

BID DOCUMENTS AND TECHNICAL SPECIFICATIONS

SHOAL RIVER GENERATOR SYSTEM (EQUIPMENT ONLY)

FOR THE SHOAL RIVER LANDING PUMP STATION PROJECT

PREPARED FOR
OKALOOSA COUNTY WATER & SEWER



BID #: ITB WS 52-20
BID OPENS: May 13, 2020 @ 3:00 P.M.

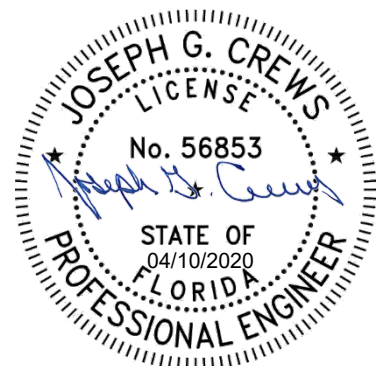


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INVITATION TO BID (ITB) & RESPONDENT'S ACKNOWLEDGEMENT

ITB TITLE:

Shoal River Generator System for the
Shoal River Landing Pump Station Project.

ITB NUMBER:

ITB WS 52-20

ISSUE DATE:

April 13, 2020

LAST DAY FOR QUESTIONS:

April 30, 2020 3:00 P.M. CST

ITB OPENING DATE & TIME:

May 13, 2020 3:00 P.M. CST

NOTE: BIDS RECEIVED AFTER THE BID OPENING DATE & TIME WILL NOT BE CONSIDERED.

Okaloosa County, Florida solicits your company to submit a bid on the above referenced goods or services. All terms, specifications and conditions set forth in this ITB are incorporated into your response. A bid will not be accepted unless all conditions have been met. All bids must have an authorized signature in the space provided below. All bids must be sealed and received by the Okaloosa County Crestview Courthouse BCC Records by the "ITB Opening Date & Time" referenced above. The official clock for the purpose of receiving bids is located in the Okaloosa County Purchasing, located at 5479A. Old Bethel Rd., Crestview, FL 32536. All envelopes containing sealed bids must reference the "ITB Title", "ITB Number" and the "ITB Opening Date & Time". Okaloosa County is not responsible for lost or late delivery of bids by the U.S. Postal Service or other delivery services used by the respondent. Neither faxed nor electronically submitted bids will be accepted. Bids may not be withdrawn for a period of ninety (90) days after the bid opening unless otherwise specified.

RESPONDENT ACKNOWLEDGEMENT FORM BELOW MUST BE COMPLETED, SIGNED, AND RETURNED AS PART OF YOUR BID. BIDS WILL NOT BE ACCEPTED WITHOUT THIS FORM, SIGNED BY AN AUTHORIZED AGENT OF THE RESPONDENT.

COMPANY NAME _____
MAILING ADDRESS _____
CITY, STATE, ZIP _____
FEDERAL EMPLOYER'S IDENTIFICATION NUMBER (FEIN): _____
TELEPHONE: _____ EXT: _____ FAX: _____
EMAIL: _____

I CERTIFY THAT THIS BID IS MADE WITHOUT PRIOR UNDERSTANDING, AGREEMENT, OR CONNECTION WITH ANY OTHER RESPONDENT SUBMITTING A BID FOR THE SAME MATERIALS, SUPPLIES, EQUIPMENT OR SERVICES, AND IS IN ALL RESPECTS FAIR AND WITHOUT COLLUSION OR FRAUD. I AGREE TO ABIDE BY ALL TERMS AND CONDITIONS OF THIS BID AND CERTIFY THAT I AM AUTHORIZED TO SIGN THIS BID FOR THE RESPONDENT.

AUTHORIZED SIGNATURE: _____ PRINTED NAME: _____

TITLE: _____ DATE: _____

Rev: September 22, 2015

NOTICE TO RESPONDENTS
ITB WS 52-20

Notice is hereby given that the Board of County Commissioners of Okaloosa County, FL, will accept sealed bids until **3:00 p.m. (CST) May 13, 2020**, for **Shoal River Generator System**.

Interested respondents desiring consideration shall provide an original and two (2) copies (total three (3)) of their Invitation to Bids (ITB) response with the respondent's areas of expertise identified. Submissions shall be portrait orientation, unbound, and 8 ½" x 11" where practical. **All originals must have original signatures in blue ink.**

Proposal documents are available for download by accessing the following sites:

<http://www.myokaloosa.com/purchasing/hom>

<https://www.bidnetdirect.com/florida>

https://www.demandstar.com/supplier/bids/agency_inc/bid_list.asp?f=search&mi=2442519

At **3:00 p.m. (CST), May 13, 2020**, all bids will be opened and read aloud. All bids must be in sealed envelopes reflecting on the outside thereof the Respondent's name and "**Shoal River Generator System**". The Board of County Commissioners will consider all bids properly submitted at its scheduled bid opening located at 5479A Old Bethel Rd., Crestview, FL 32536. Bids may be submitted at the Purchasing department prior to bid opening or delivered to the Okaloosa County Purchasing Department, 5479A Old Bethel Rd., , Crestview, FL 32536..

NOTE: Crestview, FL is not a next day guaranteed delivery location by most delivery services. Respondents using mail or delivery services assume all risks of late or non-delivery.

The County reserves the right to award the bid to the lowest responsive respondent and to waive any irregularity or technicality in bids received. Okaloosa County shall be the sole judge of the bid and the resulting negotiated agreement that is in its best interest and its decision shall be final.

Any Respondent failing to mark outside of the envelope as set forth herein may not be entitled to have their bid considered.

All bids should be addressed as follows:

Shoal River Generator System

ITB WS 52-20

Okaloosa County Purchasing Department
5479A Old Bethel Rd.
Crestview, FL 32536

Jeff Hyde
Purchasing Manager

Date

OKALOOSA COUNTY
BOARD OF COUNTY COMMISSIONERS

Robert A "Trey" Goodwin, III
Chairman

BID REQUIREMENTS

BID #: ITB WS 52-20

BID ITEM: Shoal River Generator System

SCOPE

Equipment covered by this bid includes the manufacture, deliver and start-up services for **Shoal River Generator System** specified herein. All materials shall be manufactured within the continental United States. No substitutions will be accepted unless approved by the Purchasing and the Water & Sewer Departments. **Note: Evaluation of bid will be based on “TOTAL BASE BID AMOUNT”. All bids shall include itemized unit cost for each identified items and any Additive Alternates listed.**

Price shall be guaranteed for 90 days after the bids are read and received. Price shall include delivery of all equipment and appurtenances to the following location:

1804 LEWIS TURNER BLVD. FORT WALTON BEACH, FL. 32547

OWNER Delivery Contact:

Mark Griffin, Okaloosa County Water & Sewer

850-651-7176 or mgriffin@myokaloosa.com

Vendor is required to coordinate fabrication and shipping with the installation Contractor once a construction contract has been executed between the County and a Contractor.

THE FOLLOWING MUST BE SUBMITTED WITH THE PROPOSAL:

- A list of any and all exceptions to the Bid and Contract Documents.
- Dimensional and weight information on components and assemblies.
- Catalog information and cuts.
- Manufacturer's specifications, including materials description and paint system. Also a list of any requested exceptions to the Bid and Contract Documents.
- Performance data and pump curves, as applicable. Horsepower of all motors supplied.
- Outside utility requirements for each component, such as water, power, air, etc.
- Addresses and phone numbers of nearest service center and a listing of the manufacturers or manufacturer's representatives' services available at this location.
- Addresses and phone numbers for the nearest parts warehouse capable of providing mil parts replacement and/or repair service.
- A list of the three most recent installations where similar equipment by the manufacturer or manufacturer's representative is currently in service; include contact name, telephone number, mailing address, and the names of the Engineer, Owner, and installation contractor; if three installations do not exist, the list shall include all that do exist, if any.
- Description of structural, electrical, mechanical, and all other changes or modifications necessary to adapt the equipment or system to the arrangement shown and/or functions described on the Drawings and in the Technical Specifications.
- Any additional information requested by the OWNER.

THE FOLLOWING SHALL BE SUPPLIED AFTER CONTRACT AWARD

- A SUPPLY BOND in the amount at least equal to 5% of the Base Bid Amount.

GENERAL BID CONDITIONS**PRE-BID ACTIVITY -**

Except as provided in this section, respondents are prohibited from contacting or lobbying the County, County Administrator, Commissioners, County staff, and Review Committee members, or any other person authorized on behalf of the County related or involved with the solicitation. All inquiries on the scope of work, specifications, additional requirements, attachments, terms and general conditions or instructions, or any issue must be directed in writing, by US mail or email to:

Okaloosa County Purchasing Department
5479A Old Bethel Road
Crestview, FL 32536
Email: dmason@myokaloosa.com
(850) 689-5960

All questions or inquiries must be received no later than the last day for questions (reference ITB & Respondent's Acknowledgement form). Any addenda or other modification to the bid documents will be issued by the County five (5) days prior to the date and time of bid closing, as written addenda, and will be posted to and the Okaloosa County website at <https://www.myokaloosa.com> and the Bidnet website at <https://www.bidnetdirect.com/florida>.

Such written addenda or modification shall be part of the bid documents and shall be binding upon each respondent. Each respondent is required to acknowledge receipt of any and all addenda in writing and submit with their bid. No respondent may rely upon any verbal modification or interpretation.

PREPARATION OF BID – The bid form is included with the bid documents. Additional copies may be obtained from the County. The respondent shall submit bids in accordance with the public notice.

All blanks in the bid documents shall be completed by printing in ink or by typewriter in both words and numbers with the amounts extended, totaled and the bid signed. A bid price shall be indicated for each section, bid item, alternative, adjustment unit price item, and unit price item listed therein, or the words “No Bid”, “No Change”, or “Not Applicable” entered. No changes shall be made to the phraseology of the form or in the items mentioned therein. In case of any discrepancy between the written amount and the numerical figures, the written amount shall govern. Any bid which contains any omissions, erasures, alterations, additions, irregularities of any kind, or items not called for which shall in any manner fail to conform to the conditions of public notice inviting bids may be rejected.

A bid submitted by a partnership shall be executed in the partnership name and signed by a partner (whose title must appear under the signature). The official address of the partnership shall be shown below the signature.

A bid submitted by a limited liability company shall be executed in the name of the firm by a member 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 below the signature.

A bid submitted by an individual shall show the respondent's name and official address.

A bid submitted by a joint venture shall be executed by each joint venture in the manner indicated on the bid form. The official address of the joint venture must be shown below the signature. It is preferred that all signatures be in blue ink with the names type or printed below the signature. Okaloosa County does not accept electronic signatures.

The bid shall contain an acknowledgement of receipt of all Addenda, the numbers of which shall be filled in on the form. The address and telephone # for communications regarding the bid shall be shown.

If the respondent is an out-of-state corporation, the bid shall contain evidence of respondent's authority and qualification to do business as an out-of-state corporation in the State of Florida. A state contractor license # for the State of Florida shall also be included on the bid form. Respondent shall be licensed in accordance with the requirements of Chapter 489, Florida Statutes.

INTEGRITY OF BID DOCUMENTS - Respondents shall use the original Bid documents provided by the Purchasing Department and enter information only in the spaces where a response is requested. Respondents may use an attachment as an addendum to the Bid documents if sufficient space is not available. Any modifications or alterations to the original bid documents by the respondent, whether intentional or otherwise, will constitute grounds for rejection of a bid. Any such modification or alteration that a respondent wish to propose must be clearly stated in the respondent's response in the form of an addendum to the original bid documents.

SUBMITTAL OF BID – A bid shall be submitted no later than the date and time prescribed and at the place indicated in the advertisement or invitation to bid and shall be enclosed in an opaque sealed envelope plainly marked with the project title (and, if applicable, the designated portion of the project for which the bid is submitted), the name and address of the respondent, and shall be accompanied by the bid security and other required documents. It is the respondent's responsibility to assure that its bid is delivered at the proper time and place. Offers by telegram, facsimile, or telephone will **NOT** be accepted.

Note: Crestview is not a next day delivery site for overnight carriers.

MODIFICATION & WITHDRAWAL OF BID - A bid may be modified or withdrawn by an appropriate document duly executed in the manner that a bid must be executed and delivered to the place where bids are to be submitted prior to the date and time for the opening of bids.

If within 24 hours after bids are opened any respondent files a duly signed written notice with the County and promptly thereafter demonstrates to the reasonable satisfaction of the County that there was a material substantial mistake in the preparation of its bid, that respondent may withdraw its bid, and the bid security may be returned. Thereafter, if the work is rebid, that respondent will be disqualified from 1) further bidding on the work, and 2) doing any work on the contract, either as a subcontractor or in any other capacity.

BIDS TO REMAIN SUBJECT TO ACCEPTANCE – All bids will remain subject to acceptance or rejection for ninety (90) calendar days after the day of the bid opening, but the County may, in its sole discretion, release any bid and return the bid security prior to the end of this period.

IDENTICAL TIE BIDS - – In cases of identical procurement responses, the award shall be determined either by lot or on the basis of factors deemed to serve the best interest of the County. In the case of the latter, there must be adequate documentation to support such a decision.

CONDITIONAL & INCOMPLETE BIDS - Okaloosa County specifically reserves the right to reject any conditional bid and bids which make it impossible to determine the true amount of the bid.

PRICING – The bid price shall include all equipment, labor, materials, freight, taxes etc. Okaloosa County reserves the right to select that bid most responsive to our needs.

ADDITION/DELETION OF ITEM – The County reserves the right to add or delete any item from this bid or resulting contract when deemed to be in the County’s best interest.

SPECIFICATION EXCEPTIONS – Specifications are based on the most current literature available. Respondent shall clearly list any change in the manufacturer’s specifications which conflict with the bid specifications. Respondent must also explain any deviation from the bid specification in writing, as a foot note on the applicable bid page and enclose a copy of the manufacturer’s specifications data detailing the changed item(s) with their bid. Failure of the respondent to comply with these provisions will result in respondents being held responsible for all costs required to bring the equipment in compliance with bid specifications.

APPLICABLE LAWS & REGULATIONS – All applicable Federal and State laws, County and municipal ordinances, orders, rules and regulations of all authorities having jurisdiction over the project shall apply to the bid throughout, and they will be deemed to be included in the contract the same as though they were written in full therein.

DISQUALIFICATION OF RESPONDENTS - Any of the following reasons may be considered as sufficient for the disqualification of a respondent and the rejection of its bid:

Submission of more than one proposal for the same work from an individual, firm or corporation under the same or different name.

Evidence that the respondent has a financial interest in the firm of another respondent for the same work.

Evidence of collusion among respondents. Participants in such collusion will receive no recognition as respondents for any future work of the County until such participant has been reinstated as a qualified respondent.

Uncompleted work which in the judgment of the County might hinder or prevent the prompt completion of additional work if awarded.

Failure to pay or satisfactorily settle all bills due for labor and material on former contracts in force at the time of advertisement of proposals.

Default under previous contract.

Listing of the respondent by any Local, State or Federal Government on its barred/suspended vendor list.

AWARD OF BID

Okaloosa County Review - Okaloosa County designated Staff will review all bids and will participate in the Recommendation to Award.

The County will award the bid to the responsive and responsible vendor(s) with the lowest responsive bid(s), and the County reserves the right to award the bid to the respondent submitting a responsive bid with a resulting negotiated agreement which is most advantageous and in the best interest of the County, and to reject any and all bids or to waive any irregularity or technicality in bids received. Okaloosa County shall be the sole judge of the bid and the resulting negotiated agreement that is in its best interest and its decision shall be final.

Okaloosa County reserves the right to waive any informalities or reject any and all bids, in whole or part, to utilize any applicable state contracts in lieu of or in addition to this bid and to accept the bid that in its judgment will best serve the interest of the County.

Okaloosa County specifically reserves the right to reject any conditional bids and will normally reject those which made it impossible to determine the true amount of the bid. Each item must be bid separately and no attempt is to be made to tie any item or items to any other item or items.

DISCRIMINATION - An entity or affiliate who has been placed on the discriminatory vendor list may not submit a bid on a contract to provide 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 award or perform work as a contractor, supplier, subcontractor, or consultant under contract with any public entity, and may not transact business with any public entity.

PUBLIC ENTITY CRIME INFORMATION - Pursuant to Florida Statute 287.133, a respondent may not be awarded or perform work as a 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 s. [287.017](#) for CATEGORY TWO for a period of 36 months following the date of being placed on the convicted vendor list.

CONE OF SILENCE CLAUSE - The Okaloosa County Board of County Commissioners has established a solicitation silence policy (**Cone of Silence Clause**) that prohibits oral and written communication regarding all formal solicitations for goods and services (formal bids, Request for Proposals, Requests for Qualifications) issued by the Board through the County Purchasing Department. The period commences from the date of advertisement until award of contract.

All communications shall be directed to the Purchasing Department.

Note: For respondent's convenience, this certification form is enclosed and is made a part of the bid package.

REORGANIZATION OR BANKRUPTCY PROCEEDINGS – Bids will not be considered from respondents who are currently involved in official financial reorganization or bankruptcy proceedings.

INVESTIGATION OF RESPONDENT – The County may make such investigations, as it deems necessary to determine the stability of the respondent to perform the work and that there is no conflict of interest as it relates to the project. The respondent shall furnish to the Owner any additional information and financial data for this purpose as the County may request.

Note: For respondent's convenience, this certification form is enclosed and is made a part of the bid package.

REVIEW OF PROCUREMENT DOCUMENTS - Per Florida Statute 119.071 (2) 2 sealed bids, proposals, or replies received by the County pursuant to a competitive solicitation are exempt from public disclosure until such time as the County provides notice of an intended decision or until 30 days after opening the bids, proposals, or final replies, whichever is earlier.

COMPLIANCE WITH FLORIDA STATUTE 119.0701 - The Respondent shall comply with all the provisions of section 119.0701, Florida Statutes relating to the public records which requires, among other things, that the Respondent: (a) Keep and maintain public records; (b) Provide the public with access to public records on the same terms and conditions that the public agency would provide the records; (c) ensure that public records that are exempt or confidential and exempt from public records disclosure requirements are not disclosed except as authorized by law; and (d) Meet all requirements for retaining public records and transfer, at no cost, to the public agency all public records in possession of the respondent upon termination of the contract.

IF THE CONTRACTOR HAS QUESTIONS REGARDING THE APPLICATION OF CHAPTER 119, FLORIDA STATUTES, TO THE CONTRACTOR'S DUTY TO PROVIDE PUBLIC RECORDS RELATING TO THIS CONTRACT, CONTACT THE CUSTODIAN OF PUBLIC RECORDS AT OKALOOSA COUNTY RISK MANAGEMENT DEPARTMENT 302 N. WILSON ST. CRESTVIEW, FL 32536 PHONE: (850) 689-5977 riskinfo@co.okaloosa.fl.us.

ROTECTION OF RESIDENT WORKERS – The Okaloosa County Board of County Commissioners actively supports the Immigration and Nationality Act (INA) which includes provisions addressing employment eligibility, employment verifications, and nondiscrimination. Under the INA, employers may hire only persons who may legally work in the United States (i.e., citizens and nationals of the U.S.) and aliens authorized to work in the U.S. The employer must verify the identity and employment eligibility of anyone to be hired, which includes completing the Employment Eligibility Verifications. The respondent shall establish appropriate procedures and controls so no services or products under the Contract Documents will be performed or manufactured by any worker who is not legally eligible to perform such services or employment. Okaloosa County reserves the right to request documentation showing compliance with the requirements.

Respondents doing construction business with Okaloosa County are required to use the Federal Government Department of Homeland Security's website and use the E-Verify Employment Eligibility Verifications System to confirm eligibility of all employees to work in the United States.

SUSPENSION OR TERMINATION FOR CONVENIENCE - The County may, at any time, without cause, order Respondent in writing to suspend, delay or interrupt the work in whole or in part for such period of time as the County may determine, or to terminate all or a portion of the Contract for the County's convenience. Upon such termination, the Contract Price earned to the date of termination shall be paid to Respondent, but Respondent waives any claim for damages, including loss of profits arising out of or related to the early termination. Those Contract provisions which by their nature survive final acceptance shall remain in full force and effect. If the County orders a suspension, the Contract price and Contract time may be adjusted for increases in the cost and time caused by suspension, delay or interruption. No adjustment shall be made to the extent that performance is, was or would have been so suspended, delayed or interrupted by reason for which Respondent is responsible; or that an equitable adjustment is made or denied under another provision of this Contract.

FAILURE OF PERFORMANCE/DELIVERY - In case of default by the respondent, the County after due notice (oral or written) may procure the necessary supplies or services from other sources and hold the respondent responsible for difference in cost incurred. Continuous instances of default shall result in cancellation of the award and removal of the respondent from the bid list for duration of one (1) year, at the option of the County.

AUDIT - If requested, respondent shall permit the County or an authorized, independent audit agency to inspect all data and records of respondent relating to its performance and its subcontracts under this bid from the date of the award through three (3) years after the expiration of contract.

EQUAL EMPLOYMENT OPPORTUNITY; NON DISCRIMINATION – Respondent will not discriminate against any employee or an applicant for employment because of race, color, religion, gender, sexual orientation, national origin, age, familial status or handicap.

NON-COLLUSION – Respondent certifies that it has entered into no agreement to commit a fraudulent, deceitful, unlawful or wrongful act, or any act which may result in an unfair advantage over other respondents. See Florida Statute 838.22.

UNAUTHORIZED ALIENS/PATRIOT'S ACT – The knowing employment by respondent or its subcontractors of any alien not authorized to work by the immigration laws is prohibited and shall be a default of the contract. In the event that the respondent is notified or becomes aware of such default, the respondent shall take steps as are necessary to terminate said employment with 24 hours of notification or actual knowledge that an alien is being employed. Respondent's failure to take such steps as are necessary to terminate the employment of any said alien within 24 hours of notification or actual knowledge that an alien is being employed shall be grounds for immediate termination of the contract. Respondent shall take all commercially reasonable precautions to ensure that it and its subcontractors do not employ persons who are not authorized to work by the immigration laws.

CERTIFICATE OF GOOD STANDING FOR STATE OF FLORIDA - Florida Statute 607.1501 requires that all vendors who wish to do business in the State of Florida be licensed to do business through the Department of State of Florida and be in good standing with the State of Florida. As such, to do business with Okaloosa County a vendor must provide a Certificate of Good Standing with their bid/proposal package to the County. For more information on doing business in the State of Florida, please refer to the Florida Department of State. The website to register is <https://dos.myflorida.com/sunbiz>.

The following documents are to be submitted with the proposal packet. Failure to submit all required forms might result in your submittal being deemed non-responsive:

- A. Drug-Free Workplace Certification Form
- B. Conflict of Interest Form
- C. Federal E-Verify Form
- D. Indemnification and Hold Harmless Form
- E. Lobbying Form
- F. Cone of Silence Form
- G. Company Data/Sam Form
- H. Addendum Acknowledgement Form
- I. Equipment Owner's Data Sheet Form
- J. Bid Sheet Form
- K. Anti-Collusion Form
- L. Vendor on Scrutinized List Form
- M. Exhibit "B" General Grant Funding Special Provisions
- N. Certificate of Good Standing for the State of Florida-provided by the contractor

SPECIAL BID CONDITIONS

1. **Equipment Acceptance** - Delivery of material to Okaloosa Board of County Commissioners does not constitute acceptance for the purpose of payment. Final acceptance and authorization of payment shall be given only after a thorough inspection indicates that the material meets contract specifications and conditions as listed. Should the delivered material differ in any respect from specifications, payment will be withheld until such time as the supplier takes necessary corrective action. The Purchasing Department shall be notified of the deviation in writing within 10 days and the provisions of the delivery paragraph shall prevail. If the proposed corrective action is not acceptable to Okaloosa County, the final acceptance of the material shall remain the property of the supplier and the county shall not be liable for payment for any portion thereof.
2. **Right to Waive and Reject**
 - A. The Board, in its absolute discretion, may reject any bid of a bidder that has failed, in the opinion of the Board, to complete or perform an Okaloosa County contracted project in a timely fashion or has failed in any other way, in the opinion of the Board, to perform a prior contract in a satisfactory manner and has directed the Okaloosa County Purchasing Director to emphasize this condition to potential bidders.
 - B. The County will award the bid to the lowest and most responsive bidder, and the County reserves the right to award the bid to the bidder submitting a responsive bid with a resulting negotiated agreement which is most advantageous and in the best interest of the County, and to reject any and all bids or to waive any irregularity or technicality in bids received. Okaloosa County shall be the sole judge of the bid and the resulting negotiated agreement that is in its best interest and its decision shall be final
 - C. The Board of County Commissioners reserves the right to waive any informalities or reject any and all bids, in whole or part, and to utilize any applicable state contracts in lieu of or in addition to this bid.
 - D. The Board of County Commissioners specifically reserves the right to reject any conditional bid and will normally reject those that make it impossible to determine the true amount of the bid. Each item must be bid separately and no attempt is to be made to tie any item or items to any other item or items.
3. **Terms and Conditions** – All bidders shall review the Terms and Conditions attached hereto and if the Board accepts their bid and executes a contract, the bidder awarded the contract (Seller) shall agree to the Terms and Conditions, completely, and agree to furnish the materials and services specified herein in accordance with the Specifications and Terms and Conditions herein.
4. **Delivery Schedule** - Submittal data to be delivered for approval with the Bid.
Operation & Maintenance manuals to be delivered for approval no later than 30 calendar days prior to start-up and after receipt of Approved or Approved as Noted submittal data.
Delivery of on-site Equipment/Materials shall be no later than calendar days identified on the Bid, after receipt of Purchase Order and shall be coordinated with the on-site installation Contractor.
5. **Terms of Sale** - FOB Job Site
6. **Sales Tax** – Is excluded from the Lump Sum amount of this order.

7. Supply Bond

- A. Upon notice of Award, the Seller shall furnish to Buyer a Supply Bond in an amount at least equal to 5% of the Contract Price, as security for the faithful and timely delivery of all procured items covered by this procurement agreement. The bond shall remain in effect until 1) inspection by Buyer of satisfaction of delivery based on visual inspection, or 2) twenty days after receipt of all procured items, whichever is later. Seller shall also furnish such other bonds as are required by the Contract Documents.
- B. All bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. All bonds signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual's authority to bind the surety. The evidence of authority shall show that it is effective on the date the agent or attorney-in-fact signed each bond.
- C. If the surety on any bond furnished by Seller is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of Contract, Seller shall promptly notify Buyer and Engineer and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the requirements.

STANDARD TERMS AND CONDITIONS

1. **AGREEMENT.** The executed agreement (Order) between the Board and the Seller for materials and services, including the terms and conditions herein and any attachments or specifications hereto, contains the complete agreement between the Board and the Seller and supersedes all prior agreements.
2. **TIME.** Time is of the essence in the performance of this Order.
3. **SELLERS CONDITIONS.** By acceptance of this Order and/or commencement of performance hereunder, Seller agrees to comply fully with the terms and conditions set forth in this document. Acceptance of this Order is expressly limited to the terms and conditions of this Order and none of the Seller's terms and conditions shall apply in acknowledging this Order or in the acceptance of this Order. Acceptance by the Board of the goods, equipment and/or services ("goods") delivered under this Order shall not constitute acceptance of the Seller's terms and conditions.
4. **DEFINITIONS.** As used herein, the term "goods" shall mean and includes all supplies, materials, work, services, equipment, training, start-up services, operation and maintenance manuals or other items whatsoever to be furnished by Seller under this Order.
5. **INSPECTION.** Notwithstanding any prior inspection or test, payment or receiving document, goods are subject to final inspection and acceptance at the destination for delivery stated herein. Payment for goods shall not constitute acceptance.
6. **WARRANTIES.** (a) Notwithstanding inspection and acceptance by the Board of goods furnished under this Order, Seller warrants that all goods furnished will be of merchantable quality, and will be free from defects in material, workmanship and design, and conform in all aspects with the specifications and requirements of this Order. (b) Seller further warrants that all goods furnished will be of the highest workmanlike quality. (c) All Warranties hereunder shall be for a period of one (1) year from the date of delivery or the beneficial use of the goods, or as indicated otherwise in this Order, whichever is later, and shall be warranties of future performance for each warranty year. (d) In the event of a breach of warranty hereunder, the Board may, at no increase in Order price or other cost to the Board, either: (1) require the prompt correction or replacement of defective or otherwise nonconforming goods or parts thereof, along with such new or revised data as is associated with the corrective action taken; or (2) retain such goods, whereupon the price thereof shall be reduced by an amount equitable under the circumstances; or (3) correct or replace such goods with similar goods, by contract or otherwise, and charge Seller for all additional costs caused thereby. (e) Any goods or parts thereof corrected or furnished in replacement pursuant to this clause shall be subject to all the provisions of this clause to the same extent as goods initially delivered. The warranty with respect to such goods or parts thereof shall be equal in duration to the initial warranty period and shall run from the date of delivery or placement in service of such corrected or replaced goods, whichever is later. (f) the Board's or its agents approval of Seller-generated designs drawings or other technical documents shall in no way relieve Seller of its obligations under this or any other clause of this Order.

7. **SCHEDULE & EXPEDITING.** Seller shall keep the Board informed as the status of the goods hereunder and Seller's schedule of activities to assure delivery by the time required herein. Without any responsibility to do so, the Board reserves the right to take steps to expedite acquisition, production and/or shipment of the goods, if, in the Board's sole judgment, delivery of the completed goods by the date required becomes doubtful. Seller shall reimburse the Board for all costs it may incur in expediting acquisition, production or shipment of the goods.
8. **CHANGES.** The Board reserves the right at any time prior to delivery, by written order, to cancel, suspends, revise or change the goods or quantity of goods to be furnished by Seller hereunder, and in no event shall the Board be responsible for loss of anticipated profits or consequential damages. In the event of a revision to this Order by the Board, the Board shall be responsible only for the price of the goods accepted. Any increase in the price of the goods resulting from a revision is subject to the approval of the Board. Failure to agree to any adjustment shall be a dispute within the meaning of the "Disputes" clause hereof. Pending resolution of the dispute, the Seller shall not be excused from proceeding with the order as changed.
9. **BANKRUPTCY.** The Board may terminate this Order in whole or in part by written notice: (a) if the Seller shall become insolvent or make a general assignment for the benefit of creditors; or (b) if a petition under any bankruptcy act or similar statute is filed by or against the Seller and is not vacated within ten (10) days after it is filed.
10. **PRICES.** Seller warrants that the prices of the goods covered by this Order are not in excess of prices charged by Seller for similar goods to Seller's most favored customers.
11. **INVOICING AND PAYMENT.** Unless otherwise specified, a separate invoice shall be issued for each shipment. Unless otherwise specified, an invoice shall not be issued prior to shipment of goods and payment will not be made prior to receipt and acceptance of both the goods and a correct invoice. Credit and discount periods as identified on the face of this Order (if any) shall be computed from the date of receipt of the correct invoice to the date Board's check is mailed. Discount shall be taken on full amount of invoice.
12. **ASSIGNMENT.** Neither this Order nor any interest herein nor claim thereunder shall be assigned or transferred by Seller, except as expressly authorized in writing by the Board.
13. **ADVERTISING AND PUBLICITY.** Seller shall not, without prior written consent of the Board, publish the fact that the Board has placed this Order with Seller, or release any information relative thereto. Seller shall not use the name of Seller or Engineer, or affiliates (hereinafter collectively referred to as Engineer) in any advertising or promotional literature without the prior written consent of the Board and Engineer.
14. **PATENT, COPYRIGHT OR TRADEMARK INFRINGEMENT.** Seller agrees to indemnify, defend and hold harmless Owner, the Board, Engineer and their officers, agents, employees, successors and assigns against loss, damage or liability, including costs, expenses and attorneys' fees on account of any suit, claim, judgment or demand involving the alleged infringement of any patent, copyright, trademark, or trade name by reason of the manufacture, use, sale or disposition of any item or material supplied hereunder. If so requested by the

Board or Engineer, Seller shall, at its expense, appear in and assume the defense of any litigation to which Owner, the Board and Engineer has been made a party which relates to any such infringement. If a final injunction against Owner or the Board's use of the goods results from such claim (or if the Board reasonably believes such a claim is likely), Seller shall, at its own expense and at the Board's request, obtain for Owner and the Board the right to continue using the goods or replace or modify (or any part thereof) so that it becomes non-infringing but functionally equivalent.

15. **INDEMNITY.** (a) Seller agrees to indemnify and hold harmless and upon request, defend the Board and Engineer and their agents and employees and persons claiming through the Board or Engineer from and against all claims, losses, damages, expenses for (1) damages to persons or property caused in whole or in part by any act, omission or default of Seller, its contractors, subcontractors, sub-subcontractors, material men, or agents of any tier or their respective employees except for claims of or damages resulting from the gross negligence, or willful, wanton or intentional misconduct of the Board, or Engineer, their officers, directors, agents or employees; and (2) statutory or punitive damages caused by or result from the acts or omissions of the Seller, its contractors, subcontractors, sub-subcontractors, material men, or agents of any tier or their respective employees. The indemnity provided by this Section 15 (a) shall be limited to the dollar amount of insurance specified in Section 25. (b) Seller further agrees to indemnify and hold harmless and upon request defend the Board and Engineer and persons claiming through the Board or Engineer and their agents and employees from liabilities, damages, losses and costs, including but not limited to attorneys' fees, to the extent caused by the negligence, recklessness, or intentional wrongful misconduct of the Seller and persons employed or utilized by Seller in the performance of the work. The indemnity provided by this herein shall in no way be limited by any insurance coverage provided by Seller.
16. **CONSEQUENTIAL DAMAGES.** Notwithstanding any other provision herein, the Board shall under no circumstances be responsible to Seller for any consequential, indirect or special damages.
17. **DELIVERY.** Delivery shall be to the project site Free on Board (F.O.B.) unless otherwise designated in this Order.
18. **TITLE AND RISK OF LOSS.** Title to and risk of loss on all goods shipped by Seller to the Board shall not pass to the Board until the Board inspects and accepts such goods at the location designated by the Board.
19. **TAXES.** The Board is a tax-exempt public entity and the prices herein should not include Federal, state or local taxes for the goods purchased herein.
20. **DISPUTE RESOLUTION.** In the event of any dispute between the parties arising out of or in connection with the Order or the services or work contemplated herein; the parties agree to first make a good faith effort to resolve the dispute informally. Negotiations shall take place between the designated principals of each party. If the parties are unable to resolve the dispute informally, then either party may submit the controversy to a court of competent jurisdiction. Each party shall be responsible for its own costs and expenses including attorneys' fees and court costs incurred in the course of any dispute, mediation, or legal proceeding.
21. **COMPLIANCE WITH LAWS.** Seller agrees to comply with all applicable local, state and Federal laws and executive orders and a regulation issued pursuant

- thereto and agrees to indemnify the Board and Engineer against any liability, loss, cost, damage, or expense incurred by reason of Seller's violation of this provision.
22. **GOVERNING LAW AND VENUE.** This Order shall be governed by the laws of the State of Florida. Venue for any legal proceedings arising out of this Order shall be in Okaloosa County, Florida.
23. **SEVERABILITY.** If any provision of this Order, or any part thereof, shall be invalid or unenforceable, such provision or part shall be deemed severed, and the remainder hereof shall be given full force and effect.
24. **INSURANCE REQUIREMENTS.** Seller shall maintain products liability and completed operations insurance which provides, under the terms of the primary policy or by contractual liability endorsement if necessary, coverage in respect of claims involving bodily injury or property damage arising out of or in connection with the goods. Such insurance shall be in such minimum amounts of 1 million, and shall declare the Board, Engineer and Owner as an additional insured. Seller shall also maintain workers compensation and employer's liability insurance. All policies of insurance shall not be cancelable except upon ten (10) days' written notice to the Board, shall include a waiver of subrogation in favor of the Board and Engineer. Seller shall furnish proof of such insurance to the Board.
25. **PUBLIC RECORDS.** Seller shall allow public access to all documents, records and other materials, subject to the provisions of Chapter 119, Florida Statutes, prepared or received by Seller in conjunction with this Order.
26. **AUDIT.** The Board shall have the right from time to time at its sole expense to audit the compliance by the Seller with the terms, conditions, obligations, limitations, restrictions and requirements of this Order and such right shall extend for a period of three (3) years after termination of this Order.

DRUG-FREE WORKPLACE CERTIFICATION

THE BELOW SIGNED RESPONDENT CERTIFIES that it has implemented a drug-free workplace program. In order to have a drug-free workplace program, a business shall:

1. Publish a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the workplace and specifying the actions that will be taken against employees for violations of such prohibition.
2. Inform employees about the dangers of drug abuse in the workplace, the business's policy of maintaining a drug-free workplace, any available drug counseling, rehabilitation and employee assistance programs, and the penalties that may be imposed upon employees for drug abuse violations.
3. Give each employee engaged in providing the commodities or contractual services that are under quote a copy of the statement specified in subsection 1.
4. In the statement specified in subsection 1, notify the employees that, as a condition of working on the commodities or contractual services that are under quote, the employee will abide by the terms of the statement and will notify the employer of any conviction of, or plea of guilty or nolo contendere to, any violation of Chapter 893, Florida Statutes, or of any controlled substance law of the United States or any state, for a violation occurring in the workplace no later than five (5) days after such conviction.
5. Impose a sanction on, or require the satisfactory participation in, drug abuse assistance or rehabilitation program if such is available in employee's community, by any employee who is convicted.
6. Make a good faith effort to continue to maintain a drug-free workplace through implementation of this section.

As the person authorized to sign this statement, I certify that this firm complies fully with the above requirements.

DATE: _____

SIGNATURE: _____

COMPANY: _____

NAME: _____

(Typed or Printed)

ADDRESS: _____

TITLE: _____

E-MAIL: _____

PHONE NO.: _____

CONFLICT OF INTEREST DISCLOSURE FORM

For purposes of determining any possible conflict of interest, all respondents, must disclose if any Okaloosa Board of County Commissioner, employee(s), elected officials(s), or if any of its agencies is also an owner, corporate officer, agency, employee, etc., of their business.

Indicate either “yes” (a 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)

POSITION(S)

FIRM NAME: _____

BY (PRINTED): _____

BY (SIGNATURE): _____

TITLE: _____

ADDRESS: _____

PHONE NO. _____

E-MAIL _____

DATE _____

FEDERAL E-VERIFY COMPLIANCE CERTIFICATION

In accordance with Okaloosa County Policy and Executive Order Number 11-116 from the office of the Governor of the State of Florida, Respondent hereby certifies that the U.S. Department of Homeland Security's E-Verify system will be used to verify the employment eligibility of all new employees hired by the respondent during the contract term, and shall expressly require any subcontractors performing work or providing services pursuant to the contract to likewise utilize the U.S. Department of Homeland Securities E-Verify system to verify the employment eligibility of all new employees hired by the subcontractor during the contract term; and shall provide documentation such verification to the COUNTY upon request.

As the person authorized to sign this statement, I certify that this company complies/will comply fully with the above requirements.

DATE: _____

SIGNATURE: _____

COMPANY: _____

NAME: _____

ADDRESS: _____

TITLE: _____

E-MAIL: _____

PHONE NO.: _____

INDEMNIFICATION AND HOLD HARMLESS

Respondent shall indemnify and hold harmless the County, its officers and employees from liabilities, damages, losses, and costs including but not limited to reasonable attorney fees, to the extent caused by the negligence, recklessness, or intentional wrongful conduct of the Respondent and other persons employed or utilized by the Respondent in the performance of this Agreement.

Respondent's Company Name

Authorized Signature – Manual

Physical Address

Authorized Signature – Typed

Mailing Address

Title

Phone Number

FAX Number

Cellular Number

After-Hours Number(s)

Date

Email

LOBBYING - 31 U.S.C. 1352, 49 CFR Part 19, 49 CFR Part 20

APPENDIX A, 49 CFR PART 20--CERTIFICATION REGARDING LOBBYING

Certification for Contracts, Grants, Loans, and Cooperative Agreements

(To be submitted with each bid or offer exceeding \$100,000)

The undersigned [Contractor] certifies, to the best of his or her knowledge and belief, that:

1. No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
2. If any funds other than Federal appropriated funds have been paid or will be paid to any person for making lobbying contacts to an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form--LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions [as amended by "Government wide Guidance for New Restrictions on Lobbying," 61 Fed. Reg. 1413 (1/19/96). Note: Language in paragraph (2) herein has been modified in accordance with Section 10 of the Lobbying Disclosure Act of 1995 (P.L. 104-65, to be codified at 2 U.S.C. 1601, *et seq.*)]
3. The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

(Continued.)

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31, U.S.C. § 1352 (as amended by the Lobbying Disclosure Act of 1995). Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

[Note: Pursuant to 31 U.S.C. § 1352(c)(1)-(2)(A), any person who makes a prohibited expenditure or fails to file or amend a required certification or disclosure form shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such expenditure or failure.]

The Contractor, _____, certifies or affirms the truthfulness and accuracy of each statement of its certification and disclosure, if any. In addition, the Contractor understands and agrees that the provisions of 31 U.S.C. A 3801, *et seq.*, apply to this certification and disclosure, if any.

_____ Signature of Contractor's Authorized Official

_____ Name and Title of Contractor's Authorized
Official

_____ Date

CONE OF SILENCE

The Board of County Commissioners have established a solicitation silence policy (**Cone of Silence**) that prohibits oral and written communication regarding all formal solicitations for goods and services (ITB, RFP, ITQ, ITN, and RFQ) or other competitive solicitation between the bidder (or its agents or representatives) or other entity with the potential for a financial interest in the award (or their respective agents or representatives) regarding such competitive solicitation, and any County Commissioner or County employee, selection committee member or other persons authorized to act on behalf of the Board including the County’s Architect, Engineer or their subconsultants, or anyone designated to provide a recommendation to award a particular contract, other than the Purchasing Department Staff..

The period commences from the time of advertisement until contract award.

Any information thought to affect the committee or staff recommendation submitted after bids are due, should be directed to the Purchasing Manager or an appointed representative. It shall be the Purchasing Manager’s decision whether to consider this information in the decision process.

Any violation of this policy shall be grounds to disqualify the respondent from consideration during the selection process.

All respondents must agree to comply with this policy by signing the following statement and including it with their submittal.

I _____ representing _____
Signature Company Name

On this day of _____, 2020 hereby agree to abide by the County’s “**Cone of Silence Clause**” and understand violation of this policy shall result in disqualification of my proposal/submittal.

COMPANY DATA

Respondent's Company Name: _____

Physical Address & Phone #: _____

Contact Person (Typed-Printed): _____

Phone #: _____

Cell #: _____

Federal ID or SS #: _____

DUNNS/SAM #: _____

Respondent's License #: _____

Fax #: _____

Emergency #'s After Hours,
Weekends & Holidays: _____

System for Award Management

(a) Definitions. As used in this provision.

“Electronic Funds Transfer (EFT) indicator” means a four-character suffix to the unique entity identifier. The suffix is assigned at the discretion of the commercial, nonprofit, or Government entity to establish additional System for Award Management records for identifying alternative EFT accounts (see [subpart 32.11](#)) for the same entity.

“Registered in the System for Award Management (SAM) database” means that:

(1) The Offeror has entered all mandatory information, including the unique entity identifier and the EFT indicator, if applicable, the Commercial and Government Entity (CAGE) code, as well as data required by the Federal Funding Accountability and Transparency Act of 2006 (see [subpart 4.14](#)) into the SAM database;

(2) The offeror has completed the Core, Assertions, and Representations and Certifications, and Points of Contact sections of the registration in the SAM database;

(3) The Government has validated all mandatory data fields, to include validation of the Taxpayer Identification Number (TIN) with the Internal Revenue Service (IRS). The offeror will be required to provide consent for TIN validation to the Government as a part of the SAM registration process; and

(4) The Government has marked the record “Active”.

“Unique entity identifier” means a number or other identifier used to identify a specific commercial, nonprofit, or Government entity. See www.sam.gov for the designated entity for establishing unique entity identifiers.

(b)(1) By submission of an offer, the offeror acknowledges the requirement that a prospective awardee shall be registered in the SAM database prior to award, during performance, and through final payment of any contract, basic agreement, basic ordering agreement, or blanket purchasing agreement resulting from this solicitation.

(2) The Offeror shall enter, in the block with its name and address on the cover page of its offer, the annotation “Unique Entity Identifier” followed by the unique entity identifier that identifies the Offeror’s name and address exactly as stated in the offer. The Offeror also shall enter its EFT indicator, if applicable. The unique entity identifier will be used by the Contracting Officer to verify that the Offeror is registered in the SAM database.

(c) If the Offeror does not have a unique entity identifier, it should contact the entity designated at www.sam.gov for establishment of the unique entity identifier directly to obtain one. The Offeror should be prepared to provide the following information:

(1) Company legal business name.

(2) Tradestyle, doing business, or other name by which your entity is commonly recognized.

(3) Company Physical Street Address, City, State, and Zip Code.

(4) Company Mailing Address, City, State and Zip Code (if separate from physical).

(5) Company telephone number.

(6) Date the company was started.

(7) Number of employees at your location.

(8) Chief executive officer/key manager.

(9) Line of business (industry).

(10) Company Headquarters name and address (reporting relationship within your entity).

(d) If the Offeror does not become registered in the SAM database in timely manner, the Contracting Officer may proceed to award to the next otherwise successful registered Offeror.

(e) Processing time, which normally takes 48 hours, should be taken into consideration when registering. Offerors who are not registered should consider applying for registration immediately upon receipt of this solicitation.

(f) Offerors may obtain information on registration at <https://www.acquisition.gov> .

Offerors SAM information:

Entity Name: _____

Entity Address: _____

Duns Number: _____

CAGE Code: _____

ADDENDUM ACKNOWLEDGEMENT
ITB WS 52-20

Acknowledgment is hereby made of the following addenda (identified by number) received since issuance of solicitation:

<u>ADDENDUM NO.</u>	<u>DATE</u>

NOTE: Prior to submitting the response to this solicitation, it is the responsibility of the respondent to confirm if any addenda have been issued. If such addenda have been issued, acknowledge receipt by noting number(s) and date(s) above.

EQUIPMENT OWNER'S DATA SHEET

NAME OF OWNER _____
ADDRESS _____
PHONE NUMBER _____
PERSON TO CONTACT _____

NAME OF OWNER _____
ADDRESS _____
PHONE NUMBER _____
PERSON TO CONTACT _____

NAME OF OWNER _____
ADDRESS _____
PHONE NUMBER _____
PERSON TO CONTACT _____

NAME OF OWNER _____
ADDRESS _____
PHONE NUMBER _____
PERSON TO CONTACT _____

NAME OF OWNER _____
ADDRESS _____
PHONE NUMBER _____
PERSON TO CONTACT _____

BID SHEET

BID #: ITB WS 52-20

BASE BID -- SHOAL RIVER GENERATOR SYSTEM for the SHOAL RIVER LANDING PUMP STATION PROJECT.

ITEM	QTY		DESCRIPTION	UNIT PRICE	EXT. PRICE
1	1	EA	250 kW DIESEL GENERATOR SYSTEM, ENCLOSURE & AUTOMATIC TRANSFER SWITCH		
	1	Lot	Specific Specification Sections (01330, 01332, 01782, 13125, 16622) Drawings: All Submittals: (Include with this bid the following: Shop Drawings, Product Data, & Calculations (1 Copy w/Electronic PDF. Preliminary O&M Manuals, and Final O&M Manuals Warranty: Warranty shall be in accordance with the attached specifications Payment: List Freight and Manufacturer Services as a separate nontaxable item when submitting invoices	Cost associated with these requirements shall be included in the associated unit price shown for the specified equipment in Item 1	N/A
	1	Lot	Manufacturer Services as detailed in Specification Section 01640, and as required providing a fully operational and functioning system per the scope of this contract.		N/A
	1	Lot	Spare Parts and Tools: As specified in Equipment Sections		N/A
			TOTAL BASE BID	\$	

DELIVERY TIME: _____ MAXIMUM* DAYS FROM RECEIPT OF PURCHASE ORDER

*Max Days is defined as calendar days to deliver all equipment to the site as specified, including submittals, manufacturing and testing. Time will be from date of receipt of purchase agreement from OWNER. Allow a max 10 working days for initial submittal review and each resubmit required by ENGINEER / OWNER.

LUMP SUM BASE BID AMOUNT IS WRITTEN AS:

_____ Dollars and _____ Cents,

\$ _____, To Be Fully Tested, Shipped and

Delivered to the Project Site within _____ Calendar Days from Receipt of Official Purchase Order.

ANTI-COLLUSION STATEMENT: The below signed bidder has not divulged to, discussed or compared his bid with other bidders and has not colluded with any other bidder or parties to bid whatever. (Note: No premiums, rebates, or gratuities permitted either with, prior to, or after any delivery of materials. Any such violation will result in the cancellation and/or return of material (as applicable) and the removal from bid list(s).

Bidder's Company Name

Address

Phone #

Federal ID # or SS #

Authorized Signature – Manual

Authorized Signature – Typed

Title

Fax #

VENDORS ON SCRUTINIZED COMPANIES LISTS

By executing this Certificate _____, the bid proposer, certifies that it is not: (1) listed on the Scrutinized Companies that Boycott Israel List, created pursuant to section 215.4725, Florida Statutes, (2) engaged in a boycott of Israel, (3) listed on the Scrutinized Companies with Activities in Sudan List or the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List, created pursuant to section 215.473, Florida Statutes, or (4) engaged in business operations in Cuba or Syria. Pursuant to section 287.135(5), Florida Statutes, the County may disqualify the bid proper immediately or immediately terminate any agreement entered into for cause if the bid proposer is found to have submitted a false certification as to the above or if the Contractor is placed on the Scrutinized Companies that Boycott Israel List, is engaged in a boycott of Israel, has been placed on the Scrutinized Companies with Activities in Sudan List or the Scrutinized Companies with Activities in the Iran Petroleum Energy Sector List, or has been engaged in business operations in Cuba or Syria, during the term of the Agreement. If the County determines that the bid proposer has submitted a false certification, the County will provide written notice to the bid proposer. Unless the bid proposer demonstrates in writing, within 90 calendar days of receipt of the notice, that the County's determination of false certification was made in error, the County shall bring a civil action against the bid proposer. If the County's determination is upheld, a civil penalty shall apply, and the bid proposer will be ineligible to bid on any Agreement with a Florida agency or local governmental entity for three years after the date of County's determination of false certification by bid proposer.

As the person authorized to sign this statement, I certify that this firm complies fully with the above requirements.

DATE: _____

SIGNATURE: _____

COMPANY: _____

NAME: _____
(Typed or Printed)

ADDRESS: _____

TITLE: _____

E-MAIL: _____

PHONE NO.: _____

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**SECTION 01330
SUBMITTALS**

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Submittals are required prior to, during, and at the end of the installation period. The submittals shall conform to the requirements described in this Section and all referenced Sections or Articles.

1.2 PROCEDURE

- A. Submit the following items within five days after the Contract is executed.
1. Shop Drawings, Product Data and Samples: Submit Shop Drawings, product data and samples in accordance with Section 01332, Shop Drawing Procedures, and as required in applicable Sections of the Contract Documents.
 2. Request for Information: Submit a Request for Information (RFI), when any of the following are required: an interpretation of the Specifications; additional details; information not shown on the Drawings or in the Specifications; or clarification of discrepancies is required. Manufacturer shall retain one copy and submit one copy to the ENGINEER for response.
 3. Operation and Maintenance Manuals and Lesson Plans: Submit Equipment Operation and Maintenance Manuals for approval, by the ENGINEER, within 30 days after approval of Equipment Shop Drawing. Submit Equipment Training Lesson Plans for approval, by the ENGINEER, 60 days prior to commencement of training. Submit Operation and Maintenance Data and Lesson Plans in accordance with Section 01782, Operation and Maintenance Data.
- B. Submittal at Final Completion: Submit the following items in the proper form as a condition of Final Acceptance of the Work:
1. Guarantees, Warranties, and Bonds: Submit as listed in various Sections of the Specifications.
 2. Operations and Maintenance Data: Submit all remaining product data and manuals as specified in various Sections of the Specifications.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01330

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SECTION 01332
SHOP DRAWING PROCEDURES

PART 1 - GENERAL

1.1 DESCRIPTION

- A. The submittal of Shop Drawings shall conform to requirements in this Section. A separate transmittal form shall be used for each specific item or class of material or equipment for which a submittal is required.
- B. The term “Shop Drawings” as used herein shall be understood to include detailed design calculations, fabrication and installation drawings, lists, graphs, test data, operating instructions, and other items which shall include, but are not necessarily limited to:
 - 1. Drawings and catalog information and cuts.
 - 2. Specifications, parts list, suggested spare parts lists, and equipment drawings.
 - 3. Wiring diagrams of systems and equipment.
 - 4. Complete lubrication, maintenance and operation instructions, including initial startup instructions.
 - 5. Applicable certifications.
 - 6. Anchor bolt templates, mounting instructions, and mounting design calculations as required.
 - 7. Required maintenance operations to allow all installed equipment to remain idle for a period of time not to exceed 24 months.
 - 8. Other technical, installation, and maintenance data as applicable.
 - 9. Unloading and handling methods and storage requirements.
 - 10. Note, highlight, and explain proposed changes to the Contract Documents.
 - 11. Paint submittal showing type of paint and the mils thickness of coating system used.
 - 12. Drawings showing Installation Contractor field verifications illustrating all field dimensions. Installation Contractor shall field verify all dimensions and existing materials shown on the Drawings. Any modifications required shall be at Installation Contractor’s expense.

1.2 PROCEDURE

- A. Submit Shop Drawings to ENGINEER.
- B. A letter of transmittal shall accompany each submittal. If data for more than one Section of the Specifications is submitted, a separate transmittal letter shall accompany the data submitted for each Section.
- C. All letters of transmittal shall be submitted in duplicate.
- D. At the beginning of each letter of transmittal, provide a reference heading indicating the following:

- 1. OWNER'S Name: _____
- 2. Project Name: _____
- 3. Contract No.: _____
- 4. Transmittal No.: _____
- 5. Section No.: _____

- E. If a Shop Drawing deviates from the requirements of the Contract Documents, Manufacturer shall specifically note each variation in his letter of transmittal.
- F. All Shop Drawings submitted for approval shall have a title block with complete identifying information satisfactory to ENGINEER.
- G. All Shop Drawings submitted shall bear the stamp of approval and signature of Manufacturer as evidence that they have been reviewed and verified to the completeness of the submittal by Manufacturer. Submittal without this stamp of approval will not be reviewed by ENGINEER and will be returned to Manufacturer. Manufacturer's stamp shall contain the following minimum information:

Project Name: _____
 Manufacturer's Name: _____
 Date: _____

-----Reference-----

Item: _____
 Specifications:
 Section: _____
 Page No.: _____
 Page No.: _____
 Drawing No.: _____ of _____
 Location: _____
 Submittal No.: _____
 Approved By: _____

- H. Manufacturer shall utilize the submittal identification numbering system as follows:
 - 1. The Submittal Number shall be a separate and unique number correlating to each individual submittal that is required to be tracked as a separate and unique item. The Submittal Number shall be a two part, eight character, alpha/numeric number assigned by Manufacturer in the following manner:
 - a. The first part of the Submittal Number shall consist of five characters that pertain to the applicable Specification Section number.

- b. The second part of the Submittal Number shall consist of three digits (numbers 001 to 999) to number each separate and unique submittal submitted under each Specification Section.
 - c. A dash shall separate the two parts of the Submittal Number.
 - d. A typical Submittal Number for the third Working Drawing submitted under Section 15101, Ductile Iron Pipe, would be 15101-003.
2. The Review Cycle shall be a three-digit number indicating the initial submission or resubmission of the same submittal. For example:

001 = First (initial) submission.
 002 = Second submission (first resubmission).
 003 = Third submission (second resubmission).

3. An example of the typical submittal identification numbers for the first submission of the third submittal submitted under Section 15051, Buried Piping Installation is:

<u>Submittal Number</u>	<u>Review Cycle</u>
15051-003	001

An example of the typical submittal identification numbers for the second submission of the third submittal submitted under Section 15051, Buried Piping Installation is:

<u>Submittal Number</u>	<u>Review Cycle</u>
15051-003	002

- I. Manufacturer shall initially submit to ENGINEER a minimum of five copies of all submittals that are on 11-inch by 17-inch or smaller sheets, and one unfolded reproducible and three prints made from that reproducible for all submittal on sheets larger than 11-inch by 17-inch.
- J. After ENGINEER completes his review, Shop Drawings will be affixed with a stamp and marked with one of the following notations:
 - 1. Approved.
 - 2. Approved as Corrected.
 - 3. Approved as Corrected, Resubmit.
 - 4. Revise and Resubmit.
 - 5. Not Approved.
 - 6. Not Reviewed.
 - 7. For Information Only.
- K. If a submittal is acceptable, it will be marked "Approved" or "Approved as Corrected." Three prints or copies of the submittal will be returned to Manufacturer.

- L. Upon return of a submittal marked "Approved" or "Approved as Corrected," Manufacturer may order, ship or fabricate the materials included on the submittal, provided it is in accordance with the corrections indicated.
- M. If a Shop Drawing marked "Approved as Corrected" has extensive corrections or corrections affecting other Shop Drawings or Work, ENGINEER may require that Manufacturer make the corrections indicated thereon and resubmit the Shop Drawings for record purposes. Such Shop Drawings will have the notation, "Approved as Corrected - Resubmit." The corrected Shop Drawing shall be a pre-condition for payment for the work item of the Shop Drawing.
- N. If a submittal is unacceptable, two copies will be returned to Manufacturer with one of the following notations:
 - 1. "Revise and Resubmit."
 - 2. "Not Approved."
- O. Upon return of a submittal marked "Revise and Resubmit", Manufacturer shall make the corrections indicated and repeat the initial approval procedure. The "Not Approved" notation is used to indicate material or equipment that is not acceptable. Upon return of a submittal so marked, Manufacturer shall repeat the initial approval procedure utilizing acceptable material or equipment.
- P. Shop Drawings shall be submitted well in advance of the need for the material or equipment for construction and with ample allowance for the time required to make delivery of material or equipment after data covering such is approved. Manufacturer and Installation Contractor shall assume the risk for all Work, materials or equipment that are fabricated, delivered or installed prior to the approval of Shop Drawings. Materials or equipment will not be included in periodic progress payments until approval thereof has been obtained in the specified manner.
- Q. ENGINEER will review and process all submittals promptly; a reasonable time shall be allowed for this, for the Shop Drawings being revised and resubmitted, and for time required to return the approved Shop Drawings to Manufacturer.
- R. Manufacturer shall furnish required submittals with complete information and accuracy in order to achieve required approval of an item within two submittals.
- S. Mark each page of a submittal and each individual component submitted with the specification number, paragraph, and subparagraph. Arrange submittal information presentation to appear in the sequence in the Specification Section.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01332

SECTION 01400
QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve CONTRACTOR of responsibility for compliance with the Contract Document requirements.
 - 1. Specified tests, inspections, and related actions do not limit CONTRACTOR's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
 - 2. Requirements for CONTRACTOR to provide quality-assurance and -control services required by ENGINEER, OWNER, or authorities having jurisdiction are not limited by provisions of this Section.
- C. See Divisions 2 through 16 Sections for specific test and inspection requirements.

1.2 DEFINITIONS

- A. **Quality-Assurance Services:** Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- B. **Quality-Control Services:** Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by ENGINEER.
- C. **Mockups:** Full-size, physical assemblies that are constructed on-site. Mockups are used to verify selections made under sample submittals, to demonstrate aesthetic effects and, where indicated, qualities of materials and execution, and to review construction, coordination, testing, or operation; they are not Samples. Approved mockups establish the standard by which the Work will be judged.
- D. **Laboratory Mockups:** Full-size, physical assemblies that are constructed at testing facility to verify performance characteristics.
- E. **Preconstruction Testing:** Tests and inspections that are performed specifically for the Project before products and materials are incorporated into the Work to verify performance or compliance with specified criteria.

- F. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with industry standards.
- G. Source Quality-Control Testing: Tests and inspections that are performed at the source, i.e., plant, mill, factory, or shop.
- H. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- I. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.
- J. Installer/Applicator/Erector: CONTRACTOR or another entity engaged by CONTRACTOR as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
 - 1. Using a term such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to trades people of the corresponding generic name.
- K. Experienced: When used with an entity, "experienced" means having successfully completed a minimum of five previous projects similar in size and scope to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

1.3 CONFLICTING REQUIREMENTS

- A. General: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to ENGINEER for a decision before proceeding.
- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to ENGINEER for a decision before proceeding.

1.4 SUBMITTALS

- A. Qualification Data: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.
- B. Reports: Prepare and submit certified written reports that include the following:
 - 1. Date of issue.
 - 2. Project title and number.
 - 3. Name, address, and telephone number of testing agency.
 - 4. Dates and locations of samples and tests or inspections.
 - 5. Names of individuals making tests and inspections.
 - 6. Description of the Work and test and inspection method.
 - 7. Identification of product and Specification Section.
 - 8. Complete test or inspection data.
 - 9. Test and inspection results and an interpretation of test results.
 - 10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
 - 11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
 - 12. Name and signature of laboratory inspector.
 - 13. Recommendations on retesting and reinspecting.
- C. Permits, Licenses, and Certificates: For OWNER's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.5 QUALITY ASSURANCE

- A. General: Qualifications paragraphs in this Article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- C. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that is similar to those indicated for this Project in material, design, and extent.
- F. Specialists: Certain sections of the Specifications require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
 - 1. Requirement for specialists shall not supersede building codes and regulations governing the Work.
- G. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 548; and with additional qualifications specified in individual Sections; and where required by authorities having jurisdiction, that is acceptable to authorities.
 - 1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
 - 2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.
- H. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- I. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:
 - 1. Build mockups in location and of size indicated or, if not indicated, as directed by ENGINEER.
 - 2. Notify ENGINEER seven days in advance of dates and times when mockups will be constructed.
 - 3. Demonstrate the proposed range of aesthetic effects and workmanship.
 - 4. Obtain ENGINEER's approval of mockups before starting work, fabrication, or construction.
 - 5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
 - 6. Demolish and remove mockups when directed, unless otherwise indicated.
- J. Laboratory Mockups: Comply with requirements of preconstruction testing and those specified in individual Sections in Divisions 2 through 16.

1.6 QUALITY CONTROL

- A. OWNER Responsibilities: Where quality-control services are indicated as OWNER's responsibility, OWNER will engage a qualified testing agency to perform these services.
1. OWNER will furnish CONTRACTOR with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspecting they are engaged to perform.
 2. Costs for retesting and re-inspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to CONTRACTOR, and the Contract Sum will be adjusted by Change Order.
- B. Tests and inspections not explicitly assigned to OWNER are CONTRACTOR's responsibility. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of CONTRACTOR by authorities having jurisdiction, whether specified or not.
1. Where services are indicated as CONTRACTOR's responsibility, engage a qualified testing agency to perform these quality-control services.
 - a. CONTRACTOR shall not employ same entity engaged by OWNER, unless agreed to in writing by OWNER.
 2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
 3. Where quality-control services are indicated as CONTRACTOR's responsibility, submit a certified written report, in duplicate, of each quality-control service.
 4. Testing and inspecting requested by CONTRACTOR and not required by the Contract Documents are CONTRACTOR's responsibility.
 5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- C. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Division 1 Section "Submittal Procedures."
- D. Retesting/Re-inspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and re-inspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- E. Testing Agency Responsibilities: Cooperate with ENGINEER and CONTRACTOR in performance of duties. Provide qualified personnel to perform required tests and inspections.
1. Notify ENGINEER and CONTRACTOR promptly of irregularities or

- deficiencies observed in the Work during performance of its services.
 - 2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
 - 3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
 - 4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through CONTRACTOR.
 - 5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
 - 6. Do not perform any duties of CONTRACTOR.
- F. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
- 1. Access to the Work.
 - 2. Incidental labor and facilities necessary to facilitate tests and inspections.
 - 3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
 - 4. Facilities for storage and field curing of test samples.
 - 5. Delivery of samples to testing agencies.
 - 6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
 - 7. Security and protection for samples and for testing and inspecting equipment at Project site.
- G. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
- 1. Schedule times for tests, inspections, obtaining samples, and similar activities.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
 - 1. Provide materials and comply with installation requirements specified in other Specification Sections.
- B. Protect construction exposed by or for quality-control service activities.

- C. Repair and protection are CONTRACTOR's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 01400

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**SECTION 01630
SUBSTITUTION PROCEDURES**

1.1 PROCEDURE FOR REQUESTING SUBSTITUTION:

- A. In order that the Owner may determine if a proposed, unnamed substitute item shall be allowed for the specified and named equipment/supplier, the information below shall be SUBMITTED A MINIMUM 10 DAYS PRIOR TO PROPOSAL BID DATE.
- B. Written requests must be submitted to the Engineer.
- C. Transmittal Contents:
 - 1. Product identification:
 - a. Manufacturer's name.
 - b. Telephone number and representative contact name.
 - c. Specification section or drawing reference of originally specified product, including discrete name or tag number assigned to original product in the Contract Documents.
 - 2. Manufacturer's literature clearly marked to show compliance of proposed product with Contract Documents.
 - 3. Itemized comparison of original and proposed product addressing product characteristics including but not necessarily limited to:
 - a. Size.
 - b. Composition or materials of construction.
 - c. Weight.
 - d. Electrical or mechanical requirements.
 - 4. Product experience:
 - a. Location of past projects utilizing product including three of the most recent installations where similar equipment by the manufacturer or manufacturer's representative is currently in service; include contact name, telephone number, mailing address, and the names of the Engineer, Owner, and installation contractor; if three installations do not exist, the list shall include all that do exist, if any.
 - b. Available field data and reports associated with proposed product.
 - 5. Data relating to changes in construction schedule.
 - 6. Data relating to changes in cost.
 - 7. Samples:
 - a. As requested by the Engineer/ Owner.

1.2 APPROVAL OR REJECTION:

- A. Written approval or rejection of substitution given by the Engineer.
- B. Engineer reserves the right to require proposed product to comply with color and pattern of specified product if necessary to secure design intent.

- C. In event substitution results in a change in design or time, provisions in General Conditions will be applied for adjustment.
- D. Substitutions will be rejected if:
 - 1. Submittal is not through the Supplier with their written approval product is of equal quality and service.
 - 2. Requests are not made in accordance with this Section.
 - 3. In the Engineer's opinion, acceptance will require substantial revision of the original design.
 - 4. In the Engineer's opinion, substitution will not perform adequately the function consistent with the design intent, including operational and maintenance impacts.

END OF SECTION 01630

**SECTION 01640
MANUFACTURER'S SERVICES**

PART 1 - GENERAL

1.1 DEFINITIONS

- A. Reference Section 01650, FACILITY STARTUP
- B. Person-Day: One person for 8 hours within regular CONTRACTOR working hours.

1.2 SCOPE

- A. Work under this section defines the minimum scope of services to be provided using factory representatives of the manufacturers of the equipment to be installed during installation, start-up, and operator training.
- B. Equipment manufacturers assigned unit responsibility for systems comprised of several components shall provide the service of factory representative from each component manufacturer to perform the duties required under these Specifications. The equipment manufacturer assigned unit responsibility shall be responsible for coordinating the activities of the system component manufacturers.

1.3 SUBMITTALS

- A. Training Schedule: Submit not less than 15 days prior to equipment installation and revise as necessary for acceptance.
- B. Training Materials:
 - 1. Final training materials must be approved by ENGINEER prior to equipment startup and training.
 - 2. Furnish complete outlines of proposed training session, operation and maintenance data for each trainee in attendance.
- C. Quality Control Submittals: As required in the individual Specification, submit:
 - 1. Qualifications of Manufacturer's Representative performing specified services.
 - 2. Manufacturer's Certificate of Proper Installation using form provided by Manufacturer.

1.4 QUALIFICATION

- A. Qualification of the representatives for installation, startup, and operator training purposes shall be an authorized representative of the manufacturer, factory trained, and experienced in the technical applications, installation, operation and maintenance of the equipment being installed and shall be subject to the approval of the ENGINEER. No substitutions of approved representatives will be allowed without the prior written approval of the ENGINEER.

- B. References in various equipment sections of the terms “factory representative” or “field representative” shall mean an employee or contractor of the equipment manufacturer who is trained, articulate, capable of coordinating and expediting training, and familiar with operation and maintenance manual information specified in Section 01782, OPERATION AND MAINTENANCE DATA.

1.5 COORDINATION

- A. Contractor shall notify ENGINEER 72 hours prior to any impending visit by factory representatives so that the ENGINEER may be present.
- B. ENGINEER may approve the services of a manufacturer’s representative for more than one system during the same site visit.
- C. Installation Contractor shall perform the necessary inspections to ensure that all conditions necessary for successful training and/or startup services have been met prior to scheduling manufacturer’s onsite services.

1.6 MINIMUM MANUFACTURER’S SERVICES REQUIREMENTS

- A. Qualified factory representatives shall furnish manufacturer’s services as specified in the Contract Documents.
- B. Where time is specified in the Contract Documents for manufacturer’s services, the specified time shall be considered a minimum time and any time in excess of the specified time stated in the specifications to perform the required manufacturer’s services shall be considered incidental work. ENGINEER approved days of service will be credited to fulfill the specified minimum manufacturer’s services.
- C. Installation Contractor’s training and startup schedule shall coordinate manufacturer’s services to avoid conflicting with other onsite testing or other manufacturer’s services.
- D. Manufacturer’s services will include the following, as applicable to the specific system or equipment items:
 - 1. Installation assistance including observation, guidance, instruction of Installation Contractor’s assembly, erection, installation or applications.
 - 2. Inspection, checking, and adjustment as required for product (system, subsystem, or component) to function as warranted by manufacturer and necessary to furnish written approval of installation.
 - 3. Additional site visits as necessary to address problems and until installation and operation are acceptable to ENGINEER.
 - 4. Perform, coordinate, and assist during functional and performance testing and startup demonstration, and until product acceptance by the ENGINEER.
 - 5. Training of OWNER’S personnel in the operation and maintenance of respective product as required.
 - 6. Completion of Manufacturer’s Certificate of Proper Installation with applicable certificates for proper installation and initial, interim, and final test or service.

1.7 SCHEDULE

- A. Coordinate with Installation Contractor the following.
- B. List specified equipment and systems with respective manufacturers that require training services of manufacturers' representatives and show:
 - 1. Estimated dates for installation completion.
 - 2. Estimated training dates to allow for multiple sessions when several shifts are involved.
- C. Adjust training schedule to ensure training of appropriate personnel as deemed necessary by OWNER, and to allow full participation by manufacturers' representatives. Adjust schedule for interruptions in operability of equipment.

1.8 TRAINING PLAN

- A. Training Plan: Submit for each proposed course:
 - 1. Title and objectives.
 - 2. Schedule of training courses including dates, durations, and locations of each class.
 - 3. Recommended types of attendees (e.g., managers, engineers, operators, maintenance).
 - 4. Course description and outline of course content.
 - 5. Duration.
 - 6. Instruction materials and equipment requirements.
 - 7. Detailed course schedule for each day showing time allocated to each topic.
 - 8. Resumes of instructors providing the training.

1.9 TRAINING OWNER'S PERSONNEL

- A. Manufacturer shall furnish the services of a factory representative to train the operations staff in the operation and maintenance of each item installed under these Specifications. The time required to perform these services shall be shown in the equipment section, but shall be no less than one (1), eight (8) hour day.
- B. Prestartup Training:
 - 1. Coordinate training sessions with operating personnel and manufacturers' representatives, and with submission of operation and maintenance manuals in accordance with Section 01782, OPERATION AND MAINTENANCE DATA.
 - 2. Complete at least 14 days prior to actual startup.
- C. Post-Startup Training: If required in Specifications, furnish and coordinate training of OWNER'S operating personnel by respective manufacturer's representatives.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01640

SECTION 01650
FACILITY STARTUP

PART 1 - GENERAL

1.1 DEFINITIONS

- A. Reference Section 01640, MANUFACTURER'S SERVICES
- B. Functional Test: A test or tests in the presence of the ENGINEER and OWNER to demonstrate that the installed equipment or system meets manufacturer's installation and adjustment requirements and other requirements specified including, but not limited to, noise, vibration, alignment, speed, proper electrical and mechanical connections, thrust restraint, proper rotation, and initial servicing.
- C. Performance Test: A test performed in the presence of the ENGINEER and OWNER and after any required functional test specified, to demonstrate and confirm that the equipment and/or system meet the specified performance requirements.
- D. System: The overall process, or a portion thereof, that performs a specific function. A system may consist of two or more subsystems as well as two or more types of equipment. Examples of systems on this Project are as follows:
 - 1. FRP wetwell, discharge piping, Pre-fabricated Electrical Building.
 - 2. Pumps, motors, variable frequency drives, equipment appurtenances, transducers.
 - 3. Instrumentation and control system(s).

1.2 SCOPE

- A. Work under this Section includes, but is not necessarily limited to, the provision of all labor and material required to perform startup of all equipment and mechanical systems installed under this Contract.
- B. Work defined under this Section includes providing the services of a factory representative in accordance with the requirements of Section 01640 MANUFACTURER'S SERVICES.

1.3 SUBMITTALS

- A. Administrative Submittals:
 - 1. Functional and performance test schedules and plan for equipment, units, and systems at least 15 days prior to start of related testing. Include test plan, procedures, and log format.
 - 2. Schedule and plan of facility startup activities at least 15 days prior to commencement.
- B. Quality Control Submittals:

1. Manufacturer's Certificate of Proper Installation as required.
2. Test Reports: Functional and performance testing, in format acceptable to ENGINEER and certification of functional and performance test for each piece of equipment or system specified.
3. Certifications of Calibration: Testing equipment.

1.4 MANUFACTURER AND INSTALLATION CONTRACTOR FACILITY STARTUP RESPONSIBILITIES

A. General:

1. Perform all Work necessary for functional and performance tests specified in the Contract Documents.
2. Demonstrate proper installation, adjustment, function, performance, and operation of equipment, systems, control devices, and required interfaces individually and in conjunction with process instrumentation and control system.
3. Complete Work associated with the unit and related processes before testing, including related manufacturer's representative services.
4. Installation Contractor shall have, at the plant site, Operation and Maintenance Manuals for equipment to be started.
5. Furnish qualified manufacturer's representatives when required to assist in testing.
6. Utilize the Manufacturer's Certificate of Proper Installation Form from Section 01640, MANUFACTURERS' SERVICES, supplemented as necessary, to document functional and performance procedures, results, problems, and conclusions.
7. Schedule and attend pretest (functional and performance) meetings related to test schedule, plan of test, materials, chemicals, and liquids required, facilities' operations interface, ENGINEER and OWNER involvement.
8. Designate and furnish one or more persons to be responsible for coordinating and expediting Installation Contractor's facility startup duties. The person or persons shall be present during facility startup meetings and shall be available at all times during the facility startup period.
9. Provide temporary valves, gauges, piping, test equipment and other materials and equipment required to conduct testing.

1.5 OWNER/ENGINEER FACILITY STARTUP RESPONSIBILITIES

A. General:

1. Review CONTRACTOR'S test plan and schedule.
2. Witness each functional or performance test.
3. Coordinate other plant operations, if necessary, to facilitate testing.
4. Provide water, power, chemicals, and other items as required for testing, unless otherwise indicated.

B. Startup Test Period:

1. Operate process units and devices, with support of Installation Contractor.
2. Provide sampling, labor, and materials as required and provide laboratory analyses.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TESTING PREPARATION

- A. Cleaning and Checking: Prior to starting functional testing:
1. Calibrate testing equipment for accurate results.
 2. Inspect and clean equipment, devices, connected piping, and structures so they are free of foreign material.
 3. Lubricate equipment in accordance with manufacturer's instructions.
 4. Turn rotating equipment by hand and check motor-driven equipment for correct rotation.
 5. Open and close valves by hand and operate other devices to check for binding, interference, or improper functioning.
 6. Check power supply to electric-powered equipment for correct voltage.
 7. Adjust clearances and torques.
 8. Test piping for leaks.
 9. Balance HVAC systems, measuring airflow (cfm) static pressure, and component pressure losses. Furnish typed report documenting results of balancing.
 10. Obtain completion of applicable portions of Manufacturer's Certificate of Proper Installation in accordance with Section 01640, MANUFACTURERS' SERVICES.
- B. Startup Test Period:
1. As applicable to the equipment furnished, state in writing that all necessary hydraulic structures, piping systems, and valves have been successfully tested; that all necessary equipment systems and subsystems have been checked for proper installation, started, and successfully tested to indicate that they are all operational; that the systems and subsystems are capable of performing their intended functions; and that the facilities are ready for startup and intended operation.
 2. Attend prestartup planning meetings and arrange for attendants by key major equipment manufacturer representatives as required by the Contract Documents.
 3. Designate and provide one or more persons to be responsible for coordinating and expediting Installation Contractor's startup duties.
 4. When plant startup has commenced, schedule remaining Work so as not to interfere with or delay the completion of plant startup. Support the startup activities with adequate staff to prevent delays, process upsets. This staff shall include, but not be limited to, major equipment and system manufacturers' representatives, subcontractors, electricians, instrumentation personnel, millwrights, pipefitters and plumbers.
 5. Supply and coordinate specified manufacturer's plant startup services.
 6. Make adjustments, repairs, and corrections necessary to complete plant startup.
 7. After the plant is operating, complete the testing of those items of equipment, systems, and subsystems which could not be or were not adequately or successfully tested prior to plant startup.

- C. Ready-to-test determination will be by ENGINEER based at least on the following:
 - 1. Notification by CONTRACTOR of equipment and system readiness for testing.
 - 2. Acceptable testing plan.
 - 3. Acceptable Operation and Maintenance Manuals.
 - 4. Receipt of Manufacturer's Certificate of Proper Installation, if specified.
 - 5. Adequate completion of Work adjacent to, or interfacing with, equipment to be tested.
 - 6. Availability and acceptability of manufacturer's representative, when specified, to assist in testing of respective equipment, and satisfactory fulfillment of other specified manufacturers' responsibilities.
 - 7. Equipment and electrical tagging complete.
 - 8. All spare parts and special tools delivered to OWNER.

3.2 FUNCTIONAL TESTING—GENERAL

- A. Begin testing at a time mutually agreed upon by the OWNER, ENGINEER, and Installation Contractor.
- B. ENGINEER will be present during test. Notify in writing OWNER, ENGINEER, and manufacturer's representative(s) at least 10 days prior to scheduled date of functional tests.
- C. Separate items of equipment demonstrated to function properly during subsystem testing may require no further functional test if documentation of subsystem testing is acceptable to ENGINEER.
- D. Conduct functional tests as specified for each equipment item or system.
- E. Demonstrate all operational features and instrumentation and control functions while in automatic mode.
- F. If, in ENGINEER'S opinion, functional test results do not meet requirements specified, the systems will be considered as nonconforming.
- G. Performance testing shall not commence until the equipment or system meets the specified functional tests.

3.3 PERFORMANCE TEST—GENERAL

- A. Begin testing at a time mutually agreed upon by the OWNER, ENGINEER, and Installation Contractor.
- B. ENGINEER will be present during test. Notify in writing OWNER, ENGINEER, and manufacturer's representative(s) at least 15 days prior to scheduled date of functional tests.
- C. Conduct performance tests as specified for each equipment item or system.
- D. Unless otherwise indicated, Installation Contractor shall furnish all labor, materials, and supplies for conducting the test and taking all samples and performance measurements.
- E. Prepare performance test report summarizing test method. Include test logs, pertinent calculations, and Manufacturer's written certification that the equipment or system performs as specified.

3.4 STARTUP TEST PERIOD

- A. A. General:
 - 1. Attend planning meetings and arrange for attendance by key major equipment manufacturer representatives as required by the Contract Documents.
 - 2. When facility startup has commenced, schedule remaining Work so as not to interfere with or delay the completion of facility startup.
 - 3. Support facility startup activities with adequate staff to prevent delays. Such staff shall include, but not be limited to, major equipment and system manufacturer's representatives, electricians, instrumentation and control personnel, millwrights, pipefitters, and plumbers.
 - 4. Furnish and coordinate specified manufacturer's facility startup services.
 - 5. After the facility is operating, complete the testing of those items of equipment, systems, and subsystems which could not or were not successfully tested prior to the startup test period.
- B. Startup Testing:
 - 1. Startup of the entire facility or any portion thereof requires the coordinated operation of the facilities by the CONTRACTOR, subcontractors, OWNER'S operating personnel, and manufacturer's representatives.
 - 2. Startup test period shall occur after all required functional tests have been completed and those performance tests deemed necessary for the safe operation of the entire facility have been completed.
 - 3. Startup of the entire facility or any portion thereof shall be considered complete when, in the opinion of the ENGINEER, the facility or designated portion has operated in the manner intended for 20 continuous days without significant interruption. This period is in addition to any training, functional, or performance test periods specified elsewhere.
 - 4. Signification interruption may include any of the following events:

- a. Failure of CONTRACTOR to maintain qualified onsite startup personnel as schedule.
 - b. Failure to meet specified performance for more than 2 consecutive hours.
 - c. Failure of any critical equipment unit, system, or subsystem that is not satisfactorily corrected within 5 hours after failure.
 - d. Failure of any non-critical unit, system, or subsystem that is not satisfactorily corrected within 8 hours after failure.
 - e. As may be determined by ENGINEER.
5. A significant interruption will require the startup then in progress to be stopped and restarted after corrections are made.
- C. Startup Test Reports: As applicable to the equipment furnished, certify in writing that:
1. Hydraulic structures, piping systems, and valves have been successfully tested.
 2. Equipment systems and subsystems have been checked for proper installation, started, and successfully tested to indicate that they are operational.
 3. Systems and subsystems are capable of performing their intended functions, including fully-automatic.
 4. Facilities are ready for intended operation.

END OF SECTION 01650

SECTION 01782
OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL**1.1 SUMMARY**

- A. This Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
 - 1. Emergency manuals.
 - 2. Operation manuals for systems, subsystems, and equipment.
 - 3. Maintenance manuals for the care and maintenance of products, materials, finishes, systems, and equipment.

- B. See Divisions 16 Sections for specific operation and maintenance manual requirements for the Work in those Sections.

1.2 SUBMITTALS

- A. Manual: Submit 3 copies of each manual in final form at least 15 days before final inspection. ENGINEER will return copy with comments within 15 days after final inspection.
 - 1. Correct or modify each manual to comply with ENGINEER's comments. Submit 3 copies of each corrected manual within 20 days of receipt of ENGINEER's comments.
 - 2.

PART 2 - PRODUCTS**2.1 MANUALS, GENERAL**

- A. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain a title page, table of contents, and manual contents.

- B. Title Page: Enclose title page in transparent plastic sleeve. Include the following information:
 - 1. Subject matter included in manual.
 - 2. Name and address of Project and Project Number.
 - 3. Name and address of OWNER.
 - 4. Date of submittal.
 - 5. Name, address, and telephone number of CONTRACTOR.
 - 6. Name and address of ENGINEER.
 - 7. Cross-reference to related systems in other operation and maintenance manuals.

- C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.
- D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.
 - 1. Binders: Heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch (215-by-280-mm) paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
 - a. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project name and number, and subject matter of contents. Indicate volume number for multiple-volume sets.
 - 2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
 - 3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software diskettes for computerized electronic equipment.
 - 4. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
 - a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
 - b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

2.2 EMERGENCY MANUALS

- A. Content: Organize manual into a separate section for type of emergency, emergency instructions, and emergency procedures.
- B. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component for fire, flood, gas leak, water leak, power failure, water outage, equipment failure, and chemical release or spill.
- C. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of OWNER's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.
- D. Emergency Procedures: Include instructions on stopping, shutdown instructions for

each type of emergency, operating instructions for conditions outside normal operating limits, and required sequences for electric or electronic systems.

2.3 OPERATION MANUALS

- A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and equipment descriptions, operating standards, operating procedures, operating logs, wiring and control diagrams, and license requirements.
- B. Descriptions: Include the following:
 - 1. Product name and model number.
 - 2. Manufacturer's name.
 - 3. Equipment identification with serial number of each component.
 - 4. Equipment function.
 - 5. Operating characteristics.
 - 6. Limiting conditions.
 - 7. Performance curves.
 - 8. Engineering data and tests.
 - 9. Complete nomenclature and number of replacement parts.
- C. Operating Procedures: Include start-up, break-in, and control procedures; stopping and normal shutdown instructions; routine, normal, seasonal, and weekend operating instructions; and required sequences for electric or electronic systems.
- D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.
- E. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.

2.4 PRODUCT MAINTENANCE MANUAL

- A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.
- B. Source Information: List each product included in manual identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.

- C. Product Information: Include the following, as applicable:
 1. Product name and model number.
 2. Manufacturer's name.
 3. Color, pattern, and texture.
 4. Material and chemical composition.
 5. Reordering information for specially manufactured products.
- D. Maintenance Procedures: Include manufacturer's written recommendations and inspection procedures, types of cleaning agents, methods of cleaning, schedule for cleaning and maintenance, and repair instructions.
- E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.
- F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

2.5 SYSTEMS AND EQUIPMENT MAINTENANCE MANUAL

- A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.
- B. Source Information: List each system, subsystem, and piece of equipment included in manual identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual.
- C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including maintenance instructions, drawings and diagrams for maintenance, nomenclature of parts and components, and recommended spare parts for each component part or piece of equipment:
- D. Maintenance Procedures: Include test and inspection instructions, troubleshooting guide, disassembly instructions, and adjusting instructions, and demonstration and training videotape if available, that detail essential maintenance procedures:
- E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
- F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.
- G. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.

- H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

PART 3 - EXECUTION

3.1 MANUAL PREPARATION

- A. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by OWNER's operating personnel for types of emergencies indicated.
- B. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
- C. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.
- D. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
- E. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in Record Drawings to ensure correct illustration of completed installation.
 - 1. Do not use original Project Record Documents as part of operation and maintenance manuals.

END OF SECTION 01782

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SECTION 16060
GROUNDING AND BONDING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes methods and materials for grounding systems and equipment.
 - 1. Underground distribution grounding.
 - 2. Common ground bonding with lightning protection system.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Other Informational Submittals: Plans showing dimensioned as-built locations of grounding features specified in Part 3 "Field Quality Control" Article, including the following:
 - 1. Ground rods.
 - 2. Ground rings.
 - 3. Grounding arrangements and connections for separately derived systems.
 - 4. Grounding for sensitive electronic equipment.
- C. Field quality-control test reports.

- D. Operation and Maintenance Data: For grounding to include the following in emergency, operation, and maintenance manuals:
1. Instructions for periodic testing and inspection of grounding features at ground rings grounding connections for separately derived systems based on NFPA 70.
 - a. Tests shall be to determine if ground resistance or impedance values remain within specified maximums, and instructions shall recommend corrective action if they do not.
 - b. Include recommended testing intervals.

1.4 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with UL 467 for grounding and bonding materials and equipment.

PART 2 - PRODUCTS

2.1 CONDUCTORS

- A. Insulated Conductors: Copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.
- B. Bare Copper Conductors:
 1. Solid Conductors: ASTM B 3.
 2. Stranded Conductors: ASTM B 8.
 3. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG conductor, 1/4 inch in diameter.
 4. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.
 5. Bonding Jumper: Copper tape, braided conductors, terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.

- C. Grounding Bus: Rectangular bars of annealed copper, 1/4 by 2 inches in cross section, unless otherwise indicated; with insulators.

2.2 CONNECTORS

- A. Listed and labeled by a nationally recognized testing laboratory acceptable to authorities having jurisdiction for applications in which used, and for specific types, sizes, and combinations of conductors and other items connected.
- B. Bolted Connectors for Conductors and Pipes: Copper or copper alloy, bolted pressure-type, with at least two bolts.
 - 1. Pipe Connectors: Clamp type, sized for pipe.
- C. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.

2.3 GROUNDING ELECTRODES

- A. Ground Rods: Copper-clad steel, sectional type, 1 inch in diameter (length as required to achieve resistance to ground as specified in 3.5, B).

PART 3 - EXECUTION

3.1 APPLICATIONS

- A. Conductors: All conductors shall be stranded.
- B. Underground Grounding Conductors: Install bare copper conductor, No. 2/0 AWG minimum.
 - 1. Bury at least 24 inches below grade.
- C. Isolated Grounding Conductors: Green-colored insulation with continuous yellow stripe. On feeders with isolated ground, identify grounding conductor where visible to normal inspection, with alternating bands of green and yellow tape, with at least three bands of green and two bands of yellow.

- D. Grounding Bus: Install in electrical and telephone equipment rooms, in rooms housing service equipment, and elsewhere as indicated.
1. Install bus on insulated spacers 1 inch, minimum, from wall 6 inches above finished floor, unless otherwise indicated.
 2. Where indicated on both sides of doorways, route bus up to top of door frame, across top of doorway, down to specified height above floor, and connect to horizontal bus
- E. Conductor Terminations and Connections:
1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.
 2. Underground Connections: Welded connectors, except at test wells and as otherwise indicated.
 3. Connections to Ground Rods at Test Wells: Bolted connectors.
 4. Connections to Structural Steel: Welded connectors.

3.2 GROUNDING UNDERGROUND DISTRIBUTION SYSTEM COMPONENTS

- A. Comply with IEEE C2 grounding requirements.
- B. Grounding Manholes and Handholes: Install a driven ground rod through manhole or handhole floor, close to wall, and set rod depth so 4 inches will extend above finished floor. If necessary, install ground rod before manhole is placed and provide No. 1/0 AWG bare, copper conductor from ground rod into manhole through a waterproof sleeve in manhole wall. Protect ground rods passing through concrete floor with a double wrapping of pressure-sensitive insulating tape or heat-shrunk insulating sleeve from 2 inches above to 6 inches below concrete. Seal floor opening with waterproof, nonshrink grout.
- C. Grounding Connections to Manhole Components: Bond exposed-metal parts such as inserts, cable racks, pulling irons, ladders, and cable shields within each manhole or handhole, to ground rod or grounding conductor. Make connections with No. 4 AWG minimum, stranded, hard-drawn copper bonding conductor. Train conductors level or plumb around corners and fasten to manhole walls. Connect to cable armor and cable shields as recommended by manufacturer of splicing and termination kits.

3.3 EQUIPMENT GROUNDING

- A. Install insulated equipment grounding conductors with all feeders and branch circuits.
- B. Install insulated equipment grounding conductors with the following items, in addition to those required by NFPA 70:

1. Feeders and branch circuits.
 2. Lighting circuits.
 3. Receptacle circuits.
 4. Single-phase motor and appliance branch circuits.
 5. Three-phase motor and appliance branch circuits.
 6. Flexible raceway runs.
 7. Armored and metal-clad cable runs.
 8. Busway Supply Circuits: Install insulated equipment grounding conductor from grounding bus in the switchgear, switchboard, or distribution panel to equipment grounding bar terminal on busway.
 9. Computer and Rack-Mounted Electronic Equipment Circuits: Install insulated equipment grounding conductor in branch-circuit runs from equipment-area power panels and power-distribution units.
- C. Air-Duct Equipment Circuits: Install insulated equipment grounding conductor to duct-mounted electrical devices operating at 120 V and more, including air cleaners, heaters, dampers, humidifiers, and other duct electrical equipment. Bond conductor to each unit and to air duct and connected metallic piping.
- D. Water Heater, Heat-Tracing, and Antifrost Heating Cables: Install a separate insulated equipment grounding conductor to each electric water heater and heat-tracing cable. Bond conductor to heater units, piping, connected equipment, and components.
- E. Isolated Grounding Receptacle Circuits: Install an insulated equipment grounding conductor connected to the receptacle grounding terminal. Isolate conductor from raceway and from panelboard grounding terminals. Terminate at equipment grounding conductor terminal of the applicable derived system or service, unless otherwise indicated.
- F. Isolated Equipment Enclosure Circuits: For designated equipment supplied by a branch circuit or feeder, isolate equipment enclosure from supply circuit raceway with a nonmetallic raceway fitting listed for the purpose. Install fitting where raceway enters enclosure and install a separate insulated equipment grounding conductor. Isolate conductor from raceway and from panelboard grounding terminals. Terminate at equipment grounding conductor terminal of the applicable derived system or service, unless otherwise indicated.

- G. Signal and Communication Equipment: For telephone, alarm, voice and data, and other communication equipment, provide No. 4 AWG minimum insulated grounding conductor in raceway from grounding electrode system to each service location, terminal cabinet, wiring closet, and central equipment location.
 - 1. Service and Central Equipment Locations and Wiring Closets: Terminate grounding conductor on a 1/4-by-2-by-12-inch grounding bus.
 - 2. Terminal Cabinets: Terminate grounding conductor on cabinet grounding terminal.
- H. Metal Poles Supporting Outdoor Lighting Fixtures: Install grounding electrode and a separate insulated equipment grounding conductor in addition to grounding conductor installed with branch-circuit conductors.

3.4 INSTALLATION

- A. Grounding Conductors: Route along shortest and straightest paths possible, unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.
- B. Common Ground Bonding with Lightning Protection System: Comply with NFPA 780 and UL 96 when interconnecting with lightning protection system. Bond electrical power system ground directly to lightning protection system grounding conductor at closest point to electrical service grounding electrode. Use bonding conductor sized same as system grounding electrode conductor, and install in conduit.
- C. Ground Rods: Drive rods until tops are 2 inches below finished floor or final grade, unless otherwise indicated.
 - 1. Interconnect ground rods with grounding electrode conductor below grade and as otherwise indicated. Make connections without exposing steel or damaging coating, if any.
- D. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance, except where routed through short lengths of conduit.
 - 1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
 - 2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install so vibration is not transmitted to rigidly mounted equipment.
 - 3. Use exothermic-welded connectors for outdoor locations, but if a disconnect-type connection is required, use a bolted clamp.

E. Grounding and Bonding for Piping:

1. **Metal Water Service Pipe:** Install insulated copper grounding conductors, in conduit, from building's main service equipment, or grounding bus, to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes, using a bolted clamp connector or by bolting a lug-type connector to a pipe flange, using one of the lug bolts of the flange. Where a dielectric main water fitting is installed, connect grounding conductor on street side of fitting. Bond metal grounding conductor conduit or sleeve to conductor at each end.
2. **Water Meter Piping:** Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with a bolted connector.
3. **Bond each aboveground portion of gas piping system downstream from equipment shutoff valve.**

F. Bonding Interior Metal Ducts: Bond metal air ducts to equipment grounding conductors of associated fans, blowers, electric heaters, and air cleaners. Install bonding jumper to bond across flexible duct connections to achieve continuity.

G. Grounding for Steel Building Structure: Install a driven ground rod at base of each corner column and at intermediate exterior columns at distances not more than 60 feet apart.

H. Ground Ring: Install a grounding conductor, electrically connected to each building structure ground rod and to each steel column, extending around the perimeter of building area or item indicated.

1. Install copper conductor not less than No. 2/0 AWG for ground ring and for taps to building steel.
2. Bury ground ring not less than 24 inches from building foundation.

3.5 FIELD QUALITY CONTROL

A. Perform the following tests and inspections and prepare test reports:

1. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.
2. Test completed grounding system at each location where a maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal and at individual ground rods. Make tests at ground rods before any conductors are connected.

- a. Measure ground resistance not less than two full days after last trace of precipitation and without soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance.
 - b. Perform tests by fall-of-potential method according to IEEE 81.
3. Prepare dimensioned drawings locating each test well, ground rod and ground rod assembly, and other grounding electrodes. Identify each by letter in alphabetical order, and key to the record of tests and observations. Include the number of rods driven and their depth at each location, and include observations of weather and other phenomena that may affect test results. Describe measures taken to improve test results.
- B. Report measured ground resistances that exceed the following values:
1. Power and Lighting Equipment or System with Capacity 500 kVA and Less: 5 ohms.
 2. Power and Lighting Equipment or System with Capacity 500 to 1000 kVA: 5 ohms.
 3. Power and Lighting Equipment or System with Capacity More Than 1000 kVA: 3 ohms.
 4. Power Distribution Units or Panelboards Serving Electronic Equipment: 3 ohm.
 5. Substations and Pad-Mounted Equipment: 5 ohms.
 6. Manhole Grounds: 10 ohms.
- C. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Engineer promptly and include recommendations to reduce ground resistance.

END OF SECTION 16060

**SECTION 16100
ELECTRICAL**

1. SCOPE

- A. General: Provide a complete electrical system as described herein and as shown on the drawings.
- B. Items Included: Items under Division 16 shall include but not be limited to:
 - 1. Power and lighting distribution complete beginning with secondary service and extending through all branch circuits.
 - 2. Panelboards, breakers, and switches.
 - 3. Power wiring for all electrically operated equipment.
 - 4. Low Voltage Industrial Motor Control Centers.
 - 5. Automatic or Enclosed Transfer Switch.
 - 6. Adjustable Frequency Drive Controller.
 - 7. Packaged Engine Generator System.
 - 8. Transient Voltage Surge Suppressor.

2. CODES, ORDINANCES AND PERMITS

- A. General: Where requirements of these specifications exceed specified codes and ordinances conform to these specifications. Materials and equipment included in Underwriters' Label Service shall bear that label. Electrical equipment shall be UL approved as installed, unless noted otherwise herein.
- B. Codes: The work covered under this section of specifications shall conform to the following Codes and Standards as applicable:
 - 1. All applicable state and local codes and amendments
 - 2. Institute of Electrical and Electronic Engineers - (2002) IEEE C2 National Electrical Safety Code
 - 3. International Code Council – (2003) ICC IBC International Building Code
 - 4. International Code Council – (2003) ICC IFC International Fire Code
 - 5. International Power Cable Engineer's Association – IPCEA
 - 6. National Electrical Manufacturer's Association - NEMA
 - 7. National Fire Protection Association - NFPA 70 National Electrical Code (2002)
 - 8. National Fire Protection Association - (2002) NFPA 72 National Fire Alarm Code
 - 9. National Fire Protection Association - (2002) NFPA 79 Electrical Standard for Industry Machinery
 - 10. National Fire Protection Association - (2003) NFPA 101 Life Safety Code
 - 11. National Fire Protection Association - (2002) NFPA 110 Standard for Emergency and Standby Power Systems
 - 12. Underwriters Laboratories, Inc. Publications

- C. Permits: See General Conditions

3. COMPLETION OF WORK

- A. Testing: At the completion of work, a test shall be made and the entire system shall be shown to be in perfect working condition. The following shall be made available to personnel conducting the test:
 - 1. Electrician with hand tools.
 - 2. Accurate voltmeter.
 - 3. Clamp-on ammeter.
 - 4. Test lamp.
 - 5. Phase rotation indicator.
 - 6. Complete electrical specifications and drawings with addenda and revisions.
- B. Submittal: Upon completion of work, submit for approval three bound copies of the Certificate of Final Inspection from local authorities.
- C. Instructions: After completion and at a time convenient to the Owner, qualified mechanics shall thoroughly familiarize the Owner's personnel with the operation and the maintenance of the items listed under "Submittal".
- D. Guarantee: All equipment and materials furnished and all work performed under this section of specifications shall be guaranteed to be free of defective materials and workmanship for a period of one year (unless a longer period is specified elsewhere herein) after final acceptance of the work by the Owner. Upon notice from the Owner of failure of any part of the guaranteed equipment or failure of systems to operate properly during the guarantee period, the Contractor at no additional cost to the Owner shall promptly replace the affected part or parts with new parts. All labor required to perform guarantee shall be included as part of the complete guarantee warranty.
- E. Warranties: Provide manufacturer's equipment warranties prior to final inspection.
- F. Record Drawings: Furnish to the General Contractor one set of as-built drawings with all changes to the project neatly drafted.

4. SPACE CONDITIONS

- A. All apparatus shall fit into the available spaces in the building and must be introduced into the building so as not to cause damage to the structure. All equipment requiring service shall be accessible.

5. DRAWINGS

- A. Drawings are diagrammatic and show generally the location of the lighting, lamps, wiring, raceways, switches and accessories and are not to be scaled. All dimensions shall be verified at the building site. Prefabrication of work from

drawings shall be at Contractor's risk.

6. WORKMANSHIP AND MATERIALS

- A. Workmanship: All work necessary to complete the project shall be executed in a thorough, neat, and workmanlike manner.
- B. Materials: All materials shall be new and equipment included in Underwriters Label Service shall bear that label.
- C. Substitutions:
 - 1. Basis of Design: Model numbers indicated herein or shown on the drawings are the Basis of Design. The Contractor may substitute equal and approved equipment from manufacturers listed in this specification or set forth in an addendum provided said equipment meets all requirements of the plans and specifications, and will fit in the available spaces in the building as shown.
 - 2. Prior Approval: Substitutions of specified items will be considered only if written request has been submitted and received by the Architect for review at least ten (10) days prior to the receipt of bid proposals. Each request shall include a description of the proposed substitute, the name of material or equipment for which it is to be substituted, drawings, cuts, performance and test data for an evaluation and a statement from the equipment manufacturer's representative that the items to be substituted meet or exceed the specifications of the item substituted for.
 - 3. Addenda: If the substitution is allowed, such approval will be set forth in an addendum.
- D. Costs: All costs incurred by the acceptance of substitutions shall be borne by the Contractor.

7. SHOP DRAWINGS AND CUTS

- A. Contractor's Approval: Each copy of shop drawings and cuts shall be signed and dated by Contractor as evidence of checking to ensure compliance with plans and specifications. Unsigned drawings will be returned.
- B. Submittals: Shall be assembled, bound in a 3-ring binder with an index sheet showing general and subcontractor's name, address, phone number, and contact person and shall be submitted at one time unless unavailable drawings would delay project. Submittal shall include but not be limited to:
 - 1. Motor Control Centers
 - 2. Panelboards
 - 3. Transformers
 - 4. Circuit Breakers
 - 5. Disconnect Switches
 - 6. Starters and Contactors
 - 7. Wiring Devices and Plates

8. Adjustable Frequency Drive Controller
9. Soft Start Controller
10. Lighting Fixtures
11. Conduit and Wire
12. Transient Voltage Surge Suppression
13. Enclosed Transfer Switch
14. Control Panels
15. Packaged Engine Generator System

8. APPARATUS UNDER OTHER SECTIONS

- A. General: No roughing shall be done until roughing drawings are furnished.
- B. Other Equipment (Pumps, Controls, etc.): Connect for operation and provide any appurtenances required for operation. Refer to appropriate sections of these specifications and shop drawings for more details.

9. CONDUIT

- A. General: Conduit underground and inside chlorine building shall be Schedule 80 PVC except conduit between transducer and transmitter shall be aluminum and bonded as shown on the drawings. Conduit under asphalt drives and parking shall be concrete encased. Elsewhere conduit shall be rigid aluminum. Underground PVC shall transition to aluminum 12" below grade. Conduit through concrete walls and slabs shall be PVC coated rigid.
- B. Connectors and Couplings: Same material and finish as raceway. Rigid shall be threaded. Indenter or setscrew types are not acceptable.
- C. Threads: Cut clean and remove rough edges. Running threads shall not be used.
- D. Pullboxes: Specified in NEC Article 370.
- E. Insulating Bushings: On all conduits entering raceways, pullboxes, cabinets, stubs, panelboards, switchboard, and motor control centers.
- F. Connections to Motors: Where over 18" from walls or column, a vertical conduit, minimum size 3/4" attached to ceiling and floor with wiring into and from this conduit with flexible conduit and condulets.
- G. Expansion Fittings: Appleton, Crouse-Hinds or O.Z. at all expansion joints.
- H. Capping: Cap conduits exposed during construction to prevent entrance of moisture or foreign matter, use T&B Push-Pennies.
- I. Plugging: All conduit runs which extend from interior to exterior of building shall be sealed to prevent the circulation of air. This shall be done by stuffing the conduit ends with wicking where the conduit run terminates inside the building in the outlet box or panel, as the case may be.

- J. Manufacturers: Allied, Carlon, Cantex, Certainteed, Wheatland, or Indalex.
- K. Conduit Routing:
1. Clearances: Maintain 3" crossing hot piping and 12" paralleling.
 2. Concealed: Where possible.
 3. Exposed Routings: Run parallel or at right angles to the building lines.
 4. Supports: Individual runs shall be anchored in place within 3' of changes in direction and at intervals not over 8' by means of straps or clamps specifically designed for the purpose. Wire, hanger iron, nails, and other means shall not be used. Do not strap to the piping. Multiple runs shall be supported by assemblies or trapeze type hangers to provide a rigid installation. Anchor supports by means of toggle bolts on hollow masonry units, expansion anchors on solid masonry units and machine screws in steelwork. Conduit shall not be supported from ceiling system. All hangers, straps, struts, bolts, screws, nuts, washers, etc. shall be aluminum or stainless steel.
 5. Firestopping: Seal conduit penetrations in fire rated walls, partitions, floors and ceilings with Dow Corning, Silicone RTV or 3M fire barrier compounds.
- L. All raceways shall have an insulated copper system ground conductor.
- M. Conduit Installed Below Grade:
1. Bury conduit minimum 24".
 2. Install 6" wide detectable Extra Strength Terratape within 6" of finished grade above all conduits and/or duct banks installed below grade.

10. FLEXIBLE METAL CONDUIT

- A. General: Short lengths for connection to rotating or vibrating machinery or equipment. B-X cable is not acceptable. Flexible connections to motors shall not be less than four diameters nor more than 24" in length and shall be liquid-tight neoprene-coated for motor connections and where subjected to moisture. Provide separate grounding conductor in flexible conduits.
- B. Connectors: Aluminum. Fittings that anchor the conduit by means of setscrews are not acceptable.

11. CONDUCTORS (50 to 600 VOLTS)

- A. General: Minimum size AWG 12 copper with minimum conductance of 98% unless noted otherwise, solid for #10 and smaller, stranded for #8 and larger installed in continuous conduit system.
- B. Taps and Joints: Mechanically and electrically sound. Use 3M Skotch-loks or Ideal Wing Nut for #10 and smaller. Burndy Hydent or T&B Color-Keyed on #8 and larger.

- C. Tape: All joints shall be covered with gum tape and taped over with friction tape. Vinyl plastic tape may be used in lieu of gum and friction tape.
- D. Terminal Lugs: Use for connecting conductors larger than #10 and for all multiple connections to terminals. Burndy Hydent to T&B Color-Keyed.
- E. Lacing: All wiring in cabinets, panels, pullboxes, junction boxes are to be neatly laced and held with T&B Ty-Raps.
- F. Lubricants: Electro Y-ER-EAS, Ideal Wire-Lube or Minerallac 100.
- G. Color Code: Use 3/4" tape bands corresponding to color code on all wire not available with factory applied color-coding. Color code shall be as follows:

<u>Phase</u>	<u>208/120</u>	<u>480/277</u>
A	Blue	Brown
B	Red	Orange
C	Black	Yellow
N	White	White
G	Green	Green

The color-coding shall be permanently posted at each panelboard in accordance with NEC 210-4(d).

- H. Wire Pulling: Not until conduit system is complete.
 - I. Conductor Insulation, Unless Noted Otherwise:
 1. No. 8 and Smaller: Type "THWN-THHN"
 2. No. 6 and Larger: Type "XHHW", "THW"
 - J. Manufacturers: Carol, Collyer, Essex, Guardian, Manhattan, Okonite, Pirelli, Rome, Royal, or Triangle.
12. OUTLET BOXES
- A. General: Provide aluminum or PVC outlet boxes of such form and dimensions as to be adapted to their specific usage, location and size and number of conduits connecting thereto. Box type shall match conduit.
 - B. Pullboxes: Material type shall match conduit. Such boxes shall be sized in accordance with NEC requirements.
13. NAMEPLATES
- A. General: Provide for all switchboards, motor control centers, panels, circuit breakers, safety switch, push buttons, control switch, circuit breaker in main distribution switchboard. Mount on exterior of door on all surface panels, interior of flush panels, or on cover plate for push buttons and control switches.

- B. Designation: The usage of each device or circuit shall be etched in 1/4" letters and mounted on device cover except flush panels shall be nameplate mounted inside panel.
- C. Type: White core black bakelite for 208/120 volts and white core orange bakelite for 480/277 volts, adhered with epoxy glue.

14. FUSES

- A. General: Provide in all fused devices, switches, etc. This shall include equipment of other trades. Fuse sizes on drawings are based on design equipment. Contractor shall verify equipment nameplate data and size fuses accordingly.
- B. Types:
 - 1. 601 to 6000 Amps - Class L Bussman KRP-C-SP.
 - 2. 600 Amps or Less - Class RK-1 Bussman LPN-RK-SP (250V) or LPS-RK-5P (600V).
- C. Manufacturers: Bussman as specified or by Reliance, General Electric or Ferraz Shawmut.
- D. Spare Fuses: Prior to Final Inspection, provide minimum three (3) spare fuses for each type of fuse used on project.

15. SAFETY SWITCH, HEAVY DUTY

- A. General: Provide heavy-duty safety switches having the electrical characteristics, ratings and modifications shown on the drawings. All switches shall have a handle whose position is easily recognizable that is integral with the switch base and is padlockable in the "OFF" position; visible blades, reinforced fuse clips; non-teasible, positive, quick-make, quick-break mechanisms and switch assembly plus operating handle as an integral part of the enclosure base. All switches shall be UL listed, HP rated, shall have defeatable door interlocks that prevent the door from opening when the operating handle is in the "ON" position and shall have line terminal shields.
- B. Manufacturer: General Electric, Square D, Cutler Hammer or Siemens.
- C. Nameplates: Label each device as specified under "Nameplates".

16. MOTOR VOLTAGES

- A. The motor horsepowers, voltages and phases are the estimated power requirements of all equipment furnished under other sections of these specifications. If the contractor selects equipment with larger horsepowers, different voltages, or phases, the circuits (wire and conduit) and protective devices (circuit breakers or switches and starters), both size and poles, shall be changed for the ampacity, voltage, and phase actually to be installed. In no case shall the circuit KVA be less than that specified. The contractor shall coordinate with trades to this end at no additional cost to the contract.

17. UNDERGROUND DUCT WITH CONCRETE ENCASEMENT

- A. Construct underground duct lines of individual conduits encased in concrete under asphalt drives and parking area. Conduit shall be PVC Type EB-35. Concrete encasement surrounding the bank shall be rectangular in cross-section and shall provide at least 3" of concrete cover for ducts. Separate conduits by a minimum concrete thickness of 2". Top of the concrete encasement shall not be less than 24" below grade. Stagger conduit joints by rows and layers to strengthen the duct bank. Provide plastic duct spacers that interlock vertically and horizontally. Spacer assembly shall consist of base spacers, intermediate spacers, and top spacers to provide a completely enclosed and locked-in duct bank. Install spacers per manufacturer's instructions, but provide a minimum of two spacer assemblies per 10 feet of duct bank. Before pouring concrete, anchor duct bank assemblies to prevent the assemblies from floating during concrete pouring. Anchoring shall be done by driving reinforcing rods adjacent to every other duct spacer assembly and attaching the rod to the spacer assembly.

18. GROUNDING

- A. General: Provide grounding for the following items as required by National Electrical Code and as indicated and specified herein:
1. Conduit and other conductor enclosure.
 2. Neutral or grounded conductor of interior wiring system.
 3. All panelboards, safety switches, non-current carrying parts of fixed equipment, such as motor and starters.
 4. Provide a separate grounding conductor in all conduits.
 5. Provide a grounding conductor for ground pole on each receptacle and toggle switch.
 6. The building electrical system shall be a solid grounded wye supplemented with equipment grounding systems. Where possible, ground electrical system to building steel and metal water service.
 - a. Ground rods shall be 3/4" copper weld rods 10'-0" in length. Not more than four 10'-0" rods shall be required and these shall be installed not less than ten feet apart.
 - b. Top of ground rods shall be twelve inches below finished grade. Connections to ground rods shall be made by chemical weld process.
 - c. Resistance to ground shall not exceed twenty-five ohms.
 - d. Upon completion of the ground rod installation, the Contractor shall test the installation. Ground resistance readings shall not be taken within forty-eight hours of rainfall.
 - e. Each ground rod installation shall be tested after all connection to ground rods are made but before grounding conductor connection is made to the building cold water system. Ground rod installations shall be tested by "fall of potential" measuring method using ground resistance test meter and two auxiliary electrodes

driven into the earth, interconnected through the meter with the ground rod installation being tested. Placement of auxiliary electrodes shall be in accordance with operating instructions of test meter, but in no case shall auxiliary current electrodes be placed within seventy feet of the grounding system being tested. Test data shall indicate placement of auxiliary electrodes with respect to system being tested; date readings were taken and lowest resistance recorded.

- f. Three (3)-typewritten copies of the test shall be submitted to the Engineer for approval.
 - g. If the resistance to ground is above twenty-five ohms after installation of four ground rods, provide test information to engineer.
7. Provide "TW" copper wire to water pipe for telephone equipment as directed by Telco.

19. WIRING DEVICES

A. General: Provide devices as specified herein and as shown on the drawings. Receptacles not specified herein nor scheduled on drawings but shown on the drawings shall be of similar construction and NEMA configuration.

B. Devices:

- | | | |
|----|------------------------------------|---------------|
| 1. | <u>Switches:</u> | <u>Cooper</u> |
| | SPST | 1221-I |
| | Three-Way | 1223-I |
| | Motor Rated (Surface) | 6808GDAC |
| | Motor Rated (Flush) | 6808FDAC |
| 2. | <u>Convenience Outlets: Cooper</u> | |
| | Simplex | 5251-I |
| | Duplex | 5252-I |

(20A-120V)

Receptacles on dedicated circuit shall be 20 AMP rated Ground Fault GF 5242-I.

- 3. Other Special Outlets: Refer to schedule on drawings. Provide one mating plug with each special outlet. Provide a 1/2" x 1-1/2" nameplate with rating engraved in 3/16" letters on all special outlets.

C. Alternate Manufacturers: Leviton, Hubbell, Pass & Seymour.

20. DEVICE PLATES

- A. General: Provide suitable plate for all outlets and install with all edges in contact with finished wall. Mount plates vertically.
- B. Gangs: Where two or more devices are shown adjacent, they shall be mounted in ganged boxes and covered with one faceplate.

- C. Size: Plates shall be standard size, except where necessary to cover masonry openings jumbo plates shall be used.
- D. Finish:
 - 1. Device plates on exposed boxes shall be galvanized steel.
 - 2. Weatherproof covers shall be Tay Mac 20310.
 - 3. All other device plates shall be satin stainless steel.

21. LIGHTING FIXTURES

- A. General: Provide lighting fixtures of types and sizes as indicated on drawings complete with plaster frames, supports and mounting accessories. Fixtures shall be left clean at completion of project.
- B. Ballast:
 - 1. Fluorescent: Electronic, rapid start, high power factor (.99 min.), Class P as manufactured by Motorola or approved equal. Ballast shall have total harmonic distortion of less than 10 percent and third harmonic distortion of less than 6 percent.
 - 2. High Pressure Sodium, Mercury Vapor or Metal Halide: High power factor, constant wattage type. Indoor units shall be encapsulated type with an "A" sound rating.
 - 3. Ballasts in luminaries installed out of doors or in cooler/freezers shall have ambient temperature rating of -20°F .
- C. Lenses: All flat plastic lenses shall be one hundred percent virgin acrylic with minimum thickness of 0.125 inches (not nominal 0.125).
- D. Suspension:
 - 1. Grid Troffers: Omit hangers and fasten to inverted tees with hold down clips.
 - 2. Surface and Recessed Incandescent: For ceiling support systems with members 2' on center, use fixture support brackets supplied by manufacturer. Where no bracket is supplied by manufacturer and where span exceeds 2', provide two 1-5/8" x 7/8" x 12 gauge minimum channels spanning ceiling supports except as noted. Secure fixture supports to ceiling supports with 18 gauge stainless steel wire ties.
 - 3. Flanged Troffers, Surface Fluorescent or Recessed H.I.D.: Support from structural system with two 3/8" threaded rods unless otherwise noted. Use nut and locknut to secure fixture. For fixtures not connected with flexible conduit, the Contractor shall verify exact location of fixture knockouts and wireway prior to roughing outlet box.
- E. Structural System Attachments:
 - 1. Poured-in-Place Concrete or Precast Solid Masonry: Concrete expandable

anchors unless otherwise noted.

2. Steel Bar Joists or Steel Beams: 1-5/8" x 3/4" x 12 gauge channel bolted to top chords. Drill channel and secure threaded rods to channel with nut and locknut unless otherwise noted.
3. Along Bar Joist or Steel Beam Center Line: F&M Fig. 255, Grinnell Fig. 88 or Elcen Fig. 29 beam clamps unless noted otherwise.

F. Fixture Ceiling Compatibility: Fixture numbers scheduled are for general design only (i.e. size, number of lamps, lens, etc.). Contractor is to verify type ceiling system (plaster, sheetrock, grid, spline, etc.) to be used and order appropriate fixtures complete with all necessary accessories as required for ceiling system.

G. Manufacturer: As scheduled on drawings.

22. LAMPS

A. General: Provide for all fixtures. Fixtures shall be left clean and lamps burning at completion of project.

B. Manufacturer: General Electric, Norelco, Sylvania, or Westinghouse.

1. Fluorescent: T-8, 32 watt, 2850 initial lumens (minimum), 3500EK by GE or equal.
2. Incandescent: 130-volt type as scheduled on drawings.
3. High Pressure Sodium: Clear.
4. Mercury Vapor: Deluxe white.
5. Metal Halide: Clear.

23. PHOTOELECTRIC CONTROLS

A. All photoelectric controls shall be made in the United States of America and shall conform to all EEI and NEMA specifications. All controls shall be UL listed where applicable. Minimum wattage/VA ratings shall be 1000 W/1800 VA and shall be suitable for operation from 105 to 285 volts, unless otherwise specified. All controls shall be factory preset to turn on at one foot candle and be field adjustable. All photoelectric controls shall be of the plug-in type and be Area Lighting Research, Inc. BF-PV, Precision Multiple Controls, Inc., or AMF Paragon.

24. TELEPHONE CONDUIT SYSTEM

- A. General: Provide entrance, backboard, outlets and raceways at locations shown on the drawings.
- B. Entrance: Provide conduit as shown on drawings to extend from the street to new backboard.
- C. Backboard: See "Backboards".
- D. Wall Outlets: Flush boxes with blank plates.

- E. Raceway: 1" to telephone backboards. Leave #16 galvanized pull-wire or nylon cord in conduits.

25. MAIN DISCONNECT

- A. General: Contractor shall coordinate location of main disconnect with local authorities before beginning work.

END OF SECTION 16100

SECTION 16415
TRANSFER SWITCHES

PART 1 - GENERAL

1.1 SCOPE

- A. Furnish, test and place into operation the automatic transfer switch with features, accessories, enclosures, number of poles, amperage, voltage and withstand current ratings as shown on the Drawings and in accordance with these Specifications.
- B. The automatic transfer switch shall be provided as part of the emergency generator package.
- C. The equipment shall be provided with a warranty for parts and labor for a period of twelve months from the initial start-up date.

1.2 RELATED DOCUMENTS

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

1.3 SUMMARY

- A. This Section includes transfer switches rated 600 V and less, including the following:
 - 1. Automatic transfer switches.
- B. Related Sections include the following:
 - 1. Division 16 Electrical

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated. Include rated capacities, weights, operating characteristics, furnished specialties, and accessories.
- B. Shop Drawings: Dimensioned plans, elevations, sections, and details showing minimum clearances, conductor entry provisions, gutter space, installed features and devices, and material lists for each switch specified.
- C. Qualification Data: For manufacturer.
- D. Field quality-control test reports.

- E. Operation and Maintenance Data: For each type of product to include in emergency, operation, and maintenance manuals. In addition to items specified in Division 1 Section "Operation and Maintenance Data," include the following:
1. Features and operating sequences, both automatic and manual.
 2. List of all factory settings of relays; provide relay-setting and calibration instructions, including software, where applicable.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Maintain a service center capable of providing training, parts, and emergency maintenance repairs within a response period of less than eight hours from time of notification.
- B. Source Limitations: Obtain automatic transfer switches through one source from a single manufacturer.
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- D. Comply with NEMA ICS 1.
- E. Comply with NFPA 70.
- F. The manufacturer shall have a certified service center within one-hundred fifty (150) miles of Fort Walton Beach, Florida. The service center shall have qualified trained in the service of the installed equipment.
- G. Provide services of a manufacturer's representative specifically trained on the type of equipment specified. Submit qualifications of the representative for approval. The manufacturer's representative for the equipment specified herein shall be present at the job site for a minimum of one (1) day, travel time excluded, for installation inspection, performance testing and training of owner's personnel. Factory trained representatives shall have complete knowledge of proper operation and maintenance and shall be capable of instructing representatives of the Owner on proper operation and maintenance. If there are difficulties in operation of the equipment due to the manufacturer's design or fabrication, additional service shall be provided at no additional cost to the Owner.
- H. Man-day requirements listed herein are exclusive of travel time, and do not relieve Contractor of obligation to provide sufficient service to place equipment in satisfactory operation. This instruction period shall be scheduled at least 10 days in advance with the Owner and shall take place prior to start-up and acceptance by the Owner. The final copies of operation and maintenance manuals specified in Section 01782 must have been delivered to the Owner prior to scheduling the instruction period with the Owner.

- I. Provide service and maintenance of transfer switches for one year from Date of Final Acceptance.
- J. The automatic transfer switch manufacturer shall demonstrate at least ten years of continuous field operating experience in automatic transfer switch design and fabrication within the last fifteen years. Submit customer/user list with telephone numbers, addresses and names of customer/user representatives.
- K. The manufacturer of the assembly shall be the manufacturer of major components and control modules installed within the assembly.
- L. The manufacturer shall provide a notarized letter certifying compliance with all the requirements of this specification. The certification shall identify, by serial number, the equipment involved. No exceptions to this specification, other than those stipulated at the time of submittal, shall be included in the certification.
- M. The manufacturer shall maintain records of each switch, by serial number, for a minimum of 20 years

1.6 COORDINATION

- A. Coordinate size and location of concrete bases. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified in Division 3.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Square D
 - 2. Caterpillar
 - 3. Kohler

2.2 GENERAL TRANSFER-SWITCH PRODUCT REQUIREMENTS

- A. Indicated Current Ratings: Continuous loading and total system transfer, including tungsten filament lamp loads not exceeding 30 percent of switch ampere rating, unless otherwise indicated.
- B. Tested Fault-Current Closing and Withstand Ratings: Adequate for duty imposed by protective devices at installation locations in Project under the fault conditions indicated.

1. Where transfer switch includes internal fault-current protection, rating of switch and trip unit combination shall exceed indicated fault-current value at installation location.
- C. Solid-State Controls: Repetitive accuracy of all settings shall be plus or minus 2 percent or better over an operating temperature range of minus 20 to plus 70 deg C.
- D. Resistance to Damage by Voltage Transients: Components shall meet or exceed voltage-surge withstand capability requirements when tested according to IEEE C62.41. Components shall meet or exceed voltage-impulse withstand test of NEMA ICS 1.
- E. Neutral Terminal: Solid and fully rated, unless otherwise indicated.
- F. Heater: Equip switches exposed to outdoor temperatures and humidity, and other units indicated, with an internal heater. Provide thermostat within enclosure to control heater.
- G. Factory Wiring: Train and bundle factory wiring and label, consistent with Shop Drawings, either by color-code or by numbered or lettered wire and cable tape markers at terminations. Color-coding and wire and cable tape markers are specified in Division 16 Section "Electrical Identification."
 1. Designated Terminals: Pressure type, suitable for types and sizes of field wiring indicated.
 2. Power-Terminal Arrangement and Field-Wiring Space: Suitable for top, side, or bottom entrance of feeder conductors as indicated.
 3. Control Wiring: Equipped with lugs suitable for connection to terminal strips.
- H. Enclosures: General-purpose NEMA 250, Type 1, complying with NEMA ICS 6 and UL 508, unless otherwise indicated.

2.3 CIRCUIT BREAKER STYLE AUTOMATIC TRANSFER SWITCHES

- A. Switching Arrangement: Double-throw type, incapable of pauses or intermediate position stops during normal functioning, unless otherwise indicated.
- B. Manual Switch Operation: Under load, with door closed and with either or both sources energized. Transfer time is same as for electrical operation. Control circuit automatically disconnects from electrical operator during manual operation.
- C. Signal-Before-Transfer Contacts: A set of normally open/normally closed dry contacts operates in advance of retransfer to normal source. Interval is adjustable from 1 to 30 seconds.
- D. Digital Communication Interface: Provide Ethernet communication to station control system.
- E. Automatic Transfer-Switch Features:

1. Under-voltage Sensing for Each Phase of Normal Source: Sense low phase-to-ground voltage on each phase. Pickup voltage shall be adjustable from 85 to 100 percent of nominal, and dropout voltage is adjustable from 75 to 98 percent of pickup value. Factory set for pickup at 90 percent and dropout at 85 percent.
2. Adjustable Time Delay: For override of normal-source voltage sensing to delay transfer and engine start signals. Adjustable from zero to six seconds, and factory set for one second.
3. Voltage/Frequency Lockout Relay: Prevent premature transfer to generator. Pickup voltage shall be adjustable from 85 to 100 percent of nominal. Factory set for pickup at 90 percent. Pickup frequency shall be adjustable from 90 to 100 percent of nominal. Factory set for pickup at 95 percent.
4. Time Delay for Retransfer to Normal Source: Adjustable from 0 to 30 minutes, and factory set for 10 minutes to automatically defeat delay on loss of voltage or sustained under-voltage of emergency source, provided normal supply has been restored.
5. Test Switch: Simulate normal-source failure.
6. Switch-Position Pilot Lights: Indicate source to which load is connected.
7. Source –Available Indicating Lights: Supervise sources via transfer-switch, normal- and emergency-source sensing circuits.
 - a. Normal Power Supervision: Green light with nameplate engraved “Normal Source Available.”
 - b. Emergency Power Supervision: Red light with nameplate engraved “Emergency Source Available.”
8. Unassigned Auxiliary Contacts: Two normally open, single-pole, double-throw contacts for each breaker position, rated 10 A at 240-V ac.
9. Transfer Override Switch: Overrides automatic retransfer control so automatic transfer switch will remain connected to emergency power source regardless of condition of normal source. Pilot light indicates override status.
10. Engine Starting Contacts: One isolated, normally closed and one isolated, normally open, rated 10A at 32-V dc minimum.
11. Engine Shutdown Contacts: Time delay adjustable from zero to five minutes; factory set for five minutes. Initiates shutdown at remote engine-generator controls after retransfer of load to normal source.
12. Engine-Generator Exerciser: Solid-state, programmable-time switch starts engine-generator set and transfers load to it from normal source for a preset time, then retransfers and shuts down engine after a preset cool-down period. Initiates exercise cycle at preset intervals adjustable from 7 to 30 days. Running periods are adjustable from 10 to 30 minutes. Factory settings are for 7-day exercise cycle, 20-minute running period, and 5-minute cool-down period. Exerciser features include the following:
 - a. Exerciser Transfer Selector Switch: Permits selection of exercise with and without load transfer.
 - b. Push-button programming control with digital display of settings.
 - c. Integral battery operation of time switch when normal control power is not available.
13. The following shall be installed on the Automatic Transfer Switch such that the operator shall be capable of monitoring both the normal and emergency sources

simultaneously:

- a. Analog ammeters.
 - b. Analog voltmeters.
 - c. Selector switches.
14. The automatic transfer switch shall be provided with the option annunciator module to allow all of the warning and alarm conditions to be monitored by the Owner's remote SCADA system. The points shall be provided by dedicated outputs that shall be connected to the on-site pump station controller.

2.4 SOURCE QUALITY CONTROL

- A. Factory test and inspect components, assembled switches, and associated equipment. Ensure proper operation. Check transfer time and voltage, frequency, and time-delay settings for compliance with specified requirements. Perform dielectric strength test complying with NEMA ICS 1.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Floor-Mounting Switch: Anchor to floor by bolting.
 1. Concrete Bases: 4 inches high, reinforced, with chamfered edges. Extend base no more than 4 inches in all directions beyond the maximum dimensions of switch, unless otherwise indicated. Construct concrete bases according to Division 16 Section.
- B. Identify components according to Division 16 Section "Electrical Identification."
- C. Set field-adjustable intervals and delays and relays.

3.2 CONNECTIONS

- A. Wiring to Remote Components: Match type and number of cables and conductors to control and communication requirements of transfer switches as recommended by manufacturer. Increase raceway sizes at no additional cost to Owner if necessary to accommodate required wiring.
- B. Ground equipment according to Division 16 Section "Grounding and Bonding."
- C. Connect wiring according to Division 16 Section "Conductors and Cables."

3.3 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust components, assemblies, and equipment installations, including connections. Report results in writing.
- B. Perform tests and inspections and prepare test reports.
 - 1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installation, including connections, and to assist in testing.
 - 2. After installing equipment and after electrical circuitry has been energized, test for compliance with requirements.
 - 3. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
 - 4. Measure insulation resistance phase-to-phase and phase-to-ground with insulation-resistance tester. Include external annunciation and control circuits. Use test voltages and procedure recommended by manufacturer. Comply with manufacturer's specified minimum resistance.
 - a. Check for electrical continuity of circuits and for short circuits.
 - b. Inspect for physical damage, proper installation and connection, and integrity of barriers, covers, and safety features.
 - c. Verify that manual transfer warnings are properly placed.
 - d. Perform manual transfer operation.
 - 5. After energizing circuits, demonstrate interlocking sequence and operational function for each switch at least three times.
 - a. Simulate power failures of normal source to automatic transfer switches and of emergency source with normal source available.
 - b. Simulate loss of phase-to-ground voltage for each phase of normal source.
 - c. Verify time-delay settings.
 - d. Verify pickup and dropout voltages by data readout or inspection of control settings.
 - e. Test bypass/isolation unit functional modes and related automatic transfer-switch operations.
 - f. Perform contact-resistance test across main contacts and correct values exceeding 500 microhms and values for 1 pole deviating by more than 50 percent from other poles.
 - g. Verify proper sequence and correct timing of automatic engine starting, transfer time delay, retransfer time delay on restoration of normal power, and engine cool-down and shutdown.
 - 6. Ground-Fault Tests: Coordinate with testing of ground-fault protective devices for power delivery from both sources.
 - a. Verify grounding connections and locations and ratings of sensors.

- C. Coordinate tests with tests of generator and run them concurrently.
- D. Report results of tests and inspections in writing. Record adjustable relay settings and measured insulation and contact resistances and time delays. Attach a label or tag to each tested component indicating satisfactory completion of tests.
- E. Remove and replace malfunctioning units and retest as specified above.
- F. Infrared Scanning: After Substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scan of each switch. Remove all access panels so joints and connections are accessible to portable scanner.
 - 1. Follow-up Infrared Scanning: Perform an additional follow-up infrared scan of each switch 11 months after date of Substantial Completion.
 - 2. Instrument: Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.
 - 3. Record of Infrared Scanning: Prepare a certified report that identifies switches checked and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

3.4 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain transfer switches and related equipment as specified below.
- B. Coordinate this training with that for generator equipment.

END OF SECTION 16415

SECTION 16622
PACKAGED GENERATOR SYSTEM

PART 1 - GENERAL

1.1 SCOPE

- A. This is a performance specification for a Standby Emergency Generator Power System.
- B. This section includes the performance specification for providing the standby power generation and includes, but is not limited to, a packaged engine generator system, weatherproof housing, exhaust silencer and fittings, fuel system, control panel, battery and charger, automatic transfer switch, and appurtenances, connections, and supplies required to provide a fully functioning system.
- C. The following references shall be followed for the design of the emergency power generation system.
 - 1. ANSI/NEMA 250: Enclosures for electrical equipment (1,000 volts maximum).
 - 2. ANSI/NEMA MG 1: Motors and generators.
 - 3. ANSI/NFPA: National electrical code.
 - 4. NFPA 110 Level 1.
 - 5. ANSI/NFPA 99: Health care facilities.
 - 6. ANSI/NEMA AB 1: Molded case circuit breakers.
 - 7. NEMA ICS 1: General Standards for industrial Control and Systems.
 - 8. NEMA ICS 2: Standards for Industrial Control Devices, Controllers, and Assemblies.
 - 9. NEMA ICS 6: Enclosures for Industrial Controls and Systems.
- D. The following documents are required before the Owner will accept the system for ownership and maintenance:
 - 1. Submit shop drawings showing plan and elevation views with overall and interconnection point dimensions, fuel consumption rate curves at various loads, ventilation and combustion requirements, and electrical diagrams including schematic and interconnection diagrams.
 - 2. Submit product data showing dimensions, weights ratings, interconnection points, and internal wiring diagrams for engine, generator, control panel, battery, battery rack, battery charger, exhaust silencer, vibrator isolators, fuel system, radiator, and remote annunciator.
 - 3. Submit record of system load test.
 - 4. Accurately record location of engine generator and mechanical and electrical connections.
 - 5. Submit 5 copies of operation and maintenance data upon delivery of the emergency generator.

6. Include instructions for normal operation, routine maintenance requirements, service manuals for engine and fuel system, oil sampling and analysis for engine wear, and emergency maintenance procedures.
7. Provide a full one-year warranty for engine and alternator against wear and defects from date of startup, including the generator and transfer switch.
8. Furnish service and maintenance of emergency generator system for one year every four months from date of startup, whichever occurs first.
9. List of special tools, maintenance materials, and replacement parts.

PART 2 - PRODUCTS

2.1 GENERATOR

- A. The generator shall be one of the following power systems. All control panels, breakers, transfer switches, and other appurtenances shall be provided by the same manufacturer or authorized distributor and will be guaranteed to operate with the system. All parts of the system shall be covered under a single warranty by the generator manufacturer. The accepted generator manufacturer shall have a facility authorized service center within 150 miles of Okaloosa County, FL.
- B. Approved generator manufacturers are:
 1. Caterpillar
 2. Kohler
 3. Generac
- C. Approved automatic transfer switch manufacturers are:
 1. Caterpillar
 2. Kohler
 3. Generac
 4. ASCO
 5. Zenith
- D. Rating: As indicated in the project drawings shall be provided.
 1. Note: The size indicated is based on minimum kW requirements. If the manufacturer does not have the size shown, the next available size shall be used.
- E. Qualifications:
 1. Manufacturer: company specializing in packaged engine generator system with minimum ten years' experience.
 2. Supplier: authorized distributor of engine generator manufacturer with service facilities within 150 miles of Okaloosa County, FL. The service facility must be staffed with a minimum of 4 technicians capable of providing warranty service on the proposed equipment (generator and ATS).
 3. The supplier must carry sufficient inventory to cover no less than 80% parts service within 24 hours and 95% within 48 hours. 80% of the spare parts

inventory necessary to provide service or repairs for each size (as a group) generator set being provided.

2.2 ENGINE

- A. Type: Water-cooled inline or V-type, internal combustion engine, operating at no more than 1800 rpm. A diesel generator shall be provided with skid-mounted double wall fuel storage tank.
- B. The engine shall have a rating sufficient to operate at 100 percent load continuously for the duration of the power outage at the specified elevation and ambient temperature limits. The unit has been sized to start and operate all motors at the location.
- C. The engine shall have an electronic governor.
- D. The generator shall be capable of delivering full load amps with up to 5% total harmonic distortion.
- E. Safety devices: engine shutdown on high water temperature, low oil pressure, over-speed, and engine over-crank. Limits as selected by manufacturer.
- F. Engine Accessories: lube oil filter, intake air filter, lube oil cooler, gear-drive water pump. Include water temperature gage, and lube oil pressure gage on engine-generator control panel. For diesel fuel units, include fuel filter, fuel pumps, fuel priming pumps, fuel primer gage, as required.
- G. Engine starting: DC starting system with positive engagement, number and voltage of starter motors in accordance with manufacturer's instructions. Include remote starting control circuit, with MANUAL-OFF-REMOTE selector switch on engine-generator control panel.
- H. Engine Jacket Heater: thermal circulation type water heater with integral thermostatic control, sized to maintain engine jacket water at 90 degrees F (32 degrees C), and suitable for operation on 208 volts AC.
- I. Radiator: radiator using glycol coolant, with blower type fan, sized to maintain safe engine temperature in ambient temperature of 110 degrees F (43 degrees C). Radiator air flow restriction: 0.5 inches of water (9.34 mm of mercury), maximum.

2.3 GENERATOR

- A. Generator: ANSI/NEMA MG 1; three-phase, four pole, re-connectable brushless synchronous generator with brushless exciter.
- B. Insulation: ANSI/NEMA MG1, Class F.

- C. Temperature Rise: 130 degrees C standby.
- D. Enclosure: ANSI/NEMA MG1; open drip proof.

2.4 AUTOMATIC TRANSFER SWITCH (ATS)

- A. Provide an automatic transfer switch that is recommended by the manufacturer of the generator set and sized as required per the plans. See specification section 16415 for additional ATS requirements.
- B. The ATS shall be rated as UL 1008.
- C. The switch shall be housed in a NEMA 4X enclosure.
- D. The ATS shall be listed as service rated equipment.
- E. Indicating Lights: Mount in cover of enclosure to indicate NORMAL SOURCE AVAILABLE, ALTERNATE SOURCE AVAILABLE, SWITCH POSITION.
- F. Test Switch: Required.
- G. Return To Normal Switch: Mount in cover of enclosure to initiate manual transfer from alternate to normal source.
- H. Transfer Switch Auxiliary Contacts: 1 normally open; 1 normally closed for each of the following signals:
 - 1. Normal Source Available
 - 2. Emergency Source Available
 - 3. Switch Position (both normal and emergency)
- I. Alternate Source Monitor: Monitor alternate source voltage and frequency; inhibit transfer when voltage is below 85 percent or frequency varies more than 3 percent from rated nominal voltage.
- J. Provide adjustable time delay on transfer and re-transfer.
- K. The ATS shall be supplied with surge protection.

2.5 ACCESSORIES

- A. Diesel Fuel System: The fuel storage tank shall be sized (at a minimum) for at least 48 hours of operation at 90% load. Tank shall be double walled painted steel fuel tank used as the base of the generator with fuel gauge, overfill protection, stage II vapor recovery, audible leak detectors, per DEP and EPA requirements. All joints shall be fully welded before preparation and painting. Provide low-level fuel indicator. The painting shall be 100% shop applied as follows:

1. Organic Zinc-rich/Urethane/Urethane Coating System
 - a. Surface Preparation: SSPC-SP6 Commercial Blasting Cleaning
 - b. Prime Coat: Series 90-97 Tnemac-Zinc at 2.5 to 3.5 mils DFT
 - c. Intermediate and Finish: Series 1075 Endura-Shield-Color at 2.0 to 3.0 mils DFT each coat
 - d. Minimum Total DFT: 7.0 mils
 2. In addition, the fuel tank will be manufactured so the bottom of the tank will not come in full contact with the concrete slab.
 3. The fuel tank level shall be monitored and transmitted by a transducer (or similar instrument). The level measurement instrument shall provide a 4-20mA output that can be monitored by the site's control system.
- B. Batteries: Heavy duty, diesel starting type lead-acid storage batteries. Match battery voltage to starting system. Include necessary cables and clamps.
- C. Battery charger: Current limiting type designed to float at 2.17 volts per cell and equalize at 2.33 volts per cell. Include overload protection. Full wave rectifier, DC voltmeter and ammeter, and 120 volts AC fused input. Provide enclosure to meet ANSI/NEMA 250, Type 1 requirements, and unit to be mounted inside of generator enclosure.
- D. Generator Enclosure:
1. Sound Attenuated: Enclosures shall be aluminum construction, with stainless steel hardware. Doors shall be weather-protective seals; keyed and padlockable. Non-hydroscopic sound-insulating materials. The average "dB" rating shall be no greater than 78 dB at 23 feet from center of enclosure. The panel openings shall be designed so as not to allow wind-driven rain to enter the enclosure and cause damage to the unit while in operation. The enclosure shall be designed to withstand 140 mph wind speed.
 2. High Wind Enclosures: Enclosure designed to withstand 140 mph wind speed, Exposure C, Importance Factor 1.15, partially enclosed condition in accordance with methodology contained in ASCE 7-98.
- E. Enclosure shall also be designed with removable louvers for servicing the generator.
- F. Generator enclosure to house battery tray, battery charger, generator circuit breakers.
- G. All electrical controls shall be contained within the enclosures.
- H. Exhaust Silencer: The exhaust silencer shall be critical type and the silencer shall be mounted inside the unit.
- I. Engine-Generator Control Panel: ANSI/NEMA 250, Type 1 generator mounted control panel enclosure with engine and generator controls and indicators. Include provision for padlock and the following equipment and features:
1. All indications for protection and diagnostics according to NFPA 110 Level 1, including remote and local annunciation.
 2. Frequency Meter: 45-65 Hz range, 3-1/2 inch (89 mm) dial.

3. AC Output Voltmeter: 3-1/2 inch (89 mm) dial, 2 percent accuracy, with phase selector switch.
 4. AC Outlet Ammeter: 3-1/2 inch (89 mm) dial, 2 percent accuracy, with phase selector switch.
 5. Output voltage adjustment.
 6. Push-to-test indicator lamps, one each for low oil pressure, high water temperature, overspeed, and overcrank.
 7. Engine start/stop selector switch.
 8. Engine running time meter.
 9. Oil pressure and water temperature gages.
 10. Auxiliary Relay: 3 PDT, operates when engine runs, with contact terminals pre-wired to terminal strip.
 11. Provision for regularly scheduled starting and operation of engine generator for maintenance purposes.
- J. Generator circuit breaker: Each generator shall be supplied with a unit mounted circuit breaker rated for the capacity of the generator and coordinated with the ATS.
- K. Pre-engineered prefabricated access platform and stairs: The generator shall be supplied with an access platform and/or stairs as necessary to allow personnel to access all essential hatches for operation and maintenance. In the event that the generator's enclosure provides enough area for the site personnel to access all of the essential equipment for operation and maintenance the access platform can be omitted. If the distance from the generator slab to the top of the fuel tank is greater than 18" stairs will be required at a minimum to access all essential hatches and/or doors. The access platform and/or stairs shall be constructed of aluminum to match the enclosure.

2.6 REMOTE COMMUNICATIONS

- A. Remote Alarm Contacts: Pre-wire SPCT contacts to terminal strip for remote alarm functions required by ANSI/NFPA 99.
- B. All alarm conditions shall be made available for connection to control unit at the generator site for transmission to a central communication facility. A
- C. The generator's fuel tank level shall be monitored and made available through a 4-20 mA signal for monitoring by the site's control system.
- D. The supplier of the generator set is responsible for labeling where these signals are available, but not for connecting them to the local monitoring system.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Installation of the generator will be by others under separate contract.

3.2 TESTING

- A. Testing shall be performed by a manufacturer's representative. All fuel for the testing procedures shall be supplied by the contractor. After all testing has been completed the contractor shall provide the first full tank of fuel for the generator.
- B. Provide full load test utilizing portable test bank, for four (4) hours minimum.
- C. During test, record the following at 20 minute intervals:
1. Kilowatts
 2. Amperes
 3. Voltage
 4. Coolant temperature
 5. Ambient temperature
 6. Frequency
 7. Oil pressure
- D. Test alarm and shutdown circuits by simulating conditions.
- E. Manufacturer's representative should be present to prepare, start, test, and adjust systems. Adjust generator output voltage and engine speed.

END OF SECTION 16622

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EMERGENCY GENERATOR SYSTEM

For the

OKALOOSA COUNTY BOARD OF COMMISSIONERS

SHOAL RIVER LANDING PUMP STATION

COUNTY ADMINISTRATOR

JOHN HOFSTAD

OKALOOSA COUNTY WATER AND SEWER

JEFF LITRELL, DIRECTOR

CHAIRMAN

TREY GOODWIN (DISTRICT 4)

BOARD MEMBERS

GRAHAM FOUNTAIN (DISTRICT 1)

CAROLYN KETCHEL (DISTRICT 2)

NATHAN BOYLES (DISTRICT 3)

KELLY WINDES (DISTRICT 5)

CLERK

J. D. PEACOCK II



VICINITY MAP

Sheet List Table

Sheet Number	Cover Sheet	Sheet Title
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G-1.1	MECHANICAL SYMBOLS	
M-2.0	GRADING AND EROSION PLAN	
M-2.1	SITE PLAN & PROFILE	
M-3.0	PUMP STATION PLAN	
M-4.0	PUMP STATION SECTIONS	
M-4.1	PUMP STATION SECTIONS	
D-1.0	MECHANICAL DETAILS	
D-1.1	MECHANICAL DETAILS	
D-1.2	MECHANICAL DETAILS	
D-1.3	MECHANICAL DETAILS	
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E-7	ELECTRICAL BUILDING	
E-8	PUMP STATION ELECTRICAL	
E-9	PUMP STATION ELECTRICAL ALTERNATE	
E-10	ELECTRICAL EQUIPMENT RACK	
E-11	ELECTRICAL EQUIPMENT MOUNTING ALTERNATE	
E-12	SCHEDULES	

DATE PREPARED

APRIL 2020

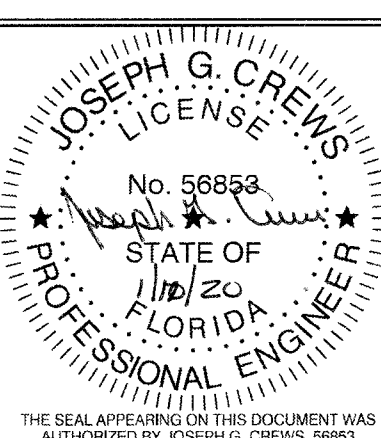
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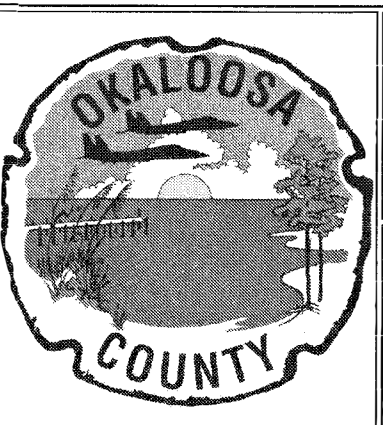
FOR INFORMATION REGARDING THIS PROJECT,
CONTACT: JOSEPH G. CREWS, P.E.
FORT WALTON BEACH, FLORIDA
OFFICE: (850) 244-5800

COVER SHEET

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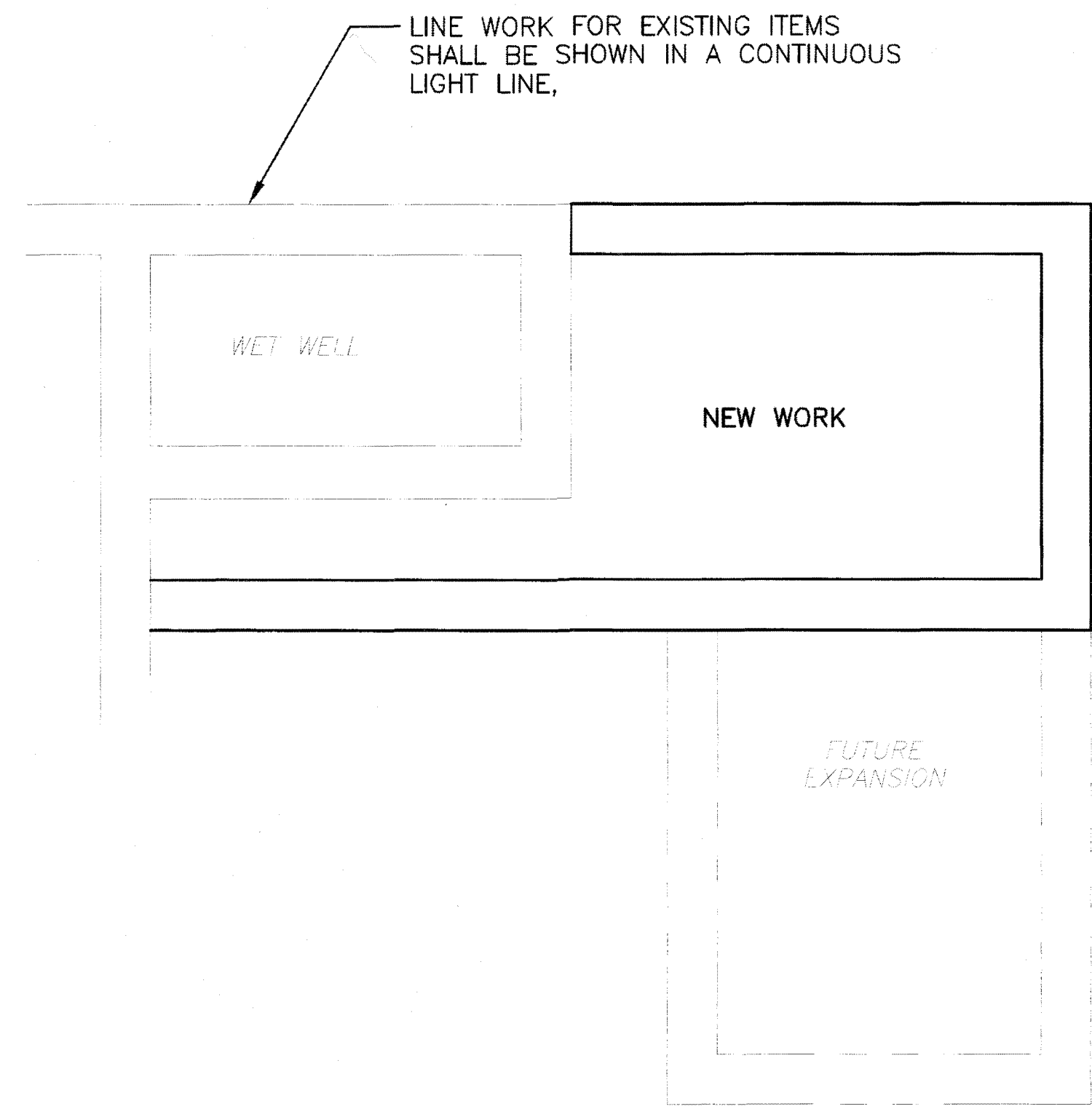


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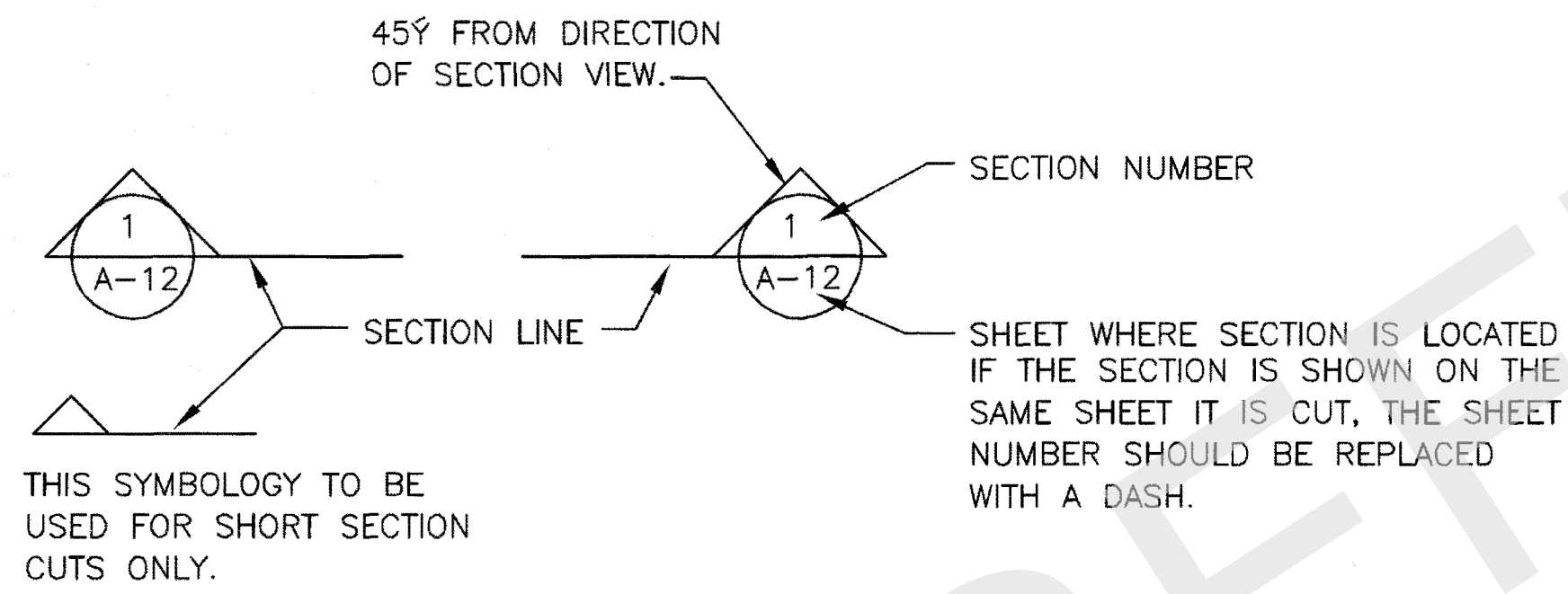


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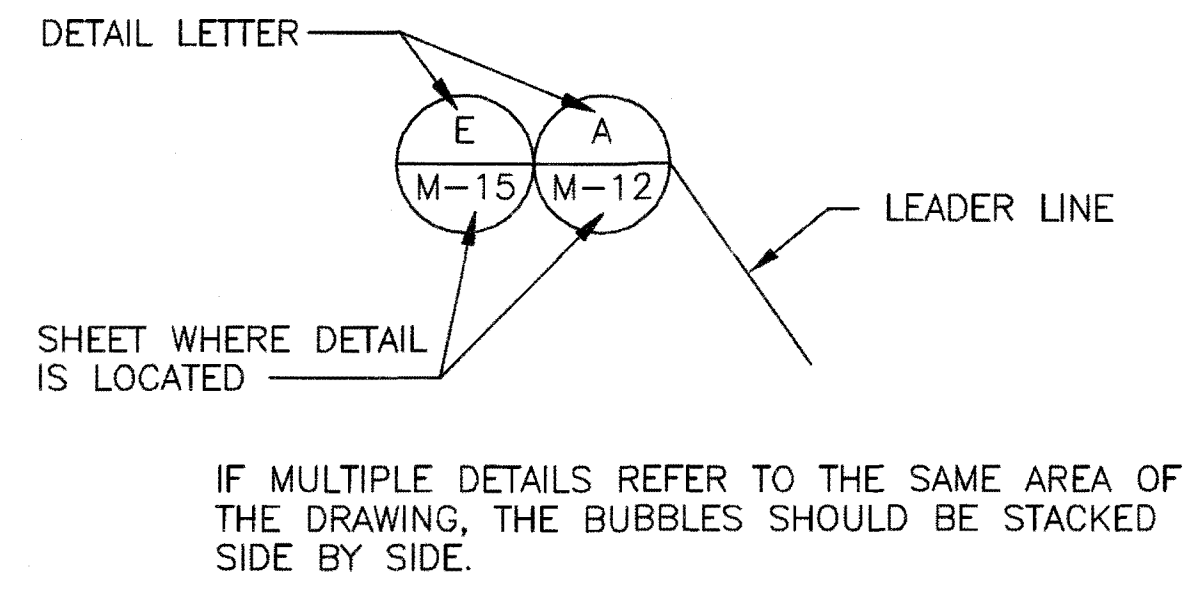
- NEW MAIN THIS PROJECT
- EXISTING WATER MAIN
- EXISTING RAW WATER MAIN
- EXISTING SANITARY SEWER W/ MANHOLE
- EXISTING FORCE MAIN
- EXISTING BURIED TELEPHONE
- EXISTING POWER DUCTS OR CABLES
- OVERHEAD POWER
- EXISTING CABLE TELEVISION
- EXISTING STORM SEWER W/CATCH BASIN
- FIRE HYDRANT
- R/W - RIGHT OF WAY
- P - PROPERTY LINE
- NEW MAIN TO BE CONST. UNDER EXISTING UTILITY
- NEW MAIN TO BE CONST. OVER EXISTING UTILITY
- EXISTING POWER POLE
- EXISTING LIGHT POLE
- SOIL BORING
- PIEZOMETER
- BENCH MARK
- EXISTING CHAIN LINK FENCE
- NEW FENCE
- EXISTING CONTOUR
- NEW CONTOUR
- EXISTING SPOT ELEVATION
- NEW SPOT ELEVATION
- NEW STRUCTURES OR STRUCTURAL COMPONENTS OR EQUIPMENT

- EXISTING STRUCTURES (TO REMAIN)
- EXISTING STRUCTURES (TO BE MODIFIED)
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- SLANTED TEXT
- VERTICAL TEXT

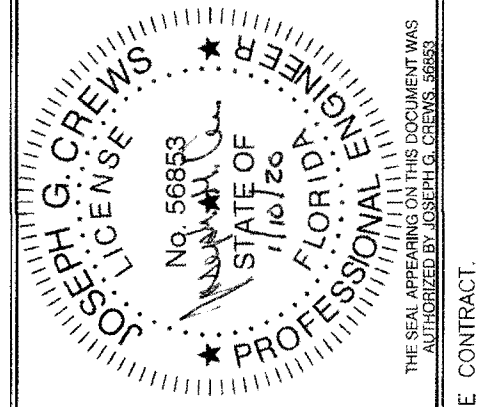
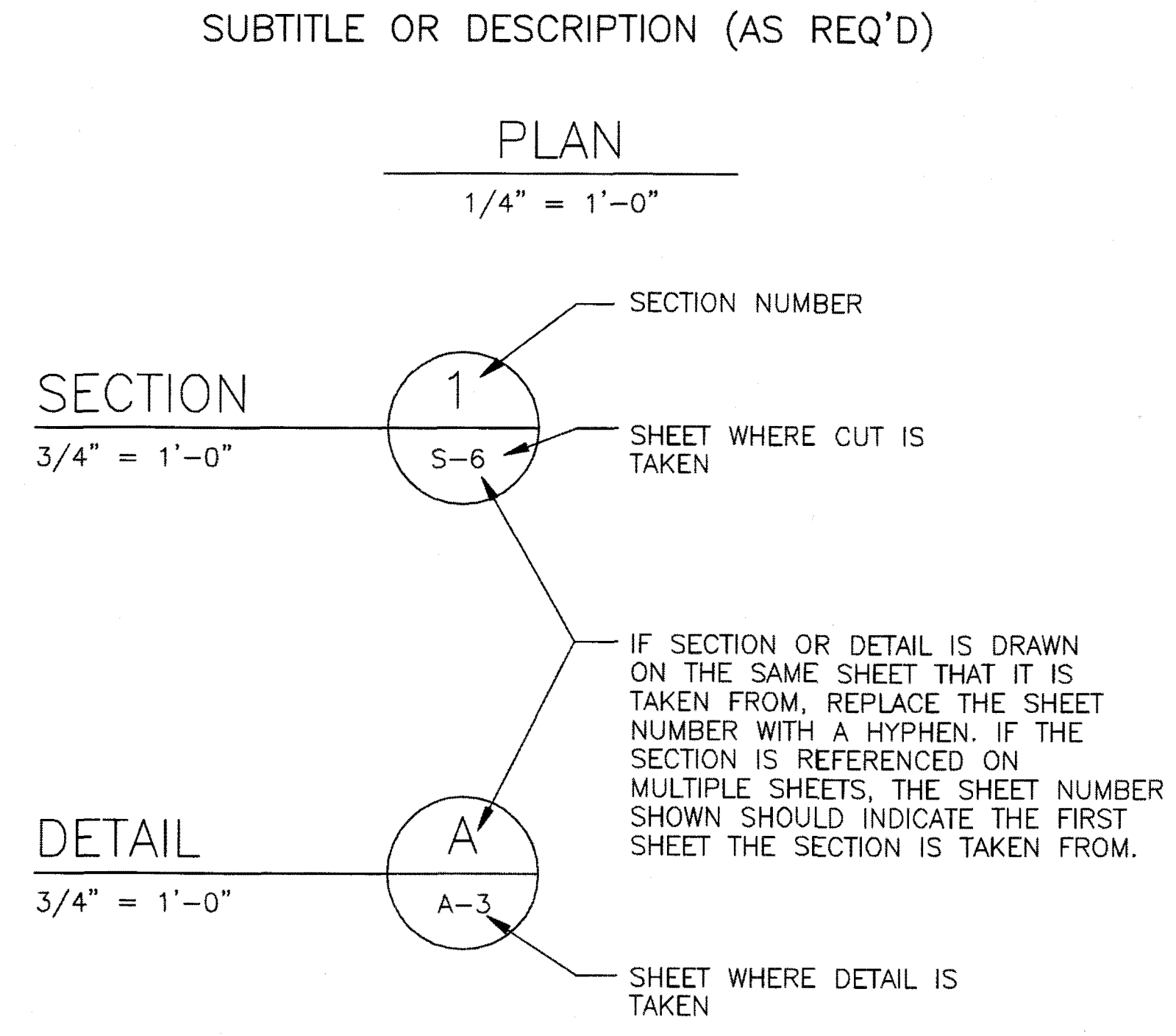
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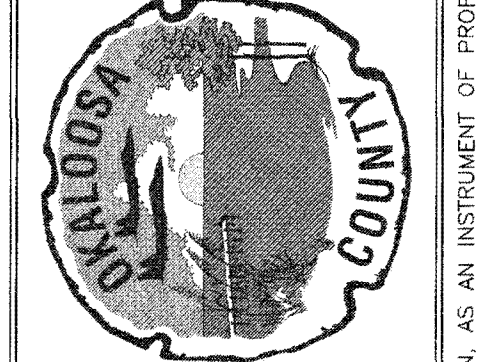
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GENERAL SYMBOLS

SHOAL RIVER LANDING PUMP STATION



Constantine Engineering

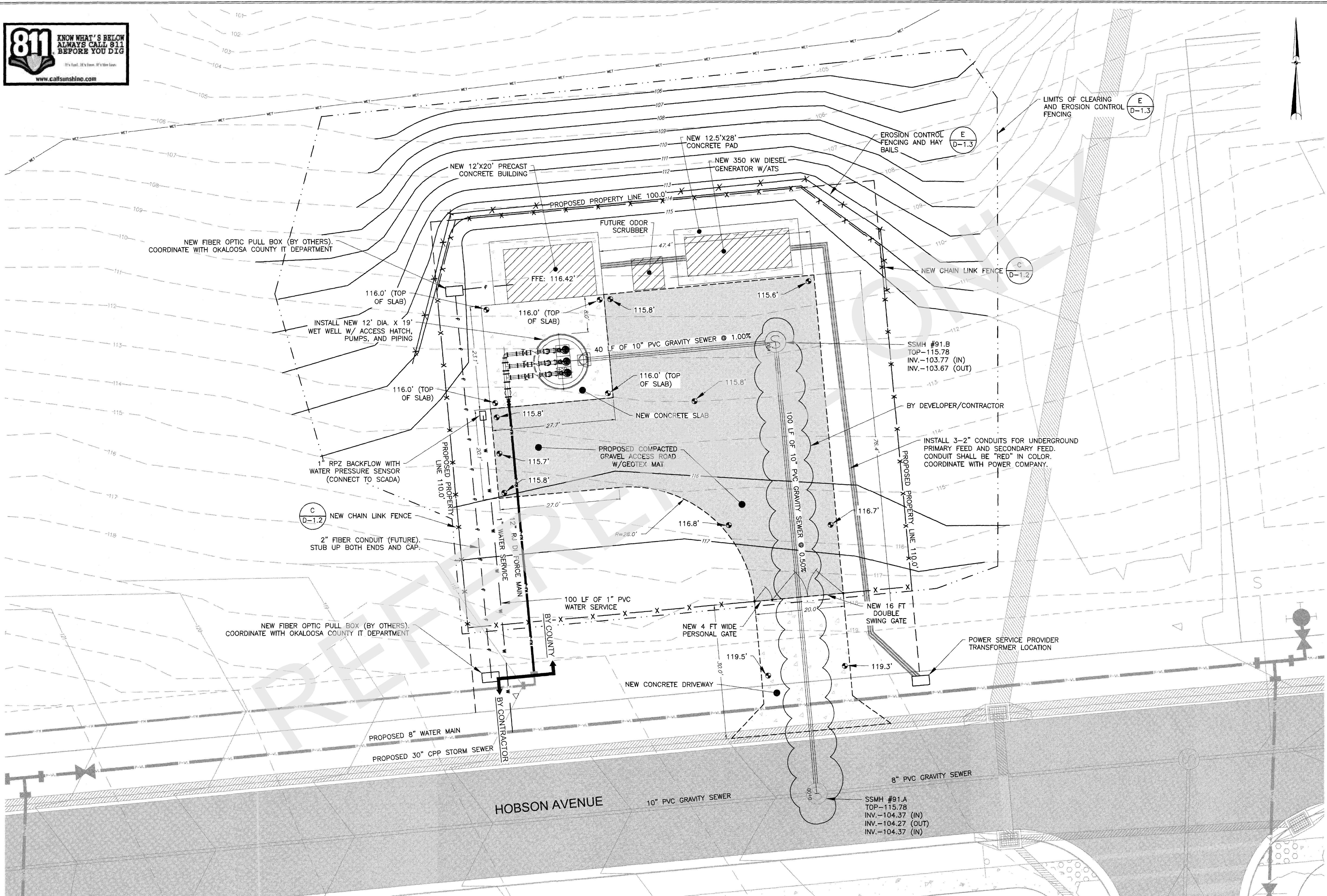
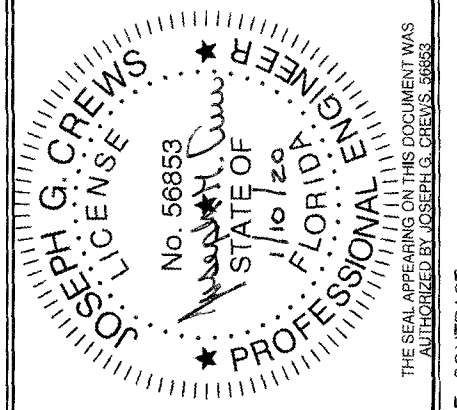
CONSTANTINE ENGINEERING
1988 LEWIS TURNER BLVD., UNIT 3
FORT WORTH, TEXAS 76104
P.E. CERTIFICATE OF AUTHORIZATION # 9816

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PROJ.	100502.09
DWG.	G-1.0

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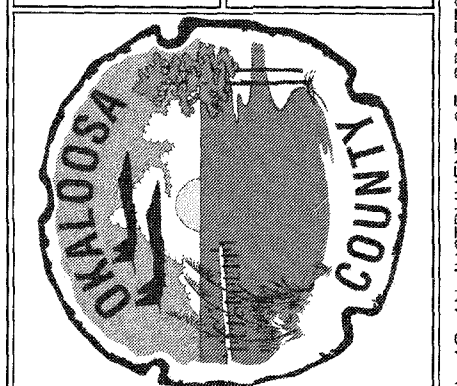
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GRADING AND EROSION PLAN

SHOAL RIVER LANDING PUMP STATION

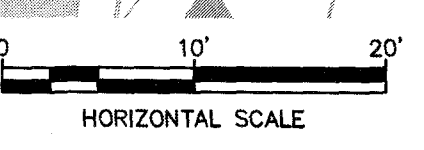


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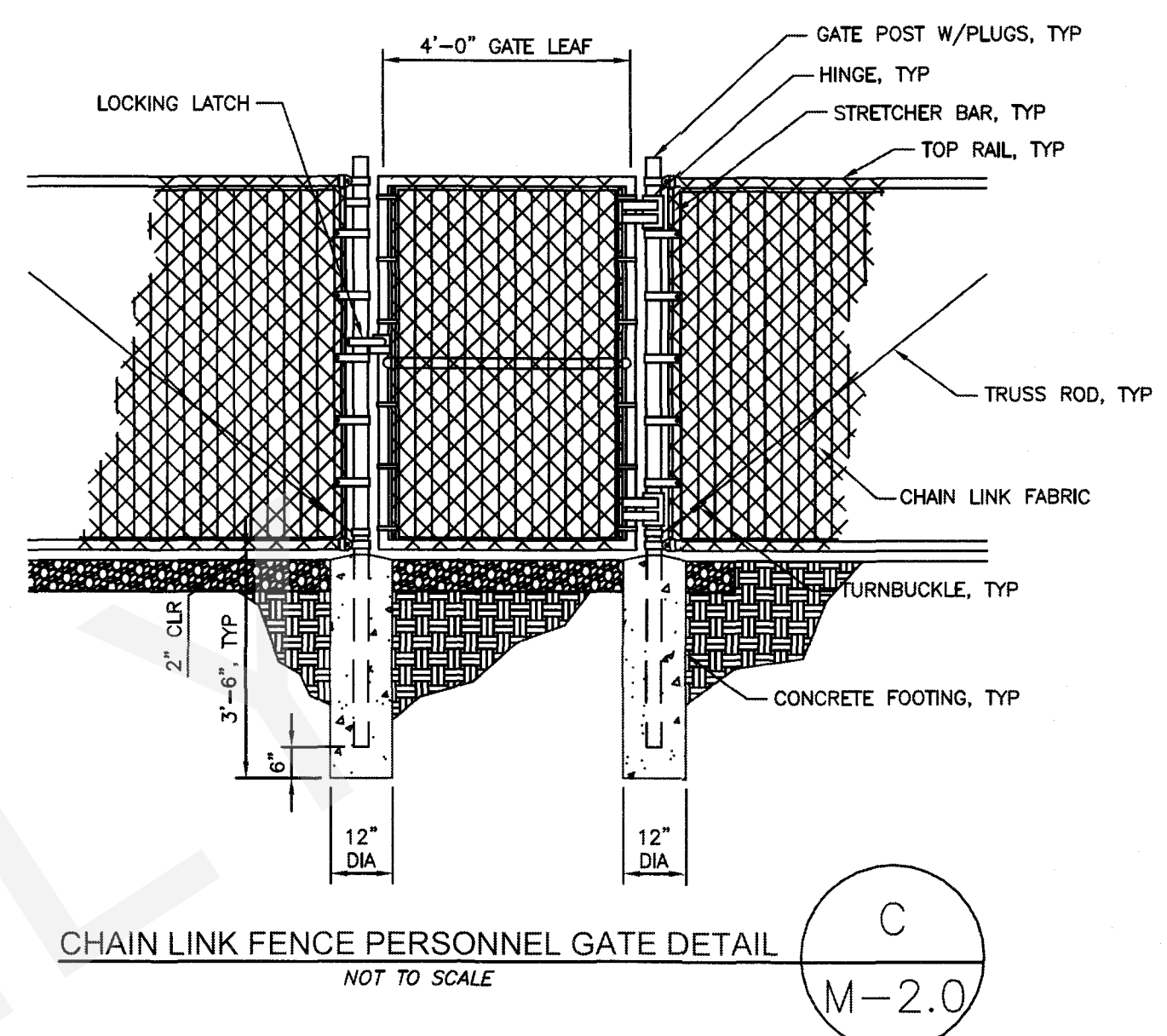
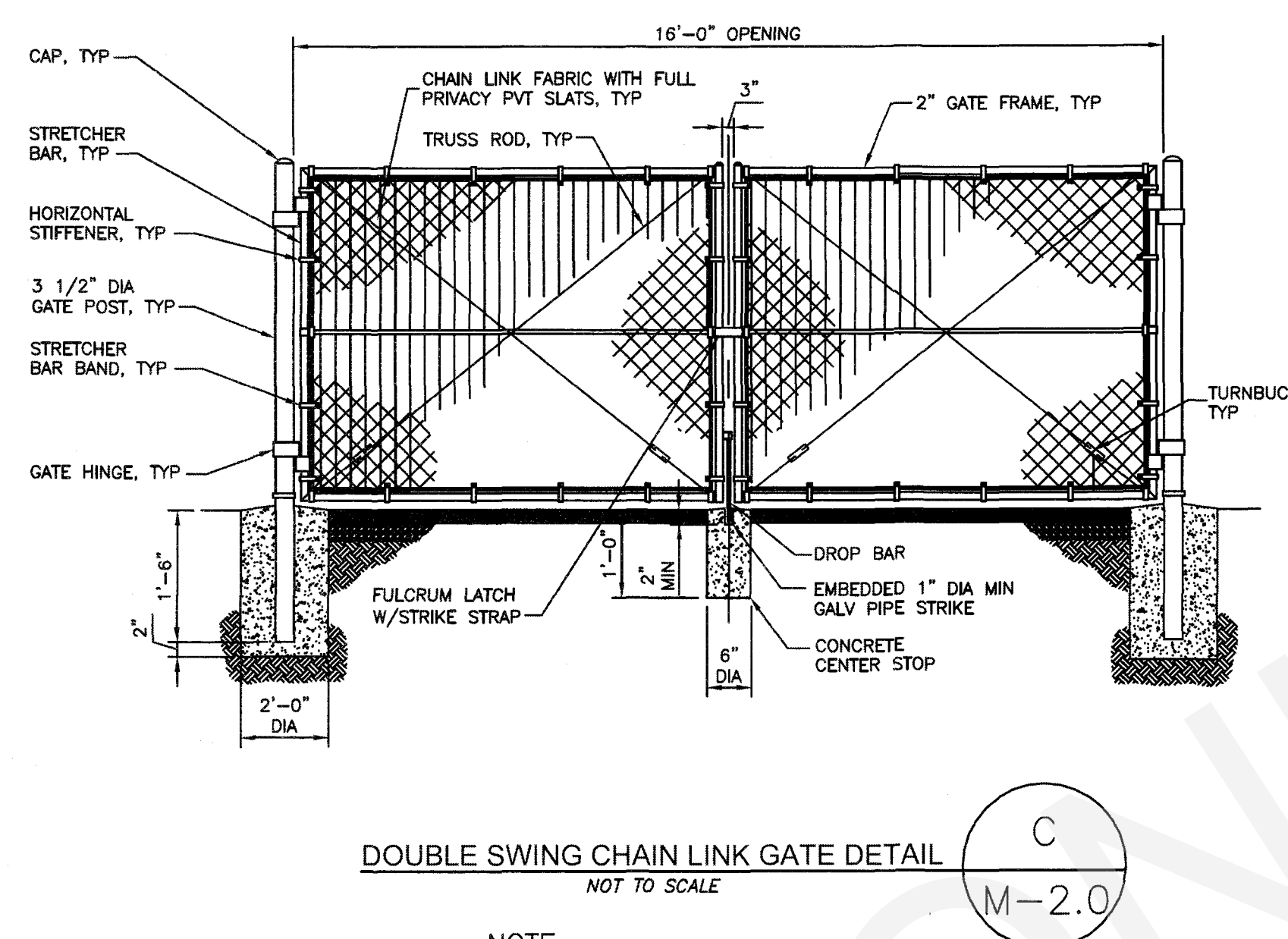
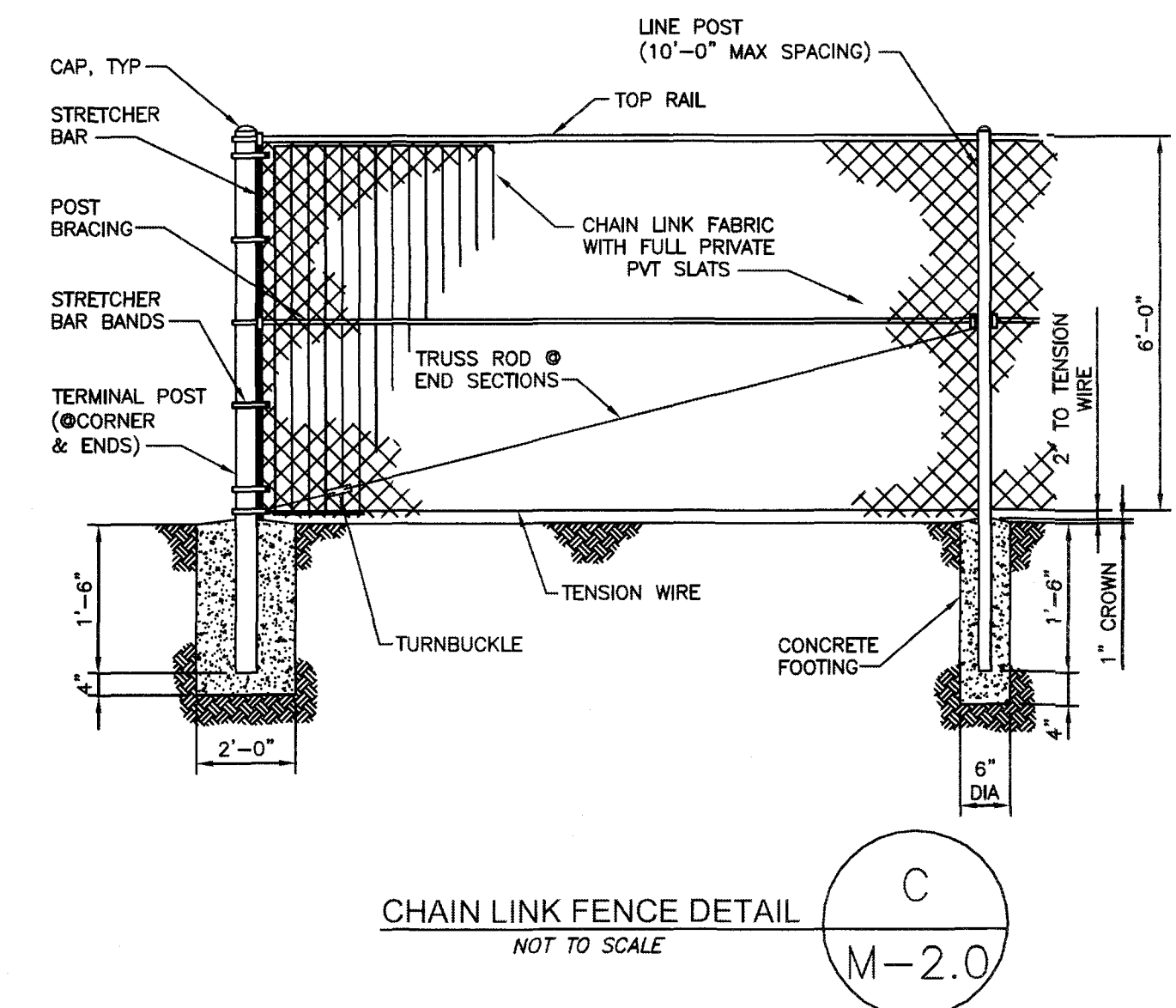
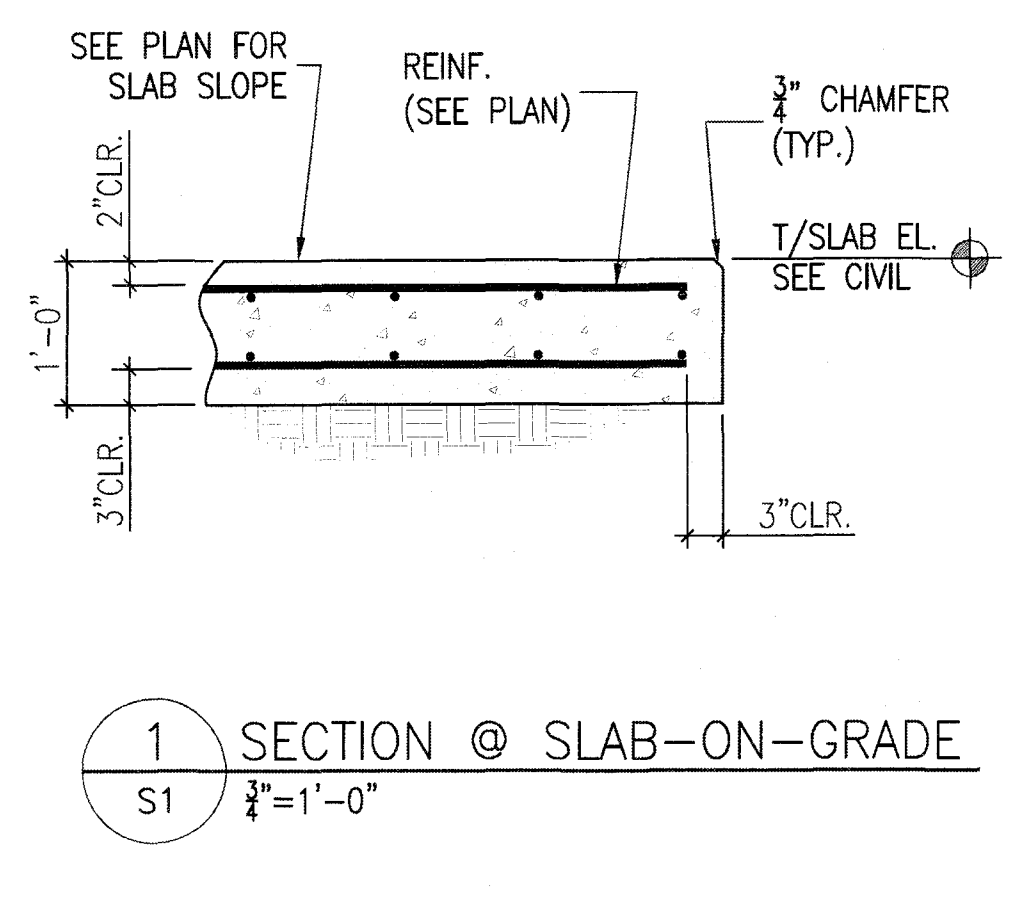
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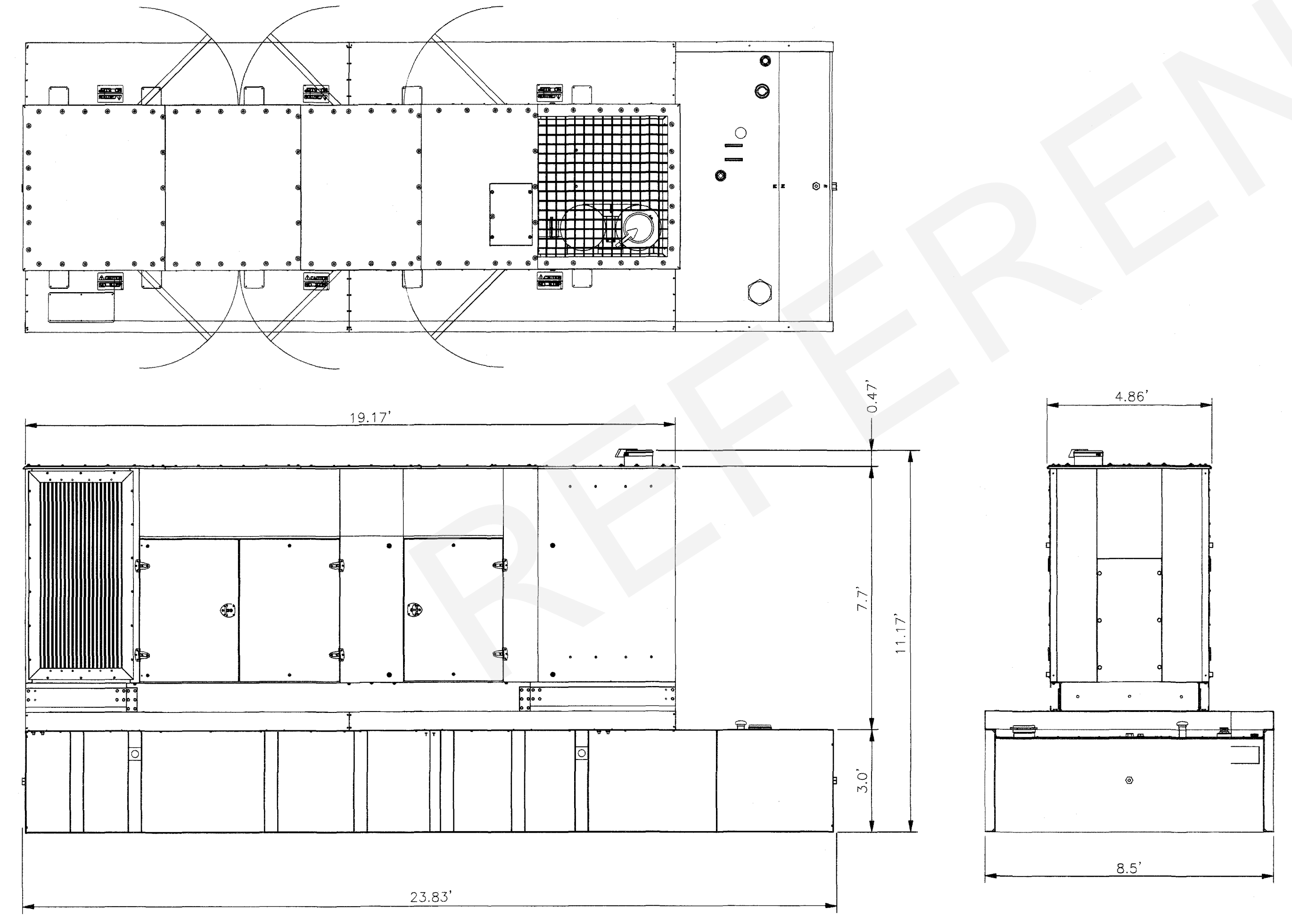


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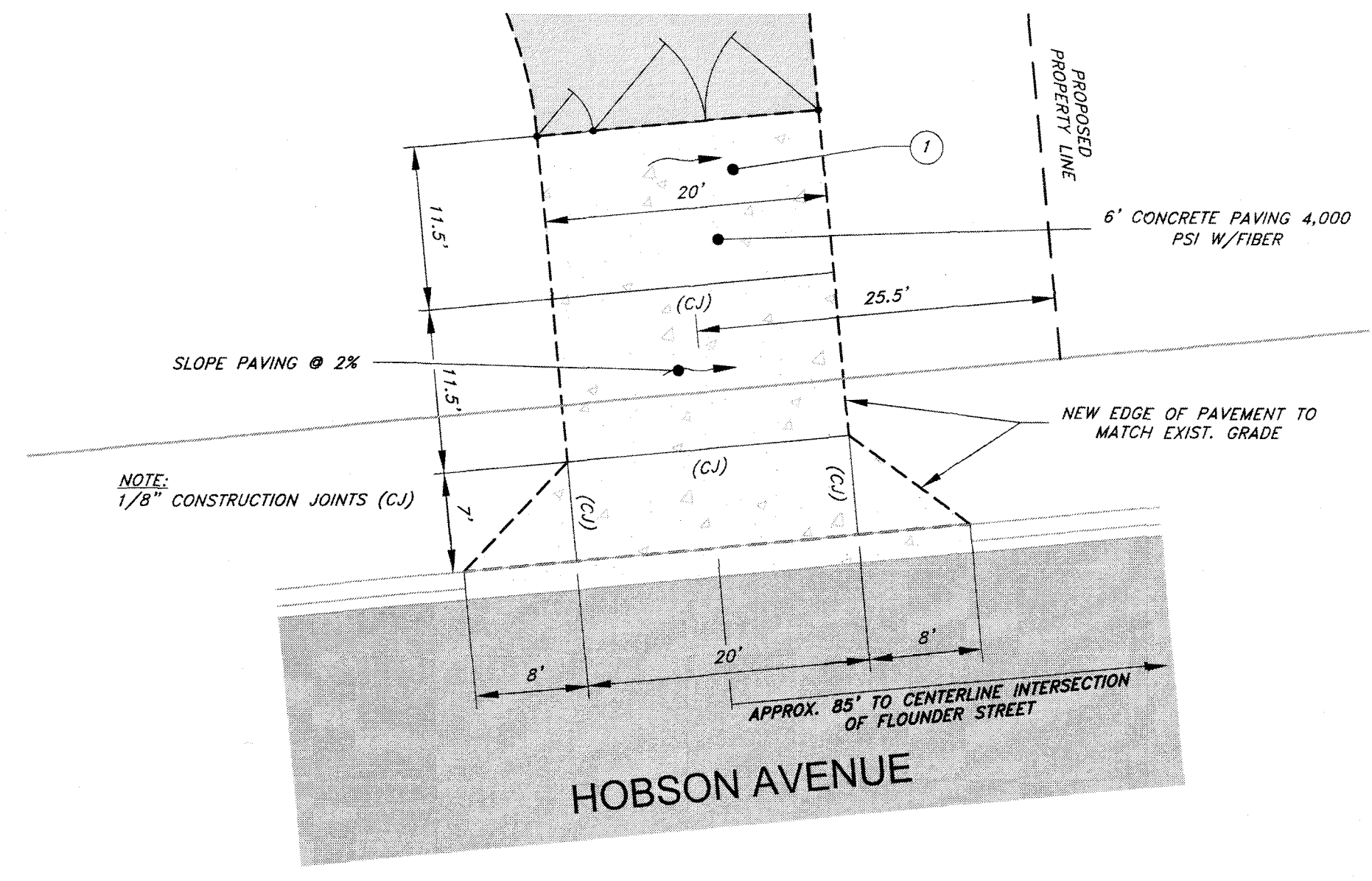
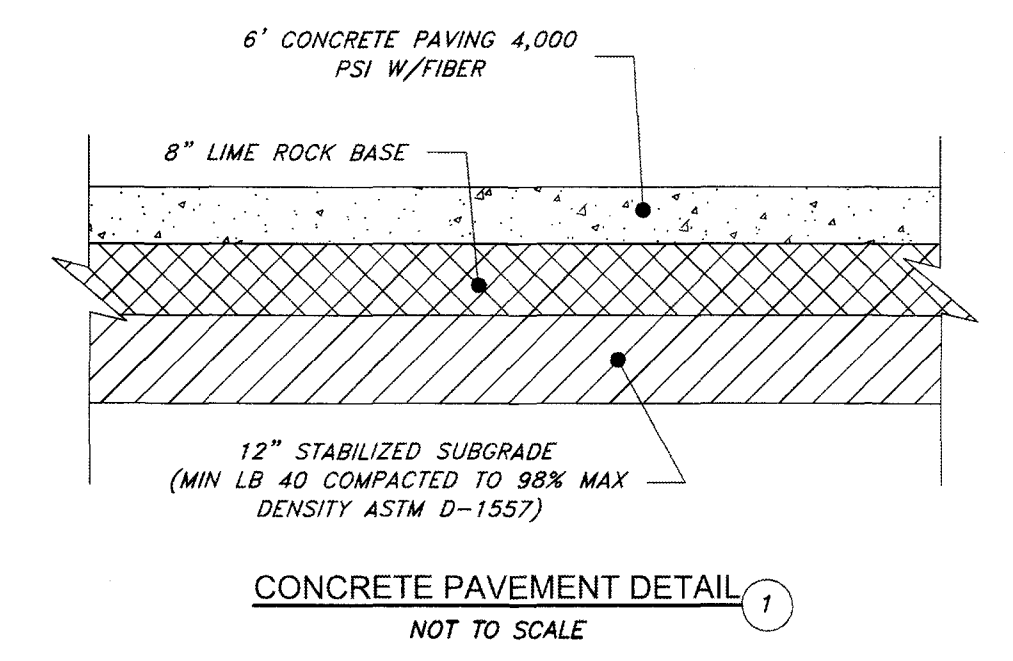
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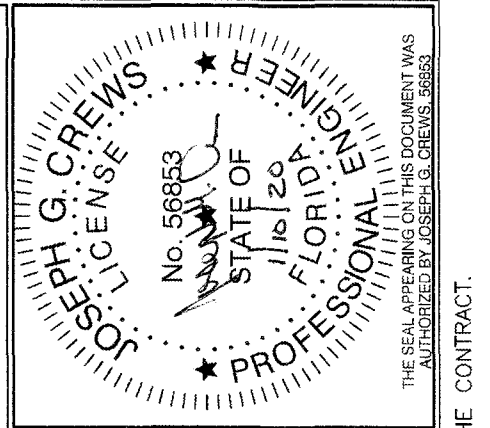
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ALL FENCING MATERIAL SHALL BE VINYL COATED GREEN IN COLOR.



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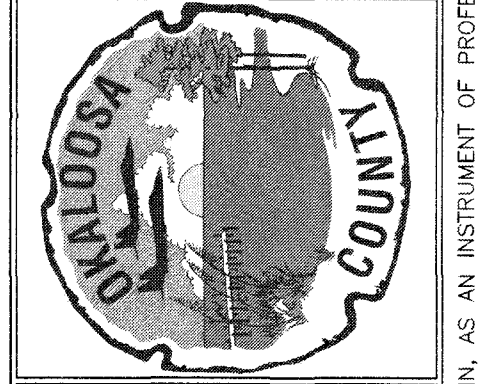
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MECHANICAL DETAILS

SHOALS RIVER LANDING PUMP STATION



Constantine
Engineering

CONSTANTINE ENGINEERING
1886 LEWIS TURNER BLVD., UNIT 3
FORT WALTON BEACH, FL 32434
FL CERTIFICATE OF AUTHORIZATION # 9816

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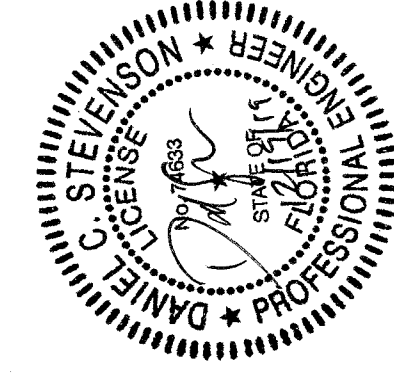
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SYMBOL	DESCRIPTION
	CONTACT, NORMALLY OPEN
	CONTACT, NORMALLY CLOSED
	OPERATING COIL * DESIGNATION: C - CONTACTOR R - CONTROL RELAY M - MAGNETIC MOTOR STARTER - NON REVERSING MF - MAGNETIC MOTOR STARTER - FORWARD MR - MAGNETIC MOTOR STARTER - REVERSE MO - MAGNETIC MOTOR STARTER - OPEN MC - MAGNETIC MOTOR STARTER - CLOSE MH - MAGNETIC MOTOR STARTER - HIGH SPEED ML - MAGNETIC MOTOR STARTER - LOW SPEED SOV - SOLENOID OPERATED VALVE TD - TIME DELAY RELAY T - PROGRAMMABLE TIMER
	METER, ELAPSED TIME
	INDICATING LIGHT - FULL VOLTAGE TRANSFORMER OR LED * DESIGNATION: A - AMBER R - RED B - BLUE W - WHITE G - GREEN Y - YELLOW
	INDICATING LIGHT, PUSH -TO-TEST * DESIGNATION: A - AMBER R - RED B - BLUE W - WHITE G - GREEN Y - YELLOW
	SWITCH, PUSHBUTTON, NORMALLY OPEN CIRCUIT
	SWITCH, PUSHBUTTON, NORMALLY CLOSED CIRCUIT
	SWITCH, PUSHBUTTON, TAG LINE, NORMALLY CLOSED CIRCUIT WITH MAINTAINED CONTACT
	SWITCH, PUSHBUTTON, TWO CIRCUIT, NORMALLY OPEN AND NORMALLY CLOSED
	SWITCH, EMERGENCY SHUTDOWN, MUSHROOM-HEAD PUSHBUTTON, NORMALLY CLOSED CIRCUIT WITH MAINTAINED CONTACT
	SWITCH, MASTER OR CONTROL X - INDICATES CONTACT CLOSED
	MOMENTARY-CONTACT SWITCH
	SWITCH PRESSURE/VACUUM OPERATED. NORMALLY OPEN. CLOSING ON RISING PRESSURE
	SWITCH PRESSURE/VACUUM OPERATED. NORMALLY CLOSED OPENING ON RISING PRESSURE
	SWITCH, FLOW ACTUATED, NORMALLY OPEN, CLOSING ON INCREASE IN FLOW
	SWITCH, FLOW ACTUATED, NORMALLY CLOSED OPENING ON INCREASE IN FLOW
	SWITCH, TEMPERATURE ACTUATED, NORMALLY CLOSED OPENING ON RISING TEMPERATURE
	SWITCH, TEMPERATURE ACTUATED, NORMALLY OPEN CLOSING ON RISING TEMPERATURE
	CONTACT, TIME DELAY, NORMALLY OPEN WITH TIME DELAY CLOSING
	CONTACT, TIME DELAY, NORMALLY OPEN WITH TIME DELAY OPENING
	CONTACT, TIME DELAY, NORMALLY CLOSED WITH TIME DELAY OPENING
	CONTACT, TIME DELAY, NORMALLY CLOSED WITH TIME DELAY CLOSING
	SWITCH, LIMIT
	SWITCH, TORQUE
	SWITCH, LIQUID LEVEL ACTUATED, CLOSING ON RISING LEVEL
	SWITCH, LIQUID LEVEL ACTUATED, OPENING ON RISING LEVEL

SYMBOL	DESCRIPTION
	FUSE (AMPERE RATING SHOWN)
	FUSED DISCONNECT SWITCH, 3 POLE * DESIGNATION: LS - LOAD BREAK SWITCH DS - DISCONNECT SWITCH
	POWER CIRCUIT BREAKER, MEDIUM-VOLTAGE, DRAWOUT TYPE (AMPERE RATING SHOWN)
	CIRCUIT BREAKER, DRAWOUT TYPE, 600VAC OR LESS, 3P (TRIP AND FRAME AMPERE RATING SHOWN)
	CIRCUIT BREAKER, THERMOMAGNETIC, 600 VAC OR LESS, 3P (AMPERE RATING SHOWN)
	CIRCUIT BREAKER, THERMOMAGNETIC, 600 VAC OR LESS, 3P ADJUSTABLE TRIP (TRIP & FRAME AMPERE RATING SHOWN)
	MOTOR CIRCUIT PROTECTOR, 600V AC OR LESS, 3P UON (CONTINUOUS AMPERE RATING SHOWN)
	CONTACTOR (NUMBER OF POLES AND AMPERE RATING SHOWN)
	MAGNETIC MOTOR STARTER * NEMA SIZE ** DESIGNATION: NONE - FULL VOLTAGE, NON-REVERSING FVR - FULL VOLTAGE, REVERSING RVNR - REDUCED VOLTAGE, NON-REVERSING RVR - REDUCED VOLTAGE, REVERSING
	MANUAL MOTOR STARTER
	VARIABLE FREQUENCY DRIVE / INVERTER
	POWER TRANSFORMER (KVA RATING, VOLTAGES AND WINDINGS CONNECTIONS SHOWN)
	SERIES REACTOR (LINE OR LOAD RATING SHOWN)
	VOLTAGE TRANSFORMER (QUANTITY AND VOLTAGE RATIO SHOWN)
	CURRENT TRANSFORMER (QUANTITY AND CURRENT RATIO SHOWN)
	MULTI-RATIO CURRENT TRANSFORMER (QUANTITY, MAXIMUM CURRENT RATIO AND SETTING SHOWN)
	ZERO SEQUENCE CURRENT TRANSFORMER (CURRENT RATIO SHOWN)
	CAPACITOR
	GROUND CONNECTION
	SURGE ARRESTER (QUANTITY SHOWN)
	TRANSFER SWITCH (NUMBER OF POLES AND AMPERE RATING SHOWN)
	BATTERY (RATING SHOWN)
	MOTOR, INDUCTION (HORSEPOWER SHOWN)

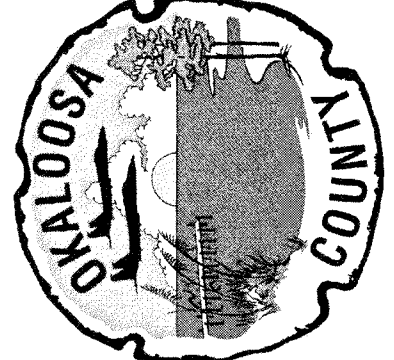
SYMBOL	DESCRIPTION
	GENERATOR (KW RATINGS, VOLTAGE AND PHASE SHOWN)
	THERMISTOR
	DIODE, SEMICONDUCTOR
	RESISTANCE TEMPERATURE DETECTOR
	RESISTOR
	SPACE HEATER
	CONTROL POWER TRANSFORMER, (VA RATING VOLTAGES)
	AMMETER SWITCH
	VOLTMETER SWITCH
	CONTROL SWITCH
	METER * DESIGNATION: AM - AMMETER VM - VOLTMETER PFM - POWER FACTOR WM - WATTMETER FMM - FREQUENCY METER WHM - WATTHOUR METER PM - POWER MONITORING DEVICE
	PROTECTIVE RELAY OR DEVICE * DESIGNATION: 11 - MULTIFUNCTION PROTECTIVE RELAY 25 - SYNCHRONIZING OR SYNCHRONISM-CHECK RELAY 26 - APPARATUS THERMAL DEVICE 27 - UNDERVOLTAGE RELAY 32 - DIRECTIONAL POWER RELAY 37 - UNDERCURRENT OR UNDERPOWER RELAY 40 - FIELD RELAY 46 - REVERSE-PHASE OR PHASE-BALANCE CURRENT RELAY 49 - MACHINE OR TRANSFORMER THERMAL RELAY 50 - INSTANTANEOUS OVERCURRENT RELAY 50GS- INSTANTANEOUS GROUND FAULT RELAY 51 - AC TIME OVERCURRENT RELAY 51GS- AC TIME GROUND FAULT RELAY 51V - AC TIME OVERCURRENT RELAY (VOLTAGE RESTRAINT) 55 - POWER FACTOR RELAY 59 - OVERVOLTAGE RELAY 60 - VOLTAGE OR CURRENT BALANCE RELAY 63 - PRESSURE SWITCH 64 - GROUND DETECTOR RELAY 67 - AC DIRECTIONAL OVERCURRENT RELAY 81 - FREQUENCY RELAY 86 - LOCKOUT RELAY 87 - DIFFERENTIAL PROTECTIVE RELAY 87G - GENERATOR DIFFERENTIAL GROUND FAULT RELAY



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ELECTRICAL SYMBOLS 1

SHOAL RIVER LANDING PUMP STATION



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DWG.	E-1

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WIRING	
	JUNCTION BOX
	PULL BOX
	HANDHOLE
	CONDUIT CONDUCTOR WIRE TAG. P-DENOTES POWER, L-DENOTES 120V CIRCUITS, I-DENOTES INSTRUMENTATION TO PLC, AND C-DENOTES CONTROL CIRCUIT FROM MCC.
COMMUNICATION	
	DATA COMMUNICATION OUTLET
	CABLE TELEVISION OUTLET
	DATA COMMUNICATION FLOOR OUTLET
	TELEPHONE FLOOR RECEPTACLE
	WALL MOUNTED TELEPHONE
	WALL MOUNTED DATA
	CEILING MOUNTED SPEAKER
LIGHTING	
	EXIT SIGN WALL MOUNTED LIGHT
	ELECTRIC RESISTANCE HEATER
	FLUORESCENT EMERGENCY LIGHT FIXTURE
	SINGLE POLE SWITCH
	THREE-WAY SWITCH
	TIMER OPERATED SWITCH
	FUSED SWITCH
	SWITCH WITH PILOT LIGHT
	CEILING MOUNTED PULL SWITCH
	DOUBLE POLE SWITCH
	FOUR-WAY SWITCH
	KEY OPERATED SWITCH
	LAMP HOLDER POLE SWITCH

LIGHTING (CONT)	
	LOW VOLTAGE MASTER SWITCH
	WEATHER PROOF SWITCH
	INCANDESCENT CEILING MOUNTED LIGHT
	RECESSED FLUORESCENT 2X4 LIGHT FIXTURE
	RECESSED FLUORESCENT 1X4 LIGHT FIXTURE
	RECESSED FLUORESCENT 1X8 LIGHT FIXTURE
	SURFACE MOUNTED FLUORESCENT 2X4 LIGHT FIXTURE
	SURFACE MOUNTED FLUORESCENT 1X4 LIGHT FIXTURE
	SURFACE MOUNTED FLUORESCENT 1X8 LIGHT FIXTURE
	STREET LIGHT WITH BRACKET
	EXTERIOR BUILDING LIGHT
	EMERGENCY BATTERY POWERED LIGHTS
	2' X 2' LIGHT FIXTURE
	INDUSTRIAL OR STRIP FIXTURE
	HIGHMAST LIGHTING ASSEMBLY
	AREA LIGHTING ASSEMBLY

POWER	
	CLOCK HANGER RECEPTACLE
	DUPLEX RECEPTACLE
	DUPLEX ON EMERGENCY POWER RECEPTACLE
	DUPLEX WITH GFI RECEPTACLE
	QUADRAPLEX RECEPTACLE
	SINGLE RECEPTACLE
	SINGLE RECEPTACLE WITH SWITCH
	SPECIAL PURPOSE RECEPTACLE
	DUPLEX RECEPTACLE WITH SWITCH
	FLUSH MOUNTED PANELBOARD CABINET
	SURFACE MOUNTED PANELBOARD CABINET
	TRANSFORMER

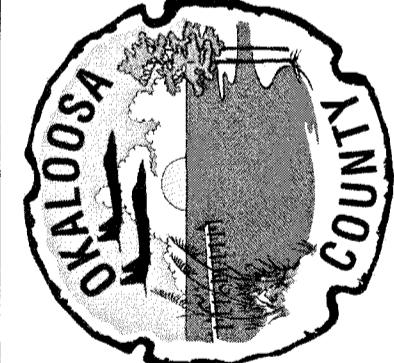
SINGLE LINE (CONT)	
	EARTH GROUND
	FUSED DISCONNECT SWITCH
	UNFUSED DISCONNECT SWITCH
	METER
	DISTRIBUTION PANEL
	LIGHTING PANEL
	POWER PANEL



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ELECTRICAL SYMBOLS 2

SHOAL RIVER LANDING PUMP STATION



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ABBREVIATIONS

A OR AMP	AMPERES	UG	UNDERGROUND
AFF	ABOVE FINISH FLOOR	UL	UNDERWRITER'S LABORATORIES
AHU	AIR HANDLING UNIT	UNO	UNLESS NOTED OTHERWISE
AIC	AMPERE INTERRUPTING CAPACITY	V	VOLTS
AM	AMMETER	VFD	VARIABLE FREQUENCY DRIVE
AS	AMMETER SELECTION SWITCH	VM	VOLTMETER
ASYM	ASYMMETRICAL	VMS	VOLTMETER SELECTOR SWITCH
ATS	AUTOMATIC TRANSFER SWITCH	W	WIDTH
AT	AUTOMATIC TRANSFORMER	W/	WITH
BCP	BACKUP CONTROL PANEL	WHDM	WATT HOUR DEMAND METER
C	CONDUIT	WM	WATTMETER
CB	CIRCUIT BREAKER	WP	WEATHER PROOF
CKT	CIRCUIT	XFMR	TRANSFORMER
CLF	CURRENT LIMITING FUSE	Y	WYE CONNECTION
CNTL	CONTROL		
CT	CURRENT TRANSFORMER		
Δ	DELTA CONNECTION		
D	DEPTH		
DP	DISTRIBUTION PANELBOARD		
DS OR DISC	DISCONNECT SWITCH		
DTC	DATA TERMINAL CABINET		
EF	EXHAUST FAN		
EG	EQUIPMENT GROUND		
EMCP	ENERGY MANAGEMENT CONTROL PANEL		
EGC	EQUIPMENT GROUNDING CONDUCTOR		
EMT	ELECTRICAL METALLIC TUBING		
ESTOP	EMERGENCY STOP		
ETR	EXISTING TO REMAIN		
EX OR EXIST.	EXISTING		
EXP	EXPLOSION PROOF		
F	FUSE		
FA	FIRE ALARM		
FCR	FLOAT CONTROL RELAY		
FLR	FLOOR		
FACP	FIRE ALARM CONTROL PANEL		
FMPX	FIRE ALARM MULTIPLEX PANEL		
G OR GND	GROUND		
GEC	GROUNDING ELECTRODE CONDUCTOR		
GF	GROUND FAULT		
GFI	GROUND FAULT INTERRUPTING		
H	HEIGHT		
HP	HORSEPOWER		
HV	HIGH VOLTAGE, 600VAC		
HVAC	HEATING, VENTILATION AND AIR		
IMC	INTERMEDIATE METAL CONDUIT		
JB OR J	JUNCTION BOX		
KVA	KILOVOLT - AMPS		
KW	KILOWATTS		
KWH	KILOWATT-HOUR		
L	LENGTH		
LA	LIGHTING ARRESTOR		
LCP	LIGHTING CONTROL PANEL		
LFMC	LIQUIDTIGHT FLEXIBLE METAL CONDUIT		
LP	LIGHTING PANELBOARD		
LV	LOW VOLTAGE, 240VAC		
MCB OR MB	MAIN CIRCUIT BREAKER		
MCC	MOTOR CONTROL CENTER		
MFR	MANUFACTURER		
MH OR MTG	MOUNTING HEIGHT		
MLO	MAIN LUG ONLY		
MMS	MICROPROCESSOR-BASED METERING SYSTEM		
MT OR MTD	MOUNT OR MOUNTED		
N	NEUTRAL		
NC	NORMALLY CLOSED		
NEC	NATIONAL ELECTRICAL CODE		
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION		
NF	NON-FUSIBLE		
NFPA	NATIONAL FIRE PROTECTION ASSOCIATES		
NO	NORMALLY OPEN		
NTS	NOT TO SCALE		
P	POLE		
PFC	POWER FACTOR CAPACITOR		
PLC	PROGRAMMABLE LOGIC CONTROLLER		
PMT	PAD MOUNT TRANSFORMER		
PNL	PANEL		
PVC	POLYVINYLCHLORIDE CONDUIT		
RC	REMOTE CONTROL SWITCH		
REC OR RECPT	RECEPTACLE		
RGC	RIGID GALVANIZED COUDUIT		
RMS	ROOT MEAN SQUARE		
RTU	REMOTE TERMINAL UNIT		
SS	STAINLESS STEEL, SOFT START		
SW	SWITCH		
SWBD	SWITCHBOARD		
SYM	SYMMETRICAL		
TBB	TELEPHONE BACKBOARD		
TCP	TEMPERATURE CONTROL PANEL		
TTC	TELEPHONE TERMINAL CABINET		
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR		
TYP	TYPICAL		

GENERAL NOTES

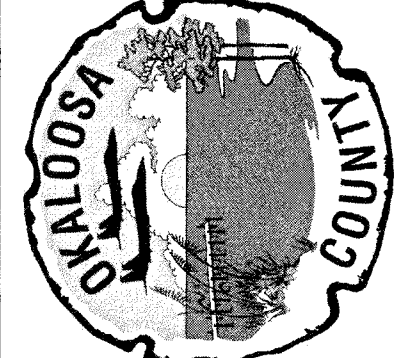
- ENTIRE INSTALLATION SHALL BE IN ACCORDANCE WITH THE FOLLOWING CODES AND STANDARDS:
 - NFPA 70, NATIONAL ELECTRICAL CODE.
 - NFPA 101 LIFE SAFETY CODE.
 - NFPA 820 STANDARD FOR FIRE PROTECTION IN WASTEWATER TREATMENT AND COLLECTION FACILITIES.
- WET WELLS ARE CLASS 1, DIV. 1, SPACES.
- ALL ELECTRICAL CIRCUITS SHALL INCLUDE A GREEN GROUNDING CONDUCTOR SIZED PER NEC.
- CONDUIT AND DEVICE LOCATIONS ARE SHOWN DIAGRAMMATICALLY ONLY, CONTRACTOR SHALL FIELD LOCATE OR ROUTE AS REQUIRED.
- ALL CONDUIT SHALL BE INSTALLED PARALLEL AND PERPENDICULAR TO BUILDING STRUCTURE.
- ALL PANEL LEGENDS SHALL BE RETYPED TO REFLECT UP TO DATE CONDITIONS. ALL PANEL LEGENDS SHALL INDICATE THE PANEL'S FEEDER CKT. SOURCE PANEL (OR SUBSTATION) AND ITS LOCATION.
- ELECTRICAL EQUIPMENT AND DEVICES SHALL BE PROVIDED WITH PHENOLIC NAMEPLATES. ALL NAMEPLATES SHALL BE MECHANICALLY FASTENED WITH S.S. SCREWS OR RIVETS. THE USE OF ADHESIVE NAMEPLATES SHALL NOT BE ALLOWED.
- CONTRACTOR SHALL MAINTAIN A SET OF PRINTS AND MARK-UP DURING CONSTRUCTION TO REFLECT "AS-BUILT" CONDITIONS. PRINTS SHALL BE DELIVERED TO THE ENGINEER UPON COMPLETION OF THE PROJECT AS A COMPLETE SET OF RECORD DRAWINGS. IN ADDITION, THE CONTRACTOR SHALL PROVIDE ELECTRONIC COPIES OF ALL UPDATES "AS-BUILT" DRAWINGS IN AUTOCAD 2007 FORMAT.
- THE CONTRACTOR SHALL PROVIDE PULL BOXES IN POWER CIRCUIT CONDUIT AS REQUIRED, SO AS TO LIMIT THE NUMBER OF BENDS TO A MAXIMUM OF 360 DEGREES OR FOUR 90 DEGREE TURNS.
- PROVIDE CONDUIT EXPANSION FITTINGS AS CONDUIT CROSSES BUILDING EXPANSION JOINTS.
- ALL EXTERIOR ELECTRICAL ENCLOSURES SHALL BE NEMA 4X STAINLESS STEEL UNLESS OTHERWISE NOTED.
- ALL SUPPORTING AND FASTENING DEVICES SHALL BE STAINLESS STEEL.
- CONTRACTOR MAY COMBINE HOMERUNS TO ALL PANEL BOARDS PER NEC.
- ALL RECEPTACLE BRANCH CIRCUITS OVER 75' IN LENGTH SHALL USE #10 AWG CONDUCTOR (FOR VOLTAGE DROP).
- CONTRACTOR TO PROVIDE ALL REQUIRED POWER AND STARTERS FOR PROCESS EQUIPMENT (COORDINATE WITH PROCESS EQUIPMENT SUPPLIER).
- ALL SERVICE ENTRANCE CONDUITS SHALL BE SCH. 80 PVC BURIED 4' BELOW GRADE WITH MARKER TAPE 6" ABOVE TOP OF CONDUIT.
- CONTRACTOR SHALL PAY ALL FEES ASSESSED BY ELECTRICAL UTILITY CO.
- CONTRACTOR SHALL COORDINATE INSTALLATION OF ELECTRICAL SERVICE WITH UTILITY COMPANY.
- CONTRACTOR SHALL PROVIDE 2 SPARE FUSES FOR EACH FUSE INSTALLED INCLUDING ALL EQUIPMENT AND CONTROLS.
- CONTROL AND POWER CONDUITS SHALL BE SEPARATED BY 12" MIN. AND SHALL BE IN SEPARATE JUNCTION BOXES AND DUCT BANKS. MAINTAIN 12" SEPARATION BETWEEN DUCT BANKS.
- CONTRACTOR SHALL MAINTAIN OPERATION OF THE ELECTRICAL SERVICE DURING THE UPGRADE.
- CONTRACTOR SHALL PROVIDE A GROUNDING SYSTEM AS DETAILED IN PLANS. THE INSTALLED GROUNDING SYSTEM SHALL HAVE A RESISTANCE OF LESS THAN 5 OHMS TO GROUND.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR READING ALL PROJECT SPECIFICATIONS AND WILL BE RESPONSIBLE FOR MEETING ALL REQUIREMENTS OUTLINED IN THE SPECIFICATIONS.
- ALL CONDUITS ENTERING CLASS 1 DIV. 1 SPACES SHALL BE STAINLESS STEEL OR RIGID ALUMINUM.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING A COORDINATED ELECTRICAL SYSTEM IN ACCORDANCE WITH NEC ARTICLE 240.12 AND ARTICLE 700.27.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING DETAILED ELECTRICAL EQUIPMENT LAYOUT DRAWINGS TO THE ENGINEER FOR APPROVAL PRIOR TO INSTALLATION.



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ELECTRICAL NOTES

SHOAL RIVER LANDING PUMP STATION



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ELECTRICAL UTILITY SERVICE
 480 VOLT, 3 PH, 3 WIRE,
 60 HZ, WYE
 SOLIDLY GROUND NEUTRAL

MCB
 NEMA 4X S.S.
 ENCLOSURE
 600A

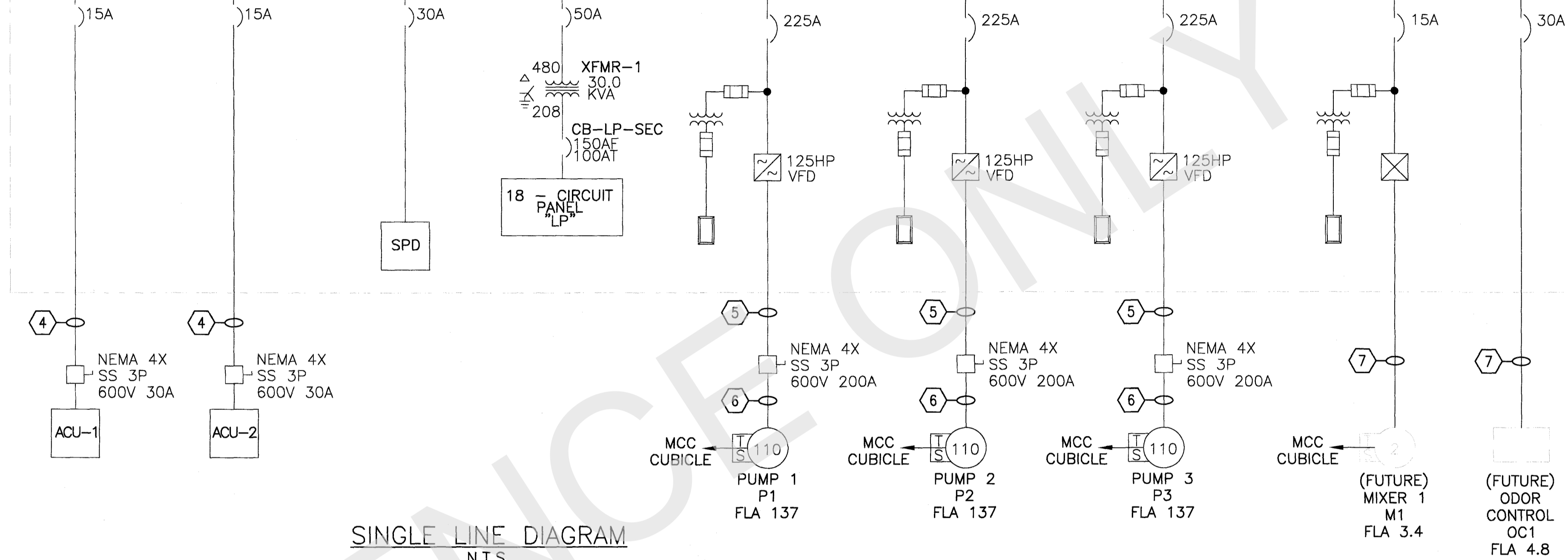
ATS
 SERVICE ENTRANCE RATED
 NEMA 12
 600A, 3P

400A
 250KW
 480V
 3-PHASE
 EMERGENCY GENERATOR

2/0 BARE COPPER
 10' COPPER GROUND ROD (TYP)
 2/0 BARE COPPER (TYP)

MCC-1 - ALLEN BRADLEY, 480VAC, 3-PHASE, 3-WIRE, SOLIDLY GROUND

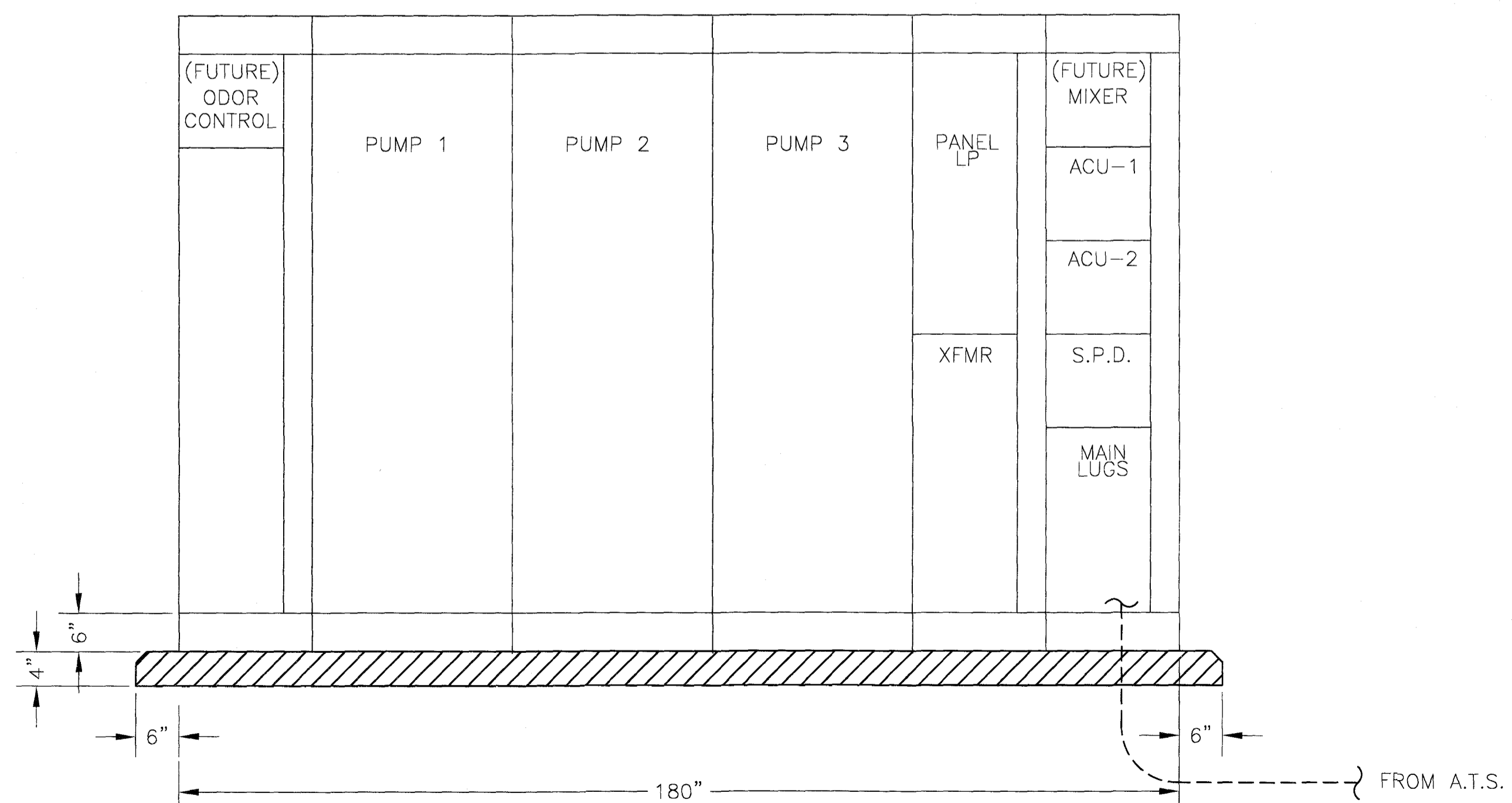
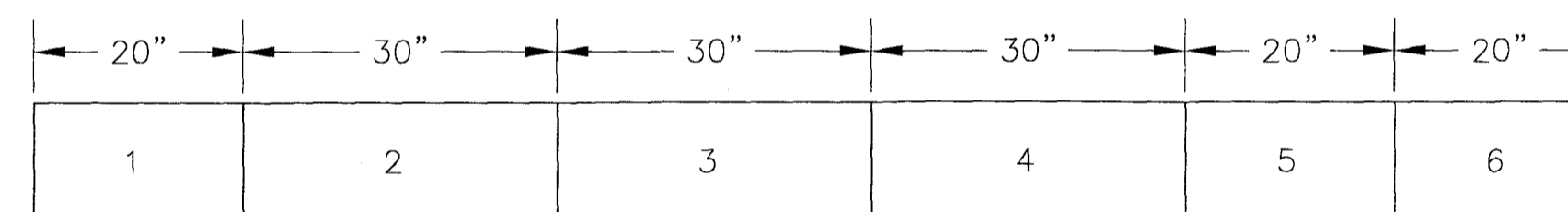
600A COPPER/TIN PLATED 42,000A RMS BRACING



SINGLE LINE DIAGRAM
N.T.S.

CONDUIT AND CONDUCTOR SCHEDULE

MARKER	DESCRIPTION
1	2 SETS - 3#350KCM EACH IN A 4" C
2	2 SETS - 3#3/0, 1#3G EACH IN A 3" C
3	2 SETS - 3#350KCM, 1#2G EACH IN A 4" C
4	3#10, 1#10 G IN A 1" C
5	3#3/0, 1#4G VFD CABLE IN A 3" C
6	MANUFACTURER CABLE, CONDUIT AS REQUIRED
7	1" CONDUIT
8	3#12 IN A 1" C
9	8#14 IN A 1" C
10	2-2#18 TSP CABLE IN A 1" C
11	16#14 IN A 1" C
12	CAT6 ETHERNET CABLE IN A 1" C

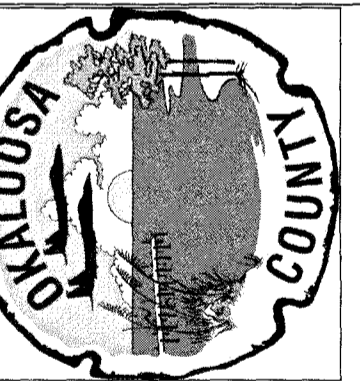


MCC-1 ELEVATION
N.T.S.



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		DCS	JCS	DCS

SINGLE LINE
 SHOAL RIVER LANDING PUMP STATION

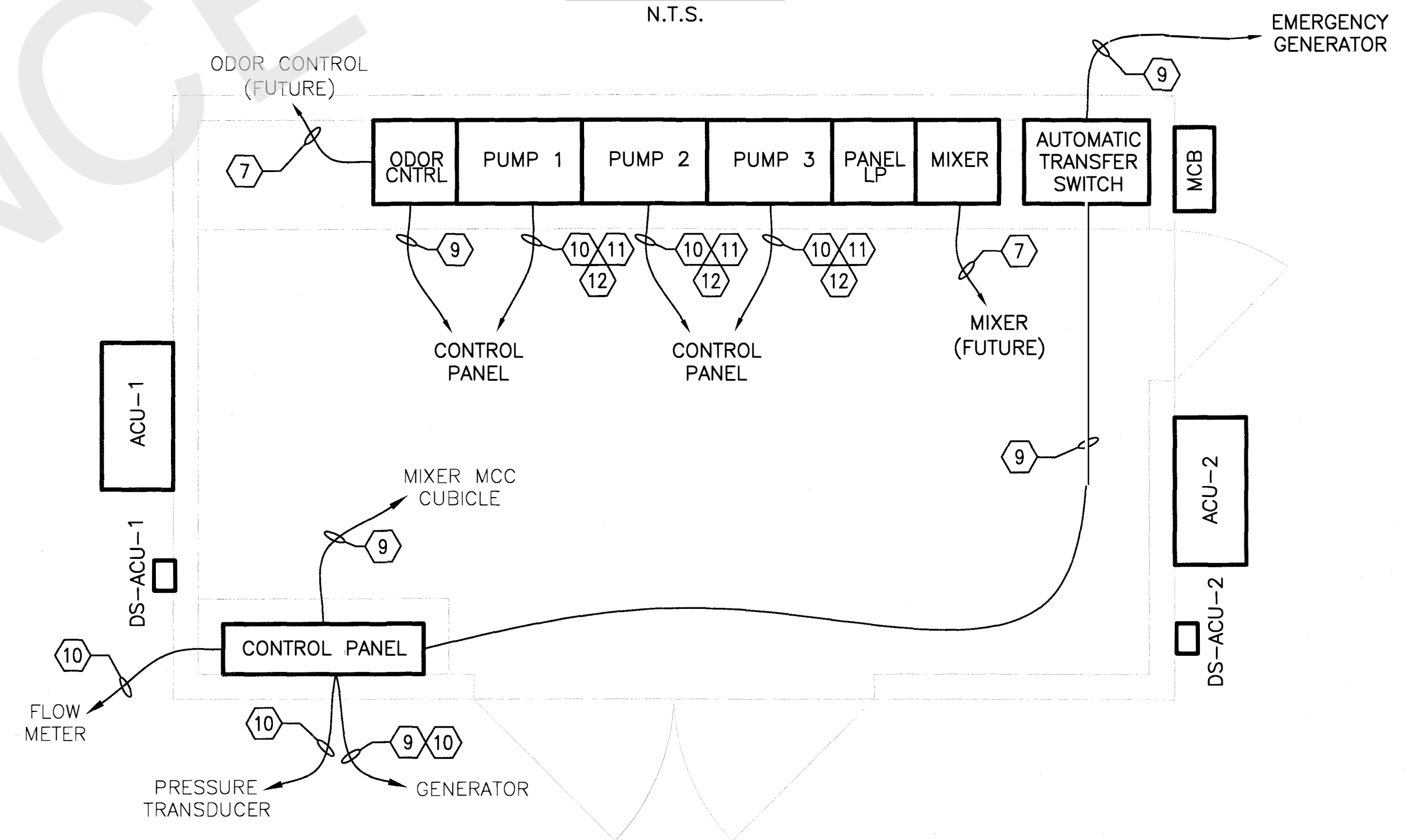
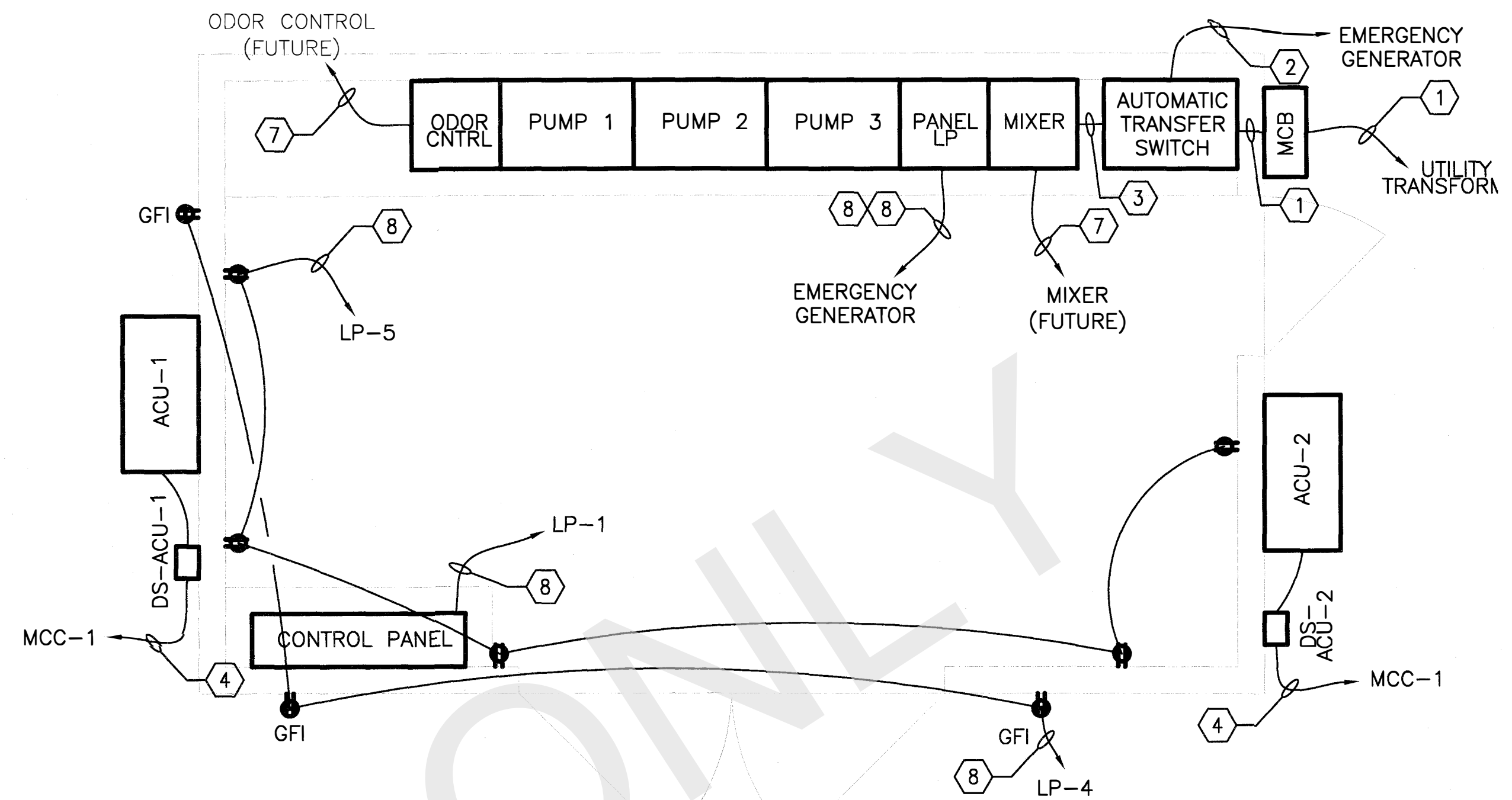
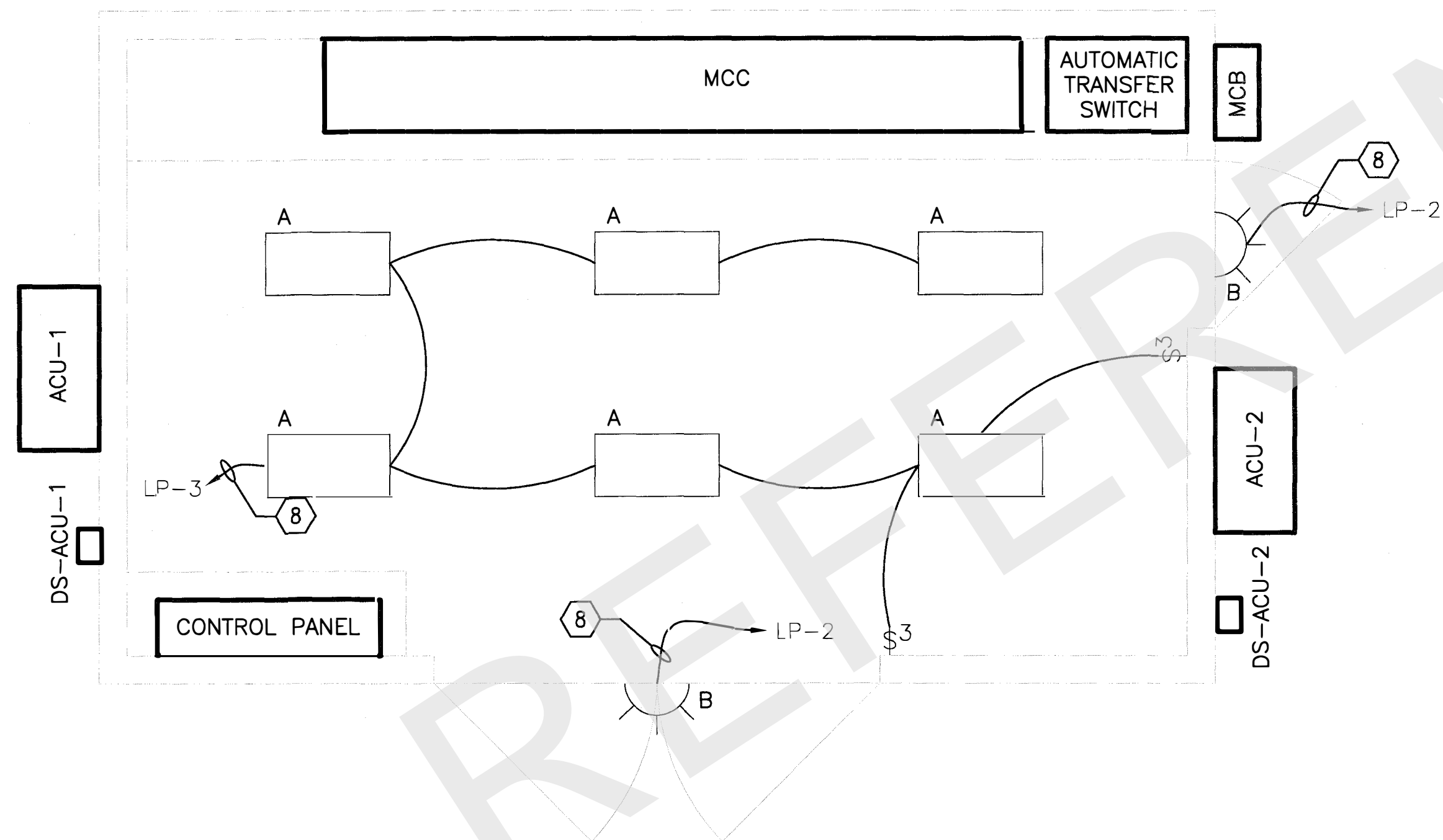
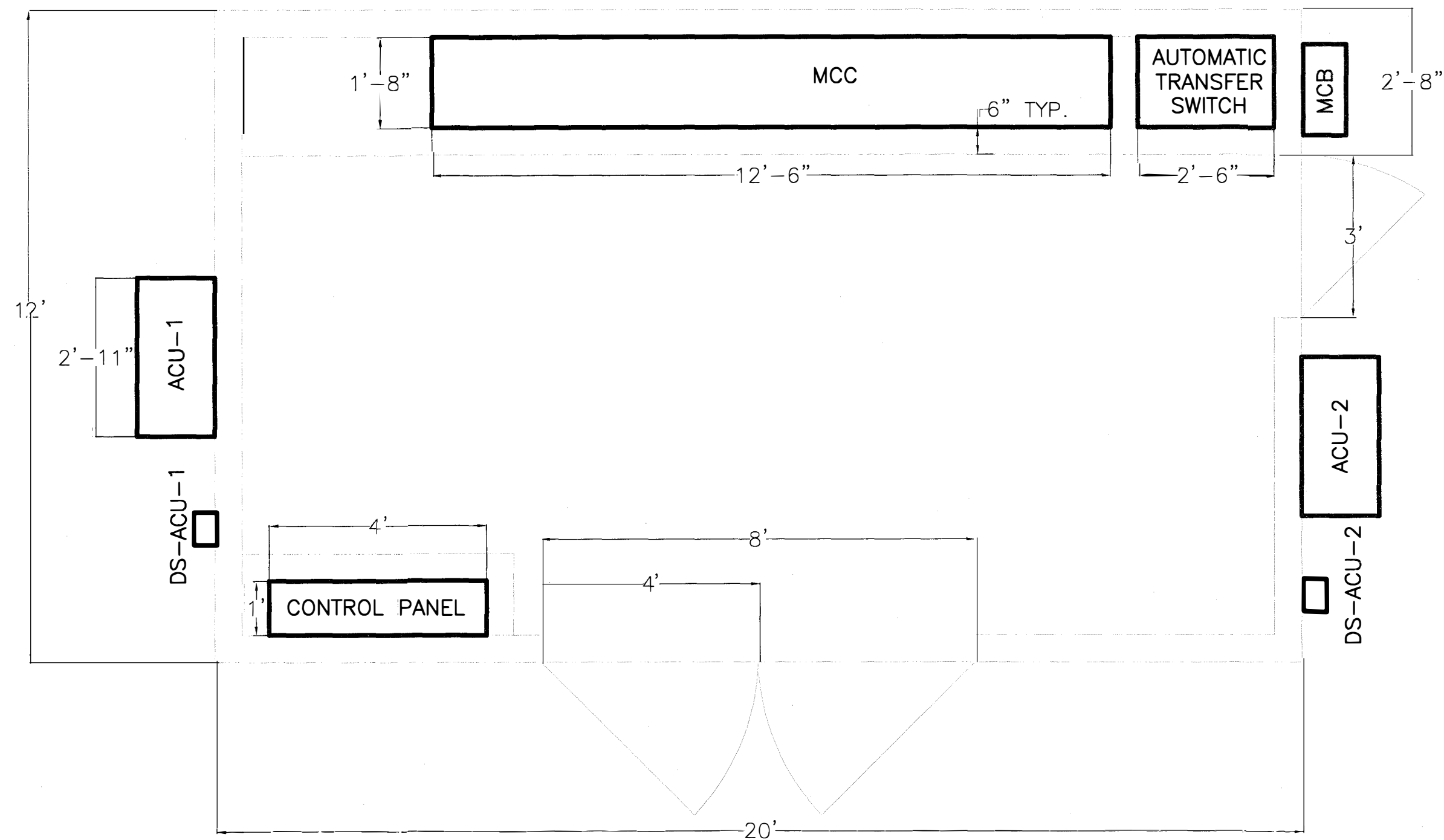


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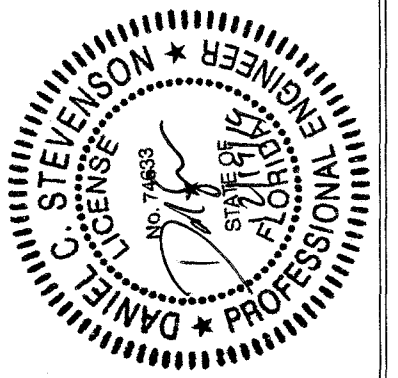


ELECTRICAL BUILDING CONTROL PLAN
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FIXTURE SCHEDULE

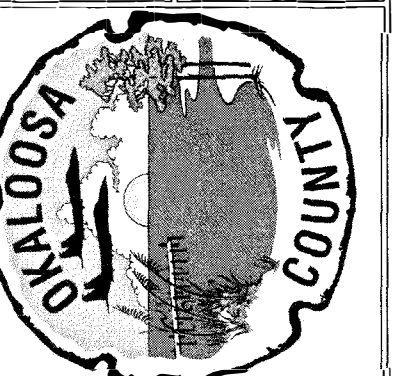
MARK	MANUFACTURER CATALOG NO.	MANUFACTURER	DESCRIPTION	LAMPS		MOUNTING HEIGHT	TYPE MOUNTING	REMARKS	OPTIONS
				WATTS	NO. PER FIXTURE				
A	EG3-4-LED-4L-DA-S-UNV-40-80-EM-SL	LSI	FRP ENCLOSED AND GASKETED LED STRIP FIXTURE	32	LED	LED	CEILING SURFACE	EMERGENCY BALLAST	
B	SWPM-WB-LED-PL1-40-UE-BRZ-PD	LSI	OUTDOOR WALLPACK	50W	LED	LED	WALL SURFACE		PHOTOCELL CONTROL

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ELECTRICAL BUILDING
SHOAL RIVER LANDING PUMP STATION



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PANEL: LP														
LOCATION: MCC			VOLTAGE			L-N: 208			I-N: 120			MAIN: 150A MCO		
CKT#	BKR.	POLE	DESCRIPTION	VOLT-AMP	PHASE A	PHASE B	PHASE C	VOLT-AMP	DESCRIPTION	POLE	BKR.	CKT#		
1	20	1	CONTROL PANEL	1000	1084			84	EXTERIOR LIGHTS	1	20	2		
3	20	1	INTERIOR LIGHTS	384		924		540	EXTERIOR RECEPT	1	20	4		
5	20	1	INTERIOR RECEPT	900			900	0	SPARE	1	20	6		
7	20	1	YARD LIGHT	250	250			0	SPARE	1	20	8		
9	20	1	SPARE	0		0		0	SPARE	1	20	10		
11	20	1	SPARE	0			0	0	SPARE	1	20	12		
13	60	3	SPARE	0	5			5	SPD	3	50	14		
15	-	-	SPARE	0		5		5		-	-	16		
17	-	-	SPARE	0			5	5		-	-	18		
TOTAL LOAD(VA)/PHASE THIS PANEL:					1349	928	905							
TOTAL CONNECTED LOAD(VA) THIS PANEL:					3173	TOTAL CONNECTED LOAD (AMPS):			9					
TOTAL DEMAND LOAD (VA) THIS PANEL:					2538	TOTAL DEMAND LOADS (AMPS):			7					
NOTES:														
1. MINIMUM A.I.C. SHALL BE 22K SERIES RAFFD.														

ACU SCHEDULE	
ACU-1	24,000 BTUH, 9.0 EER, 1600 CFM, 480/3Ø/ 60 HZ 1/5 HP DIRECT DRIVE FAN, 6 KW HEATER
ACU-2	24,000 BTUH, 9.0 EER, 1600 CFM, 480/3Ø/ 60 HZ 1/5 HP DIRECT DRIVE FAN, 6 KW HEATER

MOTOR SCHEDULE			
	MOTOR SIZE	FULL LOAD (NAMEPLATE)	VOLT/ PHASE
PUMP #1	110 HP	137A (RUN) 822A (START)	480/3
PUMP #2	110 HP	137A (RUN) 822A (START)	480/3
PUMP #3	110 HP	137A (RUN) 822A (START)	480/3
MIXER #1 (FUTURE)	2 HP	3.4A (RUN) 20.4A (START)	480/3
ODOR CONTROL (FUTURE)	3 HP	4.8A (RUN) 28.8A (START)	480/3

LOAD CALCULATION					
LOAD	CONNECTED				
	KVA	HP	AMPS	VOLTAGE	PHASE
PUMP NO. 1	114	110	137	480	3
PUMP NO. 2	114	110	137	480	3
PUMP NO. 3	114	110	137	480	3
(FUTURE) MIXER NO. 1	1.6	2	3.4	480	3
(FUTURE) ODOR CONTROL	2.8	3	4.8	480	3
PANEL LP	3.4		10	208	3
HVAC	8.3		20	480	3
TOTAL	358.1		449.2		
25% OF LARGEST MOTOR			34.25		
CONNECTED + 25% OF LARGEST MOTOR			483.45		



NO.	DATE	DESIGNED BY	DRAWN BY	REVISION	CHECKED BY	APPROVED BY

SCHEDULES

SHOAL RIVER LANDING PUMP STATION



FILE	SEE LEFT
VERIFY SCALE	
BAR IS ONE INCH ON ORIGINAL DRAWING	
DATE	OCTOBER 2019
PROJ.	100502.09
DWG.	E-12