DB
DRAWN BY R.G.R.
PROJECT ENG.
PROJECT MGR. RGS
CHECKED BY
CHECKED BY

ROBERT W. FESSLER REGISTERED NO. 5198 DELAWARE

Betz • Converse • Murdoch • Inc.
Potomac Group
VIENNA AND STAUNTON, VIRGINIA
BCM

CITY OF DOVER
KENT COUNTY, DELAWARE

PUNCHEON RUN SEWER FACILITIES

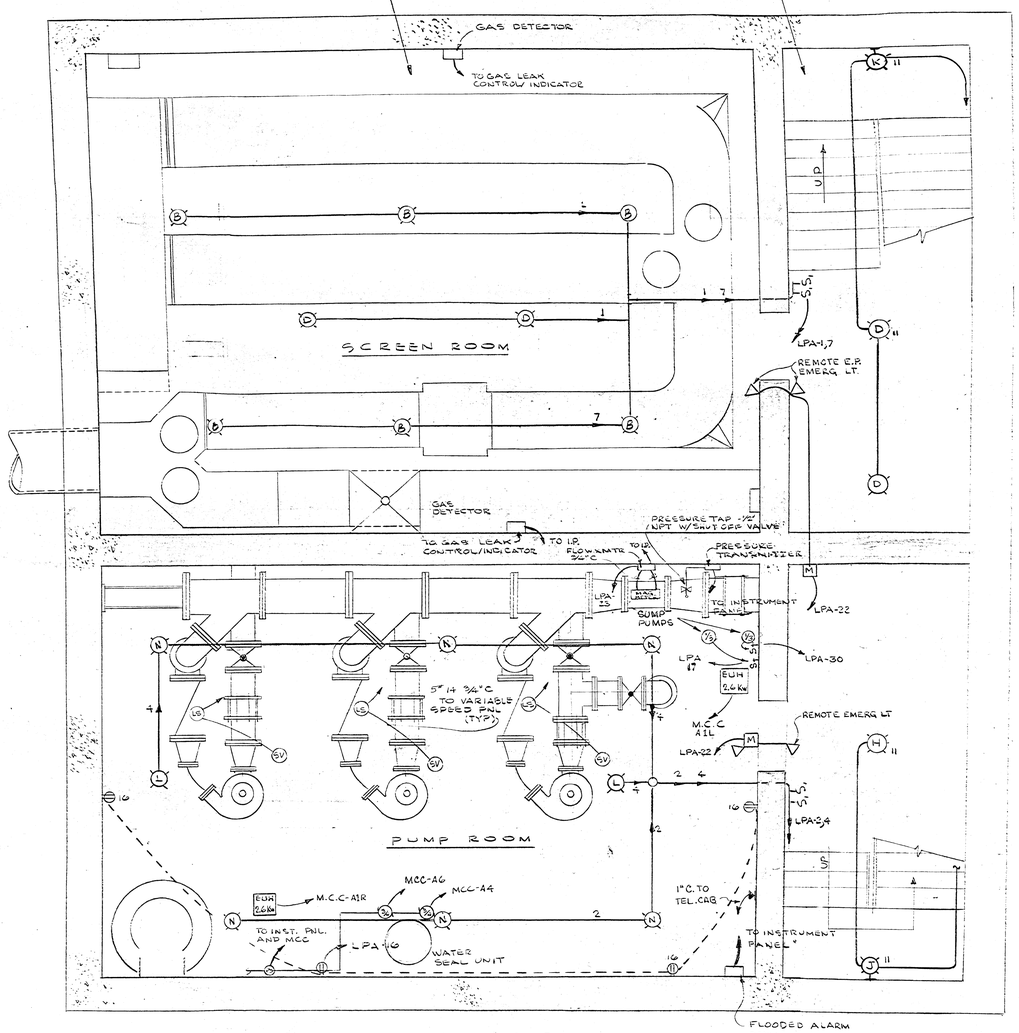
PUMPING STATION

ELECTRICAL - 1st FLOOR PLAN

DATE: SEPT 1978 | FILE No. | W.O. No. 02-0034-03 | PLAN No. 502

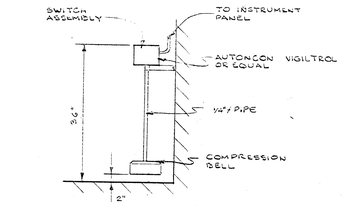
UPDATE: JAN. 1983

NOTE: WIRING & EQUIPMENT IN THIS AREA SHALL BE IN ACCORDANCE WITH THE N.E.C FOR A CLASS I, DIV. I, GROUP D HAZ. LOCATION



PUMP STATION PLAN - EL. 8.75

3/8" 0 1 2 3 4 5 6 7



FLOODED ALARM DEVICE
NO SCALE

120-208V 100A 3φ 4W ~ LTG PANEL SCHEDULE ~ 100A MAIN BKR

CKT	LOCATION	POLE	BKR	WATTS		LOCATION	POLE	BKR	WATTS
1	SCREEN RM EL. 8.75' LTS	1P	20A	1350	2	PUMP RM EL.-5' LTS	1P	20A	600
3	MECH. RM EL. 19' LTS	1P	20A	1500	4	PUMP RM EL -5' LTS	1P	20A	600
5	OUTSIDE LTG	1P	20A	800	6	MOTOR RM EL. 19' LTS	1P	20A	1500
7	SCREEN RM EL. 8.75' LTS	1P	20A	750	8	MOTOR RM EL. 19' LTS	1P	20A	1500
9	MECH. RM EL. 19' LTS	1P	30A	600	10	RECEPTACLES EL. 19'	1P	20A	800
11	STAIRWAY LTS	1P	20A	900	12	RECEPTACLES EL. 19'	1P	20A	800
13	GEN. BAT CHARGER, HTR BOX	1P	20A	300	14	MENS ROOM LTS EL. 19'	1P	20A	200
15	GEN. FUEL PUMP	1P	20A	700	16	PUMP ROOM RECEPTACLES	1P	20A	800
17	SUMP PUMP	1P	20A	900	18	CIRC. PUMP	1P	30A	800
19	EXH FAN PRV-1	1P	20A	1200	20	WALL HEATER	1P	30A	2000
21	UNIT HEATERS, MOD	2P	30A	5000	22	EMERG LTG UNITS	1P	30A	500
23	MAG. METER & TRANSMITTER	1P	20A	100	24	INSTR. PANEL	1P	30A	200
25	WATER HEATER	1P	20A	1650	26	GAS DETECTOR SYSTEM	1P	20A	200
27	GEN. JACKET WATER HTR. LEFT	1P	20A	1500	28	GEN. JACKET WATER HTR. RIGHT	1P	20A	1500
29	CLOCK	1P	20A		30	SUMP PUMP	1P	20A	900
31	H_2O_2 LEVEL PROBE / CONTROL	1P	20A		32	RECEPTACLE	1P	20A	
33	SPARE	1P	20A		34	UNIT HEATER	2P	30A	5000
35	SPACE				36	SPARE	1P	20A	
37	SPACE				38	SPACE			
39	SPACE				40	SPACE			

LTG FIXT. SCHEDULE

TYPE	DESCRIPTION	MFR
A	175 W MV CLG MTD W/ DOME REFLECTOR FOR CLASS I DIV. I AREA 120V (RD75)	C-HINDS EVMCX82170
B	SAME AS ABOVE EXCEPT 100W (RD75 REFLECTOR) SG02 FIN.	C-HINDS EVMCX82100
C	300W INCAND. CLG. MTD W/DOME REFLECTOR FOR CLASS I DIV. I AREA 120V	C-HINDS EVCX2081
D	SAME AS ABOVE EXCEPT 150W, SG02 FIN.	C-HINDS EVCX2011
E	175 W MV CLG MTD W/ DOME REFLECTOR W RD70	C-HINDS VMVC2175G
F	2-40W, RAPID START, 120V. LAMPS - RECESSED 2'X2' FLUORESCENT FIXTURE	MILLER CAT. #GT-2692-82
G	WALL MTD MV 175W LEXAN SHIELD, 120V PHOTOCELL	LIGHTRON LW8335-L5-PC
H	SURFACE MTD 150W INCAND. 120V	CROUSE HINDS CAT # VXH253 C.D.
J	WALL MTD 150W INCAND. 120V.	CROUSE HINDS CAT # VXH8253
K	WALL MTD 150 W INCAND. 120V FOR CLASS I, DIV. I AREA	CROUSE HINDS CAT # EVJ210
L	300W INCAND. FIXTURE W/DOME REFLECTOR PENDANT MTD (18'-6")	CROUSE HINDS CAT # VDA2550
M	2 LAMP/35W EMERGENCY LTG UNIT W/ REMOTE HEADS AS INDICATED - MTG HEIGHT - 8'-6"	EXIDE TYPE FSS
N	PENDANT MTD (18'-6") 250W M.V. W/DOME REFLECTOR # RD70	C-HINDS VMVC2A250GP

REVISIONS		
DATE	DESCRIPTION	BY
2/83	VARIOUS CHANGES	JCO

DESIGN ENGR. DS
DRAWN BY RWL
PROJECT ENG.
PROJECT MGR. RJG
CHECKED BY
CHECKED BY

ROBERT W. HESSON REGISTERED NO. 3106 PROFESSIONAL ENGINEER

Betz • Converse • Murdoch • Inc.
Potomac Group
VIENNA AND STAUNTON, VIRGINIA
BCM

CITY OF DOVER
KENT COUNTY, DELAWARE

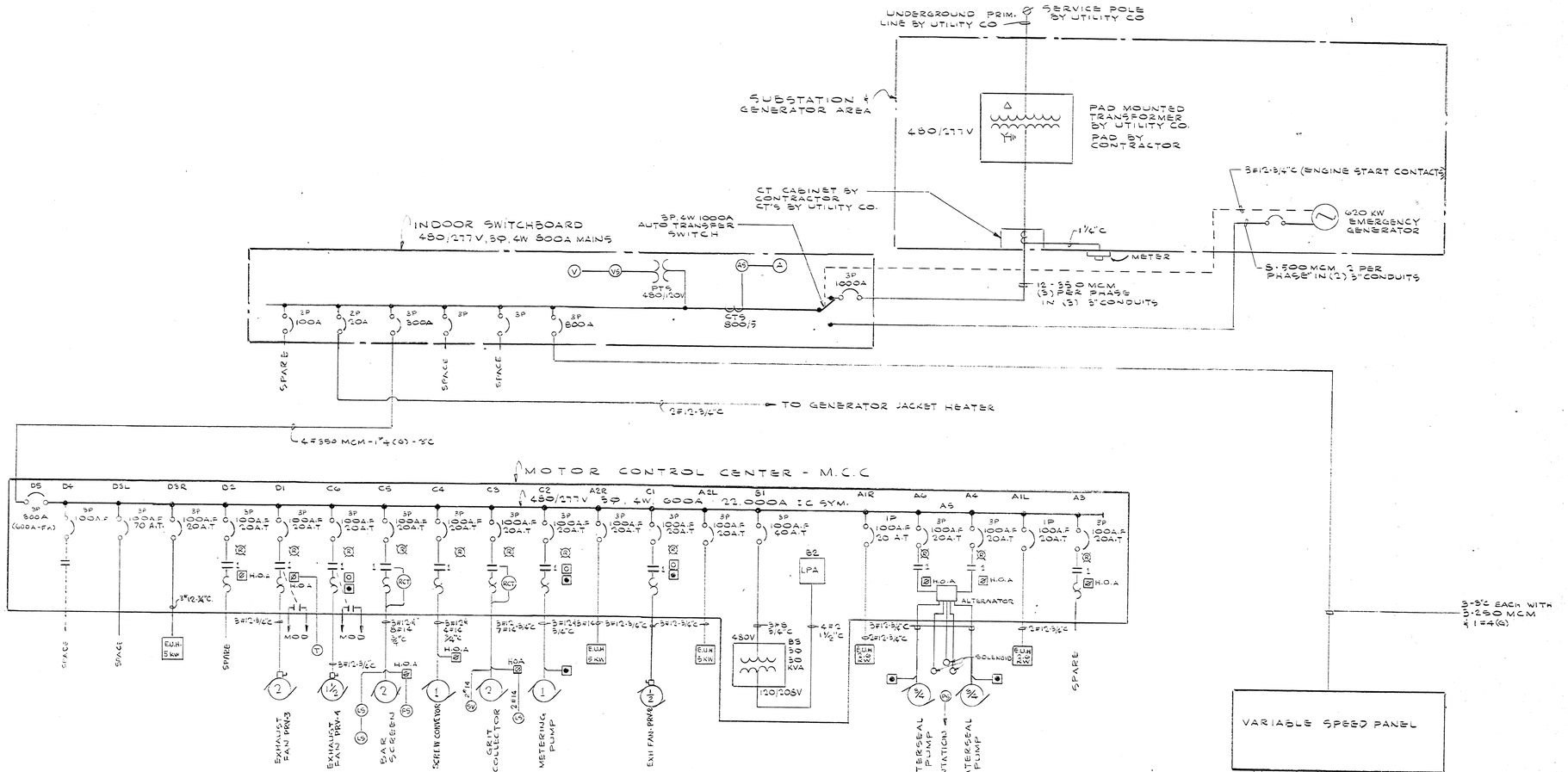
PUNCHEON RUN SEWER FACILITIES

PUMPING STATION

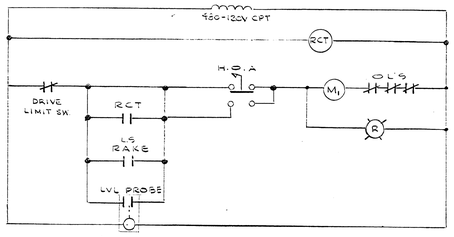
ELECTRICAL - BASEMENT PLAN

DATE: SEPT 1978 | FILE No. | W.O. No. 02-0034-03 | PLAN No. 503

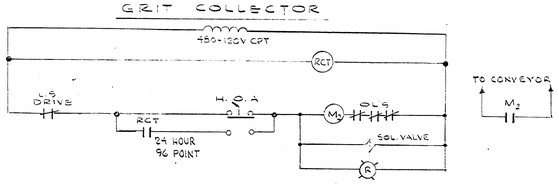
UPDATE: JAN. 1983



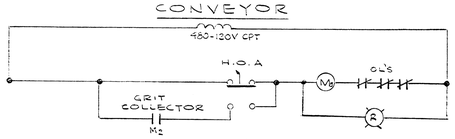
BAR SCREEN



GRIT COLLECTOR



CONVEYOR



REVISIONS		
DATE	DESCRIPTION	BY
2/83	VARIOUS CHANGES	JCO

DESIGN ENGR. DB
DRAWN BY RGE
PROJECT ENG.
PROJECT MGR. RGE
CHECKED BY RGE
CHECKED BY

ROBERT G. HEDGEPETH REGISTERED PROFESSIONAL ENGINEER NO. 2198

Betz • Converse • Murdoch • Inc.
Potomac Group
VIENNA AND STAUNTON, VIRGINIA

BCM

CITY OF DOVER
KENT COUNTY, DELAWARE

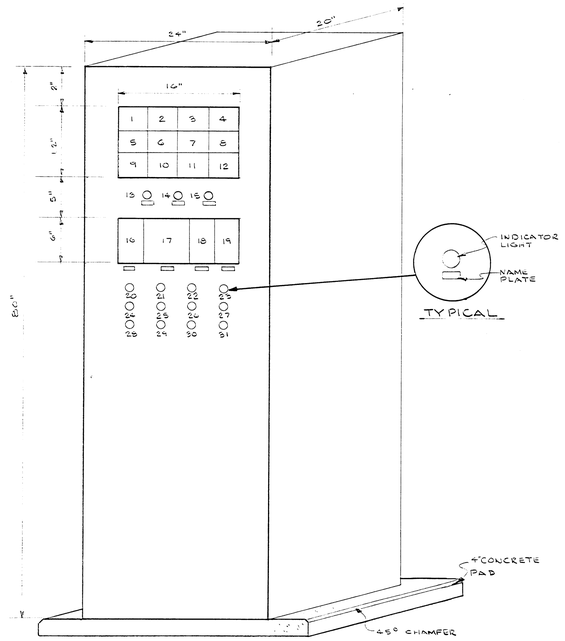
PUNCHEON RUN SEWER FACILITIES

PUMPING STATION

ELECTRICAL - SINGLE LINE DIAGRAM

DATE: SEPT 1978 | FILE No. | W.O. No. 02-0034-03 | PLAN No. 504

UPDATE: JAN. 1983

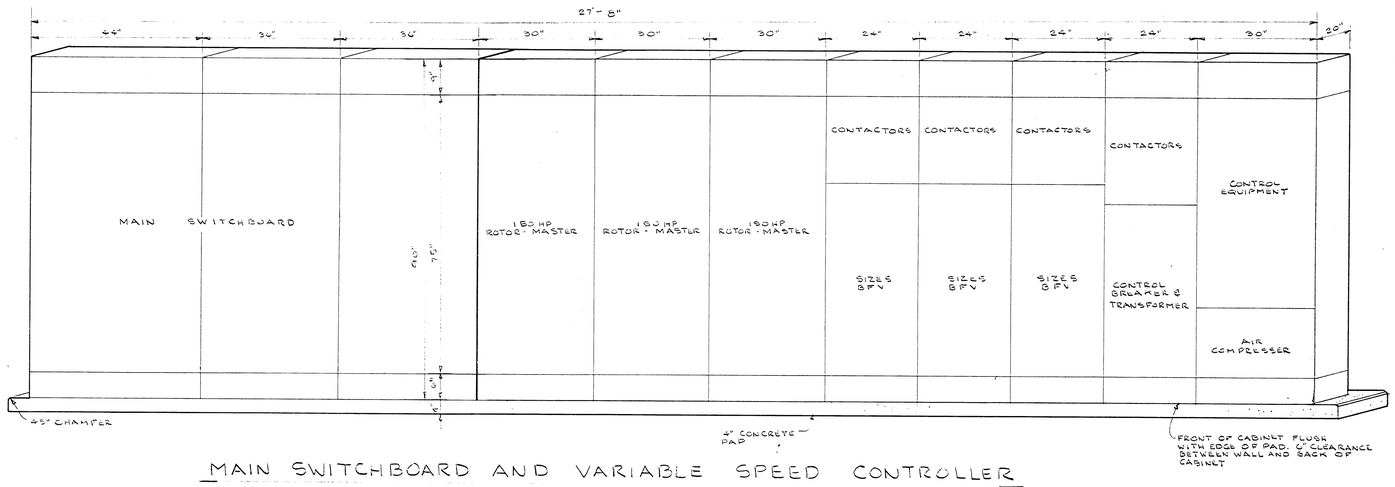


PUMPING STATION INSTRUMENTATION PANEL

NOT TO SCALE

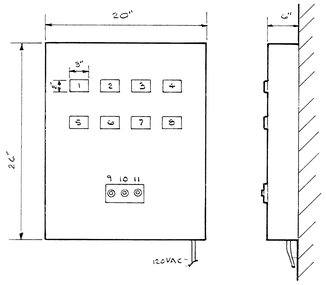
Legend - Pumping Station Instrumentation Panel

1. Annunciator - High Wet Well Level
2. Annunciator - Low Wet Well Level
3. Annunciator - Power Failure
4. Annunciator - Combustible Gases in Influent Chamber
5. Annunciator - Pump Room Flooded
6. Annunciator - Mechanical Bar Screen Failure
7. Annunciator - Seal Water Pressure Loss
8. Annunciator - Generator Operating
9. Annunciator - Pump No.1 Failure
10. Annunciator - Pump No.2 Failure
11. Annunciator - Pump No.3 Failure
12. Annunciator - Blank
13. Annunciator and Lamp Test Pushbutton
14. Audible Alarm Device
15. Audible Alarm Silence Pushbutton
16. Wet Well Level Indicator
17. Pump Station Effluent Flow Recorder
18. Pump Station Effluent Flow Totalizer
19. Force Main Pressure Indicator
20. Pump No. 1 On (Red - Typ)
21. Pump No. 1 Off (Green - Typ)
22. Check Valve No. 1 Open (Red - Typ)
23. Check Valve No. 1 Closed (Green - Typ)
24. Pump No. 2 On
25. Pump No. 2 Off
26. Check Valve No. 2 Open
27. Check Valve No. 2 Closed
28. Pump No. 3 On
29. Pump No. 3 Off
30. Check Valve No. 3 Open
31. Check Valve No. 3 Closed



MAIN SWITCHBOARD AND VARIABLE SPEED CONTROLLER

NOT TO SCALE



DISPATCHERS MONITORING PANEL

(LOCATED AT PW-2)

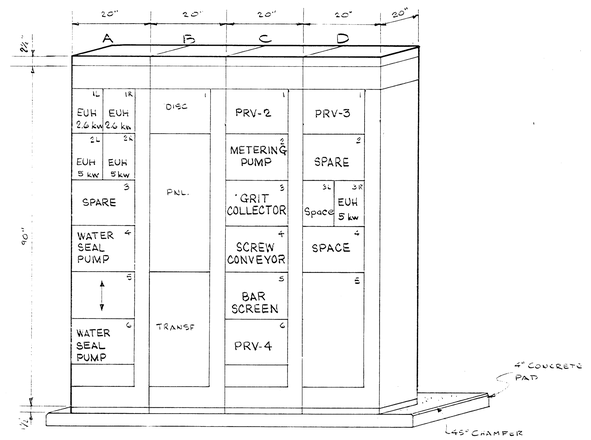
NOT TO SCALE

Legend - Dispatcher's Monitoring Panel
(City of Dover)

1. Annunciator - High Wet Well Level
2. Annunciator - Loss Normal Power
3. Annunciator - Pump Room Flooding
4. Annunciator - Generator Operating

5 - 8 Space

9. Lamp Test
10. Lamp Reset
11. Alarm Acknowledge



MOTOR CONTROL CENTER (MCC)

NOT TO SCALE

REVISIONS			DESIGN ENGR.
DATE	DESCRIPTION	BY	DRAWN BY
9/83	MCC LABELS ADDED	JCO	PROJECT ENG.
			PROJECT MGR.
			CHECKED BY
			CHECKED BY

ROBERT D. LESSIN REGISTERED No. 2198 PROFESSIONAL ENGINEER DELAWARE

Betz • Converse • Murdoch • Inc.
Potomac Group
VIENNA AND STAUNTON, VIRGINIA
BCM

CITY OF DOVER
KENT COUNTY, DELAWARE

PUNCHEON RUN SEWER FACILITIES

INSTRUMENTATION AND CONTROL

DATE: SEPT. 1978 | FILE No. | W.O. No. 02-0034-03 | PLAN No. 550

UPDATE: JAN. 1983

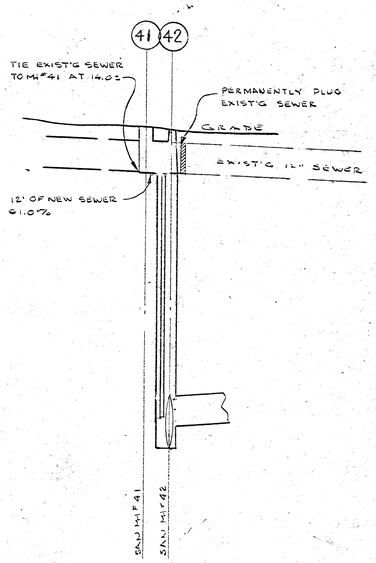
Coordinate work with adjacent contractor as required. Contract 34-82-01 is responsible for construction of MH 38 including bench and invert work, if interceptor pipe is installed before MH 38 is constructed. If MH 38 is built before interceptor pipe is installed, Contract 34-82-02 is responsible for bench and invert work. Contract 34-82-02 is responsible for pumping out water accumulated in interceptor pipe. Contract 34-82-01 is responsible for testing manhole 38.

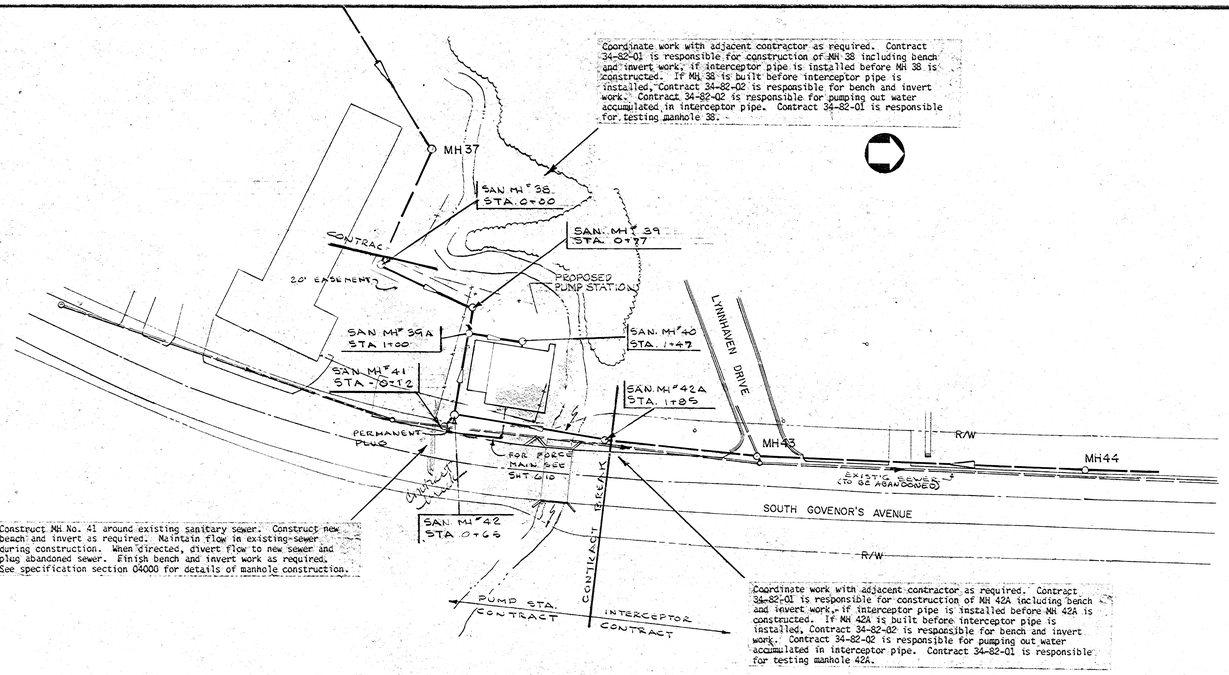
Construct MH No. 41 around existing sanitary sewer. Construct new bench and invert as required. Maintain flow in existing sewer during construction. When directed, divert flow to new sewer and plug abandoned sewer. Finish bench and invert work as required. See specification section 04000 for details of manhole construction.

Coordinate work with adjacent contractor as required. Contract 34-82-01 is responsible for construction of MH 42A including bench and invert work, if interceptor pipe is installed before MH 42A is constructed. If MH 42A is built before interceptor pipe is installed, Contract 34-82-02 is responsible for bench and invert work. Contract 34-82-02 is responsible for pumping out water accumulated in interceptor pipe. Contract 34-82-01 is responsible for testing manhole 42A.

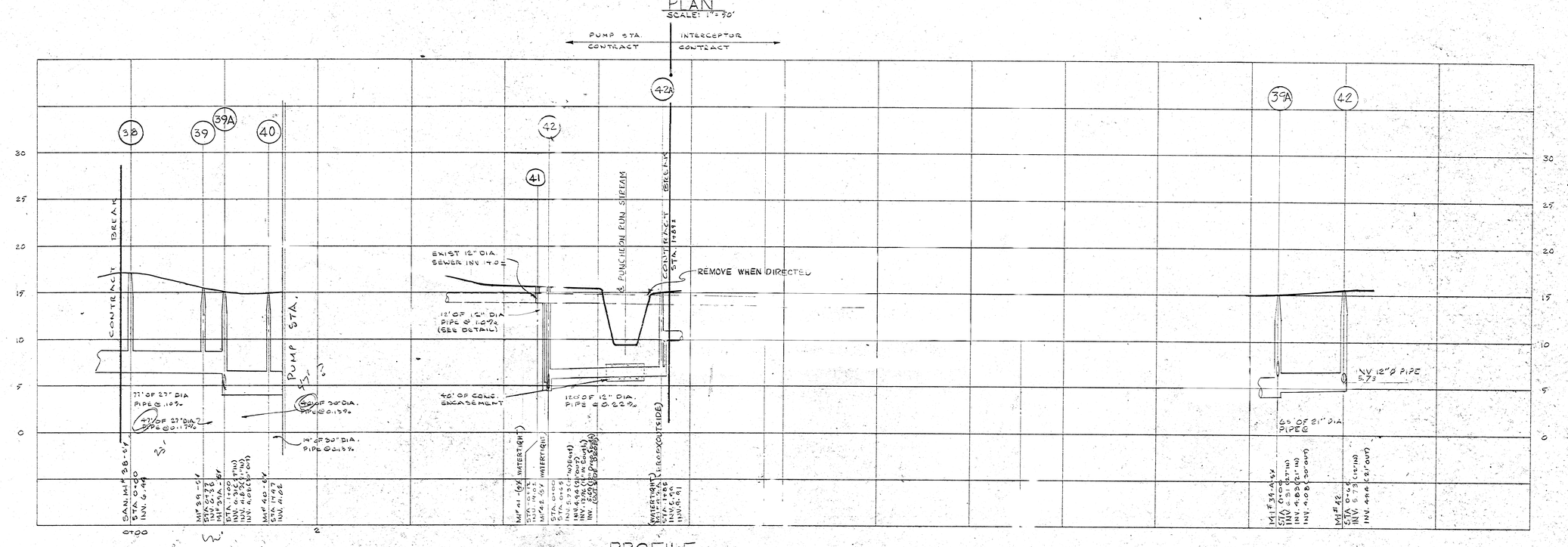
NOTES:

1. Do not direct sewage flow in to new sewer until directed by Owner. Maintain flow in existing sewers during construction.
2. Fill all abandoned sewers with grout after sewage flow is directed is to new sewer.
3. When directed, remove portion of existing 12" sewer that spans Puncheon Run and plug ends of pipe left in the ground.





PLAN
SCALE: 1" = 50'



PROFILE
SCALE: 1" = 5' VERT. 1" = 50' HORZ

REVISIONS		
DATE	DESCRIPTION	BY
5/82	ADDED MH #42A = CONTRACT DIV.	PSW
8/83	VARIOUS CHANGES/NOTES ADDED	JCO

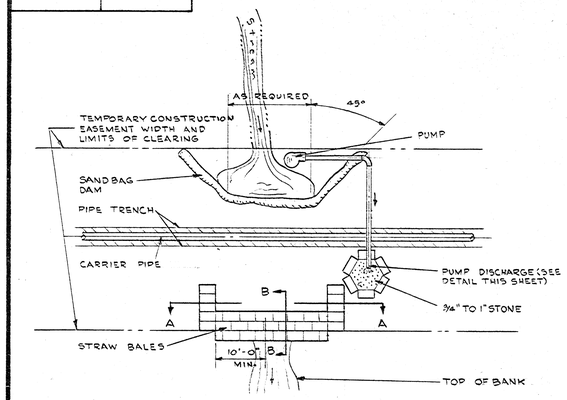
DESIGN ENGR: FRM
DRAWN BY: KW
PROJECT ENG: FRM
PROJECT MGR: AJD
CHECKED BY: FRM
CHECKED BY

ROBERT W. MESSA REGISTERED PROFESSIONAL ENGINEER NO. 2192 STATE OF DELAWARE

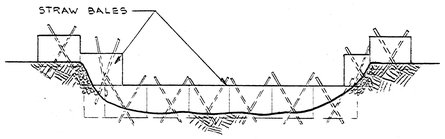
Betz • Converse • Murdoch • Inc.
Potomac Group
VIENNA AND STAUNTON, VIRGINIA
BCM

CITY OF DOVER
KENT COUNTY, DELAWARE
PUNCHEON RUN SEWER FACILITIES
PUMPING STATION
PLAN & PROFILE

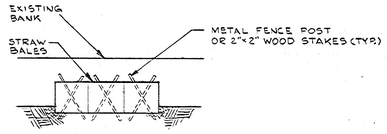
DATE: SEPT. 1978 | FILE No. | W.O. No. 02-0034-03 | PLAN No. 608
UPDATE: JAN. 1983



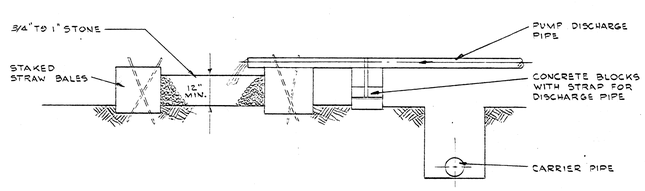
TYPICAL PLAN
(SEDIMENT CONTROL CROSSING STREAM)



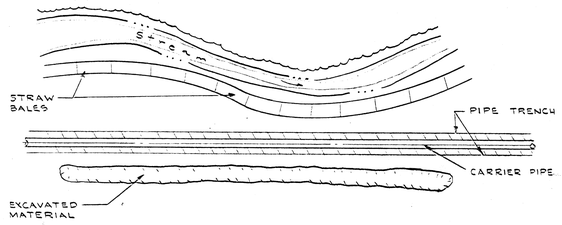
SECTION A-A



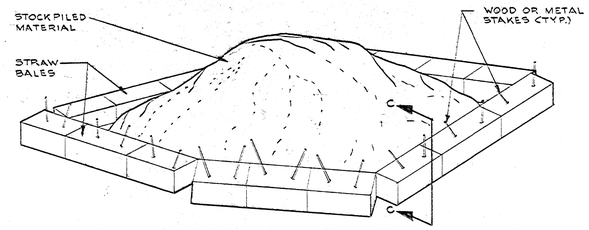
SECTION B-B



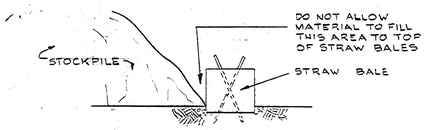
PUMP DISCHARGE DETAIL



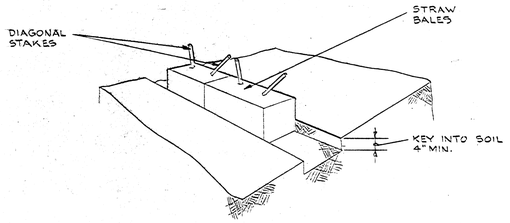
TYPICAL PLAN
(SEDIMENT CONTROL PARALLEL TO STREAM)



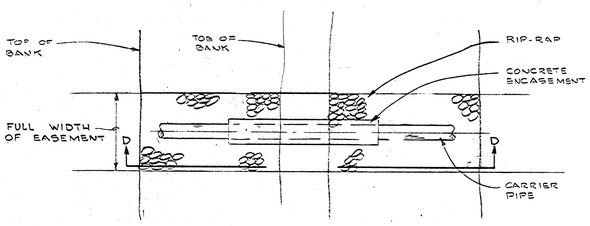
STOCKPILE CONTROL DETAIL



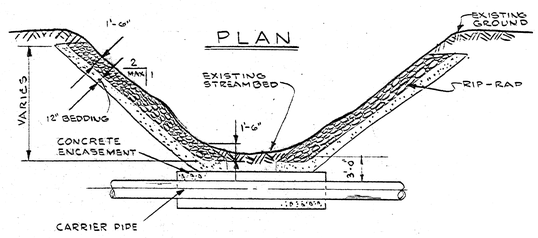
SECTION C-C



BALE IMBEDMENT DETAIL

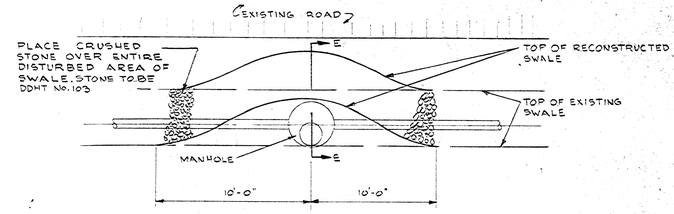


PLAN

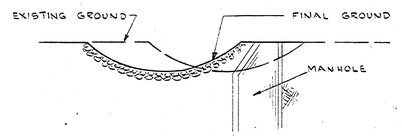


SECTION D-D

RIP RAP DETAIL

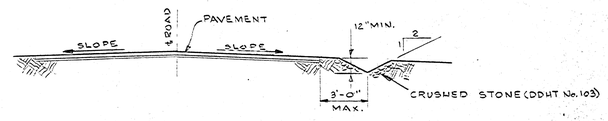


PLAN



SECTION E-E

TYPICAL SWALE RELOCATION



SWALE RECONSTRUCTION DETAIL

REVISIONS		
DATE	DESCRIPTION	BY
1/83	ADDED MORE RIP-RAP	TRM

DESIGN ENGR. FRM
DRAWN BY HP
PROJECT ENG. FRM
PROJECT MGR. AJD
CHECKED BY FRM
CHECKED BY

ROBERT W. HESS REGISTERED NO. 3196 DELAWARE

Betz • Converse • Murdoch • Inc.
Potomac Group
VIENNA AND STAUNTON, VIRGINIA
BCM

CITY OF DOVER
KENT COUNTY, DELAWARE

PUNCHEON RUN SEWER FACILITIES

SOIL EROSION AND SEDIMENTATION CONTROL PLAN

DATE: SEPT. 1978 | FILE No. | W. O. No. 02-0034-03 | PLAN No. 611

UPDATE: JAN. 1983

CITY MANAGER
ANTHONY J. DEPRIMA, AICP

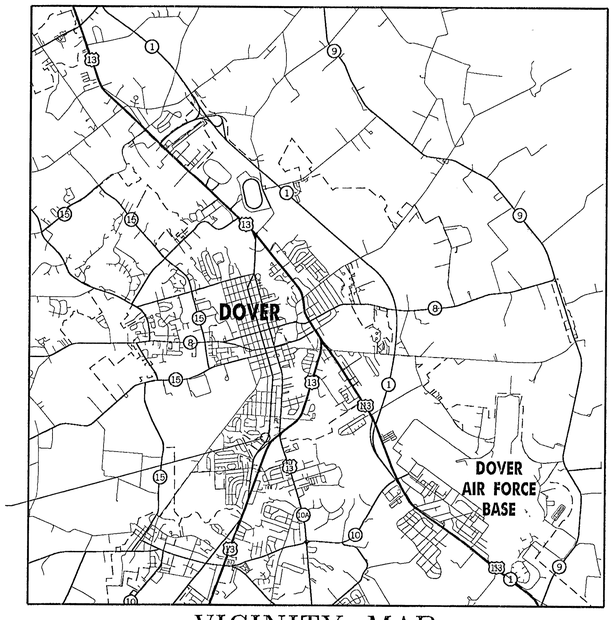
PUBLIC WORKS DIRECTOR
SCOTT KOENIG

LIST OF DRAWINGS

G-1	TITLE SHEET, LIST OF DRAWINGS AND LOCATION PLAN
C-1	SITE PLAN, GENERAL NOTES AND DETAILS
S-1	STRUCTURAL NOTES
S-2	REMOVAL PLAN, FRAMING PLAN, SECTIONS AND DETAILS
M-1	GENERAL NOTES, LEGEND, SCHEDULES AND SYSTEM CHARACTERISTICS
M-2	REMOVAL PLANS AND SECTIONS
M-3	REVISED PLANS, SECTIONS AND DETAILS
E-1	LEGEND, ABBREVIATIONS AND GENERAL NOTES
E-2	PUMPING STATION CONTROL ROOM - DEMOLITION
E-3	SINGLE LINE DIAGRAM - POWER DISTRIBUTION SYSTEM
E-4	PUMPING STATION CONTROL ROOM - POWER
E-5	PUMPING STATION PUMP ROOM - POWER
E-6	MISCELLANEOUS DETAILS
E-7	SECTION AND DETAILS
E-8	SCHEDULES
I-1	LEGEND, ABBREVIATIONS AND GENERAL NOTES
I-2	PROCESS AND INSTRUMENTATION DIAGRAMS
I-3	PUMP CONTROL SCHEMATIC
I-4	CONTROL PANEL ELEVATION AND LAYOUT
I-5	LAYOUT, LOOP AND RISER

CITY OF DOVER

PUNCHEON RUN SEWAGE PUMPING STATION UPGRADES



VICINITY MAP

JOHN S. MAYNES REGISTERED 7005 DELAWARE PROFESSIONAL ENGINEER

Whitman, Requardt and Associates, LLP
Engineers, Architects and Planners

CITY OF DOVER, DELAWARE
DEPARTMENT OF PUBLIC WORKS

PUNCHEON RUN SEWAGE PUMPING STATION UPGRADES

TITLE SHEET, LIST OF DRAWINGS AND LOCATION PLAN

DRAWING NO. 1 OF 20

SHEET G-1

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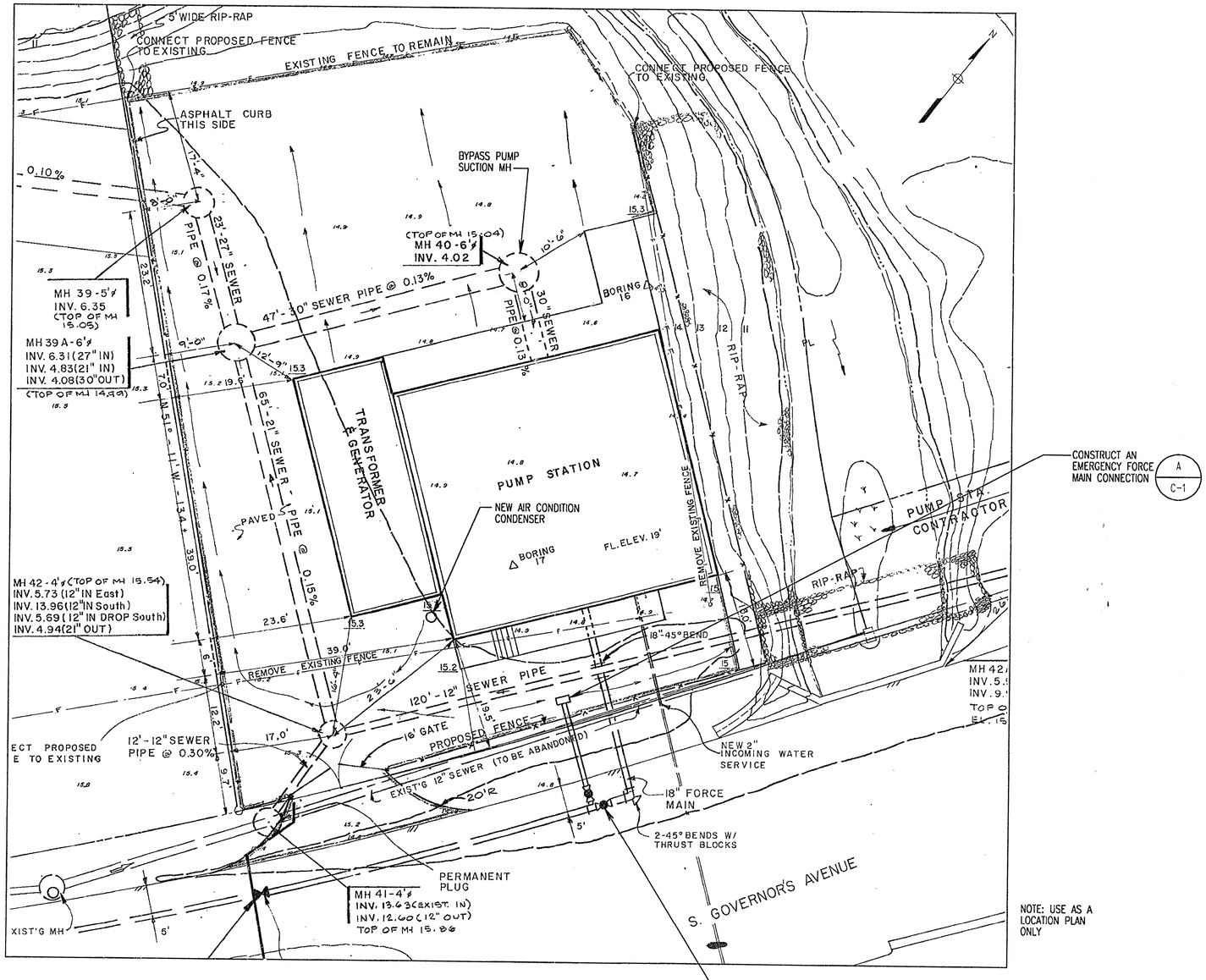
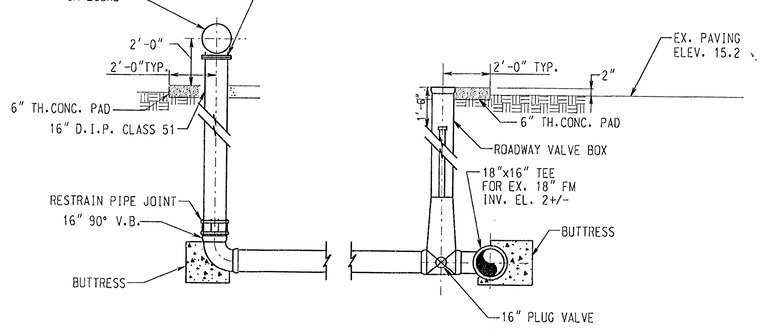
Mon Feb 28 14:13:39 2005

FEBRUARY 2005



1 / C-1 **EXISTING PUMPING STATION SITE PLAN PER PROJECT NO. 02-0034-02 (DATED JAN. 1983)**

SCALE: 1"=10'



A / C-1 **EMERGENCY FORCE MAIN CONNECTION - DETAIL**

NO SCALE

GRAPHIC SCALE

10' 5' 0' 10' 20'

SCALE: 1" = 10'

REV	DATE	DESCRIPTION
1		

JOHN S. MAYNE REGISTERED 7005 DELAWARE PROFESSIONAL ENGINEER

WR&A Whitman, Requardt and Associates, LLP
Engineers, Architects and Planners

CITY OF DOVER, DELAWARE
DEPARTMENT OF PUBLIC WORKS

PUNCHEON RUN SEWAGE PUMPING STATION UPGRADES

SITE PLAN, GENERAL NOTES AND DETAILS

DRAWING NO. 2 OF 20

SHEET C-1

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Mon Feb 28 14:13:17 2005

FEBRUARY 2005

GENERAL NOTES:

1. FIELD VERIFY ALL DIMENSIONS, LOCATIONS AND ELEVATIONS SHOWN ON CONTRACT DRAWINGS FOR EXISTING STRUCTURES. ALL DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER BEFORE PROCEEDING WITH THE WORK.

2. THE SIZES AND LOCATIONS OF EQUIPMENT PADS AND PEDESTALS, AS WELL AS EQUIPMENT RELATED FLOOR AND WALL OPENINGS, ARE DEPENDENT ON THE ACTUAL EQUIPMENT FURNISHED. VERIFY AND COORDINATE ALL SUCH ITEMS. DIMENSIONS INDICATED ON THESE DRAWINGS SHALL NOT BE ALTERED WITHOUT APPROVAL OF THE ENGINEER. STRUCTURAL DRAWINGS MAY NOT SHOW ALL EQUIPMENT PADS AND OTHER EQUIPMENT SUPPORTS REQUIRED. REFER TO CIVIL, ARCHITECTURAL, MECHANICAL AND ELECTRICAL DRAWINGS.

CONCRETE NOTES:

1. PROVIDE CONCRETE WITH A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI AT 28 DAYS.

2. DETAIL AND CONSTRUCT REINFORCED CONCRETE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE ACI 301, "SPECIFICATION FOR STRUCTURAL CONCRETE."

3. DETAIL REINFORCING STEEL IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE ACI 315, "MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES," AND ACI SP-66, "ACI DETAILING MANUAL."

4. PROVIDE REINFORCEMENT CONFORMING TO ASTM A 615, GRADE 60, DEFORMED BARS. ALL REINFORCEMENT IS DESIGNATED IN SOFT METRIC UNITS.

5. PROVIDE WELDED WIRE FABRIC CONFORMING TO ASTM A 185.

6. UNLESS NOTED OTHERWISE ON THE DRAWINGS, THE CONCRETE COVER FOR REINFORCEMENT SHALL BE AS FOLLOWS:

   A. BEAMS, SLABS, COLUMNS AND WALLS EXPOSED TO GROUND, WEATHER, PROCESS LIQUIDOR VAPORS AFTER REMOVAL OF FORMS: 2"
   B. BEAMS, COLUMNS, WALLS AND PIERS NOT EXPOSED TO WEATHER OR PROCESS LIQUID OR VAPORS: 1 1/2"

7. SUBMIT REINFORCING STEEL DETAILS (SHOP DRAWINGS) AND RECEIVE APPROVAL BEFORE PROCEEDING WITH APPLICATION.

8. PROVIDE SWELLABLE (Rx TYPE) WATERSTOPS AS SHOWN ON THE DRAWINGS.

9. SIZE AND LOCATE ANCHOR BOLTS AND EQUIPMENT PADS OR PEDESTALS TO SUIT EQUIPMENT FIRNISHED.

10. REVIEW ALL DRAWINGS FROM OTHER DISCIPLINES AND COORDINATE ALL OPENINGS AND ENBEDDED ITEMS SUCH AS SLEEVES, ANCHORS, CONDUIT, ETC. THAT WILL BE INCORPORATED INTO CONCRETE WORK.

STRUCTURAL STEEL NOTES:

1. FABRICATE AND ERECT STRUCTURAL STEEL CONFORMING TO THE REQUIREMENTS OF AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC), "MANUAL OF STEEL CONSTRUCTION".

2. SUBMIT ERACTION PLANS AND SHOP DETAILS AND RECEIVE APPROVAL BEFORE PROCEEDING WITH FABRICATION.

3. PROVIDE STRUCTURAL STEEL WIDE-FLANGE SHAPES CONFORMING TO ASTM A992, HSS MEMBERS CONFORMING TO ASTM A500, AND ALL OTHER MEMBERS CONFORMING TO ASTM A36.

4. PROVIDE ANCHOR BOLTS CONFORMING TO ASTM F1554.

5. PROVIDE HIGH STRENGTH BOLTS CONFORMING TO ASTM A325. PROVIDE ALL BOLTED CONNECTIONS WITH COMPRESSIBLE-WASHER-TYPE DIRECT-TENSION INDICATORS CONFORMING TO ASTM F959.

6. WELD IN COMPLIANCE WITH AMERICAN WELDING SOCIETY AWS D1.1, "STRUCTURAL WELDING CODE."

7. WELD ALL SHOP CONNECTIONS WITH CLASS E-70 SERIES ELECTRODES. PROVIDE FIELD CONNECTIONS WITH HIGH STRENGTH BOLTED CONNECTIONS EXCEPT WHERE NOTED.

8. CONNECTIONS NOT INDICATED SHALL BE DESIGNED BY THE FABRICATOR. DESIGN BEAM CONNECTIONS FOR ONE HALF OF TOTAL ALLOWABLE UNIFORM LOAD FOR THE SPAN OF THE BEAM AS GIVEN IN PART 2 OF THE "MANUAL OF STEEL CONSTRUCTION". PROVIDE MINIMUM CONNECTION OF TWO 3/4" DIAMETER HIGH STRENGTH STEEL BOLTS OR WELDS OF EQUIVALENT STRENGTH.

9. MILL BOTTOM OF ALL COLUMNS AND FINISH TOP OF ALL BASE PLATES IN ACCORDANCE WITH AISC SPECIFACATIONS. WELD BASE PLATES TO BOTTOM OF COLUMNS.

10. PROVIDE 1/4" THICK LEVELING PLATE UNDER ALL BEAMS AND COLUMNS RESTING ON CONCRETE OR MASONRY.

11. ALL STRUCTURAL STEEL SHALL BE PAINTED IN ACCORDANCE WITH SPECIFICATION SECTION HIGH PERFORMANCE COATING.

JOHN S. MAYNES REGISTERED 7005 DELAWARE PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION
1		

WMR&A
Whitman, Requardt and Associates, LLP
Engineers, Architects and Planners

CITY OF DOVER, DELAWARE
DEPARTMENT OF PUBLIC WORKS

PUNCHEON RUN SEWAGE PUMPING STATION UPGRADES

STRUCTURAL NOTES

DRAWING NO. 3 OF 20

SHEET S-1

FEBRUARY 2005

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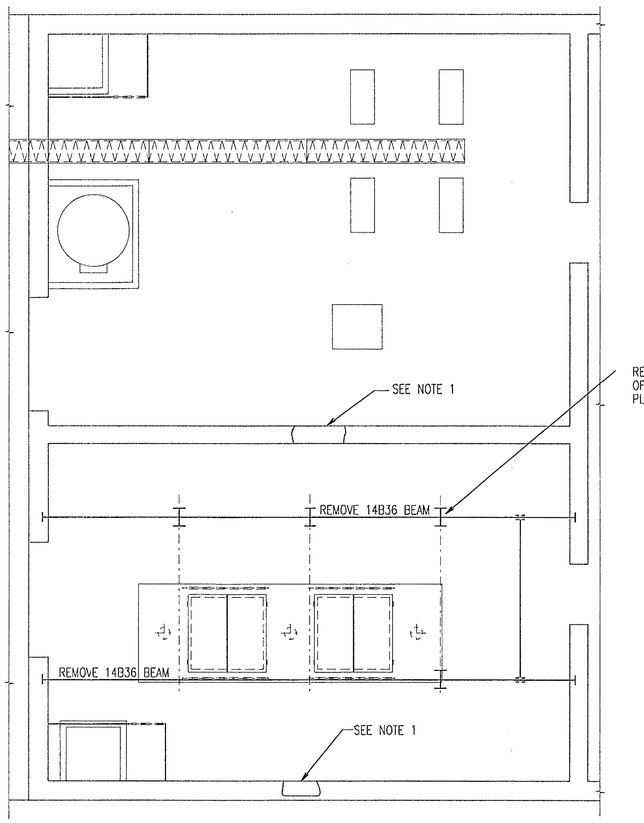
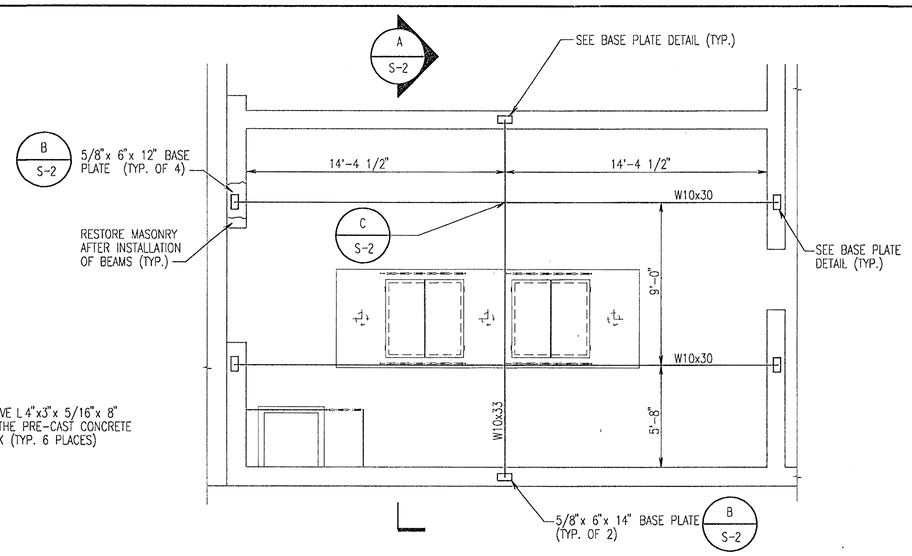


1 / S-2 **REMOVAL PLAN AT ELEVATION - 19.00**

SCALE: 1/4"=1'-0"

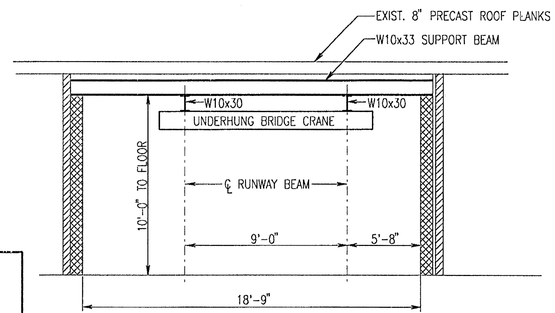


2 / S-2 **CRANE RAIL SUPPORT PLAN AT ELEVATION - 19.00**

SCALE: 1/4"=1'-0"

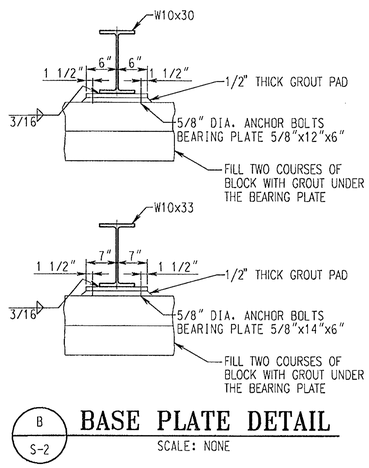
NOTE:

1. REMOVE EXISTING BRICK AND CMU WALL ENOUGH TO INSTALL W10x33. PROVIDE TEMPORARY SUPPORTS FOR ROOF PLANKS AS REQUIRED.



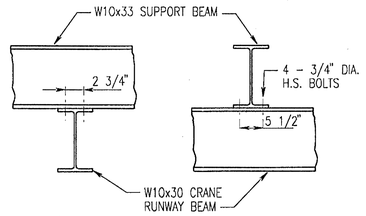
A / S-2 **CRANE RAIL SUPPORT SECTION**

SCALE: 1/4"=1'-0"



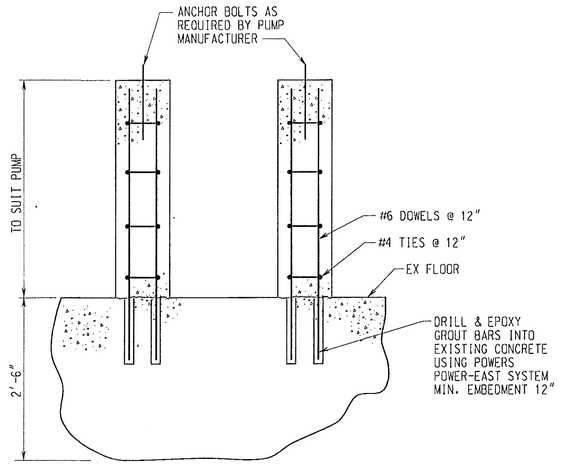
B / S-2 **BASE PLATE DETAIL**

SCALE: NONE



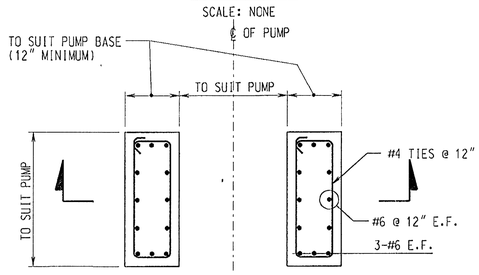
C / S-2 **DETAIL**

SCALE: NONE



SECTION

SCALE: NONE



D / S-2 **TYPICAL PUMP SUPPORT**

SCALE: NONE

"CONTRACTOR TO MODIFY AND/OR PROVIDE ADDITIONAL SUPPORTS PER PUMP MANUFACTURER RECOMMENDATIONS TO SUIT"

GRAPHIC SCALE

2 0 2 4 6 8 10

SCALE: 1/4" = 1'-0"

JOHN S. MAYER REGISTERED 7005 DELAWARE PROFESSIONAL ENGINEER

REV	DATE	DESCRIPTION
1		

Whitman, Requardt and Associates, LLP
Engineers, Architects and Planners

CITY OF DOVER, DELAWARE
DEPARTMENT OF PUBLIC WORKS

PUNCHEON RUN SEWAGE PUMPING STATION UPGRADES

REMOVAL PLAN, FRAMING PLAN, SECTION AND DETAILS

DRAWING NO. 4 OF 20

SHEET S-2

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FEBRUARY 2005

GENERAL NOMENCLATURE

DESCRIPTION	ABBREVIATION
BOTTOM ELEVATION	B.E.
BUBBLER TUBE	BT
CENTER LINE ELEVATION	℄ EL.
COMPRESSED AIR	CA
EMERGENCY VENT	EV
FLANGE	FLG.
FLUSHING CONNECTION	F.C.
FUEL OIL RETURN	FOR
FUEL OIL SUPPLY	FOS
GALLONS PER MINUTE	GPM
HIGH WATER LEVEL	HWL
HUB END	HE
LEAK DETECTOR	LD
LOW WATER LEVEL	LWL
NON-POTABLE WATER	NPW
NORMALLY CLOSED	N.C.
NORMALLY OPEN	N.O.
NORMAL WATER LEVEL	NWL
RAW SEWAGE PUMP	RSP
RAW SEWAGE	RS
RESTRAINED JOINT	R.J.
STAINLESS STEEL	S.S.
SURGE RELIEF DISCHARGE	SRD

GENERAL SYMBOLS

SYMBOL	DESCRIPTION	ABBREVIATION
	2-WAY SOLENOID VALVE	
	3-WAY SOLENOID VALVE	
	ANGLE VALVE	
	AUTOMATIC AIR VENT	
	BACKFLOW PREVENTER	BFP
	BALANCING VALVE	
	BALL CHECK VALVE	
	BALL VALVE	
— D —	DRAIN	D
	FLEXIBLE CONNECTION	
	FLEXIBLE COUPLING WITH TIE RODS	
	FLEXIBLE HOSE	
	FLOOR DRAIN	FD
	FLOW ARROW	
	GATE VALVE	
	GLOBE VALVE	
	HUB END DRAIN	H.E.
	MAGNETIC FLOW METER	
	NEEDLE VALVE	
	PLUG VALVE (SEAT POSITION DEPICTED)	

GENERAL SYMBOLS

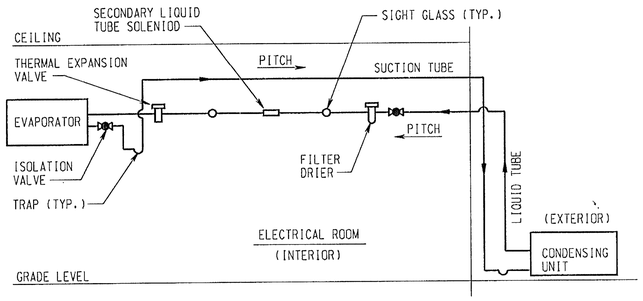
SYMBOL	DESCRIPTION	ABBREVIATION
	PIPE CAP	
	PIPE ELBOW-TURNED DOWN	
	PIPE ELBOW-TURNED UP	
	PIPE GUIDE/SLEEVE	
	PIPE HANGERS	
	PIPE TEE-OUTLET DOWN	
	PIPE TEE-OUTLET UP	
	PLUG VALVE	
	PRESSURE GAUGE WITH DIAPHRAGM SEAL	
	PRESSURE GAUGE WITH STOPCOCK	
	PRESSURE REDUCING VALVE (DIAPHRAGM TYPE)	PRV
	PRESSURE RELIEF VALVE	
P	PROCESS PUMP	
	REDUCER OR INCREASER	
	ROTOMETER METER	RD
— S —	SANITARY SEWER	S
	STOPCOCK	
	SURGE RELIEF VALVE	SRV
	SWING CHECK VALVE	
	UNION	
- - - V - - -	VENT	

SPLIT SYSTEM AIR CONDITIONER DESIGN CRITERIA

AREA	ELECTRICAL ROOM
SUPPLY FAN CFM	3250
OUTDOOR CFM	0
FAN EXTERNAL STATIC PRESSURE	0.25
FAN RPM	787
MAX. FAN MOTOR HP	2
TOTAL COOLING, BTUH	89500
SENSIBLE COOLING, BTUH	86600
TOTAL COOLING, KWI	7.9
CONDENSER COIL EDB	93
EVAPORATOR COIL EDB/EWB	82.0/65.0
EVAPORATOR COIL LDB/LWB	57.3/55.9
COOLING CONTROL STEPS	2
TOTAL HEATING BTUH	46500
ELECTRIC HEATER KWO	12.5
SYSTEM HEATING EDB	70.0
SYSTEM HEATING LDB	83.3
HEATER MINIMUM CFM	2250
SYSTEM HEATING STEPS	2
ELECTRICAL CHARACTERISTICS VOLT/PH/HZ	460V/3Ø/60

VENTILATION LEGEND:

BTUH- BRITISH THERMAL UNIT PER HOUR
CE- CEILING EXHAUST
CFM- CUBIC FEET PER MINUTE
CU - CENTRIFUGAL UTILITY
EDB- ENTERING DRY BULB
EF- EXHAUST FAN
EWB- ENTERING WET BULB
ESP- EXTERNAL STATIC PRESSURE
P- PROPELLER (WALL MOUNTED)
SF - SUPPLY FAN

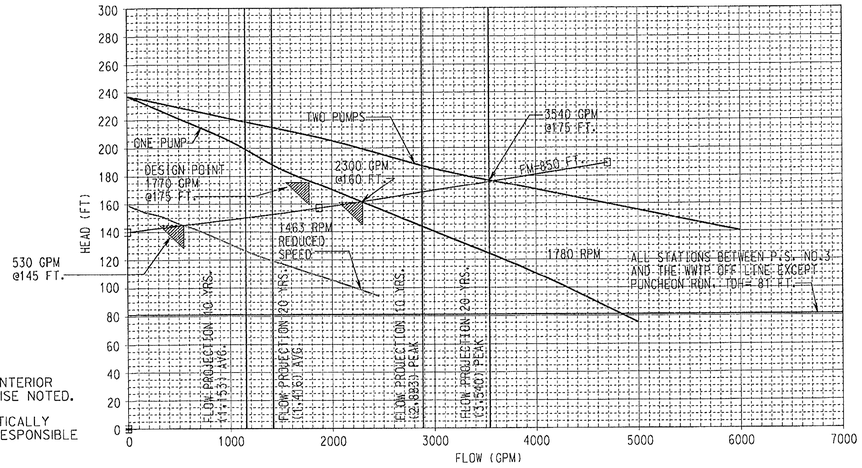


AIR CONDITIONING RISER DIAGRAM

NOT TO SCALE

SPLIT SYSTEM AIR CONDITIONER NOTES:

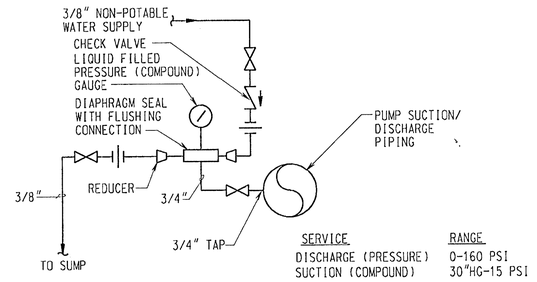
1. FAN PERFORMANCE INCLUDES INTERNAL PRESSURE DROP OF RETURN AIR GRILLE, FILTERS, COOLING COIL, AND ELECTRIC HEATER.
2. SPACE DESIGN CONDITIONS: 82F DB 40% RH (COOLING), 70F DB (HEATING).
3. CAPACITY CONTROL (COOLING): EVAPORATOR COIL STAGING AND COMPRESSOR CYCLING WITH APR VALVE MODULATION TO 45% THRU SPACE THERMOSTAT.
4. CAPACITY CONTROL (HEATING): COMPRESSOR AND ELECTRIC HEATER STAGING TO 50% THRU SPACE THERMOSTAT.



SYSTEM CHARACTERISTICS

LEGEND

- PROPOSED PUMPING CHARACTERISTICS.
- OPERATING POINT



SERVICE	RANGE
DISCHARGE (PRESSURE)	0-160 PSI
SUCTION (COMPOUND)	30"HG-15 PSI

A / M-1/M-3 PRESSURE/COMPOUND GAUGE DETAIL (TYP. OF 6)

NO SCALE

GENERAL NOTES

1. ALL PIPING AND DUCTWORK PASSING THRU FLOORS AND INTERIOR WALLS SHALL BE SLEEVED AND SEALED UNLESS OTHERWISE NOTED.
2. PIPING CONNECTIONS 3" AND SMALLER HAVE BEEN SCHEMATICALLY SHOWN ON PLAN DRAWINGS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETAILED PIPE ROUTING AND ALL APPURTENANCES IN ACCORDANCE WITH RESPECTIVE PROCESS SCHEMATICS.
3. UNLESS OTHERWISE INDICATED, ALL INTERIOR EQUIPMENT SHALL BE PROVIDED WITH A MINIMUM 4-INCH CONCRETE HOUSE-KEEPING PAD SIZED TO SUIT EQUIPMENT.

(XX) DENOTES RESPECTIVE PROCESS RELATED REFERENCE NOTES.

JOHN S. MAYNER REGISTERED 7006 DELAWARE PROFESSIONAL ENGINEER

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CITY OF DOVER, DELAWARE
DEPARTMENT OF PUBLIC WORKS

PUNCHEON RUN SEWAGE PUMPING STATION UPGRADES

GENERAL NOTES, LEGEND, SCHEDULES AND SYSTEM CHARACTERISTICS

DRAWING NO. 5 OF 20

SHEET M-1

FEBRUARY 2005

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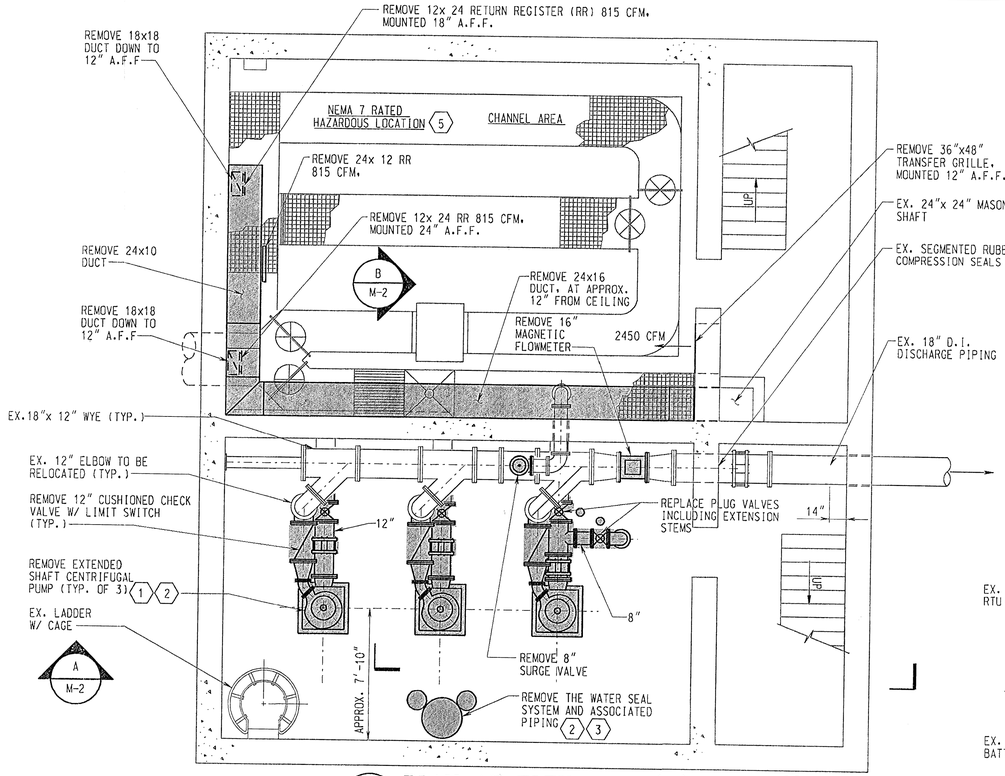
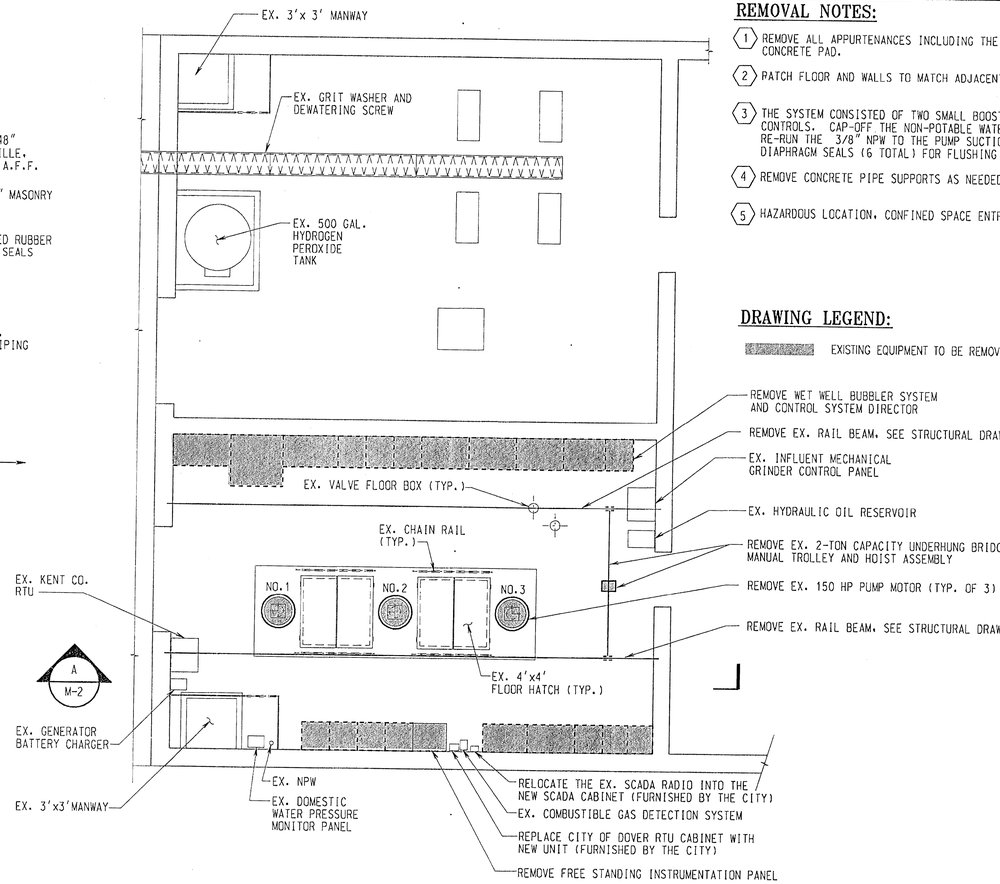


1 M-2 PLAN AT ELEVATION (-) 4.81

SCALE: 1/4"=1'-0"



2 M-2 PLAN AT ELEVATION - 19.00

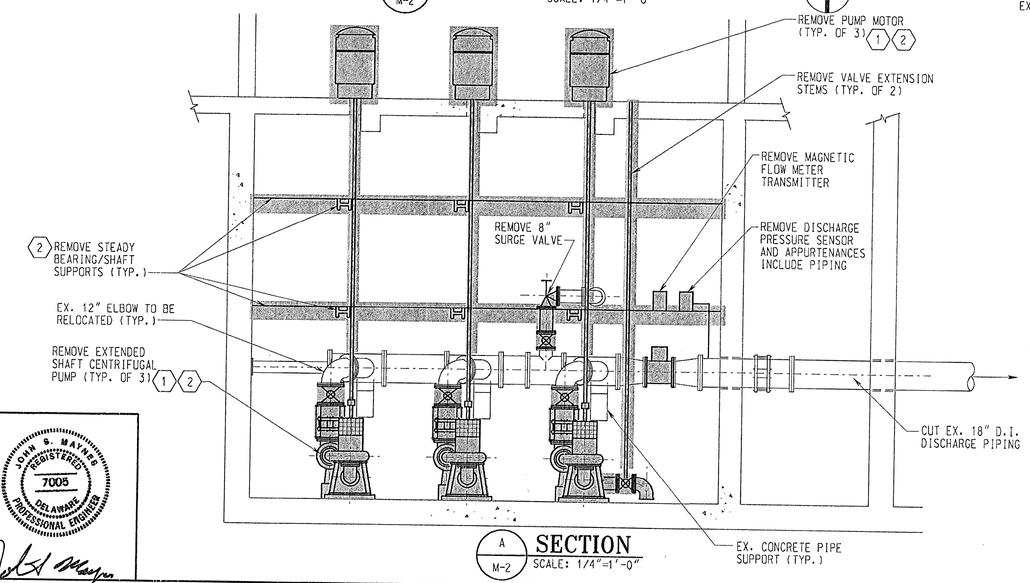
SCALE: 1/4"=1'-0"

REMOVAL NOTES:

1. REMOVE ALL APPURTENANCES INCLUDING THE EXTENDED SHAFTING, SUPPORTS AND CONCRETE PAD.
2. PATCH FLOOR AND WALLS TO MATCH ADJACENT SURFACES (NO PAINTING).
3. THE SYSTEM CONSISTED OF TWO SMALL BOOSTER PUMPS AND A HOLDING TANK W/ CONTROLS. CAP-OFF THE NON-POTABLE WATER (NPW) SUPPLY TO THE SYSTEM AND RE-RUN THE 3/8" NPW TO THE PUMP SUCTION AND DISCHARGE PRESSURE GAUGE DIAPHRAGM SEALS (6 TOTAL) FOR FLUSHING OPERATION.
4. REMOVE CONCRETE PIPE SUPPORTS AS NEEDED.
5. HAZARDOUS LOCATION, CONFINED SPACE ENTRY REQUIRED.

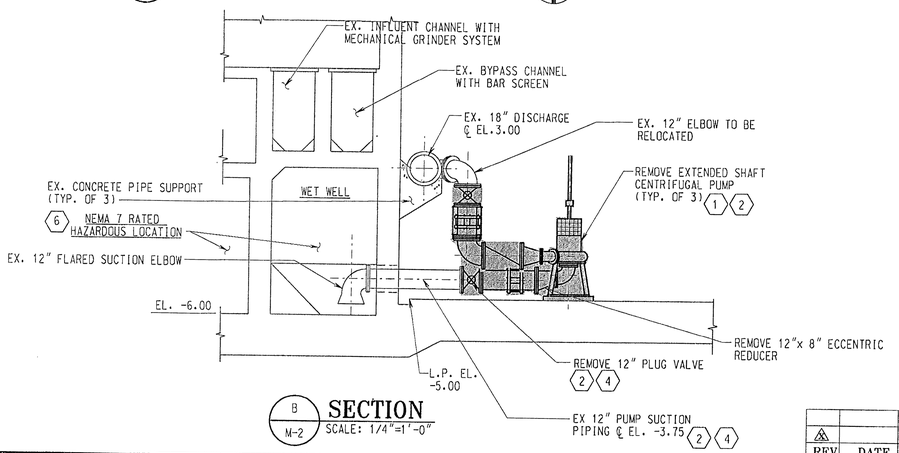
DRAWING LEGEND:

EXISTING EQUIPMENT TO BE REMOVED



A M-2 SECTION

SCALE: 1/4"=1'-0"



B M-2 SECTION

SCALE: 1/4"=1'-0"

GRAPHIC SCALE

2 0 2 4 6 8 10

SCALE: 1/4" = 1'-0"

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CITY OF DOVER, DELAWARE
DEPARTMENT OF PUBLIC WORKS

PUNCHEON RUN SEWAGE PUMPING STATION UPGRADES

REMOVAL PLANS AND SECTIONS

REV	DATE	DESCRIPTION
1		

DRAWING NO. 6 OF 20

SHEET M-2

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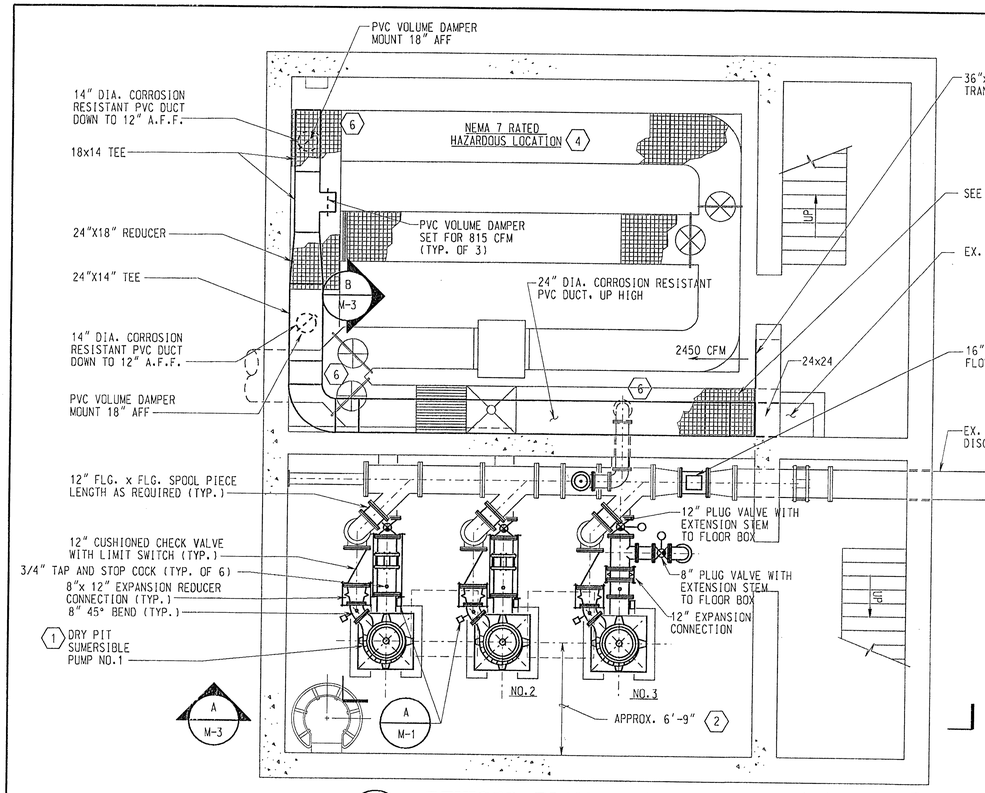
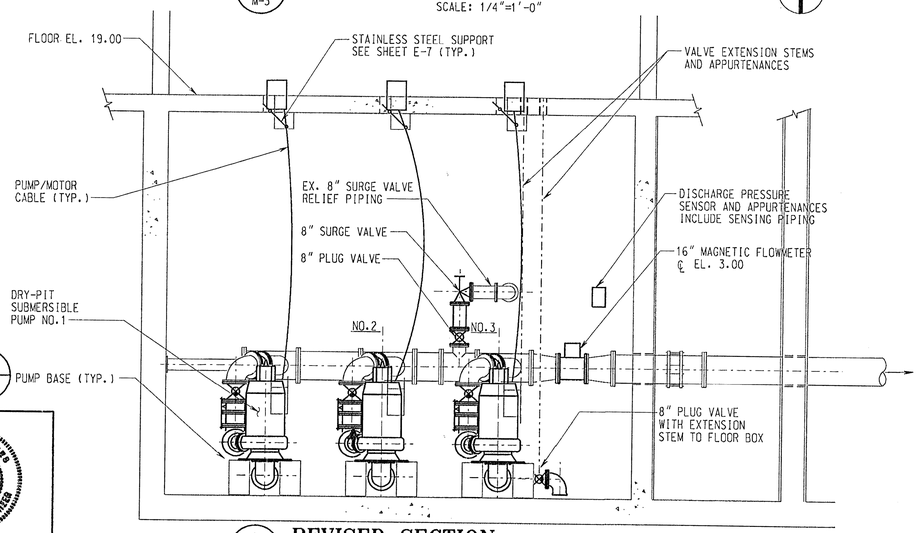
FEBRUARY 2005



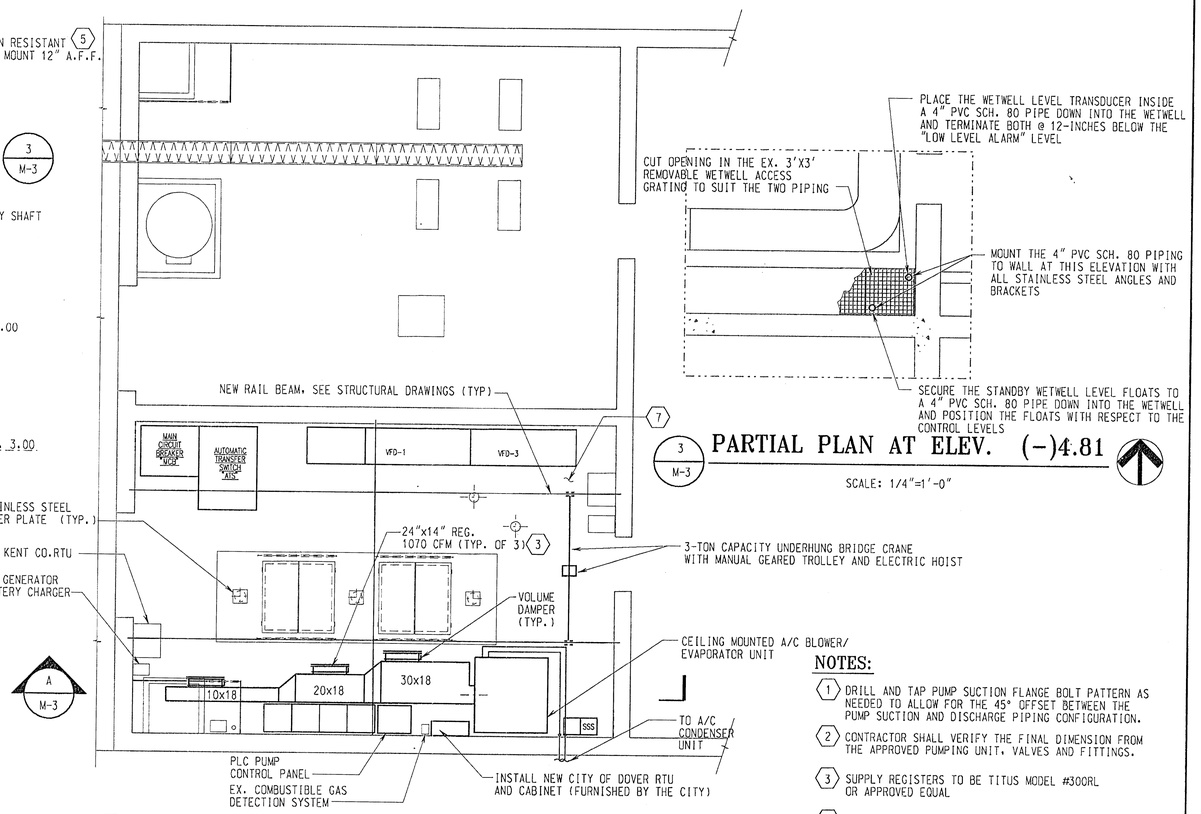
1 M-3 REVISED PLAN AT ELEVATION (-)4.81

SCALE: 1/4"=1'-0"



A M-3 REVISED SECTION

SCALE: 1/4"=1'-0"



2 M-3 REVISED PLAN AT ELEVATION - 19.00

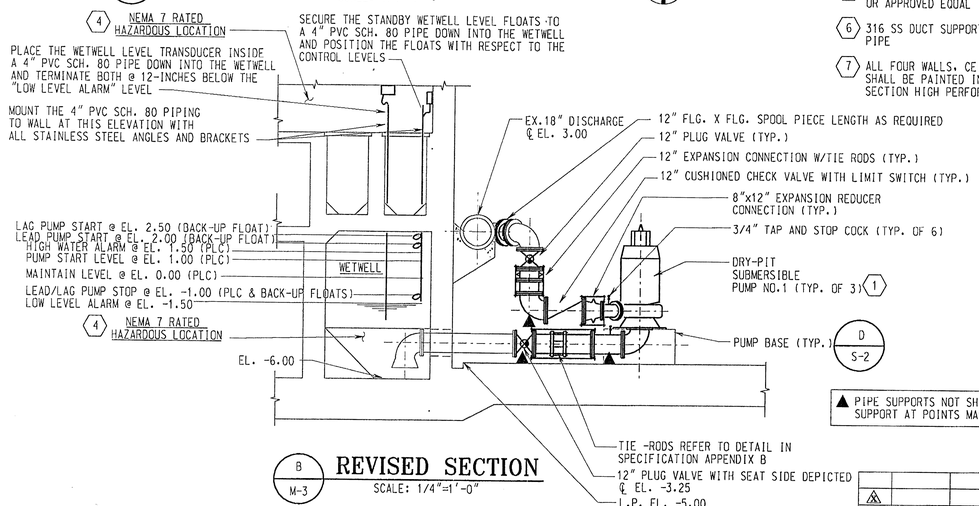
SCALE: 1/4"=1'-0"

3 M-3 PARTIAL PLAN AT ELEV. (-)4.81

SCALE: 1/4"=1'-0"

NOTES:

1. DRILL AND TAP PUMP SUCTION FLANGE BOLT PATTERN AS NEEDED TO ALLOW FOR THE 45° OFFSET BETWEEN THE PUMP SUCTION AND DISCHARGE PIPING CONFIGURATION.
2. CONTRACTOR SHALL VERIFY THE FINAL DIMENSION FROM THE APPROVED PUMPING UNIT, VALVES AND FITTINGS.
3. SUPPLY REGISTERS TO BE TITUS MODEL #300RL OR APPROVED EQUAL
4. HAZARDOUS LOCATION, CONFINED SPACE ENTRY PROTOCOL REQUIRED.
5. SUPPLY GRILLE TO BE TITUS MODEL #50R-SS OR APPROVED EQUAL
6. 316 SS DUCT SUPPORTS SUITABLE FOR SCHEDULE 40 PVC PIPE
7. ALL FOUR WALLS, CEILING AND FLOOR AT ELEVATION 19.00 SHALL BE PAINTED IN ACCORDANCE WITH SPECIFICATION SECTION HIGH PERFORMANCE COATING.



B M-3 REVISED SECTION

SCALE: 1/4"=1'-0"

GRAPHIC SCALE

2 0 2 4 6 8 10

SCALE: 1/4" = 1'-0"

▲ PIPE SUPPORTS NOT SHOWN, SUPPORT AT POINTS MARKED "▲"

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CITY OF DOVER, DELAWARE
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PUNCHEON RUN SEWAGE PUMPING STATION UPGRADES

REVISED PLANS, SECTIONS AND DETAILS

DRAWING NO. 7 OF 20

SHEET M-3

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FEBRUARY 2005

LEGEND

SAFETY SWITCHES/BREAKERS/STARTERS

- □ 60/3 — NON-FUSED DISCONNECT SWITCH, SUBSCRIPT INDICATES AMPACITY AND NUMBER OF POLES, 3P-30A. UON.
- F 15/3 — FUSED DISCONNECT SWITCH, SUBSCRIPT INDICATES FUSE SIZE AND NUMBER OF POLES
- 2 S — MAGNETIC MOTOR STARTER, SUBSCRIPT INDICATES NEMA SIZE, NEMA SIZE 1 STARTER UON
- VFD — VARIABLE FREQUENCY DRIVE
- SSS — SOFT START STARTER

EQUIPMENT CONNECTION

- M — MOTOR
- J J — JUNCTION BOX
- MOD — MOTOR OPERATED DAMPER
- CB — CONNECTION BOX

EMERGENCY SYSTEM

- ATS — AUTOMATIC TRANSFER SWITCH

WIRING

- INDICATES A CONDUIT RUN BELOW FLOOR SLAB.
- EXPOSED CONDUIT RUN AS INDICATED.
- CONDUIT TURNED UP
- CONDUIT TURNED DOWN

MISCELLANEOUS

- 1 — SPECIFIC NOTE NUMBER
- 1 — FEEDER SIZE
- 1 — DEMOLITION NOTE NUMBER
- X1 / X2
- X3 / X4 | X2
- X3 / X4

X1 - DESIGNATION OF PLAN (1, 2, 3,..)
X2 - DRAWING WHERE PLAN IS LOCATED
X3 - DESIGNATION OF SECTION/ DETAIL (A, B, C.....)
X4 - DRAWING WHERE SECTION OR DETAIL IS LOCATED

SCHEMATICS

- INCOMING LINE
- (3) — CT-CURRENT TRANSFORMER NUMBER DENOTE QUANTITY
- 100/20 — MOLDED CASE CIRCUIT BREAKER, 3P UON., 100 = FRAME SIZE, 20 = TRIP SIZE
- 1200/1200 — INSULATED CASE CIRCUIT BREAKER, FIXED TYPE MANUALLY OPERATED, FRONT ACCESSIBLE ONLY
- AUTOMATIC TRANSFER SWITCH
- PM — POWER MONITOR
- G — GENERATOR
- TVSS — TRANSIENT VOLTAGE SURGE SUPPRESSION
- M — MOTOR
- VFD — VARIABLE FREQUENCY DRIVE
- SSS — SOFT START STARTER
- □ 60/3 — DISCONNECT SWITCH - 3P, 30A. UON. 60 INDICATES SWITCH SIZE AND 3 INDICATES NUMBER OF POLES
- TRANSFORMER
- ALT — ALTERNATOR
- EUH — ELECTRIC UNIT HEATER
- 2 S — COMBINATION MAGNETIC STARTER - FVNR, SIZE 1 UON. NUMBER ADJACENT TO STARTER INDICATES NEMA STARTER SIZE.
- CB — CONNECTION BOX

ABBREVIATIONS

A, AMP	AMPERE
&	AND
AC	ALTERNATING CURRENT
AF	AMPERE FRAME
AFF	ABOVE FINISHED/RAISED FLOOR
AIC	SYMMETRICAL AMPERES INTERRUPTING CAPACITY
ARCH	ARCHITECTURAL
AT	AMPERE TRIP
AWG	AMERICAN WIRE GAGE
BLDG	BUILDING
BKR	BREAKER
C	CONDUIT
C.B.	CIRCUIT BREAKER
CKT	CIRCUIT
CPT	CONTROL POWER TRANSFORMER
CR	CONTROL RELAY
CT	CURRENT TRANSFORMER
D	DEPTH
DIA	DIAGRAM
DN	DOWN
DWG	DRAWING
EA	EACH
E.C.	EMPTY CONDUIT
E.F.	EXHAUST FAN
ELEC	ELECTRICAL
EM, EMERG	EMERGENCY
EQUIP	EQUIPMENT
EXIST	EXISTING
ENCL	ENCLOSURE
FDR	FEEDER
FL	FLOOR
FLA	FULL LOAD AMPERES
FSS	FUSED SAFETY SWITCH
FVNR	FULL VOLTAGE NON REVERSING
G, GND	GROUND
GEN	GENERATOR
GFP	GROUND FAULT PROTECTION
HP	HORSE POWER
HZ	FREQUENCY, HERTZ
I.C.	INTERRUPTING CAPACITY
J.B.	JUNCTION BOX
KVA	KILOVOLT AMPERE
KVAR	KILOVAR (REACTIVE KILO VOLT AMPERE)
KW	KILOWATT
MAX	MAXIMUM
MCB	MAIN CIRCUIT BREAKER
MDP	MAIN DISTRIBUTION PANEL
MECH	MECHANICAL
MH	MOUNTING HEIGHT, MANHOLE
MIN	MINIMUM
MLO	MAIN LUG ONLY
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
NFSS	NON-FUSIBLE SAFETY SWITCH
NIC	NOT IN CONTRACT
NO	NUMBER
NTS	NOT TO SCALE
OC	OVER CURRENT
P	POLE
PCP	PUMP CONTROL PANEL
PH, ø	PHASE
PNL	PANEL
PM	POWER MONITOR
PT	POTENTIAL TRANSFORMER
RGS	RIGID GALVANIZED STEEL
RM	ROOM
SEC	SECONDARY
SW	SWITCH
SWBD	SWITCHBOARD
SYMM	SYMMETRICAL
TYP	TYPICAL
UON	UNLESS OTHERWISE NOTED
UH	UNIT HEATER
V	VOLT, VOLTAGE
W	WIRE, WATT
WP	WEATHERPROOF
XFMR	TRANSFORMER

GENERAL NOTES

1. INSTALLATION OF ALL ELECTRICAL WORK SHALL CONFORM TO THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE (NFPA 70), AND ALL APPLICABLE LOCAL CODES.
2. CONDUIT RUNS ARE SHOWN DIAGRAMMATICALLY ONLY AND SHALL BE INSTALLED IN A MANNER TO PREVENT CONFLICTS WITH EQUIPMENT AND STRUCTURAL CONDITIONS. EXPOSED CONDUITS SHALL BE INSTALLED PARALLEL TO THE BEAMS AND WALLS.
3. PROVIDE ALL REQUIRED PULL BOXES AND JUNCTION BOXES FOR INSTALLATION OF THE WIRING IN ACCORDANCE WITH THE CONTRACT SPECIFICATIONS THOUGH THE BOXES MAY NOT BE INDICATED ON THE DRAWINGS.
4. THE WIRING DIAGRAMS, QUANTITY AND SIZE OF WIRES AND CONDUITS ARE BASED UPON SELECTED STANDARD COMPONENTS OF ELECTRICAL EQUIPMENT. MODIFICATIONS, APPROVED BY THE ENGINEER, MAY BE MADE BY THE CONTRACTOR AT HIS EXPENSE TO ACCOMMODATE EQUIPMENT ACTUALLY PURCHASED.
5. PROVIDE ALL NECESSARY COMPONENTS REQUIRED FOR MAKING FINAL CONNECTION OF ALL EQUIPMENT INSTALLED AS PART OF THIS CONTRACT.
6. ALL INDICATION AND CONTROL WIRING IN JUNCTION BOXES SHALL BE WIRED TO NUMBERED TERMINAL STRIPS AND IDENTIFIED AS TO START AND END OF RUN.
7. ALL ELECTRICAL EQUIPMENT INSTALLED AGAINST CONCRETE OR MASONRY WALLS SHALL BE INSTALLED WITHIN A 1/4" SPACE BETWEEN THE EQUIPMENT AND THE MOUNTING SURFACE. SPACERS SHALL BE STAINLESS STEEL, PVC OR NYLON.
8. ALL JUNCTION AND PULL BOXES SHALL BE LABELED WITH THEIR VOLTAGE AND USAGE.
9. DRAWINGS ARE DIAGRAMMATIC, ACTUAL LOCATION OF EQUIPMENT TO BE DETERMINED IN THE FIELD. NEW EQUIPMENT SHALL FIT INTO AVAILABLE SPACE. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE EQUIPMENT WHICH MEETS THE SPACE REQUIREMENT.
10. CONTRACTOR SHALL SUBMIT A LIST OF ALL MAJOR EQUIPMENT AND FIXTURES TO THE ENGINEER FOR REVIEW AND APPROVAL. NO SUBSTITUTIONS WILL BE ALLOWED WITHOUT THE PERMISSION OF THE ENGINEER IN WRITING. ALL EQUIPMENT SHALL BE NEW AND BEAR THE MANUFACTURER'S NAME AND TRADE NAME. ALL EQUIPMENT SHALL BE UL LISTED.
11. THE CIRCUIT NUMBERS ARE FOR IDENTIFICATION PURPOSE ONLY. THE CONTRACTOR IS RESPONSIBLE FOR BALANCING LOADS AND CORRECTLY PHASING THE CIRCUITS IN PANELBOARDS.
12. ELECTRICAL REQUIREMENTS FOR MECHANICAL EQUIPMENT ARE BASED ON EQUIPMENT SPECIFIED. COORDINATE EXACT REQUIREMENTS WITH MECHANICAL SHOP DRAWINGS PRIOR TO ORDERING AND INSTALLING EQUIPMENT.
13. WHERE ELECTRICAL INSTALLATIONS DEPEND UPON WORK OF OTHER TRADES, THE ELECTRICAL CONTRACTOR SHALL ENSURE THAT NECESSARY INSTRUCTIONS, TEMPLATES, MATERIALS, ETC. ARE PROVIDED AND SUPERVISE THE WORK OF THE OTHER TRADES FOR QUALITY AND CODE COMPLIANCE.
14. CONTRACTOR SHALL VISIT THE JOB SITE AND EXAMINE THE EXISTING CONDITIONS THAT MAY AFFECT HIS WORK.
15. CONTRACTOR SHALL OBTAIN A WRITTEN PERMISSION FROM THE OWNER TO DE-ENERGIZE ANY ENERGIZED BUILDING EQUIPMENT OR DISRUPT ANY COMMUNICATION LINE.
16. OPENINGS AND PASSAGE OF CONDUITS OR WIREWAYS THROUGH FLOOR SLABS AND FIRE RATED WALLS OR PARTITIONS SHALL BE PROVIDED WITH UL LISTED FIRE RATED SLEEVING SYSTEMS AS MANUFACTURED BY PROSET SYSTEMS INC.
17. SERIES RATING OF CIRCUIT BREAKERS SHALL NOT BE ALLOWED UNLESS SPECIFICALLY INDICATED ON CONTRACT DRAWINGS.
18. ALL WORK SHOWN ON THE DRAWINGS SHALL BE NEW UON.
19. PROVIDE PULL STRINGS IN ALL EMPTY CONDUIT TO FACILITATE PULLING OF CABLES IN FUTURE.
20. COORDINATE WITH CITY OF DOVER ELECTRICAL DEPARTMENT FOR ELECTRICAL POWER SHUTDOWN PRIOR TO DISCONNECTION OF EXISTING SWITCHBOARD AND PRIOR TO CONNECTION OF EXISTING CONDUCTORS TO NEW MAIN CIRCUIT BREAKER MCB.

GENERAL DEMOLITION NOTES

1. ALL ELECTRICAL EQUIPMENT SHALL REMAIN UNLESS OTHERWISE INDICATED TO BE REMOVED ON DEMOLITION DRAWINGS.
2. DISCONNECT AND REMOVE EXISTING MAIN CIRCUIT BREAKER, DISTRIBUTION SWITCHBOARD, AUTOMATIC TRANSFER SWITCH. REMOVE EXISTING CONDUCTORS FROM EXISTING MCB TO EXISTING ATS.
3. DISCONNECT AND REMOVE EXISTING MCC. ALL WIRES AND CONDUIT EMANATING FROM MCC FEEDING ELECTRICAL EQUIPMENT SHALL REMAIN UON. REMOVE EXISTING INCOMING ASSOCIATED WIRING, FEEDER TO MCC.
4. DISCONNECT AND REMOVE ALL VARIABLE SPEED CONTROLLERS FEEDING EXISTING PUMP MOTORS. ALL ASSOCIATED WIRING AND OUTGOING FEEDERS SHALL BE REMOVED. DISCONNECT AND REMOVE ASSOCIATED CAPACITORS AND RESISTORS.
5. ALL DISCONNECTED AND REMOVED ELECTRICAL EQUIPMENT SHALL BE DISPOSED OF AS DIRECTED BY OWNER.
6. COORDINATE WITH CITY OF DOVER ELECTRICAL DEPARTMENT PRIOR TO DISCONNECTION AND REMOVAL OF SWITCHBOARD. ALSO COORDINATE FOR CONNECTIONS OF EXISTING INCOMING POWER FEEDER FROM UTILITY TRANSFORMER TO NEW MAIN CIRCUIT BREAKER SWITCHBOARD AND ATS.
7. ABANDON ALL CONDUITS SHOWN TO BE REMOVED THAT ARE CONCEALED IN SLAB OR WALL. CUT CONDUITS FLUSH WITH GRADE OR FLOOR. IDENTIFY CONDUITS AS EMPTY IN CONSPICUOUS PLACE.
8. AFTER REMOVAL OF ALL CONDUITS, SEAL OF ALL FLOOR PENETRATIONS.
9. DEMOLITION WORK HAS BEEN INDICATED BY DASHED LINES ON DEMOLITION DRAWINGS.

JOHN C. MAYER — REGISTERED — 7008 — DEL. AWARE — PROFESSIONAL ENGINEER

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PUNCHEON RUN SEWAGE PUMPING STATION UPGRADES

LEGEND, ABBREVIATIONS AND GENERAL NOTES

DRAWING NO. 6 OF 20

SHEET E-1

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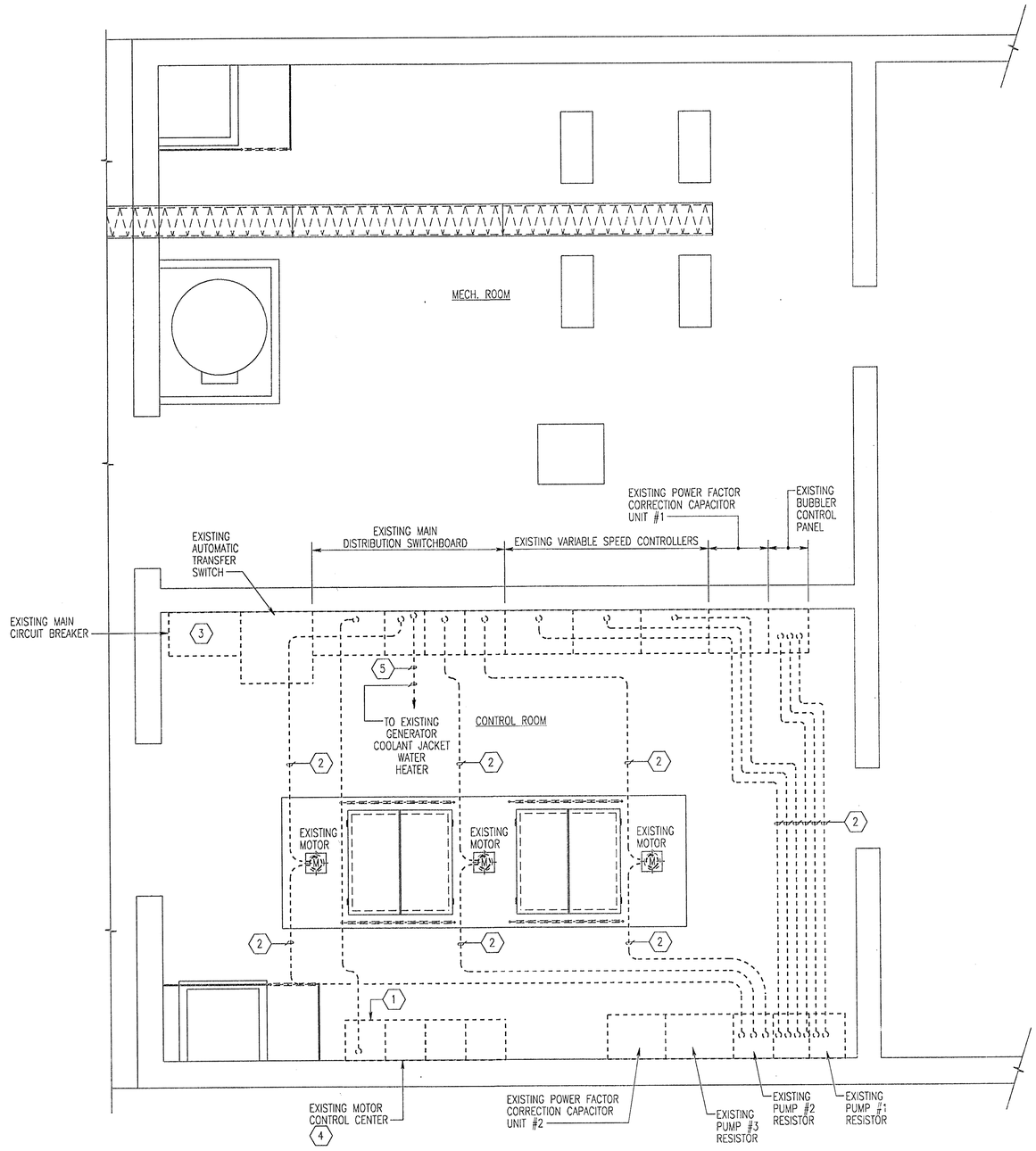

1 / E-2 PUMPING STATION CONTROL ROOM – DEMOLITION

SCALE: 3/8" = 1'-0"

GENERAL NOTES

1. ALL ELECTRICAL EQUIPMENT INDICATED ON THIS DRAWING SHALL BE REMOVED UON.

SPECIFIC NOTES

1. EXISTING MCC OUTGOING WIRES AND CONDUIT SHALL REMAIN UON.
2. DISCONNECT AND REMOVE EXISTING CONDUIT AND CONDUCTORS. REMOVE EXISTING EXPOSED CONDUIT.
3. COORDINATE WITH CITY OF DOVER ELECTRICAL DEPARTMENT TO DISCONNECT POWER TO EXISTING MAIN CIRCUIT BREAKER.
4. ALL OUTGOING BRANCH CIRCUITS INCLUDING CONDUIT AND WIRES SHALL REMAIN UON AND BE RECONNECTED TO NEW MOTOR CONTROL CENTER. SEE DRAWING E-3 FOR MCC ONE LINE DIAGRAM.
5. EXISTING GENERATOR COOLANT JACKET WATER HEATER FEEDER SHALL BE DISCONNECTED AND RECONNECTED TO NEW MDS. SEE MDS ONE LINE DIAGRAM ON DRAWING E-3. PROVIDE ADDITIONAL JUNCTION BOXES, CONDUIT AND CONDUCTORS AS REQUIRED TO CONNECT UP COMPLETE.

GRAPHIC SCALE

2 1 0 1 2 3 4 5 6

SCALE: 3/8" = 1'-0"

REV	DATE	DESCRIPTION
1		

REGISTERED 7005 DELAWARE PROFESSIONAL ENGINEER 8 MAY 2007

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PUNCHEON RUN SEWAGE PUMPING STATION UPGRADES

PUMPING STATION CONTROL ROOM – DEMOLITION

DRAWING NO. 9 OF 20

SHEET E-2

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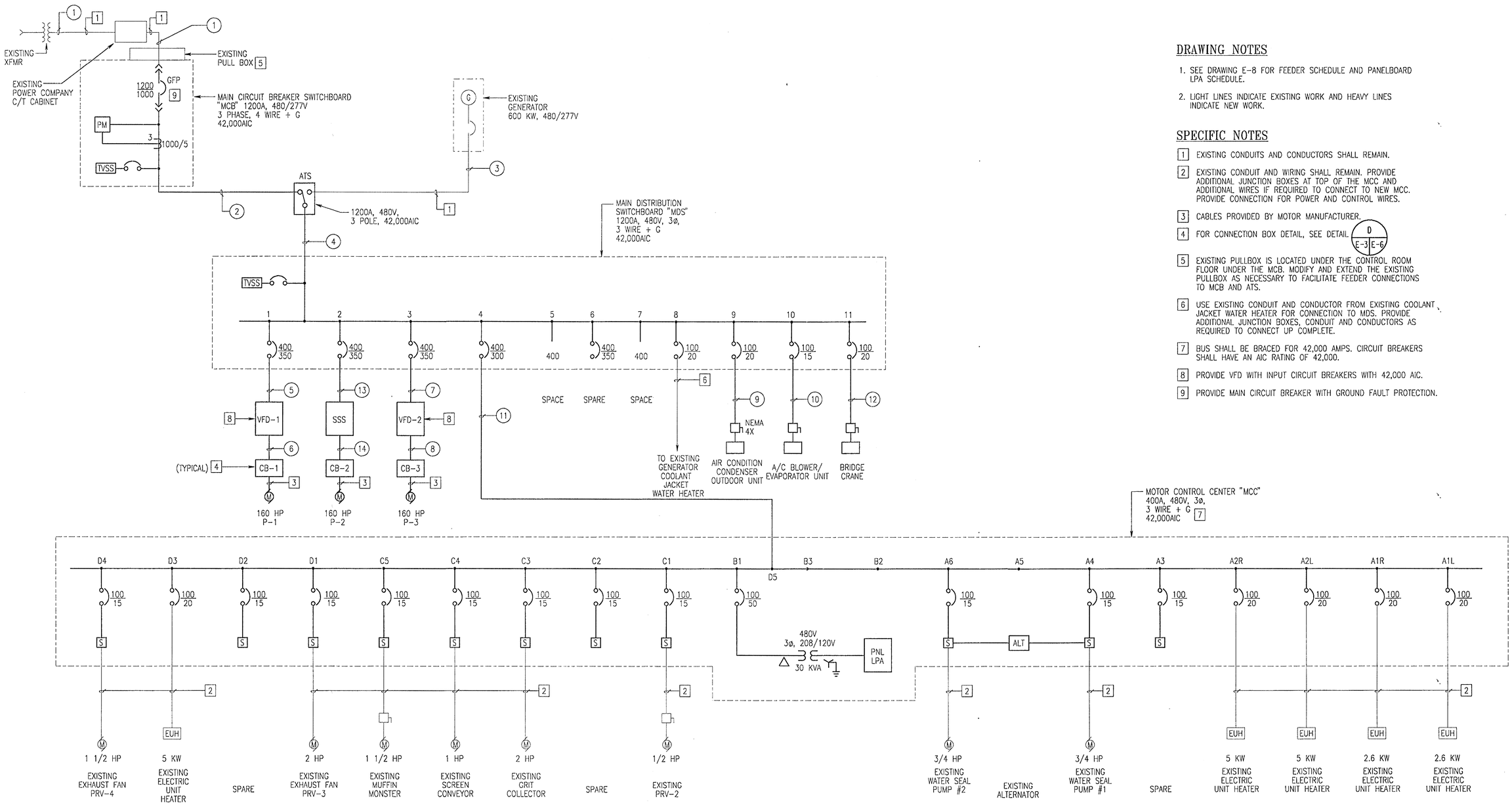

DRAWING NOTES

1. SEE DRAWING E-8 FOR FEEDER SCHEDULE AND PANELBOARD LPA SCHEDULE.
2. LIGHT LINES INDICATE EXISTING WORK AND HEAVY LINES INDICATE NEW WORK.

SPECIFIC NOTES

1. EXISTING CONDUITS AND CONDUCTORS SHALL REMAIN.
2. EXISTING CONDUIT AND WIRING SHALL REMAIN. PROVIDE ADDITIONAL JUNCTION BOXES AT TOP OF THE MCC AND ADDITIONAL WIRES IF REQUIRED TO CONNECT TO NEW MCC. PROVIDE CONNECTION FOR POWER AND CONTROL WIRES.
3. CABLES PROVIDED BY MOTOR MANUFACTURER.
4. FOR CONNECTION BOX DETAIL, SEE DETAIL D / E-3 | E-6
5. EXISTING PULLBOX IS LOCATED UNDER THE CONTROL ROOM FLOOR UNDER THE MCB. MODIFY AND EXTEND THE EXISTING PULLBOX AS NECESSARY TO FACILITATE FEEDER CONNECTIONS TO MCB AND ATS.
6. USE EXISTING CONDUIT AND CONDUCTOR FROM EXISTING COOLANT JACKET WATER HEATER FOR CONNECTION TO MDS. PROVIDE ADDITIONAL JUNCTION BOXES, CONDUIT AND CONDUCTORS AS REQUIRED TO CONNECT UP COMPLETE.
7. BUS SHALL BE BRACED FOR 42,000 AMPS. CIRCUIT BREAKERS SHALL HAVE AN AIC RATING OF 42,000.
8. PROVIDE VFD WITH INPUT CIRCUIT BREAKERS WITH 42,000 AIC.
9. PROVIDE MAIN CIRCUIT BREAKER WITH GROUND FAULT PROTECTION.

1 / E-3 SINGLE LINE DIAGRAM - POWER DISTRIBUTION SYSTEM

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PUNCHEON RUN SEWAGE PUMPING STATION UPGRADES

SINGLE LINE DIAGRAM - POWER DISTRIBUTION SYSTEM

DRAWING NO. 10 OF 20

SHEET E-3

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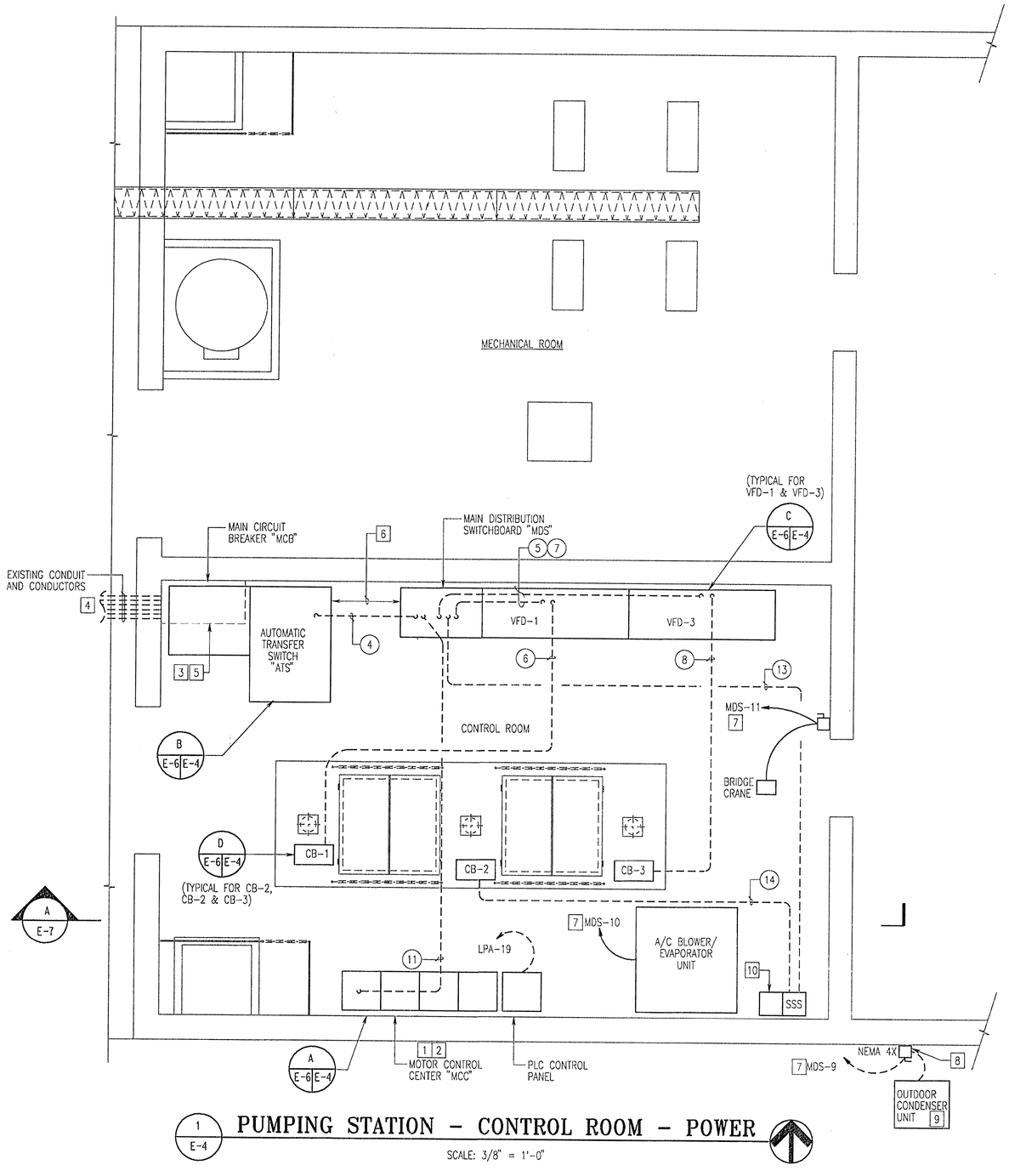

1 E-4 PUMPING STATION – CONTROL ROOM – POWER

SCALE: 3/8" = 1'-0"

GENERAL NOTES

1. SEE DRAWING E-8 FOR FEEDER SCHEDULE AND PANEL SCHEDULE.

SPECIFIC NOTES

1. MCC SHALL BE INSTALLED AT THE SAME LOCATION FROM WHERE EXISTING MCC SHALL BE REMOVED. COORDINATE IN FIELD BEFORE INSTALLATION OF MCC.
2. PROVIDE JUNCTION BOXES/PULLBOX ABOVE THE MCC IF REQUIRED TO EXTEND THE EXISTING WIRING AND MAKE FINAL CONNECTION.
3. MODIFY AND EXTEND EXISTING PULLBOX UNDER THE FLOOR TO FACILITATE POWER FEEDER CONNECTIONS TO MCB AND ATS. PROVIDE NEW CONDUCTOR AS REQUIRED IN PULLBOX TO EXTEND INCOMING EXISTING CONDUCTOR FROM TRANSFORMER AND GENERATOR AND CONNECT UP COMPLETE. NEW CONDUCTORS SHALL MATCH EXISTING
4. EXISTING CONDUIT AND CABLES TO UTILITY COMPANY TRANSFORMER AND GENERATOR SHALL REMAIN.
5. COORDINATE WITH UTILITY COMPANY PRIOR TO DISCONNECTION OF EXISTING CABLE FROM EXISTING EQUIPMENT AND PRIOR TO CONNECTION OF EXISTING CABLES TO NEW MCB.
6. MAINTAIN MINIMUM 3 FEET FOR SIDE ACCESS FOR ATS.
7. FEEDER SIZE SHALL BE 3#12, 1#12G – 3/4"C.
8. COORDINATE FINAL LOCATION OF CONDENSER UNIT PRIOR TO INSTALLATION OF DISCONNECT SWITCH ON WALL.
9. SEE DRAWING C-1 FOR ACTUAL LOCATION OF CONDENSER UNIT.
10. CAPACITOR AS REQUIRED BY MANUFACTURER TO ACHIEVE 95% POWER FACTOR.

GRAPHIC SCALE

2 1 0 1 2 3 4 5 6

SCALE: 3/8" = 1'-0"

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PUNCHEON RUN SEWAGE PUMPING STATION UPGRADES

PUMPING STATION CONTROL ROOM – POWER

DRAWING NO. 11 OF 20

SHEET E-4

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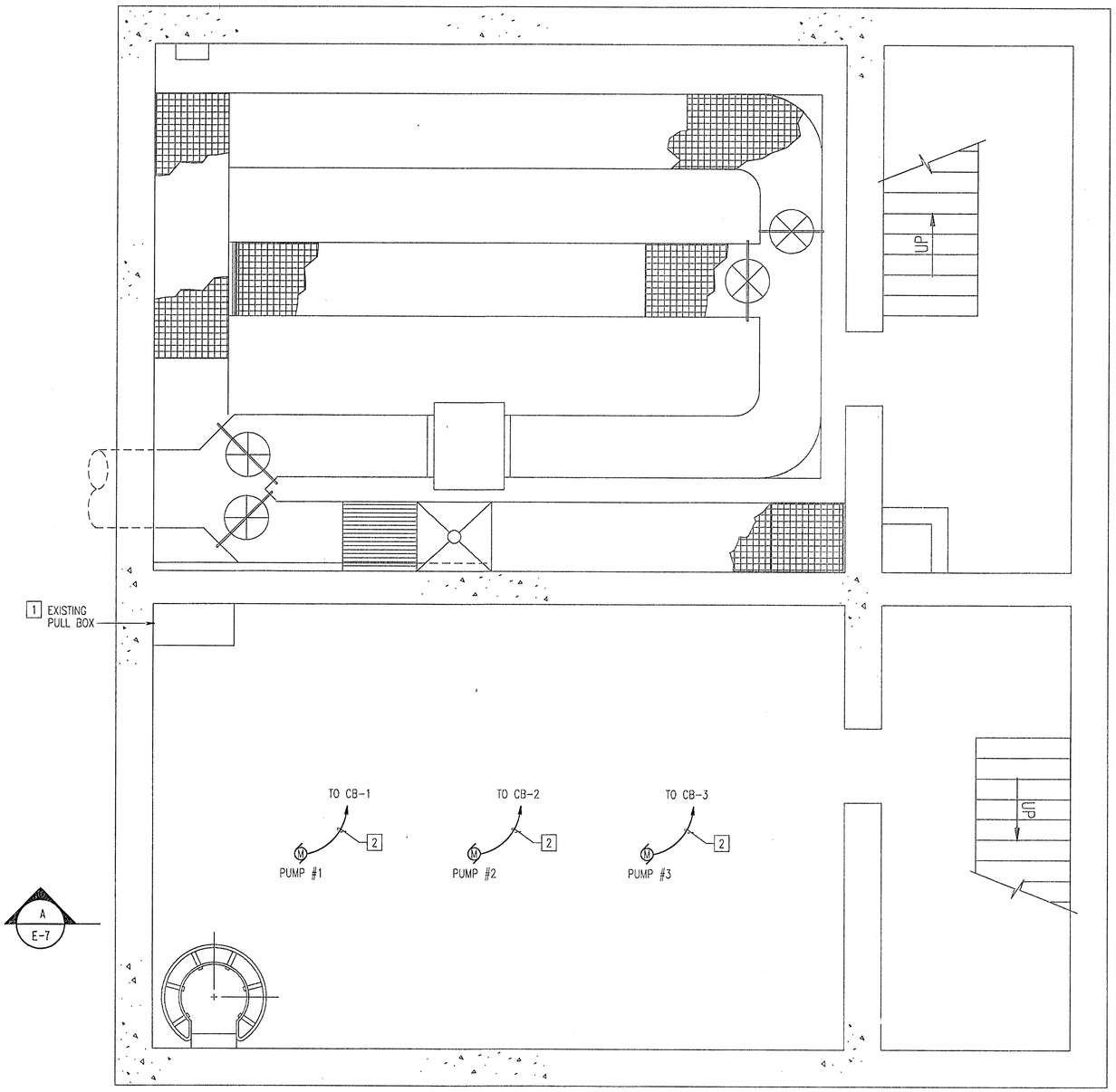

SPECIFIC NOTES

1. MODIFY AND EXTEND EXISTING PULLBOX AS REQUIRED TO FACILITATE FEEDER CONNECTIONS TO MCB AND ATS. PROVIDE ADDITIONAL FEEDERS AS REQUIRED IN PULLBOX FOR CONNECTION TO MCB ANB ATS. NEW FEEDER SHALL MATCH EXISTING.
2. CABLE SHALL BE FURNISHED BY PUMP/MOTOR MANUFACTURER. COORDINATE CABLE LENGTH IN FIELD.
3. FOR LOCATION OF CB-1, CB-2 AND CB-3, SEE DRAWING E-4.

1 / E-6 PUMPING STATION - PUMP ROOM - POWER

SCALE: 3/8" = 1'-0"

GRAPHIC SCALE

2 1 0 1 2 3 4 5 6

SCALE: 3/8" = 1'-0"

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PUNCHEON RUN SEWAGE PUMPING STATION UPGRADES

PUMPING STATION PUMP ROOM - POWER

DRAWING NO. 12 OF 20

SHEET E-5

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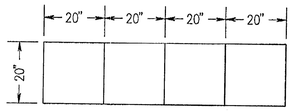
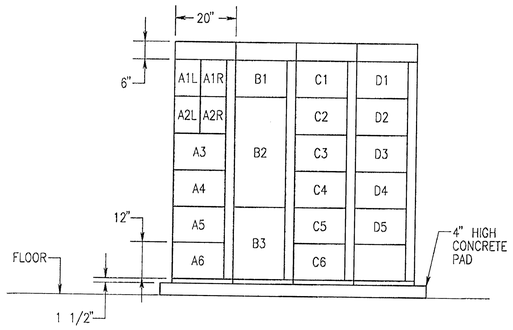


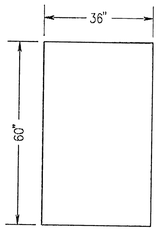
PLAN



ELEVATION
MOTOR CONTROL CENTER

A | E-4 | E-6

SCALE: NONE



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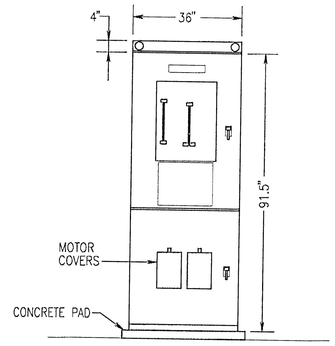
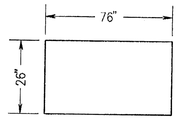


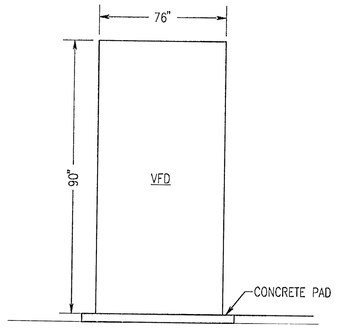
ELEVATION
AUTOMATIC TRANSFER SWITCH

B | E-4 | E-6

SCALE: NONE



PLAN



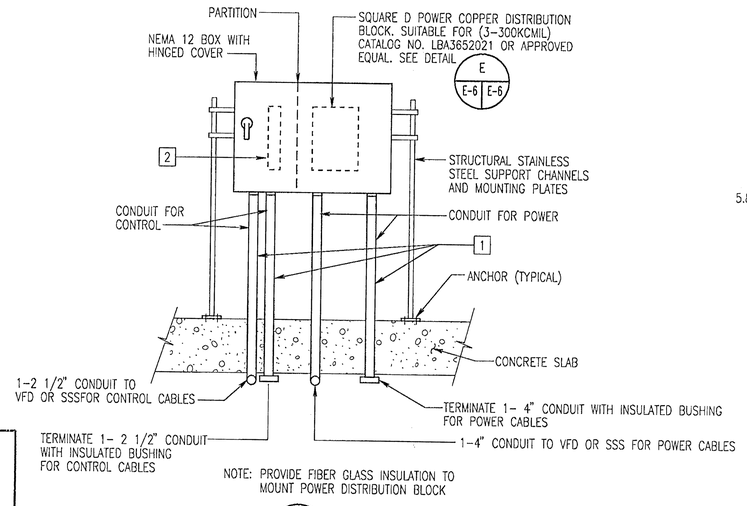
ELEVATION
VARIABLE FREQUENCY DRIVE

C | E-4 | E-6

SCALE: NONE

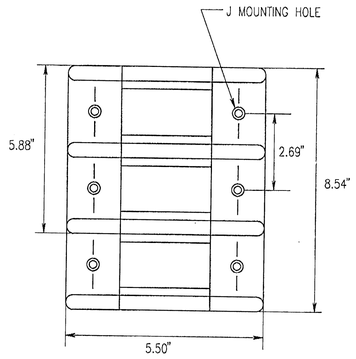
SPECIFIC NOTES

1. CONDUITS ARE SHOWN FOR CLARIFICATION PURPOSE ONLY. CONTRACTOR SHALL COORDINATE IN FIELD WITH EQUIPMENT MANUFACTURER FOR ACTUAL NO. OF CONDUITS REQUIRED PRIOR TO INSTALLATION OF CONNECTION BOX.
2. PROVIDE DISTRIBUTION BLOCK FOR CONTROL CABLES.
3. DIMENSIONS ARE APPROXIMATE. ACTUAL DIMENSIONS SHALL BE COORDINATED IN FIELD WITH ACTUAL CABLES FURNISHED WITH MOTOR.



NOTE: PROVIDE FIBER GLASS INSULATION TO MOUNT POWER DISTRIBUTION BLOCK

D | E-4 | E-6 **DETAIL** NOT TO SCALE



E | E-6 | E-6 **DETAIL** NOT TO SCALE 3

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PUNCHEON RUN SEWAGE PUMPING STATION UPGRADES

MISCELLANEOUS DETAILS

REV	DATE	DESCRIPTION
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DRAWING NO. 13 OF 20

SHEET E-6

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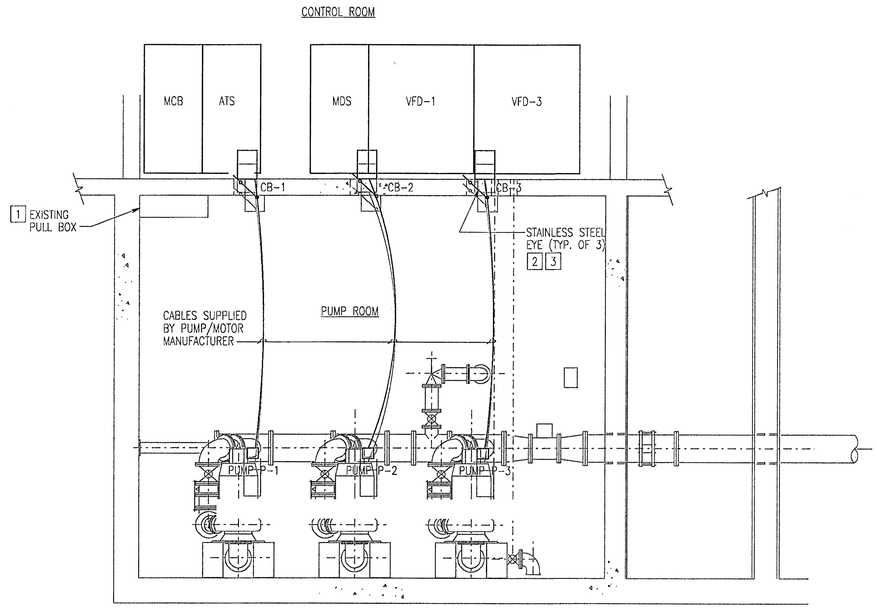

A
E-7

SECTION - PUMP ROOM AND CONTROL ROOM

SCALE: 1/4"=1'-0"

SPECIFIC NOTES

1. MODIFY AND EXTEND PULLBOX AS REQUIRED.
2. HEAVY DUTY STAINLESS STEEL SUPPORT DOUBLE TYPE EYE, SPLIT MESH LACE CLOSING. PROVIDE ADDITIONAL SUPPORT AS REQUIRED.
3. FIELD COORDINATE INSTALLATION SUCH THAT SUPPORT SHALL BE ACCESSIBLE FROM HATCH.

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PUNCHEON RUN SEWAGE PUMPING STATION UPGRADES

SECTION AND DETAILS

DRAWING NO. 14 OF 20

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PANELBOARD LPA

10K RMS AIC
NEMA 1 ENCLOSURE

100 AMP BUS
208/120 VOLTS
MCC MOUNTED

100 AMP MCB
3 PHASE, 4 WIRE + GROUND
PANEL LOCATION: MCC

LOAD SERVED	CIRCUIT BREAKER FRAME	CIRCUIT BREAKER TRIP	CIRCUIT BREAKER P	CKT. NO.	CKT. NO.	CIRCUIT BREAKER P	CIRCUIT BREAKER TRIP	CIRCUIT BREAKER FRAME	LOAD SERVED
SCREEN ROOM LIGHTS	100	20	1	1	2	1	20	100	PUMP ROOM LIGHTS
MECH. ROOM LIGHTS	100	20	1	3	4	1	20	100	PUMP ROOM LIGHTS
OUTSIDE LIGHTS	100	20	1	5	6	1	20	100	MOTOR ROOM LIGHTS
WET WELL ROOM LIGHTS	100	20	1	7	8	1	20	100	MOTOR ROOM LIGHTS
MECH. RM LTS & EXH FAN (PRV-1)	100	20	1	9	10	1	20	100	RECEPTACLES-MOTOR ROOM
STAIRWAY LIGHTS	100	20	1	11	12	1	20	100	RECEPTACLES-SCREEN ROOM
GENERATOR BATTERY CHARGER	100	20	1	13	14	1	20	100	MEN'S RM LTS & EXH FAN
GENERATOR FUEL PUMP	100	20	1	15	16	1	20	100	RECEPTACLES-PUMP ROOM
SUMP PUMP	100	20	1	17	18	1	20	100	SHORITE CONTROL BOX
SCADA PANEL	100	20	1	19	20	1	20	100	BATHROOM HEATER
UNIT HEATER SCREEN RM.	100	60	2	21	22	1	20	100	EMERGENCY LIGHTS
-	-	-	-	23	24	1	20	100	INSTRUMENT PANEL
MAGNETIC METER FLOW	100	20	1	25	26	1	20	100	GAS DETECTOR
HOT WATER HEATER	100	20	1	27	28	1	20	100	GENERATOR WATER HEATER
GENERATOR WATER HEATER	100	20	1	29	30	1	20	100	SUMP PUMP
CLOCK AND TELEPHONE	100	20	1	31	32	1	20	100	AUX. HWW FLOAT
HYDROGEN DIOXIDE CONTROL	100	20	1	33	34	2	50	100	SPARE
LANDIS AND GYR RTU	100	20	1	35	36	-	-	-	-
MAIN	100	100	3	37	38	1	20	100	SPARE
-	-	-	-	39	40	2	40	100	EXHAUST FAN
-	-	-	-	41	42	-	-	-	-

CONDUIT AND CABLE SCHEDULE

FDR NO.	FROM	TO	FEEDER VOLTS	FEEDER PHASE	FEEDER SIZE	REMARKS
(1)	EXISTING XFMR	MDS "MAIN CIRCUIT BREAKER"	480/277	3	EXISTING (3 SETS 4#350KCMIL)	[1]
(2)	MCB	AUTOMATIC TRANSFER SWITCH "ATS"	480	3	3 (3#600KCMIL, 1#3/0G - 4"C)	
(3)	EXISTING GENERATOR	AUTOMATIC TRANSFER SWITCH "ATS"	480	3	EXISTING(2 (3#500KCMIL, 1#2/0G))	[2]
(4)	ATS	MDS "DISTRIBUTION SECTION"	480	3	3 (3#600KCMIL, 1#3/0G - 4"C)	
(5)	MDS	VFD-1	480	3	3#300KCMIL, 1#3G - 3"C	
(6)	VFD-1	CONNECTION BOX CB-1	480	3	3#300KCMIL, 1#3G - 3"C	
(7)	MDS	VFD-3	480	3	3#300KCMIL, 1#3G - 3"C	
(8)	VFD-3	CONNECTION BOX CB-3	480	3	3#300KCMIL, 1#3G - 3"C	
(9)	MDS	OUTDOOR AIR CONDITION CONDENSER UNIT	480	3	3#12, 1#12G - 3/4"C	
(10)	MDS	A/C BLOWER/EVAPORATOR UNIT	480	3	3#12, 1#12G - 3/4"C	
(11)	MDS	MOTOR CONTROL CENTER " MCC"	480	3	3#350KCMIL, 1#3G - 3"C	
(12)	MDS	BRIDGE CRANE	480	3	3#12, 1#12G - 3/4"C	
(13)	MDS	SOLID STATE STARTER--SSS	480	3	3#300KCMIL, 1#3G - 3"C	
(14)	SSS	CONNECTION BOX CB-2	480	3	3#300KCMIL, 1#3G - 3"C	

SPECIFIC NOTES

[1] EXISTING FEEDER FORM UTILITY TRANSFORMER UPTO MCB SHALL REMAIN. PROVIDE ADDITIONAL FEEDER AS REQUIRED FOR THE EXTENSION OF EXISTING FEEDER TO MAKE CONNECTIONS TO MAIN CIRCUIT BREAKER. NEW FEEDER SHALL MATCH EXISTING.

[2] EXISTING FEEDER SHALL REMAIN. PROVIDE ADDITIONAL FEEDER FOR THE EXTENSION OF EXISTING FEEDER TO MAKE CONNECTIONS TO AUTOMATIC TRANSFER SWITCH. NEW FEEDER SHALL MATCH EXISTING.

JOHN D. GAYNOR
7008
DELAWARE
PROFESSIONAL ENGINEER

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PUNCHEON RUN SEWAGE PUMPING STATION UPGRADES

SCHEDULES

DRAWING NO. 15 OF 20

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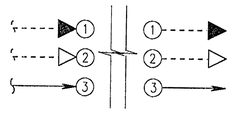
PROCESS AND INSTRUMENTATION SYMBOLS

- FIELD MOUNTED DEVICE
- PANEL MOUNTED DEVICE
- INDICATING LAMP – X INDICATES LENS COLOR (R=RED, G=GREEN, A=AMBER, W=WHITE)
- SCADA HMI INPUT/OUTPUT
- PLC INPUT/OUTPUT POINT
- ANALOG INPUT
- ANALOG OUTPUT
- DIGITAL INPUT
- DIGITAL OUTPUT
- ABC 123 — ABC – LETTERS INDICATE FUNCTION ACCORDING TO ISA SCHEDULE: 123 DIGITS IDENTIFY ASSOCIATED EQUIPMENT
- ELECTRICAL SERVICE (POWER)
- PROCESS FLOW
- ELECTRIC SIGNAL (CONTROL)
- (X) — INDICATES MULTIPLE SIGNALS TO PLC (X) DENOTES NUMBER OF SIGNALS
- I (X) (X) — INTERLOCK–PLC LOGIC OR HARDWIRED AS SHOWN ON DRAWINGS. (X) DENOTES CONDITIONS REFERENCE MODIFIERS
- EQUIPMENT GROUPED AS A TYPICAL ARRANGEMENT. GROUPING TYPICAL OF MULTIPLES OF THE SAME PROCESS.

X=A DESIGNATED CONTINUATION NUMBER WITH RESPECT TO A SPECIFIC SIGNAL, EITHER ANALOG, DISCRETE, OR SERVICE



EQUIPMENT SYMBOLS

- PUMP
- PROCESS
- BUTTERFLY VALVE
- REDUCER
- PM — 3–PHASE MONITOR
- ETM — ELAPSED TIME METER
- GM — GAS MONITOR
- FLOAT SWITCH
- DOOR
- SCR — STRIP CHART RECORDER
- OIT — OPERATOR INTERFACE TERMINAL

HAND SWITCHES

- SELECTOR SWITCH
- PUSH–TO–TEST PILOT LIGHT
- PUSHBUTTON

INSTRUMENT IDENTIFICATION SCHEDULE

	FIRST LETTER		SUCCEEDING LETTER		
	VARIABLE	MODIFIER	PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS		ALARM		AUTOMATIC
B	BREAKER		USER'S CHOICE	CLOSE OR STOP	BYPASS
C	COMMUNICATIONS			CONTROL	
D	DENSITY	DIFFERENTIAL		OPEN OR START	
E	VOLTAGE (EMF)		PRIMARY ELEMENT	SENSOR	
F	FLOW RATE	RATIO	FAIL	FAIL	FAIL
G	GAUGING		GLASS		LOCAL/MANUAL/HAND
H	HAND				HIGH OR OPEN
I	CURRENT		INDICATE		INTERMEDIATE
J	POWER	SCAN			
K	TIME	TIME RATE		CONTROL STATION	
L	LEVEL		LIGHT		LOW OR CLOSE
M	MOTOR	MOMENTARY		MOTOR	MIDDLE
N	USER'S CHOICE		INPUT	FORWARD	ON OR OPERATE
O				OFF	OVERLOAD
P	PRESSURE	PNEUMATIC	POINT (TEST)	POSITION	
Q	QUANTITY OR EVENT	TOTALIZE		EMERGENCY/ABNORMAL	
R	RADIOACTIVITY		RECORD OR PRINT	REMOTE	RUN
S	SPEED OR FREQUENCY	SUM	SWITCH	SWITCH	STOP
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
V	VARIABLE OR VISCOSITY			VALVE OR DAMPER	VFD / VALVE
W	WEIGHT OR FORCE		WELL		
X	MOD, LIGHT OR VALVE		UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED
Y	INTERLOCK			RELAY OR COMPUTE	RESET
Z	POSITION			DRIVE OR ACTUATOR	

HAND SWITCHES

HS XXX — SELECTOR SWITCH (MAINTAINED CONTACTS)

XXX = HOA : HAND–OFF–AUTO
= BV : BYPASS–VFD
= OF : ON–OFF

HMC XXX — PUSHBUTTON (MOMENTARY CONTACTS)

XXX = RES : RESET

ABBREVIATIONS

AI	= ANALOG INPUT
AO	= ANALOG OUTPUT
AUTO	= AUTOMATIC
ATS	= AUTOMATIC TRANSFER SWITCH
BP	= BOOSTER PUMP
DI	= DISCRETE INPUT
DO	= DISCRETE OUTPUT
DPDT	= DOUBLE POLE–DOUBLE THROW
ECD	= ELEMENTARY CONTROL DIAGRAMS
ETM	= ELAPSED TIME METER
HMI	= HUMAN MACHINE INTERFACE
I/O	= INPUT/OUTPUT
MCC	= MOTOR CONTROL CENTER
MMR	= MOTOR MANAGEMENT RELAY
OIT	= OPERATOR INTERFACE TOUCHSCREEN
PLC	= PROGRAMMABLE LOGIC CONTROLLER
TSP	= TWISTED SHIELDED PAIR
TYP	= TYPICAL
VAC	= VOLTS/ALTERNATING CURRENT
VDC	= VOLTS/DIRECT CURRENT
VFD	= VARIABLE FREQUENCY DRIVE

INSTRUMENT, EQUIPMENT AND CONTROL DEVICE EXAMPLES

FE	=	FLOW ELEMENT
FIT	=	FLOW INDICATING TRANSMITTER
PIT	=	PRESSURE INDICATING TRANSMITTER
PE	=	PRESSURE ELEMENT
TSH	=	TEMPERATURE SWITCH HIGH
TSL	=	TEMPERATURE SWITCH LOW
ZS	=	POSITION SWITCH

P & I D LEGEND

PANEL LEGEND:

L	=	LOCAL CONTROL PANEL
PCP	=	PUMP CONTROL PANEL
RTU	=	REMOTE TERMINAL UNIT
VFD	=	VARIABLE FREQUENCY DRIVE

ECD SYMBOLS

- CR — CONTROL RELAY
- NORMALLY OPEN CONTACT
- NORMALLY CLOSED CONTACT
- FUSE
- CIRCUIT BREAKER
- X00 — SELECTOR SWITCH X00= REPRESENT THE NUMBER OF SWITCH POSITIONS
- PUSHBUTTON
- PUSH–TO–TEST PILOT LIGHT
- RTU OUTPUT INTERPOSING RELAY
- M — MOTOR
- TERMINAL BLOCK
- NORMALLY OPEN TIMED CLOSED CONTACT
- GROUND

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PUNCHEON RUN SEWAGE PUMPING STATION UPGRADES

LEGEND, ABBREVIATIONS AND GENERAL NOTES

REV	DATE	DESCRIPTION

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RTU/SCADA I/O

(REPRESENT PHYSICAL AND DATABASE POINTS TRANSMITTED VIA RTU TO SCADA HMI TERMINAL)

WETWELL LEVEL — LN 121
DISCHARGE PRESSURE — PN 121
STATION FLOW — FN 121
FACILITY ENTRY ALARM — ZN 121
GENERATOR RUNNING — MN 401
MACHINICAL BARSCREEN FAILURE — QF 401
COMBUSTIBLE GASES IN INFLUENT CHAMBER — QN 401
3-PHASE POWER FAILURE — JNF 401
PUMP ROOM FLOODED — LNH 121
HIGH-HIGH WETWELL LEVEL ALARM (FLOAT) — LNHH 110

TYPICAL FOR PUMP NO.3 (301)

PUMP NO.1 RUNNING — MN 101
PUMP NO.1 FAILURE — MF 101

PUMP NO.2 RUNNING — MN 201
PUMP NO.2 FAILURE — MF 201

PLC/RIO I/O

(REPRESENT PHYSICAL POINTS TERMINATED AT PLC)

WETWELL LEVEL — LN 121
DISCHARGE PRESSURE — PN 121
STATION FLOW — FN 121
FACILITY ENTRY ALARM — ZN 121
GENERATOR RUNNING — MN 401
MACHINICAL BARSCREEN FAILURE — QF 401
COMBUSTIBLE GASES IN INFLUENT CHAMBER — QN 401
3-PHASE POWER FAILURE — JNF 401
PUMP ROOM FLOODED — LNH 121
HIGH-HIGH WETWELL LEVEL ALARM (FLOAT) — LNH 110

SPEED REFERENCE — SN 101
SPEED CONTROL — SC 101
P-1 IN AUTO — HN 101
P-1 RUNNING — MN 101
P-1 PUMP FAILURE — MF 101
P-1 PUMP START — MC 101
P-1 VFD FAULT — MF 102
P-1 INCOMPLETE SEQUENCE — ZN 101

P-2 IN AUTO — HN 201
P-2 RUNNING — MN 201
P-2 PUMP FAILURE — MF 201
P-2 SOFT START FAILURE — MF 202
P-2 PUMP START — MC 201
P-2 INCOMPLETE SEQUENCE — ZN 201

FIELD DEVICES

(REPRESENT PHYSICAL CONNECTION BETWEEN EQUIPMENT)

INTERNAL DEVICES
- PLC
- TERMINAL INTERFACE BLOCKS

PANEL MOUNTED DEVICES
- SCR
- MLS 122 R — ALARM
- MLS 123 W — CONTROL POWER
- OIT
- HMS 121 RES
- PCP

DIGITAL KEYPAD DISPLAY
- HS 101 HOA
- HMC 101 RES
- MMR 101
- MLS 102 R
- MLS 103 A
- MLS 101 W
- MLS 104 G
- MLS 105 A
- ETM
- VFD

- HS 201 HOA
- HMC 201 RES
- MMR 201
- MLS 201 W
- MLS 202 G
- MLS 203 R
- MLS 204 A
- MLS 205 A
- ETM
- SS

RTU

INFLUENT

(12)
TSH 104 / TSH 101
TSH 105 / TSH 102
QN 101 / TSH 103
LS 101
PUMP NO.1 (101)

LSHH 110

(12) (11)
TSH 204 / TSH 201
TSH 205 / TSH 202
QN 201 / TSH 203
LS 201
PUMP NO.2 (201)

LSH 111

LE 121

LSL 112

WETWELL

FIT 121
FE 121
FM
PT 121
PE 121

DISCHARGE

PUMP NO.3 (301)

PUMP STATION

EXISTING GENERATOR
- RUN
- L

EXISTING GAS MONITOR
- AIT 400
- GM

EXISTING POWER MONITOR
- FAIL
- JSF 400
- PM

EXISTING MECHANICAL BAR SCREEN
- FAIL
- L

EXIST FACILITY ENTRY SWITCH
- ZS 121

EXISTING PUMP ROOM FLOOD SWITCH
- HIGH LEVEL
- LSH 121

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PUMPING SYSTEM

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PROCESS AND INSTRUMENTATION DIAGRAMS

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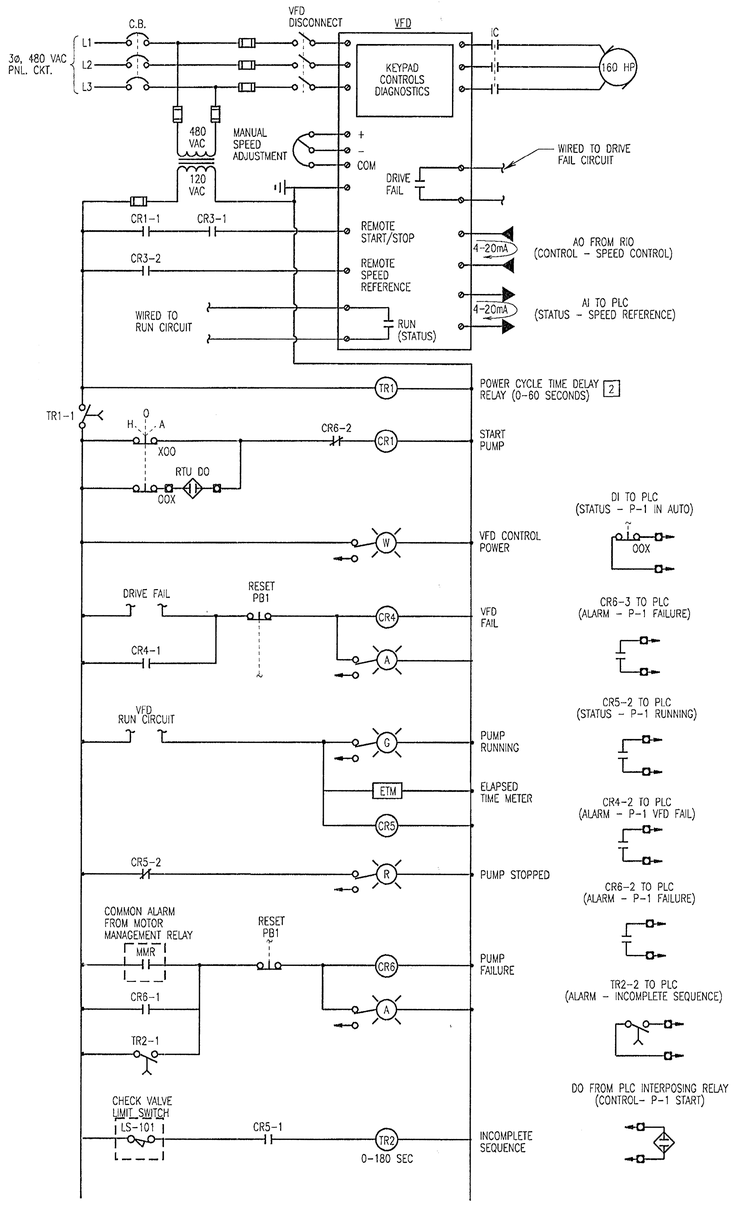
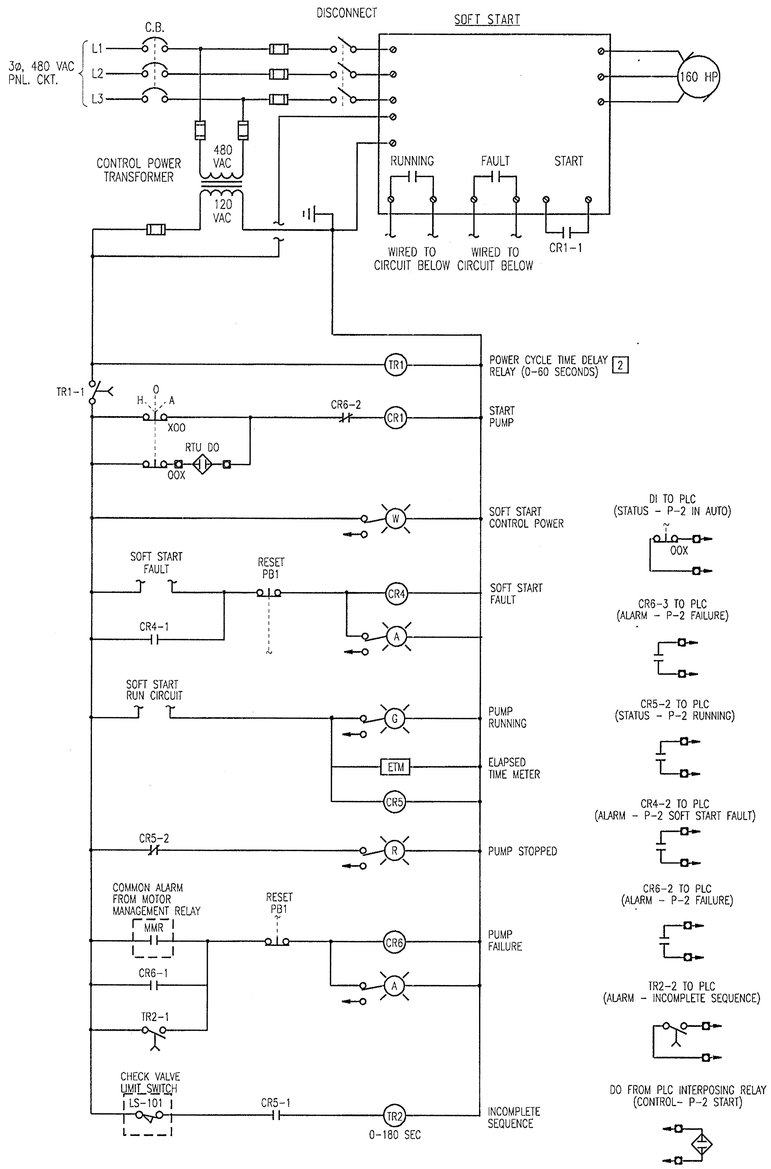
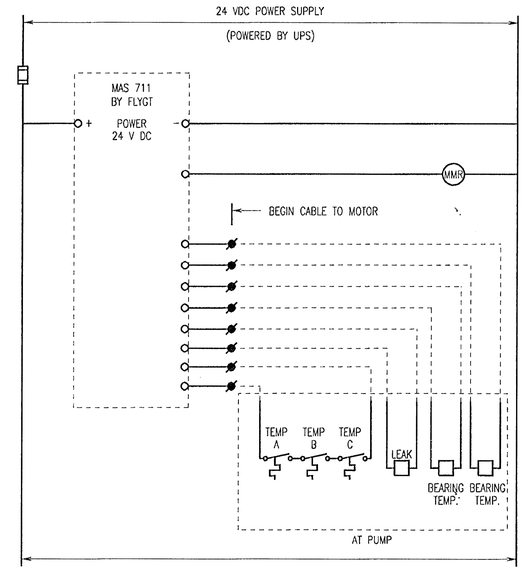


PUMP NO. 1 (P - 1)

(TYPICAL FOR P-3) 3



PUMP NO. 2 (P - 2) 4



MOTOR MANAGEMENT RELAY NO. 1 (MMR - 101)

(TYPICAL FOR MMR-201 AND MMR-301)

NOTE:

1. TWO MOTOR TEMPERATURE RTD'S FOR EACH PHASE.
2. SET TIME DELAY RELAY WITH 10 SECOND OFFSETS FOR EACH PUMP. P-1= 10 SECONDS, P-2= 20 SECONDS, FUTURE P-3= 30 SECONDS.
3. ALL PUMP CONTROLS ARE LOCATED IN VFD.
4. ALL PUMP CONTROLS ARE LOCATED IN SOFT START CABINET.

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PUNCHEON RUN SEWAGE PUMPING STATION UPGRADES

PUMP CONTROL SCHEMATIC

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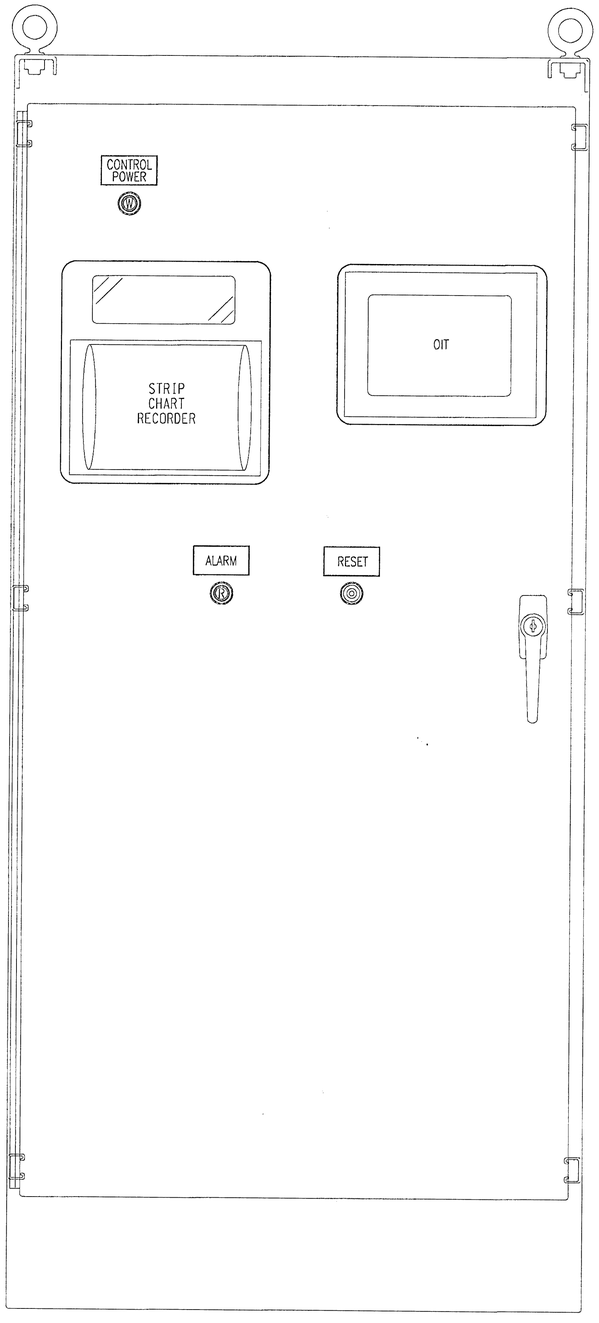
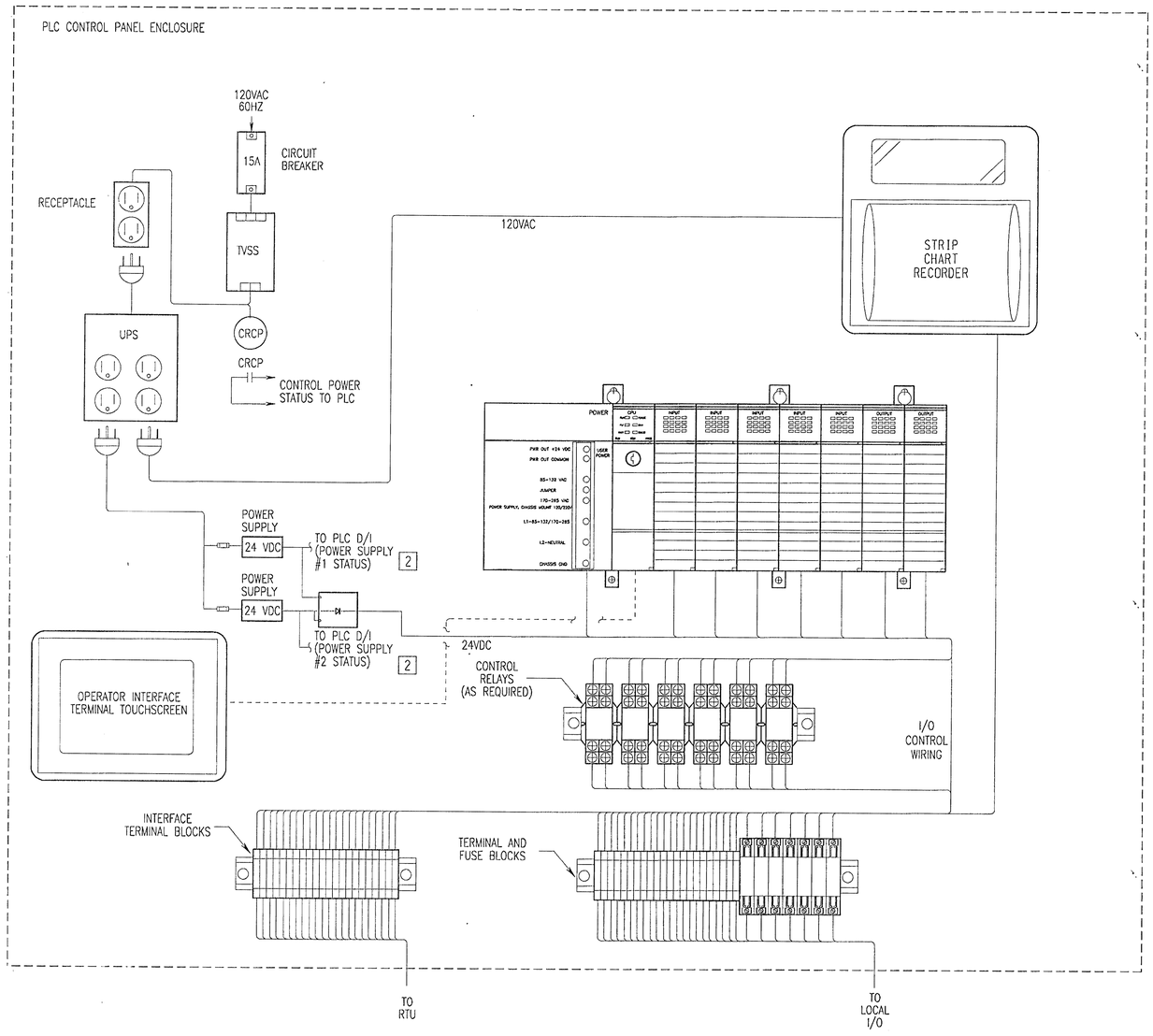


PLC PUMP CONTROL PANEL ELEVATION



PLC PUMP CONTROL PANEL LAYOUT

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CONTROL PANEL ELEVATION AND LAYOUT

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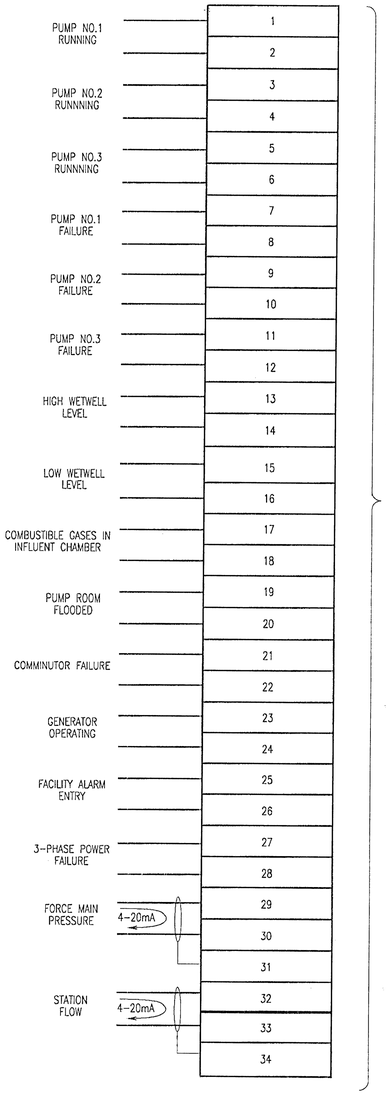
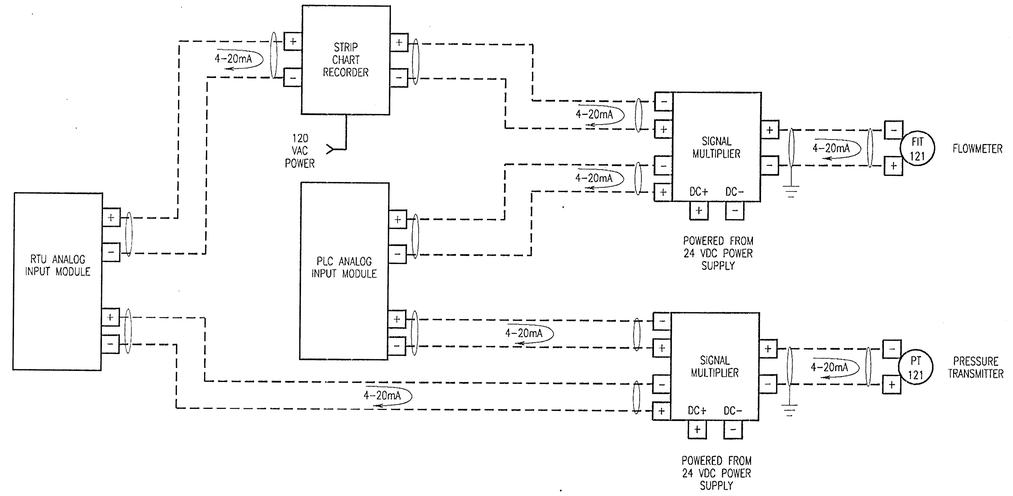
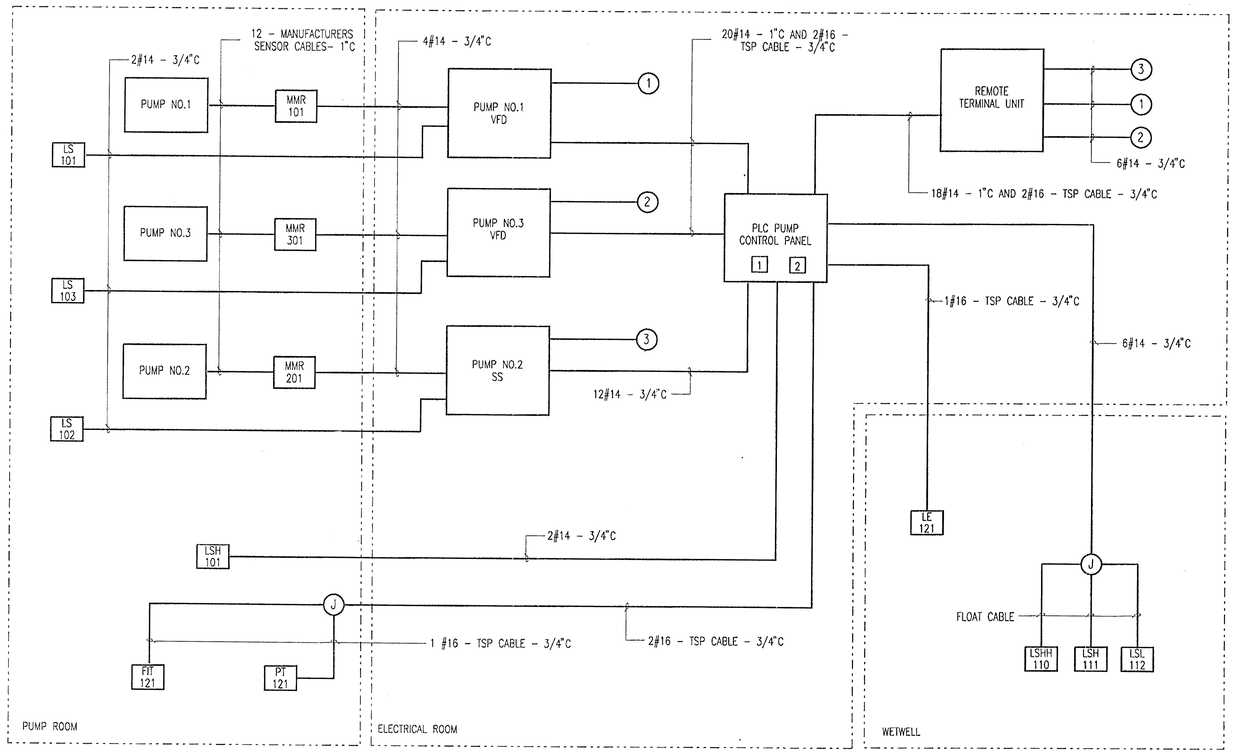


INTERFACE TERMINAL BLOCKS LAYOUT



INSTRUMENT ANALOG LOOP



STATION CONTROL RISER

NOTE:

1. NEW PLC PUMP CONTROL PANEL TO BE INSTALLED IN SAME LOCATION OF REMOVED INSTRUMENTATION PANEL.
2. INSTRUMENTATION PANELSHALL BE REMOVED AND RETURNED TO CITY. ALL EXISTING SIGNALS SHALL BE EXTENDED TO TERMINAL BLOCKS INSIDE OF NEW ALL PUMP CONTROL PANEL.

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PUNCHEON RUN SEWAGE PUMPING STATION UPGRADES

LAYOUT, LOOP AND RISER

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