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 #18-0346

BYPASS LANE GRADING & PAVING
NEW HANOVER COUNTY ENVIRONMENTAL MANAGEMENT DEPARTMENT
Landfill Scale House
5210 U.S. Highway 421 North
Wilmington, NC 28401

Request for Bids

Section 1: Advertisement
New Hanover County (NHC) is accepting sealed bids from qualified, experienced and licensed general contractors for all labor and materials to complete the work in accordance with the Scope of Service and draft contract documents for the Bypass Lane Grading & Paving at the NHC Landfill, 5210 U.S. Highway 421 North, Wilmington, North Carolina.

Bidders must be 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.

A mandatory pre-bid conference will be held at 3:00 p.m. on Tuesday, April 24, 2018, in the Administrative office of the NHC Landfill, located at 5210 U.S. Highway 421 N., Wilmington, NC 28401.

All questions must be submitted in writing to Kim Roane, Business Officer, via email @ kroane@nhcgov.com. The deadline for questions from Bidders is Tuesday, May 1, 2018, at 3:00 PM. Questions will be answered via written addendum issued by COB Friday, May 4, 2018.

Sealed bids addressed to Kim Roane, Business Officer, 3002 U.S. Highway 421 North, Wilmington, North Carolina, 28401 and marked “RFB 18-0346, “Bypass Lane Grading & Paving” on the outside of the envelope will be accepted until 2:30 p.m. (EST) on Thursday, May 10, 2018. The deadline time shall be established by the timepiece of New Hanover County’s representative. No bids will be accepted after that time.

Instructions for submitting bids and complete requirements and information may be obtained by visiting the County’s website at http://nhcgov.com/business-nhc/bids. A copy of the bid documents, technical drawings and draft contract documents may be reviewed by appointment at the New Hanover County Environmental Management Office, 3002 Highway 421 North, Wilmington, North Carolina 28401. Please call (910) 798-4402 for appointments.

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: Instructions and General Conditions

2.1 Schedule

<table>
<thead>
<tr>
<th>Date</th>
<th>Event Description</th>
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<tbody>
<tr>
<td>Tuesday, April 17, 2018</td>
<td>Bid Advertisement</td>
</tr>
<tr>
<td>Tuesday, April 24, 2018, 3:00 p.m.</td>
<td>Mandatory Pre-Bid Meeting at NHC Environmental Management Department Administrative Offices, 3002 U.S. Highway 421 N., Wilmington, NC 28401</td>
</tr>
<tr>
<td>Tuesday, May 1, 2018, 3:00 p.m.</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>
</tr>
<tr>
<td>Friday, May 4, 2018, 5:00 p.m.</td>
<td>Questions will be answered via written addendum.</td>
</tr>
<tr>
<td>Thursday, May 10, 2018, 2:30 p.m.</td>
<td>Deadline for receipt of bids.</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.

Bids must be submitted by 2:30 p.m. Thursday, May 10, 2018, in a sealed envelope properly marked “RFB # 18-0346 BYPASS LANE GRADING & PAVING” 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 Completion of Bid Form (Price Sheet):
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. 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 Mandatory Pre-Bid Meeting:
Prospective bidders must attend a mandatory pre-bid meeting at 2:00 p.m. on Tuesday, April 24, 2018 in the NHC Environmental Management Administrative Offices located at 3002 U.S. Highway 421 N., Wilmington, NC 28401. A site visit to the NHC Landfill Scale House will be conducted at the end of the meeting.

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.

2.2.4 There will not be a public bid opening.

2.2.5 After the bid issue date, all communications between the County and prospective bidders regarding this bid request shall be in writing. Any inquires, 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 3:00 P.M., EST, Tuesday, May 1, 2018.

2.2.6 The deadline for receipt of all proposals is Thursday, May 10, 2018, at 2:30 PM, EST. Any proposals received after the scheduled closing time will not be accepted.

2.2.7 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.

2.2.8 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.

2.2.9 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.

2.2.10 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.
2.2.11 The DRAFT Contract is attached in Section 3 for review.

2.2.12 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.

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

2.2.14 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.

2.2.15 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.

2.2.16 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.

2.2.17 The County is exempt from and will not pay Federal Excise Taxes or Transportation Taxes.
2.2.18 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. Contractor shall submit a Sales Tax Report (attached) with each invoice submitted to the County.

2.2.19 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.

2.2.20 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 Permitting: Contractor shall be responsible for any and all permits and all associated documentation necessary to complete the work.

2.2.22 Warranty:

- Contractor shall specify the warranty period for the project, which shall include all parts, labor and craftsmanship from date of installation
- The full cost of the warranty as specified herein shall be supported solely by the bidder (Contractor).
- Any potential actions that would potentially void the warranty must be clearly specified by the contractor

2.2.23 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 the attached draft Contract. 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.

2.2.24 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. Bidders must be 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.
2.2.25 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.

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

2.2.27 **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.

2.2.28 **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, contact email address and type & cost of project completed.

2.4 **TERM and TIME/COMPLETION SCHEDULE**

The CONTRACTOR will commence services upon receipt of executed contract and purchase order, which shall constitute the notice to proceed. Bidder must complete the section of the Bid Price Sheet regarding the number of calendar days for completion of work. Completion schedule shall be as described within the final contract document, developed as per bid award agreement.

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 applicants 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**
The bidder will make good faith efforts to subcontract with individuals who are minorities to include women, Black Americans, Hispanic Americans, Native Americans, Asian-Pacific Americans, and Asian-Indian Americans. Bidders should submit along with the bid information concerning minority business enterprises that they have contacted and those which will participate in the contract. The information will include:

1. Name, address, phone number, and email address of each minority firm.
2. Description of the work to be performed by each minority firm named.
3. Dollar value of the work to be performed by each firm named.

2.7 **Contractor Safety Compliance Requirements**

2.7.1 Contractor is responsible for compliance with OSHA and all federal, state and local laws, ordinances, rules and regulations that in any way affect the work, including but not limited to notices and training.

2.7.2 Contractor shall sign and return NHC Environmental Management Contractor Compliance Requirements document (attached).

2.7.3 The Contractor shall be solely responsible for maintaining safety at all work sites.

2.7.4 The Contractor shall take all reasonable steps to ensure safety for both workers and visitors to include traffic control.
Section 3: Scope of Work (also referred to as Contract “Exhibit A”)

Bid Specifications
Bypass Lane Grading & Paving
New Hanover County Landfill
RFB # 18-0346
RFB 18-0346
Scale House Bypass Lane Turn-Key Project

Scope of Work

The project consists of site grading and sod work, existing water line re-location, chain link fence demolition and replacement, and paving necessary to create a new bypass lane as well as repair damaged areas of existing asphalt pavement. The Contractor is responsible for locating all existing underground utilities throughout the project site prior to commencing the work. Existing underground utilities within the project area shall be “hand dug” to confirm depth is sufficient to avoid damage. All potential bidders are required to attend a mandatory pre-bid meeting in the field prior to submitting bids. Grading and paving plan specifications may be viewed at www.nhcgov.com/business-nhc/bids/.

- **Grading and Sod Work:** The existing water line shall be relocated prior to conducting the grading work. The site shall be graded in accordance to the grading plan provided by SCS Engineers. Depth to existing underground utilities within the project area shall be field verified by hand digging above marked lines or flagging prior to beginning grading to ensure avoidance during grading activities.

  Existing topography at the site is pretty flat across the majority of the project area. Grading shall conform to the drawings in order to ensure proper drainage off the pavement. Any soils cut to conform to the grading plan shall be hauled by the Contractor to the landfill working face for use as daily cover. Additionally, sod work to be performed is outlined in the SCS drawings.

- **Existing Water Line Re-location:** The existing water line within the project area shall be abandoned in place. The replacement water line shall be constructed of SCH 40 PVC or equal piping. The new line shall be two (2) inch diameter and shall be placed five (5) feet outside the limits of paving for the new bypass lane at a minimum depth of two (2) feet. The Contractor is
responsible for all necessary fittings required to tie back into the exiting line not abandoned in place. The approximate length of new piping to be placed is 350 feet. Coordination of this work with County staff will be required to minimize downtime of water service at the site.

The replacement water line shall include two (2) stub-ups to the surface including one emergency shut-off valve and one 3/4” hose spigot. Two (2) steel concrete filled four inch bollards shall be placed on either side of both stub-ups. They shall be painted safety yellow. The locations of these structures will be determined in the field with County staff.

- **Chain Link Fence Demolition and Replacement**: Approximately 160 feet of existing six (6) foot chain link fence will have to be removed and replaced as part of the project work. Once grading work is complete approximately 135 feet of new fencing shall be erected to attach to remaining fencing in place. New fencing shall be constructed from the same type of materials as the existing fencing, including barbed wire.

- **Paving**: All paving work will be completed in accordance to a Terracon Investigation and Design Report dated March 13th, 2018 (Exhibit 1). Approximate asphalt quantities, location of areas to be repaired, and survey points to be used for paving are included on grading plan site drawings provided by SCS Engineers (Exhibit 2).
  Contractor shall conduct repair/resurfacing within the existing bypass lane only to the extent that the scale installer can saw-cut the asphalt to marry the future concrete approach and exit ramps to the repaired/resurfaced asphalt. No paving/resurfacing shall be required between those points (i.e., where the new scale and approaches will be located). The interface where the concrete approach and exits marry to repaired and resurfaced pavement are as painted in the field and described during the mandatory pre-bid meeting.

  Paving work will be coordinated to take place after regular business hours and/or on weekends. One (1) inch of milling and placing an asphaltic concrete overlay consisting of three (3) inches of NCDOT Mix Type S9.5C placed in two (2) 1.5 inch lifts shall be conducted for all existing paved areas to be repaired. Speed bumps milled for re-surfacing will NOT be replaced.

  Paving of the new bypass lane shall be completed following one of two design options listed in the Terracon report (Exhibit 1 - Page 10). The chosen option may depend on existing depth of buried underground fiber across the project site.

  The new bypass lane and approaches to both inbound scales shall include striping to direct customer traffic (Figure 1). The lines shall be painted white and in accordance with NCDOT standards. The inside inbound approach shall be painted with text reading “Residents and Small Business”. The outside inbound approach shall be painted with text reading “Permitted Commercial Haulers Only”.

Bid Specifications RFB# 18-0346 Bypass Lane Grading & Paving
All waste and recyclable material generated during the project shall be picked up on a daily basis and disposed or recycled in the containers located at the on-site customer convenience site, at no charge to Contractor.
Section 4: Contract draft

A copy of the Draft Contract is attached to this RFB.
NORTH CAROLINA

NEW HANOVER COUNTY

AGREEMENT

THIS CONTRACT made and entered into this ___ day of _______________ 2018 by and between NEW HANOVER COUNTY, a political subdivision of the State of North Carolina, hereinafter referred to as "County"; and ____________________________, a __________________ hereinafter referred to as "Contractor."

WITNESSETH:

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

1. Scope of Services. Contractor shall provide necessary work to create a new bypass lane and repair damaged areas of existing asphalt pavement for the Landfill Scale House at the New Hanover County Landfill located at 3002 U.S. Highway 421 North, Wilmington, North Carolina in accordance with and as more fully described in the Bid Specifications and Contractor Compliance Requirements attached hereto as “Exhibit A” and incorporated herein by reference.

2. Time of Performance. The term of this Agreement shall begin from receipt of Notice to Proceed and all work shall be completed within sixty (60) days of said Notice.

3. Payment. County hereby agrees to pay for the cost of this Contract not to exceed a sum of __________________________ ($_______) Dollars. Payment is contingent upon a final County inspection and acceptance of work or services.

4. Extra Work. County and Contractor shall negotiate and agree upon the value of any extra work or services prior to the issuance of a County Change Order or Renewal/Amendment (CRA) form covering said extra work or services. Such Change Order or CRA shall set forth the corresponding adjustment, if any, to the Contract Price and Contract Time.

5. Indemnity. Contractor shall indemnify and hold County, its officers, officials, agents, and employees, harmless against any and all claims, demands, causes of action, or other liability, including attorney fees, for any property damages, personal injuries or death arising out of, relating to, or resulting from the negligence, willful act, or
omission of Contractor, its agents, employees and subcontractors in the performance of work or services.

6. **Insurance.** Before commencing any work or services, Contractor shall procure insurance in Contractor's name and maintain all insurance policies for the duration of the Contract of the types and in the amounts listed in this Contract. 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 Contractor, its agents, representatives, employees, or subcontractors, whether such operations by itself or anyone directly or indirectly employed by it.

7. **Minimum Scope and Limits of Insurance**

7.1. **Commercial General Liability**

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

7.1.2. CGL insurance shall be written on Insurance Services Office (ISO) "occurrence" form CG 00 01 covering CGL 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.

7.1.3. County, its officers, officials, agents, and employees are to be covered as additional insureds under the CGL by endorsement CG 20 26 or an endorsement providing equivalent coverage as respects to liability arising out of activities performed by or on behalf of Contractor; products and completed operations of Contractor; premises owned, leased or used by Contractor; and under the CUL, if any. The coverage shall contain no special limitations on the scope of protection afforded to County, its officers, officials, agents, and employees.

7.1.4. Contractor's CGL 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, agents, and employees shall be in excess of and shall not contribute to Contractor's insurance.

7.2. **Workers' Compensation and Employer's Liability**

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

7.2.2. Employer's Liability, and if necessary, CUL insurance shall not be less than $500,000 for each accident for bodily injury by accident, $500,000 for each employee for bodily injury by disease, and $500,000 policy limit.

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

7.3. **Business Auto Liability**

7.3.1. Contractor shall maintain applicable Business or Personal Auto Liability and, if necessary, CUL insurance with a limit of not less than $1,000,000 each accident. Personal auto insurance may be accepted in lieu of Business Auto Insurance.

7.3.2. Such insurance shall cover liability arising out of any auto, including owned, hired, and non-owned autos used in the performance of work or services.

7.3.3. 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.

7.3.4. 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, agents, and employees shall be in excess of and shall not contribute to Contractor's insurance.

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

7.4.1. 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, or employees; Contractor shall procure a bond guaranteeing payment of deductibles or self-insured retentions.

7.4.2. Contractor shall be solely responsible for the payment of all deductibles to which all policies are subject, regardless of whether County is an insured under the policy.

7.5. **Miscellaneous Insurance Provisions.**

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

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

7.5.3. 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.

7.6. **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 a specific exemption.

7.7. **Evidence of Insurance**

7.7.1. 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 or services, and thereafter upon renewal or replacement of each certified coverage until all operations under this Contract are deemed complete.

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

7.7.3. 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.

7.8. **Subcontractors.** Contractor shall include all subcontractors as insureds under its policies or shall furnish separate certificates for each subcontractor. All coverage for subcontractors shall be subject to all of the requirements stated herein. CGL coverage shall include independent contractors’ coverage, and Contractor shall be responsible for assuring that all subcontractors are properly insured.

7.9. **Conditions**

7.9.1. County may, at its discretion and with approval of Risk Management and the Finance Department, accept letters of credit or custodial accounts in lieu of specific insurance requirements.

7.9.2. Contractor shall warrant that the insurance contributing to the satisfaction of insurance requirements in this Contract and shall not be canceled, terminated, or modified by Contractor without prior written approval of County.

7.9.3. Contractor shall promptly notify New Hanover County Environmental Management and New Hanover County Risk Management at (910) 798-7497 of any accidents arising in the course of operations under the Contract causing bodily injury or property damage.

7.9.4. County reserves the right to obtain complete, certified copies of all required insurance policies.

7.9.5. 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.

7.9.6. County does not represent that coverage and limits will be adequate to protect 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.

7.9.7. If Contractor fails to maintain the insurance as set forth herein, County shall have the right to purchase said insurance at Contractor’s expense. Contractor agrees to reimburse County for all expenses incurred for such purchase.
7.9.8. Contractor or its agent may apply to County for approval of higher deductibles based on financial capacity and quality of the carrier affording coverage.

7.9.9. County shall have the right to prohibit Contractor or any subcontractor from performing work or services and may withhold payment until required certificates has been received and approved by County.

8. **Independent Contractor.** The parties mutually agree that the Contractor is an independent contractor and not an agent of the County, and as such, the Contractor shall not be entitled to any County employment benefits, such as, but not limited to, vacation, sick leave, insurance, workmen's compensation, or pension and retirement benefits.

9. **Default and Termination.** If Contractor fails to prosecute the work or services with such diligence as will insure its completion within the Contract time, or if Contractor breaches any of the terms or conditions contained in this Contract and fails to cure said breach within two (2) days of County's mailing of Notice of Default, or otherwise fails to perform the work or services hereunder to the County's reasonable satisfaction, County may terminate this Contract forthwith. Upon termination, County may, without prejudice to an action for damages or any other remedy, take the prosecution of the work or services out of the hands of Contractor. County may enter into another Contract for the completion of the 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 or which may become due to Contractor. In the event this Contract is terminated prior to completion of the services by the Contractor, the Contractor shall be paid for work or services performed to the date of termination. In no event will the amount due Contractor in the event of termination exceed that amount set forth in this Contract. Nothing contained herein shall prevent the County from pursuing any other remedy, which it may have against Contractor, including claims for damages.

10. **Termination for Convenience.** County may terminate this Contract for convenience at any time and without cause. Upon receipt of notice, Contractor shall immediately discontinue providing the work or service and, if applicable, the placing any
orders for any materials, facilities, and supplies in connection with the performance of the work or services of this Contract.

11. **Non-appropriation.** All funds for payment by County under this Contract are subject to the availability of an annual appropriation of Commissioners for the services provided under the Contract, County will terminate the Contract, without termination charge or liability, on the last day of the then-current fiscal year or when the appropriation made for then-current year for the services/items covered by this Contract is spent, whichever occurs first. If at any time funds are not appropriated for the continuance of this Contract, cancellation shall be accepted by the Contractor on ten (10) business days' prior written notice, but failure to give such notice shall be of no effect and County shall not be obligated under this Contract beyond the date of termination.

12. **Non-waiver of Rights.** The parties mutually agree that either party's failure to insist upon the strict performance of any provision of this Contract or to exercise any right based upon a breach thereof, or the acceptance of any performance during such breach, shall not constitute a waiver of any rights under this Contract.

13. **Conflict of Interest.** No paid employee of the County shall have a personal or financial interest, direct or indirect, as a contracting party or otherwise, in the performance of this Contract.

14. **Subcontracts.** The Contractor shall utilize no subcontractors for performing the work or services to be performed under this Contract without the prior written approval of the County.

15. **Entire Contract.** This Contract constitutes the entire understanding of the parties.

16. **Binding Effect.** This Contract shall be binding upon the parties hereto, and their heirs, successors, executors, administrators and assigns.

17. **Severability.** If any provision of this Contract is held unenforceable, all remaining provisions of this Contract shall remain in full force and effect.

18. **Inclusive Terms.** Use of the masculine herein shall include the feminine and neuter, and the singular shall include the plural.

19. **Governing Law.** All of the terms and conditions contained herein shall be interpreted in accordance with the laws of the State of North Carolina.
20. **E-Verify Compliance.** Pursuant to N.C.G.S. 143.133.3, 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.

21. **Accounting Procedures for Refund of County Sales & Use Tax.**

Pursuant to G.S. 105-164.14(c), the County is entitled to a refund of sales and/or use taxes paid by contractors on purchases of building materials, supplies, fixtures and equipment that become a part of or are annexed to any building or structure that is owned or leased by the County and is being erected, altered or repaired for use by the County.

Contractors shall provide a "certified statement" containing the specific required information. The certified statement must include all of the following information:

a. the date the property was purchased;
b. the type of property purchased;
c. the cost of property purchased and the amount of sales and use taxes paid thereon;
d. the project for which the property was used;
e. if the property was purchased in this State, the county to which it was delivered; and
f. if the property was not purchased in this State, the county in which the property was used.

If the contractor makes several purchases from the same vendor, the certified statement must indicate each invoice number, the inclusive dates of the invoices, the total amount each invoice, and the state and local sales and use taxes paid on the purchase. The statement must also include the cost of any tangible personal property withdrawn from the Contractor's warehouse stock and the amount of state and local sales or use tax paid by the Contractor. If subcontractors are used, similar certified statements by its subcontractors must be obtained by the general contractor and furnished to the County. Local sales or use taxes included in the Contractor's statements must be shown separately from the State sales or use taxes. The Contractor's statements must not contain sales or use taxes paid on purchases of tangible personal property purchased by the contractor for use in performing the contract which does not annex to, affix to or in
some manner become a part of the building or structure that is owned or leased by the County and is being erected, altered or repaired for use by the County.

Examples of property on which sales or use tax has been paid by the Contractor and which shall not be included in the Contractor's statement are scaffolding, forms for concrete, fuel for the operation of machinery and equipment, tools, equipment, equipment repair parts and equipment rentals.

A certified statement must be provided with each pay request. If there was no sales or use tax paid during the period, the contractor shall provide a "Zero" sales and use tax statement.

23. Notices. All notices required hereunder to be sent to either party shall be sent to the following designated addresses, 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
Attention: Kim Roane, Business Officer
3002 U.S. Highway 421 N.
Wilmington, NC 28401

To Contractor:

24. Assignability. The parties hereto agree that this Contract is not transferable and shall not be assigned by either party without the written consent of the other party to this Contract.


IN WITNESS WHEREOF, the parties have hereunto affixed their hands and seals, the day and year first above written and by authority duly given.
NEW HANOVER COUNTY

_________________ County Manager

ATTEST:

_________________ Clerk to the Board

[SEAL]

CONTRACTOR

BY: _______________________ (Seal)

President

ATTEST:

_________________ Secretary

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

_________________ County Finance Officer

Approved as to form:

_________________ County Attorney

STATE OF NORTH CAROLINA

NEW HANOVER COUNTY

I, ________________ , a Notary Public of the State and County aforesaid, certify that Kymerleigh G. Crowell acknowledged that she is Clerk to the Board of 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 __________ County Manager, sealed with its corporate seal and attested by herself as its Clerk.

WITNESS my hand and official seal, this _____ day of __________________, 2018.

_________________

Notary Public

My commission expires: ________________
STATE OF __________________________

____________________ COUNTY

I, __________________________, a Notary Public in and for the State and County aforesaid, certify that __________________________, personally came before me this day and acknowledged that (s)he is President of __________________________, a ______________ and that by authority duly given and as the act of the limited liability corporation, the foregoing instrument was signed and sealed in its name by its President.

WITNESS my hand and official seal, this ___ day of __________________________, 2018.

Notary Public

My commission expires: __________________________
NEW HANOVER COUNTY
RFB #18-0346
BYPASS LANE GRADING & PAVING
Price Sheet/Bid Form

TO: Kim Roane, Business Officer
New Hanover County
3002 Hwy. 421 North
Wilmington, NC 28401

DATE: ___________________ CONTRACTOR: ___________________

PHONE: ___________________ ADDRESS: ___________________

North Carolina General Contractor License # ______________________

UNIT PRICE BID: The undersigned, having carefully examined the Instructions to Bidders, RFB #18-0346, BYPASS LANE GRADING & PAVING, dated April 17, 2018, including the following addenda;

ADDENDUM #___________________ DATED:___________________
ADDENDUM #___________________ DATED:___________________
ADDENDUM #___________________ DATED:___________________

As well as the premises and conditions affecting the work, proposes to furnish all services, labor, materials and equipment called for to complete the project in accordance with the contract documents for the following price:

TOTAL TURNKEY BID PRICE: ______________________

NUMBER OF CALENDAR DAYS FOR PROJECT COMPLETION___________ DAYS AFTER DATE OF PO ISSUANCE serving as Notice to Proceed.

WARRANTY DESCRIPTION:

____________________________________________________________________________
____________________________________________________________________________
____________________________________________________________________________
____________________________________________________________________________
____________________________________________________________________________

Bid Specifications RFB# 18-0346 Bypass Lane Grading & Paving
NEW HANOVER COUNTY
RFB #18-0346
BYPASS LANE GRADING & PAVING
Price Sheet/Bid Form (PAGE 2)

Exceptions to bid (express costs to include all labor and materials):

____________________________________________________________________________
____________________________________________________________________________

___________________________________________

Signature                                                                                   Title

____________________________________________________________________________

___________________________________________

Email Address                                                              Phone / Cell Phone

____________________________________________________________________________

___________________________________________

Company Name                                                                     State of Incorporation
NEW HANOVER COUNTY
RFB #18-0346 BYPASS LANE GRADING & PAVING

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 April 17, 2018, 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

__________________________________________________________
Title

__________________________________________________________
Address of Firm

__________________________________________________________
Telephone Number

__________________________________________________________
Date

__________________________________________________________
State of Incorporation
REFERENCES
RFB 18-0346 Bypass Lane Grading & Paving
This form must be completed and submitted with Bid

Company Name of Bidder: ______________________________

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<thead>
<tr>
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<th>Reference #2</th>
<th>Reference #3</th>
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</thead>
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<td></td>
<td></td>
</tr>
<tr>
<td>Company Address</td>
<td></td>
<td></td>
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<tr>
<td>Contact Name</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contact Phone #</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contact Email Address</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type of project</td>
<td></td>
<td></td>
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<tr>
<td>Cost of project</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Date of project completion</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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. Smoking is prohibited on all construction projects at the Landfill.

11. 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, 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.

**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.
Revised Pavement Investigation and Design Report
New Hanover County Landfill - Proposed Second Inbound Scale and Bypass Drive
Wilmington, New Hanover County, North Carolina
Revised March 13, 2018
Terracon Project No. 70185008

Prepared for:
New Hanover County Department of Environmental Management
Wilmington, North Carolina

Prepared by:
Terracon Consultants, Inc.
Raleigh, North Carolina
Revised March 13, 2018

New Hanover County Department of Environmental Management
3002 Highway 421 North
Wilmington, North Carolina 28401

Attn: Mr. Sam Hawes - Landfill Manager
P: (910) 798-4454
E: SHawes@nhcgov.com

Re: Revised Pavement Investigation and Design Report
New Hanover County Landfill - Proposed Second Inbound Scale and Bypass Drive
5210 US 421
Wilmington, New Hanover County, North Carolina
Terracon Project No. 70185008

Dear Mr. Hawes:

We have completed the Revised Pavement Investigation and Design services for the above referenced project. This study was performed in general accordance with Terracon Proposal No. P70185008 dated January 12, 2018. This report presents the findings of the subsurface exploration and provides geotechnical recommendations concerning earthwork, subgrade preparation, and pavement design for the proposed project.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report, or if we may be of further service, please contact us.

Sincerely,

Terracon Consultants, Inc.

Matthew J. Alexander, PE
Senior Geotechnical Engineer
NC Registered 040231

Andrew A. Nash, PE
Geotechnical Department Manager

NC Registered Firm: F-0869
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<td>11</td>
</tr>
</tbody>
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# ATTACHMENTS

- EXPLORATION AND TESTING PROCEDURES
- SITE LOCATION AND EXPLORATION PLANS
- EXPLORATION RESULTS *(Boring Logs and In-Situ CBR Plots)*
- PAVEMENT CORE AND EXISTING CONDITION PHOTOGRAPHS
- SUPPORTING INFORMATION *(General Notes and Unified Soil Classification System)*
INTRODUCTION

This report presents the results of our subsurface exploration and geotechnical engineering services performed for the proposed second inbound scale and bypass lane to be located at 5210 US 421 in Wilmington, New Hanover County, North Carolina. The purpose of these services is to provide information and geotechnical engineering recommendations relative to:

- Subsurface soil conditions
- Groundwater conditions
- Site preparation and earthwork
- Pavement design and construction

The geotechnical engineering scope of services for this project included observing and documenting existing pavement conditions, coring the existing pavements, performing dynamic cone penetrometer (DCP) tests to evaluate the existing aggregate base course (ABC) and soil subgrade, and advancing a solid stem auger to a depth of 5 feet to observed and sample the subgrade soils. Three locations in the existing pavement and three locations in the grassy area in the vicinity of the proposed bypass lane were evaluated.

Maps showing the site and boring locations are attached in the Site Location and Exploration Plan sections, respectively. The logs of the auger borings and plots of estimated in-situ California Bearing Ratio (CBR) based on DCP tests are included in the Exploration Results section of this report.

SITE CONDITIONS

The following description of site conditions is derived from our site visit in association with the field exploration and our review of publicly available geologic and topographic maps.
Revised Pavement Investigation and Design Report

New Hanover County Landfill - Proposed Second Inbound Scale and Bypass Drive ■ Wilmington, New Hanover County, North Carolina
Revised March 13, 2018 ■ Terracon Project No. 70185008

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parcel Information</td>
<td>The project is located at 5210 US 421 in Wilmington, New Hanover County, North Carolina. See Site Location</td>
</tr>
<tr>
<td>Existing Improvements</td>
<td>The proposed services are related to the asphalt surfaced entrance road to the active New Hanover County Landfill in the vicinity of the existing scale.</td>
</tr>
<tr>
<td>Current Ground Cover</td>
<td>The entrance road is asphalt surfaced with grassed shoulders.</td>
</tr>
<tr>
<td>Existing Topography</td>
<td>The site is flat in the vicinity of the project.</td>
</tr>
<tr>
<td>Geology</td>
<td>The project site is located within the Inner Coastal Plain Physiographic Province. The site is underlain by soils deposited during periods of fluctuating shoreline.</td>
</tr>
</tbody>
</table>

We also collected photographs of the existing pavements at the time of our field exploration program. Photos of the pavement cores and existing pavement conditions near the existing inbound scale are attached to this report.

**PROJECT DESCRIPTION**

Our understanding of the project conditions is as follows:

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information Provided</td>
<td>A scaled sketch of the proposed new scale and bypass road location was provided on January 10, 2018 by you over electronic mail.</td>
</tr>
<tr>
<td>Project Description</td>
<td>The project consists of the construction of a second inbound scale adjacent to the southeast of the existing entrance scale where the bypass lane is currently located. A new bypass lane will be constructed adjacent to the proposed second inbound scale. Terracon will evaluate the pavement structure of the existing bypass lane with respect to the anticipated truck traffic over the proposed second scale and the subgrade along the proposed new alignment of the bypass lane.</td>
</tr>
<tr>
<td>Grading</td>
<td>Minimal grading is anticipated for this project. Finished grade will closely match existing site grade.</td>
</tr>
</tbody>
</table>
Pavements

The length of the new paved bypass lane will be approximately 250 feet. The existing bypass lane will be used as the approach to the proposed second entrance scale.

Anticipated total traffic is as follows, these values are assumed to be evenly distributed between the existing and proposed second inbound scale:

- Autos/light trucks: 300 vehicles per day
- Trash collection vehicles and tandem axle trucks: 450 vehicles per day
- Tractor-trailer trucks: 150 vehicles per day

Autos/light trucks only are anticipated on the bypass lane.

The pavement design period is 20 years.

Estimated Start of Construction

Spring 2018

GEOTECHNICAL CHARACTERIZATION

Subsurface Profile

We have developed a general characterization of the subsurface soil and groundwater conditions based upon our review of the subsurface investigation data and our understanding of the geologic setting and planned construction. The geotechnical characterization forms the basis of our geotechnical calculations and evaluation of site preparation, foundation options and pavement options. As noted in General Comments, the characterization is based upon widely spaced exploration points across the site, and variations are likely.

The shallow soil test borings performed for the project encountered poorly graded, clean sand typical of Undivided Coastal Plain deposits. The DCP tests indicate the sands beneath the existing pavements are very dense near the surface below the ABC to medium dense at boring termination depths of 5 feet below existing site grades. The DCP tests along the proposed bypass lane indicate the sands are loose to medium dense. Similar soils were encountered during previous Terracon subsurface investigations along the entrance road at the site.

Conditions encountered at each boring location are indicated on the individual boring logs and Dynamic Cone Penetrometer Data and In-Situ CBR plots shown in the Exploration Results section of this report. Stratification boundaries on the boring logs represent the approximate location of changes in native soil types; in situ, the transition between materials may be gradual.
Groundwater Conditions

The boreholes were observed while drilling and after completion over the short duration the boreholes remained open for the presence and level of groundwater. Groundwater was not encountered in any of the six soil test borings performed within 5 feet of existing site grades.

Groundwater level fluctuations occur due to seasonal variations in the amount of rainfall, runoff and other factors not evident at the time the borings were performed. Therefore, groundwater levels during construction or at other times in the life of the structure may be higher or lower than the levels indicated on the boring logs. The possibility of groundwater level fluctuations should be considered when developing the design and construction plans for the project.

GEOTECHNICAL OVERVIEW

In general, the anticipated subgrade soils appear to be suitable for support of entrance and bypass lane pavements. The near surface, loose sand along the bypass lane will need minor improvement before constructing the pavements. The subgrade improvement and other site preparation recommendations are provided in the Earthwork section.

The site should be graded and maintained to promote runoff of surface water and prevent ponding on or near the pavements.

The General Comments section provides an understanding of the report limitations.

EARTHWORK

Minimal earthwork is anticipated since the proposed pavements will closely match existing grades. Earthwork will include removing the surface vegetation and excavating or filling to achieve the proposed subgrade elevation for the scale approaches and the bypass lane. The following sections provide recommendations for use in the preparation of specifications for the work. Recommendations include critical quality criteria as necessary to render the site in the state considered in our geotechnical engineering evaluation for pavements.

Site Preparation

Prior to placing fill, the existing vegetation and root mat should be removed. Existing pavements to receive overlay may remain in place. Pavements not receiving an overlay should be completely demolished and removed. Following stripping of vegetation and topsoil and demolition of existing pavements, the exposed subgrade should be thoroughly rolled using a smooth-drum vibratory
Roller. Vibratory rolling of the subgrade will densify the near surface loose soils identified from the DCPs along the bypass lane and any soils loosened or disturbed during stripping and demolition of existing pavements.

The subgrade should be proof-rolled with an adequately loaded vehicle such as a fully loaded tandem axle dump truck. The proof-rolling should be performed under the direction of the Geotechnical Engineer. Areas excessively deflecting under the proof-roll should be delineated and subsequently addressed by the Geotechnical Engineer. Such areas should either be removed and replaced with approved, properly placed fill or modified by vibratory rolling with a smooth drum roller. Excessively wet or dry material should either be removed or moisture conditioned and recompacted.

**Fill Material Types**

Fill required to achieve design subgrade should be classified as structural fill and general fill. Structural fill is material used below, or within 10 feet of pavements or constructed slopes. General fill is material used to achieve grade outside of these areas. Earthen materials used for structural and general fill should meet the following material property requirements:

<table>
<thead>
<tr>
<th>Soil Type</th>
<th>USCS Classification</th>
<th>Acceptable Parameters (for Structural Fill)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Plasticity Cohesive</td>
<td>CL, CL-ML, ML, SM, SC</td>
<td>Plasticity index less than 15&lt;br&gt;Less than 25% retained on #200 sieve</td>
</tr>
<tr>
<td>High Plasticity Cohesive</td>
<td>CH, MH</td>
<td>Not acceptable, do not use for project grading</td>
</tr>
<tr>
<td>Granular</td>
<td>GW, GP, GM, GC, SW, SP, SM, SC</td>
<td>Less than 10% Passing #200 sieve</td>
</tr>
<tr>
<td>On-Site Soils</td>
<td>SP</td>
<td>Can be used as structural or general fill for the project at all locations and elevations</td>
</tr>
</tbody>
</table>

1. Structural and general fill should consist of approved materials free of organic matter and debris. Frozen material should not be used, and fill should not be placed on a frozen subgrade. A sample of each material type should be submitted to the Geotechnical Engineer for evaluation prior to use on this site.
Fill Compaction Requirements

Structural and general fill should meet the following compaction requirements.

<table>
<thead>
<tr>
<th>Item</th>
<th>Structural Fill</th>
<th>General Fill</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Lift Thickness</td>
<td>8 inches or less in loose thickness when heavy, self-propelled compaction equipment is used</td>
<td>Same as Structural fill</td>
</tr>
<tr>
<td>Minimum Compaction Requirements</td>
<td>98% of max. within 1 foot of finished pavement subgrade</td>
<td>92% of max</td>
</tr>
<tr>
<td></td>
<td>95% of max. more than 1 foot below finished pavement subgrade</td>
<td></td>
</tr>
<tr>
<td>Water Content Range</td>
<td>Low plasticity cohesive: -2% to +3% of optimum</td>
<td>As required to achieve min. compaction requirements</td>
</tr>
<tr>
<td></td>
<td>Granular: -3% to +3% of optimum</td>
<td></td>
</tr>
</tbody>
</table>

1. Maximum density and optimum water content as determined by the standard Proctor test (ASTM D 698).
2. High plasticity cohesive material should not be used as fill for this project.
3. The sand encountered at the site is of a uniform size and has a low fines content, compaction comparison to relative density may be more appropriate. In this case, granular materials should be compacted to at least 70% relative density (ASTM D 4253 and D 4254).

Grading and Drainage

All grades must provide effective drainage away from the pavements and subgrades during and after construction and should be maintained throughout the life of the pavements. Exposed ground should be sloped and maintained away from the pavement for at least 10 feet beyond the edge of pavements.

Earthwork Construction Considerations

Shallow excavations for the proposed subgrade are anticipated to be accomplished with conventional construction equipment. Construction traffic over the completed subgrades should be avoided. The site should also be graded to prevent ponding of surface water on the prepared subgrades. Water collecting over, or adjacent to, construction areas should be removed. If the subgrade freezes, desiccates, saturates, or is disturbed, the affected material should be removed, or the materials should be scarified, moisture conditioned, and recompacted, prior to pavement construction.

As a minimum, any required excavations should be performed in accordance with OSHA 29 CFR, Part 1926, Subpart P, “Excavations” and its appendices, and in accordance with any applicable local, and/or state regulations.

Construction site safety is the sole responsibility of the contractor who controls the means, methods, and sequencing of construction operations. Under no circumstances shall the information provided herein be interpreted to mean Terracon is assuming responsibility for
construction site safety, or the contractor's activities; such responsibility shall neither be implied nor inferred.

**Construction Observation and Testing**

The earthwork efforts should be monitored under the direction of the Geotechnical Engineer. Monitoring should include documentation of adequate removal of vegetation and top soil, proof-rolling and mitigation of areas delineated by the proof-roll to require mitigation.

Each lift of compacted fill and the final soil subgrade should be tested, evaluated, and reworked as necessary until approved by the Geotechnical Engineer prior to placement of additional lifts. Each lift of fill should be tested for density and water content at a frequency of at least one test for every 2,500 square feet in pavement areas.

In addition to the documentation of the essential parameters necessary for construction, the continuation of the Geotechnical Engineer into the construction phase of the project provides the continuity to maintain the Geotechnical Engineer's evaluation of subsurface conditions, including assessing variations and associated design changes.

**PAVEMENTS**

**General Pavement Comments**

Pavement designs and recommendations are provided for the traffic conditions and pavement life conditions as noted in [Project Description](#) and in the following sections of this report. A critical aspect of pavement performance is site preparation. Pavement designs noted in this section presume the site and subgrade has been prepared as recommended in the [Earthwork](#) section.

**Existing Pavement Condition**

The existing pavements approaching and exiting the inbound scale appear to be functioning but nearing the end of their service life. The age of these pavements is unknown. The pavements are exhibiting moderate severity fatigue (alligator cracking) and rutting near the ends of the existing scale. Recommendations for these pavements are discussed in the following sections. The existing bypass lane pavements appear to be in relatively good condition, but these pavements are currently only subjected to passenger automobile traffic, not heavily loaded trucks. The existing bypass lane pavements are approximately 12 years old. The existing bypass lane pavements should be removed and reconstructed or milled and overlaid to support the anticipated truck traffic over the proposed second inbound scale. Recommendations for the second inbound scale and proposed bypass lane on new location are discussed in the following sections. The
following table summarizes the existing pavements at the site based on the coring and testing performed:

<table>
<thead>
<tr>
<th>Location</th>
<th>Asphaltic Concrete (AC)</th>
<th>Aggregate Base Course (ABC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B-1 (Existing inbound scale approach)</td>
<td>2-3/4&quot;</td>
<td>10-1/2&quot;</td>
</tr>
<tr>
<td>B-5 (Existing bypass lane)</td>
<td>3&quot;</td>
<td>5-1/2&quot;</td>
</tr>
<tr>
<td>B-6 (Existing inbound scale exit)</td>
<td>2-1/4&quot;</td>
<td>9-3/4&quot;</td>
</tr>
</tbody>
</table>

**Existing Inbound Scale Approach and Exit Pavement Recommendations**

The useful life of the existing pavements approaching and exiting the existing inbound scale can be prolonged by adding an asphalt overlay. We recommend milling 1 inch and placing an asphaltic concrete (AC) overlay consisting of 3 inches of NCDOT Mix Type S9.5C placed in two 1-1/2 inch lifts. NCDOT Mix Type S9.5C should meet the Mix Design Criteria in Table 610-3 of the Standard Specifications for Roads and Structures updated December 6, 2017. Tack coat should be applied to the clean milled pavement surface before placing the overlay. The overlay should be wedged to create a smooth transition from the concrete approach and exit ramps at the scale to the AC paved lane.

**Proposed Second Inbound Scale Approach and Exit Lane Pavement Recommendations**

As previously stated, the existing pavements should be removed and reconstructed or milled and overlaid in the vicinity of the proposed second inbound scale. The existing bypass lane pavements are not structurally sufficient to support the heavy loading from the truck traffic over the proposed inbound scale. We presume the proposed scale will be very similar to the existing scale with concrete approach and exit ramps at each end. The AC pavement should be wedged to create a smooth transition from the concrete approach and exit ramps to the AC paved lane. The following table provides a full depth AC and an AC over ABC option for the approach and exit lane pavements of the proposed second inbound scale. These sections can be used where the pavement will be constructed on new location or need to be reconstructed following demolition. A milling and overlay option is discussed for existing bypass lane pavements that will remain in place near the scale following the table.
Proposed Inbound Scale Approach and Exit Asphalstic Concrete Design Alternatives

<table>
<thead>
<tr>
<th>Layer</th>
<th>Layer Thickness (inches)</th>
<th>Layer</th>
<th>Layer Thickness (inches)</th>
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<tbody>
<tr>
<td><strong>Option 1</strong></td>
<td></td>
<td><strong>Option 2</strong></td>
<td></td>
</tr>
<tr>
<td>Full Depth</td>
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<td>Asphaltic Concrete over Aggregate Base Course</td>
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<td>AC Base</td>
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<td></td>
<td></td>
<td>1,3</td>
<td></td>
</tr>
</tbody>
</table>

1. All materials should meet the current North Carolina Department of Transportation (NCDOT) Mix Design Criteria found in Table 610-3 (updated December 6, 2017) of the Standard Specifications for Roads and Structures.
   - AC Surface - NCDOT Mix Type S9.5C
   - AC Base - NCDOT Mix Type B25.0C
2. Placed in two 1-1/2 inch lifts.
3. Placed in a single lift.
4. Placed in two 2 inch lifts.

For pavements near the proposed second inbound scale that will remain in place, we recommend milling 1 inch and placing an AC overlay consisting of 3 inches of NCDOT Mix Type S9.5C placed in two 1-1/2 inch lifts. NCDOT Mix Type S9.5C should meet the Mix Design Criteria in Table 610-3 of the Standard Specifications for Roads and Structures updated December 6, 2017. Tack coat should be applied to the clean milled pavement surface before placing the overlay. The overlay should be wedged to create a smooth transition from the concrete approach and exit ramps at the scale to the AC paved lane.

Proposed Scale Bypass Lane Pavement Recommendations

The proposed bypass lane will be located on new location in the grassy area adjacent to the existing bypass lane. The DCPs performed along the bypass lane alignment indicate the near surface sand should be densified by rolling with a smooth drum roller prior to constructing the pavements on the soil subgrade. See the Earthwork section of this report for more details regarding subgrade preparation.
Proposed Bypass Lane Asphaltic Concrete Design Alternatives

<table>
<thead>
<tr>
<th>Layer</th>
<th>Layer Thickness (inches)</th>
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<td>AC Surface</td>
<td>1,2 3</td>
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<td>AC Base</td>
<td>1,3 3</td>
<td>Aggregate Base Course</td>
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</table>

1. All materials should meet the current North Carolina Department of Transportation (NCDOT) Mix Design Criteria found in Table 610-3 (updated December 6, 2017) of the Standard Specifications for Roads and Structures.
   - AC Surface - NCDOT Mix Type S9.5C
   - AC Base - NCDOT Mix Type B25.0C

2. Placed in two 1-1/2 inch lifts.
3. Placed in a single lift.

Pavement Drainage

Pavements should be sloped to provide rapid drainage of surface water. Water allowed to pond on or adjacent to the pavements could saturate the subgrade and contribute to premature pavement deterioration. In addition, the pavement subgrade should be graded to provide positive drainage within the granular base section, if chosen for this project.

Pavement Maintenance

The pavement sections represent minimum recommended thicknesses and, as such, periodic maintenance should be anticipated. Therefore, preventive maintenance should be planned and provided for through an on-going pavement management program. Maintenance activities are intended to slow the rate of pavement deterioration and to preserve the pavement investment. Maintenance consists of both localized maintenance (e.g. crack and joint sealing and patching) and global maintenance (e.g. surface sealing). Preventive maintenance is usually the priority when implementing a pavement maintenance program. Additional engineering observation is recommended to determine the type and extent of a cost-effective program. Even with periodic maintenance, some movements and related cracking may still occur and repairs may be required.

Pavement performance is affected by its surroundings. In addition to providing preventive maintenance, the civil engineer should consider the following recommendations in the design and layout of pavements:
Final grade adjacent to paved areas should slope down from the edges at a minimum 2%.

- Subgrade and pavement surfaces should have a minimum 2% slope to promote proper surface drainage.
- Install joint sealant and seal cracks immediately.

GENERAL COMMENTS

Our analyses and opinions are based upon our understanding of the project, the geotechnical conditions in the area, and the data obtained from our site exploration. Natural variations will occur between exploration point locations or due to the modifying effects of construction or weather. The nature and extent of such variations may not become evident until during or after construction. Terracon should be retained as the Geotechnical Engineer, where noted, to provide observation and testing services during pertinent construction phases. If variations appear, we can provide further evaluation and supplemental recommendations. If variations are noted in the absence of our observation and testing services on-site, we should be immediately notified so that we can provide evaluation and supplemental recommendations.

Our scope of services does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

Our services and any correspondence are intended for the sole benefit and exclusive use of our client for specific application to the project discussed and are accomplished in accordance with generally accepted geotechnical engineering practices with no third party beneficiaries intended. Any third party access to services or correspondence is solely for information purposes to support the services provided by Terracon to our client. Reliance upon the services and any work product is limited to our client, and is not intended for third parties. Any use or reliance of the provided information by third parties is done solely at their own risk. No warranties, either express or implied, are intended or made.
EXPLORATION AND TESTING PROCEDURES

Field Exploration

<table>
<thead>
<tr>
<th>Number of Test Locations</th>
<th>Boring Depth</th>
<th>Location</th>
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<tr>
<td>6</td>
<td>5 feet below existing grades</td>
<td>scale approach / exit and bypass lane</td>
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**Boring Layout and Elevations:** Terracon personnel determined the appropriate test locations in the field to obtain the necessary subsurface information for the proposed construction and avoid subsurface utilities or obstructions. The coordinates of the tests were determined based on measurements from existing site features taken by the drill crew during the investigation. Elevations were not determined and all depths reference the existing ground surface or the datum as listed.

**Subsurface Exploration Procedures:** For test locations through the existing pavements, the pavement was cored using a truck mounted rotary drill rig equipped with a thin wall core barrel. The pavement core was extracted, labeled, and stored for transport to our laboratory. Following pavement coring for test locations through existing pavements and beginning at a depth of approximately 1 foot below existing site grades for the test locations in the grassy area along the bypass lane, the DCP test was performed at each location. The DCP test was started 1 foot below existing site grades, also referred to as the estimated subgrade (ESG), along the bypass lane to account for the removal and disturbance of the near surface soils prior to preparing the soil subgrade for pavement construction. The DCP test was advanced to a depth of approximately 5 feet below the top of existing pavement or the existing ground surface. After the DCP test was completed, the drill rig was used to advance a 3-1/4 inch solid stem auger to a depth of approximately 5 feet below existing site grades. The auger was then withdrawn to observe and collect representative samples of the subgrade soils. Collected samples were stored in appropriate containers and labeled for transport to our laboratory. The open boreholes were observed for the presence of water for the brief period they remained open. Before demobilizing from the site, the drill crew used auger cuttings and soils borrowed from on site to backfill the open boreholes. Test locations through existing pavements were topped with tamped asphalt cold patch.
SITE LOCATION AND EXPLORATION PLANS
PROPOSED SECOND INBOUND SCALE AND BYPASS DRIVE
NEW HANOVER COUNTY LANDFILL
5216 US 421
NEW HANOVER COUNTY
NORTH CAROLINA

SITE LOCATION

EXHIBIT 2401 BRENTWOOD ROAD
RALEIGH, NC 27604
FAX (919) 873-9555
PH. (919) 873-2211

CONSULTING ENGINEERS AND SCIENTISTS
EXPLORATION RESULTS
(Boring Logs and In-Situ CBR Plots)
### BORING LOG NO. B-1

**PROJECT:** New Scale and Bypass Lane - New Hanover Co. Landfill  
**SITE:** 5210 US 421 Wilmington, NC  
**CLIENT:** New Hanover County Wilmington, NC

**LOCATION**  
See Exhibit A-2  
Latitude: 34.3229° Longitude: -77.991°

**DEPTH**  

<table>
<thead>
<tr>
<th>Depth (Ft.)</th>
<th>Water Level Observations</th>
<th>Sample Type</th>
</tr>
</thead>
<tbody>
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<td>ASPHALT, 2-3/4&quot;</td>
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</tr>
<tr>
<td>1.1</td>
<td>POORLY GRADED SAND (SP)</td>
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</table>

**Stratification lines are approximate. In-situ, the transition may be gradual.**

**Advancement Method:**  
3-1/4" Solid Stem Auger

**Abandonment Method:**  
Boring backfilled with cuttings or borrowed site soil and topped with asphalt cold patch.

**WATER LEVEL OBSERVATIONS**  
Groundwater not encountered

**Notes:**

**Hammer Type:** N/A

**This boring log is not valid if separated from original report.**

**TERRACON_DATATEMPATE.GDT**

**3/13/18**

**Boring Terminated at 5 Feet**

**PROJECT:** New Scale and Bypass Lane - New Hanover Co. Landfill  
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**TERRACON_DATATEMPATE.GDT**

**3/13/18**

**Boring Terminated at 5 Feet**
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Notes:
SG = Subgrade
SS = Stabilized Soil
CTBC = Cement-Treated Base Course
ABC = Aggregate Base Course
ESG = Estimated Subgrade (Approximately 1 foot below the existing ground surface)
**BORING LOG NO. B-2**

**PROJECT:** New Scale and Bypass Lane - New Hanover Co. Landfill  
**SITE:** 5210 US 421  
**CLIENT:** New Hanover County  
**Wilmington, NC**

**LOCATION**  
See Exhibit A-2  
Latitude: 34.3229° Longitude: -77.9908°

**GRAPHIC LOG**

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**POORLY GRADED GRAVEL (SP), medium grained, brown to gray, medium dense**

**Boring Terminated at 5 Feet**

**Stratification lines are approximate. In-situ, the transition may be gradual.**

**Advancement Method:** 3-1/4" Solid Stem Auger  
**Abandonment Method:** Boring backfilled with cuttings or borrowed site soil.

**Notes:**

**Hammer Type:** N/A  

**PROJECT:** New Scale and Bypass Lane - New Hanover Co. Landfill  
**Driller:** JRT  
**Boring Started:** 02-23-2018  
**Boring Completed:** 02-23-2018  
**Drill Rig:** CME-45B  
**Driller:** JRT  
**Project No.:** 70185008  
**Exhibit:** A-2
### Test Location Description

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### Cumulative Penetration in Centimeters

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### Notes:
- SG = Subgrade
- SS = Stabilized Soil
- CTBC = Cement-Treated Base Course
- ABC = Aggregate Base Course
- ESG = Estimated Subgrade (Approximately 1 foot below the existing ground surface)
**BORING LOG NO. B-3**

**PROJECT:** New Scale and Bypass Lane - New Hanover Co. Landfill  
**CLIENT:** New Hanover County  
**SITE:** 5210 US 421  
**Location:** Wilmington, NC  
**Driller:** JRT  
**Boring Completed:** 02-23-2018

---

**LOCATION** See Exhibit A-2  
Latitude: 34.323° Longitude: -77.9906°

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**DEPTH**  

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**POORLY GRADED SAND (SP), medium grained, tan, loose to medium dense**

**Boring Terminated at 5 Feet**

---

**Advancement Method:** 3-1/4" Solid Stem Auger  
**Abandonment Method:** Boring backfilled with cuttings or borrowed site soil.  
**Notes:**

---

**WATER LEVEL OBSERVATIONS**  
Groundwater not encountered

---

**Hammer Type:** N/A

---

**Drill Rig:** CME-45B  
**Driller:** JRT

**Boring Started:** 02-23-2018  
**Boring Completed:** 02-23-2018

---

**2401 Brentwood Rd Ste 107**  
**Raleigh, NC**

---

**Project No.: 70185008**  
**Exhibit:** A-3
## TEST LOCATION DESCRIPTION

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**Notes:**
- SG = Subgrade
- SS = Stabilized Soil
- CTBC = Cement-Treated Base Course
- ABC = Aggregate Base Course
- ESG = Estimated Subgrade (Approximately 1 foot below the existing ground surface)
### BORING LOG NO. B-4

**PROJECT:** New Scale and Bypass Lane - New Hanover Co. Landfill  
**SITE:** 5210 US 421  
**CLIENT:** New Hanover County  
**Wilmington, NC**

**LOCATION**  
See Exhibit A-2  
Latitude: 34.3231°  
Longitude: -77.9904°

**POORLY GRADED SAND (SP), medium grained, tan, loose to medium dense**

**DEPTH**

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**Boring Terminated at 5 Feet**

Stratification lines are approximate. In-situ, the transition may be gradual.

**Hammer Type:** N/A

**Advancement Method:** 3-1/4" Solid Stem Auger

**Abandonment Method:** Boring backfilled with cuttings or borrowed site soil.

**WATER LEVEL OBSERVATIONS**  
Groundwater not encountered

---

**Terrainon Data Template:**  
2401 Brentwood Rd Ste 107  
Raleigh, NC

**Project No.:** 70185008  
**Exhibit:** A-4

---

**Notes:**
See Exhibit A-3 for description of field procedures.
See Appendix C for explanation of symbols and abbreviations.

**Water Level Observations:**

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**Boring Started:** 02-23-2018  
**Boring Completed:** 02-23-2018

**Drill Rig:** CME-45B  
**Driller:** JRT

---

**THIS BORING LOG IS NOT VALID IF SEPARATED FROM ORIGINAL REPORT.**

---

**GEO SMART LOG-NO WELL 70185008 NEW SCALE AND BYP.GPJ TERRACON_DATATEMPLATE.GDT 3/13/18**
## Test Location Description

**B-4**

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### Cumulative Penetration in Centimeters

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### Correlated CBR Values

![Correlated CBR Values Graph](chart.png)

### Notes:

- SG = Subgrade
- SS = Stabilized Soil
- CTBC = Cement-Treated Base Course
- ABC = Aggregate Base Course
- ESG = Estimated Subgrade (Approximately 1 foot below the existing ground surface)
Boring Terminated at 5 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: N/A

Advancement Method: 3-1/4” Solid Stem Auger

Abandonment Method: Boring backfilled with cuttings or borrowed site soil and topped with asphalt cold patch.

See Exhibit A-3 for description of field procedures.

See Appendix C for explanation of symbols and abbreviations.

NOTES:

PROJECT: New Scale and Bypass Lane - New Hanover Co. Landfill

SITE: 5210 US 421 Wilmington, NC

CLIENT: New Hanover County Wilmington, NC

LOCATION See Exhibit A-2

Latitude: 34.3232° Longitude: -77.9904°

GRAPHIC LOG

DEPTH

0.3 ASPHALT, 3”

AGGREGATE BASE COURSE, very dense, 5-1/2”

0.7 POORLY GRADED SAND (SP), medium grained, brown, medium dense to very dense

DEPTH (Ft.)

WATER LEVEL OBSERVATIONS

LOCATION

See Exhibit A-2

Latitude: 34.3232° Longitude: -77.9904°

DEPTH

0.3

AGGREGATE BASE COURSE

0.7

POORLY GRADED SAND (SP)

1.0 Boring Terminated at 5 Feet

Stratification lines are approximate. In-situ, the transition may be gradual.

Boring Terminated at 5 Feet

Boring Terminated at 5 Feet

Groundwater not encountered

WATER LEVEL OBSERVATIONS

Boring Started: 02-23-2018 Boring Completed: 02-23-2018

Drill Rig: CME-45B Driller: JRT

Project No.: 70185008 Exhibit: A-5
## TEST LOCATION DESCRIPTION

<table>
<thead>
<tr>
<th>Test Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>B-5</td>
<td>Entrance Scales and Bypass Lane</td>
</tr>
</tbody>
</table>

### New Hanover

<table>
<thead>
<tr>
<th>County</th>
<th>Geologist</th>
<th>Technicians</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Hanover</td>
<td>Alexander, M. J.</td>
<td>Turnage, J. R. / Roush, J. K.</td>
</tr>
</tbody>
</table>

### Notes:

- **SG** = Subgrade
- **SS** = Stabilized Soil
- **CTBC** = Cement-Treated Base Course
- **ABC** = Aggregate Base Course
- **ESG** = Estimated Subgrade (Approximately 1 foot below the existing ground surface)
### BORING LOG NO. B-6

**PROJECT:** New Scale and Bypass Lane - New Hanover Co. Landfill  
**SITE:** 5210 US 421 Wilmington, NC  
**CLIENT:** New Hanover County Wilmington, NC

#### LOCATION
See Exhibit A-2

Latitude: 34.3232° Longitude: -77.9904°

#### ASPHALT, 2-1/4"

**AGGREGATE BASE COURSE,** very dense, 9-3/4"

#### POORLY GRADED SAND (SP)

medium grained, tan, medium dense to very dense

#### WATER LEVEL OBSERVATIONS

<table>
<thead>
<tr>
<th>DEPTH (FL.)</th>
<th>樣品</th>
<th>樣品</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Boring Terminated at 5 Feet**

Stratification lines are approximate. In-situ, the transition may be gradual.

**Hammer Type:** N/A

**Advancement Method:** 3-1/4" Solid Stem Auger

**Abandonment Method:** Boring backfilled with cuttings or borrowed site soil and topped with asphalt cold patch.

**Notes:**

See Exhibit A-3 for description of field procedures.

See Appendix C for explanation of symbols and abbreviations.

**GROUNDWATER OBSERVATIONS**

Groundwater not encountered

**Terracon**

2401 Brentwood Rd Ste 107  
Raleigh, NC

**Boring Started:** 02-23-2018  
**Boring Completed:** 02-23-2018

**Drill Rig:** CME-45B  
**Driller:** JRT

**Project No.:** 70185008  
**Exhibit:** A-6
PAVEMENT CORE AND EXISTING CONDITION PHOTOGRAPHS
PAVEMENT CORE AND EXISTING CONDITION PHOTOGRAPHS
NEW HANOVER COUNTY LANDFILL - PROPOSED SECOND INBOUND SCALE AND BYPASS LANE
TERRACON PROJECT: 70185008
MARCH 2018

VIEW ACROSS EXIT END OF EXISTING INBOUND SCALE. LOCATIONS B-5 AND B-6 SHOWN. MODERATE SEVERITY FATIGUE CRACKING IN WHEEL PATH OF SCALE EXIT LANE.

VIEW OF EXISTING BYPASS LANE / PROPOSED SECOND INBOUND SCALE LOCATION FACING INBOUND.

VIEW FACING APPROACH END OF EXISTING INBOUND SCALE. LOCATION B-1 SHOWN. MODERATE SEVERITY FATIGUE CRACKING AND POTHOLE IN WHEEL PATH OF SCALE APPROACH LANE.

VIEW OF DISTRESS AT APPROACH END OF EXISTING INBOUND SCALE.
SUPPORTING INFORMATION
(General Notes and Unified Soil Classification System)
GENERAL NOTES

DESCRIPTION OF SYMBOLS AND ABBREVIATIONS

<table>
<thead>
<tr>
<th>SYMBOL</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>Standard Penetration Test Resistance (Blows/Ft.)</td>
</tr>
<tr>
<td>HP</td>
<td>Hand Penetrometer</td>
</tr>
<tr>
<td>T</td>
<td>Torvane</td>
</tr>
<tr>
<td>DCP</td>
<td>Dynamic Cone Penetrometer</td>
</tr>
<tr>
<td>PID</td>
<td>Photo-Ionization Detector</td>
</tr>
<tr>
<td>OVA</td>
<td>Organic Vapor Analyzer</td>
</tr>
</tbody>
</table>

FIELD TESTS

OVER 12 IN. (300 MM)
12 IN. TO 3 IN. (300MM TO 75MM)
3 IN. TO #4 SIEVE (75MM TO 4.75 MM)
#4 TO #200 SIEVE (4.75MM TO 0.075MM)
PASSING #200 SIEVE (0.075MM)

LOCATION AND ELEVATION NOTES

Unless otherwise noted, Latitude and Longitude are approximately determined using a hand-held GPS device. The accuracy of such devices is variable. Surface elevation data annotated with +/- indicates that no actual topographical survey was conducted to confirm the surface elevation. Instead, the surface elevation was approximately determined from topographic maps of the area.

DESCRIPTIVE SOIL CLASSIFICATION

Soil classification is based on the Unified Soil Classification System. Coarse Grained Soils have more than 50% of their dry weight retained on a #200 sieve; their principal descriptors are: boulders, cobbles, gravel or sand. Fine Grained Soils have less than 50% of their dry weight retained on a #200 sieve; they are principally described as clays if they are plastic, and silts if they are slightly plastic or non-plastic. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size. In addition to gradation, coarse-grained soils are defined on the basis of their in-place relative density and fine-grained soils on the basis of their consistency.

RELATIVE DENSITY OF COARSE-GRAINED SOILS

(More than 50% retained on No. 200 sieve.) Density determined by Standard Penetration Resistance

<table>
<thead>
<tr>
<th>Descriptive Term (Density)</th>
<th>Standard Penetration or N-Value Blows/Ft.</th>
<th>Descriptive Term (Consistency)</th>
<th>Unconfined Compressive Strength Qu, (psf)</th>
<th>Standard Penetration or N-Value Blows/Ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Loose</td>
<td>0 - 3</td>
<td>Very Soft</td>
<td>less than 500</td>
<td>0 - 1</td>
</tr>
<tr>
<td>Loose</td>
<td>4 - 9</td>
<td>Soft</td>
<td>500 to 1,000</td>
<td>2 - 4</td>
</tr>
<tr>
<td>Medium Dense</td>
<td>10 - 29</td>
<td>Medium Stiff</td>
<td>1,000 to 2,000</td>
<td>4 - 8</td>
</tr>
<tr>
<td>Dense</td>
<td>30 - 50</td>
<td>Stiff</td>
<td>2,000 to 4,000</td>
<td>8 - 15</td>
</tr>
<tr>
<td>Very Dense</td>
<td>&gt; 50</td>
<td>Very Stiff</td>
<td>4,000 to 8,000</td>
<td>15 - 30</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hard</td>
<td>&gt; 8,000</td>
<td>&gt; 30</td>
</tr>
</tbody>
</table>

RELATIVE PROPORTIONS OF SAND AND GRAVEL

<table>
<thead>
<tr>
<th>Descriptive Term(s) of other constituents</th>
<th>Percent of Dry Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trace</td>
<td>&lt; 15</td>
</tr>
<tr>
<td>With</td>
<td>15 - 29</td>
</tr>
<tr>
<td>Modifier</td>
<td>&gt; 30</td>
</tr>
</tbody>
</table>

GRAIN SIZE TERMINOLOGY

<table>
<thead>
<tr>
<th>Major Component of Sample</th>
<th>Particle Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boulders</td>
<td>Over 12 in. (300 mm)</td>
</tr>
<tr>
<td>Cobbles</td>
<td>12 in. to 3 in. (300mm to 75mm)</td>
</tr>
<tr>
<td>Gravel</td>
<td>3 in. to #4 sieve (75mm to 4.75 mm)</td>
</tr>
<tr>
<td>Sand</td>
<td>#4 to #200 sieve (4.75mm to 0.075mm)</td>
</tr>
<tr>
<td>Silt or Clay</td>
<td>Passing #200 sieve (0.075mm)</td>
</tr>
</tbody>
</table>

RELATIVE PROPORTIONS OF FINES

<table>
<thead>
<tr>
<th>Descriptive Term(s) of other constituents</th>
<th>Percent of Dry Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trace</td>
<td>&lt; 5</td>
</tr>
<tr>
<td>With</td>
<td>5 - 12</td>
</tr>
<tr>
<td>Modifier</td>
<td>&gt; 12</td>
</tr>
</tbody>
</table>

PLASTICITY DESCRIPTION

<table>
<thead>
<tr>
<th>Term</th>
<th>Plasticity Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-plastic</td>
<td>0</td>
</tr>
<tr>
<td>Low</td>
<td>1 - 10</td>
</tr>
<tr>
<td>Medium</td>
<td>11 - 30</td>
</tr>
<tr>
<td>High</td>
<td>&gt; 30</td>
</tr>
</tbody>
</table>
### Criteria for Assigning Group Symbols and Group Names Using Laboratory Tests

<table>
<thead>
<tr>
<th>Soil Classification</th>
<th>Group Symbol</th>
<th>Group Name</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Coarse-Grained Soils:</strong> More than 50% retained on No. 200 sieve</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gravels: More than 50% of coarse fraction retained on No. 4 sieve</td>
<td>Clean Gravels: Less than 5% fines</td>
<td>GW</td>
</tr>
<tr>
<td></td>
<td>Gravels with Fines: More than 12% fines</td>
<td>GP</td>
</tr>
<tr>
<td></td>
<td>Clean Gravels: Less than 5% fines</td>
<td>GM</td>
</tr>
<tr>
<td></td>
<td>Gravels with Fines: More than 12% fines</td>
<td>GC</td>
</tr>
<tr>
<td>Sands: 50% or more of coarse fraction passes No. 4 sieve</td>
<td>Clean Sands: Less than 5% fines</td>
<td>SW</td>
</tr>
<tr>
<td></td>
<td>Sands with Fines: More than 12% fines</td>
<td>SP</td>
</tr>
<tr>
<td></td>
<td>Inorganic: PI &gt; 7 and plots on or above &quot;A&quot; line</td>
<td>CL</td>
</tr>
<tr>
<td></td>
<td>Inorganic: PI &lt; 4 or plots below &quot;A&quot; line</td>
<td>ML</td>
</tr>
<tr>
<td></td>
<td>Organic: Liquid limit - oven dried</td>
<td>OL</td>
</tr>
<tr>
<td></td>
<td>Organic: Liquid limit - not dried</td>
<td>CH</td>
</tr>
<tr>
<td></td>
<td>Inorganic: PI plots on or above &quot;A&quot; line</td>
<td>MH</td>
</tr>
<tr>
<td></td>
<td>Inorganic: PI plots below &quot;A&quot; line</td>
<td>MH</td>
</tr>
<tr>
<td></td>
<td>Organic: Liquid limit - oven dried</td>
<td>OH</td>
</tr>
<tr>
<td></td>
<td>Organic: Liquid limit - not dried</td>
<td>OH</td>
</tr>
<tr>
<td></td>
<td>Highly organic soils: Primarily organic matter, dark in color, and organic odor</td>
<td>PT</td>
</tr>
</tbody>
</table>

- **A** Based on the material passing the 3-inch (75-mm) sieve
- **B** If field sample contained cobbles or boulders, or both, add “with cobbles or boulders, or both” to group name.
- **C** Gravels with 5 to 12% fines require dual symbols: GW-GM well-graded gravel with silt, GP-GM poorly graded gravel with silt, GP-GC poorly graded gravel with clay.
- **D** Sands with 5 to 12% fines require dual symbols: SW-SM well-graded sand with silt, SW-SC well-graded sand with clay, SP-SM poorly graded sand with silt, SP-SC poorly graded sand with clay
- **E** 
  \[ Cu = \frac{D_{60}}{D_{10}} \quad Cc = \frac{(D_{30})^2}{D_{10} \times D_{60}} \]
- **F** If soil contains ≥ 15% sand, add “with sand” to group name.
- **G** If fines classify as CL-ML, use dual symbol GC-GM, or SC-SC.

### For classification of fine-grained soils and fine-grained fraction of coarse-grained soils

- **Equation of “A” line**
  - Horizontal at PI=4 and LL=25.5.
  - then PI=0.73 (LL-20)
- **Equation of “U” line**
  - Vertical at LL=16 to PI=7.
  - then PI=0.9 (LL-8)

### Definitions

- **Cu** = D_{60}/D_{10}
- **Cc** = \( \frac{(D_{30})^2}{D_{10} \times D_{60}} \)
- **PI** = Plasticity Index
- **LL** = Liquid Limit

### Legend

- **CL** = Clay
- **ML** = Medium Clay
- **OL** = Organic Clay
- **CH** = Clayey Silt
- **MH** = Medium Silt
- **OH** = Organic Silt
- **PT** = Peat
NOTES:
1. ALL LINES TO CONFORM TO NCDOT 6" LANE LINE STANDARDS
2. PAVEMENT TEXT TO BE 1" TALL MINIMUM

FIGURE 1 - LANE STRIPES AND TEXT