PROJECT MANUAL

FOR

RECLAIMED WATER TO DEER MOSS CREEK S/D
CONTRACT III – RECLAIMED WATER PUMP REPLACEMENT

THE CITY OF NICEVILLE, FLORIDA
ITB 26-07

MAYOR
Daniel Henkel

CITY COUNCIL
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Prepared By:

January 2026

Engineer Job No. 40-205

SECTION 00 21 13 – INSTRUCTIONS TO BIDDERS

ARTICLE 1—NOT USED

ARTICLE 2—BIDDING DOCUMENTS

2.01 Bidder shall obtain a complete set of Bidding Requirements and proposed Contract Documents (together, the Bidding Documents). It is Bidder's responsibility to determine that it is using a complete set of documents in the preparation of a Bid. Bidder assumes sole responsibility for errors or misinterpretations resulting from the use of incomplete documents, by Bidder itself or by its prospective Subcontractors and Suppliers.

2.02 Bidding Documents are made available for the sole purpose of obtaining Bids for completion of the Project and permission to download or distribution of the Bidding Documents does not confer a license or grant permission or authorization for any other use. Authorization to download documents, or other distribution, includes the right for plan holders to print documents solely for their use, and the use of their prospective Subcontractors and Suppliers, provided the plan holder pays all costs associated with printing or reproduction. Printed documents may not be re-sold under any circumstances.

2.03 Owner and/or Engineer has established a Bidding Documents Website as indicated in the Legal Notice or invitation to bid. Owner recommends that Bidder register as a plan holder with the Issuing Office at such website, and obtain a complete set of the Bidding Documents from such website. Bidders may rely that sets of Bidding Documents obtained from the Bidding Documents Website are complete, unless an omission is blatant. Registered plan holders will receive Addenda issued by Owner. Bids Shall be uploaded electronically as indicated in the Legal Notice.

2.04 Plan rooms (including construction information subscription services, and electronic and virtual plan rooms) may distribute the Bidding Documents, or make them available for examination. Those prospective bidders that obtain an electronic (digital) copy of the Bidding Documents from a plan room are encouraged to register as plan holders from the Bidding Documents Website or Issuing Office. Owner is not responsible for omissions in Bidding Documents or other documents obtained from plan rooms, or for a Bidder's failure to obtain Addenda from a plan room.

ARTICLE 3—NOT USED

ARTICLE 4—NOT USED

ARTICLE 5—NOT USED

ARTICLE 6—BIDDER'S REPRESENTATIONS AND CERTIFICATIONS

6.01 *Express Representations and Certifications in Bid Form, Agreement*

A. The Bid Form that each Bidder will submit contains express representations regarding the Bidder's examination of Project documentation, Site visit, and preparation of the Bid, and certifications regarding lack of collusion or fraud in connection with the Bid. Bidder should review these representations and certifications, and assure that Bidder can make the representations and certifications in good faith, before executing and submitting its Bid.

B. If Bidder is awarded the Contract, Bidder will make similar express representations and certifications when it executes the Agreement.

ARTICLE 7—INTERPRETATIONS AND ADDENDA

7.01 Owner on its own initiative may issue Addenda to clarify, correct, supplement, or change the Bidding Documents.

7.02 Bidder shall submit all questions about the meaning or intent of the Bidding Documents as described in the Invitation to Bids.

7.03 Interpretations or clarifications considered necessary in response to such questions will be issued by Addenda. Questions received less than seven days prior to the date for opening of Bids may not be answered.

7.04 Only responses set forth in an Addendum will be binding. Oral and other interpretations or clarifications will be without legal effect. Responses to questions are not part of the Contract Documents unless set forth in an Addendum that expressly modifies or supplements the Contract Documents.

ARTICLE 8—NOT USED

ARTICLE 9—NOT USED

ARTICLE 10—SUBSTITUTE AND "OR EQUAL" ITEMS

10.01 The Contract, as awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents, and those "or-equal" or substitute or materials and equipment subsequently approved by Owner prior to the submittal of Bids and identified by Addendum. No item of material or equipment will be considered by Owner as an "or-equal" or substitute unless written request for approval has been submitted by Bidder and has been received by Owner within 10 days of the issuance of the Invitation To Bid. The burden of proof of the merit of the proposed item is upon Bidder. Owner's decision of approval or disapproval of a proposed item will be final. If Owner approves any such proposed item, such approval will be set forth in an Addendum. Bidders cannot rely upon approvals made in any other manner.

ARTICLE 11—NOT USED

ARTICLE 12—PREPARATION OF BID

12.01 The Bid Form is included with the Bidding Documents.

A. All blanks on the Bid Form must be completed. A Bid price must be indicated for each Bid item.

12.02 Bidder shall prepare and submit its Bid as described in the Invitation To Bid.

12.03 A Bid by a corporation must be executed in the corporate name by a corporate officer (whose title must appear under the signature), accompanied by evidence of authority to sign. The corporate address and state of incorporation must be shown.

12.04 A Bid by a partnership must be executed in the partnership name and signed by a partner (whose title must appear under the signature), accompanied by evidence of authority to sign. The official address of the partnership must be shown.

12.05 A Bid by a limited liability company must be executed in the name of the firm by a member or other authorized person and accompanied by evidence of authority to sign. The state of formation of the firm and the official address of the firm must be shown.

12.06 A Bid by an individual must show the Bidder's name and official address.

12.07 A Bid by a joint venture must be executed by an authorized representative of each joint venturer in the manner indicated on the Bid Form. The joint venture must have been formally established prior to submittal of a Bid, and the official address of the joint venture must be shown.

12.08 All names must be printed below the signatures.

12.09 The Bid must contain an acknowledgment of receipt of all Addenda, the numbers of which must be filled in on the Bid Form.

12.10 Postal and e-mail addresses and telephone number for communications regarding the Bid must be shown.

12.11 All equipment and materials shall be supplied by a single Supplier.

12.12 Bidder must include in the Bid Form, in the blank space provided, the number of days for the delivery of the equipment and materials.

12.13 Bidder shall include the permanent location of maintenance personnel and facility in the blank space provided on the Bid Form. This location must be within 100 miles of Niceville or the Bid will not be considered.

ARTICLE 13—BASIS OF BID

13.01 *Lump Sum*

A. Bidders must submit a Bid on a lump sum basis as shown on the Bid Form.

13.02 *Unit Price (NOT USED)*

ARTICLE 14—SUBMITTAL OF BID

14.01 Bids must be submitted as required in the Invitation To Bid.

ARTICLE 15—NOT USED

ARTICLE 16—OPENING OF BIDS

16.01 Bids will be opened at the time and place indicated in the Invitation To Bid and, unless obviously non-responsive, read aloud publicly

ARTICLE 17—BIDS TO REMAIN SUBJECT TO ACCEPTANCE

17.01 All Bids will remain subject to acceptance for the period of time stated in the Bid Form, but Owner may, in its sole discretion, release any Bid prior to the end of this period.

ARTICLE 18—EVALUATION OF BIDS AND AWARD OF CONTRACT

18.01 Owner reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. Owner also reserves the right to waive all minor Bid informalities not involving price, time, or changes in the Work.

18.02 Owner will reject the Bid of any Bidder that Owner finds, after reasonable inquiry and evaluation, to not be responsible.

18.03 Owner will reject the bid of any Bidder who does not include all equipment and materials required to complete the work.

18.04 Owner will reject the Bid of any Bidder who does not have permanent maintenance personnel and capabilities located within 100 miles of the City of Niceville.

18.05 If Bidder purports to add terms or conditions to its Bid, takes exception to any provision of the Bidding Documents, or attempts to alter the contents of the Contract Documents for purposes of the Bid, whether in the Bid itself or in a separate communication to Owner or Engineer, then Owner will reject the Bid as nonresponsive.

18.06 More than one Bid for the same Work from an individual or entity under the same or different names will not be considered. Reasonable grounds for believing that any Bidder has an interest in more than one Bid for the Work may be cause for disqualification of that Bidder and the rejection of all Bids in which that Bidder has an interest.

18.07 If Owner awards the contract for the Work, such award will be to the Bidder deemed most acceptable to the Owner when considering the Bid Price, time required to complete, proposed pumping equipment, location of service facility, and financial ability. The Owner will be the sole judge of which Bidder is deemed most acceptable.

ARTICLE 19—NOT USED

ARTICLE 20—NOT USED

ARTICLE 21—PUBLIC ENTITY CRIME INFORMATION

21.01 A person or affiliate who has been placed on the convicted vendor list following a conviction for a public entity crime may not submit a Bid on a contract to provide any goods or services to a public entity, may not submit a bid on a contract with a public entity for the construction or repair of a public building or public work, may not submit Bids on leases of real property to a public entity, may not be awarded or perform work as contractor, supplier, subcontractor, or consultant under a contract with any public entity, and may not transact business with any public entity in excess of the threshold amount provided in Section 287.017, for CATEGORY TWO for a period of 36 months from the date of being placed on the convicted vendor list.

ARTICLE 22—NOT USED

ARTICLE 23—CONFLICT OF INTEREST

23.01 The award hereunder is subject to the provision of Chapter 112, Florida Statutes. All Bidders must disclose with their Bid the name of any officer, director, or agent who is also a public officer or an employee of the Owner, or any of its agencies. Further, all Bidders must disclose with their Bid the name of any employee of the Owner or any of its agencies who owns, directly or indirectly, an interest of 5% or more in the firm or any of its branches.

23.02 The disclosure is included in Section 00 41 00 as Attachment A. It shall be included with submission of the Bid.

ARTICLE 24—NOT USED

ARTICLE 25—NOT USED

END OF SECTION 00 21 13

SECTION 00 41 00 – BID FORM

BID FORM

Project Title:	Equipment and Materials for Replacement of Reclaimed Water Pumps and Controls City Of Niceville, Florida
Project Location:	Niceville, Florida
Owner:	City of Niceville, Florida
Engineer Project No.:	40-205.03
Bid Opening Location:	Niceville City Hall Conference Room, 208 Partin Dr. N
Bid Opening Date:	Friday, February 13th, 2026

SUBMITTED BY

Bidder Name:	
Bidder Address:	

ARTICLE 1 – OWNER AND BIDDER

1.01 This Bid is submitted to:

City of Niceville
208 North Partin Drive
Niceville, FL 32578

1.02 The undersigned Bidder proposes and agrees, if this Bid is accepted, to provide all equipment and materials specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.

ARTICLE 2 – ATTACHMENTS TO THIS BID

2.01 The following documents are submitted with and made a condition of this Bid:

A. Conflict of Interest Disclosure Form (Attachment A);

ARTICLE 3 – BASIS OF BID

3.01 *Lump Sum and Unit Price Bids*

A. Bidder will complete the Work in accordance with the Contract Documents for the following lump sum (stipulated) price(s):

BID SCHEDULE: MATERIALS FOR REPLACEMENT OF RECLAIMED WATER PUMPS AND CONTROLS

NOTE: BID MUST INCLUDE ALL APLICABLE TAXES AND FEES INCLUDING SALES TAX

Item No	Quantity & Units		Description	Lump Sum Bid Price
1.	1	L.S.	All Equipment, Materials, Accessories and Incidentals Required As Shown on The Drawings and As Specified Herein, Including 4 Vertical Turbine Pumps with Motors, 1 Submersible Maintenance Pump With Motor, 4 Check Valves (8") With Restraint Rods, 4 Butterfly Valves (8"), 1 Butterfly Valve (2"), 1 Control Panel And 2 Stainless Steel 8" Pipes (With Integral Bend) For the Lump Sum Price	$

Number of Calendar Days to Supply Pumps, Motors, and All Other Items EXCEPT Control Panel:*
_____ calendar days

Number of Calendar Days to Supply Control Panel:* ***_____ calendar days***

Location of maintenance personnel and facility located within 100 miles of the City of Niceville:
_____ location

**Allow 7 calendar days for review of submittal.*

ARTICLE 4 – TIME OF COMPLETION AND PENALTIES

4.01 Bidder agrees that the equipment and materials will be delivered within the number of calendar days included in the Bid Form.

4.02 Bidder accepts the provisions that Bidder will be banned from bidding future projects in Niceville for a period of 1 year if these delivery dates are not met.

ARTICLE 5 – BIDDER'S ACKNOWLEDGEMENTS: ACCEPTANCE PERIOD, INSTRUCTIONS, AND RECEIPT OF ADDENDA

5.01 *Bid Acceptance Period*

A. This Bid will remain subject to acceptance for 60 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

5.02 *Instructions to Bidders*

A. Bidder accepts all of the terms and conditions of the Invitation to Bid and Instructions to Bidders.

5.03 *Receipt of Addenda*

A. Bidder hereby acknowledges receipt of the following Addenda:

Addendum Number & Date	Addendum Number & Date

ARTICLE 6 – BIDDER'S REPRESENTATIONS AND CERTIFICATIONS

6.01 *Bidder's Representations*

A. In submitting this Bid, Bidder represents the following:

1. Bidder has examined and carefully studied the Bidding Documents, including Addenda.
2. Bidder has visited the Site, conducted a thorough visual examination of the Site and adjacent areas, and become familiar with the general, local, and Site conditions that may affect equipment selection and design and cost.
3. Bidder is familiar with all Laws and Regulations that may affect cost, progress, and performance of the Work.
4. Bidder is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.
5. Bidder has given Owner written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and of discrepancies between Site conditions and the Bidding Documents, and the written resolution thereof by Owner is acceptable to Bidder.
6. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the equipment.

7. The submission of this Bid constitutes an incontrovertible representation by Bidder that without exception the Bid and all prices in the Bid are premised upon performing and furnishing all items required by the Bidding Documents.

6.02 *Bidder's Certifications*

A. The Bidder certifies the following:

1. This Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any collusive agreement or rules of any group, association, organization, or corporation.

2. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid.

3. Bidder has not solicited or induced any individual or entity to refrain from bidding.

4. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 6.02.A:

a. Corrupt practice means the offering, giving, receiving, or soliciting of anything of value likely to influence the action of a public official in the bidding process.

b. Fraudulent practice means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition.

c. Collusive practice means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish bid prices at artificial, non-competitive levels.

d. Coercive practice means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the execution of the Contract.

BIDDER hereby submits this Bid as set forth above:

Bidder:

_____
(typed or printed name of organization)

By: _____
(individual's signature)

Name: _____
(typed or printed)

Title: _____
(typed or printed)

Date: _____
(typed or printed)

If Bidder is a corporation, a partnership, or a joint venture, attach evidence of authority to sign.

Attest: _____
(individual's signature)

Name: _____
(typed or printed)

Title: _____
(typed or printed)

Date: _____
(typed or printed)

Address for giving notices:

_____

_____

_____

Bidder's Contact:

Name: _____
(typed or printed)

Title: _____
(typed or printed)

Phone: _____

Email: _____

Address:

_____

_____

_____

Bidder's Contractor License No.: _____

ATTACHMENT A – CONFLICT OF INTEREST DISCLOSURE FORM

For purposes of determining any possible conflict of interest, all bidders/proposers must disclose if any City of Niceville, employee(s), elected official(s), or if any of its agencies is also an owner, corporate officer, agency, employee, etc., of their business.

Indicate either "YES" (a city or county employee, elected official, or agency is also associated with your business), or "NO". If yes, give person's name(s) and position(s) with your business.

YES _____ NO _____

NAME(S) and POSITION(S):

_____

_____

_____

_____

_____

FIRM NAME: _____

BY (printed): _____

BY (signature): _____

TITLE: _____

ADDRESS: _____

PHONE: _____

SECTION 01 11 00 - SUMMARY OF WORK

PART 1 - GENERAL

1.1 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work consists of furnishing all equipment and materials specified.

B. The intent of the work is to supply the Owner with all equipment and materials required to replace the components specified and to have a complete system capable of supplying reclaimed water into the City's reclaimed water distribution system at whatever demand is present, up to 6300 GPM, and maintaining a discharge pressure of 15-68 psig. All equipment and materials shall be supplied by one single supplier. The supplier shall have permanent maintenance personnel and facility located within 100 miles of the City of Niceville.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 11 00

SECTION 01 33 00 - SUBMITTALS

PART 1 - GENERAL

1.1 DESCRIPTION AND REQUIREMENTS

A. Type of Submittals. This Section of the Specifications describes the procedures for submittals of Shop Drawings and Product Data.

B. Definitions. Submittals are categorized as follows:
   1. Shop Drawings:
      a. Shop drawings shall include technical data, drawings, diagrams, performance curves, schedules, templates, patterns, reports, calculations, instructions, measurements and similar information as applicable to the specific item for which the shop drawing is prepared.
      b. Show dimensions and note which are based on field measurement. Indicate compliance with standards and special coordination requirements.
   2. Product Data:
      a. Product data includes standard printed information on materials, products and systems, not specially prepared for this project, other than the designation of selections from among available choices printed therein.
      b. Collect required data into one submittal for each system and clearly mark each copy to show which choices and options are applicable to project. Include manufacturer's standard printed recommendations for application and use and compliance with standards.
      c. Show all performance characteristics, capacities, clearances required, and wiring or piping diagrams. Supplement standard information to provide all information specifically applicable to work.

C. List of Required Submittals:

No.	Description	Section No.
1.	Operation and Maintenance Data	01 78 23
2.	Controls	26 09 16
3.	Valves and Pipe	40 05 51
4.	Lineshaft and Submersible Turbine Pumps	43 21 02

1.2 GENERAL SUBMITTAL REQUIREMENTS

A. Preparation of Submittals. Provide permanent marking on each submittal to identify project, date, submittal name and similar information to distinguish it from other submittals.

B. Transmittal Identification.
   1. Number transmittals in sequence for each Division of the Specifications. The number before the dash indicates the Section of the Specifications, and the number after the dash is the sequence number of the transmittal (33 11 00-1 would be the first transmittal

applicable to Section 33 11 00 of the Specifications. 33 11 00-2 would be the second transmittal for Section 33 11 00, etc.)

2. Identify resubmittals with a letter of the alphabet following the original number, using A for the first resubmittal, B for the second resubmittal, etc. A resubmittal affecting transmittal 33 11 00-1 would then be numbered 33 11 00-1A. The 33 11 00-1 would then be entered in the space "Previous Transmittal Number", which is left blank except on resubmittals.

1.3 SPECIFIC CATEGORY REQUIREMENTS

A. General. Except as otherwise indicated in the individual work sections, comply with general requirements specified herein for each indicated category of submittal.

1. Submittals shall be accompanied by a cover sheet which shall contain:
   a. The date of submission and the dates of any previous submissions.
   b. The Project title and number.
   c. Date.
   d. The names of the:
      1) Supplier
      2) Manufacturer
   e. Identification of the product, with the Specification Section number.
   f. A list of all the sheets included in the submittal.
   g. Field dimensions, clearly identified as such.
   h. Relation to adjacent or critical features of the work or materials.
   i. Applicable standards, such as ASTM or Federal Specification numbers.
   j. Notification to the Engineer in writing, at time of submission, of any deviations on the submittals from requirements of the Contract Documents.
   k. Identification of revisions on resubmittals.
   l. An 8 inch x 3 inch blank space for Engineer stamp.

1.4 SUBMITTAL COPIES REQUIRED

A. Shop Drawings, Product Data, and Miscellaneous Submittals. All released submittals will be distributed as follows:

1.	For Poly, Inc.	2 copies
2.	For Owner	2 copies
3.	For Supplier	2 copies
	TOTAL	6 copies

B. To the above number may be added additional copies as required by the Supplier.

NOTE: Electronic submittals may be substituted for paper submittals with the approved of the Owner.

C. For nonapproval items, such as parts lists, operation and maintenance data, four (4) copies are required, unless specified otherwise:

1.	For Poly, Inc.	2 copies
2.	For Owner	2 copies
	TOTAL	4 copies

1.5 REVIEW OF SUBMITTALS

A. Review Time. Allow two (2) weeks for the Engineer's initial processing of each submittal requiring review and response. Allow one (1) week for reprocessing each re-submittal.

B. Engineer's Action:
   1. Final Unrestricted Release. Work may proceed, provided it complies with contract documents, when submittal is returned with the following:
      a. Marking: "A" - No Exceptions Taken.
   2. Final-But-Restricted Release. Work may proceed, provided it complies with notations and corrections on submittal and with contract documents, when submittal is returned with the following:
      a. Marking: "B" - Make Corrections Noted.
   3. Returned for Resubmittal. Do not proceed with Work. Revise submittal in accordance with notations thereon, and resubmit without delay to obtain a different action marking. Do not allow submittals with the following marking (or unmarked submittals where a marking is required) to be used in connection with performance of the work.
      a. Marking: "C" - Revise and resubmit.
      b. Marking: "D" - Rejected - Does Not Comply with Project Requirements.
   4. Only three (3) copies of items marked "C" or "D" will be reviewed and marked. One copy will be retained in the Poly, Inc. office and the other copies with all remaining unmarked copies will be returned to the supplier for resubmittal.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 33 00

SECTION 01 61 00 - GENERAL MATERIALS STIPULATIONS

PART 1 - GENERAL

1.1 SCOPE

A. These General Materials Stipulations apply, in general, to all equipment and piping. They supplement the detailed specifications, but in case of conflict, the detailed specifications shall govern.

1.2 PATENT ROYALTIES

A. All royalties and fees for patents covering materials, articles, apparatus, devices, or equipment shall be included in prices bid.

1.3 WARRANTY

A. The Supplier shall warranty all equipment and materials against faulty or inadequate design, improper assembly, defective materials, defective workmanship, breakage or other failure. The warranty period shall be five (5) years from the date of delivery. If equipment fails during this warranty period, the supplier shall repair or replace failed equipment at no cost to the Owner unless the failure was due to some action of the Owner.

1.4 WORKMANSHIP AND MATERIALS

A. All material shall be designed, fabricated, and assembled in accordance with the best modern engineering and shop practice. Individual parts shall be manufactured to standard sizes and gages so that repair parts, furnished at any time, can be installed in the field. Like parts of duplicate units shall be interchangeable. Material shall be new and shall not have been in service at any time prior to delivery, except as required by tests.

B. Materials shall be suitable for service conditions. Iron castings shall be tough, close grained, gray iron free from blowholes, flaws, or excessive shrinkage and shall conform to ASTM A 48, Class 30 minimum. Plugging of defective castings shall not be permitted. Castings shall be annealed to remove internal stresses prior to machining and shall have the mark number and heat number cast on them.

C. Except where otherwise specified, structural and miscellaneous fabricated steel shall conform to the Standards of the American Institute of Steel Construction.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 61 00

SECTION 01 78 23.01 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 DESCRIPTION

A. The Supplier shall provide five (5) copies of a complete and comprehensive referenced manual containing operating and maintenance data to enable operators and plant engineers to correctly operate, service, and maintain all equipment and accessories covered by the detailed equipment specifications. The data contained in the manual shall explain and illustrate clearly and simply all principles and theory of operation, operating instructions, maintenance procedures, calibration procedures, and safety precautions and procedures for the equipment involved. Safety precautions and procedures shall be stressed.

1.2 SUBMITTAL

A. The Suppler shall submit five (5) copies of each manual complete in detail as specified below. No payment for more than 80 percent of the Contract Price will be made until all the final copies of the manuals are submitted and the submittal is satisfactory to the Engineer. The Engineer will notify the Contractor in writing of any deficiencies in the manual and will return the manual for completion and/or correction. The Contractor shall submit five (5) copies of any revised or additional data required to complete the manual or as required by the Engineer.

1.3 CONTENTS OF OPERATING AND MAINTENANCE DATA REFERENCE MANUAL

A. The operating and Maintenance Data Reference Manual shall contain, but is not limited to, the following information on all equipment and accessories furnished and installed under these specifications.
   1. Equipment function, normal operating characteristics, and limiting conditions for all equipment furnished.
   2. Detailed assembly, installation, alignment, adjustment, and checking instructions for all equipment furnished.
   3. Detailed operating instructions for start-up, calibration, routine and normal operation, regulation and control, shutdown and emergency conditions for all equipment furnished.
   4. Detailed lubrication instructions and schedules for all equipment furnished including identification of lubricant (description, specification and trade name of at least two manufacturers), diagrams illustrating lubrication points.
   5. Detailed guide to "troubleshooting" for all equipment furnished.
   6. Detailed parts list identified by generic title, materials of construction and part number (actual manufacturer's number, not Supplier's), list of recommended spare parts identified as specified above, and predicted life of parts subject to wear, and an exploded view of each equipment assembly for all equipment furnished.
   7. Detailed disassembly, overhaul, and reassembly instructions for all equipment furnished.
   8. Electrical and instrumentation schematics for all equipment furnished, including motor control centers, control panels, instrument panels, and analyzer panels.

9. List of all special tools supplied and description of their use for all equipment furnished. Special tools include any tool not normally available in an industrial hardware or mill supply house.
10. Detailed preventive maintenance procedures and schedules for all equipment furnished.
11. Detailed list of settings for relays, pressure switches, temperature switches, level switches, thermostats, alarms, relief valves, rupture discs, etc.
12. Performance and characteristics operating curves for all equipment furnished.
13. List of names and addresses of nearest service centers for parts, overhaul, and service.
14. Three (3) copies of any instructions and parts list attached to equipment when delivered.
15. Procedures for storing, handling, and disposing of any chemicals or products used with the equipment or system.
16. The suppliers O&M information will address the particular equipment furnished with specific details on operation and maintenance practices. General data will not be accepted.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 78 23.01

SECTION 26 09 16 - CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes all elements required to furnish and install complete electrical control systems to control, operate, and display information as indicated in the plans and specifications. Control systems shall include all equipment, devices, wiring, and incidental materials to operate the system and display or relay information in accordance with these specifications. The intention of this Section is to secure complete control systems that will operate equipment in accordance with narratives and requirements indicated in the plans, these specifications, and manufacturer's literature for the equipment installed. All circuits and devices for protection of installed equipment shall be included in the price bid.

1.2 RELATED WORK SPECIFIED ELSEWHERE

Section 01 33 00 – Submittals
Section 01 61 00 – General Materials Stipulations
Section 01 78 23.01 – Operation and Maintenance Data

1.3 SYSTEM OPERATION – RECLAIMED WATER PUMPING STATION

A. The control system shall include all components necessary to be capable of satisfactorily performing the functions listed in this Article.

B. Operation: During non-irrigation times, the pressure maintenance pump (PM) will cycle on and off as required to maintain irrigation system pressure. The start and stop pressures shall be a **differential** off of a set point. The set point pressure to be user selected using the operator interface device connected to the PLC. If the PM pump cannot maintain the desired pressure, then the first pump will be started and will gradually ramp the pressure up to desired irrigation pressure. The start pressure of the pump shall be a **differential** below the set point. The pump speed will be modulated to hold the set constant discharge pressure regardless of flow. As the flow rate increases and the first pump can no longer maintain pressure while at maximum speed, the next sequential pump will be started, and the first pump will accordingly reduce its speed and modulate to match the second pump. An algorithm shall be included for accurately reducing the pump speed as the next sequential pump is started so that no pressure surges are generated during the transition. All pumps shall always run at the same speed after startup. As the flow begins to decrease, pumps will be sequentially turned off until only a single pump is operating.

1.4 SUBMITTALS

A. Product Data: Manufacturing data sheets for all components indicating pertinent data and identifying each component by item number and nomenclature as indicated on the drawings and

in the specifications. Designation as listed in the bill of material shall be clearly indicated on the data sheet. If multiple products or options are shown on the same sheet, Supplier shall clearly indicate which products and options are intended for the item being provided.

B. Shop Drawings: Submit shop drawings in accordance with Section 01 33 00, Submittals. Include the following:
   1. Bill of Material listing all components provided in the control panel.
   2. Complete control schematic in ladder diagram format. The Diagram shall include all terminal and wire numbering. Designations for components shall match that used in the bill of material.
   3. Physical layout drawing of switches, pushbuttons, meters, pilot lights, and other devices on the control panel door. If there is a dead front panel behind the door on which components are mounted, then a physical layout drawing of the dead front panel is also required. Component designations shall match the bill of material. Also indicate location and designation of each nameplate.
   4. Physical layout drawing of all devices on control panel mounting plate. This shall include but not be limited to relays, starters, contactors, terminal blocks, and wiring troughs. Component designations shall match the bill of material.
   5. A detailed system of identification for control conductors using both color coding and a coded numbering system. Identification system shall be in accordance with industrial standards and practices.
   6. A set of physical wiring diagram drawings. Diagrams shall be point-to-point and shall include all terminal and wire numbering. The physical layout drawings shall be used as base sheets for the wiring diagrams. The number of wiring diagram sheets shall be kept to a minimum but still allow the accurate tracing of circuits during troubleshooting. There shall be no overlapping of wires shown in the diagrams.
   7. Nameplate legend, showing the designation for each, and a scaled or full-size detail of the nameplate. Supplier shall also include a description of the material used for the plate, and the size and typeface of the lettering.
   8. Range of and differential control setting for each variable control device.

C. All above submittals shall be completed and approved prior to Construction of the Control System. The submittal shall be bound with pages continuously numbered. Any oversize documents shall be folded to be 8.5"x11". Submittals shall include a cover sheet and table of contents listing all items being submitted, and the starting page number of each submittal item. Partial submittals will not be acceptable.

1.5 QUALITY ASSURANCE

A. All control equipment shall conform to UL 508.

B. Freestanding control panels shall be constructed in accordance with UL 508A.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. All materials relating to this section individually and as completed panels shall be handled as fragile equipment and stored only inside closed buildings and protected from moisture entry. All openings shall be continuously plugged until the moment that connections thereto are actually made.

1.7 CONTROL VOLTAGE

A. Control voltage shall be 120 volts, A.C.

PART 2 - PRODUCTS

2.1 GENERAL

A. Control devices shall be heavy duty type units as manufactured by Allen Bradley, Square "D" or General Electric. Where available, all devices incorporated shall be of the same manufacturer.

B. Pilot lights and switches shall be oil tight.

C. Control relays shall be heavy duty industrial control relays with cartridge type contacts or sealed cube relays complete with spade type sockets containing a full set of pins and numbered screw terminals. Relay contacts shall be silver alloy contacts.

D. Coils shall be continuous duty rated.

E. Power relays and contactors shall be NEMA rated.

2.2 TERMINAL STRIPS

A. Terminal strips shall be solderless box lug compression type of adequate capacity for the size and number of conductors to be terminated. The area around each lug and set screw shall have insulation barriers to prevent accidental shorting during assembly or use.

2.3 PUSHBUTTONS, SELECTOR SWITCHES, AND INDICATING LIGHTS

A. Pushbuttons, selector switches, and indicating lights shall be heavy duty type of the same NEMA rating and suitable for installation in the NEMA rated panels specified.

B. Indicating lights shall have built in transformers and 6-V, miniature, bayonet base incandescent lamps and shall be push-to-test type.

C. Pushbutton colors shall be red for stop, black for start, and as indicated or selected by Engineer for other functions.

D. Legend plates shall be provided with all units.

E. Contact blocks for pushbutton stations shall contain not less than one SPDT contact.

F. Selector switches shall be of the rotary lever type and shall have contacts as required.

G. Each device shall be installed with a nameplate. Nameplates shall be engraved hard plastic (Formica) of contrasting colors and shall be permanently attached.

2.4 CONTROL PANEL ENCLOSURE

A. General: The cover shall be gasketed and continuously hinged on one side of each door and fastened with latches as designated below. The panels shall be dead front with rear mounting panel. Main disconnected shall be interlocked with door. Cabinet shall be lockable.

B. Application:
1. NEMA 4. Constructed of 14-gauge steel. Enclosure shall be powder-coat painted.

C. Panel Size and Environmental Requirements: Panels shall be 72” high, 72” wide and 19” deep to fit in available space. The enclosure shall be provided with thermostatically controlled cooling and heating systems in order to maintain the interior temperature of the enclosure within the acceptable range of the equipment mounted in the enclosure. The cooling and heating systems shall be designed so as to operate without compromising the NEMA rating of the enclosure.

2.5 RUNNING TIME METERS

A. A running time meter shall be supplied for each pump on the front of the control enclosure. Running time meters shall be non-resettable reading in hours and tenths of hours.

2.6 PHASE LOSS MONITORS

A. Three-phase power monitors shall be designed to continuously monitor power lines for abnormal conditions. The unit shall consist of a solid-state voltage and phase angle sensing circuit driving a DPDT relay. The relay shall be furnished for the nominal voltage utilized and be field adjustable within these ranges. The unit shall incorporate an adjustable trip delay to accommodate temporary voltage dips due to motor starting. Similar and equal to Time Mark Model 2644 Series.

2.7 MOTOR STARTING EQUIPMENT

A. All motor starters for the pumping station shall be mounted on a single back panel in a single NEMA 4 enclosure. Motor starters shall meet I.E.C. standards and shall be rated for a minimum of 1,250,000 operations. Each main irrigation motor shall have dual contactors, which are both electrically and mechanically interlocked to allow the VFD to operate on any of the motors as called out in the technical data sheet. Motor overload relays shall be I.E.C. rated class 10 ambient compensated. Fuses shall supply short circuit protection to each motor and shall be rated for a minimum 200,000 amp interrupting capacity. Motor starters shall be as manufactured by Allen Bradley. Motor overloads shall be manual reset only. Auto-reset of motor overloads shall not permitted.

2.8 VARIABLE FREQUENCY DRIVES

A. Each variable speed drive shall be a digital, pulse width modulation (PWM) variable frequency drive (VFD) with IGBT transistors. The VFD shall include a 3% input line reactor to protect against voltage transients. The VFD shall have a minimum wire to wire efficiency of 98.5%,

and shall be rated up to 550 volt operation in order to eliminate nuisance tripping at marginally high voltage conditions. Incoming power end shall be protected by fast acting semiconductor fuses. Any VFD error messages shall be displayed on a 80 character LCD readout in English or any one of 11 other languages. The following fault protection circuits shall be included: Overcurrent (240%), Overvoltage (130%), Undervoltage (65%), Overtemperature (70 Deg. C), Ground fault, and motor overload. The VFD shall be capable of starting into a rotating load and accelerate or decelerate to setpoint without safety tripping. The VFD shall have an automatic extended power loss ride through circuit which will utilize the inertia of the pump to keep the drive powered. Minimum power loss ride-through shall be one cycle based on full load and no inertia. The VFD shall be optimized for a 3 kHz carrier frequency to reduce motor noise. The VFD shall employ three current limit circuits to provide "tripless" operation. The following operating information shall be displayed on the VFD LCD: KWH, elapsed time, output frequency (Hz), motor speed (RPM), motor current (amps), and voltage. Line reactor will be installed on input of VFD to protect against voltage transients. The VFD LCD display shall continuously scroll through all operating information and shutdown faults while the drive is running and while stopped. The information shall be viewable through a watertight plexiglass window on the control panel door as specified in Section 3.10. VFD shall be as manufactured by Allen Bradley, or equal.

2.9 LIGHTNING AND SURGE ARRESTER

A. All electrical equipment shall be protected by a U.L. Listed approved Category C and Category B surge arrester to suppress voltage surges on incoming power. The devise under IEEE C62.41 Category C will withstand a impulse of 10Kv/10Ka and Category B to withstand a ring wave of 6Kv/500a and a impulse of 6Kv/3Ka. Pass voltage for a 480 v devise to the end equipment shall not exceed 1500V-1800V when subjected to a 8ms * 20ms waveshape resulting in the following performance statistics: 3720 joules minimum with a power dissipation of 82,500,000VA at 1800V maximum pass voltage to the protected equipment. Response time shall be less than 5 nanoseconds.

2.10 MAIN DISCONNECT

A. A non-fusible main disconnect shall be provided to completely isolate all controls and motor starting equipment from incoming power. Main disconnect shall have a through the door operator and shall be sized as shown in the technical data sheet including horsepower rating. Disconnect shall be as manufactured by Allen-Bradley or approved equal. Disconnect shall not be rated as a service disconnect.

2.11 ELECTRONIC DIGITAL LEVEL DISPLAY

A. Electronic Digital level display shall display fluid levels in feet and tenths of feet from 0 to 20.0 feet. Minimum display height shall be 0.5". The meter shall have a minimum of two adjustable set point relay contacts and have zero and span adjustments for readout in engineering units. The meter shall operate on a 4 to 20 ma loop signal. Meter shall have a 4 to 20 ma output for remote monitoring.

2.12 CONTROL WIRING

A. Control wiring in panels shall be copper conductor, and a minimum of 16 AWG stranded.

2.13 IDENTIFICATION PRODUCTS

A. At All Terminal Ends: Self-laminating wire and cable markers equal to the Brady B-292 system. Marking shall match shop drawings

2.14 CONTROL PANEL LAYOUT AND LOGIC

A. Control Logic: All control logic shall be handled by an industrial grade programmable logic controller (PLC) with a 160 character LED industrial operator interface providing data entry and read-out capabilities. PLC shall provide demand controlled sequential pump start-up, shutdown and safety features through its pressure sensing, flow sensing and voltage sensing devices. PLC shall be provided with a built in EEPROM, capacitor, and battery for memory backup. **All** logic for system control, timing, and control of VFD speed shall be handled by the PLC. **A separate set point controller is not acceptable**. PLC shall have a built in clock calendar. The PLC shall be manufactured by Allen Bradley, or equal.

B. Software: The pump station software program shall be user friendly enough to enable user to easily change All operational parameters using the OID. The pump station software ladder logic shall be written in such a way that no other value would require changing if the set point pressure had to be adjusted. Pressure maintenance pump and main irrigation pump start pressures, the pressure maintenance pump stop pressure, low discharge shutdown and high discharge shutdown shall not be at a specific value but a differential pressure off of set point (e.g. pressure maintenance pump (PMP) to start 5 psi below set point and stop 5 psi above setpoint). Software shall be non-proprietary and one of the commonly used software packages.

Software will be included to automatically and gradually ramp up irrigation system pressure to the desired operating pressure (i.e., 1 PSI every 4 seconds) without overshooting set-point pressure. The acceleration control on the VFD is NOT an acceptable means of adjusting pressure ramp up speed.

C. Standard control features and equipment which need to be included as a minimum are as follows:

Alarms and shutdowns:

Low discharge pressure (Provide a spare dry contact for remote monitoring)
High discharge pressure (Attempt restart)* (Provide a spare dry contact for remote monitoring)
Low water level (Attempt restart) *
Phase loss (Attempt restart)*
Low voltage (Attempt restart)*
Phase unbalance (Attempt restart)*
Hand shutdown (Provide a spare dry contact for remote monitoring)
Phase loss (Provide a spare dry contact for remote monitoring)

Individual motor overload/phase loss (indicates which individual motor was shut down). (Provide a spare dry contact for each pump). Manual reset only. Automatic reset is not acceptable.
VFD fault for each pump (Attempt restart)* (Provide a spare dry contact for each pump for remote monitoring)

* Three unsuccessful restarts in 60 minute period will give hard shutdown.

Any alarm will energize a red general alarm light on the panel front and will close a dry contact for remote monitoring. Specific alarm conditions along with procedures for correction will be displayed in English on the operator interface display (OID).

D. Panel face switches and lights: Controls shall be designed so operator can discretely start and stop all pumps in all modes of operation including manual mode, operator interface failure, VFD bypass and PLC bypass modes with enclosure doors closed and disconnect switch fully engaged. Enclosure shall include the following switches/or indicator lights:

1. Individual pump run lights
2. Individual pump on/off switches
3. System Hand / Off / Automatic switch
4. Reset - Acknowledges pump station alarms.
5. Speed potentiometer - in Hand mode, allows user to adjust VFD pump speed.
6. Low discharge pressure over-ride switch - disables low discharge pressure alarm

E. Neither flow meter nor VFD output frequency shall be used for shutting down last VFD driven pump. Controls and software shall incorporate a method to eliminate excessive cycling of any main pump at very low flow conditions yet not run the pump excessively at no flow conditions.

F. Automatic alternation of first-on pump.

G. Real time clock calendar allows PLC to internally provide all date, time and day of week data.

H. Shutoff algorithm for pumps to minimize pump cycling while also remaining responsive to sudden flow reductions. Minimum run timers alone for minimizing pump cycling is not acceptable. Discharging through relief valve during pump transitions is not acceptable.

I. Full manual operation capability with panel face mounted speed potentiometer for manually adjusting VFD speed.

J. Light test sequence: Pressing the reset button for 5 seconds illuminates all lights.

K. All pump station shutdowns shall be of the controlled type that sequentially retires pumps at user selectable intervals to reduce water hammer within the irrigation system. Phase fault shutdown shall have accelerated rate to minimize motor damage. All pump system shutdowns shall be of a controlled type that sequentially retire pumps at intervals appropriate to the specific individual alarms.

L. Individual motor phase failure and low voltage safety circuitry shall retire any pump that experiences low voltage, phase failure or phase unbalance as monitored at the load-side of each pump motor contactor. Each pump motor shall have its individual protective device and time delay to allow for transient low voltage during motor starting to allow maximum motor

protection. Separate main phase failure and low voltage safety circuit shall also be provided to retire the pumping system if it experiences low voltage, phase failure or phase reversal as monitored at line-side of control enclosure. Phase monitor shall have a time delay to allow for transient low voltage during motor starting and to allow maximum motor protection. Operator interface device (OID), mounted in enclosure door, shall signal phase failure for any affected pump. The individual pumps or pumping system shall not operate until the voltage problem has been corrected, and all alarms has been manually reset. Single incoming phase monitor safety circuit is not acceptable.

M. Operator Interface Device (OID). The pump station shall include a NEMA 4, 40 character LED display and keypad mounted on the control panel door. This device will allow the operator to view and selectively modify all registers in the PLC. The unit shall store its messages in non-volatile memory. The operator interface device shall incorporate password protection for protecting data integrity. The device will allow for display and modification of all timers, set points, lockout times, etc. The device shall communicate with the PLC through the programming port, and shall include an RS232 communications port allowing a printer to be attached for real time station status logging.

In addition to the data entry keys, the following shall be included on the systems main menu.

1. Pressure, Flow and System Status: The current pressure, flow, each pump RPM and a system status overview shall be displayed. Codes or Faults ID numbers shall not be adequate.
2. Current Condition of all Alarms: The input state and alarm state for all active alarms shall be shown.
3. Pump Runtime and Starts: Runtime and number of starts for each pump shall be shown. The starts and runtime must be verified by electrical pump feedback. The OID will include a grand total and since reset value for each pump.
4. Alarm History: The last nine alarms shall stored in PLC Memory with detailed information about time, pressure and flow at the time of occurrence. The log will also include diagnostic and recommendations for correction of condition.
5. Total Flow Output: This total shall include a grand total since commission and a total since reset.
6. Stations Events: The last 255 events shall be stored in PLC memory. This will include all alarms, individual pump starts and stops, and change in system status.
7. The display shall provide detailed diagnostic information to the operator about the logical state which starts and stops irrigation pumps. This diagnostic information will provide direct insight to controller internal logic.

PART 3 - EXECUTION

3.1 GENERAL

A. All Work shall be performed in a workmanlike manner.

3.2 FABRICATION

A. All control panels shall be shop assembled and tested prior to delivery to the site. After installation by the City, the Supplier shall "de-bug", regulate and adjust all controls and

associated equipment and demonstrate all operations to the satisfaction of the Owner and the Engineer. Final as-built drawings shall be made to reflect all adjustments and modifications made to the systems after start-up has been completed satisfactorily. All equipment and devices shall be mounted, adjusted, calibrated and operated exactly as recommended by the manufacturer of each component.

B. Control switches, pilot lights, and other devices shall be grouped in a logical arrangement for ease of operation.

C. Control equipment shall be mounted to panel back plates with screws or bolts fastened into drilled and tapped holes. Nuts shall not be used. Panel face mountings shall be made by cutting holes exactly to manufacturer's instructions including keyways, etc. Engraved legend plates indicating function and operational instructions as applicable shall be mounted on all devices. All equipment shall be labeled and identified with designations which match the control wiring diagrams.

3.3 WIRING AND TERMINATIONS

A. All wires shall be run parallel to side walls of panels and/or in covered wiring troughs. Wiring passing across hinged areas shall be protected by abrasion resistant cabling material.

B. All connections shall be made on mechanical compression type terminals whenever possible. When screw terminals must be used, wire ends shall be equipped with compression applied lugs. All connections for incoming and outgoing electrical wires in all panels and junction boxes shall be made on fully labeled terminal boards mounted inside the panel.

3.4 DEMONSTRATION

A. The Supplier shall engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain control devices.

B. Schedule training with Owner, through Engineer, with at least seven (7) days' advance notice.

END OF SECTION 26 09 16

SECTION 40 05 51 – VALVES AND PIIPE

PART 1 - GENERAL

1.1 DESCRIPTION

A. This section contains general information required to furnish valves and pipe.

1.2 RELATED WORK SPECIFIED ELSEWHERE

Section 01 33 00 – Submittals
Section 01 61 00 – General Materials Stipulations
Section 01 78 23.01 – Operation and Maintenance Data

1.3 SUBMITTALS

A. Submit product data sheets showing materials, operating characteristics, construction, and dimensions on all proposed valves, associated components and piping in accordance with Section 01 33 00.

1.4 QUALITY ASSURANCE

A. The supplier of all valves, accessories, and piping furnished under this section shall be responsible for all coordination to ensure all will fit in the existing space available and operates properly.

PART 2 - PRODUCTS

2.1 BUTTERFLY VALVES

A. General: Butterly valves shall have one-piece, ductile iron bodies and shall have grooved ends for compatibility with Victaulic couplings. All valves shall be capable of withstanding bi-directional line hydrostatic pressure of 225 psi without leaking.

B. Valve Seats: The seat shall be constructed either by bonding a resilient elastomer inside a rigid plastic backing ring which is slip-fitted in the valve body or molded in the vulcanized to the body. The seat shall be EPDM.

C. Valve Discs: The disc seating edge shall be full radius polished for proper seating with the valve seat. The disc shall be ductile iron and shall be securely attached to the valve stem in such a way that it is easily field removable. The disc stems shall be 416 SS and shall have seals to prevent leakage.

D. Valve Actuator: All valves shall be equipped with a lever operator with 10 locking positions.

1. All actuators shall clearly indicate valve position and shall be provided with an adjustable stop.

E. Painting: All surfaces of the valve shall be clean, dry and free from grease before painting. The valve interior and exterior surfaces, except for the seats, shall be coated with 10 mil epoxy.

F. Testing: Each valve and actuator shall be assembled, adjusted, and tested as a unit by the valve manufacturer. Valves with actuators mounted outside of the valve manufacturing facility are not acceptable.

G. Valves shall be Victaulic 300, Demco, DeZurik, Pratt or equal.

2.2 SILENT TYPE CHECK VALVES

A. The silent type check valves shall be a single disc type with a cast-iron body, bronze trim and a stainless-steel spring and bushing, water style with ANSI 125 psi bolt circle. The valve shall be center guided and shall have a resilient seat. The flow area shall be approximately 10 percent greater than the pipe size. The valve shall be designed to open at 1/4 to 1/2 PSI and close completely while there is still a positive head on the discharge side at approximately 1/2 PSI. The valve shall be as manufactured by Val-Matic (1400 Series), APCO (600 Series), or approved equal.

2.3 PIPE

A. All piping shall be constructed from ASTM A105 schedule 40 pipe or heavier as required to maintain a 3 to 1 pressure safety factor (including 1/16" corrosion allowance). All piping shall be hydrostatically tested to 150% of maximum pump shutoff pressure. Piping shall be grit-blasted with #50 steel grit per SSPC-10 to a near white metal condition. The cleaned steel surface shall be immediately primed with an industrial grade primer to thickness of 2 ½ to 3 mils epoxy primer. The finish coat shall be acrylic enamel to a thickness of no less than 3 mils and applied through an electrostatic method to insure proper adhesion.

2.4 BOLTS

A. All bolts used in the assembly of the pumping system shall be zinc plated to retard corrosion. Anti-corrosion washers to be used on each side of fastener.

PART 3 - EXECUTION (NOT USED)

END OF SECTION 40 05 51

SECTION 43 21 02 – LINESHAFT AND SUBMERSIBLE TURBINE PUMPS

PART 1 - GENERAL

1.1 GENERAL

A. This section consists of information required to furnish vertical lineshaft turbine pumps and submersible turbine pumps as shown on the drawings and specified in these specifications, to replace the existing pumps.

B. Related Work Specified Elsewhere:

Section 01 33 00: Submittals
Section 01 61 00: General Materials Stipulation
Section 01 78 23.1: Operation and Maintenance Data

1.2 WORK INCLUDED

A. The work includes furnishing and installing the following water lubricated pumps:
1. Vertical turbine lineshaft water pumps (4) to replace the existing pumps, with motor
2. Submersible turbine water pump (1) to replace existing, with motor

1.3 QUALITY ASSURANCE

A. Pumps shall be manufactured in accordance with ANSI/AWWA Specification E101-77 - "Vertical Turbine Pumps - Line Shaft and Submersible Types". All materials shall meet the requirements of ASTM, ANSI, ASA, AIEE, AFBMA and NEMA as applicable.

B. All pumps in this section shall be supplied by a single manufacturer. Pumps shall be manufactured by Zoeller Engineered Products, or equal.

1.4 SUBMITTALS

A. Submit shop drawings, schematics, technical data and all other information necessary to evaluate compliance with the specifications, including pump curves, in accordance with Section 01 33 00.

B. Submit operation and maintenance data in accordance with Section 01 78 23.01.

1.5 STORAGE AND HANDLING

A. All pumps and motors shall be stored in a covered storage area and wrapped to prevent entry of sand and other deleterious materials. Motors shall be stored indoors in a vertical position.

PART 2 - PRODUCTS

2.1 GENERAL PUMP CONSTRUCTION REQUIREMENTS

A. All turbine pumps shall be of heavy construction throughout. The pumps shall be electric motor driven.

B. Each pump shall be capable of continuous operation at the design point below. The design point shall not be near the end of the pump curve or near the shutoff head at the pump. NPSH required shall include the strainer.

	Design Point					NPSH Reqd.	
Pump	FLOW (GPM)	TDH (FT)	Operating Speed, Max	Eff. % Min.	Max. Motor HP	Ft. Oper.	Ft. Max. Run Out
Lineshaft	1,550	157	1,800	77	100	16	20
Submersible	60	157	1,800	22	7.5	-	-

2.2 PUMP HEAD FOR LINESHAFT PUMPS

A. Pump heads shall be of cast iron, extra heavy construction throughout meeting ASTM A48, Class 30 Specifications and of sufficient size to properly support the column, bowl and driver. The pump head shall be equipped with an extra heavy separate baseplate that can be bolted to the existing steel base. The pump head shall incorporate a discharge elbow having an above ground flanged outlet designed for through bolting and to receive a 125 lb. ANSI pipe connection. The top headshaft shall be AISI 416 stainless steel. It shall be of the two (2) piece design with a coupling located between the pump and motor for ease of installation. An impeller adjusting nut shall be provided on the top of the head-shaft to allow impeller adjustment. A positive locking device shall be provided on this nut. The discharge flange shall also have a ¼-inch NPT tap and plug for mounting a pressure gauge. The pump head shall be coated on the inside with epoxy coating.

B. A stuffing box of the deep bore type with a minimum of six (6) rings of packing and a seal cage shall be provided. Connections for grease inlet and pressure relief shall be provided. The packing gland shall be of the split type and secured in place with ASTM A193, Grade B8 stainless steel studs and silicon bronze nuts.

2.3 PUMP HEAD FOR SUBMERSIBLE PUMP

A. Pump head shall be submersible discharge head.

2.4 PUMP COLUMN

A. The lineshaft shall be of stainless steel meeting ASTM A582, Grade 316 Specifications. It shall be furnished in interchangeable sections not over 10 feet in length. The butting faces shall be machined square to the axis of the shaft, with the maximum permissible axial misalignment of

the thread axis with the shaft axis 0.002" in 6 inches. The size of the shaft shall be no less than 1½" diameter. Threads shall be as necessary to tighten during pump operation.

B. The lineshaft shall be provided with couplings bored and threaded from solid ASTM A582, Grade 316 stainless steel bars at each lineshaft bearing. The lineshaft bushings shall be of 316 stainless steel. Bushings shall be spaced not more than 5 feet apart and held by a stainless steel spider mounted between the flanges of the column to prevent their movement inside the column.

C. The discharge column shall be of butt welded steel pipe, ASTM A53, Grade A in interchangeable sections not more than 10 feet in length with the ends of each section faced parallel and machined with either flanges or screwed connections. The weight of the column shall be no less than that stated in ASA Specification B58.1, "Standard Specifications for Discharge Column Pipe." The column pipe size shall be such that the friction loss will not exceed 5 feet per 100 feet, based on the rated capacity of the pump. The column pipe size shall also be such that the velocity will not be less than 4 feet per second nor greater than 10 feet per second at the rated capacity. The inside of the column shall be coated with epoxy coating.

2.5 PUMP BOWL

A. The pump bowl outer shell shall be made of cast iron, free of blow holes, sand holes and other detrimental defects and shall be accurately machined meeting ASTM A48, Class 30 Specifications. The bowl assembly shall have epoxy coating of the water passages. The suction case and intermediate bowls shall be fitted with replaceable wear rings of bronze ASTM B505 alloy 836 or 838. Bowls and casings shall have bronze sleeve type bushings to support and guide the shaft. Bushing material shall be bronze, ASTM B505 alloy 836 or 838. Impellers shall be of the enclosed type, cast of bronze, ASTM B584 alloy 836, accurately cast, machined, balanced, and filed for optimum performance and minimum vibration. The impeller shall be securely fastened to the bowl shaft with taper collets of ASTM A582, Grade 316 or 416 stainless steel. The bowl shaft material shall be high chrome stainless steel of ASTM A582, Grade 316.

2.6 STRAINER OR SUCTION INLET

A. A clip on type galvanized strainer shall be provided for the lineshaft pumps. The submersible pump shall have an integral suction inlet. Each shall have a net inlet area equal to or greater than four (4) times the suction pipe area. The maximum opening shall be not larger than 75% of the minimum opening of the water passage through the bowls and impellers.

2.7 ELECTRIC MOTOR FOR LINESHAFT PUMPS

A. Each pump motor shall be a vertical, TEFC, hollow shaft motor and shall conform to all applicable NEMA, AIEE, and ASA Standards, latest editions. Maximum motor horsepower shall be 100 HP. Motors shall be Class "B" insulated, squirrel-cage type, and have low starting current characteristics. The windings shall be rated for full voltage starting and operation without damage or unusual vibrations or noises. The motor shall have sufficient capacity to operate its pump continuously in any point of its operating range without exceeding 80°C

ambient temperature rise rating. Motor to be of proper rpm and rated for 480 volts, 3 phase, 60 Hz power, 1.15 minimum service factor.

B. The connection box on the motor shall be sized to accept the conduits and wiring for motor supply and to provide adequate space for connecting the motor winding leads to the supply conductors.

C. The rotors shall run in ball bearings provided with adequate means of continuous lubrication. The thrust bearing shall be of ample size to carry the thrust load of the pump, the weight of the shaft, couplings and impellers without overheating. It shall be of ample size to insure long life when operating continuously in carrying maximum load.

D. All stators shall incorporate thermal switches wired in series to monitor the temperature of each phase of the winding. Should high temperature occur the thermal switches shall open.

2.8 ELECTRIC MOTOR FOR SUBMERSIBLE PUMPS

A. Motor shall be hermetically sealed type. Motor shall be rated for 480 volts, 3 phase, 60 hz power, 1.15 minimum service factor. Maximum motor horsepower shall be 7.5 HP.

2.9 PAINTING

A. Pumps and motors shall receive the manufacturer's standard coatings, except all wetted parts shall be epoxy coated.

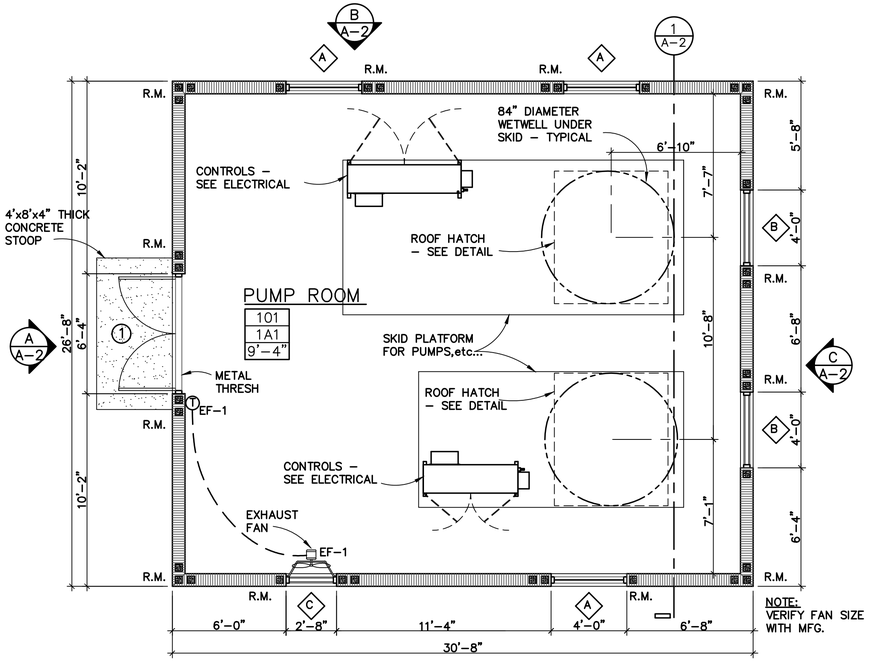
PART 3 - EXECUTION

3.1 FABRICATION

A. All pumps shall be shop assembled and tested prior to delivery to the site.

END OF SECTION 43 21 02

DRAWINGS



NOTE: VERIFY FAN SIZE WITH MFG.

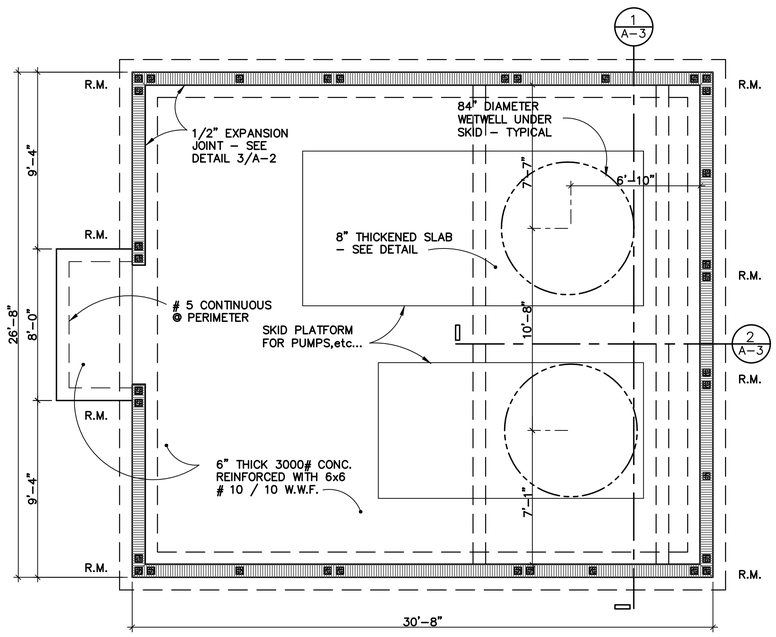
FLOOR PLAN

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

D A-2

LEGEND: ▥ – CONCRETE MASONRY UNITS

■ – R.M. – REINFORCED MASONRY – ONE #5 ROD VERTICLE FULL HEIGHT. DOWEL TO FOUNDATION FILL CELLS OF BLOCK WITH 3000# PEA GRAVEL CONCRETE.



FOUNDATION PLAN

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

DOOR & FRAME SCHEDULE

NO.	DOORS SIZE	GLAZ.	RATG.	TYPE	FRAMES TYPE	DETAILS HEAD	JAMB	SILL	HDWE. SET NO.
1	6'-0"x7'-0"x1 3/4"	—	—	A	H.M.	4/A1	4/A1	—	1

H.M.–HOLLOW METAL
W.G.–WIRE GLASS

LEGEND OF FINISHES

FLOOR/BASE		WALLS		CEILING	
1	EXPOSED CONC. W/ SEALER	A	CONCRETE BLOCK – PAINTED *	1	MARINE GRADE PLY-WOOD – PAINTED

101 – ROOM NO.
1 A 1 – FLOOR / BASE MATERIAL / WALL MATERIAL / CEILING MATERIAL
9'-4" – CEILING HEIGHT

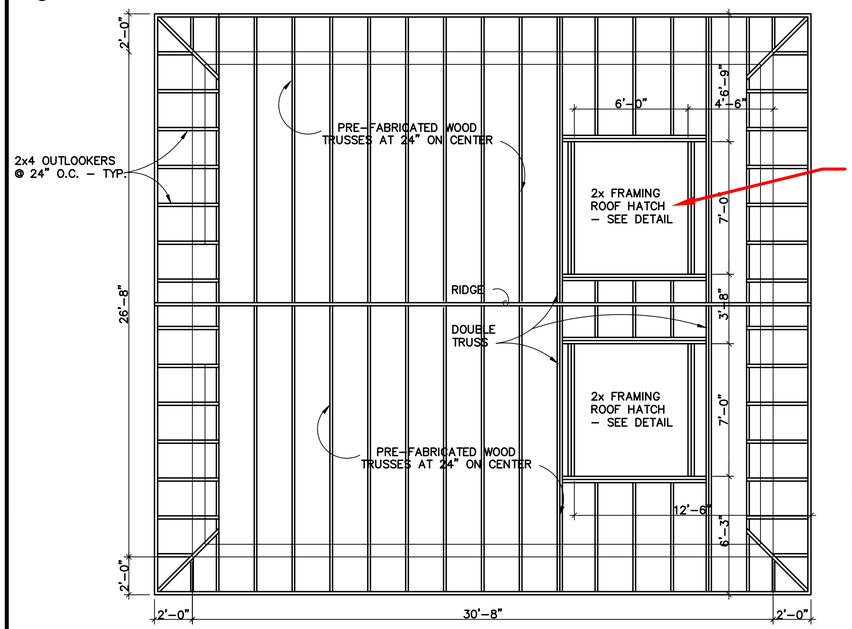
STRUCTURAL NOTES:

1. ALL POURED IN PLACE CONCRETE SHALL HAVE A MINIMUM STRENGTH OF 3000 PSI IN 28 DAYS.
2. ALL FOOTINGS SHALL REST ON SOIL CAPABLE OF SUPPORTING 2500 lbs. PER SQ.FT.
3. ALL REINFORCING STEEL SHALL BE GRADE 60.
4. WHERE SPLICES IN REINFORCING ARE NECESSARY, REINFORCING SHALL BE LAPPED 24 BAR DIAMETERS, BUT NO LESS THAN 1'-0".
5. ALL REINFORCING STEEL AND ACCESSORIES SHALL BE DETAILED, FABRICATED AND PLACED IN ACCORDANCE WITH THE LATEST EDITION OF ACI MANUAL, MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES.
6. REINFORCING IN ALL CONCRETE WALLS, FOOTINGS AND BOND BEAMS SHALL BE CONTINUOUS AROUND CORNERS. WHERE WALL FOOTINGS STEP, REINFORCING SHALL BE CONTINUOUS IN STEP.
7. ALL FILL FOR FLOOR SLABS SHALL BE COMPACTED TO A MINIMUM OF 95% OF STANDARD PROCTOR DENSITY.
8. DESIGN LIVE LOADS: ROOF, 20psf. CEILING, 20 psf, WIND 40 psf.
9. ALL WOOD ROOF FRAMING INCLUDING TRUSSED RAFTERS SHALL BE No. 2 SOUTHERN PINE K.D. OR BETTER.
10. WOOD TRUSSED RAFTERS SHALL BE BRACED FOR ERECTION IN ACCORDANCE WITH PUBLICATION BWT–76 OF THE TRUSS PLATE INSTITUTE.
11. ALL TRUSSES SHALL BE DESIGNED BY FLORIDA REGISTERED PROFESSIONAL ENGINEER.
12. TRUSS MFG. SHALL SUBMIT TRUSS SHOP DRAWINGS AND CALCULATIONS FOR APPROVAL PRIOR TO BEGINNING FABRICATION. THESE DRAWINGS SHALL SHOW THE FOLLOWING:
    A. ALL MEMBERS FORCES, MEMBER SIZES AND SIZE OF CONNECTOR PLATES AT EACHJOINT.
    B. ERECTION PLAN WHICH COORDINATE SHOP PIECE MARKS WITH THE ERECTION OF SAID PIECE.
    C. FLORIDA ENGINEER'S SEAL ON ALL DESIGN DRAWINGS AND CALCULATIONS.
13. ALL WOOD ROOF FRAMING SHALL BE ATTACHED TO SUPPORTING STRUCTURE USING APPROVED HURRICANE ANCHORS, AT EACH JOIST.

FAN									
MARK	SERVES	TYPE	CFM	SP (in. WC)	NOISE LEVEL SONES	MOTOR HP	MOTOR V/~	ACCESSORIES	INTERLOCK W/
EF–1–1	PUMP BUILDING	(A)	8500	0.5"	23	2	240/1	(1)	HIGH LIMIT T'STAT

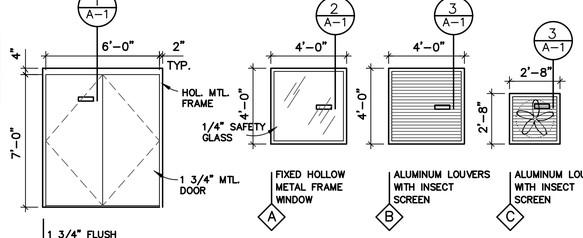
FAN NOTES:
(A) PROPELLER EXHAUST FAN BELT DRIVE

FAN ACCESSORIES:
(1) MOTOR SIDE GUARD, BIRDSCREEN, BACKDRAFT DAMPER, DISCONNECT SWITCH.



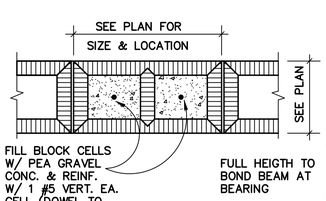
ROOF PLAN

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



DOOR & WINDOW TYPES:

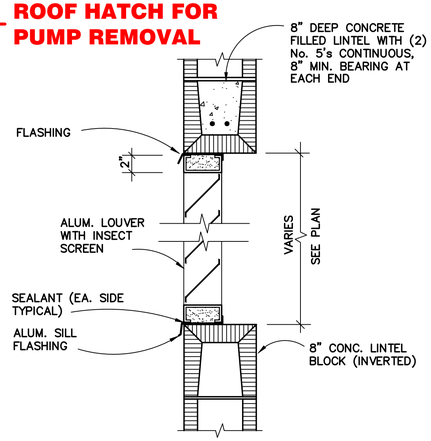
SCALE: 1/4" = 1'-0"



TYP. R.M. DETAIL

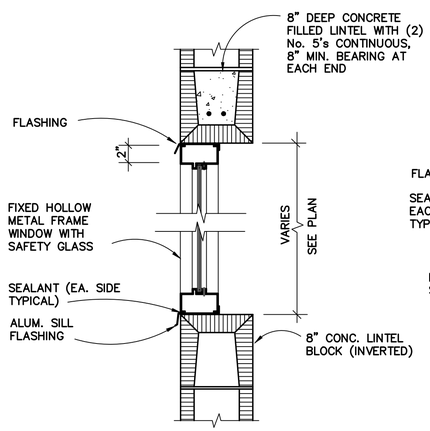
SCALE: 1 1/2" = 1'-0"

ROOF HATCH FOR PUMP REMOVAL



3 A-1 **SECTION**

SCALE: 1 1/2"=1'-0"



2 A-1 **SECTION**

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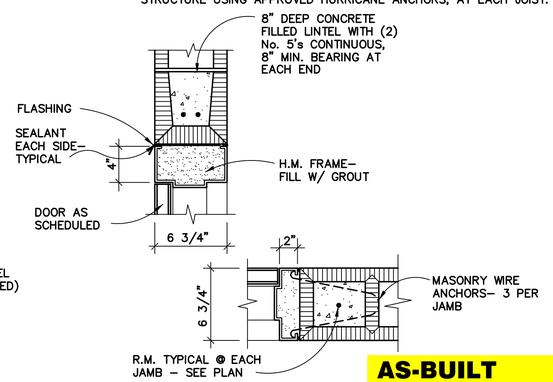

1 A-1 **SECTION**

SCALE: 1 1/2"=1'-0"

AS-BUILT

AS BUILT DRAWINGS PREPARED FROM INFORMATION FURNISHED BY THE CONTRACTOR, LOCATIONS ARE NOT CERTIFIED BY ENGINEER.

APPROVED BY: GS DRAWN BY: DH
DATE: 9-03-05

ENGINEERING PLANS
FOR
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CITY OF NICEVILLE, FLORIDA

POLYENGINEERING OF FLORIDA, INC.
Engineers & Architects
9 Eglin Street
Ft. Walton Beach, Florida 32547
(850) 862–4913
POLY

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Field Book No.
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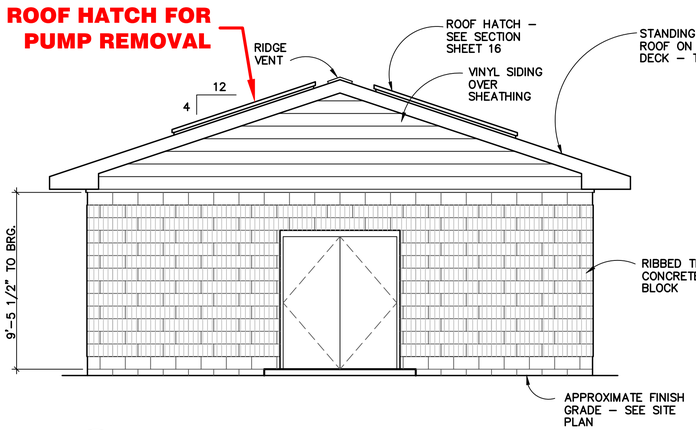
Drawn By: JEB
Apprvd. By: AGM

Date: NOVEMBER, 2001

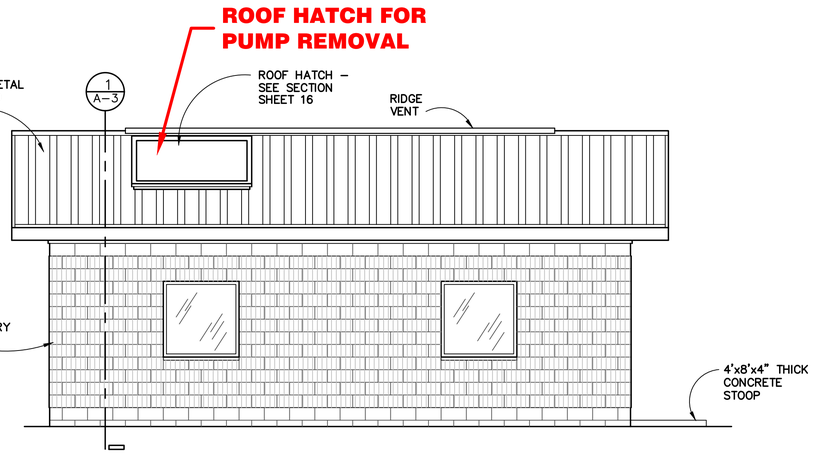
Project No.: 40–101

Sheet title: PUMP BLDG., FLOOR, FOUNDATION, ROOF PLAN AND DETAILS

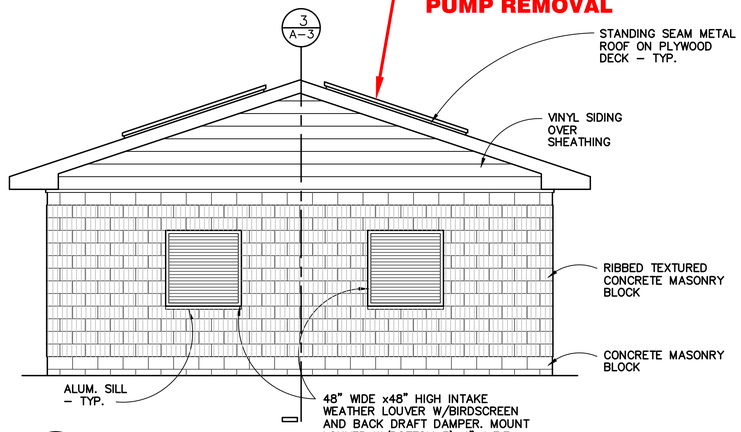
Sheet No: 14 OF 22



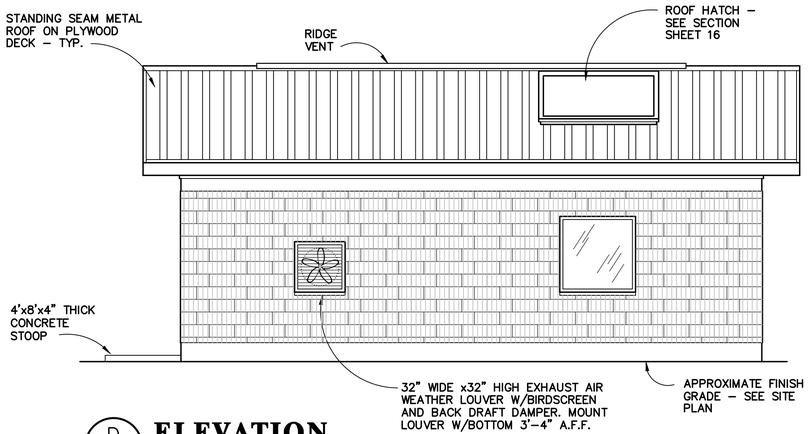
A/A-2 **ELEVATION**
SCALE: 1/4" = 1'–0"



B/A-2 **ELEVATION**
SCALE: 1/4" = 1'–0"



C/A-2 **ELEVATION**
SCALE: 1/4" = 1'–0"



D/A-2 **ELEVATION**
SCALE: 1/4" = 1'–0"

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40–101

Sheet title
PUMP BLDG. EXTERIOR ELEVATIONS AND MECHANICAL SCHEDULE

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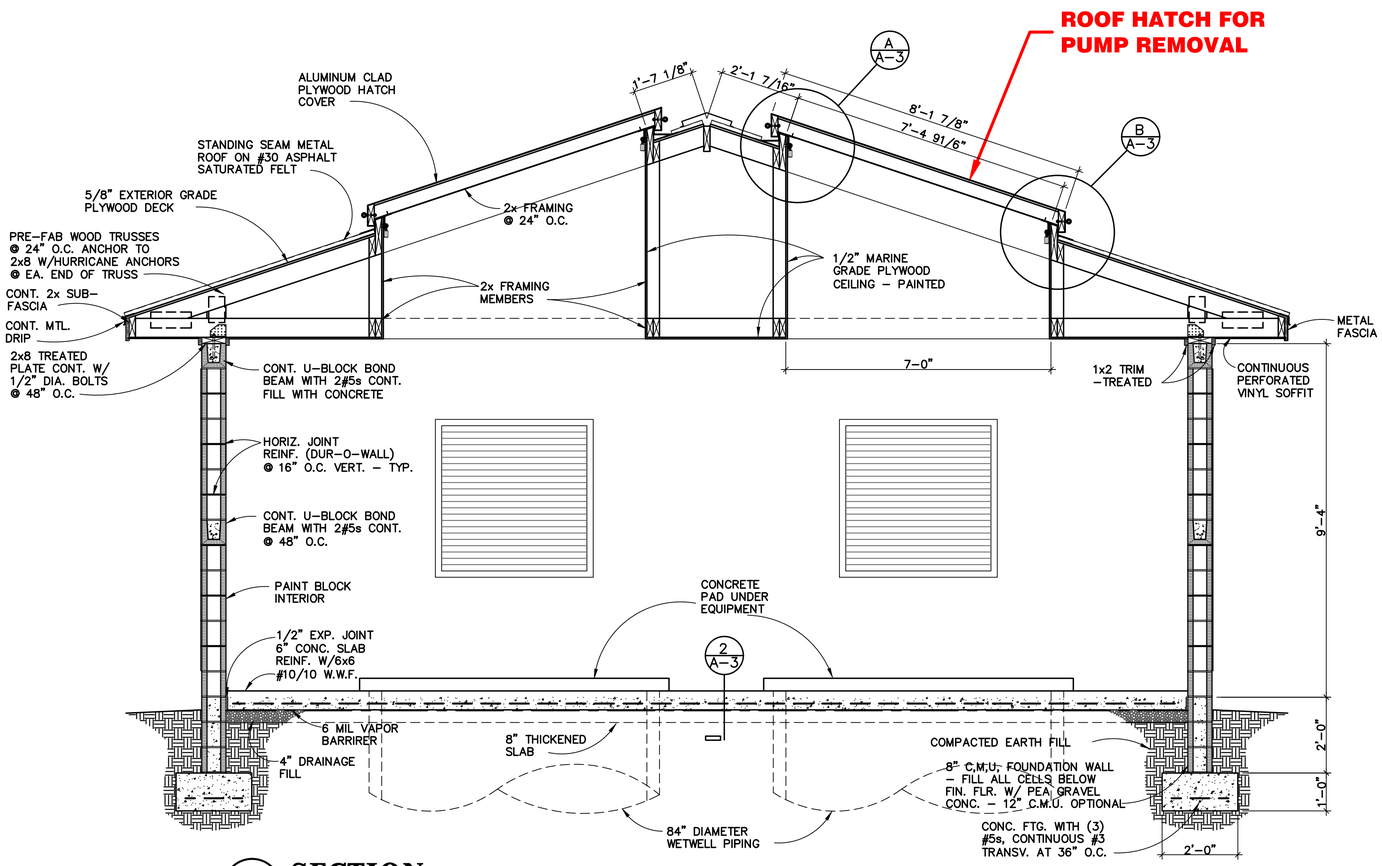
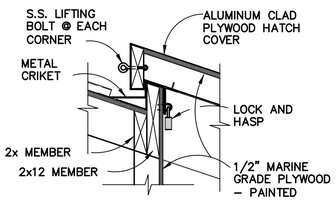
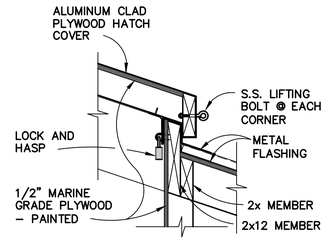
OF 22



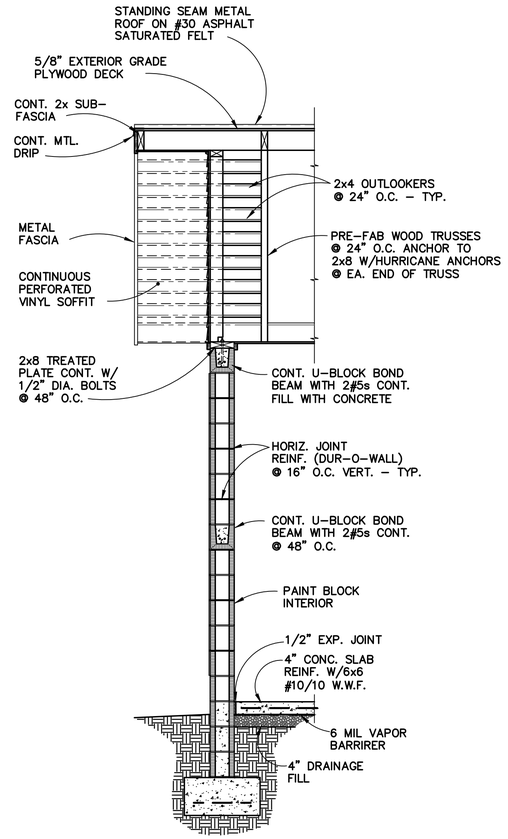
1 A-3 **SECTION**
SCALE: 1/2" = 1'-0"



A A-3 **DETAIL**
SCALE: 1" = 1'-0"



B A-3 **DETAIL**
SCALE: 1" = 1'-0"



3 A-3 **SECTION**
SCALE: 1/2" = 1'-0"

AS-BUILT

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PUMP BLDG. EXTERIOR ELEVATIONS AND SECTIONS

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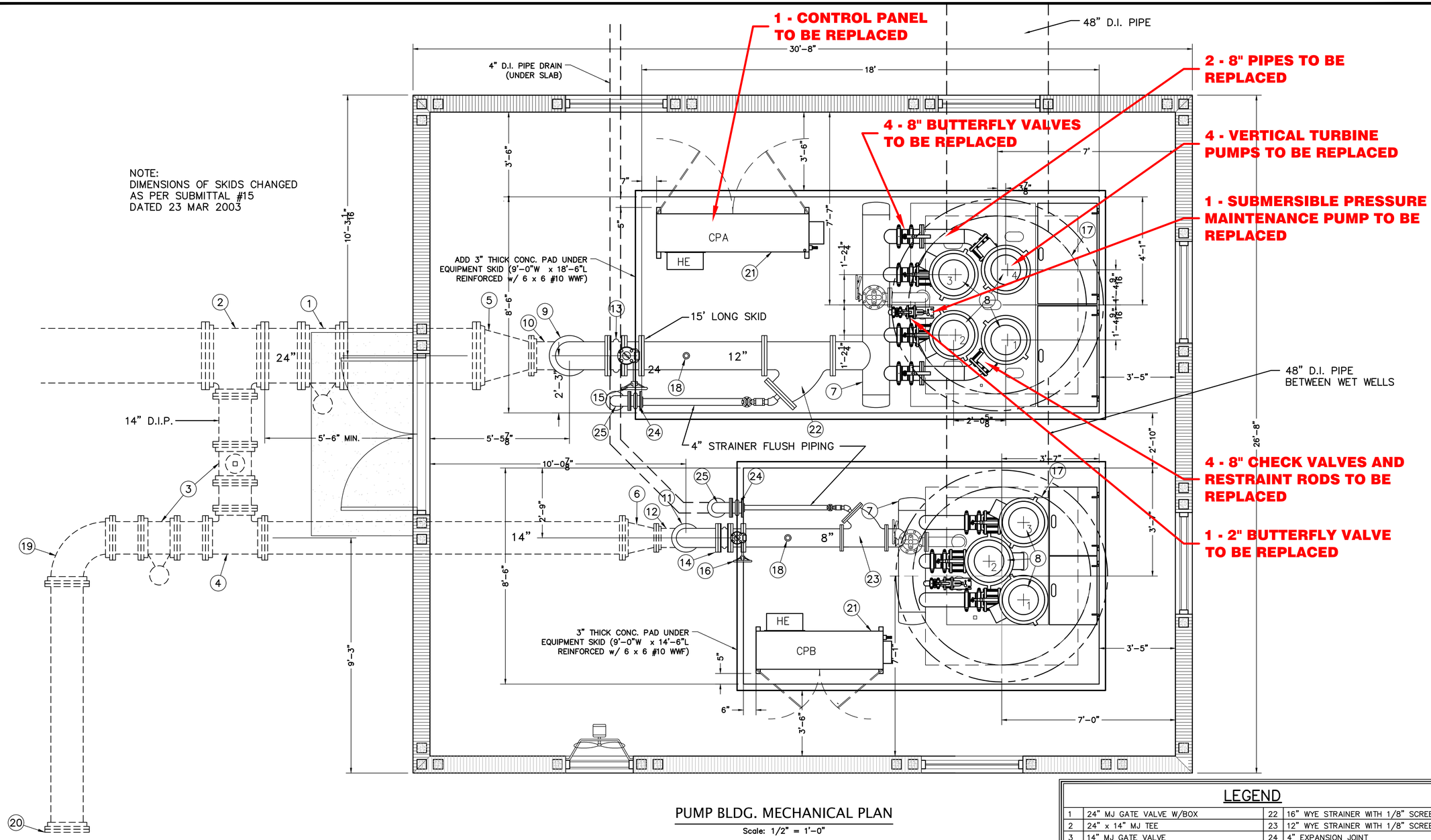

PUMP BLDG. MECHANICAL PLAN

Scale: 1/2" = 1'-0"

AS-BUILT

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APPROVED BY: GS DRAWN BY: DH
DATE: 9-03-05

LEGEND

1	24" MJ GATE VALVE W/BOX	22	16" WYE STRAINER WITH 1/8" SCREEN
2	24" x 14" MJ TEE	23	12" WYE STRAINER WITH 1/8" SCREEN
3	14" MJ GATE VALVE	24	4" EXPANSION JOINT
4	14" MJ TEE	25	4" FF 90° BEND
5	24" x 12" MJ ECCENTRIC REDUCER		
6	14" x 8" MJ ECCENTRIC REDUCER		
7	MANIFOLD		
8	PUMPS		
9	12" FF LONG RADIUS 90° BEND		
10	12" MJ LONG RADIUS 90° BEND		
11	8" FF LONG RADIUS 90° BEND		
12	8" MJ LONG RADIUS 90° BEND		
13	12" EXPANSION JOINT		
14	8" EXPANSION JOINT		
15	12" BUTTERFLY VALVE		
16	8" BUTTERFLY VALVE		
17	84" WETWELL		
18	FLOW METER		
19	14" MJ LONG RADIUS 90° BEND		
20	14" M.J. PLUG		
21	CONTROL PANEL		

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PUMP BLDG. MECHANICAL PLAN

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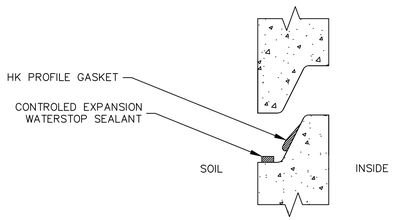

JOINT DETAIL

GENERAL INSTALLATION ELEVATION
NO SCALE

AS-BUILT

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Date NOVEMBER, 2001

Project No. 40-101

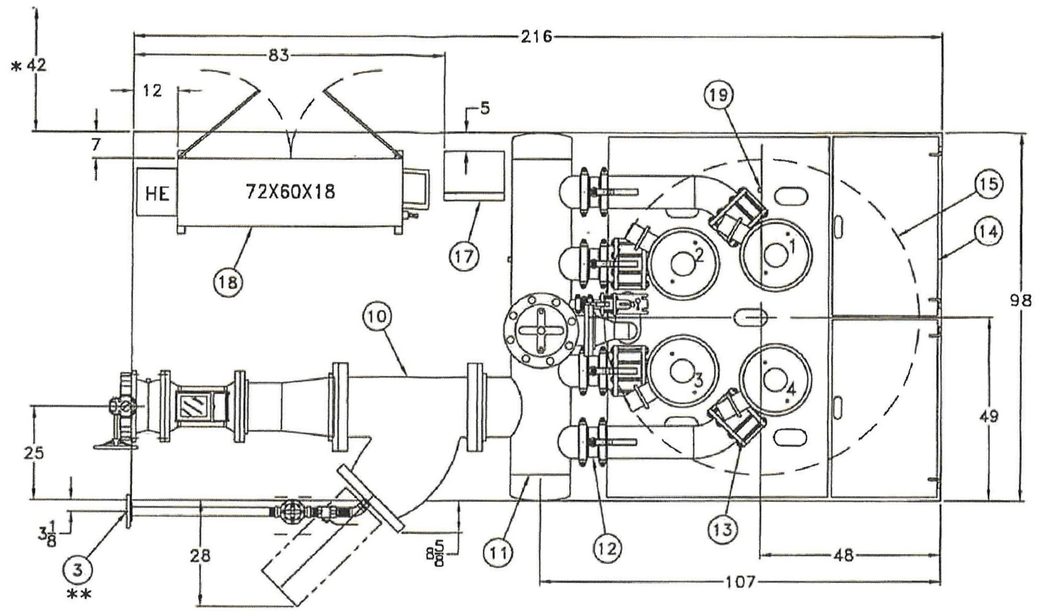
Sheet title
PUMP BLDG
WET WELL
SECTION AND DETAIL

Sheet No
18
OF 22

SHOP DRAWINGS OF EXISTING PUMP SYSTEM

ITEM	QTY	SIZE	DESCRIPTION	PART NO./NOTE
⚠ 20	1	6X6X8	BOX-J	
19	1		HOLDER-PROBE	
18	1		PANEL-CONTROL	72X60X18
17	1	10KVA	POWER PAK	
16	1	8"	VALVE-DSR	
15	1	84"DIA	WETWELL	
14	2		HATCH-WETWELL	.1875X28X47.5
13	4	8"	VALVE-CHECK	
12	4	8"	VALVE-VIC ISO	
11	1	18"	MANIFOLD-DISCHARGE	
10	1	16"	STRAINER-WYE	
9	1	12"	METER-KHRONE FLOW	
8	1	3/4"	DRAIN	
7	1	5 HP	PUMP-PM	
6	4	8"	HEAD-PUMP	
5	4	75 HP	MOTOR-ELECTRIC	US MOTORS
4	4		PUMP-TURBINE	GOULDS 14RJLC
3	1	4"	DISCHARGE-FLANGED	WYE FLUSH
2	1	12"	VALVE-LUG ISO	GEAR OPERATED
1	1		SKID-UNIT	

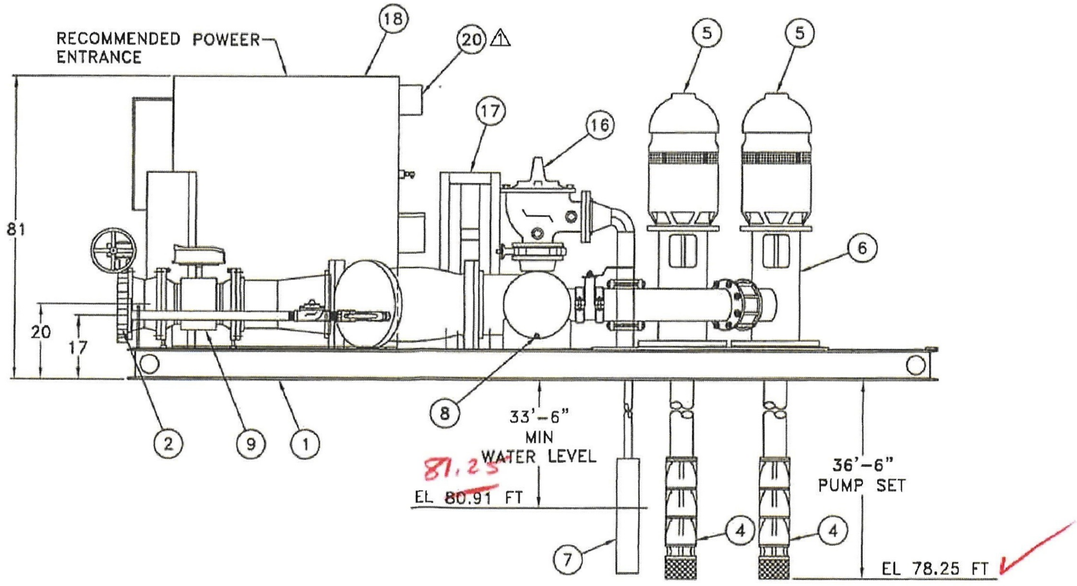
PARTS LIST



STATION STYLE:	FPX-VWTP-6200-5-60
TO PRODUCE:	6200 GPM @ 60 PSI
HORSEPOWERS:	(PM) 5 (1) 75 (2) 75 (3) 75 (4) 75
PUMP DISCHARGE SIZES:	(PM) 2" (1) 8" (2) 8" (3) 8" (4) 8"
PUMP ISOLATION VALVES:	(PM) 2" (1) 8" (2) 8" (3) 8" (4) 8"
PUMP CHECK VALVE SIZES:	(PM) 2" (1) 8" (2) 8" (3) 8" (4) 8"
POWER CONDITIONER:	NA
POWER PACK:	10 KVA
HEATER:	NA
MAIN DISCONNECT:	400 AMPS
POWER REQUIREMENTS:	325 KVA 460V, 60HZ, 3Phase
EXHAUST FAN REQUIREMENTS:	Total to be 4880 CFM

* 1. MINIMUM TO ANY OBSTRUCTION REQUIRED BY NATIONAL ELECTRIC CODE

** 2. 4"MINIMUM FLUSH LINE UNDER 100' FLUSH PIPING MUST EXHAUST TO ATMOSPHERE AND CANNOT HAVE ANY RESTRICTIONS. DO NOT PIPE BELOW LAKE SURFACE.



12"MIN. CLEARANCE FROM WETWELL BOTTOM

Flowtronex

ITT Industries
Engineered for life

10851 NEWKIRK STREET, DALLAS, TEXAS 75220, USA 1-800-786-7480

#	REVISION	DATE	BY
1	ADDED 6X6X8 J-BOX	1/7/03	JHC
2	REVISED LAKE SCREEN	3/6/03	JHC
3	.	.	.
4	.	.	.
5	.	.	.
6	.	.	.
7	.	.	.
8	.	.	.
9	.	.	.

JOB NUMBER: 11861M

JOB NAME: EGLIN AIR FORCE BASE CITY OF NICEVILLE

PROPOSAL NUMBER: 28UQ29MB-U01 | DRAWN BY: JHC | REV 2

SIZE B | DATE DRAWN: 12/17/02 | SHEET #: 1 OF 2