NEW HANOVER COUNTY
Environmental Management Dept.
3002 U.S. Highway 421 North
Wilmington, NC 28401
Kim Roane, Business Officer
ph: 910-798-4402
fax: 910-798-4408
Email: kroane@nhcgov.com

BID SPECIFICATIONS

RFB #17-0382
REPLACEMENT OF PUMP CONTROL PANELS

NEW HANOVER COUNTY LANDFILL
5210 U.S. Highway 421 North
Wilmington, NC 28401

Request for Bids

Section 1: Advertisement
New Hanover County (NHC) is accepting bids for the replacement of pump control panels at the NHC Landfill facility located at 5210 U.S. Highway 421 North, Wilmington, NC 28401.

Sealed proposals addressed to Kim Roane, Business Officer, 3002 U.S. Highway 421 North, Wilmington, North Carolina, 28401 and marked “RFB # 17-0382 REPLACEMENT OF PUMP CONTROL PANELS” will be accepted until 2:00 p.m. Thursday, September 14th, 2017.

Existing pump control panels have been negatively impacted, requiring replacement due to landfill gas intrusion. Work includes the materials and labor to provide for the replacement/relocation of three (3) electrical control panels, two (2) Duke Energy meter bases, three (3) disconnect boxes, the control panel backboard and the demolition of the old panels.

Bidders must be appropriately licensed contractors in the State of North Carolina at the time proposals are submitted. Pursuant to N.C.G.S. S87-15, it will be necessary for contractors to show evidence of such license in the bid document.

Instructions for submitting bids and complete requirements and information may be obtained by contacting Kim Roane, Business Officer: kroane@nhcgov.com. Instructions may also be obtained by visiting our website at http://www.nhcgov.com/Finance/Pages/CurrentBids.aspx. New Hanover County reserves the right to accept or reject any or all bids and to make the award which will be in the best interest of the County.

Section 2: Bidder Instructions and General Conditions

2.1 Schedule

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
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<tbody>
<tr>
<td>Thursday, August 10, 2017</td>
<td>RFB issued and advertised.</td>
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<tr>
<td>Tuesday, August 29, 2017</td>
<td>Mandatory On-site pre-bid meeting – 5210 U.S. Hwy 421 North, Wilmington NC.</td>
</tr>
<tr>
<td>Tuesday, September 5, 2017</td>
<td>Deadline for questions. All questions must be submitted in writing to Kim Roane, Business Officer (<a href="mailto:kroane@nhcgov.com">kroane@nhcgov.com</a>).</td>
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<tr>
<td>Thursday, September 7, 2017</td>
<td>Questions will be answered via written addendum.</td>
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<tr>
<td>Thursday, September 14, 2017</td>
<td>Deadline for receipt of bids and bid opening. Bids must be delivered to 3002 U.S. Highway 421 North, Wilmington NC 28401.</td>
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2.2 Bidder Instructions

2.2.1 Proposals shall be submitted as a document set, containing one (1) original, two (2) hard copies and one (1) electronic copy on either a CD or a flash drive.

Proposals must be submitted in a sealed envelope properly marked “RFB # 17-0382 REPLACEMENT OF PUMP CONTROL PANELS” and addressed to the County at the following address:

New Hanover County
Environmental Management
Attn: Kim Roane, Business Officer
3002 U.S. Highway 421 North
Wilmington, NC 28401

2.2.1(a) Completion of Bid Form (Section 00300): Bidders are expected to examine the specifications herein, the schedule and all instructions. Failure to do so will be at the bidder’s risk. Each bidder shall furnish the information required on the price sheet. Bids must be submitted on the price sheet contained in this bid package. Bids submitted that are not on the attached price sheet will be rejected. Bidders must also sign the Noncollusion Affidavit (Section 00480) and attach to the bid response. Additionally, the attached STATEMENT OF ASSURANCES AND COMPLIANCE must be signed and attached to the Bid Form, along with the list of three (3) references as described in 2.3 below. Bids not signed will be rejected.

All prices and notations shall be written in ink or typed. Discrepancies between words and numerals will be resolved in favor of words.

Changes or corrections made on the bid must be initialed by the individual signing the bid. No corrections will be permitted once bids have been opened.

2.2.2 A mandatory on-site pre-bid meeting will be held Tuesday, August 29th, 2017, at 2:00 p.m. The site address is 5210 U.S. Highway 421 North, Wilmington, NC.

2.2.3 No telephone, electronic or facsimile proposals will be considered. Proposals received after the time and date for closing will not be considered.

2.2.3 The public bid opening will be Thursday, September 14 at 2:00 p.m. in the conference room of the New Hanover County Department of Environmental Management, 3002 U.S. Hwy 421 N., Wilmington, NC 28401.

2.2.4 After the bid issue date, all communications between the County and prospective bidders regarding this bid request shall be in writing. Any inquiries, requests for
interpretation, technical questions, clarification, or additional information shall be directed to Kim Roane, Business Officer, via email: kroane@nhcgov.com. Questions and responses affecting the specifications of the bid will be provided by issuance of an Addendum. **All questions shall be received no later than 2:00 P.M., EST, Tuesday, September 5th, 2017.**

2.2.5 The deadline for receipt of all bids is **Thursday, September 14th, 2017, at 2:00 PM, EST.** Any proposals received after the scheduled closing time will not be accepted.

2.2.6 New Hanover County reserves the right to allow or disallow minor deviations or technicalities should the County deem it to be in the best interest of the County. New Hanover County shall be the sole judge of what is to be considered a minor deviation or technicality.

2.2.7 Once an award is made, all proposals become public record and will be disclosed upon request. According to General Statutes 132 - 1.2, trade secrets contained in a bid may be kept confidential if the bidder, at the time the bid is submitted, designates the secret and requests that it be kept confidential. This right of privacy will be construed as narrowly as possible to protect the interests of the vendor while attempting to maximize the availability of information to the public.

2.2.8 Bidders may withdraw or withdraw and resubmit their bid at any time prior to the closing time for receipt of bids. No bid may be withdrawn after the scheduled closing time for receipt of bids and as such shall constitute a firm offer that is binding for a period of ninety (90) days.

2.2.9 The award will be made to the responsible bidder whose proposal is determined to be the most advantageous to the County. Although price will be considered, it will not be the sole determining factor.

2.2.10 Bid forms must be signed by an authorized individual of the firm(s). Bids that are not signed will be rejected.

2.2.11 The County reserves the following rights, which may be exercised at its sole discretion:
- to reject any or all bids or any part thereof, or to accept any bid, or any part thereof;
- to supplement, amend, substitute or otherwise modify this bid at any time;
- to cancel this bid with or without the substitution of another bid;
- to take any action affecting this bid, this bid process, or the services or facilities subject to this bid that would be in the best interests of the County;
- to issue additional requests for information;
- to require one or more bidders to supplement, clarify or provide additional information in order for the County to evaluate the bids submitted;
• to conduct investigations with respect to the qualifications and experience of each bidder;
• to waive any defect or irregularity in any bid received;
• to reject any or all bids;
• to award all, none, or any part of the items that is in the best interest of the County, with one or more of the bidders responding, which may be done with or without re-solicitation;
• to enter into any agreement deemed by the County to be in the best interest of the County, with one or more of the bidders responding.

2.2.12 The successful vendor is expected to enter into a contract with the County.

2.2.13 Unless specifically stated to the contrary, any manufacturer’s names, trade names, brand names or catalog numbers used in the specifications of the Request for Bid are for the purpose of describing and/or establishing the quality, design and performance required. Any such reference is not intended to limit or restrict an offer by any bidder and is included in order to advise the potential bidder of the requirements for the County. Any offer which proposes quality, design, or performance, will be considered.

2.2.14 Any person, firm(s), corporation or association submitting a proposal shall be deemed to have read and understood all the terms, conditions and requirements in the specifications and/or scope of work.

2.2.15 All proposals and accompanying documentation will become the property of New Hanover County at the time the proposals are opened and as such will not be returned to the bidder.

2.2.16 The County is exempt from and will not pay Federal Excise Taxes or Transportation Taxes.

2.2.17 If the Vendor is required to charge North Carolina sales tax on bidder's sales, bidder shall not include it as part of the bid price. The County will pay North Carolina sales tax over and above bid prices when invoiced. A sales tax report is required to be submitted with each pay application.

2.2.18 The bidder's products, service and facilities shall be in full compliance with any and all applicable state, federal, local, environmental and safety laws, regulations, ordinances and standards or any standards adopted by nationally recognized testing facilities regardless of whether or not they are referred to in the bid documents.

2.2.19 Contractor shall sign and return NHC Environmental Management Contractor Compliance Requirements document (attached).
2.2.20 Failure to comply with these provisions or any other provisions of the General Statutes of North Carolina will result in rejection of bid.

2.2.21 Insurance

Before commencing any work and prior to contract execution, the Contractor shall procure insurance in the contractor’s name and maintain all insurance policies for the duration of the contract of the types and in the amounts listed in Section 0500, subsection 9, Agreement draft. The insurance shall provide coverage against claims for injuries to persons or damages to property which may arise from operations or in connection with the performance of the work hereunder by the contractor, his agents, representatives, employees, or subcontractors, whether such operations by himself/herself or anyone directly or indirectly employed by him/her. A certificate of insurance is required to be provided to the County by the Contractor within 3 (three) business days after notice of award.

2.2.22 The successful bidder will be a contractor familiar with this type of work with the necessary equipment and personnel to perform the work within the required time.

2.2.23 Costs incurred by prospective bidders in the preparation of the response to this Request for Bid are the responsibility of the responding bidder and will not be reimbursed by the County.

2.2.24 Federal Taxes: New Hanover County is exempt from and will not pay Federal Excise Taxes or Transportation taxes.

2.2.25 North Carolina Sales Tax: If bidder is required to charge North Carolina sales tax on bidder’s sales, bidder shall not include it as part of the bid price. County will pay North Carolina sales tax over and above bid prices when invoiced.

2.2.26 Responsibility of Compliance with Legal Requirements

The bidder’s products, service and facilities shall be in full compliance with any and all applicable state, federal, local, environmental and safety laws, regulations, ordinances and standards or any standards adopted by nationally recognized testing facilities regardless of whether or not they are referred to in the bid documents.

2.3 References

The Contractor shall provide at least three (3) references of work completed of a similar nature. Contact information shall include company name, company address, contact name, contact phone number and contact email address.

2.4 TERM and TIME/COMPLETION SCHEDULE

Bid Specifications RFB# 17-0382 Replacement of Pump Control Panels
The CONTRACTOR will commence services upon receipt of notice to proceed/purchase order (PO), with all work being completed within ninety (90) days of the date of the PO.

2.5 Equal Opportunity
The non-discrimination clause contained in Section 202 (Federal) Executive Order 11246, as amended by Executive Order 11375, relative to Equal Employment Opportunity for all persons without regard to race, color, religion, sex or national origin, and the implementing rules and regulations prescribed by the Secretary of Labor, are incorporated herein. The contractors agree not to discriminate against any employees or applicant for employment because of physical or mental handicap in regard to any position for which the employees or applicant is qualified. The contractor agrees to take affirmative action to employ, advance in employment and otherwise treat qualified handicapped individuals without discrimination based upon their physical or mental handicap in all employment practices.

2.6 Minority Participation
Bidders shall submit M/WBE information with their bids on the forms provided. This information will be subject to verification by the County prior to contract award. Firms qualifying as “M/WBE” for the County’s goals must be certified by the NC Department of Historically Underutilized Businesses (NCHUB) or by the NC Department of Transportation (NCDOT). Firms qualifying as “WBE” must be designated as “women-owned business and firms qualifying as “MBE” must be certified in one of the other categories (i.e.: Black, Hispanic, Asian American, American Indian, Disabled, or Socially and Economically Disadvantaged).

Section 3: Contract (Agreement) draft – Section 00500

3.1 Draft Agreement attached to this RFB. Contract Forms included in Section 00830.

Section 4: Scope of Work (also referred to as Contract “Exhibit A”)

SCOPE OF WORK

4.0 GENERAL

4.01 The CONTRACTOR shall comply with all applicable Federal, State and Local codes, ordinances and requirements of all agencies having jurisdiction. The CONTRACTOR will be responsible for obtaining all necessary permits and licenses to complete the scope of work.
4.02 **Performance:** The quality of workmanship concerning the Replacement of Pump Control panels must reflect professional work and conduct.

4.03 **Site Preparation:**
- Contractor shall be responsible for locating all utilities prior to beginning the work.
- Contractor shall be responsible for any needed site preparation work required to replace the control panels.
- Contractor shall be responsible for any costs arising as the result of hitting underground utilities.

4.04 **Substitution of Equipment:**
For all major equipment supplied, an affidavit signed by a corporate official must be submitted with the shop drawings stating that their equipment is equal to or exceeds the requirements of the specifications prepared by the Engineer and that its lifetime performance will be no less than equal to that obtainable from competitive equipment functioning in the same type of application and as manufactured by those companies identified in the specifications by the ENGINEER.

4.05 **Notices:**
All notices or other documents required to be delivered by the Contractor to the Engineer shall be delivered to the office of SCS Engineers, PC, 5850 South Semoran Blvd., Orlando, FL 32822.

4.06 **Control of Waste Materials:**
During the progress of the Work, CONTRACTOR shall keep the premises free from accumulations of waste materials, rubbish and other debris resulting from the WORK. At the completion of the Work, CONTRACTOR shall remove all remaining waste materials, rubbish and debris from and about the premises as well as all tools, appliances, construction equipment and machinery, and surplus materials, and shall leave the site clean and ready for use by COUNTY. CONTRACTOR shall restore to original condition all property not designated for alteration by the Contract documents.

4.1 **CONTRACTOR SAFETY REQUIREMENTS**

4.11 Contractor shall comply with all local, state and federal safety rules and regulations and shall sign and return NHC Environmental Management Contractor Compliance Requirements document (attached).

4.12 The Contractor shall be solely responsible for maintaining safety at all work sites. The Contractor shall take all reasonable steps to ensure safety for both workers and visitors to include traffic control.
4.13 The Contractor shall comply with all OSHA requirements including, but not limited to, notices and training.

4.2 Specifications Included in Scope Of Service

The following sections are attached and are included in the Scope of Service:

4.2.1 General Requirements/Scope (Section 01000)
4.2.2 Special Provisions (Section 01030)
4.2.3 Project Coordination (Section 01041)
4.2.4 Shop Drawings, Working Drawings, and Samples (Section 01340)
4.2.5 Contract Closeout (Section 01700)
4.2.6 Construction Sequencing (Section 01900)
4.2.7 Contractor Compliance Requirements (Section 01910)
4.2.8 Safety Procedure (Section 02215)
4.2.9 Excavating, Backfilling, and Compaction (Section 02220)
4.2.10 Temporary Erosion and Sedimentation Control (Section 02276)
4.2.11 Geotextile (Section 02550)
4.2.12 Sodding (Section 02930)
4.2.13 Leachate Collection and Detection Pup Systems (Section 11300)
4.2.14 Division 16 Specifications that Apply to this Project:

<table>
<thead>
<tr>
<th>Number</th>
<th>Title</th>
<th>Type</th>
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<tbody>
<tr>
<td>16000</td>
<td>General Conditions</td>
<td>Installation</td>
</tr>
<tr>
<td>16050</td>
<td>General Electrical Installation</td>
<td>Installation</td>
</tr>
<tr>
<td>16111</td>
<td>Electrical Raceways</td>
<td>Installation</td>
</tr>
<tr>
<td>16120</td>
<td>Low Votage Wire and Cable</td>
<td>Materials</td>
</tr>
<tr>
<td>16140</td>
<td>Electrical Apparatus and Equipment</td>
<td>Materials &amp; Equipment</td>
</tr>
<tr>
<td>16411</td>
<td>Underground Electrical Services</td>
<td>Installation</td>
</tr>
<tr>
<td>16450</td>
<td>Grounding</td>
<td>Installation</td>
</tr>
</tbody>
</table>
NEW HANOVER COUNTY
RFB 17-0382 Replacement of Control Panels

STATEMENT OF ASSURANCES AND COMPLIANCE

The undersigned, as bidder certifies that the General Conditions and Instructions to Bidders, the Draft Contract, the Scope of Work and the Price Sheet/Bid Form found in the bidding documents dated August 9, 2017, have been read and understood.

The bidder hereby provides assurance that the firm represented in this bid, as indicated below:

1) Will comply with all requirements, stipulations, terms, and conditions as stated in the bid document:
2) Currently complies with all applicable State and Federal Laws:
3) Is not guilty of collusion with the vendors possibly interested in this bid or in determining prices to be submitted: and
4) Such agent as indicated below is officially authorized to represent the firm in whose name this bid is submitted.

________________________________  ______________________________
Name of Firm                                     Name of Firm Representative

________________________________  ______________________________
Name of Firm Representative                                     Title

________________________________
Address of Firm

________________________________
Telephone Number                                     Email Address

________________________________
Date

________________________________
State of Incorporation

Bid Specifications RFB# 17-0382 Replacement of Pump Control Panels
New Hanover County
Minority and/or Women Business Enterprise
(M/WBE) Program

Construction Guidelines and Affidavits

These instructions shall be included with each bid solicitation.
New Hanover County
Minority and/or Women Business Enterprise Program

Construction Guidelines for M/WBE Participants

Policy Statement
It is the policy of New Hanover County that minority businesses, as defined by North Carolina General Statute 143-128 have maximum opportunity to participate in the performance of contracts and subcontracts funded in whole or in part with public funds. This includes all aspects of the County’s contracting and procurement programs, including but not limited to construction projects, supplies and materials, as well as professional and personal service contracts.

Goals and Good Faith Efforts
Bidders responding to this solicitation shall comply with the M/WBE program by making Good Faith Efforts to achieve the following aspiration goals for participation.

<table>
<thead>
<tr>
<th>M/WBE</th>
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<td>10%</td>
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Bidders shall submit M/WBE information with their bids on the forms provided. This information will be subject to verification by the County prior to contract award. Firms qualifying as “M/WBE” for the County’s goals must be certified by the NC Department of Historically Underutilized Businesses (NCHUB) or by the NC Department of Transportation (NCDOT). Firms qualifying as “WBE” must be designated as “women-owned business” and firms qualifying as “MBE” must be certified in one of the other categories (i.e.: Black, Hispanic, Asian American, American Indian, Disabled, or Socially and Economically Disadvantaged). Those firms who are certified as both a “WBE” and “MBE” may only satisfy the “MBE” requirement. A complete database of NC HUB certified firms may be found at [http://www.doa.nc.gov/hub/default.aspx](http://www.doa.nc.gov/hub/default.aspx) and NCDOT firms may be found at [https://partner.ncdot.gov/VendorDirectory/default.html](https://partner.ncdot.gov/VendorDirectory/default.html).

Please note: A contractor may utilize any firm desired; however, in order for the County to count the participation towards the goal, all M/WBE vendors who wish to do business as a minority or female must be certified by NC HUB or NCDOT.

The Bidder shall make good faith efforts to encourage participation of M/WBEs prior to submission of bids in order to be considered as a responsive bidder. Bidders are cautioned that even though their submittal indicates they will meet the M/WBE goal, they should document their good faith efforts and be prepared to submit this information, if requested.

The M/WBE’s listed by the Contractor on the Identification of Minority/Women Business Participation which are determined by the County to be certified shall perform the work and supply the materials for which they are listed unless the Contractors receive prior authorization from the County to perform the work with other forces or to obtain materials from other sources. If a contractor is proposing to perform all elements of the work with his own forces, he must be prepared to document evidence satisfactory to the owner of similar government contracts where he has self-performed.
The Contractor shall enter into and supply copies of fully executed subcontracts with each M/WBE or supply signed Letter(s) of Intent to the Project Manager after award of contract and prior to Notice to Proceed. Any amendments to subcontracts shall be submitted to the Project Manager prior to execution.
Instructions

The Bidder shall provide with the bid the following documentation:

☐ Identification of Minority/Women Business Participation
   (if participation is zero, please mark zero—Blank forms will be considered nonresponsive)

☐ Affidavit A (if subcontracting)

OR

☐ Identification of Minority/Women Business Participation
   (if participation is zero, please mark zero—Blank forms will be considered nonresponsive)

☐ Affidavit B (if self-performing; must attest that bidder does not customarily subcontract
   work on this type of project—includes supplies and materials)

Within 72 hours or 3 business days after notification of being the apparent low bidder who is
subcontracting anything must provide the following information:

☐ Affidavit C (if aspirational goals are met or are exceeded)

OR

☐ Affidavit D (if aspirational goals are not met)

After award of contract and prior to issuance of notice to proceed:

☐ Letter(s) of Intent or Executed Contracts

**With each pay request, the prime contractors will submit the Proof of Payment Certification, listing
payments made to M/WBE subcontractors.

***If a change is needed in M/WBE Participation, submit a Request to Change M/WBE Participation
Form. Good Faith Efforts to substitute with another M/WBE contractor must be demonstrated.

Minimum Compliance Requirements:

All written statements, affidavits, or intentions made by the Bidder shall become a part of the agreement
between the Contractor and the County for performance of contracts. Failure to comply with any of
these statements, affidavits or intentions or with the minority business guidelines shall constitute a
breach of the contract. A finding by the County that any information submitted (either prior to award of
the contract or during the performance of the contract) is inaccurate, false, or incomplete, shall also
constitute a breach of the contract. Any such breach may result in termination of the contract in
accordance with the termination provisions contained in the contract. It shall be solely at the option of
the County whether to terminate the contract for breach or not. In determining whether a contractor has
made Good Faith Efforts, the COUNTY will evaluate all efforts made by the Contractor and will
determine compliance in regard to quantity, intensity, and results of these efforts.
NEW HANOVER COUNTY
Identification of Minority/Women Business Participation

I, ____________________________ (Name of Bidder), hereby certify that on this project, we will use the following minority/women business enterprises as construction subcontractors, vendors, suppliers or providers of professional services.

<table>
<thead>
<tr>
<th>Firm Name, Address and Phone #</th>
<th>Work type</th>
<th>*M/WBE Category</th>
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*M/WBE categories: Black, African American (B), Hispanic (H), Asian American (A) American Indian (I), Female (F) Socially and Economically Disadvantaged (S) Disabled (D)

If you will not be utilizing M/WBE contractors, please certify by entering zero “0”

The total value of MBE business contracting will be ($) ________________.
The total value of WBE business contracting will be ($) ________________.
NEW HANOVER COUNTY AFFIDAVIT A – Listing of Good Faith Efforts

County of ___________________________ (Name of Bidder)

Affidavit of ___________________________

I have made a good faith effort to comply under the following areas checked:

Bidders must earn at least 50 points from the good faith efforts listed for their bid to be considered responsive. (1 NC Administrative Code 30 I.0101)

- 1 – (10 pts) Contacted minority businesses that reasonably could have been expected to submit a quote and that were known to the contractor, or available on State or local government maintained lists, at least 10 days before the bid date and notified them of the nature and scope of the work to be performed.

- 2 – (10 pts) Made the construction plans, specifications and requirements available for review by prospective minority businesses, or providing these documents to them at least 10 days before the bids are due.

- 3 – (15 pts) Broken down or combined elements of work into economically feasible units to facilitate minority participation.

- 4 – (10 pts) Worked with minority trade, community, or contractor organizations identified by the Office of Historically Underutilized Businesses and included in the bid documents that provide assistance in recruitment of minority businesses.

- 5 – (10 pts) Attended prebid meetings scheduled by the public owner.

- 6 – (20 pts) Provided assistance in getting required bonding or insurance or provided alternatives to bonding or insurance for subcontractors.

- 7 – (15 pts) Negotiated in good faith with interested minority businesses and did not reject them as unqualified without sound reasons based on their capabilities. Any rejection of a minority business based on lack of qualification should have the reasons documented in writing.

- 8 – (25 pts) Provided assistance to an otherwise qualified minority business in need of equipment, loan capital, lines of credit, or joint pay agreements to secure loans, supplies, or letters of credit, including waiving credit that is ordinarily required. Assisted minority businesses in obtaining the same unit pricing with the bidder's suppliers in order to help minority businesses in establishing credit.

- 9 – (20 pts) Negotiated joint venture and partnership arrangements with minority businesses in order to increase opportunities for minority business participation on a public construction or repair project when possible.

- 10 - (20 pts) Provided quick pay agreements and policies to enable minority contractors and suppliers to meet cash-flow demands.

The undersigned, if apparent low bidder, will enter into a formal agreement with the firms listed in the Identification of Minority/Women Business Participation schedule conditional upon scope of contract to be executed with the Owner. Substitution of contractors must be in accordance with GS143-128.2(d). Failure to abide by this statutory provision will constitute a breach of the contract.

The undersigned hereby certifies that he or she has read the terms of the minority/women business commitment and is authorized to bind the bidder to the commitment herein set forth.

Date: ______________ Name of Authorized Officer: __________________________

Signature: __________________________ Title: __________________________

State of ______________, County of __________________________

Subscribed and sworn to before me this _____ day of _____________ 20 __________

Notary Public __________________________

My commission expires __________________________
NEW HANOVER COUNTY --AFFIDAVIT B-- Intent to Perform
Contract with Own Workforce.

County of ______________________

Affidavit of ______________________ (Name of Bidder)

I hereby certify that it is our intent to perform 100% of the work required for the ______________________ contract.

(Name of Project)

In making this certification, the Bidder states that the Bidder does not customarily subcontract elements of this type project, and normally performs and has the capability to perform and will perform all elements of the work on this project with his/her own current work forces; and

The Bidder agrees to provide any additional information or documentation requested by the owner in support of the above statement.

The undersigned hereby certifies that he or she has read this certification and is authorized to bind the Bidder to the commitments herein contained.

Date: __________ Name of Authorized Officer: __________________________________________

Signature: ________________________________

Title: ________________________________

State of ____________________, County of ______________________

Subscribed and sworn to before me this __________ day of ______ 20__

Notary Public ______________________

My commission expires ______________________
NEW HANOVER COUNTY - AFFIDAVIT C - Portion of the Work to be Performed by M/WBE Firms

County of ____________________________
(Note this form is to be submitted only by the apparent lowest responsible, responsive bidder.)

If the portion of the work to be executed by M/WBE businesses as defined in GS143-128.2(g) and 128.4(a),(b),(c) is equal to or greater than 10% of the bidders total contract price, then the bidder must complete this affidavit. This affidavit shall be provided by the apparent lowest responsible, responsive bidder within 72 hours after notification of being low bidder.

Affidavit of ____________________________ I do hereby certify that on the ____________________________ (Name of Bidder)

______________________________ (Project Name) Amount of Bid: $______________________________

I will expend a minimum of _________ % of the total dollar amount of the contract with M/WBE firms. Minority/women businesses will be employed as construction subcontractors, vendors, suppliers or providers of professional services. Such work will be subcontracted to the following firms listed below.

<table>
<thead>
<tr>
<th>Name and Phone Number</th>
<th>*M/WBE Category</th>
<th>Work description</th>
<th>Dollar Value</th>
</tr>
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<tbody>
<tr>
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*Minority categories: Black, African American (B), Hispanic (H), Asian American (A) American Indian (I), Female (F) Socially and Economically Disadvantaged (S) Disabled (D)

Pursuant to GS143-128.2(d), the undersigned will enter into a formal agreement with M/WBE Firms for work listed in this schedule conditional upon execution of a contract with the Owner. Failure to fulfill this commitment may constitute a breach of the contract.

The undersigned hereby certifies that he or she has read the terms of this commitment and is authorized to bind the bidder to the commitment herein set forth.

Date:________________ Name of Authorized Officer: ________________________________

Signature: ________________________________

Title: ________________________________

State of ________________, County of ________________

Subscribed and sworn to before me this __________day of ___________20____

Notary Public ________________________________

My commission expires ________________________________
NEW HANOVER COUNTY AFFIDAVIT D – Good Faith Efforts

County of ________________________
(Note this form is to be submitted only by the apparent lowest responsible, responsive bidder.)

If the goal of 10% participation by minority/women business is not achieved, the Bidder shall provide the following documentation to the Owner of his good faith efforts:

Affidavit of ____________________________________________ I do hereby certify
that on the

(Name of Bidder)

__________________________________________

(Project Name)

Project ID# ___________________________ Amount of Bid $ ________________

I will expend a minimum of ______% of the total dollar amount of the contract with M/WBE firms. Minority/women businesses will be employed as construction subcontractors, vendors, suppliers or providers of professional services. Such work will be subcontracted to the following firms listed below.

(Attach additional sheets if needed)

<table>
<thead>
<tr>
<th>Name and Phone Number</th>
<th>*M/WBE Category</th>
<th>Work description</th>
<th>Dollar Value</th>
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*Minority categories: Black, African American (B), Hispanic (H), Asian American (A) American Indian (I), Female (F) Socially and Economically Disadvantaged (S) Disabled (D)

Examples of documentation required to demonstrate the Bidder's good faith efforts to meet the goals set forth in these provisions include, but are not necessarily limited to, the following:

A. Copies of solicitations for quotes to at least three (3) minority business firms from the source list provided by the State for each subcontract to be let under this contract (if 3 or more firms are shown on the source list). Each solicitation shall contain a specific description of the work to be subcontracted, location where bid documents can be reviewed, representative of the Prime Bidder to contact, and location, date and time when quotes must be received.

B. Copies of quotes or responses received from each firm responding to the solicitation.

C. A telephone log of follow-up calls to each firm sent a solicitation.

D. For subcontracts where a minority business firm is not considered the lowest responsible sub-bidder, copies of quotes received from all firms submitting quotes for that particular subcontract.

E. Documentation of any contacts or correspondence to minority business, community, or contractor organizations in an attempt to meet the goal.

F. Copy of pre-bid roster.
G. Letter documenting efforts to provide assistance in obtaining required bonding or insurance for minority business.

H. Letter detailing reasons for rejection of minority business due to lack of qualification.

I. Letter documenting proposed assistance offered to minority business in need of equipment, loan capital, lines of credit, or joint pay agreements to secure loans, supplies, or letter of credit, including waiving credit that is ordinarily required.

Failure to provide the documentation as listed in these provisions may result in rejection of the bid and award to the next lowest responsible and responsive bidder.

Pursuant to GS143-128.2(d), the undersigned will enter into a formal agreement with M/WBE Firms for work listed in this schedule conditional upon execution of a contract with the Owner. Failure to fulfill this commitment may constitute a breach of the contract.

The undersigned hereby certifies that he or she has read the terms of this commitment and is authorized to bind the bidder to the commitment herein set forth.

Date: ____________ Name of Authorized Officer: ______________________________________

                                           Signature: ______________________________________

                                           Title: ______________________________________

                                           __________________________
                                           State of _______________ , County of _______________
                                           __________
                                           Subscribed and sworn to before me this ________ day of ____
                                           _______20____
                                           Notary Public _______________________
                                           My commission expires ______________
LETTER OF INTENT
M/WBE Subcontractor Performance

Please submit this form or executed subcontracts with M/WBE firms after award of contract and prior to issuance of notice to proceed.

PROJECT: ____________________________________________
(Project Name)

TO: _________________________________________________
(Name of Prime Bidder/Architect)

The undersigned intends to perform work in connection with the above project as a:

____Minority Business Enterprise  ______Women Business Enterprise

The M/WBE status of the undersigned is certified the NC Office of Historically Underutilized Businesses (required). ___ Yes ___ No

The undersigned is prepared to perform the following described work or provide materials or services in connection with the above project at the following dollar amount:

<table>
<thead>
<tr>
<th>Work/Materials/Service Provided</th>
<th>Dollar Amount of Contract</th>
<th>Projected Start Date</th>
<th>Projected End Date</th>
</tr>
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<tbody>
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</table>

___________________________________
(Date)

___________________________________
(Address)

___________________________________
(Name & Phone No. of M/WBE Firm)

___________________________________
(Name & Title of Authorized Representative of M/WBE)

___________________________________
(Signature of Authorized Representative of M/WBE)
REQUEST TO CHANGE M/WBE PARTICIPATION

(Submit changes only if notified as apparent lowest bidder, continuing through project completion)

Project: ________________________________________________________________

Bidder or Prime Contractor: ______________________________________________

Name & Title of Authorized Representative: _________________________________

Address: ________________________________ Phone #: _______________________

________________________________________ Email Address: ________________

Total Contract Amount (including approved change orders or amendments): $__________

Name of subcontractor: ____________________________________________________

Goods or services provided:

______________________________________________________________

Proposed Action:

___ Replace subcontractor
___ Perform work with own forces

For the above actions, you must provide one of the following reasons (Please check applicable reason):

___ The listed MBE/WBE, after having had a reasonable opportunity to do so, fails or refuses to execute a written contract.

___ The listed MBE/WBE is bankrupt or insolvent.

___ The listed MBE/WBE fails or refuses to perform his/her subcontract or furnish the listed materials.

___ The work performed by the listed subcontractor is unsatisfactory according to industry standards and is not in accordance with the plans and specifications; or the subcontractor is substantially delaying or disrupting the progress of the work.

If replacing subcontractor:
Name of replacement subcontractor: ________________________________
The M/WBE status of the contractor is certified by the NC Office of Historically Underutilized Businesses (required). ___Yes ___No

Dollar amount of original contract $______________

Dollar amount of amended contract $______________

Other Proposed Action:

___Increase total dollar amount of work

___Decrease total dollar amount of work

___Add additional subcontractor

___Other

Please describe reason for requested action: ____________________________________________

_________________________________________________________________

If adding* additional subcontractor:

The M/WBE status of the contractor is certified by the NC Office of Historically Underutilized Businesses (required). ___Yes ___No

*Please attach Letter of Intent or executed contract document

Dollar amount of original contract $______________

Dollar amount of amended contract $______________

Interoffice Use Only:

Approval __Y __N

Date____________________

Signature________________
Proof of Payment Certification  
M/WBE Contractors, Suppliers, Service Providers

Project Name: ________________________________________________

Prime Contractor: ________________________________________________

Current Contract Amount (including change orders): $_______________

Requested Payment Amount for this Period: $____________________

Is this the final payment? ___Yes   ___No

<table>
<thead>
<tr>
<th>Firm Name</th>
<th>M/WBE Category*</th>
<th>Total Amount Paid from this Pay Request</th>
<th>Total Contract Amount (including changes)</th>
<th>Total Amount Remaining</th>
</tr>
</thead>
<tbody>
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</tbody>
</table>

*Minority categories: Black, African American (B), Hispanic (H), Asian American (A) American Indian (I), Female (F) Socially and Economically Disadvantaged (S) Disabled (D)

Date:_______________________  Certified By: _____________________

______________________________________________________________

Name

______________________________________________________________

Title

______________________________________________________________

Signature
SECTION 00300

BID FORM

Proposal For

NEW HANOVER COUNTY Control Panels Replacement

BID NUMBER 17-0382

Submitted: _____________, 2017

New Hanover County
Department of Environmental Management
Attn: Kim Roane, Business Officer
3002 Highway 421 North
Wilmington, North Carolina 28401

The undersigned, as Bidder, hereby declares that the only person or persons interested in the Proposal, as principal or principals, is or are named herein and that no other person than herein mentioned has any interest in the Proposal of the Contract to which the work pertains; that this Proposal is made without connection or arrangement with any other person, company, or parties making a bid or proposal and that the Proposal is in all respects fair and made in good faith without collusion or fraud.

The Bidder further declares that he has examined the site of the Work and that from personal knowledge and experience, or that he has made sufficient test holes and/or other subsurface investigations to fully satisfy himself that such site is a correct and suitable one for this Work and he assumes full responsibility therefore; that he has examined the Drawings and Specifications for the Work and from his own experience or from professional advice that the Drawings and Specifications are sufficient for the Work to be done and he has examined the other Contract Documents and all addenda relating thereto, and that he has satisfied himself fully, relative to all matters and conditions with respect to the Work to which this Proposal pertains.

The Bidder proposes and agrees, if this Proposal is accepted, to contract with New Hanover County (COUNTY) in the form of Contract specified, to furnish all necessary materials, equipment, machinery, tools, apparatus, transportation, and labor and to perform the Work specified in the Proposal and other Contract Documents.

The Bidder further proposes and agrees to comply in all respects with the time limits for commencement and completion of the work within the days stated below and as stated in the Contract Form.

<table>
<thead>
<tr>
<th>Substantial Completion</th>
<th>Final</th>
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</table>

New Hanover County Secure Landfill
Control Panels Replacement 00300 - 1

Bid Form
May 2017
New Hanover County Secure Landfill  Bid Form

Item of Project        from NTP        Completion
Control Panels Replacement  75 days        15 Additional days

The Bidder further agrees that the deductions for liquidated damages, as stated in the Contract Form, constitute fixed, agreed, and liquidated damages to reimburse the COUNTY for additional costs to the COUNTY resulting from the work not being completed to substantial completion within the time limit stated in the Contract Form.

The Bidder further agrees to execute a Contract and furnish the required Certificates of Insurance, within three (3) business days after notice being given by the COUNTY of the award of the Contract.

The undersigned agrees to accept in full compensation therefore the total of the lump sum prices and extended unit prices items named in the following schedule (estimating worksheet). It is understood that the unit prices quoted or established for a particular item are to be used for computing the amount to be paid to the Contractor, based on the quantities actually constructed as determined by the applicable measurement and payment portion of these specifications.

Bidder’s Contractors License No. ________________________

Bidder’s Utilities License No. ________________________

_________________________________________________________
Name of Bidder and/or Representative

1. BASE BID PROPOSAL:

The undersigned as BIDDER, hereby declares that the only person or persons interested in the Bid as Principal or Principals is, or are, named herein and that no other person that is herein mentioned has any interest in this Bid or in the Contract to be entered into; that this Bid is made without connection with any other person, company or parties to make a bid or proposal; and that it is in all respects fair and in good faith, without collusion or fraud.
Having become completely familiar with the local conditions affecting the cost of Work at the place where Work is to be executed, and having carefully examined the site conditions as they currently exist, and having carefully examined Bidding and Contract Documents prepared by SCS Engineers, PC and CBHF Engineers, PLLC., titled Control Panels Replacement together with any Addenda to such Bidding Documents as listed hereinafter, the undersigned hereby proposes and agrees to provide all labor, materials, plant, equipment, transportation and other facilities as necessary, but which may not be separately itemized and to execute all of the Work described by the aforesaid Bidding and Contract Documents for the lump sum consideration of:

Words


Dollars $_________________________,

said amount being hereinafter referred to as the Base Bid or Base Bid Proposal.

2. Each BIDDER shall fill out and complete the Estimating Worksheet in this Section and submit the appropriate number of copies as part of the Bid. The purpose of the Worksheet is to give each BIDDER the approximate magnitude of the Work required and a basis for uniform comparison of Bids. COUNTY does not express, imply or guarantee that the actual amount of Work to be accomplished will correspond to the quantities given, if any. The BIDDERs must assume that the quantities, if indicated, are not accurate and therefore, the BIDDERs must satisfy themselves by personal examination of the location of Work; estimate the quantity of the Work based on the Bid Drawings, Specifications, and any Addendum, thereafter; and by such other means as they may choose, as to the actual conditions and requirements of the Work and the accuracy of the estimate of the Engineer. The BIDDER shall not, at any time after the submission of Bid, dispute any such statement or estimate of the Engineer nor assert that there has been any misunderstanding in regard to the nature or amount of the Work to be done.

The BIDDER may modify the quantities given in the Worksheet if required. Quantities, if listed on the Worksheet are for in-place materials and do not account for settlement, waste, overlaps, volume changes or unusable portions of the materials or products installed. Each section contains a miscellaneous item for BIDDERs to add any cost for Work items not identified on the worksheets, but required by the Contract Documents and Plans.

This Contract includes **LUMP SUM BID ITEMS.** BIDDER is to include all costs BIDDER may anticipate during the length of this project and the contract. Each BIDDER shall also add any extras that the BIDDER may determine necessary to provide the quantity and quality of Work required by the Bid Drawings, Specifications, and any Addenda.
Any increase or decrease in the quantities listed in the Worksheet and shown on the Drawing, for any item, shall not be regarded as sufficient grounds for an increase or decrease in the price of that item, nor total price of the Contract, nor in the time allowed for the completion of the Work, except as provided in the Contract Documents. The COUNTY reserves the right to delete portions of the Work, or add to the Work, as COUNTY deems necessary and shall have the right to use the BIDDER's unit prices in these Bid Schedules as a basis of negotiation if a change in the quantity of Work occurs.

TRENCH SAFETY COMPLIANCE

1. The bidder acknowledges the existence of North Carolina trench safety standards and the requirements established therein.

2. The bidder further acknowledges that the standards follow the Federal excavation safety standards set forth at 29 CFR Part 1926, Subpart P.

3. The bidder will comply with all applicable trench safety standards, during all phases of the work, if awarded the contract, and will ensure that all subcontractors also comply with the Act.

4. The bidder will consider the geotechnical information available from the COUNTY, from its own sources, and all other relevant information in its design of the trench safety system it will employ on the subject project. The bidder acknowledges that the COUNTY is not obligated to provide such information, that he is not to rely solely on such information if provided, and that he is solely responsible for the selection of the data on which he relies in designing said safety system, as well as for the system itself.

5. The bidder acknowledges that included in the Total Price in the Bid Form are costs for complying with the trench safety standards that are in effect as of the date of award of this agreement. The undersigned further identifies the costs to be $10.00.

6. The amount in Item 12 herein includes the following Trench Safety Compliance Methods and the units of each safety measure:

<table>
<thead>
<tr>
<th>Trench Safety Compliance Method</th>
<th>Unit (LF,SY)</th>
<th>Estimated Quantity</th>
<th>Unit Cost</th>
<th>Extended Cost</th>
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<tbody>
<tr>
<td>A.</td>
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<td>B.</td>
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<td>C.</td>
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<td>D.</td>
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7. Acceptance of the bid to which this certification and disclosure applies in no way represents that the COUNTY or its representatives have evaluated or determined that the above costs are adequate to comply with the applicable trench safety requirements, nor does it in any way relieve the undersigned of his sole responsibility for complying with all applicable safety requirements.
<table>
<thead>
<tr>
<th>ITEM #</th>
<th>DESCRIPTION</th>
<th>ESTIMATED QUANTITY</th>
<th>UNITS</th>
<th>UNIT PRICE</th>
<th>TOTAL</th>
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<tbody>
<tr>
<td></td>
<td>A. General (Applies to Control Panels Replacement)</td>
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<tr>
<td>1</td>
<td>Mobilization</td>
<td>1</td>
<td>LS</td>
<td></td>
<td></td>
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<tr>
<td>2</td>
<td>Demobilization</td>
<td>1</td>
<td>LS</td>
<td></td>
<td></td>
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<tr>
<td>3</td>
<td>Insurance</td>
<td>1</td>
<td>LS</td>
<td></td>
<td></td>
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<tr>
<td>4</td>
<td>Bonds</td>
<td>0</td>
<td>LS</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>5</td>
<td>Administration</td>
<td>1</td>
<td>LS</td>
<td>$10</td>
<td>$10</td>
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<tr>
<td>6</td>
<td>Indemnification</td>
<td>1</td>
<td>LS</td>
<td>$10</td>
<td>$10</td>
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<td>7</td>
<td>Trench Safety</td>
<td>1</td>
<td>LS</td>
<td>$10</td>
<td>$10</td>
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<td><strong>Subtotal A:</strong></td>
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<td></td>
<td>B. Materials and Installation</td>
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<tr>
<td>1</td>
<td>New Control Panels for Cell 6E that serve existing pumps for primary and secondary leachate collection. Price must include any and all associated conduit, wiring, racks, meter bases, disconnect boxes, associated miscellaneous materials and labor for the complete installation</td>
<td>1</td>
<td>LS</td>
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<tr>
<td>2</td>
<td>New Control Panels for Cell 6D and Pump Station 2E that serves pumps for the primary and secondary leachate collection for Cell 6D and the 2E pumping station 2E. Price must include any and all associated conduit, wiring, racks, meter bases, disconnect boxes, associated miscellaneous materials and labor for the complete installation</td>
<td>1</td>
<td>LS</td>
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<td>3</td>
<td>Perimeter road restoration</td>
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<td>4</td>
<td>Sod disturbed areas</td>
<td>1</td>
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New Hanover County Secure Landfill
Control Panels Replacement 00300 - 6
Bid Form
May 2017
C. Demolition

1. Removal of existing control systems

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<td></td>
<td>LS</td>
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</table>

   Subtotal C: 

Total Base Bid (A through C): 

Acknowledgement is hereby made of the following Addenda received since issuance of Plans and Specifications:

Addendum No.________ Dated:_______  Addendum No.________ Dated:_______

Addendum No.________ Dated:_______  Addendum No.________ Dated:_______

Addendum No.________ Dated:_______  Addendum No.________ Dated:_______

Addendum No.________ Dated:_______  Addendum No.________ Dated:_______

_________________________ L.S.
(Name of Bidder) (Affix Seal)

_________________________ L.S.
(Signature of Officer)

_________________________ L.S.
(Title of Officer)

Address:____________________________________

City: _________________________________________

State: _________________________________________
The full names and residences of persons and firms interested in the foregoing bid, as principals, are as follows:

____________________________________________________________________________
____________________________________________________________________________
____________________________________________________________________________

Name of the executive who will give personal attention to the work:
____________________________________________________________________________

Attach list of subcontractors.

**QUALIFICATIONS QUESTIONNAIRE**

The undersigned warrants the truth and accuracy of all statements and answers herein contained. Include additional sheets if necessary.

1. What is your classification of Contractor (General, Utilities, etc.), and how many years has your organization been in business as a Contractor?

____________________________________________________________________________

2. Describe and give the dates and owners of the last two projects that you have completed similar in type, size, and nature as the one proposed?

____________________________________________________________________________

3. Have you ever failed to complete work awarded to you? If so, where and why?

____________________________________________________________________________

4. Name three individuals or corporations for which you have performed similar work and to which you refer:

____________________________________________________________________________
____________________________________________________________________________
____________________________________________________________________________

5. Have you personally inspected the site of the proposed Work? Describe any anticipated problems with the site and your proposed solutions?

____________________________________________________________________________

6. Will you subcontract any part of this Work? If so, describe which portions:

____________________________________________________________________________
7. Please list the names and addresses of the subcontractors to be used. Additional information may be required in accordance with the Instructions to Bidders, Item 10.8 and Item 3.4.

8. What equipment do you own that is available for the Work?

9. What equipment will you purchase for the Work?

10. What equipment will you rent for the Work?

11. The following is given as a summary of the Financial Statement of the undersigned: (List Assets and Liabilities and use insert sheet if necessary.)

12. State the true and exact, correct, and complete name under which you do business.

BIDDER IS: ________________________________

CORPORATION, SOLE PROPRIETORSHIP, PARTNERSHIP

_________________________________ (SEAL)

(Individual's Signature)

_________________________________ (SEAL)

(Individual's Name)

doing business as: ________________________________

Business Address:

_____________________________________

Phone No.: __________ Cell Phone No.: __________ Email: __________________________
SECTION 00480

NONCOLLUSION AFFIDAVIT
AND OF NONINTEREST OF COUNTY EMPLOYEES

STATE OF NORTH CAROLINA

COUNTY OF NEW HANOVER

______________________________, being first duly swore deposes and says that he (it) is the bidder in the above bid, that the only person or persons interested in this bid are named therein; that no officer, employee or agent of New Hanover County, or of any other bidder, is interested in this bid, and that affiant makes this bid with no past or present collusion with any other person, firm, or corporation.

______________________________ Affiant

STATE OF __________

COUNTY OF __________

The foregoing instrument was acknowledged before me this ______________ by ____________________________,

______________________________

(Name of Officer or agent, title of officer or agent)

of ________________________________, a

(Name of Corporation acknowledging)

____________ corporation, on behalf of the corporation. He/she is

(State of place of incorporation)

personally known to me or has produced __________________ ______

(Type of identification)

as identification and did take an oath.

______________________________ Notary Public, Commission No.________

______________________________ (Name of Notary typed, printed or stamped)

(SEAL ABOVE)
SECTION 00500

AGREEMENT

NEW HANOVER COUNTY CONTRACT 17-0382

NEW HANOVER COUNTY, NORTH CAROLINA

THIS CONTRACT made and entered into this_______day of____________, 2017, by and between NEW HANOVER COUNTY, a political subdivision of the State of North Carolina, hereinafter referred to as "County", and ______________________ a Corporation, hereinafter referred to as "Contractor";

W I T N E S S E T H:

That the Contractor, for the consideration hereinafter fully set out, hereby agrees with the County as follows:

1. **Performance.** Contractor shall furnish all labor, materials and equipment and shall perform all work in the manner and form as provided by the following enumerated specifications and documents, which are attached hereto and made a part hereof as if fully contained herein: Advertisement for Bids, Instructions to Bidders, General Conditions, Supplemental General Conditions, Special Conditions, Plans and Specifications, Addenda, and Insurance Certificates for Workers' Compensation, Public Liability and Property Damage, for the project more fully described herein and generally described as:

   **NEW HANOVER COUNTY LANDFILL**
   **Control Panels Replacement**

   **BID NO. 17-0382**

2. **Time of Performance.** Contractor shall commence work within ten (10) calendar days after execution of this agreement; provided that, if County specifies a Notice to Proceed, Contractor shall commence work on the date indicated in the Notice to Proceed.

   2.1 **Delay in Authorization to Commence Work.** If, through no fault of Contractor, County's authorization to commence work is delayed later than the ninetieth (90th) day after the bid opening date or the thirtieth (30th) day after Contractor's delivery of the executed agreement to County, Contractor may terminate this agreement.

   2.2 **Required Completion Time.** Prior to commencing work, Contractor shall give County a construction schedule broken down into calendar days for the
various divisions or parts of work. Contractor shall complete all work for the closure as indicated in paragraph 2.2.1., after the beginning date/Notice-to-Proceed. If the Contractor fails to complete all work within the required and specified time, the County may at its option either terminate this agreement pursuant to the procedures specified in paragraph 24 herein, or assess liquidated damages against Contractor. In the event County exercises its option to assess liquidated damages, Contractor shall pay the County One Thousand Dollars ($1,000) per day for each consecutive-calendar-day past the scheduled final completion date for the Closure that the work or performance, herein contracted for, remains unfinished and incomplete. It is understood and agreed by the parties hereto that time is of the essence of this contract and that the sum of One Thousand Dollars ($1,000) per day represents the actual damages which the County will have sustained by failure of Contractor to complete the work within the specified times and is agreed upon as liquidated damages; that the provisions for damages are a bona fide provision for such and are not a penalty. It is understood and agreed that if the work herein contracted for is not completed and finished as scheduled herein, the County will have sustained damages and, therefore, the provision for liquidated and agreed upon damages has been incorporated in this agreement as a provision beneficial to both parties.

2.2.1 Completion Time – from Notice to Proceed

<table>
<thead>
<tr>
<th>Item of Work</th>
<th>Substantial Completion</th>
<th>Final Completion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Panels Replacement</td>
<td>75 days</td>
<td>15 days</td>
</tr>
</tbody>
</table>

3. CONTRACT Amendments and Change Orders. No modification or rescission of this agreement shall be effective unless evidenced by a writing signed by both parties and by the surety to this agreement. County may issue change orders, which are defined as written orders to Contractor, approved by Board of County Commissioners and signed by the County Manager, authorizing an addition, deletion or revision in the work or an adjustment in the contract price or the contract time.

3.1 Extra Work. Contractor agrees to perform such reasonable extra work as may be ordered in writing by the County Manager. County agrees to pay Contractor, upon Contractor's presentation of itemized cost statements, for extra work computed as follows: (a) labor used at actual payroll charges therefor; (b) actual payroll charges for Workers' Compensation Insurance, Social Security and all other payroll charges; (c) an hourly rate for actual operating hours of equipment used; (d) amounts paid by Contractor to vendors, as evidenced by paid invoices, for material purchased and used on extra work orders; (e) cost of bonding, if applicable; and (f) overhead and
profit combined based on fifteen percent (15%) of the total of cost items (a) through (e) above.

3.2 Changes of the Contract Time. The time limit for completion of the project is of the essence of this agreement. If Contractor finds it impossible to complete the work on the project within the originally scheduled time, Contractor may submit a written request for a time extension to the County Manager. The writing shall specify the reasons justifying the granting of the request. Contractor's plea that insufficient time was scheduled shall not be a valid reason for a time extension. If the County Manager finds that work was delayed because of conditions beyond the control and without the fault of both Contractor and his or her subcontractors or suppliers, the County Manager, shall extend the time for completion in such amount as the conditions justify. Under no circumstances shall Contractor be entitled to damages against County on account of delay.

4. Payment. County agrees to pay Contractor, for the full and faithful performance of this agreement, the not to exceed the total lump sum and/or unit price sum of: ____________ Dollars and ____________ Cents ($__________).

4.1 Partial Payments. County shall make partial payments to Contractor in lump sum and/or unit price amounts upon the successful completion by Contractor and acceptance by County of sections of the work, as specified in the agreement specifications and in accordance with the amounts indicated for each bid in Contractor's bid proposal.

4.2 Acceptance of Final Payment as Release. The acceptance by Contractor of final payment shall be and shall operate as a release of County from all claims of Contractor against County, except for claims specifically excepted by Contractor in stated written amounts. However, no payment, final or otherwise, shall release Contractor or his or her sureties from any obligations under the agreement documents or the payment and performance bonds.

4.3 County's Right to Offset and Recoup. Nothing contained in this Section 4 shall be construed to impair County's rights to deduct from partial or final payments any sums due to County pursuant to Sections 2, 5, 24 or any other section of this agreement.

5. Contractor's Warranties. Contractor makes the following warranties concerning the materials, equipment and work furnished pursuant to this Contract.

5.1 Warranty of Title. Contractor warrants that title to all work, materials and equipment covered by a request for payment, whether incorporated in the
project or not, will have passed to County prior to the submission of the request for payment, free and clear of all liens, claims, security interests and encumbrances.

5.2  **Warranty of Materials and Equipment.** Contractor warrants to County that all materials and equipment furnished under this agreement will be new unless otherwise specified, will be of good quality and free from faults and defects, and will conform to the agreement documents. Contractor warrants all such materials and equipment for a period of one (1) year from the date of completion of the work unless the specifications require a different period of warranty.

5.3  **Warranty of Work.** Contractor warrants to County, for a period of one (1) year from the date of completion of the work, that all work performed under this agreement has been performed in a workmanlike manner, so as to meet the standards of workmanlike quality prevailing in North Carolina at the time of construction.

5.4  **Warranty Against Major Structural Defects.** Contractor warrants that all structures constructed under this agreement are free from major structural defects.

5.5  **Correction of Defects.** County shall give Contractor reasonably prompt notice of all observable defects. If Contractor fails to perform corrective work within a reasonable time, County may perform such work and charge Contractor for the costs thereby incurred. Contractor's Performance Bond shall remain in full force and effect through the applicable one (1) year warranty period.

6.  **Indemnity.** Contractor shall indemnify and hold New Hanover County, its officers, officials, agents and employees, harmless against any and all claims, demands, causes of action, or other liability, including attorney fees, on account of personal injuries or death or on account of property damages arising out of or relating to the work to be performed by Contractor hereunder, resulting from the negligence of or the willful act or omission of Contractor, his agents, employees and Subcontractors.

7.  **Insurance.** Contractor shall maintain insurance from companies licensed to write business in North Carolina and acceptable to New Hanover County, of the kinds and minimum amounts specified below.

8.  **Certificates and Notice of Cancellation.** Before commencing work under this contract, Contractor shall furnish County with certificates of all insurance required below. The certificate of insurance should also evidence self-insured retention/deductibles applicable to the insurance required. Certificates shall
indicate the type; amount, class of operations covered, effective date and expiration
date of all policies, and shall contain the following statement:

"The insurance covered by this certificate will not be canceled or
materially altered, except after thirty (30) days written notice has
been received by County”.


9.1 Contractor shall maintain Commercial General Liability and if
necessary, Commercial Umbrella Liability insurance with a total limit of not less
than $1,000,000 each occurrence for bodily injury and property damage. If such
CGL insurance contains a general aggregate limit, it shall apply separately to this
project/location or the general aggregate shall be twice the required limit.

9.2 CGL insurance shall be written on Insurance Services Office (ISO)
“occurrence” form CG 00 01 covering Commercial General Liability or its
equivalent and shall cover the liability arising from premises, operations,
independent Contractors, products-completed operations, personal and advertising
injury, and liability assumed under an insured contract (including the tort liability
of another assumed in a business contract).

9.3 County, its officers, officials, agents, and employees are to be
covered as additional insureds under the CGL by endorsement CG 20 10 and CG
20 37 or an endorsement providing equivalent coverage as respects to liability
arising out of activities performed by or on behalf of the Contractor; products and
completed operations of the Contractor; premises owned, leased or used by the
Contractor; and under the commercial umbrella, if any. The coverage shall contain
no special limitations on the scope of protection afforded to County, its officers,
officials, agents, and employees

9.4 The status of County as an additional insured under a CGL obtained
in compliance with this agreement shall not restrict coverage under such CGL with
respect to the escape or release of pollutants at or from a site owned or occupied by
or rented to County.

9.5 There shall be no endorsement or modification of the CGL or
Umbrella Liability limiting the scope of coverage for liability arising from
pollution, explosion, collapse, underground property damage, employment-related
practices, or damage to the named insured’s work.

9.6 The Contractor’s Commercial General Liability insurance shall be
primary as respects County, its officers, officials, agents, and employees. Any
other insurance or self-insurance maintained by County, its officers, officials, and
employees shall be excess of and not contribute with the Contractor’s insurance.
10. **Workers’ Compensation and Employer’s Liability.**

10.1 Contractor shall maintain Workers’ Compensation as required by the general statutes of the State of North Carolina and Employer’s Liability Insurance.

10.2 The Employer’s Liability, and if necessary, Commercial Umbrella Liability insurance shall not be less than $1,000,000 each accident for bodily injury by accident, $1,000,000 each employee for bodily injury by disease, and $1,000,000 policy limit.

10.3 The insurer shall agree to waive all rights of subrogation against the County, its officers, officials, and employees for losses arising from work performed by the Contractor for County.

11. **Business Auto Liability.**

11.1 Contractor shall maintain Business Auto Liability and, if necessary, Commercial Umbrella Liability insurance with a limit of not less than $1,000,000 each accident.

11.2 Such insurance shall cover liability arising out of any auto, including owned, hired, and non-owned autos.

11.3 Business Auto coverage shall be written on ISO form CA 00 01, or a substitute form providing equivalent liability coverage. If necessary, the policy shall be endorsed to provide contractual liability coverage equivalent to that provided in ISO form CA 00 01.

11.4 The Contractor’s Business Auto Liability insurance shall be primary as respects County, its officers, officials, agents, and employees. Any other insurance or self-insurance maintained by County, its officers, officials, and employees shall be excess of and not contribute with the Contractor’s insurance.

12. **Contractors Pollution Liability Insurance.**

12.1 Contractor shall maintain Contractors Pollution Liability covering losses caused by pollution incidents that arise from the operations of the contractor described under the scope of services of this contract.

12.2 Contractor’s Pollution Liability shall apply to bodily injury; property damage, including loss of use of damaged property or of property that has not been physically injured; cleanup costs and defense, including costs and expenses incurred in the investigation defense, or settlement of claims. The policy of insurance affording these required coverages shall be written in an amount of at least $1,000,000 per claim, with an annual aggregate of at least $1,000,000.
12.3 Contractors Pollution Liability shall include as an additional insured County, its officers, officials, agents, and employees.

12.4 If Contractors Pollution Liability is written on a claims-made basis, the Contractor warrants that any retroactive date applicable to coverage under the policy precedes the effective date of this contract; and that continuous coverage will be maintained or an extended discovery period will be exercised for a period of two (2) years, beginning from the time that work under the contract is complete.

13. **Bonds Required.** No Performance or Payment Bonds are Required.

14. **Deductibles and Self-Insured Retentions.**

   14.1 Any deductibles or self-insured retentions must be declared to and approved by County. At the option of County, either the insurer shall reduce or eliminate such deductibles or self-insured retentions as respects County, its officers, officials, agents, and employees; or the Contractor shall procure a bond guaranteeing payment of deductibles or self-insured retentions.

   14.2 The Contractor shall be solely responsible for the payment of all deductibles to which such policies are subject, whether or not County is an insured under the policy.

15. **Miscellaneous Insurance Provisions.**

   15.1 The policies are to contain, or be endorsed to contain, the following provisions:

   15.2 Any failure to comply with reporting provisions of the policies listed in this agreement shall not affect coverage provided to County its officers, officials, agents and employees.

   15.3 Each insurance policy required by this contract shall be endorsed to state that coverage shall not canceled by either party except after 30 days prior written notice has been given to County, 230 Government Center Drive #125, Wilmington, NC 28403.

   15.4 If Contractor’s liability policies do not contain the standard ISO separation of insureds provision, or a substantially similar clause, they shall be endorsed to provide cross-liability coverage.

16. **Acceptability of Insurers.** Insurance is to be placed with insurers licensed to do business in the State of North Carolina with an A.M. Best’s rating of no less than A VII unless County has granted specific approval.

17. **Evidence of Insurance.**
17.1 The Contractor shall furnish County with a certificate(s) of insurance, executed by a duly authorized representative of each insurer, showing compliance with the insurance requirements prior to commencing the work, and thereafter upon renewal or replacement of each certified coverage until all operations under this contract are deemed complete.

17.2 Evidence of additional insured status shall be noted on the certificate of insurance as per requirements in this agreement.

17.3 With respect to insurance maintained after final payment in compliance with requirements, an additional certificate(s) evidencing such coverage shall be provided to County with final application for payment and thereafter upon renewal or replacement of such insurance until the expiration of the period for which such insurance must be maintained.

18. Sub-Contractors. Contractor shall include all sub-contractors as insureds under its policies or shall furnish separate certificates for each sub-contractor. All coverage for sub-contractors shall be subject to all of the requirements stated herein. Commercial General Liability coverage shall include independent Contractors’ coverage, and the Contractor shall be responsible for assuring that all sub-contractors are properly insured.

19. Conditions

19.1 The insurance required for this contract must be on forms acceptable to County.

19.2 Where circumstances warrant, County may, at its discretion subject to acceptance by the Risk Management and Finance Department accept letters of credit or custodial accounts in lieu of specific insurance requirements.

19.3 The Contractor shall provide that the insurance contributing to satisfaction of insurance requirements in this agreement shall not be canceled, terminated, or modified by the Contractor without prior written approval of County.

19.4 The Contractor shall promptly notify Environmental Management and the Risk Management Office at (910) 798-7497 of any accidents arising in the course of operations under the contract causing bodily injury or property damage.

19.5 County reserves the right to obtain complete, certified copies of all required insurance policies, at any time.

19.6 Failure of County to demand a certificate of insurance or other evidence of full compliance with these insurance requirements or failure of County to identify a deficiency from evidence that is provided shall not be construed as a waiver of Contractor’s obligation to maintain such insurance.
19.7 By requiring insurance herein, County does not represent that coverage and limits will necessarily be adequate to protect the Contractor and such coverage and limits shall not be deemed as a limitation of Contractor’s liability under the indemnities granted to County in this contract.

19.8 If Contractor fails to maintain the insurance as set forth herein, County shall have the right, but not the obligation, to purchase said insurance at Contractor’s expense.

19.9 The Contractor or his engineer may apply to County for approval of higher deductibles based on financial capacity and quality of the carrier affording coverage.

19.10 County shall have the right, but not the obligation of prohibiting Contractor or any sub-contractor from entering the project site or withhold payment until such certificates or other evidence that insurance has been placed in complete compliance with these requirements is received and approved by County.

20. **Independent Contractor.** It is mutually understood and agreed that Contractor is an independent contractor and not an agent of County, and as such, Contractor, his or her agents and employees shall not be entitled to any County employment benefits, such as, but not limited to, vacation, sick leave, insurance, worker's compensation, or pension or retirement benefits.

21. **Subcontractors.** Contractor shall be fully responsible for all negligent acts and omissions of his or her Subcontractors and of persons and organizations employed by them to the same extent that Contractor would be responsible for these acts and omissions. Nothing in the contract documents shall create any contractual relationship between County and any subcontractor or other person or organization having a direct contract with Contractor, nor shall it create any obligation on the part of County to pay any money due any such subcontractor or other person or organization, except as may otherwise be required by law.

22. **No Waiver of Legal Rights.** Upon completion of the contract work, Engineer/County will promptly make final inspection and notify Contractor of final acceptance. However, final acceptance shall not preclude or estop County from correcting any measurement, estimate or certificate made before or after completion of the work, nor shall County be precluded or estopped from recovering over payments from Contractor or his surety, or both. A waiver on the part of County of any breach of any part of the agreement shall not be held to be a waiver of any other or subsequent breach.

23. **Default and Termination.** If, through no fault of Contractor, the work on the project is stopped for a period of thirty (30) consecutive days or more, Contractor may terminate this agreement, in which event Contractor will be paid for materials and equipment supplied and work performed up to the date of termination. If Contractor
fails to prosecute the work with such diligence as will insure its completion within the contract time, or if Contractor breaches any one of the terms or conditions contained in this agreement and fails to cure said breach within fifteen (15) days of County's mailing of Notice of Default, County may terminate this agreement forthwith. Upon termination, County may, without prejudice to an action for damages or any other remedy, take the prosecution of the work out of the hands of Contractor. County may enter into another agreement for the completion of this contract, or use such other methods as may be required for the completion of the contract. County may deduct all costs of completing the contract from any monies due to which may become due to Contractor.

24. **Assignment.** The parties mutually agree that this contract is not assignable and shall not be assigned by either party without the written consent of the other party and the surety of this contract.

25. **Contractor's Representation.** Contractor makes the following representations to the County.

Contractor has familiarized itself with the nature and extent of the Contract Documents, work, site, locality, and all local conditions and Laws and Regulations that in any manner may affect cost, progress, performance or furnishing of the work.

Contractor has reviewed and checked all information and data shown or indicated on the Contract Documents with respect to existing facilities at or contiguous to the site and assumes responsibility for the accurate location of said facilities. No additional examinations, investigations, explorations, tests, reports, studies or similar information or data in respect of said facilities are or will be required by Contractor in order to perform and furnish the work at the contract price, within the contract time and in accordance with the other terms and conditions of the Contract Documents. Contractor has given Engineer written notice of all conflicts, errors or discrepancies that he or she has discovered in the Contract Documents and the written resolution thereof by Engineer is acceptable to Contractor.

26. **Entire Understanding.** This contract constitutes the entire understanding of the parties and contains all of the terms agreed upon with respect to the subject matter hereof. No modification or rescission of this contract shall be effective unless evidenced by a signed writing.

27. **Familiarity with Laws.** The Contractor specifically acknowledges that he has made himself familiar with all Federal, State and local laws, ordinances, rules and regulations, including all Federal and State Occupational Safety and Health Act (OSHA) requirements, which may in any manner affect those engaged or employed in the work of the project, or the materials or equipment in or about such work, or in any way affect the conduct of such work and agrees that he, his employees, Subcontractors and suppliers will, at all times, comply with same. If the Contractor shall discover any provisions in the Contract Documents which are contrary to or
inconsistent with any such law ordinance, rule or regulation, he shall immediately
give notice thereof to the County in writing, identifying any items of work affected,
and he shall not proceed until he has received written direction from the County with
respect to these items. If the Contractor performs contrary to or inconsistently with
any such law ordinance rule or regulation without giving such notice, he shall bear
all costs that are consequences of such performance.

28. **Contract Work Hours and Safety Standards Act.** The Contractor shall fully comply
with the Contract Work Hours and Safety Standards Act (40 USC 327-330) as
supplemented by Department of Labor Regulations contained in 29 CFR Parts 3, 5
and 5a.

29. **Copeland “Anti-Kickback” Act.** The Contractor shall fully comply with all Federal
provisions set forth in this act and 24 CFR 85.36, such that each contractor shall be
prohibited from inducing, by any means, any person employed in the construction,
completion, or repair of public work, to give up any part of the compensation to
which he is otherwise entitled. The Contractor shall report all suspected or reported
violations to New Hanover County and other appropriate authority.

30. **Section 504 of the Rehabilitation Act of 1973, as amended and Nondiscrimination on
the Basis of Handicap.** The Contractor shall fully comply with all Federal provisions
set forth, such that no qualified handicapped person shall, on the basis of handicap be
excluded from participation in, be denied the benefits of, or otherwise be subjected
to discrimination hereunder.

31. **Age Discrimination Act of 1975, as amended and Nondiscrimination on the Basis of
Age.** The Contractor shall fully comply with all Federal provisions set forth such
that no qualified person shall on the basis of age be excluded from participation in,
be denied the benefits of, or otherwise be subjected to discrimination hereunder.

32. **Executive Order 11246, as amended.** The Contractor shall fully comply with all
Federal provisions set forth in this order including any amendments currently
enacted.

33. **Permits and Licenses.** Contractor shall procure all applicable permits and licenses,
including permits and licenses required pursuant to applicable patent and copyright
laws, shall pay all charges and fees, and shall give all notices necessary and
incidental to the due and lawful prosecution of the work.

34. **Non-Discrimination.** Contractor will take affirmative action not to discriminate
against any employee or applicant for employment or otherwise illegally deny any
person participation in or the benefits of the project that is the subject of this contract
because of age, race, creed, color, sex, disability or national origin. To the extent
applicable, Vendor will comply with all provisions of Executive Order No. 11246,
the Civil Rights Acts of 1964 (P.L. 88-352) and 1968 (P.L. 90-284), and all
applicable Federal, State and local laws, ordinances, rules, regulations, orders,
instructions, designations and other directives promulgated to prohibit discriminations. Violation of this provision, after notice, shall be a material breach of this agreement and may result, at County's option, in a termination or suspension of this agreement in whole or in part.

35. **Taxes.** Contractor shall pay all applicable Federal, State and local taxes, including sales taxes on all equipment and materials used in the project. County is qualified to receive all sales taxes paid on the project as a rebate. Contractor shall submit a statement showing the invoice, sales taxes paid to State, sales taxes paid to county of vendor's location, and name of county of all material and equipment used in the project. A sales tax report shall be submitted with each pay request and shall be accompanied by an affidavit verifying validation.

36. **Interpretation.** All of the terms and conditions contained in the agreement shall be interpreted in accordance with the laws of the state of North Carolina. The agreement documents shall be given precedence in the following order: Agreement, Modifications, Addenda, Supplementary Conditions, Special Conditions, Instructions to Bidders, General Conditions, Specifications and Drawings.

37. **Deletions of General Conditions.** The following General Conditions are hereby deleted: N/A.

38. **Arbitration.** Arbitration of claims, disputes, and questions arising under this agreement may only be used when both parties agree to arbitrate. Arbitration shall be in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association then obtaining. In no event shall fewer than three (3) arbitrators be used; County and Contractor shall each select one (1) arbitrator and the two (2) arbitrators shall select a third. The award rendered by the arbitrators shall be final, specifically enforceable and recordable as a judgment in any court having jurisdiction thereof.

39. **Notices.** All notices required hereunder to be sent to either party shall be sent to the following designated address, or to such other address or addresses as may hereafter be designated by either party by mailing of written notice of such change of address, by Certified Mail, Return Receipt Requested:

To County:

New Hanover County Environmental Management
Attn: Kim Roane, Business Officer
3002 U.S. Highway 421 North
Wilmington, NC 28401
To Contractor:

____________________________________
____________________________________
____________________________________
____________________________________

40. **Additional Provisions.** No provision of this Contract shall be amended nor deleted; however, additional provisions may be added to the Contract.

41. **E-Verify Compliance.** Pursuant to S.L. 2015-294, Contractor shall fully comply with the U.S. Department of Homeland Security employee legal status E-Verify requirements for itself and all its subcontractors. Violation of the provision, unless timely cured, shall constitute a breach of contract. By endorsement of this agreement Contractor confirms compliance.

42. **Iran Divestment Act of 2016 Compliance Pursuant to N.C.G.S. 147-86.55 et. seq.** The Act requires that the State, a North Carolina local government, or any other political subdivision of the State of North Carolina must not utilize any contractor or subcontractor found on the State Treasurer’s Final Divestment List. Contractor certifies that it or its subcontractors are not listed on the Final Divestment List created by the North Carolina State Treasurer pursuant to N.C.G.S. 147-85.60. The State Treasurer’s Final Divestment List can be found on the State Treasurer’s website at the address [www.nctreasurer.com/Iran](http://www.nctreasurer.com/Iran) and will be updated every 180 days. By endorsement of this agreement Contractor confirms compliance.

43. **Contract Documents.** The Contract Documents, as stated in the Instructions to Bidders and attached hereto, are as fully a part of this Contract as if herein repeated. An enumeration of the Drawings accompanying these Contract Documents follows:

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<th>SHEET NO.</th>
<th>TITLE</th>
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<tr>
<td>E-101</td>
<td>ELECTRICAL PLAN AND RISER DIAGRAMS</td>
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<tr>
<td>ED-101</td>
<td>ELECTRICAL DEMOLOTION PLAN</td>
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IN WITNESS WHEREOF, the parties have caused the execution of this instrument, by authority duly given and on the day and year first above written.
NEW HANOVER COUNTY

________________________
County Manager

ATTEST:

________________________
Clerk to the Board

[CORPORATE SEAL]

ATTEST:

________________________
Secretary

________________________
President

This instrument has been pre-audited in the manner required by the Local Government Budget and Fiscal Control Act.

________________________
County Finance Director

________________________
County Attorney

NORTH CAROLINA

NEW HANOVER COUNTY

I, ______________________________, a Notary Public of the State and County aforesaid, certify that____________________ personally came before me this day and acknowledged that (s)he is Clerk to the Board of County Commissioners of New Hanover County, and that by authority duly given and as the act of the Board, the foregoing instrument was signed in its name by its Chairman, ______________________________, sealed with its official seal and attested by herself as its Clerk.

WITNESS my hand and official seal, this_______ day of ____________________, 2017.

Notary Public

My commission expires:

STATE OF

COUNTY OF

New Hanover County Secure Landfill
Control Panels Replacement 00500 - 14

Agreement
May 2017
I, _______________________, a Notary Public of the State and County aforesaid, certify that ___________________ personally came before me this day and acknowledged that (s)he is Secretary of ___________________, a __________________ corporation, and that by authority duly given and as the act of the corporation, the foregoing instrument was signed in its name by its President, ______________, sealed with its official seal and attested by herself as its Secretary.

WITNESS my hand and official seal, this ________ day of __________, 2017.

Notary Public

My commission expires: ______________
SECTION 00830

CONTRACT FORMS

SUBCONTRACTOR/VENDOR FINAL RELEASE OF LIEN
SHOP DRAWING SUBMITTAL
APPLICATION FOR PAYMENT
SUBCONTRACTOR'S/SUPPLIER'S CERTIFICATION
FINAL RELEASE OF LIEN
SALES TAX REPORT
KNOW ALL MEN BY THESE PRESENTS:

that the undersigned, for and in consideration of the payment of the sum of _______________ and ______/100 Dollars ($_________), paid by _____________________________________________, receipt of which is hereby acknowledged, hereby releases and quit claims to the New Hanover County Board of County Commissioners, the OWNER, all lien rights, claims or demands of any kind whatsoever, which the undersigned now has or might have against the Bonds for Work on premises described as the New Hanover County Secure Landfill, Cell 6E and 6D/2E Control Panel Replacement.

On account of labor, equipment, and/or material furnished for the construction of any improvements thereon. That all labor, equipment and materials used by the undersigned in the erection of said improvements have been fully paid for.

Affiant hereby acknowledges that he/she is the __________________________________ of ____________________________________________, that he/she is duly authorized to make this affidavit as, or on behalf of said corporation, and that the statements contained herein are true and correct.

IN WITNESS WHEREOF, I have hereunto set my hand and seal this ______ day of _______________________, 2017.

________________________________________
Affiant

BY: ______________________________________

State of ______________________

County of ______________________

Sworn and subscribed before me this ______ day of ____________________, 2017.

_____________________________________
Notary Public

My Commission Expires: ________________
SHOP DRAWING SUBMITTAL

Owner: ______________________________
__________________________________
__________________________________
__________________________________

Contractor: ______________________________
__________________________________
__________________________________
__________________________________

SCS Engineers, PC
Project No.: ______________________________

Owner's
Project No.: ______________________________

Contractor's
Project No.: ______________________________

Contractor's Submittal No.: ______________________________
Resubmittal Yes ☐ No ☐

Specification No.: ______________________________

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<th>ITEM NO.</th>
<th>RESUBMITTAL NO.</th>
<th>NO. COPIES</th>
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ACTIONS CODE
R REVIEWED, NO COMMENTS
RN REVIEWED, COMMENTS AS NOTED
RRR REJECTED, REVISE, AND RESUBMIT
NR NOT REVIEWED

SUBMITTED BY: ______________________________ DATE: ______________________________
Contractor

ENGINEERING COMMENTS:

Distribution
☐ Contractor ______ Copies
☐ Owner ______ Copies
☐ SCS Interservice ______ Copies
☐ SCS Field ______ Copies

Discipline Review:
Reviewed By ______________________________ Date ______________________________

Reviewed By ______________________________ Date ______________________________

Project Manager ______________________________ Date ______________________________

New Hanover County Secure Landfill
Control Panels Replacement 00830 - 3
Contract Forms May 2017
APPLICATION FOR PAYMENT NO. _________

PROJECT NO. 17-0382

PROJECT NAME:  Cell 6E and 6D/2E Control Panel Replacement

OWNER:  ___________________________________________________________

CONTRACTOR:  _____________________________________________________

1. Original Contract Amount  $_____________
2. Value of original contract work performed to date:  $_____________
3. Extra work completed to date:  $_____________
4. Materials accepted and stored at site:  $_____________
5. Gross value to date:  $_____________
6. Ten percent retained:  
   (-) $_____________
7. Net amount due to date:  $_____________
8. Less previous net amount paid:  
   (-) $_____________
9. Balance due this payment:  $_____________

Note:  This Application must be accompanied with the Certification of Contractor Form.

RECOMMENDED FOR PAYMENT

______________________________
New Hanover County (signature)

By:  __________________________
  Printed Name

Date:  _________________________
CERTIFICATION OF CONTRACTOR

According to the best of my knowledge and belief, I certify that all items and amounts shown on Application for Payment No. ____ are correct, that all work has been performed and/or materials supplied in full accordance with the terms and conditions of this Contract, dated ______________, 2017, between

______________________________________________ (COUNTY)

and ____________________________________________ (Contractor)

I further certify that all just and lawful bills against the undersigned and his subcontractors and suppliers for labor, material and equipment employed in the performance of this Contract have been paid in full accordance with their terms and conditions; that all taxes imposed by North Carolina Statutes (Sales and Use Tax Act), as amended, have been paid and discharged; and that there are no Vendor's, Mechanic's or other Liens or rights to liens or conditional sales contracts which should be satisfied or discharged before such payment is made.

Date: ___________________________ Contractor:

STATE OF NORTH CAROLINA)

ss

COUNTY OF NEW HANOVER)

Personally appeared before me this ____ day of ________, 2017,

______________________________________________ known (or made known) to me to be the

______________________________________________ (Owner)  (Partner) (Corporate Officer - Give Title)

of ____________________________________________ Contractor(s), who subscribed and swore to the above instrument in my presence.

Notary Public - (Type Name)

My Commission Expires:

____________________, 20__

The Contractor shall execute this Certificate and attach it to each Application For Payment.

END OF FORM
SUBCONTRACTOR'S/SUPPLIER'S CERTIFICATION

According to the best of my knowledge and belief, I certify that payment for all billings to (Contractor) for work under the Contract entitled:

**Cell 6E and 6D/2E Control Panel Replacement**

is current and the Contractor has been making satisfactory payment for services, equipment, supplies and materials.

Date: __________  Subcontractor and/or Supplier: ______________________________

Signed: ______________________________________

(Type Name)

____________________________________

(Company)

____________________________________

(Address)

____________________________________

(Telephone No.)

Subcontractors and/or Suppliers to complete, and Contractor to return with each Application For Payment.

END OF FORM
FINAL RELEASE OF LIEN

KNOW ALL MEN BY THESE PRESENTS, that for and in consideration of the sum of $____________________ of consideration paid to ______________________ by the ______________________ of New Hanover County, North Carolina, receipt of which is hereby acknowledged, do(es) hereby release and quitclaim to New Hanover County, North Carolina, the Owner, its successors or assigns, all liens, lien rights, claims or demands of any kind whatsoever which ______________________ now has (have) or might have against the property, building, and/or improvements, on account of labor performed, material furnished, and/or for any incidental expense for the construction of:

New Hanover County Secure Landfill

Cell 6E and 6D/2E Control Panel Replacement

thereon or in otherwise improving said property situated as above described.

IN WITNESS WHEREOF _____________ have (has) hereunto set ___________ hand and seal this ___ day of ____________, 2017, A.D.

WITNESS:

__________________________ (Seal)

SWORN AND SUBSCRIBED TO BEFORE ME THIS ___ day of ____________, 2017, A.D.

Notary Public
State of North Carolina-at-Large

AFFIDAVIT

STATE OF NORTH CAROLINA

COUNTY OF NEW HANOVER

Before me, the undersigned authority, authorized to administer oaths and take acknowledgments, personally appeared ______________________, who, after being first duly sworn, upon oath deposes and says that all lienors contracting directly with, or directly employed by (him, them, it) and that all taxes imposed by North Carolina Statutes have been paid and discharged, and that all bills, wages, fees, claims and other charges incurred by ____________________________ in connection with the construction of:

NEW HANOVER COUNTY SECURE LANDFILL
Cell 6E and 6D/2E Control Panel Replacement

SIGNED: ____________________________

By:______________________________

WITNESSES:

________________________________________

________________________________________

SWORN AND SUBSCRIBED TO BEFORE ME THIS _____ day of ________, 2017 A.D.

State of North Carolina-at-Large

My Commission Expires: ________________, 20___.

END OF FORM
**SALES TAX REPORT**

Control Panel Replacement Cell 6E and 6D/2E

<table>
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<tr>
<th>VENDOR</th>
<th>ADDRESS</th>
<th>INVOICE</th>
<th>DATE</th>
<th>AMOUNT</th>
<th>STATE TAX</th>
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<th>TOTALS</th>
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</table>

_________________________ being duly sworn, certifies that the foregoing statement of sales tax paid in the connection with the referenced contract is true to the best of his or her knowledge and belief.

_________________________
Title

Sworn to before me this ____________ day of ____________, 2017.

My commission expires ________________________, 20__.

END OF FORM
Specification

For

General Conditions

Specification Number: 16000

Project Name: Cell 6E and 6D/2E Control Panel Replacement

Project Location: New Hanover County Landfill
SECTION 16000
GENERAL CONDITIONS

PART 1.0 GENERAL

1.1 DIVISION 16 DEFINITIONS

A. "Specifications" and "drawings" as used in Division 16 Specifications and on the Electrical drawings refer to the Electrical Specifications and the Electrical drawings. Reference to Specifications and drawings other than Electrical will be specifically noted as being "Mechanical Specifications", "Mechanical drawings", etc.

B. "Engineer" as used in the Specifications or on the drawings refers to the engineer responsible for the design and specification documents.

C. "Contractor" as used in the specification or on the drawings refer to the Electrical Contractor. Portions of the work which are to be furnished or installed by Contractors other than the Electrical Contractor will be specifically noted as being "by Mechanical Contractor", etc.

D. All directives such as "provide", "install", "perform", "test", etc., are addressed solely to the Contractor, whether or not the word "Contractor" is specifically mentioned. Work included for others will be specifically identified.

E. Wherever in these Specifications or on the Electrical drawings the words "as directed", "as required", "as permitted", or words of like effect are used, it shall be understood that the direction, requirement, or permission of the Engineer is intended.

1.2 SCOPE

A. Contractor shall provide all services as defined by the Specifications, the drawings and in the Contract Scope of Work.

1.3 QUALITY ASSURANCE

A. All Codes and Standards referenced to be the latest published edition, unless otherwise noted.

B. Any conflicts between design documents and various Codes and Standards are to be referred to the Engineer for resolution.

C. Codes:

2. All State and Local Codes and Ordinances.

D. Standards:

The Specifications and Standards of the following organizations are by reference made a part of these Specifications.

1. Institute of Electrical and Electronic Engineers (IEEE).
5. Insulated Cable Engineers Association (ICEA).
10. Underwriters' Laboratories, Inc. (UL).
12. Factory Mutual System (FMS).

E. Regulatory Agencies:

1. Occupational Safety and Health Administration (OSHA).

1.4 INTERPRETATIONS

A. In cases where there are differences between what is called for on the drawings and interpretations of governing Codes and Standards, it shall be the Contractor’s responsibility to ensure that the installation is made according to the governing Codes and Standards and that the Engineer is made cognizant of the situation.

1.5 INTERFERENCES

A. The drawings are generally of a diagrammatic nature. Except where dimensioned locations are shown, the Contractor shall plan and coordinate the work to eliminate interferences with other trades

New Hanover County Secure Landfill
Cell 6E & 6D/2E Control Panel Replacement 16000-3

General Conditions
March 2017
1.6 SUBSTITUTIONS

A. Manufacturer's catalog numbers noted in the Specifications and on the drawings establish the Quality level of the equipment and materials and are not intended to limit competition. Substitutions are permitted provided that the substituted equipment is of the same level of quality as the originally specified equipment. The Engineer shall have final authority as to acceptability of substitutes.

1.7 SPECIFICATIONS

A. See Attachment "A" to this Specification for a listing of specifications that apply to this Project.

PART 2.0 PRODUCTS

2.1 CONTRACTOR SUBMITTALS

A. Throughout Division 16 are requirements for various reports, confirmations and drawings which the Contractor is required to submit to the Engineer for review.

2.2 ELECTRICAL MATERIALS

A. Electrical materials shall be new and shall be listed by the Underwriters Laboratories Inc., wherever Standards have been established by that agency. In lieu of the UL listing, consideration will be given to certified test reports of an adequately equipped, recognized, independent testing laboratory competent to perform such testing, indicating conformance to all requirements of the applicable UL standard.

B. When materials or equipment must conform to the Standards of organizations such as ANSI, NEMA, and UL, proof of such conformance shall be submitted to the Engineer for approval. Unless specifically exempted in the Construction Services Contract Document, equipment listed solely by IEC is not acceptable. If an organization uses a label or listing as proof of conformance, this will be acceptable evidence, unless otherwise specified in the individual specifications. In lieu of the label or listing, the Contractor shall submit a certificate from an independent testing organization which is competent to perform acceptable tests and must be approved by the Engineer.

2.3 CATALOGED PRODUCTS

A. Materials and equipment shall be the cataloged products of manufacturers regularly engaged in the production of such materials or
equipment and shall be the manufacturer's latest standard design that complies with the specification requirements. When two or more units of the same type, class and size of equipment are required, these units shall be products of a single manufacturer; however, the component parts of the system need not be the products of the same manufacturer. Each major component of equipment shall have the manufacturer's name, address, and the model and serial number of a nameplate securely affixed in a conspicuous location; the nameplate of the distributing agent is not acceptable.

PART 3.0 EXECUTION

Not Used.

END OF SECTION
ATTACHMENT "A"

Division 16 Specifications that apply to this Project

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<thead>
<tr>
<th>Number</th>
<th>Title</th>
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<tr>
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<td>16450</td>
<td>Grounding</td>
<td>Installation</td>
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</tbody>
</table>
Specification

For

General Electrical Installation

Specification Number: 16050

Project Name: Cell 6E and 6D/2E Control Panel Replacement

Project Location: New Hanover County Landfill
SECTION 16050
GENERAL ELECTRICAL INSTALLATION

PART 1.0 GENERAL

1.1 WORK INCLUDED
A. Refer to Section 16000 for Scope of Work.

1.2 APPLICABLE CODES AND STANDARDS
A. Refer to Section 16000 for applicable codes and standards.

1.3 SPECIAL SYSTEMS
A. Not Required

1.4 SPECIAL CATEGORIES OF INSTALLATION
A. Refer to specific sections for details on special categories of electrical installations as follows:
   1. Underground Electrical Services Section 16411
   2. Grounding Section 16450

PART 2.0 EQUIPMENT

2.1 GENERAL ELECTRICAL APPARATUS, EQUIPMENT, AND MATERIAL
A. Refer to Section 16140 for general Electrical Apparatus and Equipment

2.2 MOTORS
A. Motors are purchased under a separate contract. Not Required.

2.3 VARIABLE SPEED DRIVES
A. Not Required

2.4 PANELS - RELAY, ALARM, AND OPERATOR CONTROL
A. Unless otherwise noted on the drawings, equipment list, or within this Specification, the Contractor will furnish and install the control panel, wiring, setting, adjusting, checking, and placing in satisfactory operation service.
B. Furnished Complete for External Cabling:

Panel will be furnished complete with pushbuttons, instruments, alarms, signals, switches, relays, and other control devices completely internally wired to terminal blocks for external cabling connections. Modification of equipment and wiring is required by the Contractor.

2.5 PUSHBUTTONS, SELECTOR SWITCHES, AND CONTROL STATION DEVICES

A. Contractor Furnished:

1. The Contractor shall furnish and install all pushbuttons, selector switches, and similar control station devices required unless otherwise noted on drawings.

2. Manufacturers:

The control devices shall have the electrical characteristics, contact configurations, type, modifications, and pilot lights as indicated on the elementary diagrams and other drawings. Control stations (field mounted) shall be heavy duty 800H NEMA 4X (outdoors), and 800H NEMA 7 (hazardous locations). Panel mounted switches and devices used on field panels shall normally be Allen-Bradley Type 800H NEMA 4X (outdoors) and 800H NEMA 7 (hazardous locations).

3. Enclosures:

Where required, special switches shall be of the types specified on the drawings. NEMA 4X watertight enclosures shall be normally provided for all outdoor locations. Other enclosures shall be suitable for the environment and shall be as specified on the drawings. Stainless Steel conduit shall be required as delineated on the drawings.

4. Colors and Pilot Lights:

Stop buttons shall be colored red. Start buttons shall be black as indicated. Pilot lights shall normally be 120 volt, incandescent, transformer type press-to-test type, with 6.3 volt lamps. Lenses shall be non-faceted and colored as indicated on the elementary diagrams and drawings.

5. Nameplates:
All devices shall be provided with nameplates describing the proper function or each unit or position and also with engraved giving equipment name and number.

2.6 MISCELLANEOUS CONTROL DEVICES

A. Miscellaneous control devices such as limit switches, pressure switches, level switches, float switches, trip valves, solenoid valves, louver and damper controls, relays, timers, and similar equipment shall be furnished and installed under this Contract.

B. Furnished With Equipment:

Devices that are furnished with main equipment shall be marked (normally) by special symbol "FWE" (Furnished With Equipment).

C. Contractor Responsibility:

Miscellaneous electrical control devices mounted in pipes, tanks, ducts, or furnished with equipment shall be wired, connected, adjusted, properly set, checked out, and placed in operating service by the Contractor. The Contractor shall also be responsible for mounting, identifying wiring, connecting, adjusting, setting, checking, and placing into satisfactory service as defined in the construction services contract document, all miscellaneous control devices.

2.7 ERECTION OF EQUIPMENT

A. General

1. Manufacturer's Installation Instructions:

Where furnished or called for by the manufacturer's representative, equipment manufacturer's installation instructions shall be considered a part of the Specification and fully complied with. These instructions shall be strictly adhered to for the installation of switchgear, substations, medium voltage cables, motor control centers, panels, and similar equipment.

B. Motors:

1. Motors shipped separately from driven equipment shall be set by the Electrical Contractor, coupled, and aligned by the Mechanical Contractor. Manufacturer's instructions shall be used to determine assignment of responsibility concerning equipment furnished with motors pre-mounted or mounted on an equipment skid.

C. Mounting Heights:
Individual safety switches, pushbuttons, and other devices shall normally be installed at the following mounting heights unless dictated otherwise by State or Local Codes: (All heights given are to bottom of device above grade, unless otherwise noted).

1. Safety Switches: 6 feet - 0 inches (to top)
2. Pushbuttons: 4 feet - 0 inches
3. Manual Starters: 4 feet - 6 inches
4. Manual pull stations: 4 feet - 0 inches
5. Receptacles: 1 feet - 6 inches

D. Mounting:

1. Equipment, control devices, and junction boxes shall be supported independent of conduit connections. Panels or cabinets shall not be mounted directly in contact with structure. Control devices and metal enclosures shall be bolted to channel (Unistrut) in a manner appropriate for the environment (See Typical Details).

2. All electrical equipment and devices such as miscellaneous switches, floats, photoelectric devices, and similar electrical devices will be located and set as shown on details or drawings.

2.8 GENERAL WIRING METHODS

A. Separation of Usage:

Motor and control wiring shall be routed in conduits, or other raceways as shown on the drawings. Power and control wiring shall not be routed in a common raceway except where shown on the drawings.

B. Pulling:

Where mechanical assistance is used for pulling conductors, Ideal No. 77 or equal may be used for 600 volt insulated conductors. Cable jacket and pulling compound compatibility is to be verified prior to pulling cable.

C. Splices and Terminations:

1. Lighting Conductors:

Conductors shall be continuous between boxes and condulets. No splices between boxes or condulets is permitted. Splices from fixtures to circuit conductors shall be made with wire nuts and 2-
half-lap layers of Scotch 33 Brand insulating tape applied over the joints.

2. Control Conductors:

Where control conductors (as directed by the drawings) are tapped, (i.e., where more than two conductor join), connections shall be made on terminal blocks. No taps shall be joined and tapped making them inaccessible for verification. Control conductors shall not be tapped other than in equipment and panels unless the drawings specify junction terminal boxes at other location. No control conductors shall be spliced in any manner. All control conductor terminations shall be made on terminal blocks only, including shields and routed point to point.

3. Power Conductors:

a) Conductors shall be continuous from outlet to outlet. No power cable shall be spliced except on explicit instructions by the Owner's Representative.

b) Splices, where approved, and terminations of cable operating in excess of 1000 volts, shall be made in accordance with the cable manufacturer's instructions.

c) Connections to motors shall be made using T&B one hole compression lugs on both motor terminal and feeder conductor bolted together and covered with Raychem heat shrink or 3M Corp. cold-shrink splicing boots.

D. Lugs:

1. All lugs shall be furnished and installed by the Contractor.

2. Lugs for control wiring shall be T&B "Sta-Kon" nylon or vinyl insulated locking fork-tongue or ring-tongue lugs.

3. Lugs for copper power wiring, sizes No. 12 and No. 10 AWG shall be T&B "Sta-Kon" uninsulated ring type lugs. Lugs for copper power wiring from size No. 8 AWG to size No. 1/0 AWG shall be T&B one-hole type 54100 series (600V).

4. Where 600V motor leads are furnished without lugs, T&B 54100 series lugs shall be added.

5. No mechanical type lugs shall be used. If any mechanical type lugs are furnished with equipment, the Contractor shall replace them with the proper compression type lugs.
E. Taping:

1. All voids, sharp corners, and bolt projections shall be made smooth by filling with Okonite or Scotch Fill before applying the laps of tape required for insulation.

2. Joints and other sections of wiring requiring tape shall be half-lapped and at least two layers. Taping shall be neatly done and shall form a permanent insulation equal in mechanical and electrical strength to the insulation of conductor. Taping shall be as follows:

   a) 600V Insulation: A minimum of 3 half-lapped layer of Okonite Low Voltage rubber insulating tape or 3M rubber tape and 2 half-lapped layers of 3M No. 33 or Okonite No. 35 jacketing tape.

   b) All taping, splicing, and termination materials shall be furnished by the Contractor.

2.9 IDENTIFICATION

A. All instrument and apparatus control cable individual wires shall have permanent, discrete identifiers (color or numbers) in addition to wiring identification numbers as shown on typical wiring diagrams to allow for easy identification and tracing. Wire identification numbers shall be placed on each end of the conductor involved by sign heat shrink marker tags. Raychem Co. Type TMS or equal. Wire numbers shall be as shown on the Elementary drawings.

B. Phase Identification:

Phase sequence throughout the installation shall be standardized in all power wiring (reference Section 16120 for phase sequence color coding).

C. Device Identification:

1. Control and power devices shall be plainly and permanently identified using the same identification as shown on the Elementary Diagram or Power Plan. Identification shall be shown on a plate mounted on the device. Control station components shall be identified by function.

2. Exception: Where the size or location of the devices make individual identification impractical, such as electronic assemblies, group identification shall be used.

3. Motors:
All motors shall be tagged by the Contractor with a permanent brass tag giving the motor number and driven equipment name per the equipment list. This tagging shall be submitted to the Owner for review.

4. Instrumentation:

All instrumentation including, but not limited to, flow switches, pressure switches, limit switches, solenoid valves, timers, level switches, transmitters, and analyzers shall be tagged by the Contractor with a permanent embossed brass or aluminum tag in accordance with the Flow Diagrams giving the instrument number.

5. Nameplates:

a) The Contractor shall provide and install, on indoor equipment, an engraved laminated phenolic nameplate, black letters on white background for safety switches, contactors, motor controllers, individual circuit breakers, control devices, junction terminal boxes, and any other equipment used to control, switch, or disconnect electrical circuits. The nameplate engraving shall be in accordance with data provided on the drawings.

b) The Contractor shall provide brass engraved nameplates for all field mounted pushbutton stations and disconnect switches as shown on details. The Contractor shall provide the same engraving of the name and equipment number on the field mounted pushbutton stations and disconnect switches as the name and equipment number on the starter in the Motor Control Center or as directed by the Owner's Representative. A complete listing shall be forwarded to Owner for approval.

PART 3.0 EXECUTION

Not used.

END OF SECTION
Specification

For

Electrical Raceways

Specification Number: 16111

Project Name: Cell 6E and 6D/2E Control Panel Replacement

Project Location: New Hanover County Landfill
SECTION 16111
ELECTRICAL RACEWAYS

PART 1.0 GENERAL

1.1 WORK INCLUDED

A. Equipment Furnished.

   The Electrical Contractor shall furnish and install the following equipment as required:

   1. Rigid Stainless steel conduit.
   2. Rigid PVC conduit.
   3. Liquid-tight flexible metal conduit.
   4. Conduit fittings, including explosion proof.

1.2 CODES AND STANDARDS

A. For applicable Codes and Standards, refer to Section 16000.

1.3 SUBMITTALS

A. Submit under provisions of relevant sections of the General and Supplemental General Conditions and Division 1 Specifications Sections.

B. Product Data: Provide for metallic conduit, flexible metal conduit, liquidtight flexible metal conduit, metallic tubing, nonmetallic conduit, fittings and conduit bodies.

PART 2.0 EQUIPMENT

2.1 CONDUIT

A. Rigid Stainless Steel Conduit


2. Each piece of conduit shall be straight, free from blisters and other defects, cut square and taper reamed, and furnished with coupling in 10-foot lengths threaded on each end.
3. Coupling shall be applied to one end of each length of conduit and color-coded plastic thread protectors to the other end. All couplings and fittings shall be 316 Stainless Steel.

4. Rigid Stainless steel conduit may be used in all areas except where prohibited by the NEC or noted otherwise on the drawings.

B. Rigid PVC Conduit

1. PVC conduit shall be heavy wall Schedule 40 and rated for service at 90 degrees C. Tubing shall be of PolyVinylChloride produced from high impact unplasticized PVC compound having non-combustible, non-magnetic, non-corrosive, and chemical resistant properties. Conduit shall conform in all respects to Federal Specification WC-1094 and NEC Article 347.

2. Conduit shall be furnished in 20-foot lengths with one coupling applied to each length. Each length shall be marked with the manufacturer's name, trademark, type of material, and whether it is recognized for use above or below ground (sunlight resistant).

3. Rigid PVC conduit may be installed in applications below grade, where shown on the drawings or in the specifications. Where it is installed under load-bearing driveways, roads, or parking lots it shall be concrete encased. An alternate is to install rigid stainless steel conduit at NEC minimum embedment elevations.

4. All mounting hardware shall be stainless steel.

5. Elbows from below grade up to equipment to be rigid galvanized steel using steel/PVC adapters.

C. Liquid-Tight Flexible Metal Conduit

1. Liquid-tight flexible metal conduit shall be fabricated from an aluminum tape which is spirally wrapped into an interlocked assembly and is covered with an outer liquid-tight, non-metallic, sunlight-resistant PVC jacket and is available in standard conduit trade sizes. Liquid-Tight flexible metal conduit shall comply with NEC Article 351.

2. Liquid-tight flex shall be used where necessary to allow for movement or to localize vibration. Its use shall be limited to trade sizes 1/2 inch through 4 inches, no longer than 3 feet in length.

3. All connections to distribution transformers shall be made using liquid-tight flex a minimum of 18 inches in length.
2.2 CONDUIT FITTINGS

A. Rigid Stainless Steel Conduit Fittings

1. All conduit fittings used must be of the same material as the conduit with cast covers and neoprene gaskets unless otherwise specified on the drawings. Condulets are to be of the threaded type, Crouse-Hinds or equal. Mogul series condulets are required on 1-1/4 inch conduit and larger.

2. Conduits shall terminate in threaded hubs. T&B 370 series bullet hubs may be used where required except in Class I, Division I areas.

3. Threadless or set-screw couplings are prohibited.

4. In hazardous areas, conduit fittings shall be of the type approved for the hazardous area of classification.

B. Liquid-Tight Flexible Metal Conduit Fittings.

Connectors for liquid-tight flex shall be of stainless steel or aluminum with a nylon insulated throat. Connectors shall firmly grip the metal flex as well as the PVC jacket and shall be furnished with a sealing O-ring where entering the enclosure. Fittings shall be T&B Super-Tite through 1-1/4 inch, and T&B Liquid Tight external grounding type 1-1/2 inch and larger.

2.3 RACEWAY SUPPORTS

A. Conduit Straps

1. Conduit straps for individually run conduits shall be of the same material as the conduit.

2. For structural steel support, use Kindorf type RC conduit clamps.

3. For flat wall, use of the following is permitted:

a) Two-hole pipe straps or one-hole pipe straps with wall spacers. Attach to wall with fasteners appropriate for the composition of the attachment surface. Expansion anchors to be used in concrete masonry walls. Plastic expansion and toggle anchors are not permitted.

b) Conduit secured to channel (Unistrut P1000 or P1001) with pipe straps, drilled channel secured to wall with expansion anchors, flat washers and spring nuts.
c) Conduit support devices specifically manufactured for the permanent support of electrical raceway. Strap iron and other materials not specifically designed for this purpose will not be permitted.

4. J-clamp type pipe supports are not permitted.

B. Channel Support Systems

Where multiple conduits are run together, and for other electrical equipment supports, standard structural channels shall be used (Unistrut, Kindorf, B-Line or equal).

C. Support configurations as shown on the typical details and drawings.

2.4 CONDUIT INSTALLATION

A. Motor Terminations.

Conduits shall terminate at motors in liquid-tight flexible conduit. Electrical Contractor shall provide reducers or drill and tap larger where required to facilitate installation.

B. Conduit Rack Installation.

1. For multiple runs of conduit, racks or supports must be provided and constructed of sufficient strength to ensure secure support. They must be of designs shown on typical details, or as detailed on the drawings, or as approved by the Contractor.

2. Conduit routing and racking is not shown on the plan drawings. The Electrical Contractor shall group and route conduit to avoid interferences with other trade's installations. Conduit shall not be routed other than parallel or perpendicular to walls to allow for appearance of good workmanship.

3. The Electrical Contractor shall size and locate pull boxes per all applicable codes and to allow for ease of installation and maintenance.

C. Support Spacing

1. Conduit support spacing shall be in accordance with Articles 346 through 351 of the National Electrical Code.

D. Plugging.
1. Any unused openings in raceway, fittings, boxes, etc., shall be plugged with T&B series 121 metallic bushing and series 815 steel pennies or other equivalent means.

E. Raceway Integrity

1. Conduit and other raceway shall be installed in a manner that will prohibited the entrance of water, moisture, or any other contaminants at all equipment or devices. Satisfactory and adequate methods of installation, materials, sealing, breathing, drainage, and physical aspects of installation shall be used to ensure the proper, minimum maintenance installation.

2. Seals and Drains
   a) Where conduits pass from areas of high humidity to cooler ambients, they must be sealed with Crouse-Hinds type EYS or EZS, or Appleton sealing condulets with suitable drain fittings. Conduits must also be sealed in hazardous areas as required per NEC Article 500.
   b) Vertical loops in conduit should be avoided if possible, but when they are necessary, the conduit must be drained with ECD drain installed in proper condulet.

F. PVC Conduit Installation

1. PVC conduit system shall be installed in strict accordance with the manufacturer's instructions and recommendations. The installation will be rigidly inspected for damage. Damage noted will be repaired by the Electrical Contractor in strict accordance with the manufacturer's recommendations.

G. Minimum Size

1. Minimum size conduit shall be:
   a) Rigid stainless steel conduit - 1/2 inch.
   b) Liquid-tight flexible conduit.
   c) PVC conduit - 1 inch.
   d) Below grade - 1 inch, regardless of material.

2. Size restriction does not apply to vendor furnished conduits or any raceway furnished with equipment or fixtures, except as noted on the drawings.
H. Bends

1. Changes of direction in conduit runs shall preferably be made in manufactured elbows. Where conduit must be bent, bending shall be done using a hand bender or hickey, or a hydraulic bender. Bends shall be carefully made so as not to cause any kinks, flattening of the conduit, or any changes to the internal conduit area. One-shot bending is not permitted on 4 inch and larger conduit.

2. Conduit runs shall not have more than four 90 degree bends or equivalent of 360 degrees of bends between pull points.

I. Joints

1. Electrical Contractor shall square cut all conduit ends, ream and file to remove burrs before installation, and shall properly clean and cap all empty conduits.

2. Running threads shall not be used on conduit for connection at joints and couplings.

J. Installation

1. Conduits shall not be run alongside or within 1 foot of steam, hot fluid, or gas lines.

2. Installation of raceway shall be complete including end caps, box covers and condulet covers. Raceway shall be cleaned with a swab or duct cleaner, then proved with a mandrel prior to pulling cables.

K. Typical Details.

1. See " Typical Details " on drawings for additional application requirements.

L. Conduit Wrap

1. Concrete Slabs

   a) All conduits entering or exiting from concrete slabs or pads, or elbows used to connect to PVC conduit underground shall be hot-dipped rigid galvanized steel. Conduit passing through the slab shall be given two heavy coats of coal tar enamel (Bitumastic). Conduit underneath concrete slabs may be PVC, not required to be concrete encased.
2. Below Grade

a) All conduits exiting from below grade in outside areas subject to atmospheric conditions shall be encased in concrete to a point approximately 6 inches above grade. Where PVC conduit is used below grade, adapters to rigid steel conduit shall be used for exiting above grade, outside of enclosures. The adapters shall be installed in the horizontal portion prior to the turn-up.

2.5 CABLE TRAYS

Not Required.

2.6 UNDERGROUND INSTALLATIONS

A. Underground conduit shall be PVC Schedule 40 heavy wall conduit or Stainless Steel, see drawings for locations. Concrete encasement shall be as specified on the drawings or as required by this specification. Conduit installed under and within 4'-0" of roadways and other load-bearing surfaces shall be rigid steel galvanized approved for direct burial or concrete encased PVC.

B. Underground conduit shall have a minimum of two Brady Company yellow safety tapes marked "CAUTION - BURIED ELECTRICAL LINE" above them, one 6 inches above their to surface, and one 12 inches above their to surface. On duct banks 3 feet wide and larger, one strip is to be laced on each side 6 inches above the duct bank and should be repeated 12 inches above the duct bank. On duct banks less than 3 feet wide, one strip of the warning tape should be laced in the center of the duct bank 6 inches above the concrete and another 12 inches above the concrete.

C. For further underground installation criteria, see Section 16411.

PART 3.0 EXECUTION

Not used.
Specification

For

Low Voltage Wire and Cable

Specification Number: 16120

Project Name: Cell 6E and 6D/2E Control Panel Replacement

Project Location: New Hanover County Landfill
SECTION 16120
LOW VOLTAGE WIRE AND CABLE

PART 1.0 GENERAL

1.1 WORK INCLUDED

A. This specification covers the requirements for all low voltage wire and
cable to be used in the installation of the electrical systems for this project.
The systems include power, lighting, control, and instrumentation
systems. This specifications does not include requirements of special
systems cable or plenum cable. Guidance for special systems appears in
the specific system specification.

B. All wire and cable shall be furnished and installed by the Contractor,
except where furnished by others as indicated on the conduit and cable
schedule or the plan drawings.

C. Abbreviations

1. ANSI American National Standards Institute.
2. EPR Ethylene-Propylene Rubber.
3. IEEE Institute of Electrical and Electronic Engineers, Inc.
4. ICEA Insulated Cable Engineers Associations
5. ISA Instrument Society of America.
6. NEC National Electrical Code.
7. NEMA National Electrical Manufacturer’s Association.
8. PVC Poly Vinyl Chloride.
9. UL Underwriter's Laboratories.

1.2 GENERAL REQUIREMENTS

A. All wire and cable shall be UL listed. In addition to other standard
labeling, all wire and cable shall be marked “UL” on the outer surface
indicating UL certification.

B. All insulated wire and cable shall conform to the minimum requirements of
the ICEA standards for cable installed in wet locations, with the cable
being subjected to all degrees of moisture conditions. Wire and cable

shall comply with the applicable requirements of the NEC (latest edition) in regards to cable construction and usage.

C. The conductors of wires and cables shall be of copper and have conductivity in accordance with the standardization rules of the IEEE. The conductor and each strand shall be round and free of kinks and defects.

D. Conductors of insulated wires and cables shall be stranded in accordance with the ICEA Class “B” or “C”. Single conductor sizes No. 12 AWG through No. 10 AWG used for lighting and receptacle circuits shall be solid, non-stranded.

E. Grounding conductors, when insulated, shall be colored solid green. Conductors intended as a neutral shall be colored solid white or gray.

1.3 SUBMITTALS

A. Submit under provisions of the General and Supplemental General Conditions and Division 1 Specifications Sections.

B. Product Data: Provide manufacturer's catalog information showing dimensions, ratings, colors, and configurations.

PART 2 PRODUCTS

2.1 MULTICONDUCTOR POWER CABLE

A. 600 volt multi-conductor power cable shall be type TC, suitable for cable tray installation and approved for direct burial. Rated for 90 degrees C operation in wet or dry locations without deterioration. It shall be made of single copper conductor type rated XHHW-2 (EPR or XLPE). The conductors are to be cabled together with copper ground wires in the interstices, suitable fillers, tape and a flame retardant sunlight and weather resistant overall PVC or Hypalon jacket. The cable shall pass the IEEE-383 flame test.

B. Ground wire size shall meet NEC Article 250 requirements.

C. Phase color coding for three conductor cable shall be accomplished using integrally colored cable insulation or colored tape at the cable terminations, as follows:

<table>
<thead>
<tr>
<th>240/120VAC Color Code:</th>
<th>PHASE A</th>
<th>PHASE B</th>
<th>PHASE C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black</td>
<td>Red</td>
<td>Blue</td>
<td></td>
</tr>
</tbody>
</table>
2.2 SINGLE CONDUCTOR LIGHTING, POWER, AND CONTROL WIRING

A. 600 volt single conductor power and control wiring shall be type XHHW-2 rated for 90 degrees C operation in wet or dry locations without deterioration. It shall be made of single copper conductor with EPR or XLPE insulation. The cable shall pass the IEEE-383 flame test.

B. 600 volt single conductor lighting wire shall be type THHN/THWN thermoplastic insulated stranded copper wire with a nylon jacket rated to withstand conductor temperature of not less than 75 degrees C without deterioration. Wiring terminating inside of fixture enclosures or ballast housings shall be rated not less than 90 degrees C.

C. For single conductor lighting, power, and control conductors that originate on molded case circuit breaker terminals or other device terminals rated at less than 75 degrees C, insulation must by type TW thermoplastic over stranded copper wire rated to withstand conductor temperature of 60 degrees C, wet or dry. Transition to THHN/THWN insulated conductors for lighting or XHHW insulated conductors for power is permissible downstream of the home run conduit.

2.3 MULTI-CONDUCTOR CONTROL CABLE

A. Multi-conductor control cable shall be NEC Type TC for tray installation and approved for direct burial, No. 14 AWG through No. 10 AWG, 7 or 19 strand copper with XLPE insulation. Individual conductors, 600V Type XHHW, are to be cabled together with the necessary tape and fillers. The cable shall pass the IEEE-383 flame test.

B. Individual conductors to be UL listed and color coded in accordance with Table 1 "Control Cable Color Code and Sequence".

C. Base colors shall be obtained by integrally colored insulation compound.

2.4 SHIELDED INSTRUMENT CABLE

A. Flame retardant shielded cable shall be stranded copper, individually insulated with flame retardant PVC, conductor size as indicated on the conduit and cable schedule, but no smaller than No. 18 AWG. The cable shall be 300V PLTC, UL approved for tray installation and direct burial in accordance with NEC Article 318. The insulated conductors shall be twisted into pairs or triples if specified and each pair or triple shielded with an aluminum Mylar 100% shield with a tinned copper drain wire, cable tape, and a flame retardant PVC jacket. Where multi-pair or multi-triples are required, the individual shielded pairs or triples shall be cabled together with an overall aluminum Mylar 100% shield with a copper drain wire.
B. Color code of each pair shall be black and red. Where triples are required, colors shall be black, red, and blue. Each pair of triples within a multi-pair cable shall be numbered.

2.5 THERMOCOUPLE CABLE

A. Not required.

2.6 PORTABLE CORDS

A. Portable cords shall be UL type "SO" or "STO" 600 volt cord with green grounding conductor.

PART 3.0 EXECUTION

Not Used.

END OF SECTION

TABLE 1 FOLLOWS
<table>
<thead>
<tr>
<th>CONDUCTOR NUMBER</th>
<th>BACKGROUND OR BASE COLOR</th>
<th>FIRST TRACER COLOR OR HASH MARK</th>
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<tr>
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</tbody>
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Specification

For

Electrical Apparatus and Equipment

Specification Number: 16140

Project Name: Cell 6E and 6D/2E Control Panel Replacement

Project Location: New Hanover County Landfill
SECTION 16140
ELECTRICAL APPARATUS AND EQUIPMENT

PART 1.0 GENERAL

1.1 WORK INCLUDED

A. The Contractor shall furnish and install all equipment and apparatus listed in this specification except where the items are specifically referred to as Owner furnished or furnished by others. In which case, the Contractor shall install the referenced item. For all other general provisions, refer to Section 16000.

1.2 SUBMITTALS

A. Submittals: Procedures for submittals. Submit under provisions of the General and Supplemental General Conditions and Division 1 Specifications Sections.

B. Product Data: Provide ratings and enclosure dimensions for safety switches. Submit catalog sheets showing voltage, controller size, ratings and size of switching and overcurrent protective devices, short circuit ratings, dimensions, and enclosure details for magnetic motor starters. Provide data sheets showing electrical characteristics including time-current curves for fuses.

PART 2.0 PRODUCTS

2.1 EQUIPMENT

A. Individual Magnetic Motor Starters

1. General

a) Individual magnetic motor starters shall not be smaller than NEMA Size 1. Enclosures for outdoors shall be NEMA 4X. The Contractor shall add to, and/or modify, any wiring or equipment to match the elementary diagrams, or as otherwise designated on the drawings.

2. Overload Protective Devices

a) Motor controllers and starters shall have overload protective devices in each ungrounded phase and shall be the thermal, inverse time type. A manual reset-type pushbutton shall be provided on the outside of the controller housing.
3. Type
   a) Starters and controllers shall be of the type designated on the drawings such as:
      (1) Full voltage non-reversing (FVNR).
   b) Starters and controllers shall normally be of the combination type to provide an individual disconnect means and short-circuit protection by means of a magnetic only motor circuit protector (MCP) or thermal-magnetic circuit breaker.
   c) Covers shall be interlocked with the operating handle of the switch so that the cover cannot be opened unless the switch is in the OFF position. The interlock shall be "defeatable" by authorized personnel. The operating handle shall be suitable for padlocking in the OFF position with not less than 2 padlocks.
   d) Dead-front type construction shall be used on the combination units.

4. Control Power
   a) Unless otherwise designated, controls shall be 120 volts. Starters shall be equipped with individual control power transformers with secondary fuse and grounded.

5. Auxiliary Contacts
   a) Auxiliary contacts shall be added as required by the elementary diagrams if existing equipment does not have adequate spare contacts.

B. Overload Heaters
   1. Number
      a) Three overload heaters shall be provided in all three-phase motor controls and one in 120 volt single-phase motor controls.
   2. Sizing
      a) Overload heaters shall be sized according to the motor full load currents and NEC Article 430.

C. Circuit Breakers
1. Owner or Contractor Furnished
   a) Normally, circuit breakers shall be included as a part of any equipment designated to be furnished by others. Otherwise, the Contractor will furnish and install all breakers designated on the drawings or equipment list that are not indicated as being furnished by others.

2. Breakers shall be of the type, rating, number of poles, sizes, and interrupting capacity specified or required for the environment, location, application and load served.

3. Molded Case Circuit Breakers
   a) Molded case circuit breakers shall be circuit interrupting devices which will operate both manually for normal switching functions and automatically under overload and short circuit conditions. Circuit breakers shall provide circuit and self-protection when applied within rating.
   b) The operating and switching mechanism shall be entirely trip-free so that the contacts cannot be held closed against an abnormal overcurrent or short circuit condition. The switching mechanism shall be quick-make, quick-break type.
   c) The operating handle of the circuit breaker shall open and close all poles of a multi-pole breaker simultaneously.
   d) Each circuit breaker shall have a trip unit to provide overload and short circuit protection. The trip unit for each pole shall have elements providing inverse time delay under overload conditions and instantaneous magnetic tripping for short circuit protection. The trip element shall operate a common trip bar which shall operate all poles in case of an overload or short circuit through any one pole. Automatic tripping shall be clearly indicated by handle position.
   e) Conductor terminations shall be rated 75 degrees C minimum.

4. Individually Mounted Enclosure
   a) Individually mounted circuit breakers shall be mounted in enclosures specified as suitable for the location and the environment.
   b) Outdoor enclosures shall be NEMA 4X.
5. Applications
   a) For the applications listed, molded case circuit breakers shall be rated as follows:

<table>
<thead>
<tr>
<th>SERVICE VOLTAGE</th>
<th>AMPERE RANGE</th>
<th>USAGE</th>
<th>INTERRUPTING CAPACITY (RMS SYM. AMPERES)</th>
</tr>
</thead>
<tbody>
<tr>
<td>120/240</td>
<td>15-125</td>
<td>Lighting or Service Panels</td>
<td>10,000</td>
</tr>
</tbody>
</table>

A. Safety Switches
1. Configuration
   a) The switches shall be of the type, voltage, ampere and horsepower rating, number of poles, fusible or non-fusible, as specified or required for the environment, location, application and load being served.

2. Type
   a) All safety switches shall be NEMA premium heavy-duty, horsepower rated, industrial type, Square-D Class 3110 or equal. All switches shall be UL listed.
   b) Fusible switches shall be complete with fuses of the type and rating as indicated on the drawings or in the specifications.
   c) All switches shall have switch blades that are fully visible in the OFF position when the door is open and shall be of dead front construction, with arc suppressers.
   d) The mechanism shall be quick-make, quick-break type.
   e) The door shall be the defeatable interlock type with the handle or mechanism to prevent unauthorized opening of the door in the ON position.
   f) Padlocking provisions shall be provided for padlocking in the OFF position with one or more locks or lockable hasps.
   g) Grouped switches in a common enclosure shall be mounted in enclosure types specified elsewhere.
h) Outdoor enclosures shall be NEMA 4X.

i) All switches shall be provided with an engraved laminated phenolic nameplate showing the power source (unit number or other), and title and equipment served. Nameplates to be black letters on a white background indoors, stainless steel outdoors.

B. Fuses

1. Manufacturer and Listing

   a) Dual-element, time-lag fuses shall normally be used unless otherwise specified or shown on the drawings. Fuses shall be as follows:

   (1) Bussman Manufacturing Division of McGraw Edison Company, Fusetron Class K5.

       (a) 240 VAC-type FRN-R

       (b) 600 VAC-type FRS-R

   (2) Gould-Shawmut, Trionic class K5

       (a) 240 volt-type TR-R

       (b) 600 volt-type TRS-R

2. Listing

   a) Near completion of the work, the Contractor shall confirm that the proper fuses are installed in each fusible device, and shall furnish to the Owner a complete listing of fuses. The list shall indicate the number, class, size and type fuse and the equipment number, horsepower, and descriptive title of the equipment protected. Where Contractor purchased fuses are not properly sized, the Contractor shall replace them with properly sized fuses. At the end of the project, the Contractor shall turn over to the Owner all remaining Contractor furnished fuses. One spare set of each type and size of fuse installed shall also be furnished.

C. Boxes

1. Outdoor applications shall be NEMA type 4X.
2. Special installations such as corrosive or hazardous classified areas will be as shown on the drawings.

3. All boxes shall be furnished with appropriate covers and shall be accessible for maintenance purposes.

4. Surface mounted boxes installed exposed shall be threaded, cast alloy iron or malleable iron. Iron type shall have zinc electroplate, or galvanized finish with appropriate lacquer.

5. Boxes shall be of the approved type for the devices served and shall be made of a material and finish compatible with the conduit system and location.

6. Splice and Tap Boxes
   a) Splice and tap boxes for power circuits shall be used only where designated on the drawings and shall be of the type and sizes indicated. On lighting and convenience receptacle circuitry, wiring may be spliced and boxes shall be provided for concealed or surface mounting as previously specified or may be JIC girtight of size and type indicated on the drawings or minimum size as specified in the NEC.

7. Pull Boxes
   a) Pull boxes for outdoor exposed wiring shall be provided as required to facilitate the installation of the wiring.
   b) Pull boxes shall be accessible for maintenance use.
   c) For conduit sizes 3/4, 1 and 1-1/2 inch, conduit fittings of the "C", "LB", "T" and similar types may be used for cable pulling.
   d) Where pull boxes are required, each power circuit shall have a separate galvanized steel threaded hub type box with a gasketed cover installed.
   e) For exterior, exposed work pull boxes shall be threaded hub type with gasketed cover and of equivalent lengths as shown in table above.

8. Junction and Terminal Boxes
   a) Junction and terminal boxes for control circuits shall be installed where shown on the drawings or as required to facilitate the installation.
b) In terminal boxes, all control wiring shall be terminated on identified terminal blocks or terminal points. Splicing and joints are not permitted except where specifically called for on the design documents.

c) Knockout type boxes are not permitted. All boxes shall be individually punched or with hubs as determined by the conduit routings.

d) Terminals inside terminal boxes shall be numbered to match the wire numbers as shown on the elementary diagrams (if shown) or other drawings. Wire numbers shall be placed on the terminal box subpanel using labels with the numbers typed on the labels in non-smear ink.

e) Terminal blocks in terminal boxes shall be Allen Bradley 1492-CA1, channel mounted, medium duty, tubular clamp type or equal. Not more than two conductors per terminal shall be allowed. Switch-action fused terminal blocks shall be Allen Bradley 1492-CE9 or equal.

9. Sizing

a) All junction and terminal boxes shall be sized and configured by the Contractor unless otherwise indicated on the drawings. Boxes shall not be smaller than the sizes as required by the NEC or as indicated on the drawings.

END OF SECTION
Specification

For

Underground Electrical Services

Specification Number: 16411

Project Name: Cell 6E and 6D/2E Control Panel Replacement

Project Location: New Hanover County Landfill
PART 1.0 GENERAL

1.1 WORK INCLUDED

A. Underground electrical conduits and conduit duct banks.

1.2 QUALITY ASSURANCE

A. All codes and standards are understood to be the latest editions, unless otherwise noted.

B. Comply with the following minimum requirements:

1. NEMA TC-2 Schedule 40 Polyvinyl Chloride Conduit.

2. UL Underwriter's Laboratories Labeling or Listing.

C. Standard of Quality.

D. Throughout the specification, types of materials may be specified by manufacturer's name and catalog number in order to establish standards of quality and performance and not for the purpose of limiting competition. Unless specifically stated otherwise, the Contractor may assume the phrase "or other approved" is inferred, except that it is the Contractor's responsibility to prove equality with specified items. If the Contractor elects to prove such equality, he must request the Owner's Representative's approval in writing prior to substituting such items for the specified item.

PART 2.0 PRODUCT

2.1 MATERIALS

A. Underground Duct Bank - Concrete Encased.

1. Plastic Conduit:

   Rigid PVC conduit per NEMA Standard TC-2, Designation EPC-40-PVC for Type II application, direct burial and encase in concrete. Standard lengths with tapered end and matching solvent-weld type couplings. The following list constitutes the only approved manufacturers for the conduit.

   a) Carlon.
b) Olin.
c) Orangeburg Standard.
d) Triangle.
e) Other approved.

B. Miscellaneous hardware.

1. Drag Wire:
Continuous type, nylon coated steel drag wire.

C. Cast-In-Place Concrete and Components:

Conform to the following general requirements.

1. Provide concrete work per ACI 301-72 (Rev. 81) and ASTM C94, and related reference ACI and ASTM Standards.

2. Provide normal weight, 3,000 psi air-entrained concrete at 28 days.

3. Provide cement, ASTM C150, Type II for moderate sulfate resistant, standard strength (28-day) concrete.

4. Provide fine and coarse aggregates, per referenced standards, 1-inch maximum size.

5. Utilize air-entrained admixture to produce air-entrained concrete. Submit manufacturer and type of approval.

6. Mix red inorganic pigment (iron oxide) in cement, at rate of 5 pounds per 100 pounds Portland Cement, or paint the top of the duct bank concrete red.

7. For reinforcing steel, use deformed bars per ASTM A615, Grade 60. Utilize metal or plastic chairs or spacers to support reinforcing. Do not use brick, block, tile, wood or similar material. Provide "sand plates" or resteel chair legs where chairs are supported on earth or granular fill.

D. Grounding:

Provide grounding in accordance with NEC Article 250, mandatory rules and as indicated on the drawings. Also reference Section 16450 of these Specifications.

PART 3.0 EXECUTION
3.1 TRENCH EXCAVATION

A. Comply with the following OSHA requirements, Sub-Part P.
   1. 1926.650; General Protection Requirements.
   2. 1926.651; Specific Excavation Requirements.
   3. 1926.652; General Trenching Requirements.
   4. 1926.653; Definitions.

B. Excavate by an approved method to permit installation of the duct bank along the grades shown on the drawings.

C. Excavate a trench of sufficient width to allow thorough compacting of the backfill under and around the duct bank.

D. Where excavation is in rock, remove all rock to a depth below the grade shown on the drawings. Rock excavation shall be classified or paid for on a unit price basis. Rock is defined as material that cannot be ripped or excavated by a backhoe with a one cubic yard bucket with rock teeth.

E. The Owner's approval is required for the extent of trench excavation, prior to the duct bank installation, for planning purposes.

F. Provide all necessary bracing and bridging to maintain traffic flow during construction, through all the areas interrupted by trenching.

G. Provide all necessary repair to erosion control measures and redeeding of the areas distributed by trenching.

H. Sheet and brace the excavation, as required, to prevent caving. The trench width may be increased accordingly. Maintain sheeting until the duct bank has been inspected and backfilled to a depth of two feet over the top of the duct bank. Leave sheeting and shoring in place, where directed by the Owner's Representative.

I. Provide all pumping necessary for de-watering the trenches and the existing manhole to provide proper work conditions for installation of the duct bank and appurtenances.

3.2 DUCT BANK INSTALLATION.

A. Provide Schedule 40, PVC conduit in one complete lot. Partial shipment will not be permitted.
B. Carefully handle and place all conduit to prevent breakage or other damage. Brace and support all conduit, as shown on the drawings, to prevent shifting, when concrete is poured.

C. Lay the conduit in a true straight line or a gradual and uniform sweep, unless otherwise shown on the drawings. Maintain a uniform grade, as required, between the building and existing manhole.

D. Clean out the conduits as the laying progresses and securely plug all open ends to prevent water, mud and debris from entering the duct.

E. Upon completion of work, ensure that no obstructions exist in any conduit, by pulling an approved mandrel through each conduit, witnessed by the Owner's Representative.

F. Form single conduit, as specified, into duct banks, as shown on the drawings, using molded plastic spacers, as indicated.

G. Stagger joints 6 inches vertically and horizontally in horizontal duct runs and make the joints water-tight. Where it is necessary to cut a tapered end on duct, make the cut with a tool or lathe designed to cut a taper to match the taper of the particular duct used.

H. Provide PVC/rigid steel conduit adapters, where the duct enters an existing manhole or other termination point, complete with rigid steel end bells, as required.

I. Identify the duct bank with a minimum of two Brady Company yellow safety tapes marked: "CAUTION - BURIED HIGH VOLTAGE ELECTRICAL LINE", one 6 inches below top surface and one 6 inches below final grade.

J. Leave a nylon coated steel drag wire in each empty conduit for pulling purposes.

3.3 TRENCH BACKFILLING

A. Immediately after the duct bank or conduit has been installed and the concrete cured, backfill the trench in level layers. Tamp and compact each layer, before the next layer is deposited.

B. Backfill the trench, using fine material up to 18 inches above top of the duct bank, placed in 6 inch layers and thoroughly tamped. Place balance of the backfill with the aid of dump trucks, bulldozers, crane, or other approved methods. Thoroughly compact the backfill.
C. For conduit or duct banks under paved roads or streets, consolidate the backfill in such a manner as to provide an unyielding foundation of the paving. Remove all excess materials.

D. Succeeding layers of backfill above 18 inches may contain coarser materials. Ensure that the backfill material is free from brush or any other perishable or objectionable matter that would prevent proper consolidation, or that might cause subsequent settlement. Compact the backfill thoroughly by tamping or other method approved by the Owner's Representative. Maintain compaction at a minimum of 95 percent of the maximum density at optimum moisture content, as determined by ASTM D-698-70 Standard Proctor. The Owner's Representative will direct which method of consolidation to be followed on each part of the work.

E. Do not use rock or boulders in the backfill for at least two feet above the top of the duct bank. Do not use stone larger than 6 inches in its greatest dimension, in backfilling.

F. Ensure that the surface of the backfill is safe for vehicular traffic as soon as possible. Provide an approved moist material, thoroughly compacted by the tamping in thin layers (about 4 inches each), at the upper 12 inches of the backfill. Lay the top layer at the required surface grade.

G. Assume full responsibility of any deficiency in quantity of material and filling depressions caused by settlement of backfilling.

H. Dispose of all material from construction as directed by the Owner's Representative.

END OF SECTION
Specification

For

Grounding

Specification Number: 16450
Project Name: Cell 6E and 6D/2E Control Panel Replacement
Project Location: New Hanover County Landfill
SECTION 16450
GROUNDING

PART 1.0 GENERAL

1.1 SCOPE

A. This specification covers the minimum requirements for materials, configuration, and installation of the supplemental grounding system required for this project. Grounding specifically for the purpose of lightning protection is not included.

1.2 CODES AND STANDARDS

A. Applicable Codes and Regulations.

1. General

Refer to Section 16000 for general codes and standards.

2. IEEE Institute of Electrical and Electronics Engineers

3. NEC National Electrical Code

4. OSHA Occupational Safety and Health Act.

5. ANSI American National Standards Institute

6. ICEA Insulated Cable Engineers Association.

7. ASTM American Society for Testing and Materials

8. NEMA National Electrical Manufacturer's Association

9. FM Factory Mutual System Standards.


11. UL Underwriter's Laboratory

1.3 SUBMITTALS

A. Submittals: Procedures for submittals. Submit under provisions of the General and Supplemental General Conditions and Division 1 Specifications Sections.

B. Product Data: Provide for grounding electrodes and connections.
PART 2.0 PRODUCT

2.1 GENERAL

A. Grounding System

The grounding system shall include grounding and bonding conductors for protection of the new pump installation.

B. Verification

The existing grounding installation shall be verified by the Contractor by ground resistance measurement to present an electrical impedance to ground of less than 5 ohms. This testing shall be documented and presented to the Owner's Representative prior to the installation of the Cell 4B leachate pumping system.

C. Remedial Work

If the existing ground tests at greater than 5 ohms impedance, an additional 1/2" or 5/8" X 10' copper clad ground rod shall be installed at minimum 10' spacing from the existing ground rod, interconnected with No. 2/0 AWG bare copper cable. Ground rods and interconnecting cables shall be added until a tested impedance of less than 5 ohms is measured and documented. The addition of chemicals or artificial watering of the soil is not permitted.

2.2 SPECIFIC COMPONENT REQUIREMENTS

A. Ground Rods

Where specified on the drawings, grounding connections to earth shall be made with 3/4" diameter (minimum) copper-clad steel extendible type ground rods a minimum of 10 feet long or length as indicated on the drawings or typical details.

B. Conductors

Buried conductors shall be No. 2/0 AWG, soft-drawn, stranded bare copper.

C. Connections

1. Buried

Buried grounding system connections shall be made using (in order of preference) crimp-on compression connectors or the exothermic
welding process. Typical connections are cable-to-cable splices, X's and tees, and cable-to-ground rod. Connector crimps or welds to be made per manufacturer's instructions.

2. Exposed

Unless specifically indicated on the drawings or typical details, exposed grounding system connections shall be made using (in order of preference) crimp-on compression connectors, the exothermic welding process or by silicon-bronze mechanical connectors. These connectors shall be compatible with, approved for, and listed for use with all materials involved.

3. Acceptable Manufacturers

Ground system connections shall be made with material by the following Vendors:

a) Erico/Cadweld  
b) Burndy Corporation  
c) Thomas & Betts  
d) Square-D/Anderson Electric  
e) Other approved

PART 3.0 EXECUTION

3.1 INSTALLATION

A. General Equipment

1. In general, cases, mounting frames, etc. of all switches, circuit breakers, control panels, motors, equipment skids and any other electrically operated or electrical equipment, conduit and other raceways shall be effectively and permanently grounded with a separate copper grounding conductor of cross-section as required by the National Electrical Code and the drawings. It shall be of sufficient capacity to insure continuity and continued effectiveness of the ground connections to carry fault currents. Ground conductors must be as short and straight as possible, protected from mechanical injury and if practical without splice or joint. The grounding conductor shall be run from a ground established at the source of supply to the equipment to be grounded. Ground wires
from below grade shall be protected as shown on the drawings. All grounding conductors shall be copper.

2. A copper grounding conductor must be run inside the conduit or raceway enclosing the power conductors supplying the equipment. Conductor size will be indicated on the drawings.

3. Surge Arrestors

The ground terminals of surge arrestors shall be connected to the frame of the protected equipment by a direct metallic path.

3.2 METALLIC RACEWAYS

A. Conduit

All metallic conduits and wiring channels must be connected at each end to the equipment being fed.

1. Conduits and cable armor

   a) All flexible conduits, liquid-tight flexible metal conduits and other discontinuities in the electrically continuous conduit system used for power cables shall be provided with bonding jumpers.

3.3 CONDUCTORS

A. Where circuits consist of two or more power conductors in a conduit or wiring channel, the grounding conductor will be sized per NEC Article 250, but in no case smaller than No. 12 AWG, nor larger than No. 4/0. The grounding conductor shall be stranded and covered with a green jacket. Grounding conductors for control and instruments will not normally be used.

B. In all power wiring cases the white wire should be used for the current-carrying neutral only and never as a grounding conductor, or any other purposes.

C. Fuses

Fuses shall not be installed in the grounded neutral conductor throughout the installation.

END OF SECTION
SECTION 01000
GENERAL REQUIREMENTS

1.01 SCOPE AND INTENT

The project generally consists of replacing damaged control panels. Additionally, the damaged panels are to be demolished. The new panels will be erected on the opposite side of the perimeter road to keep the panels away from potential impacts of landfill gas. The panels are to be installed on the rack so that they will be at eye level to make the operation of the system easier. The project will require coordination with the landfill staff, particularly the Landfill Manager, Sam Hawes, and Andy Mulvey, Environmental Specialist. Additionally, in association with the Landfill Manager, Duke Energy coordination will be necessary.

To provide for conduit from the existing pump locations to the control panels, the perimeter road will have to be crossed. The roadway section has compacted soil, a textile, and stone. The section will have to be repaired using the same material as existing. All wiring from the new location will need to be tied into disconnect boxes to allow for the pump, meter, and transducer to be disconnected near to the pipe risers to avoid having to re-pull the wiring through the conduit under the roadway. Additionally, there may be stormwater conveyances in the area of the work and there is a leachate force main in proximity to the work that will need to be found and protected.

The existing panels are to be removed along with any unneeded existing racks, conduit, etc., visible above grade. Note that during the demolition process the sections of the conduit immediately below the panel boxes where the seals are located need to be retained by the County. The Contractor is to cut the seal from the conduit approximately 1-inch above and below the seal on each of the conduits.

The Contractor will provide for shakedown of the new panels and will provide for training to personnel of the County, up to three persons. It is anticipated that an electrical permit will be required on this project. The Contractor will work with County personnel to obtain the permit and gain certification for operation.

Once the work is complete sod is to be placed where the ground is disturbed by the construction/demolition.

The Contractor will be responsible for controlling drainage during the construction period. Coordination with the County on placement of temporary
management practices is required. Damage to the existing grading or new grading due to erosion will be the responsibility of the Contractor to repair.

The Contractor will be responsible for providing any needed construction support and associated health and safety requirements for excavation, earthwork, installation of liner and, connecting to the existing lining. The Contractor is required to provide a plan of the proposed approach to providing for the safety features.

A. Work Included:

1. The Contractor shall furnish all supervision, labor, materials, power, light, heat, fuel, water, tools, appliances, equipment, supplies, and means of construction necessary for proper performance and completion of the work. Contractor shall obtain and pay for all required permits beyond those already obtained by the County. Contractor shall perform and complete the work in the manner best estimated to promote rapid construction consistent with safety of life and property and to the satisfaction of the County, and in strict accordance with the Contract Documents. The Contractor shall clean up the work and maintain it during and after construction, until accepted, and shall do all work and pay all costs incidental thereto. Contractor shall repair or restore all structures and property that may be damaged or disturbed during performance of the work.

2. The cost of incidental work described in these General Requirements, for which there are no specific Contract Items, shall be considered as part of the general cost of doing the work and shall be included in the prices for the various Contract Items. No additional payment will be made therefor.

3. The Contractor shall provide and maintain such modern materials, tools, and equipment as may be necessary, in the opinion of the Engineer, to perform in a satisfactory and acceptable manner all the work required by this Contract. Only equipment of established reputation and proven efficiency shall be used. The Contractor shall be solely responsible for the adequacy of his workmanship, materials and equipment, prior acceptance of the Engineer notwithstanding.

B. Public Utility Installations and Structures:
1. Public utility installations and structures shall be understood to include all poles, tracks, pipes, wires, conduits, vaults, manholes and all other appurtenances and facilities pertaining thereto whether owned or controlled by the County, other governmental bodies or privately owned by individuals, firms or corporations, used to serve the public with transportation, traffic control, gas, electricity, telephone, sewerage, drainage, water or other public or private property which may be affected by the work shall be deemed included hereunder.

2. The Contract Documents may contain data relative to existing public utility installations and structures above and below the ground surface. This data is not guaranteed as to their completeness or accuracy and it is the responsibility of the Contractor to make investigations to fully understand the character, condition and extent of all such installations and structures as may be encountered and as may affect the construction operations.

3. The Contractor shall protect all public utility installations and structures from damage during the Work. Access across any buried public utility installation or structure shall be made only in such locations and by means accepted by the Engineer. The Contractor shall so arrange his operations as to avoid any damage to these facilities. All required protective devices and construction shall be provided by the Contractor at no additional expense to County or Engineer. All existing public utilities damaged by the Contractor which are shown on the Drawings or have been located in the field by the utility shall be repaired by the Contractor, at his expense, as directed by the Engineer. No separate payment shall be made for such protection or repairs to public utility installations or structures.

4. Public utility installations or structures owned or controlled by the County or other governmental body which are shown on the Drawings to be removed, relocated, replaced or rebuilt by the Contractor shall be considered as a part of the general cost of doing the Work and shall be included in the prices bid for the various Contract items. No separate payment shall be made therefor.

5. Where public utility installations of structures owned or controlled by the County or other governmental body are encountered during the course of the Work, and are not indicated on the Drawings or in the Specifications, and when, in the opinion of the Engineer, removal, relocation, replacement or rebuilding is necessary to
complete the Work under this Contract, such work shall be accomplished by the utility having jurisdiction, or such work may be ordered, in writing by the Engineer, for the Contractor to accomplish. If such work is accomplished by the utility having jurisdiction it will be carried out expeditiously and the Contractor shall give full cooperation to permit the utility to complete the removal, relocation, replacement or rebuilding as required. If such work is accomplished by the Contractor, it will be paid for as extra work as provided in the Agreement.

6. The Contractor shall, at all times in performance of the Work, employ accepted methods and exercise reasonable care and skill so as to avoid unnecessary delay, injury, damage or destruction of public utility installations and structures; and shall, at all times in the performance of the Work, avoid unnecessary interference with, or interruption of, public utility services, and shall cooperate fully with the County thereof to that end.

7. The Contractor shall give written notice to County, other governmental utility departments and other owners of public utilities of the location of his proposed construction operations, at least forty-eight (48) hours in advance of breaking ground in any area or on any unit of the Work.

8. The maintenance, repair, removal, relocation or rebuilding of public utility installations and structures, when accomplished by the Contractor as herein provided, shall be done by methods approved by the owners of such utilities.

9. Utilities that may be encountered, can be contacted as follows:
   Duke Energy
   No Cuts
   On-site County Staff

10. The Contractor shall make provisions to avoid impacting existing facilities operation or maintenance activities. If an impact is anticipated, the Contractor shall propose a means to maintain existing activities, subject to approval by the County. The County will not be responsible for any costs associated with such proposed modification.
1.02 DRAWINGS AND PROJECT MANUAL

A. Drawings: When obtaining data and information from the Drawings, figures shall be used in preference to scaled dimensions, and large scale drawings in preference to small scale drawings.

B. Copies Furnished to Contractor:

1. After the Contract has been executed, the Contractor will be furnished one (1) sets of plans (24 inches by 36 inches), one (1) electronic copy of the plans, and one (1) copy of the Project Manual (Contract Requirements and Specifications) and all addenda.

2. The Contractor shall furnish each of the subcontractors, manufacturers, and material suppliers such copies of the Contract Documents as may be required for their work. All copies of the Contract Documents shall be printed from the reproducible sets furnished to the Contractor. All costs of reproduction and printing shall be borne by the Contractor.

C. Supplementary Drawings:

1. When, in the opinion of the County and/or Engineer, it becomes necessary to explain more fully the work to be done or to illustrate the Work further or to show any changes which may be required, drawings known as Supplementary Drawings, with specifications pertaining thereto, will be prepared by the Engineer and the Contractor will be furnished one (1) CD of revised documents, one (1) set of plans and one (1) copy of the Project Manual (Contract Requirements and Specifications) and all addenda.

2. The Supplementary Drawings shall be binding upon the Contractor with the same force as the Drawings. Where such Supplementary Drawings require either less or more than the estimated quantities of work, credit to the County or compensation therefor to the Contractor shall be subject to the terms of the Agreement.

D. Contractor to Check Drawings and Data:

1. The Contractor shall verify all dimensions, quantities and details shown on the Drawings, Supplementary Drawings, schedules, Specifications or other data received from the County and/or Engineer, and shall notify them of all errors, omissions, conflicts,
and discrepancies found therein. Failure to discover or correct errors, conflicts or discrepancies shall not relieve the Contractor of full responsibility for unsatisfactory work, faulty construction or improper operation resulting therefrom nor from rectifying such conditions at no additional expense to County or Engineer. Contractor will not be allowed to take advantage of any errors or omissions, as full instructions will be furnished by the County and/or Engineer, should such errors or omissions be discovered.

2. All schedules are given for the convenience of the County and the Contractor and are not guaranteed to be complete. The Contractor shall assume all responsibility for the making of estimates of the size, kind, and quality of materials and equipment included in work to be done under the Contract and additional work claimed by Contractor.

E. Specifications: The Technical Specifications consist of three parts: General, Products, and Execution. The General Section contains General Requirements which govern the work. Products and Execution modify and supplement these by detailed requirements for the work and shall always govern whenever there appears to be a conflict.

F. Intent:

1. All work called for in the Specifications applicable to this Contract, but not shown on the Drawings in their present form, or vice versa, shall be of like effect as if shown or mentioned in both. Work not specified in either the Drawings or in the Specifications, but involved in carrying out their intent or in the complete and proper execution of the Work, is required and shall be performed by the Contractor as though it were specifically delineated or described.

2. The apparent silence of the Specifications as to any detail, or the apparent omission from them of a detailed description concerning any work to be done and materials to be furnished, shall be regarded as meaning that only the best general practice is to prevail and that only material and workmanship of the best quality is to be used, and interpretation of these Specifications shall be made upon that basis.

1.03 MATERIALS AND EQUIPMENT

A. Manufacturer:
1. The names of proposed manufacturers, material suppliers, and dealers who are to furnish materials, fixtures, equipment, appliances or other fittings shall be submitted to the Engineer for acceptance, prior to construction, to afford proper investigation and checking. No manufacturer will be accepted for any materials to be furnished under this Contract unless he shall be of good reputation and have a plant of ample capacity. Contractor shall, upon the request of the Engineer, be required to submit evidence that he has manufactured a similar product to the one specified and that it has been previously used for a like purpose for a sufficient length of time to demonstrate its satisfactory performance.

2. All transactions with the manufacturers or subcontractors shall be through the Contractor, unless the Contractor shall request, in writing to the Engineer, that the manufacturer or subcontractor deal directly with the Engineer. Any such transactions shall not in any way release the Contractor from his full responsibility under this Contract and will not impose any liability on the County or Engineer.

3. Any two or more pieces of material or equipment of the same kind, type or classification, and being used for identical types of service, shall be made by the same manufacturer.

B. Delivery:

1. The Contractor shall deliver materials to the site in ample quantities to insure the most speedy and uninterrupted progress of the work so as to complete the work within the scheduled time. However, the Contractor shall not store materials on-site for more than thirty (30) days before installation unless adequately covered and protected. This will not supersede more stringent requirements noted in Division 2.

2. The Contractor shall also coordinate deliveries in order to avoid delay in, or impede, the progress of the work of any related Contractor.

3. All materials and equipment shall be properly stored on site in accordance with these specifications and the manufacturer's recommendations.

C. Tools and Accessories:
1. The Contractor shall, unless otherwise stated in the Contract Documents, furnish with each type, kind or size of equipment, one complete set of suitably marked high grade special tools and appliances which may be needed to adjust, operate, maintain or repair the equipment. Such tools and appliances shall be furnished in accepted painted steel cases, properly labeled and equipped with good grade cylinder locks and duplicate keys.

2. Spare parts shall be furnished as specified in the specifications.

3. Each piece of equipment shall be provided with a substantial nameplate, securely fastened in place and clearly inscribed with the manufacturer's name, year of manufacture, serial number, weight and principal rate data.

D. Service of Manufacturer's Engineer:

1. The Contract prices for equipment shall include the cost of furnishing a competent and experienced engineer or superintendent who shall represent the manufacturer and shall assist the Contractor, when required, to install, adjust, test and place in operation, the equipment in conformity with the Contract Documents.

2. Prior to the equipment being placed in permanent operation by the County, such engineer or superintendent shall make all adjustments and tests required by the County and/or Engineer to prove that such equipment is in proper and satisfactory operating condition, and shall instruct such personnel as may be designated by the County in the proper operation and maintenance of such equipment.

1.04 INSPECTION AND TESTING

A. General:

1. Inspection and testing of materials will be provided by the Contractor unless otherwise specified.

2. For tests specified to be made by the Contractor, the testing personnel shall make the necessary inspections and tests and the reports thereof shall be in such form as will facilitate checking to determine compliance with the Contract Documents. Two (2) originally executed and five (5) copies of the reports shall be submitted and authoritative certification thereof shall be furnished.
to the Engineer as a prerequisite for the acceptance of any material or equipment.

3. If, in the performing of any test of any material or equipment, it is ascertained by the Engineer that the material or equipment does not comply with the Contract Documents, the Contractor will be notified thereof and he will be directed to refrain from delivering said material or equipment, or to remove it promptly from the site or from the work and replace it with acceptable material, without cost to the County or Engineer.

4. Tests of electrical and mechanical equipment and appliances shall be conducted in accordance with recognized test codes of the ANSI, ASME, or the IEEE, except as may otherwise be stated herein.

5. The Contractor shall be fully responsible for the proper operation of equipment during tests and instruction periods and shall neither have nor make any claim for damage which may occur to equipment prior to the time when the County executes final acceptance of the work.

B. Costs:

1. The cost of preliminary shop and field tests of equipment and certain other tests specifically called for in the Contract Documents shall be borne by the Contractor and such costs shall be deemed to be included in the Contract price.

2. Materials and equipment submitted by the Contractor as the equivalent to those specifically named in the Contract may be tested by the County and/or Engineer for compliance. The Contractor is responsible for providing sufficient information to allow Engineer to determine that the item of material or equipment proposed is equivalent to that specifically named and an acceptable substitute therefor. If in the sole discretion of the Engineer, tests of the proposed substitute items are necessary for Engineer’s review, the substitute items will be tested by the Contractor at no additional cost to the County.

C. Inspection of Materials:

1. The Contractor shall give notice in writing to the Engineer, sufficiently in advance of his intention to commence the manufacture or preparation of materials especially manufactured or
prepared for use in or as part of the permanent construction. Such notice shall contain a request for inspection, the date of commencement and the expected date of completion of the manufacture or preparation of materials. Upon receipt of such notice, the Engineer will arrange to have a representative present at such times during the manufacture as may be necessary to inspect the materials or Engineer will notify the Contractor that the inspection will be made at a point other than the point of manufacture.

2. The Contractor must comply with these provisions before shipping any material. Such inspection shall not release the Contractor from the responsibility for furnishing materials meeting the requirements of the Contract Documents.

D. Certificate of Manufacture:

1. The Contractor shall furnish to Engineer authoritative evidence in the form of Certificate of Manufacture that the materials to be used in the work have been manufactured and tested in conformity with the Contract Documents.

2. These certificates shall be notarized and shall include copies of the results of physical tests and chemical analyses, where necessary, that have been made directly on the product to be provided by the manufacturer. Two (2) original and five (5) copies are to be provided to the Engineer.

E. Shop Tests:

1. Testing for pressure, duty, capacity, rating, efficiency, performance, function or special requirements which are specified shall be tested in the shop of the manufacturer in a manner which shall conclusively prove that its characteristics comply fully with the requirements of the Contract Documents.

2. No such equipment or materials shall be shipped to the Work site until the County and/or Engineer notifies the Contractor, in writing, that the results of such tests are acceptable.

3. Two (2) signed original and five (5) copies of the manufacturer's actual test data and interpreted results thereof, accompanied by two (2) signed original and five (5) copies of a certificate of authenticity sworn to by a responsible official of the manufacturing company
and/or independent laboratory, shall be forwarded to the Engineer for acceptance.

4. The cost of shop tests and of furnishing manufacturer's preliminary and shop test data of operating equipment shall be borne by the Contractor.

F. Final Field Tests:

1. Upon completion of the work and prior to final payment, all equipment and piping installed under this Contract shall be subjected to acceptance tests as specified or required to provide compliance with the Contract Documents. Two (2) original signature and five (5) copies of Letter of Compliance and test results shall be provided by Contractor.

2. The Contractor shall furnish labor, fuel, energy, water and all other materials, equipment and instruments necessary for all acceptance tests, at no additional cost to the County or Engineer. The Contractor shall assist in the final field tests.

G. Final Inspection: During such final inspections, the Work shall be clean and functional. In no case will the final estimate be prepared until the Contractor has complied with all requirements set forth and the Engineer and County have made their final inspection of the entire Work and are satisfied that the entire Work is properly and satisfactorily constructed in accordance with the requirements of the Contract Documents.

1.05 TEMPORARY STRUCTURES

A. Temporary Fences: If, during the course of the Work, it is necessary to remove or disturb any fence or part thereof, the Contractor shall provide a suitable temporary fence at no additional cost to County or Engineer.

B. Responsibility for Temporary Structures: In executing the Contract, the Contractor assumes full responsibility for the sufficiency and safety of all temporary structures or work and for any damage which may result from their failure or their improper construction, maintenance or operation and will indemnify and hold harmless the County and Engineer from all claims, suits or actions and damages or costs of every description arising by reason of failure to comply with the above provisions.
1.06 ACCIDENT PREVENTION

A. Precautions shall be exercised at all times for the protection of person and property. The safety provisions of applicable laws, building and construction codes shall be observed.

B. The Contractor shall comply with the U.S. Department of Labor Safety and Health Regulations for construction promulgated under the Occupational Safety and Health Act of 1970 (PL 91-596), and under Hours and Safety Standards Act Section 107 of the contract Work. Hours and Safety Standards Act (PL 91-54), except where state and local safety standards exceed the federal requirements and except where state safety standards have been approved by the Secretary of Labor in accordance with provisions of the Occupational Safety and Health Act, shall be complied with. Updates of the referenced regulations also shall apply.

C. First Aid: The Contractor shall keep upon the site, at each location where work is in progress, a completely equipped first aid kit and shall provide ready access thereto at all times when people are employed on the Work.

1.07 LINES AND GRADES

A. Grade:

1. All work under this Contract shall be constructed in accordance with the lines and grades shown on the Drawings, or as provided by the Engineer. The full responsibility for keeping alignment and grade shall rest upon the Contractor.

2. The County will provide available information regarding bench marks and base line controlling points on the drawings. Reference marks for lines and grades as the work progresses will be located by Contractor to cause as little inconvenience to the prosecution of the Work as possible. The Contractor shall so place excavation and other materials as to cause no inconvenience in the use of the reference marks provided. The Contractor shall remove any obstructions placed contrary to this provision.

B. Surveys:

1. The Contractor shall furnish and maintain, at no additional expense to County or Engineer, stakes, temporary benchmarks and other such materials.
2. The Contractor shall check such reference marks by such means as he may deem necessary and, before using them, shall provide written notification to Engineer's regarding presumed inaccuracies.

3. The Contractor shall, at no additional expense to County or Engineer, establish all working or construction lines and grades as required from the reference marks made available by the County, and shall be solely responsible for the accuracy thereof. Field engineering shall be in accordance with Section 01050.

C. Safeguarding Marks:

1. The Contractor shall safeguard all points, stakes, grade marks, monuments and bench marks made or established on the Work, bear the cost of reestablishing them if disturbed, and bear the entire expense of rectifying work improperly installed due to not maintaining or protecting or to removing without authorization such established points, stakes and marks.

2. The Contractor shall safeguard all existing and known property corners, monuments and marks adjacent to but not related to the Work and, if required, shall bear the cost of reestablishing them if disturbed or destroyed.

1.08 ADJACENT STRUCTURES AND LANDSCAPING

A. Responsibility:

1. The Contractor shall also be entirely responsible and liable for all damage or injury as a result of his operations to all other adjacent public and private property, structures of any kind and appurtenances thereto met with during the progress of the Work.

2. The cost of protection, replacement in their original locations and conditions or payment of damages for injuries to such adjacent public and private property and structures affected by the work, whether or not shown on the Drawings, and the removal, relocation and reconstruction of such items called for on the Drawings or specified shall be included in the various Contract Items and no separate payments will be made therefore.

3. Contractor is expressly advised that the protection of buildings, structures, road, tanks, pipelines, etc. and related work adjacent and
in the vicinity of his operations, wherever they may be, is solely his responsibility.

4. Conditional inspection of buildings or structures in the immediate vicinity of the project which may reasonably be expected to be affected by the Work shall be performed by and be the responsibility of the Contractor.

5. Contractor shall, before starting operations, make an examination of the adjacent structures, buildings, facilities, etc., and record by notes, measurements, photographs, etc., conditions which might be aggravated by open excavation and construction. Repairs or replacement of all conditions disturbed by the construction shall be made to the satisfaction of the County and Engineer. This does not preclude conforming to the requirements of the insurance underwriters. Copies of surveys, photographs, reports, etc., shall be provided to the County.

6. Prior to the beginning of any excavations the Contractor shall advise the County of all structures on which he intends to perform work or which performance of the Work will affect.

B. Protection of Trees: All trees and shrubs shall be adequately protected by the Contractor with boxes and in accordance with ordinances governing the protection of trees. Excavated materials shall be placed so as not to injure such trees or shrubs. Trees or shrubs destroyed by negligence of the Contractor or his employees shall be replaced by Contractor with new stock of similar size and age, at its proper season and at the sole expense of the Contractor.

C. Lawn Areas: Lawn areas shall be left in as good condition as before the starting of the Work. Where sod is to be removed, it shall be carefully removed, and later replaced, or the area where sod has been removed shall be restored with new sod.

D. Restoration of Fences:

1. Any fence, or part thereof, that is damaged or removed during the course of the Work shall be replaced or repaired by the Contractor unless specifically waived by the County and shall be left in as good a condition as before the starting of the Work.

2. The manner in which the fence is repaired or replaced and the materials used in such work shall be subject to the acceptance of the County and Engineer.
3. The cost of all labor, materials, equipment, and work for the replacement or repair of any fence shall be deemed included in the appropriate Contract Item or items, or if no specific item is provided therefor, as part of the overhead cost of the work, and no additional payment will be made therefor.

E. Roadway: The existing roadway at the facility shall be left in as good condition as before the starting of the Work. Work performed near the existing roadway shall be done carefully to prevent damage to the existing surface. Unless prior notification has been provided and permission is granted by the County there shall be no closure of the roadway to impede continuing operations.

1.09 PROTECTION OF WORK AND PUBLIC

A. Barriers and Lights:

1. During the prosecution of the work, the Contractor shall put up and maintain at all times such barriers and lights as will effectually prevent accidents.

2. The Contractor shall provide suitable barricades, red lights, "danger" or "caution" or "street closed" signs and flagmen at all places where the Work causes obstructions to the normal traffic or constitutes in any way a hazard to the public.

B. Noise:

1. The Contractor shall eliminate noise to as great an extent as practicable at all times. Air compressing equipment shall be equipped with silencers and the exhaust of all gasoline motors or other power equipment shall be provided with mufflers. The Contractor shall construct sound barriers as necessary to eliminate noise.

2. In the vicinity of hospitals and schools, special care shall be used to avoid noise or other nuisances. The Contractor shall strictly observe all local regulations and ordinances covering noise control.

3. Except in the event of an emergency, no work shall be done between the hours of 5:30 p.m. and 7:30 a.m., Monday through Saturday or on Sundays or New Hanover County observed Holidays. If the proper and efficient prosecution of the Work requires operations during the night, the written permission of the County shall be obtained before starting such items of the Work.
C. Access to Public Services: Neither the materials excavated nor the materials or equipment used in the construction of the Work shall be so placed as to prevent free access to all fire hydrants, valves or manholes.

D. Dust Prevention: The Contractor shall prevent dust nuisance from his operations or from traffic by keeping the roads and/or construction areas dampened with water at all times.

1.10 CUTTING AND PATCHING

A. The Contractor shall do all cutting, fitting or patching of the Work that may be required to make the several parts thereof join and coordinate in a manner satisfactory to the Engineer and in accordance with the Drawings and Specifications.

B. The work must be done by competent workmen skilled in the trade required by the restoration.

1.11 CLEANING

A. During Construction:

1. During construction, the Contractor shall, at all times, keep the site of the Work and adjacent premises as free from material, debris and rubbish as is practicable and shall remove the same from any portion of the site if, in the opinion of the County or Engineer, such material, debris, or rubbish constitutes a nuisance or is objectionable.

2. The Contractor shall remove from the site all of his surplus materials and temporary structures when no further need therefore develops. Contractor shall be responsible and liable for all spillage and incur all associated costs including, but not limited to, costs related to repair and maintenance resulting from damages thereof, and fines that may be levied as a result of citations given by State or local regulatory agencies.

B. Final Cleaning:

1. At the conclusion of the Work, all erection plant, tools, temporary structures and materials belonging to the Contractor shall be promptly removed, and shall remove and promptly dispose of all water, dirt, rubbish or any other foreign substances to a facility permitted to manage these materials.
2. The Contractor shall thoroughly clean all equipment and materials installed and shall deliver such materials and equipment undamaged in a bright, clean, polished and new operating condition.

1.12 MISCELLANEOUS

A. Protection Against Siltation and Bank Erosion:
   1. The Contractor shall arrange his operations and construct erosion control devices to minimize siltation and bank erosion on construction sites and on existing or proposed water course and drainage channels.
   2. The Contractor, at no additional expense to County or Engineer, shall remove any siltation deposits and correct any erosion problems as directed by the Engineer which results from Contractor’s construction operations.

B. Protection of Wetland Areas:
   1. The Contractor shall properly dispose of all surplus material, including soil, in accordance with local, state and federal regulations, and with County’s instruction.
   2. Under no circumstances shall surplus material be disposed of in wetland areas as defined by the Army Corps of Engineers or the North Carolina Department of Environment and Natural Resources.

C. Existing Facilities: The work shall be so conducted to maintain existing traffic lanes in operation.

D. Use of Chemicals: All chemicals used during project construction or furnished for project operation, whether herbicide, pesticide, disinfection, polymer, reactant, or of other classification, must show approval of either EPA or USDA. Use of all such chemicals and disposal of residues shall be in strict conformance with instructions. Contractor shall obtain written approval from County prior to use of chemicals.

E. Cooperation With Other Contractors and Forces:
   1. During progress of work under this Contract, it may be necessary for other contractors and persons employed by the County to work in or about the project.
2. The County reserves the right to put such other contractors to work and to afford such access to the work area to be performed at times as the County deems proper.

3. The Contractor shall not impede or interfere with the work of such other contractors engaged in or about the Work and shall so arrange and conduct the work that such other contractors may complete their work at the earliest date possible.

F. Fuels and oils stored on site shall have secondary containment.

G. Construction shall be conducted and shall result in construction of the improvements of this project in full accordance with the conditions of the permits granted for the project.

1.13 COUNTY'S REPRESENTATIVES

A. The County will appoint the Resident Project Representative (RPR) and Project Manager (PM) as the County's representative as defined in the General Conditions.

1.14 PRE-EXISTING CONDITIONS

A. The County will provide the most current annual aerial topographic survey flown at the time of bid for the proposed closure construction. The County does not guarantee or warrant the accuracy of the survey. The Contractor may conduct a pre-existing conditions survey of each of the areas that are part of the construction area. If conducted, the survey shall establish the state of the property before construction as a basis for any claims of damage that may occur and an electronic version in AutoCAD will be provided to the County.

B. This survey shall include comprehensive photography and video taping of the site, grounds, and structures; spot elevations of grades and tops of walls; side slopes; existing spillways; perimeter swales and roads; and shall make note of any identified previously damaged areas. Photos and videotape shall be submitted to Engineer/County for review and acceptance prior to start of work.
SECTION 01030

SPECIAL PROVISIONS

1.01 UTILITIES

A. The CONTRACTOR is responsible for providing any water, power, and sanitary facilities required at the site for the performance of the work in accordance with the Contract Documents.

1.02 PERMITTING

A. The CONTRACTOR shall obtain all Federal, State, County and local permits as required.

1.03 ENVIRONMENTAL PROTECTION

A. The CONTRACTOR is specifically cautioned on the following items:

1. Excavations in and Around Landfills: All excavations shall be confined to the immediate area of the work for which the excavation is required.

2. Environmental Constraints:
   a. Dust Control: Trucked water or calcium chloride shall be used if necessary to prevent dust.
   b. Odors: Excavated materials causing odors shall be trucked to an area for disposal as designated by the COUNTY. Emphasis shall be given to the reduction of any other circumstances causing odors.
   c. Explosion Protection: The CONTRACTOR shall be responsible for enforcing all explosion protection precautions according to the National Landfill Gas Committee Health and Safety Guidelines.
   d. Fire Control: The CONTRACTOR shall be responsible for fire control and submit a safety plan and fire control procedures (to which he will adhere during the entire Contract time) to the COUNTY for review. The plan will address in detail those items listed in paragraph 1.04 of this section.
   e. Litter: The CONTRACTOR shall be required to control, collect, and truck all litter excavated or exposed by the work to an on-site disposal area as directed by the COUNTY.
f. Fuel Containment: The CONTRACTOR shall provide for any temporary fuel stations for the operation of the equipment for this project. All tanks must have secondary containment consistent with current regulations to avoid impacting the site groundwater and soils.

3. Landfill Construction Procedures: CONTRACTOR operations shall not interfere with work performed by others.

1.04 SAFETY

A. Trench Safety - The CONTRACTOR shall comply with all of the requirements presented in the 0300 Section regarding trench safety. FAILURE TO COMPLY WITH THE REQUEST IN THIS SECTION SHALL RESULT IN THE BID BEING DECLARED NON-RESPONSIVE.

B. Work In and Around Landfills: All work shall be done in accordance with State and local requirements and OSHA Safety and Health Standards 29 CFR and shall conform to the Landfill Gas Division of the Solid Waste Association of North American (SWANA) A Compilation of Landfill Gas Field Practices and Procedures, most current version.

1. General

The Occupational Safety and Health Act (OSHA) of 1970 impose a duty on employers to furnish a safe and healthful job environment for all employees. The employees are required to comply with safety rules and regulations applicable to their activities and conduct. Employers have the obligation not only to eliminate recognized hazards and to comply with national safety and health standards, but also to provide information and training to create the necessary awareness on the part of the employees.

Landfill safety requires more than the common sense safety procedures common to all industry. Bacterial decomposition of trash results in the formation of methane, a colorless, odorless, explosive gas that together with other volatile materials evolves into the atmosphere and migrates through the soil into surrounding areas. Air quality studies consistently show that concentrations of potentially hazardous substances (OSHA "Priority Pollutants) in the ambient air in the vicinity of solid waste landfills are well below threshold limits. However, in confined or enclosed areas on or adjacent to landfills, dangerous concentrations of combustible and possibly toxic gases may accumulate. Oxygen depletion may also occur in these areas of confinement; therefore, safety procedures should be followed at all times.
2. Safety Equipment for Workers engaged in construction or maintenance of landfill gas (LFG) facilities should wear protective safety equipment as follows:
   a. Hard hats, if near moving mechanical equipment.
   b. Steel-toed, shoes or rubber boots with steel shank.
   c. Safety glasses or face shields, as appropriate.
   d. Protective gloves (rubber or plastic would work if working with wet solid waste or where exposure to leachate/condensate is expected).
   e. Hearing protection, depending on noise level of work environment.

3. Safety Equipment to be made available by CONTRACTOR at the job site in quantities sufficient to cover the CONTRACTOR’S construction crew:
   a. Clean water, soap and paper towels.
   b. First aid kit, eye wash station, stretcher, and blanket.
   c. Fire extinguisher (2) - 20:A-80:BC.
   d. No smoking signs.
   e. Acid vapor and particulate masks for all personnel.
   f. Parachute-type harnesses (2) and safety lines (for use in excavations, manholes, etc.).
   g. Self-contained breathing apparatus.
   h. Methane/oxygen indicator.
   i. Hydrogen sulfide indicator (Draeger Tubes).
   j. Additional monitoring equipment for toxic vapors and aerosols.
   k. Barricades.
   l. Covers for excavations that will remain open at end of working day.
m. Air-moving equipment that can provide ventilation if working in sub-standard air environment (trenches, condensate drain pits, etc.).

n. Fire blanket.

o. Organic vapor masks.

p. Construction equipment equipped with vertical exhaust or spark arrestors if within 2 feet of ground.

q. Flagging, traffic markers, and florescent orange safety vests for use when working around operating equipment or near public roadways.

4. Personal Health and Hygiene

a. Personal safety and the safety of fellow workers require that all employees are mentally alert and in good general health. No alcohol or drugs are permitted. Smoking is prohibited on the landfill site except in designated areas. No worker should handle excavated solid waste without wearing gloves. Parts of the body accidentally exposed to waste, leachate or condensate should be washed with soap and water immediately.

b. An annual medical examination also is recommended for workers whose activities include daily exposure to solid waste or LFG. Any cut or abrasion should be treated immediately as the chance of infection is high when working on a landfill. A tetanus shot and hepatitis B shot is recommended at specified intervals for all personnel involved in site construction.

c. Avoid contact with unfamiliar plants or those known to be hazardous growing on the landfill.

d. Animals, snakes, spiders, and other insects should be avoided. Be particularly careful around vaults and valve boxes.

e. The address, phone number, and location map of the local hospital and medical emergency room shall be prominently posted. In addition, the phone number of an ambulance and fire department/rescue unit should be posted.

f. Wash hands prior to eating and before leaving work area.

5. Landfill Safety Procedures
a. As a general rule LFG work shall be performed by a team composed of a minimum of two (2) people. In situations where hazards are minimal, and where it's necessary to allow an individual to work alone, another responsible individual must be aware of the lone workers task and scheduled time of completion/return, and if possible monitor the individual’s progress.

b. When working on (or within 1,000 feet of) an active or completed solid waste disposal area, be alert to the existence of (or potential for) hazardous conditions, i.e., the presence of LFG. The distance of 1,000 feet is used by some authorities as the maximum distance LFG will migrate through soils under average conditions. Migration distance, however, may be greater through underground conduits, or where surface conditions interfere with normal venting.

Hazards that might occur could be one or more of the following:

1) Fires may start spontaneously from exposed and/or decomposing solid waste.

2) Fires and explosions may occur in confined or enclosed spaces from the presence of methane gas.

3) LFG may cause an oxygen deficiency in underground trenches, vaults, conduits, and structures.

4) Hydrogen sulfide (H₂S) may be present. H₂S is a colorless, very flammable gas which, in low concentrations, has an offensive odor described as that of rotten eggs. H₂S, however, quickly numbs the olfactory senses so that reliance upon the sense of smell can lead to a very dangerous condition and even cause virtually instant death.

5) Sudden subsidence or collapse of the landfill surface.

c. A confined space is defined as a space where existing ventilation is insufficient to remove dangerous air contamination and/or oxygen deficiency, and where ready access/egress to escape, provide aid and to remove a disabled employee is difficult. In the case of flammable gases, such as methane, a hazardous concentration is defined as any concentration greater than 20 percent of the lower atmosphere containing less than 19.5 percent oxygen by volume.
In the absence of positive ventilation, a mixture of 5 percent LFG in air will exceed both of these limits.

d. Vaults and ditches greater than 3 feet and other non-ventilated confined spaces should not be entered unless tested for explosive concentrations, oxygen deficiency and H₂S levels. Air blowers or fans should be available for positive ventilation. Self-contained breathing apparatus or supplied-air masks must be used when entering areas containing hazardous and/or oxygen deficient atmospheres. "Chemical" cartridge respirators can be used for gaseous contaminants (not H₂S) if oxygen concentration is satisfactory. Mechanical filter respirators should be used only for protection against particulate matter.

e. Fires or explosions in confined spaces require a source of ignition. Smoking is strictly forbidden except in designated areas. Non-sparking and/or explosion proof tools should be used in vaults, trenches, or other enclosed areas. Positive ventilation is required in construction shacks or other structures on or near a landfill. Temporary structures on the landfill surface should be constructed on blocks or other supports with a ventilated area under the main floor. Construction equipment should be equipped with vertical exhaust and spark arrestors.

f. Hydrogen sulfide gas is always present in LFG in some concentrations, generally below 100 parts per million (ppm), in LFG. It is unlikely that hazardous concentrations of H₂S will build up (see Table 1) except in vaults or other confined spaces where oxygen deficiency may be a major hazard. However in special circumstances, where there is a natural or manmade presence of gypsum along with high moisture, for example, very high (lethal) concentration levels of H₂S gas could be encountered under certain circumstances. Personnel must be trained for, and alert to, these possibilities. Gas masks are not effective against H₂S and fresh air breathing equipment is required.

g. Employees who wear beards shall not work in areas where air masks or respirators may be necessary. All employees should be fit-tested on the respirator that they will wear in order to assure a proper facepiece seal against the face. Fit-testing should reoccur at least annually.
TABLE 1

PHYSIOLOGICAL RESPONSE TO VARIOUS CONCENTRATIONS OF HYDROGEN SULFIDE

<table>
<thead>
<tr>
<th>Response</th>
<th>Concentration/PPM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum allowable concentration for Prolonged exposure</td>
<td>10</td>
</tr>
<tr>
<td>Slight symptoms after several hours.</td>
<td>70-150</td>
</tr>
<tr>
<td>Maximum concentrations for one hour without serious consequences</td>
<td>170-300</td>
</tr>
<tr>
<td>Dangerous after exposure of one-half to one hour.</td>
<td>400-700</td>
</tr>
</tbody>
</table>

NOTES:
1. Most landfills do not have H₂S in concentrations greater than 10 PPM. However, concentrations up to 250 PPM have been measured.
2. In many cases, laboratories do not know how to properly analyze for H₂S. Draeger tube check analyses are generally more accurate than most laboratories.

6. Safety Procedures for Trenching and Pipe Installation
   a. Excavation permits and shoring may be required for excavations deeper than 4 to 5 feet (into which workers will enter). Check state regulations as standards and requirements vary.
   b. One person, with the sole responsibility of assuring the observance of all safety procedures, should be present at all times during construction. This person should be trained in the use of all the recommended safety equipment.
   c. No smoking on the landfill except in designated areas.
   d. Prior to the entry of workers into an excavation deeper than 3 feet, and periodically during their work, the atmosphere in the excavation should be tested. If there are any doubts regarding safety, no worker shall be allowed to enter the excavation without at least a half-face or full-face OV/AG mask. If there is an oxygen deficiency, a concentration of any constituent with poor warning properties at a level greater than its TLV, or a concentration of
hydrogen sulfide greater than 10 ppm, a positive pressure SCBA or supplied air respirator with 5 minute emergency escape bottle should be used. If a combustible mixture of methane is present, further precautionary measures shall be taken; entry should be forbidden until the methane concentration is acceptable and at least below 1.0 percent by volume in air, or 20 percent of the LEL. If workers are not equipped with supplied air or pressure-demand SCBAs, then entry should be forbidden until the methane concentration is below 0.1 percent by volume in air, unless the Maximum Use Limitation (Mul) of the APR is greater. Workers required to work on an emergency basis, in any environment at or above the IDLH (the level immediately dangerous to life and health as declared and published by NIOSH) for any constituent component in the working environment, should be outfitted in pressure-demand SCBAs.

e. No worker should be allowed to work alone at any time in or near the excavation. Another worker should be present, beyond the area considered to be subject to the possible effects of LFG.

f. Periodically during construction the work area should be monitored for levels of methane and hydrogen sulfide.

g. No worker should handle excavated solid waste without wearing appropriate work gloves.

h. Construction equipment should be equipped with a vertical exhaust at least 5 feet above grade and with spark arrestors.

i. Electrical motors, if used in the excavation area, shall be explosion-proof or non-sparking, totally enclosed fan cooled (TEFC); and electrical controls should be explosion-proof or intrinsically safe and meet the requirements for Class I, Division 2, Group D, (Methane), rated equipment in accordance with the National Electric Code (NEC).

j. No welding should be permitted in, on, or immediately near the excavation area, unless previously and continuously monitored for methane and other combustible gases.

k. Soil should be stockpiled near the excavation, to be used to smother any solid waste combustion should it occur.

l. Solvent cleaning, gluing, or bonding of pipe should be performed to the extent possible, outside the trench. An organic vapor
respirator shall be worn by persons using PVC solvents or glues. Personnel using solvent and cement shall be familiar with the appropriate materials safety data sheets for those products.

m. Forced ventilation may be required for workers who must work in trenches deeper than 3 feet. Air blowers and fans may be used for positive ventilation. Dilution ventilation may address either an explosive gas hazard or a hazardous chemical health hazard. The amount of air required for ventilation must be determined based on the concentrations of explosive LFG or hazardous chemical constituents, the LEL for methane or the TLVs for the hazardous chemical constituents in question, the volume to be protected, ambient conditions, and an appropriate safety factor. These calculations should be performed by a qualified individual.

n. During piping assembly, all valves should be closed immediately after installation.

o. As construction progresses, all valves should be closed as installed to prevent the migration of gases through the pipeline and gas collection system.

p. All piping shall be capped at the end of each working day.

7. General Construction/Maintenance

a. When using alternating-current powered power tools, a portable ground-fault current interrupter (GFCI) should be used.

b. When welding near gas recovery process equipment, suitable procedures and precautions should be employed including:

1) Processing a "hot work" permit. (A self-issued serial numbered permit is required in many states.)

2) Designate a specific, dedicated individual, by name, as a fire watch.

3) Verify that explosive concentrations are not present using an explosimeter.

4) Have adequate fire extinguishers (20:A-80:BC) and fire blankets on hand.

5) Sandbag all drains.
6) Provide the appropriate purge and inert blanket on process equipment and piping.

7) Procedures for safe welding and purging of process equipment are available from the American Petroleum Institute (API).

8. Field Sampling for Health and Safety

a. The following instruments will remain at the job and be continuously employed by a qualified person:

1) H$_2$S chemical reagent diffusion tube indicator or direct reading instrument.

2) Oxygen Analyzer

3) CGA (methane analyzer).

b. CGAs and other electronic portable monitoring instruments should be rated explosion-proof or intrinsically safe. It is also recommended that they be Factory Mutual rated.

c. It is important that any site always be initially characterized so that correct information can be available to make appropriate decisions about personnel exposure safety.

d. To accomplish Item C, a gas sample should be collected prior to the beginning of work or as soon as possible, and should be analyzed for volatile organic chemicals. If historical information or preliminary field screening indicate a need, the sample should also be analyzed for heavy metals capable of volatizing, acid gases, and other inorganic compounds. Proper instructions and close coordination with the laboratory are important to properly characterize the gas. Several composite samples will provide a more uniform representation of LFG at the site. Several non-composited samples, may however, provide a better indication of peak concentrations and show chemicals which would not be indicated in the composite samples.

e. Monitoring for vinyl chloride, benzene, or other constituent chemicals may also need to be conducted during drilling operations. A written record of monitoring should be maintained daily.
9. Respiratory Protection

a. All employees who may be required to wear respirators shall be trained in the proper use of respirators. Such individuals will have an appropriate physical examination for use of respirators. Each individual will be approved by a qualified physician for such respirator use. All personnel who wear respirators shall come under the jurisdiction of their employer's written respiratory protection program, and will follow and be knowledgeable about the program. Personnel will be individually fit-tested wearing their assigned respirator. Fit-testing should be performed annually.

b. Persons with interfering facial hair shall not be permitted in areas where respiratory protection equipment is required; i.e., beards are prohibited.

c. Permanent damage to the eyes (cornea) from acid gases and particulates may result if contact lenses are worn. Therefore, wearing contact lenses on site shall be prohibited. Those persons shall have prescription spectacle inserts installed in their respiratory protective equipment.

d. All NIOSH procedures and guidelines for respirator selection and use should be adhered to. Only equipment certified by NIOSH in its most recent certified equipment list will be used. APRs with chemical cartridges can only be used for acid gas/organic solvent vapors under the following conditions:

1) If the oxygen concentration is satisfactory.

2) If the chemical contaminants have been identified.

3) The concentrations are monitored.

4) The chemical filter cartridges are effective in removing the contaminants.

5) The cartridges are approved for such use (by NIOSH).

6) The contaminants have good warning properties.

If all of the above conditions cannot be satisfied, then Level B protection using positive-pressure SCBAs or supplied air is required. APRs with chemical cartridges/canisters will not be used for protection in environments containing constituents which have poor warning.
properties, and which are at or above, or can reasonably be expected to be near, at, and/or above the limitation of the protection factor (PF) for the respirator. The maximum working environment shall be determined by multiplying the PF for the type of respirator by the TLV for the chemical substance under consideration, \( \text{MUC} = \text{PF} \times \text{TLV} \). A list of PFs is shown in Table 2.

**e.** Positive-pressure SCBA or supplied-air full-face masks shall be used when entering areas containing oxygen-deficient atmospheres, unknown atmospheres, or atmospheres considered to be at or above IDLH levels. Personnel (with appropriate SCBA apparatus) will not enter IDLH environments without emergency justification by and acceptance of a site safety manager or responsible project manager. An emergency is constituted by an already existing life threatening situation.

**f.** The length of time an APR canister or cartridge is effective in removing hazardous material from the ambient air will depend on the type and concentration of hazardous material in the air and the level of effort required for a worker to accomplish his assigned tasks. The higher the breathing rate, the more frequently canisters will need to be replaced. These maximum operating periods vary according to manufacturer, so it will be necessary to monitor the total usage of cartridges and canisters during all work requiring a respirator.

### TABLE 2

**TABLE OF RESPIRATORY PROTECTION EQUIPMENT PROTECTION FACTORS**

<table>
<thead>
<tr>
<th>Type of Air Purifying Respirator</th>
<th>Protection Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Half-face APR</td>
<td>10</td>
</tr>
<tr>
<td>Full-face APR</td>
<td>100</td>
</tr>
<tr>
<td>When employed for protection from benzene. See Note 1.</td>
<td>50</td>
</tr>
<tr>
<td>When employed for protection from vinyl chloride using vinyl chloride rated specific canister with a 4 hour service life. See Notes 2 and 3.</td>
<td>25</td>
</tr>
</tbody>
</table>
Positive-Pressure SCBA or supplied air-line respirators  10,000

NOTES:


3: Because respirator cartridges/canisters meeting the service life requirements listed in 29 CFR1910.1017 (g) are not normally available, work involving vinyl chloride concentrations above the action level of 0.5 ppm will require use of pressure-demand SCBAs.

10. Special Conditions

Certain types of work may present unusual problems at certain sites with special conditions. Examples include the following:

a. For protection against infectious waste, a coated Tyvek or Sentex suit, appropriate gloves and boots, and a NIOSH-approved respirator with a high-efficiency particulate filter (HEPA) incorporated in the mask canister or cartridge, are suggested. Personnel should avoid or minimize contact with any waste, and be cautioned about possible contact with sharp objects such as needles. The HEPA filter may be combined with an OV/AG cartridge or canister.

b. For protection against gas vapors while drilling or while working around an open well casing, a NIOSH-approved full-face air-purifying respirator with an OV/AG canister including a HEPA filter may be necessary. The Saranex or Tyvek suit is also required. Also, appropriate gloves and boots. Appropriate measures may be taken to prevent heat stress.

c. For protection from asbestos fibers, the minimum required includes a respirator with a HEPA filter and a Tyvek suit. The Tyvek suit may either be coated or uncoated. Special regulations exist for asbestos, for complete requirements see the Asbestos Standard, 29 CFR 1910.1001.

d. A determination may need to be made regarding whether additional protection will be required, if significant levels of vinyl chloride or benzene (or other more toxic chemicals) are found during characterization. The action levels for vinyl chloride and benzene
are one-half of 1 ppm. The maximum threshold limit value of benzene or vinyl chloride to which workers may be exposed over an 8-hour period is 1 ppm. The maximum concentration of vinyl chloride to which workers may be exposed in any given period is 5 ppm. If higher levels of vinyl chloride are found, respiratory protection levels may need to be adjusted to Level B (SCBA or supplied air) if engineering controls cannot reduce these levels. Because vinyl chloride and benzene are both regulated carcinogens, it is imperative and required that exposure be limited where at all possible; if not, then exposure must be reduced to the minimum possible extent through appropriate respiratory protection (i.e., vinyl chloride and benzene exposure should be held to zero whenever possible). For the Vinyl Chloride Standard, see 29 CFR 1910.1017. For the Benzene Standard, see 29 CFR 1910.1028.

e. Special compliance requirements apply for personnel who must work with potential exposure to certain chemicals including vinyl chloride, benzene, and asbestos above action levels. Compliance requirements may vary with each compound and by state, but will likely include:

1) Mandatory training
2) Medical record keeping
3) Exposure monitoring, and record keeping
4) Certifications
5) Specific protective equipment requirements

11. Shoring and Bracing

a. No person shall enter any trench five (5) feet or more in depth unless that trench has been shored, braced, sloped, or other provisions made to prevent cave-in. Shoring shall be engineered by a qualified and licensed civil or structural engineer or engineering geologist. Drawings, specifications, and calculations shall be signed by CONTRACTOR’S ENGINEER.

b. Special consideration must be given to the less stable conditions represented by refuse in comparison with compacted soil. Refuse must be considered more prone to instability that may cause slope or side wall failure. This is due to the high void ratio, irregularity...
of material composing the refuse, and a typically lesser degree of compaction than soil.

12. Safety Management

a. No safety program can be effective without management support and interest. It is recommended that all companies involved in the LFG industry initiate a safety program for the protection of the health and safety of the personnel involved.

b. Safety procedures shall be reviewed with all workers to insure that they are aware of requirements and safety concerns.

c. The Safety Officer shall be adequately qualified to insure that they are aware of requirements and safety concerns.

d. Weekly meetings shall be held to review unsafe acts.

e. Unsafe acts shall be stopped if discovered by the Safety Officer.

f. Required safety equipment shall be on-site and shall be checked to verify completeness and function.

g. Contracts for landfill gas testing, construction or operation should include a safety procedure clause.

h. All employees on the job site should sign a document of their awareness of their work environment.

i. Appropriate local authorities (fire department, air quality, etc.) should be notified prior to drilling or flaring.

j. A safety checklist should be maintained at the job site.

13. NOTE THAT THE COUNTY HAS A HEALTH AND SAFETY DOCUMENT THAT THE CONTRACTOR WILL BE REQUIRED TO REVIEW AND ENDORSE.
SECTION 01041

PROJECT COORDINATION

1.01 OBSTRUCTIONS

A. All water pipes, storm drains, force mains, telephone or power cables or conduits, and all other obstructions, whether or not shown, shall be temporarily removed from or supported across pipeline excavations. Before disconnecting any pipes or cables, the CONTRACTOR shall obtain permission from the COUNTY, or shall make suitable arrangements for their disconnection by the COUNTY. The CONTRACTOR shall coordinate these operations with the COUNTY. The CONTRACTOR shall be responsible for any damage to any such pipes, conduits or cables, and shall restore them to service promptly as soon as the work has progressed past the point involved. Approximate locations of known water, sanitary, drainage, power and telephone installations along route of new pipelines or in vicinity of new work are shown, but must be verified in the field. The CONTRACTOR shall uncover these pipes, ducts, cables, etc., carefully, by hand, prior to installing new piping. Any discrepancies or differences found shall be brought to the attention of the COUNTY in order that necessary changes may be made to permit installation of new pipe. These conditions are supplemental to general requirements elsewhere in these specifications.

B. Around the toe of slope outside of the disposal area are two pipes. One is an abandoned forcemain and the other is conduit for control wiring no longer in use. If either or both of these interfere with the project then they will be removed in the area of interference and disposed of at the working face.

1.02 DAMAGE TO EXISTING STRUCTURES AND UTILITIES

A. The CONTRACTOR shall be responsible for and make good all damage to roads beyond the limits of this Contract, buildings, telephone or other cables, water pipes, sanitary pipes, or other structures which may be encountered, whether or not shown on the Drawings.

B. Information shown on the Drawings as to the location of existing utilities has been prepared from the most reliable data available to the COUNTY. This information is not guaranteed, however, and it shall be this Contractor's responsibility to determine the location, character and depth of any existing utilities. He shall assist the utility companies, by every means possible to determine said locations. Extreme caution shall be exercised to eliminate any possibility of any damage to utilities resulting from his activities.
SECTION 01340

SHOP DRAWINGS, WORKING DRAWINGS, AND SAMPLES

1.01 DESCRIPTION

A. Scope of Work:

1. The CONTRACTOR shall submit to the ENGINEER for review and exception, if any, such working drawings, shop drawings, test reports and data on materials and equipment (hereinafter in this article called data), and material samples (hereinafter in this article called samples) materials list, certificates and affidavits as are required for the proper control of work, including but not limited to those working drawings, shop drawings, data and samples for materials and equipment specified elsewhere in the Specifications and in the Contract Drawings.

2. Within thirty (30) calendar days after the Effective Date of the Agreement, the CONTRACTOR shall submit to the ENGINEER a complete materials list of preliminary data on items for which Shop Drawings are to be submitted. Included in this materials list shall be the names of all proposed manufacturers furnishing specified items. Review of this list by the ENGINEER shall in no way expressed or implied relieve the CONTRACTOR from submitting complete Shop Drawings and providing materials, equipment, etc., fully in accordance with the Specifications. This procedure is required in order to expedite final review of Shop Drawings. The Contractor’s expedition of the Shop Drawings will be a critical path issue to complete the project within the allotted time.

3. The CONTRACTOR is to maintain an accurate updated submittal log and will bring this log to each scheduled progress meeting with the County and the ENGINEER. This log should include the following items:

   a. Submittal-Description and Number assigned.

   b. Date to ENGINEER.

   c. Date returned to CONTRACTOR (from ENGINEER).

   d. Status of Submittal (Reviewed No Comments, Reviewed Comments as Noted, Rejected, Revise and Resubmit, and Not Reviewed).
e. Date of Resubmittal and Return (as applicable).
f. Date material release (for fabrication).
g. Projected date of fabrication.
h. Projected date of delivery to site.
i. Specification Section.
j. Drawings Sheet Number.

B. Related Requirements Described Elsewhere:
   2. Project Record Documents: Section 01720.

1.02 CONTRACTOR'S RESPONSIBILITY

A. **It is the duty of the CONTRACTOR to check all drawings, data and samples prepared by or for him before submitting them to the ENGINEER for review.** Each and every copy of the Drawings and data shall bear CONTRACTOR’S stamp showing that they have been so checked. Shop drawings submitted to the ENGINEER without the CONTRACTOR’S stamp will be returned to the CONTRACTOR for conformance with this requirement. Shop drawings shall indicate any deviations in the submittal from requirements of the Contract Documents. If the CONTRACTOR takes exception to the specifications, the CONTRACTOR shall note the exception in the letter of transmittal to the ENGINEER.

B. Determine and verify:
   1. Field measurements.
   2. Field construction criteria.
   3. Catalog numbers and similar data.
   4. Conformance with Specifications.

C. The CONTRACTOR shall furnish the ENGINEER a schedule of Shop Drawings submittals fixing the respective dates for the submission of shop and working drawings, the beginning of manufacture, testing and installation of materials, supplies and equipment. This schedule shall indicate those that are critical to the progress schedule.
D. The CONTRACTOR shall not begin any of the work covered by a drawing, data, or a sample returned for correction until a revision or correction thereof has been reviewed and returned to him, by the ENGINEER, with approval.

E. The CONTRACTOR shall submit to the ENGINEER all drawings and schedules sufficiently in advance of construction requirements to provide no less than thirty (30) calendar days for checking and appropriate action from the time the ENGINEER receives them.

F. Each submittal shall be for an individual material. All submittals shall be accompanied with a transmittal letter prepared in duplicate containing the following information:

1. Shop Drawing cover page.
2. Project Title and Number.
3. CONTRACTOR'S name and address.
4. The number of each Shop Drawings, Project Data, and Sample submitted.
6. Submittal Log Number conforming to Specification Section Numbers.

G. The CONTRACTOR shall submit four (4) copies of descriptive or product data submittals to complement shop drawings for the ENGINEER plus the number of copies which the CONTRACTOR requires returned. The ENGINEER will retain four (4) sets. All shop drawings shall be submitted with one (1) reproducible pdf. and four (4) sets of prints. The ENGINEER will review the hard copies and return to the CONTRACTOR the additional set(s) marked-up with appropriate review comments. All shop drawings shall be sized appropriately and legible for review.

H. The CONTRACTOR shall be responsible for and bear all costs of damages which may result from the ordering of any material or from proceeding with any part of work prior to the completion of the review by ENGINEER of the necessary Shop Drawings.

I. The CONTRACTOR shall be fully responsible for observing the need for and making any changes in the arrangement of piping, connections, wiring, manner of installation, etc., which may be required by the materials/equipment he proposed to supply both as pertains to his own work and any work affected under other parts, headings, or divisions of drawings and specifications.
1.03 ENGINEER'S REVIEW OF SHOP DRAWINGS

A. The ENGINEER's review of drawings, data and samples submitted by the CONTRACTOR will cover only general conformity to the Specifications, external connections, and dimensions which affect the installation. The ENGINEER's review and exceptions, if any, will not constitute an approval of dimensions, quantities, and details of the material, equipment, device, or item shown.

B. The review of drawings and schedules will be general, and shall not be construed:
   1. as permitting any departure from the Contract requirements;
   2. as relieving the CONTRACTOR of responsibility for any errors, including details, dimensions, and materials;
   3. as approving departures from details furnished by the ENGINEER, except as otherwise provided herein.

C. If the drawings or schedules as submitted describe variations per paragraph 1.04.E., and show a departure from the Contract requirements which ENGINEER finds to be in the interest of the COUNTY and to be so minor as not to involve a change in Contract Price or time for performance, the ENGINEER may return the reviewed drawings without noting an exception.

D. When reviewed by the ENGINEER, each of the Shop Drawings will be identified as having received such review being so stamped and dated. Shop Drawings stamped "REVISE AND SUBMIT" and with required corrections shown will be returned to the CONTRACTOR for correction and resubmittal.

E. Resubmittals will be handled in the same manner as first submittals. On resubmittals the CONTRACTOR shall direct specific attention, in writing or on resubmitted Shop Drawings, to revisions other than the corrections requested by the ENGINEER on previous submissions. The CONTRACTOR shall make any corrections required by the ENGINEER.

F. If the CONTRACTOR considers any correction indicated on the drawings to constitute a change to the Contract Drawings or Specifications, the CONTRACTOR shall give written notice thereof to the ENGINEER.

G. Shop drawings and submittal data shall be reviewed by the ENGINEER for each original submittal and first and second resubmittal; thereafter review time for subsequent resubmittals shall be charged to the CONTRACTOR in accordance with the terms of the ENGINEER'S Agreement with the COUNTY.
H. When the Shop Drawings have been completed to the satisfaction of the ENGINEER, the CONTRACTOR shall carry out the construction in accordance therewith and shall make no further changes therein except upon written instructions from the ENGINEER.

I. Partial submittals will not be reviewed. Submittals not complete will be returned to the CONTRACTOR for resubmittal. Unless otherwise specifically permitted by the ENGINEER, make all submittals in groups containing all associated items for:

2. Processes.
3. As indicated in specific specifications sections.

All drawings, schematics, manufacturer's product data, certifications and other shop drawing submittals required by a system specification shall be submitted at one time as a package to facilitate interface checking.

1.04 SHOP DRAWINGS

A. When used in the Contract Documents, the term "Shop Drawings" shall be considered to mean CONTRACTOR'S plans for materials and equipment which become an integral part of the Project. These drawings shall be complete and detailed. Shop Drawings shall consist of fabrication, erection and setting drawings and schedule drawings, manufacturer's scale drawings, and wiring and control diagrams. Cuts, catalogs, pamphlets, descriptive literature, and performance and test data, shall be considered only as supportive to required Shop Drawings as defined above. As used herein, the term "manufactured" applies to standard units usually mass-produced; and "fabricated" means items specifically assembled or made out of selected materials to meet individual design requirements.

B. Manufacturer's catalog sheets, brochures, diagrams, illustrations and other standard descriptive data shall be clearly marked to identify pertinent materials, product or models. Delete information which is not applicable to the Work by striking or cross-hatching.

C. Drawings and schedules shall be checked and coordinated with the work of all trades involved, before they are submitted for review by the ENGINEER and shall bear the CONTRACTOR'S stamp of approval as evidence of such checking and coordination. Drawings or schedules submitted without this stamp of approval shall be returned to the CONTRACTOR for resubmission.
D. Each Shop Drawing shall have a blank area 3-1/2 inches by 3-1/2 inches, located adjacent to the title block. The title block shall display the following:

1. Project Title and Number.
2. Name of project building or structure.
3. Number and title of the shop drawing.
4. Date of shop drawing or revision.
5. Name of CONTRACTOR and subcontractor submitting drawing.
6. Supplier/manufacturer.
7. Separate detailer when pertinent.
8. Specification title and number.
10. Application Contract Drawing Number.

E. If drawings show variations from Contract requirements because of standard shop practice or for other reasons, the CONTRACTOR shall describe such variations in his letter of transmittal. If acceptable, proper adjustment in the Contract shall be implemented where appropriate. If the CONTRACTOR fails to describe such variations, he shall not be relieved of the responsibility for executing the work in accordance with the Contract, even though such drawings have been reviewed.

F. Data on materials and equipment include, without limitation, materials and equipment lists, catalog data sheets, cuts, performance curves, diagrams, materials of construction and similar descriptive material. Materials and equipment lists shall give, for each item thereon, the name and location of the supplier or manufacturer, trade name, catalog reference, size, finish and all other pertinent data.

G. For all mechanical and electrical equipment furnished, the CONTRACTOR shall provide a list including the equipment name, and address and telephone number of the manufacturer's representative and service company so that service and/or spare parts can be readily obtained.

H. All manufacturers or equipment suppliers who proposed to furnish equipment or products shall submit an installation list to the ENGINEER along with the required shop drawings. The installation list shall include at least five (5)
installations where identical equipment has been installed and has been in operation for a period of at least one (1) year.

I. Only the ENGINEER will utilize the color "red" in marking Shop Drawing submittals.

1.05 WORKING DRAWINGS

A. When used in the Contract Documents, the term "working drawings" shall be considered to mean the CONTRACTOR’S plan for temporary structures such as temporary bulkheads, support of open cut excavation, support of utilities, ground water control systems, forming and falsework; for underpinning; and for such other work as may be required for construction but does not become an integral part of the Project.

B. Copies of working drawings as noted in paragraph 1.05 A. above, shall be submitted to the ENGINEER where required by the Contract Documents or requested by the ENGINEER, and shall be submitted at least thirty (30) calendar days (unless otherwise specified by the ENGINEER) in advance of their being required for work.

C. Working drawings shall be signed by a registered Professional ENGINEER, currently licensed to practice in the State of North Carolina and shall convey, or be accompanied by, calculation or other sufficient information to completely explain the structure, machine, or system described and its intended manner of use. Prior to commencing such work, working drawings must have been reviewed without specific exceptions by the ENGINEER, which review will be for general conformance and will not relieve the CONTRACTOR in any way from his responsibility with regard to the fulfillment of the terms of the Contract. All risks of error are assumed by the CONTRACTOR; the COUNTY and ENGINEER shall have no responsibility therefor.

1.06 SAMPLES

A. The CONTRACTOR shall furnish, for review by the ENGINEER, samples required by the Contract Documents or requested by the ENGINEER. Samples shall be delivered to the ENGINEER as specified or directed. The CONTRACTOR shall prepay all shipping charges on samples. Materials or equipment for which samples are required shall not be used in work until accepted by the ENGINEER.

B. Samples shall be of sufficient size and quantity to clearly illustrate:

1. Functional characteristics of the product, with integrally related parts and attachment devices.
2. Full range of color, texture and pattern.

3. A minimum of two samples of each item shall be submitted.

C. Each sample shall have a label indicating:

1. Name of project.

2. Name of CONTRACTOR and Subcontractor.

3. Material or equipment represented.

4. Place of origin.

5. Name of producer and brand (if any).

6. Location in project.

(Samples of finished materials shall have additional marking that will identify them under the finished schedules).

D. The CONTRACTOR shall prepare a transmittal letter in triplicate for each shipment of samples containing the information required in paragraph 1.06 C. above. He shall enclose a copy of this letter with the shipment and send a copy of this letter to the ENGINEER. Review of a sample shall be only for the characteristics or use named in such approval and shall not be construed to change or modify any Contract requirements.

E. Accepted samples not destroyed in testing shall be sent to the ENGINEER or stored at the site of the work. Accepted samples of the hardware in good condition will be marked for identification and may be used in the work. Materials and equipment incorporated in work shall match the accepted samples. Samples which failed testing or were not accepted will be returned to the CONTRACTOR at his expense, if so requested at time of submission.
SECTION 01700
CONTRACT CLOSEOUT

1.01 FINAL INSPECTION
A. When CONTRACTOR considers the work is complete, he shall submit written certification that:
   1. Contract Documents have been reviewed.
   2. Work has been inspected for compliance with Contract Documents.
   3. Work has been completed in accordance with Contract Documents.
   4. Work is completed and ready for final inspection.
B. The COUNTY will make an inspection to verify the status of completion with reasonable promptness after receipt of such certification.
C. Should COUNTY consider that the work is incomplete or defective:
   1. COUNTY will promptly notify the CONTRACTOR in writing, listing the incomplete or defective work.
   2. CONTRACTOR shall take immediate steps to remedy the stated deficiencies, and send a second written certification to COUNTY that the Work is complete.
   3. The COUNTY will reinspect the Work.
D. When the COUNTY finds that the Work is acceptable under the Contract Documents, he shall request the Contractor to make closeout submittals.

1.02 REINSPECTION FEES
A. Should the COUNTY perform re-inspections due to failure of the work to comply with the claims of status of completion made by Contractor:
   1. OWNER will compensate the COUNTY for such additional services.
   2. OWNER will deduct the amount of such compensation from the final payment to the Contractor.
1.03 CONTRACTOR'S CLOSEOUT SUBMITTALS TO COUNTY

A. Evidence of compliance with requirements of governing authorities.
B. Project Record Documents: To requirements of Section 01720.
C. Evidence of Payment and Release of Liens: To requirements of General and Special Conditions.
D. Certificate of Insurance for Products and Completed Operations.

1.04 FINAL ADJUSTMENT OF ACCOUNTS

A. Submit a final statement of accounting to the COUNTY.
B. Statement shall reflect all adjustments to the Contract Sum:
   1. The original Contract Sum.
   2. Additions and deductions resulting from:
      a. Previous change orders or written amendment.
      b. Allowances
      c. Unit prices
      d. Deductions for uncorrected work
      e. Penalties and bonuses
      f. Deductions for liquidated damages
      g. Deductions for re-inspection payments
      h. Other adjustments
   3. Total Contract Sum, as adjusted.
   4. Previous payments.
   5. Sum remaining due.

1.05 FINAL APPLICATION FOR PAYMENT

A. CONTRACTOR shall submit the final Application for Payment in accordance with procedures and requirements stated in the Conditions of the Contract.
SECTION 01720

PROJECT RECORD DOCUMENTS

1.01 REQUIREMENTS INCLUDED

A. Maintain at the site for the COUNTY one record copy of:
   1. Drawings
   2. Specifications
   3. Addenda
   4. Change Orders and other modifications of the contract.
   5. Engineer's Field Orders or written instructions.
   6. Approved Shop Drawings, Working Drawings and Samples.
   7. Field Test records.
   8. Construction photographs.

B. Related Requirements Described Elsewhere:
   1. Field Engineering And Survey: Section 01050
   2. Shop Drawings, Working Drawings, And Samples: Section 01340
   3. Suggested Construction Sequencing: Section 01900

1.02 MAINTENANCE OF DOCUMENTS AND SAMPLES

A. Store documents and samples in CONTRACTOR’S field office, if required, apart from documents used for construction.
   1. Provide files and racks for storage of documents.
   2. Provide locked cabinet or secure storage space for storage of samples.

B. File documents and samples in accordance with CSI format with section numbers as provided herein.
C. Maintain documents in a clean, dry, legible, condition and in good order. Do not use record documents for construction purposes.

D. Make documents and samples available at all times for inspection by the ENGINEER.

E. As a prerequisite for monthly progress payments, the CONTRACTOR is to exhibit the currently updated "Record Documents" for review by the ENGINEER and COUNTY.

1.03 MARKING DEVICES

A. Provide felt tip marking pens for recording information in the color code designated by the ENGINEER.

1.04 RECORDING

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. Drawings: Legibly mark to record actual construction:
   1. Depths of various elements of foundation in relation to finish first floor datum.
   2. All underground piping with elevations and dimensions. Change to piping location. Horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements. Actual installed pipe material, class, etc.
   3. Location of internal utilities and appurtenances concealed in the construction, referenced to visible and accessible features of the structure.
   4. Field changes of dimension and detail.
   5. Changes made by Field Order or by Change Order.
   6. Details not on original contract drawings.
   7. Structure and piping relocations.

D. Specifications and Addenda: Legibly mark each section to record:
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): Provide five (5) sets of record drawings for each process equipment, piping, electrical system and instrumentation system.

1.05 SUBMITTAL

A. At Contract closeout, deliver Record Documents to the ENGINEER for the COUNTY.

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.
SECTION 01900

CONSTRUCTION SEQUENCING

1.01 DESCRIPTION

A. Contractor is required to furnish all labor, equipment, appliances and materials, and perform all operations required to initiate and complete this suggested construction sequence schedule.

B. All construction work for this project shall be sequenced in detail and the proposed schedule must be approved by the Owner prior to construction.

C. The work under this contract shall not interfere with on-going operations. Owner will work with Contractor to assure a continuous construction schedule on this contract. This being noted, the following is a general sequence of construction that is suggested to achieve the aforementioned:

FOR THE Control Panels Replacement project

1. Contractor to verify existing conditions.

2. Contractor MUST maintain operation of the existing pumping systems during construction of the new panels.

3. Contractor to verify control points and construction baseline locations with County personnel.

4. Contractor to coordinate with Duke Energy and County for power at the new panels locations.

5. Contractor to establish panel racks at locations shown on the drawings.

6. Contractor to mount panels and other equipment necessary for the operation of the existing pumping systems.

7. Contractor to install necessary conduit and wiring to connect existing pumping systems to the new panels and repair roadway crossings in accordance with the project details.

8. Contractor to coordinate operational change from the old panels to the new replacement panels.

9. Contractor to demolish existing panel systems.
10. Contractor to place sod at all locations disturbed by the construction.

D. At the completion of the sodding the project should be completed.

E. This suggested sequence of construction is general in nature and does not illustrate the overall requirement, magnitude, scope, or responsibilities of the Contractor in the completion of the work under the Contract Agreement.

F. The contractor shall submit a sequence of construction along with the construction schedule.
SECTION 01910

CONTRACTOR COMPLIANCE REQUIREMENTS

1.01 INTRODUCTION

A. The safety and health of all contractors, customers, and employees of the New Hanover County Department of Environmental Management is of primary importance. As a result, the prevention of occupationally induced injuries and illnesses will be given precedence over operating productivity whenever necessary. Our goal is to maintain a safety and health program conforming to all applicable OSHA standards and to lead in safety program management within our industry. To be successful will require contractor cooperation in all safety and health matters.

As a contractor you will be required, as part of your contract, to take an active role in the Department of Environmental Management safety and health program. The following contractor safety and health requirements, when adhered to, will ensure safety for contractors, customers, and County employees. Additionally, potential damage to equipment and property will be avoided. It is impossible to document all possible situations or to provide precise guidance for every contingency a contractor may encounter in the course of their work. However, adherence to the rules as written and the desire to apply safe work practices will result in the highest level of safety.

1.02 GENERAL REQUIREMENTS

A. All contractor employees shall abide by the Department of Environmental Management safety and health rules and regulations at all times. The DEM Safety Manual is available for copy or review in each of the Department’s offices.

B. The contractor and all contracted employees are required to follow the procedures for signing in and out. Procedures may differ depending on the section of the department the contractor is working in; they will be explained fully before the work begins.

C. The contractor shall have a competent individual in charge at the job site to supervise the job, conduct an adequate accident prevention program, and ensure compliance to OSHA and DEM rules.
D. All accidents or injuries shall be reported immediately to the DEM Project Manager or Safety Manager.

E. Contractor employees are not allowed to enter areas other than the work site, unless it is required for the performance of their job.

F. The contractor shall inform the Project Manager of any known hazardous conditions that exist, due to the contract work being done, in areas where Departmental employees may be exposed to the known hazards.

G. The contractor shall provide Safety Data Sheets for all containers of hazardous substances brought onto DEM property.

H. The contractor shall sign the “Contractor Hold Harmless” waiver form in order to use any Department equipment.

I. Periodic job site inspections will be conducted by the DEM Project Manager or Safety Manager to ensure that the job is proceeding safely in accordance with safety rules.

J. Violation of these rules is grounds for immediate termination of contract work.

1.03 STANDARDS OF CONDUCT

A. The Department of Environmental Management has established standards to ensure the smooth, safe, and efficient operations of the Department. Violation of these standards is considered serious and may lead to termination of the contract. The following are prohibited:

1. Willful damage to any Departmental property, customer property, or the property of Department employees.

2. Possession, use, or distribution of alcohol, narcotics, or illegal drugs on Department property.

3. Possession of firearms, ammunition, concealed weapons, or explosives (unless properly authorized).

4. Abusive or threatening language, harassment, disrespectful behavior, workplace violence, or interfering with the work of Department employees.

5. Theft or attempted theft from the Department or Department employees.

6. Refusal to perform contracted work or refusal to obey instructions.
7. Sleeping on the job.
8. Negligence or conduct which could result in injury or damage to property.

1.04 CONTRACTOR SAFETY TRAINING

A. Please place a check by each of the following categories in which one or more of your employees has been trained. It is understood that not all contractors will have employees who are trained in all of the areas listed.

___ Personal Protective Equipment
___ First Aid and CPR
___ Lockout/Tagout
___ Confined Space Entry
___ Respiratory Protection
___ Hazardous Communication
___ Safety Data Sheets
___ Fire Prevention and Protection
___ Fall Protection
___ Scaffolding
___ Heavy Equipment Training/Certification (includes bulldozer, loader, forklift, excavator, grader, roller, backhoe, bobcat)
___ Welding, Cutting, and Brazing
___ Electrical Safety
___ Trenching/Excavation
___ Other ________________________________
___ Other ________________________________
* If the contracting company has ten (10) or more employees, they will be required to present OSHA 300 Logs, at a minimum for the past three calendar years, along with their bid.

The Department of Environmental Management reserves the right to ask for any training records from the categories that were checked above. The County reserves the right to reject the bid of any firm that cannot document proper safety training as it relates to conducting the work included in the contract.

1.05 CONTRACTOR AGREEMENT TO COMPLY

I, ______________________________, a representative of ___________________________ do hereby acknowledge that my company has received a copy of the guidelines governing contract work being performed on New Hanover County Department of Environmental Management property. It is agreed that as part of the contract my company and its employees will comply with these guidelines and all the written programs which apply to the work being performed.

Signed ______________________________  Date ____________________

(Contractor)

Signed ______________________________  Date ____________________

(Contractor)
SECTION 02215

SAFETY PROCEDURE

1.01 SAFETY PROCEDURES IN AND AROUND THE LANDFILL

It is the CONTRACTOR’s responsibility to provide for all safety functions during the term of their work on the project site.

A. All work conducted in and around landfills shall be done in accordance with State and local requirements and OSHA Safety and Health Standards 29 CFR and shall conform to the Landfill Gas Division of the Solid Waste Association of North American (SWANA) A Compilation of Landfill Gas Field Practices and Procedures dated August, 2011.

Additionally, for construction in the vicinity of a known landfill area, the following steps should be taken to prevent injury:

1. A combustible gas indicator must be utilized at all times during trenching and drilling, or when construction occurs within 10 feet of an open excavation.

2. When trenching or drilling deeper than 2 feet into the fill, or in the presence of detectable concentrations of methane, the soils are to be wetted and the operating equipment shall be provided with spark-proof exhausts.

3. Foam fire extinguishers will be provided on all equipment working in the landfill.

4. Personnel within or near an open trench or drill hole will:
   a. be fully clothed
   b. wear shoes with non-metallic soles
   c. wear a hard hat and safety goggles or glasses

5. Exhaust blowers should be on hand to be used in cases where trenches may show a build-up of methane or lack of oxygen.

6. Smoking should not be permitted in any area within 500 feet of the excavation.
7. An attempt should be made to keep personnel away from a downwind proximity of any open trench, unless the trench is constantly monitored and declared safe.

8. The operator of trenching equipment should wear an organic vapor and acid gas respirator while operating the equipment in or astride any trench.

9. Before personnel are permitted to enter an open trench, the trench should be carefully monitored for methane and oxygen sufficiency. The personnel should also be provided with a continuous methane and oxygen monitor in their work area as long as they are in the excavation.

B. For construction near (within 1,000 feet) of a known landfill area, the following safety precautions should be taken:

1. The areas under construction must be checked with a combustible gas indicator before excavation to determine if methane gas is in the area.

2. Any excavations must be monitored for methane and oxygen deficiency if personnel are to be sent in. This must be carried out continuously, unless the presence of methane in the area can definitely be ruled out.

3. Should methane gas be found in the area, those precautions applicable to digging in the landfill shall also apply to this situation.

C. Safety procedures to adhere to when working in landfill generated gas atmospheres:

1. Personnel monitoring equipment: tri-techtors required for detecting:
   a. flammable gas
   b. low O₂
   c. toxic gas

2. At least one monitor for each work party.

3. All appliances used in landfill generated gas atmospheres, must be explosion proof, i.e., Class I, Division -I, Group C, or, as per the 1987 NEC.

4. Ventilation must be a minimum of 2,500 CFM and should be increased as excavation of area becomes larger.

5. Entrance into utility line access manhole covers should be done with extreme caution. Sparks can occur from metal manhole covers and rings.
6. Always sample the air in a manhole or confined space with a detector, before entering.

7. If flammable vapors or low oxygen atmosphere conditions prevail, ventilate before entering.

8. Never allow smoking, open lights in or near excavations or confined spaces.

D. CONTRACTOR NOTE: New Hanover County has a standing Health and Safety Plan that must be adhered to for construction activities at the facility. See Section 01910 for additional information.
SECTION 02220

EXCAVATING, BACKFILLING, AND COMPACTION

1.01 DESCRIPTION

A. The work included under this Section consists of excavating, trenching, sheeting/shoring, grading, trench backfilling activities, compacting, transporting, segregating materials, stockpiling, disposing of materials, installing bedding and backfill materials, installing pipe and appurtenances as required for the construction of the work as shown on the drawings and specified herein.

B. The CONTRACTOR must determine for himself the volume of material required for the performance of all lump some items included in the Contract plans and specifications.

C. Work under this Section includes trenching and minor recovery grading activities anticipated to be outside of municipal solid waste (MSW). See the roadway detail for materials that are to be provided to repair the excavation for conduit under the road. Soils and stone in the roadway shall be compacted appropriately to avoid settlement.

D. Upon identification, the CONTRACTOR shall notify the COUNTY in writing if the site conditions encountered during construction differ from that indicated on the Contract Drawings. Notification by the CONTRACTOR shall include an explicit description of the differences.

E. Any damage to the existing landfill liner systems or existing vertical LFG passive vents shall be repaired as directed by the COUNTY at the CONTRACTOR’S expense.

1.02 DEFINITIONS

1. The CONTRACTOR will be required to restore the same grade existing on the slopes west of the perimeter road, grades on the finish level of the roadway, and grading around the demolition area. It is not anticipated that any additional soil will be needed to complete recovery of the slopes.

1.03 PROJECT CONDITIONS

A. Existing project conditions are shown on the Contract Drawings or otherwise described herein.

B. This information has been obtained from existing records. It is not guaranteed to be correct or complete and is shown for the convenience of the CONTRACTOR.
The CONTRACTOR shall explore ahead of the required excavation to determine the exact location of all structures, utilities, etc.

C. Structures shall be supported and protected from damage by the CONTRACTOR. If structures are broken or damaged, CONTRACTOR shall restore structures, utilities, etc. to their original condition at no additional cost to the COUNTY. Repair of damaged features or structures shall be approved by the COUNTY.

1.04 PIPE BEDDING AND SOIL BACKFILL

A. For excavations CONTRACTOR shall reuse excavated soils from trenching for backfilling around installed pipe, unless directed otherwise by COUNTY.

B. If additional soil is needed beyond the reusable quantities of soil described above, the CONTRACTOR shall provide appropriate pipe bedding and soil backfill material from an off-site source or material excavated for the trenches. These soils shall generally be free of sticks, roots, organic matter, and stones larger than 1-inch in any dimension.

1.05 EROSION AND SEDIMENT CONTROL

A. The CONTRACTOR shall provide erosion and sedimentation control methods as needed to avoid erosion.

1.06 GENERAL EXCAVATION

A. The CONTRACTOR is responsible for layout of all excavations.

B. The CONTRACTOR shall provide drainage at all times during construction by shaping excavated areas and maintaining ditches and berms. CONTRACTOR will protect graded areas against action of elements and re-establish grades where settlement, washouts, or erosion damage occurs. Damaged areas shall be repaired at no additional cost to the COUNTY.

C. When excavation has reached prescribed depths, the COUNTY shall be notified that an inspection of the excavation may be performed.

D. If the bottom of any excavation is removed below the limits shown on the Contract Drawings or as directed by the ENGINEER, it shall be backfilled with ENGINEER approved materials at no additional cost to the COUNTY.

E. The CONTRACTOR shall not leave any excavations, boreholes, or trenches open at the completion of WORK each day unless proper protection is provided. All open holes shall be backfilled flush with existing grade or covered, at the COUNTY’S direction, with acceptable materials prior to leaving the site.
F. All excavations shall conform to the Safety Procedures submitted under Section 02215 of these specifications.

1.07 SODDING/REVEGETATION

A. Sodding shall be required around side slopes and areas impacted by the installation and demolition work. Refer to Section 02930-Sodding.

B. CONTRACTOR shall maintain the seeded and sodded areas in accordance with Section 02930-Sodding and Section 02932 Seeding and Mulching.

1.08 PROTECTION OF WORK

A. The CONTRACTOR shall protect all finished earthwork at the end of the working day and over the weekend from damages from moisture loss, hot weather, inclement weather and stormwater erosion. The CONTRACTOR shall repair all damages on the construction area.
SECTION 02276

TEMPORARY EROSION AND SEDIMENTATION CONTROL

PART 1 - GENERAL

1.01 DESCRIPTION

A. The WORK specified in this Section shall include installing and maintaining erosion and sedimentation controls as necessary or as indicated described in this section for proper execution of WORK. All erosion controls shall be installed and approved by the COUNTY prior to beginning WORK. All existing and foreseeable conditions that affect the WORK both inside and outside the limits of construction shall be CONTRACTOR’S responsibility.

B. Temporary erosion controls include, but are not limited to:

1. Grassing, mulching, netting, seeding and watering on-site surfaces and soil and borrow area surfaces, providing interceptor ditches at those locations which will ensure erosion during construction will be either eliminated or maintained within acceptable limits as established by the regulatory agencies having jurisdiction.

C. Temporary sedimentation controls include, but are not limited to:

1. Silt dams, traps, barriers, and appurtenances at the foot of sloped surfaces which will ensure that sedimentation pollution will be either eliminated or maintained within acceptable limits as established by the regulatory agencies having jurisdiction.

D. CONTRACTOR is responsible for providing effective temporary erosion and sediment control measures during execution of WORK or until final controls become effective or until the WORK is accepted by the COUNTY. CONTRACTOR may, with COUNTY’S approval, perform WORK outside the limits of construction to establish, maintain, or enhance erosion control systems.

E. At no time will stormwater runoff within the limits of construction be allowed to discharge to the stormwater system or offsite without proper water quality treatment. CONTRACTOR shall plan construction activities to assure that the discharge of leachate or contaminated stormwater outside the liner and leachate collection system does not occur.

F. CONTRACTOR shall be solely responsible for all costs (including investigation, sampling, testing, analysis engineering, and remedial construction) related to the discharge of leachate or contaminated stormwater outside the liner and leachate.
collection system resulting from ineffective control of leachate or stormwater discharge by CONTRACTOR.

G. CONTRACTOR shall install additional erosion and sedimentation control measures deemed necessary by the COUNTY as a result of variations in the CONTRACTOR’s operations, or shall repair existing system as directed by the COUNTY. Additional controls or repairs shall be installed at no additional cost to the COUNTY.

H. All erosion and siltation control devices shall be checked regularly by the CONTRACTOR, especially after each rainfall event and will be cleaned out and/or repaired as required by the COUNTY.

I. Submittal

1. Submit to the ENGINEER for review prior to the start of construction, the erosion control procedures to be utilized for this project prior to construction. This shall be submitted in the form of a shop drawing titled “Erosion Control Plan”, and shall address all items in this section.

1.02 REFERENCE DOCUMENTS


PART 2 - PRODUCTS

2.01 EROSION CONTROL

A. Netting - fabricated of material acceptable to the COUNTY and the ENGINEER.

2.02 SEDIMENTATION CONTROL

A. Bales - clean, seed-free cereal hay type.

B. Netting - fabricated material acceptable to the COUNTY and the ENGINEER.

C. Filter stone - crushed stone conforming to North Carolina Department of Transportation (NCDOT) specifications.

D. Concrete block - hollow, non-load-bearing type.

E. Concrete exterior grade, Class B.
PART 3 - EXECUTION

3.01 EROSION CONTROL

A. Minimum procedures for grassing are:
   1. Scarify slopes to a depth of not less than six inches and remove large
      clods, rock, stumps, and roots larger than 1/2-inch in diameter and debris.
   2. Sow seed within 24 hours after the ground is scarified with either
      mechanical seed drills or rotary hand seeders.
   3. Apply mulch loosely and to a thickness of between 3/4-inch and 1-1/2
      inches.
   4. Apply netting over mulched areas on sloped surfaces.
   5. Roll and water seeded areas in a manner which will encourage sprouting
      of seeds and growing of grass. Reseed areas which exhibit unsatisfactory
      growth. Backfill and seed eroded areas.

3.02 SEDIMENTATION CONTROL

A. Install and maintain silt dams, traps, barriers, and appurtenances as necessary to
   prevent the movement of soils and any contaminated water from leaving the
   Project. Hay bales which deteriorate and filter stone which is dislodged shall be
   replaced at the CONTRACTOR’s expense.

B. Silt fencing will be established along the toe of the slope within the partial closure
   area. Drainage structures will be protected to prevent sediment intrusion.

3.03 PERFORMANCE

A. Should any of the temporary erosion and sediment control measures employed by
   the CONTRACTOR fail to produce results which comply with the requirements
   of the local regulatory authorities, the CONTRACTOR shall immediately take
   whatever steps are necessary to correct the deficiency at his own expense.

B. During construction, any stripped or bare areas are to be covered immediately by
   mulch products or by sod or seed any mulch with temporary or permanent
   vegetation.

C. All swales, ditches, channels, retention ponds and detention areas are to be sodded
   or seeded as required as soon as possible.
SECTION 02550

GEOTEXTILE

PART 1 - GENERAL

1.01 SUMMARY

A. The WORK specified in this section includes the manufacture, testing, and installation of woven geotextile for the gravel access road as shown on the drawings and as specified herein.

1.02 SUBMITTALS

A. Submit MANUFACTURER’s prequalification, test reports and data, specifications, installation instructions, roll dimensions, and geotextile approval form.

B. Submit copies of evaluation reports provided by the manufacturer demonstrating that properties for the materials comply with specification requirements.

C. ENGINEER’s approval shall be obtained prior to the use of any materials in the project.

PART 2 PRODUCTS

2.01 WOVEN GEOTEXTILE

A. A woven geotextile fabric shall be furnished and installed on the compacted existing soil prior to placement of 6-inch gravel at the new gravel access road.

B. Material shall be an 8-oz woven geotextile as manufactured by Tencate Miranda HP 570, or ENGINEER approved substitution conforming to the following minimum properties:

<table>
<thead>
<tr>
<th>CHARACTERISTICS</th>
<th>SPECIFICATION</th>
<th>TEST METHOD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apparent Opening Size</td>
<td>0.6 mm</td>
<td>ASTM D4751</td>
</tr>
<tr>
<td>Flow Rate</td>
<td>30 gal/min/ft²</td>
<td>ASTM D4491</td>
</tr>
<tr>
<td>Permeability</td>
<td>0.05 cm/sec</td>
<td>ASTM D4491</td>
</tr>
<tr>
<td>Permittivity</td>
<td>0.40 sec⁻¹</td>
<td>ASTM D4491</td>
</tr>
<tr>
<td>Tensile Strength (at ultimate)</td>
<td>4800 lbs/ft(MD)</td>
<td>ASTM D4595</td>
</tr>
<tr>
<td></td>
<td>4800 lbs/ft(CD)</td>
<td></td>
</tr>
<tr>
<td>Tensile Strength (at 2% strain)</td>
<td>960 lbs/ft(MD)</td>
<td>ASTM D4595</td>
</tr>
<tr>
<td></td>
<td>1320 lbs/ft(CD)</td>
<td></td>
</tr>
<tr>
<td>Tensile Strength (at 5% strain)</td>
<td>2400 lbs/ft(MD)</td>
<td>ASTM D4595</td>
</tr>
<tr>
<td></td>
<td>2700 lbs/ft(CD)</td>
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</tr>
<tr>
<td>Tensile Strength (at 10% strain)</td>
<td>4800 lbs/ft(MD)</td>
<td>ASTM D4595</td>
</tr>
<tr>
<td></td>
<td>4800 lbs/ft(CD)</td>
<td></td>
</tr>
</tbody>
</table>
PART 3 EXECUTION

3.01 SHIPPING AND HANDLING

A. The MANUFACTURER typically assumes responsibility for initial loading and shipping of geotextiles. Unloading, on-site handling, and storage shall be the responsibility of the CONTRACTOR.

B. A visual inspection of each roll should be made as it is unloaded to identify if any packaging has been damaged. Rolls with damaged packaging should be repaired prior to being placed in storage.

C. The CONTRACTOR shall contact the MANUFACTURER prior to shipment to ascertain the appropriateness of the proposed unloading methods and equipment to be utilized.

D. The CONTRACTOR assumes all liability with regards to shipping, transport and unloading of the geotextiles required to complete the WORK. The COUNTY shall not be responsible for damaged, lost or mis-stocked shipments, or mishandled or damaged materials.

E. CONTRACTOR shall submit to ENGINEER the manufacturer’s quality control test results for the geotextile produced specifically for the project and certification that the material meets the requirements of this Specification at least 15 days prior to the installation of the material.

3.02 PROTECTION AND STORAGE

A. Each roll of material shall have a MANUFACTURER’S identification label. Each roll shall be labeled to provide product identification adequate for inventory and quality control purposes. The label shall provide as a minimum the MANUFACTURER’S name, product identification, lot number, roll number, and roll dimensions. Rolls shall be labeled as per ASTM D4873 Standard Guide for Identification, Storage and Handling of Geosynthetic Rolls and Samples.

B. Materials shall be shipped and stored in rolls furnished at the manufacturing facility to prevent exposure of the geotextile to ultraviolet light, precipitation, moisture, mud, dirt, dust, puncture or other damaging conditions.

C. Rolls of geotextile should not be stacked upon one another to the extent that deformation of the core occurs. Outdoor storage shall not exceed 6 months.

D. Storage of the geotextile rolls shall be the responsibility of the CONTRACTOR. A dedicated storage area shall be selected at the site that is away from high traffic areas and is level, dry and well-drained.
E. Rolls should be stored in a manner that prevents sliding or rolling from the stacks. This may be accomplished by the use of chock blocks or by use of the dunnage shipped between rolls. Rolls should be stacked at a height no greater than the lifting apparatus can be safely handled (typically no higher than four rolls).

F. All stored geotextile must be covered with a plastic sheet or tarpaulin until their installation. Covering shall protect the geotextile from ultraviolet light exposure, precipitation, mud, dirt, puncture, cutting or any other damaging or deleterious conditions.

G. Geotextiles shall not be exposed to sunlight for more than 15 days unless otherwise specified and guaranteed by the geotextile MANUFACTURER.

3.03 INSTALLATION

A. Geotextiles shall be installed in accordance with the MANUFACTURER’S recommendations. No equipment shall be allowed to operate on the geotextile and any tears or damage to the geotextile shall be repaired prior to placement. The surface of the geotextile shall be kept relatively clean and free of debris during installation.

B. Geotextile shall not be placed in a trench that is excessively wet or has standing water.

C. Geotextile sheets shall be joined in accordance with the MANUFACTURER’S recommendations.

D. The CONTRACTOR shall place all cover materials in such a manner to prevent damage to the materials, slippage of the underlying layers and excessive tensile stresses in the materials.

3.04 REPAIRS

A. Geotextile damaged during placement shall be replaced at the CONTRACTOR’S expense in accordance with MANUFACTURER’S recommendation. The CONTRACTOR shall be responsible for the documentation of repairs describing location and type of repair. Repair documentation shall be submitted to the ENGINEER.

3.05 GEOTEXTILE EXPOSURE FOLLOWING PLACEMENT

A. Exposure of geotextiles to the elements between the time the geotextile is placed to the time backfilling operations are complete shall be limited to a maximum of 30 days.

END OF SECTION
SECTION 02930
SODDING

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

A. The extent of sodding consists of supplying and planting sod in the locations shown on the drawings or described herein. The primary areas include the area of the new panel placement and areas disturbed due to the demolition of the existing panels. The purpose of the sodding is to avoid erosion due to and/or during a storm event.

B. The sodding work shall include, but not be limited to, supplying all labor, materials, and equipment necessary to perform sodding, fertilizing, watering, mowing, and cleanup.

1.02 QUALITY ASSURANCE

A. The COUNTY reserves the right to test, reject, or accept all materials before application.

1.03 DELIVERY, STORAGE AND HANDLING

A. Deliver fertilizer in waterproof bags showing weight, chemical, analysis, and name of manufacturer.

B. The Contractor shall, at the time of delivery, furnish the County invoices of all materials received in order that the minimum application rate of materials may be determined. Failure to supply invoices at the time of delivery will warrant that payment for those items be delayed until proper submittal of invoices is obtained and the minimum application rates of material may be verified.

PART 2 - PRODUCTS

2.01 SOD

A. Sod shall be Coastal Bermuda or Centipede Bahia with well matted roots.

B. The sod shall be commercial size rectangular measuring 12-inches by 24-inches or larger.

C. The sod shall be sufficiently thick to secure a dense stand of live grass, with a minimum thickness of 2-inches. The sod shall be live, fresh and uninjured at the time of planting. It shall have a soil mat of sufficient thickness adhering firmly to the roots to withstand all necessary handling. It shall be reasonably free of weeds and other grasses.
D. Sod shall be planted as soon as possible after being harvested and shall be shaded and kept moist from the time of harvesting until it is planted.

E. The source of the sod may be inspected and accepted by the County prior to construction.

2.02 FERTILIZER

A. The fertilizer shall be a commercial granular type with a chemical designation of 12-8-8.

B. The numerical designations for fertilizer indicate the minimum percentages (respectively) of (1) total nitrogen, (2) available phosphoric acid, and (3) water soluble potash, contained in the fertilizer.

1. At least 50 percent of the phosphoric acid shall be from a normal super phosphate or an equivalent source which will provide a minimum of two units of sulfur.

2. The amount of sulfur shall be indicated on the quantitative analysis card attached to each bag of container.

C. Commercial fertilizers shall comply with the State fertilizer laws.

D. Fertilizer may, at the discretion of the County, upon satisfactory evidence of its feasibility from the manufacturer, be applied in liquid form.

2.03 WATER

A. The water used in the sodding operations may be obtained from any approved spring, pond, lake, stream, or municipal water system.

B. The water shall be free of excess and harmful chemicals, acids, alkalies, or any substance which might be harmful to plant growth or obnoxious to traffic.

C. Salt water shall not be used.

PART 3 - EXECUTION

3.01 GENERAL

The order of work for sod installation shall be as follows:

A. Fine grading
B. Removal of debris
C. Application of fertilizer
D. Placement of sod
E. Clean-up
F. Watering

3.02 SOIL MANIPULATION

A. All soil manipulation shall be done at right angles to the direction of the slope.

3.03 FINE GRADING

A. After removal of debris, fine grading shall be performed as required to bring all areas to receive grass to an acceptable smooth and finished grade. Areas to receive grass shall be fine graded by raking to eliminate wind rows, ridges, depressions and other irregularities.

B. All sodded areas bordered by paving shall have a finished grade (top of the sod) that is ½" below the grade established by the adjacent paving. All sodded areas bordered by planting areas shall have a finished grade (top of the sod) that is two inches above the soil level in the adjacent planting bed.

3.04 REMOVAL OF DEBRIS

A. Areas to receive grass shall be cleaned of all stones larger than 1" in diameter, sticks, stumps, paper, glass, and other debris which might interfere with the placement of sod, growth of grass or subsequent maintenance of grass area. All weeds shall be removed from areas to be sodded.

3.05 APPLICATION OF FERTILIZER

A. If fertilizer not already applied to topsoil, fertilizer (and/or lime) shall be spread uniformly as specified below.

1. Fertilizer application of 500 lbs. per acre.

2. Lime shall be spread at a minimum uniform rate of 250 lbs. per acre and thoroughly mixed with the soil to a depth of 4-inches.

B. Fertilizing operations will not be permitted when wind velocities exceed 15 miles per hour.

3.06 PLACING OF SOD

A. Sod size shall be as previously specified. The setting of pieces shall be staggered in such a manner as to avoid continuous seams where possible. Sod shall be moist and shall be placed on a moist earth bed. Sod shall be carefully placed by hand, edge to edge in rows at right angles to the slope, commencing at the base of the area to be sodded and working upward. Sod shall be immediately pressed firmly into contact with the sod bed by rolling with a one ton roller or any other approved equipment. The rolling operation shall provide a true and even surface and insure knitting without displacement of sod or deformation of the surfaces.
Sod located on slopes should be placed carefully enough so that rolling with a power roller is not necessary. Sod located around retention areas, along pavement areas, or in swales may require staking. The repair of any erosion or sod relocation necessary prior to the sod becoming firmly rooted to the existing soil will be the responsibility of the Contractor. Stakes, if used, shall not interfere with the mowing of the lawn areas. All sod placed in areas with slopes steeper than 4:1 shall be staked, unless agreed to otherwise by the County.

B. The Contractor shall ensure that the finished grade of sod placed directly adjacent to buildings or other walls does not vary more than ½" from a ten foot long straight edge.

3.07 CLEAN UP

A. Upon completion of the work, all debris, fertilizer bags, pallets, etc. shall be removed from the site. Any paved areas including curbs and sidewalks shall be thoroughly swept.

3.08 WATERING

A. The sod shall be kept in a moist condition after planting and for the duration of the Contract. Water shall be applied between the hours of 10:00 a.m. and 4:00 p.m.

3.09 MAINTENANCE

A. The Contractor shall, at his expense, maintain the planted areas in satisfactory condition for a period of 90 days after completion of the work. Such maintenance shall include watering, filling, leveling, and repairing any washed or eroded areas and additional fertilizer and sod applied to areas where satisfactory stand of grass has not been achieved.

B. Immediately prior to final inspection, the Contractor shall mow and remove clippings from the areas grassed under this Contract.

3.10 ACCEPTANCE

A. The Contractor shall schedule the laying of sod to allow the sod to be well established prior to the date of final completion. The County shall not accept the sod unless the roots have grown into the top soil and the sod cannot be raised. The sod shall also show signs of health and good growth.
SECTION 11300

LEACHATE COLLECTION AND DETECTION PUMP SYSTEMS

PART 1 – GENERAL

1.01 WORK INCLUDED

A. The work specified in this section consists of furnishing new control panels to replace existing panels that provide service to the leachate pump system for Cells 6D, 6E, and the pump station for 2E. The existing panels were apparently impacted by landfill gas in the presence of moisture. Landfill gases are present on the landfill site. The Contractor must take appropriate care while constructing the new systems due to the presence of the gas. Once installed the systems will be tested by the Contractor or his supplier and training of site personnel will be provided.

1.02 QUALITY ASSURANCE

A. Unit Responsibility: The pumps, motors, control elements, carriage, discharge hose, and appurtenances were originally supplied by the pump supplier, Sligo Systems. The pump supplier shall have experience in providing complete systems and equipment for leachate removal.

B. The CONTRACTOR shall become familiar with all details of the work, verify all dimensions in the field, and shall advise the COUNTY of any discrepancy before performing the work.

C. Each submittal for equipment, components or system components shall be accompanied by an “Equipment Warranty and Certification Form.” The form shall be duly executed by an authorized principal of the manufacturer warranting and certifying that the equipment and system components proposed meets or exceeds the specifications, is suitable for its intended purpose and will provide satisfactory performance at the design criteria specified. In the event that the manufacturer is not the supplier, an authorized principal of the supplier shall also execute the equipment warranty and certification form.

1.03 SUBMITTALS

A. The CONTRACTOR shall provide shop drawings prepared by the manufacturer and submit to the engineer for review prior to the manufacture of the proposed equipment. The shop drawings shall include outline dimensions and external connection diagrams. The shop drawings shall include the following:
1. Comprehensive two dimensional CAD drawing of the panel exterior as viewed from the front and side. Must also include complete control panel interior layout showing location of panel component parts as well as full electrical schematic of control panel operation.

2. Must include manufacturer’s warranty which shall be a minimum of two years from date of installation of the pump, and controls.

C. Factory Performance Test Data: A qualified technician from the factory shall be provided for one day to instruct representatives of the COUNTY and the engineer on proper operation and maintenance. With the permission of the COUNTY, this work may be conducted in conjunction with the inspection of the installation. If during start up there is an equipment failure due to the pump manufacturers design or fabrication of the equipment, additional services shall be provided at no additional cost to the COUNTY. No factory ‘representative’ shall complete the start up. The technician should be a direct employee of the manufacturer who has had first hand dealings with the equipment through its production at the factory.

D. Certifications: The contractor shall furnish the engineer with a written certification signed by the manufacturer that the equipment has been properly installed and is free from stress imposed by piping or mounting bolts. The form should indicate that all equipment has been operated without fault under load conditions and that satisfactory operation has been obtained.

1.04 MANUFACTURER’S SERVICES

A. The CONTRACTOR shall obtain the services of the manufacturer's representative experienced in the installation, adjustment, and operation of the equipment specified. The representative shall supervise the installation, adjustment, and testing of the equipment.

1.05 DELIVERY, STORAGE AND HANDLING

A. Deliver a complete system to include all parts listed in submittal sent to engineer.

B. Store in a weather tight building or suitable covering to protect against damage of any nature.

C. Handle during delivery, storage and installation in a manner to prevent damage of any nature.


1.06 WARRANTY AND GUARANTEES

A. The supplier of the leachate removal system will provide all warranty services against defects in material and workmanship for a period of 24 months from the date of start up and COUNTY’s final inspection and acceptance to the effect that any defective equipment shall be repaired or replaced without cost or obligation to the COUNTY.

PART 2 – PRODUCTS

2.01 EXISTING PUMPS

A. The Contractor for the original installation furnished and installed complete leachate pumping systems for Cell 6E and the new Cell 2 wetwell. The Cell 6D primary and secondary pumps were provided by Sligo Systems, 2451 West State Road 44, Deland, Florida 32720 (386-218-4981) in an earlier project.

B. The model of pump for the Cell 6E collection zone is a Sligo Systems Series 3-10-3 unit with a 4-inch discharge, 100 ft power lead and 100 ft lifting cable configured for sideloop riser installation, and the model of pump for the Cell 6E detection zone is a Sligo Systems Series 1-0.5-2PU with a 2-inch discharge, 100 ft power lead and 100 ft lifting cable configured for sideloop riser installation. The model of pump for the Cell D collection zone is a Sligo Systems Series 3-7.5-3 unit, and the model of pump for the detection zone is Sligo Systems Series 1-0.5-2PU. The model of pump for the Cell 2 Manhole is a Sligo Systems Series 1-5-3PSF leachate pump with a 3-inch discharge, 50 ft power lead and 50 ft lifting cable configured for vertical guiderail.

C. Pump and motor capacity shall meet the following requirements:

<table>
<thead>
<tr>
<th></th>
<th>Cell 6D Detection</th>
<th>Cell 6D Collection</th>
<th>Cell 6E Collection</th>
<th>Cell 6E Detection</th>
<th>Cell 2E Manhole</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>1-0.5-2 PU</td>
<td>3-7.5-3</td>
<td>3-10-4</td>
<td>1-0.5-2 PU</td>
<td>1-5-3 PSF</td>
</tr>
<tr>
<td>Operating Duty Point</td>
<td>59 gpm @ 13.5 ft TDH</td>
<td>236 gpm @ 41 ft TDH</td>
<td>318 gpm @ 54 ft TDH</td>
<td>59 gpm @ 13.5 ft TDH</td>
<td>172 gpm @ 46 ft TDH</td>
</tr>
<tr>
<td>Maximum Motor Hp</td>
<td>0.5</td>
<td>7.5</td>
<td>10</td>
<td>0.5</td>
<td>5</td>
</tr>
<tr>
<td>Voltage</td>
<td>230</td>
<td>230</td>
<td>230</td>
<td>230</td>
<td>230</td>
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<tr>
<td>Phase</td>
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<td>3</td>
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<tr>
<td>Frequency, Hertz</td>
<td>60</td>
<td>60</td>
<td>60</td>
<td>60</td>
<td>60</td>
</tr>
</tbody>
</table>

2.02 CONTROL PANEL
A. The new Cell 6E control panel shall be used to operate the Sligo Systems Series 3-10-3 and 1-0.5-2PU and the Cell 6D control panel shall be used to operate the Sligo Systems Series 3-7.5-3 and the 1-0.5-2 PU leachate pumps. The 1-5-3PSF leachate pump controls will be in a separate panel mounted on the Cell 6D rack.

B. The Cell 6E and D panels shall operate in duplex, individual mode of control. The two pumps will be operated independently. Each pump will be turned on when its specific on level setpoint is reached and turned off when its specific off level setpoint is reached. The control panel will provide level control and include motor starters, breakers, overload protection devices and circuit breakers (fuses will not be used as primary protection devices). Panel will provide protection against phase loss and rapid cycle protection. The panel will include a TVSS system as well as additional lightning protection as deemed appropriate. Panel will include an intrinsically safe barrier for level sensor connection. A low voltage control circuit and power transformer shall be provided. A thermostat will be included for interior temperature control of the panel body. Power feed to the panel will be 4 wire, 230VAC, 3 phase, 60 Hz. Panel shall be UL698A listed and labeled.

C. The control panels for the Cell 2E wetwell will operate in simplex mode of control. The pump will be turned on when the on level setpoint is reached and turned off when the off level setpoint is reached. Power feed to the panels will be 230 VAC, 3 phase, 60 hz.

D. Cell 6E Control Scheme:

1. Primary – Level sensor control as detailed above.

2. Backup 1 – In the event that the submersible level sensor is faulted, the controller will automatically switch to low flow operating logic. If pump flow rate falls below a user set rate for at user set period of time then the pump is stopped. After a user set sump recharge time period the controller will start the pump and the cycle begins again.

3. Backup 2 – In the event that the submersible level sensor is faulted AND the flowmeter is faulted / not installed, the controller will automatically switch to low current operating logic. If pump motor current draw falls below a user set level for at user set period of time (indicating dry run) then the pump is stopped. After a user set sump recharge time period the controller will start the pump and the cycle begins again.
4. Backup 3 – In the event that the pump run time exceeds a user set maximum run time the pump is disabled, an alarm is set. User interaction is required to restart the pump. The user will have the ability to disable this backup scheme and alarm will be set indication that this backup has been bypassed.

E. Control shall be accomplished via a microprocessor based controller with the requisite number of digital and 4-20 mA analog I/O. A NEMA 4X 7” (minimum) back-lit color graphical TFT LCD touch screen display on the face of the control panel will provide current pump and system status as well as any alarms. This user interface will permit the user to access and change operating set points, delay timer setting, and system settings through a direct entry keypad. Access to these settings shall be password protected. Any time that the user changes the set point or accesses the system settings then that fact will be recorded in a user accessible time stamped alarm log. All system parameters, current operating settings and alarms shall be held in retentive memory such that operation can be resumed after a loss of power.

F. During normal operation the screen will display sump level, pump off, pump on, and high alarm set point settings. The screen will also display current pump mode, flow rate and discharge pressure. Pump mode selection shall be made with panel mounted NEMA 4X HOA switches. The switches will remain in the Auto, Hand, or Off position when placed in that position by the operator. The switches will be mounted in the panel such that the switch may be operated without opening the cabinet. The controller shall monitor the following alarm conditions:

<table>
<thead>
<tr>
<th>Alarm</th>
<th>Action</th>
<th>Beacon</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Sump Level</td>
<td>--</td>
<td>Red</td>
</tr>
<tr>
<td>Over/Under voltage</td>
<td>Stop pumps until corrected</td>
<td>Red</td>
</tr>
<tr>
<td>Loss of phase</td>
<td>Stop pumps until corrected</td>
<td>Red</td>
</tr>
<tr>
<td>Pump / motor starter failure</td>
<td>Take pump out of Lead/lag Logic</td>
<td>Red</td>
</tr>
<tr>
<td>Level sensor fault</td>
<td>Switch to backup control logic</td>
<td>Red</td>
</tr>
<tr>
<td>Flowmeter fault</td>
<td>--</td>
<td>Blue</td>
</tr>
<tr>
<td>Force main pressure sensor fault</td>
<td>--</td>
<td>Blue</td>
</tr>
<tr>
<td>Low Flow</td>
<td>--</td>
<td>Blue</td>
</tr>
<tr>
<td>No Flow</td>
<td>Stop Pump. Retry a User Defined Number of Times at a User Defined Interval. If No Response Take Pump Out of Lead/Lag Logic</td>
<td>Blue then Red</td>
</tr>
<tr>
<td>Force main pressure Over Limit</td>
<td>--</td>
<td>Blue</td>
</tr>
<tr>
<td>Motor amp draw over</td>
<td>--</td>
<td>Blue</td>
</tr>
</tbody>
</table>
The individual alarm trigger points and on / off delay settings shall be adjustable via a touch screen menu. Access to these set points shall be password protected. When an alarm is triggered, a context sensitive alarm screen giving troubleshooting guidelines / suggested resolutions shall be accessible to the user. The alarm condition shall be logged in a user accessible time stamped alarm log. The display shall also include the manufacturers 24 hour technical assistance telephone number that the operator can call should the fault remain after basic on site troubleshooting. User accessible trending screens shall graphically display sump level, flow rate and discharge pressure trends for at least the previous 80 hours of operation.

G. The controller shall read flowmeter rate and total via HART protocol. 4-20 mA (rate) and digital pulse (totalizer count) inputs are not acceptable.

H. The controller shall be “SCADA ready.” Addition of a radio unit and a single RJ45 connection shall allow network access to and from the controller’s data and command registers. Communication protocol shall be MODBUS RTU or TCP.

I. Each pump shall drive a panel mounted non reset type elapsed time meter which will indicate total hours that the pump has run. The run time will be measured up to 99999.9 hours.

J. The control panel shall be manufactured out of 14 gauge, unpainted 304 stainless steel and meet NEMA 4X standards. The enclosure door shall be hinged along its length allowing the door to open out 180 degrees. The door shall have a gasket with a rubber composition material around the perimeter and shall be installed with a retainer to assure a positive weatherproof seal. A stainless steel drip shield shall be included. The panel must be capable of being padlocked. The main power disconnect shall be located on the inner door of the panel. The inner door should not be capable of being opened unless the panel power is disconnected.

K. Control panel shall include a viewing window to allow the components mounted on the inner door to be seen without the need to open the front of the enclosure. A NEMA 4X momentary on reset / acknowledge push button shall be mounted on the side of the enclosure.

L. The control panel shall be equipped with a NEMA 4 (watertight), red and blue colored beacons on top of the panel that will flash if the pump is called on. Rotating beacons are not acceptable.
M. Motor starters shall be open form, across the line, UL/HP rated with individual overload protection built in each leg. Motor starter contact and coil shall be replaceable from the front of the starter without removing it from its position. Adjustable overloads will be used. They shall provide visual trip indication on the overload itself as well as illuminate a motor trip light on the panel inner door. The overload shall be sized for the full load amperage draw of the pump motor.

N. A courtesy 110V / single phase GCFI duplex power receptacle shall be provided on the inner door. This receptacle shall be protected by an individual 15A circuit breaker.

O. Pilot lights, push buttons, switches, circuit breakers, components, and devices shall all be labeled with nameplates. Internal panel control components shall also be labeled identifying the component function.

P. All nameplates shall be three ply phenolic, engraved through the first layer. Lettering shall be 0.5cm (3/16”) minimum in height and securely fixed to the respective panel location.

Q. Switches for all pumps will have Auto-Off-Hand On capabilities and will be mounted so as to be operated from the outside of the panel without requiring opening of the panel.

2.03 SUBMERSIBLE LEVEL SENSOR

A. The submersible level sensor is a Sligo Series SLS700-TI-5-A-75. The submersible level sensor shall utilize titanium, polyamide and fluorocarbon wetted components, be surge suppressed and mounted inside the polymer skid that the pump is incased within. Submersible level sensor lead shall be a minimum of 75’ long.

B. The transducer shall provide a 4-20Ma signal corresponding with 0-138” of liquid level above the sensor face.

C. The transducer shall control the pump based upon control levels as directed by the engineer. The pumps shall be activated at the ON setpoint and continue to run until the OFF setpoint is reached. If the pump is commanded to run, however the inflow of liquid is greater than the amount of liquid the pump can move on its own, then there will be a designated HIGH LEVEL setpoint that will cause the red strobe to flash. The pump will continue to operate until the OFF level has been reached.

2.04 ELECTROMAG FLOW METER (NO NEW METER REQUIRED)
A. The flow meter shall be capable of handling raw leachate and be a Sligo Systems Model 8705 flow tube with an integral mount 8732E transmitter as manufactured by Rosemount-Emerson Process Management or approved equal.

B. Be designed to fit a 3” discharge line for the primary and a 2” inch discharge line for the secondary. Connection to flowmeter shall be achieved via a 150lb ANSI flanged configuration.

C. Be capable of operation with a minimum of 2 times pipe diameter upstream and no straight pipe limitations downstream of the meter to achieve maximum accuracy.

D. Utilize an electromagnetic design to measure and record flow rates and volumetric total. Flowmeters that utilize moving parts (such as paddlewheel or turbine style) to measure and record flow rates will not be acceptable.

E. Have an accuracy of ± .25% full scale.

F. Operate off 24VDC, and be capable of transmitting a 4-20mA flow signal, a pulsed totalizer signal and incorporate a full HART protocol data and diagnostics capability.

G. Incorporate a 2-line 16 character backlit display with through-the-glass buttons (or equivalent) to allow set up and programming while the unit remains sealed. Display shall be lockable to prevent non-authorized users from making changes.

H. Incorporate diagnostic feature for fault alarms.

I. Be capable of detecting ‘empty pipe’, forward or reverse flow and net totalization.

J. Allow user defined presets for damping and low-flow cutoff.

2.05 PUMP RETRIEVAL CABLE (NO NEW CABLE IS REQUIRED)

A. Retrieval cable should be a minimum of 3/8”’ diameter and made of stainless steel.

B. Cable shall be attached to the top of the Sligo Systems pump in a secure manner as to facilitate its removal from the riser pipe assembly.

2.06 BREAKOUT BOXES
A. CONTRACTOR to supply three (3) separate electrical breakout/junction boxes per panel with the following performance, design and construction criteria:

B. Breakout/Junction Boxes shall:

1. Be incorporated into the power, flowmeter, and level/pressure transducer cabling system to ensure that no gas migration occurs from the sump into the control panel.

2. Meet NEMA 4X standards.

3. Have a hinged front door and pad-lockable quick release latches to facilitate easy access. Screws to secure the front of the breakout box will not be acceptable.

4. All exposed fittings and fixtures will be stainless steel.

5. Electrical terminal connections inside the box must be DIN rail mounted. Multiple terminal strips will not be acceptable. Each terminal must be able to be separated from the rest without the need to replace the complete connector strip.

6. All conduit connections between the breakout boxes to the main control panel must be completely ‘sealed off” with an epoxy based potting compound to prevent gas migration into the control panel.

C. Submersible Level Sensor Breakout/Junction Box – Part # SJB-IS-Series manufactured by Sligo Systems, 2451 West State Road 44, Deland, Florida 32720 (386-218-4981) or approved equal.

D. Flow Meter / Pressure Sensor Breakout/Junction Box – Part # SJB-EE-Series manufactured by Sligo Systems, 2451 West State Road 44, Deland, Florida 32720 (386-218-4981) or approved equal.

E. Power Cable Breakout/Junction Box – Part # SJB-PP-Series manufactured by Sligo Systems, 2451 West State Road 44, Deland, Florida 32720 (386-218-4981) or approved equal.

PART 3 – EXECUTION

3.01 PUMP INSTALLATION (PUMPS ARE IN PLACE IN THE PIPE RISERS)

A. Pumping equipment and appurtenances shall be installed in the position indicated and in accordance with the manufacturer’s written instructions.
All appurtenances required for a complete and operating pumping system shall be provided, including but not limited to such items as piping, conduit, valves, wall sleeves, wall pipes, concrete foundations, anchors, grouting, pumps, starters, power supply, and controls.

3.02 FIELD TESTING AND ADJUSTING EQUIPMENT

A. Field supervisor: The manufacturer will furnish a suitably qualified technician to inspect the completed installation, make necessary adjustments and instruct operating personnel in the proper care and operation of the equipment, prior to the final acceptance of the pumping station. No distributor, representative or agent acting on behalf of the manufacturer shall be approved to complete start up services. This task must be reviewed and completed by a direct employee of the manufacturer.

B. Field Test: When the pumping facility is complete and ready for operation, then the station shall be inspected and tested for compliance to the contract documents. Test of equipment shall be made by the contractor in the presence of the engineer, electrical sub contractor, equipment manufacturer and the COUNTY. The equipment tests shall include, but will not be limited to the following:

1. Pumps and motors: Pumps shall be run dry to ensure their run dry compatibility as well as being run in the sump under 'wet' conditions. A determination shall be made of the pumping capacity. Performance of the pumps shall meet the specified criteria when field tested.

2. Electrical: Readings shall be made of the voltage and amperage draw and recorded on the manufacturers start up form. This form should be kept by the manufacturer, Engineer, Contractor and COUNTY for future reference.

3. Controls: Control primary elements shall be tested to determine satisfactory performance for starting and stopping at the proper liquid levels. Pump sequence and alarm functions will also be tested.

4. Equipment: Equipment shall be operated to determine that the pump is located in the correct position in the riser assembly. A check will be conducted to ensure that there is no overloading of the pump or any overheating in any of the controls. A check will be conducted for any abnormal vibration that may be evident in the discharge plumbing. Pump will be raised and reset to ensure correct placement in riser pipe.

5. Inspection: An inspection of all mechanical and electrical equipment, controls, piping, valves, fittings, brackets, mountings,
seals, conduit, painting and component features shall be made while the station is being tested to determine performance and compliance with design requirements and the specification.

6. Structure: The station shall be inspected for performance, structural soundness and water tightness.

7. Repairs, adjustments and replacement: The contractor shall make any and all necessary repairs, adjustments and replace any component parts until performance has been demonstrated to the satisfaction of the engineer. The contractor shall bear the cost of any repair, adjustment and replacement.

8. Pump and Controls manufacturer must submit to the engineer for review a full synopsis outlining occasions where the pump assembly has been:

   i. Run dry without damage.

   ii. Operated under conditions whereby solids at least 3/8” have been passed through the pump assembly without degrading the pump performance or damaging the pump or motor assembly.

The pumps, control panel, flow meters and break out boxes shall be supplied by one manufacturer.

PART 4: MANUAL FOR EQUIPMENT AND SYSTEMS

A. Submit six copies of complete manual in final form.

B. Content, for each unit of equipment and system, as appropriate:

   1. Description of unit and component parts.

      i. Function, normal operating characteristics, and limiting conditions.

      ii. Performance curves, engineering data and tests.

      iii. Complete nomenclature and commercial number of replaceable parts.

      iv. Summary of information listed on equipment and motor data plates.

   2. Operating procedures:
i. Start-up, break-in, routine and normal operating instructions.

ii. Regulation, control, stopping, shut-down and emergency instructions.

iii. Summer and winter operating instructions.

iv. Special operating instructions.

3. Maintenance procedures:
   i. Routine operations.
   ii. Guide to "trouble-shooting".
   iii. Disassembly, repair and reassembly.
   iv. Alignment, adjusting and checking.

4. Servicing and lubrication required.

5. Manufacturer's printed operating and maintenance instructions.

6. Description of sequence of operation by control manufacturer.

7. Original manufacturer's parts list, illustrations, assembly drawings and diagrams required for maintenance.
   i. Predicted life of parts subject to wear.
   ii. Items recommended to be stocked as spare parts.

8. As-installed control diagrams by controls manufacturer.


10. Charts of valve tag numbers, with location and function of each valve.

11. List of original manufacturer's spare parts, manufacturer's current prices and recommended quantities to be maintained in storage.

12. Other data as required under pertinent sections of specifications.

13. Approved record shop drawings with all corrections made, and a copy of the warranty statement, check-out memo, and demonstration test procedures and certification.

C. Content, for each electric and electronic system, as appropriate:

1. Description of system and component parts.
i. Function, normal operating characteristics, and limiting conditions.

ii. Performance curves, engineering data and tests.

iii. Complete nomenclature and commercial number of replaceable parts.

2. Circuit directories of panel boards.
   i. Electrical service
   ii. Controls

3. As installed color coded wiring diagrams.

4. Operating procedures:
   i. Routine and normal operating instructions.
   ii. Sequences required.
   iii. Special operating instructions.

5. Maintenance procedures:
   i. Routine operations.
   ii. Guide to "trouble-shooting.
   iii. Disassembly, repair and reassembly.
   iv. Adjustment and checking.

6. Manufacturer's printed operating and maintenance instructions.

7. List of original manufacturer's spare parts, manufacturer's current prices, and recommended quantities to be maintained in storage.

8. Other data as required under pertinent sections of specifications.

D. Prepare and include additional data when the need for such data becomes apparent during instruction of COUNTY’S personnel.

E. Additional requirements for operating and maintenance data: Respective sections of Specifications.
PART 5: WARRANTY SUBMITTALS REQUIREMENTS

F. For all major pieces of equipment, submit a warranty from the equipment manufacturer. Manufacturer's warranty period shall be concurrent with CONTRACTOR'S for one (1) year, unless otherwise specified, commencing at the time of final acceptance by COUNTY. Certain materials will require a longer term warranty. These limits will be designated in the specification for those materials.

G. CONTRACTOR shall be responsible for obtaining certificates for equipment warranty for all major equipment which has at least a 1 hp motor or which lists for more than $1,000. ENGINEER reserves the right to request warranties for equipment not classified as major. CONTRACTOR shall still warrant equipment not considered to be "major" in the CONTRACTOR'S one-year warranty period even though certificates of warranty may not be required.

H. In the event that the equipment manufacturer or supplier is unwilling to provide a one-year warranty commencing at the time of COUNTY acceptance, the CONTRACTOR shall obtain from the manufacturer a two (2) year warranty commencing at the time of equipment delivery to the job site. This two-year warranty from the manufacturer shall not relieve CONTRACTOR of the one-year warranty starting at the time of COUNTY acceptance of the equipment.

I. COUNTY shall incur no labor or equipment cost during the guarantee period.

J. Guarantee shall cover all necessary labor, equipment and replacement parts resulting from faulty or inadequate design, improper assembly or erection, defective workmanship and materials, leakage, breakage or other failure of all equipment and components furnished by manufacturer.
Table 11300

EQUIPMENT WARRANTY AND CERTIFICATION FORM

Project: New Hanover County Secure Landfill

Project No.: __________________________

The undersigned hereby attests that he has examined all the referenced project drawings and specifications and hereby warrants and certifies that the equipment, component, or system he proposes to furnish and deliver meets or exceeds the contract specification, is suitable for its intended purpose and installation, and will provide satisfactory performance at the design criteria specified. This warranty shall be in addition to and not in lieu of all other warranties, express and implied.

Equipment: __________________________

Manufacturer: __________________________

Address: __________________________

By: __________________________

Type Name and Title __________________________

(Seal)

(Signature/Date)

Equipment Warranty and Certification must be signed by a Principal Person (President, Vice-President, etc.) of the equipment manufacturer. In the event the manufacturer is not the Supplier, than a Principal Person of the Supplier must also sign this form.

By: __________________________

(Type Name and Title)

(Seal)

(Signature/Date)
Contractor Compliance Requirements
Introduction

The safety and health of all contractors, customers, and employees of the New Hanover County Department of Environmental Management is of primary importance. As a result, the prevention of occupationally induced injuries and illnesses will be given precedence over operating productivity whenever necessary.

Our goal is to maintain a safety and health program conforming to all applicable OSHA standards and to lead in safety program management within our industry. To be successful will require contractor cooperation in all safety and health matters.

As a contractor you will be required, as part of your contract, to take an active role in the Department of Environmental Management safety and health program. The following contractor safety and health requirements, when adhered to, will ensure safety for contractors, customers, and County employees. Additionally, potential damage to equipment and property will be avoided. It is impossible to document all possible situations or to provide precise guidance for every contingency a contractor may encounter in the course of their work. However, adherence to the rules as written and the desire to apply safe work practices will result in the highest level of safety.
General Requirements

1. All contractor employees shall abide by the Department of Environmental Management safety and health rules and regulations at all times. The DEM Safety Manual is available for copy or review in each of the Department’s offices.

2. The contractor and all contracted employees are required to follow the procedures for signing in and out. Procedures may differ depending on the section of the department the contractor is working in; they will be explained fully before the work begins.

3. The contractor shall have a competent individual in charge at the job site to supervise the job, conduct an adequate accident prevention program, and ensure compliance to OSHA and DEM rules.

4. All accidents or injuries shall be reported immediately to the DEM Project Manager or Safety Manager.

5. Contractor employees are not allowed to enter areas other than the work site, unless it is required for the performance of their job.

6. The contractor shall inform the Project Manager of any known hazardous conditions that exist, due to the contract work being done, in areas where Departmental employees may be exposed to the known hazards.

7. The contractor shall provide Material Safety Data Sheets for all containers of hazardous substances brought onto DEM property.

8. The contractor shall sign the “Contractor Hold Harmless” waiver form in order to use any Department equipment.

9. Periodic job site inspections will be conducted by the DEM Project Manager or Safety Manager to ensure that the job is proceeding safely in accordance with safety rules.

10. Violation of these rules is grounds for immediate termination of contract work.
Standards of Conduct

The Department of Environmental Management has established standards to ensure the smooth, safe, and efficient operations of the Department. Violation of these standards is considered serious and may lead to termination of the contract. The following are prohibited:

1. Willful damage to any Departmental property, customer property, or the property of Department employees.

2. Possession, use, or distribution of alcohol, narcotics, or illegal drugs on Department property.

3. Possession of firearms, ammunition, concealed weapons, or explosives (unless properly authorized).

4. Abusive or threatening language, harassment, disrespectful behavior, workplace violence, or interfering with the work of Department employees.

5. Theft or attempted theft from the Department or Department employees.

6. Refusal to perform contracted work or refusal to obey instructions.

7. Sleeping on the job.

8. Negligence or conduct which could result in injury or damage to property.

Contractor Safety Training

Please place a check by each of the following categories in which one or more of your employees has been trained. It is understood that not all contractors will have employees who are trained in all of the areas listed.

___ Personal Protective Equipment
___ First Aid and CPR
___ Lockout/Tagout
___ Confined Space Entry
___ Respiratory Protection
___ Hazardous Communication
___ Material Safety Data Sheets
___ Fire Prevention and Protection
___ Fall Protection
___ Scaffolding
___ Heavy Equipment Training/Certification (includes bulldozer, loader, forklift, excavator, grader, roller, back-hoe, bobcat)
___ Welding, Cutting, and Brazing
___ Electrical Safety
___ Trenching/Excavation
___ Other ________________________________
___ Other ________________________________

* If the contracting company has ten (10) or more employees, they will be required to present OSHA 300 Logs, at a minimum for the past three calendar years, along with their bid.

The Department of Environmental Management reserves the right to ask for any training records from the categories that were checked above. The County reserves the right to reject the bid of any firm that cannot document proper safety training as it relates to conducting the work included in the contract.
Contractor Agreement to Comply

I, ________________________________, a representative of ___________________________ do hereby acknowledge that my company has received a copy of the guidelines governing contract work being performed on New Hanover County Department of Environmental Management property. It is agreed that as part of the contract my company and its employees will comply with these guidelines and all the written programs which apply to the work being performed.

Signed ___________________________  Date _____________________

(Contractor)

Please return this signed page to the designated Department of Environmental Management Project Manager. A copy of the signed form will be kept in the Safety Officer’s files.