Colliers
Engineering
& Design

Bid Proposal & Specifications For

NORTH STREET STORM WATER PUMP STATION ELECTRICAL UPGRADES

BOROUGH OF HIGHLANDS, MONMOUTH COUNTY, NEW JERSEY

September 2021

Carolyn Broullon, Mayor

Borough of Highlands Council
Jo-Anne Olszewski, COUNCIL PRESIDENT
Council Persons
Kevin Martin
Linda Mazzola
Donald Melnyk

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Prepared by:

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New Jersey Professional Engineer
License No. GE39607

Project No. 21001682G
State of N.J. Certificate of Authorization: 24GA27986500

Maser Consulting is now Colliers Engineering & Design

INDEX TO SPECIFICATIONS

Notice to Bidders

Notice is hereby given that sealed proposals will be received by the Municipal Clerk of the Borough of Highlands, Monmouth County, New Jersey for the **"North Street Stormwater Pump Station Electrical Upgrades"** and be opened and read in public at Borough Hall, 42 Shore Drive, Highlands, NJ 07732 **at 11:00 AM prevailing time on Tuesday, October 26, 2021.**

All work on this contract shall be completed within ninety (90) calendar days.

Contract Documents and Drawings for the proposed work, which have been prepared by Theodore Wilkinson, P.E. of the firm of Colliers Engineering & Design, Inc. (DBA Maser Consulting), are available at Colliers Engineering & Design, Inc., 331 Newman Springs Rd STE 203, Red Bank, NJ 07701, and may be inspected and/or purchased by prospective bidders between the hours of 9:00 AM and 4:00 PM. Bidders will be furnished with a copy of the Contract Documents by request upon proper notice and payment of a non-refundable charge of Seventy-Five Dollars ($75.00) payable to Colliers Engineering and Design to defray the cost thereof. To expedite, email Donna Halsted, Administrative Assistant, to obtain Bid Proposal/Plans – donna.halsted@colliersengineering.com.

The project scope includes pile driving, structural steel framing, and installation of a new elevated shelter to house electrical equipment, re-power up the existing pump, install new transducers, new 400-amp electrical service, fencing, and a new removable pump station lid and steps and platform to the Main Service Disconnect box.

Proposals must be made on the standard Proposal forms in the manner designated in the Contract documents, must be enclosed in sealed envelopes bearing the name and address of the Bidder and the name of the project on the outside and be addressed to the Borough Clerk, 42 Shore Drive, Highlands, NJ 07732, and must be accompanied by a Statement of Consent of Surety from a surety company authorized to do business in the State of New Jersey and acceptable to the Borough of Highlands and either a Bid Bond or a Certified Check drawn to the order of Borough of Highlands for not less than ten percent (10%) of the amount bid, except that the check shall not exceed $20,000.00. The successful bidder is hereby notified that a performance bond for the full amount of this project is required.

The award of the Contract for this project will not be made until the necessary funds have been provided by the Borough of Highlands in a lawful manner.

The Borough or the Engineer reserves the right to require a complete experience statement from prospective bidders showing that they have satisfactorily completed work of the nature required before awarding the Contract.

Proposals for this Contract will only be accepted from bidders who have properly qualified in accordance with the requirements of the Contract documents.

The right is also reserved to reject any or all bids or to waive any informalities where such informality is not detrimental to the best interest of the Township. The right is also reserved to increase or decrease the quantities specified in the manner designated in the Specifications.

The successful bidder shall be required to comply with the following:

A. Affirmative Action requirements (P.L. 1975, C.127, N.J.A.C. 17:27, N.J.S.A. 10:5-31 et seq.).

B. The provisions of the New Jersey Prevailing Wage Act (N.J.S.A. 34:11-56.25 et seq.).

C. Anti-Kickback Regulations under Section 2 of the Act of June 13, 1934, known as the Copeland Act.

D. Worker and Community Right-to-Know Act (N.J.S.A. 34:5A-1).

E. New Jersey Business Registration Certificate (P.L. 2004 C.57 & P.L. 2009, c.315).

F. Disclosure of Investment Activities in Iran (P.L. 2012, C.25).

Moreover, the bid must be accompanied by a list of names and addresses of all stockholders owning 10% or more of the stock in accordance with the provisions of the Public Disclosure Law (P.L. 1988, C.33, N.J.S.A. 52:25-24.2).

By order of the Mayor and Borough Council of the Borough of Highlands, Monmouth County, New Jersey.

Michelle Hutchinson
Borough Clerk

PROPOSAL

FORM OF PROPOSAL

BY

_____

(Bidder's Name)

_____

(Address)

TO THE

BOROUGH OF HIGHLANDS

_____

(Owner's Name)

HIGHLANDS BOROUGH, MONMOUTH COUNTY, NEW JERSEY

_____

(City, County & State)

FOR

NORTH STREET STORMWATER PUMP STATION ELECTRICAL UPGRADES

_____

The UNDERSIGNED, as bidder, declares that the only persons or parties interested in this proposal as principals are named herein; that this proposal is in all respects fair and without collusion or fraud; that no officer or employee of the Owner is directly or indirectly interested in this bid or the work of this contract or in any portions of the profits thereof; that he has carefully examined the annexed proposed Forms of Contracts and Instructions to Bidders, the Notice to Contractors, the Special Provisions, and the General Conditions; that he or his representative has made a personal inspection of the site of the proposed work; and that he proposes and agrees that if this proposal is accepted, he will contract with the above-named Owner, in the form of contract hereto annexed, and to provide the necessary machinery, tools, apparatus, and other means of construction, and to furnish all the materials, equipment and labor specified in the contract in the manner and time therein specified, and according to the requirements of the Engineer as therein specified, and according to the requirements of the Engineer as therein set forth, and that he will take in full payment therefore the following prices to wit:

NOTE: Complete and submit the loose, unbound copy of this Proposal Form only.

NORTH STREET STORMWATER PUMP STATION
ELECTRICAL UPGRADES
PROPOSAL

Borough of Highlands
Monmouth County, New Jersey

ITEM NO.	DESCRIPTION	QUANTITY	UNIT PRICE	AMOUNT
1.	Clearing Site	Lump Sum	$_____	$_____
	Write Unit Price Bid _____			
	_____			
2.	Test Timber Pile, Complete	40 LF	$_____	$_____
	Write Unit Price Bid _____			
	_____			
3.	Timber Pilings, Complete	200 LF	$_____	$_____
	Write Unit Price Bid _____			
	_____			
4.	Fiberglass Shelter & Platform, Complete	Lump Sum	$_____	$_____
	Write Unit Price Bid _____			
	_____			
5.	Timber Steps, Complete	Lump Sum	$_____	$_____
	Write Unit Price Bid _____			
	_____			
6.	Miscellaneous Concrete, Platform, Steps, Conc. Pad	5 CY	$_____	$_____
	Write Unit Price Bid _____			
	_____			
7.	Electrical, Complete	Lump Sum	$_____	$_____
	Write Unit Price Bid _____			
	_____			

ITEM NO.	DESCRIPTION	QUANTITY	UNIT PRICE	AMOUNT
8.	¾" Clean Decorative Stone, 3" Thick Write Unit Price Bid _____	35 SY	$_____	$_____
9.	Pump Station Lid, Complete Write Unit Price Bid _____	Lump Sum	$_____	$_____
10.	Picket Fence & Gate, 4ft. High Write Unit Price Bid _____	Lump Sum	$_____	$_____
11.	Restoration, Complete Write Unit Price Bid _____	Lump Sum	$_____	$_____
12.	Allowance Write Unit Price Bid Five Thousand Dollars	Allowance	$5,000.00	$5,000.00

TOTAL AMOUNT **BID PROPOSAL** (ITEMS 1 THROUGH 12):

$_____

WRITE TOTAL AMOUNT **BID PROPOSAL** (ITEMS 1 THROUGH 12):

_____

BASIS OF AWARD:

Award is subject to availability of funds.

Name of Bidder: _____

By Authorized Representative: _____

Signature: _____

Print Name and Title:_____

Date: _____

Address: _____

Phone number: _____

Email: _____

PAYMENT PROCEDURES FOR CONSTRUCTION CONTRACTS

Pursuant to P.L. 1991, Chapter 133 (C.2A:30A-1), payment of construction contracts to prime contractors requires approval by the Borough Council of the Borough of Highlands once submitted and reviewed for compliance and certifications by the responsible department(s). Once approval and certification are obtained by the prime contractor through the Borough, said contractor is entitled to the payment not more than 30 calendar days after the periodic billing date specified in the contract, **except that a contractor will not be paid by the Borough of Highlands within that 30 day period if the Borough of Highlands Council is required to vote approval of each periodic payment, final payment or retainage monies, in which instance, the amount due and approved may be paid during the Borough's Council's subsequent payment cycle.** Billing is deemed approved and certified 20 days after the Borough has received it unless the amount withheld and its reasons for withholding payment.

Any contractor not paid may, after providing seven calendar days' written notice to the Borough, suspend performance of a construction contract without penalty for breach of contract but only: (1) until payment is made, if the contractor is not paid; (2) if the contractor is not provided a written statement of the amount withheld; and (3) the Borough is not engaged in a good faith effort to resolve the reason for withholding. If this contract involved the improvement of structures, any disputes regarding whether a party has failed to make payments pursuant to this section may be submitted by the Borough of Highlands to a process of alternative dispute resolution in a forum selected by the Borough of Highlands, or, in the alternative, the Borough of Highlands may elect to submit to the court for adjudication. Alternative dispute resolution does not apply to disputes concerning bid solicitation or award process or to the formation of contracts or subcontracts.

The rights and remedies provided within this section for contractors shall be in addition to other remedies provided pursuant to any other provision of State law. No provision of this section shall be construed as restricting any State or federal law rights or remedies to an owner who is a resident homeowner or purchaser with respect to real property being improved.

The relevant interest rates that are applicable if the Borough of Highlands is delinquent in payment shall not apply to any transportation projects as defined in section 3 of P.L. 1984, c.73 (C.27:1B-3), if the project receives federal funding and the Borough of Highlands has been notified by the federal government that it will be classified as a high-risk grantee pursuant to 49 C.F.R. 18.13.

BID DOCUMENT SUBMISSION CHECKLIST

Borough of Highlands, Monmouth County, NJ
(Name of Local Contracting Unit)

North Street Stormwater Pump Station Electrical Upgrades — 21001682G
(Name of Construction/Public Works Project) — *(Project or Bid Number)*

A. Failure to submit the following documents is a mandatory cause of the bid to be rejected. (N.J.S.A. 40A:11-23.2)

Required With Submission of Bid (Owner's checkmarks)		Initial Each Item Submitted with Bid (Bidder's initials)
X	A bid guarantee as required by N.J.S.A. 40A:11-21	
X	A certificate from a surety company, pursuant to N.J.S.A. 40A:11-22	
X	A statement of corporate ownership, pursuant to N.J.S.A. 52:25-24.2	
X	A list of subcontractors as required by N.J.S.A. 40A:11-16	
X	Bidder's acknowledgment of receipt of any notice(s) or revisions(s) or addenda to an advertisement, specifications or bid document(s)	
X	Completed Proposal Form	

B. Failure to submit the following documents may be cause for the bid to be rejected. (N.J.S.A. 40A:11-23.1b.)

Required with Submission of Bid (Owner's checkmarks)		Initial Each Item Submitted with Bid (Bidder's initials)
X	Consent of Surety as to a Labor and Material Payment Bond	
	Statement of compliance with N.J.S.A. 45:14C-2(h) (licensed master plumber)	
X	Experience Statement	
X	Public Works Contractor Registration	
X	Disclosure of Investment Activities in Iran as required by N.J.S.A 40A:11-2.1	

Required with Submission of Bid (Owner's checkmarks)		Initial Each Item Submitted with Bid (Bidder's initials)
X	Submission of a Non-Collusion Affidavit	
X	Certification of Bidder showing that Bidder owns, leases or controls necessary equipment	
X	Business Registration Act – Registration Form	
X	Current Contract Obligations Statement	
X	Certification of Non-Debarment for Federal Government Contracts	

C. SIGNATURE: The undersigned hereby acknowledges and has submitted the above listed requirements.

Name of Bidder: _____

By Authorized Representative: _____

Signature: _____

Print Name and Title: _____

Date: _____

BID BOND

KNOW ALL MEN BY THESE PRESENTS, that we _____ hereinafter called the Principal, as Principal, and the _____of _____ a corporation duly organized under the laws of the State of _____ hereinafter called the Surety, are held firmly bound unto _____hereinafter called the Obligee, in the sum of _____ Dollars ($_____), which sum shall not exceed $20,000.00 for the payment of which sum will and truly to be made, the said Principal and the said Surety, bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS the Principal has submitted a bid for _____ _____.

NOW, THEREFORE, if the obligee shall accept the bid of the Principal and the Principal shall enter into a Contract with the Obligee in accordance with the terms of such bid, and give such bond or bonds as may be specified in the bidding or Contract Documents with good and efficient Surety for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof or in event of the failure of the Principal to enter each Contract and give such bond or bonds, if the Principal shall pay to the Obligee the difference not to exceed the penalty hereof between the amount specified in said bid and such larger amount for which the Obligee may in good faith Contract with another party to perform the work covered by said bid, then this obligation shall be null and void, otherwise remain in full force and effect.

In the presence of:

_____ _____ (Seal)
PRINCIPAL

_____

SIGNED AND SEALED this _____ day of

_____ A.D. 20____

_____ (Seal)
PRINCIPAL

_____ _____
WITNESS TITLE

_____(Seal)
SURETY

_____ _____ (Seal)
WITNESS TITLE

CONSENT OF SURETY

In consideration of the premises and of One Dollar (1.00), lawful money of the United States, it is in hand paid by the CONTRACTOR, the receipt whereof is hereby acknowledged, the undersigned surety consents and agrees that if the contract, for which the preceding estimate and proposal is made, be awarded to the person or persons submitting the same as contracted, it will become bound as surety and guarantor for its faithful performance, in an amount equal to one hundred percent (100%) of the contract price, and will execute it as party of the third part thereto when required to do so by the OWNER, and if the said CONTRACTOR shall omit or refuse to execute such contract, if so awarded, it will pay without proof of notice and on demand to the OWNER any increase between the sum to which the said CONTRACTOR would have been entitled upon the completion of the said contract and the sum which the said OWNER may be obligated to pay to another contractor to whom the contract may be afterwards awarded, the amount in such case to be determined by the bids plus the cost, if any, of re-advertising for bids for this work, less the amount of any certified check or bid bond payable and received.

In witness whereof, said surety has caused these presents to be signed and attested by a duly authorized officer and its corporate seal to be hereto affixed this_____ day of_____20_____.

(A corporate acknowledgement and statement of authority to be here attached by the surety company).

_____
Surety Company

By:_____
Surety Company
Attorney-in-Fact

Attest:

_____

(Surety may substitute a similar statement subject to the OWNER'S approval.)

STATEMENT OF OWNERSHIP DISCLOSURE

N.J.S.A. 52:25-24.2 (P.L. 1977, c.33, as amended by P.L. 2016, c.43)

This statement shall be completed, certified to, and included with all bid and proposal submissions. Failure to submit the required information is cause for automatic rejection of the bid or proposal.

Name of Organization: _____

Organization Address: _____

Part I Check the box that represents the type of business organization:

☐ Sole Proprietorship (skip Parts II and III, execute certification in Part IV)

☐ Non-Profit Corporation (skip Parts II and III, execute certification in Part IV)

☐ For-Profit Corporation (any type) ☐ Limited Liability Company (LLC)

☐ Partnership ☐ Limited Partnership ☐ Limited Liability Partnership (LLP)

☐ Other (be specific): _____

Part II

☐ The list below contains the names and addresses of all stockholders in the corporation who own 10 percent or more of its stock, of any class, or of all individual partners in the partnership who own a 10 percent or greater interest therein, or of all members in the limited liability company who own a 10 percent or greater interest therein, as the case may be. (**COMPLETE THE LIST BELOW IN THIS SECTION**)

OR

☐ No one stockholder in the corporation owns 10 percent or more of its stock, of any class, or no individual partner in the partnership owns a 10 percent or greater interest therein, or no member in the limited liability company owns a 10 percent or greater interest therein, as the case may be. (**SKIP TO PART IV**)

(Please attach additional sheets if more space is needed):

Name of Individual or Business Entity	Home Address (for Individuals) or Business Address

Part III DISCLOSURE OF 10% OR GREATER OWNERSHIP IN THE STOCKHOLDERS, PARTNERS OR LLC MEMBERS LISTED IN PART II

If a bidder has a direct or indirect parent entity which is publicly traded, and any person holds a 10 percent or greater beneficial interest in the publicly traded parent entity as of the last annual federal Security and Exchange Commission (SEC) or foreign equivalent filing, ownership disclosure can be met by providing links to the website(s) containing the last annual filing(s) with the federal Securities and Exchange Commission (or foreign equivalent) that contain the name and address of each person holding a 10% or greater beneficial interest in the publicly traded parent entity, along with the relevant page numbers of the filing(s) that contain the information on each such person. **Attach additional sheets if more space is needed**.

Website (URL) containing the last annual SEC (or foreign equivalent) filing	Page #'s

Please list the names and addresses of each stockholder, partner or member owning a 10 percent or greater interest in any corresponding corporation, partnership and/or limited liability company (LLC) listed in Part II **other than for any publicly traded parent entities referenced above**. The disclosure shall be continued until names and addresses of every noncorporate stockholder, and individual partner, and member exceeding the 10 percent ownership criteria established pursuant to N.J.S.A. 52:25-24.2 has been listed. **Attach additional sheets if more space is needed.**

Stockholder/Partner/Member and Corresponding Entity Listed in Part II	Home Address (for Individuals) or Business Address

Part IV CERTIFICATION

I, being duly sworn upon my oath, hereby represent that the foregoing information and any attachments thereto to the best of my knowledge are true and complete. I acknowledge: that I am authorized to execute this certification on behalf of the bidder/proposer; that the Borough of Highlands is relying on the information contained herein and that I am under a continuing obligation from the date of this certification through the completion of any contracts with Borough to notify the Borough in writing of any changes to the information contained herein; that I am aware that it is a criminal offense to make a false statement or misrepresentation in this certification, and if I do so, I am subject to criminal prosecution under the law and that it will constitute a material breach of my agreement(s) with the, permitting the Borough to declare any contract(s) resulting from this certification void and unenforceable.

Full Name (Print):		Title:	
Signature:		Date:	

PROPOSED SUBCONTRACTORS

Bidders shall set forth the names of all proposed subcontractors to whom Bidder will subcontract work:

Proposed Subcontractors	Address
(1) _____	_____
	_____
(2) _____	_____
	_____
(3) _____	_____
	_____
(4) _____	_____
	_____
(5) _____	_____
	_____
(6) _____	_____
	_____
(7) _____	_____
	_____
(8) _____	_____
	_____

ACKNOWLEDGMENT OF RECEIPT OF CHANGES TO BID DOCUMENTS FORM

Borough of Highlands, Monmouth County, NJ
(Name of Local Contracting Unit)

North Street Stormwater Pump Station Electrical Upgrades — 21001682G
(Name of Construction/Public Works Project) — *(Project or Bid Number)*

Pursuant to N.J.S.A. 40A:11-23.1a., the undersigned bidder hereby acknowledges receipt of the following notices, revisions or addenda to the bid advertisement, specifications or bid documents. By indicating date of receipt, the bidder acknowledges the submitted bid takes into account the provisions of the notice, revision or addendum. Note that the local unit's record of notice to bidders shall take precedence and that failure to include provisions of changes in a bid proposal may be subject for rejection of the bid.

Local Unit Reference Number Or Title of Addendum/Revision	How Received (mail, fax, pick-up, etc.)	Date Received

Acknowledgement by Bidder:

Name of Bidder: _____

By Authorized Representative: _____

Signature: _____

Printed Name and Title: _____

Date: _____

Address: _____

Telephone No.: _____

Fax No.: _____

Email Address: _____

EXPERIENCE STATEMENT

The bidder shall furnish with the Proposal a listing of similar type projects on which he has performed work:

Project Name	Owner	Approximate Value	Contact Person

CURRENT CONTRACT OBLIGATIONS STATEMENT

The bidder shall furnish with the Proposal a listing of similar type projects on which he is performing work:

Project Name	Owner	Approximate Value	Contact Person

NON-COLLUSION AFFIDAVIT

STATE OF NEW JERSEY)
) ss:
COUNTY OF)

I,_____ of _____in the County of_____and the State of New Jersey, of full age, being duly sworn according to law on my oath depose and say that:

I am_____ of the firm of _____the bidder making the Proposal for the above named project, and that I executed the said Proposal with full authority so to do; that said bidder has not, directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of free, competitive bidding in connection with the above named project; and that all statements contained in said proposal and in the affidavit are true and correct, and made with full knowledge that the _____relies upon the truth of the statements contained in said Proposal and in the statements contained in this affidavit in awarding the contract for the said project.

Accompanying this Proposal is a Consent of Surety and a Bid Guarantee, in the form of a Bid Bond ( ), a Certified or Cashier's Check ( ), payable to the order of the

_____

in the sum of _____

_____ Dollars ($_____) which the undersigned agrees is to be forfeited as liquidated damages, and not as a penalty, if the Contract is awarded to the undersigned and the undersigned shall fail to execute the Contract for the project or to furnish the Bond required within the stipulated time, otherwise the check will be returned to the undersigned.

The undersigned is an corporation / individual / partnership / limited liability company under the

Laws of the State of _____ having principal

offices at _____

Telephone Number _____

Trade Name of Bidder _____

1. Signed By_____

   Signature_____(s)

   Title_____

2. Signed By_____

   Signature_____(s)

   Title_____

3. Signed By_____

   Signature_____(s)

   Title_____

Signed this _____ day of _____, 20_____

NOTE: If a partnership, all partners must sign. If a corporation, the president and at least one other officer must sign. If a proprietorship, the proprietor must sign. Proposals signed by an agent must be accompanied by a Power-of-Attorney for the Principal or Principals involved. Attach additional signature sheets in the above form, if necessary.

EQUIPMENT CERTIFICATION

INSTRUCTIONS FOR COMPLETING THE EQUIPMENT CERTIFICATION

If the Bidder owns, leases or controls all the necessary equipment required, he shall complete Parts 1 & 3. Should the Bidder not own, lease or control the necessary equipment required, he shall have Parts 2 & 3 completed. This certification must be attached to and submitted with the Proposal.

PART 1

"This is to certify that I, the Bidder signing the attached Proposal, own, lease or control all the necessary equipment required to accomplish the work shown and described on the Contract Drawings and in the Contract Specifications."

_____ _____

Date Signature of Bidder

PART 2

"This is to certify that I, the undersigned, own or control the equipment required and noted below and definitely grant or will grant the Bidder named below the control of said equipment during such time as may be required for that portion of the work described on the Contract Drawings and in the Contract Specifications for which said equipment is necessary."

_____ _____

Date Signature of Bidder
Controller of Equipment

_____ _____

Date Business Address of Above

_____

PART 3

LIST OF EQUIPMENT

_____

_____

_____

_____

(Attach additional sheets as required)

(REVISED 4/10)
EXHIBIT B

MANDATORY EQUAL EMPLOYMENT OPPORTUNITY LANGUAGE
N.J.S.A. 10:5-31 et seq. (P.L. 1975, C. 127)
N.J.A.C. 17:27

CONSTRUCTION CONTRACTS

During the performance of this contract, the contractor agrees as follows:

The contractor or subcontractor, where applicable, will not discriminate against any employee or applicant for employment because of age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation, gender identity or expression, disability, nationality or sex. Except with respect to affectional or sexual orientation and gender identity or expression, the contractor will ensure that equal employment opportunity is afforded to such applicants in recruitment and employment, and that employees are treated during employment, without regard to their age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation, gender identity or expression, disability, nationality or sex. Such equal employment opportunity shall include, but not be limited to the following: employment, up-grading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the Public Agency Compliance Officer setting forth provisions of this nondiscrimination clause.

The contractor or subcontractor, where applicable will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation, gender identity or expression, disability, nationality or sex.

The contractor or subcontractor will send to each labor union, with which it has a collective bargaining agreement, a notice, to be provided by the agency contracting officer, advising the labor union or workers' representative of the contractor's commitments under this act and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

The contractor or subcontractor, where applicable, agrees to comply with any regulations promulgated by the Treasurer, pursuant to N.J.S.A. 10:5-31 et seq., as amended and supplemented from time to time and the Americans with Disabilities Act.

When hiring or scheduling workers in each construction trade, the contractor or subcontractor agrees to make good faith efforts to employ minority and women workers in each construction trade consistent with the targeted employment goal prescribed by N.J.A.C. l7:27-7.2; provided, however, that the Division may, in its discretion, exempt a contractor or subcontractor from compliance with the good faith procedures prescribed by the following provisions, A, B and C, as long as the Division is satisfied that the contractor or subcontractor is employing workers provided by a union which provides evidence, in accordance with standards prescribed by the Division, that its percentage of active "card carrying" members who are minority and women workers is equal to or greater than the targeted employment goal

established in accordance with N.J.A.C. l7:27-7.2. The contractor or subcontractor agrees that a good faith effort shall include compliance with the following procedures:

(A) If the contractor or subcontractor has a referral agreement or arrangement with a union for a construction trade, the contractor or subcontractor shall, within three business days of the contract award, seek assurances from the union that it will cooperate with the contractor or subcontractor as it fulfills its affirmative action obligations under this contract and in accordance with the rules promulgated by the Treasurer pursuant to N.J.S.A. 10:5-31 et. seq., as supplemented and amended from time to time and the Americans with Disabilities Act. If the contractor or subcontractor is unable to obtain said assurances from the construction trade union at least five business days prior to the commencement of construction work, the contractor or subcontractor agrees to afford equal employment opportunities minority and women workers directly, consistent with this chapter. If the contractor's or subcontractor's prior experience with a construction trade union, regardless of whether the union has provided said assurances, indicates a significant possibility that the trade union will not refer sufficient minority and women workers consistent with affording equal employment opportunities as specified in this chapter, the contractor or subcontractor agrees to be prepared to provide such opportunities to minority and women workers directly, consistent with this chapter, by complying with the hiring or scheduling procedures prescribed under (B) below; and the contractor or subcontractor further agrees to take said action immediately if it determines that the union is not referring minority and women workers consistent with the equal employment opportunity goals set forth in this chapter.

(B) If good faith efforts to meet targeted employment goals have not or cannot be met for each construction trade by adhering to the procedures of (A) above, or if the contractor does not have a referral agreement or arrangement with a union for a construction trade, the contractor or subcontractor agrees to take the following actions:

(l) To notify the public agency compliance officer, the Division, and minority and women referral organizations listed by the Division pursuant to N.J.A.C. 17:27-5.3, of its workforce needs, and request referral of minority and women workers;

(2) To notify any minority and women workers who have been listed with it as awaiting available vacancies;

(3) Prior to commencement of work, to request that the local construction trade union refer minority and women workers to fill job openings, provided the contractor or subcontractor has a referral agreement or arrangement with a union for the construction trade;

(4) To leave standing requests for additional referral to minority and women workers with the local construction trade union, provided the contractor or subcontractor has a referral agreement or arrangement with a union for the construction trade, the State Training and Employment Service and other approved referral sources in the area;

(5) If it is necessary to lay off some of the workers in a given trade on the construction site, layoffs shall be conducted in compliance with the equal employment opportunity and non-discrimination standards set forth in this regulation, as well as with applicable Federal and State court decisions;

Exhibit B
(continued)

(6) To adhere to the following procedure when minority and women workers apply or are referred to the contractor or subcontractor:

(i) The contactor or subcontractor shall interview the referred minority or women worker.

(ii) If said individuals have never previously received any document or certification signifying a level of qualification lower than that required in order to perform the work of the construction trade, the contractor or subcontractor shall in good faith determine the qualifications of such individuals. The contractor or subcontractor shall hire or schedule those individuals who satisfy appropriate qualification standards in conformity with the equal employment opportunity and non-discrimination principles set forth in this chapter. However, a contractor or subcontractor shall determine that the individual at least possesses the requisite skills, and experience recognized by a union, apprentice program or a referral agency, provided the referral agency is acceptable to the Division. If necessary, the contractor or subcontractor shall hire or schedule minority and women workers who qualify as trainees pursuant to these rules. All of the requirements, however, are limited by the provisions of (C) below.

(iii) The name of any interested women or minority individual shall be maintained on a waiting list, and shall be considered for employment as described in (i) above, whenever vacancies occur. At the request of the Division, the contractor or subcontractor shall provide evidence of its good faith efforts to employ women and minorities from the list to fill vacancies.

(iv) If, for any reason, said contractor or subcontractor determines that a minority individual or a woman is not qualified or if the individual qualifies as an advanced trainee or apprentice, the contractor or subcontractor shall inform the individual in writing of the reasons for the determination, maintain a copy of the determination in its files, and send a copy to the public agency compliance officer and to the Division.

(7) To keep a complete and accurate record of all requests made for the referral of workers in any trade covered by the contract, on forms made available by the Division and submitted promptly to the Division upon request.

(C) The contractor or subcontractor agrees that nothing contained in (B) above shall preclude the contractor or subcontractor from complying with the union hiring hall or apprenticeship policies in any applicable collective bargaining agreement or union hiring hall arrangement, and, where required by custom or agreement, it shall send journeymen and trainees to the union for referral, or to the apprenticeship program for admission, pursuant to such agreement or arrangement. However, where the practices of a union or apprenticeship program will result in the exclusion of minorities and women or the failure to refer minorities and women consistent with the targeted county employment goal, the contractor or subcontractor shall consider for employment persons referred pursuant to (B) above without regard to such agreement or arrangement; provided further, however, that the contractor or subcontractor shall not be required to employ women and minority advanced trainees and trainees in numbers which result in the employment of advanced trainees and trainees as a percentage of the total workforce for the construction trade, which percentage significantly exceeds the apprentice to journey worker ratio specified in the applicable collective bargaining agreement, or in the absence of a collective bargaining agreement, exceeds the ratio established by practice in the area for said construction trade. Also, the contractor or subcontractor agrees that, in implementing the procedures of (B) above, it shall,

where applicable, employ minority and women workers residing within the geographical jurisdiction of the union.

(D) After notification of award, but prior to signing a construction contract, the contractor shall submit to the public agency compliance officer and the Division an initial project workforce report (Form AA 201) electronically provided to the public agency by the Division, through its website, for distribution to and completion by the contractor, in accordance with N.J.A.C. 17:27-7. The contractor also agrees to submit a copy of the Monthly Project Workforce Report once a month thereafter for the duration of this contract to the Division and to the public agency compliance officer.

The contractor agrees to cooperate with the public agency in the payment of budgeted funds, as is necessary, for on-the-job and/or off-the-job programs for outreach and training of minorities and women.

(E) The contractor and its subcontractors shall furnish such reports or other documents to the Division of Public Contracts Equal Employment Opportunity Compliance as may be requested by the Division from time to time in order to carry out the purposes of these regulations, and public agencies shall furnish such information as may be requested by the Division of Public Contracts Equal Employment Opportunity Compliance for conducting a compliance investigation pursuant to **Subchapter l0 of the Administrative Code (NJAC 17:27)**.

AMERICANS WITH DISABILITIES ACT OF 1990
Equal Opportunity for Individuals with Disability

The contractor and the Borough of Highlands (hereafter the “Borough”) do hereby agree that the provisions of Title 11 of the Americans With Disabilities Act of 1990 (the "Act") *(42U.S.C. S121 01* et seq.*)* which prohibits discrimination on the basis of disability by public entities in all services, programs, and activities provided or made available by public entities, and the rules and regulations promulgated pursuant there unto, are made a part of this contract. In providing any aid, benefit, or service on behalf of the Borough pursuant to this contract, the contractor agrees that the performance shall be in strict compliance with the Act. In the event that the contractor, its agents, servants, employees, or subcontractors violate or are alleged to have violated the Act during the performance of this contract, the contractor shall defend the Borough in any action or administrative proceeding commenced pursuant to this Act. The contractor shall indemnify, protect, and save harmless the Borough, its agents, servants, and employees from and against any and all suits, claims, losses, demands, or damages, of whatever kind or nature arising out of or claimed to arise out of the alleged violation. The contractor shall, at its own expense, appear, defend, and pay any and all charges for legal services and any and all costs and other expenses arising from such action or administrative proceeding or incurred in connection therewith. In any and all complaints brought pursuant to the Borough’s grievance procedure, the contractor agrees to abide by any decision of the Borough which is rendered pursuant to said grievance procedure. If any action or administrative proceeding results in an award of damages against the Borough, or if the Borough incurs any expense to cure a violation of the ADA which has been brought pursuant to its grievance procedure, the contractor shall satisfy and discharge the same at its own expense.

The Borough shall, as soon as practicable after a claim has been made against it, give written notice thereof to the contractor along with full and complete particulars of the claim, If any action or administrative proceeding is brought against the Borough or any of its agents, servants, and employees, the *Borough shall* expeditiously forward or have forwarded to the contractor every demand, complaint, notice, summons, pleading, or other process received by the Borough or its representatives.

It is expressly agreed and understood that any approval by the Borough of the services provided by the contractor pursuant to this contract will not relieve the contractor of the obligation to comply with the Act and to defend, indemnify, protect, and save harmless the Borough pursuant to this paragraph.

It is further agreed and understood that the Borough assumes no obligation to indemnify or save harmless the contractor, its agents, servants, employees and subcontractors for any claim which may arise out of their performance of this Agreement. Furthermore, the contractor expressly understands and agrees that the provisions of this indemnification clause shall in no way limit the contractor’s obligations assumed in this Agreement, nor shall they be construed to relieve the contractor from any liability, nor preclude the Borough from taking any other actions available to it under any other provisions of the Agreement or otherwise at law.

DISCLOSURE OF INVESTMENT ACTIVITIES IN IRAN

NAME OF CONTRACTOR/BIDDER: _____

PART 1: CERTIFICATION
CONTRACTORS/BIDDERS MUST COMPLETE PART 1 BY CHECKING EITHER BOX.

Pursuant to Public Law 2012, c. 25, any person or entity that submits a bid or proposal or otherwise proposes to enter into or renew a contract must complete the certification below to attest, under penalty of perjury, that neither the person or entity, nor any of its parents, subsidiaries, or affiliates, is identified on the Department of Treasury's Chapter 25 list as a person or entity engaging in investment activities in Iran. The Chapter 25 list is included in this certification and can also be found on the State of New Jersey, Department of Treasury, Division of Purchase and Property website at http://www.state.nj.us/treasury/purchase/pdf/Chapter25List.pdf. Contractors/Bidders **must** review this list prior to completing the below certification. If the Borough finds a person or entity to be in violation of law, it shall take action as may be appropriate and provided by law, rule or contract, including but not limited to, imposing sanctions, seeking compliance, recovering damages, declaring the party in default and seeking debarment or suspension of the party.

PLEASE CHECK THE APPROPRIATE BOX:

☐ **I certify, pursuant to Public Law 2012, c. 25, that neither the contractor/bidder listed above nor any of the contractor's/bidder's parents, subsidiaries, or affiliates is listed** on the N.J. Department of the Treasury's list of entities determined to be engaged in prohibited activities in Iran pursuant to P.L. 2012, c. 25 ("Chapter 25 List"). I further certify that I am the person listed above, or I am an officer or representative of the entity listed above and I am authorized to make this certification on its behalf. **I will skip Part 2 and sign and complete the Certification below.**

OR

☐ **I am unable to certify as above because the contractor/bidder and/or one or more of its parents, subsidiaries, or affiliates is listed on the Department's Chapter 25 list. I will provide a detailed, accurate and precise description of the activities in Part 2 below and sign and complete the Certification below.**

PART 2: PLEASE PROVIDE FURTHER INFORMATION RELATED TO INVESTMENT ACTIVITIES IN IRAN

You must provide a detailed, accurate and precise description of the activities of the bidding person/entity, or one of its parents, subsidiaries or affiliates, engaging in the investment activities in Iran outlined above by completing the requested information below. Please provide thorough answers to each question. If you need to make additional entries, provide the requested information on a separate sheet.

Name _____Relationship to Contractor/Bidder _____

Description of Activities _____

_____

Duration of Engagement _____ Anticipated Cessation Date _____

Contractor/Bidder Contact Name _____ Contact Phone Number _____

Certification: I, being duly sworn upon my oath, hereby represent and state that the foregoing information and any attachments thereto to the best of my knowledge are true and complete. I attest that I am authorized to execute this certification on behalf of the above referenced person or entity. I acknowledge that the Borough of Highlands is relying on the information contained herein and thereby acknowledge that I am under a continuing obligation from the date of this certification through the completion of any contracts with the Borough to notify the Borough in writing of any changes to the answers of information contained herein. I acknowledge that I am aware that it is a criminal offense to make a false statement or misrepresentation in this certification, and if I do

so, I recognize that I am subject to criminal prosecution under the law and that it will also constitute a material breach of my agreement(s) with the Borough of Highlands and that the Borough at its option may declare any contract(s) resulting from this certification void and unenforceable.

FULL NAME (print): _____

SIGNATURE: _____

TITLE: _____ DATE _____

State of New Jersey

PHILIP D. MURPHY
Governor

SHEILA Y. OLIVER
Lt. Governor

DEPARTMENT OF THE TREASURY
DIVISION OF PURCHASE AND PROPERTY
OFFICE OF THE DIRECTOR
33 WEST STATE STREET
P. O. BOX 039
TRENTON, NEW JERSEY 08625-0039
https://www.njstart.gov
Telephone (609) 292-4886 / Facsimile (609) 984-2575

ELIZABETH MAHER MUOIO
State Treasurer

MAURICE A. GRIFFIN
Acting Director

The following list represents entities determined, based on credible information available to the public, to be engaged in prohibited activities in Iran pursuant to P.L. 2012, c. 25 ("Chapter 25"):

1. AK Makina Ltd.
2. Amona
3. Bank Markazi Iran (Central Bank of Iran)
4. Bank Mellat
5. Bank Melli Iran
6. Bank Saderat PLC
7. Bank Sepah
8. Bank Tejarat
9. China International United Petroleum & Chemicals Co., Ltd. (Unipec)
10. China National Offshore Oil Corporation (CNOOC)
11. China National Petroleum Corporation (CNPC)
12. China National United Oil Corporation (ChinaOil)
13. China Oilfield Services Limited
14. China Petroleum & Chemical Corporation (Sinopec)
15. China Precision Machinery Import-Export Corp. (CPMIEC)
16. Indian Oil Corporation
17. Kingdream PLC
18. Naftiran Intertrade Company (NICO)
19. National Iranian Tanker Company (NITC)
20. Oil and Natural Gas Corporation (ONGC)
21. Oil India Limited
22. Persia International Bank
23. Petroleos de Venezuela (PDVSA Petróleo, SA)
24. PetroChina Company, Ltd.
25. Sameh Afzar Tajak Co. (SATCO)
26. Shandong Fin Cnc Machine Company, Ltd.
27. Sinohydro Co., Ltd.
28. SK Energy Co. Ltd.
29. SKS Ventures
30. Som Petrol AS
31. Zhuhai Zhenrong Company

List Date: January 4, 2021

NEW JERSEY ANTI-DISCRIMINATION PROVISIONS
N.J.S.A. 10:2-1 ET SEQ.

Pursuant to N.J.S.A. 10:2-1, if awarded a contract, the contractor agrees that:

a. In the hiring of persons for the performance of work under this contract or any subcontract hereunder, or for the procurement, manufacture, assembling or furnishing of any such materials, equipment, supplies or services to be acquired under this contract, no contractor, nor any person acting on behalf of such contractor or subcontractor, shall, by reason of race, creed, color, national origin, ancestry, marital status, gender identity or expression, affectional or sexual orientation or sex, discriminate against any person who is qualified and available to perform the work to which the employment relates;

b. No contractor, subcontractor, nor any person on his behalf shall, in any manner, discriminate against or intimidate any employee engaged in the performance of work under this contract or any subcontract hereunder, or engaged in the procurement, manufacture, assembling or furnishing of any such materials, equipment, supplies or services to be acquired under such contract, on account of race, creed, color, national origin, ancestry, marital status, gender identity or expression, affectional or sexual orientation or sex;

c. There may be deducted from the amount payable to the contractor by the contracting public agency, under this contract, a penalty of $50.00 for each person for each calendar day during which such person is discriminated against or intimidated in violation of the provisions of the contract; and

d. This contract may be canceled or terminated by the contracting public agency, and all money due or to become due hereunder may be forfeited, for any violation of this section of the contract occurring after notice to the contractor from the contracting public agency of any prior violation of this section of the contract.

PROVISIONS CONCERNING CHANGED CONDITIONS IN CONSTRUCTION CONTRACTS
(N.J.S.A. 40A:11-16.7)

(1) If the contractor encounters differing site conditions during the progress of the work of the contract, the contractor shall promptly notify the contracting unit in writing of the specific differing site conditions encountered before the site is further disturbed and before any additional work is performed in the impacted area.

(2) Upon receipt of a differing site conditions notice in accordance with paragraph (1) of this subsection, or upon the contracting unit otherwise learning of differing site conditions, the contracting unit shall promptly undertake an investigation to determine whether differing site conditions are present.

(3) If the contracting unit determines different site conditions that may result in additional costs or delays exist, the contracting unit shall provide prompt written notice to the contractor containing directions on how to proceed.

(4) (a) The contracting unit shall make a fair and equitable adjustment to the contract price and contract completion date for increased costs and delays resulting from the agreed upon differing site conditions encountered by the contractor.

(b) If both parties agree that the contracting unit's investigation and directions decrease the contractor's costs or time of performance, the contracting unit shall be entitled to a fair and equitable downward adjustment of the contract price or time of performance.

(c) If the contracting unit determines that there are no differing site conditions present that would result in additional costs or delays, the contracting unit shall so advise the contractor, in writing, and the contractor shall resume performance of the contract, and shall be entitled to pursue a differing site conditions claim against the contracting unit for additional compensation or time attributable to the alleged differing site conditions.

(5) Execution of the contract by the contractor shall constitute a representation that the contractor has visited the site and has become generally familiar with the local conditions under which the work is to be performed.

(6) As used in this subsection, "differing site conditions" mean physical conditions at the contract work site that are subsurface or otherwise concealed and which differ materially from those indicated in the contract documents or are of such an unusual nature that the conditions differ materially from those ordinarily encountered and generally recognized as inherent in the work of the character provided for in the contract.

b. A contract subject to this section shall include the following suspension of work provisions:

(1) The contracting unit shall provide written notice to the contractor in advance of any suspension of work lasting more than 10 calendar days of the performance of all or any portion of the work of the contract.

(2) If the performance of all or any portion of the work of the contract is suspended by the contracting unit for more than 10 calendar days due to no fault of the contractor or as a consequence of an occurrence beyond the contracting unit's control, the contractor shall be entitled to compensation for any resultant delay to the project completion or additional contractor expenses, and to an extension of time, provided that, to the extent feasible, the contractor, within 10 calendar days following the conclusion of the suspension, notifies the contracting unit, in writing, of the nature and extent of the suspension of work. The notice shall include available supporting information, which information may thereafter be supplemented by the contractor as needed and as may be reasonably requested by the contracting unit. Whenever a work suspension exceeds 60 days, upon seven days' written notice, either party shall have the option to terminate the contract for cause and to be fairly and equitably compensated therefor.

(3) Upon receipt of the contractor's suspension of work notice in accordance with paragraph (2) of this subsection, the contracting unit shall promptly evaluate the contractor's notice and promptly advise the contractor of its determination on how to proceed in writing.

(4) (a) If the contracting unit determines that the contractor is entitled to additional compensation or time, the contracting unit shall make a fair and equitable upward adjustment to the contract price and contract completion date.

(b) If the contracting unit determines that the contractor is not entitled to additional compensation or time, the contractor shall proceed with the performance of the contract work and shall be entitled to pursue a suspension of work claim against the contracting unit for additional compensation or time attributable to the suspension.

(5) Failure of the contractor to provide timely notice of a suspension of work shall result in a waiver of a claim if the contracting unit can prove by clear and convincing evidence that the lack of notice or delayed notice by the contractor actually prejudiced the contracting unit's ability to adequately investigate and defend against the claim.

c. A contract subject to this section shall include the following change in character of work provisions:

(1) If the contractor believes that a change directive by the contracting unit results in a material change to the contract work, the contractor shall so notify the contracting unit in writing. The contractor shall continue to perform all work on the project that is not the subject of the notice.

(2) Upon receipt of the contractor's change in character notice in accordance with paragraph (1) of this subsection, the contracting unit shall promptly evaluate the contractor's notice and promptly advise the contractor of its determination on how to proceed in writing.

(3) (a) If the contracting unit determines that a change to the contractor's work caused or directed by the contracting unit materially changes the character of any aspect of the contract work, the contracting unit shall make a fair and equitable upward adjustment to the contract price and contract completion date. The basis for any such price adjustment shall be the difference between the cost of performance of the work as planned at the time of contracting and the actual cost of such work as a result of its change in character, or as otherwise mutually agreed upon by the contractor and the contracting unit prior to the contractor performing the subject work.

(b) If the contracting unit determines that the contractor is not entitled to additional compensation or time, the contractor shall continue the performance of all contract work and shall be entitled to pursue a claim against the contracting unit for additional compensation or time attributable to the alleged material change.

(4) As used in this subsection, "material change" means a character change which increases or decreases the contractor's cost of performing the work, increases or decreases the amount of time by which the contractor completes the work in relation to the contractually required completion date, or both.

d. A contract subject to this section shall include the following change in quantity provisions:

(1) The contracting unit may increase or decrease the quantity of work to be performed by the contractor.

(2) (a) If the quantity of a pay item is cumulatively increased or decreased by 20 percent or less from the bid proposal quantity, the quantity change shall be considered a minor change in quantity.

(b) If the quantity of a pay item is increased or decreased by more than 20 percent from the bid proposal quantity, the quantity change shall be considered a major change in quantity.

(3) For any minor change in quantity, the contracting unit shall make payment for the quantity of the pay item performed at the bid price for the pay item.

(4) (a) For a major increase in quantity, the contracting unit or contractor may request to renegotiate the price for the quantity in excess of 120 percent of the bid proposal quantity. If a mutual agreement cannot be reached on a negotiated price for a major quantity increase, the contracting unit shall pay the actual costs plus an additional 10 percent for overhead and an additional 10 percent for profit, unless otherwise specified in the original bid.

(b) For a major decrease in quantity, the contracting unit or contractor may request to renegotiate the price for the quantity of work performed. If a mutual agreement cannot be reached on a negotiated price for a major quantity decrease, the contracting unit shall pay the actual costs plus an additional 10 percent for overhead and an additional 10 percent for profit, unless otherwise specified in the original bid; provided, however, that the contracting unit shall not make a payment in an amount that exceeds 80 percent of the value of the bid price multiplied by the bid proposal quantity.

(5) As used in this subsection, the term "bid proposal quantity" means the quantity indicated in the bid proposal less the quantities designated in the project plans as "if and where directed.

CERTIFICATION OF NON-DEBARMENT
FOR FEDERAL GOVERNMENT CONTRACTS
N.J.S.A. 52:32-44.1 (P.L. 2019, c.406)

This certification shall be completed, certified to, and submitted to the contracting unit prior to contract award, except for emergency contracts where submission is required prior to payment.

PART I: VENDOR INFORMATION	
Individual or Organization Name	
Address of Individual or Organization	
DUNS Code (if applicable)	
CAGE Code (if applicable)	
CHECK THE BOX THAT REPRESENTS THE TYPE OF BUSINESS ORGANIZATION:	

☐Sole Proprietorship (skip Parts III and IV) ☐Non-Profit Corporation (skip Parts III and IV)

☐For-Profit Corporation (any type) ☐Limited Liability Company (LLC) ☐Partnership

☐Limited Partnership ☐Limited Liability Partnership (LLP)

☐Other (be specific): _____

PART II – CERTIFICATION OF NON-DEBARMENT: INDIVIDUAL OR ORGANIZATION			
I hereby certify that the **individual or organization listed above in Part I** is not debarred by the federal government from contracting with a federal agency. I further acknowledge: that I am authorized to execute this certification on behalf of the above-named organization; that the Borough of Highlands is relying on the information contained herein and that I am under a continuing obligation from the date of this certification through the date of contract award by the Borough to notify the Borough in writing of any changes to the information contained herein; that I am aware that it is a criminal offense to make a false statement or misrepresentation in this certification, and if I do so, I am subject to criminal prosecution under the law and that it will constitute a material breach of my agreement(s) with the Borough, permitting the Borough to declare any contract(s) resulting from this certification void and unenforceable.			
Full Name (Print):		Title:	
Signature:		Date:	

PART III – CERTIFICATION OF NON-DEBARMENT: INDIVIDUAL OR ENTITY OWNING GREATER THAN 50 PERCENT OF ORGANIZATION	
SECTION A (CHECK THE BOX THAT APPLIES)	
☐	Below is the name and address of the stockholder in the corporation who owns more than 50 percent of its voting stock, or of the partner in the partnership who owns more than 50 percent interest therein, or of the member of the limited liability company owning more than 50 percent interest therein, as the case may be.
Name of Individual or Organization	
Home Address (for Individual) or Business Address	
OR	
☐	No one stockholder in the corporation owns more than 50 percent of its voting stock, or no partner in the partnership owns more than 50 percent interest therein, or no member in the limited liability company owns more than 50 percent interest therein, as the case may be.
SECTION B (SKIP IF NO BUSINESS ENTITY IS LISTED IN SECTION A ABOVE)	
☐	Below is the name and address of the stockholder in the corporation who owns more than 50 percent of the voting stock of the organization's parent entity, or of the partner in the partnership who owns more than 50 percent interest in the organization's parent entity, or of the member of the limited liability company owning more than 50 percent interest in organization's parent entity, as the case may be.
Stockholder/Partner/Member Owning Greater Than 50 Percent of Parent Entity	
Home Address (for Individual) or Business Address	
OR	
☐	No one stockholder in the parent entity corporation owns more than 50 percent of its voting stock, no partner in the parent entity partnership owns more than 50 percent interest therein, or no member in the parent entity limited liability company owns more than 50 percent interest therein, as the case may be.

SECTION C – PART III CERTIFICATION			
I hereby certify that no individual or organization that is debarred by the federal government from contracting with a federal agency owns greater than 50 percent of the **Organization listed above in Part I** or, if applicable, owns greater than 50 percent of a parent entity of **<name of organization>**. I further acknowledge: that I am authorized to execute this certification on behalf of the above-named organization; that the Borough of Highlands is relying on the information contained herein, and, that I am under a continuing obligation, from the date of this certification through the date of contract award, to notify the Borough in writing of any changes to the information contained herein; that I am aware that it is a criminal offense to make a false statement or misrepresentation in this certification, and if I do so, I am subject to criminal prosecution under the law and that it will constitute a material breach of my agreement(s) with the Borough, permitting the Borough to declare any contract(s) resulting from this certification void and unenforceable.			
Full Name (Print):		Title:	
Signature:		Date:	

PART IV – CERTIFICATION OF NON-DEBARMENT: CONTRACTOR – CONTROLLED ENTITIES		
SECTION A		
☐	Below is the name and address of the corporation(s) in which the **Organization listed in Part I** owns more than 50 percent of voting stock, or of the partnership(s) in which the **Organization listed in Part I** owns more than 50 percent interest therein, or of the limited liability company or companies in which the **Organization listed above in Part I** owns more than 50 percent interest therein, as the case may be.	
Name of Business Entity		**Business Address**
Add additional sheets if necessary		
OR		
☐	The **Organization listed above in Part I** does not own greater than 50 percent of the voting stock in any corporation and does not own greater than 50 percent interest in any partnership or any limited liability company.	

SECTION B (SKIP IF NO BUSINESS ENTITIES ARE LISTED IN SECTION A OF PART IV)	
☐	Below are the names and addresses of any entities in which an entity listed in Part III A owns greater than 50 percent of the voting stock (corporation) or owns greater than 50 percent interest (partnership or limited liability company).

Name of Business Entity Controlled by Entity Listed in Section A of Part IV	Business Address

Add additional Sheets if necessary

OR

☐	No entity listed in Part III A owns greater than 50 percent of the voting stock in any corporation or owns greater than 50 percent interest in any partnership or limited liability company.

SECTION C – PART IV CERTIFICATION

I hereby certify that the **Organization listed above in Part I** does not own greater than 50 percent of any entity that that is debarred by the federal government from contracting with a federal agency and, if applicable, does not own greater than 50 percent of any entity that in turns owns greater than 50 percent of any entity debarred by the federal government from contracting with a federal agency. I further acknowledge: that I am authorized to execute this certification on behalf of the above-named organization; that the Borough of Highlands is relying on the information contained herein and that I am under a continuing obligation from the date of this certification through the date of contract award by the Borough to notify the Borough in writing of any changes to the information contained herein; that I am aware that it is a criminal offense to make a false statement or misrepresentation in this certification, and if I do so, I am subject to criminal prosecution under the law and that it will constitute a material breach of my agreement(s) with the Borough, permitting the Borough to declare any contract(s) resulting from this certification void and unenforceable.

Full Name (Print):		Title:	
Signature:		Date:	

INSTRUCTIONS TO BIDDERS

(SECTION IB)

INSTRUCTIONS TO BIDDERS

IB.1 RECEIPT AND OPENING OF PROPOSALS

IB.1.1 Owner and Project

The Mayor and Council of the Borough of Highlands, New Jersey (hereinafter called the "Owner") invite proposals for **"NORTH STREET STORM WATER PUMP STATION ELECTRICAL UPGRADES".**

IB.1.2 Time and Place of Opening of Proposals

Proposals will be received by the Owner at the time and place specified in the Notice to Bidders, publicly opened and read aloud.

IB.1.3 Withdrawing Proposals

Proposals forwarded to the Owner before the time of opening of Proposals may be withdrawn upon written application of the bidder who shall be required to produce evidence showing that he is or represents the principal or principals involved in the Proposal. Proposals may not be withdrawn within twenty-four (24) hours of the stipulated time of opening of bids.

IB.2 QUALIFICATIONS OF BIDDERS

IB.2.1 Experience and Capital Required

Bidders must be experienced in the kind of work required to be performed, have the equipment required and/or have the means to secure it, and have sufficient capital to properly execute the work within the time allowed.

IB.2.2 Proof of Qualifications

Each proposal shall contain adequate proof of the qualifications of the bidder to perform in a satisfactory manner all work covered by the Contract Documents within the time specified in the Contract. This proof shall be fully recorded in the form of Bid or Proposal on pages left blank for that purpose.

These records shall show, among other things:

a. That the bidder is a competent organization which performed work similar in amount, value, cost, character and proportions.

b. That he has available for immediate use on the work, the necessary plant and equipment.

c. The names of all officers of the bidder corporation.

d. The name of the executive who will give personal attention to the work whenever so desired by the Engineer and Owner.

The Owner, at its discretion, may require such guarantees as it may deem necessary to protect its interests, and their proposals may be required by the Owner as a condition precedent to receipt of the same as formal and acceptable.

In addition to the statements herein required, any bidder, before the award of the Contract, may be otherwise required to establish that he has the necessary facilities, plant, experience, and financial resources to perform the work in a satisfactory manner, and within the time stipulated, and that he has had experience in performing work of the same or similar nature.

IB.3 TIME FOR COMPLETION OF WORK

The Contractor shall begin work on or before the date indicated in the Notice to Proceed unless otherwise instructed by the Owner and shall continue regularly and uninterruptedly at a rate to insure completion of all work within **ninety (90) calendar** days. This allows 45-days for delivery of product and the shelter.

The Contractor shall, however, not begin work until:

a. The Contract has been fully executed and the required bonds and insurance certificates have been provided and approved by the Owner;

b. The Contractor has provided the Engineer with the minimum of seventy-two (72) hours notice concerning the time and place he intends to commence work; and

c. The Contractor has received permission from the Engineer to commence initial work on the project.

IB.4 LIQUIDATED DAMAGES

IB.4.1 Damages for Cause

The Contractor shall be liable to the Owner for all expenses, losses, damages, as determined by the Engineer, incurred in consequence of any defect, omission or mistake of the Contractor, his subcontractors, agents or employees, or for the making good thereof.

IB.4.2 Costs of Engineering and Inspection

There will be deducted from any payments due the Contractor and retained by the Owner an amount to defray the cost of wages and overhead paid by the Owner to any Resident Engineer, Observer and Observers employed on the work for any time in excess of the completion time stipulated, in excess of eight (8) hours per day or on Saturdays, Sundays, or legal holidays. This amount shall be determined at the rate of One Hundred Twenty Dollars ($120.00) per manhour for each Observer or Resident Project Representative.

IB.4.3 Damages for Non-Completion

If the Contractor is permitted to finish the work after the specified period of completion, the Owner shall have full authority to and may deduct and retain from any payments due the Contractor the sum of Two Hundred Dollars ($200.00) for each calendar day thereafter that the contract remains uncompleted, as a liquidated damage, and not as a penalty, to defray reasonable loss to the Owner due to failure to complete the work in the stipulated time.

IB.5 ADDENDA AND INTERPRETATIONS (PREBID)

No interpretations of the meaning of the plans, specifications, or other pre-bid documents will be made to any bidder orally.

Every request for such interpretations should be in writing addressed to the Engineer at the address given in the Notice to Bidders (Advertisement) and to be given consideration must be received at least ten (10) working days prior to the date fixed for the opening of bids. Any and all such interpretations and any supplemental instructions will be in the form of written addenda to the specifications which, if issued, will be mailed by certified mail with return receipt requested to all prospective bidders (at the respective address furnished for such purposes), not later than seven (7) working days prior to the date fixed for the opening of bids. The issue of interpretation shall not relieve such bidder from any obligation under his bid as submitted. All addenda so issued shall become part of the Contract Documents.

IB.6 PREPARATION OF PROPOSALS

IB.6.1 Basis of Contract Award

Bids will be received under these specifications for the completion of the whole work. The correct total lump sum bid for the total of Base Bid and Add Alternates added in order up to the limit of available funds by formal and responsible bidder(s) will govern in the awarding of the Contract. The Contractor must give separate prices per unit measure for each of the several classes of work to be performed as given in the Estimate of Quantities. The sum of the estimated quantities multiplied by the prices per unit of measure should equal the lump sum bid for the entire work. If not, then the bid can be deemed informal.

IB.6.2 Incomplete or Informal Proposals

No bids will be considered in which all of the items given in the Estimate of Quantities are not filled out. Bidders are cautioned not to attach any conditions, limitations or provisions to the Proposal as such conditions, limitations or provisions will render their bid informal and cause its rejection.

IB.6.3 Completion and Submission of Proposals

Proposals must be typed or written in ink on the blank form provided. Prices must be given both in writing and in numerical values. In the case of a difference, however, the bid shall be deemed informal.

Proposals which are incomplete, conditional or obscure, or which contain additions not called for, erasures, alterations, or irregularities of any kind, may be rejected as informal. If any information required herein is not provided, the proposal shall be deemed irregular and for which cause may be rejected as informal and not considered.

Bids must be enclosed in a sealed envelope, addressed to the Owner, bearing on the outside the name and address of the bidder and must be delivered at the place and time required or mailed so as to be received prior to the opening time set in the advertisement. Bids received after the hour herein named or in unsealed envelopes or without the bidder's name on the outside thereof will not be considered.

The Owner may consider informal any bids not prepared and submitted in accordance with the provisions hereof and may waive any informalities in or reject any and all bids.

IB.6.4 Materials to be Bid in Place

Unless otherwise specified, the price for each of the items in the Proposal shall be for the material in place and/or when applicable materials/equipment delivered to the Owner. Any and all work necessary to construct, erect or place such material in the work shall be estimated and included in the cost of each item.

IB.6.5 Estimated Quantities

It has been the endeavor to estimate these approximate amounts in each class to cover the requirements; however, it is usually expected that the amount finally paid for will be different than those submitted for bidding. In case either a greater or lesser amount of the various classes given in the estimated amounts for bidding is required to finally complete the work, the Contractor agrees to make no claim for the variation, but will accept final payment on the actual amount of work performed at his unit price bid.

IB.7 PROPOSAL SECURITY

IB.7.1 Security Required

Each proposal must be accompanied by a bid guarantee in accordance with Chapter 189 of the Laws of 1974. Said guarantee may, at the bidder's option, be in the form of a cashier's check or a certified check or a bid bond from a surety company authorized to do business in the State of New Jersey and acceptable to the Owner in the amount of at least ten percent (10%) of the amount of the bid, but not in excess of $20,000.00.

IB.7.2 Return of Proposal Security

Such Proposal Security will be returned to all except the three (3) lowest formal bidders within ten (10) working days after the opening of bids; all bid security, except the security of the three apparent lowest responsible bidders, shall be returned, unless otherwise requested by the bidder, within ten (10) after the opening of the bids, Sundays and holidays excepted, and the bids of such bidders shall be considered as withdrawn. Within three (3) days, Sundays and holidays excepted, after the awarding and signing of the contract and the approval of the contractor’s performance bond, the bid security of the remaining unsuccessful bidders shall be returned to them. The Proposal Security of the Bidder to whom the Contract is awarded shall be retained until the Contract is executed and any required performance bond or other security is submitted. If bid proposals are rejected, the Proposal Securities of all bidders will be returned within ten (10) days thereafter.

IB.7.3 Time for Award of Contract

The Contract shall be awarded or all bids therefore rejected within sixty (60) days after the opening of bids except where the invitation to bid states that the execution of the contract shall be subject to prior approval or disapproval by a Federal or State agency or department, in which event the contract shall be awarded or all bids therefore rejected within fifteen (15) days after the approval or disapproval by such Federal or State agency or department.

IB.8 CONSENT OF SURETY

In addition to the Proposal Security, each proposal must be accompanied by a statement, similar in form to that annexed to the Proposal, of a surety company authorized to do business in the State of New Jersey and acceptable to the Owner, agreeing, in the event that the bidder is awarded the Contract, to furnish a performance bond, in the form annexed hereto, of a face value of one hundred percent (100%) of the amount of the Proposal.

IB.9 PERFORMANCE SECURITY

IB.9.1 Security Required

The Contractor, as part of the performance of this Contract, shall furnish and deliver to the Owner, a bond of indemnity for one hundred percent (100%) of the full amount of the Contract Price, for the faithful performance by the Contractor of all the covenants and agreements on the part of the Contractor contained in this Contract, including the safeguarding of the Owner against infringements of any and all patents and the guaranteeing of the materials and workmanship and for the protection of all persons furnishing material and labor for the construction of this Contract to the Contractor or the subcontractor. Said Contract Bond must be a surety bond satisfactory to the Owner, shall be substantially in the form included in the Contract Documents, and must stipulate that any change, extension of time, alteration or addition to the terms of the Contract or to the work to be performed thereunder or in the specifications accompanying same shall not in any way affect the surety's obligation for the bond and must further provide for a waiver of notice of same.

Said bond shall comply with all statutes of the State of New Jersey and all revisions thereto and meet all the requirements, of said statutes.

IB.9.2 Release of Performance Security

The surety bond or bonds provided shall not be released until final acceptance of the whole work and then only if all liens or claims have been satisfied and any maintenance or guarantee bonds required have been executed and approved by the Owner.

IB.9.3 Form of Performance Bond

The Owner shall require the Contractor and his surety to execute a performance bond of the following form:

PERFORMANCE BOND

KNOW ALL PERSONS BY THESE PRESENTS, that we the undersigned

_____
(Name of Contractor)

_____
(Address of Contractor)

as principal and _____
as surety, a corporation organized and existing under the laws of the State of _____ and duly authorized to do business in the State of New Jersey, are held and firmly bound unto _____
_____
_____
County of _____ State of New Jersey, in the penal sum of _____ Dollars, for the payment of which will and truly to be made we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors and assigns.

Signed this _____ day of _____,
Nineteen Hundred and _____AD.

The condition of the above obligation is such that whereas the named principal did on the _____ day of _____, 20_____ enter into a contract with _____
_____ County of _____, State of _____ which said Contract is made a part of this, the bond, the same as though set forth herein.

Now if the said principal shall well and faithfully do and perform the things agreed by (him) (them) (it) to be done and performed according to the terms of said Contract, or any changes or modifications therein made as therein provided and shall pay lawful claims of subcontractors, materialmen, laborers, persons, firms or corporations, for labor performed, or materials, provisions, provender or other supplies or teams, fuel oils, implements or machinery furnished, used or consumed in the carrying forward, performing or completing of said Contract; we agreeing and assenting that this undertaking shall be for the benefit of any subcontractor, materialman, laborer, person, firm or corporation having a just claim as well as for the obligee herein; and shall indemnify and save harmless the Owner mentioned in the Contract aforesaid, its officers, agents, and servants, and each and every one of them against and from all suits and costs of every kind and description from all damages to which the said Owner in said Contract mentioned, or any of its officers, agents or servants may be put by reason of injury to the person or property of others resulting from the performance of said work, or through the negligence of said Contractor aforementioned, or through any improper or defective machinery, implements or appliances used by the said Contractor in the aforesaid work, or

through any act or omission on the part of the said Contractor or his agents, employees or servants; and shall further indemnify and save harmless the Owner mentioned in the Contract aforesaid, its officers, agents and servants from all suits and actions of any kind or character whatsoever, which may be brought or instituted by any subcontractor, materialman or laborer who has performed work or furnished materials in or about the work required to be done pursuant to the said Contract or by, or on account of any claims or amount recovered for any infringement of patent, trademark or copyright; then this obligation shall be void; otherwise the same shall remain in full force and effect; it being expressly understood and agreed that the liability of the surety for any and all claims hereunder, shall in no event exceed the penal amount of this obligation as herein stated.

The said surety hereby stipulates and agrees that no modifications, omissions or additions in or to the terms of the said Contract, or in or to the plans or specifications therefore, shall in any way affect the obligation of said surety on its bond.

CONTRACTOR _____
SIGNED BY _____
SIGNATURE _____
TITLE _____
ADDRESS _____
_____
_____

ATTEST:

_____
(SEAL)

(A corporate acknowledgement and statement of authority to be attached by the Surety Company. Date of Bond must not be prior to date of Contract).

APPROVAL OF BOND

The foregoing Bond approved this _____ day of _____ _____, 20 _____.

Signed by _____
Signature _____(s)
Title _____

IB.10 EXECUTION OF CONTRACT

IB.10.1 Bidder to Execute Contract

The individual, firm or corporation to whom or to which the Contract is awarded, shall sign the necessary agreements, shall provide the required bond and insurance certificates and shall return them, fully executed, to the office of the Owner within ten (10) days of the date of mailing of Contract Documents by the Owner to the successful bidder.

IB.10.2 Award Not Binding Prior to Contract Execution

No award of Contract shall be binding upon the Owner unless and until the contract has been fully executed, the required insurance certificates have been provided and the successful bidder's surety has been approved by the Owner.

IB.10.3 Failure or Refusal to Execute Contract

The bidder to whom the Contract is awarded shall execute such Contract and bonds required within ten (10) days after the Award of the Contract to him by the Owner.

Should the bidder fail to execute and deliver the Contract and bonds within the time above-mentioned, the Owner shall be entitled to retain the certified check accompanying the bid or proposal and to deduct therefrom (a) the expenses of reletting the contract, and (b) any difference between the sum which the said bidder would have been entitled to receive upon the completion of the Contract, if awarded to him, and the sum which the Owner may be obliged to pay the person or persons by whom the Contract shall be finally executed, provided the latter sum be greater.

IB.10.4 Form of Contract

The Owner shall require the Contractor to execute a Contract of the following form:

CONTRACT

THIS AGREEMENT, made this _____ day of _____ in the year of Our Lord Two Thousand and _____, between the_____
_____
_____
hereinafter called "Owner" and _____
_____
_____
hereinafter called the Contractor.

WITNESSETH: That the Owner and the Contractor, for the consideration hereinafter specified, agree as follows:

ARTICLE ONE: SCOPE OF WORK. Contractor covenants and agrees to provide all necessary machinery, tools and equipment and to furnish and deliver all

materials, and to do and perform in a good and workmanlike manner all the work and labor required to be furnished and delivered, done and performed in conformity with the Contractor Documents hereto annexed which said Contract Documents and Contractor's Proposal annexed thereto are hereby made a part of this agreement as fully and with the same effect as if the same had been set forth in the body of this agreement.

ARTICLE TWO: TIME OF DELIVERY AND PERFORMANCE: Said delivery of performance shall be in accordance with the provisions of the Contract Documents annexed hereto or if no time is set forth therein, as directed by the Owner. Time duration shall be 90-calendar days.

ARTICLE THREE: PAYMENT: Owner agrees to pay Contractor for said work and materials when completed or delivered, as the case may be, in accordance with the said Contract Documents within the time stated for the actual quantity of authorized work done under each item scheduled in the Proposal at the respective unit prices bid therefore by the Contractor, which payment, according to the estimated quantities will amount to _____
_____
_____ payments to be made in accordance with the Owner's manual requirements for submission of invoices and vouchers and approval by authorized official(s). It is further agreed that the Owner reserves the right to reduce or increase any and all of the quantities in each item at the unit price bid. Acceptance of the final payment to the Contractor shall be understood to be a release in full of all claims against the Owner arising out of or by reason of the work done and the materials furnished under this Contract.

ARTICLE FOUR: INDEMNIFICATION: The Contractor shall indemnify and hold harmless the Owner, the Engineer, and the Counsel and their agents and employees from and against all claims, damages, losses and expenses, including attorneys' fees, arising out of or resulting from the performance of the work provided that any such claim, damage, loss or expense (a) is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the work itself), including the loss of use resulting therefrom and (b) is caused in whole or in part of any negligent act or omission of the Contractor, and subcontractor, any directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, regardless or whether or not it is caused in part by a party indemnified hereunder.

In any and all causes against the Owner, the Engineer, or the Counsel or any of their agents, or employees by any employee of the Contractor, any subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, the indemnification obligation under this Article Four shall not be limited in any way by any limitation of the amount or type of damages, compensation, or benefits payable by or from the Contractor or any subcontractor under workmen's compensation acts, disability benefits acts, or other employee benefit acts.

ARTICLE FIVE: ASSIGNMENT OF SUBLETTING: Contract covenants and agrees not to assign or sublet the work specified or covered under the terms of this agreement without the prior approval in writing of the Owner.

ARTICLE SIX: DISCRIMINATION: Bidders are referred to Exhibit B – Mandatory Equal Opportunity Language, attached hereto.

This Contract shall be binding upon the Owner, its successors, and assigns, and upon the Contractor, its successors, and assigns of heirs, executors, administrators and assigns.

IN WITNESS WHEREOF, the Owner has caused this instrument to be signed by _____ _____ attested by _____ _____ and the (Municipality) seal to be hereunto affixed, and the Contractor hereunto set their hands and seals, or caused these presents to be signed by their proper corporate seal to be hereto affixed, the day and year first above mentioned.

OWNER _____

SIGNED BY _____

SIGNATURE _____(s)

TITLE _____

ATTEST:

_____
(SEAL)

CONTRACTOR _____

1. SIGNED BY _____

   SIGNATURE _____(s)

   TITLE _____

2. SIGNED BY _____

   SIGNATURE _____(s)

   TITLE _____

3. SIGNED BY _____

SIGNATURE _____(s)

TITLE _____

ATTEST:

_____

(SEAL) NOTE: Attach additional signature sheets in the above form if necessary.

IB.11 MODIFICATIONS OF PROPOSAL

Any bidder may modify his proposal by telegraphic communication or registered mail at any time prior to scheduled closing time for receipt of bids, provided such communications are received by the Owner prior to the closing time, and, provided further, the Owner is satisfied that a written confirmation of any telegraphic modification over the signature of the bidder was mailed prior to the closing time. The communications should not reveal the bid price, but should provide the addition or subtraction or other modification so that the final prices or terms will not be known by the Owner until the sealed bid is opened. If written confirmation is not received prior to closing time, no consideration will be given to telegraphic modifications.

IB.12 REJECTION OF PROPOSALS

IB.12.1 Multiple Proposals Not Allowed

More than one Proposal from an individual, a firm or partnership, corporation or association of principals under the same or different names shall not be considered.

IB.12.2 Unbalanced Proposal

Proposals which are obviously unbalanced may be rejected at the option of the Owner.

IB.12.3 Right to Reject Proposal Reserved

The right is reserved to reject any or all Proposals presented, if the Owner, and the Owner alone deems it in his best interest to do so.

IB.12.4 Right to Waive Informalities Reserved

The Owner expressly reserves the right to waive any informality in any proposal, and to accept the proposal, which, in the Owner's judgement, serves his best interests.

IB.13 PERMITS TO BE SECURED BY CONTRACTOR

The Contractor shall secure all permits, licenses and bonds. All necessary fees associated with local permits will be waived. The bidder shall fully inform himself as to the cost of all necessary permits, licenses and bonds, and shall include this cost in the unit prices bid for the work.

IB.14 BIDDERS REFERRED TO LAWS

The attention of the Bidder is especially directed to the provisions of Federal, State, County, Municipal ordinances, laws, statutes and regulations that may apply to the work, including particularly all safety regulations. Such provisions refer to construction safety, sheeting and bracing, obstruction of streets, open burning, maintaining of signals, storing and handling of explosives, etc. Particular note is to be taken also of those provisions affecting the Contractor or his employees in the prosecution of the work or his relation to any political subdivision or person. All pertinent laws, statutes, ordinances and regulations shall be obeyed and complied with by the Contractor, his subcontractors and all of his representatives.

In the construction of the work under this Contract, all provisions of Federal and New Jersey State Labor Laws shall be complied with by the Contractor.

The Contractor shall comply with all current requirements of the Federal Department of Labor Safety and Health Regulations for construction promulgated under the Occupational Safety and Health Act (PL 91-596) and under Section 107 of the Contract Work Hours and Safety Standards (PL 91-54).

The Contractor shall also comply with all current requirements of the construction promulgated under the New Jersey Department of Labor and Industry's Bureau of Engineering and Safety regulations; in particular under the Construction Safety Code, Chapter 180, Title 12 of the New Jersey Administrative Code.

In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for conditions in, on or near the job site, including safety of all persons and property affected directly or indirectly by his operations during performance of the work. This requirement will apply continuously 24 hours a day until acceptance of the work by the Owner and shall not be limited to normal working hours.

The duty of the Engineer is to conduct construction review of the Contractor's performance, but is not intended to include review of the adequacy of the Contractor's safety measures, in, on, or near the construction site.

All safety on the job is the responsibility of the Contractor, and prior to starting the project, he shall forward a letter to the State of New Jersey, Department of Labor and Industry, Bureau of

Engineering and Safety, Trenton, New Jersey, advising this State Agency that he has been awarded the contract, his proposed schedule of operation and the name, address and telephone number of the individual he is naming as safety inspector on the project. A copy of this letter shall be sent to the Owner and the Engineer before construction is started.

IB.15 BIDDERS TO EXAMINE SITE AND CONDITIONS

IB.15.1 Bidders to Visit Site

All bidders or their representative(s) are strongly encouraged to visit the site of the work of this Contract and examine the means of access to the site. Bidders shall make all necessary investigations in order to become thoroughly informed as to the character and magnitude of all work involved in the complete execution of the Contract, including facilities for delivery and handling of material, plant(s), if any, at site, and conditions and difficulties that will be encountered in the performance of the work specified herein. All examinations and investigations will be made prior to submission of bids.

IB.15.2 Bidders to Determine Conditions

Each bidder must fully inform himself as to the conditions under which the work is to be performed. These conditions shall include problems of construction, availability of labor, and equipment, transportation, and all else necessary to perform and complete the project as specified herein. All examinations and investigations will be made prior to submission of bids.

IB.16 LAYING OUT THE WORK

IB.16.1 Engineer to Establish Controls

The Engineer shall provide bench marks and the position of base line control points on the site of the work. The Engineer shall establish such horizontal and vertical controls within three (3) working days of the date that the Contractor presents a request that they be so established.

IB.16.2 Contractor to Provide Production Stakes

From the established controls the Contractor shall run all offset lines, set and drive stakes, set batter boards, and take all other measurements in order to lay out the work in accordance with the intent of the Contract Drawings.

IB.16.3 Engineer to Check Contractor's Layout

After the Contractor has erected batter boards, or forms, and set line and elevations for grading, paving or structures, the Engineer will check such work for obvious errors in alignment and grade and only upon approval of the Engineer, shall the Contractor proceed with permanent construction of the work so checked. There is no specific payment for layout; include said costs in various other pay items.

IB.16.4 Contractor Responsible for Errors

Not withstanding the Engineer's responsibility to check the Contractor's layout of the work for obvious errors or omissions, the basic responsibility for laying out the work remains the Contractor's and he shall be responsible to the Owner for the rectifying or for the cost of rectifying any errors resulting from this layout of the work.

IB.16.5 Contractor to Assist Engineer

When requested by the Engineer, the Contractor shall make available a competent man from his construction forces to assist the Engineer in any manner which may be necessary to check the grades and alignment as well as other features of the work. No extra payment will be made for the services of such assistant, and payment for the assistance shall be deemed to be included in the various unit prices bid. Failure to comply with this provision shall be sufficient cause for the Engineer to stop the work on unchecked sections.

IB.16.6 Contractor to Protect Control Points

The Contractor shall adequately protect all monuments, stakes and marks set by the Engineer. If they are disturbed or obliterated by the Contractor during the progress of the work, they shall be replaced by the Engineer at the Contractor's expense, and the amount thereof may be withheld from any payment due or becoming due.

IB.17 MAINTENANCE PERIOD REQUIRED

The bidder's attention is directed to the provisions hereinafter in the Contract Documents which require the maintenance of all work and materials furnished under this Contract.

IB.18 NORMAL WORKING HOURS REQUIRED

Unless otherwise provided, the Contractor will be expected to accomplish all of the work of this project during normal working hours. No work will be performed on Saturdays, Sundays, Legal Holidays, in excess of eight (8) hours or prior to 7:00 a.m. or after 6:00 p.m. on any normal working day, without the permission of the Engineer.

IB.19 AMERICAN PRODUCTS

The products to be provided under this contract shall be only manufactured and farm products of the United States, wherever available, and where possible, shall purchase such products and services.

IB.20 PAYMENT SECURITY

IB.20.1 Security Required

Simultaneously with his delivery of the executed contract and required Performance Security, the Contractor shall furnish a payment bond or bonds of face value equal to one hundred percent (100%) of the amount of the Proposal as security for the payment by the Contractor, and by all subcontractors, for all labor performed or material, provisions, provender or other supplies, teams, fuels, oils, implements or machinery used or consumed in, upon, for or about the construction,

erection, alteration or repair of subject buildings, work or improvements. The surety on such bonds shall be a duly authorized surety company satisfactory to the Owner.

IB.20.2 Release of Payment Security

The surety or bonds provided shall not be released until one (1) year after the release of the Performance Bond or if no Performance Security was required one (1) year after final acceptance of the whole work and then only if all properly filed liens or claims have been satisfied and any maintenance or guarantee bonds required have been executed and approved by the Owner.

IB.20.3 Form of Payment Bond

The bond required by this article shall be substantially the following form:

CONTRACT BOND

No. _____

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned _____ _____ as principal, and_____ _____ a Corporation organized and existing under the laws of the State of _____, and duly authorized to do business in the State of New Jersey, as Surety, are held and firmly bound unto the _____ in the penal sum of _____ _____ for payment of which well and truly to be made, we hereby jointly and severally bond ourselves, our heirs, executors, administrators, successors, and assigns.

Signed this _____ day of _____ Two Thousand and _____ (20___).

The condition of the above obligation is such that whereas the above named principal did on the _____ day of _____, 20_____, enter into a Contract with _____, which said contract is made a part of this bond the same as through set forth herein:

NOW, if the said _____ shall well and faithfully do and perform the things agreed by _____ to be done and performed according to the terms of the said Contract, or any changes or modifications therein made, as therein provided, and shall pay all lawful claims of subcontractors, materialmen, laborers, persons, firms, or corporations for labor performed or materials, provisions, provender, or other supplies or terms, fuels, oils implements, or machinery furnished, used or consumed in the carrying forward, performing or completing of the said Contract. We agreeing and assenting

that this undertaking shall be for the benefit of any subcontractor, materialman, laborer, person, firm, or corporation having a just claim, as well as for the obligee herein, and shall indemnify and save harmless the party of the first part mentioned in the Contract aforesaid, its Engineer, and officers, agents, employees and each and every one of them against and from all suits and costs of every kind and description, and from all damages to which the said party of the first part in the said Contract mentioned, or its Engineer and officers, agents, or employees may be put by reason of injury to the person, or property of others, resulting from the performance of said work, or through the negligence of the said party of the second part of the said Contract, or through any improper or defective machinery, implements, or appliances used by said party of the second part in the aforesaid work, or through any act or omission on the part of the said party of the second part, or his agents, employees, or servants, and shall further indemnify and save harmless the party of the first part mentioned in the Contract aforesaid, its Engineer and officers, agents and employees from all suits and actions of any kind or character whatsoever which may be brought or instituted by any subcontractor, materialman, or laborer who has performed work or furnished materials in or about the work required to be done pursuant to the said Contract or by infringement on patent, trademark, or copyright; and completes all requirements of the one (1) year guarantee; then this obligation shall be void. Otherwise, the same shall remain in full force and effect, it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event exceed the penal amount of this obligation as herein stated. The said Surety hereby stipulates and agrees that no modification, omission, or additions in or to the terms of the said Contract or in or to the plans or specifications therefore, shall in anyway affect the obligations of said Surety on its bond.

IN WITNESS WHEREOF, the said Principal and Surety have duly executed this bond under seal the day and year above written.

Witness:

_____ By _____ (SEAL)
(Principal - Individual)

_____

_____ _____
Attorney-in-fact

By _____
(Principal - Partnership)

Witness:

_____ (SEAL)

_____ (SEAL)

_____ (SEAL)

_____ (SEAL)

_____ Surety By _____
Attorney-in-fact

Attest: _____
(Principal - Corporation)

_____
Secretary

By: _____

(Corporate Seal)
Attest:

_____
Surety By

_____
Attorney-in-fact

NOTE: Date of Bond must not be prior to date of Contract. If Contractor is a partnership, all partners must execute bond. A corporate acknowledgement and statement of authority to be attached by the Surety Company.

APPROVAL OF BOND

The foregoing Bond approved this _____ day of _____ 20 _____.

Signed By: _____
Signature: _____(s)
Title: _____

IB.21 DISCLOSURE OF OWNERSHIP

In accordance with the P.L. 1977, Chapter 33, effective March 8, 1977, all bidders shall submit with their bid, a statement setting forth the names and addresses of all stockholders in the corporation (or partnership) who own ten percent (10%) or more of its stock, of any class (or of any individual partners in the partnership who own a 10% or greater interest therein, as the case may be). If one or more such stockholder (or partner) is itself a corporation (or partnership), the stockholders holding 10% or more of that corporation's stock (or the individual partners owning 10% or greater interest in that partnership, as the case may be), shall also be listed. The disclosure shall be continued until names and addresses of every non-corporate stockholder, and individual partner, exceeding the 10% ownership criteria has been listed. This shall also apply to Limited Liability Companies.

Bidders may utilize the forms provided with the proposal for this purpose or may submit their own statement forms provided the necessary information is disclosed. If the bidder's own forms are used, they shall be executed and attested in the same form as the Proposal.

IB.22 "AFFIRMATIVE ACTION AGAINST DISCRIMINATION"

IB.22.1 Bidder Referred to Law

The bidder is specifically referred to P.L. 1975, Chapter 127, which supplements P.L. 1945, Chapter 169, relating to affirmative action in relation to discrimination.

IB.22.2 Specific Language Required

The following is made a part of this Contract:

MANDATORY EQUAL EMPLOYMENT OPPORTUNITY LANGUAGE
N.J.S.A 10:5-31 et seq., N.J.A.C. 17:27
CONSTRUCTION CONTRACTS

During the performance of this contract, the contractor agrees as follows:
The contractor or subcontractor, where applicable, will not discriminate against any employee or applicant for employment because of age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation or sex. Except with respect to affectional or sexual orientation, the contractor will take affirmative action to ensure that such applicants are recruited and employed, and that employees are treated during employment, without regard to their age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation or sex. Such action shall include, but not be limited to the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the Public Agency Compliance Officer setting forth provisions of this nondiscrimination clause.
The contractor or subcontractor, where applicable will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to age, race, creed, color, national origin, ancestry, marital status, affectional or sexual orientation or sex.
The contractor or subcontractor, where applicable, will send to each labor union or representative of workers with which it has a collective bargaining agreement or other contract or understanding, a notice, to be provided by the agency contracting officer advising the labor union or workers' representative of the contractor's commitments under this act and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
The contractor or subcontractor where applicable, agrees to comply with any regulations promulgated by the Treasurer pursuant to **N.J.S.A. 10:5-31 et seq.,** as amended and supplemented from time to time and the Americans with Disabilities Act
When hiring or scheduling workers in each construction trade, the contractor or subcontractor agrees to make good faith efforts to employ minority and women workers in each construction trade consistent with the applicable employment goal prescribed by **N.J.A.C. 17:27-7.**3 provided, however, that the Division may, in its discretion, exempt a contractor or subcontractor from compliance with the good faith procedures prescribed by the following provisions, A, B and C, as long as the Division is satisfied that the contractor or subcontractor is employing workers provided by a union which provides evidence, in accordance with standards prescribed by the Division, that its percentage of active "card carrying" members who are minority and women workers is equal to or greater than the applicable employment goal established in accordance with **N.J.A.C. 17:27-7.3.**
The contractor or subcontractor agrees that a good faith effort shall include compliance with the following procedures:
(A). If the contractor or subcontractor has a referral agreement or arrangement with a union for a construction trade, the contractor or subcontractor shall, within three business days of the contract award, seek assurances from the union that it will cooperate with the contractor or subcontractor as it fulfills its affirmative action obligations under this contract and in accordance with the rules promulgated by the Treasurer pursuant to
N.J.S.A. 10:5-3 1 et. seq., as supplemented and amended from time to time and the Americans

with Disabilities Act. If the contractor or subcontractor is unable to obtain said assurances from the construction trade union at least five business days prior to the commencement of construction work, the contractor or subcontractor agrees to attempt to hire or schedule minority and women workers directly, consistent with the applicable employment goal. If the contractor's or subcontractor's prior experience with a construction trade union, regardless of whether the union has provided said assurances, indicates a significant possibility that the trade union will not refer sufficient minority and women workers consistent with the applicable employment goal, the contractor or subcontractor agrees to be prepared to hire or schedule minority and women workers directly, consistent with the applicable employment goal, by complying with the hiring or scheduling procedures prescribed under (B) below; and the contractor or subcontractor further agrees to take said action immediately if it determines or is so notified by the Division that the union is not referring minority and women workers consistent with the applicable employment goal.

(B). If the hiring or scheduling of a workforce consistent with the employment goal has not or cannot be achieved for each construction trade by adhering to the procedures of (A) above, or if the contractor does not have a referral agreement or arrangement with a union for a construction trade, the contractor or subcontractor agrees to take the following actions consistent with the applicable county employment goals:

(1). To notify the public agency compliance officer, the Division, and minority and women referral organizations listed by the Division pursuant to N.J.A.C. 17:27-5.3, of its workforce needs, and request referral of minority and women workers;

(2). To notify any minority and women workers who have been listed with it as awaiting available vacancies;

(3). Prior to commencement of work, to request that the local construction trade union refer minority and women workers to fill job openings, provided the contractor or subcontractor has a referral agreement or arrangement with a union for the construction trade;

(4). To leave standing requests for additional referral to minority and women workers with the local construction trade union, provided the contractor or subcontractor has a referral agreement or arrangement with a union for the construction trade, the State Training and Employment Service and other approved referral sources in the area until such time as the workforce is consistent with the employment goal;

(5). If it is necessary to lay off some of the workers in a given trade on the construction site, to assure, consistent with the applicable State and Federal statutes and court decisions, that sufficient minority and women employees remain on the site consistent with the employment goal; and to employ any minority and women workers so laid off by the contractor on any other construction site on which its workforce composition is not consistent with an employment goal established pursuant to rules implementing **N.J.S.A. 10:5-3 1 et. seq.**

(6) To adhere to the following procedure when minority and women workers apply or are referred to the contractor or subcontractor:

(i) If said individuals have never previously received any document or certification signifying a level of qualification lower than that required in order to perform the work of the construction trade, the contractor or subcontractor shall determine the qualifications of such individuals and if the contractor's or subcontractor's workforce in each construction trade is not consistent with the applicable employment goal, it shall hire or schedule those individuals who satisfy appropriate qualification standards. However, a contractor or subcontractor shall determine that the individual at least possesses the requisite skills, and experience recognized by a union, apprentice program or a referral agency, provided the referral agency is acceptable to the Division. If necessary, the contractor or subcontractor shall hire or schedule minority and women workers

who qualify as trainees pursuant to these rules. All of the requirements, however, are limited by the provisions of(C) below.
(ii). If the contractor's or subcontractor's workforce is consistent with the applicable employment goal, the name of any interested women or minority individual shall be maintained on a waiting list for the first consideration, in the event the contractor's or subcontractor's workforce is no longer consistent with the applicable employment goal.
(iii). If, for any reason, said contractor or subcontractor determines that a minority individual or a woman is not qualified or if the individual qualifies as an advanced trainee or apprentice, the contractor or subcontractor shall inform the individual in writing of the reasons for the determination, maintain a copy of the determination in its files, and send a copy to the public agency compliance officer and to the Division.
(7) To keep a complete and accurate record of all requests made for the referral of workers in any trade covered by the contract, on forms made available by the Division and submitted promptly to the Division upon request.
(C **)** The contractor or subcontractor agrees that nothing contained in (B) above shall preclude the contractor or subcontractor from complying with the union hiring hall or apprenticeship policies in any applicable collective bargaining agreement or union hiring hall arrangement, and, where required by custom or agreement, it shall send journeymen and trainees to the union for referral, or to the apprenticeship program for admission, pursuant to such agreement or arrangement. However, where the practices of a union or apprenticeship program will result in the exclusion of minorities and women or the failure to refer minorities and women consistent with the county employment goal, the contractor or subcontractor shall consider for employment persons referred pursuant to (B) above without regard to such agreement or arrangement; provided further, however, that the contractor or subcontractor shall not be required to employ women and minority advanced trainees and trainees in numbers which result in the employment of advanced trainees and trainees as a percentage of the total workforce for the construction trade, which percentage significantly exceeds the apprentice to journey worker ratio specified in the applicable collective bargaining agreement, or in the absence of a collective bargaining agreement, exceeds the ratio established by practice in the area for said construction trade. Also, the contractor or subcontractor agrees that, in implementing the procedures of (B) above it shall, where applicable, employ minority and women workers residing within the geographical jurisdiction of the union.
After notification of award, but prior to signing a construction contract, the contractor shall submit to the public agency compliance officer and the Division an initial project workforce report (Form AA 201) provided to the public agency by the Division for distribution to and completion by the contractor, in accordance with **N.J.A.C. 17:27-7.** The contractor also agrees to submit a copy of the Monthly Project Workforce Report once a month thereafter for the duration of this contract to the Division and to the public agency compliance officer.
The contractor agrees to cooperate with the public agency in the payment of budgeted funds, as is necessary, for on-the-job and/or off-the-job programs for outreach and training of minorities and women.
(D). The contractor and its subcontractors shall furnish such reports or other documents to the Division of Contract Compliance & EEO as may be requested by the Division from time to time in order to carry out the purposes of these regulations, and public agencies shall furnish such information as may be requested by the Division of Contract Compliance & EEO for conducting a compliance investigation pursuant to **Subchapter 10 of the Administrative Code at N.J.A.C. 17:27.**

IB.22.3 Notices to be Provided

The Owner will provide the successful bidder with two (2) copies of the notices required by Section 3 of P.L. 1975, Chapter 127. Additional copies may be secured by the Contractor in payment of the cost of reproduction thereof.

IB.22.4 Contract Documents

The Contractor must sign a contract containing the mandatory language of IB.22.2. The construction goals and related contract obligations and procedures, as described in the regulations, do not apply to any construction contractor or subcontractor which submits appropriate evidence that it is operating under a federally approved or sanctioned affirmative action plan or to any subcontractor with four (4) or fewer employees.

If the contractor refuses to sign a contract containing the mandatory affirmative action contract language at the time the contract is submitted for signing by the Owner, then the Owner will reject the contractor's bid as non-responsive. When such a rejection occurs, the same affirmative action requirements shall apply to any other contractor selected by the Owner in accordance with contracting laws and procedures.

If, prior to or at the time the Owner submits a contract for signing, the contractor does not submit to the Owner evidence of an existing federally approved or sanctioned Affirmative Action Program; then no later than three (3) days after the contractor signs the construction contract, the contractor shall complete and submit the Initial Projected Manning Table Form AA201 to the Owner and Affirmative Action Office, provided, however, that for construction projects with a total cost of less than $50,000, the Project Manning Report shall not be submitted except when requested by the Affirmative Action Office. The contractor should retain the copy marked "Contractor", submit the copy marked "Public Agency" to the Owner and the remaining copies will be forwarded immediately to:

Affirmative Action Office
Department of the Treasury
State House
CN 209
Trenton, NJ 08625-0209

The Owner may extend in a particular case the allowable time for submitting the initial form to no more than fourteen (14) days.

Contractor's must require their subcontractors (except subcontractors with four (4) or less employees) to agree to the mandatory provisions of IB.22.2.

IB.22.5 Subcontractors

All provisions of this Section IB.22 shall apply to subcontractors, except that subcontractors with less than five (5) employees need not submit and obtain the approval of the State Treasurer for an affirmative action program. The Owner will not approve any subcontract for a subcontractor having five (5) or more employees, in accordance with the provisions of General Condition 26, unless the subcontractor has in effect an affirmative action program approved by the State Treasurer.

IB.22.6 Federal Civil Rights Compliance

The Contractor shall comply with Title IV of the Civil Rights Act of 1964, as amended (42 USC 2000d-2000d-4) and Executive Orders 11246 and 11375, as amended, and specifically to the following equal opportunity clause:

During the performance of this Contract, the Contractor agrees as follows:

1. The Contractor will not discriminate against any employment because of race, color, religion, sex, or national origin. Such action shall include, but not be limited to the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; lay-off or termination; rates of pay or other forms of compensation; selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants discrimination clause.

2. The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex or national origin.

3. The Contractor will send to each labor union or representative or workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided by the agency contracting officer, advising the labor union or workers's representative of the Contractor's commitments under Section 202 of Executive Order No. 11246 of September 24, 1965, and shall post copies of the notices in conspicuous places available to employees and applicants for employment.

4. The Contractor will comply with all provisions of Executive Order No. 11246 of September 24, 1965, and of the rules and regulations and relevant orders, and amendments of the foregoing, of the Secretary of Labor.

5. The Contractor will furnish all information and reports required by Executive Order No. 11246 of September 24, 1965, and by the rules and regulations and orders and amendments

of the foregoing, of the Secretary of Labor, and will permit access to his books, records and accounts by the Government and the Secretary of Labor for the purposes of investigation to ascertain compliance with such rules, regulations and orders. The Contractor must submit to the Owner the Standard Form 257 Monthly Employment Utilization Report included in the Contract Specifications.

6. In the event of the Contractor's non-compliance with the non-discrimination clauses of this Contract or with any of such rules, regulations or orders, this Contract may be canceled, terminated or suspended in whole or in part and the Contractor may be declared ineligible for further Government Contracts in accordance with procedures authorized in Executive Order No. 11246 of September 24, 1965, and such other sanctions may be imposed and remedies involved as provided in Executive Order No. 11246 of September 24, 1965, or by rule, regulation, or order, and amendments of the foregoing, of the Secretary of Labor, or as otherwise provided by law.

7. The Contractor will include the provisions of paragraphs 1 through 6 in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to Sections 204 and/or 303 of the Executive Order No. 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The Contractor will take such action with respect to any subcontract or purchase order as the Government may direct as a means of enforcing such provisions, including sanctions for non-compliance: Provided, however, that in the even that the Contractor becomes involved in, or is threatened with, litigation with a subcontractor, or vendor, as a result of such direction by the Government, the Contractor may request the United States to enter into such litigation to protect the interest of the United States.

The Contractor shall comply with Executive Order No. 11246, entitled "Equal Employment Opportunity", as amended by Executive Order No. 11375, and as supplemented in Department of Labor regulation (41 CFR Chapter 60). The bidder or prospective Contractors and their proposed subcontractors are required to fill out the Certification regarding Equal Opportunity included in the specification prior to the award of Contracts or subcontracts. The form also contains certification that every bidder and their proposed subcontractors will not maintain any facilities for its employees in a segregated manner.

The Local Unit shall (1) comply with the above provisions in construction work carried out by itself, and (2) assist and cooperate actively with the Commissioner, the BOR, and the above mentioned Committee in obtaining the compliances of Contractors and subcontractors with the above Contract provisions with the rules and regulations, and relevant orders of the Committee, (3) obtain and furnish to the Commissioners, the BOR and to the Committee, such information as they may require for the supervision of such compliance, (4) enforce he obligation of the Contractors and subcontractors under such provisions, rules, regulations, and orders (5) carry out sanctions imposed upon Contractors and subcontractors by the Committee or the BOR, pursuant to Part III, Subpart D, of Executive Order Number 11246 and (6) refrain from entering into any Contract with a contractor debarred from Government Contracts under Part III, Subpart D, of Executive Order Number 11246.

IB.23 LABOR STANDARDS

The Contractor and all subcontractors shall comply with the Regulations of the Secretary of Labor made pursuant to the Copeland "Anti-Kickback" Act as amended (40 USC 276 c); (18 USC 874).

The Contractor and all subcontractors shall furnish the Owner with weekly Statements of Compliance. In the case of subcontracts, the Contractor shall cause appropriate provisions to be inserted in any subcontracts for the work which he may let to insure compliance with said Anti-Kickback Act by all subcontractors subject thereto, and the Contractor shall be responsible for submission of all Statements of Compliance required of subcontractors by said Anti-Kickback Act, except as the Secretary of Labor may specifically provide for reasonable limitations, variations and exemptions from the requirements thereof. Payroll and Anti-Kickback Statements shall be submitted weekly for each and every subcontractor on the project and shall be submitted on a form equal to Form WH-347.

IB.24 EMPLOYMENT OF ILLEGAL ALIENS

During the performance of this Contract, the Contractor agrees not to employ on such project any alien in the United States in violation of the Immigration and Nationality Act or any other law, convention, or treaty of the United States relating to the immigration, exclusion, deportation or expulsion of aliens.

The Contractor will include the provisions of the preceding paragraph in every subcontract so that such provisions will be binding upon each subcontractor.

IB.25 STATE WAGE RATES

The Contractor shall be responsible for obtaining the current list of rates and familiarizing himself with applicable provisions of the New Jersey Prevailing Age Act, Chapter 150, of the Laws of 1963 as amended, governing the prevailing rates of wages for workmen who are employed on this project. All provisions of said Wage Act and amendments thereto shall be considered part of this Contract and made a part thereof.

The Bidder does, by submitting the Proposal, declare and represent to the Owner that he is aware of the provisions of said Wage Act with relation to the prevailing rates of wages for workmen to be employed on this project.

The Bidder does also declare and represent that in the event of any redetermination of such prevailing rates at any time before the execution and delivery of the Contract between the Bidder and the Owner for the work of construction of the project, or at any time thereafter, the new rates, if any, will become the applicable minimum rates for work performed thereafter under said Contract. No increase in the Contract price shall be claimed by the Bidder, and no such increase will be granted by the Owner as a result of such redetermination.

IB.26 PREVAILING WAGES

IB.26.1 Requirements of Law

Attention is called specifically to the requirements of Chapter 10, Title 34, Revised Statutes providing, as a condition of this Contract, the establishment of an eight (8) hour working day for laborers, workmen and mechanics and requiring payment of prevailing rates of wages.

If required in this Contract, and so stated in the Notice to Contractors (Advertisement), the Contractor will be required to comply with the provisions of the New Jersey Prevailing Wage Act, the payment of prevailing wages and for the proper documentation of such payments.

The Contractor agrees:

a. That it will fully comply with all the provisions of Chapter 150 of the New Jersey Laws of 1963, known as the New Jersey Prevailing Wage Act;

b. That all workmen employed by this Contractor, or by any subcontractors working under this Contractor, shall be paid not less than the prevailing wage rate for the particular craft or trade, in the locality within which the job site herein is located, as determined by the Department of Labor and Industry of the State of New Jersey; and

c. That in the event it is found that any workman, employed by this Contractor, or by any subcontractor covered by the within Contractor, has been paid a rate of wages less than the prevailing wage required to be paid by such Contract, the Owner may terminate the right of this Contractor or of his subcontractor to (1) proceed with the work, or such part of the work, as to which there has been a failure to pay the required wages, and to (2) prosecute the work to completion or otherwise; and in the event of such termination, the Contractor and his sureties shall be liable to the Owner for any excess costs occasioned thereby.

IB.26.2 Wage Rate Determination on File

Copies of the Act cited above and of the New Jersey Department of Labor Prevailing Wage Rate Determination for this project are available at the office of the Department of Labor, Division of Workplace Standards; Office of Wage and Hour Compliance; Labor Building, Trenton, New Jersey 08625-0389.

IB.26.3 Wage Rates, A Condition of Contract

Bidders should familiarize themselves with the above cited Act and the particular wage rate determination for this project since they will be attached to and made a condition of the Contract to be executed for this project.

IB.27 ACCESS TO THE WORK AND TO CONTRACTOR'S DOCUMENTS

The representative of the Owner and the Department of Labor and Industry shall be afforded access to the work under this Contract whether it is in preparation or progress. The Contractor shall provide proper facilities for such access and inspection.

The Owner, or any of their authorized representatives, shall have access to any books, documents, papers, and records of the Contractor which are pertinent to the project for the purpose of making audit, examination, excerpts, and transactions thereof.

IB.28 OPEN CHAMBERS, SAFETY BARRICADES, WATCHMEN

The attention of the Contractor is specifically directed to the exacting requirements in connection with the protection of all open chambers and the safety of all persons. Due to the character of the work, the Contractor shall be expected to keep all chambers protected at all times. He shall provide lights at night. Warning signs shall be located where required.

If required by the Owner, the Contractor shall provide personnel for the sole purpose of insuring the safety of persons other than his own employees, by directing traffic, issuing warnings, resetting barricades, etc. If deemed necessary by the Owner, the Contractor shall be required to have a watchman present at night in particularly hazardous locations.

IB.29 EMPLOYMENT OF VETERANS

The Contract agrees to provide certification that special consideration, consonant with existing applicable collective bargaining agreements and practices, shall be given to the employment on the project of qualified disabled veterans as defined in 38 USC 2011 (1), and to qualified Vietnam-era veterans, as defined in 38 USC 2011 (2) (A).

IB.30 PROJECT RECORDS

The Contractor shall establish, maintain, and preserve and require each of its subcontractors to establish, maintain, and preserve property management, project performance financial management payrolls, and reporting documents and systems, and such other books, records, and other data pertinent to the project as the Government may require. While such records shall be retained for a period of three (3) years following receipt of final payment by the Owner, detailed exceptions are stated in 13 CFR 309.9.

IB.31 CONTRACT DOCUMENT RETENTION

The contractor shall maintain all documentation related to products, transactions or services under this contract for a period of five years from the date of final payment. Such records shall be made available to the New Jersey Office of the State Comptroller upon request.

IB.32 NEW JERSEY ANTI-DISCRIMINATION

The contract for this bid shall require that the contractor agrees not to discriminate in employment and agrees to abide by all anti-discrimination laws including but not limited to N.J.S.A. 10:2-1.

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GC.1 HEADINGS

The headings of the sections herein and in other parts of these Contract Documents are for convenience or reference only and shall have no bearing on their interpretation.

GC.2 NUMBERING OF SECTIONS

The sections herein and in other parts of these Contract Documents, except for the supplementary specifications, are numbered in three parts; the first part, a capital block letter or letters, designates the general portion of the contract documents as follows:

NB.	Notice to Bidders (Advertisement)
P.	Proposal and Consent of Surety
IB.	Instructions to Bidders
GC.	General Conditions
SP.	Special Provisions
S.	Standard Specifications
SS.	Supplementary Specifications

The second part, an Arabic numeral, denotes the article number of the general portion of the Contract Documents, and the third part, also an Arabic number, denotes the number of the section.

General portion SS - The Supplementary Specifications - is an exception to the above rule. The Supplementary Specifications are numbered in four parts; the first part, the capital letters SS, denoting that the subject section is Supplementary Specification has been omitted from the individual sections; the second, third and fourth parts denote the division, section and subsection number respectively, of technical information amending or not referred to in the Standard Specifications.

When a particular division, section or subsection does not lend itself to or require such extensive division as outlined above, the fourth, third or even the second portion of the heading may be omitted. The heading numbering of the division, sections or subsection; herein, shall have no bearing on their interpretation.

GC.3 DEFINITIONS

Whenever in these Contract Documents the following terms and abbreviations or pronouns in place of them are used, their intent and meaning shall be interpreted as follows:

"ABBREVIATIONS"-

"AASHO"	American Association of State Highway Officials
"ACI"	American Concrete Institute

"AISC"	American Institute of Steel Construction
"APWA"	American Public Works Association
"ASA"	American Standards Association
"ASCE"	American Society of Civil Engineers
"ASTM"	American Society for Testing Materials
"NEC"	National Electric Code
"NEMA"	National Electric Manufacturers Association
"NJDOT"	New Jersey Department of Transportation
"NJDOT SPECIFICATIONS"	NJDOT Standard Specifications for Road and Bridge Construction
"LS"	Lump Sum
"EA"	Each
"LF"	Lineal Feet
"CY"	Cubic Yard
"SF"	Square Feet
"SY"	Square Yards

"BID" - The offer or proposal of the Bidder submitted on the prescribed form setting forth the prices for the work to be performed.

"BIDDER" - Any individual, firm or corporation submitting a proposal for the work contemplated, acting directly or through a duly authorized representative.

"CHANGE ORDER" - A written order to the Contractor signed by the Owner authorizing an addition, deletion or revision of the work, or an adjustment of the contract amount or contract time.

"CLERK" - The Clerk of the governing body if the Owner be a County or Municipality.

"CONTRACT" - The Agreement covering the performance of the work and the furnishing of materials in the construction of the work. The Contract shall include the "Proposal," "Contract Documents," "Plans," "Specifications," "Performance Bond," and "Notice to Bidders," also any and all supplemental agreements which reasonably could be required to complete the construction of the work in a substantial and acceptable manner.

"CONTRACTOR" - Party of the second part to the contract, acting directly or through his agents or employees.

"CONTRACT DOCUMENTS" - The Contract, Notice to Bidders, Proposal, Instruction to Bidders, General Conditions, Special Provisions; Specifications, Standard and Supplementary; Drawings, Addenda and Modifications.

"CONTRACT PRICE" - The total monies payable to the Contractor under the Contract Documents.

"CONTRACT TIME" - The number of calendar days stated in the Contract for the completion of the work.

"COUNSEL" - The person or firm holding the position or acting in the capacity of legal counsel for

the Owner in the performance of the work contemplated.

"ENGINEER" - Whenever the word Engineer is used in reference to the work or any part thereof in these specifications of the Contract, it shall be understood to apply and refer to the professional engineering representative of the Owner, duly authorized to represent the Owner in the execution of the work covered by the Specifications and Contract. The term "Engineer" or the pronouns used in place thereof shall refer to acting either directly or through assistants under him, limited to the particular duties entrusted to them.

"MODIFICATION" - (a) a written amendment of the Contract Documents signed by both parties,
or
(b) a change order,
or
(c) a written clarification or interpretation issued by the Engineer.

"OWNER" - A public body or authority, association, partnership, corporation or individual for whom the work is to be performed; the party of the first part in the Contract.

"PERFORMANCE BONDS" - The approved form of security furnished by the Contractor and his Surety as a guaranty of good faith on the part of the Contractor to execute the work in accordance with the terms of the Specifications and Contract.

"PERSONAL INJURY" - Shall be interpreted to mean "Bodily Injury" for insurance coverage purposes.

"PLANS" - All drawings, or reproductions of drawings, pertaining to the construction of the project.

"PROJECT" - The design or scheme used and set forth on the plans and to be carried out by the Specifications in order to complete the work in a manner satisfactory to the Engineer.

"PROJECT REPRESENTATIVE" - An Authorized representative of the "Owner" assigned, under the supervision of the Engineer, to the observation of the work.

"PROPOSAL" - The approved prepared form on which the Bidder will or did submit his, their or its prices for the work contemplated.

"PROPOSAL SECURITY" - The security designated in the proposal, to be furnished by the Bidder as a guaranty of good faith to enter into a contract with the Owner if the work is awarded to him.

"ROADWAY" - That portion of the highway included between the gutter or side ditch lines, reserved for the accommodation of traveling public, and its appertaining structures and slopes, and all ditches, channels, waterways, etc., necessary to its correct drainage.

"SHOP DRAWINGS" - All drawings, diagrams, illustrations, brochures, schedules, and other data which are prepared by the Contractor, Subcontractor, manufacturer, supplier or distributor and which illustrate the equipment, material, or some portion of work.

"SPECIFICATIONS" - The directions, provisions and requirements contained herein, together with all written agreements, made or to be made, pertaining to the method and manner of performing the work, or to the quantities and qualities of materials to be furnished under the contract.

"SUBCONTRACTOR" - An individual, firm or corporation having a direct contract with the Contractor or with any other subcontractor for the performance of a part of the work at the site.

"SUBSTANTIAL COMPLETION" - The date as certified by the Engineer when the construction of the Project or a specified part thereof is sufficiently completed, in accordance with the Contract Documents, so that the Project or specified part can be utilized for the purposes for which it was intended; or if there be no such certification, the date when final payment is due in accordance with paragraphs hereinbefore.

"SURETY" - The corporate body which is bound with and for the Contractor who is primarily liable and which engages to be responsible for his payment of all debts pertaining to and for his acceptable performance of the work which he has contracted.

"WORK" - Any and all obligations, duties and responsibilities necessary to the successful completion of the project under the Contract Documents, including the furnishing of all labor, materials equipment and other incidentals.

"WORKING DAY" - A calendar day, exclusive of Saturdays, Sundays, legal holidays, on which, in the sole opinion of the Engineer, weather and working conditions permit the Contractor to make effective use, during normal working hours, of not less than one-half of his normal current daily manhours.

GC.4 CONTRACT DOCUMENTS

GC.4.1 Description of Contract Documents

The Contract Documents consist of the Contract, Notice to Bidders (Advertisement), Proposal, Instructions to Bidders, General Conditions, Special Provisions, Standard Specifications, Supplementary Specifications, Drawings, Addenda and Modifications.

GC.4.2 Sequence of Precedence

In the case of conflict between the various parts of the Contract Documents, they shall be interpreted; (a) to require the higher, in terms of quality of materials and workmanship, of the possible interpretations, and (b) in accordance with this sequence of precedence:

a. Contract Agreement
b. ADDENDA, Bulletins, Changes of Plan
c. Details
d. Plans (Drawings)
e. Additional Specifications
f. Supplementary Specifications
g. Special Provisions

h. Standard Specifications
i. Standard General Conditions
j. Instructions to Bidders

In case of discrepancies between calculated and scaled dimensions on the details or drawings, the calculated dimensions shall govern.

GC.4.3 Ownership of Documents

All Contract Documents and copies thereof are furnished by the Engineer for use only on the project herein described, and with the exception of those sets which have been signed in connection with the execution of the Contract, shall at all times remain the property of the Engineer. They shall not be used in connection with any other project.

GC.5 INTENT OF CONTRACT DOCUMENTS

GC.5.1 Description of Complete Project

It is the intention of the Contract Documents to describe a complete project to be constructed in accordance with all the requirements herein notwithstanding that each and every item required may not be shown on the drawings or mentioned in the specifications. The Contract Documents comprise the entire agreement between the Owner and the Contractor and may be amended or added to only as herein described.

GC.5.2 Documents are Complementary

The Contract Documents are complementary; they are to be considered as an instrument; the intent is to make them explanatory, one of the other. No sections thereof or any papers attached to or bound with the Contract Documents shall be detached as each one is a necessary part thereof.

GC.6 ADDENDA AND INTERPRETATION (PRE-BID)

No interpretation of the meaning of the plans, specifications, or other pre-bid documents will be made to any bidder orally.

Every request for such interpretation should be in writing, addressed to the Engineer at the address given in the Notice to Bidders (Advertisement) and to be given consideration must be received at least ten (10) days prior to the date fixed for the opening of bids. Any and all such interpretations and any supplemental instructions will be in the form of written addenda to the specifications which, if issued, will be mailed by certified mail with return receipt requested to all prospective bidders (at the respective addresses furnished for such purpose), not later than seven (7) days prior to the date fixed for the opening of bids. Failure of any bidder to receive any such addendum or interpretation shall not relieve such bidder from any obligation under his bid as submitted. All addenda so issued shall become part of the Contract Documents.

GC.7 OWNER TO FURNISH PLANS AND SPECIFICATIONS

The Owner will furnish or cause the Engineer to furnish the Contractor with two (2) complete sets of Plans (paper prints) and two (2) complete sets of other Contract Documents after the execution of the contract agreement. Additional sets of plans or Contract Documents will be furnished the Contractor upon application, at the cost of reproduction.

When plans are revised or supplemental drawings are prepared, two (2) copies of such revisions or supplements shall also be furnished the Contractor for inclusion with the previously issued plans.

GC.8 CONTRACTOR TO REVIEW PLANS

The Contractor shall be assumed to have reviewed all plans, drawings, details and schedules for conflicts or discrepancies. He shall notify the Engineer of any and all conflicts or discrepancies therein for interpretation and correction and/or revision as necessary.
The Contractor will be deemed to have fully examined the plans and Contract Documents during the preparation of his Proposal and to have been aware of and have made allowances therein for any such discrepancies; consequently, no additional compensation on account of any such discrepancies will be due the Contractor in excess of the amounts scheduled in the Proposal.

GC.9 WORK TO BE PERFORMED

The Contractor shall furnish miscellaneous materials not specifically stated herein, and the superintendence, labor, tools, equipment, and transportation and shall execute, construct, and finish in an expeditious, substantial and workmanlike manner, to the satisfaction of the Engineer and the Owner, all of the work required for the project in accordance with the plans as prepared by the Engineer.

GC.10 QUALITY OF WORK REQUIRED

GC.10.1 Materials Required

The Contractor shall provide and pay for all materials, equipment, labor, transportation, construction equipment, machinery, tools, appliances, fuel, power, light, heat, telephone, water, and sanitary facilities, and all other facilities and incidentals necessary for the execution, testing, initial operation, and completion of work.

Unless otherwise provided, all materials shall be new and shall be of domestic manufacture. All materials required for the work, unless otherwise provided, shall be provided by the Contractor and shall be subject to the Engineer's approval before and/or after delivery and before and/or after incorporation into the work. If required by the Engineer, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

All materials and equipment shall be applied, installed, connected, erected, used, cleaned, and conditioned in accordance with the instructions of the applicable manufacturer, fabricator, or processor, except as otherwise specifically provided in the Contract Documents.

GC.10.2 Equipment Required

All bidders should familiarize themselves with the requirements herein regarding the equipment required for the proper execution of the work. All equipment used shall, in the opinion of the Engineer, be proper for the work to be performed. No equipment which, because of its weight or dimensions, will cause damage to public or private property shall be allowed.

GC.10.3 Workmanship Required

All workmanship shall be, in every respect, in accordance with the best current practice. Only skilled craftsmen, fully qualified in the various disciplines required, shall be used on the work.

GC.10.4 Equivalent Materials and Workmanship

Wherever in the Contract Documents a particular brand or make of materials is shown or specified by trade name or otherwise, such brand or make of materials is to be regarded as standard. If the Contractor wishes to furnish or use a proposed substitute he will be required to show, to the satisfaction of the Engineer, that the proposed substitute will perform adequately the duties required by the general design, be similar and of equal substance to that specified and be suited to the same use as that specified. No substitute shall be used without the written permission of the Engineer who shall be the sole judge of equality.

GC.11 COOPERATION WITH OTHERS

GC.11.1 Work of Other Contractors

The right is reserved by the Owner to do work with its own employees or by other contractors and to permit public utility companies and others to do work during and within the limits of, or adjacent to, the project. The Contractor shall conduct his work so as to cause as little interference with the work of such other contractors as possible.

GC.11.2 Requirements of Other Bodies

Certain work to be done incidental to this contract may be required by persons, municipalities or bodies other than the Owner. Plans, specifications or other available detailed information, such as is in the possession of the Owner, will be placed on file for the bidder's reference.

All such filed data, if any, is only for the guidance of the Contractor, who may use such data at his discretion. No responsibility is assumed by the Owner, Engineer, or their agents, as to the completeness or accuracy of the data, or for the acceptance of the work.

The Contractor shall be responsible for the approval and acceptance of work that is to meet the requirements of persons, municipalities or bodies other than the Owner. The work may include, but shall not be restricted to, replacement of sidewalks, curbs, pavement or utilities, as well as other incidental work required to complete the Contract.

GC.11.3 Disputes Concerning Non-Cooperation

It is agreed that, in the event of disputes arising as to possible or alleged interference among various contractors on the site of the work which, in the opinion of the Engineer, may retard the progress or adversely affect the quality of the work, the Engineer is vested with the authority to render a judgement of fault insofar as the interference, if any exists, is occasioned by the Contractor or by any of his subcontractors or agents of by the Owner. Such decision of the Engineer shall be binding and conclusive on any party to the Contract.

GC.12 CONTRACTOR'S PERSONNEL

GC.12.1 Contractor's Superintendence

The Contractor shall attend to the work personally or through a competent, English speaking superintendent, who shall be continually present on the project site whenever work is in progress. Such a superintendent shall be satisfactory to the Engineer and shall not be removed or replaced without due notice being given the Engineer. The superintendent shall have full authority to act for the Contractor without the need to consult any higher level of authority.

GC.12.2 Contractor's Employees

All workmen must be competent and fully qualified in the type of work to be performed. Any employee of the Contractor who is found by the Engineer to be incompetent, or who is performing his work in an unsightly manner or contrary to the Specifications or the Engineer's instruction, or who is disorderly, shall be removed from the project and shall not be again employed on the project without the Engineer's consent.

GC.12.3 Work Force to be Sufficient

The quality of superintendence and the number of workmen employed on the site of the work shall, in the opinion of the Engineer, be sufficient to complete the project within the stipulated time. No progress payments due or becoming due during this project shall be certified for payment for as long as any Contractor may be held in violation of the terms of this section.

GC.12.4 Certain Employment Prohibited

Neither the Contractor nor any subcontractor shall engage, on any basis, during the period of this Contract any of the professional, technical or administrative personnel of the Owner who are, or have been, employed by the Owner during the period of this contract, without written consent of the Owner.

GC.13 CONTRACTOR'S WORKING FACILITIES

GC.13.1 Working Site - Additional Rights-of-Way

The Owner will provide land, easements or rights-of-way for the work within the limits designated

on the plans. The Contractor shall not enter or occupy any land outside the limits so designated on the plans without first obtaining the written consent of the property owner(s). A copy of such written consent shall be filed with the Engineer. Upon completion of the work, including all cleanup and restoration, the Contractor shall obtain a written release from the owner of all lands used, and file such release or releases with the Engineer.

A 20-ft right of way exists, so the Contractor is notified that equipment, trucks and materials CANNOT be stored on private lands along North Street.

Find ample space to store materials and equipment; request from Borough special permission to stage and store at nearby lands owned by the Borough.

The Contractor shall inform himself of the rights-of-way provided as indicated on the plans. The Contractor shall make all necessary arrangements for additional rights-of-way required for his own purposes, such as for storage of equipment and material. No further payment will be made for additional rights of way other than that included in the unit prices bid for the construction work.

The provisions of this section apply to rights-of-way acquired from private owners and to rights-of-way owned by either the State, County, or Municipality for streets or other public thoroughfares. In these areas, the Contractor shall comply with the following:

a. No equipment or material shall be placed outside of the right-of-way without the express permission of the property owner.

b. It is the intent of this Contract to protect and save where practical, trees, shrubs, etc., such practices will be carried out. Where it is absolutely necessary to remove trees within the rights-of-way, the Contractor shall notify the State, County, or Municipality in writing, at least seven days prior to the date of removal. Where individual property owners have placed shrubs, flowers, etc., within the rights- of-way, lines and removal is absolutely necessary, the Contractor shall notify the property owner in writing at least seven days prior to the date of said removal. When such notification has been given, replacement shall be the responsibility of the Contractor.

c. It is the intent of the above section to limit the Contractor to normal work areas necessary for the construction and to eliminate unnecessary damage to other areas within the road rights-of-way.

e. The Contractor's attention is called to the following special requirements for all construction in or along streets, roads, or public thoroughfares:

    1. The Contractor shall conduct his work to limit the length of time between opening up a street and restoring it to its original condition. Length of trench opening shall be governed by the Specifications, or by the applicable rules, regulations, or requirements of the State, County, or Municipality having jurisdiction if the latter are more restrictive.

    2. Vehicular traffic must be maintained on all roads. Roads may be blocked off during construction hours only, with the express permission of the Chief of Police or other

municipal official. Where two or more work crews are used, operations must be scheduled to prevent isolation of any areas.

3. The Contractor shall not operate any valve or hydrant utilized in any public water system without the express permission of the licensed operator responsible for said water system. This restriction shall not apply to the Contractor's actions in the event of an emergency.

4. Where it is necessary to block a residential driveway, the Contractor shall notify the homeowner at least twenty-four (24) hours prior to the event.

GC.13.2 Temporary Utilities

The Contractor shall furnish, at his own expense, an adequate supply of water, electric power and telephone service as required by him in the performance of the work. He shall furnish and install all temporary connections, meters, and other appurtenances, shall conform to all requirements of the utility companies, and shall pay all expenses and charges incidental thereto. After the completion of the work, the temporary facilities shall be removed by the Contractor. The Contractor shall provide sufficient artificial lights, by means of electricity so that all work may be done in a workmanlike manner when or where there is not sufficient daylight.

GC.13.3 Sanitary Facilities

The Contractor shall provide and maintain in a strictly sanitary manner, and at his own expense, toilet facilities for himself and his workmen, which shall be screened from public view. The location thereof and the method of waste disposal shall be subject to the approval of the Engineer. The Contractor shall observe and enforce all sanitary regulations and maintain satisfactory conditions on all parts of the work.

GC.14 REPLACEMENT OF SURVEY MARKERS

When any monument, whether a stone, concrete, wood or metal or a mark on a structure, designating the line of the streets or highway or of private property, is in the line of any excavation or other construction work, and may have to be removed, the Contractor shall notify the Engineer in writing at least twenty-four (24) hours in advance. Under no circumstances shall such monument be removed or disturbed by the contractor or by any of his men without the permission of the Engineer. Should any such monument, before the Engineer has had the opportunity to provide the replacement, be destroyed through accident or neglect, the Contractor will be required, at his own expense to employ a surveyor, acceptable to the Engineer, to re-establish such points and will replace same at least equivalent to their original condition.

GC.15 USE OF COMPLETED SECTIONS OF THE WORK

The Engineer may order completed or partially completed but previously unused sections of the work to be placed in operation prior to the acceptance of the entire project. Unless otherwise provided herein, the maintenance of such sections of the project shall be the responsibility of the Owner who shall also be responsible to the Contractor for any additional costs occasioned by such opening. The Engineer shall, and is hereby agreed to have, the final authority in the determination

of such additional costs. This section does not apply to reconstruction of existing facilities.

GC.16 FINAL CLEANING UP

Before the final acceptance of the work, the Contractor shall remove all equipment, temporary work, unused and useless materials, rubbish and temporary buildings, shall repair or replace in an acceptable manner any private or public property which may have been damaged or destroyed on account of the prosecution of the work, shall fill all depressions and water pockets on public or private property caused by his work, shall clean all obstructions from waterways caused by his work, shall clean all drains, sewers and ditches within and adjacent to the work which have been obstructed by his operations, and shall leave the site and adjacent public and private property, in a neat and presentable condition wherever his operations have disturbed conditions existing at the time of starting the work. When required by the Engineer to do so, the Contractor shall procure and submit to the Engineer signed statements from effected property owners that he has fulfilled his obligations with regard to their respective properties.

GC.17 ENGINEER'S STATUS DURING CONSTRUCTION

The Engineer shall be the Owner's representative during the construction period. All instructions of the Owner to the Contractor shall be issued through the Engineer.

The Engineer shall make periodic visits to the site of the work to observe the progress and quality of the executed work to determine, in general, if the work is proceeding according to the Contract Documents. The Engineer shall not be required to make continuous or exhaustive on-site inspections, nor shall he be responsible for construction means, methods, techniques, sequences or procedures, or the safety precautions incidental thereto. On the basis of his on-site observations as experienced and qualified design professional, the Engineer shall keep the Owner informed of the progress of the work and will endeavor to guard the Owner against defects and deficiencies in the completed work.

Neither the Engineer's authority to act under this section, nor any decision made by him in good faith, either to exercise or not exercise such authority shall give rise to any duty or responsibility of the Engineer to the Contractor, any subcontractor, any of their agents or employees, or any other person performing any of the work.

The Contractor recognizes that the function of the Engineer is to present the Owner and to obtain for the Owner the best possible job. The Contractor and any subcontractor waive any claim against the Engineer and any employee or agent of the Engineer, whether in tort or contract arising out of any acts or failure to act of the Engineer or any employee, or work, duty or function of the Engineer under this Contract, and whether expressed or implied delegation to the Engineer or assumed by the engineer, including, but not limited to claims for (a) failure to coordinate the work, (b) approval or failure to approve subcontract or subcontractor, (c) any recommendation, certification, or approval or failure to recommend, certify or approve any change order, field order, schedule, payment, claim for delay or any other claim, (d) any error or discrepancy in the Plans, lines, grades, specifications, and other Contract Documents or any exercise of or failure to exercise discretion in approving or failing to approve any changes in the same, (e) any order, direction, approval, instruction, or recommendation or failure to order, direct, approve, instruct or recommend any action, operation,

charge, test, method, material, or repair, (f) any furnishing or approving or failure to furnish or approve any drawings, cut sheet, direction, instruction, or material, (g) and loss or damage due to delay or any other cause whatsoever, and (h) any observation or failure to observe.

GC.18 RESIDENT PROJECT REPRESENTATIVE

If one or more Resident Project Representatives are provided by the Owner and/or the Engineer, his or their efforts will be directed toward providing assurances for the Owner that the Completed project will conform to the requirements of the Contract Documents, but he or they will not be responsible for the Contractor's failure to perform the work in accordance with the Contract Documents. Resident Project Representatives shall consist of Field Observer(s), or Clerk(s) of the Works, or both.

GC.18.1 Field Observer

The Field Observer shall observe the work performed by the Contractor to the extent that his time permits. It is stipulated that observation of each and every item of the work is not contemplated for the following reasons:

a. It is not contemplated that sufficient Field Observers will be assigned to enable observations of each and every item of the work.

b. Where a Field Observer is observing a portion of the work, he may be required to leave the construction site for conferences, telephone calls, and/or other reasons.

The duties, responsibilities and limitations of authority of a Field Observer are as follows to the extent his time permits:

a. He shall, where possible, measure and obtain all quantities necessary to verify the amounts to be used in partial and final payments to the Contractor. Said actions shall not relieve the Contractor of his responsibility for measuring and computing the quantities required for said payments as specified in the Contract Documents.

b. He shall, where possible, locate all new construction on the Contract Plans. Said actions shall not relieve the Contractor of his responsibility in accordance with the section in the General Conditions entitled, "Ownership and Copies of Documents: Record Documents".

c. He shall notify, where possible, both the Contractor and the Engineer of all instances where, in his opinion, the work is contrary to the requirements of the Contract Documents. If the Contractor does not immediately discontinue and correct the improper performance of the work upon verbal notice of the Observer, the Observer shall, in writing, notify the Contractor or his representative in charge of the work at the site that the said work in question and/or subsequent work performed over the improper work cannot be approved for payment. The Engineer shall receive a copy of said written notification and said notification shall be a reason for the Engineer not to approve payment for the improper work, until said work is corrected. Said actions or lack of actions shall not relieve the Contractor of his responsibility to perform all work in accordance with the Contract

Documents.

d. He will not direct nor be responsible for the construction means, methods, techniques, sequences or procedures or the safety precautions thereto.

e. He will not direct nor be responsible for the direction of traffic and/or pedestrians.

GC.18.2 Clerk of the Works

The Clerk of the Works shall compile and tabulate the necessary quantities required for verification of partial or final payments, shall process correspondence, reports, etc., to and from Field Observers, and shall participate in conference relative to the construction.

The Clerk of the Works shall maintain a continuous tabulation of all quantities (rocks, unsuitable material, piles, etc.). Whenever the tabulation indicates that the quantities encountered will vary from the quantities stated in the Proposal (excluding minor variations), he shall notify the Owner, the Contractor, and the Engineer of said situation. The purpose of the notification is to keep all parties informed of the status of the Contract, and if necessary, to enable the Owner to authorize additional quantities based on the conditions encountered.

The Clerk of the Works shall be designated by the engineer. If the person(s) designated Clerk of the Works is or are on or near the actual construction, his or their duties, responsibilities, and limitations of authority shall be as defined for Field Observers.

GC.19 ENGINEER'S DECISIONS AND ORDERS

GC.19.1 Work to Satisfy Engineer

The work provided for herein shall be performed under the general direction and to the entire satisfaction of the Engineer and his decision upon all questions relating to the quality and acceptability of the work performed shall be final and binding.

GC.19.2 Clarification and Interpretations (Post-Bid)

The Engineer shall issue, with reasonable promptness, such written clarification or interpretations of the plans or specifications as he may determine necessary for the proper execution of the work. Such clarifications must be consistent with the overall intent of the Contract Documents and shall be binding upon all parties to the Contract.

GC.19.3 Engineer to Decide Payment Disputes

The Engineer shall determine the amount and quality of the work performed and of the materials furnished which are to be paid for under the Contract. Any such decision and his estimate shall be final and conclusive, and such estimate, in case of any question that may arise, shall be a condition precedent to the right of the Contractor or to the right of the Owner to withhold amounts due.

GC.20 ENGINEER'S FIELD OFFICE

On all projects where the item "Engineer's Field Office" is scheduled in the proposal, the Contractor shall provide a field office for the exclusive use of the Engineer and Inspectors, meeting the minimum requirements hereinafter set forth in the Supplementary Specifications. Such a field office shall be made available, fully equipped, within ten (10) days of starting on the project and shall be maintained a minimum of thirty (30) days and maximum of ninety (90) days following final acceptance of the work.

GC.21 INSPECTION AND TESTING PROCEDURES

GC.21.1 Thorough Inspection Requirement

The Owner contemplates and will require, and the Contractor agrees to, the most thorough possible inspection of the work at all times by the Owner, the Engineer, or their representatives. Such inspection shall include, but is not limited to, all labor performed and materials furnished, delivered, or intended to be used in the work and including their manufacture, fabrication, installation and testing.

GC.21.2 Access to the Work

The Contractor shall furnish the Engineer with every reasonable facility for ascertaining whether or not the work performed is in accordance with the requirements and intent of the Contract Documents.

The Owner or the Engineer shall have the right to inspect all work done and all materials furnished either in the field or at the point of manufacture. The Contractor shall furnish or cause to be furnished to the Engineer safe access at all times to the places where preparation, fabrication, or manufacture of materials and/or construction of the work is in progress.
When the Engineer or his representative is in or about the premises mentioned above, in the course of his duties, he shall be deemed conclusively to be an invitee of the Contractor. If the Contractor be not the Owner of the premises mentioned above, the Owner thereof shall be deemed an agent of the Contractor with respect to the obligation assumed thereof. The Contractor or his agent, as described above, shall be liable for the payment of claims for injuries to the Engineer or his representative due to negligence on the part of the Contractor or his agent.

GC.21.3 Covering Uninspected Work

If any work be buried, covered, or otherwise concealed prior to inspection or otherwise contrary to the orders and direction of the Engineer and such work is not subject to testing and approval by the Engineer, to be uncovered for examination. Such uncovering and all necessary restoration regardless of the final acceptability of the work uncovered, shall be at the expense of the Contractor.

GC.21.4 Uncovering Completed Work

The Engineer, with the approval of the Owner, may order the uncovering of any completed portion of the work at any time prior to acceptance regardless of the degree of inspection initially provided and regardless of any prior approvals. If, after examination, such uncovered work is found to be in accordance with the Contract Documents, then all expenses involved in the uncovering,

examination, testing and restoration shall be borne by the Owner. If such uncovered work does not meet the requirements of the Contract Documents, then all expenses involved, including the correction of all deficiencies in the work, shall be borne by the Contractor.

GC.21.5 Ordering Materials

Before ordering materials, the Contractor shall obtain the Engineer's approval of their acceptability. In the case of concrete aggregate, the similar materials, samples must accompany the request for approval. The Contractor must forward to the Engineer copies of all purchase orders as issued to his suppliers and must, within forty-eight (48) hours of receiving any shipments of materials, notify the Engineer of the kind, quantity, proposed use, and storage place of such materials, and must forward to the Engineer copies of any shipping lists, invoices or delivery slips that accompany such deliveries.

GC.21.6 Testing Materials

Except as may be provided elsewhere, tests or analyses of materials which are usually tested after delivery to the site, such as concrete aggregates, mixed and placed concrete and similar materials, will be performed by the Engineer or testing laboratories which will be approved by the Engineer and selected and paid for by the Owner. The preliminary testing of concrete mixtures and tests or analyses of other materials, samples of which are to be submitted prior to delivery, will also be performed by the laboratory and paid for by the Owner. The Contractor shall furnish all labor and material and otherwise make provisions for the collection and undisturbed storage of all samples of materials as required and directed by the Engineer. The Owner will furnish necessary sampling equipment and containers and transport all samples from the site to the laboratory.

If the Engineer orders sampling and analyses or tests of materials which are usually accepted on certification of the manufacturer, but which appear defective or not conforming to the requirements of the Specifications, the Owner will bear the reasonable costs of sampling, transportation, tests and analyses if the material is found to be sound and conforming to the specifications, the Contractor shall bear all costs, if the material is found to be non-conforming to the specifications.

GC.21.7 Certificates of Manufacturers

For raw or manufactured materials or products which are normally tested in the shop by the manufacturer, the Contractor shall furnish the Engineer three (3) copies of certified records of physical, chemical and other pertinent tests, and/or certified statements, from the manufacturer that the materials have been manufactured and tested in conformity with the Specifications. Where such a small quantity of material is required as to make physical tests or chemical analyses impractical, a certificate from the manufacturer stating the results of such tests or analyses of similar materials which were concurrently produced may, at the discretion of the Engineer, be considered as the basis for the acceptance of such materials.

GC.22 CONTROL OF THE WORK

GC.22.1 Unauthorized or Defective Work

Any materials or work unauthorized or found to be defective, or not in strict conformity with the

requirements of the drawings and Specifications or defaced or injured through the negligence of any Contractor or his subcontractors or employees, or through action of fire or the weather or any causes, shall be removed immediately and new materials or work substituted therefore without delays by the Contractor.

No previous inspection or partial payment shall be held as an acceptance of defective work or materials or to relieve any Contractor from the obligation to furnish sound materials or to relieve any Contractor from the obligation to furnish sound materials and to perform good satisfactory work. The Engineer is to be the final judge of the materials and work furnished.

If the Engineer deems it inexpedient to correct work injured or done not in accordance with the Contract, the difference in value between such work, and that specified, together with a fair allowance for damage, shall be deducted from the Contract Price.

GC.22.2 Suspension of Work

The Engineer shall have the authority to suspend the work wholly or in part, for such period or periods as he may deem necessary, due to unsuitable weather or such other conditions as are considered necessary and due to the failure on the part of the Contractor to carry out orders given, or perform any or all provisions of the contract. If it should become necessary to stop work for such an indefinite period, the Contractor shall store all materials in such a manner that they will not obstruct or impede the travelling public unnecessarily nor become damaged in any way, and he shall take every precaution to prevent damage or deterioration of the work performed, provide suitable drainage of the site by opening ditches, shoulder drains, etc., and erect temporary structures where necessary. The Contractor may not suspend the work without written authority.

During suspension of work due to any cause whatsoever, when deemed necessary by the Engineer, the entire work under contract or any section thereof, shall be thrown open to use, and the Contractor shall place any such section in satisfactory condition for use without additional compensation. The Contractor shall be responsible for the satisfactory maintenance of any such section of work thrown open to use prior to its final acceptance.

When work is suspended as herein provided, payments for completed portions of the work will be made as hereinafter provided for normal progress payments and a suitable extension of time for completing the suspended work will be made. No other compensation or allowance will be made on account of such suspension unless it be for more than fifteen (15) days.

Should the suspension exceed fifteen (15) days, and should the Contractor have additional expenses on account thereof he shall have the right to file with the Owner a statement of such additional expenses and if the Owner deems such statement proper, the Contractor will be reimbursed thereof, provided:

a. That the statement of additional expenses is filed within fifteen (15) days of the conclusion of the period of suspension in question;

b. That the statement of additional expenses includes no charges occurring during the first fifteen (15) days of any suspension; and

c. That no charges are made by the Contractor for any work performed during the period of suspension.

If the period of suspension exceeds one (1) year, the Owner will, upon the request of the Contractor, annul the Contract as hereinafter provided.

GC.22.2A Suspension of Work - Contractor at Fault

The Owner shall have the right to suspend the work wholly or in part, when in the opinion of the Engineer, the Contractor is not doing the work in accordance with the provisions of the Contract Documents. If it should become necessary to stop the work, the Contractor shall, at the Contractor's expense, repair all streets, sidewalks, etc. that have been excavated so that they are in such a condition that the traveling public may safely pass. All materials shall be stored so as not to obstruct or impede traffic.

The Contractor shall make no claims for delays caused by this suspension. No extension will be granted by the Owner, and once the work is allowed to continue again, the Contractor shall complete the work in this contract.

GC.22.3 Annulment of Contract

If the Contractor shall be adjudged bankrupt or make an assignment for the benefit of creditors; or if a receiver or liquidator shall be appointed for the Contractor or for any of his property and shall not be dismissed within twenty (20) days after such appointment, or the proceedings in the connection therewith shall not be stayed on appeal within the said twenty (20) days; or if the Contractor shall fail or refuse to regard laws and ordinances and such orders as may from time to time be given by the Engineer with respect to the work, or if the Contractor shall assign or sublet the work other than as hereinbefore specified or if the Contractor fails in doing the work as specified, or fails to perform the work with sufficient materials to ensure the prompt completion of said work, or shall perform the work unsuitably or shall neglect or refuse to remove materials or perform a new such work as shall be rejected as defective and unsuitable, or shall discontinue the prosecution of the fact of such delay, neglect, or default on the part of the Contractor, have full power and authority without violating the Contract, to take the prosecution of the work out of the hands of said Contractor, to appropriate or use any and all materials and equipment on the ground as may be suitable and acceptable of and may enter into an agreement with another or others for the completion of said Contract, according to the terms and provisions thereof, or use such other methods as, in the Owner's opinion, shall be required for the completion of said Contract in an acceptable manner.

Should the Owner so elect to take the prosecution of the work out of the hands of the said Contractor, all right, title, and interest in and to the equipment and materials owned by the Contractor and used in the execution of the Contract, shall be vested in the Owner, and on completion of the said Contract, the Owner may dispose of the same in the manner that to it may be deemed in the best interest of the parties concerned.

All costs and charges incurred by the Owner, together with the costs of completing the work under Contract, shall be deducted from the monies due or which may become due or which may become due said Contractor. In case the expense so incurred by the Owner shall be less than the sum which would have been payable under the Contract, if it had been completed by said Contractor, then the

said Contractor shall be entitled to receive the difference, and in case such expense shall exceed the sum which would have been payable under the Contract, then the Contractor and his surety shall be liable and shall pay to the Owner the amount of said excess.

GC.22.4 Sub-Contractors or Assignments

A. General Contractor (Prime)

The Contractor shall not assign, transfer, convey, sublet, or otherwise dispose of this Contract, or of his right, title or interest therein, or such Contract to any other person, company, or corporation without the previous consent in writing of the Owner, and he shall not assign, whether by power of attorney, or otherwise, and of the monies to become payable under this Contract unless by and with like consent. If the Contractor shall, without such previous written consent, assign, transfer, convey, sublet, or otherwise dispose of this Contract or his right, title, or interest therein, or any part thereof, or his power to execute this Contract to any other person, company, or corporation, this Contract may, at the option of the Owner, be revoked and annulled and the Owner shall thereupon be relieved and discharged from any and all liability and obligations growing out of this Contract to the Contractor and to the person, company, or corporation to whom he shall assign, transfer, convey, sublet or otherwise dispose of the same; and the Contractor and his assigns, transferee, or sublessee, shall forfeit and lose all monies thereto earned under this Contract, except so much as may be required to pay his employees; and no right under this Contract, or to any money to become due hereunder shall be asserted against the Owner, at law or in equity, by reason of any so-called assignment of this Contract or any part thereof, or of any monies to grow due thereunder unless authorized as aforesaid by written consent of the Owner, provided that nothing contained herein shall be construed to hinder, prevent, or affect an assignment by the Contractor for the benefit of his creditors made pursuant to the laws of the State of New Jersey.

B. Subcontractors, Etc.

The Contractor shall not sublet, sell, transfer, assign, or otherwise dispose of the Contract or bid on any portion thereof, or of the work provided for therein, or of his title, right, or interest therein to any person, firm, or corporation without the written consent of the Owner.

Prior to the execution and delivery of the Contract, the successful bidder shall submit to the Owner for acceptance a list of the names of subcontractors and such other persons and organizations (including those who are to furnish materials or equipment fabricated to a special design) proposed for those portions of the work as to which the identity of the subcontractors and other persons and organizations must be submitted as specified in the Contract Documents. Prior to the execution and delivery of the Contract, the Counsel will notify the successful Bidder, in writing, if either the Owner, the Engineer, or the Counsel, after due investigation, has reasonable objection to any subcontractor, person, or organization on such list. The failure of the Owner, the Engineer, or the Counsel to make objection to any subcontractor, person, or organization on the list prior to the execution and delivery of the Contract shall not constitute a waiver of any right to reject defective work, material, or equipment not in conformance with the requirements of the Contract Documents.

If, prior to the execution and delivery of the Contract, the Owner, the Engineer, or the Counsel has reasonable objection to and refuses to accept any subcontractor, person, or organization on such list, the successful Bidder, may, prior to the execution and delivery, either (a) submit an acceptable

substitute without an increase in his bid price, or (b) withdraw his bid and forfeit his bid security. If after the execution and delivery of the contract, the Owner, the Engineer, or the Counsel refuses to accept any subcontractor, person, or organization on such list, the Contractor shall submit an acceptable substitute and the Contract price shall not be increased or decreased under any circumstances.

The Contractor will not employ any subcontractor (whether initially or as a substitute) against whom the Owner, the Engineer, or the Counsel may have reasonable objection, nor will the Contractor be required to employ any subcontractor against whom he has reasonable objection. The Contractor shall not make any substitution for any subcontractor who has been accepted by the Owner, the Engineer, or the Counsel unless the Owner determines that there is good cause for doing so.

The Contractor shall be fully responsible for all acts and omissions of his subcontractors and of persons directly or indirectly employed by them and of persons for whose acts any of them may be liable to the same extent that he is responsible for the acts and omissions of persons directly employed by him. Nothing in the Contract Documents shall create any contractual relationship between any subcontractor and the Owner, the Engineer, or the Counsel or any obligation on the part of the Owner, the Engineer, or the Counsel to pay or to see to the payment of any monies due any subcontractor, except as may otherwise be required by law. The Owner may furnish to any subcontractor, to the extent of practicability, evidence of amounts paid to the Contractor on account of specific work done in accordance with the schedule of values.

The division and section of the Specifications and identifications of any drawings shall not control the Contractor in dividing the work among subcontractors or delineating the work to be performed by any trade.

The Contractor agrees to specifically bind every subcontractor to all of the applicable terms and conditions of the Contract Documents. Every subcontractor, by undertaking to perform any of the work, will thereby automatically be deemed to be bound by such terms and conditions.

The Contractor will be required to perform a minimum of fifty percent (50%) of the money value of the work of the contract with his forces. Requests for a subcontractor or combination of subcontractors totaling more than fifty percent (50%) of the money value of the work of the Contract shall not be considered by the Owner.

GC.22.5 Legal Address of Contractor

Both the address given in the Proposal upon which this Contract is founded and the Contractor's office at or near the site of the work are hereby designated as places to either of which notices, letters, and other communications to the Contractor may be mailed or delivered. The delivering at either of the above-named places, or depositing in a postpaid wrapper directed to either such place, in any post office box regularly maintained by the post office, or any notice, letter, or other communication to the Contractor, shall be deemed sufficient service thereof upon the Contractor, and the date of said service shall be the date of such delivery or mailing. The first named address may be changed at any time or an instrument in writing executed and acknowledged by the Contractor and delivered to the Owner. Nothing herein contained shall be deemed to preclude or

render inoperative the service of any notice, letter or other communication upon the Contractor personally.

GC.23 CONTRACT CHANGES

GC.23.1 Changes in Estimated Quantities

In entering this Contract, the Contractor agrees that the quantities of work as stated in the Proposal or indicated on the drawings are only approximate and that during the process of the work the Engineer may find it advisable to, and he shall have the right to, omit portions of the work or to increase or decrease the quantities. The Contractor agrees to accept payment for the actual amount of work performed under each item as measured in place by the Engineer.

The Contractor agrees that he will not make claim for anticipated profits or loss of profits, because of any difference between the quantities of the various items of work as measured in place by the Engineer and the said estimated quantities.

The Contractor will not be entitled to payment and hereby agrees that he will not be entitled to payment for any increase in the quantities estimated unless ordered or authorized in writing and signed by the Engineer and approved by the Owner.

GC.23.2 Supplementary Agreements

If it is found necessary to have any work executed beyond that covered by the items of work in the Contract, the Contractor hereby agrees to execute the same in as diligent a manner as followed in the execution of the work under the original contract. The Engineer will have the right to enforce any provisions under the Contract in the execution of said work.

The amount of compensation to be paid to the Contractor for any supplementary work, as so classified and ordered, shall be determined by any of four methods, as approved by the owner as follows:

a. Be such applicable combination of Contract unit prices, if any, as are set forth in the Contract and may be used to describe the work performed; or

b. If no such combination of unit prices is possible, then by unit prices or by a lump sum mutually agreed upon by the Owner and the Contractor; or

c. If the supplementary work is performed by subcontract, and the amount of such subcontract be verified as reasonable by the Engineer, then the Contractor shall be paid the amount of such subcontract plus ten percent (10%) as full compensation; or

d. If no such unit prices are set forth, and if the parties cannot agree upon unit prices or a lump sum and the work is not done by subcontract, then the Contractor shall receive the true necessary cost to him, including workmen's compensation, public liability, unemployment and social security insurance but exclusive of administration, general superintendence and profit, as determined by the Engineer, plus twenty percent (20%) shall be considered as covering administration, general superintendence, profit and all other expenses not included

in the new cost, and the Engineer's determination and certificate of such cost when approved by the Owner shall be binding and conclusive on the Contractor, and the Engineer shall be deemed the arbiter to determine the cost of such work. It is understood that before any work is started, or materials are ordered, the rate to be paid for labor, materials, equipment rental and all other unit costs applicable to the work, and the number and kind of laborers, quantities of material, type of equipment or appurtenances to be used in initiating and continuing the work shall be mutually agreed to by the Contractor and the Engineer and the Contractor shall make no changes in the labor, materials, equipment, supplies and appurtenances without prior written approval of the Engineer.

Prices paid by the Contractor shall be at current local rates and payment to the Contractor will be made by the Owner at the current local rates or prices mutually agreed to by the Engineer and the Contractor.

All components of cost, work performed, equipment, material and labor furnished, shall be reported on daily report sheets, and the Contractor shall be paid on the basis of the daily reports signed by the Engineer.

GC.23.3 Change Orders

Before payment is made for any additional or supplementary work or before any final payment certificate is submitted, the Engineer will prepare a Change Order for any such changes in quantities, additional items or other alterations in the requirements of the Contract Documents. He shall also prepare a reduction order if any quantities have been omitted.

These Change Orders shall be written, shall carry a statement or recommendation over the signature of the Engineer and shall be combined with the original Contract and the final estimate shall be in accord with this combination.

GC.23.4 Supplementary Drawings

Supplementary drawings may be issued by the Engineer, to the Contractor from time to time, where the plans require supplementing, to explain the work more fully or to show additions or changes which have been ordered by the Owner. These supplementary drawings shall have the same force and effect as any other Contract Documents.

GC.23.5 Extensions of Time

The Contract time may only be changed by a Change Order. If the Contractor is entitled by the Contract Documents to make a claim for an extension of time, his claim shall be in writing, delivered to the Owner, the Engineer and the Counsel within ten (10) days of the occurrence of the event giving rise to the claim. Upon notification of a possible material or equipment delay beyond the control of the Contractor, the Contractor shall immediately advise the Owner and the Engineer of said possible Delay. An extension of time may be granted by the Owner on account of some unusual difficulty, accident or other good and sufficient cause, and by so doing said Owner may waive the right to deduct from any subsequent estimates, during the period of any such allowed extension of time, the liquidated damages already provided for, but in any and all such cases of extension of time, the Contractor shall be liable to the Owner for all wages and expenses which said

Owner must pay for the inspection of the work or material such extension of time is required by a duly issued Change Order increasing the quantity of work to be performed. All requests from the Contractor for extension of time must be accompanied by the approval of the surety company or bondsmen.

GC.24 SHOP AND SETTING DRAWINGS

The Contractor shall submit with such promptness as to cause no delay in his own work or that of any other contract, a transparent copy of all shop or setting drawings, details, and schedules required for the work; and the Engineer will pass upon them with reasonable promptness. The Contractor shall make any corrections required by the Engineer and resubmit a transparent copy for approval. After final approval of the drawings has been received, the Contractor shall immediately send the Engineer (6) prints of the final approved drawings, plus one (1) approved print each to every other interested contractor or supplier. The Engineer will make proper distribution of all drawings as directed by the Owner. At the Contractor's option, the requirement for a transparent copy may be waived and the Contractor permitted to submit sufficient copies of the actual shop drawings, schedules, etc., direct to the Engineer.

The Engineer's approval of shop or setting drawings shall only be construed to apply to general layout and conformance to the design concept of the project and for compliance with the general requirements of the Contract Documents. The responsibility for any deviations from the requirements of the Contract Documents must remain the Contractor's unless he has, in writing, specifically called the Engineer's attention to such deviations at the time of submission and has received the Engineer's written approval of such deviations.

GC.25 CONSTRUCTION PHOTOGRAPHS

Unless otherwise provided, the Contractor, as directed by the Engineer, shall furnish a series of construction photographs taken by an experienced commercial photographer, to show the progress of the work. Photographs shall be taken at such times and locations as ordered by the Engineer. Not less than eight (8) photographs, not more than twelve (12) photographs, taken at regular intervals, shall be taken during each month throughout the duration of the project. Proofs of all photographs shall be provided to the Engineer. Of these proofs, the Engineer shall, monthly, select not less than four (4) nor more than eight (8) for printing. Two (2) glossy prints of each proof selected during each month shall be submitted to the Engineer. Prints for submission shall be not less than eight (8) inches by ten (10) inches in size, mounted on cloth, with a flap for binding, and properly and fully identified as to date, location, etc., by typing on the reverse side.

GC.26 PROSECUTION OF THE WORK

GC.26.1 Beginning Work

The Contractor shall begin work within ten (10) days of the date of mailing of Notice of Contract Award; provided, however, that he shall have executed the Contract, provided all necessary bonds and certificates, given the Engineer due notice of his intentions and received written permission from the Engineer to commence work. Should the Contractor, through his own error or omissions or other delays on his part, fail to begin work within the time specified, he may, at the option of the Owner be declared in default of the Contract.

The place where the work is to be started will be stated in the Special Provisions or will be designated on the ground by the Engineer.

The work will be prosecuted from as many different points in such part or parts and at such times as may be directed and shall be conducted in such manner and with sufficient materials, equipment and labor as is considered necessary to ensure its completion within the time set forth in the Contract. Should the prosecution of the work for any reason be discontinued by the Contractor, with the consent of the Engineer, he shall notify the Engineer at least twenty-four (24) hours before again resuming operation.

GC.26.3 Progress Schedule

Prior to beginning work, the Contractor shall submit to the Engineer four copies of a progress schedule for all items of construction. The schedule shall show the sequence of construction operations, the estimated time of installation and completion of each operation and the times of establishment and estimated duration of any traffic relocations. Such progress schedules shall be subject to the Engineer's approval and the Contractor, once he receives approval of a particular schedule, may not deviate from the same without the permission of the Engineer.

GC.26.4 Job Meetings

The Contractor, his subcontractors, his materialmen and suppliers whose presence is requested shall attend all job meetings called by the Engineer upon forty eight (48) hours notice. Lack of attendance at any job meeting by any of the above shall be sufficient reason for the suspension of work as herein provided. The proceedings of all job meetings shall be recorded by the Engineer who shall furnish two (2) copies of such proceedings to the Owner and four (4) to the Contractor for distribution as required.

GC.27 PUBLIC RELATIONS AND SAFETY

GC.27.1 Public Safety and Convenience

The following shall be performed prior to the commencement of any construction:

A. Notification of State

The Contractor shall notify, by certified mail, the Bureau of Engineering and Safety, Department of Labor and Industry, John Fitch Plaza, Trenton, New Jersey of the starting date, scope, location, Owner, Counsel and Engineer of the work to be performed. Said notice shall include a statement certifying that the Contractor and all subcontractors are familiar with and will comply with all applicable laws, regulations, etc., relative to safety, including but not limited to the Worker Health and Safety Act., P.L., 1965, Chapter 154, the Construction Safety Code of the State of New Jersey and the Federal Occupational Safety Health Act.

B. Notification of Employees

The Contractor shall post the following printed notice in a prominent and easily accessible place(s)

at the site(s) of the work. Said notice shall be printed in English, and if any employee cannot read and understand the notice shall be printed in language(s) or word(s) that each employee can read and understand.

The Contractor shall conduct his work with the least possible obstruction to traffic. The protection of persons and property, and the convenience of the public and of residents adjacent to the work, are of first importance and shall be provided for by the Contractor in an adequate and satisfactory manner. Suitable and safe temporary crossings shall be constructed and maintained where access to adjacent property is required. Fire Hydrants shall be left free of obstruction at all times, and access provided for fire apparatus.

Materials and equipment stored on the site shall be placed so as to cause as little inconvenience to residents and the travelling public as is necessary. Roadways, sidewalks, gutters, and sewer inlets, adjoining the work under construction, shall not be obstructed more than is absolutely necessary.

The Contractor shall provide for prompt removal, from existing roadways, of all dirt and other materials that have been spilled, washed, tracked or otherwise deposited thereon by his hauling and other operations whenever, in the opinion of the Engineer, the accumulation is sufficient to cause the formation of mud, interfere with drainage, damage pavements, or create a traffic hazard.

The Contractor shall employ construction methods and means that will keep flying dust to a minimum. He shall provide for the allaying of dust whenever the public is affected by such dust. Materials and methods of dust control shall be subject to the approval of the Engineer.

GC.27.2 Maintenance and Protection of Traffic

The Contractor shall erect or place and maintain in good condition, barricades, warning signs, lights, flares, approved yellow-flashing light units, rubber traffic cones, and other warning and danger signals and devices, appropriate and adequate for the specific needs and subject to the Engineer's approval at working sites, closed roads, intersections, open excavations, locations of material storage, standing equipment and other obstructions, at points where the usable traffic width of the road is reduced, at points where traffic is deflected from its normal courses or lanes, and at other places of danger to vehicular or pedestrian traffic.

The Contractor shall provide sufficient watchmen and traffic directors and shall take all other precautions, including any which may be ordered by the Engineer, that may be necessary for the safety of the public and protection of the work.

The Contractor shall obtain the approval of the Engineer and consent of all appropriate authorities having jurisdiction, for any detours which may be required. The Contractor shall make all necessary arrangements with such authorities regarding the establishment, maintenance and repair of such detours, the regulations and direction of traffic thereon, and the installation and maintenance of sign and traffic devices.

No specific payment to maintain a safe work zone; include said costs in various other pay items.

GC.27.3 Closing Work Areas to Public Use

All streets, intersections, sidewalks, parking areas and all other publicly used portions of the project are to be kept open overnight and on Saturdays and Sundays of each week, unless written permission is granted by the Engineer to do otherwise.

If required by Construction operations, the Contractor may close roadways and driveways for periods not to exceed eight (8) hours. Property owners affected by such closings shall receive written notice to such closing at least twenty-four (24) hours prior to the start of operations. Copies of such notices shall be provided to the Engineer.

GC.27.4 Inadequate Precautions by the Contractor

If the Engineer deems the precautions taken by the Contractor to be inadequate he may order additional protection and should the Contractor or his men neglect to put up, provide or maintain such suitable protection as is required by these Specifications, the Engineer or the authorities of the Owner may immediately, and without notice to the Contractor, furnish materials and put up and maintain such protection as is deemed necessary and the cost thereof shall be paid by the Contractor.

All expenses incurred for protective measures herein specified and for repairs and replacements, shall be borne by the Contractor.

GC.27.5 Maintenance of Drainage

The Contractor shall provide all that is required for the removal and disposal of water from the trenches, excavations for structures and other points of work. Ground water shall be lowered and maintained at such elevation that there will be no spring action or flow of water into excavation areas.

Adequate facilities, as approved by the Engineer, shall be provided for the interception of suspended matter from the pump discharge before its disposal into existing drainage facilities. Where well points are to be used the Contractor shall obtain approval of the plans and equipment from the Engineer.

The Contractor shall provide and maintain acceptable ditches, flumes or pumping installations, as required, to care for water courses and sewerage facilities (Natural or Artificial) intercepted by his operation or structures.

In all cases where temporary pipes must be installed, or where sewage water, or drainage must be pumped or otherwise carried over or around excavations, or any other portions of the work, the Contractor shall furnish such pipes, pumps, and all other materials, equipment and labor as are required to maintain continuity of services in the utilities affected.

The Contractor will be held responsible for flooding of adjacent properties from any of his operations and will be held liable for all claims due to flooding, or other damage caused by the above operations.

GC.27.6 Emergencies

In emergencies affecting the safety of persons, public or private property or the work of the project, the Contractor, without specific instructions or authorizations from the Engineer or Owner, is obligated to act, at his discretion, to prevent damage, injury or loss. He will give the Engineer prompt written notice of any changes in the work or deviations from the Contract Documents caused by such action as he was obligated to take.

GC.28 PUBLIC UTILITIES - SUBSURFACE STRUCTURES

The Contractor shall secure and pay for all construction permits and licenses and shall pay all governmental and public utility charges and inspection fees necessary for the prosecution of the work except as may be otherwise provided for in the Contract Documents.
The Contractor shall give all notices and comply with all laws, ordinances, rules, and regulations applicable to the work.

Available information as to the location of existing subsurface structures and utilities have been collected from various sources. The results of such investigations, shown on the Contract Drawings, are not guaranteed as to accuracy since locations indicated on Plans are based on Mark-Outs by respective utilities.

The Contractor's attention is also directed to the fact that the exact location elevation and sizes of the utilities and other sub-surface structures that may exist can only be guaranteed where test holes have been made as indicated on the plans. Consequently, the Contractor shall make an independent investigation of sub-surface structures and utilities as detailed below and shall have no claims for damages due to sub-surface structures or utilities encountered in locations other than shown on the contract drawings.

If the Owner, the Engineer or their agents, and employees elect to assist the Contractor in the location of underground objects, the accuracy and completeness of said assistance is not guaranteed in view of equipment malfunctions or disturbances which affect the accuracy of the equipment utilized. Any discrepancies or damage resulting from said assistance shall not be cause for compensation or claims against the Owner, the Engineer, agents or employees.

Where boring information is provided, said information has been obtained solely to assist the Engineer in his design, and the Contractor is warned that any use he makes of this information is at his own risk. The Contractor is further reminded that the borings show information at specific points. Nothing is implied or suggested relative to sub-surface conditions adjacent to or between borings. Boring information relative to ground water levels and/or frost conditions is understood to apply only to the date of the boring.

Prior to bid, the Contractor is required to make his own investigation of sub-surface conditions, including boring, test pits, and other means. By entering into this Contract, the Contractor represents that he relies solely on his own investigation as to sub-surface conditions, and not on boring or other information furnished by the Owner or the Engineer.

After award of the contract, the Contractor is required to independently determine the need for individual test pits and is to request in writing to the Engineer that said test pits be authorized for

payment. Failure of the Contractor to request said test pits, in writing, as to specific location and type of utility (i.e.: street name, station and offset, and whether utility is gas, water, sanitary sewer, storm sewer, electric, telephone, cable television, etc.), shall prevent additional compensation or claims against the Owner.

Upon completion of test pits, the Contractor shall supply the Engineer with all necessary information to determine whether a potential conflict exists at the location in question. The Engineer, upon determining that a conflict exists, based on the information supplied by the Contractor, shall notify the respective utility company to relocate their line(s). The Contractor shall have no claims, nor shall additional compensation be requested from the Owner for delays as a result of utility line relocation. The Contractor is directed to coordinate all relocation of utilities with the respective utility company so as to ensure the timely elimination of said utility conflict.

When utility facilities are damaged by the Contractor, he shall notify their owners, who may cause him to repair the damage or may cause its repair by others at the Contractor's expense. If the cost thereof has not been paid by the Contractor within thirty (30) days after billing, the Owner, upon application of the utility, may retain an amount sufficient to cover the cost from any monies due or that become due the Contractor.

No separate payment shall be made for removal, relocation, and restoration of pipes, wires, or similar structures as delineated on the plans or as required due to their being in the path of construction. At the Engineer's discretion, the Contractor may be required to gravel the top of the compacted pipe trench for a period not to exceed one (1) week to allow for settlement, during which time dust control is to be maintained. Paving is to immediately follow this one (1) week settlement period, otherwise the Contractor is to either apply cold patch or prime oil (0.40 gal./SY) to the trench. The cost for the above shall be included in the price bid for the various items scheduled in the Proposal.

GC.29 RESPONSIBILITY OF CONTRACT

GC.29.1 Responsibility of Work

The Contractor is responsible for all damages due to his operations; to all parts of the work, and to all adjoining property until the work is accepted and final payment is made. The Contractor shall protect the Owner and the Engineer and their agents or employees from all suits, actions, damages, and costs of every name and description resulting from the work of this Contract. The Contractor is responsible for the protection of all work until the project is accepted and final payment is made.

GC.29.2 Responsibility for Damages and Claims

The Contractor shall assume the defense of and indemnify and keep indemnified and save harmless the Owner and all of the officers, agents, and employees of the Owner, from and against all claims, demands, detriments, liability suits, losses, description, resulting from or arising out of the performances of the Contract or the doing of any work, or furnishing and delivery of any machines, tools, plants, equipment, supplies, materials, or labor provided for herein or therein; or resulting from or arising out of, or brought for or on account or by reason of, any injuries or damages to any person or persons or property, by or from the Contractor, or any of his or its operations, or his or its negligence or carelessness in the performance of the work, or in safeguarding the work, or from any

improper materials, implements, or appliances used in its construction or by or account of any act or omission, neglect, or misconduct of the Contractor, or his or its agents, servants, or employees, or by or on account of any claims, or amounts recovered, for any infringement of patent, trademark, or copyright, or by or from any claims arising, or recovered under any law, ordinance, regulation, order, or judgement.

The whole, or so much of the monies due under and by virtue of the Contract as shall be considered necessary by the Owner may, at its option, be retained by the Owner until all suits or claims or demands for damages as aforesaid shall have been settled and evidence to that effect furnished to the satisfaction of the Owner.

GC.29.3 Contractor Assumes Absolute Liability

The liability of the Contractor hereunder, for all injuries to persons or damages to persons or damages to property, is absolute and is not dependent upon any question of negligence on his or its part or on the part of his or its agents, servants or employees, and neither the approval of the Engineer of the methods of doing the work, nor the failure of the Engineer to call attention to improper or inadequate methods or to require a change in method nor the neglect of the Engineer to direct the Contractor to take any particular precautions or to refrain from doing any particular thing, shall excuse the Contractor in case of any such injury to persons or damages to property.

GC.29.4 Insurance Requirements

Certificates of liability and workmen's compensation insurance satisfactory to the Owner and the Engineer shall be filed with the Owner and the Engineer.

All of the Contractor's insurance coverage shall contain a clause indemnifying and saving harmless the Owner, the Engineer and their agents from any and all liability of whatever nature arising from the work to be performed under the Contract, including attorney's fees and costs in connection with the defense of such claims. The certificate of insurance furnished by the Contractor shall state specifically that the above indemnification is guaranteed by the policy. Such statement, if not included in the body of the policy will be typed on the face or back of the certificate.

The minimum amounts of insurance to be carried by the Contractor shall be as follows:

1. Workmen's Compensation and Employer's Liability Insurance

   The Contractor shall take out and maintain during the life of this Contract adequate workmen's compensation and employer's liability insurance for all employees employed in connection with the work, and in case any work is sublet, the Contractor shall require each subcontractor similarly to provide workmen's compensation and employer's liability insurance for the latter's employees, unless such employees are covered by the protection afforded by the Contractor's insurance.

   Coverage A shall be New Jersey Statutory
   Coverage B (Employer's Liability) shall be in the amount of $1,000,000 or unlimited as per the New Jersey Workmen's Compensation Laws.

2. Comprehensive General Liability

Limits shall be $1,000,000 bodily injury (BI), each occurrence and $500,000 property damage (PD) each occurrence.

The Certificate of Insurance must indicate coverage at the above limits for:

A. Explosion, collapse and underground utilities (XCU)
B. Contractual - Indicated on the face of the Certificate as being in accordance with the wording of the Contract, specifically the second paragraph of this section
C. Independent Contractors
D. Completed Operations

3. Comprehensive Automobile Liability

Limits shall be $1,000,000 bodily injury (BI), each occurrence and $500,000 property damages (PD) each occurrence.

Certificate of Insurance must indicate coverage at the above limits for:

A. Hired Vehicles
B. Non-Owned Vehicles

4. Owner's Protective Policy

The Contractor shall supply an Owner's Protector's policy written in the name of the Owner, the Engineer, and their agents, with limits of $1,000,000 bodily (BI) and $500,000 property damage (PD). In lieu of this policy, the Contractor may indicate on the Comprehensive General Liability Certificate of Insurance, the Owner, the Engineer, and their agents have been named as an additional insured for this Contract.

5. Special Insurance Requirements

A. Workmen's Compensation

If the Contract involves bulkheads, pile driving, dredging, groins, jetties or seawalls, or otherwise requires work on the banks of or adjacent to a navigable waterway, the United States Longshoreman's and Harbor Workers Endorsement must be attached. If the job requires skows, barges, tugboats or workboats of any nature, the United States Maritime Endorsement must be attached.

B. Builder's Risk/Installation Floater

If the contract provides for the construction of any structure, a Builders Risk Policy shall be required. The policy shall be for 100% of the completed value of the structure and written in the name of the Owner and the Contractor as their interests may appear. Minimum deductible shall not exceed $250.00.

C. Railroad Protective

If the Contract requires the Contractor to enter on any railroad right-of-way, the Contractor must submit certificates of insurance indicating that he has met the insurance requirements of that railroad. Such requirements will be determined by the Contractor, if not set forth in the Special Provisions.

The policies shall remain in force until all work has been completed, unless authorized differently by the Engineer. The Contractor shall ascertain the cost to him of all the required insurance policies before submitting his bid.

All policies shall be endorsed to provide both the Owner and the Engineer with ten (10) days written notice in advance of any changes or cancellations which modify the coverage provided.

In the event the Contractor shall carry blanket liability insurance coverage, compliance with the foregoing requirements shall be met by furnishing an endorsement or rider to said blanket liability policy naming the Owner, the Engineer, NJ Transit and their agents as co-insured for the work involved, hereunder, provided the limits of said blanket liability insurance policy shall comply with the amounts outlined above.

The policies and/or endorsements herein required must be submitted to the Owner and the Engineer (to each in duplicate) at least five days prior to beginning any work under the terms of the Contract.

GC.30 LIENS AND CHATTEL MORTGAGES

In case any lien, stop notice or claim of work, labor or materials, done, performed or delivered and used in the prosecution of the work herein provided for, shall be filed with the Owner, then in that case the Owner may retain from any monies due to the Contractor, a sum equal to the amount of such claims or notice, until such time as the Contractor shall furnish a receipt or release therefrom or thereof.

No materials or supplies, for the work, shall be purchased by the Contractor or by the subcontractor subject to any chattel mortgage or under a conditional sale or other agreement by which an interest is retained by the seller. The Contractor warrants that he has good title to all materials and supplies used by him in the work.

GC.31 RIGHT OF PROPERTY IN MATERIALS

Nothing in the specifications or in the Contract shall be considered as vesting in the Contractor any right of property in materials used after they shall have been attached or affixed to the work or the soil, but all such materials shall, upon being so attached or affixed, become the property of the Owner.

GC.32 PATENTS, ROYALTIES AND LICENSES

As part of his obligation, hereunder and without any additional compensation, the Contractor shall pay for all patent fees, licenses or royalties required with respect to the work, and will fully indemnify the Owner for any loss on account of infringement of any patent rights unless, prior to his use on the work of a particular process or a product of a particular manufacturer, he notifies the Owner in writing that such process or product is an infringement of a patent.

GC.33 CLAIMS AND PROTESTS

If the Contractor considers any work required of him to be outside the requirements of the Contract or considers any record or ruling of the Observers or Engineer as unfair, he shall ask for a written instruction or decision immediately and should then file a written protest with the Owner and the Engineer against the same within five (5) days thereafter or he shall be considered as having accepted the record or ruling, and shall, therefore, forfeit any claim to future compensation in any form on account of such order or decision.

GC.34 PAYMENT

GC.34.1 Measurement of Quantities

All work completed under the Contract shall be measured by the Engineer according to United States Standard Measures using the units scheduled in the Proposal. Whenever requested by the Engineer, the Contractor shall provide the necessary capable assistance together with suitable facilities for weighing measuring or otherwise determining the quantities of materials used in the work.

GC.34.2 Adjustment of Estimated Quantities

The quantities shown are approximate only, and the Owner reserves the right to increase or decrease them at the written order of the Engineer. The Owner reserves the right to omit any items in the Proposal if deemed to be in the best interest of the Owner to do so.

GC.34.3 Scope of Payments

The Contractor shall receive and accept the compensation, as herein provided, in full payment for furnishing all materials, labor, tools, plants, supplies and equipment and for performing and maintaining all work contemplated and embraced under the Contract, also for all loss or damage arising out of the nature of the work, or from the action of the elements, or from any unforeseen difficulties or obstructions which may arise or be encountered during the prosecution of the work, until its final acceptance by the Owner after duration of the maintenance period, and for all risks of every description connected with prosecution and maintenance of the work, also for all expenses incurred by, or in consequence of, the suspension or discontinuance of the said prosecution of the work as herein specified, and for any infringement of patent, trademark or copyright and for completing the work and the whole thereof, in an acceptable manner according to the plans and

specifications. The payment of any current or final estimate, or of any retained percentage, shall in no way or degree, prejudice or affect the obligation of the Contractor at his own cost and expense, to repair, correct, renew or replace any defects and imperfections, in the construction of, in the strength of, or quality of materials used in or about the construction of the work under contract and its appurtenances as well as all damage due or attributable to such defects, which defects, imperfections, or damages shall be discovered on or before final inspection and acceptance of the work or after the maintenance period, and of which defects, imperfections or damages the Engineer shall be the judge and the said Contractor shall be liable to the Owner for failure to do so.

GC.34.4 Payments and Acceptance

The Engineer will make current estimates in writing on or about the first of each month as to the work progress, of the materials in place and the amount due for the work performed in accordance with the contract during the preceding periods and the value thereof figures at the unit price bid. From the total of the amounts so ascertained will be deducted an amount equivalent to ten percent (10%) of the whole to be retained by the Owner until after the completion of the entire Contract in an acceptable manner, and the balance or a sum equal to ninety percent (90%) of the whole shall be certified by the Engineer to the Owner for payment within thirty (30) days of the date of certification by the Engineer.

Upon the completion of the work, the Engineer shall certify to the Owner, in writing, as to the completion of the work and shall further certify as to the entire amount and value of each class of work performed.

The final Application for Payment shall be accompanied by such supporting data as the Engineer may require in order to establish the final quantities for payment. The Contractor shall submit to the Counsel complete and legally effective releases or waivers (satisfactory to the Owner) of all Liens arising out of the Contract Documents and the labor and services performed and the material and equipment furnished thereunder. In lieu thereof, and as approved by the Owner and the Counsel, the Contractor may furnish receipts or releases in full; an affidavit of the services, material, and equipment, for which a Lien could be filed, and that all certified payrolls, material and equipment bills, and other indebtedness connected with the work for which the Owner or his property might in any way be responsible, have been paid or otherwise satisfied; and consent of the surety, if any, to final payment.

The Owner, within sixty (60) days, of receipt of such certificates shall certify the aforesaid certificate and estimate for payment of the amount unpaid and due, which amount shall be one hundred percent (100%) of the entire cost of the work less previous payments and any other proper deduction as herein provided.

At the time of acceptance, the whole work must have been finished in a neat and workmanlike manner and must be in that condition at that date. Defects arising from any cause or at any time before acceptance must be made good and the whole work put in the condition as herein specified before acceptance.

The Contractor, must before receipt of any certificate calling for payment, furnish the Engineer with satisfactory evidence that all persons who have sustained damage or injury by reason of any act, omission or carelessness on his part been duly paid or so secured that no liability of any kind or

character can attach to the Engineer or the Owner, or their agents or employees, on account of any such claim.

If at any time of making monthly or other estimates, the Engineer should neglect to condemn defective material or work, such neglect shall not be construed as an acceptance of any such material or work.

GC.34.5 Payment Amendments per Public Law 1979

The Contractor is advised that Public Law 1979, Chapter 152 as amended is applicable if the total amount of the Contract awarded for this project exceeds $100,000. If this contract requires the withholding of payment of a percentage of the amount of the contract. The provisions of GC.34.4 are amended to provide that the Contractor may:

1. Agree to the withholding of payments in the manner prescribed in the contract. Such agreement will be indicated by signing of estimate or payment certificates unless written communication to the contrary is made to the OWNER and Engineer, or

2. Deposit with the OWNER negotiable bearer bonds of the State of New Jersey, or negotiable bearer bonds or notes of any political subdivision of the State of New Jersey.

    a. The value of such bonds or notes will be equal to the full amount that would otherwise be withheld.

    b. If the amount of the contract is increased, additional bonds or notes will be provided or withholding shall be made on the amount of any such increase.

    c. The nature and amount of such bonds and/or notes will be subject to approval by the Owner.

    d. The term "value" shall mean par value or current market value, whichever is lower. If, after being deposited, the current market value of such bonds and/or notes increases by $1,000 or more, the Contractor shall provide additional bonds and/or notes to restore the full amount required or be subject to withholding on the difference.

    If the Contractor agrees to the withholding of payments, the amount withheld shall be deposited, with a banking institution or savings and loan association insured by an agency of the Federal Government, in an account bearing interest at the rate currently paid by such institution or associations on time or savings deposits. Any interest accruing on such cash withholdings shall be credited to the Owner.

    If the Contractor deposits bonds and/or notes, the interest on such bonds and/or notes shall accrue to the Contractor. The amount withheld, or the bond and/or notes deposited and any interest accruing on such bonds and notes, shall be returned to the Contractor within thirty (30) days of the fulfillment of the terms and conditions of the contract relating to final acceptance and payment.

The Contractor is advised that the Public Law 1979, Chapter 152 as amended is applicable if the total amount of the contract awarded for this project exceeds $100,000.

If this contract exceeds $100,000.00 partial payments will be made each month. If portions of payments are to be withheld the provisions of GC.34.4 are amended to provide that:

1. From the total amounts due as ascertained through a current engineer's estimate will be deducted an amount equivalent to two percent (2%) of the whole.

2. This amount shall be retained by the OWNER until after the completion of the entire contract is an acceptable manner and the balance of the sum of 98% of the whole shall be certified by the Engineer to the Owner for payment within thirty (30) days of the date of certification by the Engineer.

3. Any interest accruing on such cash withholdings shall be credited to the Owner.

GC.34.6 Withholding Payments

The Engineer may withhold, or on account of subsequently discovered evidence, nullify the whole or part of the certificate for payment to such extent as may be necessary to protect the Owner from loss on account of:

a. Defective work not remedied.

b. Claims filed, or reasonable evidence indicating probable filing of claims.

c. Failure of any Contractor to make payments promptly to subcontractors or for material or labor.

d. A reasonable doubt that the Contract can be completed for the balance then unpaid.

When all the above grounds are removed, certificates will at once be issued for amounts withheld because of them.

GC.35 GUARANTY (MAINTENANCE) BOND

Unless otherwise specified, before final payment is made as herein provided, the Contractor shall furnish a Surety Corporation Bond to the Owner in a sum equal to:

a. Fifty percent (50%) of the final adjusted Contract amount if such amount be $25,000 or less;

b. Thirty percent (30%) of the final adjusted Contract amount if such amount be greater than $25,000 but less than $75,000; and

c. Ten percent (10%) of the final adjusted Contract amount if such amount be $75,000 or more.

The Bond and Surety Corporation shall be satisfactory to the Owner and the Bond shall remain in full force and effect for a period of two (2) year from the date of final payment for the work by the Owner and shall provide that the Contractor and the Surety guarantees to replace for the said period of two years from the date of final payment for the work, all work performed and/or all materials furnished that was not performed or were not furnished according to the terms and performance requirements of the Contract Documents, and will make good any defects thereof which become apparent before the expiration of two (2) years.

GC.36 SURFACE REPAIR GUARANTEE

Unless otherwise provided, the Contractor's responsibility for all pavement surface repairs shall be extended beyond the normal two (2) year maintenance period as set forth in Section GC.35 Guarantee (Maintenance) Bond to a period of one (1) year beyond the normal two (2) year period of maintenance for a total surface repair period of three (3) years. During the last year of this period, the Owner will require a performance bond, of satisfactory form, in the sum of five (5) percent of the final adjusted contract amount to cover any necessary surface repairs within the limits of the Contract.

GC.37 ACCEPTANCE OR PAYMENT NOT A WAIVER

Neither the acceptance by the Owner or the Engineer, nor any of their employees, nor any order, measurement, or certificate of the Engineer, nor any order by the Owner for payment of money, nor any payment for, nor acceptance of the whole or any part of the work by the Engineer or the Owner, nor any extension of time, nor any possession taken by the Owner or employee thereof, shall operate as a waiver of any portion of this Contract or any power herein reserved to the Owner, or any right to damages herein proved, nor shall any waiver of any breach of this Contract be held to be a waiver of any other subsequent breach. All remedies provided in this Contract shall be taken and construed as cumulative, that is, in addition to each and every other remedy herein provided.

GC.38 FINAL PAYMENT TERMINATES OWNER'S LIABILITY

No person, firm, or corporation other than the signer of this Contract as Contractor now has any interest hereunder, no claim shall be made or be valid and neither the owner nor any of his agents shall be liable for or be held to pay any money except as provide in this Contract. The acceptance by the Contractor of the final payment aforesaid shall operate as, and shall be, a release to the Owner and his agents.

SUPPLEMENTAL CONDITIONS

SUPPLEMENTAL CONDITIONS

SC-1 The following outline of the scope of work for this project is intended as a supplement to the General Instructions and Conditions. The work contemplated includes, but is not limited to the following:

The project scope includes the upgrading of an existing pump stations electrical components, with all associated electrical, structural, concrete, wiring, controls, panels, pump station lid construction, fencing and restoration.

SC-2 A pre-construction conference shall be held prior to the start of work at a time and place designated by the Engineer. Refer to General Conditions.

SC-3 The Engineer shall be duly authorized to represent the OWNER in the execution of the work covered by the Specification and Contract.

SC-4 The successful bidder shall be in a position to mobilize immediately and shall start construction at the direction of the Engineer upon execution of all contract documents. This work will progress on a consecutive work day until project completion, taking into account possible weather delays.

SC-5 The OWNER shall have the authority to limit or postpone any work being performed under this contract if such limitations or postponements are in the best interest of the OWNER. The Contractor shall make no claims for any delays resulting from the limitations or postponements of work by the OWNER.

SC-6 Site Conditions: The Contractor, by the submission of a bid, acknowledges as follows: that he has satisfied himself as to the nature and location of the work, the general conditions, including, but not limited to, those bearing on accessibility, transportation, disposal, handling and storage of materials; the availability of labor, water supplies, materials, power, roads, ground conditions and obstacles; and the character of the equipment and facilities needed prior to and during prosecution of the work. Any failure of the contractor to acquaint himself with any and all factors bearing on the project will not relieve him from the responsibility of estimating properly the difficulty and cost of successfully performing the work under the terms of the contract, and at the unit, or lump sum prices bid in the Proposal.

All bidders must visit the site and verify that all sites are viewed in person.

SC-7 The OWNER reserves the right to increase, decrease, or delete the quantities or items specified in the Proposal, if such changes are in the best interest of the OWNER. The Contractor shall accept payment for the actual total quantity of work completed under each item at the unit price bid for such item in the Proposal. The Contractor shall make no claims for any anticipated profits, costs, or charges which may have varied due to any changes made in the quantities as stated in the Proposal.

SC-8 The Contractor shall not initiate work on the project until such time as authorization is given by the OWNER or Engineer.

SC-9 All quantity adjustments, contract changes, and change orders shall be prepared in accordance with N.J.A.C. 5:30-11.7 et. seq.

SC-10 If, in the sole opinion of the Engineer, weather conditions are not suitable for any or all items of work under this contract to be performed, the Contractor shall not perform such work until weather conditions are suitable. The Contractor is warned that this may cause items of work to be delayed for extended periods of time. No extra payments shall be made for such delays and the Contractor shall make no claims for damages caused by such delays.

SC-11 The Contractor shall understand that time is of the essence on this project. The Contractor shall expedite the work within the Contract time limit. The Contractor is required to submit a schedule satisfactory to the Engineer showing, in general, the times intended to commence and construct the contract items.

SC-12 The Contractor shall coordinate the limits of work and any storage areas required with the OWNER and Engineer. All work must be scheduled in such a manner to permit continued operation of the appropriate streets adjacent to the project.

SC-13 The OWNER and the Engineer shall be notified at least 72 hours prior to the commencement of construction. No work shall commence until such time as the Contractor has received permission from the Engineer.

SC-14 In the event it is found that any workman, employed by the Contractor or any subcontractor on this project has been paid a rate of wages less than the prevailing wage required, the OWNER may terminate the Contractor's or subcontractor's right to proceed with the work or such part of the work as to which there has been failure to pay required wages and to prosecute the work to completion or otherwise, the Contractor and his surety(ies) shall be liable to the OWNER for any excess costs associated thereby.

Prior to final payment, the Contractor shall be required to execute and deliver an AFFIDAVIT OF COMPLIANCE in a form provided by the OWNER as required by the New Jersey Prevailing Wage Act.

SC-15 The Contractor shall take reasonable care and caution to preserve and protect all existing pavements, curbs, grassed and landscaped areas, trees, sidewalks, roof drains, storm and sanitary sewers, utility lines, fences, driveways, building structures, and private and public property beyond the limits of work. Damage to any of the above caused by construction procedures in the opinion of the Engineer shall be replaced at the Contractor's expense.

All areas disturbed by the Contractor's operations other than those scheduled in the contract, shall be restored to its preconstruction condition at the expense of the Contractor.

SC-16 The Contractor shall be responsible for the disposal of all materials and debris that will not be reused. Said materials and debris must be removed during site clearing. There shall be no separate payment for disposal and all costs required for and incidental to the completion of work herein as shown on the drawings or as directed by the Engineer shall be included in the prices bid for other items in the Proposal Form.

All materials scheduled for removal shall become the property of the Borough of Highlands. If Borough of Highlands decides that they do not want these materials, there will be no separate payment for disposal.

SC-17 No concrete shall be poured until the Engineer inspects and approves the forms. The Contractor shall be required to adjust the forms as directed by the Engineer prior to the pouring of concrete if necessary.

SC-18 Apply for and obtain local building, framing and electrical/foundation permits before starting work. Fees will be waived.

TECHNICAL SPECIFICATIONS

TECHNICAL SPECIFICATIONS
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SECTION 01000 - SUMMARY OF WORK

1. GENERAL

1.01 Work Under This Contract

The project scope includes the construction of a fiberglass shelter with all associated electrical, structural, wiring, controls, panels, and restoration, as described herein.

The work includes, but is not limited to, the following:

A. Apply for local building and electrical permits for foundation, piles, frame and electrical. Permit fees will be waived.

B. Clear work area of any small debris that is laying around the existing pump station site.

C. Location of all existing utilities within the project limits where pile driving will be required.

D. Submit fiberglass shelter, electrical equipment, and structure steel submittals for review.

E. Perform a test timber piling to determine pile depth at which it meets or exceeds the design capacity per pile.

F. Layout the pile locations in accordance with the plans and drive piles down to meet the design bearing capacity and the top pile shall be at the proposed elevation so the shelter is at a FFE of 14.00; any reference to any other FF elevations is hereby deleted.

G. Install all structural members and pour concrete slab floor @ Elev. 14.00.

H. Furnish and install atop a steel/concrete elevated platform, one (1) 6'x7'x8' High Fiberglass Shelter, manufactured by either Shelter Works, Shelter 1, DuPont or Parkline, Or Equal; enclose all electrical components, main panels, controller. PT wood may be used to build the steps and platform to access the disconnect and terminal box.

I. Install steel walking platform, stairs, railings.

J. Install all proposed electrical equipment including the pump transducers and stilling wells.

K. Stilling wells are to be included in the 'Electrical, Complete'.

L. Get service hooked up to the new electrical equipment and simultaneously disconnect the pump from existing power and re-power up the pump to the new controls.

M. Install, mount and run all raceways, panels, boxes, controllers, MDP, etc. at a MINIMUM ELEVATION OF 15.00; NO EXCEPTIONS. The fiberglass hut shall be set at Elevation 14.00, and all equipment, raceways, boxes, jb's shall be set 12-inches above FFE at 15.00.

N. When ordering the transducers, furnish 40-ft of cable per unit, and spool up the extra inside the wetwell, hanging on wall next to stilling well; this will used in future when new station is installed.

O. Test and put in operation the stormwater pump station.

P. JCPL shall remove the existing service. Once power is cut remove all existing electrical equipment. This includes removing the (2) piles.

Q. The contractor shall Design-Build a new three (3) piece removable pump station lid out of Pressure Treated Lumber and 5/4" thick Decking Boards.

R. The contractor shall Design-Build a set of steps and a 3'x4' platform in front of the Main Service Disconnect Box. Structure shall be constructed out of PT lumber and all footings shall be 4,500psi concrete; a minimum of 12" diameter and 48" deep.

S. Remove old fence and install a new 4' high pressure treated picket fence with a man-gate.

T. Perform site work, restoration & cleanup work.

U. Coordination with the Borough of Highlands for full transfer of all warranties, etc on shelter and electrical equipment.

V. Provide as-built sketch and warranties and O&M manuals at finish. Obtain Local Construction Official approval when done.

The above general outline of work does not in any way limit the responsibility of the Contractor to perform all work and furnish the required materials, equipment, labor and means as shown or required by the Contract Documents.

END OF SECTION

SECTION 01210 - ALLOWANCES

1. GENERAL

1.01 Description

The project scope includes the construction of a new electrical system that may involve unforeseen conditions and work authorizations, during actual work in the field. This allowance pay item gives the ENGINEER the ability to review, consider, discuss with the OWNER, and immediately give authorization for labor, equipment and materials that are not part of the original scope of work.

If funds are available after all electrical work is done, the OWNER will request a proposal and scope of work to design/build a series of inside and outside mounted galvanized bar grates on the gate check valve to the river, to stop debris from clogging the flapper gate.

Alternative plans may be considered during construction as well, if funds are available.

The Successful Bidder shall not bill against the 'Allowance' without first receiving express written authorization from the Owner/ Engineer, with discrete instructions on the 'additional services' entailed.

END OF SECTION

DIVISION 01 – GENERAL REQUIREMENTS

SECTION 01340 – SUBMITTALS

PART 1 – GENERAL

It is essential for the Contractor to start the submittal process immediately upon receipt of the Contract, before the pre-construction meeting. Owner agrees to review all submittals in a timely fashion.

1.01 SECTION INCLUDES

A. CONTRACTOR'S Responsibilities.

B. OWNER'S Duties.

C. Submittal Requirements.

D. Re-submittal Requirements.

E. Products.

F. Shop Drawings.

G. Manufacturer's Requirements.

H. Submittal Codes.

1.02 RELATED SECTIONS

Contractor shall be responsible for coordination of all equipment, work, etc. specified within this section to all related sections within the contract documents.

1.03 CONTRACTOR'S RESPONSIBILITIES

A. CONTRACTOR'S Responsibilities:

1. Review submittals prior to submittal.
2. Determine and verify following:
    a. Field measurements.
    b. Field construction criteria.
    c. Catalog numbers and similar data.
    d. Conformance with Specifications.
3. Coordinate each submittal with requirements of Work and Contract Documents.
4. Notify the ENGINEER in writing, at time of submittal, of deviations in submittals from requirements of the Contract Documents. No deviation will be allowed without the written permission of the OWNER. If CONTRACTOR fails to notify OWNER of deviations, he shall pay for all cost for equipment replacement or removal to correct problem.
5. Begin no fabrication or work requiring submittals until return of submittals with the ENGINEER'S approval.
6. Designate in Construction Progress Schedule, dates for submittal and receipt of reviewed Shop Drawings and samples.

7. Submittals received but not required in Specifications shall be returned without review.

8. Submit Record Documents in accordance with Section 01720 PROJECT RECORD DOCUMENTS.

B. OWNER'S Duties:

1. Review submittals in accordance with schedule. Submit all shop drawings via email pdf to expedite. Follow up with paper copies once approved via email response.

2. Affix stamp and signature, and indicate acceptance of submittal or further action required of CONTRACTOR.

3. Return submittals to the CONTRACTOR for distribution or for resubmittal per the Construction Services Contract.

1.04 SUBMITTAL PROCEDURES

A. Contractor shall submit all shop drawings and submittals / designs via pdf via email to ENGINEER to expedite review process.

Owner and Engineer will review, provide comments via email only.

Once Shop Drawing is accepted, the ENGINEER will notify Contractor via email to submit 5-signed & sealed copies of the submittal package, via overnight delivery to the ENGINEER, for immediate review stamp and signatures.

ENGINEER will then send approved drawings to the Contractor, two stamped copies, within 2 days thereafter.

B. All paper for the production of the submittals to be recycled with a weight of 20 lbs.

C. Identify Contract, CONTRACTOR, Subcontractor and/or supplier; pertinent drawing sheet and detail and Specification section number, as appropriate.

D. Apply CONTRACTOR'S stamp, signed or initialed, certifying that review, verification of products required, field dimensions, adjacent construction work, and coordination of information, are in accordance with the requirements of the Work and Contract Documents.

E. All engineering submittals or calculations shall bear the stamp and signature of a Professional Engineer registered in the State of New Jersey.

F. Schedule submittals in accordance with the approved schedule.

G. Identify variations from Contract Documents and product or system limitations that may be detrimental to successful performance of the completed Work in the transmittal letter to the ENGINEER.

H. Provide space for the ENGINEER'S review stamp.

I. Revise and resubmit submittals within fourteen (14) days. Identify all changes made since previous submittal. CONTRACTOR'S failure to obtain approval of submittals shall not be

used by CONTRACTOR as a basis for delays in achieving Contract Completion Dates.

J. Provide a detailed schedule for the delivery of each required submittal within thirty (30) days of Notice to Proceed. Assign a submittal number to each submittal or partial submittal using the Specification number first, and a sequential number for each submittal within that Specification in accordance with the form provided by the OWNER.

K. Progress payments may be withheld if submittals, resubmittals or schedule updates are not presented to the ENGINEER in accordance with the project schedule as required.

L. In addition to the paper copies required for submission, an electronic file shall be made from the paper original, and submitted with the paper copies, for all submittals and re-submittals, other than physical samples. These electronic files shall be in electronic Adobe Acrobat PDF format or in another format acceptable to the ENGINEER. Electronic documents shall be full size of the original paper documents and shall be delivered on CD.

M. For each item that is copyrighted, submit a copyright release allowing the OWNER/ENGINEER to make unlimited copies, to edit or otherwise revise documents, and to re-use for future operation, maintenance, and training associated with LBSA facilities.

1.05 PROPOSED PRODUCTS LIST

A. Proposed products shall be provided in accordance the General Conditions or, as otherwise specified in the Contract Documents.

B. Within ten (10) days after Notice to Proceed, submit a complete list of products proposed for use, with Specification section number, name of manufacturer, trade name, and model number of each product.

C. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation, and reference standards.

D. Specifically identify the products, the anticipated schedule for delivery and storage, and the estimated value thereof for materials that the CONTRACTOR intends to request approval for off-site storage and partial progress payment therefore.

1.06 SHOP DRAWINGS

A. Shop Drawings shall be in accordance with the GENERAL CONDITIONS or as otherwise specified in the Contract Document.

B. Within thirty (30) days after Notice to Proceed, submit a list of Shop Drawings indicating Specification section number, contents, proposed numbering system, and time schedule for preparation and submission for all Shop Drawings for the contract.

C. Submit Shop Drawings in the form of five (5) opaque reproductions for the ENGINEER plus the number of copies to be returned.

1.07 PRODUCT DATA

A. Submit the number of copies that the CONTRACTOR and Subcontractors require, plus five (5) copies which will be retained by the OWNER.

B. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information unique to this Project. Indicate project equipment number or tag number for which product is proposed.

1.08 SAMPLES

A. Samples shall be submitted in accordance Section GC GENERAL CONDITIONS, except as otherwise specified herein below.

B. Submit samples to illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.

C. Submit samples of finishes from the full range of manufacturers' standard colors, textures, and patterns for the OWNER'S selection.

D. Include identification on each sample, with full project information.

E. Submit the number of samples specified in individual Specification sections; one of which will be retained by the OWNER.

F. Reviewed samples that may be used in the work are indicated in individual Specification sections.

1.09 MANUFACTURER'S INSTRUCTIONS

A. Submit manufacturers' printed instructions for delivery, storage, assembly, installation, start-up, adjusting and finishing, in quantities specified under Product Data above.

B. Identify conflicts between manufacturers' instructions and Contract Documents.

1.10 MANUFACTURER'S CERTIFICATES

A. When specified in individual Specification sections, submit manufacturers' certificate to the OWNER for review, in quantities specified for Product Data.

B. Certify material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.

C. Certificates may be recent or previous test results on material or product, but must be acceptable to the OWNER.

1.11 WARRANTY

A. Submit all warranty information in accordance with individual specification sections and Section GC GENERAL CONDITIONS.

B. Submit full warranty packages for the electrical equipment, shelter, etc.

PART 2 – PRODUCTS

NOT USED

PART 3 – EXECUTION

NOT USED

END OF SECTION

SECTION 01345 CONSTRUCTION STAKE-OUT

1. GENERAL

Successful bidder will be required to perform all construction layout of timber pile locations, foundation locations, and elevations for top of timber pilings and first floor elevation; owner's surveyor will provide plans and control upon request. OWNER's Engineer will provide successful bidder with all ACAD files, traverse points, control points, benchmarks for reproducing in the field by the Contractor's Surveyor.

Contractor's PLS should mobilize immediately and verify control, elevations, and determine if there are any discrepancies, before starting.

MEANS & METHOD OF MEASUREMENT AND PAYMENT

Construction stake-out will not be measured for payment; the costs associated with stake-out shall be included in various other pay items in the Proposal.

END OF SECTION

DIVISION 1 – GENERAL REQUIREMENTS
SECTION 01505 - CLEARING SITE AND MOBILIZATION

1. DESCRIPTION

This section includes mobilization of all Contractor's bonding, insurance, temporary facilities, security, staging areas, stockpile set-up, equipment, materials, and work force required to perform the work as specified herein within the required completion time; removal of any debris or similar obstructions in the site of the work. Mobilization will NOT be measured for payment; costs thereof should be included in various other items in the Proposal.

If there should be no separate items provided for in the Proposal, clearing site shall also include any work necessary in order to partially remove existing decking or bulk head cap to make room for the proposed structures and piles.

Additionally, this lump sum payment should also include the labor and equipment and tipping fees to dig-up, remove, haul away and dispose of the existing electrical equipment that is not to be reused and the timber pile supports.

Clearing site shall also include any work not actually listed in the schedule of items in the Proposal, which is required for completion of work as described by the plans and contract documents.

Demolition:

Successful bidder shall be responsible to remove and dispose of the existing electrical equipment that is not to be relocated and the timber piles that the electrical equipment is currently attached to or as noted as TBR on the Construction Plans.

SCHEDULE:

The contractor's schedule should include at a minimum the following tasks with critical times to complete the structural, electrical, and restorations, etc.:

a. Pre-construction meeting and formal NTP.
b. Submit all shop drawings fiberglass structure, structural steel, electrical.
c. Start test piles.
d. Layout and install timber pilings.
e. Set structural steel and concrete floor.
f. Set fiberglass shelter, platform, and stairs.
g. Install electrical equipment and obtain a new service connection.
h. Topsoiling, grass vegetation and stabilization
i. Restoration and Final Cleanup

2. MATERIALS

Materials required for work included under clearing site and mobilization shall comply with applicable

specifications cited herein.

3. METHODS OF CONSTRUCTION

The site of the project shall be cleared within the limits of construction. (Clearing will proceed only as necessary in order to facilitate construction). The ground surface shall be cleared of all trees, brush, weeds, roots, matted leaves, small structures, debris, and other unsuitable matter, except as otherwise hereinafter provided.

Construction methods, required for the work included under "Clearing Site" not specifically described, shall comply with the applicable provisions of these specifications, or as directed by the Engineer.

4. PAYMENT

4.01 Clearing Site

Payment for clearing site will be made based on the lump sum price bid for the item 'Clearing Site' in the Proposal, which price shall be for all clearing site work specified above, including, but not limited to: clearing and debris in the site area, removing and disposing of existing electrical equipment not to be relocated, removing and disposing of the existing timber piles that the electrical equipment is mounted to, modifying/removing small parts of the existing decking or sheet pile cap to install the timber piles, and all material, labor, equipment, and all else necessary for and incidental to the completion of the work specified herein.

"Clearing Site" shall also include removal, relocation, repair and/or replacement of any items damaged by the Contractor's operations, as well as any work, not specifically scheduled in the Proposal, which is required for the completion of the project. Payment for Clearing Site will be related to percent complete of said project as a whole.

4.02 Mobilization

Mobilization will not be measured for payment; all costs of initiating the contract, mobilizing equipment and material to the site should be included in various other items in the proposal.

END OF SECTION

DIVISION 1 – GENERAL REQUIREMENTS
SECTION 01600 - PRODUCTS

1. GENERAL

1.01 Protection of Material and Equipment

All electrical and mechanical equipment shall be stored in a warm, dry shelter with proper ventilation. Under no circumstances shall electrical control equipment, or any other electrical or mechanical equipment be stored under polyethylene plastic covers or tarpaulins.

2. PRODUCTS

2.01 General

Unless otherwise specifically provided for in these specifications, all equipment, materials, and articles incorporated in the work shall be new, in current production, and the best grade obtainable consistent with general construction usage.

Materials specified by reference to the number of symbol of a specified standard, such as a Commercial Standard, Federal Specification, or other similar standard, shall comply with the supplement in effect on the date of the specifications, except as limited to type, class or grade, or modified by these specifications.

The Contractor should allow adequate time for ordering long-lead time equipment and will not be entitled to a time extension for delays to the project resulting from his failure to timely order long-lead-time items.

2.02 Coordination of Dimensions

Contractor shall verify and make necessary corrections to construction dimensions so that all specified and/or alternate equipment, which is approved by the Engineer, can be installed and will function within the intent of the Contract drawings and specifications.

2.03 Safety and Health Requirements

All material, equipment, fixtures, and devices furnished shall comply with current requirements and standards of the Occupational Safety and Health Act of 1970, as currently amended, and all state and local laws, ordinances, and codes governing safety and health.

3. EXECUTION

3.01 Installation

Material and equipment shall be installed in accordance with the appropriate sections of these specifications and with manufacturer's recommendations and with all local, State and Federal code requirements.

The services of manufacturers' representative to supervise and/or inspect equipment installations shall be provided by the Contractor, as specifically required under other Sections of these Specifications, at no additional cost to the Owner.

END OF SECTION

SECTION 01700 - PROJECT CLOSEOUT

1. GENERAL

1.01 Testing of Facilities

The Contractor shall produce a first-class job and upon completion of construction all facilities shall be tested under operating conditions any leaks or building imperfections shall be repaired to the satisfaction of the Engineer at no additional expense to the Owner.

1.02 Cleaning Up

The Contractor shall periodically, or as directed during the progress of the work, remove and properly dispose of the resultant dirt and debris and keep the premises reasonably clean. Upon completion of the work, he shall remove all temporary construction facilities and unused materials provided for the work and put the premises in a neat and clean condition and do all cleaning and washing required by the specifications. Trash and combustible materials shall not be allowed to accumulate on the premises.

1.03 Guarantees and Warranties

The Contractor shall and hereby does warrant and guarantee that all work executed under this Contract will be free from defects of materials, equipment, and workmanship for a period of one year from the date of final acceptance of this work.

All equipment guarantees and warranties shall be furnished to the Owner so that the equipment guarantee and warranty shall reside with the Owner.

END OF SECTION

SECTION 01711 - RESTORATION, CLEAN-UP AND DEMOBILIZATION

1. DESCRIPTION

Unless otherwise required by the plans, all areas, structures, utilities, etc., along the line of the work, which are removed, destroyed, lost, or injured on account of any act or omission on the part of the Contractor, his agent, servants, or employees in the prosecution of the work will be restored to their original condition at the expense of the Contractor.

This item also includes the restoration of any grass strips around the new pilings, stairs, or conduit runs including the labor equipment and material to re-topsoil, seed, mulch and restore grass growth to it original condition before starting. This includes any equipment ruts being filled with topsoil and reseeded.

On paved surfaces, the Contractor shall not use or operate tractors, bulldozers, or other power-operated equipment, the treads or wheels of which are so shaped as to cut or otherwise damage such surfaces. Any damaged HMA surfaces outside of the limits of paving that are damaged by steel tracks or other heavy objects shall require milling and resurfacing, AT NO COST to the Owner.

2. METHODS OF CONSTRUCTION

At such times as may be directed all areas affected by the work done under the contract shall be restored by the Contractor to the same condition in which they were at the time of the opening of bids for this contract. Any necessary topsoiling and seeding shall be done according to the applicable specifications.

General Clean-up and Demobilization

At such times as may be directed, and upon completion of the work performed under this contract, the Contractor shall remove from the job site all materials, equipment, laborers, and all else necessary which were placed thereon by him as a consequence of performing this work ad which are not required by the Contract to be left as part of the finished work. The entire work and portions of the site affected thereby shall be left in a satisfactory condition.

3. QUANTITY AND PAYMENT

Payment for restoration, cleaning up, and demobilization should be included in the pay item ‘Restoration, Complete’ in the Proposal. The price shall include all materials, labor, equipment, and all else necessary for and incidental to the completion of the work as specified herein and required for the completion of the project.

END OF SECTION

SECTION 01720 – PROJECT RECORD DOCUMENTS

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. CONTRACTOR'S Responsibilities.

B. Construction Video/Photographs.

C. Maintenance of Documents.

D. Recordings.

E. Submittals.

1.02 RELATED SECTIONS

Contractor shall be responsible for coordination of all equipment, work, etc. specified within this section to all related sections within the contract documents.

1.03 CONTRACTOR'S RESPONSIBILITIES

A. The CONTRACTOR shall maintain at the site for turnover to the OWNER an electronic copy and a record copy of all items as follows:

1. Contract Drawings.

2. Specifications.

3. Addenda.

4. Change Orders and Other Modifications to the Contract.

5. Field Orders or Written Instructions.

6. Test records and Reports.

7. Construction Video/Photographs.

Maintain at the site for turnover to the OWNER three record copies and electronic copies of approved Shop Drawings, Product Data, Working Contract Drawings, and Samples.

1.04 CONSTRUCTION VIDEO/PHOTOGRAPHS

A. The CONTRACTOR shall videotape the entire project site including all asphalt pavements, existing bulkheads, existing bulkhead caps, existing decks, the pump station structure, all parts of the pump station, structures to be demolished, and existing structures that are to be modified. The original videotape shall be turned over to the OWNER/prior to beginning construction activities. The videotape shall be Kodak

HGX Gold or Maxell HGX Gold in VHS format, or high-quality DVD. The video shall clearly identify existing site and structural conditions prior to construction. Similar video of all affected existing structures shall be made at completion of construction. The OWNER shall accompany the CONTRACTOR when recording and shall be provided two copies of the completed video.

1.05 MAINTENANCE OF DOCUMENTS AND SAMPLES

A. Samples and submittals shall be stored by the Owner and Engineer.

B. Contractor must also have on hand one copy of each and every approved shop drawing, on-site, in a clean orderly fashion, for view by the Owner and Engineer at any time.

No Trailer is required for this Contract.

C. File documents and samples in accordance with CSI/CSC format.

D. Maintain documents in a clean, dry, legible condition and in good order. Do not use record documents for construction purposes.

E. Make documents and samples available at all times for inspection.

F. As a prerequisite for monthly progress payments, exhibit the currently updated "project record documents" for review.

1.06 RECORDING BY THE CONTRACTOR

A. Label each document "PROJECT RECORD" in neat large printed letters.

B. Record information concurrently with construction progress.

1. Do not conceal any work until required information is recorded.

C. Contract Drawings shall be legibly marked in red to record actual as-built construction to include at a minimum the following:

1. All underground piping with elevations and dimensions, changes to piping location, horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements, actual installed pipe material, class etc.

2. Field changes of dimension and detail.

3. Changes made by Field Order or by Change Order.

4. Details not on original Contract Drawings.

5. Equipment and piping relocations.

6. Depths of various elements of foundation in relation to finish first floor datum.

7. Location of internal utilities and appurtenances concealed in the construction (including electrical conduit), referenced to visible and accessible features of the structure.

8. Major architectural and structural changes (such as relocations of doors, etc.).

9. Changes to architectural schedules.

10. Wiring and Interconnection Diagrams shall be submitted for all control panels and field mounted devices/equipment. They shall include terminal number points, color of wire, location of terminal blocks, terminal block numbers and location of any wire nuts between terminal blocks. This requirement shall be in addition to any Record Document requirements specified under Division 16.

11. Record Instrumentation Loop Diagrams shall be submitted on a single 8½×11 sheet for each monitoring or control loop. The format shall be the Instrument Society of America, Standard for Instrument Loop Diagrams, ISA-S5.4., including all optional information. Each wire shall be shown with all terminations as part of the loop diagram. Terminations furnished under other sections of this Specification shall be shown and completely identified on the as-built Contract Drawings in the submittal. The loop diagram numbers shall be the same numbers as used in the Contract Documents. This requirement shall be in addition to any Record Document requirements specified under Division 11.

D. <u>Specifications and Addenda; Legibly mark each Section to record:</u>

1. Manufacturer, trade name, catalog number, and supplier of each product and item of equipment actually installed.

2. Changes made by Field Order or by Change Order.

E. Shop Drawings (after final review and approval): Three copies of each approved shop drawing, with letters of confirmation attached if appropriate.

F. Certified site survey and buried piping Contract Drawings showing all revisions.

1.07 SUBMITTAL BY THE CONTRACTOR

A. At contract close-out, deliver Record Documents and electronic copies to the OWNER.

B. Accompany submittal with transmittal letter in duplicate, containing:

1. Date.

2. Project title and number.

3. CONTRACTOR'S name and address.

4. Title and number of each Record Document.

5. Signature of CONTRACTOR or his authorized representative.

PART 2 – PRODUCTS

NOT USED

PART 3 – EXECUTION

NOT USED

END OF SECTION

SECTION 02300 – CLEAN STONE SURFACE

DESCRIPTION

This section covers the labor materials and equipment necessary to furnish, deliver, place, and compact ¾" decorative stone, fabric, and subgrade.

MATERIALS

¾" clean stone for placement on the surface.

Filter Fabric Material shall be Mirafi 500X as manufactured by Tencate or approved equal.

TenCate Geosynthetics North America Corporate Headquarters

http://www.tencate.com/Pages/1090/TenCate/Geosynthetics/Region-North-America/en/en-Geosynthetics---Geotextiles

365 South Holland Drive

Pendergrass, Georgia 30567
Tel: 706-693-2226
Fax: 706-693-4400
Email: spec@tencate.com

METHODS OF CONSTRUCTION

Under this item, the Contractor shall compact the subgrade surrounding the pump station, as shown on the plans or as directed by the engineer. Contractor shall then place filter fabric atop the compacted subgrade.

A 2-ft filter fabric overlap shall be required, along with slack to permit compaction without tearing.

Contractor shall place and compact a 3" thick layer of ¾" decorative stone directly on top of the filter fabric.

QUANTITY AND PAYMENT

The quantity for which payment for clean stone surface, measured in square yards, furnished and installed to the required limits shown on the Standard Details shall be included in the unit price bid per square yard for '3/4" Clean Decorative Stone, 3" Thick'

This price shall include all labor, material, and equipment for excavation, grading, shaping, preparation of the subgrade, and for furnishing and installing the stone and filter fabric in accordance with this section of the Specifications, and the Contract Plans, and all else necessary for and incidental to this work. There is no measurement or payment for filter fabric; the costs thereof should be included in the unit price bid for '3/4" Clean Decorative Stone, 3" Thick' in the Proposal.

END OF SECTION

SECTION 02459
TIMBER PILES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

B. The contractor will perform a Test pile on site within the project area. This test pile will be used to determine the true depth at which is needed to meet the design bearing capacity of the pile. The test pile will be paid for as a linear foot under the **Test Timber Pile, Complete** item in the proposal.

C. Once the Test Pile is complete the contractor can order the appropriately sized timber pilings for the rest of the proposed piles.

D. Timber pilings for the elevated platform are shown on the structural plans; all costs associated with the pilings should be included in the unit price bid for the **Timber Pilings, Complete** item in the Proposal.

E. The intention is for all tops of timber piles to be cut off flush with the top of the Channel Beam as seen in the detail on the plans.

1.2 SUMMARY

A. Section includes:
   1. Timber pilings

B. Related Sections:

   1. Reference Standards:
      A. Timber materials and design of timber structures shall be in complete accordance with the “National Design Specification for Wood Structures” (NDS), Current Edition, and all supplements, as published by the American Forest & Paper Association and the American Wood Council. (ANSI / AF&PA NDS-2005)
      B. ASTM Standard D25, “Standard Specification for Round Timber Piles”, latest edition.

1.3 UNIT PRICES

A. The Contract Sum: Base the Contract Sum on number of piles from top of grade to embedment into grade as indicated PLUS the length above grade to obtain the design elevation of 13.50. No exceptions.

1. Additional payment for pile lengths in excess of that indicated will not be made unless the test piles conclude that added length is required to sustain the total load.

2. No payment will be made for rejected piles, including piles driven out of tolerance, defective piles, or piles damaged during handling or driving.

3. Owner will pay for the actual total length of piles used, as authorized by the Engineer. The minimum load per pile is 2-tons each. Contractor shall complete test pile in presence of Engineer or Inspector to verify that said load bearing is achieved, before moving ahead with the remaining 5-piles.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Show fabrication and installation details for piles, including details and pile butt protection

C. Timber pile treatment data.

D. Pile-Driving Equipment Data: Include type, make, and rated energy range; weight of striking part of hammer; weight of drive cap; and, type, size, and properties of hammer cushion.

E. Pile-driving records: Submit within three days of driving each pile.

F. Field quality-control reports.

G. Static Pile Test Reports: Submit within three days of completing each test.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.

1. Installer's responsibility includes engaging a qualified professional engineer to prepare pile-driving records.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver piles to Project site in such quantities and at such times to ensure continuity of installation. Handle and store piles at Project site to prevent breaks, cuts, abrasions, or other physical damage.

1. Do not drill holes or drive spikes or nails into pile below cutoff elevation.

1.7 PROJECT CONDITIONS

A. Protect structures, underground utilities, and other construction from damage caused by pile driving.

B. If underground obstructions are encountered during installation, the contractor shall have the option of removing the obstruction if possible or relocating the pile with the engineer's approval. The latter option may require relocation of adjacent piles and/or redesign of adjacent foundations.

PART 2 - PRODUCTS

2.1 TIMBER PILES

A. All pile materials and operations shall be in compliance with the requirements of the New Jersey Uniform Building Code and International Building Code New Jersey Edition.

B. Round Timber Piles: ASTM D 25, Class B, unused, clean peeled, one piece from butt to tip; of the following species and size basis:
   A. Species: Southern Yellow Pine
   B. Size Basis: Class B

C. Timber piles shall have minimum butt diameter of 12" in all locations, unless otherwise noted on the design drawings.

D. Length of piles shall be as required to attain bottom and top elevations as shown on the design drawings, and to attain the specified load capacities.

E. The design is based on a 40-ft long timber pile, with roughly 9-feet exposed and 31-feet buried.

F. Verify in field actual depth based on required end bearing and adjust lengths as required.

G. Timber piles shall be air-seasoned prior to kiln drying.

H. Pile Butt: Trim pile butt and cut perpendicular to longitudinal axis of pile. Chamfer and shape butt to fit tightly to driving cap of hammer.

I. Pile-Length Markings: Mark each pile with horizontal lines at 12-inch (305-mm) intervals; label the distance from pile tip at 60-inch intervals. Maintain markings on piles until driven.

J. Pile Finish: Piles are to be pressure treated. Pressure treatment shall conform to all federal, state, and local regulations.

K. Piles shall be preservative treated full length by the full cell process as follows: Copper azole (CA) preservative treatment conforming to AWPA standards C-3 with wood retaining not less than 0.41 pounds/c.f. treatment shall be in accordance with American wood preservers' association specifications. The treatment shall be so performed that the timber will have as a minimum the final retention specified. The top of all-round timber piles after cut off shall be

coated with a sealing compound. The sealing compound shall be a marine epoxy and must be approved by the engineer.

PART 3 - EXECUTION

3.1 DRIVING EQUIPMENT

A. Pile Hammer: Air-, steam-, hydraulic-, or diesel-powered type capable of consistently delivering adequate peak-force duration and magnitude to develop the ultimate capacity required for type and size of pile driven and character of subsurface material anticipated.

B. Hammer Cushions and Driving Caps: Between hammer and top of pile, provide hammer cushion and steel driving cap as recommended by hammer manufacturer and as required to drive pile without damage.

C. Leads: Use fixed, semifixed, or hanging-type pile-driver leads that will hold full length of pile firmly in position and in axial alignment with hammer.

3.2 DRIVING PILES

A. General: Continuously drive piles to elevations or penetration resistance indicated. Establish and maintain axial alignment of leads and piles before and during driving.

B. All piles shall be driven by an approved gravity, steam, or diesel hammer. Pile driving hammer shall have a rated energy of 15,000 ft-lbs per blow, minimum. Jetting of piles is not permitted. If extremely hard driving materials exist and conditions persist, contractor shall contact the Engineer to determine the possible limited use of jetting.

C. Heaved Piles: Redrive heaved piles to tip elevation at least as deep as original tip elevation with a driving resistance at least as great as original driving resistance.

D. Appropriate pile cushioning shall be provided during pile driving, in accordance with the pile supplier's recommendations, in accordance with industry standards, and as approved by the Engineer.

E. Piles shall be driven vertically (plumb). Contractor shall use a piling guide as necessary to ensure piling is installed plumb.

F. Driving Tolerances:
   1. Eccentricities of "as-driven" pile groups shall be adjusted by straps, additional reinforcing, or by the driving of additional piles as indicated on redesign sheets as prepared by the structural engineer. Structural redesign and new work shall be at contractor's cost.

G. Withdraw damaged or defective piles and piles that exceed driving tolerances and install new piles within driving tolerances.

   1. Fill holes left by withdrawn piles as directed by Engineer.

H. Cutting Off: Cut off butts of driven piles square with pile axis and at elevations indicated.

1. Cover cut-off piling surfaces with caps overlapping pile end by minimum 2 inches or minimum three coats of preservative treatment according to AWPA M4.

I. Field-treat cut-off ends of piles for weather protection. Use same chemical as used for original treatment of piles, or waterproof sealant. Submit sealant data for review by the Engineer.

J. Pile-Driving Records: All pile installation operations shall keep a complete record of the pile installation operation. Written installation records shall be obtained for each pile and submitted to the engineer of record. These records shall include, but are not limited to the following data:

1. Project name and number.
2. Date and time of installation.
3. Location and reference number of each pile.
4. Pile logs signed and sealed by a licensed surveyor or a professional engineer.
5. Overall depth of installation referenced from bottom of slab.
6. Pile deviation plan.
7. Any other relevant information relating to the installation.

3.3 FIELD QUALITY CONTROL

A. Testing Agency: Contractor will engage a qualified independent, Pre-Qualified testing agency to perform tests and inspections.

B. Tests and Inspections:

1. Pile Driving logs with blows per foot, hammer data, conversion to capacity, etc.

3.4 DISPOSAL

A. Remove withdrawn piles and cutoff sections of piles from site and legally dispose of them off Owner's property.

Means and Methods of Measure and Payment:

Test Pile, Complete will be paid by the linear foot for the contractor to furnish all equipment, supervision, material, laborers, and all else necessary to perform the Test pile and determine the bearing capacity and length at which the piles shall be to reach the design bearing capacity. The Owner will pay per linear foot for this single pile to find the desired length for to achieve the design bearing capacity. The Test Pile therefore, shall not be considered for payment under any other pay items within the proposal. This test pile shall be considered one of the proposed piles.

Timber pilings, Complete will be paid by the Linear foot measured from the bottom of pile below grade to the top of pile AT DESIGN ELEVATION. This pay item shall include all equipment,

supervision, materials, labors, and all else necessary to perform the pile driving of all piles on the design plans. Once a test pile is complete the contractor will know how deep and what size piles shall be ordered and used. The Owner will NOT pay for any wasted pile length that is cut off by the contractor once the design bearing capacity is reached and pile driving has ended.

END OF SECTION

SECTION 02751
CONCRETE PAD AND CONCRETE PLATFORM/ STEPS

1. DESCRIPTION

Install a 3'x3' concrete pad at the bottom of the steel steps. Install a concrete platform with steps in front of the main electrical disconnect.

No cross slope shall exceed 2-percent for pedestrian paths.

In no way shall any concrete slabs be poured atop a sandy silty sub-base.

Follow Section 600 of the Standard Specification for means and methods.

2. MATERIALS

Concrete shall have a strength not less than 4,000 lbs. per square inch in 28 days. Other materials shall conform to the following subsections:

Curbing Materials.....…….. 903.10
Preformed Expansion Joint Filler.....…….. 914.01
Joint Sealer, Hot-Poured.....……. 914.02
Granite Curbs.....…….. 910.04
Mortar and Grout…… 903.08
Reinforcement Steel.....……... 905.01

Curing material shall be a clear or translucent liquid compound as specified in the NJ Department of Transportation Standard Specifications for Road and Bridge Construction, 2019.

2.01 Equipment

(a) Compaction - Compaction of underlying material shall be accomplished by equipment in accordance with Subsection 203.04.

(b) Forms - Forms shall be of wood, metal, or other suitable material and shall extend for the full depth of the concrete. All forms shall be true to line, free from warp, and of sufficient strength to resist the pressure of the concrete without deforming. Curved forms of proper radius shall be used on all radial sections and shall be of the acceptable design. Bracing and staking of forms shall be such that the forms remain in both horizontal and vertical alignment until their removal.

(c) Finishing - Finishing equipment shall include floats, edgers, spades, tamps, and small vibrators.

3. METHODS OF CONSTRUCTION

Excavation shall be in accordance with Section 202. Backfilling shall be in accordance with Subsection 203.03.

Excavation for the concrete pad and platform shall be made to the required depth, and to a width that

permits the installation and bracing of the forms. The underlying material shall be shaped and compacted to a firm, even surface. Unstable material shall be removed and replaced with acceptable material, which shall be compacted.

The foundation for the pad and platform shall be well compacted by means of flat-faced mechanical tampers or by other means to be approved by the Engineer.

Metal forms shall be used, except that wood forms may be used on curves too sharp for satisfactory construction with metal forms, and for curbs that are constructed monolithically with the pavement or base course. The materials and methods used for lubricating the forms shall be such that will not discolor or stain the concrete. Forms shall be removed when the concrete has hardened sufficiently to be self-supporting yet in ample time to allow for finishing as hereinafter specified.

The concrete shall be tamped and spaded, or vibrated, so that the forms are completely filled, the concrete thoroughly compacted, and mortar is flushed to the face and top. The top shall be finished with a wood float to an even, smooth, and dense surface and, as soon as the forms can be removed, the face shall be similarly finished. The edges of all concrete shall be rounded to the required radius with suitable edging tools.

4. QUANTITY AND PAYMENT

Payment will be made for the quantity of the following work items actually installed at the unit price bid per Cubic Yard in the Proposal.

This price shall include all labor, material and equipment for excavation, grading, shaping, preparation and placement of the DGA subgrade, and for furnishing and installing the concrete in accordance with this section of the Specifications, and the Contract Plans, and all else necessary for and incidental to this work.

Item	***Pay Unit***
MISCELLANEOUS CONCRETE, PLATFORM, STEPS, CONC. PAD	CY

THERE IS NO SPECIFIC PAYMENT FOR DENSE GRADED AGGREGATE SUB-BASE, 4” TH. BENEATH NEW CONCRETE SURFACES.

END OF SECTION

SECTION 05120 - STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

Provide the labor and equipment and materials to build the structural galvanized steel framing, platform, railings, and steps as drawn on the construction plans. Submit shop drawings for approval before fabricating anything. All fasteners shall be SS316 Stainless Steel.

Furnish the labor and materials and equipment to form up, reinforce and pour a concrete slab to support the new fiberglass hut.

This CONTRACT includes the performance specification to design/build a set of galvanized steel steps and platform, at elevation 14.00, including the final design of the steps, from Elevation 4.50 to 13.50, meeting current codes for rise and tread, railings, railing height, hand rail diameter, etc.

Follow the design plans for instructions; the FFE of the Shelter shall be at 14.00. Any other FFE noted herein are hereby deleted.

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Structural steel – galvanized
2. Nuts, washers bolts – stainless steel
3. Grout.
4. Metal Stairs
5. Metal Pipe and Tube Railings
6. Metal Grating

1.3 DEFINITIONS

A. Structural Steel: Elements of structural-steel frame, as classified by AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Show fabrication of structural-steel components.

1. Include details of cuts, connections, splices, camber, holes, and other pertinent data.
2. Include erection drawings.

3. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld. Show backing bars that are to be removed and supplemental fillet welds where backing bars are to remain.

4. Indicate type, size, and length of bolts, distinguishing between shop and field bolts. Identify pretensioned and slip-critical high-strength bolted connections.

C. Welding Procedure Specifications (WPSs) and Procedure Qualification Records (PQRs): Provide according to AWS D1.1/D1.1M, "Structural Welding Code - Steel," for each welded joint

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified Installer and fabricator.

B. Welding certificates.

C. Mill test reports for structural steel, including chemical and physical properties.

D. Product Test Reports: For the following:

1. Bolts, nuts, and washers including mechanical properties and chemical analysis.

2. Tension-control, high-strength bolt-nut-washer assemblies.

3. Shear stud connectors.

4. Nonshrink grout.

1.6 QUALITY ASSURANCE

A. Fabricator Qualifications: A qualified fabricator that participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, Category STD.

B. Installer Qualifications: A qualified installer who participates in the AISC Quality Certification Program and is designated an AISC-Certified Erector, Category.

C. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

1. Welders and welding operators performing work on bottom-flange, demand-critical welds shall pass the supplemental welder qualification testing, as required by AWS D1.8. FCAW-S and FCAW-G shall be considered separate processes for welding personnel qualification.

D. Preinstallation Conference: Conduct conference at Project site.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from corrosion and deterioration.

1. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.

B. Store fasteners in a protected place in sealed containers with manufacturer's labels intact.

1. Fasteners may be repackaged provided Owner's testing and inspecting agency observes repackaging and seals containers.

2. Clean and relubricate bolts and nuts that become dry or rusty before use.

3. Comply with manufacturers' written recommendations for cleaning and lubricating ASTM F 1852 fasteners and for retesting fasteners after lubrication.

1.8 COORDINATION

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' recommendations to ensure that shop primers and topcoats are compatible with one another.

B. Coordinate installation of anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, sheet metal templates, instructions, and directions for installation.

PART 2 - PRODUCTS

2.1 STRUCTURAL-STEEL MATERIALS – ALL GALVANIZED

A. W-Shapes: ASTM A 992, Grade 50.

B. Channels, Angles - Shapes: ASTM A 36.

C. Plate and Bar: ASTM A 36.

D. Cold-Formed Hollow Structural Sections: ASTM A 500, Grade B, structural tubing.

E. Steel Pipe: ASTM A 53 Grade B.

F. Welding Electrodes: Comply with AWS requirements.

G. ALL GALVANIZED

2.2 BOLTS, CONNECTORS, AND ANCHORS

A. High-Strength Bolts, Nuts, and Washers: ASTM A 325, Type 1, heavy-hex steel structural bolts; ASTM A 563, Grade C, heavy-hex STAINLESS-steel nuts; and ASTM F 436, Type 1, hardened carbon-steel washers; all with plain finish.

B. Shear Connectors: ASTM A 108, Grades 1015 through 1020, headed-stud type, cold-finished STAINLESS steel; AWS D1.1/D1.1M, Type B.

C. Anchor Rods: ASTM F 1554, Grade 36.

1. Nuts: 3 STAINLESS steel.

2. Plate Washers: STAINLESS steel.

3. Washers: STAINLESS steel.

2.3 GROUT

A. Metallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, metallic aggregate grout, mixed with water to consistency suitable for application and a 30-minute working time.

B. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, nonmetallic aggregate grout, noncorrosive and nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

2.4 FABRICATION

A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate according to AISC's "Code of Standard Practice for Steel Buildings and Bridges" and AISC 360.

1. Camber structural-steel members where indicated.
2. Fabricate beams with rolling camber up.
3. Mark and match-mark materials for field assembly.
4. Complete structural-steel assemblies, including welding of units, before starting shop-priming operations.

B. Thermal Cutting: Perform thermal cutting by machine to greatest extent possible.

1. Plane thermally cut edges to be welded to comply with requirements in AWS D1.1/D1.1M.

C. Bolt Holes: Cut, drill, or punch standard bolt holes perpendicular to metal surfaces.

D. Finishing: Accurately finish ends of columns and other members transmitting bearing loads.

E. Cleaning: Clean and prepare steel surfaces that are to remain unpainted according to SSPC-SP 2, "Hand Tool Cleaning."

F. Shear Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Use automatic end welding of headed-stud shear connectors according to AWS D1.1/D1.1M and manufacturer's written instructions.

G. Holes: Provide holes required for securing other work to structural steel and for other work to pass through steel framing members.

1. Cut, drill, or punch holes perpendicular to steel surfaces. Do not thermally cut bolt holes or enlarge holes by burning.
2. Baseplate Holes: Cut, drill, mechanically thermal cut, or punch holes perpendicular to steel surfaces.
3. Weld threaded nuts to framing and other specialty items indicated to receive other work.

2.5 SHOP CONNECTIONS

A. High-Strength Bolts: Shop install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325" for type of bolt and type of joint specified.

B. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.

1. Assemble and weld built-up sections by methods that will maintain true alignment of axes without exceeding tolerances in AISC 303 for mill material.
2. SSPC-SP 2, "Hand Tool Cleaning."

C. Priming: Immediately after surface preparation, apply primer according to manufacturer's written instructions and at rate recommended by SSPC to provide a minimum dry film

thickness of 1.5 mils. Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.

1. Stripe paint corners, crevices, bolts, welds, and sharp edges.
2. Apply two coats of shop paint to surfaces that are inaccessible after assembly or erection. Change color of second coat to distinguish it from first.

2.6 GALVANIZING

A. Galvanized Finish: All structural steel shall be Galvanized according to ASTM A 123/A 123M.

1. Fill vent and drain holes that will be exposed in the finished Work unless they will function as weep holes, by plugging with zinc solder and filing off smooth.
2. Galvanize lintels and shelf angles attached to structural-steel frame and located in exterior walls.

2.7 SOURCE QUALITY CONTROL

A. Testing Agency: Owner will engage an independent testing and inspecting agency to perform shop tests and inspections and prepare test reports.

1. Provide testing agency with access to places where structural-steel work is being fabricated or produced to perform tests and inspections.

B. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.

C. Bolted Connections: Shop-bolted connections will be inspected according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

D. Welded Connections: In addition to visual inspection, shop-welded connections will be tested and inspected according to AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:

1. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.
2. Ultrasonic Inspection: ASTM E 164.

E. In addition to visual inspection, shop-welded shear connectors will be tested and inspected according to requirements in AWS D1.1/D1.1M for stud welding and as follows:

1. Bend tests will be performed if visual inspections reveal either a less-than-continuous 360-degree flash or welding repairs to any shear connector.
2. Tests will be conducted on additional shear connectors if weld fracture occurs on shear connectors already tested, according to requirements in AWS D1.1/D1.1M.

2.8 STAIRS AND RAILINGS

A. SUBMITTALS

1. Shop drawings detailing fabrication and erection of stair and railing system indicated. Include plans, elevations, sections, and details of fabrications and their connections. Show anchorage and accessory items. Provide templates for anchors and bolts specified for installation under other sections.

2. Structural computations or test data/evaluations, material properties, PE (professional engineering) calculations signed/sealed in the state of the project, and other information needed to ensure satisfactory compliance to applicable building codes to be supplied by the manufacture, based on final fabrication drawings and documents.

B. GALVANIZED STEEL FRAMED STAIRS

1. General: Construct stairs to conform to sizes and arrangements indicated; join pieces together by welding unless otherwise indicated. Provide complete stair assemblies including metal framing, hangers, columns, railings, newels, balusters, struts, clips, brackets, bearing plates and other components necessary for the support of stairs and platforms and as required to anchor and contain the stairs on the supporting structure.
2. Stair Framing: Fabricate stringers of structural steel channels, as indicated. Provide closures for exposed ends of stringers. Construct platforms of structural steel channel headers and miscellaneous framing members as indicated. Bolt or weld headers to stringers, newels and framing members to strings and headers; fabricate and join so that bolts, if used, do not appear on finish surfaces.
3. Treads to be galvanized metal grating with slip resistance as shown. Provide thicknesses of metal grating required to support total design loading.
    a. Attach to stringers by means of brackets made of steel angles or bars. Weld brackets to strings and attach tread to brackets by welding, riveting, or bolting.

C. HANDRAILS AND GUARDRAILS

1. All materials shall be galvanized; all nuts, bolts and washers shall be stainless steel.
2. Structural Performance of Handrails and Railing Systems: Engineer, fabricate, and install handrails and railing systems to withstand the following structural loads without exceeding the allowable design working stress of the materials for handrails, railing systems, anchors, and connections. Apply each load to produce the maximum stress in each of the respective components comprising handrails and railing systems.
3. Top Rail of Guardrail Systems: Capable of withstanding the following loads applied as indicated.
    a. Concentrated load of 200 lbs (890 N) applied at any point and in any direction.
    b. Uniform load of 50 lbf per linear foot (730 N/m) applied horizontally and concurrently with uniform load of 100 lbf per linear foot (1460 N/m) applied vertically downward.
    c. Concentrated and uniform loads above need not be assumed to act concurrently.
4. Handrails Not Serving as Top Rails: Capable of withstanding the following loads applied as indicated.
    a. Concentrated load of 200 lbs (890 N) applied at any point and in any direction.
    b. Uniform load of 50 lbf per linear foot (730 N/m) applied in any direction
    c. Concentrated and uniform loads above need not be assumed to act concurrently.

5. Infill Area of Guardrail Systems: Capable of withstanding a horizontal concentrated load of 200 lbf (890 N) applied to 1 sq. ft. (0.09 sq. m) at any point in the system including panels, intermediate rails, balusters, or other elements composing the infill area.

    a. Above load need not be assumed to act concurrently with loads on top rails of railing systems in determining stress on guard.

    b. In-fill areas are to be spaced less than 4 inches (100mm) clear.

2.9 METAL GRATING

A. Steel grating to be Weldforged welded rectangular design manufactured by IKG industries or approved equal.

B. Main bearing bars and cross bars to be as specified on the design drawings. Cross bars to be resistance welded at right angles to the bearing bars.

C. No notching or cutting of bearing bars before welding is permissible.

D. Grating is to sustain the specified load capacities as shown on the design drawings

E. Finish to be in accordance with the design drawings.

F. Overall dimensions, details, and direction of bearing bars to be in accordance with the design drawings.

G. Grating to attach to base structural steel per the manufacturer's details, directions and instructions. Grating shall be Galvanized.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify, with steel Erector present, elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments for compliance with requirements.

    1. Prepare a certified survey of bearing surfaces, anchor rods, bearing plates, and other embedments showing dimensions, locations, angles, and elevations.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Provide temporary shores, guys, braces, and other supports during erection to keep structural steel secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural steel, connections, and bracing are in place unless otherwise indicated.

    1. Do not remove temporary shoring supporting composite deck construction until cast-in-place concrete has attained its design compressive strength.

3.3 ERECTION

A. Set structural steel accurately in locations and to elevations indicated and according to AISC 303 and AISC 360.

B. Base Plates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.

1. Set plates for structural members on wedges, shims, or setting nuts as required.

2. Weld plate washers to top of baseplate.

3. Snug-tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.

4. Promptly pack grout solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.

C. Maintain erection tolerances of structural steel within AISC's "Code of Standard Practice for Steel Buildings and Bridges."

D. Align and adjust various members that form part of complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that will be in permanent contact with members. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.

1. Level and plumb individual members of structure.

2. Make allowances for difference between temperature at time of erection and mean temperature when structure is completed and in service.

E. Splice members only where indicated.

F. Do not use thermal cutting during erection.

G. Do not enlarge unfair holes in members by burning or using drift pins. Ream holes that must be enlarged to admit bolts.

H. Shear Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Use automatic end welding of headed-stud shear connectors according to AWS D1.1/D1.1M and manufacturer's written instructions.

3.4 FIELD CONNECTIONS

A. High-Strength Bolts: Install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.

B. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.

1. Comply with AISC 303 and AISC 360 for bearing, alignment, adequacy of temporary connections, and removal of paint on surfaces adjacent to field welds.

2. Remove backing bars or runoff tabs, back gouge, and grind steel smooth.

3. Assemble and weld built-up sections by methods that will maintain true alignment of axes without exceeding tolerances in AISC's "Code of Standard Practice for Steel Buildings and Bridges" for mill material.

3.5 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to inspect field welds and high-strength bolted connections.

B. Bolted Connections: Bolted connections will be inspected according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

C. Welded Connections: Field welds will be visually inspected according to AWS D1.1/D1.1M.

1. In addition to visual inspection, field welds will be tested and inspected according to AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:

   a. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.

   b. Ultrasonic Inspection: ASTM E 164.

D. In addition to visual inspection, test and inspect field-welded shear connectors according to requirements in AWS D1.1/D1.1M for stud welding and as follows:

1. Perform bend tests if visual inspections reveal either a less-than-continuous 360-degree flash or welding repairs to any shear connector.

2. Conduct tests on additional shear connectors if weld fracture occurs on shear connectors already tested, according to requirements in AWS D1.1/D1.1M.

E. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.

3.6 REPAIRS AND PROTECTION

A. Galvanized Surfaces: Clean areas where galvanizing is damaged or missing and repair galvanizing to comply with ASTM A 780.

B. Touchup Painting: Immediately after erection, clean exposed areas where primer is damaged or missing and paint with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

1. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.

C. Touchup Painting: Cleaning and touchup painting are specified in Division 09 painting Sections.

MEANS AND METHODS OF MEASUREMENT AND PAYMENT

Work associated with galvanized steel framing should be included in specific pay items contained in the Proposal.

Costs associated with the structural steel, concrete floor, platform, steps and rails for the shelter should be included in the unit price bid for 'Fiberglass Shelter & Platform, Complete' in the Proposal.

All steel shall be galvanized steel; all fasteners shall be stainless steel. No exceptions.

END OF SECTION

SECTION 05125 – ELEVATED PLATFORM & HUT

PART 1 - GENERAL

1.1 DESCRIPTION

Furnish the labor, equipment and materials to build an elevated platform, including timber pilings, pile caps, framing, steel framing, steps, railings, reinforced concrete suspended floor, and a 6'x7'x 8' High Fiberglass Reinforced Shelter, manufactured by Shelter Works, Inc, or Approved Equal.

The inside wall height shall be 8-ft, plus the height of the shallow hip roof. It is imperative that this wall height inside the shelter be 8-ft high, no less, so the electrical equipment may be pushed up to the top of wall, outside of the flood zone.

The elevated platform / hut will be insulated, with an exhaust fan and an intake louver, to control the inside temperature.

The successful bidder will be required to apply for and obtain local permits for foundation, building and electrical for each elevated platform / hut proposed. All permit fees will be waived.

Manufacturer of the hut should provide the following in his or her submittal:

a. FFE of Shelter shall be Elevation 14.00.
b. FRP hut with R-15 insulation properties
c. 123-mph wind load design, signed and sealed by NJ PE.
d. IBC 2019 Building Code Compliance for Wind, Dead Load, Snow Load
e. Live load of 25 psf.
f. Exhaust fan on roof, with thermostat
g. Intake spring-loaded louver
h. Commercial Grade Solid Core Access Door
i. Stainless steel hardware, door knob, and panic bar
j. Fiberglass Faux Brick Veneer on all four sides. Standard color to be chosen by Owner.
k. Mortar lines to be grey/white finish.
l. Gel coat used for exterior of hut
m. Hip Roof Design
n. Roof shall be designed as REMOVABLE, NO EXCEPTIONS.
o. Contractor shall provide submittal showing required concrete anchors around perimeter of the shelter, meeting the minimum design wind load of 123-mph. At a minimum, anchors shall be drilled and set using concrete anchors, one every 2-ft around perimeter. Minimum anchor size shall be ½" x 6" long, stainless steel fasteners.

Design-build of Pressure-Treated Lumber steps and platform to the main service disconnect switch. The contractor shall used all pressure treated dimensional lumber and 4,500psi concrete, 12" diameter x 48" deep footings. The pay item "Timber Steps, Complete shall include all labor, materials, etc. including the concrete footings, steps, railings, fasteners etc. to construct a stable and code compliant access way.

1.2 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.3 SUMMARY

A. Section Includes:

1. Fiberglass shelter
2. Timber steps to Disconnect switch.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Show fabrication of structural-steel components.

1. Include details of cuts, connections, splices, camber, holes, and other pertinent data.
2. Include erection drawings.
3. FRP Hut with removable roof.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified Installer and fabricator.

B. Building certificates.

C. Mill test reports for structural steel, including chemical and physical properties.

D. Product Test Reports: For the following:

1. Bolts, nuts, and washers including mechanical properties and chemical analysis.
2. FRP qualities
3. Decking Fasteners

1.6 QUALITY ASSURANCE

Supplier must provide a QA/QC plan.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from corrosion and deterioration.

1. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.

B. Store fasteners in a protected place in sealed containers with manufacturer's labels intact.

1. Fasteners may be repackaged provided Owner's testing and inspecting agency observes repackaging and seals containers.
2. Clean and relubricate bolts and nuts that become dry or rusty before use.
3. Comply with manufacturers' written recommendations for cleaning and lubricating ASTM F 1852 fasteners and for retesting fasteners after lubrication.

1.8 COORDINATION

A. Do not deliver shelter until the steel frame and concrete floor are complete.

B. Be sure platform is prepped and acceptable prior to shelter placement.

C. Building shall be offloaded using an overhead crane or similar equipment.

D. Coordinate shelter placement with electrician for running conduits and penetrations thru FRP walls.

E. Conseal base gasket should be applied to the platform where the shelter will be placed. Conseal may need to be heated to 75°F, weather dependent.

F. Field penetrations to be sealed with silicone caulking.

G. Electrical connections to be tested after hut placement.

PART 2 - PRODUCTS

2.01 Shelter

Shelter shall be FRP. Fiberglass studs should be used throughout the hut to provide a structural connection between the inner and outer fiberglass skins within the walls, roof, and door(s). Shelter exterior will be a faux brick pattern with emphasized mortar lines. Exterior color determined by Owner. Standard color only.

2.02 Walls

Walls shall have an inner and outer fiberglass skin, each 1/8" thick. Wall thickness must not exceed 3" thick and must yield an insulation value of R-15. Walls shall be coated with UV-resistant Isophthalic NPG Gel Coat. Wall interior to be white gel coat.

2.03 Door

Door must be a seamless commercial grade solid access door, equipped with a panic bar. Door should be 3' wide, trimmed with EDPM sponge rubber gasketing and include stainless steel ball bearing hinges. A hydraulic door closer should be included as well. Door must consist entirely of stainless-steel components and have a corrosion-resistant padlock. Door should pass the ASTM E330/E330M-14 test.

2.04 Roof

Roof will have a standard hip design, to minimize precipitation accumulation upon it.

Roof will achieve a class C fire rating in accordance with ASTM E108 Standard Test Methods for Fire Tests of Roof Coverings. Roof to have an opening for a thermostat-controlled exhaust fan.

2.05 Interior Lighting

Lighting should be present within the shelter so that operators and others entering the shelter will be able to properly see. Use fluorescent lighting or equivalent.

2.06 Exterior Lighting

Lighting should exist on the exterior of the shelter. Dusk-to-dawn illumination should be used.

2.07 Emergency / Battery Backup

A battery backup is needed inside the hut in case of a power outage, emergency, or other incident. An illuminated exit sign and floodlight should also be included in this package.

Timber Steps and Platform

The contractor shall Design-Build P.T. timber steps and a platform.

The contractor shall supply all timber to build steps and a platform up to the proposed elevation on the plans. All timber shall be pressure treated dimensional lumber.

The platform shall be 3'x4' and shall be in front of the proposed disconnect switch.

Steps shall be 10" treads and 7" risers.

Both the steps and railings shall have a 42" tall railing mounted on both sides of the steps as well as surrounding the platform.

All joists for the platform shall be a minimum of 2"x8" lumber at a 16" O.C. spacing.

Rim joists shall be 2"x8" lumber.

All decking shall be 5/4" thick x 6" decking.

Every step shall have a kick plate, no exceptions.

All footings shall be 12" diameter x 48" deep, 4,500psi concrete.

All posts shall be 6"x6" P.T. and shall be attached to the concrete footing with galvanized Simpson Strong Tie post holder.

The posts shall be cross braced accordingly with 2"x8" lumber, as needed.

All screws shall be galvanized or coated deck screws that resist corrosion.

MEANS & METHOD OF MEASUREMENT AND PAYMENT

All costs associated with the Steel structure and shelter fabrication, delivery, erection and installation should be included in the Lump Sum bid for "Fiberglass shelter & Platform, Complete" in the Proposal. All costs associated with framing, steel frames, concrete floor, anchoring, doors, lighting, fans, louvers, steps, railings, gratings, permits, etc., should be included in said pay item.

All costs associated with the construction of the timber steps, platform AND concrete footings, delivery, erection, design, etc. shall be included in the Lump Sum bid for "Timber Steps, Complete" in the proposal.

END OF SECTION

SECTION 05130 – Pump Station Lid

PART 1 - GENERAL

1.1 DESCRIPTION

This section shall include the design, fabrication, and installation of a pressure-treated wooden lid for the pump station housing.

1. The lid frame shall be constructed with 2” x 8” pressure treated lumber, evenly spaced at 16 inches on center maximum. 5/4” X 6” pressure treated deck planks shall be used to construct the platform.

2. The Contractor shall build a sill to support the pump station lid by bolting 2” x 8” boards to the interior wall of the pump station housing.

3. The lid shall have a snug fit within the perimeter of the pump station walls.

4. The lid shall have no gaps between the pump station walls and the outer edge of the lid.

5. The lid shall be built in three (3) sections and shall span the entire 12-foot by 10-foot area atop the pump station walls. The first section shall be over the inflow side of the pump station. The second and third piece will be constructed on the pump side. The platform should be split in a fashion that it goes around the existing force main that way the two pieces can be pulled apart and fully removed.

6. The lid shall allow the proper clearance for the existing 10” force main pipe to run through.

7. All sections of the lid shall have two (2) galvanized handles mounted to the surface to be removable by hand.

8. All fasteners, nuts, bolts, washers, shall be galvanized.

9. In general, the contractor is responsible to build a sturdy, level, square surface to cover the entire pump station in three removable pieces to satisfy the engineer. Typical framing, box outs, rim joists, etc. shall all be incorporated in the design while constructing.

1.2 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.3 SUMMARY

A. Section Includes:

1. Design-Build Pump Station Lid

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified Installer and fabricator.

B. Product Test Reports: For the following:

1. Bolts, nuts, and washers including mechanical properties and chemical analysis.
2. Pressure treated lumber

1.6 DELIVERY, STORAGE, AND HANDLING

1.71 Lumber

1. All lumber and plywood materials, when delivered to the site, shall be piled to insure property drainage and ventilation. Make suitable provisions to prevent excessive absorption of moisture and provide protection from the elements.

2. Do not store material directly on concrete slabs or cement floors. Provide supports to keep material at least 6" above the floor. Do not store finished or finishing material below grade or in unventilated spaces.

3. All timber materials specified to be with preservative will be inspected as to quality. Manufacture, quantity, and treatment by the Engineer or his designated representative, before during and after treatment. The contractor shall notify the Engineer of the location of the treatment plant at least three (3) days in advance of treatment.

4. All deliveries to the site work of treated materials shall include a certificate issued by a responsible official of the treatment plant listing and describing the materials and stating that the specifications herein have been adhered to as to grade of material, treatment process, impregnation required in pounds per cubic foot and the preservative used. Each certificate shall be accompanied by copies of the plant treatment records.

5. Acceptance of timber materials at treatment plant, the project delivery point or other approved location shall constitute approval only as to quality and physical characteristics. Final acceptance shall be made only upon incorporation of the material into the finally accepted completed structure. Materials injured or rendered unfit for use on the site of work shall be rejected or removed from the site of the work. New specification material shall be furnished to replace the damaged material. The cost of removal of the damaged material and furnishing the new material shall be borne by the Contractor.

6. All timber material shall be handled with care, without sudden dropping, breaking of outer fibers, or other bruising of the surfaces and edges. Handling of treated materials shall be such as to avoid exposing untreated wood.

7. All timber material shall be accurately cut and framed true and exact to a close fit in such manner that all joints and contact surfaces will have firm and even bearing over the entire contact surface without the use of shims.

8. Drift bolt holes shall be bored with a bit of 1/16 inch less in diameter than the bolt and spike to be used. For machine bolts, holes shall be bored with a bit of the same diameter as the bolt. All bolts shall be drawn up to provide full grip and tension without breaking or crushing the timber fiber under the washers.

1.72 Fasteners

1. Store fasteners in a protected place in sealed containers with manufacturer's labels intact.
2. Fasteners may be repackaged provided Owner's testing and inspecting agency observes repackaging and seals containers.
3. Clean and relubricate bolts and nuts that become dry or rusty before use.

PART 2 - PRODUCTS

2.01 Lumber

1. All lumber furnished under these specifications and incorporated in the work shall be of the kind, grade and manufacture required herein.

2. **When specified, Southern Yellow Pine No. 1 S.R. or Southern Yellow Pine No. 1 shall strictly adhere to the latest issue of Structural Grading Rules for Southern Pine Lumber, approved by the American Lumber Standards Committee, as issued by the Southern Pine Lumber Association, New Orleans, Louisiana.**

3. When specified, Douglas Fir shall be Construction Grade, close grained, and shall adhere strictly to the latest issue of Standard Grading and Dressing Standards issued by the West Coast Lumberman's Association, Seattle, Washington.

4. Defects or blemishes prohibited by these specifications shall not appear in the material furnished even though permitted under the cited grading rules. All materials shall be straight, sound, and free from defects that will impair its strength or durability. There shall be no heartwood requirements and the amounts of sapwood shall not be limited to lumber to be preservative treated.

5. All lumber shall be seasoned and surfaced on all sides to "Standard Sizes" unless otherwise specified. Sizes specified are nominal (board measure) dimensions unless otherwise noted.

6. All lumber shall be preservative treated by the full-cell process. Lumber specified is to receive CCA Preservative Treatment and it shall be in accordance with the American Wood Preservers' Association's Latest Revision. The treatment shall be so performed that the timber will have a final retention in pounds per CCA per cubic foot as specified.

7. Preservative used to great the timber shall be CCA Preservative Treatment and shall conform to the requirements of the American Wood Preservers' Association

Specifications No. P-Latest Revision. **The wood shall be pressure treated with the waterborne salts (CCA) conforming to AWPA Standards C-18 and treated wood shall retain not less than 2.5 pounds/c.f. of oxide.**

8. **Lumber shall be wrapped in vinyl after it has been treated in order to provide a composite preservative treatment. Composite treatment shall be TimberGuard composite by CMI Limited Co. or approved equal.**

2.02 Fasteners

Hardware shall include, in general, all bolts, nuts, washers, bars, plates, shapes, and screws required to complete the structure. Unless otherwise specified, all hardware shall be as follows:

- Bolts – Per ASTM A-307 Steel
- Nuts – Per ASTM A307 or A-563 Steel
- Ogee Washers – Per ASTM A47 for Class 30-A Cast Iron
- Screws – Common Wire Type per AISI 1010 or 1020 Steel
- All of the above hardware shall be galvanized per ASTM A-123 or A-153 as applicable.

All threads shall be cut prior to galvanizing. The finished product shall be smooth. Nuts shall have a neat fit for finger turning throughout the length of thread.

All hardware deliveries to the site shall be accompanied by a certificate issued by a responsible official of the manufacturing company listing and describing the materials and stating that the specifications herein have been adhered to as to quality of material and manufacture. Final acceptance of all hardware shall be made only when incorporated into the finally accepted complete structure.

Unless otherwise indicated, the lengths of screws shall not be less than twice the nominal thickness of the material being screwed.

Nuts used on bolts shall be securely pulled with sufficient bolt thread allowed to give both nuts full grip. No chocking or shimming under bolt heads or nuts will be permitted, except in the case of unusual inequalities when the space may be taken up with additional specification washers.

MEANS & METHOD OF MEASUREMENT AND PAYMENT

All costs associated with the design, fabrication, and installation of the pump station lid should be included in the Lump Sum bid for “Pump Station Lid, Complete” in the Proposal.

END OF SECTION

SECTION 05135 – WOODEN PICKET FENCE

PART 1 - GENERAL

1.1 DESCRIPTION

Under this item, the Contractor shall furnish and install a 4-foot high, pressure treated, wooden picket fence at the prescribed locations as shown on the plans, **ROUGHLY 50' LONG,** and as directed by the Engineer. **The contractor shall understand that the length will not be measure but may vary slightly due to final site conditions.**

The fence posts shall be 4" x 4" pressure treated posts and shall be set a minimum of 30-inches below grade in concrete footings.

The concrete footings shall be 10" minimum and shall be constructed with 4,500 psi concrete.

Fence posts shall be 8-feet on center. 35 picket boards shall be installed per 8-foot section with no space between boards.

Contractor shall install 3 horizontal fence rails, which shall be 2" x 3" pressure treated lumber, evenly spaced throughout the length of fence.

The fence shall be fitted with a 10' wide dual swing locking gate at the prescribed location as shown on the plans or as directed by the Engineer.

The gate hardware including; hinges, locking mechanism, and self-closing spring shall all be powder coated black.

1.2 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.3 SUMMARY

A. Section Includes:

1. Picket Fence & 10' wide Gate, 4' High

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: Show fabrication of assembly and components signed by a licensed engineer. Drawings must be reviewed and approved by RE.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified Installer and fabricator.

B. Product Test Reports: For the following:

1. Bolts, nuts, and washers including mechanical properties and chemical analysis.
2. Pressure treated lumber

1.6 DELIVERY, STORAGE, AND HANDLING

1.71 Lumber

1. All lumber and plywood materials, when delivered to the site, shall be piled to insure property drainage and ventilation. Make suitable provisions to prevent excessive absorption of moisture and provide protection from the elements.

2. Do not store material directly on concrete slabs or cement floors. Provide supports to keep material at least 6" above the floor. Do not store finished or finishing material below grade or in unventilated spaces.

3. All timber materials specified to be with preservative will be inspected as to quality. Manufacture, quantity, and treatment by the Engineer or his designated representative, before during and after treatment. The contractor shall notify the Engineer of the location of the treatment plant at least three (3) days in advance of treatment. The cost of lumber inspection shall be borne by the City.

4. All deliveries to the site work of treated materials shall include a certificate issued by a responsible official of the treatment plant listing and describing the materials and stating that the specifications herein have been adhered to as to grade of material, treatment process, impregnation required in pounds per cubic foot and the preservative used. Each certificate shall be accompanied by copies of the plant treatment records.

5. Acceptance of timber materials at treatment plant, the project delivery point or other approved location shall constitute approval only as to quality and physical characteristics. Final acceptance shall be made only upon incorporation of the material into the finally accepted completed structure. Materials injured or rendered unfit for use on the site of work shall be rejected or removed from the site of the work. New specification material shall be furnished to replace the damaged material. The cost of removal of the damaged material and furnishing the new material shall be borne by the Contractor.

6. All timber material shall be handled with care, without sudden dropping, breaking of outer fibers, or other bruising of the surfaces and edges. Handling of treated materials shall be such as to avoid exposing untreated wood.

7. All timber material shall be accurately cut and framed true and exact to a close fit in such manner that all joints and contact surfaces will have firm and even bearing over the entire contact surface without the use of shims.

8. Drift bolt holes shall be bored with a bit of 1/16 inch less in diameter than the bolt and spike to be used. For machine bolts, holes shall be bored with a bit of the same diameter as the bolt. All bolts shall be drawn up to provide full grip and tension without breaking or crushing the timber fiber under the washers.

1.72 Fasteners

1. Store fasteners in a protected place in sealed containers with manufacturer's labels intact.
2. Fasteners may be repackaged provided Owner's testing and inspecting agency observes repackaging and seals containers.
3. Clean and relubricate bolts and nuts that become dry or rusty before use.

PART 2 - PRODUCTS

2.01 Lumber

1. All lumber furnished under these specifications and incorporated in the work shall be of the kind, grade and manufacture required herein.

2. **When specified, Southern Yellow Pine No. 1 S.R. or Southern Yellow Pine No. 1 shall strictly adhere to the latest issue of Structural Grading Rules for Southern Pine Lumber, approved by the American Lumber Standards Committee, as issued by the Southern Pine Lumber Association, New Orleans, Louisiana.**

3. When specified, Douglas Fir shall be Construction Grade, close grained, and shall adhere strictly to the latest issue of Standard Grading and Dressing Standards issued by the West Coast Lumberman's Association, Seattle, Washington.

4. Defects or blemishes prohibited by these specifications shall not appear in the material furnished even though permitted under the cited grading rules. All materials shall be straight, sound, and free from defects that will impair its strength or durability. There shall be no heartwood requirements and the amounts of sapwood shall not be limited to lumber to be preservative treated.

5. All lumber shall be seasoned and surfaced on all sides to "Standard Sizes" unless otherwise specified. Sizes specified are nominal (board measure) dimensions unless otherwise noted.

6. All lumber shall be preservative treated by the full-cell process. Lumber specified is to receive CCA Preservative Treatment and it shall be in accordance with the American Wood Preservers' Association's Latest Revision. The treatment shall be so performed that the timber will have a final retention in pounds per CCA per cubic foot as specified.

7. Preservative used to great the timber shall be CCA Preservative Treatment and shall conform to the requirements of the American Wood Preservers' Association Specifications No. P-Latest Revision. **The wood shall be pressure treated with the waterborne salts (CCA) conforming to AWPA Standards C-18 and treated wood shall retain not less than 2.5 pounds/c.f. of oxide.**

8. **Lumber shall be wrapped in vinyl after it has been treated in order to provide a composite preservative treatment. Composite treatment shall be TimberGuard composite by CMI Limited Co. or approved equal.**

2.02 Fasteners

Hardware shall include, in general, all bolts, nuts, washers, bars, plates, shapes, and screws required to complete the structure. Unless otherwise specified, all hardware shall be as follows:

- Bolts – Per ASTM A-307 Steel
- Nuts – Per ASTM A307 or A-563 Steel
- Ogee Washers – Per ASTM A47 for Class 30-A Cast Iron
- Screws – Common Wire Type per AISI 1010 or 1020 Steel
- All of the above hardware shall be hot-dip galvanized per ASTM A-123 or A-153 as applicable.

All threads shall be cut prior to galvanizing. The finished product shall be smooth. Nuts shall have a neat fit for finger turning throughout the length of thread.

All hardware deliveries to the site shall be accompanied by a certificate issued by a responsible official of the manufacturing company listing and describing the materials and stating that the specifications herein have been adhered to as to quality of material and manufacture. Final acceptance of all hardware shall be made only when incorporated into the finally accepted complete structure.

Unless otherwise indicated, the lengths of screws shall not be less than twice the nominal thickness of the material being screwed.

Nuts used on bolts shall be securely pulled with sufficient bolt thread allowed to give both nuts full grip. No chocking or shimming under bolt heads or nuts will be permitted, except in the case of unusual inequalities when the space may be taken up with additional specification washers.

MEANS & METHOD OF MEASUREMENT AND PAYMENT

All costs associated with the design, fabrication, and installation of the wooden picket fence and gate should be included in the Lump Sum bid for “Picket Fence & Gate, 4 Ft High” in the Proposal.

END OF SECTION

11006 - PUMPING EQUIPMENT & CONTROLS

PART 1 - GENERAL

1.01 DESCRIPTION

A. The CONTRACTOR shall furnish and install a new 3-phase single pump control panel that operates with transducers, two (2) new transducers, conduit, controls and wiring, power wiring and accessories, as indicated on the Drawings and/or as Specified.

1.02 SUBMITTALS

A. Submit the following for the pump controls system

1. A complete set of drawings shall be supplied to insure successful installation and operation of the control system. The shop drawings shall consist of all of the following:

2. -Sufficient detail to evaluate compliance with these specifications.

3. A detailed component list including manufacturer and catalog number.

4. A custom wiring diagram for this specific application to facilitate and insure accurate field connections to the control panel by electrical installation personnel.

5. A description of operation for the control system.

6. An enclosure dimension print.

1.03 DELIVERY, STORAGE AND HANDLING

A. Protect all equipment from damage due to exposure, the elements, theft, vandalism, or any other cause.

1.04 WARRANTY

A. All controls, miscellaneous equipment, and installations shall be warranted for a period of not less than five (5) year from the date of acceptance of the entire facility.

PART 2 - PRODUCTS

Single Pump Control Panel:

The Contractor shall provide a pump control system to meet the following standards;

Pump control shall be rated for 3-phase 480V power, to control the existing 20 hP centrifugal pump.

Pump control system shall be mounted in inside the shelter and connect directly to the terminal box on the exterior.

The pump control system shall be able to control a Single Pump, a primary water level transducer, and a back-up water level transducer.

Sensor system shall be a Primary and Secondary Transducer Model Xylem MJK located in a plastic stilling well with a float back up.

New Terminal Box is required outside next to the disconnect box. Set panels at 15.00 for BFE.

Terminal Box requires air gap with wire cage.

2.02 PUMP CONSTRUCTION

PART 3 – EXECUTION

No new pumps are required. Re-connect the old pump once new shelter is installed and cut -in card is issued by JCP&L.

3.01 GENERAL

A. All equipment shall be installed by skilled personnel in a neat and workmanlike manner, true to alignment and elevation to match piping and fittings and in accordance with each respective pump manufacturers latest printed instructions.

3.02 PROTECTION

A. All equipment and spare parts shall be carefully handled and stored to prevent damage, theft, weathering, etc., until final acceptance. All units shall be left in shipping containers where applicable until the time of installation.

3.03 INSTALLATION

A. All equipment shall be installed complete, with all accessories, connections, controls, etc. as indicated on the drawings and as specified to provide complete and operable system(s).

MEANS AND METHODS OF MEASUREMENT & PAYMENT:

There is no specific measurement or payment for this work item and the costs thereof should be included in the unit prices bid for the respective Electrical, Complete pay items in the Proposal.

The costs associated with designs, shop drawings, installation, training, start-up of the new equipment in the shelter, two new transducers, new terminal box, air gap, and single pump controller, should be included in the unit prices bid in the Proposal. Contractor must train Owner on operations and maintenance of the new controller and the transducers.

END OF SECTION

SECTION 15838 – POWER VENTILATORS

PART 1 – GENERAL

1.1 SUMMARY

A. This section includes furnishing and installation of ventilation fan and in-take louver.

B. equipment shall run on 3-phase 480-volt power.

C. Exhaust shall be interconnected with the pump controller, with a relay to only turn-on and operate when the pump in ON.

1.2 GENERAL

A. Coordinate all related work, specified elsewhere.

B. Installer shall meet the entire intent of these specifications and associated drawings.

Deviations from specified equipment and/or operation of the system shall be at Installer's risk, unless written notification is made with the Shop Drawing submittal and such items pre approved in writing.

1.3 SUBMITTALS

A. General: Submit the following according to the Conditions of the Contract and Division 1 Specification Sections.

B. Product data, including dimensions, construction, materials, performance data, etc.

C. Operation and maintenance data for materials and products to include in the "Operating and Maintenance Manual" specified in Division 1.

1.4 QUALITY ASSURANCE

A. Construct fans in accordance with the applicable UL standards.

1.5 PRODUCT WARRANTY

A. Warranty period shall be 1 year from Date of Substantial Completion.

PART 2 – PRODUCTS

2.1 ROOF FANS

A. Provide the following features:

1. Aluminum housing with down blast shroud.

2. Centrifugal backward inclined non-overloading aluminum wheel.

3. Ground and polished fan shaft.

4. Belts, pulleys, and keys shall be oversized 150% of driven horsepower.

5. Machined-cast pulleys shall be adjustable for final system balancing.

6. Belts shall be static-free and oil-resistant

7. Belt driven motor mounted on vibration isolation.

8. Epoxy coated with Hi-pro polyester top coat.

9. Motorized exhaust damper with 24v. actuator.

B. Manufacturers: Subject to compliance with requirements, provide fans of one of the following:

1. Greenheck model GB.

2. Others by prior approval of the Architect/Engineer.

2.2 ACCESSORIES

A. Thermostat

1. Provide a thermostat for the exhaust fan when shown in the details or called for in the schedules on the drawings. Provide Honeywell T631F1068 NEMA 4 thermostat, or equal.

B. Current sensor

1. Provide a split core current sensor with Normally Open contact. The sensor shall have an adjustable trip point. Provide ACI #A/ASCSX2 N.C. or equal.

C. Enclosed Relay

1. Must run on 3-phase power only.

PART 3 – EXECUTION

3.1 INSTALLATION OF FANS

A. Install fans in accordance with the manufacturer's instructions and the Drawings.

3.2 ELECTRICAL WIRING AND CONNECTION INSTALLATION

A. Connect power and control wiring in accordance with manufacturer's instructions and the Drawings.

3.3 FIELD QUALITY CONTROL

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

1. Operational Test: After electrical circuitry has been energized, start units to confirm proper unit operation. Remove and replace malfunctioning units and retest.

2. Test each system for compliance with sequence of operation.

3.4 DEMONSTRATION

A. Train Owner's maintenance personnel to adjust, operate, and maintain HVAC equipment.

MEANS AND METHODS OF MEASURE AND PAYMENT

There is no specific payment for said work and the cost thereof should be included in the associated electrical pay items in the proposal.

END OF SECTION 15838

SECTION 16010 – GENERAL ELECTRICAL PROVISIONS

PART 1 - GENERAL

1.1 SCOPE OF WORK

A. Install all boxes, panels and raceways at or above Elevation 14.00.

Note: This specification is subject to applicable sections of other Divisions of this Work, where equipment and instruments are specified and such equipment and instruments have electrical connections. All work in Division 16 shall meet requirements of this section.

B. This work includes all labor, materials, equipment and services for a complete electrical system. Work in this Contract includes, but is not limited to the following:

1. Electrical equipment and grounding systems.

2. Furnish and install raceways, conductors, circuit protection devices, and accessory devices as required to result in a fully functional, complete and workable electrical system.

3. Furnish and install electrical devices as required by National Electrical Code.

4. Test all electrical systems to the satisfaction of the Engineer.

5. Obtain all required permits.

6. Perform restoration for all disturbed areas.

C. Under this section provide electric services for and connections to all fixtures, appliances and items of equipment requiring same and shown on any Contract Drawings, specified under this Division, or any other Division of specifications.

D. The Electrical Contractor shall be licensed to perform work in the Borough of Highlands, New Jersey. The Contractor shall be responsible for all fees, licenses, and inspections required to accomplish the work.

E. The conductors and cables run from the panels to the transducers must be contained in a 6" SDR-35 strong well supported stilling well, using SS mounting straps and SS anchors into the wet well walls. Install two (2) stilling wells; one for the primary transducer and one for the backup transducer. The contractor shall furnish, deliver, and install both stilling wells. All material costs, supervision, laborers, and all else necessary to complete this work SHALL BE INCLUDED IN THE UNIT PRICE 'ELECTRICAL, COMPLETE' IN THE PROPOSAL.

1.2 LOCAL CONDITIONS

A. Examine the premises and observe the conditions under which work will be done and all other circumstances which will affect the work before submitting bid. The submittal of a bid will indicate that the Contractor has full knowledge of the challenges involved in the performance of the work.

B. Prior to installation of materials and equipment, discrepancies between plans and actual field conditions or between plans and specifications shall be brought to the attention of the Engineer for clarification.

1.3 APPLICABLE CODES AND STANDARDS

A. Unless stated otherwise in the GENERAL CONDITIONS, the currently adopted codes by the enforcing authorities shall govern.

1. NFPA Codes

2. International Building Code (IBC)

3. Local codes

1.4 SUBMITTALS

A. All submittals shall include sufficient data to make a thorough evaluation of features, construction and performance. Submittals shall be bound in booklet form with a cover sheet indicating each item and respective manufacturer's catalog number and shall indicate if the item is as specified or a substitute.

B. Materials, equipment and fixtures shall completely satisfy specification requirements and be suitable for their intended use. Items of equipment submitted shall include all accessories and options recommended by the manufacturer for satisfactory, reliable and safe operation in its designated location.

C. Where model number or name of one manufacturer is followed in specifications by one or more other manufacturer's names, design has been based on first product named and shall be considered to be the specified product or manufacturer, named alternates may require minor deviations. The Contractor shall indicate deviations in submittals/shop drawings.

D. Provide equipment and material specified or named alternates. Products submitted shall be equal in quality to products of the specified manufacturer and shall include the standard features of the specified product and also optional features or necessary changes specified herein. Submittal of alternates shall include all changes in building systems, piping, wiring, supports or accessories required for satisfactory and intended operation. The Engineer shall make all determinations regarding equivalence.

E. Manufacturer's model and catalog numbers included in the specifications may not include all specified or required features and may not ensure compatibility with supporting systems or intended application. Contractor shall insure that material and equipment delivered to job site is suitable for the intended application and indicated connections. Review of shop drawings shall not include review and verification of submitted catalog numbers or quantities required.

F. Review of Contractor's submitted shop drawings and noted comments on Contractor's submitted shop drawings does not constitute a change order or a waiver of Contract requirements. In the event of conflict between submittals or shop drawings and Contract Documents, the latter shall govern. If waiver of a particular requirement is requested by Contractor, a formal written request shall be made to the Engineer for presentation to the Owner.

G. When directed, Contractor shall provide samples of material or equipment.

H. Equipment shall be shipped or fabricated in sections of suitable size for entering buildings and all necessary arrangements for their installation shall be made by Contractor.

I. Shop drawings and submittals shall bear the Contractor's review and approval stamp prior to submission to the Engineer.

J. Submit copies of shop drawings for all electrical equipment custom-made for this Contract. If necessary, drawings shall be revised as directed and resubmitted.

K. Manufacturer's drawings, sketches, and instructions shall supplement but not supersede Contract Drawings and specifications.

L. Submittals shall show:

1. Physical size and arrangement of equipment.

2. Wiring diagrams for all equipment showing all circuit devices, conductor sizes, color coding, type, etc.

3. Elementary control diagrams in straight line form for motor control equipment showing all control devices connected to the system.

4. Specifications for all components.

1.5 MATERIALS AND ACCESSORIES

A. Materials shall be new and listed by the Underwriters Laboratories, Inc., or locally approved national testing agency as conforming to standards in every case where such a standard has been established for the particular materials in question.

B. Equipment shall be packaged in their original containers and be limited to products regularly produced and recommended for service ratings in accordance with manufacturer's catalogs, engineering data or other comprehensive literature made available to the public, and in effect at the time of contract award and shall be turned over to the Owner free of all defects.

C. All equipment or materials for any one system shall be furnished by the same manufacturer. Such items as lamps, conduit fittings, wire, electrical switchgear, wiring devices, etc., shall be the same throughout the project.

D. Materials installed on exterior of buildings or structures shall be weather tight and of such design as intended for this purpose.

E. Equipment shall be installed in strict accordance with manufacturer's instructions for type, capacity and suitability of each piece of equipment used. Use weatherproof equipment where required. Install equipment in accordance with manufacturer's recommendations and meet conditions for manufacturer's standard warranty.

F. Contractor shall effectively protect his work, materials, or equipment which may be subject to damage during construction period. Openings into any part of conduit system as well as associated fixtures, equipment, both before and after being set in place must be securely covered or otherwise protected to prevent obstruction of conduit or damage due to carelessness, dropped tools or materials, grit, dirt, or any foreign matter. Contractor is responsible for all damage so

done until his work is installed and accepted. Conduit ends shall be covered with capped bushings.

G. Provide all accessories, equipment and connections required for complete installation, ready for continuous use by Owner.

1.6 INSPECTION AND REGULATIONS

A Do not allow or cause any work to be covered up or enclosed until it has been inspected, tested and approved by the authorities having jurisdiction over the work and the Engineer. Should any Work be enclosed or covered before such an inspection and test, Contractor shall, at his own expense, uncover the work and after it has been inspected, tested and approved make all repairs with such material as may be necessary to restore all of his work and that of any other Contractor to its original condition.

B. Work shall meet requirements of Owner, National Electrical Code, local regulations, and rules of the electric service provider. Equipment and materials shall bear label of approval of National Board of Fire Underwriters and be UL listed for their particular application.

C. Work shall meet requirements of the Owner's insurer.

1.7 TESTS

A. Give timely notice of intention to test or cover up work to permit observation. Contractor shall test all wiring for continuity and grounds before connecting any equipment or outlets. Contractor shall test entire system in accordance with current procedures stated in Acceptance Testing Specifications published by the National Electric Testing Association, Inc. All equipment necessary to conduct such test shall be furnished at the Contractor's expense.

1.8 FIELD MEASUREMENTS

A. Visit the site before submitting bid and check location of existing utilities, conditions, verify dimensions and locations shown on the plans and over all costs and work herein described or shown.

B. Take measurements necessary for this work and be responsible for their accuracy. Provide all necessary pull boxes and junction boxes as required to accomplish distribution.

1.9 STRUCTURAL DIFFICULTIES

A. Should structural difficulties prevent performing work, necessary deviations, as determined by Engineer, shall be performed.

1.10 DRAWINGS AND SPECIFICATIONS

A. Drawings shall be considered schematic in nature and shall represent a completed product. Contractor is responsible for installation of equipment and methods of achieving a satisfactory and intended installation. Locations of devices are intended to show a general arrangement and intended function. Door swings and architectural features shall be checked for final condition. Coordinate with all Contract Documents and with other trades.

B. Where a conflict exists between Drawings and Specifications, the Engineer shall be contacted to determine the intent. In all circumstances, the final Contract Document interpretation shall provide compliance with all codes.

C. Wiring devices shall be located uniformly with respect to building structure and other work. Locations shall be coordinated. Should there be any interference between electrical wiring and other trades, Contractor shall notify the Engineer so that proper location may be determined.

D. Maintain a complete set of Contract Documents on the project site. As work is installed, carefully draw on prints, in red colored pencil, correct locations of work installed with dimensions from permanent walls, wiring diagrams and details corrected. On completion of project, deliver as-built prints to Owner in good condition.

1.11 PERMITS

A. All permits, licenses shall be borne by the Contractor unless otherwise noted.

1.12 GUARANTEE

A. Unless otherwise specified, guarantee unconditionally for a guarantee period as set forth in General Conditions all materials, workmanship and installation. During this period, adjust, repair or replace, at no cost to the Owner, any item of equipment or workmanship found to be defective.

B. Contractor shall be responsible for and pay for damages caused by or resulting from defects in workmanship.

PART 2 – MATERIALS

Not Used

PART 3 – EXECUTION

Not Used

END OF SECTION

SECTION 16050 – BASIC MATERIALS AND METHODS

PART 1 - GENERAL

1.1 DESCRIPTION

A. All electrical work equipment, wiring, permit applications, single line diagrams, etc, for each pump station shall comply with the plans and specifications herein. The Costs associated with the labor, equipment and materials for each pump station should be included in the corresponding unit price for each pay item, Electrical, Complete in the Proposal.

B. All Sections related to Electrical, 16000 Series will not be measured for payment, and all costs associated with said work and purchase of equipment and materials, should be included in the unit prices noted above.

C. The costs associated with the reconnection of the existing pump to the controls in the new location, conduit runs, conductor wires, receptacles, interior lighting, exterior lighting, panels, meters, electrical equipment as shown on the plan, breakers, roof fan, louver, relocation of the existing pump control equipment etc. should be included in the unit price bid for Electrical, Complete in the Proposal.

D. Furnish, install, adjust, and test all electrical wiring systems, equipment and accessories in accordance with the drawings and specifications.

E. The drawings are diagrammatic unless indicated otherwise.

F. Capacities, ratings and arrangement for specified items may be shown on the drawings.

G. Final connections to equipment shown on electrical drawings shall be made under this Division unless otherwise indicated. Drawings indicate equipment that is to be connected and branch circuit requirements for same. The Contractor shall check manufacturers equipment drawings for exact location of connection, number of connections required for equipment and any equipment needed for proper operation of equipment. The Contractor shall furnish all items needed for proper operation of equipment.

1.2 APPLICABLE STANDARDS AND PUBLICATIONS

A. Standards and publications of the organizations listed below but referred to in the various sections by basic designation only, form a part of this specification to the extent indicated by the reference thereto:

1. American Society for Testing and Materials (ASTM).
2. National Fire Protection Association (NFPA).
3. American National Standards Institute (ANSI).
4. Illuminating Engineering Society (IES).
5. Institute of Electrical and Electronic Engineers (IEEE).
6. Insulated Cable Engineers Association (ICEA).
7. National Electrical Manufacturers Association (NEMA).

8. National Electrical Contractors' Association (NECA).
9. Underwriters Laboratories, Inc. (UL).

B. Reference shall mean to the latest edition of that standard.

1.3 CODES

A. Minimum requirements of the following codes shall be standard except where the drawings and specifications dictate a more stringent requirement. Where conflicts exist between these codes, the most stringent requirements shall apply.

1. The National Electrical Code (NEC), latest edition, as amended or supplemented by the authority having local jurisdiction over this project.

2. Occupational Safety and Health Administration (OSHA), as contained in the Code of Federal Regulations, Title 29, Part 1916, Subpart 9.

3. Americans with Disabilities Act Public Law 101-366.

4. National Electrical Safety Code (NESC).

5. The International Building Code (IBC).

1.4 SUBMITTALS

A. The Contractor shall make submittals for all electrical items and equipment shown on the drawings or hereinafter specified in accordance with Division 1.

B. Submittals required by this Division shall be made at one time. Partial submittals will not be accepted unless specifically noted by the Engineer.

C. Material or equipment that has not been reviewed for acceptance prior to delivery to the site shall not be permitted for installation or storage at the site.

D. Submittals shall indicate compliance with specific standards required in each section.

1.5 COORDINATION

A. Coordinate chases, slots, inserts, sleeves, and openings with other construction work and arrange in building structure during progress of construction to facilitate the electrical installations that follow.

1. Set inserts and sleeves in concrete, masonry work, and other structural components as they are constructed.

2. Coordinate construction related to building penetrations to minimize interruption of normal business conducted at the facility.

3. Coordinate all work of this Division requiring excavation, backfill, and placement of concrete by other Contractors.

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT

A. Material and equipment shall be listed, labeled or certified by UL, where such standards have been established. Equipment and material not covered by any UL Standard will be accepted provided equipment or material is listed, labeled, certified or otherwise determined to meet safety requirements of a recognized testing laboratory. Equipment of a class which no recognized testing laboratory accepts, certifies, lists, labels, or determines to be safe will be considered if inspected or tested in accordance with industrial standards such as NEMA, ICEA, or ANSI.

B. Materials and equipment furnished shall be new and of current production by manufacturers regularly engaged in the manufacture of such items, for which replacement parts should be available. Special items not meeting this requirement, but which otherwise meet technical specifications, and the merits of which can be established through reliable test reports or physical examination of representative samples, will be considered.

C. When more than one unit of the same class of equipment or material is required, such units shall be the products of a single manufacturer.

D. Equipment Assemblies and Components:

1. Constituent/component parts which are similar shall be the product of a single manufacturer.

2. Contractor furnishing equipment assemblies which include components made by several manufacturers shall assume complete responsibility for the final assembled unit.

H. Warranty. The entire installation and any equipment furnished under these specifications shall be warranted for a minimum period of one year after final acceptance. If warranties of a longer duration are required by specifications provide those warranties on items as required by the specification section.

2.2 GROUNDING

A. Provide a separate ground conductor with green colored jacket in every conduit serving a motor load.

B. Ground rods shall be provided in accordance with requirements of Grounding section of the specifications.

2.3 SUPPORTING DEVICES

A. Material: Cold-formed steel, with corrosion-resistant coating acceptable to authorities having jurisdiction.

B. Metal Items for Use Outdoors or in Damp Locations: Hot-dip galvanized steel, fiberglass, or stainless steel as noted on drawings or in other specification sections.

C. Slotted Steel Channel Supports: Flange edges turned toward web, and 9/16-inch- diameter slotted holes at a maximum of 2 inches o.c., in webs.

1. Channel Thickness: Selected to suit structural loading.

2. Fittings and Accessories: Products of the same manufacturer as channel supports.

3. Coat or place end caps on all channel supports.

D. Raceway and Cable Supports: Manufactured clevis hangers, riser clamps, straps, threaded C-clamps with retainers, ceiling trapeze hangers, wall brackets, and spring-steel clamps or click-type hangers.

E. Pipe Sleeves: ASTM A 53, Type E, Grade A, Schedule 40, galvanized steel, plain ends. Where appropriate use Link-seal modular seals.

F. Cable Supports for Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug for nonarmored electrical cables in riser conduits. Plugs shall have number and size of conductor gripping holes as required to suit individual risers. Body to be constructed of malleable-iron casting with hot-dip galvanized finish.

G. Expansion Anchors: Carbon-steel wedge or sleeve type.

H. Toggle Bolts: All-steel springhead type.

PART 3 – EXECUTION

3.1 INSTALLATION

A. Equipment locations shall be close as practical to locations shown on the drawings and subject to such revisions as may be found necessary or desirable at the time the work is installed.

1. Minor relocation of equipment, and offsets and rerouting of raceways may be made where required, provided that such work is coordinated with all other work and that there be no impairment of system operation as a result.

2. Major relocation of equipment, offsets, or rerouting of raceways shall not be made without prior approval from the Engineer or Owner's Representative.

B. Where specific conduit size, number of conductors, and destination of circuit is shown, combining of circuits in raceways other than the manner indicated shall not be accepted unless shop drawings are presented and written approval obtained prior to installation.

C. All penetrations by electrical raceways or equipment through (fire rated) walls or floors shall be sealed with fire retardant sealant.

D. Installer shall have the technical qualifications, experience, trained personnel and facilities to accomplish the installation in accordance with manufacturer's instructions and the best practices of the trade. NECA publication STANDARD OF INSTALLATION shall be used as a reference as to the quality of workmanship required.

3.2 LOCATIONS

All locations are subject to changes that may be necessary to avoid obstacles in building construction. The Contractor shall verify all dimensions and conditions at the site, and he shall check the layout for sizes and clearances, to verify that the apparatus and materials he proposes to furnish can be installed and operated satisfactorily in the space shown. Equipment and raceways shall be installed to preserve headroom and to keep openings and passageways clear. Equipment, boxes and outlets shall be installed in accessible locations. The Contractor shall examine drawings of other trades and avoid interferences with their work.

3.3 SLEEVES

Provide sleeves wherever conduit pass through concrete walls or floors. Sleeves shall be of wrought iron pipe of the proper size for the conduit to be installed, and shall extend 2 inches above finished floors and finish flush with the ceiling below and flush on both sides where installed in walls. Link-seal or similar type mechanical protective sealing and sleeving device can also be used.

3.4 PROTECTION OF WORK

The Contractor shall, at his expense, protect all of his work, materials and equipment that are liable to damage or theft during the construction period. All openings into any part of the raceways, as well as all associated fixtures, equipment, etc., both before and after being set in place, must be securely covered or otherwise protected to prevent obstruction of raceways or damage to equipment in any way. Conduit ends shall be covered with capped bushings or fiber disks and bushings. The Contractor will be held responsible for all damage done and missing items until his work is fully and finally accepted.

3.5 TESTS

The Borough of Highlands reserves the right to make tests for insulation resistance, voltage levels, load balance and operation of all systems. The Electrical Contractor shall furnish all labor, equipment and materials required for making such tests, and shall make corrections necessary to balance the load and obtain proper voltages and operation of the systems.

3.6 PAINTING

A. All surfaces of boxes, cabinets and equipment shall have suitable lacquer, enamel or plated finishes. The Contractor shall touch up any finishes marred during construction.

B. Supports and other metal work not finished with a protective coating shall be given a shop coat of paint after completion of the work.

3.7 ELECTRICAL SUPPORTING DEVICE APPLICATION

A. Damp Locations and Outdoors: Hot-dip galvanized materials or nonmetallic, U-channel system components.

B. Dry Locations: Steel materials.

C. Support Clamps for PVC Raceways: Click-type clamp system.

D. Selection of Supports: Comply with manufacturer's written instructions.

E. Strength of Supports: Adequate to carry present and reasonable expected future loads, times a safety factor of at least four; minimum of 200-lb design load.

F. Drawings may identify alternate materials required for a specific location. Material notes on drawings supersede requirements of this article.

3.8 SUPPORT INSTALLATION

A. Install support devices to securely and permanently fasten and support electrical components.

B. Install individual and multiple raceway hangers and riser clamps to support raceways. Provide U-bolts, clamps, attachments, and other hardware necessary for hanger assemblies and for securing hanger rods and conduits.

C. Support parallel runs of horizontal raceways together on trapeze- or bracket-type hangers.

D. Size supports for multiple raceway installations so capacity can be increased by a 25 percent minimum in the future.

E. Support individual horizontal raceways with separate, malleable-iron pipe hangers or clamps.

F. Install 1/4-inch- diameter or larger threaded steel hanger rods, unless otherwise indicated.

G. Spring-steel fasteners specifically designed for supporting single conduits or tubing may be used instead of malleable-iron hangers for 1-1/2-inch and smaller raceways serving

lighting and receptacle branch circuits above suspended ceilings and for fastening raceways to slotted channel and angle supports.

H. Arrange supports in vertical runs so the weight of raceways and enclosed conductors is carried entirely by raceway supports, with no weight load on raceway terminals.

I. Simultaneously install vertical conductor supports with conductors.

J. Separately support cast boxes that are threaded to raceways and used for fixture support. Support sheet-metal boxes directly from the building structure or by bar hangers. If bar hangers are used, attach bar to raceways on opposite sides of the box and support the raceway with an approved fastener not more than 24 inches from the box.

K. Install metal channel racks for mounting cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices unless components are mounted directly to structural elements of adequate strength.

L. Install sleeves for cable and raceway penetrations of concrete slabs and walls unless core-drilled holes are used. Install sleeves for cable and raceway penetrations of masonry and fire-rated gypsum walls and of all other fire-rated floor and wall assemblies. Install sleeves during erection of concrete and masonry walls.

M. Securely fasten electrical items and their supports to the building structure, unless otherwise indicated. Perform fastening according to the following unless other fastening methods are indicated:

1. Wood: Fasten with wood screws do not use nails.
2. Masonry: Toggle bolts on hollow masonry units and expansion bolts on solid masonry units.
3. New Concrete: Concrete inserts with machine screws and bolts.
4. Existing Concrete: Expansion bolts.
5. Steel: Welded threaded studs or spring-tension clamps on steel.
6. Welding to steel structure may be used only for threaded studs, not for conduits, pipe straps, or other items.
7. Light Steel: Sheet-metal screws.
8. Fasteners: Select so the load applied to each fastener does not exceed 25 percent of its proof-test load.

END OF SECTION

SECTION 16075 – ELECTRICAL IDENTIFICATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings, General Conditions, Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes electrical identification materials and devices required to comply with ANSI C2, NFPA 70, OSHA standards, and authorities having jurisdiction.

1.3 SUBMITTALS

A. Product Data: For each electrical identification product indicated.

B. Schedule of Nomenclature: An index of electrical equipment and system components used in identification signs and labels.

C. Samples: For each type of label and sign to illustrate color, lettering style, and graphic features of identification products.

1.4 QUALITY ASSURANCE

A. Comply with ANSI C2.

B. Comply with NFPA 70.

C. Comply with ANSI A13.1 and NFPA 70 for color-coding.

PART 2 - PRODUCTS

2.1 RACEWAY AND CABLE LABELS

A. Comply with ANSI A13.1, Table 3, for minimum size of letters for legend and for minimum length of color field for each aboveground raceway and cable size.

1. Color: Black letters on orange field.
2. Legend: Indicates voltage and service.

B. Adhesive Labels: Preprinted, flexible, self-adhesive vinyl with legend over laminated with a clear, weather- and chemical-resistant coating.

C. Pretensioned, Wraparound Plastic Sleeves: Flexible, preprinted, color-coded, acrylic band sized to suit the diameter of the line it identifies and arranged to stay in place by pretensioned gripping action when placed in position.

D. Colored Adhesive Tape: Self-adhesive vinyl tape not less than 3 mils thick by 1 to 2 inches wide.

E. Underground-Line Warning Tape: Permanent, bright-colored, continuous-printed, vinyl tape.

1. Not less than 6 inches wide by 4 mils thick.

2. Compounded for permanent direct-burial service.

3. Embedded continuous metallic strip or core.

4. Printed legend indicating type of underground line.

F. Tape Markers: Vinyl or vinyl-cloth, self-adhesive, wraparound type with preprinted numbers and letters.

G. Aluminum, Wraparound Marker Bands: Bands cut from 0.014-inch- thick aluminum sheet, with stamped or embossed legend, and fitted with slots or ears for permanently securing around wire or cable jacket or around groups of conductors.

H. Plasticized Card-Stock Tags: Vinyl cloth with preprinted and field-printed legends. Orange background, unless otherwise indicated, with eyelet for fastener.

I. Aluminum-Faced, Card-Stock Tags: Weather-resistant, 18-point minimum card stock faced on both sides with embossable aluminum sheet, 0.002 inch thick, laminated with moisture-resistant acrylic adhesive, punched for fasteners, and preprinted with legends to suit each application.

J. Brass or Aluminum Tags: 2 by 2 by 0.05-inch metal tags with stamped legend, punched for fastener.

2.2 NAMEPLATES AND SIGNS

A. Safety Signs: Comply with 29 CFR, Chapter XVII, Part 1910.145.

B. Engraved Plastic Nameplates and Signs: Engraving stock, melamine plastic laminate, minimum 1/16 inch thick for signs up to 20 sq. in. and 1/8 inch thick for larger sizes.

1. Engraved legend with black letters on white face.

2. Punched or drilled for mechanical fasteners.

C. Baked-Enamel Signs for Interior Use: Preprinted aluminum signs, punched or drilled for fasteners, with colors, legend, and size required for the application. 1/4-inch grommets in corners for mounting.

D. Exterior, Metal-Backed, Butyrate Signs: Weather-resistant, nonfading, preprinted, cellulose-acetate butyrate signs with 0.0396-inch galvanized-steel backing; and with colors, legend, and size required for the application. 1/4-inch grommets in corners for mounting.

E. Fasteners for Nameplates and Signs: Self-tapping, stainless-steel screws or No. 10/32, stainless-steel machine screws with nuts and flat and lock washers.

2.3 MISCELLANEOUS IDENTIFICATION PRODUCTS

A. Cable Ties: Fungus-inert, self-extinguishing, one-piece, self-locking, Type 6/6 nylon cable ties.

1. Minimum Width: 3/16 inch.

2. Tensile Strength: 50 lb minimum.

3. Temperature Range: Minus 40 to plus 185 deg F.

4. Color: According to color-coding.

B. Paint: Formulated for the type of surface and intended use.

1. Primer for Galvanized Metal: Single-component acrylic vehicle formulated for galvanized surfaces.

2. Primer for Concrete Masonry Units: Heavy-duty-resin block filler.

3. Primer for Concrete: Clear, alkali-resistant, binder-type sealer.

4. Enamel: Silicone-alkyd or alkyd urethane as recommended by primer manufacturer.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Identification Materials and Devices: Install at locations for most convenient viewing without interference with operation and maintenance of equipment.

B. Lettering, Colors, and Graphics: Coordinate names, abbreviations, colors, and other designations with corresponding designations in the Contract Documents or with those required by codes and standards. Use consistent designations throughout Project.

C. Sequence of Work: If identification is applied to surfaces that require finish, install identification after completing finish work.

D. Self-Adhesive Identification Products: Clean surfaces before applying.

E. Install painted identification according to manufacturer's written instructions and as follows:

1. Clean surfaces of dust, loose material, and oily films before painting.

2. Prime surfaces using type of primer specified for surface.

3. Apply one intermediate and one finish coat of enamel.

F. Color Banding Raceways and Exposed Cables of auxiliary systems. Band exposed and accessible raceways of the systems listed below:

1. Bands: Pretensioned, wraparound plastic sleeves; colored adhesive tape; or a combination of both. Make each color band 2 inches wide, completely encircling conduit, and place adjacent bands of two-color markings in contact, side by side.

2. Band Locations: At changes in direction, at penetrations of walls and floors, at 50-foot maximum intervals in straight runs, and at 25-foot maximum intervals in congested areas.

3. Apply the following colors to the systems listed below:
   a. Mechanical and Electrical Supervisory System: Green and blue.
   b. Control Wiring: Green and red.
   c. Telecommunication system: Green and yellow.

G. Caution Labels for Indoor Boxes and Enclosures for Power and Lighting: Install pressure-sensitive, self-adhesive labels identifying system voltage with black letters on orange background. Install on exterior of door or cover.

H. Circuit Identification Labels on Boxes: Install labels externally.

1. Exposed Boxes: Pressure-sensitive, self-adhesive plastic label on cover.
2. Concealed Boxes: Plasticized card-stock tags, within boxes.
3. Labeling Legend: Permanent, waterproof listing of panel and circuit number or equivalent.

I. Paths of Underground Electrical Lines: During trench backfilling, for exterior underground power, control, signal, and communication lines, install continuous underground plastic line marker located directly above line at 6 to 8 inches below finished grade. Where width of multiple lines installed in a common trench or concrete envelope does not exceed 16 inches overall, use a single line marker. Install line marker for underground wiring, both direct-buried cables and cables in raceway.

J. Color-Coding of Secondary Phase Conductors: Use the following colors for service, feeder and branch-circuit phase conductors:

1. 208/120-V Conductors:

   a. Phase A: Black.
   b. Phase B: Red.
   c. Phase C: Blue.
   d. Neutral: White

2. 480/277-V Conductors:

   a. Phase A: Brown.
   b. Phase B: Orange.
   c. Phase C: Yellow.
   d. Neutral: Grey.

3. Factory apply color the entire length of conductors, except the following field-applied, color-coding methods may be used instead of factory-coded wire for sizes larger than No. 10 AWG:

   a. Colored, pressure-sensitive plastic tape in half-lapped turns for a 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. Use 1-inch- wide tape in colors specified. Adjust tape bands to avoid obscuring cable identification markings.
   b. Colored cable ties applied in groups of three ties of specified color to each wire at each terminal or splice point starting 3 inches from the terminal and spaced 3 inches apart. Apply with a special tool or pliers, tighten to a snug fit, and cut off excess length.

K. Power-Circuit Identification: Metal tags or aluminum, wraparound marker bands for cables, feeders, and power circuits in vaults, pull and junction boxes, manholes, and switchboard rooms.

1. Legend: 1/4-inch- steel letter and number stamping or embossing with legend corresponding to indicated circuit designations.
2. Tag Fasteners: Nylon cable ties.
3. Band Fasteners: Integral ears.

L. Apply identification to conductors as follows:

1. Conductors to Be Extended in the Future: Indicate source and circuit numbers.
2. Multiple Power or Lighting Circuits in the Same Enclosure: Identify each conductor with source, voltage, circuit number, and phase. Use color-coding to identify circuits' voltage and phase.
3. Multiple Control and Communication Circuits in the Same Enclosure: Identify each conductor by its system and circuit designation. Use a consistent system of tags, color-coding, or cable marking tape.

M. Apply warning, caution, and instruction signs as follows:

1. Warnings, Cautions, and Instructions: Install to ensure safe operation and maintenance of electrical systems and of items to which they connect. Install engraved plastic-laminated instruction signs with approved legend where instructions are needed for system or equipment operation. Install metal-backed butyrate signs for outdoor items.
2. Emergency Operation: Install engraved laminated signs with white legend on red background with minimum 3/8-inch- high lettering for emergency instructions on power transfer, load shedding, and other emergency operations.

N. Equipment Identification Labels: Engraved plastic laminate. Install on each unit of equipment, including central or master unit of each system. This includes power, lighting, communication, signal, and alarm systems, unless units are specified with their own self-explanatory identification. Unless otherwise indicated, provide a single line of text with 1/2-inch- high lettering on 1-1/2-inch- high label; where two lines of text are required, use labels 2 inches high. Use white lettering on black field. Apply labels for each unit of the following categories of equipment using mechanical fasteners:

1. Service Entrance.
2. Panelboards, electrical cabinets, and enclosures.
3. Disconnect switches.
4. Enclosed circuit breakers.
5. Motor starters.
6. Push-button and control stations.
7. Control devices.
8. Telephone switching equipment.
9. Transformers

END OF SECTION

SECTION 16120 – CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

B. Furnish and install and power up all equipment, panels, re-power up existing pump, relocate and repower up existing pump control equipment, lighting, fans etc.

C. The conductors and cables run from the panels to the transducers must be contained in a strong well supported stilling well, using SS mounting straps and SS anchors into the wet well walls. THIS WORK SHALL BE INCLUDED IN THE UNIT PRICE 'ELECTRICAL, COMPLETE' IN THE PROPOSAL.

1.2 SUMMARY

A. This Section includes building wires and cables and associated connectors, splices, and terminations for wiring systems rated 600 V and less.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Field Quality-Control Test Reports: From a qualified testing and inspecting agency engaged by Contractor.

1.4 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with NFPA 70.

1.5 DELIVERY STORAGE AND HANDLING

A. Deliver wires and cables according to NEMA WC 26.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, provide products by the manufacturers listed below.

1. Wires and Cables:

   a. American Insulated Wire Corp.; a Leviton Company.

   b. General Cable Corporation.

   c. Southwire Company.

d. Cerrowire.

e. Republic Wire.

B. Refer to Part 3 "Conductor and Insulation Applications" for insulation type, cable construction, and ratings.

C. Conductor Material: Copper complying with ANSI/NEMA WC 70-2009; For power circuits, stranded conductor or solid conductor for No. 12 AWG and smaller. If solid conductors are used, they are to be used for lighting and receptacle circuits only. Provide stranded conductors for No. 8 AWG and larger. All control circuit conductors shall be stranded.

D. Conductor Insulation Types: Type THHN-THWN, XHHW-2 and complying with ANSI/NEMA WC 70-2009/ICEA S-95-658-2009.

E. Analog control signal wire shall be #18 AWG cable or larger. Cables shall be copper pairs with color coded conductor insulation. Each pair shall have a foil shield with a drain conductor continuously in contact with the shield. Insulation shall be 300 volt minimum.

F. Cable from the valve actuator remote control station to the actuator shall be Belden 3084A 5 conductor cable, 2 data, 2 power, or approved equal.

2.2 CONNECTORS AND SPLICES

A. Available Manufacturers:

1. AMP Incorporated/Tyco International.

2. Hubbell/Anderson.

3. O-Z/Gedney; EGS Electrical Group LLC.

4. 3M Company; Electrical Products Division.

B. 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 AND INSULATION APPLICATIONS

A. Exposed Feeders: Type THHN-THWN, single conductors in raceway. All wire shall be Copper Stranded.

B. Feeders Concealed in Ceilings, Walls, and Partitions: Type THHN-THWN, single conductors in raceway.

C. Feeders Concealed in Concrete, below Slabs-on-Grade, and in Crawlspaces: Type XHHW-2, single conductors in raceway.

D. Branch Circuits Concealed in Concrete and below Slabs-on-Grade: Type XHHW-2, single conductors in raceway.

E. Cord Drops and Portable Appliance Connections: Type SO, hard service cord.

F. Class 1 Control Circuits: Type THHN-THWN, in raceway.

G. Class 2 Control Circuits: Type THHN-THWN, in raceway.

H. No wire smaller than No.12 AWG shall be used for lighting and power. All wire shall be sized such that the drop in potential to the most distant point of the power circuit will not exceed code requirements.

I. Control wire (used for discrete signals in monitoring and control circuits) shall be No. 14 AWG.

J. Analog circuits twisted shielded pairs (TSP) shall be No. 18 AWG minimum, tinned copper with drain wire in contact with overall shield, installed within raceway. Cables with multiple TSP in a single jacketed cable will be reviewed on a case by case basis by the Engineer. All analog cables shall have 300 Volt minimum insulation.

3.2 INSTALLATION

A. Conceal cables in finished walls, ceilings, and floors, unless otherwise indicated.

B. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must 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.

D. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.

E. Support cables according to Section 16050 "Basic Electrical Materials and Methods."

F. Seal around cables penetrating fire-rated elements with appropriate “firestopping.”

G. Identify and color-code conductors and cables according to Section 16075 "Electrical Identification."

H. Each conduit or raceway that has phase conductors shall also contain a green insulated grounding conductor sized per NEC unless otherwise noted.

3.3 CONNECTIONS

A. Conductor splices shall be kept to a minimum.

B. 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.

C. Make splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.

D. Wiring at Outlets: Install conductor at each outlet, with at least 6 inches of slack.

3.4 FIELD QUALITY CONTROL

A. Testing: Perform the following field quality-control testing:

1. After installing conductors and cables and before electrical circuitry has been energized, test for compliance with requirements.

2. Perform each electrical test and visual and mechanical inspection stated in NETA ATS, Section 7.3.1. Certify compliance with test parameters.

3. Test wires and cables for electrical continuity and for short-circuits

B. Test Reports: Prepare a written report to record the following:

1. Test procedures used.

2. Test results that comply with requirements.

3. Test results that do not comply with requirements and corrective action taken to achieve compliance with requirements.

END OF SECTION

SECTION 16130 – RACEWAYS AND BOXES AND SURFACE CAGE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes raceways, fittings, boxes, enclosures, and cabinets for electrical wiring.

B. All of this work shall be included in the unit price bid for Electrical, Complete.

C. Related Sections include the following:
1. Division 16 Section 16050 "Basic Electrical Materials and Methods" for supports, anchors, and identification products.
2. Division 16 Section 16140 "Wiring Devices" for devices installed in boxes and for floor-box service fittings.

1.3 DEFINITIONS

A. RGS: Rigid Galvanized Steel conduit.

B. RA: Rigid aluminum conduit

C. LFMC: Liquidtight flexible metal conduit.

D. RNC: Rigid nonmetallic conduit.

E. LFNC: Liquidtight flexible nonmetallic conduit.

1.4 SUBMITTALS

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

1.5 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with NFPA 70.

1.6 COORDINATION

A. Coordinate layout and installation of raceways, boxes, enclosures, cabinets, and suspension system with other construction that penetrates ceilings or is supported by them, including light fixtures and HVAC equipment.

PART 2 - PRODUCTS

2.1 METAL CONDUIT AND TUBING

A. Available Manufacturers:

1. Alflex Inc.
2. Anamet Electrical, Inc.; Anaconda Metal Hose.
3. Grinnell Co./Tyco International; Allied Tube and Conduit Div.
4. O-Z Gedney; Unit of General Signal.
5. Wheatland Tube Co.

B. LFMC: Flexible steel conduit with PVC jacket.

C. Fittings: NEMA FB 1; compatible with conduit and tubing materials.

2.2 NONMETALLIC CONDUIT AND TUBING

A. Available Manufacturers:

1. Condux International.
2. Carlon Electrical Products.
3. RACO; Division of Hubbell, Inc.
4. Thomas & Betts Corporation.

B. RNC: NEMA TC 2, Schedule 40 and Schedule 80 PVC.

C. LFNC: UL 1660.

2.3 BOXES, ENCLOSURES, AND CABINETS

A. Available Manufacturers:

1. Appleton Electric Company.
2. Hoffman.
3. Killark Electric Manufacturing Co.
4. O-Z/Gedney; Unit of General Signal.
5. Robroy Industries, Inc.; Enclosure Division.
6. Thomas & Betts Corporation.

B. Sheet Metal Outlet and Device Boxes: NEMA OS 1.

C. Cast-Metal Outlet and Device Boxes: NEMA FB 1, Type FD, with gasketed cover.

D. Outdoor cabinets, junction boxes and pull boxes shall be NEMA 3R. Indoor cabinets, junction boxes and pull boxes shall be NEMA 12, type mild steel, painted. Junction boxes shall include removable interior subpanel. Provide boxes with hinged door. Include metal barriers to separate wiring of different systems and voltage and include accessory feet where required for freestanding equipment. All junction boxes shall include the appropriate size terminal blocks for all conductors terminated within the box.

2.4 FACTORY FINISHES

A. Finish: Exteriors of stainless steel enclosures shall be free of all marks and defects.

B. Finish: Subpanels shall have white enamel finish.

PART 3 - EXECUTION

3.1 RACEWAY APPLICATION

A. Meet the following requirements outdoors, unless otherwise noted:

1. Exposed: RGS or RA.
2. Concealed in concrete floor: RGS. Conduit shall have protective coating applied.
3. Underground, Single Run: RGS.
4. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
5. Boxes and Enclosures: NEMA 250, Type 3R.

B. Indoors:

1. RGS or RA.
2. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.

C. Minimum Raceway Size: 3/4-inch trade size indoors, 1 inch trade size outdoors.

D. Raceway Fittings: Compatible with raceways and suitable for use and location.

3.2 INSTALLATION

A. 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.

B. Complete raceway installation before starting conductor installation.

C. Support raceways as specified in Division 16 Section "Basic Electrical Materials and Methods."

D. Install temporary closures to prevent foreign matter from entering raceways.

E. Protect stub-ups from damage where conduits rise through floor slabs. Arrange so curved portions of bends are not visible above the finished slab.

F. Make bends and offsets so ID is not reduced. Keep legs of bends in the same plane and keep straight legs of offsets parallel, unless otherwise indicated.

G. Conceal conduit within finished walls, ceilings, and floors, unless otherwise indicated.

1. Install concealed raceways with a minimum of bends in the shortest practical distance, considering type of building construction and obstructions, unless otherwise indicated.

H. Raceways Embedded in Slabs: Install in middle 1/3 of slab thickness where practical and leave at least 2 inches of concrete cover.

1. Secure raceways to reinforcing rods to prevent sagging or shifting during concrete placement.
2. Space raceways laterally to prevent voids in concrete.
3. Run conduit larger than 1-inch trade size parallel or at right angles to main reinforcement. Where at right angles to reinforcement, place conduit close to slab support.
4. Change from RNC to RGS or rigid aluminum before rising above the finished floor or grade.
5. Install exposed raceways parallel or at right angles to nearby surfaces or structural members and follow surface contours as much as possible.
6. Run parallel or banked raceways together on common supports.
7. Make parallel bends in parallel or banked runs. Use factory elbows only where elbows can be installed parallel; otherwise, provide field bends for parallel raceways.

I. Join raceways with fittings designed and approved for that purpose and make joints tight.

1. Use insulating bushings to protect conductors.

J. Threadless fittings are not to be used with GRS conduits.

K. Terminations:

1. Locknuts and bushings are not allowed. Use threaded hubs. Screw raceways or fittings tightly into hub so end bears against wire protection shoulder. Where chase nipples are used, align raceways so coupling is square to box; tighten chase nipple so no threads are exposed.

L. Install pull lines in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 12 inches of slack at each end of pull wire.

M. Telephone and Signal System Raceways, 2-Inch Trade Size and Smaller: In addition to above requirements, install raceways in maximum lengths of 150 feet and with a maximum of two 90-degree bends or equivalent. Separate lengths with pull or junction boxes where necessary to comply with these requirements.

N. Install raceway sealing fittings at suitable, approved, and accessible locations and fill them with UL-listed sealing compound. For concealed raceways, install each fitting in a flush metal box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings at the following points:

1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
2. Where otherwise required by NFPA 70.

O. Stub-up Connections: Extend conduits through concrete floor for connection to freestanding equipment. Install with an adjustable top or coupling threaded inside for plugs set flush with finished floor. Extend conductors to equipment with RGS or rigid aluminum conduit; LFMC may be used 6 inches above the floor. Install screwdriver-operated, threaded plugs flush with floor for future equipment connections.

P. Flexible Connections: Use maximum of 72 inches of flexible conduit for recessed and semirecessed lighting fixtures; for equipment subject to vibration, noise transmission, or movement; and for all motors. Use LFMC in damp or wet locations. Install separate ground conductor across flexible connections.

Q. Surface Raceways: Install a separate, green, ground conductor in raceways from junction box supplying raceways to receptacle or fixture ground terminals.

R. Install hinged-cover enclosures and cabinets plumb. Support at each corner.

3.3 PROTECTION

A. Provide final protection and maintain conditions that ensure coatings, finishes, and cabinets are without damage or deterioration at time of Substantial Completion.

1. Repair damage to PVC or paint finishes with matching touchup coating recommended by manufacturer.

3.4 CLEANING

A. After completing installation of exposed, factory-finished raceways and boxes, inspect exposed finishes and repair damaged finishes.

END OF SECTION

SECTION 16140 – WIRING DEVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:

1. Single and duplex receptacles, ground-fault circuit interrupters, integral surge suppression units, and isolated-ground receptacles.
2. Single- and multi-pole light switches and dimmer switches.
3. Device wall plates.
4. Pin and sleeve connectors and receptacles.

1.3 DEFINITIONS

A. GFCI: Ground-fault circuit interrupter.

B. PVC: Polyvinyl chloride.

C. UTP: Unshielded twisted pair.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

1.5 QUALITY ASSURANCE

A. Source Limitations: Obtain each type of wiring device through one source from a single manufacturer.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

C. Comply with NFPA 70.

1.6 COORDINATION

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

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Wiring Devices:

a. Hubbell Incorporated.
b. Leviton Mfg. Company Inc.
c. Pass & Seymour/Legrand; Wiring Devices Div.

2. Wiring Devices for Hazardous (Classified) Locations:

a. Crouse-Hinds/Cooper Industries, Inc.;
b. EGS/Appleton Electric Company.
c. Killark Electric Manufacturing Co./Hubbell Incorporated.

2.2 RECEPTACLES

A. Straight-Blade-Type Receptacles: Comply with NEMA WD 1, NEMA WD 6, DSCC W-C-596G, and UL 498.

B. Straight-Blade and Locking Receptacles: Heavy-Duty grade comply with UL 498 and Fed Spec WC 596.

C. GFCI Receptacles: Straight blade, feed -through type, Heavy-Duty grade, with integral NEMA WD 6, Configuration 5-20R duplex receptacle; complying with UL 498 and UL 943. Design units for installation in a 2-3/4-inch- deep outlet box without an adapter.

D. Industrial Heavy-Duty Pin and Sleeve Devices: Comply with IEC 309-1.

E. Hazardous (Classified) Location Receptacles: Comply with NEMA FB 11.

2.3 SWITCHES

Single- and Double-Pole Switches: Comply with DSCC W-C-896F and UL 20.

2.4 WALL PLATES

F. Single and combination types to match corresponding wiring devices.

1. Plate-Securing Screws: Metal with head color to match plate finish.
2. Material: 0.035-inch- thick, satin-finished stainless steel.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install devices and assemblies level, plumb, and square with building lines.

B. 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.

C. Remove wall plates and protect devices and assemblies during painting.

3.2 IDENTIFICATION

A. Comply with Division Section 16075 "Electrical Identification."

1. Receptacles: Identify panelboard and circuit number from which served. Use hot stamped or engraved machine printing with white-filled lettering on face of plate, and durable wire markers or tags inside outlet boxes.

3.3 CONNECTIONS

A. Ground equipment according to Division Section 16450 "Grounding and Bonding."

B. Connect wiring according to Division Section 16120 "Conductors and Cables."

C. 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.

3.4 FIELD QUALITY CONTROL

D. Perform the following field tests and inspections and prepare test reports:

1. After installing wiring devices and after electrical circuitry has been energized, test for proper polarity, ground continuity, and compliance with requirements.
2. Test GFCI operation with both local and remote fault simulations according to manufacturer's written instructions.

E. Remove malfunctioning units, replace with new units, and retest as specified above.

END OF SECTION

SECTION 16170 – CIRCUIT AND MOTOR DISCONNECTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract including General and Supplementary Conditions apply to this section.

B. Section 16050 - Basic Materials and Methods

1.2 DESCRIPTION OF WORK

A. Extent of circuit and motor disconnect switch work is indicated on drawings and schedules. The Contractor shall provide all circuit and motor disconnect switches as required by codes, whether shown or not shown on drawings.

B. Types of circuit and motor disconnect switches in this section include the following:

1. Equipment disconnects
2. Appliance disconnects
3. Motor-circuit disconnects

C. Wires/cables, raceways and electrical boxes and fittings required in connection with circuit and motor disconnect work are specified in other Sections.

1.3 QUALITY ASSURANCE

A. Provide equipment manufactured by firms regularly engaged in manufacture of circuit and motor disconnect switches of types and capacities required, whose products have been in satisfactory use in similar service for not less than 3 years.

B. Comply with NEC requirements pertaining to construction and installation of electrical circuit and motor disconnect devices.

C. Comply with requirements of UL 98 “Enclosed and Dead-Front Switches.” Provide circuit and motor disconnect switches which have been UL-listed and labeled.

D. Comply with applicable requirements of NEMA Standards. No. KS 1, “Enclosed Switches” and 250, “Enclosures for Electrical Equipment” (1000 Volts Maximum).

1.4 SUBMITTALS

A. Submit manufacturer’s product data on circuit and motor disconnect switches.

B. Submit shop drawings of electrical circuit and motor disconnect switches and enclosures showing accurately scaled switches.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. All devices shall be the product of the same manufacturer unless specifically noted otherwise. Subject to compliance with requirements, provide circuit and motor disconnects of one of the following (for each type of switch).

1. Square D Company
2. Eaton / Cutler-Hammer
3. ABB

2.2 FABRICATED SWITCHES

A. Switches indicated or specified shall be heavy-duty type, horsepower rated, quick-make, quick-break type switches with spring reinforced wire grips and self-aligning switch contacts. Indoor switches shall be enclosed in NEMA-1 heavy sheet metal enclosure with a hinged interlocking cover which shall prevent the covering being opened when the switch is "ON". Outdoor switches shall be in enclosures with NEMA ratings as noted on drawings. Equip with operating handle which is an integral part of enclosure base and whose position is easily recognizable and is padlockable in OFF position; construct current carrying part of high-conductivity copper, with silver-tungsten type switch contacts, and positive pressure type reinforced fuse clips, if required. Switches generally shall be NEMA-1 type.

B. Weatherproof switches shall be provided for all locations exposed to the elements whether called for or not.

C. Switches in corrosive areas shall include NEMA 4X enclosures.

D. Switches provided shall be suitable for:

1. Circuit application voltage.
2. Circuit application ampacity x 125%. 1 pole, 2 pole, 3 pole, solid neutral, ground connection all as required by item served or as shown on the drawings.

E. Provide cartridge type fuses in fusible switches.

F. Motor circuit disconnect switches must be horse power rated for the motor served.

G. Motor thermal overload switches: Where indicated on the plans, provide motor thermal overload switches. Switches shall be Eaton MS Series for single phase motors and B100 Series for three phase motors, or approved equal, toggle operated with thermal overload protection. Use NEMA-1 general purpose enclosure where conduit is exposed and flush mounted with stainless steel plate where conduit is concealed. Provide proper size heater for motor installed. Switches shall have red jeweled pilot light where motor controller is out of sight of the switch. Where automatic starting is required, motors shall be equipped with magnetic starters as required, shown or not shown on the drawings.

PART 3 - EXECUTION

3.1 INSTALLATION OF CIRCUIT AND MOTOR DISCONNECT SWITCHES

A. Install circuit and motor disconnect switches as indicated, complying with manufacturer's written instructions, applicable requirements of NEC, NEMA and NECA's "Standard of Installation", and in accordance with recognized industry practices.

B. Coordinate circuit and motor disconnect switch installation work with electrical raceway and cable work, as necessary for proper interface.

C. Install disconnect switches for use with motor-driven appliances, and motors and controllers within sight of controller position, unless otherwise indicated.

D. All switches shall be provided with laminated plastic labels which clearly identify the equipment served.

3.2 GROUNDING

A. Provide equipment grounding connections sufficiently tight to assure a permanent and effective ground for electrical disconnect switches where indicated.

3.3 FIELD QUALITY ASSURANCE

A. Subsequent to completion of installation of electrical disconnect switches, energize circuitry and demonstrate capability and compliance with requirements. Where possible, correct malfunctioning units at project site, then retest to demonstrate compliance; otherwise remove and replace with new units and retest.

END OF SECTION

SECTION 16190 – ELECTRICAL SUPPORT DEVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes hangers and supports for electrical equipment. Construction requirements for concrete bases for mounting electrical equipment.

B. Related Sections include the following:
1. Division 16 Section 16050 "Basic Electrical Materials and Methods" for supports, anchors, and identification products.

1.3 DEFINITIONS

A. RGS: Rigid Galvanized Steel conduit.

B. RA: Rigid aluminum conduit

C. LFMC: Liquidtight flexible metal conduit.

D. RNC: Rigid nonmetallic conduit.

E. IMC: Intermediate Metal Conduit

1.4 SUBMITTALS

A. Product Data: For steel slotted support systems. Nonmetallic slotted support system.

1.5 QUALITY ASSURANCE

A. Comply with NFPA 70.

1.6 COORDINATION

A. Coordinate layout and installation of support systems with other construction. Coordinate the size and location of concrete bases. Cast anchor-bolt inserts into bases.

PART 2 - PRODUCTS

2.1 SUPPORTS AND HANGERS

A. Conduit shall be supported in accordance with the National Electrical Code.

B. Conduits shall be supported by strut support system of the same material as the conduit (example: aluminum strut for ARC). The supports system shall consist of threaded rod, strut, clamps, straps, fasteners, etc., matching the support system material.

C. No electrical equipment of any nature shall be fastened directly to masonry surfaces.

D. Where supporting channels are fastened to masonry walls, toggle bolts, expansion shields or through bolts shall be used. Wood or plastic plug masonry anchors shall not be used.

E. Provide "supports" or "hangers" (brackets, rods, angle members, channel, clamps, nuts, etc.) where required to fasten or support electrical equipment.

F. The required strength of the supporting equipment, and the size and type of anchors, shall be based on the combined weight of conduit, hanger and cables.

G. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:

1. Powder-Actuated Fasteners: Threaded-stainless steel stud, for use in hardened Portland cement concrete, steel, or wood, with tension, shear, pullout capacities appropriate for supported loads and building materials where used.

    a. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

        1) Hilti Inc.
        2) ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.
        3) MKT Fastening, LLC.

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.

    a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

        1) B-Line, Inc.
        2) Empire Tool and Manufacturing Co., Inc.
        3) Hilti Inc.
        4) ITW Ramset/Red Head; a Division of Illinois Tool Works, Inc.
        5) MKT Fastening, LLC.

3. Concrete Inserts: Stainless 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 stainless-steel springhead type.

7. Hanger Rods: Threaded stainless steel.

H. Conduit and Cable Support Devices: Steel and malleable-iron hangers, clamps, and associated fittings, designed for types and sizes of raceways or cable to be supported.

2.2 EQUIPMENT SUPPORTS AND STANDS

A. Design and construct supporting structures of strength to safety withstand stresses to which subjected and to distribute the load properly. Stainless steel structures shall be used where work is subject to corrosion. Channel dimensions shall be selected for applicable load criteria.

B. Provide supports by one of the following manufacturers, subject to compliance with requirements:
1. Allied Tube & Conduit
2. B-Line
3. Flex-Strut
4. G-Strut
5. Kindorf
6. Thomas & Betts Corporation
7. Unistrut
8. Wesanco

PART 3 - EXECUTION

3.1 APPLICATION

A. Comply with NECA 1 and NECA 101 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 scheduled in NECA 1, where its Table 1 lists maximum spacing less than stated in NFPA 70. 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 single-bolt conduit clamps.

3.2 SUPPORT INSTALLATION

A. Comply with NECA 1 and NECA 101 for application of hangers and supports for electrical equipment and systems except if requirements in this Section are stricter.

B. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading

limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb.

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 New Concrete: Bolt to concrete inserts,

2. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.

3. To Existing Concrete: Expansion anchor fasteners.

4. 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.

5. To Steel: Beam clamps (MSS Type 19, 21, 23, 25, or 27) complying with MSS SP-69.

6. To Light Steel: Sheet metal screws.

7. Items Mounted on Hollow Walls and Noncontractual Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, control panels, 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 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. Unless noted otherwise, use 3500-psi, 28-day compressive-strength concrete.

C. Anchor equipment to concrete base.

1. Place and secure anchorage devices. Use supported equipment manufacturer's setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

2. Install anchor bolts to elevations required for proper attachment to supported equipment.

3. Install anchor bolts according to anchor-bolt manufacturer's written instructions.

3.4 PAINTING

A. Touchup: Clean abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.

1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils.

B. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

END OF SECTION

SECTION 16450 – GROUNDING AND BONDING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes grounding of electrical systems and equipment. Grounding requirements specified in this Section may be supplemented by special requirements of systems described in other Sections.

1.3 SUBMITTALS

A. Product Data: For the following:

1. Ground rods.

2. Intersystem Bonding Terminal

3. Handholes

B. Qualification Data: For firms and persons specified in "Quality Assurance" Article.

C. Field Test Reports: Submit written test reports to include the following:

1. Test procedures used.

2. Test results that comply with requirements.

3. Results of failed tests and corrective action taken to achieve test results that comply with requirements.

1.4 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

1. Comply with UL 467.

B. Comply with NFPA 70; for overhead-line construction and medium-voltage underground construction, comply with IEEE C2.

C. Comply with NFPA 70; Article 250.94, requirements for intersystem bonding terminations.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Grounding Conductors, Cables, Connectors, and Rods:

a. Chance/Hubbell.
b. Erico Inc.; Electrical Products Group.
c. O-Z/Gedney Co.; a business of the EGS Electrical Group.

2. Intersystem bonding termination:
a. Arlington Industries AIGBB5
b. Erico, Eritech part number IBTB.

3. Handhole (Ground Test Well) to be 9 inches diameter (+/-) or larger, 42. inches long (+/-) made of HDPE with HDPE lid/cover.
a. Harger
b. Erico
c. Pencell Plastics.

2.2 GROUNDING CONDUCTORS

A. For insulated conductors, comply with Division 16 Section "Conductors and Cables."

B. Material: Copper.

C. Equipment Grounding Conductors: Insulated with green-colored insulation.

D. Grounding Electrode Conductors: Stranded cable.

E. Underground Conductors: Bare, tinned, stranded, unless otherwise indicated.

F. Bare Copper Conductors: Comply with the following:

1. Solid Conductors: ASTM B 3.

2. Assembly of Stranded Conductors: ASTM B 8.

3. Tinned Conductors: ASTM B 33.

G. Copper Bonding Conductors: As follows:

1. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG copper conductor, 1/4 inch in diameter.

2. Bonding Conductor: Copper wire, size as shown on drawings or as required by NEC.

3. Bonding Jumper: Bare copper tape, braided bare copper conductors, terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.

4. Tinned Bonding Jumper: Tinned-copper tape, braided copper conductors, terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.

H. Ground Conductor and Conductor Protector for Wood Poles: As follows:

1. No. 4 AWG minimum, soft-drawn copper conductor.

2. Conductor Protector: Half-round PVC or wood molding. If wood, use pressure-treated fir, cypress or cedar.

I. Grounding Bus: Bare, annealed copper bars of rectangular cross section, with insulators.

2.3 CONNECTOR PRODUCTS

A. Comply with IEEE 837 and UL 467; listed for use for specific types, sizes, and combinations of conductors and connected items.

B. Bolted Connectors: Bolted-pressure-type connectors, or compression type.

C. Welded Connectors: Exothermic-welded type, in kit form, and selected per manufacturer's written instructions.

2.4 INTERSYSTEM BONDING TERMINAL

A. Compliance.

1. Provide intersystem bonding terminal(s) compliant with 2017 NEC Article 250.94 or other listing included in the latest version of the National Electric Code.

2. Intersystem Bonding Terminal shall be recognized by UL or other authorized and recognized testing agency acceptable to the Engineer.

B. Shall accommodate at least 5 #14 to #4 conductors and 1 #6 to #2 grounding electrode conductor. Shall include a polymeric base and cover which is UV resistant.

2.5 GROUNDING TEST WELL

A. Grounding test well shall be handhole made of HDPE material. Unit shall be sized to accommodate the ground rod and connector and shall provide access for inspection. Material of construction shall be stabilized and UV resistant. Cover shall be easily removable.

2.6 GROUNDING ELECTRODES

A. Ground Rods: Copper-clad, ¾” diameter, 10’ in length.

PART 3 - EXECUTION

3.1 APPLICATION

A. Use only copper conductors for both insulated and bare grounding conductors in direct contact with earth, concrete, masonry, crushed stone, and similar materials.

B. In raceways, use insulated equipment grounding conductors.

C. Exothermic-Welded Connections: Use for connections to structural steel, and for underground connections, except for those shown as bolted connections on the drawings.

D. Equipment Grounding Conductor Terminations: Use bolted pressure clamps.

E. Underground Grounding Conductors: Use copper conductor, sized as shown on drawings. Bury at least 24 inches below grade or bury 12 inches above duct bank when installed as part of the duct bank.

3.2 EQUIPMENT GROUNDING CONDUCTORS

A. Comply with NFPA 70, Article 250, for types, sizes, and quantities of equipment grounding conductors, unless specific types, larger sizes, or more conductors than required by NFPA 70 are indicated.

B. Install equipment grounding conductors in all feeders and circuits.

C. Equipment grounding conductors #4 and smaller shall be covered or insulated and have a continuous outer finish is green or green with yellow stripes. Equipment grounding conductors #4 or larger that are insulated or covered can be identified at each end and where accessible by marking with green tape that completely encircles the conductor.

D. Busway Supply Circuits: Install insulated equipment grounding conductor from the grounding bus in the switchgear, switchboard, or distribution panel to equipment grounding bar terminal on busway.

E. Nonmetallic Raceways: Install an equipment grounding conductor in nonmetallic raceways unless they are designated for telephone or data cables.

F. Signal and Communication Systems: For telephone, alarm, voice and data, and other communication systems, provide intersystem bonding terminal.

1. Service and Central Equipment Locations and Wiring Closets: Terminate grounding conductor on a 1/4-by-2-by-12-inch grounding bus.

2. Terminal Cabinets: Terminate grounding conductor on cabinet grounding terminal.

G. Metal Poles Supporting Outdoor Lighting Fixtures: Provide a grounding electrode in addition to installing a separate equipment grounding conductor with supply branch-circuit conductors.

3.3 COUNTERPOISE

A. Ground the steel framework of the building with a driven ground rod at the base of every corner column and at intermediate exterior columns at distances not more than 60 feet apart. Provide a grounding conductor (counterpoise), electrically connected to each ground rod and to each steel column, extending around the perimeter of the building. Use tinned-copper conductor not less than No. 2/0 AWG for counterpoise and for tap to

building steel. Bury counterpoise not less than 18 inches below grade and 24 inches from building foundation.

3.4 INSTALLATION

A. Ground Rods: Install at least three rods spaced at least one-rod length from each other and located at least the same distance from other grounding electrodes.

1. Drive ground rods until tops are 2 inches below finished floor or final grade, unless otherwise indicated.

2. Interconnect ground rods with grounding electrode conductors. Use exothermic welds, except as otherwise indicated. Make connections without exposing steel or damaging copper coating.

B. Grounding Conductors: Route along shortest and straightest paths possible, unless otherwise indicated. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.

C. Bonding Straps and Jumpers: Install so vibration by equipment mounted on vibration isolation hangers and supports is not transmitted to rigidly mounted equipment. Use exothermic-welded connectors for outdoor locations, unless a disconnect-type connection is required; then, use a bolted clamp. Bond straps directly to the basic structure taking care not to penetrate any adjacent parts. Install straps only in locations accessible for maintenance.

D. Bond interior metal piping systems and metal air ducts to equipment grounding conductors of associated pumps, fans, blowers, electric heaters, and air cleaners. Use braided-type bonding straps.

E. Install one test well for each service at the ground rod electrically closest to the service entrance. Set top of well flush with finished grade or floor.

3.5 CONNECTIONS

A. General: Make connections so galvanic action or electrolysis possibility is minimized. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact will be galvanically compatible.

1. Use electroplated or hot-tin-coated materials to ensure high conductivity and to make contact points closer to order of galvanic series.

2. Make connections with clean, bare metal at points of contact.

3. Make aluminum-to-steel connections with stainless-steel separators and mechanical clamps.

4. Make aluminum-to-galvanized steel connections with tin-plated copper jumpers and mechanical clamps.

5. Coat and seal connections having dissimilar metals with inert material to prevent future penetration of moisture to contact surfaces.

B. Exothermic-Welded Connections: Comply with manufacturer's written instructions. Welds that are puffed up or that show convex surfaces indicating improper cleaning are not acceptable.

C. Equipment Grounding Conductor Terminations: For No. 8 AWG and larger, use pressure-type grounding lugs. No. 10 AWG and smaller grounding conductors may be terminated with winged pressure-type connectors.

D. Noncontact Metal Raceway Terminations: If metallic raceways terminate at metal housings without mechanical and electrical connection to housing, terminate each conduit with a grounding bushing. Connect grounding bushings with a bare grounding conductor to grounding bus or terminal in housing. Bond electrically noncontinuous conduits at entrances and exits with grounding bushings and bare grounding conductors, unless otherwise indicated.

E. Tighten screws and bolts for grounding and bonding 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.

F. Compression-Type Connections: Use hydraulic compression tools to provide correct circumferential pressure for compression connectors. Use tools and dies recommended by connector manufacturer. Provide embossing die code or other standard method to make a visible indication that a connector has been adequately compressed on grounding conductor.

G. Moisture Protection: If insulated grounding conductors are connected to ground rods or grounding buses, insulate entire area of connection and seal against moisture penetration of insulation and cable.

3.6 UNDERGROUND DISTRIBUTION SYSTEM GROUNDING

A. Duct Banks: Install a grounding conductor with at least 50 percent ampacity of the largest phase conductor in the duct bank.

B. Connections to Manhole Components: Connect exposed-metal parts, such as inserts, cable racks, pulling irons, ladders, and cable shields within each manhole or handhole, to ground rod or grounding conductor. Make connections with No. 4 AWG minimum, stranded, hard-drawn copper conductor. Train conductors level or plumb around corners and fasten to manhole walls. Connect to cable armor and cable shields as recommended by manufacturer of splicing and termination kits.

C. Pad-Mounted Transformers and Switches: Install at least two ground rods and counterpoise circling pad. Ground pad-mounted equipment and noncurrent-carrying metal items associated with substations by connecting them to underground cable and grounding electrodes. Use tinned-copper conductor not less than No. 2 AWG for counterpoise and for taps to equipment ground pad. Bury counterpoise not less than 18 inches below grade and 6 inches from the foundation.

D. Testing: Perform the following field quality-control testing:

1. After installing grounding system but before permanent electrical circuitry has been energized, test for compliance with requirements.

2. Test completed grounding system at each location where a maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal, and at ground test wells. Measure ground resistance not less than two full days after the last trace of precipitation, and without the soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance. Perform tests, by the fall-of-potential method according to IEEE 81.

3. Provide drawings locating each ground rod and ground rod assembly and other grounding electrodes, identify each by letter in alphabetical order, and key to the record of tests and observations. Include the number of rods driven and their depth at each location and include observations of weather and other phenomena that may affect test results. Describe measures taken to improve test results.

    a. Equipment Rated 500 kVA and Less: 10 ohms.
    b. Equipment Rated 500 to 1000 kVA: 5 ohms.

4. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Engineer promptly and include recommendations to reduce ground resistance.

END OF SECTION

SECTION 16470- PANELBOARDS

PART 1 – GENERAL

1.1 SCOPE

A. The Contractor shall furnish and install the panelboard(s) as specified and as shown on the Contract Drawings.

1.2 RELATED SECTIONS

A. Section 16075 – Electrical Identification

1.3 REFERENCES

A. The panelboards and all components shall be designed, manufactured and tested in accordance with the latest applicable standards of NEMA and UL as follows:

1. UL 67 – Standard for Panelboards
2. UL 50 – Enclosures for Electrical Equipment
3. UL 489-Molded Case Circuit Breakers, Molded Case Switches, and Circuit Breaker Enclosures
4. NEMA PB 1, Panelboards
5. NEMA AB 1, Molded Case Circuit Breakers and Molded Case Switches
6. Fed. Spec. W-P-115C, Panel, Power Distribution

1.4 SUBMITTALS – FOR REVIEW/APPROVAL

A. The following information shall be submitted to the Engineer:

1. Breaker layout drawing with dimensions indicated and nameplate designation
2. Bus materials, OCPD, and accessories indicated.
3. Conduit entry/exit locations
4. Assembly ratings including:
    a. Short-circuit rating
    b. Voltage
    c. Continuous current
5. Cable terminal sizes

6. Product data sheets

B. The following information shall be submitted for record purposes:

1. Final as-built drawings and information for items listed above, which shall incorporate all changes made during the manufacturing process

2. Installation information

3. Equipment anchoring details for the specific panelboard(s) provided.

4. Panelboard schedule after load balancing has been completed.

1.5 QUALIFICATIONS

A. The manufacturer of the assembly shall also be the manufacturer of the major components within the assembly.

B. For the equipment specified herein, the manufacturer shall be ISO 9001 or 9002 certified.

C. The manufacturer of this equipment shall have produced similar electrical equipment for a minimum period of five (5) years. When requested by the Engineer, an acceptable list of installations with similar equipment shall be provided demonstrating compliance with this requirement.

1.6 REGULATORY REQUIREMENTS

A. The panelboards shall be UL labeled.

1.7 DELIVERY, STORAGE AND HANDLING

A. Equipment shall be handled and stored in accordance with manufacturer's instructions. One (1) copy of these instructions shall be included with the equipment at time of shipment.

1.8 OPERATION AND MAINTENANCE MANUALS

A. Equipment operation and maintenance manuals shall be provided with each assembly shipped and shall include instruction leaflets, instruction bulletins and renewal parts lists where applicable, for the complete assembly and each major component.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Basis of design is Square D I-Line panelboard.

B. Alternate manufacturer can be submitted but must meet these specifications in their entirety.

2.2 RATINGS

A. Panelboards rated above 240 Vac to 480 Vac shall have minimum short-circuit ratings of 35 KAIC unless otherwise noted.

B. Panelboards shall be labeled with a UL short-circuit rating. When series ratings are applied with integral or remote upstream devices, a label or manual shall be provided. It shall state the conditions of the UL series ratings including:

1. Size and type of upstream device

2. Branch devices that can be used

3. UL series short-circuit rating

2.3 CONSTRUCTION

A. Panelboard shall be rated 480V maximum. Continuous current rating as shown on the drawings. Interiors shall be completely factory assembled.

B. Interior trim shall be of dead-front construction. Doors in panelboard trims shall not uncover any live parts. Trim front shall be four piece with door, for flush mounting. Trim front door shall have rounded corners and edges free of burrs. Trim front steel shall meet the strength and rigidity requirements per UL 50 standards. Finish shall be ANSI 49 medium gray enamel electrodeposited over clean phosphatized steel.

C. Distribution panelboard trims shall cover all live parts. Switching device handles shall be accessible.

D. A directory card with a clear plastic cover shall be supplied and mounted on the inside of the door.

E. Locks shall be cylindrical tumbler type with larger enclosures requiring sliding vault locks with 3-point latching. All lock assemblies shall be keyed alike.

F. Panelboard shall include welded base channels

2.4 BUS

A. Main bus bars shall be plated copper. Bussing shall be three busbar stacked and aligned vertically with glass reinforced polyester insulators laminated between phases. Insulators shall support and provide phase isolation the entire length of the bus.

B. A solidly bonded equipment ground bar shall be provided.

C. Full-size (100%-rated) insulated neutral bars shall be included for panelboards shown with neutral. Bus bar taps for panels with single-pole branches shall be arranged for sequence phasing of the branch circuit devices. Neutral busing shall have a suitable lug for each outgoing feeder requiring a neutral connection.

2.5 CIRCUIT BREAKER TYPE

A. Circuit breakers shall be I-Line up to 800 Amps with factory installed mechanical lugs. Lugs shall be UL listed to accept solid (up to #8) and/or stranded copper and aluminum conductors. Lugs shall be suitable for 75 degree C wire. Line side circuit breaker connections are to be jaw type.

B. Circuit breaker ratings shall be as shown on the drawings. Panelboard shall have fully rated interrupting rating. Where indicated, provide circuit breakers UL listed for application at 100% of their continuous ampere rating in their intended enclosure.

C. Provide shunt trips, bell alarms, and auxiliary switches as shown on the Contract Drawings.

D. All unused spaces provided, unless otherwise specified, shall be fully equipped for future devices.

E. Main circuit breaker shall have electronic trip with adjustments for LSI and G.

2.6 ENCLOSURE

A. All Outdoor panelboards shall be housed in NEMA 3R enclosures. Provide minimum gutter space in accordance with the National Electrical Code.

B. All Indoor panelboards shall be housed in NEMA 1 enclosure unless otherwise noted.

2.7 NAMEPLATES

A. Provide an engraved nameplate for each panel section.

PART 3 – EXECUTION

3.1 INSTALLATION

A. The Contractor shall install all equipment per the manufacturer's recommendations, NEMA PB 1.1, and NEC Standards, and as shown on the Contract Drawings. Identify to the Engineer and resolve any space or mounting conflicts prior to installation of equipment.

B. Label each circuit.

C. Create a circuit directory to indicate installed conditions.

D. Observe manufacturer's published torque tightening values. If manufacturer's values are not available use the values listed in UL 486.

3.2 IDENTIFICATION

A. Install nameplates on all panelboards. Label each panelboard with an engraved metal or laminated plastic nameplate securely fixed to the panelboard with screws. Comply with the requirements of Specification Section 16075, “Electrical Identification”

3.3 TESTING

A. Perform continuity tests on each circuit before energizing.

B. Test insulation resistance for each panelboard bus.

C. Measure stable state load current at each feeder. Maintain proper phasing for multi-wire circuits.

D. Check tightness of bolted connections and circuit breaker connections using calibrated torque wrench or torque screw driver per manufacturer’s written specifications.

END OF SECTION

SECTION 16500 - LIGHTING

PART 1 - GENERAL

1.1 SUMMARY

A. Furnish install, wire up and start up any building interior and exterior lighting, with switches as well. All exterior lighting shall be motion detector controlled, plus shall have an over-ride switch inside the shelter, so the Borough may turn on the lights to stay on in event of an emergency. The cost of installing this override ON/OFF switch should be included in the Unit Prices Bid for Electrical, Complete. All lights shall be LED, no exceptions.

B. Provide the complete system of lighting fixtures and lamps as shown on the drawings and specified. The requirements of all other sections of the specification are equally applicable to the work to be performed under this section.

C. The fixture numbers listed on the drawing indicate manufacturer or standard sheet number listed in this section. Modify fixtures if necessary to comply with this specification. Lighting fixtures specified by catalog number or standard sheet will be the basis for comparison in the consideration of fixtures submitted.

D. All lighting fixtures shall bear the Underwriters Laboratories label and be approved for installation in the locations indicated on the drawings or implied in the specifications.

E. Manufacture and assemble fixture component parts at the manufacturing plant for shipment in one or more packages. Include in the shipment from the fixture manufacturer integrally-mounted and/or remote-mounted ballasts where ballasts are required for the fixture.

1.2 SUBMITTALS

A. Submittals shall be in accordance with Section 01300. Provide dimensional drawings, manufacturers data, catalogue cut sheets and complete information describing each light fixture.

B. Provide for each fixture color temperature and color rendering index (CRI) that will result with the lamps being provided.

C. Provide Light Loss Factor for each fixture.

D. Coordination Drawings: Reflected ceiling plan(s) and other details, drawn to scale, on which the following items are shown and coordinated with each other, based on input from installers of the items involved:

1. Structural members to which lighting-fixture suspension systems will be attached.

1.3 REFERENCES

A. American National Standards Institute

B. Underwriters Laboratory (UL)

1. UL844 – Luminaires for Use in Hazardous (Classified) Locations
2. UL 1598 – Standard for Safety of Luminaires
3. UL 1598A – Standard of Safety of Luminaires for Installation on Marine Vessels

C. Canadian Standards Association (CSA)

1. CSA 22.2 No. 137-M1981

D. International Electrotechnical Commission (IEC)

1. EN 60529 Ingress Protection Rating
2. EN 62471:2008 Photobiological Safety of Lamps and Luminaires
3. EN61000-3-2 Harmonics Standards
4. EN61000-4-5 Surge Testing

E. International Organization for Standardizations (ISO)

1. ISO 9001-2008 Quality Management System

F. National Electrical Manufacturers Association (NEMA)

1. NEMA Standards Publication 250-2003 “Enclosures for Electrical Equipment”

G. International Illuminating Engineers Society of North America (IESNA)

1. LM-79 “Electrical and Photometric Measurement of Solid State Lighting Products”
2. LM-80 “Measuring Lumen Maintenance of LED Light Sources”
3. TM-21 “Projecting Long Term Lumen Maintenance of LED Light Sources”

H. Occupational Safety and Health Administration:

1. OSHA Hazard Communication Standards 29 CFR 1910.307

I. International Dark Skies Association (IDA)

1. IDA Fixture Seal of Approval

1.4 QUALITY ASSURANCE

A. Comply with NFPA 70.

B. Comply with visibility and luminance requirements of NFPA 101 Compliance for exit signs.

C. For LED Fixtures the following apply:

1. Luminaire independently tested by a DOE certified illumination lab to the IESNA LM-79
2. Luminaire incorporates LEDs evaluated to IESNA LM-80
3. Luminaire evaluated and documented to IESNA TM-21

1.5 PRODUCT DELIVERY STORAGE AND HANDLING

A. Deliver fixtures to the project site in original unopened manufacturers cartons or containers. Store fixtures on arrival to project site in accordance with manufacturers requirements. Protect fixtures from damage.

1.6 DEFINITIONS

A. BF: Ballast factor. Ration of light output of a given lamp(s) operated by the subject ballast to the light output of the same lamp(s) when operated on an ANSI reference circuit.

B. CRI: Color rendering index.

C. CCT: Correlated color temperature.

D. HID: High intensity discharge.

E. LED: Light emitting diode

F. MH: Metal Halide

G. EFFICACY: Lumens/Watt

1.7 EXTRA MATERIALS

A. Furnish extra material described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Lamps: 1 for every 10 of each type and rating installed. Furnish at least one of each type.
2. Plastic Diffuser and Lenses: 1 for every 100 of each type and rating installed. Furnish at least one of each type.
3. Battery and Charger Data: One for each emergency lighting unit.
4. Ballasts: 1 for every 25 of each type and rating installed. Furnish at least one of each type.
5. Globes and Guards: 1 for every 20 of each type and rating installed. Furnish at least one of each type.

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT

A. Provide the fixture types listed in these specifications and as shown on the drawings.

2.2 FLUORESCENT FIXTURES

A. Fixture Construction.

1. The fixtures shall be constructed of steel, thermoplastic, fiberglass, or aluminum as noted in the schedules included in the drawings. Fixtures shall be rust protected where called out in the schedules.

2. Ballasts shall be of the electronic, high power factor type and shall bear the U.L. label. Ballasts shall be equipped with automatic resetting thermal protection device in accordance with UL requirements.

3. Ballasts shall be mounted to eliminate vibration noise and to provide adequate heat transfer. Mounting shall incorporate captive bolts and nuts or similar means to permit easy replacement of ballast.

4. Provide electronic ballasts CBM certified for full light output with an average input wattage of 32 watts when operating two (2) F32T8 Octron rapid start fluorescent lamps in ambient of 77 degrees F.

5. Provide ballasts rated to operate at 50 degrees F. ambient room temperature when installed in fixture for interior mounting. Provide ballasts rated to operate at 0 degrees F. ambient outside temperature when installed in fixture for exterior mounting and unheated interior spaces.

2.3 METAL HALIDE FIXTURE

A. Provide metal Halide fixtures complete with ballast. Provide separately mounted ballast enclosure where ballast cannot be mounted integrally with fixture.

B. Provide single lamp, high power factor ballasts Class H insulation. Provide ballast to limit starting current to that of normal operating current. Lamp to remain ignited with voltage dips up to 10%. Minimum starting temperature -20 degrees F. Maximum temperature 55 degrees C. Ballast: Peak lead autotransformer. Lamp wattage regulation for + l0% line voltage fluctuation: + l0%.

2.4 HIGH-INTENSITY-DISCHARGE LAMP BALLASTS

A. General: Comply with NEMA C82.4 and UL 1029. Shall include the following features, unless otherwise indicated.

1. Type: Constant-wattage autotransformer or regulating high-power-factor type.

2. Minimum Starting Temperature: Minus 22 deg F Minus 30 deg C for single-lamp ballasts.

3. Normal Ambient Operating Temperature: 104 deg F, 40 deg C.

4. Open-circuit operation that will not reduce average life.

B. Auxiliary, Instant-On, Quartz System: Automatically switches quartz lamp on when fixture is initially energized and when momentary power outages occur. Automatically turns quartz lamp off when high-intensity-discharge lamp reaches approximately 60 percent light output.

2.5 EXIT SIGNS

A. General: Comply with UL 924; for sign colors and lettering size, comply with authorities having jurisdiction.

B. Internally Lighted Signs:

1. Lamps for AC Operation: Light-emitting diodes (Light Sticks), 70,000 hours minimum of rated lamp life.

2. Additional Lamps for DC Operation: Two minimum, bayonet-base type, for connection to external dc source.

C. Self-Powered Exit Signs (Battery Type): Integral automatic charger in a self-contained power pack.

1. Battery: Sealed, maintenance-free, nickel-cadmium type with special warranty.

2. Charger: Fully automatic, solid-state type with sealed transfer relay.

3. Operation: Relay automatically energizes lamp from battery when circuit voltage drops to 80 percent of nominal voltage or below. When normal voltage is restored, relay disconnects lamps from battery, and battery is automatically recharged and floated on charger.

2.6 EMERGENCY LIGHTING UNITS

A. General: Self-contained units complying with UL 924.

1. Battery: Sealed, maintenance-free, lead-acid type with minimum 10-year nominal life and special warranty.

2. Charger: Fully automatic, solid-state type with sealed transfer relay.

3. Operation: Relay automatically turns lamp on when power supply circuit voltage drops to 80 percent of nominal voltage or below. Lamp automatically disconnects from battery when voltage approaches deep-discharge level. When normal voltage is restored, relay disconnects lamps from battery, and battery is automatically recharged and floated on charger.

4. Wire Guard: Where indicated, heavy-chrome-plated wire guard protects lamp heads or fixtures.

5. Integral Time-Delay Relay: Holds unit on for fixed interval when power is restored after an outage; time delay permits high-intensity-discharge lamps to restrike and develop adequate output.

2.7 LED LAMPS AND FIXTURES

A. Acceptable Manufacturers, Dialight Corporation, RUUD or Approved equal.

B. Lamp shall have a 10 year operational life while operated between -45 degrees C and 65 degrees C.

C. Operate on 120 to 277 vac, 60 Hz power.

D. Hazardous area fixtures shall comply with the rating of the area in which the fixture is being used.

E. Lamp shall be rated minimum 86 lm/w. CRI shall be 70 or higher.

F. Fixture shall have a power factor of 0.9 or greater.

2.8 LAMPS

A. Provide lamps manufactured in conformance with the following, unless otherwise indicated on the drawings.

B. Fluorescent lamps: Provide T-8 lamps, 4-foot length, having a CCT of 4,100K, a CRI of 80 or greater.

C. Minimum initial rating of 3,000 lumens. Initial rating defined as rating after 40 hours of use.

D. High Pressure Sodium: Provide lamps as specified on the drawings and as recommended by the fixture manufacturer.

2.9 MOUNTING POLES

A. Provide mounting poles for site lighting in the material, finish, size and shape as noted on the drawings. If drawings do not call for specific material, finish, size and shape, provide 20 foot tapered, round, aluminum, bronze finish mounting poles.

2.10 ACCESSORIES

A. Provide mounting brackets with lamps.

B. For site lighting, provide arms, knuckles, extensions and other mounting hardware to result in lamps installed and focused as intended.

C. Provide lens protection where application requires or where called for in specifications or included on drawings.

D. Provide motion sensor or photocell control when specified on drawings or shown on wiring or control diagrams or schematics.

PART 3 - EXECUTION

3.1 COORDINATION

A. Coordinate the mounting requirements for lighting fixtures with other trades.

3.2 INSTALLATION

A. In General, unless otherwise directed, set fixtures level and plumb; square with ceilings and walls.

B. Install lamps in fixtures immediately after installing fixture and make operable.

C. Provide manufacturer's standard hanging or mounting devices for all fixtures and be responsible for checking the type needed for various ceiling conditions. Detail fixture hangers on the shop drawings.

D. Where fixtures are located so that they can not be supported from ceiling framing members, provide additional framing in ceiling construction as required to support fixtures. Material for fixture support shall match the ceiling framing material. Support ceiling fixtures from framing materials.

1. Square and Rectangular Fixtures: Mount square and rectangular fixtures with sides parallel to building lines and parallel with ceiling lines unless otherwise shown.

2. Surface Mounted Fluorescent Fixtures: Mount fixtures installed on low density ceiling material on l-l/2 inch ceiling spacers unless fixture is approved for mounting directly to ceiling material.

3. Install fluorescent fixtures as recommended by the manufacturer to provide exact horizontal alignment, preventing horizontal or vertical deflection, or angular jointing of fixtures installed in continuous rows.

4. Industrial Fixture Pendant Hangers: Rigid type consisting of l/2” rigid conduit; with self-alignment joint located at canopy fastened to fixture stud or mounting strap. Fasten hangers to outlet box with offset type No. l6 gage minimum mounting strips.

5. Commercial Fixture Pendant Hangers: Rigid type consisting of l/2” steel tubing; finish to match fixture; designed with self-aligning joint located at canopy fastened to fixture stud or mounting strap. Mounting straps shall be of the same manufacture as fixtures.

6. Hanger Spacing: Space stem hangers for commercial and industrial fixtures mounted individually or in continuous rows approximately 4'-0" O.C. unless specified otherwise.

3.3 WIRING

A. Wiring for lighting shall conform to project wire requirements.

B. Prewired splice boxes for recessed incandescent fixtures shall be 4" square type or its equivalent with a minimum of four l/2" knock outs and/or shall comply with code required size for branch circuit wiring.

C. Tighten electrical connectors and terminals according to manufacturer’s published torque values. If manufacturer’s torque tightening values are not indicated, use those specified in UL 486A and UL 486B.

3.4 ADJUST AND CLEAN

A. Clean fixtures and lamp with new lamps.

B. Adjust and focus lamps and fixtures.

3.5 TESTING

A. Test lighting fixtures for “on” and “off” times if operated from a timer.

B. Test motion detectors and photocells for proper control of fixtures.

C. Test emergency lighting by interrupting power to demonstrate proper operation. Verify normal transfer to battery power source and retransfer to normal power.

D. Ballasts noticeably noisier than others of the same type shall be deemed detective and be replaced.

E. Repair or replace any fixtures found to be defective during testing.

END OF SECTION

SECTION 16671-TRANSIENT VOLTAGE SURGE SUPPRESSION (TVSS)

PART 1 - GENERAL

1.1 SCOPE

A. The Contractor shall furnish and install the Transient Voltage Surge Suppression (TVSS) equipment having the electrical characteristics, ratings and modifications as specified herein and as shown on the contract drawings. The TVSS shall provide low voltage ac surge protection for the facility electrical distribution system.

1.2 REFERENCES

A. TVSS units and all components shall be designed, manufactured and tested in accordance with the latest applicable UL Listed standards (UL 1449, 3RD Edition), UL 1283 and CSA certified per CSA 22.2.

1.3 SUBMITTALS – FOR REVIEW/APPROVAL

A. The following information shall be submitted to the Engineer:

1. Provide verification that the TVSS device complies with the required UL 1449 3RD Edition and CSA approvals

2. Provide actual let through voltage test data in the form of oscillograph results for the ANSI/IEEE C62.41Category C3 & C1 (combination wave) and B3 (ringwave) tested in accordance with ANSI/IEEE C62.45

B. In addition to the information required above, submit the following information to the Engineer:

1. Descriptive bulletins

2. Product sheets

1.4 QUALIFICATIONS

A. The manufacturer of the assembly shall be the manufacturer of the major components within the assembly.

B. The manufacturer of this equipment shall have produced similar electrical equipment for a minimum period of five (5) years. When requested by the Engineer, an acceptable list of installations with similar equipment shall be provided demonstrating compliance with this requirement.

1.5 DELIVERY, STORAGE AND HANDLING

A. Equipment shall be handled and stored in accordance with manufacturer's instructions. One (1) copy of manufacturer's instructions shall be included with the equipment at time of shipment.

1.6 OPERATION AND MAINTENANCE MANUALS

A. Equipment operation and maintenance manuals shall be provided with each assembly shipped, and shall include instruction leaflets and instruction bulletins for the complete assembly and each major component.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Schneider Electric, Surgelogic.

B. Advanced Protection Technologies (APT)

C. The listing of specific manufacturers above does not imply acceptance of their products that do not meet the specified ratings, features and functions. Manufacturers listed above are not relieved from meeting these specifications in their entirety.

2.2 VOLTAGE SURGE SUPPRESSION – GENERAL

A. The surge suppressor shall be suitable for SPD type 2 applications.

B. Electrical Requirements

1. Unit Operating Voltage – 480V Three Phase.

2. Maximum Continuous Operating Voltage (MCOV) – 320 volts.

3. The suppression system shall incorporate a thermally protected metal oxide varistor (TPMOV) surge suppressor or Gas Discharge Tube for the service entrance and other distribution levels. The system shall not utilize silicon avalanche diodes, selenium cell, air gaps or other components that may crowbar the system voltage leading to system upset or create any environmental hazards.

4. Maximum Surge Current per Phase 160kA, L-N 80kA, L-G 80kA.

a. All overcurrent protection components shall be tested in compliance with UL 1449-Limited Current Test and AIC rating test.

2.3 ENCLOSURE

A. The unit shall be housed in a, locking, weatherproof enclosure meeting NEMA 1 rating.

PART 3 - EXECUTION

3.1 FACTORY TESTING

A. Standard factory tests shall be performed on the equipment under this section. All tests shall be in accordance with the latest version of NEMA and UL standards.

3.2 INSTALLATION

A. The Contractors shall install all equipment per the manufacturer's recommendations and the contract drawings.

3.3 WARRANTY

A. The manufacturer shall provide a five (5) year warranty from the date of shipment against any TVSS part failure when installed in compliance with manufacturer's written instructions and any applicable national or local code.

B. The Contractor shall warranty the TVSS for 1 year from date of final completion.

END OF SECTION

SECTION 16950 - ARC FLASH HAZARD ANALYSIS/ SHORT-CIRCUIT/ COORDINATION STUDY

PART 1 - GENERAL

1.1 SCOPE

A. The contractor shall furnish short-circuit and protective device coordination studies.

B. The Contractor shall furnish an Arc Flash Hazard Analysis Study per the requirements set forth in the current version of NFPA 70E -Standard for Electrical Safety in the Workplace. The arc flash hazard analysis shall be performed according to the IEEE Standard 1584 – 2018, the IEEE Guide for Performing Arc-Flash Calculations.

C. The scope of the studies shall include all equipment from the secondary side of the pole-mounted transformers and the transformer primary fuses.

1.2 RELATED SECTIONS

A. Drawings and general provisions of the Contract.

1.3 REFERENCES

A. Institute of Electrical and Electronics Engineers, Inc. (IEEE):
   1. IEEE 141 – Recommended Practice for Electric Power Distribution and Coordination of Industrial and Commercial Power Systems
   2. IEEE 242 – Recommended Practice for Protection and Coordination of Industrial and Commercial Power Systems
   3. IEEE 399 – Recommended Practice for Industrial and Commercial Power System Analysis
   4. IEEE 241 – Recommended Practice for Electric Power Systems in Commercial Buildings
   5. IEEE 1015 – Recommended Practice for Applying Low-Voltage Circuit Breakers Used in Industrial and Commercial Power Systems.
   6. IEEE 1584 -Guide for Performing Arc-Flash Hazard Calculations

B. American National Standards Institute (ANSI):
   1. ANSI C57.12.00 – Standard General Requirements for Liquid-Immersed Distribution, Power, and Regulating Transformers
   2. ANSI C37.13 – Standard for Low Voltage AC Power Circuit Breakers Used in Enclosures
   3. ANSI C37.010 – Standard Application Guide for AC High Voltage Circuit Breakers Rated on a Symmetrical Current Basis
   4. ANSI C 37.41 – Standard Design Tests for High Voltage Fuses, Distribution Enclosed Single-Pole Air Switches, Fuse Disconnecting Switches and Accessories.

C. The National Fire Protection Association (NFPA)
   1. NFPA 70 -National Electrical Code, latest edition
   2. NFPA 70E – Standard for Electrical Safety in the Workplace

1.4 SUBMITTALS FOR REVIEW/APPROVAL

A. The studies shall be submitted to the design Engineer prior to receiving final approval of the distribution equipment shop drawings and/or prior to release of equipment drawings for manufacturing. If formal completion of the study may cause delays in equipment shipments, approval from the Engineer may be obtained for a preliminary submittal of data to ensure that the selection of device ratings and characteristics will be satisfactory to properly select the distribution equipment. The formal study will be provided to verify preliminary findings.

1.5 SUBMITTALS FOR CONSTRUCTION

A. The results of the short-circuit, protective device coordination and arc flash hazard analysis studies shall be summarized in a final report. A minimum of five (5) bound copies of the complete final report shall be submitted. Electronic PDF copies of the report shall be provided upon request.

B. The report shall include the following sections:
1. Executive Summary including Introduction, Scope of Work and Results/Recommendations.
2. Short-Circuit Methodology Analysis Results and Recommendations
3. Short-Circuit Device Evaluation Table
4. Protective Device Coordination Methodology Analysis Results and Recommendations
5. Protective Device Settings Table
6. Time-Current Coordination Graphs and Recommendations
7. Arc Flash Hazard Methodology Analysis Results and Recommendations including the details of the incident energy and flash protection boundary calculations, along with Arc Flash boundary distances, working distances, Incident Energy levels and Personal Protection Equipment levels.
8. Arc Flash Labeling section showing types of labels to be provided. Section will contain descriptive information as well as typical label images.
9. One-line system diagram that shall be computer generated and will clearly identify individual equipment buses, bus numbers used in the short-circuit analysis, cable and bus connections between the equipment, calculated maximum short-circuit current at each bus location, device numbers used in the time-current coordination analysis, and other information pertinent to the computer analysis.

1.6 QUALIFICATIONS

A. The short-circuit, protective device coordination and arc flash hazard analysis studies shall be conducted under the responsible charge and approval of a Registered Professional Engineer skilled in performing and interpreting the power system studies.

1.7 COMPUTER ANALYSIS SOFTWARE

A. The studies shall be performed using SKM Systems Analysis Power*Tools for Windows (PTW) software program or similar application approved by the Engineer.

PART 2 - PRODUCT

2.1 STUDIES

A. The contractor shall furnish an Arc Flash Hazard Analysis Study per NFPA 70E - Standard for Electrical Safety in the Workplace, reference Article 130.3 and Annex D. This study shall also include short-circuit and protective device coordination studies.

2.2 DATA

A. Contractor shall furnish all data as required for the power system studies.

B. Source combination may include new motor loads and the existing generator.

C. Load data utilized may include existing and proposed loads obtained from Contract Documents provided by Owner, or Contractor.

D. If applicable, include fault contribution of existing motors in the study. The Contractor shall obtain required existing equipment data, if necessary, to satisfy the study requirements.

2.3 SHORT-CIRCUIT ANALYSIS

A. Transformer design impedances shall be used when test impedances are not available.

B. Provide the following:
1. Calculation methods and assumptions
2. Selected base per unit quantities
3. One-line diagram of the system being evaluated that clearly identifies individual equipment buses, bus numbers used in the short-circuit analysis, cable and bus connections between the equipment, calculated maximum short-circuit current at each bus location and other information pertinent to the computer analysis
4. The study shall include input circuit data including electric utility system characteristics, source impedance data, conductor lengths, number of conductors per phase, conductor impedance values, insulation types, transformer impedances and X/R ratios, motor contributions, and other circuit information as related to the short-circuit calculations.
5. Tabulations of calculated quantities including short-circuit currents, X/R ratios, equipment short-circuit interrupting or withstand current ratings and notes regarding adequacy or inadequacy of the equipment rating.
6. Results, conclusions, and recommendations. A comprehensive discussion section evaluating the adequacy or inadequacy of the equipment must be provided and include recommendations as appropriate for improvements to the system.

C. For solidly-grounded systems, provide a bolted line-to-ground fault current study for applicable buses as determined by the engineer performing the study.

D. Protective Device Evaluation:
1. Evaluate equipment and protective devices and compare to short circuit ratings
2. Adequacy of switchgear, motor control centers, and panelboard bus bars to withstand short-circuit stresses
3. Contractor shall notify Owner in writing, of any circuit protective devices improperly rated for the calculated available fault current.

2.4 PROTECTIVE DEVICE TIME-CURRENT COORDINATION ANALYSIS

A. Protective device coordination time-current curves (TCC) shall be displayed on log-log scale graphs.

B. Include on each TCC graph, a complete title with descriptive device names.

C. Terminate device characteristic curves at a point reflecting maximum symmetrical or asymmetrical fault current to which the device is exposed.

D. Identify the device associated with each curve by manufacturer type, function, and, if applicable, tap, time delay, and instantaneous settings recommended.

E. Plot the following characteristics on the TCC graphs, where applicable:
   1. Electric utility's overcurrent protective device.
   2. Medium voltage equipment overcurrent relays.
   3. Medium and low voltage fuses including manufacturer's minimum melt, total clearing, tolerance, and damage bands.
   4. Low voltage equipment circuit breaker trip devices, including manufacturer's tolerance bands.
   5. Transformer full-load current, magnetizing inrush current, and ANSI through-fault protection curves.
   6. Medium voltage conductor damage curves.
   7. Ground fault protective devices, as applicable.
   8. Pertinent motor starting characteristics and motor damage points, where applicable.
   9. Pertinent generator short-circuit decrement curve and generator damage point
   10. The largest feeder circuit breaker in each motor control center and applicable panelboard.

F. Provide adequate time margins between device characteristics such that selective operation is provided, while providing proper protection.

G. Provide the following:
   1. A One-line diagram shall be provided which clearly identifies individual equipment buses, bus numbers, device identification numbers and the maximum available short-circuit current at each bus when known.
   2. A sufficient number of log-log plots shall be provided to indicate the degree of system protection and coordination by displaying the time-current characteristics of series connected overcurrent devices and other pertinent system parameters.
   3. Computer printouts shall accompany the log-log plots and will contain descriptions for each of the devices shown, settings of the adjustable devices, and device identification numbers to aid in locating the devices on the log-log plots and the system one-line diagram.
   4. The study shall include a separate, tabular printout containing the recommended settings of all adjustable overcurrent protective devices, the equipment designation where the device is located, and the device number corresponding to the device on the system one-line diagram
   5. A discussion section which evaluates the degree of system protection and service continuity with overcurrent devices, along with recommendations as required for addressing system protection or device coordination deficiencies.
   6. Notify Owner in writing of any significant deficiencies in protection and/or coordination. Provide recommendations for improvements.

2.5 ARC FLASH HAZARD ANALYSIS

A. The arc flash hazard analysis shall be performed according to the IEEE 1584 equations that are presented in NFPA70E-2018, Annex D. The arc flash hazard analysis shall be performed in conjunction with the short-circuit analysis (Section 2.3) and the protective device time-current coordination analysis (Section 2.4)

B. The flash protection boundary and the incident energy shall be calculated at significant locations in the electrical distribution system (switchboards, switchgear, motor-control centers, panelboards, busway and splitters) where work could be performed on energized parts.

C. Circuits 240V or less fed by single transformer rated less than 15 kVA may be omitted from the computer model and will be assumed to have a hazard risk category 0 per NFPA 70E.

D. Working distances shall be based on IEEE 1584. The calculated arc flash protection boundary shall be determined using those working distances.

E. When appropriate, the short circuit calculations and the clearing times of the phase overcurrent devices will be retrieved from the short-circuit and coordination study model. Ground overcurrent relays should not be taken into consideration when determining the clearing time when performing incident energy calculations.

F. The short-circuit calculations and the corresponding incident energy calculations for multiple system scenarios must be compared and the greatest incident energy must be uniquely reported for each equipment location in a single table. Calculations must be performed to represent the maximum and minimum contributions of fault current magnitude for normal and emergency operating conditions. The minimum calculation will assume that the utility contribution is at a minimum. Conversely, the maximum calculation will assume a maximum contribution from the utility. Calculations shall take into consideration the parallel operation of synchronous generators with the electric utility, where applicable as well as any stand-by generator applications.

   The Arc-Flash Hazard Analysis shall be performed utilizing mutually agreed upon facility operational conditions, and the final report shall describe, when applicable, how these conditions differ from worst-case bolted fault conditions.

G. The incident energy calculations must consider the accumulation of energy over time when performing arc flash calculations on buses with multiple sources. Iterative calculations must take into account the changing current contributions, as the sources are interrupted or decremented with time. Fault contribution from motors should be decremented as follows:
   1. Fault contribution from induction motors should not be considered beyond 5 cycles.

H. For each piece of ANSI rated equipment with an enclosed main device, two calculations shall be made. A calculation shall be made for the main cubicle, sides, or rear; and shall be based on a device located upstream of the equipment to clear the arcing fault. A second calculation shall be made for the front cubicles and shall be based on the equipment's main device to clear the arcing fault. For all other non-ANSI rated equipment, only one calculation shall be required and it shall be based on a device located upstream of the equipment to clear the arcing fault.

I. When performing incident energy calculations on the line side of a main breaker (as required per above), the line side and load side contributions must be included in the fault calculation.

J. Mis-coordination should be checked amongst all devices within the branch containing the immediate protective device upstream of the calculation location and the calculation should utilize the fastest device to compute the incident energy for the corresponding location.

K. Arc Flash calculations shall be based on actual overcurrent protective device clearing time. A maximum clearing time of 2 seconds will be used based on IEEE 1584-2002 section B.1.2. Where it is not physically possible to move outside of the flash protection boundary in less than 2 seconds during an arc flash event, a maximum clearing time based on the specific location shall be utilized.

L. Provide the following:
1. Results of the Arc-Flash Hazard Analysis shall be submitted in tabular form, and shall include device or bus name, bolted fault and arcing fault current levels, flash protection boundary distances, working distances, personal-protective equipment classes and AFIE (Arc Flash Incident Energy) levels.
2. The Arc-Flash Hazard Analysis shall report incident energy values based on recommended device settings for equipment within the scope of the study.
3. The Arc-Flash Hazard Analysis may include recommendations to reduce AFIE levels and enhance worker safety.

PART 3 - EXECUTION

3.1 FIELD ADJUSTMENT

A. Contractor shall adjust relay and protective device settings according to the recommended settings table provided by the coordination study.

B. Contractor shall make minor modifications to equipment as required to accomplish conformance with short circuit and protective device coordination studies.

C. Contractor shall notify Owner in writing of any required major equipment modifications.

3.2 ARC FLASH LABELS

A. Contractor shall provide a 4.0 in. x 4.0 in. Brady thermal transfer type label of high adhesion polyester for each work location analyzed.

B. The labels shall be designed according to the following standards:
1. UL969 – Standard for Marking and Labeling Systems
2. ANSI Z535.4 – Product Safety Signs and Labels
3. NFPA 70 (National Electric Code) – Article 110.16

C. The label shall include the following information:
1. System Voltage
2. Flash protection boundary
3. Personal Protective Equipment category
4. Arc Flash Incident energy value (cal/cm^2)
5. Limited and restricted Approach Boundaries

6. Study report number and issue date

D. Labels shall be printed by a thermal transfer type printer, with no field markings.

E. Arc flash labels shall be provided for equipment as identified in the study and the respective equipment access areas per the following:
   1. Floor Standing Equipment - Labels shall be provided on the front of each individual section. Equipment requiring rear and/or side access shall have labels provided on each individual section access area. Equipment line-ups containing sections with multiple incident energy and flash protection boundaries shall be labeled as identified in the Arc Flash Analysis table.
   2. Wall Mounted Equipment – Labels shall be provided on the front cover or a nearby adjacent surface, depending upon equipment configuration.

3.3 ARC FLASH TRAINING

A. The vendor supplying the Arc Flash Hazard Analysis shall train the Owner's qualified electrical personnel of the potential arc flash hazards associated with working on energized equipment (minimum of 2 hours).

END OF SECTION

UTILITY CONTACTS

ELECTRIC
JERSEY CENTRAL POWER & LIGHT
101 CRAWFORDS CORNER ROAD
BUILDING 1, SUITE 1-511
HOLMDEL, NJ 07733
ATTN: HARVEY LOCKLEY

NATURAL GAS
NEW JERSEY NATURAL GAS COMPANY
1415 WYCKOFF ROAD
WALL, NJ 07719
ATTN: JOSEPH P. PUGLISI

TELEPHONE
VERIZON COMMUNICATIONS
175 WEST MAIN STREET
FREEHOLD, NJ 07728
ATTN: CHRIS HOBSON

CABLE
COMCAST CABLE COMMUNICATIONS
830 STATE HIGHWAY #37
TOMS RIVER, NJ 08755

NJ ONE CALL: (1-800-272-1000) or (811)

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MAYOR	CAROLYN BROULLON
TOWNSHIP COUNCIL	JO-ANNE OLSZEWSKI, COUNCIL PRESIDENT KEVIN MARTIN LINDA MAZZOLA DONALD MELNYK

INDEX OF SHEETS

CONSTRUCTION PLANS
FOR

NORTH STREET STORM WATER PUMP STATION ELECTRICAL UPGRADES
BOROUGH OF HIGHLANDS
MONMOUTH COUNTY, NEW JERSEY

AERIAL MAP
SOURCE: MICROSOFT BING MAPS

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NEW JERSEY LICENSED PROFESSIONAL ENGINEER
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N.J. C.O.A. #: 24GA27986500

NORTH STREET STORM WATER PUMP STATION ELECTRICAL UPGRADES
FOR
BOROUGH OF HIGHLANDS

BOROUGH OF HIGHLANDS
MONMOUTH COUNTY
NEW JERSEY

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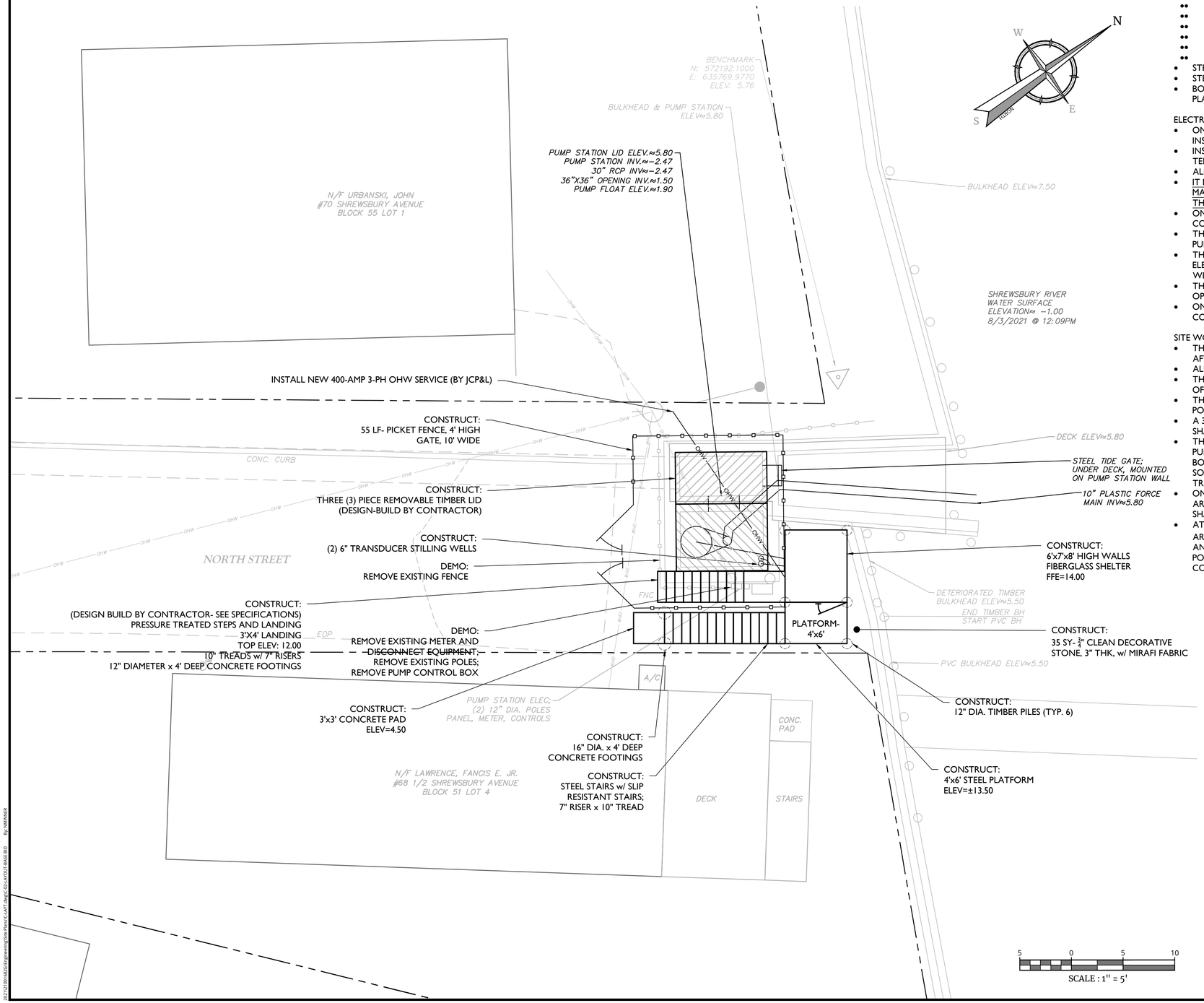
21001682G	C-COVER

SHEET TITLE: COVER SHEET

SHEET NUMBER: 1 of 8

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.



CONSTRUCTION SEQUENCING & GENERAL NOTES:

- ALL WORK SHALL BE COMPLETE WITH THE EXISTING POWER STILL LIVE.
- THE CONTRACTOR SHALL NOT CUT POWER TO THE PUMP STATION UNTIL THE ELECTRICAL IS ROUGHED IN AND READY TO BE CONNECTED FOR MINIMAL DOWN TIME.
- THE CONTRACTOR SHALL CALL FOR ONE-CALL MARKOUT PRIOR TO ANY DIGGING OR PILE DRIVING.

STRUCTURAL/ SHELTER

- THE CONTRACTOR SHALL DRIVE A TEST PILE TO FIND DEPTH AT DESIGN PILE BEARING PRESSURE.
- ONCE THE PILE DEPTH IS CONFIRMED THE CONTRACTOR SHALL DRIVE THE REST OF THE PILES AND CONSTRUCT THE DESIGNED STRUCTURAL STEEL FRAME.
- ONCE THE FRAME IS COMPLETE, POUR THE PROPOSED CONCRETE SLAB ATOP THE STEEL STRUCTURE.
- THE SHELTER SHALL BE DESIGNED BY THE CONTRACTOR WITH THE GUIDANCE OF THE PLANS AND SPECIFICATIONS FOR FINAL APPROVAL BY THE ENGINEER AND BOROUGH. THE SHELTER PARAMETERS THAT THE CONTRACTOR SHALL MEET ARE AS FOLLOWS:
  - FIBERGLASS STRUCTURE w/ FAUX BRICK DESIGN
  - 6' x 7' x 8' HEIGHT
  - HIP ROOF
  - REMOVABLE ROOF
  - EXHAUST FAN AND SPRING LOUVERS
  - 36" WIDE DOOR (AS LOCATED ON THE PLAN)
  - STAINLESS STEEL DOOR ACCESSORIES
  - COLOR IS TO BE PICKED BY THE BOROUGH
  - R15 INSULATION
- STEEL PLATFORM SHALL BE 4' x 6' ALONG THE SIDE OF THE HUT.
- STEEL STEPS SHALL BE 3' WIDE; SLIP RESISTANT TREADS; 7" RISER, 10" TREAD DEPTH.
- BOTH THE PLATFORM AND STAIRS SHALL HAVE GALVANIZED STEEL PIPE RAILINGS AS DETAILED IN THE PLANS.

ELECTRICAL

- ONCE THE SHELTER AND ALL STRUCTURAL STEEL IS COMPLETE THE ELECTRICIAN SHALL START INSTALLING THE NEW 400-AMP SERVICE DISCONNECT, METER SOCKET, MDP, CONTROL PANEL, ETC.
- INSTALL THE (2) 6" STILLING WELLS IN THE PUMP STATION AND GET THE CONDUIT RUN TO THE TERMINAL BOX AND GET THE NEW TRANSDUCERS HOOKED UP TO THE NEW CONTROL PANEL.
- ALL STILLING WELL BRACKETS, NUTS, BOLTS, ETC. SHALL BE STAINLESS STEEL.
- IT IS ASSUMED THAT THE PAY LIMIT FOR ELECTRICAL INCLUDES EVERYTHING ON THE PLANS UP TO THE MAIN STANCHION WHERE THE ELECTRIC COMPANY WILL RUN A NEW OVERHEAD SERVICE WIRE FOR THE ELECTRICIAN TO MAKE THE CONNECTION.
- ONLY WHEN ALL ELECTRICAL EQUIPMENT IS COMPLETE CAN THE CONTRACTOR HAVE THE ELECTRIC COMPANY UN-POWER THE EXISTING SERVICE AND POWER UP THE NEW SERVICE.
- THE ELECTRICIAN SHALL THEN IMMEDIATELY, WITHOUT DELAY, WORK TO DISCONNECT THE EXISTING PUMP WIRES AND RUN TO THE NEW TERMINAL BOX AND INTO THE CONTROL PANEL.
- THIS WORK MUST ALL BE COORDINATED BETWEEN THE WEATHER, THE ELECTRIC COMPANY, AND THE ELECTRICIAN. THE PUMP STATION MUST ONLY BE DOWN FOR A SHORT TIME PERIOD WHERE WEATHER WILL NOT BE AN ISSUE.
- THE ELECTRICIAN CAN REMOVE THE EXISTING PUMP FLOATS ONCE TRANSDUCERS AND PUMP IS OPERATIONAL.
- ONCE THE PUMP STATION IS MADE OPERATIONAL AGAIN TO THE SATISFACTION OF THE ENGINEER THE CONTRACTOR CAN COMPLETE THE SITE WORK.

SITE WORK

- THE CONTRACTOR SHALL REMOVE THE EXISTING METER, PANEL, CONTROL BOX, AND POLES RIGHT AFTER THE NEW POWER IS ALL HOOKED UP AND THE PUMP STATION IS MADE OPERATIONAL.
- ALL HOLES FROM THE POLES SHALL BE FILLED IN AND COMPACTED.
- THE CONTRACTOR CAN THEN REMOVE THE EXISTING FENCE TO MAKE ROOM TO COMPLETE THE REST OF THE WORK.
- THE CONTRACTOR WILL DESIGN BUILD PRESSURE TREATED LUMBER STEPS AND PLATFORM TO THE MAIN POWER DISCONNECT.
- A 3'X3' CONCRETE PAD SHALL BE POURED IN FRONT OF THE STEEL STEPS TO THE SHELTER. CONCRETE SHALL BE POURED TO NOT EXCEED 2% SLOPE IN ANY DIRECTION.
- THE CONTRACTOR SHALL THEN REMOVE ALL EXISTING LUMBER THAT IS BEING USED TO COVER THE PUMP STATION AND CREATE A THREE (3) PIECE REMOVABLE WOOD LID. ONE (1) PIECE FOR THE INFLOW BOX; TWO (2) PIECES FOR OVERTOP OF THE PUMP SECTION SPLIT AROUND THE EXISTING FORCE MAIN SO THAT THE LID CAN BE DISCONNECTED AND COMPLETED LIFTED OFF. ALL LUMBER SHALL BE PRESSURE TREATED.
- ONCE THE LID IS COMPLETE THE CONTRACTOR SHALL INSTALL A WOODEN PICKET FENCE, 4' HIGH AROUND THE ENTIRE PUMP STATION. INCLUDE A 10' WIDE DOUBLE SWING MAN GATE. ALL WOOD SHALL BE PRESSURE TREATED.
- AT THE END OF CONSTRUCTION THE CONTRACTOR SHALL PERFORM MINOR GRADING TO LEVEL THE AREA AND INSTALL FABRIC AND ¾" CLEAN DECORATIVE STONE, 3" THICK, AROUND THE PUMP STATION AND UNDER THE SHELTER. THE CONTRACTOR SHALL UNDERSTAND THAT THIS WILL REQUIRE SOME POSSIBLE WEEDING AND CLEANING UP OF EXISTING GROWTH. THE FINAL INSPECTION SHALL CONCLUDE NO GROWTH AROUND THE ENTIRE AREA.

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NORTH STREET STORM WATER PUMP STATION ELECTRICAL UPGRADES

FOR

BOROUGH OF HIGHLANDS

BOROUGH OF HIGHLANDS
MONMOUTH COUNTY
NEW JERSEY

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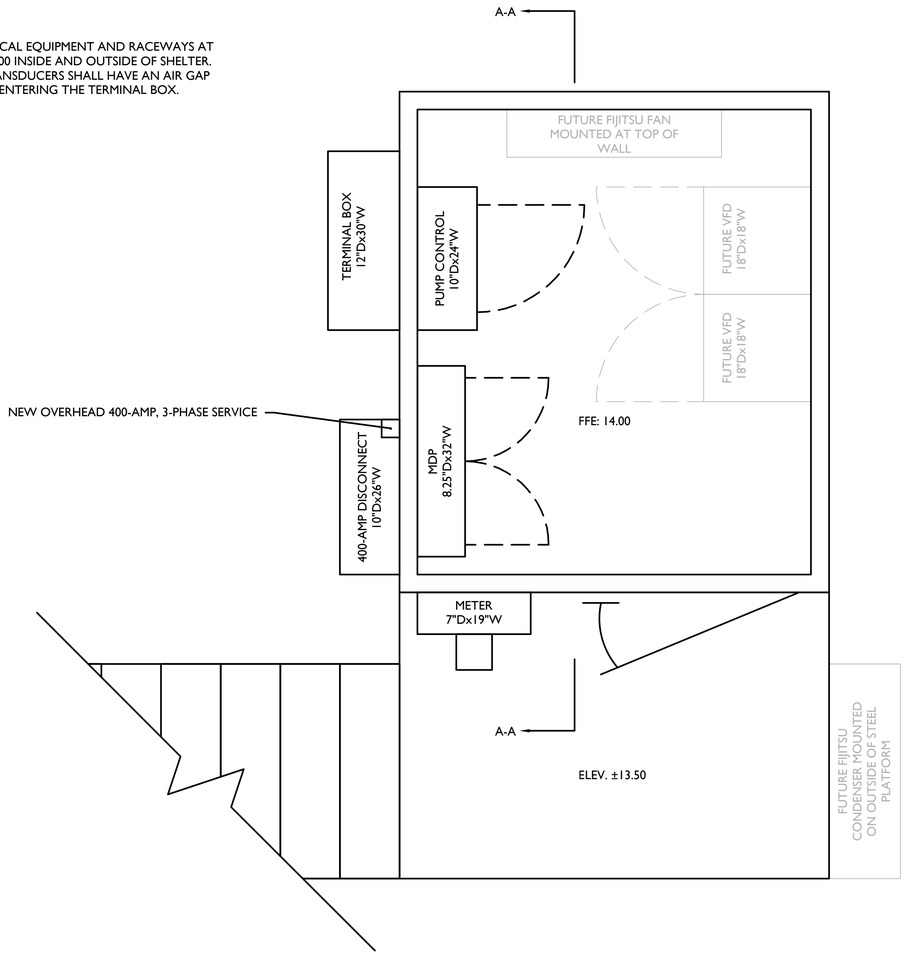
SHEET TITLE:
CONSTRUCTION PLAN

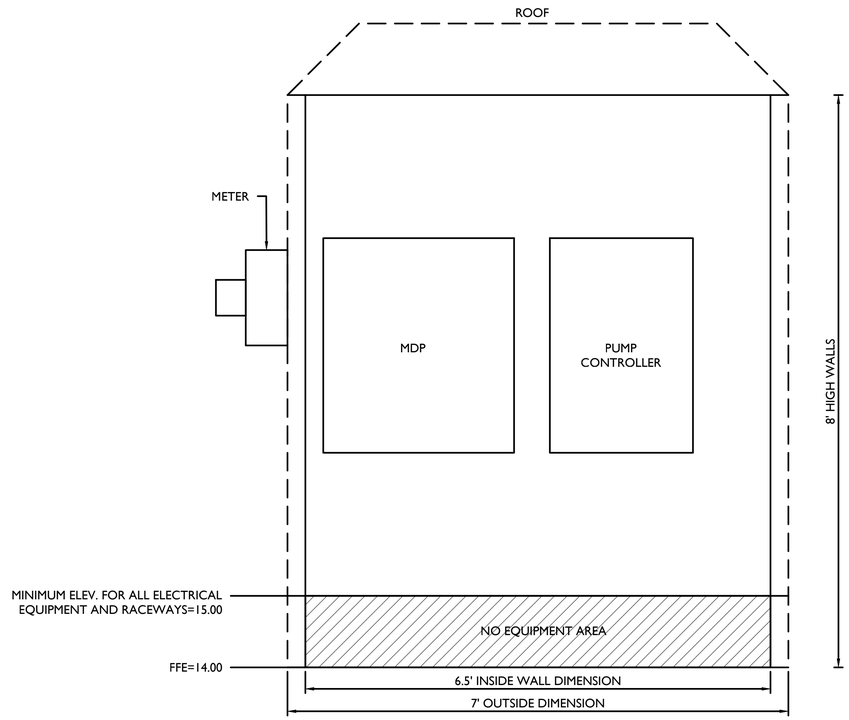
SHEET NUMBER:
2 of 8

2021\21001682G\Engineering\Site Plans\C_LAYT_dwg\C-02LAYOUT-BASE.BIG By: NMINNER

ALL GRAYED LINE WORK SHALL BE CONSIDERED FUTURE AND NOT IN CONTRACT (NIC)

- BOTTOM OF ALL ELECTRICAL EQUIPMENT AND RACEWAYS AT MINIMUM ELEVATION. 15.00 INSIDE AND OUTSIDE OF SHELTER.
- CONDUIT FROM THE TRANSDUCERS SHALL HAVE AN AIR GAP WITH A CAGE PRIOR TO ENTERING THE TERMINAL BOX.





SECTION A-A

1 0 1 2

SCALE : 1" = 1'

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SHEET TITLE:

SHELTER LAYOUT PLAN

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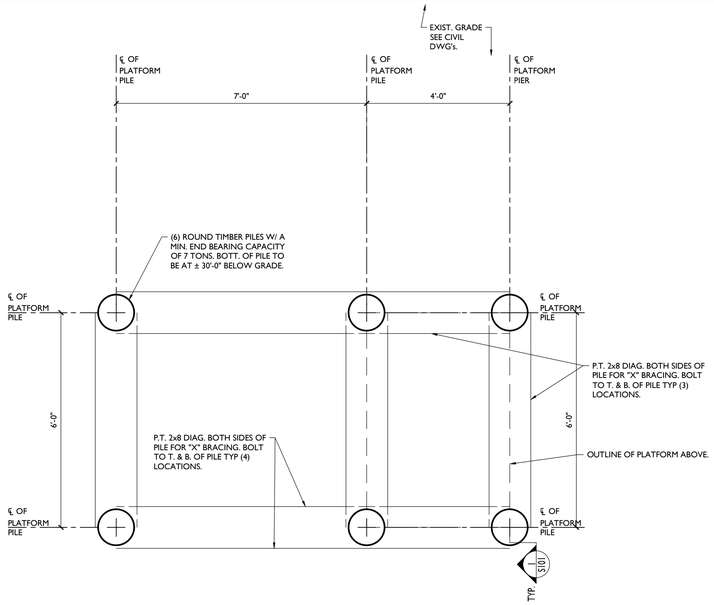
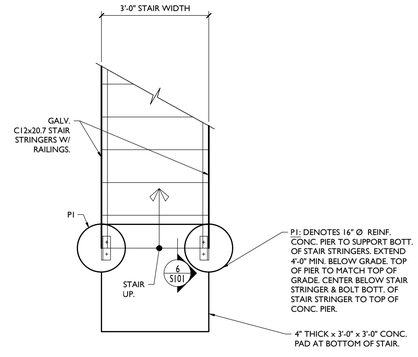
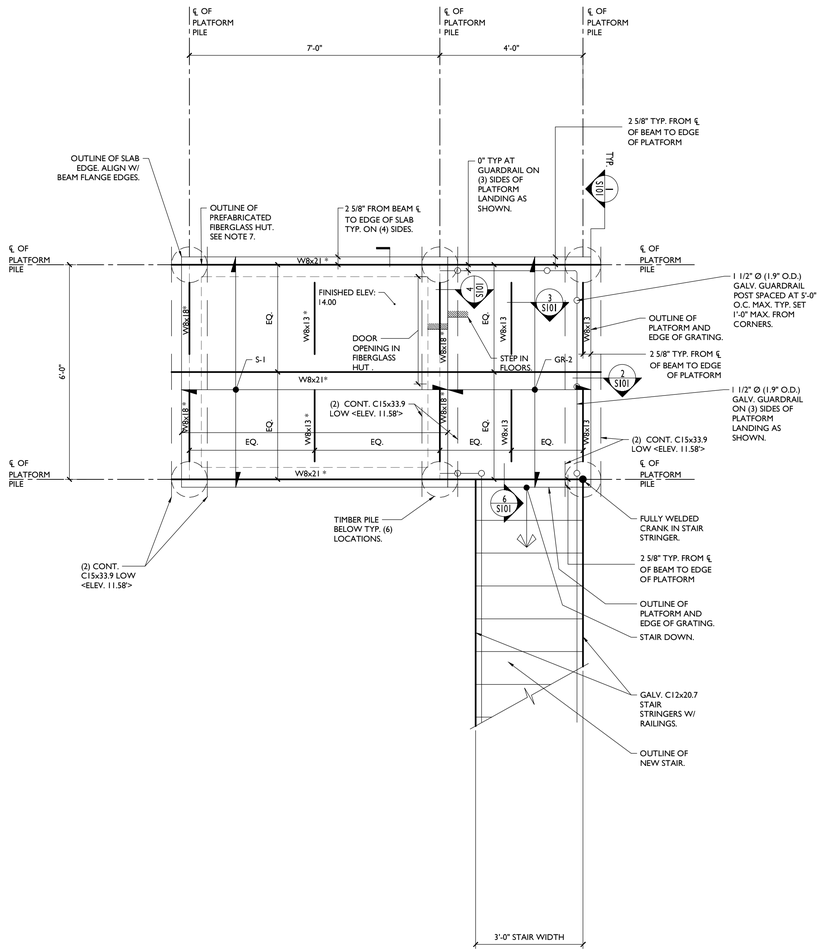




A PLATFORM PILE FOUNDATION PLAN

SCALE: ½"=1'-0"

NOTES:
1. PLAN ABOVE TO BE USED FOR THE ELEVATED ELECTRICAL PLATFORM. SEE CIVIL DWG's FOR LOCATION & ADD'L INFO.



B PLATFORM FRAMING PLAN

SCALE: ½"=1'-0"

NOTES:
1. GR-2 DENOTES GALV. WELDED TYPE WB GRATING BY IKG W/ 1 ½" x ⅜" O.C. MAIN BARS AND CROSS BARS AT 4" O.C. 3" MIN. BEARING ON BEAMS. SEE MANUF. FOR ATTACHMENT TO BEAMS. TOP OF GRATING TO BE ELEV. ±13.58.'
2. U.O.N. TOP OF PLATFORM STEEL TO BE -1 ½" BELOW TOP OF GRATING.
3. ALL NEW PLATFORM STEEL & STEEL CONNECTORS, GRATING, STAIR COMPONENTS, & RAILING TO BE GALV.
4. COORD. W/ CIVIL DWG's FOR FINAL SIZE, ELEVATION, AND LOCATION OF ELECT. EQUIPMENT AND CONN. TO STRUCTURE.
5. S-1 DENOTES 6" THICK FORMED CONC. SLAB. REINF. W/ EPOXY COATED #4 @ 12" O.C. EA. WAY. BOTT. TOP OF SLAB TO BE ELEV. 14.00'.
6. * DENOTES BEAMS SUPPORTING CONCRETE SLAB TO HAVE 3/4" Ø x 4" TALL HEADED STUDS WELDED TO THE TOP OF BEAMS AT 12" O.C.
7. SEE CIVIL DWG's FOR PREFABRICATED FIBERGLASS HUT INFO., DIM., ELEV., & LOCATION, & MANUF. FOR CONNECTION TO BASE SLAB. DESIGN OF SLAB & FRAMING MAY NEED TO BE MODIFIED BASED ON EOR REVIEW OF FINAL FIBERGLASS HUT DESIGN BY OTHERS. FIBERGLASS HUT DESIGN TO BE SUBMITTED IN THE FORM OF SHOP DWG's & CALCULATIONS SIGNED AND SEALED BY A NEW JERSEY PROFESSIONAL ENGINEER WHO PREPARED THE DESIGN.

STAIR AND RAILS DESIGNATED DESIGN REQUIREMENT NOTES:
1. DESIGN SHOWN FOR STAIR AND RAILS ARE CONCEPTUAL ONLY. FINAL DESIGN TO BE BY CONTRACTOR'S ENGINEER. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS TO ENGINEER OF RECORD FOR REVIEW OF THE STAIR AND RAILS. ALL SUBMITTALS SHALL BE SIGNED AND SEALED BY THE CONTRACTOR'S ENGAGED NJ PROFESSIONAL ENGINEER.
2. STAIR AND RAILS DIMENSIONAL REQUIREMENTS SHALL BE IN ACCORDANCE W/ THE REQUIREMENTS OF THE LATEST OSHA STANDARD FOR INDUSTRIAL APPLICATIONS.
3. PROVIDE WELDED CONNECTIONS AT TOP AND INTERMEDIATE RAILS.

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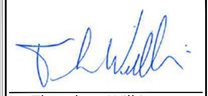

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NORTH STREET STORM WATER PUMP STATION ELECTRICAL UPGRADES

FOR

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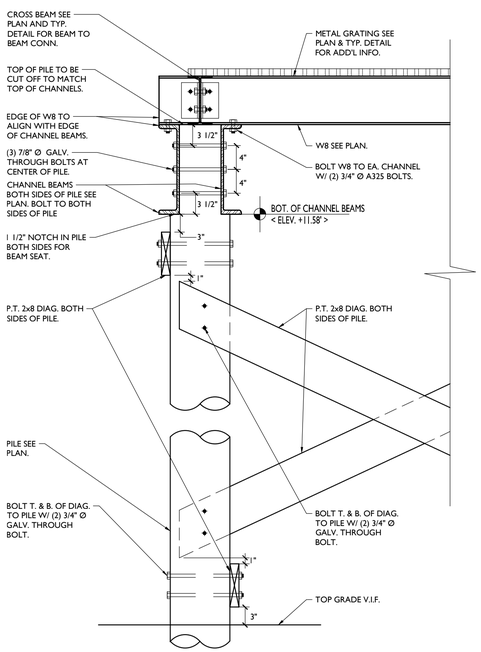
SHEET TITLE:
ELECTRICAL PLATFORM FRAMING PLANS

SHEET NUMBER: 4 of 8

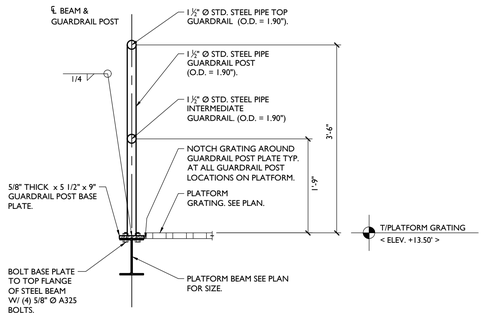
S100



1 TYP. SECTION AT PLATFORM PILE

SCALE: 1"=1'-0"

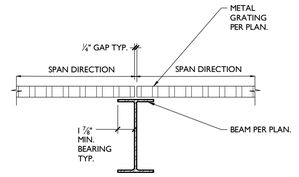
NOTES:
1. GUARDRAIL INFO. NOT SHOWN FOR CLARITY. SEE TYP. DETAIL FOR ADD'L INFO. ON GUARDRAIL.



2 TYP. SECTION AT PLATFORM RAILING

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

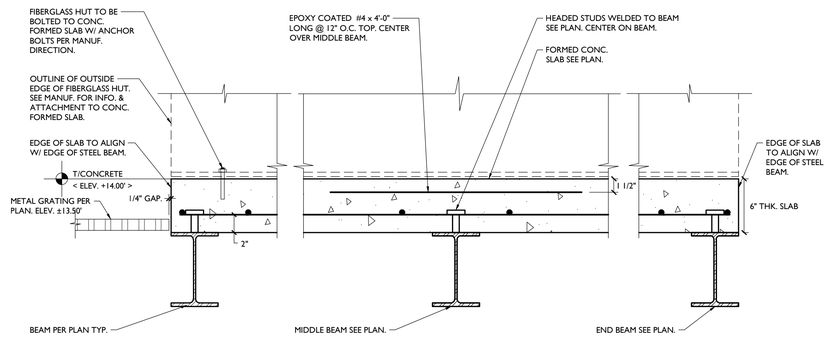
NOTES:
1. ALL GUARDRAILS SHALL BE IN ACCORDANCE W/ THE REQUIREMENTS OF THE LATEST OSHA STANDARD FOR INDUSTRIAL APPLICATIONS.
2. PROVIDE WELDED CONNECTIONS AND TOP AND INTERMEDIATE GUARDRAILS.
3. PROVIDE CONT. CANT., CRANKED TOP AND INTERMEDIATE GUARDRAILS AT CORNERS.



3 TYP. GRATING DETAIL AT BEAM

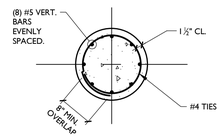
SCALE: 1½"=1'-0"

NOTES:
1. COORD. W/ MANUF. FOR GRATING ATTACHMENTS TO BEAM.



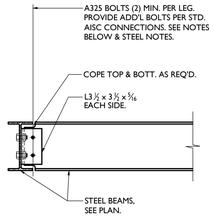
4 TYP. SECTION AT HUT SLAB

SCALE: 1½"=1'-0"



6A PIER CROSS SECTION

SCALE: ¾"=1'-0"



5 TYP. BEAM TO BEAM CONN.

SCALE: 1"=1'-0"

NOTES:
1. IF BOLTING IS NOT FEASIBLE PROVIDE FILLET WELD ALL AROUND.
2. AS AN ALTERNATE PROVIDE ¼" FILLET WELD ALL AROUND.

6 SECTION AT STAIR

SCALE: ¾"=1'-0"

NOTES:
1. PROVIDE SIM. HANDRAIL & GUARDRAIL DETAIL ON OUTSIDE STRINGER. TOP OF HANDRAIL AT OUTSIDE STRINGER TO EXTEND 12" BEYOND TOP TREAD.

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NORTH STREET STORM WATER PUMP STATION ELECTRICAL UPGRADES

FOR

BOROUGH OF HIGHLANDS

BOROUGH OF HIGHLANDS
MONMOUTH COUNTY
NEW JERSEY

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21001682G	S-DTLS_S101

SHEET TITLE:
ELECTRICAL PLATFORM TYPICAL DETAILS AND SECTIONS

SHEET NUMBER:
5 of 8

S101

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

GENERAL NOTES:

ALL WORK SHALL COMPLY WITH THE REQUIREMENTS OF THE BUILDING CODE OF THE NEW JERSEY UNIFORM BUILDING CONSTRUCTION CODE, THE INTERNATIONAL BUILDING CODE NEW JERSEY EDITION (2018), AND LOCAL BUILDING CODES, AND OTHER APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS.

THE CONTRACTOR SHALL OBTAIN ALL PERMITS FROM THE BUILDING DEPARTMENT PRIOR TO THE START OF WORK.

IN CASE OF CONFLICT BETWEEN THE GENERAL NOTES, SPECIFICATIONS, AND DETAILS, THE MOST STRINGENT REQUIREMENTS SHALL GOVERN.

COORDINATE THE STRUCTURAL DRAWINGS WITH THE PLUMBING DRAWINGS.

EXISTING CONDITIONS, ELEVATIONS, DIMENSIONS AND SYSTEMS SHOWN ON PLANS ARE BASED ON LIMITED FIELD OBSERVATIONS. THE CONTRACTOR SHALL FIELD-VERIFY ALL DETAILS, DIMENSIONS AND ASSUMPTIONS PRIOR TO ANY WORK, AND COORDINATE WITH THE PLUMBING DRAWINGS. FOR FINAL CONSTRUCTION WHERE EXISTING CONDITIONS DIFFER FROM OR PRECLUDE THE EXECUTION OF THE OUTLINED DETAILS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER AND PROVIDE A SKETCH OF THE CONDITION WITH HIS PROPOSED MODIFICATION OF THE DETAILS GIVEN ON THE CONTRACT DOCUMENTS. DO NOT COMMENCE WORK UNTIL CONDITION IS RESOLVED AND MODIFICATION IS APPROVED.

THE CONTRACTOR SHALL PROVIDE ALL TEMPORARY SHORING AND BRACING REQUIRED FOR PLUMBNESS, STRUCTURAL STABILITY AND SAFETY WHENEVER REQUIRED TO SUPPORT LOADS AS MAY BE IMPOSED UPON THE STRUCTURE DURING CONSTRUCTION. BRACING AND SHORING AND SEQUENCES OF SUCH WORK SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND HIS/HER LICENSED ENGINEER REGISTERED IN THE STATE OF NEW JERSEY. ALL SUBMITTALS SHALL BEAR THIS ENGINEER'S SEAL AND SIGNATURE.

CONTRACTOR TO PROTECT AT ALL TIMES EQUIPMENT, PIPES AND OTHER EXPOSED OR EMBEDDED ITEMS ON THE SITE AGAINST DAMAGE. COORDINATE WITH PLUMBING DWGS AND REROUTE AS REQUIRED.

SHORE ALL EXISTING CONDUITS, PIPES, ETC. REFASTEN TO NEW CONSTRUCTION. DO NOT DAMAGE ANY EMBEDDED CONDUITS OR OTHER EMBEDDED ITEMS SCHEDULED TO REMAIN DURING DEMOLITION. CONTRACTOR SHALL FIELD VERIFY THE EXISTENCE OF ANY ELECTRICAL CONDUITS PRIOR TO CUTTING OPENING. REROUTE AS REQUIRED.

SUBMIT SHOP DRAWINGS FOR ALL WORK. DO NOT PROCEED WITH ANY FABRICATION UNTIL THE SHOP DRAWINGS ARE FAVORABLY REVIEWED FOR ALL STRUCTURAL WORK, AND PLUMBING SHOP DRAWINGS RELATED TO THE STRUCTURAL WORK. SHOP DRAWINGS SHALL BE BASED ON FIELD VERIFIED CONDITIONS.

REVIEW OF SHOP DRAWINGS AND SUBMITTALS BY STRUCTURAL ENGINEER OF RECORD SHALL BE TO REVIEW AND TAKE APPROPRIATE ACTION ON SHOP DRAWINGS FOR CONFORMANCE WITH THE STRUCTURAL CONSTRUCTION DOCUMENTS BUT NOT FOR ACCURACY OF DIMENSIONS AND QUANTITIES REQUIRED FOR PROPER CONSTRUCTION, WHICH ARE THE CONTRACTOR'S RESPONSIBILITY.

REPRODUCTION OF ANY PORTION OF THE STRUCTURAL CONTRACT DRAWINGS FOR SUBMITTAL AS SHOP DRAWINGS IS PROHIBITED. SHOP DRAWINGS PRODUCED IN SUCH A MANNER WILL BE REJECTED AND RETURNED.

PROTECT ALL WORK SCHEDULED TO REMAIN AND IF DAMAGED REPAIR TO MATCH EXISTING.

ANY ADDITIONAL WORK/FRAMING/FOUNDATIONS NOT SPECIFICALLY SHOWN OR CALLED FOR IN THE DRAWINGS AND SPECIFICATIONS, THAT ARE REQUIRED TO COMPLETE THE INTENT OF THE WORK, SHALL BE SUPPLIED AND INSTALLED BY THE CONTRACTOR AS IF INCLUDED IN THE DRAWINGS/SPECIFICATIONS. THE CONTRACTOR SHALL ADVISE THE ENGINEER OF SUCH OCCURRENCES.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF ALL AREAS. PROVIDE ANY PROTECTIVE MEASURES DEEMED NECESSARY TO PROTECT PROPERTY AND PREVENT INJURY.

REMOVE ALL DEMOLITION MATERIALS FROM THE SITE PROMPTLY. TRANSPORT AND DISPOSE OF DEBRIS AS REQUIRED BY THE APPROPRIATE CODES.

EXCAVATION AND FOUNDATION NOTES:

ALL MATERIAL, FABRICATION, INSTALLATION, AND INSPECTION REQUIREMENTS RELATING TO THE FOUNDATIONS SHALL CONFORM TO THE NEW JERSEY STATE AND LOCAL BUILDING CODES.

ALL STRUCTURAL WORK SHALL BE COORDINATED AND VERIFIED WITH THE PLUMBING REQUIREMENTS.

THE CONTRACTOR SHALL DEMOLISH AND REMOVE EXISTING ELEMENTS AS INDICATED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL REMOVE, TRANSPORT, AND DISPOSE OF ALL DEBRIS PROMPTLY.

EXCAVATION SHALL BE PERFORMED SO AS NOT TO DISTURB EXISTING ADJACENT BUILDINGS, STREETS, AND UTILITY LINES. VERIFY LOCATION OF ALL UTILITIES PRIOR TO COMMENCEMENT OF WORK. HAND EXCAVATE AROUND AND RESUPPORT UTILITIES AS REQUIRED.

SUBGRADES SHOULD BE THOROUGHLY CLEARED OF ALL MUD, DEBRIS AND LOOSE MATERIAL PRIOR TO THE PLACEMENT OF CONCRETE OR CRUSHED STONE.

THE CONTRACTOR SHALL PROVIDE ALL MEASURES NECESSARY TO CONTROL ICE, FROST, SURFACE AND SUBSURFACE WATER SO THAT THE FOUNDATION WORK IS PERFORMED ON DRY SUBGRADE.

DO NOT PLACE CONCRETE WITHOUT FAVORABLY REVIEWED STRUCTURAL SHOP DRAWINGS AND PLUMBING SHOP DRAWINGS RELATED TO THE CONCRETE WORK.

THE CONTRACTOR SHALL PROVIDE ALL MEASURES AND PRECAUTIONS NECESSARY TO PREVENT DAMAGE AND SETTLEMENT (HORIZONTAL AND VERTICAL) OF EXISTING OR NEW CONSTRUCTION, INSIDE OR OUTSIDE THE PROJECT LIMITS.

NEW EXCAVATION SHALL NOT UNDERMINE NOR DISTURB ANY EXISTING ADJACENT FOOTINGS.

TIMBER PILE NOTES:

ALL PILE MATERIALS AND OPERATIONS SHALL BE IN COMPLIANCE WITH THE REQUIREMENTS OF THE NEW JERSEY UNIFORM BUILDING CODE AND INTERNATIONAL BUILDING CODE NEW JERSEY EDITION.

PILES SHALL BE ROUND SOUTHERN YELLOW PINE CLASS B PILES.

ANTICIPATED LENGTH OF PILES FROM DESIGN TOP OF PILE ELEVATION TO THE BOTTOM IS 40'-0". CUT OFF TOP OF PILES AT ELEVATIONS NOTED.

VERIFY IN FIELD ACTUAL DEPTH BASED ON REQUIRED END BEARING AND ADJUST LENGTHS AS REQUIRED.

PILES SHALL CONFORM TO THE SPECIFICATIONS OUTLINED IN ASTM D25 (LATEST EDITION), TABLE 2

PILES FOR THE ELECTRICAL PLATFORM ARE TO BE PRESSURE TREATED. PRESSURE TREATMENT SHALL CONFORM TO ALL FEDERAL, STATE AND LOCAL REGULATIONS.

ELECTRICAL PLATFORM PILES SHALL BE PRESERVATIVE TREATED FULL LENGTH BY THE FULL CELL PROCESS AS FALLOWS: COPPER AZOLE (CA) PRESERVATIVE TREATMENT CONFORMING TO AWPA STANDARDS C-3 WITH WOOD RETAINING NOT LESS THAN 0.41 POUNDS/C.F. TREATMENT SHALL BE IN ACCORDANCE WITH AMERICAN WOOD PRESERVERS' ASSOCIATION SPECIFICATIONS. THE TREATMENT SHALL BE SO PERFORMED THAT THE TIMBER WILL HAVE AS A MINIMUM THE FINAL RETENTION SPECIFIED. THE TOPS OF ALL ROUND TIMBER PILES AFTER CUT OFF SHALL BE COATED WITH A SEALING COMPOUND. THE SEALING COMPOUND SHALL BE A MARINE EXOXY AND MUST BE APPROVED BY THE ENGINEER.

IF UNDERGROUND OBSTRUCTIONS ARE ENCOUNTERED DURING INSTALLATION, THE CONTRACTOR SHALL HAVE THE OPTION OF REMOVING THE OBSTRUCTION IF POSSIBLE OR RELOCATING THE PILE WITH THE ENGINEER'S APPROVAL. THE LATTER OPTION MAY REQUIRE THE RELOCATION OF ADJACENT PILES AND/OR REDESIGN OF ADJACENT FOUNDATIONS.

ALL PILE INSTALLATION OPERATIONS SHALL KEEP A COMPLETE RECORD OF THE PILE INSTALLATION OPERATION.

WRITTEN INSTALLATION RECORDS SHALL BE OBTAINED FOR EACH PILE AND SUBMITTED TO THE ENGINEER OF RECORD. THESE RECORDS SHALL INCLUDE, BUT ARE NOT LIMITED TO THE FOLLOWING:

1. PROJECT NAME AND/OR LOCATION.
2. DATE AND TIME OF INSTALLATION.
3. LOCATION AND REFERENCE NUMBER OF EACH PILE.
4. PILE LOGS SIGNED AND SEALED BY A LICENSED SURVEYOR OR A PROFESSIONAL ENGINEER.
5. OVERALL DEPTH OF INSTALLATIONS REFERENCED FROM BOTTOM OF SLAB.
6. PILE DEVIATION PLAN.
7. ANY OTHER RELEVANT INFORMATION RELATING TO THE INSTALLATION.

THE CONTRACTOR SHALL NOT CONTINUE WITH THE STEEL STRUCTURE UNTIL THE ENGINEER OF RECORD AND BUILDING DEPARTMENT HAS APPROVED THE ABOVE DOCUMENTS.

ECCENTRICITIES OF "AS-DRIVEN" PILE GROUPS SHALL BE ADJUSTED BY STRAPS, ADDITIONAL REINFORCING OR BY THE DRIVING OF ADDITIONAL PILES AS INDICATED ON REDESIGN SHEETS AS PREPARED BY THE STRUCTURAL ENGINEER. STRUCTURAL REDESIGN AND NEW WORK SHALL BE AT CONTRACTOR'S COST.

ADHESIVE ANCHORS:

THE ANCHOR HOLE SHALL BE MADE WITH CARBIDE THREADED RODS TIPPED BITS.

ALL BOLTS SHALL BE INSTALLED AS PER THE MANUFACTURER'S INSTRUCTION TAKING CAREFUL NOTE OF DRILL BIT TYPE, CLEANING OF HOLE, TEMPERATURE OF ADHESIVE AND HEATING OF ANCHOR HOLE.

SUBMIT MANUFACTURER'S LOAD TABLE AND SPECIFICATIONS FOR APPROVAL.

BOLT HOLES SHALL BE ACCURATELY SET USING A TEMPLATE AND FIX DRILL GUIDE. USE SMALL PILOT HOLES AS REQUIRED TO ASSURE A PERFECT FIT AND TO ENSURE THAT NO REINFORCING BARS ARE DAMAGED. LOCATION OF HOLES AND PLATE SIZES MAY HAVE TO BE ADJUSTED SO THAT REINFORCEMENT BARS ARE NOT DAMAGED.

STRUCTURAL STEEL NOTES:

DETAILING, FABRICATION AND ERECTION SHALL COMPLY WITH AISC SPECIFICATIONS AND CODES, LATEST EDITIONS AS AMENDED BY THE STATE OF NEW JERSEY AND LOCAL BUILDING CODES.

STRUCTURAL STEEL W SHAPES SHALL COMPLY WITH ASTM A992 GR. 50 UNLESS OTHERWISE NOTED.

STRUCTURAL STEEL CHANNELS, ANGLES, PLATES AND BARS SHALL BE ASTM A36, UNLESS OTHERWISE NOTED.

STEEL PIPE SHALL COMPLY WITH ASTM A53, GR B, UNLESS OTHERWISE NOTED.

HOLLOW STRUCTURAL SECTIONS (HSS) SHALL COMPLY WITH ASTM A500, GR B, UNLESS OTHERWISE NOTED.

BOLTS SHALL COMPLY WITH ASTM A325. BOLTS SHALL BE A MINIMUM 3/4 INCH DIAMETER, UNLESS OTHERWISE NOTED.

NUTS SHALL COMPLY WITH ASTM A563.

WASHERS SHALL COMPLY WITH ASTM F436.

AT BOLTED CONNECTIONS PROVIDE A MINIMUM OF TWO (2) BOLTS.

SUBMIT SHOP DRAWINGS FOR ALL WORK. DO NOT PROCEED WITH ANY FABRICATION UNTIL THE SHOP DRAWINGS ARE FAVORABLY REVIEWED. SHOP DRAWINGS SHALL BE BASED ON FIELD VERIFIED CONDITIONS.

ALLOW FOR A TWO-WEEK REVIEW PERIOD (MIN.) FOR SHOP DRAWINGS, AND TIME ALL SUBMISSIONS ACCORDINGLY.

PROVIDE ANY MEASURES REQUIRED FOR STABILITY OF STRUCTURE DURING ERECTION.

AFTER FABRICATION, CLEAN STEEL OF ALL RUST, LOOSE MILL, SCALE AND OTHER FOREIGN MATERIALS.

ALL WELDING SHALL BE DONE BY QUALIFIED WELDERS AND SHALL CONFORM TO "AWS STRUCTURAL WELDING CODE - STEEL", LATEST EDITION. WELDERS SHALL BE LICENSED IN ACCORDANCE WITH ALL REQUIREMENTS OF THE LOCAL BUILDING CODE.

WELDING ELECTRODES SHALL BE E70XX.

WELDING SHALL BE PERFORMED IN A MANNER THAT WOULD AVOID ANY DETRIMENTAL OVERHEATING OF EXISTING LOAD BEARING STEEL.

WELDING SHOULD BE PERFORMED IN AS SYMMETRICAL A WAY AS POSSIBLE.

MINIMUM FILLET WELDS SHALL COMPLY WITH AISC, BUT SHALL NOT BE LESS THAN 1/4 INCH, UNLESS OTHERWISE NOTED.

PROVIDE FIREPROOF BLANKETS AND OTHER FIRE PROTECTION MEASURES AS REQUIRED FOR FIRE SAFETY DURING WELDING.

SURFACES OF ALL STEEL THAT IS TO RECEIVE WELDS SHALL BE POWER BRUSHED AND CLEANED THOROUGHLY OF ALL FOREIGN MATTER INCLUDING PAINT FOR A DISTANCE OF 2 INCHES FROM EACH SIDE OF THE OUTSIDE LINES OF WELD.

ALL FIELD WELDING AREAS SHALL BE TOUCHED UP ON SITE WHERE PAINT IS REQUIRED.

ALL LIVE LOADS SHALL BE REMOVED FROM AREAS BEING WELDED DURING CONSTRUCTION.

ALL NEW INTERIOR STEEL SHALL BE PAINTED WITH THE FOLLOWING SYSTEM BY TNEMEC OR EQUAL. (PAINT SYSTEMS TO BE COORDINATED WITH ARCH. DWG'S PRIOR TO ANY WORK AND VERIFIED WITH TNEMEC FOR APPLICABILITY OF INTENDED USE).

Surface Prep: SSPC-SP2 Hand Tool Clean
Prime: V10-99 or 4 Versare, 2-3 mils dft
Intermediate: 2H or 23 Endurazone, 2-3 mils dft
Finish: 2H or 23 Endurazone, 2-3 mils dft

ALL EXTERIOR EXPOSURE FIELD WELDING AREAS SHALL BE TOUCHED UP WITH ZINC-RICH PAINT AND A FINAL COAT PER ARCH. SPECIFICATIONS.

ALL EXTERIOR EXPOSURE BOLTS, SHIMS, AND OTHER HARDWARE SHALL BE GALVANIZED AND TOUCHED UP WITH ZINC RICH PAINT. ALL EXTERIOR LINTELS SHALL BE GALVANIZED.

FABRICATE BEAMS WITH THE NATURAL CAMBER UP. PROVIDE CAMBERS AS INDICATED ON THE DRAWINGS.

WHERE STEEL MEMBERS ARE REQUIRED TO BE SPLICED, THE SPLICE SHALL BE MADE TO DEVELOP THE FULL STRENGTH OF THE SECTION. SUCH SPLICES SHALL NOT INTERFERE WITH ANY ARCHITECTURAL OR MECHANICAL DESIGN AND CLEARANCES. SUBMIT SHOP DRAWING OF SPLICE DETAIL, LOCATION AND CALCULATION SIGNED AND SEALED BY THE CONTRACTOR'S PROFESSIONAL ENGINEER. INDICATED ALL BEAM SPLICES ON SHOP DRAWINGS.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONTROL OF ALL ERECTION PROCEDURES AND SEQUENCES WITH RELATION TO TEMPERATURE DIFFERENTIALS.

ALL ADDITIONAL STEEL REQUIREMENTS BY THE CONTRACTOR FOR ERECTION PURPOSES SHALL BE REMOVED BY THE CONTRACTOR, UNLESS APPROVED BY THE OWNER IN WRITING.

STAIR DESIGN SHOWN IS CONCEPTUAL. FINAL STAIR DESIGN, DETAILS AND CONNECTIONS SHALL BE BY STAIR MANUFACTURER AND HIS/HER DETAILER/ENGINEER. ALL SUBMITTALS SHALL BEAR THIS ENGINEER'S SEAL AND SIGNATURE.

STAIR STRINGERS SHALL HAVE FULL PENETRATION WELDED CONNECTIONS ALL AROUND AT CRANKED SEGMENTS AND GROUND SMOOTH, UNLESS OTHERWISE NOTED.

GAS CUTTING OF MAIN STRUCTURAL MEMBERS IN THE FIELD WILL NOT BE PERMITTED.

CONTRACTOR SHALL INCLUDE COST OF POSSIBLE MODIFICATIONS TO CONNECTIONS DUE TO EXISTING CONDITIONS.

HANDRAILS/GUARDRAIL ASSEMBLY NOTES:

ALL HANDRAILS/GUARDRAILS ASSEMBLIES SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE LATEST OSHA STANDARDS.

HANDRAIL/GUARDRAIL DESIGN SHOWN IS CONCEPTUAL. FINAL DESIGN, DETAILS, & CONNECTIONS SHALL BE BY THE CONTRACTOR'S RAILING MANUFACTURER AND HIS/HER ENGINEER. RAILING SUBMITTALS SHALL BEAR THIS ENGINEER'S SEAL & SIGNATURE.

HANDRAILS/GUARDRAILs AND THEIR CONNECTIONS SHALL BE DESIGNED AND DETAILED TO WITHSTAND THE VERTICAL AND LATERAL LOADS AS SPECIFIED BY NEW JERSEY STATE IBC AND AS FOLLOWS:

A. UNIFORM LOAD: 50 LBS/FT APPLIED IN ANY DIRECTION ON TOP RAIL
B. CONCENTRATED LOAD: 200 LBS APPLIED AT ANY POINT AND IN ANY DIRECTION ON TOP RAIL

HANDRAILS/GUARDRAILS SHALL BE GALVANIZED STEEL PIPE, IN ACCORDANCE WITH ASTM A53, GRADE B.

POSTS FOR HANDRAIL/GUARDRAIL SHALL BE 2" Ø SCHEDULE 80 PIPE, LOCATED AT 5'-0" MAXIMUM ON CENTER OR AS REQUIRED BY DETAILERS.

RAILS FOR HANDRAILS/GUARDRAILS SHALL BE 2" Ø SCHEDULE 40 PIPE.

HANDRAIL/GUARDRAIL SHALL BE FABRICATED IN THE LARGEST SECTIONS PRACTICAL FOR SHIPPING AND HANDLING IN FIELD FOR INSTALLATION.

ALL HANDRAIL/GUARDRAIL SECTIONS SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A123.

ANY GALVANIZING DAMAGED DURING SHIPMENT, INSTALLATION, OR FIELD WELDING SHALL BE REPAIRED USING "ZRC COLD GALVANIZING COMPOUND" OR EQUAL AS APPROVED BY THE ENGINEER.

PROVIDE FULLY WELDED CANTILEVER TOP AND MID-RAIL SECTIONS AT CORNERS AND CHANGE IN RAIL DIRECTION.

LOADING CRITERIA

DEAD LOAD	
EXTERIOR ELECTRICAL PLATFORM	20 PSF
INTERIOR ELECTRICAL PLATFORM	20 PSF
LIVE LOAD (REF. TABLE 1607.1)	
PUMP STATION LIVE LOAD	100 PSF
PLATFORM LIVE LOADS	100 PSF
ROOF LIVE LOAD (REF. SECTION 1607.13)	
PREFAB SHELTER ON EXTERIOR PLATFORM	20 PSF
SNOW LOAD (REF. SECTION 1608)	
GROUND SNOW LOAD, Pg:	20 PSF
EXPOSURE CATEGORY:	C
EXPOSURE FACTOR, Ce:	1.0
THERMAL FACTOR, Ct:	1.0
IMPORTANCE FACTOR:	1.1
FLAT-ROOF SNOW LOAD, Pf:	15.4 PSF
WIND LOAD (REF. SECTION 1609)	
BASIC WIND SPEED:	130 MPH
EXPOSURE CATEGORY:	C
BUILDING RISK CATEGORY:	III
SEISMIC DATA (REF. SECTION 1613)	
SITE CLASS:	D
SEISMIC DESIGN CATEGORY:	B
IMPORTANCE FACTOR:	1.25
SDS = 0.127	
SD1 = 0.076	

TIMBER NOTES:

DETAILS OF ALL WOOD FRAMING SHALL CONFORM TO THE REQUIREMENTS OF THE NEW JERSEY STATE AND LOCAL BUILDING CODES.

DESIGN, FABRICATION, AND CONSTRUCTION OF WOOD FRAMING SHALL CONFORM WITH THE FOLLOWING CODES AND STANDARDS:

"NATIONAL DESIGN SPECIFICATIONS FOR WOOD CONSTRUCTION", AMERICAN FOREST AND PAPER ASSOCIATION.

"TIMBER CONSTRUCTION MANUAL", LATEST EDITION, AS ADOPTED BY THE AMERICAN INSTITUTE OF TIMBER CONSTRUCTION, INCLUDING THE "CODE OF STANDARD PRACTICE", AITC 106.

ALL FRAMING LUMBER FOR BRACES SHALL BE DOUGLAS FIR-LARCH NO. 2 WITH A MINIMUM UNFACTORED BASIC FB=875 PSI AND E=1,600,000 PSI.

ALL DIMENSIONAL LUMBER TO BE MARKED "S-DRY" WITH A MAXIMUM OF 19% MOISTURE CONTENT. COMPLY WITH DRY SIZE REQUIREMENTS OF PS 20.

NOTCHES IN NEW FRAMING SHALL NOT BE ALLOWED WITHOUT THE PERMISSION OF THE ENGINEER.

PROVIDE SHOP DRAWINGS FOR ALL REQUESTED ITEMS.

ALL CONNECTION HARDWARE SHALL BE STAINLESS STEEL OR HOT DIP GALVANIZED AND PAINTED WITH AN EPOXY PAINT.

ALL TIMBER SHALL BE PRESSURE TREATED/ROT RESISTANT. TIMBER TREATMENT SHALL ADHERE TO THE LOCAL BUILDING CODE REQUIREMENTS.

PROVIDE MISCELLANEOUS FRAMING AS REQUIRED.

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NEW JERSEY LICENSED PROFESSIONAL ENGINEER
LICENSE NUMBER: GE39607
COLLIERS ENGINEERING & DESIGN, INC.
N.J. C.O.A. #: 24GA27986500

NORTH STREET STORM WATER PUMP STATION ELECTRICAL UPGRADES

FOR

BOROUGH OF HIGHLANDS

BOROUGH OF HIGHLANDS
MONMOUTH COUNTY
NEW JERSEY

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SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	9/24/21	NM	TW

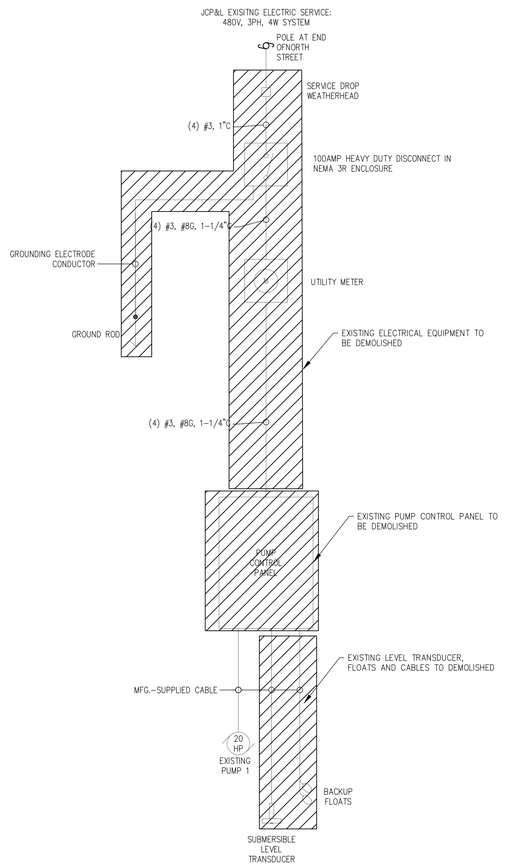
PROJECT NUMBER: 21001682G
DRAWING NAME: S-NOTE_S200

SHEET TITLE: GENERAL STRUCTURAL NOTES & LOADING CRITERIA

SHEET NUMBER: 6 of 8

S200

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

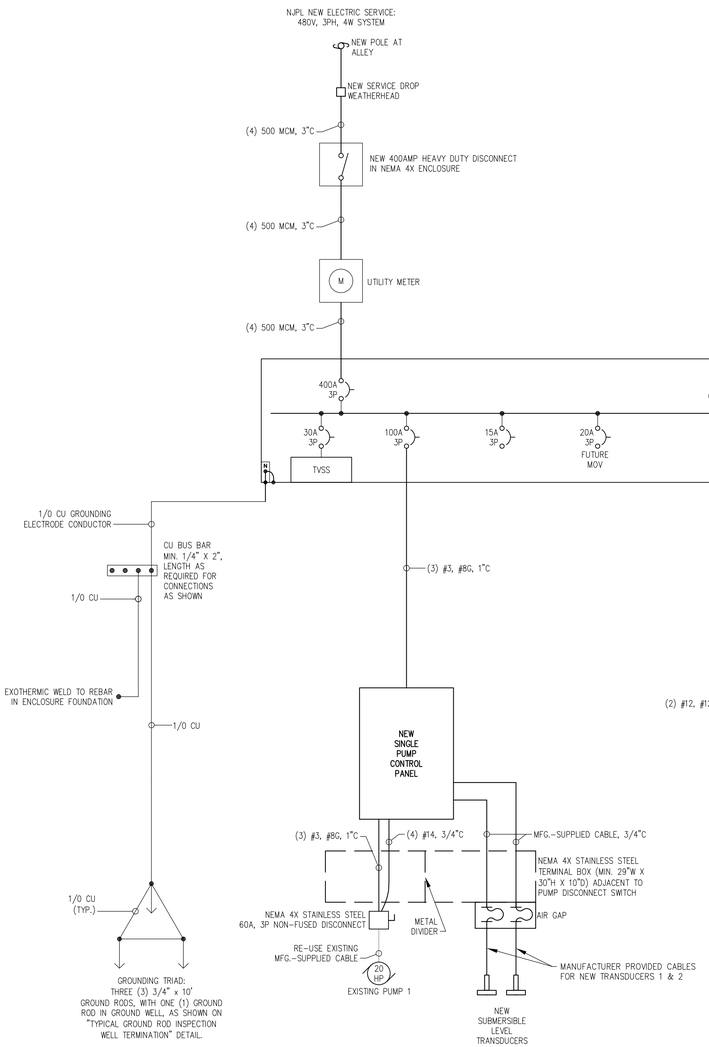


DEMOLITION ELECTRICAL SINGLE LINE DIAGRAM

SCALE: N.T.S.

NOTES:

1. EXISTING UTILITY METER SOCKET AND DISCONNECT SWITCH TO BE DEMOLISHED.
2. EXISTING PUMP, AND CABLES TO BE REUSED.
3. DEMOLISH EXISTING TRANSDUCER, FLOATS AND CABLES.

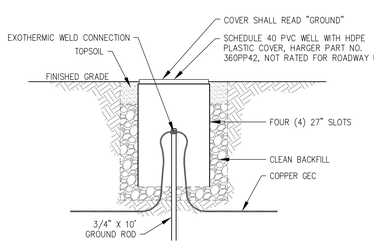


NEW ELECTRICAL SINGLE LINE DIAGRAM

SCALE: N.T.S.

NOTES:

1. UTILITY DISCONNECT SWITCH SHALL BE 400A, 3P, NON-FUSED, HP-RATED DISCONNECT SWITCH IN NEMA 4X ENCLOSURE.
2. NEW SINGLE PUMP CONTROL PANEL SHALL BE INSTALLED TO CONTROL 20HP PUMP. PROVIDE NEMA 2 FVNR STARTER WITH OVERLOAD RELAY, HAND-OFF-AUTO SWITCH, CONTROL TRANSFORMER, PUMP PROTECTION RELAY FOR THERMAL AND SEAL LEAK PROTECTION, AND PRECISION DIGITAL PROVU, OR EQUAL, PROCESS METER WITH OUTPUT RELAYS TO START OR STOP THE MOTOR BASED ON PRESET LEVELS. PROVIDE INTRINSICALLY SAFE BARRIERS AND SURGE PROTECTION FOR LEVEL TRANSDUCER CIRCUITS.
3. MANUFACTURER-SUPPLIED TRANSDUCER CABLES SHALL BE RUN IN 3/4" RIGID ALUMINUM CONDUITS FROM STILLING WELL TO AIR GAP.



TYPICAL GROUND ROD INSPECTION WELL TERMINATION

SCALE: N.T.S.

LUMINAIRE SCHEDULE

FIXTURE ID	QUANTITY	MANUFACTURER/ MODEL	DESCRIPTION	REMARKS
LA (INTERIOR LED)	1	COOPER LIGHTING 4VT2 SERIES	30W, 4' LED LIGHT FIXTURE, 4000 LUMENS, 5000K, UNIVERSAL VOLTAGE 120-277V.	
LB (EXTERIOR)	1	COOPER LIGHTING XTOR3B SERIES	26W WALL MOUNT LED LIGHT FIXTURE, LED KELVIN COLOR: BRIGHT WHITE (5000K), CARBON BRONZE HOUSING COLOR.	ALL EXTERIOR WALL PACKS SHOULD BE LED CUT OFF WALL MOUNT.
MS (MOTION SENSOR)	1	LEVITON PS200	277V OUTDOOR OCCUPANCY SENSOR	MOUNT MOTION SENSOR ADJACENT TO THE EXTERIOR WALLPACK. WIRE IN PARALLEL WITH SWITCH AS SHOWN ON SINGLE LINE TO PROVIDE "ON" OVERRIDE.

ELECTRICAL MATERIALS AND EQUIPMENT:

CONDUCTORS AND CABLES

POWER AND CONTROL WIRE AND CABLE

A. UNDERGROUND OR WET LOCATION POWER AND CONTROL WIRE AND CABLE SHALL BE STRANDED COPPER WIRE TYPE XHHW-2, BELDEN, CAROL, HWC OR EQUAL WITH INSULATION RATED FOR 600V.
B. POWER AND CONTROL WIRE AND CABLE WITHIN THE PUMP STATION ENCLOSURE SHALL BE STRANDED COPPER WIRE TYPE THHN, BELDEN, CAROL, HWC OR EQUAL WITH INSULATION RATED FOR 600V.
C. ANALOG SIGNAL CABLE TO BE 18AWG MINIMUM WITH 300V INSULATION. ANALOG SIGNAL CABLE TO HAVE TWO TWISTED CONDUCTORS WITH OVERALL SHIELD, DRAIN WIRE, AND COLOR CODED INSULATION.
D. MINIMUM POWER WIRE SIZE TO BE #12 AWG.
E. MINIMUM CONTROL WIRE SIZE TO BE #14 AWG.
F. POWER WIRE FOR LIGHTS AND RECEPTACLES SHALL BE MINIMUM #12 AWG SOLID COPPER WIRE TYPE THHN, BELDEN, CAROL, HWC OR EQUAL WITH INSULATION RATED FOR 600V.
G. ALL CONDUCTORS SPLICED WITH EXISTING SHALL BE OF THE SAME WIRE TYPE AND INSULATION AS EXISTING.

RACEWAYS AND BOXES

UNLESS OTHERWISE NOTED, CONDUIT SHALL CONFORM TO THE FOLLOWING:

A. CONDUIT ROUTINGS ARE SHOWN DIAGRAMMATICALLY ON THE DRAWINGS. THE CONTRACTOR SHALL COORDINATE THE FINAL LOCATION OF ALL ROUTINGS TO MEET THE SPECIFIC CONDITIONS OF THE INSTALLATION.
B. ALL OUTDOORS ABOVE GROUND CONDUITS SHALL BE RIGID ALUMINUM, MINIMUM SIZE 3/4".
C. ALL UNDERGROUND CONDUITS SHALL BE 1" MINIMUM.
   - ALL UNDERGROUND CONDUITS TO INCLUDE ELECTRICAL MARKING TAPE (SEE "TYPICAL DUCTBANK SECTION (CONCRETE)" DETAIL).
   - ALL UNDERGROUND CONDUITS NOTED AS "CONCRETE" TO BE SCHEDULE 40 PVC IN CONCRETE (SEE "TYPICAL DUCTBANK SECTION (CONCRETE)" DETAIL).
D. INCLUDE A GROUNDING CONDUCTOR IN ALL CONDUITS.
E. BITUMINOUS COATING IS TO BE PROVIDED FOR ALL METAL PARTS IN CONTACT WITH CONCRETE.
F. RIGID ALUMINUM RACEWAY SHALL BE SUPPORTED IN ACCORDANCE WITH THE NEC. CONDUITS SHALL BE SUPPORTED BY STRUT SUPPORT SYSTEM OF THE SAME MATERIAL AS THE CONDUIT. THE SUPPORT SYSTEM SHALL CONSIST OF THREADED ROD, STRUT, CLAMPS, STRAPS, FASTENERS, ETC., MATCHING THE SUPPORT SYSTEM MATERIAL.

GROUNDING

GROUNDING SHALL BE IN ACCORDANCE WITH THE LATEST VERSION OF N.E.C. AVAILABLE AT THE TIME OF INSTALLATION. GROUNDING SHALL MEET ALL LOCAL CODES IN EFFECT AT THE TIME OF INSTALLATION.

A. GROUNDING SYSTEM
   A GROUNDING SYSTEM SHALL BE INSTALLED TO TIE ALL FENCING, ELECTRICAL EQUIPMENT ENCLOSURES AND DEVICES TO A COMMON REFERENCE. GROUND RODS SHALL BE COPPER CLAD, 3/4"øX 10' LONG. ALL UNDERGROUND CONNECTIONS SHALL BE MADE WITH AN EXOTHERMIC WELD. GROUND RODS SHALL BE BURIED 18" BELOW FINISHED GRADE EXCEPT GROUND ROD IN INSPECTION CELL. GROUND RESISTANCE SHALL NOT EXCEED 5.00 OHMS. ALL ABOVE GROUND CONNECTIONS TO EQUIPMENT AND OTHER ELECTRICAL CONDUCTORS SHALL BE WITH MECHANICAL COMPRESSION CONNECTORS.
B. GROUND ROD INSPECTION WELL
   GROUND ROD INSPECTION WELL SHALL BE HARGER PART NO. 360PP42, NOT RATED FOR ROADWAY USE, OR EQUAL. SEE "TYPICAL GROUND ROD INSPECTION WELL TERMINATION," DETAIL.

UTILITY METER BASE

PROVIDE JCP&L/FIRST ENERGY APPROVED METER BASE. SERVICE SHALL BE 400A, 480/277V, 3PH, 4W.

PANELBOARD DP

PANELBOARD "DP" SHALL BE SQUARE D I-LINE DISTRIBUTION PANELBOARD, 400A BUS, 400A MAIN CIRCUIT BREAKER, WITH MOUNTING SPACE TO PROVIDE FOR CIRCUIT BREAKERS AND SPACES LISTED ON PANELBOARD SCHEDULE. PROVIDE A NEMA 1 ENCLOSURE. PROVIDE MODULAR SPD WITH SURGE CURRENT PER PHASE RATING OF 160kA. MEET THE CIRCUIT BREAKER RATING AND QUANTITY REQUIREMENTS OUTLINED IN THE SCHEDULES. 30kA MINIMUM SC RATING.

EXHAUST FAN STARTER

EXHAUST FAN STARTER SHALL BE NEMA 00, FULL VOLTAGE NON-REVERSING STARTER IN NEMA 1 ENCLOSURE. PROVIDE AUTOMATIC RESET PUSHBUTTON, AND A HAND-OFF-AUTO SWITCH. AUTO CIRCUIT TO BE CONNECTED THROUGH THERMOSTAT CONTACTS. PROVIDE 120V CONTROL TRANSFORMER TO POWER ALL RELAYS AND THE MOTORIZED DAMPER FOR INTAKE LOUVER.

PANELBOARD DP SCHEDULE

SERVICE VOLTAGE 480Y/277V, 3PH, 4W — MAIN DEVICE TYPE 400A MCB — MANUF. SQUARE D NF
BUS RATING & TYPE 400A COPPER — ENCLOSURE NEMA 12 — MOUNTING SURFACE

DESCRIPTION	kVA LOAD L1	L2	L3	CKT	C/B	L1 L2 L3	C/B	CKT	kVA LOAD L1	L2	L3	DESCRIPTION
SPD	0			1	30		20	2	--			FUTURE MOV
		0		3	30		20	4		--		
			0	5	30		20	6			--	
NEW SINGLE PUMP CONTROL PANEL	--			7	100		15	8	--			EXHAUST FAN
		--		9	100		15	10		--		
			--	11	100		15	12			--	
SPARE	--			13	20		15	14	--			NEW PUMP CONTROL PANEL
		--		15	20		15	16		--		
			--	17	20		15	18			--	
SPACE	--			19	--		--	20	--			SPACE
SPACE		--		21	--		--	22		--		SPACE
SPACE			--	23	--		--	24			--	SPACE
SPACE	--			25	--		--	26	--			SPACE
SPACE		--		27	--		--	28		--		SPACE
LIGHTING			--	29	20		--	30			--	SPACE
LOAD kVA TOTAL	--	--	--	kVA TOTAL:		-- -- --			--	--	--	LOAD kVA TOTAL

EXHAUST FAN

TAG	MFGR.	MODEL	CAPACITY	POWER VOLTS, PHASE, CYCLES, AMPS	NOTES
EF-1	GREENHECK	GB-099	215 CFM @ 0.25"	480, 3, 60, 1.1	1,2,3,4,5,6

1. WITH ROOF CURB.
2. EPOXY COATED WITH HI-PRO POLYESTER TOP COAT.
3. WEIGHT 56 LBS.
4. WITH VCD-23 DAMPER AND 120VAC ACTUATOR.
5. OR APPROVED EQUAL.
6. PROVIDE HONEYWELL T6051A1016 THERMOSTAT, OR EQUAL.

LOUVER AND DAMPER

MARK	MFGR.	MFGR./MODEL	TYPE	DIMENSIONS	NOTES
LV-1	GREENHECK	GREENHECK ESD-403-14X14	ALUMINUM LOUVER	14" X 14" X 4"	1,2,3
DMP-1	GREENHECK	GREENHECK VCD-23	LOW LEAK CONTROL DAMPER	14" X 14"	1,2,3,4

1. BIRD SCREEN.
2. OR APPROVED EQUAL.
3. 2-COAT 70% KYNAR COATING.
4. 120VAC ACTUATOR, INTERNAL MOUNT.

Number	Description	Date

JOSEPH A. GUAGNO
NEW JERSEY PROFESSIONAL ENGINEER
LICENSE NUMBER 38814
CERTIFICATE OF AUTHORIZATION NUMBER 24GA28207800

Scale: AS NOTED | Job No.: 163-052

ELECTRICAL SINGLE LINE DIAGRAMS

FOR THE

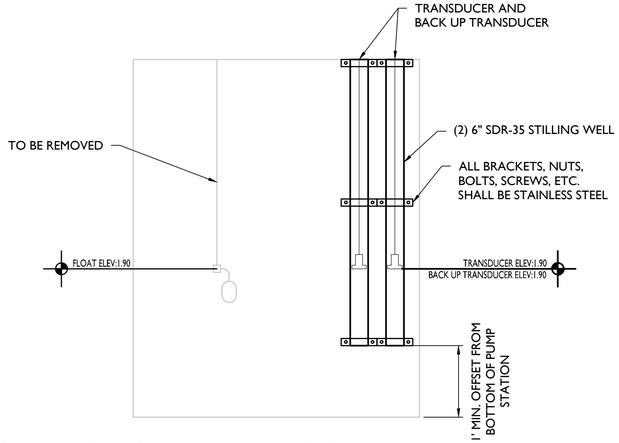
NORTH STREET STORM WATER PUMP STATION ELECTRICAL UPGRADES

PREPARED FOR

BOROUGH OF HIGHLANDS, MONMOUTH COUNTY, NJ

IC&EE
Instrumentation, Control & Energy Engineering, LLC
P.O. BOX 591, SKIPPACK, PA 19474
(610) 584-6574, WWW.ICEE-LLC.COM
FIVE GREENTREE CENTRE, 525 ROUTE 73 NORTH STE 104, MARLTON, NJ 08053

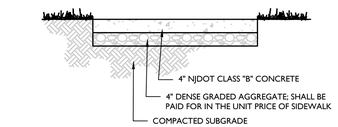
Drawn By	Project Engr.	Checked By	Dwg. No.	Date
SSS	GDD	JAG	7 OF 8	08/17/21



NOTES:
THE CONTRACTOR SHALL RETROFIT TWO (2) NEW STILLING WELLS TO HOUSE THE NEW WATER LEVEL TRANSDUCER AND THE BACK UP.

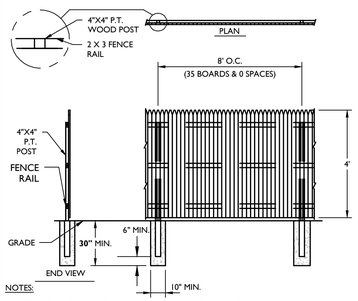
6" STILLING WELL DETAIL

NOT TO SCALE — MOD: 06/18/21 07/01/19



CONCRETE PAD DETAIL

NOT TO SCALE — MCNJ-SITE-PVMT-2001 — MOD: 06/16/21 08/01/20

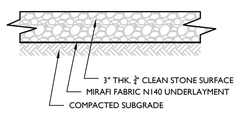


NOTES:

1. FOOTING WIDTH TO BE 2 X POST WIDTH, MINIMUM **30"** DEPTH, **4,500 PSI** CONCRETE.
2. SHOP DRAWINGS SIGNED BY A LICENSED ENGINEER TO BE REVIEWED AND APPROVED.

STOCKADE PICKET WOOD FENCE DETAIL

NOT TO SCALE — MCCM-SITE-FNCE-1700 — MOD: 09/15/21 07/01/19



NOTES:

1. MIRAFI FABRIC N140 UNDERLAYMENT SHALL BE PAID FOR IN THE UNIT PRICE OF STONE SURFACE.

CLEAN STONE SURFACE DETAIL

NOT TO SCALE — MCNJ-SITE-PVMT-2200 — MOD: 06/16/21 08/01/20

Colliers Engineering & Design

www.colliersengineering.com

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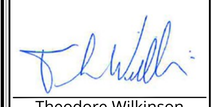
REV	DATE	DRAWN BY	DESCRIPTION



Theodore Wilkinson
NEW JERSEY LICENSED PROFESSIONAL ENGINEER
LICENSE NUMBER: GE39607
COLLIERS ENGINEERING & DESIGN, INC.
N.J. C.O.A. #: 24GA27986500

NORTH STREET STORM WATER PUMP STATION ELECTRICAL UPGRADES

FOR

BOROUGH OF HIGHLANDS

BOROUGH OF HIGHLANDS
MONMOUTH COUNTY
NEW JERSEY

Colliers Engineering & Design

MT. LAUREL
2000 Midlantic Drive, Suite 100
Mt. Laurel, NJ 08054
Phone: 856.797.0412
COLLIERS ENGINEERING & DESIGN, INC. DOING BUSINESS AS MASER CONSULTING

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	9/24/21	NM	TW

PROJECT NUMBER:	DRAWING NAME:
21001682G	C-DTLS

SHEET TITLE:

CONSTRUCTION DETAILS

SHEET NUMBER:

8 of 8

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

2021\21001682G\Engineering\Site Plans\C-DTLS.dwg|C-8 DETAILS By: NMINNER