

---

---

**Surry County Marina – Fueling Station**

633 Marina Drive, Surry, VA 23883

VIA design Project Code: 14012

Architect  
**VIA Design Architects, P.C.**

PME Engineers  
**PACE Collaborative**

Civil Engineer  
**Kimley-Horn**

---

---

**VIA Design Architects, P.C.**  
**150 Randolph Street**  
**Norfolk, Virginia 23510**

SECTION 000100 - TABLE OF CONTENTS

---

**BIDDING/GENERAL REQUIREMENTS, AND CONTRACT FORMS**

FUELING STATION SUMMARY OF WORK

INSTRUCTIONS TO BIDDERS

CONSTRUCTION CONTRACT

FORM OF PROPOSAL

QUALITY ASSURANCE

SAFETY

SUBMITTALS

TESTING REQUIREMENTS

**DIVISION 26 - ELECTRICAL**

260500 ELECTRICAL GENERAL PROVISIONS

260519 LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

260526 GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

260529 HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

260533 RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

260544 SLEEVES AND SLEEVE SEALS FOR ELECTRICAL RACEWAYS AND CABLING

260553 IDENTIFICATION FOR ELECTRICAL SYSTEMS

262416 PANELBOARDS

262726 WIRING DEVICES

262816 ENCLOSED SWITCHES AND CIRCUIT BREAKERS

262900 MOTOR AND MOTOR CONTROL

END OF SECTION 000100

## SECTION 011000 – SUMMARY OF WORK

### PART 1 - GENERAL

#### 1.1 SUMMARY

A. This Section includes the following:

1. Work covered by the Contract Documents – Includes but is not limited to furnishing and installing a Complete and Functioning 4,000 gallon and 1,000 gallon Above Ground Storage Tanks (AST) installation along with Fuel Lines and Dispensers in accordance with the Contract Drawings dated December 15, 2016 from VIA Design. Site work to include installation of underground fuel lines, fuel dispensers on the end of the Marina Docks and dedicated underground electrical lines.
2. Work under other contracts.- Surry County Marina and Bathhouse
3. Use of premises.- Combined use of premises. The Surry Seafood Co. restaurant is currently in operation and its patrons use the existing gravel parking lot. Also, there is an active Boat Ramp-Launching Facility which will remain in operation during the construction. Contractor shall coordinate its use so as not to interfere with restaurant or boat ramp operations.
4. Specification – Available with Contract Drawings.

#### 1.2 WORK COVERED BY CONTRACT DOCUMENTS

A. Project Identification: Surry County Marina Fueling Station

1. Project Location: 633 Marina Drive, Surry County, VA, 23883

B. Owner: Surry County

1. Owner's Representative: Brian Camden (Alpha Corporation) 757-567-8865  
Joe Gilbert (Alpha Corporation) 757-435-4143

C. Architect: VIA Design PC, 150 Randolph Street, Norfolk, VA 23510.

D. The Work consists of the following:

1. Includes but not limited to a Complete and Functioning Fueling Station. Site work to include installation of underground fuel lines, and dedicated underground electrical lines as indicated in the Contract Plans and Specifications entitled Surry County Marina Fueling Station, dated December 15, 2016.

## 1.3

- A. Project will be constructed under a single prime contract.
- B. Before commencing Work, submit a schedule showing the sequence, commencement and completion dates.

## 1.4 WORK UNDER OTHER CONTRACTS

- A. General: Cooperate fully with separate contractors, if any, so work on those contracts may be carried out smoothly, without interfering with or delaying work under this Contract. Coordinate the Work of this Contract with work performed under separate contracts.

## 1.5 USE OF PREMISES

- A. General: Contractor shall have limited use of premises for construction operations as needed for the continued operation of the restaurant and boat ramp and as required for safety. There may be additional storage areas available in the gravel parking lots up the hill from the site. Coordinate with the Construction Manager.
- B. Use of Site: Limit use of premises to work in areas indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated including the Restaurant or Boat Ramp operations

## 1.6 SPECIFICATION FORMATS AND CONVENTIONS

- A. Specification Format: The Specifications are organized into Divisions and Sections using the 16-division format and CSI/CSC's "MasterFormat" numbering system.
  - 1. Division 1: Sections in Division 1 govern the execution of the Work of all Sections in the Specifications.
- B. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. Contact the Program Manager if any meaning is unclear prior to submitting Bid.

## INSTRUCTIONS TO BIDDERS

### 1. DRAWINGS AND SPECIFICATIONS

Copies of the IFB and Contract Drawings with Specifications may be obtained from the web site: <ftp://projectftp.viadesignarchitects.com/> . The username is **Grays Creek** utilizing access code **14012**.

### 2. PROPOSALS

Before submitting a proposal, each bidder shall carefully examine the drawings, specifications and other contract documents; shall visit the site of the work including Grays Creek, the Surry Seafood Company; the Boat Ramp operations and shall fully inform himself as to all existing conditions and limitations; and shall include in the proposal the cost of all items included in the contract.

Submit the proposal on forms provided. Only information requested/required by the proposal form will be accepted. Unsolicited alternates or qualified bids will not be considered. Modifications to bids shall only be in accordance with Paragraph 15, Instructions to Bidders.

**The Contractor is required to achieve Substantial Completion of the project within three (3) months after the date of receiving all applicable permits to commence construction.**

Fill in all blank spaces for bid prices in both words and figures. In case of discrepancy between figures and written amounts, the written amount will govern. Submit proposal in sealed opaque envelope. Indicate on outside of envelope name of bidder, his address, and name of project for which bid is submitted.

### 3. CONTRACT AND BONDS

Each bid shall be accompanied by a bid security in the form of a Bid Bond, a cashier's or certified check in the amount of five percent (5%) of the total bid, made payable to Surry County. This Bid Bond, cashier's check or certified check pledges that the bidder will enter into a Contract with the Owner on the terms stated in the Bid and will furnish bonds covering faithful performance of the Contract and payment of all obligations arising thereunder. Should the bidders refuse to enter into such a Contract or fail to furnish such bonds, the amount of the bid security shall be forfeited to the Owner as liquidated damages, not as a penalty.

Surety Bond shall be written on AIA Document A310, Bid Bond, and the attorney-in-fact who executes the bond on behalf of the surety shall affix to the bond a certified and current copy of the power of attorney.

All bonds shall be written by sureties or insurance companies licensed to do business in the Commonwealth of Virginia. Other bid bond forms will be acceptable if in the same format as AIA Document A310, Bid Bond.

The contract agreement will be on a form similar to that which is bound in the specifications. The completion date of construction will be as indicated in the proposal. The successful bidder simultaneously with the execution of the contract agreement will be required to furnish a performance bond and a payment bond in an amount equal to one hundred percent (100%) of the contract price, said bonds shall be secured from a surety company licensed to do business in Virginia and acceptable to Surry County.

#### 4. LISTING OF SUBCONTRACTORS

The experience and responsibility of subcontractors may have bearing on the choice of a contractor by the Owner.

The apparent low bidder shall deliver to the Program Manager within 48 hours (not including Saturday, Sunday or State Holidays) for approval, a list of the names of subcontractors to be employed for each of the principal parts of the work and the corresponding dollar amounts. Each principal part shall mean a subcontract dollar value in excess of \$5,000.00. Such a list shall be binding upon the Contractor; however, the Owner has a right to reject any or all subcontractors listed or unlisted which Owner and/or Program Manager feels is unqualified to do the work. Owner may withhold awarding contract to any particular bidder if one or more of his proposed subcontractors are considered by the Owner to be unqualified.

#### 5. INTERPRETATIONS OF PLANS AND SPECIFICATIONS

If any person contemplating submitting a bid for the proposed contract is in doubt as to the true meaning of any part of the drawings, specifications or other proposed contract documents, he may submit to the Program Manager, Alpha Corporation, a written request no later than 10 days prior to the bid opening, for an interpretation thereof. The person submitting the request will be responsible for its prompt delivery. Any interpretation of the proposed documents will be made only by addendum. A copy of such addendum will be mailed or delivered to each person receiving a set of documents. Neither the Owner, Program Manager or the Architect will be responsible for any other explanations or interpretations of the proposed documents.

#### 6. ADDENDA OR BULLETINS

Any addenda or bulletins issued during the time of bidding shall become part of the documents provided to the bidders for the preparation of the bid, shall be covered in the bid, and shall be made a part of the contract.

## 7. RIGHT TO NEGOTIATE

The Owner reserves the right to negotiate with the lowest responsive and responsible Bidder to obtain a contract price with funds available to the Owner whenever such low bid exceeds the Owner's availability of funds for the work. The Work includes a complete Fueling System with underground utilities, and the Owner may select to build either portion of the Work depending on funds available.

## 8. AWARD OF CONTRACT

The contract will be awarded, as soon as possible, to the bidder submitting the lowest responsive and responsible bid. Any alternates on the proposal form will not be prioritized and will be selected based upon the Owner's interests and available funds.

The Owner reserves the right to waive any technicalities or formalities in any bid or in the bidding. The accepted bidder(s) shall assist and cooperate with the Owner in preparing formal Contract Agreement(s) and within five (5) days following its presentation shall sign and deliver four (4) complete sets of contract documents to the Owner, including but not limited to: the Agreement, the Performance Bond, Payment Bond, Hold Harmless Agreement, and all necessary Certificates of Insurance.

The successful bidder(s), upon failure or refusal to enter in the Contract and/or to furnish the required Performance Bond, Payment Bond, and other required documents within the time specified, shall pay to the Owner as liquidated damages, an amount equal to the bid guaranty deposited with the bid or a portion thereof equal to the difference between the bid security and or next highest acceptable bid.

## 9. QUALIFICATIONS

Time is of the essence. The contractors' and subcontractors' past performance, organization, equipment and ability to perform and complete their contract within Three (3) months after receipt of permits will be considered in awarding this contract.

## 10. COST BREAKDOWN

The Contractor shall, before starting his work, submit to the Program Manager a cost loaded schedule of values showing the cost of various segments of the work according to construction activity, the total amount equaling the contract price. This breakdown shall be used as the basis for the payment of estimates as stated in the contract documents.

## 11. RIGHT TO REJECT PROPOSALS

The Owner reserves the right to reject any or all proposals, to waive irregularities or informalities as may be deemed in the Owner's interest.

## 12. BID BOND OR CHECKS OF SUCCESSFUL BIDDERS

Bid Bond or Checks of successful bidder will be returned upon acceptance of the 100% performance bond and separate 100% payment bond. Checks of other bidders, not previously forfeited, will be returned as soon as it is determined that the bids represented by the checks will receive no further consideration by the Owner.

## 13. TIME IS OF THE ESSENCE AND AWARD OF CONTRACT

Time is essence of the Contract.

## 14. WITHDRAWAL OF BIDS

Bids may be withdrawn by written or telegraphic request received from bidders prior to the time fixed for the bid opening. Telegraphic requests must be received by the Owner in written form before the bid opening. Negligence on the part of the bidder in preparing the bid confers no right for the withdrawal of the bid after it has been opened except as permitted in Section 2.2-4330) of the Code of Virginia as outlined below.

A bidder may withdraw his bid from consideration if the bid price was substantially lower than other bids due solely to a mistake therein, provided the bid was submitted in good faith, and the mistake was a clerical mistake as opposed to a judgment mistake, and was actually due to an unintentional arithmetic error or an unintentional omission of a quantity of work, labor or material made directly in the compilation of a bid which unintentional arithmetic error or unintentional omission can be clearly shown by objective evidence drawn from inspection of original work papers, documents and materials used in the preparation of the bid sought to be withdrawn.

The bidder must submit to the Owner his original work papers, documents and materials used in the preparation of the bid within one (1) day or twenty-four (24) hours after the date fixed for submission of bids. Such work papers shall be delivered to the Owner by the bidder in person or by registered mail.

Such mistake shall be proved only from the original work papers, documents, and materials delivered to the Owner as required herein.

Failure of bidder to submit his original work papers, documents and materials used in the preparation of this bid at the time, date and place required shall constitute a waiver by that bidder of his right to claim any mistake in his bid.



No bid shall be withdrawn under this section when the result would be the awarding of the contract on another bid of the same bidder.

No bidder who is permitted to withdraw a bid shall for compensation, supply any material or labor to or perform any subcontract or other work agreement for the person or firm to whom the contract is awarded or otherwise benefit directly or indirectly from the performance of the project for which the withdrawn bid was submitted without the approval of the Owner.

If the bid is withdrawn under authority of this section, the next lowest responsive and responsible bidder shall be deemed to be the low bidder on the project.

When the procedure set forth in the paragraphs above is utilized, original work papers, documents, and materials used in the preparation of the bid must be submitted in an envelope or package separate and apart from the envelope containing the bid marked clearly as to the contents.

#### 15. REQUEST FOR INTERPRETATIONS OR SUBSTITUTIONS

Within fifteen (15) days after Award of Contract, submit to the Architect through the Program Manager, a complete list of major products which are proposed as substitutions for installation with the name of the manufacturer, trade name and model.

#### 16. PRE-BID CONFERENCE

A Pre-bid Conference will be held at the site, 633 Marina Dr., Surry County, at 10:30am on **Tuesday June 6, 2017**. It is encouraged for bidding purposes that the bidders visit the site to confirm existing conditions, and pursuant to the Form of Proposal, bidders will declare their site visit and examinations and acceptance of site conditions. Attendance at the pre-bid conference is requested, not mandatory.

**SURRY COUNTY PROJECT NO: BC2016-04 Surry County Marina Fueling Station, Surry County, VA.**

THIS AGREEMENT, made and entered into this \_\_\_\_\_ day of \_\_\_\_\_ by and between Surry County, Virginia, hereinafter called the Owner, and \_\_\_\_\_ hereinafter called the Contractor, whose address is \_\_\_\_\_.

WITNESSETH: WHEREAS, the Owner intends to have the Marina Fueling Station work located on 633 Marina Drive in Surry County, Virginia.

WHEREAS, the Contractor agrees to perform the work for the sum herein stated.

NOW THEREFORE, the Owner and the Contractor for the consideration hereinafter provided agree as follows:

**ARTICLE 1. SCOPE OF WORK**

The work to be performed shall be in accordance with Contract Documents prepared by VIA Design Architects dated December 15, 2016 and entitled Surry County Marina Fueling Station, Surry County, the Contractor agrees to furnish all labor, materials and equipment to complete the work as required in the Contract Documents, which are hereby made a part of this contract by reference. It is understood and agreed by the parties hereto that all work shall be performed as required in the Contract Documents and shall be subject to inspection and approval of the Owner or its authorized representative. The relationship of the Contractor to the Owner hereunder is that of an independent Contractor. The AIA General Conditions of the contract are included in the Contract Documents are defined in the General Conditions and are incorporated herein by reference.

**ARTICLE 2. TIME OF COMPLETION**

The Contractor shall commence the work promptly upon the date established in the Notice to Proceed and be 100% complete within Three (3) Months after receipt of necessary permits to start construction. If there is no Notice to Proceed, the date of commencement of the Work shall be the date of this agreement or such other date as may be established therein.

**ARTICLE 3. CONTRACT SUM**

The Owner agrees to pay, and the Contractor agrees to accept in full performance of this contract, the sum of \_\_\_\_\_, which sum also include the cost of a 100% Performance Bond and 100% Payment Bond, said bonds having been posted by the Contractor Pursuant to State Law.

**ARTICLE 4 PAYMENT**

The Owner agrees to pay the Contractor from time to time as the work progresses, but no more than once each month after the date of Notice to Proceed, and only after complying with the General Conditions and

completion of the value of the labor performed and, subject to the requirements for the General Conditions, ninety-five percent (95%) of the value of materials furnished in place or on-site.

#### ARTICLE 5. INDEBTEDNESS

Before final payment is made, the Contractor must submit evidence in the form of a final waiver of lien or claim to the Owner that all payrolls, materials bills, subcontracts and outstanding indebtedness in connection with the work have been paid or what arrangement have been made for the payment.

Payment will be made without unnecessary delay and after receipt of such evidence as mentioned above and final acceptance of the work by the owner.

#### ARTICLE 6. ADDITIONAL WORK

In its understood and agreed by the parties hereto that no money will be paid to the Contractor for any additional labor or materials furnished unless an new contract in writing or a modification hereto for such additional materials or labor has been executed by the Owner and Contractor. The Owner specifically reserves the right to modify or amend this contract and the total sum due hereunder either by enlarging or restricting the scope of work.

#### ARTICLE 7. ACCEPTANCE

The work shall be inspected for acceptance by the Construction Manager and Architect promptly upon receipt of the notice from the Contractor that the work is complete and ready for inspection.

#### ARTICLE 8. DISPUTES PERTAINING TO PAYMENT FOR WORK

Should disputes arise respecting the value of any work done, or any work omitted, or any extra work which the said Contractor may be required to perform, or respecting any other elements involved in this contract, the said dispute shall be brought to the attention of the Program Manager who will attempt to settle matters. If he/she is unsuccessful, the dispute will be brought to the attention of Surry County and their decision shall be final and conclusive. Any claims, disputes or other matters in question between the parties to this Agreement shall not be subject to binding arbitration. Any and all claims or disputes, or other matters in question between the parties arising out of or relating to this Agreement or a breach thereof shall be resolved by appropriate proceedings in the Surry County Circuit Court, and in no other forum.

#### ARTICLE 9. TERMINATION FOR BREACH, ETC

IF the Contractor shall be adjudged bankrupt or if he should make a general assignment for the benefit of his creditors or if a receiver should be appointed on account of his insolvency, or if he or any of his subcontractors violate any of the provisions of this contract, the Owner may serve written notice upon him of its intention to terminate said contract; and unless, within ten (10) days after the serving of such notice, such violation shall cease, the Owner then may take over the work and prosecute same to completion by contract or by any other method it may deem advisable for the account and at the expense of the Contractor. The

Owner may take possession of and utilize in completing the work, such materials, appliances, paint, and any other property belonging to the Contractor as may be on the site of the work and necessary therefore. The Owner may, at any time upon ten (10) days written notice to the Contractor, terminate (without prejudice to any right of remedy of the Owner) the whole or any portion of the work for the convenience of the Owner.

#### ARTICLE 10. OWNER'S RIGHT TO WITHHOLD CERTAIN AMOUNT AND MAKE APPLICATION THEREOF.

The Owner may withhold from payment to the Contractor such an amount or amounts as, in its judgment, may be necessary to pay just claims against the Contractor or any subcontractor for labor and services rendered and materials furnished in and about the work. The Owner may apply such withheld amounts on the payment of such claims in its discretion. In so doing, the Owner shall be deemed the agent of the Contractor and payments so made by the Owner shall be considered as payment made under the Contract by the Owner as to such payment made in good faith. Such payments may be made without prior determination of the claim or claims.

#### ARTICLE 11. LIABILITY AND INDEMNIFICATION

The Contractor agrees that it/he shall at all times protect and indemnify and save harmless, Surry County and all institutions, agencies, departments, authorities and instrumentalities of the County and any member of their governing bodies or of their boards or commissions or any of their elected or appointed officers or any of their employees or authorized volunteers as described in the General Conditions of the project specifications which are included herein by reference, from any and all claims, damages of every kind and nature made, rendered or incurred by or in behalf of any person or corporation whatsoever, including the parties hereto and their employees that may arise, that occur or grow out of any acts, actions, work or other activity done by the said Contractor in the performance and execution of this Contract.

#### ARTICLE 12. SUBCONTRACTOR

No part of this contract shall be sublet by the Contractor without prior written approval of the Owner.

#### ARTICLE 13. LIQUIDATED DAMAGES

Should the Contractor fail to Substantially Complete the work on or before the Substantial Completion Date, the Contractor shall pay the Owner the sum of \$250.00 for each consecutive calendar day that the terms of the Contract remain unfulfilled.

For each consecutive calendar day that the work remains incomplete after the date established for the Final Completion, the Contractor will pay the Owner the additional sum of \$200.00 for each calendar day beyond the said Final Completion Date that the work remains uncompleted. Permitting the Contractor to continue and finish the work or any part of it after the time fixed for its completion, or after the date to which the time for completion may have been extended, shall in no way operate as a waiver on the part of the Owner of any of his rights under the Contract. Liquidated damages will be calculated and assessed based on provisions defined in the General Conditions and the date upon which the Program Manager and Owner certify that all

items on the Substantial Completion "Punch List" are complete. The sums mentioned above shall represent the actual measure of liquidated damages which the Owner will sustain per diem by failure of the undersigned to complete the Work at the times stipulated. The sum is in no way to be considered a penalty.

ARTICLE I4. VIRGINIA PUBLIC PROCUREMENT ACT.

Contractor agrees to comply with all of the mandatory provisions of the Virginia Public Procurement Act, which are incorporated herein by reference, including those concerning non-discrimination, payment of subcontractors, employment of aliens, maintaining a drug free workplace and maintaining all state licenses and SCC corporate registration. Contractor's tax identification number is \_\_\_\_\_.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement on the day and year first above written.

CONTRACTOR: .

BY: \_\_\_\_\_

ATTEST

BY: \_\_\_\_\_ TITLE: \_\_\_\_\_

BY: \_\_\_\_\_ TITLE: \_\_\_\_\_

OWNER:

SURRY COUNTY

BY: \_\_\_\_\_ TITLE: \_\_\_\_\_

ATTEST

BY: \_\_\_\_\_ TITLE: \_\_\_\_\_

BY: \_\_\_\_\_ TITLE: \_\_\_\_\_

APPROVED AS TO FORM:

ATTORNEY

BY: \_\_\_\_\_ TITLE: \_\_\_\_\_

To: Tyrone Franklin, Surry County Administrator

Submitted By: \_\_\_\_\_

Date: \_\_\_\_\_

Having carefully examined the drawings and specifications prepared by Via Design Architects and entitled Surry County Marina Fueling Station dated December 15, 2016 as well as the premises and conditions affecting the work, the undersigned proposes to furnish all materials, labor, equipment and services, including applicable taxes, for a lump sum consideration of:

**BASE BID** – Surry County Marina Fueling Station, Surry County, Virginia.

\_\_\_\_\_ Dollars

(\$ \_\_\_\_\_ ) **TOTAL BASE BID**

**TIME OF COMPLETION**

Work shall commence immediately upon contract signing or upon Notice To Proceed. Owner anticipates Award of Contract/Notice to Proceed by **July 1, 2017**. All work shall be substantially complete and available for occupancy within three (3) months of receiving all permits to start construction.

**BID SECURITY**

If notified of the acceptance of this bid within sixty (30) calendar days after the date fixed for the opening of the bids, the undersigned agrees to execute and deliver to the Owner the Contract and Contractor's Bonds within ten (10) calendar days from the date of notification and, to faithfully and properly complete the work with the best interest of the Owner, the safety of the public and in accordance with first class workmanship.

The undersigned agrees the Owner may retain five percent (5%) of the contract amount.

Attached hereto is a cashiers check/certified check in the amount of \_\_\_\_\_ or Bid Bond (AIA Document A310 or from Bid Bond Surety Company authorized to do business in the State of Virginia and acceptable to the Authority), none of which shall be less than five percent (5%) of the principal's bid, made payable to the Owner.

The Undersigned agrees, if awarded the Contract, to comply with all provisions regarding commencement, performance, completion and acceptance of the work described in the above mentioned specifications and as stipulated in his proposal and the construction contract. In case of failure on his part to execute the said contract and bond and commence work thereon, the check or bid bond shall be paid as liquidated damages for such failure; otherwise, the check or bid bond accompanying this proposal shall be returned to the Undersigned.

It is agreed that the Undersigned has complied with and/or will comply with all requirements concerning licensing and with all other Local, State and National Laws and that no legal requirement has been or will be violated in making or accepting this proposal, in awarding the contract to him and/or in the prosecution of the work required thereunder.

The Undersigned declares that the person or persons signing this proposal is/are fully authorized to sign the proposal on behalf of the firm listed and to fully bind the firm listed to all the conditions and provisions thereof. It is agreed that no person or persons or company other than the firm listed below or as otherwise indicated hereinafter

has any interest whatsoever in this proposal of the Contract that may be entered into as a result thereof and that in all respects the proposal is legal and fair, submitted in good faith without collusion or fraud.

Respectfully submitted this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_\_.

\_\_\_\_\_  
(Name of Firm)

\_\_\_\_\_  
(Mailing Address of Firm)

\_\_\_\_\_  
(City/State/Zip Code of Firm)

( \_\_\_\_\_ )  
\_\_\_\_\_  
(Phone Number)

By \_\_\_\_\_

Title \_\_\_\_\_

General Contractor Number: \_\_\_\_\_

**QUALITY ASSURANCE****A. OBSERVATION OF WORK**

1. Site Observation - The Construction Manager/Architect will periodically inspect the construction and report activities to the contractor, Program Manager and County. The Architect will be required to provide the Program Manager with a field observation report for each day the Architect visits the site.

The General Contractor will be solely responsible for construction means, methods, sequence or procedures, safety precautions and programs in connection with the work.

2. Code Inspection - The Contractor has the SOLE obligation to schedule and notify the various County, State and other inspection agencies and the Program Manager for the proper inspections as prescribed by the applicable code and permit requirements. The costs for all inspections are to be paid by the Contractor. Prior to calling for said inspection, the Contractor shall notify the Construction Manager and Architect or his consultants in order to review the work if so required.
3. Testing & Inspection – The Contractor is required to provide independent manufacturer testing of the complete Fueling System as required by the Contract Documents and which will be employed and paid directly by the General Contractor. A copy of the manufacturer's testing results shall be sent to the Owner, Architect and Construction Manager.

**B. REJECTION**

Should a case arise where a deficiency is discovered and the Construction Manager as well as the Architect, recommends rejection of a part of the work, the following procedures shall be implemented:

1. Construction Manager and the Architect shall make an investigation of the problem and review all the pertinent facts with the Contractor.
2. After consultation with the Contractor and the Construction Manager, if an order of non-compliance is appropriate, the Architect and/or Program Manager will formally notify the Contractor of the work to be rejected. This will be accomplished by issuing a Notice of Defective or Non-Conforming Work.
3. The Construction Manager shall then issue a Notice of Defective or Non-Conforming Work form which will consist of three (3) elements as follows:
  - a. A concise description which clearly and thoroughly defines work which is rejected;
  - b. References to the provisions of the contract which are deficient, and;
  - c. The allowable time for correction of non-conforming work is three (3) calendar days from the date of the Notice of Non-Conformance was issued.
4. Three methods exist for the resolution of a Notice of Defective or Non-Conforming Work:



- a. The Contractor shall correct, at his expense, the defective work
- b. County, at the Contractor's expense, shall correct the defective work.
- c. At the opinion of the County, the defective or non-conforming work may remain as is with an equitable adjustment by reduction of the contract amount. (This would be accomplished by a Change Order).
- d. A Resolution of Defective or Non-Conforming Work will be issued when all corrective measures have been completed.
- e. The Construction Manager shall log the date the Notice of Defective or Non-Conforming Work was issued and the date the Resolution of Defective or Non-Conforming Work was issued.

**NOTICE OF DEFECTIVE OR NON-CONFORMING WORK**

**PROJECT NAME:**

**NONC NO.:**

**GENERAL CONTRACTOR:**

**DATE:**

**NOTICE:**

Gentlemen:

You are hereby notified that the following work has been found to be defective or not in accordance with the Contract Documents:

See Attached EXHIBIT Date \_\_\_\_\_

This Notice of Defective or Non-Conforming work is a demand of the Program Manager that the above identified rejected work shall be brought into conformity with the Contract Documents by no later than the time fixed herein below. Failure on the part of the Contractor to comply with this demand within the time allowed with constitute a breach of contract and will, in addition, constitute neglect and failure to perform pursuant to which neglect and failure, the Owner will, after three (3) days written notice to the Contractor, be entitled under the terms of the General Conditions to make good the above mentioned deficiencies with deduction of the cost thereof from any payment due to become due to the Contractor.

The General Conditions provides that the Contractor shall promptly correct all work rejected and that the Contractor shall bear all costs of correcting such rejected work. It is the opinion of the Program Manager that taking all circumstances into consideration, the Contractor must have completed the aforesaid no later than the close of the business day on \_\_\_\_\_. The designation of the space of time allowed is not an extension of time, does not alter the pace of the construction progress schedule, and does not extend the time for making good deficiencies on any earlier notices of defective or non-conforming work. It is the time within which the deficiencies must have been made good or the omissions supplied under pain of giving rise to a right of the Owner to have the work performed directly and promptly at the expense of the Contractor.

Sincerely,

ALPHA CORPORATION INC.

- cc. Architect
- Office
- Field
- Site

**ATTACHMENT  
RESOLUTION OF NON-CONFORMING WORK**

<b>PROJECT NAME: Surry County Marina Fueling Station</b>	<b>NONC NO.:</b>
<b>ATTENTION:</b>	<b>DATE:</b>
<b>GENERAL CONTRACTOR:</b>	

This is to inform you that the above referenced Notice is hereby dissolved.

Your letter of \_\_\_\_\_ notified us that work rejected by Notice of Defective or Non-Conforming Work Number \_\_\_\_\_ as described in Exhibit 'A' dated \_\_\_\_\_ and enclosed herewith, has been corrected.

Pursuant to our inspection of the work made \_\_\_\_\_, we herewith dissolve the Notice of Defective of Non-Conforming Work dated \_\_\_\_\_.

Respectfully,

ALPHA CORPORATION, INC.

Enclosure: Exhibit 'A'

cc: Architect  
Office  
Field  
Site

**ATTACHMENT I**  
**NOTICE OF NON-COMPLIANCE LOG**  
 (Surry County Marina Fueling Station)

PROJECT: \_\_\_\_\_

A/E: \_\_\_\_\_

PAGE \_\_\_

OF \_\_\_

NONC. NO.	DESCRIPTION	DWGS/SPEC REFERENCE	ISSUE DATE	TO CONTRACTOR	ACTION TAKEN BY G.C. DATE	DATE CLEARED

## 5. SAFETY PROGRAMS

### A. SAFETY AND SECURITY PROGRAMS

The Contractor is required to submit to the Construction Manager a copy of his safety program and any revisions and monthly updates, and the name of their authorized Safety Supervisor at the pre-construction meeting and continuously thereafter for the duration of the Contract. (Note requirements of law for posting of telephone numbers and for first aid training).

**The General Contractor has the sole and complete responsibility for the conditions of the job site including safety of all persons and property affected by his work for the duration of the project.**

The Contractor must furnish any and all accident reports to the Construction Manager within twenty-four (24) hours of the incident.

With the restaurant and boat ramp in operations, the Contractor shall designate a responsible member of his organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's Superintendent unless otherwise designated by the Contractor in writing to the Program Manager.

The Contractor shall protect persons, property, vehicles, waterways wetlands, adjoining property and nearby buildings, including, roads and public streets, from dust, dirt, rubbish or other nuisances arising out of the Contractor's operations or storage practices. If the Contractor damages buildings, vehicles, roads or any other property which belongs to the County or any department or agency thereof, restaurant or boat ramp patrons, he shall repair or replace the same to the satisfaction of the County. In the event the Contractor fails to repair or replace the said property or, in the event the County so elects, Alpha Corporation may direct the Contractor not to repair or replace that which has been damaged, but in lieu thereof, may retain from money due under the Contract an amount sufficient to ensure repair of the damage.

The Construction Manager may observe a safety violation and will immediately issue a Safety Notification to the Contractor. The Contractor is to immediately correct the unsafe condition.

### B. SECURITY

It is the responsibility of the Contractor to provide security for the project duration of the construction period ending with final completion. The Contractor shall provide services to ensure the following:

1. Guarding the area of construction and restricting trespassers, especially stopping persons from entering the Work Area.
2. Protecting work under his and other separate contracts.
3. Protecting field offices, restaurant building, boat ramp, etc..

**SAFETY NOTIFICATION**

**PROJECT NAME: Surry County Marina Fueling Station**

---

**ATTENTION:**

**DATE:**

---

**GENERAL CONTRACTOR:**

---

Gentlemen:

We direct your attention to the following potential unsafe condition(s) observed at the construction site by the CONSTRUCTION MANAGER while performing inspection services:

---

---

---

---

---

---

---

---

---

---

---

---

Sincerely,

**ALPHA CORPORATION INC.**

### 3. SUBMITTALS

#### A. SUBMITTAL SCHEDULE

The General Contractor must include all submittals into their construction schedule for acceptance. A review and approval time frame of 7 days must be indicated on the schedule.

#### B. SUBMITTAL REQUIREMENTS

Submittals can be submitted to the Architect electronically where applicable and shall be made by Letter of Transmittal which shall contain a list of items submitted and identification of deviations from Plans and Specifications contained in the Submittal with all deviations, regardless of substance clearly and completely identified. Deviations not so identified will be deemed not acceptable for incorporation into the work. The cost of correcting unacceptable deviations to meet the requirements of the Contract Documents will be the responsibility of the General Contractor. Substitutions should follow the respective procedure. The letter and items accompanying the letter shall be fully identified as to the project name and location, the Contractor's name, the work order and contract numbers with ample cross references to the Contract Documents, to facilitate identification of items and their locations in the work. Additional specific requirements shall be as follows:

1. Shop Drawings - Submit shop drawings required by the Architect and Specifications. The Architect will examine the prints noting corrections on sepias and copies. Shop drawings include any drawing which requires execution by a draftsman. Size of shop drawings shall not exceed the size of the Contract Drawings.
2. Descriptive Data - Submit brochures or other data required by the Architect or Specifications. The Architect will examine such submittals, noting thereon corrections and will return specified copies with a Letter of Transmittal indicating actions taken by the Architect to the Contractor.
3. Samples - Submit samples as required by the Architect and Specifications. The work shall be in accordance with the approval of the samples. Samples shall be removed from County property when directed or may be incorporated into the work provided the County's approval is first obtained. Samples not removed by the Contractor at the County's option, will become the property of Surry County or will be removed and disposed of by Surry County at the Contractor's expense.
4. The Contractor will indicate by a signed stamp on all Submittals that he has checked the shop drawings and that the work shown is in accordance with the Contract requirements and has been checked for field dimensions and relationship with work of all other trades involved. Architect may reject a Submittal immediately if the Architect notes that it obviously is incomplete or inadequate and return all copies to the Contractor with reasons noted.
5. The Architect will examine such Submittals and return the Submittals to the Contractor. The Architect's review and/or approval shall not relieve the Contractor from responsibility for deviations and alternatives from contract Plans and Specifications, nor shall it relieve him from responsibility for errors in Submittals. No progress will be recorded for installation of non-conforming items or installation of any item which requires a Submittal which has not been fully approved.

6. Failure by the Contractor to identify in his Letter of Transmittal material deviations from the Plans and Specifications shall void the Submittal and any action taken thereon by the Architect. When specifically requested by the Architect, the Contractor shall resubmit such shop drawings, descriptive data and samples as may be required.

### C. **SUBSTITUTION REQUESTS**

All proposed deviations from specified items require a formal submittal for review by the Architect, even if the Contract Documents do not otherwise require a formal submittal for review. All deviations from the specified contract items shall be submitted as a substitution request.

All Requests for Substitution must be received by the Architect within fifteen (15) days after award of contract. No other substitution request will be accepted after that date.

The General Contractor will be required to remove all non-conforming items from the project site. For convenience in designation on the Plans or Specifications, materials, articles or equipment may be designated by brand or trade name or name of manufacturer together with catalog designation or other identifying information hereinafter referred to generically as "designed by brand name". Substitutions of materials, article or equipment which is of equal quality and of required characteristics for the purpose intended may be proposed for use provided the Contractor complies with the following requirements:

1. The Contractor shall submit his proposal for substitution in writing as designed in the Specifications or if not designated, then within the period which will cause no delay in the work. If the material contained in the Submittal information includes any deviations from the Contract requirements, the Contractor must identify the deviations and the reasons for their incorporation into the Submittal request. Additionally, if the deviation includes a major departure from the Contract requirements, then the Contractor must supply the Program Manager with submittal material covering both the specified requirements of the contract and the alternative proposed by the Contractor, indicating any change in price or time for the Program Manager's full evaluation.
2. No such proposal will be considered unless accompanied by complete information and descriptive data necessary to determine equality of offered materials, articles or equipment. Samples shall be provided as requested by the Program Manager. The burden of proof as to comparative quality, suitability or performance of offered proposal shall be upon the Contractor. The Program Manager in concurrence with the County and the Architect shall be the sole judge as to such matters. In the event that the Program Manager rejects use of such an alternative, then one of the particular products designated by brand name shall be furnished.
3. When Submittals and/or request for substitution are received at the Architect's office, they will be logged and checked for completeness and compliance and comments will be transmitted to the Architect for incorporation into his review. One (1) copy of approved/unapproved Submittals/Substitutions will be retained in the project file.
4. Submittals and/or request for substitution shall be made in sufficient time to allow for adequate review by the Architect so as not to impact the schedule. Contract time extensions will not be granted as a result of approved or denied substitution requests. Upon return of the Submittals to the Contractor by the Program Manager, they will be marked in one of the following ways:
  - √ 'No Exceptions Noted'
  - √ 'Revise and Resubmit'



- √ 'Rejected'
- √ 'Not Reviewed'
- √ 'Implement Exceptions Noted'

Submittals and/or request for substitution marked 'Revise and Resubmit', 'Rejected' or 'Not Reviewed' are not accepted and will require changes before resubmission and construction.

**D. DISTRIBUTION OF SUBMITTALS**

The following distribution will be made for descriptive data Submittals:

1. If the Architect has no objections, 'No Exceptions Noted', then:
  - One (1) copy retained by Architect
  - One (1) copy to the Contractor
  - One (1) copy of Transmittal Letter stating such to Construction Manager
2. For samples:
  - One (1) retained by Architect
  - Remainder to Contractor
  - One (1) copy of Transmittal Letter stating such to Construction Manager
3. Sections requiring the submission of operation and maintenance information summaries and equipment data will be processed in the manner described within their appropriate sections.
4. Any fabrications of other work performed in advance of receipt of Submittals shall be entirely at the Contractor's risk.

## 1. MANUFACTURER'S TESTING SERVICES

All inspection and testing required to establish compliance with the Contract Document requirements shall be made by the Manufacturer or his rep and paid for by the Contractor, but approved by the Architect, as required for the execution of the Work, including those expressly noted within the technical Specifications.

The cost of the services for testing and inspection will be paid by the Contractor as required for the execution of the Work. If initial tests indicate non-compliance with Contract Document requirements, any subsequent testing shall be performed by the same inspection service and paid for by the Contractor. Schedule portions of the Work requiring testing and inspection services so that the time of such work is as continuous and brief as possible.

The cost of contract plans approval made by a legally constituted authority, shall be the responsibility of, and paid for by, the Owner.

## 2. WORK INCLUDED

- A. General requirements for tests and inspections may include the following.
- B. Testing laboratory inspection, sampling and testing for work provided under the following specification sections:
  - 1. Tank Tightness
  - 3. Leak Detection
  - 4. Mechanical
  - 5. Electrical
  - 6. Underground Fuel Lines

## 3. CONTRACTOR'S RESPONSIBILITY

- A. **Coordination** - Contractor, as required for the execution of his Work, shall initiate and coordinate testing and inspections required by the Contract Documents and public authorities having inspection jurisdiction over the work.
- B. **Access** - Assist testing and inspection personnel in the performance of their duties at no additional cost to the Owner.
- C. **Data** - Furnish records, drawings, certificates, and similar data as may be required by the testing and inspection personnel to assure compliance with the Contract Documents.
- D. **Defective Work** - Remove and replace any work found defective or not complying with Contract Document requirements at no additional cost to the Owner.
- E. **Quality Control - General**
  - 1. Maintain quality control over suppliers, manufacturers, products, services, site conditions, and workmanship to produce work of specified quality.
  - 2. Failure of materials and of equipment tested or inspected:

- a. Previous acceptance may be withdrawn and material may be subject to removal and replacement with material meeting specification requirements, at no cost to the Owner.
- b. The Owner may refuse consideration of further samples of same item for testing.

#### 4. MANUFACTURER’S TESTING RESPONSIBILITY

- A. **Tank Tightness/Leak Detection/Underground Fuel Lines** – In accordance with Federal, State and Local requirement for AST installation.. Sampling equipment and personnel will be provided by the manufacturer.
- B. **Test Reports** - Reports shall include all tests made, regardless of whether such tests indicate that material is satisfactory or unsatisfactory. Reports shall state with which requirements the material or materials were sampled and tested. Test reports shall show the indicated or specified design strength(s) and state definitely whether or not the materials tested comply with the specification requirements.

Report distribution shall be as follows:

The Owner	-	2 copies
Construction Manager	-	1 copy (VIA email)
Architect	-	2 copies
Engineer (if applicable)	-	2 copies

#### C. Manufacturer’s Testing Duties

1. Cooperate with the Owner, Construction Manager, and Architect, in notifications, information, scheduling, storage, and access as necessary to meet requirements for service without causing delays on Project.
2. Perform specified inspections, testing, and sampling of materials to comply with specified standards.
3. Ascertain compliance of materials with requirements of the Contract Documents.
4. Notify, through the Construction Manager, the Owner, and Architect, immediately, orally, and subsequently by a written report stating pertinent data, when test or inspection reveals undesirable conditions, non-conformance, or failure to meet requirements.
5. Promptly submit written reports of each test and inspection to the Architect for distribution to the Owner and Construction Manager. Each report is to include:
  - a. Date issued
  - b. Project title and number.
  - c. Manufacturer’s Testing name, address, and telephone number.
  - d. Name and signature of manufacturer’s testing inspector.
  - e. Date and item of testing inspection.
  - f. Record of temperature and weather conditions.
  - g. Date of test.

- h. Identifications of product and Specification Section.
- i. Type of inspection or test.
- j. Results of tests and compliance with the Project Documents.
- k. Interpretation of test results, when requested by the Program Manager, the Owner, or the Architect.

**5. REQUIRED INSPECTIONS AND TESTS**

- F. **Completed Work** - Should the Owner require tests and inspections for work completed before final acceptance of the entire work, furnish the necessary facilities, labor, and materials to uncover or remove work in question to the extent necessary.
- 1. If work is found defective, that Contractor shall pay for removal, tests, inspections, and satisfactory reconstruction. Time extensions may not be granted.
  - 2. If work is found to conform with the Contract Documents, reasonable time extension, if warranted, shall be granted. If inspection and testing was not required as part of the Contract Documents, the Owner will reimburse costs for facilities, labor, and materials for removal and reconstruction.
  - 3. All reimbursements to the Contractor will be handled in the form of a Change Order to the Contract.

## SECTION 260500 – ELECTRICAL GENERAL PROVISIONS

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

- A. The General Conditions, Supplementary General Conditions, and Special Conditions of this Contract form a part of this Division of Specification.
- B. This section forms a part of all sections under Division 26 Electrical and Division 27 Communications.
- C. Requirements herein augment or clarify articles specified under aforementioned General and Special Conditions.

## 1.2 QUALIFICATIONS FOR BIDDERS

- A. Before submitting bid, visit the site and examine all adjoining existing equipment and space conditions on which work is in any way dependent, for the best workmanship and operation according to the intent of specifications and drawings. Report to the Engineer any condition which might prevent the installation of the equipment in the manner intended.

## 1.3 CODES AND STANDARDS

- A. Latest effective publications of following standards, codes, etc., as they apply, form part of these specifications as if were written fully herein and constitute minimum requirements. Minimum requirements shall not relieve the Contractor of the responsibility of furnishing and installing higher grade materials and workmanship than herein specified. The following will be referred to throughout in abbreviated forms.
  - 1. National Electrical Code, (NFPA 70) (NEC)
  - 2. Standard Rules of Institute of Electrical and Electronic Engineers (IEEE)
  - 3. Rules and Regulations of Local Electric Utility Company
  - 4. Applicable Standards of the National Electrical Manufacturer's Association (NEMA)
  - 5. Applicable Standards of the American National Standards Institute (ANSI)
  - 6. Applicable Local Codes
  - 7. Virginia Uniform Statewide Building Code
  - 8. Applicable Standards and Lists of the Underwriter's Laboratories, Inc. (UL)
  - 9. Applicable Standards of the National Fire Protection Association (NFPA)
  - 10. International Building Code (IBC)
  - 11. The Americans with Disabilities Act (ADA)
  - 12. International Electrical Testing Association (NETA)
  - 13. Life Safety Code (NFPA 101)

## 1.4 SCOPE OF WORK

- A. Provide all work required for this Division including all labor, materials, equipment, appurtenances and services to provide complete electrical systems as shown on the drawings and specified in this Division of the specifications. The word "Provide" shall mean "Furnish and Install Complete and Ready for Use". The work includes, but is not limited to the following:

1. Interior and exterior electrical lighting system including fixtures, lamps, time switches, photoelectric cells, contactors and other control devices and equipment.
2. Power wiring system, including outlets, receptacles, switches, wire, conduit, junction boxes, panelboards, switchboards and new electric service.
3. Disconnect switches and power wiring up to and including motor connections for all equipment provided under other Divisions of this specification shall be included in this Division. Where manual motor control switches for single phase motors are indicated, they shall be provided and wired complete under this Division. Motor controllers and motor starters furnished under other Divisions shall be set in place and connected to source and load under this Division. In general, motors will be provided with the equipment they drive and are not part of this work under this Division, except that they shall be connected hereunder.
4. System of empty conduits, cabinets and outlets for telephone, computer and other communication systems.
5. Fire Alarm System and control center.
6. Exit and emergency lighting systems.
7. Nurse call system.
8. Emergency Generator System.
9. Temporary Construction Power and Lighting.
10. Lightning Protection System.

B. The following work is not included in this Division:

1. Heating, ventilating, and air conditioning equipment and all associated motors and magnetic motor starters.
2. Plumbing equipment except as specifically indicated.
3. Control, interlock, and internal equipment wiring regardless of voltage.
4. Cable, terminals, instrument wiring, and instruments for telephone, computer and other communication systems unless specifically addressed by other sections of the specification.

#### 1.5 DRAWINGS AND SPECIFICATIONS

- A. The drawings are diagrammatic and indicate the general extent, character and arrangement of equipment, fixtures and conduit and wiring systems. If any departures from the contract drawings are deemed necessary, submit details of such departures and the reasons therefore as soon as practicable after award of contract to the Engineer for approval. Make no such departures without prior written approval of the Engineer.
- B. It is the intention of these specifications and drawings to fully cover all work and materials for a complete, first-class electrical installation, and any devices such as pull boxes and disconnect switches, usually employed in this class of work, though not specifically mentioned or shown on the drawings or in this specification, but which may be necessary for the satisfactory completion of the work, shall be furnished and installed by the Contractor as a part of his total work under this Division. Consult the specifications and drawings of all other trades and perform all electrical work required therein. Cooperate with all other contractors or subcontractors to furnish complete workable systems.
- C. In case of conflicting information on the drawings and/or in the specifications, the proper interpretation shall be made by the Engineer.
- D. Disagreements occurring between trades covering various phases of the work shall be referred to General Contractor for final decision.
- E. Changes and additions to scope of the work under this contract shall be submitted to the Engineer and his written approval obtained before proceeding with the changed work.

- F. During construction, the Electrical Subcontractor shall keep an accurate record of all deviations between the work as shown on the contract drawings and that which is actually installed. He shall secure a set of blue line prints of the electrical drawings for this purpose, and note changes thereon with red marks, in a neat and accurate manner, thus making a complete record of all changes and revisions in the original design which exist in the completed work. The cost of furnishing above prints and preparing these record drawings shall be borne by the subcontractor, and shall be included in the contract price. When all revisions have been shown on these prints to indicate the work as finally installed, the prints shall be delivered to the Engineer, before final payment.

#### 1.6 PERMITS, INSPECTION AND TESTS

- A. The right is reserved to inspect and test any portion of the installation/equipment during the progress of its erection. Test all wiring for continuity and grounds before connecting any fixtures or devices. Perform insulation resistance tests on wiring #6 or larger. Test the entire system when the work is finally completed to insure that all portions are free from short circuits and grounds. Provide all equipment necessary to conduct the above tests.
- B. Secure and pay for all required permits and inspections. Inspection certificates from local authorities having jurisdiction shall be delivered to the Owner before final payment.

#### 1.7 SUBMITTALS

- A. Submit Shop Drawings, Product Data and Samples within thirty (30) days of award of contract and in accordance with the General Conditions and Supplementary Conditions. Review of submittals by the Engineer and any associated action taken by the Engineer does not relieve the contractor of any requirements set forth by the contract documents. Submittals are required for the following items if and only if those items are specified herein.
1. Panelboards
  2. Circuit Breakers
  3. Lighting Fixtures and Occupancy Sensors
  4. Surge Protection Device (SPD)
  5. Lighting Dimming System
  6. Lighting Control System
  7. Standby Generator
  8. Automatic Transfer Switch
- B. Submittals shall contain:
1. The date of submission and of any previous submissions.
  2. The project title and number.
  3. Contract or project identification.
  4. The names of:
    - a. Contractor.
    - b. Supplier.
    - c. Manufacturer.
  5. Identification of the product, and specification section.
  6. Field dimensions, clearly identified as such.
  7. Relation to adjacent or critical features or materials.
  8. Applicable standards.
  9. Identification of deviations from Contract Documents.

10. Identification of non-complying features and reason for the non-compliance. The reason shall be specific in nature.
11. Identification of revisions on resubmittals.
12. Contractor's stamp, initialed or signed, certifying to review of submittal, verification of products, field measurements and field construction criteria, and coordination of the information within the submittal with requirements of the work and of Contract Documents.

### C. SUBSTITUTIONS

1. For a period of 10 days after Contract date, Engineer will consider written requests from Contractor for substitution of products.
2. Submit a separate request for each product, supported with complete data, with drawings and samples as appropriate, including:
  - a. Comparison of the proposed substitution with that specified.
  - b. Changes required elsewhere because of the substitution.
  - c. Effect on the construction schedule.
  - d. Cost comparison of the substitution and product specified.
  - e. Availability of maintenance service, and replacement parts.
3. The Engineer shall be the judge of the acceptability of the proposed substitution.
4. A request for a substitution constitutes a representation that the Contractor:
  - a. Has investigated the proposed product and determined that it is equal to or superior in all respects to that specified.
  - b. Will provide the same warranties or bonds for the substitution as for the product specified.
  - c. Will coordinate the installation of an accepted substitution into the work, and make such other changes as may be required to make the work complete in all respects.
  - d. Waives all claims for additional costs, under his responsibility, which may subsequently become apparent.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURING STANDARDS

- A. Materials shall be new and approved and labeled by UL wherever standards have been established by that agency. Defective equipment or equipment damaged in the course of installation or test shall be replaced or repaired in a manner meeting the approval of the Engineer. Materials to be furnished under this specification shall be the standard products of manufacturers regularly engaged in the production of such equipment and shall be the manufacturer's latest standard design. All items of the same type and rating shall be identical.

### 2.2 TRADE NAMES

- A. Unless specifically identified otherwise, manufacturers' names and catalog numbers indicated herein and on the drawings are not intended to be proprietary designations. They are to indicate general type and quality of materials and equipment required. Equipment and materials by other manufacturers which in the opinion of the Engineer are of equal quality and which will produce the same results with regard to both their ability to perform the required technical functions as well as to their appearance in the specific location on this project will be considered.



### 2.3 MOTORS AND EQUIPMENT

- A. All motors shall have disconnecting means, controller and thermal overload protection. All three phase motors shall have power loss, phase outage, and phase reversal protection features.
- B. Provide motors, controllers, integral disconnects, and contactors with their respective pieces of equipment. Motors, controllers, integral disconnects, and contactors shall conform to the requirements defined under the electrical provisions of the specifications. Extended voltage range motors shall not be permitted. Control voltage for controllers and contactors shall not exceed 120 volts nominal. When motors and equipment furnished are larger than sizes indicated, the cost of additional electrical service and related work shall be included under the section that specified that motor or equipment. Where fuse protection is specifically recommended by the equipment manufacturer, provide fused switches in lieu of non-fused switches indicated.
- C. Provide internal wiring for components of packaged equipment as an integral part of the equipment. Provide power wiring and conduit for field-installed equipment under the electrical provisions of the contract. Control wiring and conduit shall be provided under the section specifying the associated equipment. Wiring and conduit for power systems and control systems shall conform to the requirements defined under the electrical provisions of the specifications.

### 2.4 ELECTRICAL SERVICE

- A. Provide the electrical service as indicated. All arrangements shall be as indicated with proper extension, terminations, provisions and necessary materials for final connections by the local power company. Service and all metering shall be provided in accordance with the latest regulations of the local power company. The local power company may provide the meter and current transformers and may participate in the cost of supplying service to the building. Consult the local power company and determine limit of this participation. The bid on electrical work shall reflect this participation except that any charges which the local power company proposes to make for supplying service will be paid directly by Owner and will not be part of this contract.
- B. Short circuit ratings for all panelboards, main disconnect switches, etc. shall be suitable to accommodate the Power Company's available fault current. Contractor shall provide label on service equipment stating available fault current and the date it was calculated.

### 2.5 TEMPORARY ELECTRICAL SERVICE

- A. Reasonable amounts of electricity will be made available to the Contractor for the project. The Contractor shall be responsible for extending the electricity to the specific required locations within the project.

### 2.6 GROUNDING

- A. The entire electrical system, including equipment frames, conduit, switches, controllers, wireways, neutral conductors, and all other such equipment shall be permanently and effectively grounded in accordance with the NEC. Ground rods shall be copper clad steel, 3/4" diameter by 10'-0" long. Grounding of each transformer secondary shall be provided and each shall be considered as a separate service ground. Provide a separate insulated ground conductor in all branch circuit conduits sized in accordance with the N.E.C. Provide minimum #6 ground conductor in conduit from the building main service ground to the telephone backboard.

## PART 3 - EXECUTION

## 3.1 SCHEDULE OF WORK

- A. The schedule of the electrical work shall be arranged to suit the progress of work by the other trades and shall in no way retard progress of construction of the project.
- B. Work under this Division shall proceed in advance of the work of others whenever possible, eliminating all cutting and patching. When such procedure is impossible, cutting and patching shall be done in an approved manner. Cutting shall not endanger structural integrity in any way. Patching shall exactly match contiguous work. Actual work of cutting and patching of existing surfaces shall be performed by the subcontractor who originally prepared these surfaces, e.g., cutting and patching of masonry wall will be performed by the masonry subcontractor. Costs of such cutting and patching shall be borne by the Electrical contractor. Cutting shall be carefully done and damage to building, piping, wiring or equipment as a result of cutting shall be repaired by skilled mechanics of trade involved.

## 3.2 STORAGE AND MATERIALS

- A. Space will be assigned to the Contractor by the Owner for the storage of materials. This Contractor will be responsible for the protection and safekeeping of materials, tools, and equipment. All materials and equipment shall be kept in its assigned place until the time of its installation. Excess materials, dirt and refuse shall be promptly removed from the work site.

## 3.3 LABELING OF EQUIPMENT

- A. All panelboards, cabinets, transformers, safety switches, motor disconnect switches, and motor controllers shall be identified by machine engraved laminated plastic designation plates permanently attached thereto with self-tapping screws or rivets. All component parts of each item of equipment or device shall bear the manufacturer's nameplate, giving name of manufacturer, description, size, type, serial and model number and electrical characteristics in order to facilitate maintenance or replacement. The nameplate of a subcontractor or distributor will not be acceptable. Self-adhesive, plastic laminate labels are not acceptable.
- B. All panelboards, industrial control panels, and motor control centers shall be field marked to warn personnel of the potential for Arc Flash. Labels shall state "WARNING – ARC FLASH AND SHOCK HAZARD APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT (PPE) REQUIRED".

## 3.4 OTHER TRADES

- A. Excavation shall be performed in accordance with the section of these specifications which cover excavating, filling and backfilling.
- B. Concrete work shall be performed in accordance with the section of these specifications which cover concrete.
- C. Painting shall be performed in accordance with the section of these specifications which cover painting. Paint all exposed conduit as well as cabinets and related items which are not supplied with a factory finish. Touch up all factory finishes damaged during installation or by adjacent construction work.

### 3.5 COORDINATION

- A. Cooperate and coordinate efforts with all Contractors on the project. This is especially important in determining exact locations of all switches, receptacles and lighting fixtures. Arrange lighting fixtures in accordance with the architectural reflected ceiling plans unless otherwise indicated. Coordinate lighting fixture locations with grilles, diffusers, access panels, etc. Verify ceiling and wall construction and material prior to ordering lighting fixtures or other devices to ensure proper fixture or device is furnished to match construction. This verification must be executed regardless of information placed on the drawings. Any cost incurred which in the opinion of the Engineer, could have been avoided by this step shall be the responsibility of the Contractor. Coordinate switch locations with thermostats, control switches, etc.
- B. Carefully check space requirements with the other subcontractors to insure that electrical equipment can be installed in the spaces allotted for them. Sufficient access and working space shall be provided and maintained about all electrical equipment as required by the National Electrical Code. Consult all applicable drawings for details. Where interferences occur and work must be relocated, relocate without additional cost.
- C. No conduit, outlet box, conduit stub-up, or any other electrical devices shall be installed until the exact location has been determined by the coordinated effort of all Subcontractors and other parties concerned. Any relocating of devices or cutting or patching which becomes necessary due to improper coordination shall be done at this Contractor's expense.
- D. Determine electrical requirements of other Divisions in order to fully understand wiring, and provide as required for complete and satisfactory operation of project. Make connections for other Divisions where indicated.
- E. Obtain approved shop drawings showing wiring diagrams, connection diagrams, roughing-in and hookup details, from other involved contractors for all equipment and comply therewith.

### 3.6 GUARANTEE OF WORK

- A. Contractor guarantees by his acceptance of the contract that all work installed is free from any and all defects in workmanship and/or materials, and that the apparatus will develop capacities and characteristics specified, and that if, during the period of one year or as otherwise specified, from date of certificate of completion and acceptance of the work any such defects in workmanship, material or performance appear, he will, without cost to the Owner, remedy such defects within a reasonable time to be specified in notice from Engineer. In default thereof, the Owner may have such work done and charge cost to Contractor. Equipment guarantees from date of "start-up" will not be recognized.
- B. Comply, also, with the General Conditions and the Supplementary Conditions and the applicable Sections of Division 01 General Requirements.
- C. Provide service for the installation for one year from date of final acceptance. This shall include all emergency service and adjustment. Provide evidence upon request by the Engineer that a factory authorized local service organization is in existence to service and furnish spare and replacement parts for all equipment under this Division of the specifications.
- D. Compile and assemble and provide all shop drawings, maintenance manuals, operation manuals and warranties in a separated set of vinyl covered, three ring binders, tabulated and indexed for easy reference.

3.7 CLEANING

- A. Refer to the Division 01 Section "CLOSEOUT PROCEDURES" or "FINAL CLEANING" for general requirements for final cleaning.
- B. Clean all light fixtures, lamps and lenses prior to final acceptance. Replace all inoperative lamps.

END OF SECTION 260500

## SECTION 260519 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. This Section includes the following:
  - 1. Building wires and cables rated 600 V and less.
  - 2. Connectors, splices, and terminations rated 600 V and less.

## PART 2 - PRODUCTS

## 2.1 CONDUCTORS AND CABLES

- A. Aluminum and Copper Conductors: Comply with NEMA WC 70/ICEA S-95-658.
- B. Conductor Insulation: Comply with NEMA WC 70/ICEA S-95-658 for Types THW-2, THHN-2, THWN-2, and XHHW-2.
- C. Multiconductor Cable: Comply with NEMA WC 70/ICEA S-95-658 for metal-clad cable, Type MC with ground wire.

## 2.2 CONNECTORS AND SPLICES

- A. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.

## PART 3 - EXECUTION

## 3.1 CONDUCTOR MATERIAL APPLICATIONS

- A. Feeders: Copper for feeders smaller than No. 2 AWG; copper or aluminum for feeders No. 2 AWG and larger. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.
  - 1. Electrical designs are based on copper wire and cable. If at option of the Contractor, aluminum or copper-clad aluminum is selected for cables No. 2 AWG or larger, equivalent aluminum or copper-clad aluminum conductor sizes shall be selected and provided by the Contractor. Additionally, all adjustments in raceway and pull box sizes shall be the responsibility of the Contractor.
  - 2. The manufacturers of certain air conditioning system components and certain other equipment place restrictions and prohibitions on the use of aluminum conductors in their equipment. Before adopting the option of using aluminum or copper-clad aluminum conductors to feed this equipment, the Contractor must check for such restrictions and prohibitions and abide by them. No requests for extra compensation for changing conductor type in these circuits will be considered.

- B. Branch Circuits: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

### 3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

- A. Service Entrance: Type THHN-2-THWN-2, single conductors in raceway or Type XHHW-2, single conductors in raceway.
- B. Feeders and Branch Circuits: Type THHN-2-THWN-2, or XHHW-2 single conductors in raceway.
- C. Branch Circuits #6 AWG and Smaller: Type MC cable where concealed and allowed by the NEC.
- D. Cord Drops and Portable Appliance Connections: Type SO, hard service cord with ground. Stainless-steel, wire-mesh, strain relief device at terminations to suit application.

### 3.3 INSTALLATION OF CONDUCTORS AND CABLES

- A. Conceal cables and conduits in finished walls, ceilings, and floors, unless otherwise indicated.
- B. Use manufacturer-approved pulling compound or lubricant where necessary; compound used shall not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- C. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway. Conductors #8 and smaller shall be pulled by hand and without aid of block and tackle or other mechanical device. Only approved equipment for pulling conductors shall be used for #6 and larger conductors.
- D. Install exposed conduits parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.

### 3.4 CONNECTIONS

- A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.
- B. Make splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.
  - 1. Use oxide inhibitor in each splice and tap conductor for aluminum conductors.
- C. Utilize compression type pin terminals for terminating all aluminum conductors on mechanical lugs and circuit breakers.
- D. Wiring at Outlets: Install conductor at each outlet, with at least 6 inches of slack.

### 3.5 FIRESTOPPING

- A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly.

3.6 FIELD QUALITY CONTROL

A. Perform the following tests and inspections.

1. After installing conductors and cables and before electrical circuitry has been energized, test all conductors #6 and larger for continuity and insulation resistance.
2. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification.

B. Cables will be considered defective if they do not pass tests and inspections.

END OF SECTION 260519

## SECTION 260526 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes: Grounding and bonding systems and equipment.

## 1.2 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- 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.

## 2.2 CONNECTORS

- A. Listed and labeled by an NRTL 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, 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.
- D. Bus-Bar Connectors: Mechanical type, cast silicon bronze, solderless compression-type wire terminals, and long-barrel, two-bolt connection to ground bus bar.

## 2.3 GROUNDING ELECTRODES

- A. Ground Rods: Copper-clad steel; 3/4 inch in diameter by 10 feet in length.



## PART 3 - EXECUTION

### 3.1 APPLICATIONS

- A. Conductors: Install solid conductor for No. 10 AWG and smaller, and stranded conductors for No. 8 AWG and larger unless otherwise indicated.
- B. Underground Grounding Conductors: Install bare copper conductor, size as indicated. Bury at least 24 inches below grade.
- C. 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 AT THE SERVICE

- A. Equipment grounding conductors and grounding electrode conductors shall be connected to the ground bus. Install a main bonding jumper between the neutral and ground buses.

### 3.3 EQUIPMENT GROUNDING

- A. Install insulated equipment grounding conductor in all feeder and branch circuits.
- B. Signal and Communication Equipment: In addition to grounding and bonding required by NFPA 70, provide a separate grounding system complying with requirements in TIA/ATIS J-STD-607-A.
  - 1. For telephone, alarm, voice and data, and other communication equipment, provide No. 6 AWG minimum insulated grounding conductor in raceway from grounding electrode system to each service location, terminal cabinet, wiring closet, and central equipment location.
  - 2. Service and Central Equipment Locations and Wiring Closets: Terminate grounding conductor on a minimum 1/4-by-4-by-12-inch grounding bus.
  - 3. Terminal Cabinets: Terminate grounding conductor on cabinet grounding terminal.
- C. 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. Ground Rods: Drive rods until tops are 12 inches below finish grade unless otherwise indicated.
  - 1. Interconnect ground rods as required to achieve required maximum resistance with grounding electrode conductor below grade and as otherwise indicated. Make connections without exposing steel or damaging coating if any.

- C. 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 bonding so vibration is not transmitted to rigidly mounted equipment.
  3. Use exothermic-welded connectors for outdoor locations; if a disconnect-type connection is required, use a bolted clamp.
- D. 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; use a bolted clamp connector or bolt 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.
- E. Grounding Electrode System: All grounding electrodes that are present at each building or structure served shall be bonded together to form the grounding electrode system. This shall include the following:
1. A metal underground water pipe in direct contact with the earth for 10 ft or more.
  2. The metal frame of the building or structure that is connected to the earth.
  3. An electrode encased by at least 2 in. of concrete, located horizontally near the bottom or vertically, and within that portion of a concrete foundation or footing that is in direct contact with the earth.
  4. A ground ring encircling the building or structure, in direct contact with the earth.
  5. Ground rod.
  6. Plate electrode.
  7. All local metal underground systems or structures such as piping systems, underground tanks, and underground metal well casings that are not bonded to a metal water pipe.

### 3.5 LABELING

- A. Comply with specified requirements. The label or its text shall be green.
- B. Install labels at the telecommunications bonding conductor and grounding equalizer and at the grounding electrode conductor where exposed.
1. Label Text: "If this connector or cable is loose or if it must be removed for any reason, notify the facility manager."

3.6 FIELD QUALITY CONTROL

- A. Perform tests and inspections. Inspect physical and mechanical condition. Verify tightness of accessible, bolted, electrical connections with a calibrated torque wrench according to manufacturer's written instructions.

END OF SECTION 260526

## SECTION 260529 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section includes:
  - 1. Hangers and supports for electrical equipment and systems.
  - 2. Construction requirements for concrete bases.

## 1.2 PERFORMANCE REQUIREMENTS

- A. Design supports for multiple raceways capable of supporting combined weight of supported systems and its contents.
- B. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.

## 1.3 QUALITY ASSURANCE

- A. Comply with NFPA 70.

## PART 2 - PRODUCTS

## 2.1 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

- A. Steel Slotted Support Systems: Comply with MFMA-4, factory-fabricated components for field assembly.
  - 1. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.
  - 2. Nonmetallic Coatings: Manufacturer's standard PVC, polyurethane, or polyester coating applied according to MFMA-4.
  - 3. Painted Coatings: Manufacturer's standard painted coating applied according to MFMA-4.
  - 4. Channel Dimensions: Selected for applicable load criteria.
- B. Raceway and Cable Supports: As described in NECA 1, NECA 101 and NECA 120.
- C. Conduit Support Devices: Steel for indoor and malleable-iron with nest-back for exterior hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.
- D. Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug or plugs for non-armored electrical conductors or cables in riser conduits. Plugs shall have number, size, and shape of conductor gripping pieces as required to suit individual conductors or cables supported. Body shall be malleable iron.
- E. Structural Steel for Fabricated Supports and Restraints: ASTM A 36/A 36M, steel plates, shapes, and bars; black, galvanized, and stainless.

- F. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:
1. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete, steel, or wood, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.
  2. Mechanical-Expansion Anchors: Insert-wedge-type, stainless steel, for use in hardened portland cement concrete with tension, shear, and pullout capacities appropriate for supported loads and building materials in which used.
  3. Concrete Inserts: Steel or malleable-iron, slotted support system units similar to MSS Type 18; complying with MFMA-4 or MSS SP-58.
  4. Clamps for Attachment to Steel Structural Elements: MSS SP-58, type suitable for attached structural element.
  5. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM A 325.
  6. Toggle Bolts: All-steel springhead type.
  7. Hanger Rods: Threaded steel.

## 2.2 FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES

- A. Description: Welded or bolted, structural-steel shapes, shop or field fabricated to fit dimensions of supported equipment.

## PART 3 - EXECUTION

### 3.1 APPLICATION

- A. Comply with NECA 1, NECA 101 and 120 for application of hangers and supports for electrical equipment and systems except if requirements in this Section are stricter.
- B. Maximum Support Spacing and Minimum Hanger Rod Size for Raceway: Space supports for EMT, IMC, and RMC as maximum of 8 feet on center. Minimum rod size shall be 1/4 inch in diameter.
- C. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.
1. Secure raceways and cables to these supports with conduit clamps.
- D. Spring-steel clamps designed for supporting single conduits without bolts may be used for 1-1/2-inch and smaller raceways serving branch circuits and communication systems above suspended ceilings and for fastening raceways to trapeze supports.

### 3.2 SUPPORT INSTALLATION

- A. Comply with NECA 1, NECA 101 and 120 for installation requirements except as specified in this Article.
- B. Raceway Support Methods: In addition to methods described in NECA 1, EMT, IMC, and RMC may be supported by openings through structural members, as permitted in NFPA 70.

- C. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:
1. To Wood: Fasten with lag screws or through bolts.
  2. To New Concrete: Bolt to concrete inserts.
  3. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
  4. To Existing Concrete: Expansion anchor fasteners.
  5. Instead of expansion anchors, powder-actuated driven threaded studs provided with lock washers and nuts may be used in existing standard-weight concrete 4 inches thick or greater. Do not use for anchorage to lightweight-aggregate concrete or for slabs less than 4 inches thick.
  6. To Steel: Beam clamps complying with Spring-tension clamps.
  7. To Light Steel: Sheet metal screws.
  8. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted-channel racks attached to substrate.
- D. Drill holes for expansion anchors in concrete at locations and to depths that avoid reinforcing bars.

### 3.3 INSTALLATION OF FABRICATED METAL SUPPORTS

- A. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.

### 3.4 CONCRETE BASES

- A. Construct concrete bases of dimensions indicated but not less than 4 inches larger in both directions than supported unit, and so anchors will be a minimum of 10 bolt diameters from edge of the base.
- B. Use 4000-psi, 28-day compressive-strength concrete unless otherwise noted on drawings.
- C. Anchor equipment to concrete base.

END OF SECTION 260529

## SECTION 260533 - RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes:
  - 1. Conduits, tubing, and fittings.
  - 2. Surface raceways.
  - 3. Boxes, enclosures, and cabinets.
  - 4. Handholes and boxes for exterior underground cabling.

## 1.2 ACTION SUBMITTALS

- A. Product Data: For surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.

## PART 2 - PRODUCTS

## 2.1 METAL CONDUITS, TUBING, AND FITTINGS

- A. Listing and Labeling: Metal conduits, tubing, and fittings shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. GRC: Comply with ANSI C80.1 and UL 6.
- C. IMC: Comply with ANSI C80.6 and UL 1242.
- D. PVC-Coated Steel Conduit: PVC-coated rigid steel conduit.
  - 1. Comply with NEMA RN 1.
  - 2. Coating Thickness: 0.040 inch, minimum.
- E. EMT: Comply with ANSI C80.3 and UL 797.
- F. FMC: Comply with UL 1; zinc-coated steel.
- G. LFMC: Flexible steel conduit with PVC jacket and complying with UL 360.
- H. Fittings for Metal Conduit: Comply with NEMA FB 1 and UL 514B.
  - 1. Conduit Fittings for Hazardous (Classified) Locations: Comply with UL 886 and NFPA 70.
  - 2. Fittings for EMT:
    - a. Material: Steel.
    - b. Type: Setscrew or compression.

3. Expansion Fittings: PVC-coated or steel to match conduit type, complying with UL 651, rated for environmental conditions where installed, and including flexible external bonding jumper.
  4. Coating for Fittings for PVC-Coated Conduit: Minimum thickness of 0.040 inch, with overlapping sleeves protecting threaded joints.
- I. Joint Compound for IMC or GRC: Approved, as defined in NFPA 70, by authorities having jurisdiction for use in conduit assemblies, and compounded for use to lubricate and protect threaded conduit joints from corrosion and to enhance their conductivity.

## 2.2 NONMETALLIC CONDUITS, TUBING, AND FITTINGS

- A. Listing and Labeling: Nonmetallic conduits, tubing, and fittings shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. RNC: Type EPC-40-PVC, complying with NEMA TC 2 and UL 651 unless otherwise indicated.
- C. Fittings for RNC: Comply with NEMA TC 3; match to conduit type and material.

## 2.3 BOXES, ENCLOSURES, AND CABINETS

- A. General Requirements for Boxes, Enclosures, and Cabinets: Boxes, enclosures, and cabinets installed in wet locations shall be listed for use in wet locations.
- B. Sheet Metal Outlet and Device Boxes: Comply with NEMA OS 1 and UL 514A.
- C. Cast-Metal Outlet and Device Boxes: Comply with NEMA FB 1, ferrous alloy, Type FD, with gasketed cover.
- D. Metal Floor Boxes, Cover plates, Trim rings, etc.: Finishes shall be as selected by Architect. Provide floor boxes complete with all devices, trim kits, activation kits, covers, etc.
- E. Luminaire Outlet Boxes: Nonadjustable, designed for attachment of luminaire weighing 50 lb. Outlet boxes designed for attachment of luminaires weighing more than 50 lb shall be listed and marked for the maximum allowable weight.
- F. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.
- G. Cast-Metal Access, Pull, and Junction Boxes: Comply with NEMA FB 1 and UL 1773, cast aluminum or galvanized cast iron with gasketed cover.
- H. Box extensions used to accommodate new building finishes shall be of same material as recessed box.
- I. Device Box Dimensions: Except as noted hereinafter minimum size outlet box shall be 4" square, 1 1/2" deep, and shall be increased in dimensions to accommodate conductors, conduits, and devices as required by the NEC. Shallower boxes may be used where required by structural conditions and when specifically approved by the Architect/Engineer. Provide raised ring to accommodate the wiring device.
- J. Hinged-Cover Enclosures: Comply with UL 50 and NEMA 250, Type 1 with continuous-hinge cover with flush latch unless otherwise indicated.
  1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.
  2. Interior Panels: Steel; all sides finished with manufacturer's standard enamel.



## 2.4 HANDHOLES AND BOXES FOR EXTERIOR UNDERGROUND WIRING

- A. General Requirements for Handholes and Boxes:
1. Boxes and handholes for use in underground systems shall be designed and identified as defined in NFPA 70, for intended location and application.
  2. Boxes installed in wet areas shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Polymer-Concrete Handholes and Boxes with Polymer-Concrete Cover: Molded of sand and aggregate, bound together with polymer resin, and reinforced with steel, fiberglass, or a combination of the two.
1. Standard: Comply with SCTE 77.
  2. Configuration: Designed for flush burial with open bottom unless otherwise indicated.
  3. Cover: Weatherproof, secured by tamper-resistant locking devices and having structural load rating consistent with enclosure and handhole location.
  4. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.
  5. Cover Legend: Molded lettering, "ELECTRIC" or as otherwise required for description of system wiring.
  6. Conduit Entrance Provisions: Conduit-terminating fittings shall mate with entering ducts for secure, fixed installation in enclosure wall.

## PART 3 - EXECUTION

### 3.1 RACEWAY APPLICATION

- A. Outdoors: Apply raceway products as specified below unless otherwise indicated:
1. Exposed Conduit: GRC IMC, or PVC – coated steel conduit.
  2. Concealed Conduit, Aboveground: GRC, IMC, or PVC – coated steel conduit or EMT.
  3. Underground Conduit: RNC, Type EPC-40-PVC, or PVC – coated steel conduit direct buried minimum 24" below finished grade.
  4. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
  5. Boxes and Enclosures, Aboveground: NEMA 250, Type 3R.
- B. Indoors: Apply raceway products as specified below unless otherwise indicated.
1. Exposed, Not Subject to Physical Damage: EMT.
  2. Exposed and Subject to Physical Damage: GRC or IMC.
  3. Concealed in Ceilings and Interior Walls and Partitions: EMT.
  4. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC, except use LFMC in damp or wet locations.
  5. Concealed in Concrete Floor: Type EPC-40-PVC, GRC, IMC.
  6. Boxes and Enclosures: NEMA 250, Type 1, except use NEMA 250, Type 4 stainless steel in institutional and commercial kitchens and damp or wet locations.
- C. Minimum Raceway Size: 1/2-inch above grade or finish floor and 3/4-inch below grade, below floor, or in concrete floor.
- D. Raceway Fittings: Compatible with raceways and suitable for use and location.

1. Rigid and Intermediate Steel Conduit: Use threaded rigid steel conduit fittings unless otherwise indicated. Comply with NEMA FB 2.10.
  2. PVC Externally Coated, Rigid Steel Conduits: Use only fittings listed for use with this type of conduit. Patch and seal all joints, nicks, and scrapes in PVC coating after installing conduits and fittings. Use sealant recommended by fitting manufacturer and apply in thickness and number of coats recommended by manufacturer.
  3. EMT: Use setscrew or compression, steel fittings. Comply with NEMA FB 2.10.
  4. Flexible Conduit: Use only fittings listed for use with flexible conduit. Comply with NEMA FB 2.20.
- E. Install surface raceways only where indicated on Drawings and where approved by the Owner or Architect.

### 3.2 INSTALLATION

- A. Comply with NECA 1, NECA 101 and NECA 120 for installation requirements except where requirements on Drawings or in this article are stricter. Comply with NFPA 70 limitations for types of raceways allowed in specific occupancies and number of floors.
- B. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.
- C. Arrange stub-ups so curved portions of bends are not visible above finished slab.
- D. Install no more than the equivalent of three 90-degree bends in any conduit run. Support within 12 inches of changes in direction.
- E. Conceal conduit and EMT within finished walls, ceilings, and floors unless otherwise indicated. In addition conduits shall not be run concealed in fire rated shaft or stairwell walls unless specifically required to serve the shaft or stairwell. Install conduits parallel or perpendicular to building lines.
- F. Support conduit within 12 inches of enclosures to which attached.
- G. Raceways Beneath Floor Slabs:
1. Convert PVC to GRC or IMC before rising through floor slab or rising out of soil where conduit will be exposed. Where conduit is to be concealed within a wall, PVC may be stubbed up to the first outlet box or panelboard back-can. All conduit from that point on shall be metallic.
  2. Conduit shall not be run in the floor slab. Do not stack conduits beneath slab.
  3. Conduit run beneath slab shall be properly suspended from slab such that sub-slab settlement will not adversely affect electrical system.
- H. Arrange raceways to cross building expansion joints at right angles with expansion fittings.
- I. Stub-ups to Above Recessed Ceilings:
1. Use EMT, IMC, or GRC for raceways.
  2. Use a conduit bushing or insulated fitting to terminate stub-ups not terminated in hubs or in an enclosure.
- J. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.

- K. Coat field-cut threads on PVC-coated raceway with a corrosion-preventing conductive compound prior to assembly.
- L. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors No. 4 AWG and larger.
- M. Terminate threaded conduits into threaded hubs or with locknuts on inside and outside of boxes or cabinets. Install bushings on conduits up to 1-inch trade size, and insulated throat metal bushings on 1-1/4-inch trade size and larger conduits terminated with locknuts. Install insulated throat metal grounding bushings on service conduits.
- N. Install pull wires in empty raceways. Use polypropylene line with not less than 200-lb tensile strength. Leave at least 12 inches of slack at each end of pull wire. Cap underground raceways designated as spare above grade alongside raceways in use.
- O. Install raceway sealing fittings at accessible locations according to NFPA 70 and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces.
- P. Install devices to seal raceway interiors at accessible locations. Locate seals so no fittings or boxes are between the seal and the following changes of environments. Seal the interior of all raceways at the following points:
  - 1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
  - 2. Where an underground service raceway enters a building or structure.
  - 3. Where otherwise required by NFPA 70.
- Q. Expansion-Joint Fittings:
  - 1. Install fitting(s) that provide expansion and contraction for at least 0.00041 inch per foot of length of straight run per degree F of temperature change for PVC conduits.
  - 2. Install expansion fittings at all locations where conduits cross building or structure expansion joints.
  - 3. Install each expansion-joint fitting with position, mounting, and piston setting selected according to manufacturer's written instructions for conditions at specific location at time of installation. Install conduit supports to allow for expansion movement.
- R. Flexible Conduit Connections: Comply with NEMA RV 3. Use a maximum of 72 inches of flexible conduit for recessed and semirecessed luminaires, equipment subject to vibration, noise transmission, or movement; and for transformers and motors.
  - 1. Use LFMC in damp or wet locations.
- S. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block, and install box flush with surface of wall. Prepare block surfaces to provide a flat surface for a raintight connection between the box and cover plate or the supported equipment and box.
- T. Horizontally separate boxes mounted on opposite sides of walls so they are not in the same vertical channel.
- U. Locate boxes so that cover or plate will not span different building finishes.
- V. Support boxes of three gangs or more from more than one side by spanning two framing members or mounting on brackets specifically designed for the purpose.

- W. Fasten junction and pull boxes to or support from building structure. Do not support boxes by conduits.
- X. Set metal floor boxes level and flush with finished floor surface.

### 3.3 INSTALLATION OF UNDERGROUND CONDUIT

#### A. Direct-Buried Conduit:

1. Excavate trench bottom to provide firm and uniform support for conduit.
2. After installing conduit, backfill and compact. Start at tie-in point, and work toward end of conduit run, leaving conduit at end of run free to move with expansion and contraction as temperature changes during this process. Firmly hand tamp backfill around conduit to provide maximum supporting strength. After placing controlled backfill to within 12 inches of finished grade, make final conduit connection at end of run and complete backfilling with normal compaction.
3. Install manufactured rigid steel conduit elbows for exposed stub-ups at poles and equipment and at building entrances through floor. For concealed stub-ups, as inside of switchboard enclosures, PVC duct elbows may be used.
  - a. Couple steel conduits to ducts with adapters designed for this purpose, and encase coupling with 3 inches of concrete for a minimum of 12 inches on each side of the coupling.
  - b. For stub-ups at equipment mounted on outdoor concrete bases and where conduits penetrate building foundations, extend steel conduit horizontally a minimum of 60 inches from edge of foundation or equipment base. Install insulated grounding bushings on terminations at equipment.
4. Underground Warning Tape: Comply with requirements in Division 26 Section "Identification for Electrical Systems."

### 3.4 INSTALLATION OF UNDERGROUND HANDHOLES AND BOXES

- A. Install handholes and boxes level and plumb and with orientation and depth coordinated with connecting conduits to minimize bends and deflections required for proper entrances.
- B. Unless otherwise indicated, support units on a level bed of crushed stone or gravel, graded from 1/2-inch sieve to No. 4 sieve and compacted to same density as adjacent undisturbed earth.
- C. Elevation: In paved areas, set so cover surface will be flush with finished grade. Set covers of other enclosures 1 inch above finished grade.
- D. Install handholes with bottom below frost line, 30 inch minimum below grade.
- E. Field-cut openings for conduits according to enclosure manufacturer's written instructions. Cut wall of enclosure with a tool designed for material to be cut. Size holes for terminating fittings to be used, and seal around penetrations after fittings are installed.

### 3.5 FIRESTOPPING

- A. Install firestopping at penetrations of fire-rated floor and wall assemblies.

3.6 PROTECTION

A. Protect coatings, finishes, and cabinets from damage and deterioration.

1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
2. Repair damage to PVC coatings or paint finishes with matching touchup coating recommended by manufacturer.

END OF SECTION 260533

## SECTION 260544 - SLEEVES AND SLEEVE SEALS FOR ELECTRICAL RACEWAYS AND CABLING

## PART 1 - GENERAL

## 1.1 SUMMARY

## A. Section Includes:

1. Sleeves for raceway and cable penetration of non-fire-rated construction walls and floors.
2. Sleeve-seal systems.
3. Sleeve-seal fittings.
4. Grout.
5. Silicone sealants.

## PART 2 - PRODUCTS

## 2.1 SLEEVES

## A. Wall Sleeves:

1. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, zinc coated, plain ends.
2. Cast-Iron Pipe Sleeves: Cast or fabricated "wall pipe," equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop unless otherwise indicated.

## B. Sleeves for Conduits Penetrating Non-Fire-Rated Gypsum Board Assemblies: Galvanized-steel sheet; 0.0239-inch minimum thickness; round tube closed with welded longitudinal joint, with tabs for screw-fastening the sleeve to the board.

## C. Sleeves for Rectangular Openings:

1. Material: Galvanized sheet steel.
2. Minimum Metal Thickness:
  - a. For sleeve cross-section rectangle perimeter less than 50 inches and with no side larger than 16 inches, thickness shall be 0.052 inch.
  - b. For sleeve cross-section rectangle perimeter 50 inches or more and one or more sides larger than 16 inches, thickness shall be 0.138 inch.

## 2.2 SLEEVE-SEAL SYSTEMS

## A. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and raceway or cable.

1. Sealing Elements: Nitrile (Buna N) rubber interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
2. Connecting Bolts and Nuts: Stainless steel of length required to secure pressure plates to sealing elements.

### 2.3 GROUT

- A. Description: Nonshrink; recommended for interior and exterior sealing openings in non-fire-rated walls or floors.
- B. Standard: ASTM C 1107/C 1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.
- C. Design Mix: 5000-psi, 28-day compressive strength.
- D. Packaging: Premixed and factory packaged.

## PART 3 - EXECUTION

### 3.1 SLEEVE INSTALLATION FOR NON-FIRE-RATED ELECTRICAL PENETRATIONS

- A. Comply with NECA 1.
- B. Comply with NEMA VE 2 for cable tray and cable penetrations.
- C. Sleeves for Conduits Penetrating Above-Grade Non-Fire-Rated Concrete and Masonry-Unit Floors and Walls:
  - 1. Interior Penetrations of Non-Fire-Rated Walls and Floors:
    - a. Seal annular space between sleeve and raceway or cable, using joint sealant appropriate for size, depth, and location of joint.
    - b. Seal space outside of sleeves with mortar or grout. Pack sealing material solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect material while curing.
  - 2. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.
  - 3. Size pipe sleeves to provide 1/4-inch annular clear space between sleeve and raceway or cable unless sleeve seal is to be installed.
  - 4. Install sleeves for wall penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of walls. Cut sleeves to length for mounting flush with both surfaces of walls. Deburr after cutting.
- D. Sleeves for Conduits Penetrating Non-Fire-Rated Gypsum Board Assemblies:
  - 1. Use circular metal sleeves unless penetration arrangement requires rectangular sleeved opening.
  - 2. Seal space outside of sleeves with approved joint compound for gypsum board assemblies.
- E. Roof-Penetration Sleeves: Seal penetration of individual raceways and cables with flexible boot-type flashing units applied in coordination with roofing work.
- F. Aboveground, Exterior-Wall Penetrations: Seal penetrations using steel pipe sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch annular clear space between pipe and sleeve for installing mechanical sleeve seals.
- G. Underground, Exterior-Wall and Floor Penetrations: Install cast-iron pipe sleeves. Size sleeves to allow for 1-inch annular clear space between raceway or cable and sleeve for installing sleeve-seal system.

3.2 SLEEVE-SEAL-SYSTEM INSTALLATION

- A. Install sleeve-seal systems in sleeves in exterior concrete walls and slabs-on-grade at raceway entries into building.
- B. Install type and number of sealing elements recommended by manufacturer for raceway or cable material and size. Position raceway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between raceway or cable and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

3.3 SLEEVE-SEAL-FITTING INSTALLATION

- A. Install sleeve-seal fittings in new walls and slabs as they are constructed.
- B. Assemble fitting components of length to be flush with both surfaces of concrete slabs and walls. Position waterstop flange to be centered in concrete slab or wall.
- C. Secure nailing flanges to concrete forms.
- D. Using grout, seal the space around outside of sleeve-seal fittings.

END OF SECTION 260544



## SECTION 260553 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes:
  - 1. Identification for raceways.
  - 2. Identification of power and control cables.
  - 3. Identification for conductors.
  - 4. Underground-line warning tape.
  - 5. Warning labels and signs.
  - 6. Instruction signs.
  - 7. Equipment identification labels.
  - 8. Miscellaneous identification products.

## 1.2 QUALITY ASSURANCE

- A. Comply with ANSI A13.1.
- B. Comply with NFPA 70.
- C. Comply with 29 CFR 1910.144 and 29 CFR 1910.145.
- D. Comply with ANSI Z535.4 for safety signs and labels.
- E. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks used by label printers, shall comply with UL 969.

## PART 2 - PRODUCTS

## 2.1 CONDUCTOR IDENTIFICATION MATERIALS

- A. Color-Coding Conductor Tape: Colored, self-adhesive vinyl tape not less than 3 mils thick by 1 to 2 inches wide.
- B. Self-Adhesive Vinyl Labels: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound adhesive tape for securing ends of legend label.
- C. Marker Tapes: Vinyl or vinyl-cloth, self-adhesive wraparound type, with circuit identification legend machine printed by thermal transfer or equivalent process.
- D. Write-On Tags: Polyester tag, 0.010 inch thick, with corrosion-resistant grommet and cable tie for attachment to conductor or cable.
  - 1. Marker for Tags: Machine-printed, permanent, waterproof, black ink marker recommended by printer manufacturer.

## 2.2 FLOOR MARKING TAPE

- A. 2-inch- wide, 5-mil pressure-sensitive vinyl tape, with black and white stripes and clear vinyl overlay.

## 2.3 DETECTABLE UNDERGROUND-LINE WARNING TAPE

### A. Tape:

1. Recommended by manufacturer for the method of installation and suitable to identify and locate underground electrical and communications utility lines.
2. Printing on tape shall be permanent and shall not be damaged by burial operations.
3. Tape material and ink shall be chemically inert, and not subject to degrading when exposed to acids, alkalis, and other destructive substances commonly found in soils.

### B. Color and Printing:

1. Comply with ANSI Z535.1 through ANSI Z535.5.
2. Inscriptions for Red-Colored Tapes: ELECTRIC LINE, HIGH VOLTAGE.
3. Inscriptions for Orange-Colored Tapes: TELEPHONE CABLE, CATV CABLE, COMMUNICATIONS CABLE, OPTICAL FIBER CABLE.

## 2.4 WARNING LABELS AND SIGNS

- A. Comply with NFPA 70 and 29 CFR 1910.145.

### B. Baked-Enamel Warning Signs:

1. Preprinted aluminum signs, punched or drilled for fasteners, with colors, legend, and size required for application.
2. 1/4-inch grommets in corners for mounting.
3. Nominal size, 7 by 10 inches.

### C. Metal-Backed, Butyrate Warning Signs:

1. Weather-resistant, nonfading, preprinted, cellulose-acetate butyrate signs with 0.0396-inch galvanized-steel backing; and with colors, legend, and size required for application.
2. 1/4-inch grommets in corners for mounting.
3. Nominal size, 10 by 14 inches.

## 2.5 EQUIPMENT IDENTIFICATION LABELS

- A. Engraved, Laminated Acrylic or Melamine Label: with white letters on a dark-gray background. Minimum letter height shall be 3/8 inch.
- B. Stenciled Legend: In nonfading, waterproof, black ink or paint. Minimum letter height shall be 1 inch.

## 2.6 MISCELLANEOUS IDENTIFICATION PRODUCTS

- A. Fasteners for Equipment Identification Labels, and Signs: Self-tapping, stainless-steel screws or stainless-steel machine screws with nuts and flat and lock washers.

## PART 3 - EXECUTION

## 3.1 INSTALLATION

- A. Location: Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment.
- B. Apply identification devices to surfaces that require finish after completing finish work.
- C. Attach all signs and labels with mechanical fasteners appropriate to the location and substrate.
- D. Underground-Line Warning Tape: During backfilling of trenches install continuous underground-line warning tape directly above line at 12 inches below finished grade. Use multiple tapes where width of multiple lines installed in a common trench or concrete envelope exceeds 16 inches overall.

## 3.2 IDENTIFICATION SCHEDULE

- A. Accessible Raceways and Cables within Buildings: Identify the covers of each junction and pull box with the circuit number and panelboard of circuits within.
- B. Power-Circuit Conductor Identification, 600 V or Less: For conductors in vaults, pull and junction boxes, manholes, and handholes, use color-coding conductor tape to identify the phase.
  - 1. Color-Coding for Phase and Voltage Level Identification, 600 V or Less: Use colors listed below for ungrounded service, feeder, and branch-circuit conductors.
    - a. Color shall be factory applied or field applied for sizes larger than No. 8 AWG, if authorities having jurisdiction permit.
    - b. Colors for 208/120-V Circuits:
      - 1) Phase A: Black.
      - 2) Phase B: Red.
      - 3) Phase C: Blue.
      - 4) Neutral: White
    - c. Common Conductors
      - 1) Ground: Green
    - d. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches from terminal points and in boxes where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding. Locate bands to avoid obscuring factory cable markings.
- C. Auxiliary Electrical Systems Conductor Identification: Identify field-installed alarm, control, and signal connections.
  - 1. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, and pull points. Identify by system and circuit designation.
  - 2. Use system of marker tape designations that is uniform and consistent with system used by manufacturer for factory-installed connections.
  - 3. Coordinate identification with Project Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual.

- D. Locations of Underground Lines: Identify with underground-line warning tape for power, lighting, communication, control wiring and optical fiber cable.
1. Install underground-line warning tape for both direct-buried cables and cables in raceway.
- E. Warning Labels for Indoor Cabinets, Boxes, and Enclosures for Power and Lighting: Baked-enamel warning signs or metal-backed, butyrate warning signs.
1. Comply with 29 CFR 1910.145.
  2. Identify system voltage with black letters on white background.
  3. Apply to exterior of door, cover, or other access.
  4. For equipment with multiple power or control sources, apply warning to door or cover of equipment including, but not limited to, the following:
    - a. Power transfer switches.
    - b. Controls with external control power connections.
- F. Operating Instruction Signs: Install instruction signs to facilitate proper operation and maintenance of electrical systems and items to which they connect. Install instruction signs with approved legend where instructions are needed for system or equipment operation.
- G. Equipment Identification Labels: On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and the Operation and Maintenance Manual. Apply labels to disconnect switches and protection equipment, central or master units, control panels, control stations, terminal cabinets, and racks of each system. Systems include power, lighting, control, communication, signal, monitoring, and alarm systems unless equipment is provided with its own identification.
1. Labeling Instructions:
    - a. Indoor Equipment: Engraved, laminated acrylic or melamine label. Unless otherwise indicated, provide a single line of text with 1/2-inch- high letters on 1-1/2-inch- high label; where two lines of text are required, use labels 2 inches high.
    - b. Outdoor Equipment: Engraved, laminated acrylic or melamine label or stenciled legend 4 inches high.
    - c. Elevated Components: Increase sizes of labels and letters to those appropriate for viewing from the floor.
    - d. Fasten labels with appropriate mechanical fasteners that do not change the NEMA or NRTL rating of the enclosure.

END OF SECTION 260553

## SECTION 262416 - PANELBOARDS

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section includes distribution panelboards and lighting and appliance branch-circuit panelboards.

## 1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: For each panelboard and related equipment.
  - 1. Include dimensioned plans, elevations, sections, and details. Show tabulations of installed devices, equipment features, and ratings.
  - 2. Detail enclosure types and details for types other than NEMA 250, Type 1.
  - 3. Detail bus configuration, current, and voltage ratings.
  - 4. Short-circuit current rating of panelboards and overcurrent protective devices.
  - 5. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.
  - 6. Include wiring diagrams for power, signal, and control wiring.
- C. Panelboard schedules for installation in panelboards.

## 1.3 CLOSEOUT SUBMITTALS

- A. Operation and maintenance data.

## 1.4 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with NEMA PB 1.
- C. Comply with NFPA 70.

## PART 2 - PRODUCTS

## 2.1 GENERAL REQUIREMENTS FOR PANELBOARDS

- A. Enclosures: Flush- and surface-mounted cabinets as indicated.
  - 1. Rated for environmental conditions at installed location.

- a. Indoor Dry and Clean Locations: NEMA 250, Type 1, unless otherwise noted on drawings.
  - b. Outdoor Locations: NEMA 250, Type 3R, unless otherwise noted on drawings.
- 2. Hinged Front Cover: Entire front trim hinged to box and with standard door within hinged trim cover.
- 3. Directory Card: Inside panelboard door, mounted in transparent card holder.
- B. Incoming Mains Location: Top or bottom.
- C. Phase, Neutral, and Ground Buses: Tin-plated aluminum or copper.
- D. Conductor Connectors: Suitable for use with conductor material and sizes.
  - 1. Main and Neutral Lugs: Mechanical type.
  - 2. Ground Lugs and Bus Configured Terminators: Mechanical type.
- E. Service Equipment Label: NRTL labeled for use as service equipment for panelboards with one or more main service disconnecting and overcurrent protective devices.
- F. Future Devices: Where “space only” is indicated, provide mounting brackets, bus connections, filler plates, and necessary appurtenances required for future installation of devices.
- G. Panelboard Short-Circuit Current Rating: Fully rated to interrupt symmetrical short-circuit current available at terminals.

## 2.2 DISTRIBUTION AND LIGHTING AND APPLIANCE BRANCH CIRCUIT PANELBOARDS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
  - 2. General Electric Company; GE Consumer & Industrial - Electrical Distribution.
  - 3. Siemens Energy & Automation, Inc.
  - 4. Square D; a brand of Schneider Electric.
- B. Panelboards: NEMA PB 1, power and feeder distribution type or lighting and appliance branch circuit type as required..
- C. Doors: Secured with vault-type latch with tumbler lock; keyed alike.
- D. Main Circuit Breaker: Thermal-magnetic circuit breaker, inverse time-current element and adjustable instantaneous magnetic trip element.
- E. Branch Overcurrent Protective Devices: Bolt-on circuit breakers.
  - 1. Overcurrent protective device for fire alarm system shall have red marking and have provisions to be locked in the “ON” position.

## 2.3 DISCONNECTING AND OVERCURRENT PROTECTIVE DEVICES

- A. Molded-Case Circuit Breaker (MCCB): Comply with UL 489, fully rated with interrupting capacity to meet available fault currents.

1. Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level overloads, and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger. Provide the following features where shown on plans:
  - a. GFI Circuit Breakers: Single- and two-pole configurations with Class A ground-fault protection (5-mA trip).
  - b. Ground-Fault Equipment Protection (GFEP) Circuit Breakers: Class B ground-fault protection (30-mA trip).
  - c. Arc-Fault Circuit Interrupter (AFCI) Circuit Breakers: Comply with UL 1699; 120/240-V, single-pole configuration.
2. Molded-Case Circuit-Breaker (MCCB) Features and Accessories, provide as required or indicated.
  - a. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HID for feeding fluorescent and high-intensity discharge (HID) lighting circuits.
  - b. Shunt Trip: 120 -V trip coil energized from separate circuit, set to trip at 55 percent of rated voltage.

### PART 3 - EXECUTION

#### 3.1 INSTALLATION

- A. Receive, inspect, handle, store and install panelboards and accessories according to NEMA PB 1.1.
- B. Mount top of trim so that the handle on any breaker does not exceed 78”.
- C. Mount panelboard cabinet plumb and rigid without distortion of box. Mount recessed panelboards with fronts uniformly flush with wall finish and mating with back box.
- D. Stub four 1-inch empty conduits from flush mounted panelboards into accessible ceiling space or space designated to be ceiling space in the future.
- E. Arrange conductors in gutters into groups and bundle and wrap with wire ties.
- F. Comply with NECA 1.

#### 3.2 IDENTIFICATION

- A. Create a directory to indicate installed circuit loads and incorporating Owner's final room designations. Obtain approval before installing. Use a computer or typewriter to create directory; handwritten directories are not acceptable. Update any existing panelboard directories affected by work under this contract.
- B. Circuit serving fire alarm shall be identified as “FIRE ALARM CIRCUIT”.

#### 3.3 FIELD QUALITY CONTROL

- A. Perform tests and inspections.

- B. Acceptance Testing Preparation:
  - 1. Test insulation resistance for each panelboard bus, component, connecting supply, feeder, and control circuit.
  - 2. Test continuity of each circuit.
  
- C. Tests and Inspections:
  - 1. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
  - 2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
  
- D. Panelboards will be considered defective if they do not pass tests and inspections.

END OF SECTION 262416



## SECTION 262726 - WIRING DEVICES

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes:
1. Receptacles, switches, and associated device plates.
  2. Weather-resistant receptacles.
  3. Wall-box dimmers.

## 1.2 ADMINISTRATIVE REQUIREMENTS

- A. Coordination:
1. Receptacles for Owner-Furnished Equipment: Match plug configurations.

## PART 2 - PRODUCTS

## 2.1 MANUFACTURERS

- A. Manufacturers' Names: Subject to compliance with requirements, provide products by one of the following manufacturers:
1. Cooper Wiring Devices; Division of Cooper Industries, Inc. (Cooper).
  2. Hubbell Incorporated; Wiring Device-Kellems (Hubbell).
  3. Leviton Mfg. Company Inc. (Leviton).
  4. Pass & Seymour/Legrand (Pass & Seymour).

## 2.2 GENERAL WIRING-DEVICE REQUIREMENTS

- A. Wiring Devices, Components, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with NFPA 70.

## 2.3 STRAIGHT-BLADE RECEPTACLES

- A. Convenience Receptacles, 125 V, 20 A: Comply with NEMA WD 1, NEMA WD 6 Configuration 5-20R, UL 498, and FS W-C-596. Device shall be "specification" grade.

## 2.4 GFI RECEPTACLES

### A. General Description:

1. Straight blade.
2. Comply with NEMA WD 1, NEMA WD 6, UL 498, UL 943 Class A, and FS W-C-596.

## 2.5 TOGGLE SWITCHES

### A. Comply with NEMA WD 1, UL 20, and FS W-S-896.

### B. Switches, 120/277 V, 20 A.

## 2.6 WALL-BOX DIMMERS

### A. Dimmer Switches: Modular, full-wave, solid-state units with integral, quiet on-off switches, with audible frequency and EMI/RFI suppression filters.

### B. Control: Continuously adjustable slider; with single-pole or three-way switching. Comply with UL 1472.

### C. Incandescent Lamp Dimmers: 120 V; control shall follow square-law dimming curve. On-off switch positions shall bypass dimmer module.

1. 600 W; dimmers shall require no derating when ganged with other devices.

### D. Fluorescent Lamp Dimmer Switches: Modular; compatible with dimming ballasts; trim potentiometer to adjust low-end dimming; dimmer-ballast combination capable of consistent dimming with low end not greater than 10 percent of full brightness.

### E. LED Dimming Switches: Compatible with LED drivers, capable of consistent dimming with low end not greater than 10 percent of full brightness.

## 2.7 WALL PLATES

### A. Single and combination types shall match corresponding wiring devices.

1. Plate-Securing Screws: Metal with head color to match plate finish.
2. Material for Finished Spaces: Smooth, high-impact thermoplastic 0.035-inch- thick.
3. Material for Unfinished Spaces: Galvanized steel.

### B. Wet-Location, Weatherproof Cover Plates: NEMA 250, "in use" type, complying with NEMA Type 3R, weather-resistant.

## 2.8 FINISHES

### A. Device Color:

1. Wiring Devices Connected to Normal Power System: As selected by Architect unless otherwise indicated or required by NFPA 70 or device listing.
2. Wiring Devices Connected to Emergency Power System: Red.

### B. Wall Plate Color: For plastic covers, match device color.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

#### A. Comply with NECA 1, including mounting heights listed in that standard, unless otherwise indicated.

#### B. Coordination with Other Trades:

1. Protect installed devices and their boxes. Do not place wall finish materials over device boxes and do not cut holes for boxes with routers that are guided by riding against outside of boxes.
2. Keep outlet boxes free of plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other material that may contaminate the raceway system, conductors, and cables.
3. Install device boxes in brick or block walls so that the cover plate does not cross a joint unless the joint is troweled flush with the face of the wall.
4. Install wiring devices after all wall preparation, including painting, is complete.

#### C. Conductors:

1. Do not strip insulation from conductors until right before they are spliced or terminated on devices.
2. Strip insulation evenly around the conductor using tools designed for the purpose. Avoid scoring or nicking of solid wire or cutting strands from stranded wire.
3. The length of free conductors at outlets for devices shall meet provisions of NFPA 70, Article 300, without pigtails.
4. Existing Conductors:
  - a. Cut back and pigtail, or replace all damaged conductors.
  - b. Straighten conductors that remain and remove corrosion and foreign matter.
  - c. Pigtailling existing conductors is permitted, provided the outlet box is large enough.

#### D. Device Installation:

1. Replace devices that have been in temporary use during construction and that were installed before building finishing operations were complete.
2. Keep each wiring device in its package or otherwise protected until it is time to connect conductors.
3. Do not remove surface protection, such as plastic film and smudge covers, until the last possible moment.
4. Connect devices to branch circuits using pigtails that are not less than 6 inches in length.
5. When there is a choice, use side wiring with binding-head screw terminals. Wrap solid conductor tightly clockwise, two-thirds to three-fourths of the way around terminal screw.

6. Use a torque screwdriver when a torque is recommended or required by manufacturer.
7. When conductors larger than No. 12 AWG are installed on 15- or 20-A circuits, splice No. 12 AWG pigtails for device connections.
8. Tighten unused terminal screws on the device.
9. When mounting into metal boxes, remove the fiber or plastic washers used to hold device-mounting screws in yokes, allowing metal-to-metal contact.

E. Receptacle Orientation:

1. Install ground pin of vertically mounted receptacles up.

F. Device Plates: Do not use oversized or extra-deep plates. Repair wall finishes and remount outlet boxes when standard device plates do not fit flush or do not cover rough wall opening.

G. Dimmers:

1. Install dimmers within terms of their listing.
2. Verify that dimmers used for fan speed control are listed for that application.
3. Install unshared neutral conductors on line and load side of dimmers according to manufacturers' device listing conditions in the written instructions.

H. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical and with grounding terminal of receptacles on top. Group adjacent switches under single, multigang wall plates, where possible.

### 3.2 FIELD QUALITY CONTROL

A. Perform the following tests and inspections:

1. Test Instruments: Use instruments that comply with UL 1436.
2. Test ground-fault receptacles with a "load" (such as a plug in light) to verify that the "line" and "load" leads are not reversed.

B. Wiring device shall be considered defective if it does not pass tests and inspections.

END OF SECTION 262726

## SECTION 262816 - ENCLOSED SWITCHES AND CIRCUIT BREAKERS

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section Includes:
  - 1. Fusible switches.
  - 2. Nonfusible switches.
  - 3. Molded-case circuit breakers (MCCBs).
  - 4. Enclosures.

## 1.2 SUBMITTALS

- A. Product Data: For each type of enclosed switch, circuit breaker, accessory, and component indicated.
- B. Shop Drawings: For enclosed switches and circuit breakers. Include plans, elevations, sections, details, and attachments to other work.
  - 1. Wiring Diagrams: For power, signal, and control wiring.

## 1.3 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with NFPA 70.

## PART 2 - PRODUCTS

## 2.1 FUSIBLE SWITCHES

- A. Type GD, General Duty, Single Throw, 240-V ac, 400 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, with cartridge fuse interiors to accommodate specified fuses, lockable handle with capability to accept two padlocks, and interlocked with cover in closed position.
- B. Type HD, Heavy Duty, Single Throw, all current ratings at 600-V ac, and 240V ac 600 A and Larger: UL 98 and NEMA KS 1, horsepower rated, with clips or bolt pads to accommodate specified fuses, lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.
- C. Accessories:
  - 1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.
  - 2. Neutral Kit: Internally mounted; insulated, capable of being grounded and bonded; labeled for copper and aluminum neutral conductors.
  - 3. Class R Fuse Kit: Provides rejection of other fuse types when Class R fuses are specified.

4. Lugs: Suitable for number, size, and conductor material.
5. Service-Rated Switches: Labeled for use as service equipment.

## 2.2 NONFUSIBLE SWITCHES

- A. Type GD, General Duty, Single Throw, 240V ac, 400 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, lockable handle with capability to accept two padlocks, and interlocked with cover in closed position.
- B. Type HD, Heavy Duty, Single Throw, all current ratings at 600-V ac, and 240V ac 600 A and Larger: UL 98 and NEMA KS 1, horsepower rated, lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.
- C. Accessories:
  1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.
  2. Neutral Kit: Internally mounted; insulated, capable of being grounded and bonded; labeled for copper and aluminum neutral conductors.
  3. Lugs: Suitable for number, size, and conductor material.

## 2.3 MOLDED-CASE CIRCUIT BREAKERS

- A. General Requirements: Comply with UL 489, NEMA AB 1, and NEMA AB 3, with interrupting capacity to comply with available fault currents.
- B. Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level overloads and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.

## 2.4 ENCLOSURES

- A. Enclosed Switches and Circuit Breakers: NEMA AB 1, NEMA KS 1, NEMA 250, and UL 50, to comply with environmental conditions at installed location.
  1. Indoor, Dry and Clean Locations: NEMA 250, Type 1, unless otherwise noted.
  2. Outdoor Locations: NEMA 250, Type 3R, unless otherwise noted.

## PART 3 - EXECUTION

### 3.1 INSTALLATION

- A. Install individual wall-mounted switches and circuit breakers with tops at uniform height unless otherwise indicated.
- B. Install fuses in fusible devices.
- C. Comply with NECA 1.

3.2 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
- B. Acceptance Testing Preparation:
  - 1. Test insulation resistance for each enclosed switch and circuit breaker, component, connecting supply, feeder, and control circuit.
  - 2. Test continuity of each circuit.
- C. Tests and Inspections:
  - 1. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
  - 2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
- D. Enclosed switches and circuit breakers will be considered defective if they do not pass tests and inspections.

END OF SECTION 262816

## SECTION 262900 - MOTORS AND MOTOR CONTROL

## PART 1 - GENERAL

## 1.1 GENERAL

- A. Provide motors, motor controllers and motor control systems as required to serve all motorized equipment.
- B. See the general requirements defined in Section 260500 "ELECTRICAL GENERAL PROVISIONS", the paragraph entitled "MOTORS AND EQUIPMENT".

## PART 2 - PRODUCTS

2.1 Motors: Motors shall comply with NEMA MG 1; hermetic-type sealed motor compressors shall also comply with UL 984. Determine specific motor characteristics to ensure provision of correctly sized starters and overload heaters. Motors for operation on 208-volt, 3-phase circuits shall have terminal voltage rating of 200 volts, and those for operation on 480-volt, 3-phase circuits shall have terminal voltage rating of 460 volts. Motors shall be designed to operate at full capacity with voltage variation of plus or minus 10 percent of motor voltage rating.

- A. Motor Sizes: Provide size for duty to be performed, not exceeding the full-load nameplate current rating when driven equipment is operated at specified capacity under most severe conditions likely to be encountered. When motor size provided differs from size indicated or specified, make adjustments to wiring, disconnect devices, and branch circuit protection to accommodate equipment actually provided.
- B. Motor Controllers: Motor controllers shall comply with UL 508, NEMA ICS 1, and NEMA ICS 2. Controllers shall have thermal overload protection in each phase and shall have one spare normally open and one spare normally closed auxiliary contact. Magnetic-type motor controllers shall have undervoltage protection when used with momentary-contact pushbutton stations or switches and shall have undervoltage release when used with maintained-contact pushbutton stations or switches. When used with pressure, float, or similar automatic-type or maintained-contact switch, controller shall have hand/off/automatic selector switch. Connections to selector switch shall be such that only normal automatic regulatory control devices are bypassed when switch is in "hand" position. Safety control devices, such as low and high pressure cutouts, high temperature cutouts, and motor overload protective devices, shall be connected in motor control circuit in "hand" and "automatic" positions. Control circuit connections to hand/off/automatic selector switch or to more than one automatic regulatory control device shall be made in accordance with indicated or manufacturer's approved wiring diagram. For each motor not in sight of controller or where controller disconnecting means is not in sight of motor location and driven machinery location, controller disconnecting means shall be capable of being locked in open position. As an alternative, provide a manually operated, lockable, nonfused switch which disconnects motor from supply source within sight of motor. Overload protective devices shall provide adequate protection to motor windings; be thermal inverse-time-limit type; and include manual reset-type pushbutton on outside of motor controller case. Cover of combination motor controller and manual switch or circuit breaker shall be interlocked with operating handle of switch or circuit breaker so that cover cannot be opened unless handle of switch or circuit breaker is in "off" position. Minimum short circuit withstand rating of combination motor controller shall be equal to or greater than the short circuit rating of the up-stream circuit breaker serving the motor.

- 1. Motors for use with variable frequency drives shall have shaft grounding kits.



- C. Control Circuits: Control circuits shall have maximum voltage of 120 volts. The circuit may be derived directly by use of the neutral conductor in 120/208V, 3-phase, 4-wire electrical systems; or shall be derived from control transformer in same enclosure. Transformers shall conform to UL 506. Transformers, other than transformers in bridge circuits, shall have primaries wound for voltage available and secondaries wound for correct control circuit voltage. Size transformers so that 80 percent of rated capacity equals connected load. Provide disconnect switch on primary side. Provide fuses in each ungrounded primary feeder. One secondary lead shall be fused; other shall be grounded.
- D. Manual Motor Starters and Motor Rated Switches: Provide number of poles indicated. Provide motor overload protection when specifically indicated on the drawings or where required by the NEC and in conjunction with the actual motor type provided. Voltage and amperage ratings shall be coordinated with the actual electrical systems and motor loads connected. Provide surface mounted enclosures in utility type spaces and flush mounted enclosures in finished rooms. (Coordinate with concealed conduit requirements.)
- E. Miscellaneous Features: Enclosures shall be specifically approved for the environments in which they are installed and shall comply with NEMA ICS 6. Pushbutton stations shall have "start/stop" momentary contacts having one normally open and one normally closed set of contacts, and red lights to indicate when motor is running. Stations shall be heavy duty, oil-tight design. Pilot and indicating lights shall be transformer, resistor, or diode type. Terminal blocks shall comply with NEMA ICS 4.

### PART 3 - EXECUTION

- 3.1 Coordinate final locations of motor controllers, disconnect switches, motor rated switches, control components, and other similar equipment with all involved parties including the Owner's Construction Representative (OCR). Fulfill all requirements of Article 430: "Motors, Motor Circuits, and Controllers" of the National Electrical Code. All equipment shall be installed in a secured and approved manner.
- 3.2 Motor and Equipment Connections: Provide and fulfill all instructions and recommendations of the manufacturer of the equipment connected. All circuits shall be concealed in finished spaces. In finished spaces, exposed circuits may only be provided as specifically approved by the OCR. Such exposed circuits shall be installed in surface metal raceway. The raceway shall be painted to match the adjacent surfaces. Provide power wiring for the connection of motors and control equipment under this section of the specification. Except as otherwise specifically noted or specified, automatic control wiring, control devices, and protective devices within the control circuitry are not included in this section of the specifications but shall be provided under the section specifying the associated equipment.

END OF SECTION 262900



GENERAL NOTES:

- 1. ALL WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE GEOTECHNICAL REPORT.
2. DISTURBED AREAS ARE TO BE RESTORED TO ORIGINAL OR BETTER CONDITION.
3. ALL EROSION PREVENTION MEASURES SHALL BE INSTALLED PRIOR TO ANY EXCAVATION OR FILLING OPERATIONS.
4. EROSION PREVENTION MEASURES SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION AND FOR A PERIOD OF 90 DAYS AFTER COMPLETION.

STANDARD EROSION AND SEDIMENT CONTROL NOTES

- 1. FOR SITES GREATER THAN ONE (1) ACRE THE CONTRACTOR SHALL DESIGN AND CONSTRUCT EROSION AND SEDIMENT CONTROL MEASURES TO PREVENT POLLUTANT DISCHARGE EXCEEDING THE LIMITS OF THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) GENERAL PERMIT FOR STORM WATER DISCHARGES FROM CONSTRUCTION SITES, AND THE PRECONSTRUCTION MEETING TO PROMOTION, IMPLEMENTATION, CORRECTIONS, AND INSPECTIONS.
2. THE CONTRACTOR SHALL OBTAIN A COPY OF THE STORM WATER POLLUTION PREVENTION PLAN AT THE CONSTRUCTION SITE. THE PLAN AND OTHER RELATED DOCUMENTS SHALL BE MADE AVAILABLE UPON REQUEST TO AUTHORIZED LOCAL, STATE, OR FEDERAL REPRESENTATIVES.

STANDARD EROSION AND SEDIMENT CONTROL NOTES CONTINUED

- 14. A PRECONSTRUCTION MEETING SHALL BE HELD ON SITE BETWEEN THE CONTRACTOR, THE DESIGNER, THE PROPERTY OWNER, AND THE CONTRACTOR PRIOR TO ISSUANCE OF THE LAND DISTURBING PERMIT. THE CONTRACTOR SHALL SUBMIT A SCHEDULE OF CONSTRUCTION TO THE CITY OF SUDBURY FOR APPROVAL AT THE PRECONSTRUCTION MEETING. THE CONTRACTOR WILL SUPPLY THE NAME OF THE INDIVIDUAL WHO WILL BE RESPONSIBLE FOR OBTAINING A CONFORMANCE WITH THESE MEASURES ON A DAILY BASIS, AND THE NAME OF THE RESPONSIBLE LAND DISTURBER.
15. PRIOR TO COMMENCING LAND DISTURBING ACTIVITIES IN AREAS OTHER THAN INDICATED ON THESE PLANS (INCLUDING, BUT NOT LIMITED TO, OFF-SITE HIGHWAY OR WASTE AREAS), THE CONTRACTOR SHALL SUBMIT A SUPPLEMENTARY EROSION CONTROL PLAN TO THE OWNER FOR REVIEW AND APPROVAL BY THE PLANNING AUTHORITY OR SHALL SUBMIT EVIDENCE THAT THE OFF-SITE SOURCE AND/OR DISPOSAL AREA HAS PREVIOUSLY BEEN APPROVED FOR THIS USE.

STANDARD EROSION AND SEDIMENT CONTROL NOTES CONTINUED

- 35. ALL EXISTING SLOPES STEEPER THAN 2:1 SHALL REQUIRE THE USE OF EROSION CONTROL MEASURES TO AID IN THE ESTABLISHMENT OF A VEGETATIVE COVER. DISCHARGES FROM CONSTRUCTION SITES, INCLUDING, BUT NOT LIMITED TO, INSTALLATION AND SLOPES SHALL BE GRATED STEEPER THAN 2:1 UNLESS SPECIFICALLY NOTED ON THE DRAWINGS.
36. SILT FENCE NOTES:
A. SILT FENCE AND FILTER FABRIC MUST BE EXTENDED.
B. SEDIMENT MUST BE REMOVED WHEN DEPOSITS REACH APPROXIMATELY ONE-HALF THE HEIGHT OF THE BARRIER.
C. UNDER NO CIRCUMSTANCES SHOULD SILT FENCE BE CONSTRUCTED IN LIVE STREAMS.

GENERAL NOTES FOR WETLANDS

- 1. REGULATORY NOTES ARE CONTAINED IN THE SPECIFICATIONS AND THE CONTRACTOR IS REQUIRED TO COMPLY WITH ALL CONDITIONS OF SUCH PERMITS.
2. CAUTION: WETLANDS ARE LOCATED WITHIN THE BOUNDARY OF THIS DEVELOPMENT. CONTRACTOR MUST VERIFY THE EXACT LOCATION OF WETLANDS.
3. THE WETLANDS DELINEATION ON THE PLANS WERE OBTAINED BY THE USE OF AIRBORNE PHOTO INTERPRETATION AND FIELD SURVEY.

STANDARD EROSION AND SEDIMENT CONTROL NOTES CONTINUED

- 16. THE CONTRACTOR SHALL MAINTAIN ANY AND ALL EAS MEASURES INSTALLED BY SEPARATE CONTRACTS THAT EXIST PRIOR TO OCCUPANCY OF THE SITE FOR THIS CONSTRUCTION CONTRACT. THE CONTRACTOR SHALL REPLACE ANY EAS MEASURES DETERMINED UNREPAIRABLE BY THE LOCAL PLAN APPROVING AUTHORITY.
17. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO LEAVE THE SITE ADEQUATELY PROTECTED AGAINST EROSION, SEDIMENTATION, OR ANY DAMAGE TO ANY ADJACENT PROPERTY AT THE END OF EACH DAY'S WORK.

STANDARD EROSION AND SEDIMENT CONTROL NOTES CONTINUED

- 20. ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION AND FOR A PERIOD OF 90 DAYS AFTER COMPLETION OF THE PROJECT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE MAINTENANCE AND REPAIR OF ALL TEMPORARY MEASURES.
21. ALL DOCUMENTS, RECORDS, REPORTS, AND OTHER INFORMATION RELEVANT TO THE GENERAL PERMIT REGULATIONS SHALL BE OBTAINED BY THE CONTRACTOR FROM THE SUDBURY PLANNING AUTHORITY.
22. SOIL STABILIZATION:
A. PERMANENT OR TEMPORARY SOIL STABILIZATION SHALL BE APPLIED TO EXPOSED AREAS WITHIN TEN (10) DAYS AFTER FINAL GRADE IS REACHED ON ANY PORTION OF THE SITE.

STANDARD EROSION AND SEDIMENT CONTROL NOTES CONTINUED

- 41. ALL SEEDING PROCEDURES SHALL BE IN ACCORDANCE WITH APPLICABLE VDOT SPECIFICATIONS.
42. ALL SEEDING AREAS, BOTH TEMPORARY AND PERMANENT, SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION DURATION UNTIL SUBSTANTIAL COMPLETION AND FINAL ACCEPTANCE BY THE OWNER. MAINTENANCE SHALL INCLUDE BUT NOT BE LIMITED TO: WEEDING, MOWING, FERTILIZING, WEEDING, TENDING, REPLANTING, MULCHING, AND OTHER NECESSARY MAINTENANCE OPERATIONS.
43. SEEDING MATERIAL SHALL BE PLACED ON THE UPWIND SIDE OF TRENCHES.

EROSION CONTROL & TREE PROTECTION

- 1. ALL EROSION CONTROL AND TREE PROTECTION MEASURES SHALL BE INSTALLED WITH THE FIRST PHASE OF CONSTRUCTION. MEASURES SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION AND FOR A PERIOD OF 90 DAYS AFTER COMPLETION.
2. THE CONTRACTOR SHALL MAINTAIN EXISTING VEGETATION TO PREVENT SOIL FROM BEING EXPOSED TO EROSION. VEGETATION SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION AND FOR A PERIOD OF 90 DAYS AFTER COMPLETION.
3. EXISTING VEGETATION SURROUNDING THE CONSTRUCTION AREA SHALL REMAIN IN A NATURAL STATE UNLESS THE CONTRACTOR CANNOT MAINTAIN IT IN ACCORDANCE WITH THE SPECIFICATIONS AND NOTES AS SHOWN ON THE DRAWINGS AND SEDIMENT CONTROL PLAN.

STANDARD EROSION AND SEDIMENT CONTROL NOTES CONTINUED

- 23. ALL PERMANENT SEEDING SHALL BE PERFORMED SEPTEMBER 1 THROUGH NOVEMBER 15 AND MARCH 1 THROUGH MAY 15.
24. IF DISTURBED AREA STABILIZATION IS TO BE ACCOMPLISHED DURING THE MONTHS OF DECEMBER, JANUARY, OR FEBRUARY, STABILIZATION SHALL CONSIST OF MULCHING SEEDING, WHICH TAKE PLACE AS SOON AS THE SEASON PERMITS.
25. STABILIZATION MEASURES SHALL BE APPLIED TO EXISTING STRUCTURES SUCH AS BARRIERS, TRENCHES, AND DITCH OR WATERCOURSE BEDS AND BASINS IMMEDIATELY AFTER INSTALLATION.

STANDARD EROSION AND SEDIMENT CONTROL NOTES CONTINUED

- 28. ALL AREAS WHICH HAVE NOT DEVELOPED AN OPEN, SATISFACTORY STAND OF GRASS, FESCUE, OR BARE SOIL, SHALL BE RESEED BY THE CONTRACTOR AS DIRECTED BY THE ENGINEER. THIS OPERATION SHALL BE REPEATED UNTIL COMPLETE COVER IS OBTAINED.
29. MAINTENANCE OF ALL LAWN AREAS INCLUDING WEEDING, MOWING AND PEST CONTROL SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR UNTIL FINAL APPROVAL AND ACCEPTANCE, WHICH SHALL ONLY BE GIVEN BY THE OWNER UPON REQUEST TO THE CONTRACTOR.
30. CONTRACTOR SHALL PROVIDE A MINIMUM OF ONE MOWING TO ALL LAWN AREAS PRIOR TO FINAL ACCEPTANCE.

STANDARD EROSION AND SEDIMENT CONTROL NOTES CONTINUED

- 44. SEDIMENT BARRIERS AND TRAPS, PERMITS BARRIERS AND OTHER MEASURES INSTALLED TO TRAP SEDIMENT SHALL BE CONSTRUCTED AS A FIRST STEP IN ANY LAND-DISTURBING ACTIVITY AND SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION AND FOR A PERIOD OF 90 DAYS AFTER COMPLETION.
45. UNDERGROUND UTILITY LINES SHALL BE INSTALLED IN ACCORDANCE WITH THE FOLLOWING STANDARDS IN ADDITION TO OTHER APPLICABLE CODES:
A. NO MORE THAN 300 LINEAR FEET OF TRENCH MAY BE OPENED AT ONE TIME.
B. EXCAVATING MATERIAL SHALL BE PLACED ON THE UPWIND SIDE OF TRENCHES.

CLEARING & DEMOLITION

- 1. THE CONTRACTOR SHALL PERFORM CLEARING AS NOTED AND SHOWN ON THESE PLANS.
2. ALL CLEARING AND DEMOLITION OPERATIONS SHALL BE CONDUCTED IN ACCORDANCE WITH THE SPECIFICATIONS AND NOTES AS SHOWN ON THE DRAWINGS AND SEDIMENT CONTROL PLAN.
3. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONS TO AVOID UNNECESSARY DAMAGE TO EXISTING VEGETATION AND STRUCTURES.
4. ALL EXISTING TREES TO REMAIN WHICH ARE DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED TO THEIR ORIGINAL CONDITION AT THE EXPENSE OF THE CONTRACTOR.

STANDARD EROSION AND SEDIMENT CONTROL NOTES CONTINUED

- 31. ALL DISTURBED AREAS ARE TO BE BROUGHT TO APPROVED SEDIMENT CONTROL STANDARDS AT ALL TIMES THROUGHOUT CONSTRUCTION AND DURING SITE DEVELOPMENT UNTIL FINAL STABILIZATION IS ACHIEVED.
32. TEMPORARY DRAINAGE DURING CONSTRUCTION SHALL BE PROVIDED BY THE CONTRACTOR TO PREVENT FLOODING AREAS THAT MAY CAUSE DAMAGE TO THE SITE OR ADJACENT PROPERTY.
33. CUT AND FILL SLOPES SHALL BE DESIGNED AND CONSTRUCTED BY A DESIGNER WHO WILL MAINTAIN EROSION SLOPES THAT ARE FOUND TO BE EXCESSIVELY STEEP WITHIN ONE (1) YEAR OF PERMANENT STABILIZATION SHALL BE PROVIDED WITH ADEQUATE EROSION CONTROL MEASURES UNTIL THE PROBLEM IS CORRECTED.

STANDARD EROSION AND SEDIMENT CONTROL NOTES CONTINUED

- 34. CONCENTRATED RUNOFF SHALL NOT FLOW DOWN CUT OR FILL SLOPES UNLESS CONTAINED WITHIN AN APPROVED TEMPORARY OR PERMANENT CHANNEL, FLUME, OR SOFT GRASS CHANNEL.
35. THE COUNTY OF SUDBURY MUST BE NOTIFIED ONE (1) WEEK PRIOR TO THE PRECONSTRUCTION CONFERENCE, ONE (1) WEEK PRIOR TO THE COMMENCEMENT OF LAND DISTURBING ACTIVITY, AND ONE (1) WEEK PRIOR TO THE FINAL INSPECTION.

STANDARD EROSION AND SEDIMENT CONTROL NOTES CONTINUED

- 46. PERMANENT SEEDING SHALL BE APPLIED WITH A HYDROSEEDER UNLESS OTHERWISE SPECIFIED.
47. ALL SEEDING PROCEDURES SHALL BE IN ACCORDANCE WITH APPLICABLE VDOT SPECIFICATIONS.
48. ALL SEEDING AREAS, BOTH TEMPORARY AND PERMANENT, SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION DURATION UNTIL SUBSTANTIAL COMPLETION AND FINAL ACCEPTANCE BY THE OWNER. MAINTENANCE SHALL INCLUDE BUT NOT BE LIMITED TO: WEEDING, MOWING, FERTILIZING, WEEDING, TENDING, REPLANTING, MULCHING, AND OTHER NECESSARY MAINTENANCE OPERATIONS.

UTILITIES

- 1. THIS PLAN DOES NOT QUANTIFY THE EXISTING, NON-DESIGNED, SIZE, TYPE, LOCATION, OR DEPTH OF EXISTING UTILITIES OR OTHER UTILITIES.
2. THE CONTRACTOR SHALL VERIFY THE LOCATION AND DEPTH OF ALL UTILITIES PRIOR TO CONSTRUCTION.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL UTILITIES TO REMAIN IN PLACE.

STANDARD EROSION AND SEDIMENT CONTROL NOTES CONTINUED

- 36. THE CONTRACTOR SHALL USE AN EC-2 JETTED MESH OR APPROVED EQUIVALENT THROUGHOUT THE BLOCK CURBS AND RIGHT-OF-WAY ALONG ALL ROADWAYS AND SIDEWALKS OF 4:1 OR GREATER.
37. FAILURE OF THE CONTRACTOR TO PROVIDE THE ABOVE MENTIONED E & S MEASURES IS A BREACH OF CONTRACT.
38. PRIOR TO ISSUANCE OF A LAND DISTURBING PERMIT, AN E & S SURETY WILL NEED TO BE POSTED WITH THE COUNTY OF SUDBURY.

STANDARD EROSION AND SEDIMENT CONTROL NOTES CONTINUED

- 39. THE CONTRACTOR SHALL COMPLETE DRAINAGE FACILITIES WITHIN THIRTY (30) DAYS FOLLOWING COMPLETION OF ROUGH GRADE AT ANY POINT WITHIN THE PROJECT.
40. CONSTRUCTION WILL BE SEQUENCED SO THAT GRADING OPERATIONS CAN BEGIN AND END AS QUICKLY AS POSSIBLE.
41. THE CONTRACTOR SHALL USE AN EC-2 JETTED MESH OR APPROVED EQUIVALENT THROUGHOUT THE BLOCK CURBS AND RIGHT-OF-WAY ALONG ALL ROADWAYS AND SIDEWALKS OF 4:1 OR GREATER.

STANDARD EROSION AND SEDIMENT CONTROL NOTES CONTINUED

- 49. EROSION AND SEDIMENT CONTROL MEASURES WILL BE CHECKED REGULARLY FOR UNDERCUTTING OR BULGING OR CLOSING UP WITH SEDIMENT. CORRECTIVE ACTION WILL BE TAKEN IMMEDIATELY.
50. ALL SEEDING AREAS WILL BE CHECKED REGULARLY TO SEE THAT A GOOD STAND IS MAINTAINED. AREAS SKULLED BE FERTILIZED AND RE-SEED AS NECESSARY.



VIA design architects, pc

150 RANDOLPH STREET

WINDSOR, ONTARIO M9S 2G9

TEL: 416-291-1111

WWW.VIADARCHITECTS.COM



City of Sudbury, VA
500 Atlantic Drive, Curry, VA 23060

Table with 2 columns: Description, Date. Includes entries for PRELIMINARY, 50% PROGRESS PERMITS, 100% PROGRESS PERMITS, PERMITS, RECORDS, and RECORDS.

Table with 2 columns: Description, Date. Includes entries for PRELIMINARY, 50% PROGRESS PERMITS, 100% PROGRESS PERMITS, PERMITS, RECORDS, and RECORDS.

GENERAL NOTES

MD
CA002

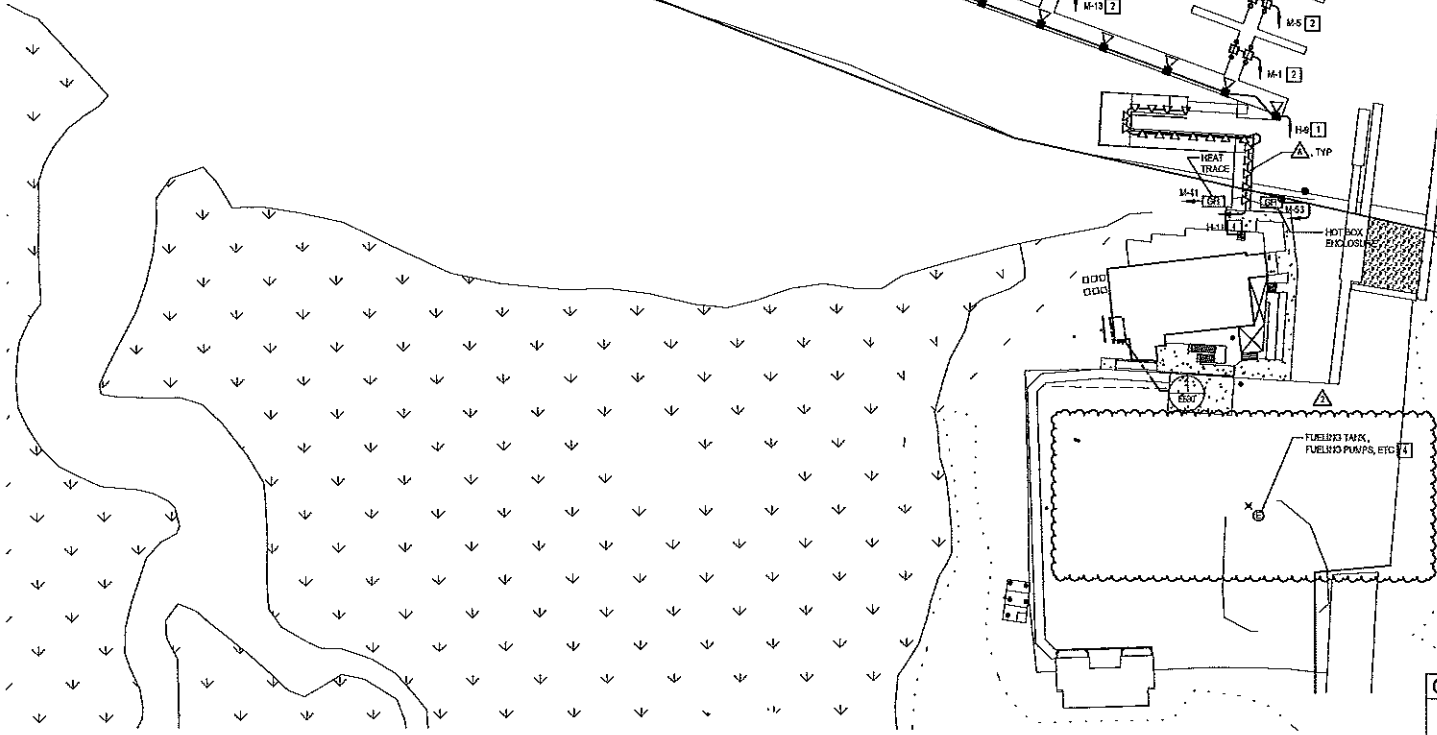
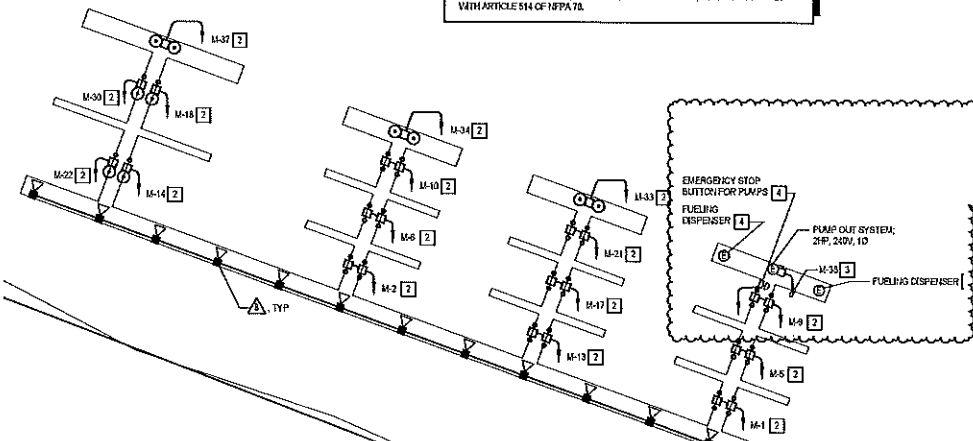
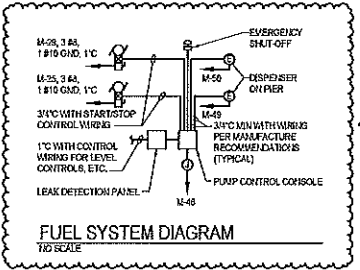


1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

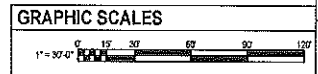
A  
B  
C  
D  
E  
F  
G  
H  
I  
J  
K

**HAZARDOUS CLASSIFICATION NOTE:**  
 AREA AROUND FUEL DISPENSERS IS CLASSIFIED AS HAZARDOUS CLASS 1, DIVISION 1 AND 2. PER NEC, ALL BOXES, WIRING METHODS, ETC. SHALL COMPLY WITH ARTICLE 514 OF NFPA 70.

- NOTES THIS SHEET**
- 1 RUN CIRCUIT VIA LIGHTING CONTRACTOR.
  - 2 REFER TO FLOATING DOCK DETAIL ON SHEET E500. PROVIDE 3/8", 1" WID GLED-1" FROM DOCK TO PANEL.
  - 3 REFER TO FLOATING DOCK DETAIL ON SHEET E500. PROVIDE ANKER CABLE 3/4"-42-008 OR EQUAL FROM DOCK TO EQUIPMENT.
  - 4 FUELING DISPENSING SYSTEM SHALL BE PROVIDED BY THE DISPENSING FUELING SYSTEM PROVIDER. CONTRACTOR SHALL PROVIDE POWER CONNECTION AND CONTROLS CASKET PER SYSTEM MANUFACTURER RECOMMENDATIONS. REFER TO FUEL SYSTEM DIAGRAM, THIS SHEET.



**ELECTRICAL MARINA SITE PLAN**  
 SCALE: 1" = 30'-0"



VIA design architects, pc  
 150 RAYBOLM STREET  
 NORFOLK, VIRGINIA 23502  
 757.637.1498 FAX 637.3629  
 www.viaa.com/gm/contracts.cfm



County of Surry, VA  
**Surry County Marina**  
 633 Marina Drive, Surry, VA, 23883

NO.	DATE	DESCRIPTION
1	11/22/2010	ISSUED FOR PERMITS
2	11/22/2010	ISSUED FOR PERMITS
3	11/22/2010	ISSUED FOR PERMITS
4	11/22/2010	ISSUED FOR PERMITS

PROJECT NO: 1004  
 DATE: 11/22/10  
 SHEET NO: 13

PRELIMINARY  
 10% PROGRESS PRINTS  
 30% PROGRESS PRINTS  
 50% PROGRESS PRINTS  
 PERMITS  
 RECORD  
 ARCHIVE/CONSTRUCTION  
 RECORD DRAWINGS

PROJECT: ELECTRICAL MARINA SITE PLAN

PROJECT NO: 1004  
 SHEET NO: 13  
**MD**  
**E002**

**EXISTING PANELBOARD H SCHEDULE**

SEE POWER RISER DIAGRAM FOR RATINGS

LOAD SERVED	LOAD (AMPS)		BKR TRIP	CKT NO.	PHASE		CMT	BKR TRIP	LOAD (AMPS)		LOAD SERVED
	A	B			A	B			A	B	
LIGHTING	0.0		201P	1				2	201P	3.0	RECEPTACLES
EXTERIOR LIGHTING	4.8		201P	3				4	201P	4.5	RECEPTACLES
PHOTOCELL	1.0		201P	5				6	201P	6.0	RECEPTACLES
PIER LIGHTING	3.4		201P	7				8	201P	10.0	REFRIGERATOR
PIER LIGHTING	1.6		201P	9				10	201P	10.0	REFRIGERATOR
PIER LIGHTING		0.5	201P	11				12	201P	10.0	ICE MACHINE
SPARE			201P	13				14	201P		SPARE
SPARE			201P	15				16	201P		SPARE
SPARE			201P	17				18	201P		SPARE
SPARE			201P	19				20	201P		SPARE
SPARE			201P	21				22	201P		SPARE
DSS-IB		9.6	202P	23				24	1002P	71.9	PANEL A1
	6.6									67.4	
SPARE			300P	27				28	1002P	65.6	PANEL A2
										55.1	
SPARE			1002P	31				32	1002P	70.1	PANEL A3
										48.6	
PANEL BH		60.0	1002P	35				36	1002P	53.6	PANEL A4
	83.0									55.1	
PANEL M		750.0	6002P	39				40	1002P	0.0	PANEL BH
	750.0									0.0	
TOTAL	845.1	658.2								243.2	TOTAL
										284.7	TOTAL

TOTAL CONNECTED AMPS A: 1095.3 B: 1143.9

NOTES:  
 1) EXISTING PANELBOARD IS CUTLER HAMMER CATALOG #P000001444R  
 2) INDICATES NEW LOADS, PROVIDE AS PART OF THIS PROJECT

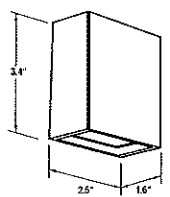
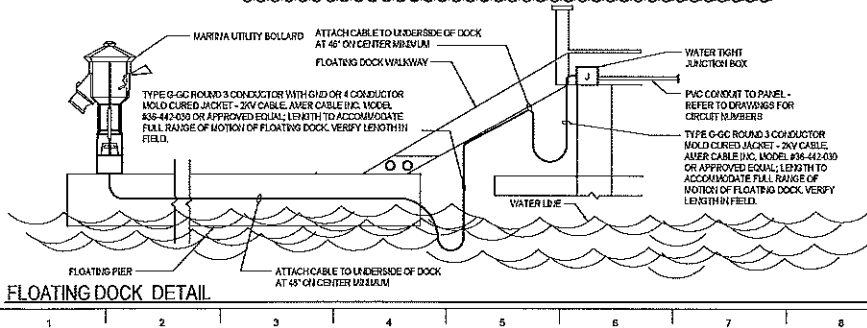
**PANELBOARD M SCHEDULE**

SEE POWER RISER DIAGRAM FOR RATINGS

LOAD SERVED	LOAD (AMPS)		BKR TRIP	CMT	PHASE		CMT	BKR TRIP	LOAD (AMPS)		LOAD SERVED
	A	B			A	B			A	B	
MARINA BOLLARD	50.0		602P	1				2	602P	50.0	MARINA BOLLARD
	50.0							6	602P	50.0	MARINA BOLLARD
MARINA BOLLARD	50.0		602P	5				10	602P	50.0	MARINA BOLLARD
	50.0							14	602P	33.0	MARINA BOLLARD
MARINA BOLLARD	50.0		602P	13				18	602P	33.0	MARINA BOLLARD
	50.0							22	602P	33.0	MARINA BOLLARD
MARINA BOLLARD	50.0		602P	17				26	602P	33.0	MARINA BOLLARD
	50.0							30	602P	33.0	MARINA BOLLARD
MARINA BOLLARD	41.0		602P	33				34	602P	41.0	MARINA BOLLARD
	41.0							38	602P	12.0	PUMP OUT SYSTEM
MARINA BOLLARD	41.0		602P	37				42	201P		SHUNT TRIP POWER
	41.0							46	201P		LEAK DETECTOR
HEAT TRACE	9.0		201P	41				45	201P		FUEL CTRL CONSOLE
HEAT TRACE	9.0		201P	43				47	201P		NEUTRAL FOR CXT 50
SPARE			201P	45				49	201P		FUEL DISPENSER
NEUTRAL FOR CXT 49			201P	47				51	201P		SHUNT TRIP
FUEL DISPENSER			201P	49				53	201P		SPARE
SHUNT TRIP			201P	51							
HOT BOX ENCLOSURE			201P	53							
TOTAL	391.0	302.0								368.0	TOTAL
										368.0	TOTAL

TOTAL CONNECTED AMPS A: 750.0 B: 750.0

NOTES:  
 1) PROVIDE BREAKER FOR THE FUEL DISPENSER SYSTEM BEING PROVIDED BY THE FUELING SYSTEM PROVIDER. COORDINATE ACTUAL CONNECTIONS PRIOR TO COMMENCEMENT WORK, ETC.



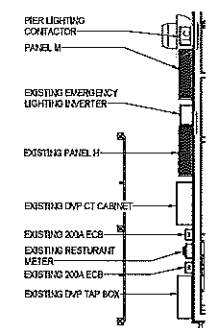
- LUMINAIRE REQUIREMENTS**
- HOUSING AND BACK PLATE SHALL BE DIE CAST ALUMINUM, GASKETED, SEALED, AND UL APPROVED FOR WET LOCATIONS.
  - REFRACTOR SHALL BE ONE PIECE, HIGH IMPACT RESISTANT GLASS.
  - PROVIDE HIGH POWER FACTOR, ELECTRONIC, DRIVER.
  - FINISH COLOR SHALL BE WHITE.

DETAIL BASED ON: SLY LIGHTING, "QUAD 1" SERIES

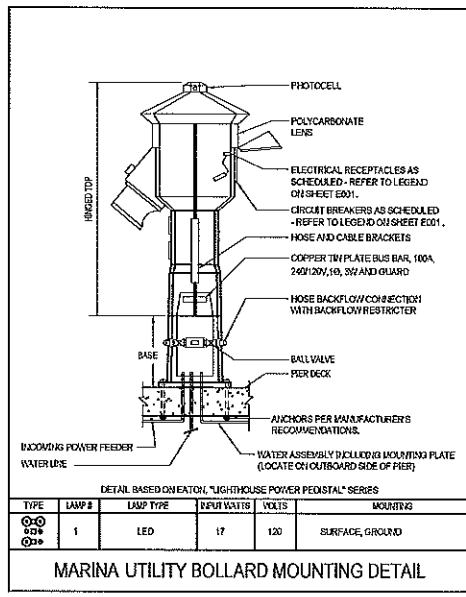
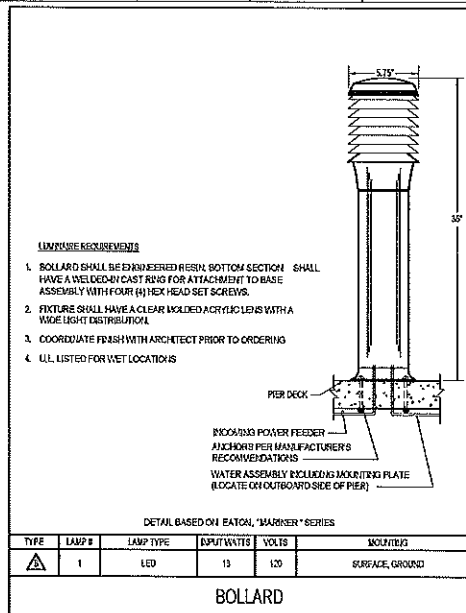
TYPE	LAMP #	LAMP TYPE	OUTPUT WATTS	VOLTS	LOCATION
▲	1	LED	3W 300K	3	120

SURFACE, COORDINATE HEIGHT WITH OWNER PRIOR TO INSTALLATION

**EXTERIOR PIER FIXTURE**



**ENLARGED EXTERIOR EQUIPMENT AREA POWER PLAN - NEW WORK**  
 SCALE: 1/4" = 1'-0"



VIA design architects, pc  
 150 RANDOLPH STREET  
 ROCKFORD, VA 24152  
 757.637.1438 FAX 637.1495  
 www.viadesign.com

CONTRACTOR  
 KEITH H. MERTER  
 1416 N. 2ND ST.  
 ROCKFORD, VA 24152  
 757.637.1438 FAX 637.1495  
 www.viadesign.com

CONTRACTOR  
 LORRY  
 150 RANDOLPH STREET  
 ROCKFORD, VA 24152  
 757.637.1438 FAX 637.1495  
 www.viadesign.com

County of Surry, VA  
 Surry County Marina  
 633 Marina Drive, Surry, VA 22983

PROJECT NUMBER: 017  
 DATE: 08/25/17  
 PROJECT BY: J. B. BRYAN  
 CHECKED BY: J. B. BRYAN  
 SCALE: AS SHOWN  
 REVISIONS:

NO.	DATE	DESCRIPTION
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		
26		
27		
28		
29		
30		
31		
32		
33		
34		
35		
36		
37		
38		
39		
40		
41		
42		
43		
44		
45		
46		
47		
48		
49		
50		
51		
52		
53		
54		
55		
56		
57		
58		
59		
60		
61		
62		
63		
64		
65		
66		
67		
68		
69		
70		
71		
72		
73		
74		
75		
76		
77		
78		
79		
80		

PROJECT NUMBER: 017  
 DATE: 08/25/17  
 PROJECT BY: J. B. BRYAN  
 CHECKED BY: J. B. BRYAN  
 SCALE: AS SHOWN  
 REVISIONS:

PROJECT TITLE: MARINA UTILITY BOLLARD MOUNTING DETAIL

**MD**  
**E600**