

**BID PROPOSAL**  
**CASTLE HAYNE PARK IMPROVEMENTS**  
**RFB # 15-0185**

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**COUNTY COMMISSIONERS**

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**JONATHAN BARFIELD, JR.**  
**BRIAN BERGER**  
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## Section 1 - Advertisement

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Pursuant to GS 143-129, sealed bids addressed to Lena Butler, Purchasing Supervisor, New Hanover County Finance Department, 230 Government Center Drive, Suite 165, Wilmington, NC 28403 and marked “**CASTLE HAYNE PARK RENOVATIONS: RFB # 15-0185**” will be accepted until **1:00 PM EST, Thursday, December 4, 2014** for the following work:

**Castle Hayne Park Improvements:** The work consists of furnishing of labor and materials for expansion of existing park infrastructure and construction of two multi-purpose fields, multi-use trails, new park entrance and roadway, parking lot, basketball court, sidewalks, associated grading, drainage and landscape work.

**The bids will be publicly opened and read aloud following the latest time for receipt of bids in the New Hanover County Finance Office, Suite 165, Conference Room 500, Wilmington, North Carolina.**

Bids will be received for a Single Prime Contract. Bidders must be properly licensed under Chapter 87 of the North Carolina General Statutes.

All prime bidders on this project must be pre-qualified in accordance with New Hanover County’s Pre-qualification Ordinance in order to bid. Bids will not be accepted unless the bidder is pre-qualified. Pre-qualification applications may be obtained at the County Legal Department, 230 Government Center Drive, Suite 155, Wilmington, NC 28403 or by visiting the County’s website at <http://legalinsurance.nhc.gov/contractors-approved-for-bidding/>.

Bidding Documents and Site Development Plans may be examined and/or obtained at the County’s Parks & Gardens Office located at 230 Government Center Drive, Suite 120, Wilmington, NC 28403 during regular office hours or by contacting Copy Cat at [info@copycatprintshop.com](mailto:info@copycatprintshop.com) or visit <http://www.nhc.gov/business-nhc/bids/>. Persons requesting shipment of documents shall bear the additional, non-refundable cost of shipment, if applicable.

**The County will conduct a Mandatory Pre-Bid meeting at 1:00 PM on Wednesday, November 12, 2014. The meeting will be held in Finance Conference Room 500 located at 230 Government Center Drive, Suite 165, Wilmington, NC 28403.**

A Bid Bond Equal to 5% of the base bid price is required by all bidders. The successful bidder will be required to provide Performance and Payment bonds equal to one hundred percent (100%) of the contract price.

No Bid may be withdrawn thirty (30) days after bid opening date.

The bidder shall make good faith efforts, as defined in the bid specifications, to subcontract 10% of the dollar value of the single prime contract to businesses owned and controlled by minorities.

The County reserves the right to waive any informalities, to reject any or all bids, and to accept that Bid or Bids which is in the best interest of the County.

## Section 2 Instructions to Bidders

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### 2.1 SCHEDULE

Advertisement	Monday, November 3, 2014
1 <sup>st</sup> Round of Questions	Wednesday, November 12, 2014 by 12:00 PM
Pre-Bid Meeting	Wednesday, November 12, at 1:00 PM
Deadline for Final Questions	Thursday, November 20, 2014 by 5:00 PM
Deadline for Receipt of Bids	Thursday, December 4, 2014 at 1:00 PM New Hanover County Finance Office 230 Government Center Drive, Suite 165 Wilmington, NC 28403 (Bid Opening: Conference Room 500)
Board Meeting for Award	Monday, January 5, 2015 at 4:00 PM

### PRE-BID CONFERENCE

The County will conduct a **Mandatory Pre-Bid meeting at 1:00 PM on Wednesday, November 12, 2014**. The meeting will be held in Finance Conference Room 500 located at 230 Government Center Drive, Suite 165, Wilmington, NC 28403. The purpose of this conference is to review project requirements and to respond to questions from prospective bidders and their subcontractors or material suppliers related to the intent of bidding documents.

**It is requested that prospective Bidders review the bidding documents and submit their initial questions to Lena Butler** by emailing [lbutler@nhcgov.com](mailto:lbutler@nhcgov.com) no later than **12:00 PM on Wednesday, November 12, 2014**. This is the same day as the Pre-Bid meeting. Bidders will also have an opportunity to submit follow-up questions prior to the deadline for receipt of bids.

### 2.3 PREQUALIFICATION REQUIRED

All prime bidders on this project must be pre-qualified in accordance with New Hanover County's Pre-qualification Ordinance in order to bid. Bids will not be accepted unless the bidder is pre-qualified. Pre-qualification applications may be obtained at the County's Legal Department, 230 Government Center Drive, Suite 155, Wilmington, NC 28403 or by visiting the County's website <http://legalinsurance.nhcgov.com/contractors-approved-for-bidding/>.

### 2.4 PROPOSAL

Proposals shall be made in strict accordance with the "Bid Proposal Package" provided herein, and all blank spaces for bids, alternates and unit prices shall be properly filled in. When requested alternates are not bid, the proposal may be considered incomplete. Any modifications to the "Bid Proposal Package" (including alternates and/or unit prices) may disqualify the bid and cause the bid to be rejected.

The Bidder agrees that the "Bid Proposal Package" detached from specifications will be considered and will have the same force and effect as if attached thereto. Photocopied or faxed proposals will not be accepted. Numbers shall be stated both in writing and in figures for the base bids and alternates.

Unit prices quoted in the "Bid Proposal Package" shall include overhead, profit and taxes and shall be the full compensation for the Bidder's cost involved in the work.

Proposals may be rejected if they show omissions, alterations of form, additions not called for, conditional bids, or irregularities of any kind.

Bidder shall identify on the bid, the minority businesses that will be utilized on the project with corresponding total dollar value of the bid and affidavit listing good faith efforts or an affidavit indicating work under contract will be self-performed, as required by G.S. 143-128.2(c) and G.S. 143-128.2(f). Failure to comply with these requirements is grounds for rejection of the bid.

## **2.5 EXAMINATION OF CONDITIONS**

By submitting a bid, the Bidder is affirming that he has carefully examined all documents pertaining to the work, the location, accessibility and general character of the site of the work and all existing buildings and structures within and adjacent to the site, and has satisfied himself as to the nature of the work, the condition of existing buildings and structures, the conformation of the ground, the character, quality and quantity of the material to be encountered, the character of the equipment, machinery, plant, and any other facilities needed preliminary to and during prosecution of the work, the general and local conditions, the construction hazards, and all other matters, including but not limited to the labor situation which can in any way affect the work under the contract, and including all safety measures required by the Occupational Safety and Health Act of 1970 and all rules and regulations issued pursuant thereto.

The Bidder further affirms by submitting a proposal that he has satisfied himself as to the feasibility and meaning of the plans, drawings, specifications, and other contract documents for the construction of work and that he accepts all the terms, conditions and stipulations contained therein, and that he is prepared to work in cooperation with other Contractors performing work on the site.

Reference is made to contract documents for the identification of those surveys and investigative reports of subsurface or latent physical conditions at the site or otherwise affecting performance of the work which have been relied upon by the Designer/owner in preparing the documents. The County will make copies of all such surveys and reports available to the Bidder upon request. Each Bidder may, at his own expense, make such additional surveys and investigations as he may deem necessary to determine his bid price for the performance of the work. Any on-site investigation shall be done at the convenience of the County. Any reasonable request for access to the site will be honored by the County.

## 2.6 FAMILIARITY WITH LAWS

The bidders are assumed to have made themselves familiar with all laws, ordinances, and regulations which in any manner affect those engaged or employed in the work or the materials or equipment used in or upon the work, or in any way affects the conduct of the work.

## 2.7 CODES AND STANDARDS

Wherever reference is given to codes, standard specifications or other data published by regulating agencies including, but not limited to, national electrical codes, North Carolina state building codes, federal specifications, ASTM specifications, various institute specifications, etc., it shall be understood that such reference is to the latest edition including addenda published prior to the date of the contract documents.

## 2.8 PREPARATION OF PROPOSAL

The bidder must submit their bid proposal on the form herewith provided, and prices must be given both in writing and in figures (if requested). The bidder shall sign the bid proposal. **Bids not signed will be rejected.**

## 2.9 SUBMISSION OF BID FORM

**2.9.1 Bid Bond:** Each bid shall be accompanied by a deposit of cash, or a cashier's check, or a certified check on some bank or trust company insured by the Federal Deposit Insurance Corporation in an amount equal to not less than five percent (5%) of the proposal. In lieu of making the cash deposit as above provided, such bidder may file a bid bond executed by a corporate surety licensed under the laws of North Carolina to execute such bonds, conditioned that the surety will upon demand forthwith make payment to the obligee upon said bond if the bidder fails to execute the contract in accordance with the bid bond. This deposit shall be retained if the successful bidder fails to execute the contract within 10 days after the award or fails to give satisfactory surety as required herein. **(Bidders providing a bid bond in lieu of the cash deposit must use the attached bid bond form).**

**2.9.2 Addressee:** Bids must be on the form contained in this bid package and must be submitted in a sealed envelope properly marked "**CASTLE HAYNE PARK IMPROVEMENTS: RFB # 15-0185**" and shall be addressed to County at the following address:

New Hanover County Finance Office  
Attn: Lena Butler, Purchasing Supervisor  
230 Government Center Drive, Suite 165  
Wilmington, NC 28403

**2.9.3 Unacceptable Bids:** Bids submitted via telegraph, facsimile (FAX), telephone, and electronic means, including but not limited to e-mail, in response to the Request for Bids will not be acceptable.

## **2.10 LICENSING**

The successful Contractor must be properly licensed to do the work in accordance with the North Carolina General Statutes (Chapter 87, Article 1). Upon request, bidders shall show evidence of proper license type and limitation.

## **2.11 LATE BIDS**

Late bids will not be accepted. It is the responsibility of the Bidder to have his/her bid in the office specified in the Request for Bids by the time and date of the opening.

## **2.12 COMMUNICATION**

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 **Lena L. Butler, Purchasing Supervisor** by emailing [lbutler@nhcgov.com](mailto:lbutler@nhcgov.com) or faxing (910) 798-7806. All questions concerning this bid shall reference the bid number, section number and paragraph. Questions and responses affecting the specifications of the bid will be provided by issuance of an Addendum to all known bidders of record. The first round of questions is due prior to the Pre-Bid Meeting to be held on **Wednesday, November 12, 2014 at 1:00 PM**. Final questions related to this Request for Bids shall be received no later than **5:00 P.M., EST, Thursday, November 20, 2014**.

## **2.13 TIME OF BID OPENING**

Bids shall be opened and read aloud. After the opening of bids, no bid may be withdrawn, except under the provisions of General Statute 143-129.1, for a period of thirty (30) days unless otherwise specified. Should the successful bidder default and fail to execute a contract, the contract may be awarded to the next lowest and responsible bidder. **Bids will be publicly opened and read aloud on Thursday, December 4, 2014 at 1:00 PM** in Conference Room 500 located within the New Hanover County Finance Department, 230 Government Center Drive, Suite 165, Wilmington, NC 28403.

## **2.14 WITHDRAWAL OF BIDS**

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 for a period of thirty (30) days except as provided under G.S. 143-129.1 which allows a bidder to withdraw his/her bid from consideration after the bid opening without forfeiture of his/her bid security if the price bid was based upon a mistake, which constituted a substantial error, provided the bid was submitted in good faith, and the bidder submits credible evidence that the mistake was clerical in nature as opposed to a

judgment error, and was actually due to an unintentional and substantial arithmetic error or an unintentional omission of a substantial quantity of work, labor, apparatus, supplies, materials, equipment, or services made directly in the compilation of the bid, which unintentional arithmetic error or unintentional omission can be clearly shown by objective evidence drawn from inspection of the original work papers, documents or materials used in the preparation of the bid sought to be withdrawn.

## **2.15 AWARD OF CONTRACT**

The award of any contract resulting from this bid will be made to the lowest responsible bidder, taking into consideration quality, performance and time specified in the bid for the performance of the contract. In the event the lowest responsible, responsive bid is in excess of the funds available for the project, the County may enter into negotiations with the lowest responsible, responsive bidder and may make reasonable changes in the plans and specifications to bring the price within the funds available for the project and award the bid. If such negotiations prove to be unsuccessful, the County will re-advertise the project after making such changes in the plans and specifications as may be necessary to bring the cost of the project within the funds available.

## **2.16 SUBSTITUTIONS**

In accordance with the provisions of G.S. 133-3, material, product, or equipment substitutions proposed by the bidders to those specified herein can only be considered during the bidding phase until ten (10) days prior to the receipt of bids when submitted to the Designer/owner with sufficient data to confirm material, product, or equipment equality. Proposed substitutions submitted after this time will be considered only as potential change order.

Submittals for proposed substitutions shall include the following information:

- a. Name, address, and telephone number of manufacturer and supplier as appropriate.
- b. Trade name, model or catalog designation.
- c. Product data including performance and test data, reference standards, and technical descriptions of material, product, or equipment. Include color samples and samples of available finishes as appropriate.
- d. Detailed comparison with specified products including performance capabilities, warranties, and test results.
- e. Other pertinent data including data requested by the Designer/owner to confirm product equality.

If a proposed material, product, or equipment substitution is deemed equal by the Designer/owner to those specified, all bidders of record will be notified by Addendum.

## **2.17 PERFORMANCE BOND**

Each contractor shall furnish a performance bond executed by a surety company authorized to do business in North Carolina. The bonds shall be in the full contract amount. Bonds shall be executed in the form included with these specifications. The bond shall be countersigned by an authorized agent of the bonding company who is licensed to do business in North Carolina.

## **2.18 PAYMENT BOND**

Each contractor shall furnish a performance bond executed by a surety company authorized to do business in North Carolina. The bonds shall be in the full contract amount. Bonds shall be executed in the form included with these specifications. The bond shall be countersigned by an authorized agent of the bonding company who is licensed to do business in North Carolina.

## **2.19 ADDENDA**

Any addenda to specifications issued during the time of bidding are to be considered covered in the proposal and in closing a contract they will become a part thereof. It shall be the bidder's responsibility to ascertain prior to bid time the addenda issued and to see that his bid includes any changes thereby required.

Should the bidder find discrepancies in, or omission from, the drawings or documents or should he be in doubt as to their meaning, he shall at once notify Lena Butler by emailing [lbutler@nhcgov.com](mailto:lbutler@nhcgov.com) who will send written instructions in the form of addenda to all bidders. Notification should be no later than seven (7) days prior to the date set for receipt of bids. Neither the owner nor the designer/owner will be responsible for any oral instructions.

All addenda should be acknowledged by the bidder(s) on the Bid Proposal Form. However, even if not acknowledged, by submitting a bid, the bidder has certified that he has reviewed all issued addenda and has included all costs associated within his bid.

## **2.20 LIQUIDATED DAMAGES**

Since actual damages for any delay in the completion of the work which the contractor is required to perform under this contract are or will be difficult to determine, Bidders and his /her sureties shall be liable for and shall pay to the Owner the sum of **\$200** as fixed and agreed as liquidated damages, and not as penalty for each calendar day of delay from the date stipulated for completion, or as modified in accordance with the terms of this agreement until such work is satisfactorily completed and accepted. Said liquidated damages may be deducted from any payments owed to the contractor by the Owner or collected from the sureties, whichever is deemed expedient by the Owner.

## **2.21 COMPLIANCE WITH BID REQUIREMENTS**

Failure to comply with these provisions or any other provisions of the General Statutes of North Carolina will result in rejection of bid.

## **2.22 E-VERIFY**

Pursuant to N.C.G.S. § 143-48.5 (Session Law 2014-418), Contractor shall fully comply and certify compliance of each of its subcontractors with Article 2 of Chapter 64 of the N.C. General Statutes, including the requirement for each employer with more than 25

employees in North Carolina to verify the work authorization of its employees through the federal E-Verify system. County shall be provided affidavits attesting to Contractor's and subcontractor's compliance or exemption. Violation of the provision, unless timely cured, shall constitute a breach of Contract.

### **2.23 RIGHT TO REJECT BIDS**

The County reserves the right to waive any or all informalities, to reject any or all bids, and to accept that Bid or Bids which is in the best interest of the County.

**Section 3 – General Conditions**

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## ARTICLE 1-DEFINITIONS

1. The **contract documents** consist of the Instructions to Bidders; General Conditions, special conditions if applicable; drawings and specifications, including all bulletins, addenda or other modifications of the drawings and specifications incorporated into the documents prior to their execution; the proposal; the contract; the performance bond; the payment bond; and insurance certificates.
2. The **owner** is New Hanover County.
3. The **designer** are those referred to within this contract, or their authorized representatives. The Designer/owner(s), as referred to herein, shall mean architect and/or engineer. They will be referred to hereinafter as if each were of the singular number, masculine gender.
4. The **contractor**, as referred to hereinafter, shall be deemed to be either of the several contracting parties called the "Party of the First Part" in either of the several contracts in connection with the total project. Where, in special instances hereinafter, a particular contractor is intended, an adjective precedes the word "contractor," as "general," "heating," etc. For the purposes of a single prime contract, the term Contractor shall be deemed to be the single contracting entity identified as the "Party of the First Part" in the single Construction Contract. Any references or adjectives that name or infer multiple prime contractors shall be interpreted to mean the single prime Contractor.
5. A **subcontractor**, as the term is used herein, shall be understood to be one who has entered into a direct contract with a contractor, and includes one who furnishes materials worked to a special design in accordance with plans and specifications covered by the contract, but does not include one who only sells or furnishes materials not requiring work so described or detailed.
6. **Written notice** shall be defined as notice in writing delivered in person to the contractor, or to a partner of the firm in the case of a partnership, or to a member of the contracting organization, or to an officer of the organization in the case of a corporation, or sent to the last known business address of the contracting organization by registered mail.
7. **Work**, as used herein as a noun, is intended to include materials, labor, and workmanship of the appropriate contractor.
8. The **project** is the total construction work to be performed under the contract documents.
9. **Project Expediter**, as used herein, is an entity stated in the contract documents, designated to effectively facilitate scheduling and coordination of work activities. **For the purposes of a single prime contract, the single prime contractor shall be designated as the Project Expediter.**
10. **Change order** shall mean a written order to the Contractor executed by the County, issued after execution of this Contract, authorizing and directing a change in the Work or an adjustment in the Contract Price or the Contract Time, or any combination thereof. The Contract Price and the Contract Time may be changed only by Change Order.
11. **Field Order**, as used herein, shall mean a written approval for the contractor to proceed with the work requested by owner prior to issuance of a formal Change Order. The field order shall be signed by the contractor, designer/owner, owner, and State Construction Office.
12. **Time of completion**, as stated in the contract documents, is to be interpreted as consecutive calendar days measured from the date established in the written Notice to Proceed.
13. **Liquidated damages**, as stated in the contract documents, is an amount reasonably estimated in advance to cover the consequential damages associated with the Owner's economic loss in not being able to use the Project for its intended purposes at the end of the contract's completion date as amended by change order, if any, by reason of failure of the contractor(s)

to complete the work within the time specified. Liquidated damages does not include the Owner's extended contract administration costs (including but not limited to additional fees for architectural and engineering services, testing services, inspection services, commissioning services, etc.), such other damages directly resulting from delays caused solely by the contractor, or consequential damages that the Owner identified in the bid documents that may be impacted by any delay caused solely by the Contractor (e.g., if a multi-phased project-subsequent phases, delays in start other projects that are dependent on the completion of this Project, extension of leases and/or maintenance agreements for other facilities).

14. **Surety**, as used herein, shall mean the bonding company or corporate body which is bound with and for the contractor, and which engages to be responsible for the contractor and his acceptable performance of the work.
15. **Routine written communications between the Designer/owner and the Contractor** are any communication other than a "request for information" provided in letter, memo, or transmittal format, sent by mail, courier, electronic mail, or facsimile. Such communications cannot be identified as "request for information."
16. **Clarification or Request for information (RFI)** is a request from the Contractor seeking an interpretation or clarification by the Designer/owner relative to the contract documents. The RFI, which shall be labeled (RFI), shall clearly and concisely set forth the issue or item requiring clarification or interpretation and why the response is needed. The RFI must set forth the Contractor's interpretation or understanding of the contract documents requirements in question, along with reasons for such an understanding.
17. **Approval** means written or imprinted acknowledgement that materials, equipment or methods of construction are acceptable for use in the work.
18. **Inspection** shall mean examination or observation of work completed or in progress to determine its compliance with contract documents.
19. **"Equal to" or "approved equal"** shall mean materials, products, equipment, assemblies, or installation methods considered equal by the bidder in all characteristics (physical, functional, and aesthetic) to those specified in the contract documents. Acceptance of equal is subject to approval of Designer/owner and owner.
20. **"Substitution" or "substitute"** shall mean materials, products, equipment, assemblies, or installation methods deviating in at least one characteristic (physical, functional, or aesthetic) from those specified, but which in the opinion of the bidder would improve competition and/or enhance the finished installation. Acceptance of substitution is subject to the approval of the Designer/owner and owner.
21. **Provide** shall mean furnish and install complete in place, new, clean, operational, and ready for use.
22. **Indicated and shown** shall mean provide as detailed, or called for, and reasonably implied in the contract documents.
23. **Special inspector** is one who inspects materials, installation, fabrication, erection or placement of components and connections requiring special expertise to ensure compliance with the approved construction documents and referenced standards.
24. **Commissioning** is a quality assurance process that verifies and documents that building components and systems operate in accordance to the owner's project requirements and the project design documents.
25. **Final Inspection** is the inspection performed by the County to determine the completeness of the project in accordance with NC Building Codes and approved plans and specifications.
26. **Beneficial Occupancy** is requested by the owner and is occupancy or partial occupancy of the building after all life safety items have been completed as determined by the County. Life

safety items include but not limited to fire alarm, sprinkler, egress and exit lighting, fire rated walls, egress paths and security.

27. **Final Acceptance** is the date in which the County accepts the construction as totally complete. This includes the County's Final Inspection and certification by the designer/owner that all punch lists are completed.
28. **Parks/Gardens** shall be the Owner's representative assigned to monitor the project and receive communication from the contractor regarding all issues related to the project.

## **ARTICLE 2 - INTENT AND EXECUTION OF DOCUMENTS**

a. The drawings and specifications are complementary, one to the other, and that which is shown on the drawings or called for in the specifications shall be as binding as if it were both called for and shown. The intent of the drawings and specifications is to establish the scope of all labor, materials, transportation, equipment, and any and all other things necessary to provide a bid for a complete job. In case of discrepancy or disagreement in the contract documents, the order of precedence shall be: Agreement, Modifications, Addenda, Supplementary Conditions, Special Conditions, and Instructions to Bidders, General Conditions, Specifications and Drawings.

b. The wording of the specifications shall be interpreted in accordance with common usage of the language except that words having a commonly used technical or trade meaning shall be so interpreted in preference to other meanings.

c. The contractor shall execute each copy of the proposal, contract, performance bond and payment bond as follows:

1. If the documents are executed by a sole owner, that fact shall be evidenced by the word "Owner" appearing after the name of the person executing them.
2. If the documents are executed by a partnership, that fact shall be evidenced by the word "Co-Partner" appearing after the name of the partner executing them.
3. If the documents are executed on the part of a corporation, they shall be executed by either the president or the vice president and attested by the secretary or assistant secretary in either case, and the title of the office of such persons shall appear after their signatures. The seal of the corporation shall be impressed on each signature page of the documents.
4. If the documents are made by a joint venture, they shall be executed by each member of the joint venture in the above form for sole owner, partnership or corporation, whichever form is applicable to each particular member.
5. All signatures shall be properly witnessed.
6. If the contractor's license is held by a person other than an owner, partner or officer of a firm, then the licensee shall also sign and be a party to the contract. The title "Licensee" shall appear under his/her signature.
7. The bonds shall be executed by an attorney-in-fact. There shall be attached to each copy of the bond a certified copy of power of attorney properly executed and dated.
8. Each copy of the bonds shall be countersigned by an authorized individual agent of the bonding company licensed to do business in North Carolina. The title "Licensed Resident Agent" shall appear after the signature.  
The seal of the bonding company shall be impressed on each signature page of the bonds.

10. The contractor's signature on the performance bond and the payment bond shall correspond with that on the contract. The date of performance and payment bond shall not be prior to the date of the contract.

### **ARTICLE 3 - CLARIFICATIONS AND DETAIL DRAWINGS**

a. In such cases where the nature of the work requires clarification by the designer/owner, such clarification shall be furnished by the designer/owner with reasonable promptness by means of written instructions or detail drawings, or both. Clarifications and drawings shall be consistent with the intent of contract documents, and shall become a part thereof.

b. The contractor(s) and the designer/owner shall prepare, if deemed necessary, a schedule fixing dates upon which foreseeable clarifications will be required. The schedule will be subject to addition or change in accordance with progress of the work. The designer/owner shall furnish drawings or clarifications in accordance with that schedule. The contractor shall not proceed with the work without such detail drawings and/or written clarifications.

### **ARTICLE 4 - COPIES OF DRAWINGS AND SPECIFICATIONS**

Bidding Documents and Site Development Plans may be examined and/or obtained at the County's Parks & Gardens Office located at 230 Government Center Drive, Suite 120, Wilmington, NC 28403 during regular office hours or by contacting Copy Cat at [info@copycatprintshop.com](mailto:info@copycatprintshop.com) or visit <http://www.nhcgov.com/business-nhc/bids/>. Persons requesting shipment of documents shall bear the additional, non-refundable cost of shipment, if applicable.

### **ARTICLE 5 - SHOP DRAWINGS, SUBMITTALS, SAMPLES, DATA**

a. Within 10 consecutive calendar days after the notice to proceed, the contractor shall submit a schedule for submission of all shop drawings, product data, samples, and similar submittals to the Owner. This schedule shall indicate the items, relevant specification sections, other related submittal, data, and the date when these items will be furnished to the designer.

b. The Contractor(s) shall review, approve and submit to the Owner all Shop Drawings, Coordination Drawings, Product Data, Samples, Color Charts, and similar submittal data required or reasonably implied by the Contract Documents. Required Submittals shall bear the Contractor's stamp of approval, any exceptions to the Contract Documents shall be noted on the submittals, and copies of all submittals shall be of sufficient quantity for the Owner to retain up to two (2) copies of each submittal for his own use plus additional copies as may be required by the Contractor. Submittals shall be presented to the Owner in accordance with the schedule submitted in paragraph (a) so as to cause no delay in the activities of the Owner or of separate Contractors, if applicable.

c. The Owner shall review required submittals promptly, noting desired corrections if any, and retaining two (2) copies for the Owners use. The remaining copies of each submittal shall be returned to the Contractor not later than twenty (20) days from the date of receipt by the Owner, for the Contractor's use or for corrections and resubmittal as noted by the Owner.

When resubmittals are required, the submittal procedure shall be the same as for the original submittals.

d. Approval of shop drawings/submittals by the Designer/owner shall not be construed as relieving the Contractor from responsibility for compliance with the design or terms of the contract documents nor from responsibility of errors of any sort in the shop drawings, unless such lack of compliance or errors first have been called in writing to the attention of the Designer/owner by the Contractor.

#### **ARTICLE 6 - WORKING DRAWINGS AND SPECIFICATIONS AT THE JOB SITE**

a. The contractor shall maintain, in readable condition at his job office, one complete set of working drawings and specifications for his work including all shop drawings. Such drawings and specifications shall be available for use by the designer/Owner and any authorized representative.

b. The contractor shall maintain at the job office, a day-to-day record of work-in-place that is at variance with the contract documents. Such variations shall be fully noted on project drawings by the contractor and submitted to the designer/owner upon project completion and no later than 30 days after final acceptance of the project.

c. The contractor shall maintain at the job office a record of all required tests that have been performed, clearly indicating the scope of work inspected and the date of approval or rejection.

#### **ARTICLE 7 - OWNERSHIP OF DRAWINGS AND SPECIFICATIONS**

All drawings and specifications are instruments of service and remain the property of the owner. The use of these instruments on work other than this contract without permission of the owner is prohibited. All copies of drawings and specifications other than contract copies shall be returned to the owner upon request after completion of the work.

#### **ARTICLE 8 - MATERIALS, EQUIPMENT, EMPLOYEES**

a. The contractor shall, unless otherwise specified, supply and pay for all labor, transportation, materials, tools, apparatus, lights, power, heat, sanitary facilities, water, scaffolding and incidentals necessary for the completion of his work, and shall install, maintain and remove all equipment of the construction, other utensils or things, and be responsible for the safe, proper and lawful construction, maintenance and use of same, and shall construct in the best and most workmanlike manner, a complete job and everything incidental thereto, as shown on the plans, stated in the specifications, or reasonably implied therefrom, all in accordance with the contract documents.

b. All materials shall be new and of quality specified, except where reclaimed material is authorized herein and approved for use. Workmanship shall at all times be of a grade accepted as the best practice of the particular trade involved, and as stipulated in written standards of recognized organizations or institutes of the respective trades except as exceeded or qualified by the specifications.

c. Upon notice, the contractor shall furnish evidence as to quality of materials.

d. Products are generally specified by ASTM or other reference standard and/or by manufacturer's name and model number or trade name. When specified only by reference standard, the Contractor may select any product meeting this standard, by any manufacturer. When several products or manufacturers are specified as being equally acceptable, the Contractor has the option of using any product and manufacturer combination listed. However, the contractor shall be aware that the cited examples are used only to denote the quality standard of product desired and that they do not restrict bidders to a specific brand, make, manufacturer or specific name; that they are used only to set forth and convey to bidders the general style, type, character and quality of product desired; and that equivalent products will be acceptable. Request for substitution of materials, items, or equipment shall be submitted to the designer/owner for approval or disapproval; such approval or disapproval shall be made by the designer/owner prior to the opening of bids. Alternate materials may be requested after the award if it can clearly be demonstrated that it is an added benefit to the owner and the designer/owner and owner approves.

e. The designer/owner is the judge of equality for proposed substitution of products, materials or equipment.

f. If at any time during the construction and completion of the work covered by these contract documents, the language, conduct, or attire of any workman of the various crafts be adjudged a nuisance to the owner or designer/owner, or if any workman be considered detrimental to the work, the contractor shall order such parties removed immediately from grounds.

## **ARTICLE 9 - ROYALTIES, LICENSES AND PATENTS**

It is the intention of the contract documents that the work covered herein will not constitute in any way infringement of any patent whatsoever unless the fact of such patent is clearly evidenced herein. The contractor shall protect and save harmless the owner against suit on account of alleged or actual infringement. The contractor shall pay all royalties and/or license fees required on account of patented articles or processes, whether the patent rights are evidenced hereinafter.

## **ARTICLE 10 - PERMITS, INSPECTIONS, FEES, REGULATIONS**

a. The contractor shall give all notices and comply with all laws, ordinances, codes, rules and regulations bearing on the conduct of the work under this contract. If the contractor observes that the drawings and specifications are at variance therewith, he shall promptly notify the designer/owner in writing. See Instructions to Bidders, Bulletins and Addenda. Any necessary changes required after contract award shall be made by change order. If the contractor performs any work knowing it to be contrary to such laws, ordinances, codes, rules and regulations, and without such notice to the designer/owner, he shall bear all cost arising therefrom. Additional requirements implemented after bidding will be subject to equitable negotiations.

b. All work under this contract shall conform to the North Carolina State Building Code and other State, local and national codes as are applicable. The cost of all required inspections and permits shall be the responsibility of the contractor and included within the bid proposal. All water taps, meter barrels, vaults and impact fees shall be paid by the contractor unless otherwise noted.

c. Projects constructed by the County are subject to inspection by county authorities and are subject to county building codes. Permits shall be obtained at no cost.

## **ARTICLE 11 - PROTECTION OF WORK, PROPERTY AND THE PUBLIC**

a. The contractors shall be jointly responsible for the entire site and the building or construction of the same and provide all the necessary protections, as required by the owner or designer/owner, and by laws or ordinances governing such conditions. They shall be responsible for any damage to the owner's property or of that of others on the job, by them, their personnel, or their subcontractors, and shall make good such damages. They shall be responsible for and pay for any damages caused to the owner. All contractors shall have access to the project at all times.

b. The contractor shall provide cover and protect all portions of the structure when the work is not in progress, provide and set all temporary roofs, covers for doorways, sash and windows, and all other materials necessary to protect all the work on the building, whether set by him, or any of the subcontractors. Any work damaged through the lack of proper protection or from any other cause, shall be repaired or replaced without extra cost to the owner.

c. No fires of any kind will be allowed inside or around the operations during the course of construction without special permission from the designer/owner and owner.

d. The contractor shall protect all trees and shrubs designated to remain in the vicinity of the operations by building substantial boxes around same. He shall barricade all walks, roads, etc., as directed by the designer/owner to keep the public away from the construction. All trenches, excavations or other hazards in the vicinity of the work shall be well barricaded and properly lighted at night.

e. The contractor shall provide all necessary safety measures for the protection of all persons on the job, including the requirements of the A.G.C. *Accident Prevention Manual in Construction*, as amended, and shall fully comply with all state laws or regulations and North Carolina State Building Code requirements to prevent accident or injury to persons on or about the location of the work. He shall clearly mark or post signs warning of hazards existing, and shall barricade excavations, elevator shafts, stairwells and similar hazards. He shall protect against damage or injury resulting from falling materials and he shall maintain all protective devices and signs throughout the progress of the work.

f. The contractor shall adhere to the rules, regulations and interpretations of the North Carolina Department of Labor relating to Occupational Safety and Health Standards for the Construction Industry (Title 29, Code of Federal Regulations, Part 1926, published in

Volume 39, Number 122, Part II, June 24, 1974, *Federal Register*), and revisions thereto as adopted by General Statutes of North Carolina 95-126 through 155.

g. The contractor shall designate a responsible person of his organization as safety officer/inspector to inspect the project site for unsafe health and safety hazards, to report these hazards to the contractor for correction, and whose duties also include accident prevention on the project, and to provide other safety and health measures on the project site as required by the terms and conditions of the contract. The name of the safety inspector shall be made known to the designer/owner and owner at the time of the preconstruction conference and in all cases prior to any work starting on the project.

h. In the event of emergency affecting the safety of life, the protection of work, or the safety of adjoining properties, the contractor is hereby authorized to act at his own discretion, without further authorization from anyone, to prevent such threatened injury or damage. Any compensation claimed by the contractor on account of such action shall be determined as provided for under Article 19(b).

i. Any and all costs associated with correcting damage caused to adjacent properties of the construction site or staging area shall be borne by the contractor. These costs shall include but not be limited to flooding, mud, sand, stone, debris, and discharging of waste products.

#### **ARTICLE 12 - SEDIMENTATION POLLUTION CONTROL ACT OF 1973**

a. Any land-disturbing activity performed by the contractor(s) in connection with the project shall comply with all erosion control measures set forth in the contract documents and any additional measures which may be required in order to ensure that the project is in full compliance with the Sedimentation Pollution Control Act of 1973, as implemented by Title 15, North Carolina Administrative Code, Chapter 4, Sedimentation Control, Subchapters 4A, 4B and 4C, as amended (15 N.C.A.C. 4A, 4B and 4C).

b. Upon receipt of notice that a land-disturbing activity is in violation of said act, the contractor(s) shall be responsible for ensuring that all steps or actions necessary to bring the project in compliance with said act are promptly taken.

c. The contractor(s) shall be responsible for defending any legal actions instituted pursuant to N.C.G.S. 113A-64 against any party or persons described in this article.

d. To the fullest extent permitted by law, the contractor(s) shall indemnify and hold harmless the owner, the designer/owner and the agents, consultants and employees of the owner and designer/owner, from and against all claims, damages, civil penalties, losses and expenses, including, but not limited to, attorneys' fees, arising out of or resulting from the performance of work or failure of performance of work, provided that any such claim, damage, civil penalty, loss or expense is attributable to a violation of the Sedimentation Pollution Control Act. Such obligation shall not be construed to negate, abridge or otherwise reduced any other right or obligation of indemnity which would otherwise exist as to any party or persons described in this article.

## **ARTICLE 13 - INSPECTION OF THE WORK**

a. It is a condition of this contract that the work shall be subject to inspection during normal working hours and during any time work is in preparation and progress by the designer/owner, designated official representatives of the owner, and those persons required by state law to test special work for official approval. The contractor shall therefore provide safe access to the work at all times for such inspections.

b. All instructions to the contractor will be made only by or through the designer/owner or his designated project representative. Observations made by official representatives of the owner shall be conveyed to the designer/owner for review and coordination prior to issuance to the contractor.

c. All work shall be inspected by the designer/owner and/or special inspector prior to being covered by the contractor. Contractor shall give a minimum two weeks' notice unless otherwise agreed to by all parties. If inspection fails, after the first re-inspection all costs associated with additional re-inspections shall be borne by the contractor.

d. Where special inspection or testing is required by virtue of any state laws, instructions of the designer/owner, specifications or codes, the contractor shall give adequate notice to the designer/owner of the time set for such inspection or test, if the inspection or test will be conducted by a party other than the designer/owner. Such special tests or inspections will be made in the presence of the designer/owner, or his authorized representative, and it shall be the contractor's responsibility to serve ample notice of such tests.

e. All laboratory tests shall be paid by the owner unless provided otherwise in the contract documents except the general contractor shall pay for laboratory tests to establish design mix for concrete, and for additional tests to prove compliance with contract documents where materials have tested deficient except when the testing laboratory did not follow the appropriate ASTM testing procedures.

f. Should any work be covered up or concealed prior to inspection and approval by the designer/owner, or special inspector, such work shall be uncovered or exposed for inspection, if so requested by the designer/owner in writing. Inspection of the work will be made upon notice from the contractor. All cost involved in uncovering, repairing, replacing, recovering and restoring to design condition, the work that has been covered or concealed will be paid by the contractor involved.

## **ARTICLE 14 - CONSTRUCTION SUPERVISION AND SCHEDULE**

a. Throughout the progress of the work, each contractor shall keep at the job site, a competent superintendent and supervisory staff satisfactory to the designer/owner and the owner. The superintendent and supervisory staff shall not be changed without the consent of the designer/owner and owner unless said superintendent ceases to be employed by the contractor or ceases to be competent as determined by the contractor, designer/owner or owner. The superintendent and other staff designated by the contractor in writing shall have authority to act on behalf of the contractor, and instructions, directions or notices given to him shall be as binding as if given to the contractor. However, directions, instructions, and notices shall be confirmed in writing.

b. The contractor shall examine and study the drawings and specifications and fully understand the project design, and shall provide constant and efficient supervision to the work. Should he discover any discrepancies of any sort in the drawings or specifications, he shall report them to the designer/owner without delay. He will not be held responsible for discrepancies in the drawings and/or specifications, but shall be held responsible to report them should they become known to him.

c. All contractors shall be required to cooperate and consult with each other during the construction of this project. Prior to installation of work, all contractors shall jointly prepare coordination drawings, showing locations of various ductworks, piping, motors, pumps, and other mechanical or electrical equipment, in relation to the structure, walls and ceilings. These drawings shall be submitted to the designer/owner through the Contractor for information only. Each contractor shall lay out and execute his work to cause the least delay to other contractors. Each contractor shall be financially responsible for any damage to other contractor's work and for undue delay caused to other contractors on the project.

d. The contractor is required to attend job site progress conferences as called by the designer/owner. The contractor shall be represented at these job progress conferences by both home office and project personnel. These representatives shall have authority to act on behalf of the contractor. These meetings shall be open to subcontractors, material suppliers and any others who can contribute toward maintaining required job progress. It shall be the principal purpose of these meetings, or conferences, to effect coordination, cooperation and assistance in every practical way toward the end of maintaining progress of the project on schedule and to complete the project within the specified contract time. Each contractor shall be prepared to assess progress of the work as required in his particular contract and to recommend remedial measures for correction of progress as may be appropriate. The designer/owner or his authorized representative shall be the coordinator of the conferences and shall preside as chairman. The contractor shall turn over a copy of his daily reports to the Owner at the progress meetings. Owner will determine daily report format.

**Bar Chart Schedule:** Where a bar chart schedule is required, it shall be time-scaled in weekly increments, shall indicate the estimated starting and completion dates for each major element of the work by trade and by area, level, or zone, and shall schedule dates for all salient features, including but not limited to the placing of orders for materials, submission of shop drawings and other Submittals for approval, approval of shop drawings by designer/owners, the manufacture and delivery of material, the testing and the installation of materials, supplies and equipment, and all Work activities to be performed by the Contractor. The Contractor shall allow sufficient time in his schedule for all commissioning, required inspections and completion of final punchlist(s). Each Work activity will be assigned a time estimate by the Contractor. One day shall be the smallest time unit used.

**CPM Schedule:** Where a CPM schedule is required, it shall be in time-scaled precedence format using the Contractor's logic and time estimates. The CPM schedule shall be

**Early Completion of Project:** The Contractor may attempt to complete the project prior to the Contract Completion Date. However, such planned early completion shall be for the Contractor's convenience only and shall not create any additional rights of the Contractor or obligations of the Owner under this Contract, nor shall it change the Time for Completion or

the Contract Completion Date. The Contractor shall not be required to pay liquidated damages to the Owner because of its failure to complete by its planned earlier date. Likewise, the Owner shall not pay the Contractor any additional compensation for early completion nor will the Owner owe the Contractor any compensation should the Owner, its officers, employees, or agents cause the Contractor not to complete earlier than the date required by the Contract Documents.

h. The proposed project construction schedule shall be presented to the owner no later than fifteen (10) days after written notice to proceed. No application for payment will be processed until this schedule is accepted by the owner.

i. The approved project construction schedule shall be distributed to all contractors and displayed at the job site by the Contractor.

## **ARTICLE 15 - SEPARATE CONTRACTS AND CONTRACTOR RELATIONSHIPS**

a. Chapter 143, Article 8, allows public contracts to be delivered by the following delivery methods: separate prime, single prime, dual, construction manager at risk, design-build, design-build bridging, private-public-partnership, and alternative contracting method as approved by the State Building Commission. The owner reserves the right to prepare separate specifications, receive separate bids, and award separate contracts for such other major items of work as may be in the best interest of the County. For the purposes of a single prime contract, refer to Article 1 – Definitions.

b. All contractors shall cooperate with each other in the execution of their work, and shall plan their work in such manner as to avoid conflicting schedules or delay of the work. See Article 14, Construction Supervision.

c. If any part of contractor's work depends upon the work of another contractor, defects which may affect that work shall be reported to the designer/owner/owner in order that prompt inspection may be made and the defects corrected. Commencement of work by a contractor where such condition exists will constitute acceptance of the other contractor's work as being satisfactory in all respects to receive the work commenced, except as to defects which may later develop. The designer/owner shall be the judge as to the quality of work and shall settle all disputes on the matter between contractors.

d. Any mechanical or electrical work such as sleeves, inserts, chases, openings, penetrations, etc., which is located in the work of the general contractor shall be built in by the general contractor. The respective mechanical and electrical contractors shall set all sleeves, inserts and other devices that are to be incorporated into the structure in cooperation and under the supervision of the general contractor. The responsibility for the exact location of such items shall be that of the mechanical and/or electrical contractor.

e. The designer/owner and the owner shall have access to the work whenever it is in preparation and progress and during normal working hours. The contractor shall provide facilities for such access so the designer/owner may perform his functions under the contract documents.

f. Should a contractor cause damage to the work or property of another contractor, he shall be directly responsible, and upon notice, shall promptly settle the claim or otherwise resolve the dispute.

## **ARTICLE 16 - SUBCONTRACTS AND SUBCONTRACTORS**

a. The contractor shall submit to the owner a list giving the names and addresses of subcontractors and equipment and material suppliers he proposes to use, together with the scope of their respective parts of the work. Should any subcontractor be disapproved by the owner, the owner shall submit his reasons for disapproval in writing for its consideration with a copy to the contractor. If the Owner concurs with the owner's recommendation, the contractor shall submit a substitute for approval. The owner shall act promptly in the approval of subcontractors, and when approval of the list is given, no changes of subcontractors will be permitted except for cause or reason considered justifiable by the designer/owner or owner.

b. The Owner will furnish to any subcontractor, upon request, evidence regarding amounts of money paid to the contractor on account of the subcontractor's work.

c. The contractor is and remains fully responsible for his own acts or omissions as well as those of any subcontractor or of any employee of either. The contractor agrees that no contractual relationship exists between the subcontractor and the owner in regard to the contract, and that the subcontractor acts on this work as an agent or employee of the contractor.

## **ARTICLE 17 - CONTRACTOR AND SUBCONTRACTOR RELATIONSHIPS**

The contractor agrees that the terms of these contract documents shall apply equally to each subcontractor as to the contractor, and the contractor agrees to take such action as may be necessary to bind each subcontractor to these terms. The contractor further agrees to conform to the Code of Ethical Conduct as adopted by the Associated General Contractors of America, Inc., with respect to contractor-subcontractor relationships, and that payments to subcontractors shall be made in accordance with the provisions of G.S. 143-134.1 titled Interest on final payments due to prime contractors: payments to subcontractors.

a. On all public construction contracts which are let by a board or governing body of the state government or any political subdivision thereof, except contracts let by the Department of Transportation pursuant to G.S. 136-28.1, the balance due prime contractors shall be paid in full within 45 days after respective prime contracts of the project have been accepted by the owner, certified by the architect, engineer or designer/owner to be completed in accordance with terms of the plans and specifications, or occupied by the owner and used for the purpose for which the project was constructed, whichever occurs first. Provided, however, that whenever the architect or consulting engineer in charge of the project determines that delay in completion of the project in accordance with terms of the plans and specifications is the fault of the contractor, the project may be occupied and used for the purposes for which it was constructed without payment of any interest on amounts withheld past the 45 day limit. No payment shall be delayed because of the failure of another prime contractor on such project to complete his contract. Should final payment to any prime contractor beyond the

date such contracts have been certified to be completed by the designer/owner or architect, accepted by the owner, or occupied by the owner and used for the purposes for which the project was constructed, be delayed by more than 45 days, said prime contractor shall be paid interest, beginning on the 46th day, at the rate of one percent (1%) per month or fraction thereof unless a lower rate is agreed upon on such unpaid balance as may be due. In addition to the above final payment provisions, periodic payments due a prime contractor during construction shall be paid in accordance with the payment provisions of the contract documents or said prime contractor shall be paid interest on any such unpaid amount at the rate stipulated above for delayed final payments. Such interest shall begin on the date the payment is due and continue until the date on which payment is made. Such due date may be established by the terms of the contract. Funds for payment of such interest on state-owned projects shall be obtained from the current budget of the owning department, institution or agency. Where a conditional acceptance of a contract exists, and where the owner is retaining a reasonable sum pending correction of such conditions, interest on such reasonable sum shall not apply.

b. Within seven days of receipt by the prime contractor of each periodic or final payment, the prime contractor shall pay the subcontractor based on work completed or service provided under the subcontract. Should any periodic or final payment to the subcontractor be delayed by more than seven days after receipt of periodic or final payment by the prime contractor, the prime contractor shall pay the subcontractor interest, beginning on the eighth day, at the rate of one percent (1%) per month or fraction thereof on such unpaid balance as may be due.

c. The percentage of retainage on payments made by the prime contractor to the subcontractor shall not exceed the percentage of retainage on payments made by the owner to the prime contractor. Any percentage of retainage on payments made by the prime contractor to the subcontractor that exceeds the percentage of retainage on payments made by the owner to the prime contractor shall be subject to interest to be paid by the prime contractor to the subcontractor at the rate of one percent (1%) per month or fraction thereof.

d. Nothing in this section shall prevent the prime contractor at the time of application and certification to the owner from withholding application and certification to the owner for payment to the subcontractor for unsatisfactory job progress; defective construction not remedied; disputed work; third-party claims filed or reasonable evidence that claim will be filed; failure of subcontractor to make timely payments for labor, equipment and materials; damage to prime contractor or another subcontractor; reasonable evidence that subcontract cannot be completed for the unpaid balance of the subcontract sum; or a reasonable amount for retainage not to exceed the initial percentage retained by owner.

## **ARTICLE 18 – DESIGNER STATUS**

a. The designer shall provide general administration of the performance of construction contracts, including liaison and necessary inspection of the work to ensure compliance with plans and specifications. He is the agent of the owner only for the purpose of constructing this work and to the extent stipulated in the contract documents. He has authority to direct work to be performed, to stop work, to order work removed, or to order corrections of faulty work, where any such action by the designer/owner may be necessary to assure successful completion of the work.

- b. The designer is the impartial interpreter of the contract documents, and, as such, he shall exercise his powers under the contract to enforce faithful performance by both the owner and the contractor, taking sides with neither.
- c. Should the designer cease to be employed on the work for any reason whatsoever, then the owner shall employ a competent replacement who shall assume the status of the former designer/owner.
- d. The designer and his consultants will make inspections of the project. He will inspect the progress, the quality and the quantity of the work.
- e. The designer shall have access to the work whenever it is in preparation and progress during normal working hours. The contractor shall provide facilities for such access so the designer and owner may perform their functions under the contract documents.
- f. Based on the designer inspections and evaluations of the project, the designer shall issue interpretations, directives and decisions as may be necessary to administer the project. His/her decisions relating to artistic effect and technical matters shall be final, provided such decisions are within the limitations of the contract.

#### **ARTICLE 19 - CHANGES IN THE WORK**

- a. The owner may have changes made in the work covered by the contract. These changes will not invalidate and will not relieve or release the contractor from any guarantee given by him pertinent to the contract provisions. These changes will not affect the validity of the guarantee bond and will not relieve the surety or sureties of said bond. All extra work shall be executed under conditions of the original contract.
- b. Except in an emergency endangering life or property, no change shall be made by the contractor except upon receipt of approved change order or written field order from the designer/owner, countersigned by the owner authorizing such change. No claim for adjustments of the contract price shall be valid unless this procedure is followed:
  - 1. A field order, transmitted by fax, electronically, or hand delivered, may be used where the change involved impacts the critical path of the work. A formal change order shall be issued as expeditiously as possible.
  - 2. In the event of emergency endangering life or property, the contractor may be directed to proceed on a time and material basis whereupon the contractor shall proceed and keep accurately on such form as specified by the designer/owner, a correct account of costs together with all proper invoices, payrolls and supporting data. Upon completion of the work the change order will be prepared as outlined under either Method "c(1)" or Method "c(2)" or both.
- c. In determining the values of changes, either additive or deductive, contractors are restricted to the use of the following methods:
  - 1. Where the extra work involved is covered by unit prices quoted in the proposal, or subsequently agreed to by the Contractor, Designer/owner, the value of the change shall be computed by application of unit prices based on quantities, estimated or actual as agreed of the items involved, except in such cases where a quantity exceeds the estimated quantity allowance in the contract by one hundred percent (100%) or

more. In such cases, either party may elect to proceed under subparagraph c2 herein. If neither party elects to proceed under c2, then unit prices shall apply.

2. The contracting parties shall negotiate and agree upon the equitable value of the change prior to issuance of the change order, and the change order shall stipulate the corresponding lump sum adjustment to the contract price.

d. Under Paragraph "b" and Methods "c(2)" above, the allowances for overhead and profit combined shall be as follows: all contractors (the single contracting entity (prime), his subcontractors(1<sup>st</sup> tier subs), or their sub-subcontractors (2<sup>nd</sup> tier subs, 3<sup>rd</sup> tier subs, etc)) shall be allowed a maximum of 10% on work they each self-perform; the prime contractor shall be allowed a maximum of 5% on contracted work of his 1<sup>st</sup> tier sub; 1<sup>st</sup> tier, 2<sup>nd</sup> tier, 3<sup>rd</sup> tier, etc contractors shall be allowed a maximum of 2.5% on the contracted work of their subs. ; Under Method "c(1)", no additional allowances shall be made for overhead and profit. In the case of deductible change orders, under Method "c(2)" and Paragraph (b) above, the contractor shall include no less than five percent (5%) profit, but no allowances for overhead.

e. The term "net cost" as used herein shall mean the difference between all proper cost additions and deductions. The "cost" as used herein shall be limited to the following:

1. The actual costs of materials and supplies incorporated or consumed as part of the work;

2. The actual costs of labor expended on the project site; labor expended in coordination, change order negotiation, record document maintenance, shop drawing revision or other tasks necessary to the administration of the project are considered overhead whether they take place in an office or on the project site.

3. The actual costs of labor burden, limited to the costs of social security (FICA) and Medicare/Medicaid taxes; unemployment insurance costs; health/dental/vision insurance premiums; paid employee leave for holidays, vacation, sick leave, and/or petty leave, not to exceed a total of 30 days per year; retirement contributions; worker's compensation insurance premiums; and the costs of general liability insurance when premiums are computed based on payroll amounts; the total of which shall not exceed thirty percent (30%) of the actual costs of labor;

4. The actual costs of rental for tools, excluding hand tools; equipment; machinery; and temporary facilities required for the work;

5. The actual costs of premiums for bonds, insurance, permit fees, and sales or use taxes related to the work.

Overtime and extra pay for holidays and weekends may be a cost item only to the extent approved by the owner.

f. Should concealed conditions be encountered in the performance of the work below grade, or should concealed or unknown conditions in an existing structure be at variance with the conditions indicated by the contract documents, the contract sum and time for completion may be equitably adjusted by change order upon claim by either party made within thirty (30) days after the condition has been identified. The cost of such change

shall be arrived at by one of the foregoing methods. All change orders shall be supported by a unit cost breakdown showing method of arriving at net cost as defined above.

g. In all change orders, the contractor will provide a proposal and supporting data in suitable format. The designer/owner shall verify correctness. Delay in the processing of the change order due to lack of proper submittal by the contractor of all required supporting data shall not constitute grounds for a time extension or basis of a claim. Within fourteen (14) days after receipt of the contractor's accepted proposal including all supporting documentation required by the designer/owner, the designer/owner shall prepare the change order and forward to the contractor for his signature or otherwise respond, in writing, to the contractor's proposal. Within seven (7) days after receipt of the change order executed by the contractor, the designer/owner shall, certify the change order by his signature, and forward the change order and all supporting data to the owner for the owner's signature. The owner shall execute the change order within seven (7) days of receipt. In case of emergency or extenuating circumstances, approval of changes may be obtained verbally by telephone or field orders approved by all parties, then shall be substantiated in writing as outlined under normal procedure.

h. A change order, when issued, shall be full compensation, or credit, for the work included, omitted or substituted. It shall show on its face the adjustment in time for completion of the project as a result of the change in the work.

i. If, during the progress of the work, the owner requests a change order and the contractor's terms are unacceptable, the owner may require the contractor to perform such work on a time and material basis whereupon the contractor shall proceed and keep accurately on such form as specified by the owner, a correct account of cost together with all proper invoices, payrolls and supporting data. Upon completion of the work a change order will be prepared with allowances for overhead and profit per paragraph d. above and "net cost" and "cost" per paragraph e. above. Without prejudice, nothing in this paragraph shall preclude the owner from performing or to have performed that portion of the work requested in the change order.

## **ARTICLE 20 - CLAIMS FOR EXTRA COST**

a. Should the contractor consider that as a result of instructions given by the designer/owner/owner, he is entitled to extra cost above that stated in the contract, he shall give written notice thereof to the designer/owner within seven (7) days without delay. The written notice shall clearly state that a claim for extra cost is being made and shall provide a detailed justification for the extra cost. The contractor shall not proceed with the work affected until further advised, except in emergency involving the safety of life or property, which condition is covered in Article 19(b) and Article 11(h). No claims for extra compensation shall be considered unless the claim is so made. The designer/owner shall render a written decision within seven (7) days of receipt of claim.

b. The contractor shall not act on instructions received by him from persons other than the designer/owner, and any claims for extra compensation or extension of time on account of such instruction will not be honored. The designer/owner shall not be responsible for misunderstandings claimed by the contractor of verbal instructions which have not been confirmed in writing, and in no case shall instructions be interpreted as

permitting a departure from the contract documents unless such instruction is confirmed in writing and supported by a properly authorized change order.

c. Should a claim for extra compensation that complies with the requirements of (a) above by the contractor and is denied by the designer/owner or owner, and cannot be resolved, the contractor may request a mediation in connection with GS 143-128(f1) in the dispute resolution rules adopted by the New Hanover County

#### **ARTICLE 21 - MINOR CHANGES IN THE WORK**

The designer/owner will have the authority to order minor changes in the work not involving an adjustment in the contract sum or time for completion, and not inconsistent with the intent of the contract documents. Such changes shall be effected by written order and shall be binding on the owner and the contractor.

#### **ARTICLE 22 - UNCORRECTED FAULTY WORK**

Should the correction of faulty or damaged work be considered inadvisable or inexpedient by the owner and the designer/owner, the owner shall be reimbursed by the contractor. A change order will be issued to reflect a reduction in the contract sum.

#### **ARTICLE 23 - TIME OF COMPLETION, DELAYS, EXTENSION OF TIME**

a. The time of completion is stated in the Contract Document. The Contractor, upon notice of award of contract, shall prepare a construction schedule to complete the project within the time of completion as required by Article 14.

b. The contractors shall commence work to be performed under this agreement on a date to be specified in a written Notice to Proceed from the owner and shall fully complete all work hereunder within the time of completion stated. Time is of the essence and the contractor acknowledges the Owner will likely suffer financial damage for failure to complete the work within the time of completion. For each day in excess of the above number of days, the contractor(s) shall pay the owner the sum stated as liquidated damages reasonably estimated in advance to cover the losses to be incurred by the owner by reason of failure of said contractor(s) to complete the work within the time specified, such time being in the essence of this contract and a material consideration thereof.

c. In the event of multiple prime contractors, the designer/owner shall be the judge as to the division of responsibility between the contractor(s), based on the construction schedule, weekly reports and job records, and shall apportion the amount of liquidated damages to be paid by each of them, according to delay caused by any or all of them.

d. If the contractor is delayed at any time in the progress of his work solely by any act or negligence of the owner, the designer, or by any employee of either; by any separate contractor employed by the owner; by changes ordered in the work; by labor disputes at the project site; by abnormal weather conditions not reasonably anticipated for the locality where the work is performed; by unavoidable casualties; by any causes beyond the contractor's control; or by any other causes which the designer/owner and owner

determine may justify the delay, then the contract time may be extended by change order only for the time which the designer/owner and owner may determine is reasonable. Time extensions will not be granted for rain, wind, snow or other natural phenomena of normal intensity for the locality where work is performed. For purpose of determining extent of delay attributable to unusual weather phenomena, a determination shall be made by comparing the weather for the contract period involved with the average of the preceding five (5) year climatic range during the same time interval based on the National Oceanic and Atmospheric Administration National Weather Service statistics for the locality where work is performed and on daily weather logs kept on the job site by the contractor reflecting the effect of the weather on progress of the work and initialed by the designer/owner's representative. No weather delays shall be considered after the building is dried in unless work claimed to be delayed is on the critical path of the baseline schedule or approved updated schedule. Time extensions for weather delays, acts of God, labor disputes, fire, delays in transportation, unavoidable casualties or other delays which are beyond the control of the Owner do not entitle the Contractor to compensable damages for delays. Any contractor claim for compensable damages for delays is limited to delays caused solely by the owner or its agents. Contractor caused delays shall be accounted for before owner or designer/owner caused delays in the case of concurrent delays.

e. Request for extension of time shall be made in writing to the owner within twenty (20) days following cause of delay. In case of continuing cause for delay, the Contractor shall notify the owner of the delay within 20 days of the beginning of the delay and only one claim is necessary.

f. No claim for time extension shall be allowed on account of failure of the designer/owner to furnish drawings or instructions until twenty (20) days after demand for such drawings and/or instructions. See Article 5c. Demand must be in written form clearly stating the potential for delay unless the drawings or instructions are provided. Any delay granted will begin after the twenty (20) day demand period is concluded.

#### **ARTICLE 24 - PARTIAL UTILIZATION/BENEFICIAL OCCUPANCY**

a. The owner may desire to occupy or utilize all or a portion of the project prior to the completion of the project.

b. Should the owner request a utilization of a building or portion thereof, the designer/owner shall perform a designer/owner final inspection of area after being notified by the contractor that the area is ready for such. After the contractor has completed designer/owner final inspection punch list and the designer/owner has verified, then the designer/owner shall schedule a beneficial occupancy inspection at a time and date acceptable to the owner, contractor(s) and State Construction Office. If beneficial occupancy is granted by the State Construction Office, in such areas the following will be established:

1. The beginning of guarantees and warranties period for the equipment necessary to support in the area.
2. The owner assumes all responsibilities for utility costs for entire building.
3. Contractor will obtain consent of surety.

4. Contractor will obtain endorsement from insurance company permitting beneficial occupancy.
- c. The owner shall have the right to exclude the contractor from any part of the project which the designer/owner has so certified to be substantially complete, but the owner will allow the contractor reasonable access to complete or correct work to bring it into compliance with the contract.
- d. Occupancy by the owner under this article will in no way relieve the contractor from his contractual requirement to complete the project within the specified time. The contractor will not be relieved of liquidated damages because of beneficial occupancy. The owner may prorate liquidated damages based on the percentage of project occupied.

#### **ARTICLE 25 - FINAL INSPECTION, ACCEPTANCE, AND PROJECT CLOSEOUT**

- a. Upon notification from the contractor(s) that the project is complete and ready for inspection, the designer/owner shall make a final inspection to verify that the project is complete.
- b. The designer/owner and his consultants shall, if job conditions warrant, record a list of items that are found to be incomplete or not in accordance with the contract documents. At the conclusion of the final inspection, the designer/owner shall make one of the following determinations:
  1. That the project is completed and accepted.
  2. That the project will be accepted subject to the correction of the list of discrepancies (punch list). All punch list items must be completed within thirty (30) days of final inspection or the owner may invoke Article 28, Owner's Right to Do Work.
  3. That the project is not complete and another date for a final inspection will be established.
- c. Within fourteen (14) days of final acceptance per Paragraph b1 or within fourteen (14) days after completion of punch list per Paragraph b2 above, the designer/owner shall certify the work and issue applicable certificate(s) of compliance.
- d. Any discrepancies listed or discovered after the date of SCO final inspection and acceptance under Paragraphs b1 or b2 above shall be handled in accordance with Article 42, Guarantee.
- e. The final acceptance date will establish the following:
  1. The beginning of guarantees and warranties period.
  2. The date on which the contractor's insurance coverage for public liability, property damage and builder's risk may be terminated.
  3. That no liquidated damages (if applicable) shall be assessed after this date.
  4. The termination date of utility cost to the contractor.
- f. Prior to issuance of final acceptance date, the contractor shall have his authorized representatives visit the project and give full instructions to the designated**

**personnel regarding operating, maintenance, care, and adjustment of all equipment and special construction elements. In addition, the contractor shall provide to the owner a complete instructional video (media format acceptable to the owner) on the operation, maintenance, care and adjustment of all equipment and special construction elements.**

#### **ARTICLE 26 - CORRECTION OF WORK BEFORE FINAL PAYMENT**

- a. Any work, materials, fabricated items or other parts of the work which have been condemned or declared not in accordance with the contract by the designer/owner shall be promptly removed from the work site by the contractor, and shall be immediately replaced by new work in accordance with the contract at no additional cost to the owner. Work or property of other contractors or the owner, damaged or destroyed by virtue of such faulty work, shall be made good at the expense of the contractor whose work is faulty.
- b. Correction of condemned work described above shall commence within twenty-four (24) hours after receipt of notice from the designer/owner, and shall make satisfactory progress, as determined by the designer/owner, until completed.
- c. Should the contractor fail to proceed with the required corrections, then the owner may complete the work in accordance with the provisions of Article 28.

#### **ARTICLE 27 - CORRECTION OF WORK AFTER FINAL PAYMENT**

See Article 35, Performance Bond and Payment Bond, and Article 42, Guarantee. Neither the final certificate, final payment, occupancy of the premises by the owner, nor any provision of the contract, nor any other act or instrument of the owner, nor the designer/owner, shall relieve the contractor from responsibility for negligence, or faulty material or workmanship, or failure to comply with the drawings and specifications. Contractor shall correct or make good any defects due thereto and repair any damage resulting there from, which may appear during the guarantee period following final acceptance of the work except as stated otherwise under Article 42, Guarantee. The owner will report any defects as they may appear to the contractor and establish a time limit for completion of corrections by the contractor. The owner will be the judge as to the responsibility for correction of defects.

#### **ARTICLE 28 - OWNER'S RIGHT TO DO WORK**

If, during the progress of the work or during the period of guarantee, the contractor fails to prosecute the work properly or to perform any provision of the contract, the owner, after seven (7) days' written notice sent by certified mail, return receipt requested, to the contractor from the designer/owner, may perform or have performed that portion of the work. The cost of the work may be deducted from any amounts due or to become due to the contractor, such action and cost of same having been first approved by the designer/owner. Should the cost of such action of the owner exceed the amount due or to become due the contractor, then the contractor or his surety, or both, shall be liable for and shall pay to the owner the amount of said excess.

## **ARTICLE 29 - ANNULMENT OF CONTRACT**

If the Contractor persistently or repeatedly refuses or fails to prosecute the Work in a timely and/or competent manner, supply enough properly skilled workers, supervisory personnel or proper equipment or materials, or if it fails to make prompt payment to Subcontractors or for materials or labor, or persistently disregards laws, ordinances, rules, regulations or orders of any public authority having jurisdiction, or otherwise is guilty of a substantial violation of a material provision of this Contract, then the County may by written notice to the Contractor, without prejudice to any other right or remedy, terminate the employment of the Contractor and take possession of the site and of all materials owned by the County and may finish the Work by whatever methods it may deem expedient. In such case the Contractor shall not be entitled to receive any further payment until the Work is finished.

29.1 If the unpaid balance of the Contract Price exceeds the cost of finishing the work, including compensation for the County's additional services and expenses made necessary thereby, such excess shall be paid to the Contractor. If such cost exceeds the unpaid balance, the Contractor shall pay the difference to the County. This obligation for payment shall survive the termination of the Contract.

29.2 In the event the employment of the Contractor is terminated by the County for cause and it is subsequently determined by a Court of competent jurisdiction that such termination was without cause, such termination shall thereupon be deemed a Termination for Convenience, such termination shall thereupon be deemed a Termination for Convenience.

## **ARTICLE 30 - CONTRACTOR'S RIGHT TO STOP WORK OR TERMINATE THE CONTRACT**

a. Should the work be stopped by order of a court having jurisdiction, or by order of any other public authority for a period of three months, due to cause beyond the fault or control of the contractor, or if the owner should fail or refuse to make payment on account of a certificate issued by the owner within forty-five (45) days after receipt of same, then the contractor, after fifteen (15) days' written notice sent by certified mail, return receipt requested, to the owner, may suspend operations on the work or terminate the contract.

b. The owner shall be liable to the contractor for the cost of all materials delivered and work performed on this contract to date.

## **ARTICLE 31 - REQUEST FOR PAYMENT**

a. Not later than the fifth day of the month, the contractor shall submit to the Owner a request for payment for work done during the previous month. The request shall be in the form agreed upon between the contractor and owner. The Request for Payment shall show substantially the value of work done and materials delivered to the site during the period since the last payment, and shall sum up the financial status of the contract with the following information:

1. Total of contract including change orders.
2. Value of work completed to date.

3. Less five percent (5%) retainage, provided however, that after fifty percent (50%) of the contractor's work has been satisfactorily completed on schedule, with approval of the owner, further requirements for retainage will be waived only so long as work continues to be completed satisfactorily and on schedule.
  4. Less previous payments.
  5. Current amount due.
- b. The contractor, upon request of the Owner, shall substantiate the request with invoices of vouchers or payrolls or other evidence.
- c. Prior to submitting the first request, the contractor shall prepare for the owner a schedule showing a breakdown of the contract price into values of the various parts of the work, so arranged as to facilitate payments to subcontractors in accordance with Article 17, Contractor and Subcontractor Relationships. The contractor(s) shall list the value of each subcontractor and supplier, identifying each minority business subcontractor and supplier as listed in Affidavit C, if applicable.
- d. When payment is made on account of stored materials and equipment, such materials must be stored on the owner's property, and the requests for payments shall be accompanied by invoices or bills of sale or other evidence to establish the owner's title to such materials and equipment. Such payments will be made only for materials that have been customized or fabricated specifically for this project. Raw materials or commodity products including but not limited to piping, conduit, CMU, metal studs and gypsum board may not be submitted. Responsibility for such stored materials and equipment shall remain with the contractor regardless of ownership title. Such stored materials and equipment shall not be removed from the owner's property. Should the space for storage on-site be limited, the contractor, at his option, shall be permitted to store such materials and/or equipment in a suitable space off-site. Should the contractor desire to include any such materials or equipment in his application for payment, they must be stored in the name of the owner in an independent, licensed, bonded warehouse approved by the owner and located as close to the site as possible. The warehouse selected must be approved by the contractor's bonding and insurance companies; the material to be paid for shall be assigned to the owner and shall be inspected by the designer/owner. Upon approval by the designer/owner, of the storage facilities and materials and equipment, payment therefore will be certified. Responsibility for such stored materials and equipment shall remain with the contractor. Such stored materials and equipment shall not be moved except for transportation to the project site. Under certain conditions, the owner may approve storage of materials at the point of manufacture, which conditions shall be approved by the owner prior to approval for the storage and shall include an agreement by the storing party which unconditionally gives the Owner absolute right to possession of the materials at any time. Bond, security and insurance protection shall continue to be the responsibility of the contractor(s).
- e. In the event of beneficial occupancy, retainage of funds due the contractor(s) may be reduced with the approval of owner to an equitable amount to cover the list of items to be completed or corrected. Retainage may not be reduced to less than two and one-half (2 1/2) times the estimated value of the work to be completed or corrected. Reduction of retainage must be with the consent and approval of the contractor's bonding company.

## ARTICLE 32 - CERTIFICATES OF PAYMENT AND FINAL PAYMENT

- a. Within five (5) days from receipt of request for payment from the contractor, the designer/owner shall issue and forward to the owner a certificate for payment. This certificate shall indicate the amount requested or as approved by the designer/owner. If the certificate is not approved by the designer/owner, he shall state in writing to the contractor and the owner his reasons for withholding payment.
- b. No certificate issued or payment made shall constitute an acceptance of the work or any part thereof. The making and acceptance of final payment shall constitute a waiver of all claims by the owner except:
1. Claims arising from unsettled liens or claims against the contractor.
  2. Faulty work or materials appearing after final payment.
  3. Failure of the contractor to perform the work in accordance with drawings and specifications, such failure appearing after payment.
  4. As conditioned in the performance bond and payment bond.
- c. The making and acceptance of final payment shall constitute a waiver of all claims by the contractor except those claims previously made and remaining unsettled (Article 20(c)).
- d. Prior to submitting request for final payment to the designer/owner for approval, the contractor shall fully comply with all requirements specified in the “ project closeout” section of the specifications. These requirements include but not limited to the following:
1. Submittal of Product and Operating Manuals, Warranties and Bonds, Guarantees, Maintenance Agreements, As-Built Drawings, Certificates of Inspection or Approval from agencies having jurisdiction. (The designer/owner must approve the Manuals prior to delivery to the owner).
  2. Transfer of Required attic stock material and all keys in an organized manner.
  3. Record of Owner’s training.
  4. Resolution of any final inspection discrepancies.
  5. Granting access to Contractor’s records, if Owner’s internal auditors have made a request for such access pursuant to Article 52.
- e. The contractor shall forward to the designer/owner, the final application for payment along with the following documents:
1. List of minority business subcontractors and material suppliers showing breakdown of contract amounts and total actual payments to subs and material suppliers.
  2. Affidavit of Release of Liens.

3. Affidavit of contractors of payment to material suppliers and subcontractors. (See Article 36).

4. Consent of Surety to Final Payment.

f. The designer/owner will not authorize final payment until the work under contract has been certified by designer/owner, certificates of compliance issued, and the contractor has complied with the closeout requirements. The designer/owner shall forward the contractor's final application for payment to the owner along with respective certificate(s) of compliance required by law.

### **ARTICLE 33 - PAYMENTS WITHHELD**

a. The designer/owner may withhold payment for the following reasons:

1. Faulty work not corrected.
2. The unpaid balance on the contract is insufficient to complete the work in the judgment of the designer/owner.
3. To provide for sufficient contract balance to cover liquidated damages that will be assessed.

b. The owner may authorize the withholding of payment for the following reasons:

1. Claims filed against the contractor or evidence that a claim will be filed.
2. Evidence that subcontractors have not been paid.

c. When grounds for withholding payments have been removed, payment will be released. Delay of payment due the contractor without cause will make owner liable for payment of interest to the contractor in accordance with G.S. 143-134.1. As provided in G.S.143-134.1(e) the owner shall not be liable for interest on payments withheld by the owner for unsatisfactory job progress, defective construction not remedied, disputed work, or third-party claims filed against the owner or reasonable evidence that a third-party claim will be filed.

### **ARTICLE 34 – INSURANCE REQUIREMENTS**

Before commencing any work, the successful bidder shall procure insurance in the bidder's name and maintain all insurance policies for the duration of the contract of the types and in the amounts listed below. 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.

Commercial General Liability. Bidder shall maintain Commercial General Liability and if necessary, Commercial Umbrella Liability insurance with a total limit of not less than \$5,000,000 each occurrence for bodily injury and property damage. If such CGL insurance contains a general aggregate limit, it shall apply separately to this project/location or the general aggregate shall be twice the required limit.

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

New Hanover County, its officers, officials, agents, and employees are to be covered as additional insureds under the CGL by endorsement CG 20 10 **or** CG 20 33 **and** CG 20 37 or an endorsement providing equivalent coverage as respects to liability arising out of activities performed by or on behalf of the contractor; products and completed operations of the contractor; premises owned, leased or used by the contractor; and under the commercial umbrella, if any.

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

The bidder’s Commercial General Liability insurance shall be primary as respects New Hanover County, its officers, officials, agents, and employees. Any other insurance or self-insurance maintained by New Hanover County, its officers, officials, and employees shall be excess of and not contribute with the bidder’s insurance.

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

The Employer’s Liability, and if necessary, Commercial Umbrella Liability insurance shall not be less than \$5,000,000 each accident for bodily injury by accident, \$5,000,000 each employee for bodily injury by disease, and \$5,000,000 policy limit.

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

Business Auto Liability. Bidder shall maintain Business Auto Liability and, if necessary, Commercial Umbrella Liability insurance with a limit of not less than \$5,000,000 each accident.

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

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.

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

Environmental/Pollution Liability. If required, bidder shall maintain Environmental/Pollution Liability covering losses caused by pollution incidents that arise from the operations of the contractor described under the scope of services of this contract.

Environmental/Pollution Liability shall apply to bodily injury; property damage, including loss of use of damaged property or of property that has not been physically injured; cleanup costs and defense, including costs and expenses incurred in the investigation defense, or settlement of claims. The policy of insurance affording these required coverages shall be written in an amount of at least \$5,000,000 per claim, with an annual aggregate of at least \$5,000,000.

Contractors Pollution Liability shall include as an additional insured New Hanover County, its officers, officials, agents, and employees.

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

If the scope of services as defined in this contract includes the disposal of any hazardous or nonhazardous materials from the job site, the Contractor must furnish to the New Hanover County evidence of pollution liability insurance maintained by the disposal site operator for losses arising from the insured facility accepting waste under this contract. Coverage certified to the New Hanover County under this paragraph must be maintained in minimum amounts of \$5,000,000 per loss, with an annual aggregate of at least \$5,000,000.

Installation Floater. Bidder shall purchase and maintain in force Installation Floater insurance for the installation of equipment. Such insurance shall be written in an amount equal to the replacement cost of the equipment. The insurance shall apply on a replacement cost basis.

Insured property shall include portions of the work located away from the site but intended for use at the site, and shall also cover portions of the work in transit.

Installation Floater insurance shall name New Hanover County as loss payee.

Installation Floater Insurance shall, at a minimum, cover the perils insured under the ISO special causes of loss form (CP 10 30).

Any deductible applicable to the Installation Floater shall be paid by the Bidder.

If New Hanover County is damaged by the failure of Bidder to maintain Installation Floater insurance, then Bidder shall bear all reasonable costs properly attributable to that failure.

Deductibles and Self-Insured Retentions. Any deductibles or self-insured retentions must be declared to and approved by New Hanover County. At the option of New Hanover County, either the insurer shall reduce or eliminate such deductibles or self-insured retentions as respects New Hanover County, its officers, officials, agents, and employees; or the contractor shall procure a bond guaranteeing payment deductibles or self-insured retentions. The bidder shall be solely responsible for the payment of all deductibles to which such policies are subject, whether or not New Hanover County is an insured under the policy.

Miscellaneous Insurance Provisions. The policies are to contain, or be endorsed to contain, the following provisions:

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

If bidder'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.

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 specific approval has been granted by New Hanover County.

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

Evidence of additional insured status shall be noted on the certificate of insurance as per requirements in 2.16.3 above.

Subcontractors. Bidder 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. Commercial General Liability coverage shall include independent contractors' coverage, and the contractor shall be responsible for assuring that all subcontractors are properly insured.

Conditions.

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

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

The bidder shall provide that the insurance contributing to satisfaction of insurance requirements shall not be canceled, terminated or modified by the contractor without prior written approval of New Hanover County.

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

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

Failure of New Hanover County to demand a certificate or other evidence of full compliance with these insurance requirements or failure of New Hanover 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.

By requiring insurance herein, New Hanover County does not represent that coverage and limits will necessarily be adequate to protect the bidder and such coverage and limits shall not be deemed as a limitation of bidder's liability under the indemnities granted to New Hanover County in this contract.

If bidder fails to maintain the insurance as set forth herein, New Hanover County shall have the right, but not the obligation, to purchase said insurance at bidder's expense.

The bidder may apply to New Hanover County for approval of higher deductibles based on financial capacity and quality of the carrier affording coverage.

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

#### **ARTICLE 35 - PERFORMANCE BOND AND PAYMENT BOND**

- a. Each contractor shall furnish a performance bond and payment bond executed by a surety company authorized to do business in North Carolina. The bonds shall be in the full contract amount. Bonds shall be executed in the form bound with these specifications.
- b. All bonds shall be countersigned by an authorized agent of the bonding company who is licensed to do business in North Carolina.

#### **ARTICLE 36 - CONTRACTOR'S AFFIDAVIT**

The final payment of retained amount due the contractor on account of the contract shall not become due until the contractor has furnished to the owner an affidavit signed, sworn and notarized to the effect that all payments for materials, services or subcontracted work in connection with his contract have been satisfied, and that no claims or liens exist against the contractor in connection with this contract. In the event that the contractor cannot obtain similar affidavits from subcontractors to protect the contractor and the owner from possible liens or claims against the subcontractor, the contractor shall state in his affidavit that no claims or liens exist against any subcontractor to the best of his (the contractor's) knowledge, and if any appear afterward, the contractor shall save the owner harmless.

#### **ARTICLE 37 - ASSIGNMENTS**

The contractor shall not assign any portion of this contract nor subcontract in its entirety. Except as may be required under terms of the performance bond or payment bond, no funds or sums of money due or become due the contractor under the contract may be assigned.

## **ARTICLE 38 - USE OF PREMISES**

- a. The contractor(s) shall confine his apparatus, the storage of materials and the operations of his workmen to limits indicated by law, ordinances, permits or directions of the designer/owner and owner and shall not exceed those established limits in his operations.
- b. The contractor(s) shall not load or permit any part of the structure to be loaded with a weight that will endanger its safety.
- c. The contractor(s) shall enforce the designer/owner's and owner's instructions regarding signs, advertisements, fires and smoking.
- d. No firearms, any type of alcoholic beverages or drugs (other than those prescribed by a physician) will be permitted at the job site.

## **ARTICLE 39 - CUTTING, PATCHING AND DIGGING**

- a. The contractor shall do all cutting, fitting or patching of his work that may be required to make its several parts come together properly and fit it to receive or be received by work of other contractors shown upon or reasonably implied by the drawings and specifications for the completed structure, as the designer/owner may direct.
- b. Any cost brought about by defective or ill-timed work shall be borne by the party responsible therefor.
- c. No contractor shall endanger any work of another contractor by cutting, digging or other means. No contractor shall cut or alter the work of any other contractor without the consent of the designer/owner and the affected contractor(s).

## **ARTICLE 40 - UTILITIES, STRUCTURES, SIGNS**

- a. The contractor shall provide necessary and adequate facilities for water, electricity, gas, oil, sewer and other utility services which may be necessary and required for completion of the project including all utilities required for testing, cleaning, balancing, and sterilization of designated plumbing, mechanical and electrical systems. Any permanent meters installed shall be listed in the contractor's name until work has a final acceptance. The contractor will be solely responsible for all utility costs prior to final acceptance. Contractor shall contact all affected utility companies prior to bid to determine their requirements to provide temporary and permanent service and include all costs associated with providing those services in their bid. Coordination of the work of the utility companies during construction is the sole responsibility of the contractor.
- b. Meters shall be relisted in the owner's name on the day following final acceptance of the Contractor's work, and the owner shall pay for services used after that date.
- c. The owner shall be reimbursed for all metered utility charges after the meter is relisted in the owner's name and prior to completion and acceptance of the work of **all** contractors. Reimbursement shall be made by the contractor whose work has not been

completed and accepted. If the work of two or more contractors has not been completed and accepted, reimbursement to the owner shall be paid by the contractors involved on the basis of assessments by the designer/owner.

d Prior to the operation of permanent systems, the Contractor will provide temporary power, lighting, water, and heat to maintain space temperature above freezing, as required for construction operations.

e. All contractors shall have the permanent building systems in sufficient readiness for furnishing temporary climatic control at the time a building is enclosed and secured. The HVAC systems shall maintain climatic control throughout the enclosed portion of the building sufficient to allow completion of the interior finishes of the building. A building shall be considered enclosed and secured when windows, doorways (exterior, mechanical, and electrical equipment rooms), and hardware are installed; and other openings have protection which will provide reasonable climatic control. The appropriate time to start the mechanical systems and climatic condition shall be jointly determined by the contractor(s), the designer/owner and owner. Use of the equipment in this manner shall be subject to the approval of the Designer/owner and owner and shall in no way affect the warranty requirements of the contractor(s).

f. The electrical contractor shall have the building's permanent power wiring distribution system in sufficient readiness to provide power as required by the HVAC contractor for temporary climatic control.

g. The electrical contractor shall have the building's permanent lighting system ready at the time the general contractor begins interior painting and shall provide adequate lighting in those areas where interior painting and finishing is being performed.

h. Each prime contractor shall be responsible for his permanently fixed service facilities and systems in use during progress of the work. The following procedures shall be strictly adhered to:

1. Prior to final acceptance of work by the Owner, each contractor shall remove and replace any parts of the permanent building systems damaged through use during construction.
2. Temporary filters as recommended by the equipment manufacturer in order to keep the equipment and ductwork clean and free of dust and debris shall be installed in each of the heating and air conditioning units and at each return grille during construction. New filters shall be installed in each unit prior to the owner's acceptance of the work.
3. Extra effort shall be maintained to keep the building and the site adjacent to the building clean and under no circumstances shall air systems be operated if finishing and site work operations are creating dust in excess of what would be considered normal if the building were occupied.
4. It shall be understood that any warranty on equipment presented to the owner shall extend from the day of final acceptance by the owner. The cost of warranting the equipment during operation in the finishing stages of construction shall be borne by the contractor whose system is utilized.
5. The electrical contractor shall have all lamps in proper working condition at the time of final project acceptance.

i. The Contractor shall provide, if required and where directed, a shed for toilet facilities and shall furnish and install in this shed all water closets required for a complete and adequate sanitary arrangement. These facilities will be available to other contractors on the job and shall be kept in a neat and sanitary condition at all times. Chemical toilets are acceptable.

j. The Project Expediter shall, if required by the Supplementary General Conditions and where directed, erect a temporary field office, complete with lights, telephone, heat and air conditioning. A portion of this office shall be partitioned off, of sufficient size, for the use of a resident inspector, should the designer/owner so direct.

k. On multi-story construction projects, the Contractor shall provide temporary elevators, lifts, or other special equipment for the general use of all contractors. The cost for such elevators, lifts or other special equipment and the operation thereof shall be included in the Project Expediter's bid.

l. The Contractor will erect one sign on the project if required. The sign shall be of sound construction, and shall be neatly lettered with black letters on white background. The sign shall bear the name of the project, and the names of prime contractors on the project, and the name of the designer/owner and consultants. Directional signs may be erected on the owner's property subject to approval of the owner with respect to size, style and location of such directional signs. Such signs may bear the name of the contractor and a directional symbol. No other signs will be permitted except by permission of the owner.

#### **ARTICLE 41 - CLEANING UP**

a. The contractors shall keep the building and surrounding area reasonably free from rubbish at all times, and shall remove debris from the site on a timely basis or when directed to do so by the Owner. The Contractor shall provide an onsite refuse container(s) for the use of all contractors. Each contractor shall remove their rubbish and debris from the job site on a daily basis. If a building is involved, the Contractor shall broom clean the building as required to minimize dust and dirt accumulation.

b. The Contractor shall provide and maintain suitable all-weather access to the building.

c. Before final inspection and acceptance of the building, each contractor shall clean his portion of the work, including glass, hardware, fixtures, masonry, tile and marble (using no acid), clean and wax all floors as specified, and completely prepare the building for use by the owner, with no cleaning required by the owner.

#### **ARTICLE 42 - GUARANTEE**

a. The contractor shall unconditionally guarantee materials and workmanship against patent defects arising from faulty materials, faulty workmanship or negligence for a period of twelve (12) months following the date of final acceptance of the work or beneficial occupancy and shall replace such defective materials or workmanship without cost to the owner.

b. Where items of equipment or material carry a manufacturer's warranty for any period in excess of twelve (12) months, then the manufacturer's warranty shall apply for that particular piece of equipment or material. The contractor shall replace such defective equipment or materials, without cost to the owner, within the manufacturer's warranty period.

c. Additionally, the owner may bring an action for latent defects caused by the negligence of the contractor which is hidden or not readily apparent to the owner at the time of beneficial occupancy or final acceptance, whichever occurred first, in accordance with applicable law.

d. Guarantees for roof, equipment, materials, and supplies shall be stipulated in the specifications sections governing such roof, equipment, materials, or supplies.

#### **ARTICLE 43 - CODES AND STANDARDS**

Wherever reference is given to codes, standard specifications or other data published by regulating agencies including, but not limited to, national electrical codes, North Carolina state building codes, federal specifications, ASTM specifications, various institute specifications, etc., it shall be understood that such reference is to the latest edition including addenda published prior to the date of the contract documents.

#### **ARTICLE 44 - INDEMNIFICATION**

To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless County, its officers, officials, agents and employees from and against liability, claims, damages, losses and expenses, including attorneys' fees, arising out of or resulting from performance of the Work, provided that such liability, claims, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself) including loss of use resulting therefrom, but only to the extent caused in whole or in part by negligent acts or omissions of the Contractor, anyone directly or indirectly employed by it or anyone for whose acts they may be liable, regardless of whether or not such liability, claim, damage, loss or expense is caused in part by County, its officers, officials, agents and employees.

#### **ARTICLE 45 - TAXES**

a. Federal excise taxes do not apply to materials entering into state work (Internal Revenue Code, Section 3442(3)).

b. Federal transportation taxes do not apply to materials entering into state work (Internal Revenue Code, Section 3475(b) as amended).

c. North Carolina sales tax and use tax, as required by law, do apply to materials entering into state work and such costs shall be included in the bid proposal and contract sum.

d. Local option sales and use taxes, as required by law, do apply to materials entering into state work as applicable and such costs shall be included in the bid proposal and contract sum.

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

Amount of county sales and use tax paid per contractor's statements: Contractors performing contracts for state agencies shall give the state agency for whose project the property was purchased a signed statement containing the information listed in G.S. 105-164.14(e).

The Department of Revenue has agreed that in lieu of obtaining copies of sales receipts from contractors, an agency may obtain a certified statement as of April 1, 1991 from the contractor setting forth the date, the type of property and the cost of the property purchased from each vendor, the county in which the vendor made the sale and the amount of local sales and use taxes paid thereon. If the property was purchased out-of-state, the county in which the property was delivered should be listed. The contractor should also be notified that the certified statement may be subject to audit.

In the event the contractors make several purchases from the same vendor, such certified statement must indicate the invoice numbers, the inclusive dates of the invoices, the total amount of the invoices, the counties, and the county sales and use taxes paid thereon.

Name of taxing county: The position of a sale is the retailer's place of business located within a taxing county where the vendor becomes contractually obligated to make the sale. Therefore, it is important that the county tax be reported for the county of sale rather than the county of use.

When property is purchased from out-of-state vendors and the county tax is charged, the county should be identified where delivery is made when reporting the county tax. Such statement must also include the cost of any tangible personal property withdrawn from the contractor's warehouse stock and the amount of county sales or use tax paid thereon by the contractor.

Similar certified statements by his subcontractors must be obtained by the general contractor and furnished to the claimant.

Contractors are not to include any tax paid on supplies, tools and equipment which they use to perform their contracts and should include only those building materials, supplies, fixtures and equipment which actually become a part of or annexed to the building or structure.

**ARTICLE 46 - EQUAL OPPORTUNITY CLAUSE**

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.

## **ARTICLE 47 - EMPLOYMENT OF INDIVIDUALS WITH DISABILITIES**

The contractor(s) agree not to discriminate against any employee or applicant for employment because of physical or mental disabilities in regard to any position for which the employee or applicant is qualified. The contractor agrees to take affirmative action to employ, advance in employment and otherwise treat qualified individuals with such disabilities without discrimination based upon their physical or mental disability in all employment practices.

## **ARTICLE 48 - ASBESTOS-CONTAINING MATERIALS (ACM)**

There are no asbestos-containing materials in the work areas; however, Contractors are reminded of the requirements of instructions under Instructions to Bidders and General Conditions of the Contract, titled Examination of Conditions.

## **ARTICLE 49 - MINORITY BUSINESS PARTICIPATION**

For construction contracts with an estimated value of \$300,000 or more, the Bidder has the responsibility to make a good faith effort to solicit minority bids. The County has established a verifiable goal of ten percent (10%). Each 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.

The bidder shall include with his bid his/her a completed Identification of HUB Certified/Minority Business Participation form and Affidavit A or Affidavit B.

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

The document, "New Hanover County Minority and/or Women Business Enterprise (M/WBE) Program" including Affidavits are hereby incorporated into and made a part of this contract.

## **ARTICLE 50 – GIFTS**

Pursuant to N.C. Gen. Stat. § 133-32, it is unlawful for any vendor or contractor ( i.e. architect, bidder, contractor, construction manager, design professional, engineer, subcontractor, supplier, vendor, etc.), to make gifts or to give favors to any County employee. This prohibition covers those vendors and contractors who: (1) have a contract with a governmental agency; or (2) have performed under such a contract within the past year; or (3) anticipate bidding on such a contract in the future. For additional information regarding the specific requirements and exemptions, vendors and contractors are encouraged to review G.S. Sec. 133-32.

During the construction of the Project, the Contractor is prohibited from making gifts to any of the Owner's employees, Owner's project representatives (architect, engineers, construction manager and their employees or any other person that may have any

involvement, influence, responsibilities, oversight, management and/or duties that pertain to and/or relate to the contract administration, financial administration and/or disposition of claims arising from and/or relating to the Contract and/or Project.

#### **ARTICLE 51 – AUDITING-ACCESS TO PERSONS AND RECORDS**

The County shall have access to Contractor’s officers, employees, agents and/or other persons in control of and/or responsible for the Contractor’s records that relate to this Contracts for purposes of conducting audits. The Owner’s internal auditors shall also have the right to access and copy the Contractor’s records relating to the Contract and Project during the term of the Contract and within two years following the completion of the Project/close-out of the Contract to verify accounts, accuracy, information, calculations and/or data affecting and/or relating to Contractor’s requests for payment, requests for change orders, change orders, claims for extra work, requests for time extensions and related claims for delay/extended general conditions costs, claims for lost productivity, claims for loss efficiency, claims for idle equipment or labor, claims for price/cost escalation, pass-through claims of subcontractors and/or suppliers, and/or any other type of claim for payment or damages from Owner and/or its project representatives.

#### **ARTICLE 52 – TERMINATION FOR CONVENIENCE**

The County may for any reason whatsoever terminate performance under this Contract by the Contractor for convenience. The County shall give written notice of such termination to the Contractor specifying when termination becomes effective.

52.1 The Contractor shall incur no further obligations in connection with the Work and the Contractor shall stop Work when such termination becomes effective. The Contractor shall also terminate outstanding orders and subcontracts. The Contractor shall settle the liabilities and claims arising out of the termination of subcontracts and orders. The County may direct the Contractor to assign the Contractor's right, title, and interest under terminated orders or subcontracts to the County or its designee.

52.2 The Contractor shall transfer title and deliver to the County such completed or partially completed Work and materials, equipment, parts, fixtures, information and Contract rights Contractor controls or possesses.

52.3 (a) The Contractor shall submit a termination claim to the County specifying the amounts due because of the termination for convenience together with costs, pricing or other data required by the County. If the Contractor fails to file a termination claim within one (1) year from the effective date of termination, the County shall pay the Contractor, an amount derived in accordance with subparagraph [c] below.

(b) The County and the Contractor may agree to the compensation, if any, due to the Contractor hereunder.

(c) Absent agreement to the amount due to the Contractor, the County shall pay the Contractor the following amounts:

(i) Contract prices for labor, materials, equipment, and other services accepted under this Contract.

(ii) Reasonable costs incurred in preparing to perform and in performing the terminated portion of the Work, and in terminating the Contractor's performance, plus a fair and reasonable allowance for overhead and profit thereon (such profit shall not include anticipated profit or consequential damages); provided however,

that if it appears that the Contractor would have not profited or would have sustained a loss if the entire Contract would have been completed, no profit shall be allowed or included and the amount of compensation shall be reduced to reflect the anticipated rate of loss, if any;

(iii) Reasonable costs of settling and paying claims arising out of the termination of subcontracts or orders pursuant hereto. These costs shall not include amounts paid in accordance with other provisions hereof.

**Section 4 – Bid Proposal Form**

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**CASTLE HAYNE PARK IMPROVEMENTS**

**RFB # 15-0185**

**Bid Proposal Form**

**Deadline for Receipt of Bids: 1:00 P.M. EST, Thursday, December 4, 2014**

Name of Bidder: \_\_\_\_\_

Bidder's Address: \_\_\_\_\_  
\_\_\_\_\_

Bidders Phone Number: \_\_\_\_\_

Bidder's Email: \_\_\_\_\_

Bidder's License Number: \_\_\_\_\_

The undersigned, as bidder, hereby declares that the only person or persons interested in this proposal as principal or principals is or are named herein and that no other person than herein mentioned has any interest in this proposal or in the contract to be entered into; that this proposal is made without connection with any other person, company or parties making a bid or proposal; and that it is in all respects fair and in good faith without collusion or fraud. The bidder further declares that he has examined the site of the work and the contract documents relative thereto, and has read all special provisions furnished prior to the opening of bids; that he has satisfied himself relative to the work to be performed. The bidder further declares that he and his subcontractors have fully complied with NCGS 64, Article 2 in regards to E-Verification as required by Section 2.(c) of Session Law 2013-418, codified as N.C. Gen. Stat. § 143-129(j).

The undersigned, as bidder, proposes and agrees if this bid is accepted, to contract with the New Hanover County for the furnishing of all materials, equipment, and labor necessary to complete the construction of the work described in these documents in full and complete accordance with plans, specifications, and contract documents, and to the full and entire satisfaction of the New Hanover County for the sum of:

Bidder's Name: \_\_\_\_\_

- |   |              |
|---|--------------|
| 1. Base Bid   | \$ _____     |
| 2. Irrigation System                                  | \$ _____     |
| 3. Contingency Allowance<br>(5% of line 1 and line 2) | \$ _____     |
| <br>Total Bid   | <br>\$ _____ |

Should the undersigned be required to perform work over and above that required by the Contract Documents, or should he/she be ordered to omit work required by the Contract Documents, he/she will be paid an extra, or shall credit the Owner, as case may be on the basis of unit prices stated herein.

Unit Price: Unsuitable Soil Removal                      \$ \_\_\_\_\_ per cubic yard

Unit Price: Suitable Soil Replacement                      \$ \_\_\_\_\_ per cubic yard

Unit Price: Asphalt    \$ \_\_\_\_\_ per linear foot

The Contractor is hereby notified that the Contract will contain a Liquidated Damages Clause.

A. Performance and Delivery Time:

The Contractor shall begin work on or before the "commence work" date specified in the **NOTICE TO PROCEED** issued by the Owner and as set forth in the plans, specifications, and proposal. All work shall be completed in all events on or before the date set forth in the **NOTICE TO PROCEED**.

B. Liquidated Damages:

Since actual damages for any delay in the completion of the work which the contractor is required to perform under this contract are or will be difficult to determine, the contractor and his /her sureties shall be liable for and shall pay to the Owner the sum of **\$200** as fixed and agreed as liquidated damages, and not as penalty for each calendar day of delay from the date stipulated for completion, or as modified in accordance with

Bidder's Name: \_\_\_\_\_

the terms of this agreement until such work is satisfactorily completed and accepted. Said liquidated damages may be deducted from any payments owed to the contractor by the Owner or collected from the sureties, whichever is deemed expedient by the Owner.

**Acknowledgment of Addenda**

Addendum No. \_\_\_\_\_ Dated \_\_\_\_\_

**Attachments to Bid Proposal**

- 1. Bid Bond
- 2. Sample Certificate of Insurance
- 3. E-Verify Form
- 4. Identification of Minority/Women Business Participation and Affidavit A or Affidavit B

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Printed Name/Title

Date \_\_\_\_\_

# Site/Civil Specifications

For

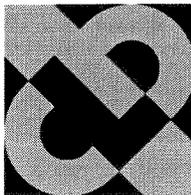
## Castle Hayne Park Section 1 & 2

New Hanover County, North Carolina

Prepared for:

New Hanover County  
230 Government Center Drive  
Wilmington, NC 28403

Prepared by:



**Coastal Land Design, PLLC**  
Civil Engineering/Landscape Architecture  
Land Planning/Construction Management

P.O. Box 1172

Wilmington, NC 28402

Phone: 910-254-9333

Fax: 910-254-0502

[www.cldeng.com](http://www.cldeng.com)



Seal for sections  
311000, 312000  
312319, 315000  
321216, 334100

October 24, 2014

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## SECTION 02920 - LAWNS AND GRASSES

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

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

## 1.2 SUMMARY

## A. Section Includes:

1. Seeding.
2. Hydroseeding.
3. Sodding.
4. Sprigging.
5. Erosion-control material(s).

## B. Related Sections:

1. Section 02110 "Site Clearing" for topsoil stripping and stockpiling.
2. Section 02204 "Earthwork" for excavation, filling and backfilling, and rough grading.
3. Section 02720 "Storm Drainage" for subsurface drainage.
4. Section 32840 "Irrigation Systems" for turf irrigation.
5. Section 02930 "Exterior Plants" for border edgings.

## 1.3 DEFINITIONS

- A. Duff Layer: The surface layer of native topsoil that is composed of mostly decayed leaves, twigs, and detritus.
- B. Finish Grade: Elevation of finished surface of planting soil.
- C. Manufactured Topsoil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.
- D. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. This includes insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. It also includes substances or mixtures intended for use as a plant regulator, defoliant, or desiccant.
- E. Pests: Living organisms that occur where they are not desired or that cause damage to plants, animals, or people. These include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.

- F. Planting Soil: Standardized topsoil; existing, native surface topsoil; existing, in-place surface soil; imported topsoil; or manufactured topsoil that is modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.
- G. Subgrade: Surface or elevation of subsoil remaining after excavation is complete, or top surface of a fill or backfill before planting soil is placed.
- H. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.
- I. Surface Soil: Soil that is present at the top layer of the existing soil profile at the Project site. In undisturbed areas, the surface soil is typically topsoil, but in disturbed areas such as urban environments, the surface soil can be subsoil.

#### 1.4 SUBMITTALS

- A. Planting Schedule: Indicate anticipated delivery date and installation dates for lawns and grasses
- B. Product Data: For each type indicated in the plans.
  - 1. Pesticides and Herbicides: Include product label and manufacturer's application instructions specific to this Project.
- C. Certification of Grass Seed, sod, and/or plugs: From vendor for each grass-seed monostand or mixture stating the botanical and common name, percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production and date of packaging.
  - 1. Certification of seed and sod plugs. Include identification of source and name and telephone number of supplier.
- D. Qualification Data: For qualified landscape Installer.
- E. Product Certificates: For soil amendments and fertilizers, from manufacturer.
- F. Material Test Reports: For standardized ASTM D 5268 topsoil existing native surface topsoil, imported or manufactured topsoil to be used as playfield soil, sand base.
- G. Maintenance Instructions: Recommended procedures to be established by Owner for maintenance of turf during a calendar year. Submit before expiration of required initial maintenance periods.

#### 1.5 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified landscape Installer whose work has resulted in successful turf establishment on athletic fields.
  - 1. Professional Membership: Installer shall be a member in good standing of either the Professional Landcare Network or the American Nursery and Landscape Association.

2. Experience: Five years' experience in turf installation in addition to requirements in Division 1 Section "Quality Requirements."
  3. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
  4. Personnel Certifications: Installer's field supervisor shall have certification in one of the following categories from the Professional Landcare Network:
    - a. Certified Landscape Technician - Exterior, with installation specialty area(s), designated CLT-Exterior.
    - b. Certified Turfgrass Professional designated CTP.
  5. Maintenance Proximity: Not more than one hour normal travel time from Installer's place of business to Project site.
  6. Pesticide Applicator: State licensed, commercial.
- B. Soil-Testing Laboratory Qualifications: An independent laboratory or university laboratory, recognized by the State Department of Agriculture, with the experience and capability to conduct the testing indicated and that specializes in types of tests to be performed.
- C. Soil Analysis: For each soil type, furnish soil analysis and a written report by a qualified soil-testing laboratory stating percentages of organic matter; gradation of sand, silt, and clay content; cation exchange capacity; sodium absorption ratio; deleterious material; pH; and mineral and plant-nutrient content of the soil.
1. Testing methods and written recommendations shall comply with USDA's Handbook No. 60.
  2. The soil-testing laboratory shall oversee soil sampling, with depth, location, and number of samples to be taken per instructions from Architect. A minimum of 8 (4 per sports field) representative samples shall be taken from varied locations for each soil to be used or amended for planting purposes.
  3. Report suitability of tested soil for turf growth.
    - a. Based on the test results, state recommendations for soil treatments and soil amendments to be incorporated. State recommendations in weight per 1000 sq. ft. (92.9 sq. m) or volume per cu. yd. (0.76 cu. m) for nitrogen, phosphorus, and potash nutrients and soil amendments to be added to produce satisfactory planting soil suitable for healthy, viable plants.
    - b. Report presence of problem salts, minerals, or heavy metals, including aluminum, arsenic, barium, cadmium, chromium, cobalt, lead, lithium, and vanadium. If such problem materials are present, provide additional recommendations for corrective action.
- D. Preinstallation Conference: Conduct conference at Project site.
1. Notify Architect 7 days in advance of preinstallation conference.

## 1.6 DELIVERY, STORAGE, AND HANDLING

- A. Seed and Other Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of conformance with state and federal laws, as applicable.

- B. Sod: Harvest, deliver, store, and handle sod according to requirements in "Specifications for Turfgrass Sod Materials" and "Specifications for Turfgrass Sod Transplanting and Installation" in TPI's "Guideline Specifications to Turfgrass Sodding." Deliver sod in time for planting within 24 hours of harvesting. Protect sod from breakage and drying.
- C. Bulk Materials:
  - 1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
  - 2. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
  - 3. Accompany each delivery of bulk fertilizers, lime, and soil amendments with appropriate certificates.

#### 1.7 PROJECT CONDITIONS

- A. Planting Restrictions: Plant during one of the following periods unless otherwise instructed by owner. Coordinate planting periods with initial maintenance periods to provide required maintenance from date of Substantial Completion.
  - 1. Spring Planting: February 15 – June 1.
  - 2. Fall Planting: September 15 – December 15
  - 3. **Sprigging should be scheduled and ready to begin early June 2015**
- B. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions.

#### 1.8 MAINTENANCE SERVICE

- A. Initial Turf Maintenance Service: Provide full maintenance by skilled employees of landscape Installer. Maintain as required in Part 3. Begin maintenance immediately after each area is planted and continue until acceptable turf is established but for not less than the following periods:
  - 1. Seeded Turf: 60 days from date of Substantial Completion.
    - a. When initial maintenance period has not elapsed before end of planting season, or if turf is not fully established, continue maintenance during next planting season.
  - 2. Sodded Turf: 60 days from date of Substantial Completion.
  - 3. Sprigged Turf: 60 days from date of Substantial Completion.

## PART 2 - PRODUCTS

## 2.1 SEED

- A. Grass Seed: Fresh, clean, dry, new-crop seed complying with AOSA's "Journal of Seed Technology; Rules for Testing Seeds" for purity and germination tolerances.
- B. Seed Species: Bluetag, State-certified seed of grass species as follows:
- C. Seed Species: Seed of grass species as follows, with not less than 95 percent germination, not less than 85 percent pure seed, and not more than 0.5 percent weed seed:
  - 1. Turfgrass Species: Bermudagrass (*Cynodon dactylon*).

## 2.2 TURFGRASS SOD

- A. Turfgrass Sod: Bluetag Certified Number 1 Quality/Premium, including limitations on thatch, weeds, diseases, nematodes, and insects, complying with "Specifications for Turfgrass Sod Materials" in TPI's "Guideline Specifications to Turfgrass Sodding." Furnish viable sod of uniform density, color, and texture, strongly rooted, and capable of vigorous growth and development when planted.
- B. Turfgrass Species: Bermudagrass Celebration (*Cynodon dactylon* v. Celebration)
- C. Turfgrass Species: Sod of grass species as follows, with not less than 95 percent germination, not less than 85 percent pure seed, and not more than 0.5 percent weed seed:

## 2.3 SPRIGS

- A. Sod Sprigs: Healthy living stems, rhizomes, or stolons with a minimum of two nodes and attached roots free of soil, of the following turfgrass species shall be provided and installed within 48 hours of harvesting:
  - 1. Turfgrass Species: Bermudagrass Celebration (*Cynodon dactylon* v. Celebration)
  - 2. Anticipate Athletic fields to be playable by September 1, 2015
  - 3. Sprigging at a rate of 1,000 bu/acre
  - 4. Both Broadcast and Row Planting sprigging planting methods should be priced. Owner will decide on planting method with consultation from contractor.
  - 5. Irrigation should be scheduled and managed efficiently to ensure germination and establishment.
  - 6. Prior to planting sprigs, Phosphorus (0-48-0) should be applied at a rate of 2 lbs. per 1,000 sq. ft. to a depth of 4 to 6 inches.
  - 7. Ronstar (Oxidiazon) pre emergence herbicide should be applied at 3 lbs. active ingredient per acre for control of crabgrass and goose grass within 3 days of post planting
  - 8. Sprigging Fertilizer applications and a "grow in program" should be established by Matt Martin with the North Carolina State University Crop Science Department. **Contractor is to provide the fertilizer and grow in program specifications per Matt Martin to the New Hanover County Parks Department beforehand.**

9. Sprigged Fields should be monitored and treated for any pest and insects (army worms, mole crickets, fire ants, etc.) that will affect the sprigging establishment.
10. Mowing sprigged areas should begin in week 3 of 4 depending on growth rates.

## 2.4 INORGANIC SOIL AMENDMENTS

- A. Lime: ASTM C 602, agricultural liming material containing a minimum of 80 percent calcium carbonate equivalent and as follows:
  1. Class: T, with a minimum of 99 percent passing through No. 8 (2.36-mm) sieve and a minimum of 75 percent passing through No. 60 (0.25-mm) sieve.
  2. Class: O, with a minimum of 95 percent passing through No. 8 (2.36-mm) sieve and a minimum of 55 percent passing through No. 60 (0.25-mm) sieve.
  3. Provide lime in form of ground dolomitic limestone
- B. Sulfur: Granular, biodegradable, containing a minimum of 90 percent sulfur, and with a minimum of 99 percent passing through No. 6 (3.35-mm) sieve and a maximum of 10 percent passing through No. 40 (0.425-mm) sieve.
- C. Iron Sulfate: Granulated ferrous sulfate containing a minimum of 20 percent iron and 10 percent sulfur.
- D. Aluminum Sulfate: Commercial grade, unadulterated.
- E. Perlite: Horticultural perlite, soil amendment grade.
- F. Agricultural Gypsum: Minimum 90 percent calcium sulfate, finely ground with 90 percent passing through No. 50 (0.30-mm) sieve.
- G. Sand: Clean, washed, natural or manufactured, and free of toxic materials.
- H. Diatomaceous Earth: Calcined, 90 percent silica, with approximately 140 percent water absorption capacity by weight.
- I. Zeolites: Mineral clinoptilolite with at least 60 percent water absorption by weight.

## 2.5 ORGANIC SOIL AMENDMENTS

- A. Compost: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 7; moisture content 35 to 55 percent by weight; 100 percent passing through 1/2-inch (12.5-mm) sieve; soluble salt content of 5 to 10 decisiemens/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings; and as follows:
  1. Organic Matter Content: 50 to 60 percent of dry weight.
  2. Feedstock: Agricultural, food, or industrial residuals; biosolids; yard trimmings; or source-separated or compostable mixed solid waste.
- B. Sphagnum Peat: Partially decomposed sphagnum peat moss, finely divided or of granular texture, with a pH range of 3.4 to 4.8.

- C. Muck Peat: Partially decomposed moss peat, native peat, or reed-sedge peat, finely divided or of granular texture, with a pH range of 6 to 7.5, and having a water-absorbing capacity of 1100 to 2000 percent.
- D. Wood Derivatives: Decomposed, nitrogen-treated sawdust, ground bark, or wood waste; of uniform texture and free of chips, stones, sticks, soil, or toxic materials.
  - 1. In lieu of decomposed wood derivatives, mix partially decomposed wood derivatives with ammonium nitrate at a minimum rate of 0.15 lb/cu. ft. (2.4 kg/cu. m) of loose sawdust or ground bark, or with ammonium sulfate at a minimum rate of 0.25 lb/cu. ft. (4 kg/cu. m) of loose sawdust or ground bark.
- E. Manure: Well-rotted, unleached, stable or cattle manure containing not more than 25 percent by volume of straw, sawdust, or other bedding materials; free of toxic substances, stones, sticks, soil, weed seed, and material harmful to plant growth.

## 2.6 FERTILIZERS

- A. Fertilizers shall be applied to achieve the desired PH as outlined by the turf grass supplier. Soil testing and materials shall meet the desired Ph range for successful turf establishment, typically 6.5-7 but to be determined by sprig supplier.
- B. Bonemeal: Commercial, raw or steamed, finely ground; a minimum of 1 percent nitrogen and 10 percent phosphoric acid.
- C. Superphosphate: Commercial, phosphate mixture, soluble; a minimum of 20 percent available phosphoric acid.
- D. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:
  - 1. Composition: 1 lb/1000 sq. ft. (0.45 kg/92.9 sq. m) of actual nitrogen, 4 percent phosphorous, and 2 percent potassium, by weight.
  - 2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing laboratory.
- E. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:
  - 1. Composition: 20 percent nitrogen, 10 percent phosphorous, and 10 percent potassium, by weight.
  - 2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing laboratory.

## 2.7 PLANTING SOILS

- A. Planting Soil: Existing, native surface topsoil formed under natural conditions with the duff layer retained during excavation process and stockpiled on-site. Verify suitability of native

surface topsoil to produce viable planting soil. Clean soil of roots, plants, sod, stones, clay lumps, and other extraneous materials harmful to plant growth.

1. Supplement with ASTM D 5268 topsoil, with pH range of 6 to 7, a minimum of 10 percent organic material content; free of stones 1 inch (25 mm) or larger in any dimension and other extraneous materials harmful to plant growth when planting soil when quantities are insufficient.
2. For Playfield Soil Mix existing, native surface topsoil with appropriate combination of soil amendments listed under 2.2 and 2.3 necessary to achieve the performance specifications below:
  - a. 15% Topsoil (silt/native soil mix)
  - b. 85% Sand
3. Sand Base shall be all certified course sand
4. Supply complete information on all analysis / test methodologies and results; laboratory certifications, manufacturer's specifications, and agency approvals to the Architect prior to placement of soil mixtures. In addition, provide the Architect with thoroughly mixed sample of soil mixes for approval prior to placement. Landscape Contractor shall make modifications and improvements to soil mixes deemed necessary by the Architect to meet requirements specified here in before, and to ensure proper growing medium for plant material.
5. Planting mix shall have the following nutrients at the specified percent base saturation, to be determined by soil tests conducted by the Contractor:
  - a. Calcium: 55% - 80%
  - b. Magnesium: 10% - 30%
  - c. Potassium: 5% - 8%

## 2.8 MULCHES

- A. Straw Mulch: Provide air-dry, clean, mildew- and seed-free, salt hay or threshed straw of wheat, rye, oats, or barley.
- B. Fiber Mulch: Biodegradable, dyed-wood, cellulose-fiber mulch; nontoxic and free of plant-growth or germination inhibitors; with a maximum moisture content of 15 percent and a pH range of 4.5 to 6.5.
- C. Nonasphaltic Tackifier: Colloidal tackifier recommended by fiber-mulch manufacturer for slurry application; nontoxic and free of plant-growth or germination inhibitors.
- D. Asphalt Emulsion: ASTM D 977, Grade SS-1; nontoxic and free of plant-growth or germination inhibitors.

## 2.9 PESTICIDES

- A. General: Pesticide, registered and approved by EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as

required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction.

- B. Pre-Emergent Herbicide (Selective and Non-Selective): Effective for controlling the germination or growth of weeds within planted areas at the soil level directly below the mulch layer.
- C. Post-Emergent Herbicide (Selective and Non-Selective): Effective for controlling weed growth that has already germinated.

## 2.10 EROSION-CONTROL MATERIALS

- A. Erosion-Control Blankets: Biodegradable wood excelsior, straw, or coconut-fiber mat enclosed in a photodegradable plastic mesh. Include manufacturer's recommended steel wire staples, 6 inches (150 mm) long.
- B. Erosion-Control Fiber Mesh: Biodegradable burlap or spun-coir mesh, a minimum of 0.92 lb/sq. yd. (0.5 kg/sq. m), with 50 to 65 percent open area. Include manufacturer's recommended steel wire staples, 6 inches (150 mm) long.
- C. Erosion-Control Mats: Cellular, non-biodegradable slope-stabilization mats designed to isolate and contain small areas of soil over steeply sloped surface, of 3-inch (75-mm) 4-inch (100-mm) 6-inch (150-mm) nominal mat thickness. Include manufacturer's recommended anchorage system for slope conditions.
  - 1. Products: Subject to compliance with requirements, provide the following provide one of the following available products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Invisible Structures, Inc.; Slopetame 2.
    - b. Presto Products Company, a business of Alcoa; Geoweb.
    - c. Tenax Corporation - USA; Tenweb.
    - d. Insert manufacturer's name; product name or designation.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine areas to be planted for compliance with requirements and other conditions affecting performance.
  - 1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.
  - 2. Do not mix or place soils and soil amendments in frozen, wet, or muddy conditions.
  - 3. Suspend soil spreading, grading, and tilling operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.

4. Uniformly moisten excessively dry soil that is not workable and which is too dusty.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.
- C. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Architect and replace with new planting soil.

### 3.2 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities, trees, shrubs, and plantings from damage caused by planting operations.
  1. Protect adjacent and adjoining areas from hydroseeding and hydromulching overspray.
  2. Protect grade stakes set by others until directed to remove them.
- B. Install erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

### 3.3 TURF AREA PREPARATION

- A. Limit turf subgrade preparation to areas to be planted.
- B. Newly Graded Subgrades: Loosen subgrade to a minimum depth of 4 inches (100 mm). Remove stones larger than 1 inch (25 mm) in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.
  1. Thoroughly blend planting soil off-site before spreading or spread topsoil, apply soil amendments and fertilizer on surface, and thoroughly blend planting soil.
    - a. Delay mixing fertilizer with planting soil if planting will not proceed within a few days.
    - b. Mix lime with dry soil before mixing fertilizer.
  2. Spread playfield soil to a depth of 6 inches (100 mm) but not less than required to meet finish grades after light rolling and natural settlement. Do not spread if planting soil or subgrade is frozen, muddy, or excessively wet.
    - a. Spread approximately 1/2 the thickness of planting soil over loosened subgrade. Mix thoroughly. Spread remainder of planting soil.
    - b. Reduce elevation of planting soil to allow for soil thickness of sod.
- C. Finish Grading: Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Grade to within plus or minus 1/2 inch (13 mm) of finish elevation. Roll and rake, remove ridges, and fill depressions to meet finish grades. Limit finish grading to areas that can be planted in the immediate future.
- D. Moisten prepared area before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

- E. Before planting, obtain Architect's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

### 3.4 PREPARATION FOR EROSION-CONTROL MATERIALS

- A. Prepare area as specified in "Turf Area Preparation" Article.
- B. For erosion-control mats, install planting soil in two lifts, with second lift equal to thickness of erosion-control mats. Install erosion-control mat and fasten as recommended by material manufacturer.
- C. Fill cells of erosion-control mat with planting soil and compact before planting.
- D. For erosion-control blanket or mesh, install from top of slope, working downward, and as recommended by material manufacturer for site conditions. Fasten as recommended by material manufacturer.
- E. Moisten prepared area before planting if surface is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

### 3.5 SEEDING

- A. Sow seed with spreader or seeding machine. Do not broadcast or drop seed when wind velocity exceeds 5 mph (8 km/h). Evenly distribute seed by sowing equal quantities in two directions at right angles to each other.
  - 1. Do not use wet seed or seed that is moldy or otherwise damaged.
  - 2. Do not seed against existing trees. Limit extent of seed to outside edge of planting saucer.
- B. Sow seed at a total rate of 2 lb/1000 sq. ft. (0.9 kg/92.9 sq. m).
- C. Rake seed lightly into top 1/8 inch (3 mm) of soil, roll lightly, and water with fine spray.
- D. Protect seeded areas with slopes exceeding 1:4 with erosion-control blankets and 1:6 with erosion-control fiber mesh installed and stapled according to manufacturer's written instructions.
- E. Protect seeded areas with erosion-control mats where shown on Drawings; install and anchor according to manufacturer's written instructions.
- F. Protect seeded areas with slopes not exceeding 1:6 by spreading straw mulch. Spread uniformly at a minimum rate of 2 tons/acre (42 kg/92.9 sq. m) to form a continuous blanket 1-1/2 inches (38 mm) in loose thickness over seeded areas. Spread by hand, blower, or other suitable equipment.
  - 1. Anchor straw mulch by crimping into soil with suitable mechanical equipment.
  - 2. Bond straw mulch by spraying with asphalt emulsion at a rate of 10 to 13 gal./1000 sq. ft. (38 to 49 L/92.9 sq. m). Take precautions to prevent damage or staining of structures or other plantings adjacent to mulched areas. Immediately clean damaged or stained areas.

- G. Protect seeded areas from hot, dry weather or drying winds by applying compost mulch within 24 hours after completing seeding operations. Soak areas, scatter mulch uniformly to a thickness of 3/16 inch (4.8 mm), and roll surface smooth.

### 3.6 HYDROSEEDING

- A. Hydroseeding: Mix specified seed, fertilizer, and fiber mulch in water, using equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into homogeneous slurry suitable for hydraulic application.
  - 1. Mix slurry with fiber-mulch manufacturer's recommended tackifier.
  - 2. Apply slurry uniformly to all areas to be seeded in a two-step process. Apply first slurry coat at a rate so that mulch component is deposited at not less than 500-lb/acre (5.2-kg/92.9 sq. m) dry weight, and seed component is deposited at not less than the specified seed-sowing rate. Apply slurry cover coat of fiber mulch (hydromulching) at a rate of 1000 lb/acre (10.4 kg/92.9 sq. m).
  - 3. Protect seeded areas with slopes exceeding 1:6 per section 3.5
  - 4. Provide erosion control seeding as required by NCDENR Sediment and Erosion Control Specifications.

### 3.7 SODDING

- A. Lay sod within 24 hours of harvesting. Do not lay sod if dormant or if ground is frozen or muddy.
- B. Lay sod to form a solid mass with tightly fitted joints. Butt ends and sides of sod; do not stretch or overlap. Stagger sod strips or pads to offset joints in adjacent courses. Avoid damage to subgrade or sod during installation. Tamp and roll lightly to ensure contact with subgrade, eliminate air pockets, and form a smooth surface. Work sifted soil or fine sand into minor cracks between pieces of sod; remove excess to avoid smothering sod and adjacent grass.
  - 1. Lay sod across angle of slopes exceeding 1:3.
  - 2. Anchor sod on slopes exceeding 1:6 with wood pegs spaced as recommended by sod manufacturer but not less than 2 anchors per sod strip to prevent slippage.
- C. Saturate sod with fine water spray within two hours of planting. During first week after planting, water daily or more frequently as necessary to maintain moist soil to a minimum depth of 1-1/2 inches (38 mm) below sod.

### 3.8 SPRIGGING

- A. Plant freshly shredded sod sprigs in furrows 1-1/2 to 2 inches (38 to 50 mm) deep. Place individual sprigs with roots and portions of stem in moistened soil, 6 inches (150 mm) apart in rows 10 inches (250 mm) apart, and fill furrows without covering growing tips. Lightly roll and firm soil around sprigs after planting.

### 3.9 TURF MAINTENANCE

- A. Maintain and establish turf by watering, fertilizing, weeding, mowing, trimming, replanting, and performing other operations as required to establish healthy, viable turf. Roll, regrade, and replant bare or eroded areas and remulch to produce a uniformly smooth turf. Provide materials and installation the same as those used in the original installation.
1. Fill in as necessary soil subsidence that may occur because of settling or other processes. Replace materials and turf damaged or lost in areas of subsidence.
  2. In areas where mulch has been disturbed by wind or maintenance operations, add new mulch and anchor as required to prevent displacement.
  3. Apply treatments as required to keep turf and soil free of pests and pathogens or disease. Use integrated pest management practices whenever possible to minimize the use of pesticides and reduce hazards.
- B. Watering: Install and maintain temporary piping, hoses, and turf-watering equipment to convey water from sources and to keep turf uniformly moist to a depth of 4 inches (100 mm).
1. Schedule watering to prevent wilting, puddling, erosion, and displacement of seed or mulch. Lay out temporary watering system to avoid walking over muddy or newly planted areas.
  2. Water turf with fine spray at a minimum rate of 1 inch (25 mm) per week unless rainfall precipitation is adequate.
- C. Mow turf as soon as top growth is tall enough to cut. Repeat mowing to maintain specified height without cutting more than 1/3 of grass height. Remove no more than 1/3 of grass-leaf growth in initial or subsequent mowings. Do not delay mowing until grass blades bend over and become matted. Do not mow when grass is wet. Schedule initial and subsequent mowings to maintain the following grass height:
- D. Turf Postfertilization: Apply fertilizer after initial mowing and when grass is dry.
1. Use fertilizer that will provide actual nitrogen of at least 1 lb/1000 sq. ft. (0.45 kg/92.9 sq. m) to turf area.

### 3.10 SATISFACTORY TURF

- A. Turf installations shall meet the following criteria as determined by Architect:
1. Satisfactory Seeded Turf: At end of maintenance period, a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities, with coverage exceeding 90 percent over any 10 sq. ft. (0.92 sq. m) and bare spots not exceeding 5 by 5 inches (125 by 125 mm).
  2. Satisfactory Sodded Turf: At end of maintenance period, a healthy, well-rooted, even-colored, viable turf has been established, free of weeds, open joints, bare areas, and surface irregularities.
  3. Satisfactory Plugged Turf: At end of maintenance period, the required number of plugs has been established as well-rooted, viable patches of grass, and areas between plugs are

free of weeds and other undesirable vegetation with coverage exceeding 90 percent over any 10 sq. ft. (0.92 sq. m) and bare spots not exceeding 5 by 5 inches (125 by 125 mm).

4. Satisfactory Sprigged Turf: At end of maintenance period, the required number of sprigs has been established as well-rooted, viable plants, and areas between sprigs are free of weeds and other undesirable vegetation with coverage exceeding 90 percent over any 10 sq. ft. (0.92 sq. m) and bare spots not exceeding 5 by 5 inches (125 by 125 mm).
- B. Use specified materials to reestablish turf that does not comply with requirements and continue maintenance until turf is satisfactory.

### 3.11 PESTICIDE APPLICATION

- A. Apply pesticides and other chemical products and biological control agents in accordance with requirements of authorities having jurisdiction and manufacturer's written recommendations. Coordinate applications with Owner's operations and others in proximity to the Work. Notify Owner before each application is performed.
- B. Post-Emergent Herbicides (Selective and Non-Selective): Apply only as necessary to treat already-germinated weeds and in accordance with manufacturer's written recommendations.

### 3.12 CLEANUP AND PROTECTION

- A. Promptly remove soil and debris created by turf work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.
- B. Erect temporary fencing or barricades and warning signs as required to, protect newly planted areas from traffic. Maintain fencing and barricades throughout initial maintenance period and remove after plantings are established.
- C. Remove nondegradable erosion-control measures after grass establishment period.

END OF SECTION 02920

**PART 1 - GENERAL****1.1 SUMMARY**

- A. This Section includes the following:
  - 1. Trees.
  - 2. Shrubs.
  - 3. Topsoil and soil amendments.
  - 4. Fertilizers and mulches.
  - 5. Stakes and guys.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
  - 1. Division 31, Section "Site Clearing" for protection of existing trees and planting, topsoil stripping and stockpiling, and site clearing.
  - 2. Division 31, Section "Earthwork" for excavation, filling, rough grading, and subsurface aggregate drainage and drainage backfill.

**1.2 SUBMITTALS**

- A. Product certificates signed by manufacturers certifying that their products comply with specified requirements.
  - 1. Manufacturer's certified analysis for standard products.
  - 2. Analysis for other materials by a recognized laboratory made according to methods established by the Association of Official Analytical Chemists, where applicable.
- B. Product Data:
  - 1. Tree Staking and Guying material.
- C. Qualification data for firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and address of architects and owners, and other information specified.
- D. Planting schedule indicating anticipated dates and locations for each type of planting.
- E. Maintenance instructions recommending procedures to be established by Owner for maintenance of landscape work during entire year. Submit prior to Substantial Completion.
  - 1. Contractor shall continue to maintain plantings throughout the period for correction of the Work until required maintenance instructions have been submitted.

**1.3 QUALITY ASSURANCE**

- A. Installer Qualifications: Engage an experienced Installer who has completed landscaping work similar in material, design, and extent to that indicated for this Project and with a record of successful tree and shrub establishment.
  - 1. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on the Project site during times that tree and shrub planting is in progress.
- B. Provide quality, size, genus, species, and variety of trees and shrubs indicated, complying with applicable requirements of ANSI Z60.1 "American Standard for Nursery Stock."
  - 1. Selection of trees and shrubs purchased under allowances will be made by Architect, who will tag stock at their place of growth before they are prepared for transplanting.
- C. Topsoil Analysis: Furnish a soil analysis made by a qualified independent soil-testing agency stating percentages of organic matter, inorganic matter (silt, clay, and sand), deleterious material, pH, and mineral and plant-nutrient content of topsoil.
  - 1. Report suitability of topsoil for growth of applicable planting material. State recommended quantities of nitrogen, phosphorus, and potash nutrients and any limestone, aluminum sulfate, or other soil amendments to be added to produce a satisfactory topsoil.
- D. Measurements: Measure trees and shrubs according to ANSI Z60.1 with branches and trunks or canes in their normal position. Do not prune to obtain required sizes. Take caliper measurements 6 inches above ground for trees up to 4-inch caliper size, and 12 inches above ground for larger sizes. Measure main body of tree or shrub for height and spread; do not measure branches or roots tip-to-tip.
- E. Observation: Architect may observe trees and shrubs either at place of growth or at site before planting for compliance with requirements for genus, species, variety, size and quality. Architect retains right to observe trees and shrubs further for size and condition of balls and root systems, insects, injuries, and latent defects and to reject unsatisfactory or defective material at any time during progress of work. Remove rejected trees or shrubs immediately from Project site.

#### 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver freshly dug trees and shrubs. Do not prune before delivery, except as approved by Architect. Protect bark, branches, and root systems from sun scald, drying, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy natural shape. Provide protective covering during delivery. Do not drop trees and shrubs during delivery.
- B. Handle balled and burlapped stock by the root ball.
- C. Deliver trees and shrubs after preparations for planting have been completed and install immediately. If planting is delayed more than 6 hours after delivery, set trees and shrubs in shade, protect from weather and mechanical damage, and keep roots moist.
  - 1. Set balled stock on ground and cover ball with soil, peat moss, sawdust, or other acceptable material.
  - 2. Do not remove container-grown stock from containers before time of planting.
  - 3. Water root systems of trees and shrubs stored on site with a fine-mist spray. Water as often as necessary to maintain root systems in a moist condition.

#### 1.5 COORDINATION AND SCHEDULING

- A. Coordinate planting of trees and shrubs during normal planting seasons for such work in location of Project.
  - 1. Plant frost-tender trees and shrubs only after danger of frost is past or before frost season to allow establishment before first frost. Do not plant in frozen ground.
- B. Coordination with Lawns: Plant trees and shrubs after finish grades are established and before planting lawns, unless otherwise acceptable to Architect.
  - 1. When planting trees and shrubs after lawns, protect lawn areas and promptly repair damage caused by planting operations.

#### 1.6 WARRANTY

- A. General Warranty: The special warranty specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.
- B. Special Warranty: Warrant living trees and shrubs for a period of one year after date of Substantial Completion, against defects including death and unsatisfactory growth, except for defects resulting from lack of adequate maintenance, neglect, or abuse by Owner, abnormal weather conditions unusual for warranty period, or incidents which are beyond Contractor's control.
  - 1. Contractor shall be responsible for under this special warranty for defects resulting from lack of adequate maintenance or neglect by the Owner unless adequate maintenance instructions have been submitted as required.
- C. Remove and replace dead trees and shrubs immediately unless required to plant in the succeeding planting season.
- D. Replace trees and shrubs that are more than 25 percent dead or in an unhealthy condition at end of warranty period.
- E. A limit of one replacement of each tree and shrub will be required, except for losses or replacements due to failure to comply with requirements.

#### 1.7 MAINTENANCE

- A. Maintain trees and shrubs by pruning, cultivating, watering, weeding, fertilizing, restoring planting saucers, tightening and repairing stakes and guy supports, and resetting to proper grades or vertical position, as required to establish healthy, viable plantings. Spray as required to keep trees and shrubs free of insects and disease. Restore or replace damaged tree wrappings. Maintain trees and shrubs for the following period:
  - 1. Maintenance Period: 3 months following Substantial Completion.

### PART 2 - PRODUCTS

#### 2.1 TREE AND SHRUB MATERIAL

- A. General: Unless otherwise indicated, furnish nursery-grown trees and shrubs conforming to ANSI Z60.1, with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, vigorous stock free of disease, insects, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement.

- B. Grade: Provide trees and shrubs of sizes and grades conforming to ANSI Z60.1 for type of trees and shrubs required. Trees and shrubs of a larger size may be used if acceptable to Architect, with a proportionate increase in size of roots or balls.
- C. Label at least 1 tree and 1 shrub of each variety and caliper with a securely attached, waterproof tag bearing legible designation of botanical and common name.
  - 1. Where formal arrangements or consecutive order of trees or shrubs are shown, select stock for uniform height and spread, and number label to assure symmetry in planting.

## 2.2 SHADE AND FLOWERING TREES

- A. Shade Trees: Single-stem trees with straight trunk, well-balanced crown, and intact leader, of height and caliper indicated, conforming to ANSI Z60.1 for type of trees required.
  - 1. Branching Height: 1/3 to 1/2 of tree height.
- B. Small Trees: Small upright or spreading type, branched or pruned naturally according to species and type, and with relationship of caliper, height, and branching recommended by ANSI Z60.1, and stem form as follows:
  - 1. Form: Single stem.
- C. Provide balled and burlapped trees.
  - 1. Container-grown trees will be acceptable in lieu of balled and burlapped trees subject to meeting ANSI Z60.1 limitations for container stock.

## 2.3 DECIDUOUS SHRUBS

- A. Form and Size: Deciduous shrubs with not less than the minimum number of canes required by and measured according to ANSI Z60.1 for type, shape, and height of shrub.
- B. Provide balled and burlapped deciduous shrubs.
  - 1. Container-grown deciduous shrubs will be acceptable in lieu of balled and burlapped deciduous shrubs subject to meeting ANSI Z60.1 limitations for container stock.

## 2.4 CONIFEROUS EVERGREENS

- A. Form and Size: Normal-quality, well-balanced, coniferous evergreens, of type, height, spread, and shape required, conforming to ANSI Z60.1.
- B. Provide balled and burlapped coniferous evergreens.
  - 1. Container-grown coniferous evergreens will be acceptable in lieu of balled and burlapped coniferous evergreens subject to meeting ANSI Z60.1 limitations for container stock.

## 2.5 BROADLEAF EVERGREENS

- A. Form and Size: Normal-quality, well-balanced, broadleaf evergreens, of type, height, spread, and shape required, conforming to ANSI Z60.1.
- B. Provide balled and burlapped broadleaf evergreens.
  - 1. Container-grown broadleaf evergreens will be acceptable in lieu of balled and burlapped broadleaf evergreens subject to meeting ANSI Z60.1 limitations for container stock.

## 2.6 BALLED AND BURLAPPED STOCK

- A. Provide trees and shrubs dug with firm, natural ball of earth in which they are grown.
- B. Ball Size: Not less than diameter and depth recommended by ANSI Z60.1 for type and size of tree or shrub required. Increase ball size or modify ratio of depth to diameter to encompass enough fibrous and feeding-root system necessary for full recovery of trees and shrubs.
- C. Wrap, tie, and rigidly support earth ball as recommended by ANSI Z60.1 for size of balls required. Drum-lace balls with a diameter of 30 inches or greater.

## 2.7 CONTAINER-GROWN STOCK

- A. Provide healthy, vigorous, well-rooted trees or shrubs established in container. Provide balled and burlapped stock when required trees or shrubs exceed maximum size recommended by ANSI Z60.1 for container-grown stock.
  - 1. Established container stock is defined as a tree or shrub transplanted into container and grown in container long enough to develop new fibrous roots, so that root mass will retain its shape and hold together when removed from container.

- B. Containers: Rigid containers that will hold ball shape and protect root mass during shipping. Provide trees and shrubs established in containers of not less than minimum sizes recommended by ANSI Z60.1 for kind, type, and size of trees and shrubs required.

## 2.8 TOPSOIL

- A. Topsoil: ASTM D 5268, fertile, friable, naturally loamy, pH range of 5.5 to 7, 4 percent organic material minimum, free of stones 1 inch or larger in any dimension, and other extraneous materials harmful to plant growth.
  - 1. Topsoil Source: Amend existing surface soil to produce topsoil. Supplement with imported topsoil when required.

## 2.9 SOIL AMENDMENTS

- A. Lime: ASTM C 602, Class T, agricultural limestone containing a minimum 80 percent calcium carbonate equivalent, with a minimum 99 percent passing a No. 8 sieve and a minimum 75 percent passing a No. 60 sieve.
  - 1. Provide lime in the form of dolomitic limestone.
- B. Aluminum Sulfate: Commercial grade, unadulterated.
- C. Sand: Clean, washed, natural or manufactured sand, free of toxic materials.
- D. Perlite: Horticultural perlite, soil amendment grade.
- E. Peat Humus: Finely divided or granular texture, with a pH range of 6 to 7.0, composed of partially decomposed moss peat (other than sphagnum), peat humus, or reed-sedge peat.
- F. Peat Humus: For acid-tolerant trees and shrubs, provide moss peat with a pH range of 3.2 to 4.5, coarse fibrous texture, medium-divided sphagnum moss peat or reed-sedge peat.
- G. Manure: Well-rotted, unleached stable or cattle manure containing not more than 25 percent by volume of straw, sawdust, or other bedding materials; free of toxic substances, stones, sticks, soil, weed seed, and material harmful to plant growth.
- H. Herbicides: EPA registered and approved, of type recommended by manufacturer.
- I. Water: Potable.

## 2.10 FERTILIZER

- A. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea-form, phosphorous, and potassium in the following composition:
  - 1. Composition: 5 percent nitrogen, 10 percent phosphorous, and 5 percent potassium, by weight.
- B. Slow-Release Fertilizer: Granular fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:
  - 1. Composition: 5 percent nitrogen, 10 percent phosphorous, and 5 percent potassium, by weight.

## 2.11 MULCHES

- A. Organic Mulch: Organic mulch, free from deleterious materials and suitable as a top dressing of trees and shrubs, consisting of the following:
  - 1. Type: Contractor shall verify with owners representative type of mulch to be used; if no preference, mulch shall be natural hardwood mulch uniform in color.

## 2.12 STAKES AND GUYS

- A. Upright and Guy Stakes: Rough-sawn, sound, new hardwood, or un-treated softwood, free of knots, holes, cross grain, and other defects, 2 by 2 inches by length indicated, pointed at one end.
- B. Tree Staking and Guying Material: Flat woven, nylon or polypropylene fabric, 3/4 inch wide, minimum 900 lb breaking strength. Color: White.

## 2.13 MISCELLANEOUS MATERIALS

- A. Antidesiccant: Water-insoluble emulsion, permeable moisture retarder, film forming, for trees and shrubs. Deliver in original, sealed, and fully labeled containers and mix according to manufacturer's instructions.

**PART 3 - EXECUTION****3.1 EXAMINATION**

- A. Examine areas to receive trees and shrubs for compliance with requirements and for conditions affecting performance of work of this Section. Do not proceed with installation until unsatisfactory conditions have been corrected.

**3.2 PREPARATION**

- A. Lay out individual tree and shrub locations and areas for multiple plantings. Stake locations, outline areas, adjust locations when requested, and obtain Architect's acceptance of layout before planting. Make minor adjustments as may be required.

**3.3 PLANTING SOIL PREPARATION**

- A. Before mixing, clean topsoil of roots, plants, sod, stones, clay lumps, and other extraneous materials harmful to plant growth.
- B. Mix soil amendments and fertilizers with topsoil at rates indicated. Delay mixing fertilizer if planting does not follow placing of planting soil within a few days.
  - 1. A "Planting Soil Amendments Schedule" is included at the end of this Section.
- C. For tree pit and trench backfill, mix planting soil before backfilling and stockpile at site.

**3.4 EXCAVATION**

- A. Pits and Trenches: Excavate with vertical sides and with bottom of excavation slightly raised at center to assist drainage. Loosen hard subsoil in bottom of excavation.
  - 1. Balled and Burlapped Trees and Shrubs: Excavate approximately 1-1/2 times as wide as ball diameter and equal to ball depth, plus the following setting layer depth:
    - a. Setting Layer: Allow 9 inches of planting soil.
  - 2. Container-Grown Trees and Shrubs: Excavate to container width and depth, plus the following setting-layer depth:
    - a. Setting Layer: Allow 6 inches of planting soil.
  - 3. Where drain tile is shown or required under planted areas, excavate to top of porous backfill over tile.
- B. Dispose of subsoil removed from landscape excavations. Do not mix with planting soil or use as backfill.
- C. Obstructions: Notify Architect if unexpected rock or obstructions detrimental to trees or shrubs are encountered in excavations.
  - 1. Hardpan Layer: Drill 6-inch- diameter holes into free-draining strata or to a depth of 10 feet, whichever is less, and backfill with free-draining material.
- D. Drainage: Notify Architect if subsoil conditions evidence unexpected water seepage or retention in tree or shrub pits.
- E. Fill excavations with water and allow to percolate out, before placing setting layer and positioning trees and shrubs.

**3.5 PLANTING TREES AND SHRUBS**

- A. Set balled and burlapped stock plumb and in center of pit or trench with top of ball raised above adjacent finish grades as indicated.
  - 1. Place stock on setting layer of compacted planting soil.
  - 2. Remove burlap and wire baskets from tops of balls and partially from sides, but do not remove from under balls. Remove pallets, if any, before setting. Do not use planting stock if ball is cracked or broken before or during planting operation.
  - 3. Place backfill around ball in layers, tamping to settle backfill and eliminate voids and air pockets. When pit is approximately 1/2 backfilled, water thoroughly before placing remainder of backfill. Repeat watering until no more is absorbed. Water again after placing and tamping final layer of backfill.
- B. Set container-grown stock plumb and in center of pit or trench with top of ball raised above adjacent finish grades as indicated.
  - 1. Carefully remove containers so as not to damage root balls.
  - 2. Place stock on setting layer of compacted planting soil.
  - 3. Place backfill around ball in layers, tamping to settle backfill and eliminate voids and air pockets. When pit is approximately 1/2 backfilled, water thoroughly before placing remainder of backfill. Repeat watering until no more is absorbed. Water again after placing and tamping final layer of backfill.

SECTION 311000 - SITE CLEARING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Protecting existing vegetation to remain.
2. Removing existing vegetation.
3. Clearing and grubbing.
4. Stripping and stockpiling topsoil.
5. Removing above- and below-grade site improvements.
6. Disconnecting, capping, or sealing site utilities.
7. Temporary erosion and sedimentation control.

1.2 MATERIAL OWNERSHIP

- A. Except for materials indicated to be stockpiled or otherwise remain Owner's property, cleared materials shall become Contractor's property and shall be removed from Project site.

1.3 FIELD CONDITIONS

- A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.
1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
  2. Provide alternate routes around closed or obstructed trafficways if required by Owner or authorities having jurisdiction.
- B. Utility Locator Service: Notify utility locator service for area where Project is located before site clearing.
- C. Do not commence site clearing operations until temporary erosion- and sedimentation-control and plant-protection measures are in place.
- D. Tree- and Plant-Protection Zones: Protect according to landscape plan.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Satisfactory Soil Material: Requirements for satisfactory soil material are specified in Section 312000 "Earth Moving."

1. Obtain approved borrow soil material off-site when satisfactory soil material is not available on-site.

### PART 3 - EXECUTION

#### 3.1 PREPARATION

- A. Protect and maintain benchmarks and survey control points from disturbance during construction.
- B. Verify that trees, shrubs, and other vegetation to remain or to be relocated have been flagged and that protection zones have been identified and enclosed according to requirements in Section 015639 "Temporary Tree and Plant Protection."
- C. Protect existing site improvements to remain from damage during construction.
  1. Restore damaged improvements to their original condition, as acceptable to Owner.

#### 3.2 TEMPORARY EROSION AND SEDIMENTATION CONTROL

- A. Provide temporary erosion- and sedimentation-control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to erosion- and sedimentation-control Drawings and requirements of authorities having jurisdiction.
- B. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.
- C. Inspect, maintain, and repair erosion- and sedimentation-control measures during construction until permanent vegetation has been established.
- D. Remove erosion and sedimentation controls, and restore and stabilize areas disturbed during removal.

#### 3.3 EXISTING UTILITIES

- A. Locate, identify, disconnect, and seal or cap utilities indicated to be removed or abandoned in place.
  1. Arrange with utility companies to shut off indicated utilities.
- B. Interrupting Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others, unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:
  1. Notify Engineer not less than two days in advance of proposed utility interruptions.
  2. Do not proceed with utility interruptions without Engineer's written permission.

### 3.4 CLEARING AND GRUBBING

- A. Remove obstructions, trees, shrubs, and other vegetation to permit installation of new construction.
  - 1. Grind down stumps and remove roots larger than 3 inches (75 mm) in diameter, obstructions, and debris to a depth of 18 inches (450 mm) below exposed subgrade.
  - 2. Use only hand methods or air spade for grubbing within protection zones.
- B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.
  - 1. Place fill material in horizontal layers not exceeding a loose depth of 8 inches (200 mm), and compact each layer to a density equal to adjacent original ground.

### 3.5 TOPSOIL STRIPPING

- A. Remove sod and grass before stripping topsoil.
- B. Strip topsoil to depth of 6 inches (150 mm) in a manner to prevent intermingling with underlying subsoil or other waste materials.
- C. Stockpile topsoil away from edge of excavations without intermixing with subsoil or other materials. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust and erosion by water.

### 3.6 SITE IMPROVEMENTS

- A. Remove existing above- and below-grade improvements as indicated and necessary to facilitate new construction.

### 3.7 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off Owner's property.
- B. Separate recyclable materials produced during site clearing from other nonrecyclable materials. Store or stockpile without intermixing with other materials, and transport them to recycling facilities. Do not interfere with other Project work.

END OF SECTION 311000

## SECTION 312000 - EARTH MOVING

## PART 1 - GENERAL

## 1.1 SUMMARY

## A. Section Includes:

1. Excavating and filling for rough grading the Site.
2. Preparing subgrades for [slabs-on-grade] [walks] [pavements] [turf and grasses] [and] [plants].
3. Excavating and backfilling for buildings and structures.
4. Drainage course for concrete slabs-on-grade.
5. Subbase course for concrete [walks] [pavements].
6. Subbase course[ and base course] for asphalt paving.
7. Excavating and backfilling trenches for utilities and pits for buried utility structures.

## 1.2 DEFINITIONS

## A. Backfill: Soil material used to fill an excavation.

1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
2. Final Backfill: Backfill placed over initial backfill to fill a trench.

## B. Base Course: Aggregate layer placed between the subbase course and hot-mix asphalt paving.

## C. Bedding Course: Aggregate layer placed over the excavated subgrade in a trench before laying pipe.

## D. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.

## E. Drainage Course: Aggregate layer supporting the slab-on-grade that also minimizes upward capillary flow of pore water.

## F. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.

1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by Engineer. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
2. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Engineer. Unauthorized excavation, as well as remedial work directed by Architect, shall be without additional compensation.

## G. Fill: Soil materials used to raise existing grades.

- H. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.
- I. Subbase Course: Aggregate layer placed between the subgrade and base course for hot-mix asphalt pavement, or aggregate layer placed between the subgrade and a cement concrete pavement or a cement concrete or hot-mix asphalt walk.
- J. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.
- K. Utilities: On-site underground pipes, conduits, ducts, and cables as well as underground services within buildings.

### 1.3 INFORMATIONAL SUBMITTALS

- A. Material test reports.

### 1.4 FIELD CONDITIONS

- A. Utility Locator Service: Notify utility locator service for area where Project is located before beginning earth-moving operations.
- B. Do not commence earth-moving operations until plant-protection measures specified in landscape plan are in place.

## PART 2 - PRODUCTS

### 2.1 SOIL MATERIALS

- A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.
- B. Satisfactory Soils: Soil Classification Groups GW, GP, GM, SW, SP, and SM according to ASTM D 2487 Groups A-1, A-2-4, A-2-5, and A-3 according to AASHTO M 145, or a combination of these groups; free of rock or gravel larger than 3 inches (75 mm) in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.
- C. Unsatisfactory Soils: Soil Classification Groups GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D 2487 Groups A-2-6, A-2-7, A-4, A-5, A-6, and A-7 according to AASHTO M 145, or a combination of these groups.
  - 1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.
- D. Subbase Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940/D 2940M; with at least 90 percent passing a 1-1/2-inch (37.5-mm) sieve and not more than 12 percent passing a No. 200 (0.075-mm) sieve.

- E. Base Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 294/D 2940M 0; with at least 95 percent passing a 1-1/2-inch (37.5-mm) sieve and not more than 8 percent passing a No. 200 (0.075-mm) sieve.
- F. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940/D 2940M; with at least 90 percent passing a 1-1/2-inch (37.5-mm) sieve and not more than 12 percent passing a No. 200 (0.075-mm) sieve.
- G. Bedding Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940/D 2940M; except with 100 percent passing a 1-inch (25-mm) sieve and not more than 8 percent passing a No. 200 (0.075-mm) sieve.
- H. Drainage Course: Narrowly graded mixture of crushed stone, or crushed or uncrushed gravel; ASTM D 448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2-inch (37.5-mm) sieve and zero to 5 percent passing a No. 8 (2.36-mm) sieve.

## 2.2 ACCESSORIES

- A. Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, 6 inches (150 mm) wide and 4 mils (0.1 mm) thick, continuously inscribed with a description of the utility; colored to comply with local practice or requirements of authorities having jurisdiction.
- B. Detectable Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches (150 mm) wide and 4 mils (0.1 mm) thick, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches (750 mm) deep; colored to comply with local practice or requirements of authorities having jurisdiction.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth-moving operations.
- B. Protect and maintain erosion and sedimentation controls during earth-moving operations.
- C. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.

### 3.2 EXCAVATION, GENERAL

- A. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil

materials, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions.

1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.

### 3.3 EXCAVATION FOR STRUCTURES

- A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch (25 mm). If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.
  1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.
  2. Pile Foundations: Stop excavations 6 to 12 inches (150 to 300 mm) above bottom of pile cap before piles are placed. After piles have been driven, remove loose and displaced material. Excavate to final grade, leaving solid base to receive concrete pile caps.
  3. Excavation for Underground Tanks, Basins, and Mechanical or Electrical Utility Structures: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 1 inch (25 mm). Do not disturb bottom of excavations intended as bearing surfaces.
- B. Excavations at Edges of Tree- and Plant-Protection Zones:
  1. Excavate by hand or with an air spade to indicated lines, cross sections, elevations, and subgrades. If excavating by hand, use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.
  2. Cut and protect roots according to landscape requirements.

### 3.4 EXCAVATION FOR WALKS AND PAVEMENTS

- A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

### 3.5 EXCAVATION FOR UTILITY TRENCHES

- A. Excavate trenches to indicated gradients, lines, depths, and elevations.
- B. Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches (300 mm) higher than top of pipe or conduit unless otherwise indicated.
  1. Clearance: 12 inches (300 mm) each side of pipe or conduit As indicated.
- C. Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape subgrade to provide continuous support for bells, joints, and barrels of

pipes and for joints, fittings, and bodies of conduits. Remove projecting stones and sharp objects along trench subgrade.

1. Excavate trenches 6 inches (150 mm) deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.

D. Trenches in Tree- and Plant-Protection Zones:

1. Hand-excavate to indicated lines, cross sections, elevations, and subgrades. Use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.
2. Do not cut main lateral roots or taproots; cut only smaller roots that interfere with installation of utilities.
3. Cut and protect roots according to landscape requirements.

### 3.6 SUBGRADE INSPECTION

- A. Proof-roll subgrade below roadways and parking lot pavements with a pneumatic-tired dump truck to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.
- B. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Architect, without additional compensation.

### 3.7 UNAUTHORIZED EXCAVATION

- A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill, with 28-day compressive strength of 2500 psi (17.2 MPa), may be used when approved by Architect.
  1. Fill unauthorized excavations under other construction, pipe, or conduit as directed by Architect.

### 3.8 STORAGE OF SOIL MATERIALS

- A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
  1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

### 3.9 UTILITY TRENCH BACKFILL

- A. Place backfill on subgrades free of mud, frost, snow, or ice.

- B. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.
- C. Initial Backfill: Place and compact initial backfill of subbase material, free of particles larger than 1 inch (25 mm) in any dimension, to a height of 12 inches (300 mm) over the pipe or conduit.
  - 1. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.
- D. Final Backfill: Place and compact final backfill of satisfactory soil to final subgrade elevation.
- E. Warning Tape: Install warning tape directly above utilities, 12 inches (300 mm) below finished grade, except 6 inches (150 mm) below subgrade under pavements and slabs.

### 3.10 SOIL FILL

- A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.
- B. Place and compact fill material in layers to required elevations as follows:
  - 1. Under grass and planted areas, use satisfactory soil material.
  - 2. Under walks and pavements, use satisfactory soil material.
  - 3. Under steps and ramps, use engineered fill.
  - 4. Under building slabs, use engineered fill.
  - 5. Under footings and foundations, use engineered fill.

### 3.11 SOIL MOISTURE CONTROL

- A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.
  - 1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
  - 2. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

### 3.12 COMPACTION OF SOIL BACKFILLS AND FILLS

- A. Place backfill and fill soil materials in layers not more than 8 inches (200 mm) in loose depth for material compacted by heavy compaction equipment and not more than 4 inches (100 mm) in loose depth for material compacted by hand-operated tampers.
- B. Place backfill and fill soil materials evenly on all sides of structures to required elevations and uniformly along the full length of each structure.

- C. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D 698:
1. Under structures, building slabs, steps, and pavements, scarify and recompact top 12 inches (300 mm) of existing subgrade and each layer of backfill or fill soil material at 95 percent.
  2. Under walkways, scarify and recompact top 6 inches (150 mm) below subgrade and compact each layer of backfill or fill soil material at 92 percent.
  3. Under turf or unpaved areas, scarify and recompact top 6 inches (150 mm) below subgrade and compact each layer of backfill or fill soil material at 85 percent.
  4. For utility trenches, compact each layer of initial and final backfill soil material at 90 percent.

### 3.13 GRADING

- A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
- B. Site Rough Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to elevations required to achieve indicated finish elevations, within the following subgrade tolerances:
1. Turf or Unpaved Areas: Plus or minus 1 inch (25 mm).
  2. Walks: Plus or minus 1 inch (25 mm).
  3. Pavements: Plus or minus 1/2 inch (13 mm).

### 3.14 SUBBASE AND BASE COURSES UNDER PAVEMENTS AND WALKS

- A. Place subbase course and base course on subgrades free of mud, frost, snow, or ice.
- B. On prepared subgrade, place subbase course and base course under pavements and walks as follows:
1. Shape subbase course and base course to required crown elevations and cross-slope grades.
  2. Place subbase course and base course that exceeds 6 inches (150 mm) in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches (150 mm) thick or less than 3 inches (75 mm) thick.
  3. Compact subbase course and base course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D 698.

### 3.15 DRAINAGE COURSE UNDER CONCRETE SLABS-ON-GRADE

- A. Place drainage course on subgrades free of mud, frost, snow, or ice.
- B. On prepared subgrade, place and compact drainage course under cast-in-place concrete slabs-on-grade as follows:

1. Place drainage course that exceeds 6 inches (150 mm) in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches (150 mm) thick or less than 3 inches (75 mm) thick.
2. Compact each layer of drainage course to required cross sections and thicknesses to not less than 95 percent of maximum dry unit weight according to ASTM D 698.

### 3.16 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a qualified special inspector to perform inspections:
- B. Testing Agency: Owner will engage a qualified geotechnical engineering testing agency to perform tests and inspections.
- C. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.
- D. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil materials to depth required; recompact and retest until specified compaction is obtained.

### 3.17 PROTECTION

- A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
- B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
- C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
  1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

### 3.18 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

END OF SECTION 312000

## SECTION 312319 - DEWATERING

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section includes construction dewatering.

## 1.2 FIELD CONDITIONS

- A. Survey Work: Engage a qualified land surveyor or professional engineer to survey adjacent existing buildings, structures, and site improvements; establish exact elevations at fixed points to act as benchmarks. Clearly identify benchmarks and record existing elevations.

## PART 2 - PRODUCTS

## 2.1 PERFORMANCE REQUIREMENTS

- A. Dewatering Performance: Design, furnish, install, test, operate, monitor, and maintain dewatering system of sufficient scope, size, and capacity to control hydrostatic pressures and to lower, control, remove, and dispose of ground water and permit excavation and construction to proceed on dry, stable subgrades.

## PART 3 - EXECUTION

## 3.1 PREPARATION

- A. Provide temporary grading to facilitate dewatering and control of surface water.
- B. Protect and maintain temporary erosion and sedimentation controls, which are specified in Section 311000 "Site Clearing," during dewatering operations.

## 3.2 INSTALLATION

- A. Install dewatering system utilizing wells, well points, or similar methods complete with pump equipment, standby power and pumps, filter material gradation, valves, appurtenances, water disposal, and surface-water controls.
  - 1. Space well points or wells at intervals required to provide sufficient dewatering.
  - 2. Use filters or other means to prevent pumping of fine sands or silts from the subsurface.
- B. Place dewatering system into operation to lower water to specified levels before excavating below ground-water level.

- C. Provide standby equipment on-site, installed and available for immediate operation, to maintain dewatering on continuous basis if any part of system becomes inadequate or fails.

### 3.3 OPERATION

- A. Operate system continuously until drains, sewers, and structures have been constructed and fill materials have been placed or until dewatering is no longer required.
- B. Operate system to lower and control ground water to permit excavation, construction of structures, and placement of fill materials on dry subgrades. Drain water-bearing strata above and below bottom of foundations, drains, sewers, and other excavations.
  - 1. Do not permit open-sump pumping that leads to loss of fines, soil piping, subgrade softening, and slope instability.
  - 2. Reduce hydrostatic head in water-bearing strata below subgrade elevations of foundations, drains, sewers, and other excavations.
  - 3. Maintain piezometric water level a minimum of 24 inches (600 mm) below bottom of excavation.
- C. Remove dewatering system from Project site on completion of dewatering. Plug or fill well holes with sand or cut off and cap wells a minimum of 36 inches (900 mm) below overlying construction.

### 3.4 FIELD QUALITY CONTROL

- A. Survey-Work Benchmarks: Resurvey benchmarks regularly during dewatering and maintain an accurate log of surveyed elevations for comparison with original elevations. Promptly notify Architect if changes in elevations occur or if cracks, sags, or other damage is evident in adjacent construction.

END OF SECTION 312319

## SECTION 315000 - EXCAVATION SUPPORT AND PROTECTION

## PART 1 - GENERAL

## 1.1 SUMMARY

- A. Section includes temporary excavation support and protection systems.

## 1.2 INFORMATIONAL SUBMITTALS

- A. Contractor Calculations: For excavation support and protection system. Include analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- B. Record Drawings: Identify locations and depths of capped utilities, abandoned-in-place support and protection systems, and other subsurface structural, electrical, or mechanical conditions.

## 1.3 FIELD CONDITIONS

- A. Survey Work: Engage a qualified land surveyor or professional engineer to survey adjacent existing buildings, structures, and site improvements; establish exact elevations at fixed points to act as benchmarks. Clearly identify benchmarks and record existing elevations.

## PART 2 - PRODUCTS

## 2.1 PERFORMANCE REQUIREMENTS

- A. Provide, design, monitor, and maintain excavation support and protection system capable of supporting excavation sidewalls and of resisting earth and hydrostatic pressures and superimposed and construction loads.
  - 1. Design excavation support and protection system, including comprehensive engineering analysis by a qualified professional engineer.

## PART 3 - EXECUTION

## 3.1 SOLDIER PILES AND LAGGING

- A. Install steel soldier piles before starting excavation. Extend soldier piles below excavation grade level to depths adequate to prevent lateral movement. Space soldier piles at regular intervals not to exceed allowable flexural strength of wood lagging. Accurately align exposed faces of flanges to vary not more than 2 inches (50 mm) from a horizontal line and not more than 1:120 out of vertical alignment.

- B. Install wood lagging within flanges of soldier piles as excavation proceeds. Trim excavation as required to install lagging. Fill voids behind lagging with soil, and compact.
- C. Install wales horizontally at locations indicated on Drawings and secure to soldier piles.

### 3.2 SHEET PILING

- A. Before starting excavation, install one-piece sheet piling lengths and tightly interlock vertical edges to form a continuous barrier.
- B. Accurately place the piling, using templates and guide frames unless otherwise recommended in writing by the sheet piling manufacturer. Limit vertical offset of adjacent sheet piling to 60 inches (1500 mm). Accurately align exposed faces of sheet piling to vary not more than 2 inches (50 mm) from a horizontal line and not more than 1:120 out of vertical alignment.
- C. Cut tops of sheet piling to uniform elevation at top of excavation.

### 3.3 TIEBACKS

- A. Drill, install, grout, and tension tiebacks.
- B. Test load-carrying capacity of each tieback and replace and retest deficient tiebacks.
  - 1. Have test loading observed by a qualified professional engineer responsible for design of excavation support and protection system.
- C. Maintain tiebacks in place until permanent construction is able to withstand lateral earth and hydrostatic pressures.

### 3.4 BRACING

- A. Bracing: Locate bracing to clear columns, floor framing construction, and other permanent work. If necessary to move brace, install new bracing before removing original brace.
  - 1. Do not place bracing where it will be cast into or included in permanent concrete work unless otherwise approved by Architect.
  - 2. Install internal bracing if required to prevent spreading or distortion of braced frames.
  - 3. Maintain bracing until structural elements are supported by other bracing or until permanent construction is able to withstand lateral earth and hydrostatic pressures.

### 3.5 FIELD QUALITY CONTROL

- A. Survey-Work Benchmarks: Resurvey benchmarks regularly during installation of excavation support and protection systems, excavation progress, and for as long as excavation remains open. Maintain an accurate log of surveyed elevations and positions for comparison with original elevations and positions. Promptly notify Architect if changes in elevations or positions occur or if cracks, sags, or other damage is evident in adjacent construction.

3.6 REMOVAL AND REPAIRS

- A. Remove excavation support and protection systems when construction has progressed sufficiently to support excavation and earth and hydrostatic pressures. Remove in stages to avoid disturbing underlying soils and rock or damaging structures, pavements, facilities, and utilities.
  - 1. Remove excavation support and protection systems to a minimum depth of 48 inches (1200 mm) below overlying construction and abandon remainder.

END OF SECTION 315000

SECTION 321216 - ASPHALT PAVING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Cold milling of existing asphalt pavement.
2. Hot-mix asphalt patching.
3. Hot-mix asphalt paving.
4. Hot-mix asphalt overlay.
5. Asphalt curbs.

B. Related Requirements:

1. Section 312000 "Earth Moving" for subgrade preparation, fill material, unbound-aggregate subbase and base courses, and aggregate pavement shoulders.
2. Section 321373 "Concrete Paving Joint Sealants" for joint sealants and fillers at pavement terminations.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.3 INFORMATIONAL SUBMITTALS

A. Material Certificates: For each paving material.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: A paving-mix manufacturer registered with and approved by NCDOT.

B. Regulatory Requirements: Comply with materials, workmanship, and other applicable requirements of NCDOT for asphalt paving work.

1. Measurement and payment provisions and safety program submittals included in standard specifications do not apply to this Section.

## PART 2 - PRODUCTS

### 2.1 AGGREGATES

- A. Coarse Aggregate: ASTM D 692/D 692M, sound; angular crushed stone, crushed gravel, or cured, crushed blast-furnace slag.
- B. Fine Aggregate: ASTM D 1073 or AASHTO M 29, sharp-edged natural sand or sand prepared from stone, gravel, cured blast-furnace slag, or combinations thereof.
- C. Mineral Filler: ASTM D 242/D 242M or AASHTO M 17, rock or slag dust, hydraulic cement, or other inert material.

### 2.2 ASPHALT MATERIALS

- A. Per Plan

### 2.3 AUXILIARY MATERIALS

- A. Recycled Materials for Hot-Mix Asphalt Mixes: Reclaimed asphalt pavement; reclaimed, unbound-aggregate base material; and recycled tires, asphalt shingles, or glass from sources and gradations that have performed satisfactorily in previous installations, equal to performance of required hot-mix asphalt paving produced from all new materials.
- B. Herbicide: Commercial chemical for weed control, registered by the EPA, and not classified as "restricted use" for locations and conditions of application. Provide in granular, liquid, or wettable powder form.

## PART 3 - EXECUTION

### 3.1 PATCHING

- A. Asphalt Pavement: Saw cut perimeter of patch and excavate existing pavement section to sound base. Excavate rectangular or trapezoidal patches, extending 12 inches (300 mm) into perimeter of adjacent sound pavement, unless otherwise indicated. Cut excavation faces vertically. Remove excavated material. Recompact existing unbound-aggregate base course to form new subgrade.
- B. Portland Cement Concrete Pavement: Break cracked slabs and roll as required to reseat concrete pieces firmly.
  - 1. Remove disintegrated or badly cracked pavement. Excavate rectangular or trapezoidal patches, extending into perimeter of adjacent sound pavement, unless otherwise indicated. Cut excavation faces vertically. Recompact existing unbound-aggregate base course to form new subgrade.

- C. Tack Coat: Before placing patch material, apply tack coat uniformly to vertical asphalt surfaces abutting the patch. Apply at a rate of 0.05 to 0.15 gal./sq. yd. (0.2 to 0.7 L/sq. m).
  - 1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
  - 2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.
- D. Placing Patch Material: Fill excavated pavement areas with hot-mix asphalt base mix for full thickness of patch and, while still hot, compact flush with adjacent surface.

### 3.2 SURFACE PREPARATION

- A. General: Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces. Ensure that prepared subgrade is ready to receive paving.
- B. Proof-roll subgrade below pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.
- C. Herbicide Treatment: Apply herbicide according to manufacturer's recommended rates and written application instructions. Apply to dry, prepared subgrade or surface of compacted-aggregate base before applying paving materials.
- D. Tack Coat: Apply uniformly to surfaces of existing pavement at a rate of 0.05 to 0.15 gal./sq. yd. (0.2 to 0.7 L/sq. m).
  - 1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
  - 2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillages and clean affected surfaces.

### 3.3 PLACING HOT-MIX ASPHALT

- A. Machine place hot-mix asphalt on prepared surface, spread uniformly, and strike off. Place asphalt mix by hand in areas inaccessible to equipment in a manner that prevents segregation of mix. Place each course to required grade, cross section, and thickness when compacted.
  - 1. Spread mix at a minimum temperature of 250 deg F (121 deg C).
  - 2. Regulate paver machine speed to obtain smooth, continuous surface free of pulls and tears in asphalt-paving mat.
- B. Place paving in consecutive strips not less than 10 feet (3 m) wide unless infill edge strips of a lesser width are required.
- C. Promptly correct surface irregularities in paving course behind paver. Use suitable hand tools to remove excess material forming high spots. Fill depressions with hot-mix asphalt to prevent segregation of mix; use suitable hand tools to smooth surface.

### 3.4 JOINTS

- A. Construct joints to ensure a continuous bond between adjoining paving sections. Construct joints free of depressions, with same texture and smoothness as other sections of hot-mix asphalt course.
  - 1. Clean contact surfaces and apply tack coat to joints.
  - 2. Offset longitudinal joints, in successive courses, a minimum of 6 inches (150 mm).
  - 3. Offset transverse joints, in successive courses, a minimum of 24 inches (600 mm).
  - 4. Construct transverse joints at each point where paver ends a day's work and resumes work at a subsequent time. Construct these joints using either "bulkhead" or "papered" method according to AIMS-22, for both "Ending a Lane" and "Resumption of Paving Operations."

### 3.5 COMPACTION

- A. General: Begin compaction as soon as placed hot-mix paving will bear roller weight without excessive displacement. Compact hot-mix paving with hot, hand tampers or with vibratory-plate compactors in areas inaccessible to rollers.
  - 1. Complete compaction before mix temperature cools to 185 deg F (85 deg C).
- B. Breakdown Rolling: Complete breakdown or initial rolling immediately after rolling joints and outside edge. Examine surface immediately after breakdown rolling for indicated crown, grade, and smoothness. Correct laydown and rolling operations to comply with requirements.
- C. Intermediate Rolling: Begin intermediate rolling immediately after breakdown rolling while hot-mix asphalt is still hot enough to achieve specified density. Continue rolling until hot-mix asphalt course has been uniformly compacted to the following density:
  - 1. Average Density: 92 percent of reference maximum theoretical density according to ASTM D 2041, but not less than 90 percent or greater than 96 percent.
- D. Finish Rolling: Finish roll paved surfaces to remove roller marks while hot-mix asphalt is still warm.
- E. Edge Shaping: While surface is being compacted and finished, trim edges of pavement to proper alignment. Bevel edges while asphalt is still hot; compact thoroughly.
- F. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.
- G. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

### 3.6 ASPHALT CURBS

- A. Construct hot-mix asphalt curbs over compacted pavement surfaces. Apply a light tack coat unless pavement surface is still tacky and free from dust. Spread mix at a minimum temperature of 250 deg F (121 deg C).

1. Asphalt Mix: Same as pavement surface-course mix.
- B. Place hot-mix asphalt to curb cross section indicated or, if not indicated, to local standard shapes, by machine or by hand in wood or metal forms. Tamp hand-placed materials and screed to smooth finish. Remove forms after hot-mix asphalt has cooled.

### 3.7 INSTALLATION TOLERANCES

- A. Pavement Thickness: Compact each course to produce the thickness indicated within the following tolerances:
  1. Base Course: Plus or minus 1/2 inch (13 mm).
  2. Surface Course: Plus 1/4 inch (6 mm), no minus.
- B. Pavement Surface Smoothness: Compact each course to produce a surface smoothness within the following tolerances as determined by using a 10-foot (3-m) straightedge applied transversely or longitudinally to paved areas:
  1. Base Course: 1/4 inch (6 mm).
  2. Surface Course: 1/8 inch (3 mm).
  3. Crowned Surfaces: Test with crowned template centered and at right angle to crown. Maximum allowable variance from template is 1/4 inch (6 mm).

### 3.8 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
- B. Replace and compact hot-mix asphalt where core tests were taken.
- C. Remove and replace or install additional hot-mix asphalt where test results or measurements indicate that it does not comply with specified requirements.

### 3.9 WASTE HANDLING

- A. General: Handle asphalt-paving waste according to approved waste management plan required in Section 017419 "Construction Waste Management and Disposal."

END OF SECTION 321216

## SECTION 334100 - STORM UTILITY DRAINAGE PIPING

## PART 1 - GENERAL

## 1.1 SUMMARY

## A. Section Includes:

1. Pipe and fittings.
2. Channel drainage systems.
3. Manholes.
4. Nonpressure transition couplings.
5. Expansion joints.
6. Catch basins.
7. Stormwater inlets.
8. Pipe outlets.

## 1.2 ACTION SUBMITTALS

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

## B. Shop Drawings:

1. Manholes: Include plans, elevations, sections, details, frames, and covers.
2. Catch basins and stormwater inlets. Include plans, elevations, sections, details, frames, covers, and grates.

## 1.3 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Show pipe sizes, locations, and elevations. Show other piping in same trench and clearances from storm drainage system piping. Indicate interface and spatial relationship between manholes, piping, and proximate structures.
- B. Profile Drawings: Show system piping in elevation. Draw profiles at horizontal scale of not less than 1 inch equals 50 feet (1:500) and vertical scale of not less than 1 inch equals 5 feet (1:50). Indicate manholes and piping. Show types, sizes, materials, and elevations of other utilities crossing system piping.
- C. Product Certificates: For each type of cast-iron soil pipe and fitting, from manufacturer.
- D. Field quality-control reports.

## PART 2 - PRODUCTS

## 2.1 CONCRETE PIPE AND FITTINGS

- A. Reinforced-Concrete Sewer Pipe and Fittings: ASTM C 76 (ASTM C 76M).

## 2.2 NONPRESSURE TRANSITION COUPLINGS

- A. Comply with ASTM C 1173, elastomeric, sleeve-type, reducing or transition coupling, for joining underground nonpressure piping. Include ends of same sizes as piping to be joined, and corrosion-resistant-metal tension band and tightening mechanism on each end.
- B. Sleeve Materials:
  - 1. For Concrete Pipes: ASTM C 443 (ASTM C 443M), rubber.
  - 2. For Cast-Iron Soil Pipes: ASTM C 564, rubber.
  - 3. For Plastic Pipes: ASTM F 477, elastomeric seal or ASTM D 5926, PVC.
  - 4. For Dissimilar Pipes: ASTM D 5926, PVC or other material compatible with pipe materials being joined.

## 2.3 CONCRETE

- A. General: Cast-in-place concrete according to ACI 318, ACI 350/350R (ACI 350M/350RM), and the following:
  - 1. Cement: ASTM C 150, Type II.
  - 2. Fine Aggregate: ASTM C 33, sand.
  - 3. Coarse Aggregate: ASTM C 33, crushed gravel.
  - 4. Water: Potable.
- B. Portland Cement Design Mix: 4000 psi (27.6 MPa) minimum, with 0.45 maximum water/cementitious materials ratio.
  - 1. Reinforcing Fabric: ASTM A 185/A 185M, steel, welded wire fabric, plain.
  - 2. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (420 MPa) deformed steel.
- C. Manhole Channels and Benches: Factory or field formed from concrete. Portland cement design mix, 4000 psi (27.6 MPa) minimum, with 0.45 maximum water/cementitious materials ratio. Include channels and benches in manholes.
  - 1. Channels: Concrete invert, formed to same width as connected piping, with height of vertical sides to three-fourths of pipe diameter. Form curved channels with smooth, uniform radius and slope.
    - a. Invert Slope: [1] [2] percent through manhole.
  - 2. Benches: Concrete, sloped to drain into channel.
    - a. Slope: [4] [8] percent.

- D. Ballast and Pipe Supports: Portland cement design mix, 3000 psi (20.7 MPa) minimum, with 0.58 maximum water/cementitious materials ratio.
  - 1. Reinforcing Fabric: ASTM A 185/A 185M, steel, welded wire fabric, plain.
  - 2. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (420 MPa) deformed steel.

## 2.4 CATCH BASINS

- A. Standard Precast Concrete Catch Basins per plan.

## PART 3 - EXECUTION

### 3.1 EARTHWORK

- A. Excavation, trenching, and backfilling are specified in Section 312000 "Earth Moving."

### 3.2 PIPING INSTALLATION

- A. General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of underground storm drainage piping. Location and arrangement of piping layout take into account design considerations. Install piping as indicated, to extent practical. Where specific installation is not indicated, follow piping manufacturer's written instructions.
- B. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements.

### 3.3 MANHOLE INSTALLATION

- A. General: Install manholes, complete with appurtenances and accessories indicated.
- B. Install precast concrete manhole sections with sealants according to ASTM C 891.
- C. Where specific manhole construction is not indicated, follow manhole manufacturer's written instructions.
- D. Set tops of frames and covers flush with finished surface of manholes that occur in pavements. Set tops 3 inches (76 mm) above finished surface elsewhere unless otherwise indicated.

### 3.4 CATCH BASIN INSTALLATION

- A. Set frames and grates to elevations indicated.

### 3.5 STORMWATER INLET AND OUTLET INSTALLATION

- A. Construct inlet head walls, aprons, and sides of reinforced concrete, as indicated.
- B. Construct riprap of broken stone, as indicated.
- C. Install outlets that spill onto grade, anchored with concrete, where indicated.
- D. Install outlets that spill onto grade, with flared end sections that match pipe, where indicated.
- E. Construct energy dissipaters at outlets, as indicated.

### 3.6 FIELD QUALITY CONTROL

- A. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24 inches (610 mm) of backfill is in place, and again at completion of Project.
  - 1. Submit separate reports for each system inspection.
  - 2. Defects requiring correction include the following:
    - a. Alignment: Less than full diameter of inside of pipe is visible between structures.
    - b. Deflection: Flexible piping with deflection that prevents passage of ball or cylinder of size not less than 92.5 percent of piping diameter.
    - c. Damage: Crushed, broken, cracked, or otherwise damaged piping.
    - d. Infiltration: Water leakage into piping.
    - e. Exfiltration: Water leakage from or around piping.
  - 3. Replace defective piping using new materials, and repeat inspections until defects are within allowances specified.
  - 4. Reinspect and repeat procedure until results are satisfactory.
- B. Test new piping systems, and parts of existing systems that have been altered, extended, or repaired, for leaks and defects.
  - 1. Do not enclose, cover, or put into service before inspection and approval.
  - 2. Test completed piping systems according to requirements of authorities having jurisdiction.
  - 3. Schedule tests and inspections by authorities having jurisdiction with at least 24 hours' advance notice.
  - 4. Submit separate report for each test.
  - 5. Gravity-Flow Storm Drainage Piping: Test according to requirements of authorities having jurisdiction, UNI-B-6, and the following:
    - a. Exception: Piping with soiltight joints unless required by authorities having jurisdiction.
    - b. Option: Test plastic piping according to ASTM F 1417.
    - c. Option: Test concrete piping according to ASTM C 924 (ASTM C 924M).
- C. Leaks and loss in test pressure constitute defects that must be repaired.

- D. Replace leaking piping using new materials, and repeat testing until leakage is within allowances specified.

END OF SECTION 334100

IRRIGATION SYSTEM

**PART 1 - GENERAL**

1.01 GENERAL REQUIREMENTS

- A. Contractor shall bid irrigation based upon performance specifications and irrigation layout provided by the County. If any changes or modifications are recommended, the selected contractor shall submit irrigation layout, design, and materials changes and recommendations to County staff for approval prior to purchase and installation. All design and installation shall follow submittals as outlined within specifications and coordination with primary project coordinator prior to execution and installation. Coordinate work of this Section with other underground utilities and with trades responsible for their installation. Refer to respective Drawings pertaining to other work.

1.02 WORK TO BE DONE

- A. Work to be done includes furnishing all labor, materials, equipment and services required to complete all irrigation work indicated on the Drawings, as specified herein, or both.
- B. The mechanical point of connection for the irrigation system shall be a new 2-inch tap of the domestic water supply specified as a well system.
- C. The electrical point of connection for the irrigation system shall be to a 120-volt, 20-amp electrical circuit located inside the irrigation and well enclosures.
- D. The Drawings and Specifications must be interpreted and are intended to complement each other. The Contractor shall furnish and install all parts, which may be required by the Drawings and omitted by the Specifications, or vice versa, just as though required by both. Should there appear to be discrepancies or question of intent, the Contractor shall refer the matter to the Owner's Representative for decision, and his interpretation shall be final, conclusive and binding.
- E. All necessary changes to the Drawings to avoid any obstacles shall be made by the Contractor with the approval of the Owner's Representative.
- F. Trench excavation, back filling and bedding materials, together with the testing of the completed installation shall be included in this work.
- G. The work shall be constructed and finished in every respect in a good, workmanlike and substantial manner, to the full intent and meaning of the Drawings and Specifications. All parts necessary for the proper and complete execution of the work, whether the same may have been specifically mentioned or not, or indicated on the Drawings, shall be done or furnished in a manner corresponding with the rest of the work as if the same were specifically herein described.

- H. Record Drawing as well as Operating & Maintenance Manual generation, in accordance to these specifications shall also be included in this work.

1.03 SCOPE

- A. The irrigation system shown on the Drawings and described within these Specifications represents two single controllers; one controller for each athletic field, to operate a turf irrigation system supplied from submersible irrigation well(s) and pumps. The Drawings specify the irrigation system is designed for 67 gallons per minute with 70-75 PSI at the well head. Minimum of 72-psi dynamic pressure at full system flow is required downstream of the backflow preventer.
- B. Design specifies two installation options for the irrigation wells. Option 1 will consists of drilling one well in early stage of project to determine well yield with a 7.5 horsepower pump, at 65 gallons per minute to three phase, 230 volts. Installation will consist of drilling a 8 x 4 gravel packed well utilizing 30 feet of 4" diameter, .012 slot screens to enhance well to eliminate any sand uptake. If two wells are required to meet irrigation specification requirements Option 2 will consists of installing (2) wells with same specifications as listed and (2) three submersible horsepower pumps, at 35 gallons per minute. If two wells are required they are to be installed at a minimum distance of 100 feet apart. Wells and pumps will be installed within both irrigation enclosures.

1.04 ORDINANCES, PERMITS AND FEES

- A. The Work under this Section shall comply with all ordinances and regulations of authorities having jurisdiction.
- B. The Contractor shall obtain and pay for any and all permits, tests and certifications required for the execution of Work under this Section, including water supply tap fee.
- C. Furnish copies of Permits, Certifications and Approval Notices to the Owner's Representative prior to requesting payment.
- D. The Contractor shall include in their bid any charges by the Water Department, Utility Company, or other authorities for work done by them and charged to the Contractor.

1.05 EXAMINATION OF CONDITIONS

- A. The Contractor shall fully inform himself of existing conditions on the site before submitting his bid, and shall be fully responsible for carrying out all work required to fully and properly execute the work of the Contract, regardless of the conditions encountered in the actual Work. No claim for extra compensation or extension of time will be allowed on account of actual conditions inconsistent with those assumed, except those conditions described in the GENERAL CONDITIONS.

1.06 QUALITY ASSURANCE

- A. Installer: A firm which has at least five (5) years experience in work of the type and size required by this Section and which is acceptable to the Owner's Representative.
- B. References: The Contractor must supply three references for work of this type and size with their bid including names and phone numbers of contact person(s).
- C. Applicable requirements of accepted Standards and Codes shall apply to the Work of this Section and shall be so labeled or listed:
  - 1. American Society for Testing & Materials (ASTM)
    - a. ASTM: D1784 Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds.
    - b. ASTM: D1785 Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and CI200.
    - c. ASTM: D2464 Threaded Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80.
    - d. ASTM: D2466 Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40.
    - e. ASTM: D2564 Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Piping Systems.
    - f. ASTM: B88-99 Seamless Copper Water Tube
    - g. ASTM: B828-00 Soldered Copper Joints.
    - h. ASTM: D2737-99 Polyethylene (PE) Pressure rated tube.
  - 2. National Plumbing Code (NPC)
  - 3. National Electric Code (NEC)
  - 4. National Sanitary Foundation (NSF)
  - 5. American Society of Agricultural Engineers (ASAE)
  - 6. Underwriters Laboratories, Inc. (UL)
  - 7. Occupational Safety and Health Regulations (OSHA)

1.07 TESTS

- A. Observation: The Owner's Representative will be on site at various times to insure the system is being installed according to the Specifications and Drawings.
- B. Coverage Test: After completion of the system, test the operation of entire system and adjust sprinklers as directed by the Owner's Representative. Demonstrate to the Owner's Representative that all irrigated areas are being adequately covered. Furnish and install materials required to correct inadequacies of coverage due to deviations from the Drawings or where the system has been willfully installed when it is obviously inadequate or inappropriate without bringing it to the attention of the Owner. (See Part 3 - Execution).
- C. The Owner's Representative shall be notified 48 hours in advance for observations.
- D. During final observation, the contractor shall be responsible for having two-way communication and sufficient personnel to provide instantaneous communication between the observation area and the controller for the system.

1.08 SHOP DRAWINGS

- A. The Contractor shall provide copies of product specification sheets on all proposed equipment to be installed to the Owner's Representative for approval prior to the start of work, in accordance with the parameters of Division-1. Work on the irrigation system may not commence until product sheets are submitted and approved. Submittals shall be marked up to show proper nozzles, sizes, flows, etc. Equipment to be included:
  - 1. Sprinkler Heads
  - 2. Drip Tubing
  - 3. Valves: Manual and Automatic
  - 4. Controllers/ Irrigation and Well Housing Enclosures
  - 5. Valve Boxes
  - 6. Pipe and Fittings
  - 7. Wire and Connectors
  - 8. Quick Coupling Valves
  - 9. Rain Sensor
  - 10. Backflow Prevention Device/ Enclosure
  - 11. Grounding Equipment
  - 12. Air Vacuum / Relief Valves

13. Exclusion Water Meter
14. Miscellaneous Materials
15. Irrigation Well and Pumps

B. Project Record Documents:

1. The Contractor shall provide and keep up-to-date a complete redlined Record Set of Drawings of the system as the project proceeds. Drawings shall be corrected daily, showing every change from the original Drawings and Specifications. Record Drawings shall specify and exactly locate sprinkler type; pop up height and nozzle for each sprinkler installed. Each valve location to be referenced by distance from a minimum of two permanent locations. Controller(s), rain sensor(s), air vacuum relief valves, flushing valves, quick coupling valves, water meters, back flow prevention device, irrigation well and pumps and all other equipment shall be indicated on the drawings. All wire routing, wire size and splices shall be indicated. Main line pipe and wire route shall have two (2) distinctly different graphic symbols (line types). Prints for this purpose may be obtained from Owner's Representative at cost. This redlined record set of drawings shall be kept at job site and shall be used only as a record set.
2. This redlined set of documents shall also serve as work progress sheets and shall be the basis for measurement and payment for work completed. This record set of drawings shall be available at all times for observation and shall be kept in a location designated by Owner's Representative. Should this record set of drawings not be available for review or not be up-to-date at the time of the observation, it will be assumed no work has been completed. Provide copies of the redlined record set of drawings for Owner's Representative review on a monthly basis.
3. Make neat and legible notations on this record set of drawings daily as the work proceeds, showing the work as actually installed. For example, should a piece of equipment be installed in a location that does not match the plan, indicate that equipment in a graphic manner in the location of installation and so as to match the original symbols as indicated in the irrigation legend. Should the equipment

be different from that specified, indicate with a new graphic symbol both on the drawings and the irrigation legend. The relocated equipment dimensions and northing and easting coordinates should then be transferred to the appropriate drawing in this record set of drawings at the proper time.

4. On or before the date of final field observation, deliver corrected and completed AutoCAD computer plots of "record drawings" on vellum and AutoCAD electronic files on disk to Owner's Representative as part of contract closeout. Delivery of plots will not relieve Contractor of the responsibility of furnishing required information that may have been omitted from the prints.
- C. At the end of each segment of the project the contractor shall submit the following to the Owner's Representative.
1. Plumbing permits: If none required, so state.
  2. Material approvals.
  3. Pressure line tests: By whom approved and date.
  4. Materials furnished: Recipient and date.

1.09 DELIVERY, STORAGE AND HANDLING

- A. Store and handle all materials in compliance with manufacturer instructions and recommendations. Protect from all possible damage. Minimize on-site storage.

1.10 GUARANTEE

- A. The Contractor shall obtain in the Owner's name the standard written manufacturer's guarantee of all materials furnished under this Section where such guarantees are offered in the manufacturer's published product data. All these guarantees shall be in addition to, and not in lieu of, other liabilities that the Contractor may have by law.
- B. In addition to the manufacturers guarantees the Contractor shall warrant the entire irrigation system, both parts and labor for a period of one (1) year from the date of acceptance by the Owner.
- C. As part of the one-year warranty the Contractor shall perform the first year-end winterization and spring start-up for the irrigation system.
- D. Should any problems develop within the warranty period because of inferior or faulty materials or workmanship, they shall be corrected to the satisfaction of the Owner's Representative at no additional expense to the Owner.
- E. A written warranty showing date of completion and period of warranty shall be supplied upon completion of each segment of the project.

1.11 COORDINATION

- A. The Contractor shall at all times coordinate his work closely with the Owner's Representative to avoid misunderstandings and to efficiently bring the project to completion. The Owner's Representative shall be notified as to the start of work, progression and completion, as well as any changes to the drawings before the change is made. The Contractor shall also coordinate his work with that of his sub-contractors.
- B. The Contractor shall be held responsible for and shall pay for all damage to other work caused by his work, workmen or sub-contractors. Repairing of such damage shall be done by the Contractor who installed the work, as directed by the Owner's Representative.

1.12 MAINTENANCE AND OPERATING INSTRUCTIONS

- A. Contractor shall include in their Bid an allowance for four (4) hours of instruction of Owner and/or Owner's personnel upon completion of check/test/start-up/adjust operations by a competent operator (The Owner's Representative office shall be notified at least one (1) week in advance of check/test/start-up/adjust operations).
- B. Upon completion of work and prior to application for acceptance and final payment, a minimum of three (3) three ring, hard cover binders titled MAINTENANCE AND OPERATING INSTRUCTIONS FOR THE CASTLE HAYNE PARK IRRIGATION SYSTEM, shall be submitted to the Owner's Representative office. After review and approval, the copies will be forwarded to the Owner. Included in the Maintenance and Operating binders shall be:
  - 1. Table of Contents
  - 2. Written description of Irrigation System.
  - 3. System drawings:
    - a. One (1) copy of the original irrigation plan;
    - b. One (1) copy of the Record Drawing;
    - c. One (1) reproducible of the Record Drawing;
    - d. One (1) copy of the controller valve system wiring diagram
    - e. One (1) copy of the irrigation well and pump system and wiring diagram
    - f. One (1) copy of the irrigation and valve manifold system designed enclosures

4. Listing of Manufacturers.
5. Manufacturers' data where multiple model, type and size listings are included; clearly and conspicuously indicating those that are pertinent to this installation.
  - a. "APPROVED" submittals of all irrigation equipment;
  - b. Operation:
  - c. Maintenance: including complete troubleshooting charts.
  - d. Parts list.
  - e. Names, addresses and telephone numbers of recommended repair and service companies. A copy of the suggested "System Operating Schedule" which shall call out the controller program required (zone run time in minutes per day and days per week) in order to provide the desired amount of water to each area under "no-rain" conditions.
6. Winterization and spring start-up procedures.
7. Guarantee data.

1.13 PROCEDURE

- A. Notify all County departments and/or public utility owners concerned, of the time and location of any work that may affect them. Cooperate and coordinate with them in the protection and/or repairs of any utilities.
- B. Provide and install temporary support, adequate protection and maintenance of all structures, drains, sewers, and other obstructions encountered. Where grade or alignment is obstructed, the obstruction shall be permanently supported, relocated, removed or reconstructed as directed by the Architect.

**PART 2 - PRODUCTS**

2.01 GENERAL

- A. All materials to be incorporated in this system shall be new and without flaws or defects and of quality and performance as specified and meeting the requirements of the system. All material overages at the completion of the installation are the property of the Contractor and shall be removed from the site. System shall be installed per drawings and contain locator wire for ease of future maintenance operations.
- B. No material substitutions from the irrigation products described in these specifications and shown on the drawings shall be made without prior approval and acceptance from the Owner's Representative.

2.02 PVC IRRIGATION PIPE

- A. All piping shall bear the following markings: Manufacturer's name, nominal pipe size, schedule or class, pressure rating in psi, and date of extrusion.
- B. All pipe in sizes 2-1/2 inches and smaller shall be PVC, Class 200, Type 1120, SDR 21, Solvent-Weld PVC, conforming to ASTM No. D2241 as manufactured by Certainteed, Cresline, JM or equal.

2.03 COPPER PIPE AND FITTINGS

- A. Copper pipe shall be Type K, hard tempered ASTM B88.
- B. Copper fitting shall be wrought copper, solder joint type in accordance with ASTM B828-00.
- C. Joints shall be soldered with silver solder ASTM B32, Grade 95TA up to 250 degree using non-corrosive flux.
- D. Supply only pipes and fittings that are marked by the manufacturer with the appropriate ASTM designations and pressure ratings and are free from cracks, wrinkles, blisters, dents or other damage.

2.04 PVC PIPE SLEEVES

- A. All pipe sleeves beneath non-soil areas shall be PVC, Class 160 water pipe as manufactured by Certainteed, Cresline, JM or equal. Minimum sleeve size to be 3-inch.

2.05 WIRE CONDUIT

- A. Conduit for wiring beneath non-soil areas shall be PVC, SCH-40 conduit with solvent-weld joints, as manufactured by Certainteed, Cresline, JM or equal.
- B. Sweep ells shall be standard electrical type PVC schedule 40 long sweep elbows. Cap sweep ell with tri-plug with the ring for securing nylon pull rope.
- C. Conduit for above ground wiring to rain sensors or controllers shall be galvanized, rigid metallic conduit.

2.06 PVC IRRIGATION FITTINGS

- A. Fittings for solvent weld PVC pipe, 2-1/2 inch and smaller in size, shall be Schedule 40 solvent weld PVC fittings as manufactured by Dura, Lasco, Spears or equal.
- B. Fittings shall bear manufacturer's name or trademark, material designation, size, and applicable I.P.S. schedule.
- C. All PVC threaded connections in and out of valves shall be made using Schedule 80 toe nipples and Schedule 40 couplers or socket fittings. Schedule 40 threads will not be approved for installation.

- D. PVC solvent shall be NSF approved, for Type I and Type II PVC pipe, and Schedule 40 and 80 fittings. Cement is to meet ASTM D2564 and FF493 for potable water pipes. PVC solvent cement shall be Rectorseal Gold, IPS Weld-ON 711, Oatey Heavy Duty Cement or equal, and shall be used in conjunction with the appropriate primer. Primer shall be NSF approved, and formulated for PVC and CPVC pipe applications. Primer is to meet ASTM F 656. Primer shall be Rectorseal Jim PR-2, IPS Weld-ON P-68 Clear, Oatey Clear Primer for PVC and CPVC, or equal.
- E. All nipples to be schedule 80 PVC.

2.07 POLYETHYLENE IRRIGATION PIPE (IF APPLICABLE)

- A. Piping 1-1/4 inch and smaller in size as indicated on the drawings may also be installed with polyethylene (PE3408) pipe, SDR 15, Class 100, Type III, Grade 3, Class C conforming to ASTM D2239, with a minimum pressure rating of 100 psi as manufactured by Oil Creek or equal. Polyethylene pipe shall only be used in landscape areas.

2.08 POLYETHYLENE IRRIGATION FITTINGS (IF APPLICABLE)

- A. Fittings for polyethylene pipe shall be insert PVC or Nylon type fittings. Fittings shall conform to NSF standards and be attached with two (2) dog-eared stainless steel clamps. Clamps shall be as manufactured by Oetiker or approved equal.
- B. Supply only pipes and fittings that are marked by the manufacturer with the appropriate ASTM designations and pressure ratings and are free from cracks, wrinkles, blisters, dents or other damage. Fittings shall be per ASTM D2609 as manufactured by Dura, Lasco or approved equal.

2.09 SPRAY SPRINKLERS (IF APPLICABLE)

- A. Full and part circle pop up spray sprinklers shall be pressure regulating (30-psi), plastic construction with ratcheting riser, removable nozzle and check valve. Nozzle size shall be as indicated on the drawing and in the legend. Pop-up height shall be 6 inches for turf and 12 inches for ground cover, shrubs and annual beds.
- B. Sprinkler shall carry a minimum 3-year exchange warranty against defects. Sprinklers shall be manufactured by Toro or Hunter as specified in irrigation drawing or approved equal.

2.10 MP ROTATOR SPRINKLERS (IF APPLICABLE)

- A. Full and part circle pop up spray sprinklers with multi-stream rotary nozzles shall be plastic construction with ratcheting riser, removable nozzle and check valve. Nozzle size shall be as indicated on the drawing and in the legend. Pop-up height shall be 6 inches for turf and 12 inches for ground cover, shrubs and annual beds.

- B. Multi-stream rotary nozzles shall be manufactured by Hunter Industries or approved equal for 18 foot spacing.
- C. Sprinkler shall carry a minimum 3-year exchange warranty against defects. Sprinklers shall be manufactured by Toro or Hunter Industries or approved equal.

2.11 LARGE ROTARY SPRINKLERS

- A. Large rotary sprinklers shall be gear-driven, rotary type with drain check valve and stainless steel riser designed for in-ground installation. The nozzle assembly shall elevate three inches when in operation and retraction shall be achieved by a stainless steel spring. Check valve shall be capable of holding up to 10 feet of elevation. Sprinkler shall be capable of covering a 49-61 foot radius and flow range of 7.5 to 15.7 gpm at 60 pounds per square inch of pressure.
- B. All sprinkler parts shall be removable through the top of the unit by removing a heavy-duty threaded cap. The sprinkler shall have a one- inch (1") IPS water connection on the bottom of the sprinkler.
- C. Sprinklers shall be manufactured by Hunter Industries or approved equal,
- D. Approved Performance Chart (45' Spacing):

Model	Pressure	Arc	Nozzle	Flow	Radius
Toro TR70XT	60psi	90 Deg.	7	7.8	47'
Toro TR70XT	60psi	180/360 Deg.	12	12.4	50'
Rain Bird 7005-SS	60psi	90 Deg.	6	6.1	45'
Rain Bird 7005-SS	60psi	180/360 Deg.	8	8.4	49'
Hunter I25-ADS	60psi	90 Deg.	5	5.3	45'
Hunter I25-ADS	60psi	180/360 Deg.	8	9.2	50'

2.12 ELECTRIC CONTROL VALVES

- A. Electric control valves shall be two-inch, diaphragm type, fiberglass or reinforced nylon body plastic valves with manual flow control, manual bleed screw and 200 psi pressure rating.
- B. Valves shall be manufactured by Hunter Industries PGV-201G or approved equal.

2.13 ELECTRIC VALVE AND IRRIGATION SYSTEM WELL AND PUMP ENCLOSURE

- A. See attached drawings and pictures. Attached drawings and pictures serve as an example and may require adjustments. Two enclosures are to be installed; one enclosure is to be installed for each athletic field. Enclosures are to serve as an irrigation valve manifold system. All electric irrigation valves, controllers, submersible well and pumps are to be installed inside enclosures.

2.14 AUTOMATIC CONTROLLER

- A. Controller shall be electronic in construction with capability of up to 10 hour run times per zone in increments of 1 or 10 minutes. Controllers are to have minimum four independent programs, auto/off switch and be capable of manual, semi-automatic and automatic operation. Controller shall have water budgeting feature, cycle and soak feature, sensor input terminal, locking, weather resistant cabinet and internal transformer. Terminal strip connection shall be easily accessible. The controller shall be U.L. listed, 120 volt, 60 Hertz, A.C. type.
- B. Controller shall be as manufactured by Hunter Industries I-CORE SERIES or approved equal.
- C. Station quantity shall be a minimum of 12 zones for each controller.

2.15 WIRE

- A. All valve control wire shall be minimum #14-awg, common #12-awg, single strand, solid copper, UL- approved direct burial AWG-U.F. 600V and shall meet all state and local codes for this service. Individual wires must be used for each zone valve. Common wire shall be white in color, control wire for spray and rotor zones shall be red in color, drip zone control wire shall be orange and spare wires, installed where indicated on the drawings shall be blue. White color shall be used for common wire only.
- B. In ground wire connections shall be UL listed, manufactured by 3M, model DBY-6 splice kits. All wire splices shall be made in valve boxes, at controller, or at valves.
- C. Wire type and method of installation shall be in accordance with local codes for NEC Class II circuits of 30-volt A.C. or less.
- D. System shall be installed per drawings and contain locator wire for ease of future maintenance operations

2.16 ISOLATION VALVES (TO BE LOCATED OUTSIDE OF ATHLETIC PLAYING FIELDS)

- A. Isolation valves 2-1/2 inches and smaller in size shall be gate type, of bronze construction, US Manufacture, 200 WOG with steel cross handle and 200 psi rating. Gate valves to be as manufactured by Nibco, model T-113-K, or approved equal.

2.17 SWING JOINTS

- A. Spray sprinklers shall be installed on swing pipe assemblies, minimum length 6 inches, maximum 18 inches.(IF APPLICABLE)
- B. Large rotary sprinklers shall be installed on 1-inch prefabricated PVC unitized swing joint assemblies with double o-ring seals, minimum 315 psi rating and minimum length of 12 inches.

2.18 AUTOMATIC RAIN SENSOR

- A. Rain sensor shall be plastic in construction with adjustable interruption point, 1/2-inch IPS threads and stainless steel vandal resistant guard. Rain sensor shall be manufactured by Hunter Industries, model Rain-Clik or approved equal with sensor guard.

2.19 IN-LINE DRIP TUBING (IF APPLICABLE)

- A. In-line emitters in drip tubing to be .92 gallon per hour on pre-installed 12-inch spacing within tube for all planting beds. In-line drip tubing to be as manufactured by Netafim Irrigation, Model TLDL-9-12 or approved equal. Start pressure shall be a minimum of 45PSI.

2.20 IN-LINE DRIP TUBING FITTINGS (IF APPLICABLE)

- A. Fittings for in-line drip tubing shall be constructed of molded brown plastic having a (I.D) of .57 inches. Female and male threaded ends shall be capable of mating to standard pipe threads with tapered threads. In-line drip tubing fittings shall be as manufactured by Netafim, TL Series or approved equal.
- B. Stainless steel clamps shall be used to secure in-line drip tubing to insert barbed fittings. Nominal size shall be 13/16 inches, Part No. 210. Clamps shall be constructed of 304-grade stainless steel. Interior clamp wall shall be smooth to prevent crimping or pinching of tubing. Wall thickness of clamps shall be 0.236 inches with an overall bandwidth of 1/4-inch. Properly secured clamps shall be capable of withstanding a maximum operating pressure of 441 psi. Clamps shall be one "ear" type. Clamps shall be as manufactured by Oetiker or approved equal.
- C. Tubing stakes shall be plastic coated steel, or other non-corrosive strong material to secure tubing.

2.21 DISK FILTER (IF APPLICABLE)

- A. The filters at each drip zone valve shall be a plastic filter consisting of a two piece threaded housing with o-ring seal. The filter screen shall be 140-mesh size. Filters shall be sized to mid-range flow and not exceed 2.5-PSI pressure loss.

- B. Filter shall be as manufactured by Netafim, Model DF-xxx-140 or approved equal.

2.22 PRESSURE REGULATORS (IF APPLICABLE)

- A. Pressure regulators shall assure an incoming pressure of 45-PSI into drip tubing. Discharge pressure shall not be less than 45-PSI. Manifold regulators to match flow rate to mid-range flow.
- B. The pressure regulator shall be as manufactured by Netafim, Model PRV-XXX-XX-45 or approved equal.

2.23 AUTOMATIC FLUSHING VALVE

- A. Flush valves shall produce 1-gallon flush and be constructed of black molded plastic with insert barbed fitting end configuration. The top of the flush valves shall have six openings from which debris or sediment can pass through from the system to the atmosphere or valve box.
- B. Flush valve shall be as manufactured by Netafim, Model TLFV or approved equal.

2.24 AIR VACUUM / RELIEF VALVES

- A. The air vacuum / relief valves shall be constructed of black plastic with 1/2-inch male pipe thread capable of mating with a threaded PVC reduction bushing.
- B. Air vacuum relief valves shall be as manufactured by Netafim, Model TLAVRV or approved equal.

2.25 WATER METER

- A. Water meter shall be 1-1/2-inch in size as per Wilmington Water Department requirements.

2.26 BACKFLOW PREVENTION DEVICE

- A. Back flow prevention device shall be 1-1/2-inch Reduced Pressure Assembly as per Wilmington Cross Connection Department requirements. Back flow prevention device shall have maximum 12-psi pressure loss at system flow.
- B. Back flow prevention device shall be as manufactured by Watts model 909-M1 or approved equal.

2.27 BACK FLOW ENCLOSURE

- A. The back flow prevention device enclosure shall be of a vandal and weather resistant nature manufactured entirely of marine grade aluminum alloy 5052-H32, with a wall thickness of one-eighth inch.

- B. The mounting base shall be manufactured entirely of stainless steel. The main housing shall be of solid sheet construction punched on the sides with a rectangular pattern for viewing back flow prevention device operation. The length of the enclosure shall be expandable to allow for site adjustment. The enclosure shall have a mounting lip on one end and a locking mechanism on the other end. The mounting base shall be submerged into the concrete a minimum of two inches, and position the enclosure two and one half inches above the concrete for drainage purposes.
- C. The locking mechanism shall be of the full release type, which allows for complete removal of the enclosure from its mounting base without the use of tools. The handle controlling the locking mechanism shall be concealed within the surface of the enclosure and provide for a padlock.
- D. The enclosure shall be 30 inches high, 16 inches wide and 45 inches long. Unit shall be as manufactured by VIT Products, Inc., model SBBC-45AL or approved equal.

## 2.28 GROUNDING EQUIPMENT

- A. Each exterior field controller installed outside of a building shall include factory-installed and factory-recommended lightning protection and shall be connected to a 5/8-inch diameter x 10-foot long copper clad grounding rods with minimum #6 AWG, solid, bare copper wire and 4-inch x 96-inch x 0.0625-inch copper grounding plates as outlined below. Minimum 20-foot separation between rod and plate. Minimum 12-foot separation between controller and ground rod. All connections to rods shall be with Cadweld connectors as specified. All connections to plates shall be performed by the plate manufacturer (Paige #182199L) with 25-feet of bare copper wire already attached. Each grounding rod is to be covered by a 4-inch round, grated top, plastic valve cover with metal detection and six inches of 4-inch ADS drainage pipe. Plates shall be installed in ground enhancement material. Plates shall be covered with 4-inch plastic grated cover with detection and minimum 36 inches of 4 inch ADS drainage pipe. Ground rods and plates shall be UL listed.
- B. Each controller shall be grounded to one rod and one plate. The 10-foot rod shall be installed penetrating into the soil to its full length. Plate shall be installed at a 36-inch depth with 50 lbs of Power Set ground enhancement material spread evenly below the plate and 50 lbs spread evenly above the plate in accordance with manufacturer's requirements. The grounding electrodes shall be installed at least 10 feet from wires connected to the field controllers. Each field controller shall have a separate grounding system.

## 2.29 SPARE PARTS

- A. Contractor shall supply the following tools and equipment to the Owner's Representative before final observation:
  - 1. Two (2) wrenches for disassembling and adjusting each type of sprinkler head provided.

- 2. One (1) quick coupler key assembly for every five or fraction thereof of each type of quick coupling valve provided.
  - 3. One (1) of each type of gate valve used in the project.
  - 4. Two (2) of each type sprinkler head and pattern (PC & FC) used in the project.
  - 5. Two (2) of each type nozzle used in the project.
- B. Before final observation can occur, written evidence that the Owner's Representative has received the tools and equipment must be shown to the Owner.

**PART 3 - EXECUTION**

3.01 GENERAL

- A. Before work is commenced, hold a conference with the Owner's Representative to discuss general details of the work.
- B. Examine all contract documents applying to this Section noting any discrepancies and bringing the same to the attention of the Owner's Representative for timely resolution.
- C. All work indicated on Drawings shall be provided whether or not specifically mentioned in the Specifications.
- D. If there are ambiguities between Drawings and Specifications, and specific interpretation or clarification is not issued prior to bidding, the interpretation or clarification will be made only by Owner's Representative and Contractor shall comply with the decisions. In the event the installation contradicts the directions given, the installation shall be corrected by Contractor at no additional cost to Owner.
- E. Verify dimensions and grades at job site before work is commenced. Do not proceed with installation of the landscape irrigation system when it is apparent that obstructions or grade differences exist or if conflicts in construction details. Legend or specific notes are discovered. All such obstructions, conflicts, or discrepancies shall be brought to the attention of the Owner's Representative.
- F. Make all field measurements necessary for the work noting the relationship of the irrigation work to the other trades. Coordinate with other trades (landscaping and other site work trades). Project shall be laid out essentially as indicated on the Irrigation Plans, making minor adjustments for variations in the planting arrangement. Major changes shall be reviewed with the Owner's Representative prior to proceeding.
- G. Layout of sprinkler lines indicated on Drawings is diagrammatic only. Location of sprinkler equipment is contingent upon and subject to integration with all other underground utilities. Contractor shall employ all data contained in the Contract Documents and shall verify this information at the construction site to confirm the manner by which it relates to the installation.

- H. Coordinate installation of all sprinkler materials, irrigation well and pumps, enclosures, including pipe, to avoid conflict with the trees, shrubs, or other plantings.
- I. During progress of work, a competent superintendent and all assistants necessary shall be on site. All shall be satisfactory to the Owner's Representative. The superintendent shall not be changed, except with the consent of the Owner's Representative, unless that person proves unsatisfactory and ceases to be employed. The superintendent shall represent the Contractor in his absence and all directions given to the superintendent shall be as binding as if given to the Contractor.
- J. At all times, protect existing irrigation, landscaping, paving, structures, walls, footings, etc. from damage. Any inadvertent damage to the work of another trade shall be reported at once.
- K. Replace, or repair to the satisfaction of the Owner, all existing paving disturbed during course of work. New paving shall be the same type, strength, texture, finish, and be equal in every way to removed paving.

### 3.02 PIPE AND FITTINGS INSTALLATION

- A. Using proper width trencher chain, excavate a straight (vertical) and true trench to a depth indicated on plans or as recommended by manufacturer
- B. Loam or topsoil encountered within the limits of trench excavation for irrigation mains and branch lines shall be carefully removed to the lines and depths as shown on the Drawings and stockpiled for subsequent replacement in the upper 6 inches of the trench from which it is excavated. Such removal and replacement of the quantities of loam shall be considered incidental to the irrigation system and no additional compensation will be allowed therefore.
- C. Pipe shall be laid on undisturbed trench bottom provided suitable base is available - no rock larger than 1-inch or sharp edges; if not, excavate to 2-inch below pipe invert and provide and install sand base or crushed stone upon which to lay pipe.
- D. Back filling shall be accomplished as follows: the first 10-inch of backfill material shall contain no foreign matter and no rock larger than 1-inch in diameter. Carefully place material around pipe and wire and tamp in place. Remainder of backfill shall be laid-up in 6-inch (maximum) lifts and tamped to compaction with mechanical equipment. Compact backfill in trenches to dry density equal to the adjacent undisturbed soil, and conform to adjacent grades without dips, sunken area, humps, or other irregularities. Frozen material shall not be used for backfill.
- E. Do backfilling when pipe is cool. During hot weather cool pipe by operating the system for a short period, or by backfilling in the early part of the morning before the heat of the day.
- F. Do not, under any circumstances, use truck wheels for compacting soil.
- G. Where feasible, Owner's Representative may authorize the use of flooding in lieu of tamping.

- H. Restore grades and repair damage where settling occurs.
- I. Make all solvent-weld joints in strict accordance with manufacturer's recommendations, making certain not to apply an excess of primer or solvent, and wiping off excess solvent from each connection. Allow welded joints at least 15 minutes set-up/curing time before moving or handling. When the temperature is above 80° F, allow connections to set minimum 24 hours before pulling or pressure is applied to the system. When temperature is below 80° F, follow manufacturer's recommendations. Provide and install for expansion and contraction as recommended. Wire shall be laid in same trench as mainline and at pipe invert (see Wire Installation).
- J. Mainline pipe shall have minimum 22 inches of COVER (excavate to invert as required by pipe size). Lateral pipe shall have minimum 16 inches of COVER for PVC and 12 inches of cover for Polyethylene (excavate to invert as required by pipe size).
- K. Cut plastic pipe with handsaw or pipe-cutting tool, removing all burrs at cut ends. All pipe cuts are to be square and true. Bevel cut end as required conforming to Manufacturer's Specifications.
- L. Every precaution shall be taken to prevent foreign material from entering the pipe while it is being placed in the trench. At times, when installation of the piping is not in progress, the open end(s) of the pipe shall be closed by a watertight plug or other means. All piping, which cannot temporarily be joined, shall be sealed to make as watertight as possible. This provision shall apply during the lunch hour as well as overnight. Pipe not to be installed that day shall not be laid out. Should water enter the trench during or after installation of the piping, no additional piping may be installed or back filled until all water is removed from the trench. Pipe shall not be installed when water is in the trench, when precipitation is occurring, or when the ambient temperature is at 40° F or below. Pipe installed at temperatures below 40° F shall be removed and replaced at no cost to the Owner. PVC pipe shall be snaked in the trench to accommodate for expansion and contraction due to changes in temperature.
- M. In installing irrigation pipe the Contractor shall route the pipe as necessary to prevent damage to tree roots. Where trenching must occur near trees, the Contractor shall provide proper root pruning and sealing methods to all roots 1-inch and larger.
- N. Maintain 6-inch minimum clearance between sprinkler lines and lines of other trades. Do not install sprinkler lines directly above another line of any kind.
- O. Maintain 1-inch minimum between lines which cross at angles of 45 to 90 degrees.
- P. Exercise care when excavating, trenching and working near existing utilities.
- Q. Throughout the guarantee period it will be the responsibility of the Contractor to refill any trenches that have settled due to incomplete compaction.
- R. Pulling of pipe will be allowed provided soil is suitable and specified depth of bury can be maintained.

### 3.03 ELECTRICAL WIRE CONDUIT INSTALLATION

- A. Electrical conduit shall be installed in all non-soil areas, as well as for all above ground wiring where wire passes under or through walls, walks and paving to controllers and rain sensor.
- B. Conduit shall extend 18 inches beyond edges of walls and pavement.

### 3.04 PIPE SLEEVING INSTALLATION

- A. Sleeving shall be installed wherever piping is going under a non-soil area, generally where indicated on the Drawings. Minimum cover over all sleeving pipe shall be 24 inches as shown on the detail.
- B. Sleeving shall extend 18 inches beyond edges of walls and pavement.

### 3.05 ISOLATION VALVE INSTALLATION

- A. Install isolation valves per detail where indicated on the Drawings. Install all isolation valves on a level crushed stone base so that they can be easily opened or closed with the appropriate valve wrench. Install specified valve box over each isolation valve.
- B. Check and tighten valve bonnet packing before valve box and backfill installation.

### 3.06 VALVE BOX INSTALLATION

- A. Furnish and install a valve access box for each electric valve, quick coupling valve, isolation valve, flushing valve, air relief valve and wire splice.
- B. All valve access boxes shall be installed on a minimum 4-inch crushed stone base. Finish elevation of all boxes shall be at grade. All crushed stone to be supplied by the Contractor and installed before valve box. Crushed stone shall not be poured into previously installed valve boxes.

### 3.07 24 VOLT CONTROL VALVE INSTALLATION

- A. Control valves shall be installed as a manifold design system. Valves shall be set plumb with adjusting handle and all bolts, screws and wiring accessible through the irrigation and well enclosure opening. Valves shall be set in a plumb position with 24-inch minimum maintenance clearance from other equipment.
- B. Adjust zone valve operation after installation using flow control device on valve.

### 3.08 WIRING INSTALLATION

- A. Wiring shall be installed along with the main line. Multiple wire bundles shall be cinched together at maximum 12-foot centers using plastic cable cinches and shall be laid beside, and at the same invert as, the irrigation lines. Sufficient slack for expansion and contraction shall be maintained and wiring shall at no point be installed tightly. Provide

and install an additional 8 inches to 12 inches slack at all changes of direction. Wiring in valve boxes shall be a sufficient length to allow the valve solenoid, splice, and all connections to be brought above grade for servicing. This additional slack shall be coiled for neatness in the valve box. Each valve shall have a separate wire back to the controller.

- B. All wire shall be laid in trenches and shall be carefully back-filled to avoid any damage to the wire insulation or wire conductors themselves. In areas of unsuitable material, the trench shall have a 2 inches layer of sand or stone dust on the bottom before the wires are laid into the trench and back-filled. The wires shall have a minimum of 12 inches of cover. Wire not to be installed that day shall not be laid out.
- C. An expansion curl shall be provided and installed within 6 inches of each wire connection to a solenoid and at least every 100 feet of wire length on runs more than 100 feet in length. Expansion curls can be formed by wrapping five (5) turns of wire around a 1-inch diameter or larger pipe and then withdrawing the pipe.
- D. Provide and install a common ground wire of white color. No white color shall be used for power wire. Control wire shall be red, drip zone control wire shall be orange and spare wiring shall be blue in color.
- E. Service wiring in connection with Drawings and local codes for 24-volt service. All in-ground wire connections shall be waterproofed with 3M DBY-6 splice kits. All splices shall be made in valve boxes (wire runs requiring splices between valve locations shall be provided and installed in splice box-valve box shall be used). Splice locations shall be shown on the Record Drawings.
- F. Contractor shall provide a complete wiring diagram showing wire routing for the connections between the controller and valves. See section one for the inclusion of wiring diagram in operation and maintenance manuals.

### 3.09 CONTROLLER INSTALLATION

- A. Contractor to install controller in enclosure, generally where shown on the drawings. Contractor to wire valves and rain sensor into controller and set proper program.
- B. Wire controller to 120-volt electrical supply provided and installed to the controller locations by OTHERS.
- C. Keys shall be turned over to Owner's Representative.

### 3.10 GROUNDING INSTALLATION

- A. Each grounding rod shall be driven into the ground its full length within 8-feet of the controller and connected via a Cadweld connection to #6 solid, bare copper wire. The copper wire is to be installed in as straight a line as possible, and if it is necessary to make a turn or bend, it shall be done in a sweeping curve with a minimum radius of 8 inches and a minimum included angle of 90 degrees. There shall be no splices in the bare copper wire. The top of the ground rod shall be driven below the ground surface. A

4-inch grated cover as specified, set a minimum of 1-inch below grade, shall be placed over the ground rod and Cadweld connection for periodic maintenance. Cover shall be installed on a minimum of 6 inches of 4-inch ADS corrugated polyethylene, perforated drainage pipe. Plates shall be installed 36 inches below grade with 50 lbs of Power Set ground enhancement material spread evenly below the plate and 50 lbs of Power Set ground enhancement material spread evenly above the plate in accordance with the manufacturer's requirements. Plates shall also be covered with a 4 inch grated cover as specified, set a minimum of 1-inch below grade, to facilitate drainage onto the plate. Cover shall be installed on a minimum of 36 inches of 4-inch ADS corrugated polyethylene, perforated drainage pipe.

- B. When tested, grounding grid shall have an earth resistance no greater than 5 ohms. If earth resistance is greater than 5 ohms, additional grounding plates and enhancement material shall be added to system until desired test results have been meet.

### 3.11 RAIN SENSOR INSTALLATION

- A. Install rain sensor outside controller enclosure, generally where indicated on the drawings. Coordinate final location of rain sensor with Owner's Representative. Rain sensor shall be in direct contact with the weather and not in contact with the irrigation spray.
- B. Install rain sensor wiring within 1/2-inch conduit where exposed. All above ground wires shall be installed in conduits.

### 3.12 SPRINKLER INSTALLATION

- A. Spray sprinklers shall be installed flush (perpendicular) to grade on swing pipe assemblies, minimum length 6 inches, maximum 18 inches.
- B. Large rotary sprinklers shall be installed flush to grade on 1-inch prefabricated PVC unitized swing joint assemblies with integral o-rings, minimum length 12 inches.
- C. Sprinklers shall not exceed maximum spacing indicated
- D. Adjust sprinkler zone after installation using flow control device on valve.

### 3.13 IN-LINE EMITTER TUBE INSTALLATION (IF APPLICABLE)

- A. In-line emitter tubing shall be installed in areas designated by hand under the mulch, and shall have an average depth of 4 inches unless otherwise indicated on the drawings. Tubing should not be visible through the mulch. All in-line emitter tubing shall be installed on the high side of the plant material being watered to help insure dispersion of the water.
- B. In-line emitter tubing is to be installed 4 inches from all planter edges, curbs and walls. Spacing of in-line emitter tube is to be 18 inches center-to-center in all irrigated areas.

- C. All in-line tubing shall have a minimum incoming pressure of not less than 5-PSI of the pressure regulator, 45-PSI, to assure a maximum linear length of 280 feet at zero elevation lift.

3.14 DRIP PRESSURE REGULATOR (IF APPLICABLE)

- A. Pressure regulator shall assure a 45-PSI downstream pressure entering drip supply header. Pressure shall be verified by contractor to assure proper operating pressure for the in-line emitter tubing at maximum linear run of 280 feet. Contractor may need to manifold pressure regulators to reach the mid-range flow of the regulator.

3.15 TUBING STAKE INSTALLATION (IF APPLICABLE)

- A. In-line drip tubing shall be secured with stakes. Stakes shall be spaced to ensure that tubing does not shift location in presence of foot traffic, operations, gravity on slope installations, or environmental effects. Stake in-line drip tubing at minimum 5-foot intervals to prevent movement.

3.16 AIR RELIEF VALVE INSTALLATION (IF APPLICABLE)

- A. Air relief valves shall be installed in the emitter tubing, at high elevation points as indicated on the drawing.

3.17 FLUSH VALVE INSTALLATION (IF APPLICABLE)

- A. Flush lines shall be installed on end of PVC exhaust header where indicated on the drawings.

3.18 WATER METER INSTALLATION

- A. 1-1/2-inch water meter and curbside shut off valve shall be purchased from and installed by Wilmington Water Department. All charges, fees and coordination for this installation are the responsibility of the Contractor.

3.19 BACKFLOW PREVENTION INSTALLATION

- A. Install 1-1/2-inch reduced pressure back flow prevention assembly in above grade enclosure as specified. Back flow installation shall be in accordance with Wilmington Cross Connection Department.

3.20 BACK FLOW / CONTROLLER ENCLOSURE INSTALLATION

- A. Install enclosures on concrete pads as indicated on the detail, generally where indicated on the drawings. Final location of enclosures shall be coordinated with the Owner's Representative as to best screen the enclosure and deter vandalism. Final location shall also be coordinated with utility department to ensure proper placement of water supply line.

- B. Concrete pad for back flow enclosure shall be 53 inches long by 24 inches wide by 8 inches deep.
- C. Concrete pad for controller enclosure shall be 24 inches long by 24 inches wide by 6 inches deep.
- D. Install one (1) 1-inch sweep elbow (power), one (1) 1-1/2-inch sweep elbow (ground), and one (1) 3-inch sweep elbow (field wiring) through concrete pad into controller enclosure as per detail.

3.21 CHECK/TEST/START-UP/ADJUST

- A. Flushing:
  - 1. After all piping, valves, sprinkler bodies, pipe lines and risers are in place and connected, but prior to installation of sprinkler internals, open the control valves and flush out the system under a full head of water.
  - 2. Sprinkler internals, flush caps and riser nozzles shall be installed only after flushing of the system has been accomplished to the full satisfaction of the Owner's Representative.
  - 3. Contractor shall be responsible for flushing the entire system after installation is complete and will be responsible for any clogged nozzles for thirty (30) days after substantial completion of this portion of the landscape irrigation system.
- B. Testing:
  - 1. Leakage test: test all lines for leaks under operating pressure. Repair all leaks and re-test.
  - 2. Coverage test: perform a coverage test in the presence of the Owner's Representative (notify Architect at least seven (7) days in advance of scheduled coverage test). Representative will determine if the water coverage is complete and adequate. Readjust heads and/or head locations as necessary or directed to achieve proper coverage.
  - 3. All testing shall be at the expense of the Contractor.

3.22 CLEANING AND ADJUSTING

- A. At the completion of the work, all parts of the installation shall be thoroughly cleaned. All equipment, pipe, valves and fittings shall be cleaned of grease, metal cuttings and sludge which may have accumulated by the operation of the system for testing.
- B. Adjust sprinkler heads, valve boxes, and quick coupling valves to grade as required, so that they will not be damaged by mowing operations.

- C. Continue sprinkler coverage adjustment as required by settlement, etc., throughout the guarantee period.
- D. Each control zone shall be operated for a minimum of 5 minutes and all heads checked for consistency of delivering water. Adjustments shall be made to sprinklers that are not consistent to the point that they match the manufacturer's standards. All sprinklers, valves, timing devices or other mechanical or electrical components, which fail to meet these standards, shall be rejected, replaced and tested until they meet the manufacturer's standards.

3.23 ACCEPTANCE AND OPERATION BY OWNER

- A. Upon completion of the work and acceptance by the Owner, the Contractor shall be responsible for the training of the Owner's Representative(s) in the operation of the system (provide minimum 48 hours written notice in advance of test). The Contractor shall furnish, in addition to the Record Drawings and operational manuals, copies of all available specification sheets and catalog sheets to the Owner's personnel responsible for the operation of the irrigation system. The Contractor shall guarantee all parts and labor for a minimum period of one (1) year from date of acceptance.
- B. Conditions for acceptability of work for start of maintenance by Owner issued by Owner or Owner's Representative shall include but not be limited to:
  - 1. Punch list items complete and approved by Owner or Owner's Representative.
  - 2. Landscape irrigation system complete and in place.
  - 3. Record drawings complete.
  - 4. Maintain installation and watering schedules until all conditions noted above have been completed.

3.24 CLEAN UP

- A. Upon completion of all installation work, Contractor shall remove all leftover materials and equipment from the site in a safe and legal manner.
- B. Contractor shall remove all debris resulting from work of this section.
- C. Contractor shall regrade, lightly compact, and replant around sprinkler heads where necessary to maintain proper vertical positioning in relation to established grade.
- D. Contractor shall fill all depressions and eroded channels with sufficient soil mix to adjust grade to ensure proper drainage. Compact lightly, and replant filled areas in accord with Drawings requirements.

**END OF SECTION-SEE ATTACHED IRRIGATION AND WELL ENCLOSURE DRAWINGS ON PAGES 25-29**

**IRRIGATION, WELL AND PUMP ENCLOSURE SPECIFICATIONS AND DESCRIPTION**

Contractor is to visit New Hanover County Arrowhead Park, 720 Arnold Road for review of current irrigation and well enclosure. The Castle Hayne Park irrigation, well and pump enclosures are to be designed and constructed as Arrowhead Park and as outlined in the attached specifications. All necessary changes shall be made by the Contractor with the approval of the Owner's Representative.

See Pages 26-29 for pictures and examples

- A. Length of Enclosure 18 feet, 10 inches X Width 6 feet, 9 inches
- B. Front wall height 2 feet, 11 inches
- C. Rear wall height 3 feet, 7 inches

The perimeter walls have drainage holes around the base. The roof is made of steel frame work and sheet metal.







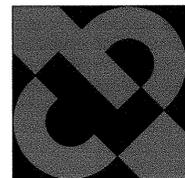


# Castle Hayne Park

## Construction Plans

### Section One & Section Two

Wilmington, North Carolina  
New Hanover County

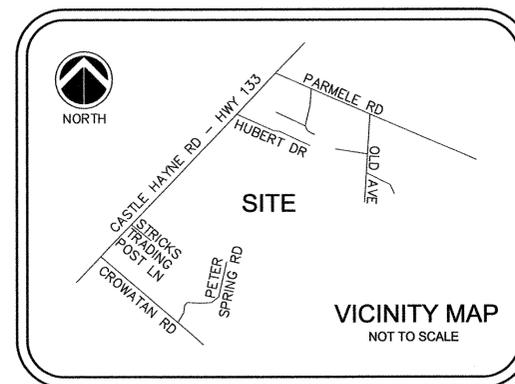


**Coastal Land Design, PLLC**

Civil Engineering / Landscape Architecture  
Land Planning / Construction Management

NCBELS Firm License No: P-0369

P.O. Box 1172 Phone: 910-254-9333  
Wilmington, NC 28402 www.cldeng.com Fax: 910-254-0502



CONTENTS		
1	INDEX PLAN	
2	PLAN / PROFILE	SECTION ONE
3	PLAN / PROFILE	SECTION ONE
4	PLAN / PROFILE	SECTION TWO
5	NCDOT DRIVEWAY PLAN	SECTION ONE
6	WETLAND IMPACT EXHIBIT	SECTION ONE
7	GRADING / DRAINAGE PLAN	SECTION TWO
8	SITE DETAILS	
9	SITE DETAILS	
10	STORMWATER DETAILS	
11	S&E DETAILS	
12	S&E DETAILS	
L-1.0	LANDSCAPE PLAN	SECTION TWO
L-2.0	LANDSCAPE DETAILS	SECTION TWO
IR-1	IRRIGATION PLAN (DESIGNED AND PROVIDED BY OTHERS)	

- PERMITS PERTAINING TO PROJECT**
- SECTION 1**
- NCDOT DRIVEWAY: D-065-13-026
  - DWQ STREAM IMPACT: 13-0789
  - US ACOE STREAM IMPACT: SAW-2013-00989
  - STATE STORMWATER: SW8 950204
  - COUNTY STORMWATER: 587-09/04/13
  - STATE S&E: NEWHA-2013-022
- SECTION 2**
- US ACOE DETERMINATION: SAW-2014-00059
  - STATE STORMWATER: SW8 950204
  - COUNTY STORMWATER: 587-08/11/14
  - STATE S&E: NEWHA-2015-001

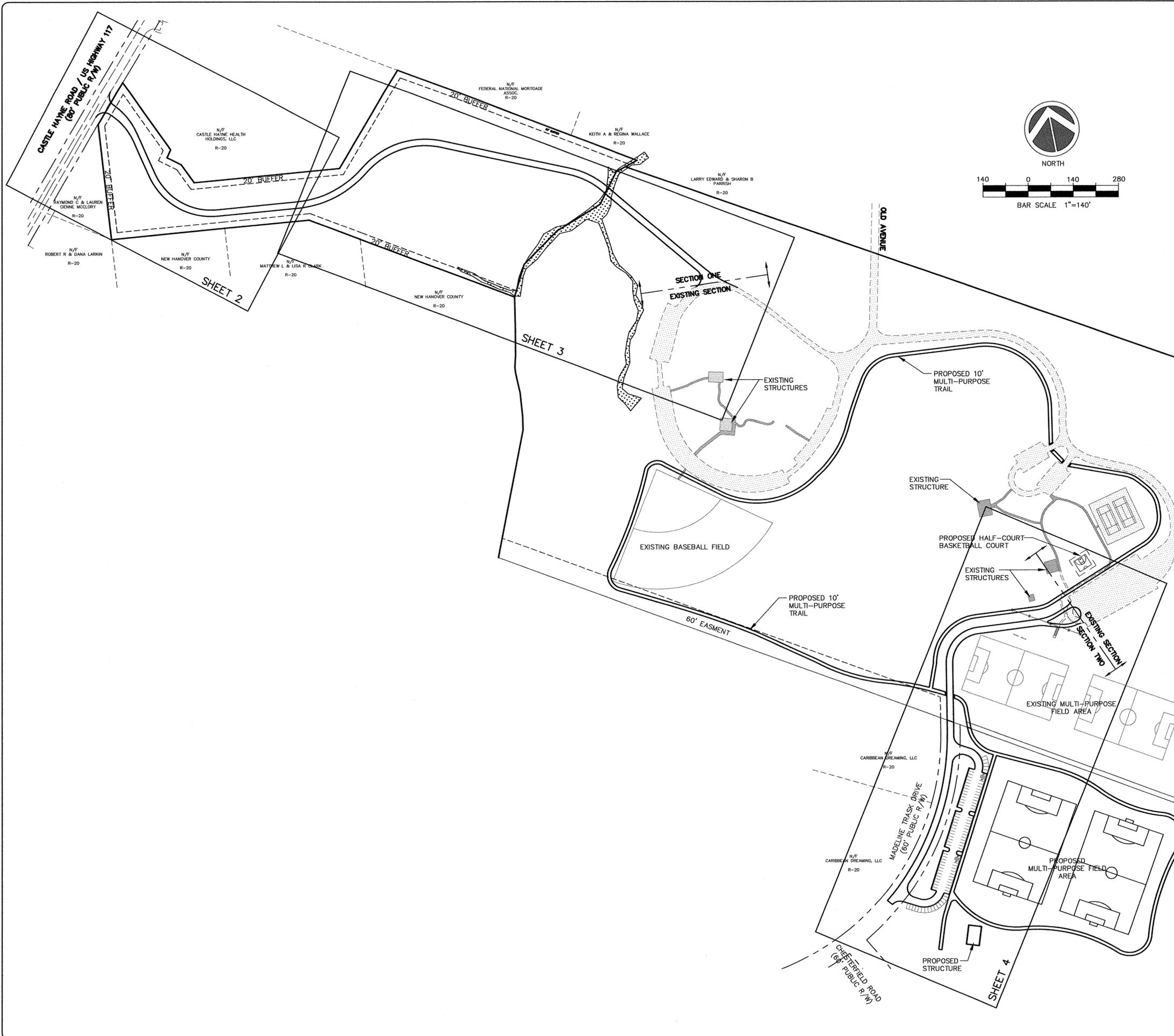


**OWNER:**  
NEW HANOVER COUNTY  
230 GOVERNMENT CENTER DRIVE  
WILMINGTON, NC 28403

**GENERAL NOTES:**

1. CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING ALL EXISTING UTILITIES, ABOVE AND BELOW GROUND, PRIOR TO CONSTRUCTION.
2. SURVEY AND TOPOGRAPHICAL INFORMATION AS SHOWN ON THESE PLANS HAVE BEEN PROVIDED BY MARK A. STOCKS, PLS, PC OF WILMINGTON, NC.
3. WETLANDS SHOWN ON THIS PLAN WERE DELINEATED BY SOUTHERN ENVIRONMENTAL GROUP, INC. 5315 SOUTH COLLEGE ROAD, SUITE E WILMINGTON, NC 28412. TELEPHONE 910-452-2711.
4. PROPERTY ADDRESS:  
4700 OLD AVE.  
CASTLE HAYNE  
NEW HANOVER COUNTY
5. THE IRRIGATION PLAN FOUND WITHIN THIS SET OF PLANS IS PROVIDED FOR INFORMATION ONLY AND IS NOT A PART OF THE SEALED DESIGN COMPLETED BY COASTAL LAND DESIGN, PLLC AND SAGEDSIGN.

**FINAL DRAWING  
- NOT RELEASED  
FOR CONSTRUCTION**



**LEGEND:**

	DELINEATED WETLANDS
	EXISTING IMPERVIOUS

REV. #	DESCRIPTION	REV. BY	DATE
REVISIONS			



OWNER:  
 NEW HANOVER COUNTY  
 230 GOVERNMENT CENTER DRIVE  
 WILMINGTON, NC 28403

**Coastal Land Design, PLLC**  
 Civil Engineering / Landscape Architecture  
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 P.O. Box 1172 Wilmington, NC 28402 www.cldeng.com Phone: 910-254-9333 Fax: 910-254-0502

DRAWN : A. Mills	PROJECT : 110-01
DESIGN : A. Mills	NUMBER : 110-01
CHECK : J. Petroff	SCALE : 1" = 140'
APPROVED : J. Petroff	DATE : 29 Jan 13
FILE NAME :	

**Castle Hayne Park**  
 New Hanover County, NC

Index Sheet

JOB NUMBER 110-01	SHEET NUMBER 1
----------------------	-------------------

**DITCH TABLE**

Ditch	Drainage Area (ac)	Runoff Coef. C	Time of Conc. Tc (min)	Intensity I <sub>30</sub> (in/hr)	Flowrate Q (cfs)	Length L (ft)	Height H (ft)	Slope S (ft/ft)	Depth y (ft)	Velocity V (fps)
1	0.12	0.32	1.41	11.58	0.45	90	1	0.011	0.34	1.32
2	1.58	0.27	5.97	9.22	3.88	536	5	0.009	0.78	2.12
3	0.58	0.29	3.11	10.56	1.78	283	4	0.014	0.54	2.04
4	0.32	0.43	3.49	10.35	1.44	424	10	0.024	0.45	2.34
5	0.22	0.47	2.58	10.85	1.13	327	10	0.031	0.39	2.43
6	0.17	0.42	2.19	11.08	0.79	225	5	0.022	0.37	1.97
7	0.14	0.41	1.64	11.43	0.66	163	4	0.025	0.34	1.96
8	0.09	0.37	1.22	11.71	0.39	100	2	0.020	0.28	1.59
9	0.24	0.36	2.13	11.12	0.95	233	6	0.026	0.38	2.18
10	0.34	0.38	3.11	10.55	1.35	357	8	0.022	0.45	2.26
11	0.24	0.24	4.01	10.69	3.87	380	5	0.015	0.73	2.41
12	0.57	0.27	3.33	10.44	1.58	300	4	0.013	0.52	1.94
13	0.57	0.37	6.38	9.06	1.92	568	5	0.009	0.61	1.74
14	0.15	0.30	1.36	11.61	0.52	110	2	0.018	0.32	1.65
15	3.46	0.27	3.65	10.27	9.61	205	1	0.005	1.24	2.09
16	1.05	0.41	10.33	7.77	3.32	800	4	0.005	0.83	1.61
17	0.50	0.41	10.33	7.77	1.58	800	4	0.005	0.63	1.34
18	0.45	0.44	6.81	8.90	1.74	620	5.5	0.009	0.58	1.70
19	0.85	0.43	6.81	8.90	3.22	620	5.5	0.009	0.74	1.99

**CULVERT TABLE**

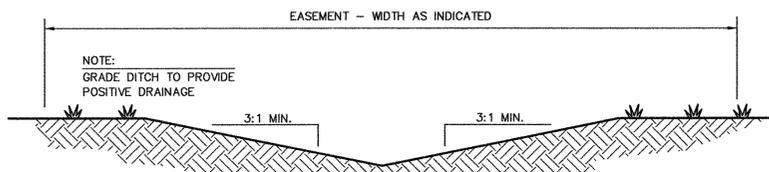
Culvert	Material	Size (in)	Length (ft)	Invert Dn (ft)	Invert Up (ft)	Slope (%)
1	RCP - Class 4 (min. cover)	18	50	18.36	18.61	0.50
2	RCP - Class 4 (min. cover)	18	50	20.00	20.25	0.50
3	RCP - Class 3	18	90	19.00	19.45	0.50
4	Corr Aluminum Pipe (10 Gauge)	96	56	7.36	7.50	0.25
5	RCP - Class 4 (min. cover)	30	60	22.00	22.30	0.50
6	RCP - Class 4 (min. cover)	30	60	19.50	19.80	0.50
7	RCP - Class 4 (min. cover)	36	40	19.00	19.20	0.50

**GENERAL NOTES:**

- CONTRACTOR IS RESPONSIBLE TO FIELD VERIFY THE HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO THE START OF CONSTRUCTION.
- CONTRACTOR IS RESPONSIBLE FOR DISPOSAL OF ALL WASTE MATERIALS GENERATED THROUGH DEMOLITION AND GRUBBING ACTIVITIES.
- WETLANDS SHOWN ON THIS PLAN WERE DELINEATED BY SOUTHERN ENVIRONMENTAL GROUP, INC. 5315 SOUTH COLLEGE ROAD, SUITE E WILMINGTON, NC 28412. TELEPHONE 910-452-2711.
- DISTURBANCE IS TO BE KEPT TO A MINIMUM.
- ALL DISTURBED AREAS NOT WITHIN THE PROPOSED EDGE OF PAVEMENT (EOP) TO BE SEEDED, FERTILIZED, AND MULCHED WITHIN 15 CALENDAR DAYS OF GRADING ACTIVITIES.
- ALL SITE GRADING AND DITCHES TO PROVIDE POSITIVE DRAINAGE.
- SURVEY AND TOPOGRAPHICAL INFORMATION AS SHOWN ON THESE PLANS HAVE BEEN PROVIDED BY MARK A. STOCKS, PLS, PC OUT OF WILMINGTON, NC.

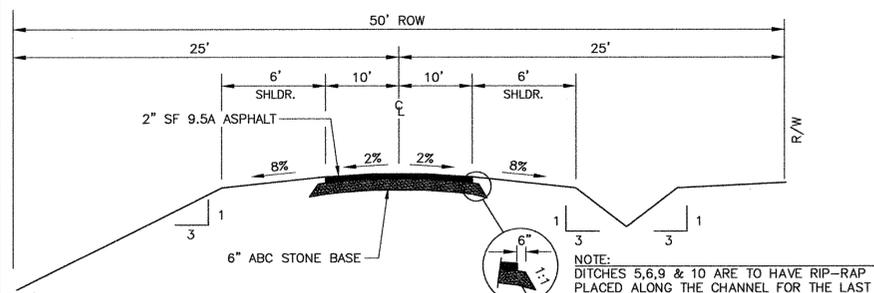
**CONSTRUCTION SEQUENCE:**

- INSTALL TEMPORARY CONSTRUCTION ENTRANCE.
- INSTALL SILT FENCING AROUND WETLAND AREAS AS SHOWN ON THE PLANS.
- CONSTRUCT TEMPORARY SEDIMENT TRAPS/BASINS IN LOCATIONS AND DIMENSIONS AS SPECIFIED ON THE PLANS.
- CONSTRUCT ROADSIDE DITCHES AND ENSURE PROPER DRAINAGE INTO TEMPORARY SEDIMENT TRAPS. LINE DITCHES WITH MATERIAL SPECIFIED ON PLANS.
- CLEAR, GRUB, AND GRADE ALL AREAS WITHIN THE PROPOSED RIGHT OF WAY AND IN OTHER AREAS WITHIN THE LIMITS OF DISTURBANCE AS SHOWN ON PLANS.
- DO NOT DISTURB ANY WETLANDS PRIOR TO APPROVAL FROM NCDENR - WILMINGTON REGIONAL OFFICE.
- UPON APPROVAL FROM NCDENR FOR WETLAND IMPACTS, REMOVE TEMPORARY SILT FENCE AND CLEAR, GRUB, GRADE, AND INSTALL NECESSARY STORMWATER OR CROSSING APPURTENANCES ONLY IN AREAS THAT HAVE BEEN APPROVED FOR IMPACTS.
- ALL DISTURBED AREAS ARE TO BE SEEDED, FERTILIZED, AND MULCHED PER THE FOLLOWING:
  - ALL PERIMETER DIKES, SWALES, DITCHES, PERIMETER SLOPES AND ALL SLOPES STEEPER THAN 3:1 SHALL BE PROVIDED TEMPORARY OR PERMANENT STABILIZATION WITHIN 7 CALENDAR DAYS FROM THE LAST LAND-DISTURBING ACTIVITY.
  - ALL OTHER DISTURBED AREAS SHALL BE PROVIDED TEMPORARY OR PERMANENT STABILIZATION WITH GROUND COVER WITHIN 14 CALENDAR DAYS FROM THE LAST LAND-DISTURBING ACTIVITY.
- AFTER ALL LAND DISTURBING ACTIVITIES ARE COMPLETE, THE NECESSARY STORMWATER SYSTEM IS IN PLACE, AND THE GROUND HAS BEEN ADEQUATELY STABILIZED, REMOVE SEDIMENT CONTROL DEVICES.



**TRIANGULAR DITCH**

NOT TO SCALE



**STANDARD STREET SECTION**

NOT TO SCALE

**TEMPORARY SEEDING**

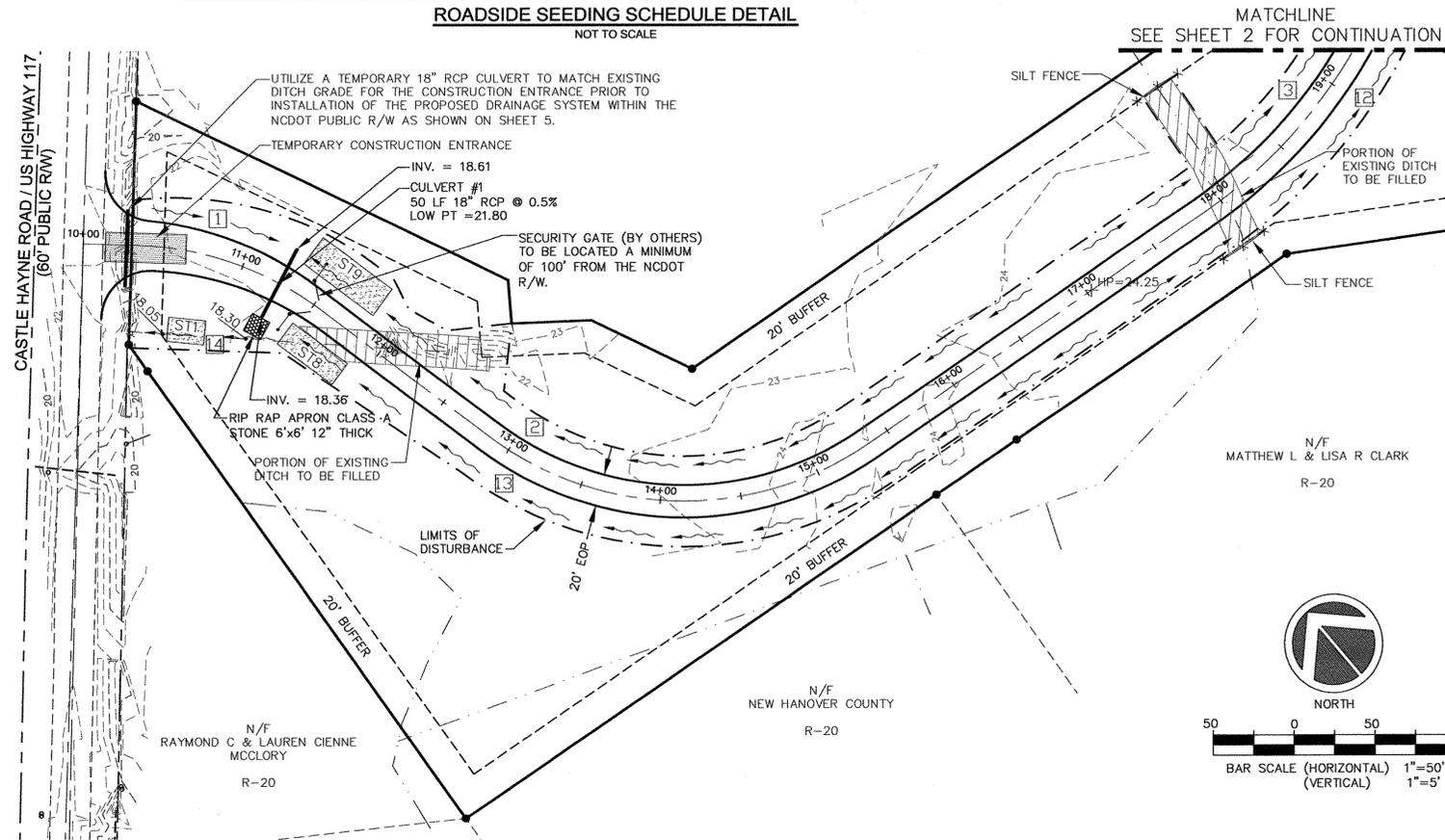
GRASS TYPE	AMOUNT/1000 SF.	TIME OF SEEDING	INITIAL	FERTILIZATION/1000 SF. MAINTENANCE
RYE GRASS	1-2 LBS.	NOV. THRU JAN.	25 LBS. 10-10-10	NA
BROWNTOP MILLET	1-2 LBS.	JUNE THRU AUG.	25 LBS. 10-10-10	NA

**PERMANENT SEEDING**

GRASS TYPE	AMOUNT/1000 SF.	TIME OF SEEDING	INITIAL	FERTILIZATION/1000 SF. MAINTENANCE
BERMUDA, COMMON	1-2 LBS.	APR. THRU JUNE	25 LBS. 10-10-10	MARCH - APRIL 12 LBS. 10-10-10 EACH 4-8 WEEKS 1-2 LBS. N. AUG. - SEPT. 12 LBS. 10-10-10
FESCUE, TALL (KENTUCKY 31)	5-7 LBS.	SEPT. THRU OCT. FEB. THRU OCT.	25 LBS. 10-10-10	FEB. - MARCH 12 LBS. 10-10-10 MAY & DEC. 1/2 TO 1 LB. N. SEPT. - OCT. 12 LBS. 10-10-10
SERICIA LESPEDEZA (SLOPES)	1-2 LBS.	MARCH THRU APR.	25 LBS. 10-10-10	FEB. - MARCH 1/2 TO 1 LB. N. NA

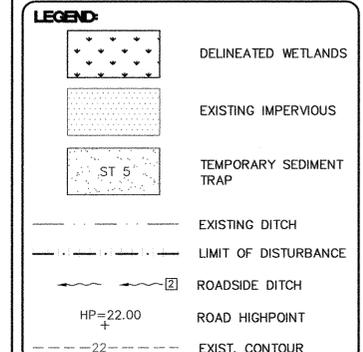
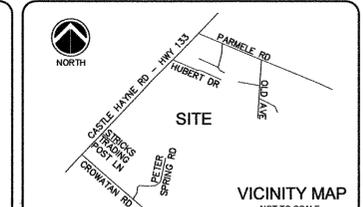
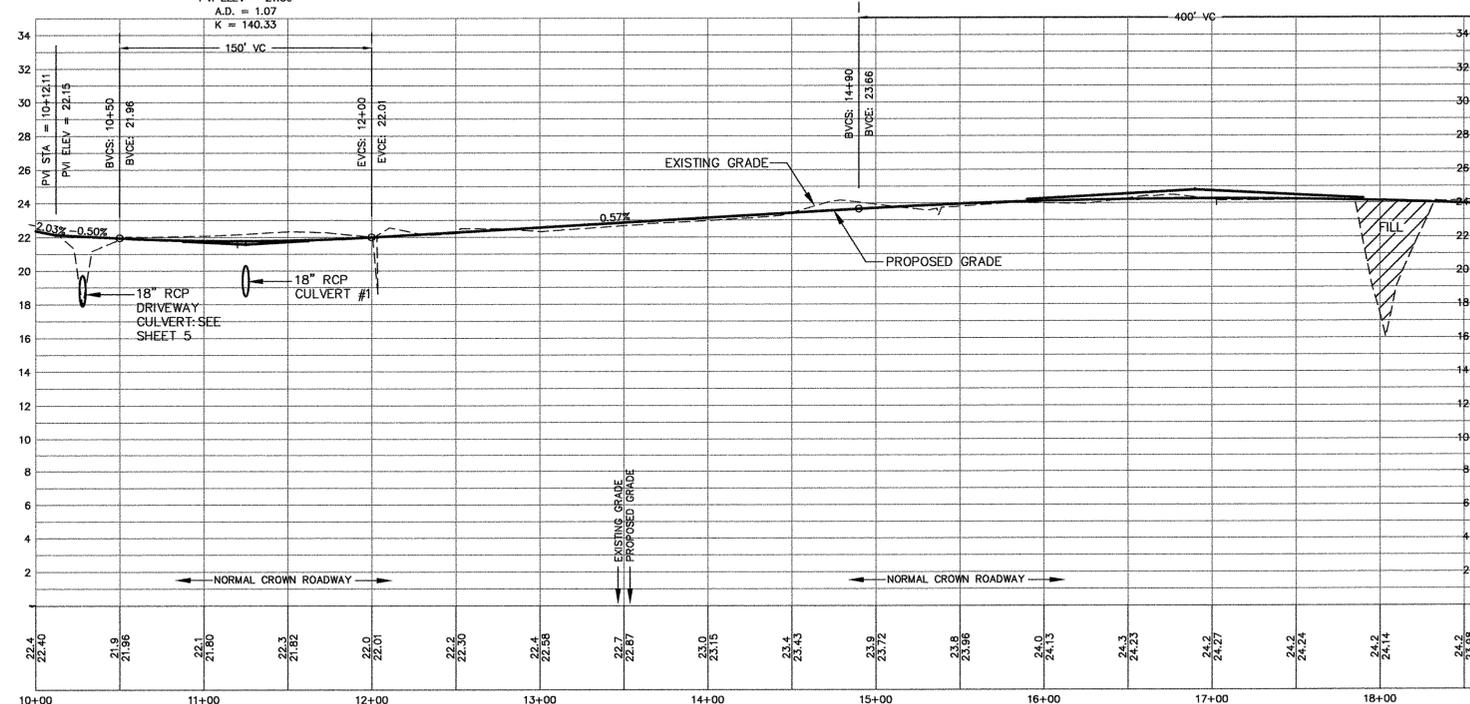
**ROADSIDE SEEDING SCHEDULE DETAIL**

NOT TO SCALE



LOW POINT ELEV = 21.79  
LOW POINT STA = 11+20.16  
PVI STA = 11+25  
PVI ELEV = 21.59  
A.D. = 1.07  
K = 140.33

HIGH POINT ELEV = 24.27  
HIGH POINT STA = 17+02.90  
PVI STA = 16+90  
PVI ELEV = 24.80  
A.D. = -1.07  
K = 374.21



**FINAL DRAWING - NOT RELEASED FOR CONSTRUCTION**

REV. # DESCRIPTION REV. BY DATE

REVISIONS

NORTH

50 0 50 100

BAR SCALE (HORIZONTAL) 1"=50'  
(VERTICAL) 1"=5'

N/F MATTHEW L. & LISA R. CLARK R-20

N/F NEW HANOVER COUNTY R-20

N/F RAYMOND C. & LAUREN CIENNE MCCLORY R-20

Professional Seal: NORTH CAROLINA PROFESSIONAL SEAL 028858, dated 10/24/14.

Seal of New Hanover County, North Carolina, established 1710.

OWNER: NEW HANOVER COUNTY, 230 GOVERNMENT CENTER DRIVE, WILMINGTON, NC 28403

**Coastal Land Design, PLLC**  
Civil Engineering / Landscape Architecture  
Land Planning / Construction Management  
NCBES Firm License No: P-03959  
P.O. Box 1172, Wilmington, NC 28402, www.cldng.com, Phone: 910-254-9883, Fax: 910-254-6002

DRAWN: A. Mills PROJECT: 110-01  
DESIGN: A. Mills NUMBER: 110-01  
CHECK: J. Petroff SCALE: 1"= 50'  
APPROVED: J. Petroff DATE: 06 Sept 12  
FILE NAME:

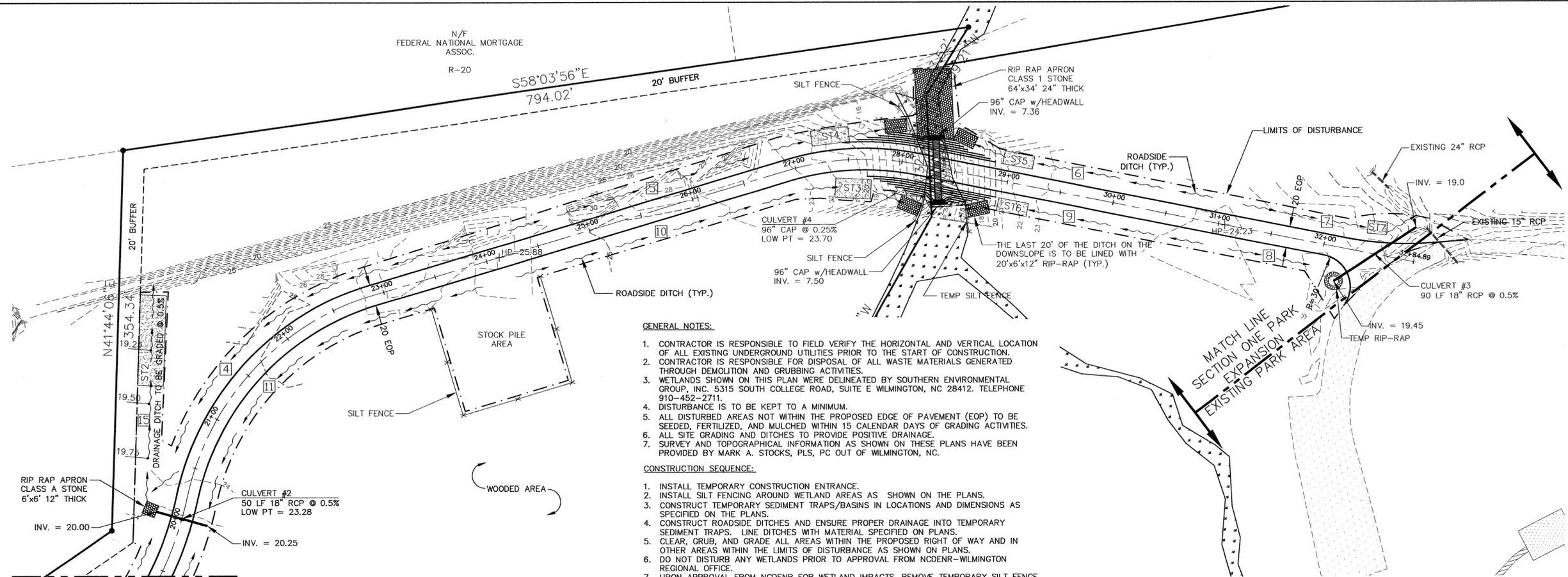
**Castle Hayne Park**  
New Hanover County, NC

**Plan / Profile**  
Section One

JOB NUMBER: 110-01 SHEET NUMBER: 2

N/F  
FEDERAL NATIONAL MORTGAGE  
ASSOC.  
R-20

S58°03'56"E  
794.02'



**GENERAL NOTES:**

1. CONTRACTOR IS RESPONSIBLE TO FIELD VERIFY THE HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO THE START OF CONSTRUCTION.
2. CONTRACTOR IS RESPONSIBLE FOR DISPOSAL OF ALL WASTE MATERIALS GENERATED THROUGH DEMOLITION AND GRUBBING ACTIVITIES.
3. WETLANDS SHOWN ON THIS PLAN WERE DELINEATED BY SOUTHERN ENVIRONMENTAL GROUP, INC. 5315 SOUTH COLLEGE ROAD, SUITE E WILMINGTON, NC 28412. TELEPHONE 910-452-2711.
4. DISTURBANCE IS TO BE KEPT TO A MINIMUM.
5. ALL DISTURBED AREAS NOT WITHIN THE PROPOSED EDGE OF PAVEMENT (EOP) TO BE SEEDED, FERTILIZED, AND MULCHED WITHIN 15 CALENDAR DAYS OF GRADING ACTIVITIES.
6. ALL SITE GRADING AND DITCHES TO PROVIDE POSITIVE DRAINAGE.
7. SURVEY AND TOPOGRAPHICAL INFORMATION AS SHOWN ON THESE PLANS HAVE BEEN PROVIDED BY MARK A. STOCKS, PLS, PC OUT OF WILMINGTON, NC.

**CONSTRUCTION SEQUENCE:**

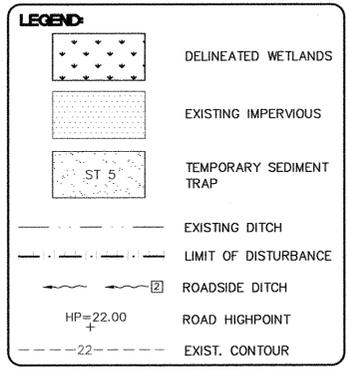
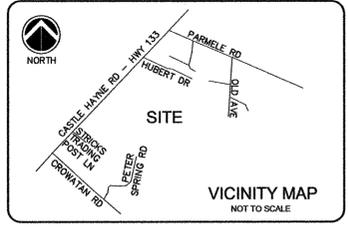
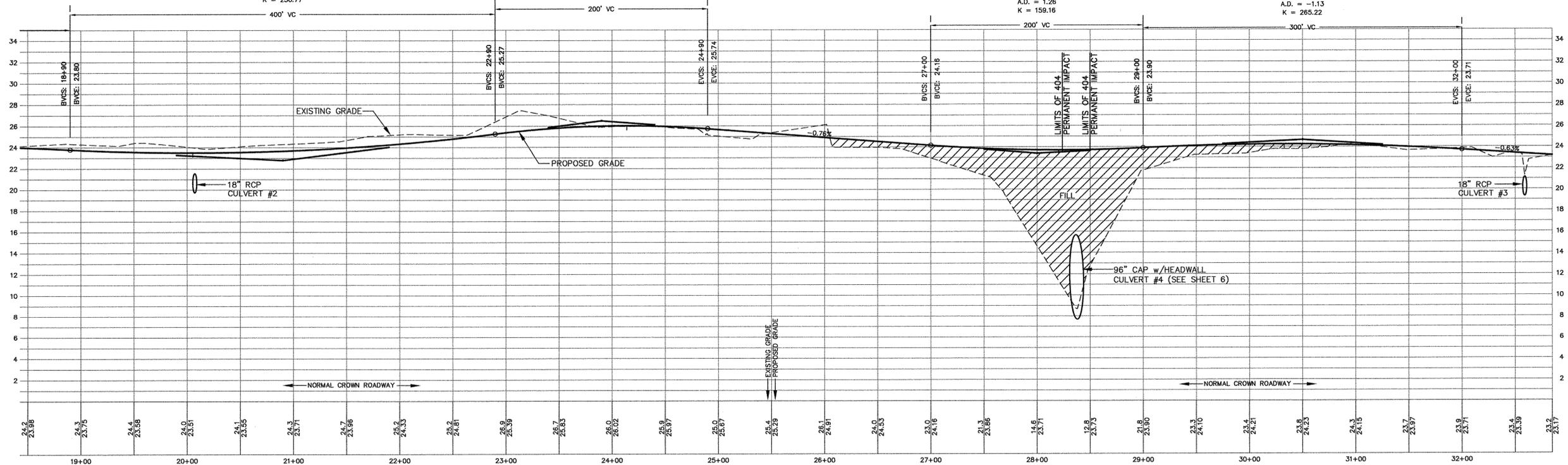
1. INSTALL TEMPORARY CONSTRUCTION ENTRANCE.
2. INSTALL SILT FENCING AROUND WETLAND AREAS AS SHOWN ON THE PLANS.
3. CONSTRUCT TEMPORARY SEDIMENT TRAPS/BASINS IN LOCATIONS AND DIMENSIONS AS SPECIFIED ON THE PLANS.
4. CONSTRUCT ROADSIDE DITCHES AND ENSURE PROPER DRAINAGE INTO TEMPORARY SEDIMENT TRAPS. LINE DITCHES WITH MATERIAL SPECIFIED ON PLANS.
5. CLEAR, GRUB, AND GRADE ALL AREAS WITHIN THE PROPOSED RIGHT OF WAY AND IN OTHER AREAS WITHIN THE LIMITS OF DISTURBANCE AS SHOWN ON PLANS.
6. DO NOT DISTURB ANY WETLANDS PRIOR TO APPROVAL FROM NCDENR - WILMINGTON REGIONAL OFFICE.
7. UPON APPROVAL FROM NCDENR FOR WETLAND IMPACTS, REMOVE TEMPORARY SILT FENCE AND CLEAR, GRUB, GRADE, AND INSTALL NECESSARY STORMWATER OR CROSSING APPURTENANCES ONLY IN AREAS THAT HAVE BEEN APPROVED FOR IMPACTS.
8. ALL DISTURBED AREAS ARE TO BE SEEDED, FERTILIZED, AND MULCHED PER THE FOLLOWING:
  - 1) ALL PERIMETER DIKES, SWALES, DITCHES, PERIMETER SLOPES AND ALL SLOPES STEEPER THAN 3:1 SHALL BE PROVIDED TEMPORARY OR PERMANENT STABILIZATION WITHIN 7 CALENDAR DAYS FROM THE LAST LAND-DISTURBING ACTIVITY.
  - 2) ALL OTHER DISTURBED AREAS SHALL BE PROVIDED TEMPORARY OR PERMANENT STABILIZATION WITH GROUND COVER WITHIN 14 CALENDAR DAYS FROM THE LAST LAND-DISTURBING ACTIVITY.
9. AFTER ALL LAND DISTURBING ACTIVITIES ARE COMPLETE, THE NECESSARY STORMWATER SYSTEM IS IN PLACE, AND THE GROUND HAS BEEN ADEQUATELY STABILIZED, REMOVE SEDIMENT CONTROL DEVICES.

LOW POINT ELEV = 23.51  
LOW POINT STA = 20+05.38  
PVI STA = 20+90  
PVI ELEV = 22.80  
A.D. = 1.73  
K = 230.77

HIGH POINT ELEV = 26.03  
HIGH POINT STA = 24+13.99  
PVI STA = 23+90  
PVI ELEV = 26.50  
A.D. = -1.99  
K = 100.53

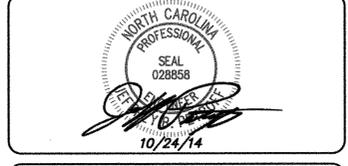
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PVI STA = 28+00  
PVI ELEV = 23.40  
A.D. = 1.26  
K = 159.16

HIGH POINT ELEV = 24.23  
HIGH POINT STA = 30+32.75  
PVI STA = 30+50  
PVI ELEV = 24.65  
A.D. = -1.13  
K = 265.22



**FINAL DRAWING  
- NOT RELEASED  
FOR CONSTRUCTION**

REV. #	DESCRIPTION	REV. BY	DATE
REVISIONS			



**OWNER:**  
NEW HANOVER COUNTY  
230 GOVERNMENT CENTER DRIVE  
WILMINGTON, NC 28403

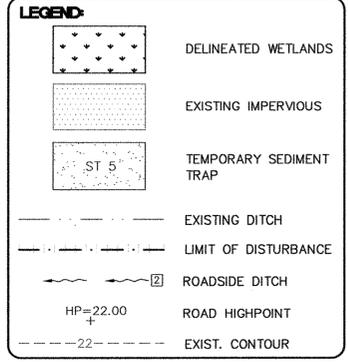
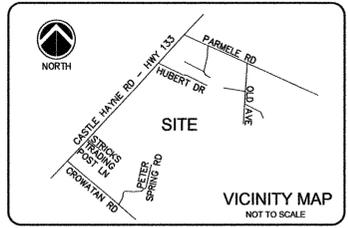
**Coastal Land Design, PLLC**  
Civil Engineering / Landscape Architecture  
Land Planning / Construction Management  
NCELS Firm License No: P-0089  
P.O. Box 1172  
Wilmington, NC 28402  
www.cldeng.com  
Phone: 910-254-9333  
Fax: 910-254-0002

DRAWN : A. Mills	PROJECT NUMBER : 110-01
DESIGN : A. Mills	SCALE : 1" = 50'
CHECK : J. Petroff	DATE : 08 Sept 12
APPROVED : J. Petroff	
FILE NAME :	

**Castle Hayne Park  
New Hanover County, NC**

**Plan / Profile  
Section One**

JOB NUMBER	SHEET NUMBER
110-01	3



**FINAL DRAWING  
- NOT RELEASED  
FOR CONSTRUCTION**

REV. #	DESCRIPTION	REV. BY	DATE
REVISIONS			



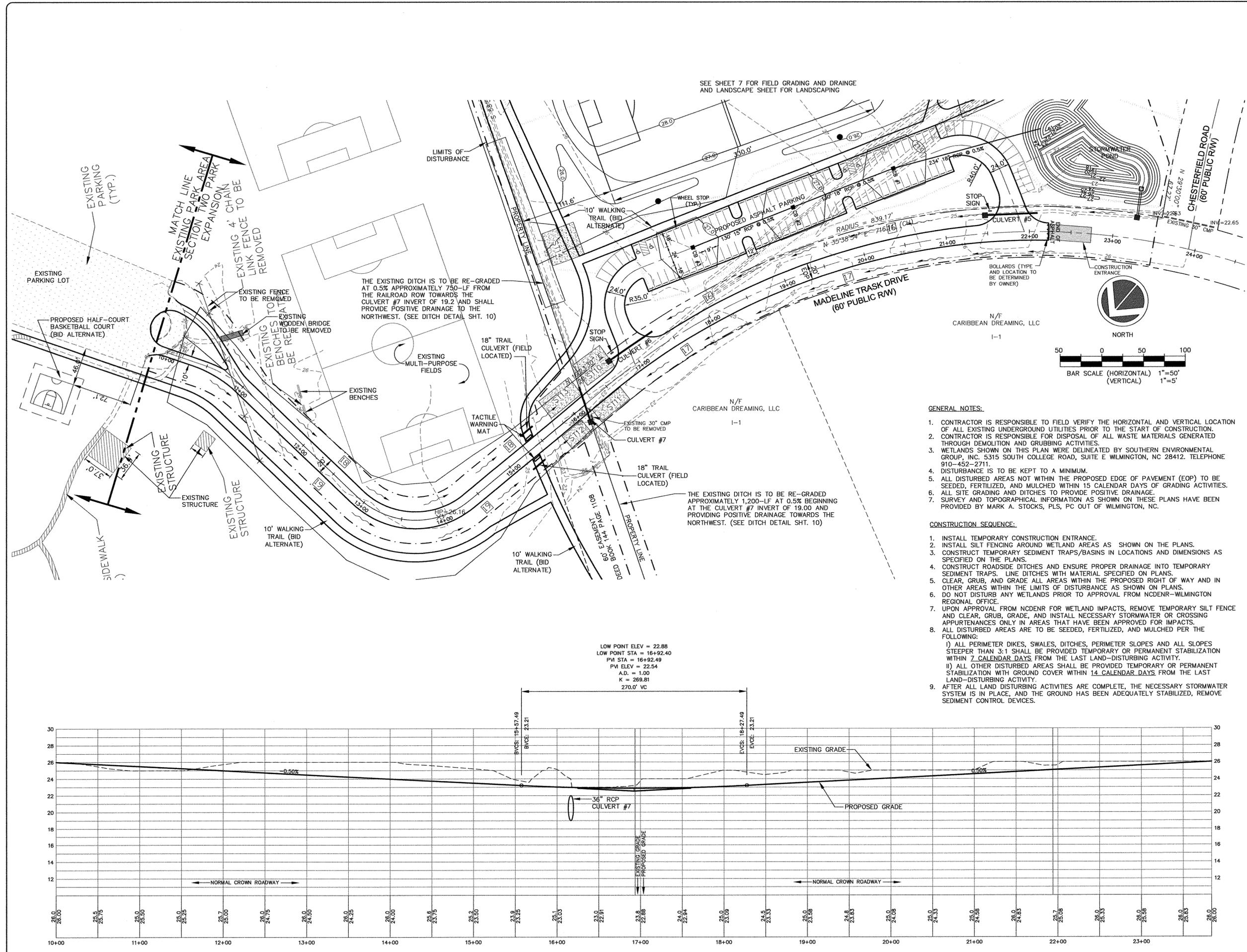
**Coastal Land Design, PLLC**  
 Civil Engineering / Landscape Architecture  
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 NCBELS Firm License No. P-0089  
 P.O. Box 1172, Wilmington, NC 28402 www.cldeng.com Phone: 910-254-6338 Fax: 910-254-0502

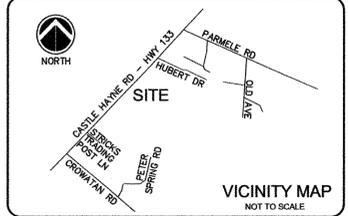
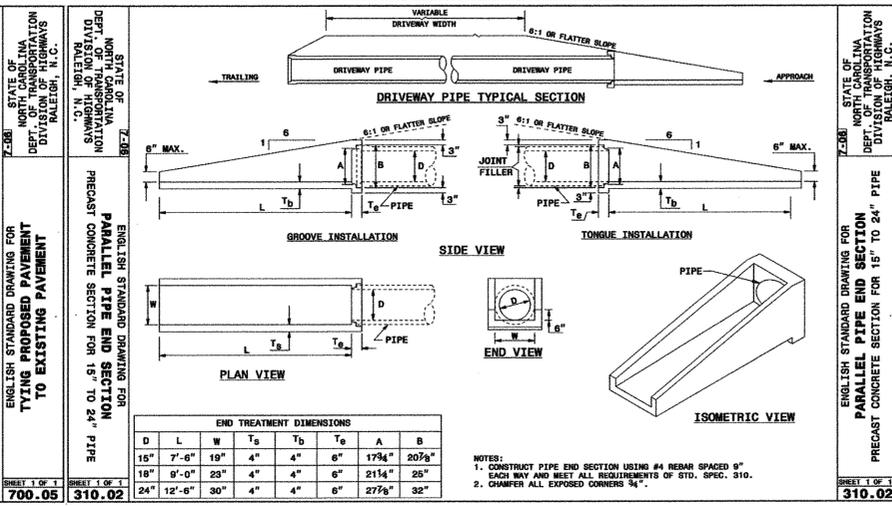
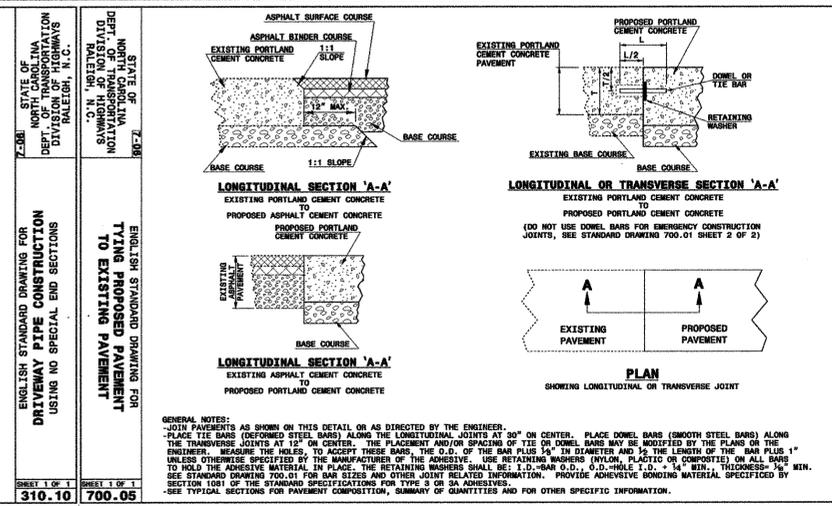
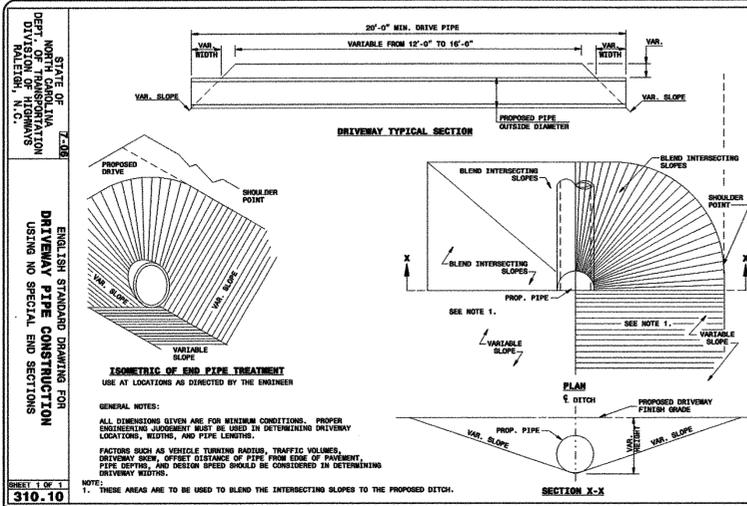
DRAWN : A. Mills	PROJECT : 110-01
DESIGN : A. Mills	NUMBER :
CHECK : J. Petroff	SCALE : 1" = 50'
APPROVED : J. Petroff	DATE : 06 Sept 12
FILE NAME :	

**Castle Hayne Park  
New Hanover County, NC**

**Plan / Profile  
Section Two**

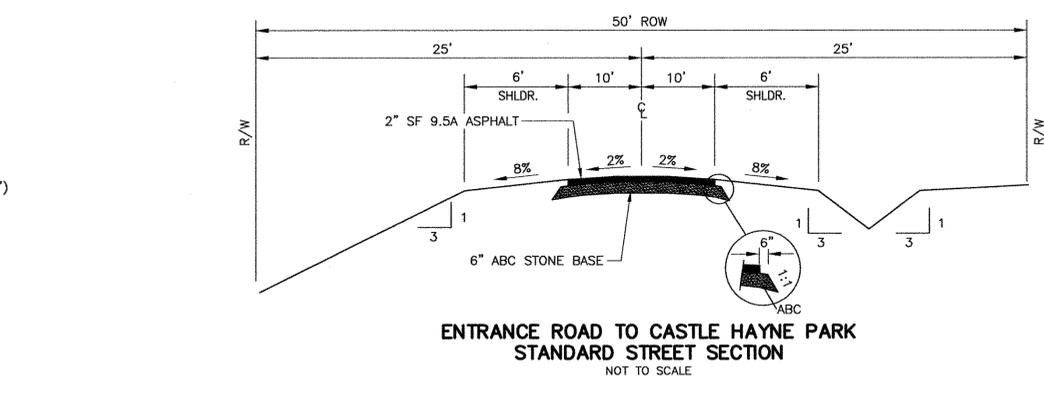
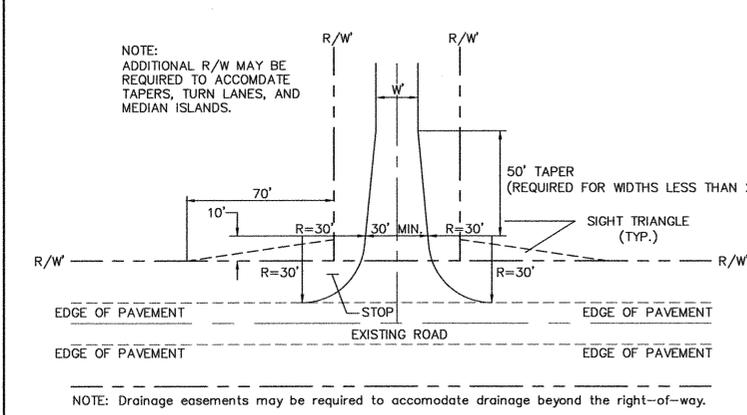
JOB NUMBER <b>110-01</b>	SHEET NUMBER <b>4</b>
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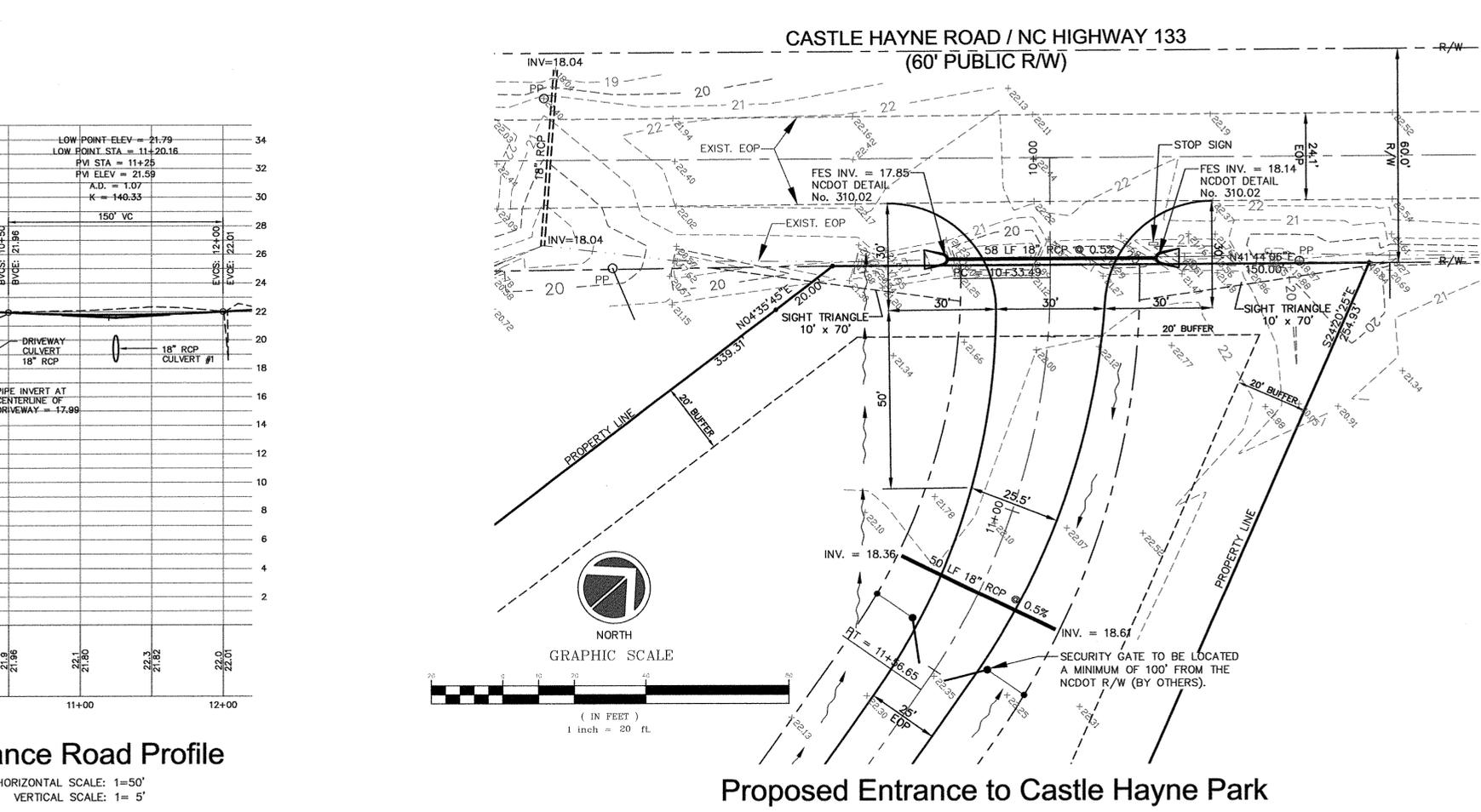
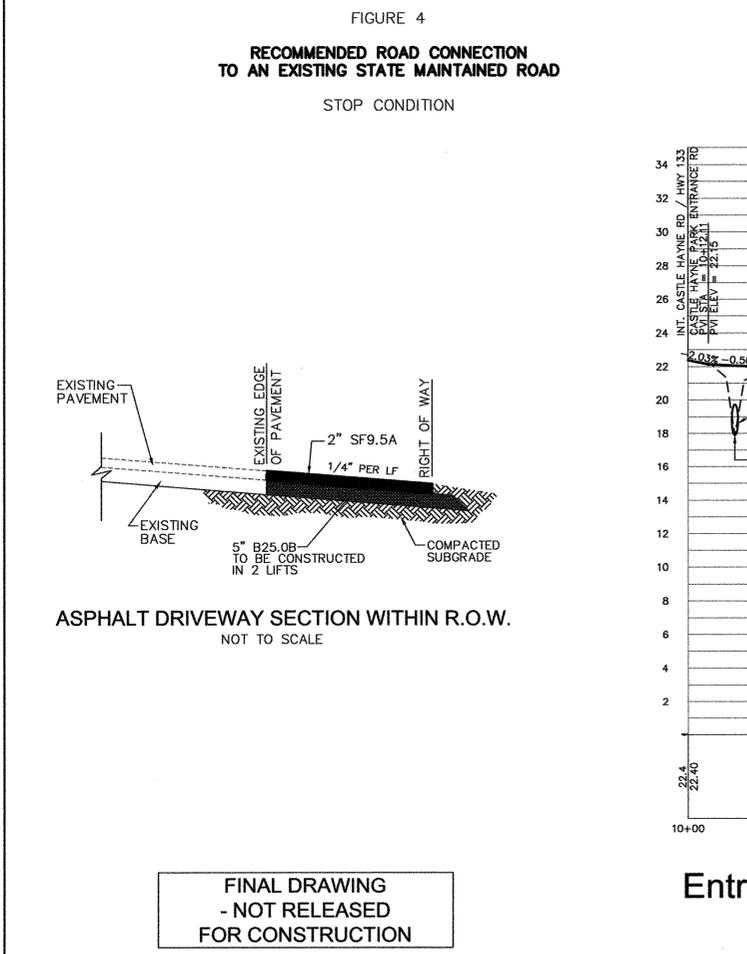


**LEGEND**

- EXISTING DITCH
- DRAINAGE DITCH
- EXIST. SPOT ELEVATION
- EXIST. CONTOUR
- EXIST. POWER POLE



- GENERAL NOTES:**
- CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING ALL EXISTING UTILITIES, ABOVE AND BELOW GROUND, PRIOR TO CONSTRUCTION.
  - CONTRACTOR IS RESPONSIBLE FOR DISPOSAL OF ALL WASTE MATERIALS GENERATED THROUGH DEMOLITION AND GRUBBING ACTIVITIES.
  - SURVEY AND TOPOGRAPHICAL INFORMATION AS SHOWN ON THESE PLANS HAVE BEEN PROVIDED BY MARK A. STOCKS, PLS, PC OUT OF WILMINGTON, NC.
  - POSTED SPEED LIMIT IS 50 MPH; DESIGN SPEED IS 55 MPH.
  - ALL STORM DRAIN DEVICES ARE TO PROVIDE POSITIVE DRAINAGE.
  - EROSION AND SEDIMENTATION CONTROL PRACTICES ARE TO BE INSTALLED IN THE LOCATION THAT THE STORMWATER SYSTEM IS BEING INSTALLED CONCURRENTLY.
  - ALL DISTURBED AREAS ARE TO BE SEEDED, FERTILIZED, AND MULCHED PER THE FOLLOWING:
    - ALL PERIMETER DIKES, SWALES, DITCHES, PERIMETER SLOPES AND ALL SLOPES STEEPER THAN 3:1 SHALL BE PROVIDED TEMPORARY OR PERMANENT STABILIZATION WITHIN 7 CALENDAR DAYS FROM THE LAST LAND-DISTURBING ACTIVITY.
    - ALL OTHER DISTURBED AREAS SHALL BE PROVIDED TEMPORARY OR PERMANENT STABILIZATION WITH GROUND COVER WITHIN 14 CALENDAR DAYS FROM THE LAST LAND-DISTURBING ACTIVITY.



**REVISIONS**

REV. #	DESCRIPTION	REV. BY	DATE
2	REVISED THE STANDARD ROAD DETAIL TO SHOW 2" SF 9.5A ASPHALT IN LIEU OF 1"	AEM	4/16/14
1	ADDED THE DETAIL NUMBER TO THE FES ON THE PIPE AT THE ENTRANCE. ADDED THE PROPOSED SECURITY GATE FOR THE ROAD.	AEM	5/23/13



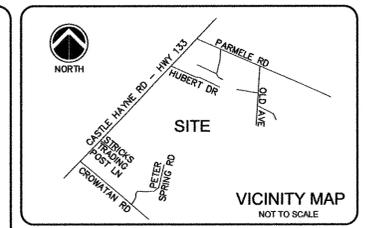
**DRAWN:** A. Mills  
**DESIGN:** A. Mills  
**CHECK:** J. Petroff  
**APPROVED:** J. Petroff

**PROJECT:** 110-01  
**NUMBER:** 5  
**SCALE:** AS NOTED  
**DATE:** 29 Jan 13

**Castle Hayne Park**  
New Hanover County, NC

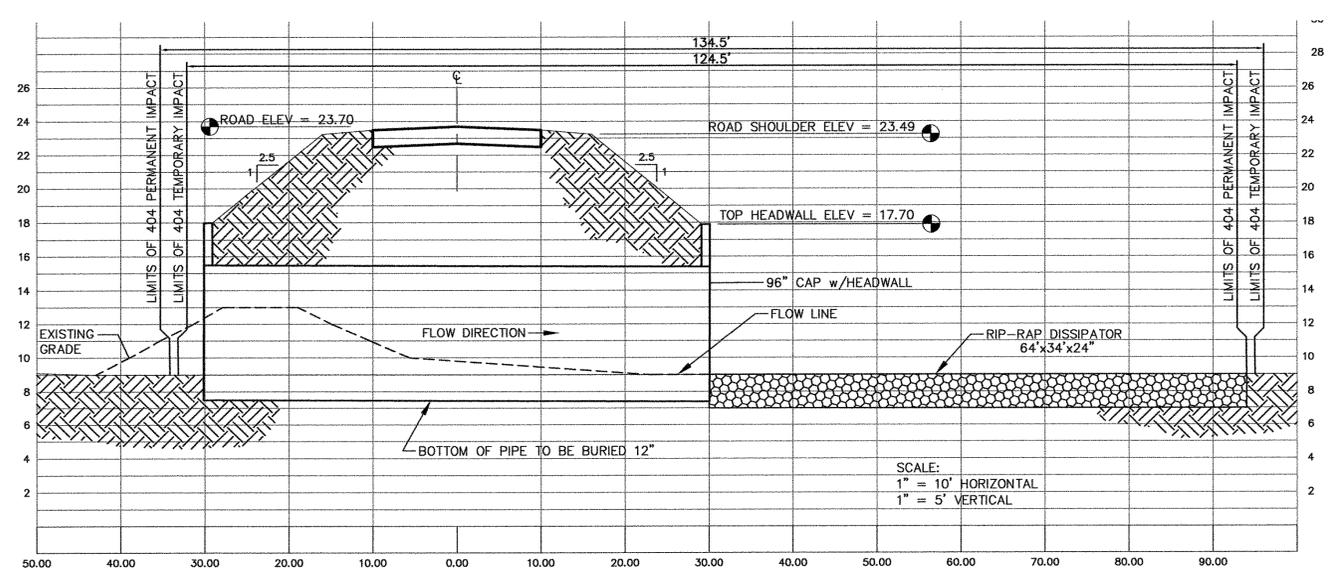
**Driveway / Entrance Plan**  
SECTION ONE

**JOB NUMBER:** 110-01  
**SHEET NUMBER:** 5



**LEGEND:**

- DELINEATED WETLANDS
- EXISTING IMPERVIOUS
- TEMPORARY SEDIMENT TRAP (ST 5)
- EXISTING DITCH
- DRAINAGE AREA
- ROADSIDE DITCH
- ROAD HIGHPOINT (HP=22.00)
- EXIST. CONTOUR



**SECTION A-A CROSS-SECTION**

- GENERAL NOTES:**
- THIS PLAN IS TO BE USED FOR THE PURPOSE OF WETLAND IMPACT PERMITTING AT THE ROAD/STREAM CROSSING.
  - WETLANDS SHOWN ON THIS PLAN WAS DELINEATED BY SOUTHERN ENVIRONMENTAL GROUP, INC. OF WILMINGTON, NC.
  - DISTURBANCE TO BE KEPT TO A MINIMUM.
  - ALL STORM DRAINAGE TO PROVIDE POSITIVE DRAINAGE.
  - SURVEY PROVIDED BY STOCKS SURVEYING OF WILMINGTON, NC.
  - THE WETLANDS TO BE DISTURBED IS APPROXIMATELY 0.06 ACRES.

- SPECIFICATIONS FOR ALUMINUM HEADWALLS:**
- ALL ALUMINUM STRUCTURAL PLATE FOR HEADWALLS SHALL CONSIST OF PLATES AND APPURTENANT ITEMS SHOWN ON THE PLANS AND SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M219 (AND ASTM B746) SPECIFICATION AND HAVE AN EXTERNAL ANNULAR CORRUGATION OF 9" X 2-1/2" WITH THE PLATE THICKNESS CORRESPONDING TO THE PLAN DRAWINGS. STRUCTURAL PLATE HEADWALL PLATES ARE TO BE MANUFACTURED WITH 5052 ALUMINUM ALLOY AND BE FULLY WELDED INSIDE AND OUT TO THE ALUMINUM STRUCTURE BY A CERTIFIED WELDER.
  - THE CORRUGATED PLATES SHALL BE BOLT HOLE PUNCHED AND PRE-ASSEMBLED AT THE PLANT WITH BOLTS AND NUTS CONFORMING TO THE REQUIREMENTS OF ASTM A307 OR ASTM A 449 AND SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A 153.
  - ALL ALUMINUM WALE BEAMS, WALE NUTS, AND ALUMINUM HEADWALL CAP SHALL BE PREFABRICATED AND ASSEMBLED PER THE PLANS ON THE ALUMINUM HEADWALL AT THE PLANT.
  - ALL DEAD MAN ANCHOR ASSEMBLIES FOR THE ALUMINUM STRUCTURAL PLATE HEADWALLS SHALL CONSIST OF 3/4" DIAMETER GALVANIZED STEEL TIEBACK RODS AND ALUMINUM STRUCTURAL PLATE DMA PLATES WITH SIZES OF PLATES AND LENGTH OF RODS ACCORDING TO THE PLANS AND SPECIFICATIONS.
  - PE STAMPED DRAWINGS AND CALCULATION FOR ALUMINUM HEADWALLS WILL BE REQUIRED BY NORTH CAROLINA PROFESSIONAL ENGINEER.

- SPECIFICATIONS FOR CORRUGATED ALUMINUM PIPE:**
- MATERIAL:** THE ALUMINUM COILS SHALL CONFORM TO THE APPLICABLE REQUIREMENTS OF AASHTO M197 OR ASTM B 744.
- PIPE:** THE C.A.P. SHALL BE MANUFACTURED IN ACCORDANCE WITH THE APPLICABLE REQUIREMENTS OF AASHTO M-196 OR ASTM B 745. ALL FABRICATION OF THE PRODUCT SHALL OCCUR WITHIN THE UNITED STATES.
- HANDLING & ASSEMBLY:** SHALL BE IN ACCORDANCE WITH THE MANUFACTURES RECOMMENDATIONS.
- INSTALLATION:** SHALL BE IN ACCORDANCE WITH AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, SECTION 26, DIVISION II OR ASTM B 788 AND IN CONFORMANCE WITH THE PROJECT PLANS AND SPECIFICATIONS. IF THERE ARE ANY INCONSISTENCIES OR CONFLICTS, THE CONTRACTOR MUST BRING THEM TO THE ATTENTION OF THE PROJECT ENGINEER. IT IS ALWAYS THE CONTRACTOR'S RESPONSIBILITY TO FOLLOW OSHA GUIDELINES FOR SAFE PRACTICES.

REV. #	DESCRIPTION	REV. BY
REVISIONS		



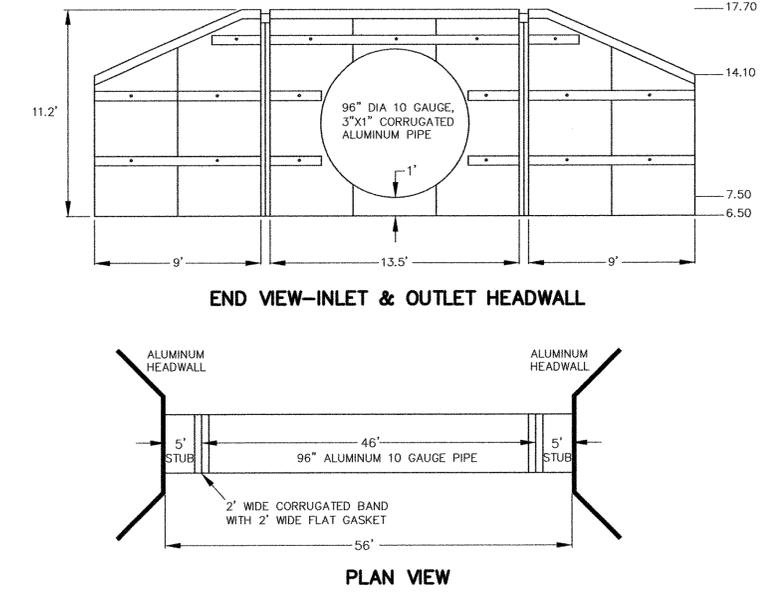
**Coastal Land Design, PLLC**  
 Civil Engineering / Landscape Architecture  
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 NCBELS Firm License No: P-0889  
 P.O. Box 1172, Wilmington, NC 28402, www.cldeng.com, Phone: 910-254-8833, Fax: 910-254-0502

DRAWN : A. Mills	PROJECT NUMBER : 110-01
DESIGN : A. Mills	SCALE : AS NOTED
CHECK : J. Petroff	DATE : 06 Sept 12
APPROVED : J. Petroff	FILE NAME :

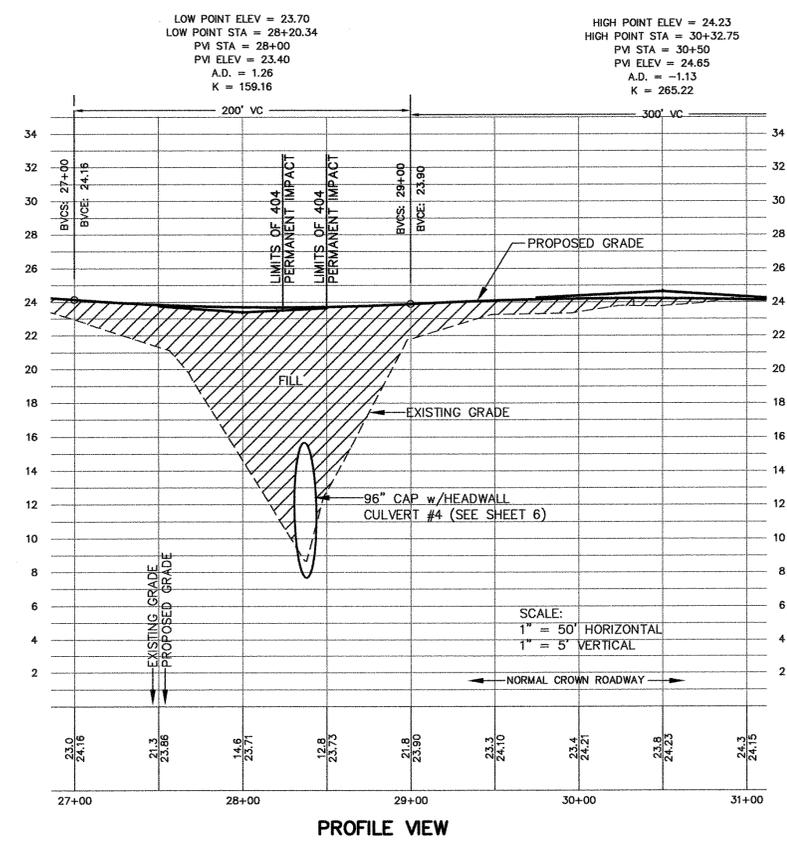
**Castle Hayne Park**  
 New Hanover County, NC

**Wetland Impact Exhibit**  
 For The  
**Road and Stream Crossing**  
 Section One

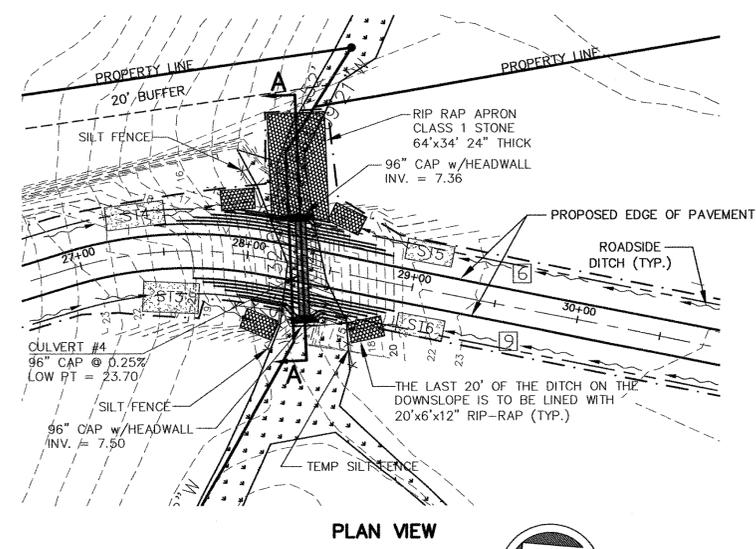
JOB NUMBER <b>110-01</b>	SHEET NUMBER <b>6</b>
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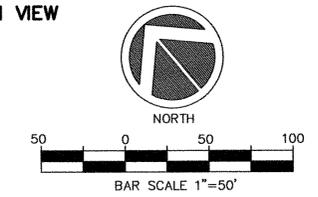
**PLAN VIEW**



**PROFILE VIEW**



**PLAN VIEW**



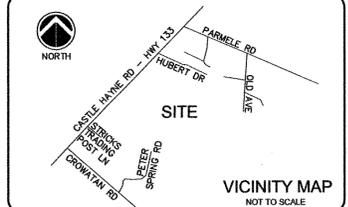
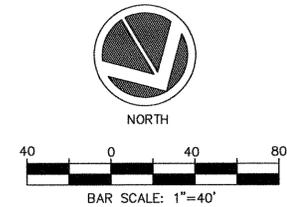
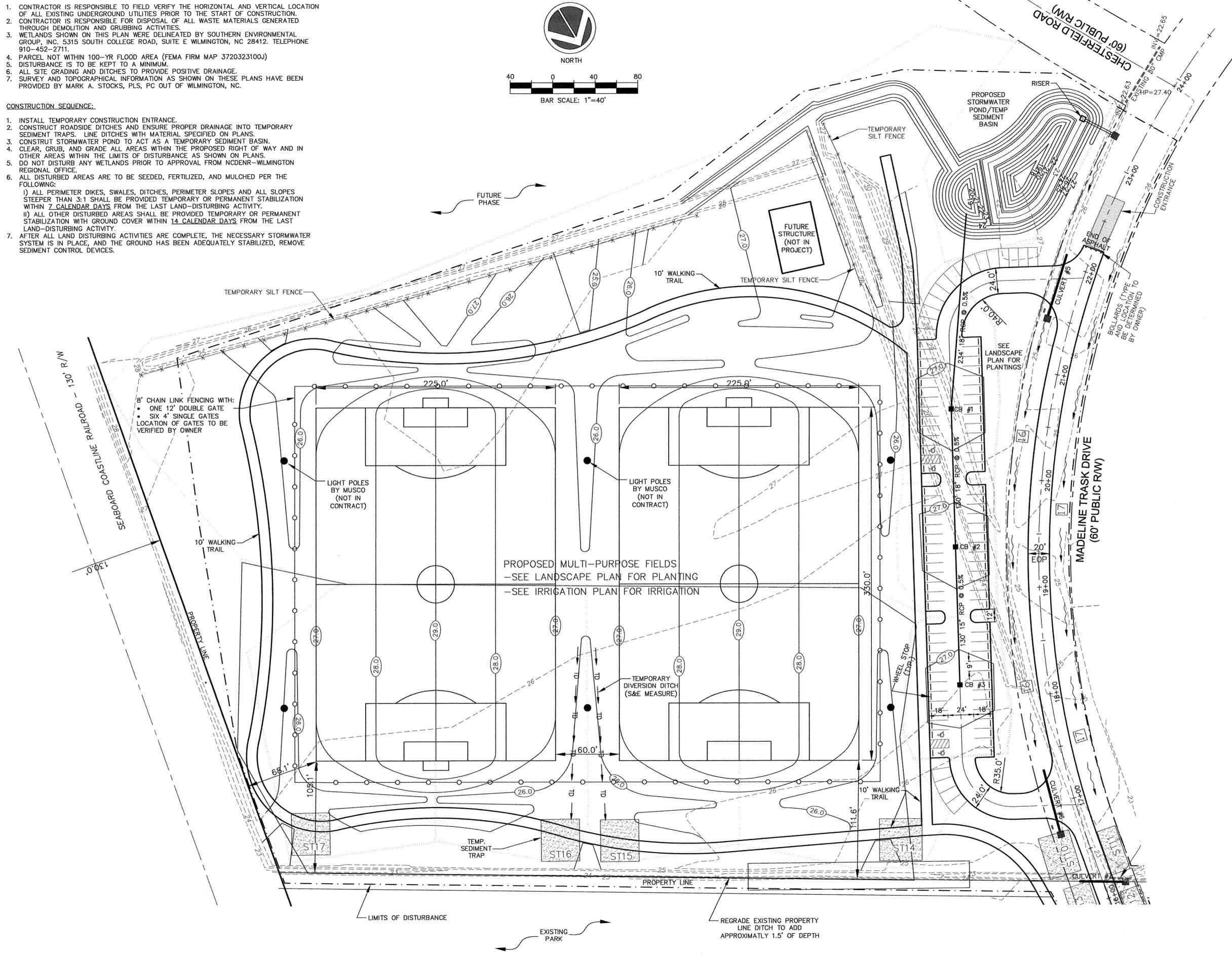
**FINAL DRAWING**  
 - NOT RELEASED  
 FOR CONSTRUCTION

**GENERAL NOTES:**

1. CONTRACTOR IS RESPONSIBLE TO FIELD VERIFY THE HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO THE START OF CONSTRUCTION.
2. CONTRACTOR IS RESPONSIBLE FOR DISPOSAL OF ALL WASTE MATERIALS GENERATED THROUGH DEMOLITION AND GRUBBING ACTIVITIES.
3. WETLANDS SHOWN ON THIS PLAN WERE DELINEATED BY SOUTHERN ENVIRONMENTAL GROUP, INC. 5315 SOUTH COLLEGE ROAD, SUITE E WILMINGTON, NC 28412. TELEPHONE 910-452-2711.
4. PARCEL NOT WITHIN 100-YR FLOOD AREA (FEMA FIRM MAP 3720323100J)
5. DISTURBANCE IS TO BE KEPT TO A MINIMUM.
6. ALL SITE GRADING AND DITCHES TO PROVIDE POSITIVE DRAINAGE.
7. SURVEY AND TOPOGRAPHICAL INFORMATION AS SHOWN ON THESE PLANS HAVE BEEN PROVIDED BY MARK A. STOCKS, PLS, PC OUT OF WILMINGTON, NC.

**CONSTRUCTION SEQUENCE:**

1. INSTALL TEMPORARY CONSTRUCTION ENTRANCE.
2. CONSTRUCT ROADSIDE DITCHES AND ENSURE PROPER DRAINAGE INTO TEMPORARY SEDIMENT TRAPS. LINE DITCHES WITH MATERIAL SPECIFIED ON PLANS.
3. CONSTRUCT STORMWATER POND TO ACT AS A TEMPORARY SEDIMENT BASIN.
4. CLEAR, GRUB, AND GRADE ALL AREAS WITHIN THE PROPOSED RIGHT OF WAY AND IN OTHER AREAS WITHIN THE LIMITS OF DISTURBANCE AS SHOWN ON PLANS.
5. DO NOT DISTURB ANY WETLANDS PRIOR TO APPROVAL FROM NCDENR-WILMINGTON REGIONAL OFFICE.
6. ALL DISTURBED AREAS ARE TO BE SEEDED, FERTILIZED, AND MULCHED PER THE FOLLOWING:
  - i) ALL PERIMETER DIKES, SWALES, DITCHES, PERIMETER SLOPES AND ALL SLOPES STEEPER THAN 3:1 SHALL BE PROVIDED TEMPORARY OR PERMANENT STABILIZATION WITHIN 7 CALENDAR DAYS FROM THE LAST LAND-DISTURBING ACTIVITY.
  - ii) ALL OTHER DISTURBED AREAS SHALL BE PROVIDED TEMPORARY OR PERMANENT STABILIZATION WITH GROUND COVER WITHIN 14 CALENDAR DAYS FROM THE LAST LAND-DISTURBING ACTIVITY.
7. AFTER ALL LAND DISTURBING ACTIVITIES ARE COMPLETE, THE NECESSARY STORMWATER SYSTEM IS IN PLACE, AND THE GROUND HAS BEEN ADEQUATELY STABILIZED, REMOVE SEDIMENT CONTROL DEVICES.

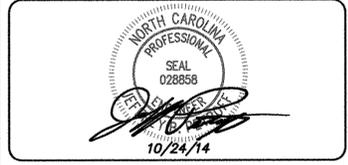


**LEGEND:**

	PROPOSED CONTOUR
	EXIST. CONTOUR
	DELINEATED WETLANDS
	TEMPORARY SEDIMENT TRAP
	FENCING
	EXISTING DITCH
	DITCH NUMBER
	RIP-RAP APRON
	LIMIT OF DISTURBANCE
	ROADSIDE DITCH

**FINAL DRAWING  
- NOT RELEASED  
FOR CONSTRUCTION**

REV. #	DESCRIPTION	REV. BY	DATE
1	REVISED NOTE REGARDING GATES ON THE CHAIN LINK FENCE	AEM	10/08/14



**OWNER:**  
NEW HANOVER COUNTY  
230 GOVERNMENT CENTER DRIVE  
WILMINGTON, NC 28403

**Coastal Land Design, PLLC**  
Civil Engineering / Landscape Architecture  
Land Planning / Construction Management  
NCBELS Firm License No. P-0369  
P.O. Box 1172 Wilmington, NC 28402 www.clderg.com Phone: 910-254-6233 Fax: 910-254-6202

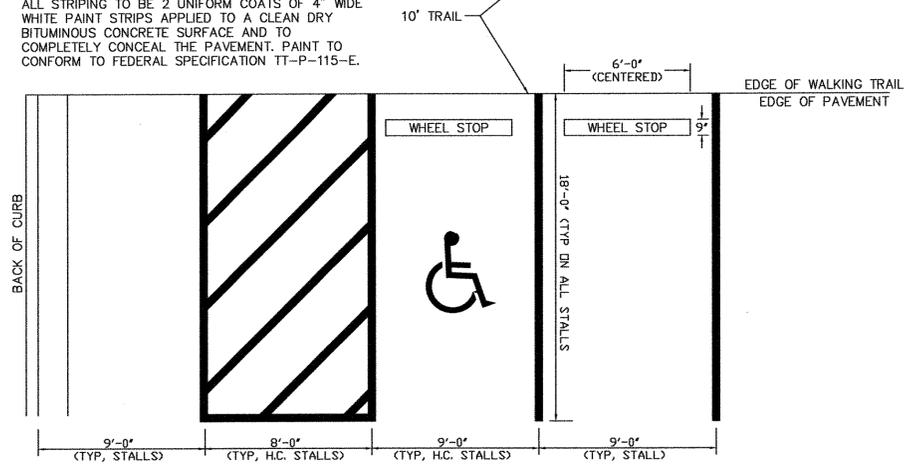
<b>DRAWN:</b> A. Mills	<b>PROJECT:</b> 110-01
<b>DESIGN:</b> A. Mills	<b>NUMBER:</b> 110-01
<b>CHECK:</b> J. Petroff	<b>SCALE:</b> 1"= 40'
<b>APPROVED:</b> J. Petroff	<b>DATE:</b> 06 Sept 12

**Castle Hayne Park  
New Hanover County, NC**

**Grading / Drainage Plan  
Section Two**

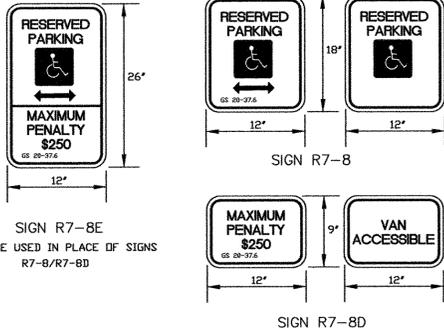
<b>JOB NUMBER</b> 110-01	<b>SHEET NUMBER</b> 7
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NOTE:  
ALL STRIPING TO BE 2 UNIFORM COATS OF 4" WIDE WHITE PAINT STRIPS APPLIED TO A CLEAN DRY BITUMINOUS CONCRETE SURFACE AND TO COMPLETELY CONCEAL THE PAVEMENT. PAINT TO CONFORM TO FEDERAL SPECIFICATION TT-P-115-E.

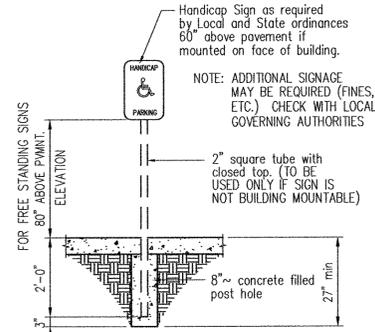


NOTE:  
ALL SIGNAGE AND PAVEMENT MARKINGS MUST COMPLY WITH THE MANUAL FOR UNIFORM TRAFFIC CONTROL DEVICES (MUTCD)

**VAN ACCESS AND PARKING STALL DETAIL**  
NOT TO SCALE

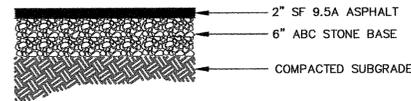


SIGN R7-8E  
MAY BE USED IN PLACE OF SIGNS R7-8/R7-8D

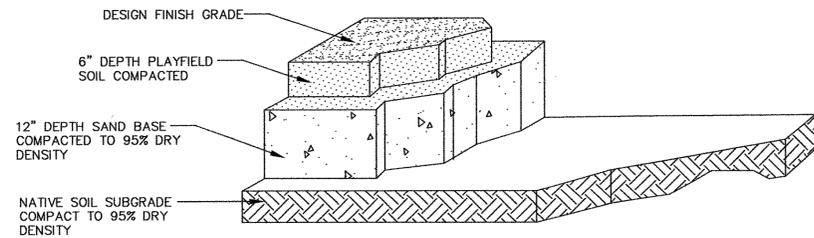


**TYPICAL HANDICAP SIGN**  
NOT TO SCALE

**HANDICAPPED SIGN DETAIL**  
NOT TO SCALE

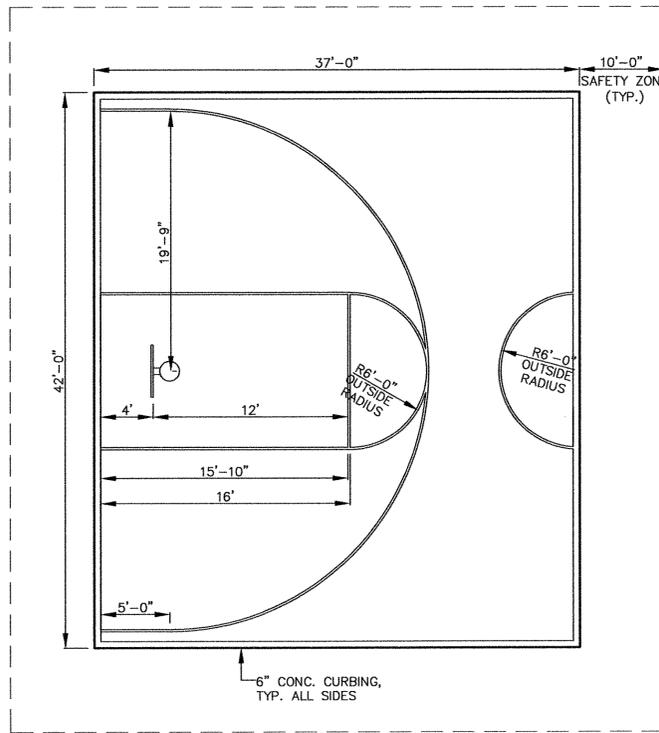


**PAVEMENT SECTION (ROADWAY AND PARKING LOT)**  
NOT TO SCALE

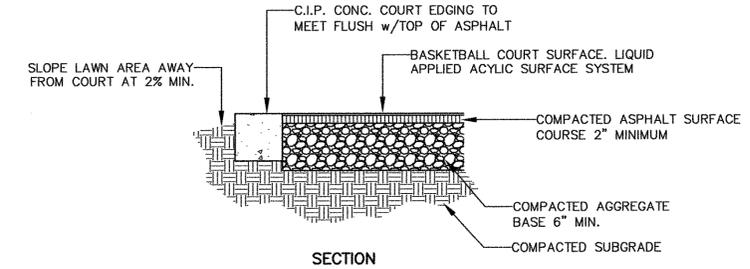


NOTES:  
1. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS.

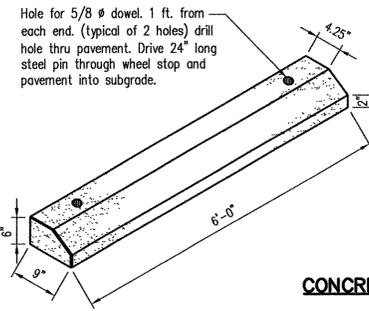
**ATHLETIC FIELD LAYERING SECTION**  
NOT TO SCALE



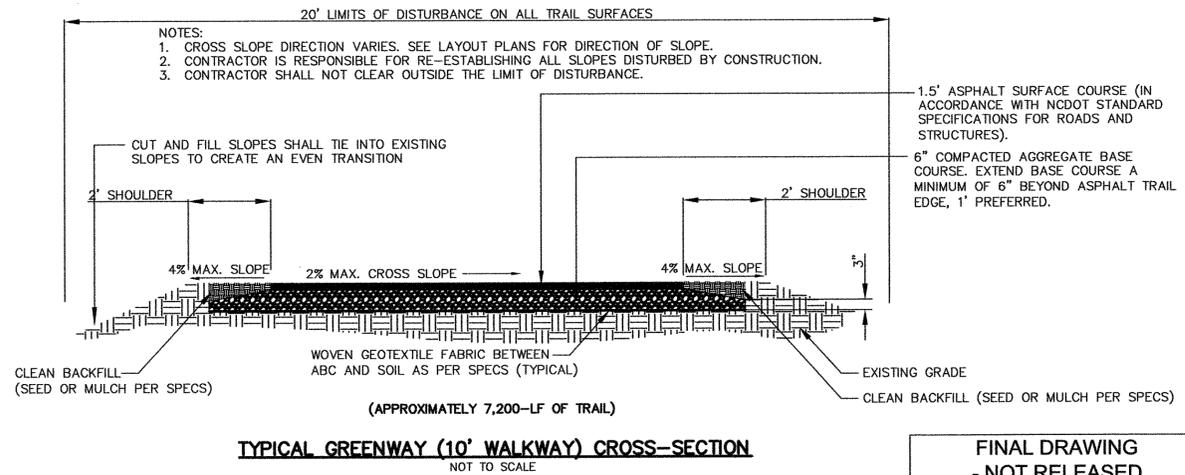
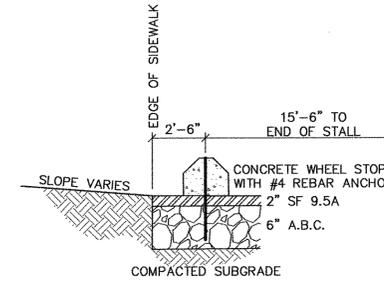
**YOUTH BASKETBALL HALF COURT DETAIL**  
NOT TO SCALE



NOTES:  
1. ACRYLIC COURT SURFACING TO COVER ALL ASPHALT PAVING.  
2. ALL LINES ARE 5" WIDE UNLESS OTHERWISE NOTED.

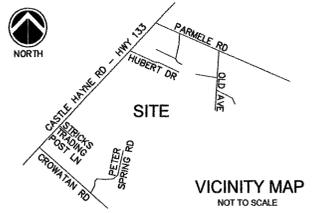


**CONCRETE WHEEL STOP DETAIL**  
NOT TO SCALE



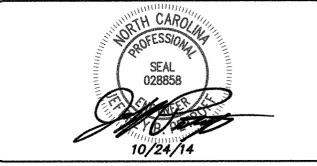
**TYPICAL GREENWAY (10' WALKWAY) CROSS-SECTION**  
NOT TO SCALE

**FINAL DRAWING**  
**- NOT RELEASED**  
**FOR CONSTRUCTION**



**LEGEND**

REV. #	DESCRIPTION	REV. BY	DATE
REVISIONS			



**Coastal Land Design, PLLC**  
Civil Engineering / Landscape Architecture  
Land Planning / Construction Management  
NCBELS Firm License No: P-03989  
P.O. Box 1172, Wilmington, NC 28402, www.cldmg.com, Phone: 910-254-6503, Fax: 910-254-6502

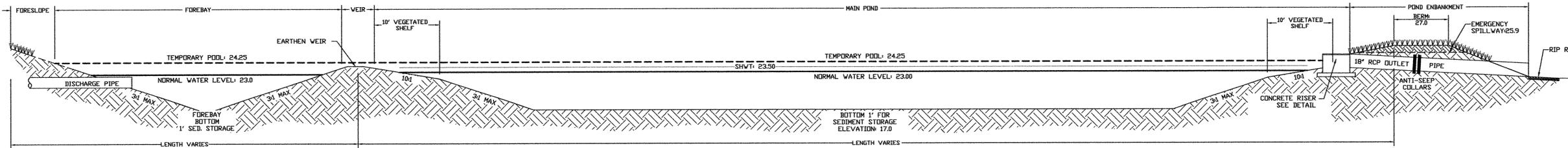
DRAWN : A. Mills	PROJECT NUMBER : 110-01
DESIGN : A. Mills	SCALE : NTS
CHECK : J. Petroff	DATE : 06 Sept 12
APPROVED : J. Petroff	FILE NAME :

**Castle Hayne Park**  
New Hanover County, NC

**Site Details**

JOB NUMBER <b>110-01</b>	SHEET NUMBER <b>8</b>
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**POND CROSS SECTION**  
NOT TO SCALE

**PARKING LOT PIPING SCHEDULE**

Downstream Inlet	Upstream Inlet	Length (ft)	Slope (%)	Invert Down (ft)	Invert Up (ft)	Rim El. (ft)	Size (in)	Pipe Material
End	CB1	234	0.50	21.00	22.17	26.78	18	RCP
	CB2	130	0.50	22.17	22.82	26.78	18	RCP
	CB3	130	0.50	23.07	23.71	26.78	15	RCP

**TEMPORARY SEEDING**

GRASS TYPE	AMOUNT/1000 SF.	TIME OF SEEDING	INITIAL	FERTILIZATION/1000 SF. MAINTENANCE
RYE GRASS	1-2 LBS.	NOV. THRU JAN.	25 LBS. 10-10-10	-NA-
BROWNTOP MILLET	1-2 LBS.	JUNE THRU AUG.	25 LBS. 10-10-10	-NA-

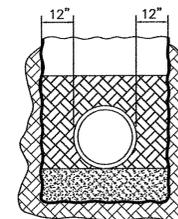
**PERMANENT SEEDING**

GRASS TYPE	AMOUNT/1000 SF.	TIME OF SEEDING	INITIAL	FERTILIZATION/1000 SF. MAINTENANCE
BERMUDA, COMMON	1-2 LBS.	APR. THRU JUNE	25 LBS. 10-10-10	MARCH - APRIL 12 LBS. 10-10-10 EACH 4-8 WEEKS 1-2 LBS. N.
FESCUE, TALL (SOUTHWEST)	5-7 LBS.	SEPT. THRU OCT.	25 LBS. 10-10-10	FEB. - MARCH 12 LBS. 10-10-10 MAY & DEC. 1/2 TO 1 LB. N.
SERISA LEONORZA (SLOPES)	1-2 LBS.	MARCH THRU APR.	25 LBS. 10-10-10	FEB. - MARCH 1/2 TO 1 LB. N.

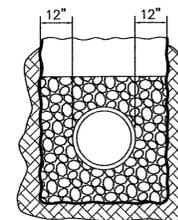
**SEEDING SCHEDULE DETAIL**

**NOTES:**

- CONSIDERATION OF THE PIPE-ZONE EMBEDMENT CONDITIONS INCLUDED IN THIS FIGURE MAY BE INFLUENCED BY FACTORS OTHER THAN PIPE STRENGTH. FOR ADDITIONAL INFORMATION ON PIPE BEDDING AND BACKFILL, SEE ANSI/AWWA C600.



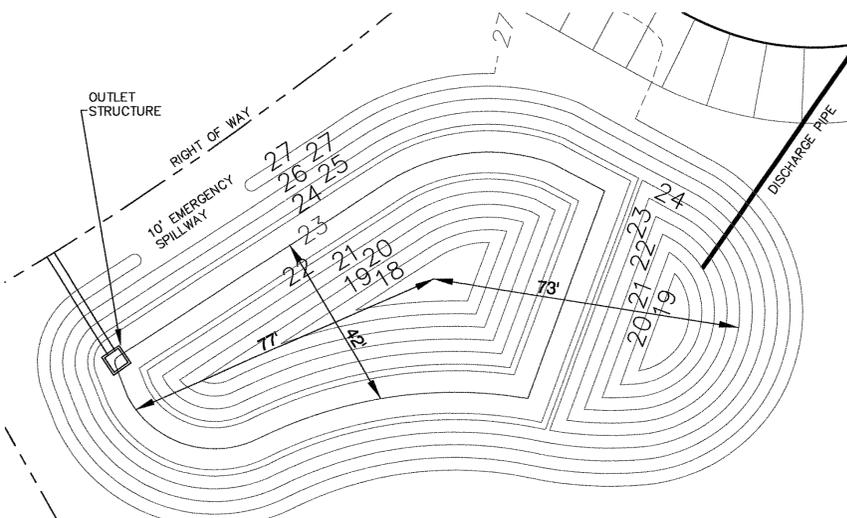
**TYPE 4**  
PIPE BEDDED IN SAND, GRAVEL, OR CRUSHED STONE TO A DEPTH OF 1/8 PIPE DIAMETER, 4" MINIMUM WITH BACKFILL COMPACTED TO TOP OF PIPE. (APPROXIMATELY 80 PERCENT STANDARD PROCTOR, AASHTO T-99)



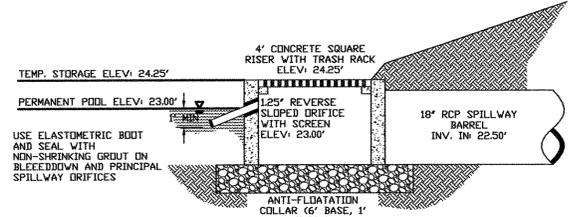
**TYPE 5**  
PIPE BEDDED TO ITS CENTERLINE IN COMPACTED GRANULAR MATERIAL, 4" MINIMUM UNDER PIPE. COMPACTED GRANULAR OR SELECT MATERIAL TO TOP OF PIPE. (APPROXIMATELY 90 PERCENT STANDARD PROCTOR, AASHTO T-99) (SELECT MATERIAL IS DEFINED AS NATIVE SOIL EXCAVATED FROM THE TRENCH, FREE OF ROCKS, ORGANIC MATERIAL, FOREIGN MATERIALS AND FROZEN EARTH)

**STANDARD PIPE BEDDING DETAILS**  
NOT TO SCALE

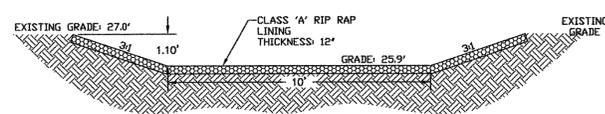
- PROVIDE ALL REINFORCING STEEL WHICH MEETS ASTM A615 FOR GRADE 60 AND WELDED WIRE FABRIC CONFORMING TO ASTM A185,
- PLACE LIFT HOLES OR PINS IN ACCORDANCE WITH OSHA STANDARD 1926.704
- PROVIDE FORMED OPENINGS, FOR PIPE TO PROVIDE REQUIRED SIZE AND LOCATION. SEAL OPENINGS WITH HYDRAULIC CEMENT.
- ALL ELEMENTS PRECAST TO MEET ASTM C913.
- SET ON 6" WASHED STONE
- FRAME AND GRATE HEIGHT MAY BE ADJUSTED WITH BRICK.
- PROVIDE PRECAST STRUCTURES OVER 4'-0" IN DEPTH WITH STEPS/LADDER INSTALLED IN ACCORDANCE WITH ASHA STANDARD 1910.27 AND AS FIELD CONDITIONS DICTATE.
- WELDED WIRE FABRIC MAY BE SUBSTITUTED FOR REBAR AS LONG AS THE SAME AREA OF STEEL IS PROVIDED,
- SEAL JOINTS WITH A FLEXIBLE BUTYL RUBBER BASE CONFORMING TO FEDERAL SPECIFICATION SS-S-21A, AASHTO M-19B, TYPE B - BUTYL RUBBER.
- USE FRAME AND GRATE AS PER SD-19.
- GROUT INVERT TO PROVIDE SMOOTH FLOW



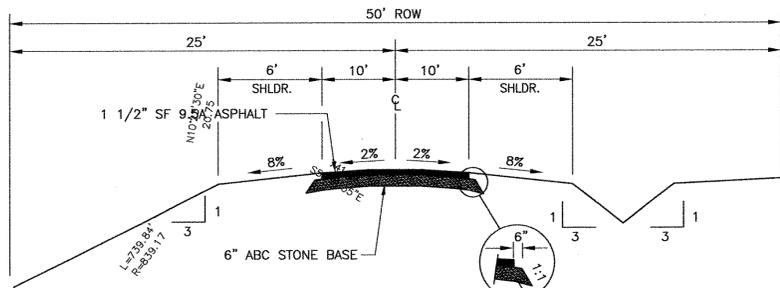
**POND PLAN VIEW**  
1" = 20'



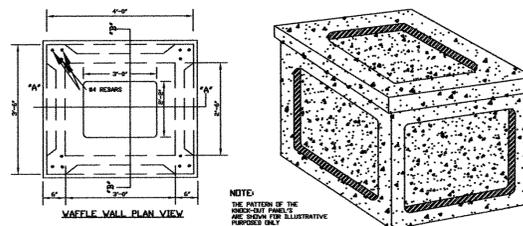
**POND RISER WITH ORIFICE DETAIL**  
NOT TO SCALE



**EMERGENCY SPILLWAY DETAIL**  
NOT TO SCALE

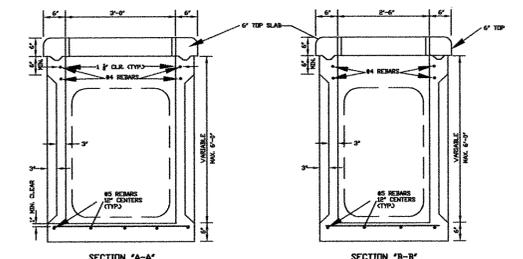


**STANDARD STREET SECTION**  
NOT TO SCALE



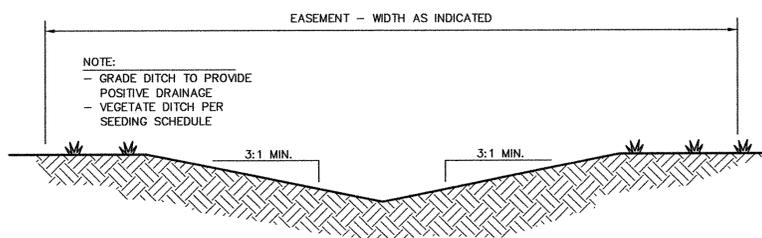
**VAFFLE WALL PLAN VIEW**

**VAFFLE WALL ISOMETRIC VIEW**

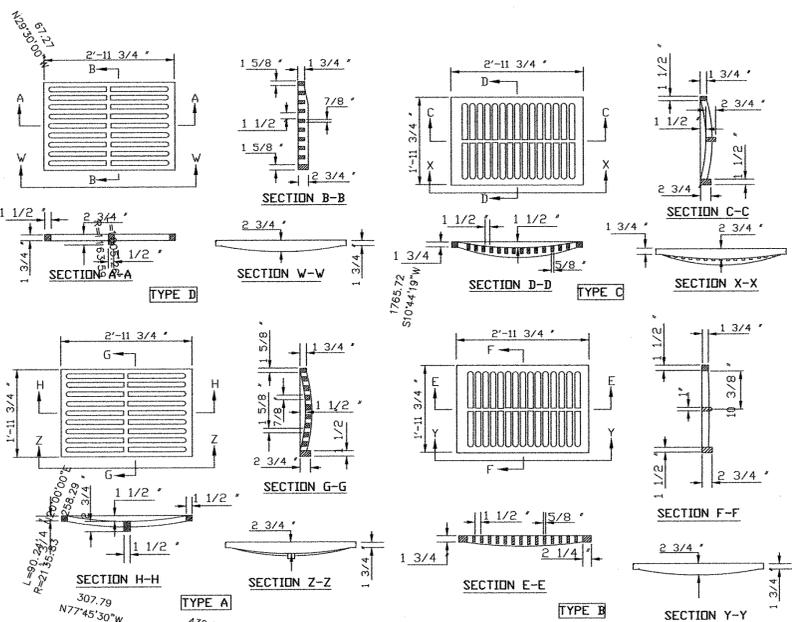


**PRECAST DRAINAGE WAFFLE STRUCTURE**

SD 2-23  
NOT TO SCALE



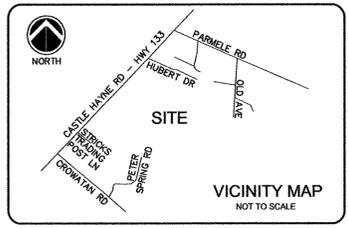
**TRIANGULAR DITCH**  
NOT TO SCALE



**CATCH BASIN CASTING FOR PRE-CAST**  
FOR USE ON STANDARD CATCH BASIN  
NOT TO SCALE

**SUITABLE SPECIES FOR STORMWATER POND LITTORAL SHELF**  
NOT TO SCALE

BOTANICAL NAME	COMMON NAME
INUNDATION: 6"-12" DEPTH	
Sagittaria latifolia	Arrowhead, Duck Potato
Pontederia cordata	Pickeralweed
Peltandra virginica	Arrow Arum
Juncus effusus	Soft Rush
Iris virginica	Blue Flag Iris
INUNDATION: 0"-6" DEPTH	
Juncus effusus	Soft Rush
Saururus cernuus	Lizard Tail
Lobelia cardinalis	Cardinal Flower
Hibiscus coccineus	Scarlet Rose Mallow
SHALLOW LAND (0"-12" ABOVE WATER LEVEL)	
Cephalanthus occidentalis	Buttonbush
Clethra alnifolia	Sweet Pepperbush
Aronia arbutifolia	Red Cockberry
Myrica cerifera	Waxmyrtle
Eupatorium dubium	Joe Pye Weed

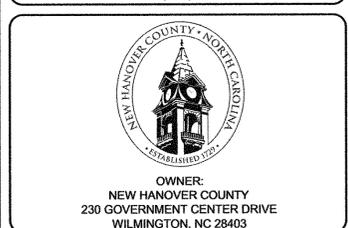
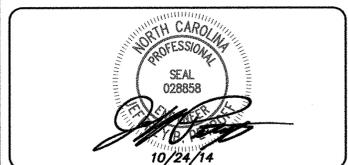


**LEGEND:**

Blank legend area for symbols and materials.

**FINAL DRAWING - NOT RELEASED FOR CONSTRUCTION**

REV. #	DESCRIPTION	REV. BY	DATE
REVISIONS			



OWNER:  
NEW HANOVER COUNTY  
230 GOVERNMENT CENTER DRIVE  
WILMINGTON, NC 28403



DRAWN : A. Mills	PROJECT : 110-01
DESIGN : A. Mills	NUMBER : NTS
CHECK : J. Petroff	SCALE : NTS
APPROVED : J. Petroff	DATE : 06 Sept 12
FILE NAME :	

**Castle Hayne Park**  
New Hanover County, NC

**Stormwater Details**

JOB NUMBER <b>110-01</b>	SHEET NUMBER <b>10</b>
-----------------------------	---------------------------

**RIPRAP CONSTRUCTION SPECIFICATIONS:**

- SUBGRADE PREPARATION**
- PREPARE THE SUBGRADE FOR RIPRAP AND FILTER TO THE REQUIRED LINES AND GRADES SHOWN ON THE PLANS.
  - COMPACT ANY FILL REQUIRED IN THE SUBGRADE TO A DENSITY APPROXIMATING THAT OF THE SURROUNDINGS UNDISTURBED MATERIAL OR OVERFILL DEPRESSIONS WITH RIPRAP.
  - REMOVE BRUSH, TREES, STUMPS, AND OTHER OBJECTIONABLE MATERIAL. CUT THE SUBGRADE SUFFICIENTLY DEEP THAT THE FINISHED GRADE OF THE RIPRAP WILL BE AT THE ELEVATION OF THE SURROUNDING AREA. CHANNELS SHOULD BE EXCAVATED SUFFICIENTLY TO ALLOW PLACEMENT OF THE RIPRAP IN A MANNER SUCH THAT THE FINISHED INSIDE DIMENSIONS AND GRADE OF THE RIPRAP MEET DESIGN SPECIFICATIONS.

**SAND AND GRAVEL FILTER BLANKET**

- PLACE THE FILTER FABRIC BLANKET IMMEDIATELY AFTER THE GROUND FOUNDATION IS PREPARED.
- FOR GRAVEL, SPREAD FILTER STONE IN A UNIFORM LAYER TO THE SPECIFIED DEPTH.
- WHERE MORE THAN ONE LAYER OF FILTER MATERIAL IS USED, SPREAD THE LAYERS WITH MINIMAL MIXING.

**SYNTHETIC FILTER FABRIC**

- PLACE THE CLOTH FILTER DIRECTLY ON THE PREPARED FOUNDATION.
- OVERLAP THE EDGES BY AT LEAST TWELVE (12) INCHES, AND SPACE ANCHOR PINS EVERY THREE (3) FEET ALONG THE OVERLAP.
- BURY THE UPSTREAM END OF THE CLOTH A MINIMUM OF TWELVE (12) INCHES BELOW GROUND AND WHERE NECESSARY, BURY THE LOWER END OF THE CLOTH OR OVERLAP WITH THE NEXT SECTION AS REQUIRED.
- IF DAMAGE OCCURS TO FILTER FABRIC WHEN PLACING RIPRAP, REMOVE THE RIPRAP AND REPAIR THE SHEET BY ADDING ANOTHER LAYER OF FILTER MATERIAL WITH A MINIMUM OVERLAP OF TWELVE (12) INCHES AROUND THE DAMAGED AREA.

**STONE PLACEMENT**

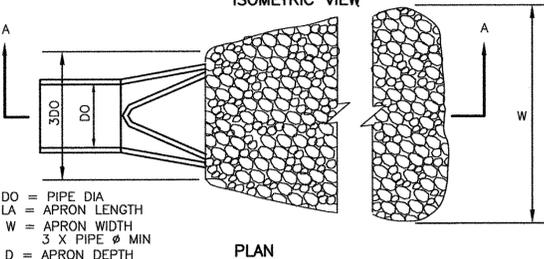
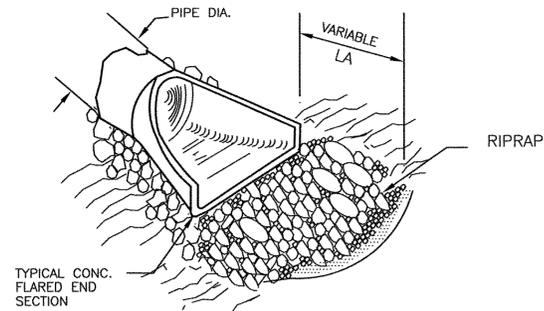
- PLACEMENT OF RIPRAP SHOULD FOLLOW IMMEDIATELY AFTER PLACEMENT OF THE FILTER.
- PLACE RIPRAP SO THAT IT FORCES A DENSE, WELL-GRADED MASS OF STONE WITH A MINIMUM OF VOIDS.
- PLACE RIPRAP TO ITS FULL THICKNESS IN ONE OPERATION.
- DO NOT PLACE RIPRAP BY DUMPING THROUGH CHUTES OR OTHER METHODS THAT MAY CAUSE SEGREGATION OF THE STONE SIZES.
- THE TOE OF THE RIPRAP SHOULD BE KEYS TO A STABLE FOUNDATION AT ITS BASE.
- THE TOE SHOULD BE EXCAVATED TO A DEPTH ABOUT 1.5 TIMES THE DESIGN THICKNESS OF THE RIPRAP AND SHOULD EXTEND HORIZONTALLY FROM THE SLOPE.
- THE FINISHED SLOPE SHOULD BE FREE OF POCKETS OF SMALL STONE OR CLUSTERS OF LARGE STONES.
- THE FINAL GRADE OF THE RIPRAP SHOULD BLEND WITH THE SURROUNDING AREA.
- NO OVERFALL OR PROTRUSION OF RIPRAP SHOULD BE APPARENT.

**RIPRAP MAINTENANCE:**

- INSPECT RIPRAP PERIODICALLY FOR SCOUR OR DISLODGED STONES.
- CONTROL WEED AND BRUSH GROWTH THROUGHOUT THE RIPRAP APRON.

**CONSTRUCTION SEQUENCE:**

- INSTALL TEMPORARY CONSTRUCTION ENTRANCE.
- INSTALL SILT FENCING AROUND WETLAND AREAS AS SHOWN ON THE PLANS.
- CONSTRUCT TEMPORARY SEDIMENT TRAPS/BASINS IN LOCATIONS AND DIMENSIONS AS SPECIFIED ON THE PLANS.
- CONSTRUCT ROADSIDE DITCHES AND ENSURE PROPER DRAINAGE INTO TEMPORARY SEDIMENT TRAPS. LINE DITCHES WITH MATERIAL SPECIFIED ON PLANS.
- CLEAR, GRUB, AND GRADE ALL AREAS WITHIN THE PROPOSED RIGHT OF WAY AND IN OTHER AREAS WITHIN THE LIMITS OF DISTURBANCE AS SHOWN ON PLANS.
- DO NOT DISTURB ANY WETLANDS PRIOR TO APPROVAL FROM NCDENR-WILMINGTON REGIONAL OFFICE.
- UPON APPROVAL FROM NCDENR FOR WETLAND IMPACTS, REMOVE TEMPORARY SILT FENCE AND CLEAR, GRUB, GRADE, AND INSTALL NECESSARY STORMWATER OR CROSSING APPURTENANCES ONLY IN AREAS THAT HAVE BEEN APPROVED FOR IMPACTS.
- ALL DISTURBED AREAS ARE TO BE SEEDED, FERTILIZED, AND MULCHED PER THE FOLLOWING:
  - ALL PERIMETER DIKES, SWALES, DITCHES, PERIMETER SLOPES AND ALL SLOPES STEEPER THAN 3:1 SHALL BE PROVIDED TEMPORARY OR PERMANENT STABILIZATION WITHIN 7 CALENDAR DAYS FROM THE LAST LAND-DISTURBING ACTIVITY.
  - ALL OTHER DISTURBED AREAS SHALL BE PROVIDED TEMPORARY OR PERMANENT STABILIZATION WITH GROUND COVER WITHIN 14 CALENDAR DAYS FROM THE LAST LAND-DISTURBING ACTIVITY.
- AFTER ALL LAND DISTURBING ACTIVITIES ARE COMPLETE, THE NECESSARY STORMWATER SYSTEM IS IN PLACE, AND THE GROUND HAS BEEN ADEQUATELY STABILIZED, REMOVE SEDIMENT CONTROL DEVICES.



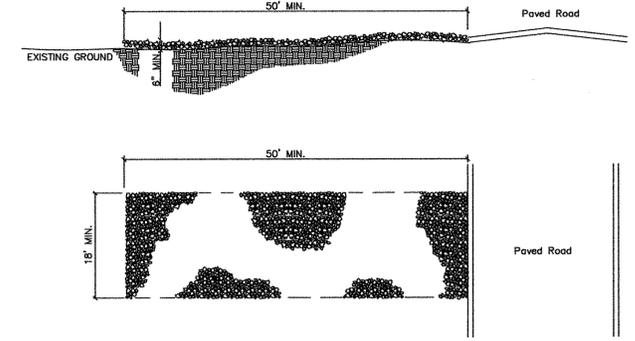
- NOTES:**  
SEE APPROPRIATE SCHEDULE FOR DIMENSIONS
- LA IS THE LENGTH OF THE RIPRAP APRON.
  - D = 1.5 TIMES THE MAXIMUM STONE DIAMETER BUT NOT LESS THAN 6"
  - A FILTER BLANKET OR FILTER FABRIC SHOULD BE INSTALLED BETWEEN THE RIPRAP AND SOIL FOUNDATION.

**RIP-RAP AT FLARED END SECTION**  
NOT TO SCALE

RIP RAP SCHEDULE	
<b>Culvert #1</b> do = 18" La = 6.0' W = 6.0' d = 12" Class = A	<b>Culvert #2</b> do = 18" La = 6.0' W = 6.0' d = 12" Class = A
<b>Culvert #3</b> do = 18" La = 6.0' W = 6.0' d = 12" Class = A	<b>Culvert #4</b> do = 96" La = 64' W = 34' d = 24" Class = 1
<b>Culvert #5</b> do = 30" La = 10' W = 6.5' d = 12" Class = A	<b>Culvert #6</b> do = 30" La = 10' W = 6.5' d = 12" Class = A
<b>Culvert #7</b> do = 36" La = 18' W = 10.2' d = 18" Class = B	<b>Riser Outlet</b> do = 18" La = 6.0' d = 12" Class = A

**NOTES:**

- A STABILIZED ENTRANCE PAD OF # 4 STONE SHALL BE LOCATED WHERE TRAFFIC WILL ENTER OR LEAVE THE CONSTRUCTION SITE ONTO A PUBLIC STREET.
- FILTER FABRIC OR COMPACTED CRUSHER RUN STONE MAY BE USED AS A BASE FOR THE CONSTRUCTION ENTRANCE.
- THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC STREETS OR EXISTING PAVEMENT. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS WARRANT AND REPAIR OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT.
- ANY SEDIMENT SPILLED, DROPPED, WASHED, OR TRACKED ONTO PUBLIC STREETS MUST BE REMOVED IMMEDIATELY.
- WHEN APPROPRIATE, WHEELS MUST BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTERING A PUBLIC STREET. WHEN WASHING IS REQUIRED, IT SHALL BE DONE IN AN AREA STABILIZED WITH CRUSHED STONE WHICH DRAINS INTO AN APPROVED SEDIMENT BASIN.
- SOIL STABILIZATION FABRIC SHALL BE USED.
- NCDOT MAY REQUIRE A STANDARD COMMERCIAL DRIVEWAY TO ACCESS THE CONSTRUCTION SITE IF THE DRIVEWAY IS ON A THOROUGHFARE.



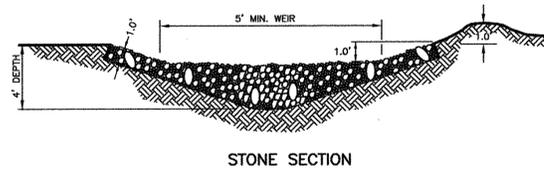
**CONSTRUCTION ENTRANCE DETAIL**  
NOT TO SCALE

**SEDIMENT FENCE CONSTRUCTION SPECIFICATIONS:**

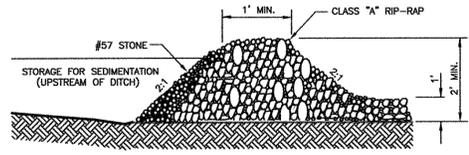
- SILT FENCE IS TO BE TRENCHED IN WITH TRENCHING MACHINE IN ORDER TO HAVE THE MINIMUM AREA OF DISTURBANCE (NON-EVASIVE) UPON INSTALLATION.
- HEIGHT OF SEDIMENT FENCE IS NOT TO EXCEED 18" ABOVE THE GROUND SURFACE.
- FILTER FABRIC TO BE CONSTRUCTED FROM CONTINUOUS ROLL CUT TO LENGTH TO AVOID JOINTS. IF JOINTS ARE NECESSARY, FILTER CLOTH IS TO BE SECURELY FASTENED TO SUPPORT POST WITH OVERLAP TO THE NEXT POST.
- FILTER FABRIC TO BE SUPPORTED BY WIRE MESH FASTENED SECURELY TO THE UPSLOPE SIDE OF THE POSTS USING HEAVY DUTY STAPLES AT LEAST 1" LONG OR TIE WIRES. EXTEND WIRE MESH SUPPORT TO THE BOTTOM OF THE TRENCH.
- A MAXIMUM OF 8' STAKE SPACING IS ALLOWED WHEN WIRE MESH SUPPORT FENCE IS USED. SUPPORT POST SHOULD BE DRIVEN SECURELY INTO THE GROUND A DISTANCE OF AT LEAST 18".
- EXTRA STRENGTH FILTER FABRIC WITH 6" POST SPACES DOES NOT REQUIRE WIRE MESH SUPPORT FENCE. STAPLE OR WIRE THE FILTER FABRIC DIRECTLY TO POSTS.
- EXCAVATE A TRENCH APPROXIMATELY 4" WIDE AND 8" DEEP ALONG THE PROPOSED LINE OF POSTS AND UPSLOPE FROM THE BARRIER.
- BACKFILL TRENCH WITH COMPACT SOIL OR GRAVEL PLACED OVER THE FILTER FABRIC.
- DO NOT ATTACH FILTER FABRIC TO EXISTING TREES.

**SEDIMENT FENCE MAINTENANCE:**

- INSPECT SEDIMENT FENCES AT LEAST ONCE A WEEK AND AFTER EACH RAINFALL. MAKE ANY REQUIRED REPAIRS IMMEDIATELY.
- SHOULD THE FABRIC OF A SEDIMENT FENCE COLLAPSE, TEAR, DECOMPOSE OR BECOME INEFFECTIVE, REPLACE IT PROMPTLY. REPLACE BURLAP EVERY 60 DAYS.
- REMOVE SEDIMENT DEPOSITS AS NECESSARY TO PROVIDE ADEQUATE STORAGE VOLUME FOR THE NEXT RAIN AND TO REDUCE PRESSURE ON THE FENCE. TAKE CARE TO AVOID UNDERMINING THE FENCE DURING CLEANOUT.
- REMOVE ALL FENCING MATERIALS AND UNSTABLE SEDIMENT DEPOSITS AND BRING THE AREA TO GRADE AND STABILIZE IT AFTER THE CONTRIBUTING DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.



**STONE SECTION**



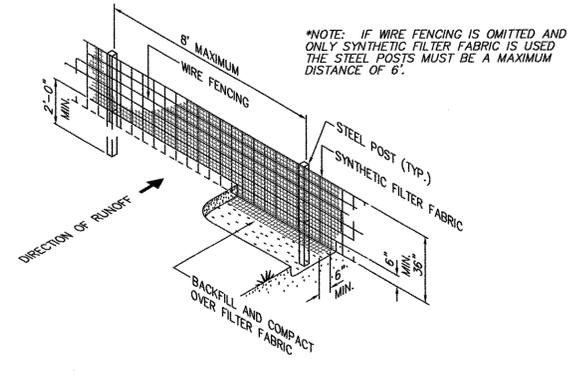
**CROSS SECTION**

**CHECK DAM**  
NOT TO SCALE

**CHECK DAM TABLE**

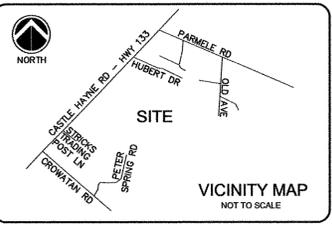
Storage Behind Check Dam	Slope S (R/F)	Required Storage (cf) from 25yr st	Check Dam Depth (ft)
1	0.011	175	1.2
2	0.009	1733	2.5
3	0.014	689	2.1
4	0.024	848	2.7
5	0.031	750	2.8
6	0.022	450	2.2
7	0.025	352	2.1
8	0.030	190	1.6
9	0.026	479	2.3
10	0.022	731	2.5
11	0.013	992	2.4
12	0.013	606	2.0
13	0.009	1419	2.3

\* CHECK DAMS ARE PART OF THE PERMITTED STORMWATER SYSTEM AND ARE TO BE INSTALLED AFTER ROADSIDE DITCHES ARE GRADED AND STABILIZED. INSTALL CHECK DAMS TO DEPTHS SPECIFIED IN CHECK DAM TABLE ABOVE.



**ISOMETRIC SILT FENCE DETAIL**  
NOT TO SCALE

**FINAL DRAWING - NOT RELEASED FOR CONSTRUCTION**



**LEGEND:**

REV. #	DESCRIPTION	REV. BY	DATE
REVISIONS			



**OWNER:**  
NEW HANOVER COUNTY  
230 GOVERNMENT CENTER DRIVE  
WILMINGTON, NC 28403

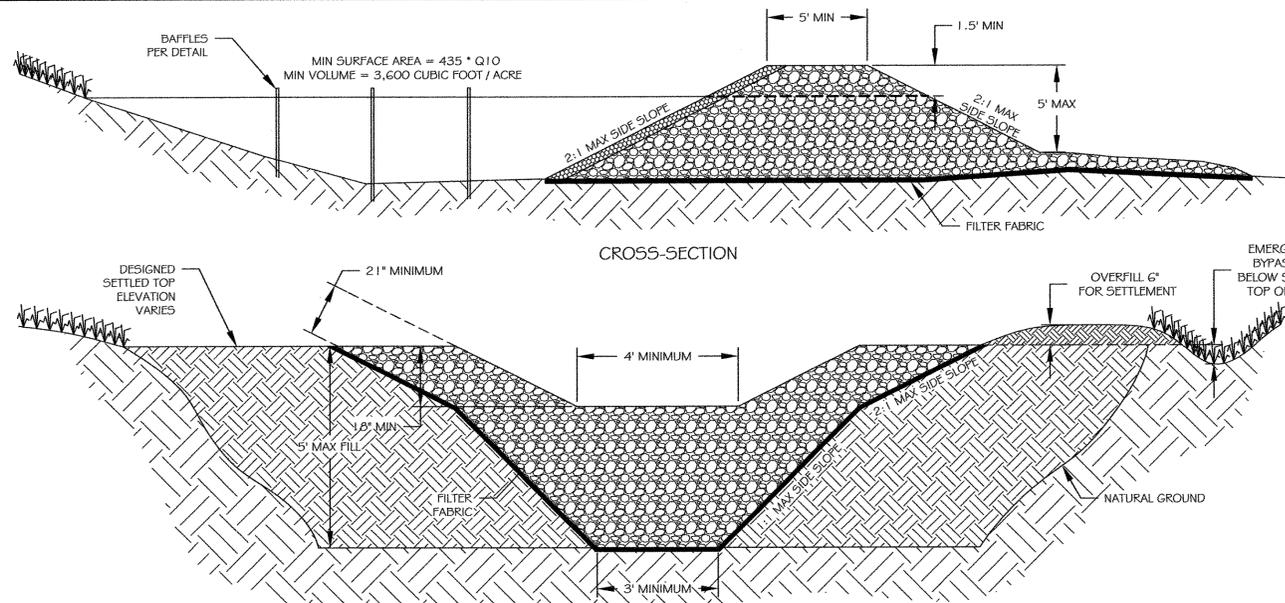
**Coastal Land Design, PLLC**  
Civil Engineering / Landscape Architecture  
Land Planning / Construction Management  
NCBELS Firm License No: P-0369  
P.O. Box 1172, Wilmington, NC 28402 www.cldeng.com Phone: 910-254-8333 Fax: 910-254-0202

DRAWN : A. Mills	PROJECT : 110-01
DESIGN : A. Mills	NUMBER : NTS
CHECK : J. Petroff	SCALE : NTS
APPROVED : J. Petroff	DATE : 06 Sept 12
FILE NAME :	

**Castle Hayne Park**  
New Hanover County, NC

**Sediment and Erosion Control Details**

JOB NUMBER <b>110-01</b>	SHEET NUMBER <b>11</b>
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CROSS-SECTION  
STONE-SECTION  
**TEMPORARY SEDIMENT TRAP DETAIL**  
NOT TO SCALE

**SEDIMENT TRAP TABLE**

Sediment Trap	Length @ Weir Elev. (ft)	Width @ Weir Elev. (ft)	Depth (Weir Invert to Bottom)	Height (Top of Trap to Weir Invert)	Side Slope	Weir Length (ft)
ST1	23	15	4	1.50	2.00	4.00
ST2*	84	24	3	1.50	2.00	8.00
ST3	33	18	3	1.50	2.00	4.00
ST4	35	14	3	1.50	2.00	4.00
ST5	28	12	3	1.50	2.00	4.00
ST6	28	12	3	1.50	2.00	4.00
ST7	18	12	4	1.50	2.00	4.00
ST8	42	16	4	1.50	2.00	4.00
ST9*	53	20	3	1.50	2.00	6.00
ST10	40	30	3	1.50	2.00	4.00
ST11	43	18	3	1.50	2.00	4.00
ST12	30	20	3	1.50	2.00	4.00
ST13	46	25	3	1.50	2.00	4.00
ST14	40	40	3	1.50	2.00	4.00
ST15	40	36	3	1.50	2.00	4.00
ST16	40	36	3	1.50	2.00	4.00
ST17	40	36	3	1.50	2.00	4.00

\* USE SKIMMER DRAWDOWN SYSTEM SHOWN ON DETAIL SHEET.

**BAFFLE CONSTRUCTION SPECIFICATIONS:**

- GRADE THE BASIN SO THAT THE BOTTOM IS LEVEL FRONT TO BACK AND SIDE TO SIDE
- INSTALL POSTS OR SAW HORSES ACROSS THE WIDTH OF THE SEDIMENT TRAP OR BASIN
- STEEL POSTS SHOULD BE DRIVEN TO A DEPTH OF TWENTY-FOUR (24) INCHES, SPACED A MAXIMUM OF FOUR (4) FEET APART, AND INSTALLED UP THE SIDES OF THE BASIN AS WELL. THE TOP OF THE FABRIC SHOULD BE SIX (6) INCHES HIGHER THAN THE INVERT OF THE SPILLWAY. TOPS OF BAFFLES SHOULD BE TWO (2) INCHES LOWER THAN THE TOP OF BERMS.
- INSTALL AT LEAST THREE ROWS OF BAFFLES BETWEEN THE INLET AND OUTLET DISCHARGE POINT. BASINS LESS THAN TWENTY (20) FEET IN LENGTH MAY USE TWO (2) BAFFLES.
- WHEN USING POSTS, ADD A 9 GAUGE HIGH TENSION SUPPORT WIRE ACROSS THE TOP OF THE MEASURE TO PREVENT SAGGING.
- WRAP POROUS MATERIAL, SUCH AS JUTE BACKED BY COIR MATERIAL, OVER A SAWHORSE OR 9 GAUGE HIGH TENSION TOP WIRE. HAMMER REBAR INTO THE SAWHORSE LEGS FOR ANCHORING. THE FABRIC SHOULD HAVE FIVE (5) TO TEN (10) PERCENT OPENINGS IN THE WEAVE. ATTACH FABRIC TO A ROPE AND A SUPPORT STRUCTURE WITH ZIP TIES, WIRE, OR STAPLES.
- THE BOTTOM AND SIDES OF THE FABRIC SHOULD BE ANCHORED IN A TRENCH OR PINNED WITH EIGHT (8) INCH EROSION CONTROL MATTING STAPLES.
- DO NOT SPLICE THE FABRIC. USE A CONTINUOUS PIECE ACROSS THE BASIN.

**BAFFLE MAINTENANCE:**

- INSPECT BAFFLES AT LEAST ONCE A WEEK AND AFTER EACH RAINFALL. MAKE ANY REQUIRED REPAIRS IMMEDIATELY.
- BE SURE TO MAINTAIN ACCESS TO THE BAFFLES. SHOULD THE FABRIC OF THE BAFFLE COLLAPSE, TEAR, DECOMPOSE, OR BECOME INEFFECTIVE, REPLACE IT PROMPTLY.
- REMOVE SEDIMENT DEPOSITS WHEN IT REACHES HALF FULL TO PROVIDE ADEQUATE STORAGE FOR THE NEXT RAIN AND TO REDUCE PRESSURE ON THE BAFFLES. TAKE CARE TO AVOID DAMAGING THE BAFFLES DURING CLEANOUT. SEDIMENT DEPTH SHOULD NEVER EXCEED HALF THE DESIGNED STORAGE DEPTH.
- AFTER THE CONTRIBUTING DRAINAGE AREA HAS BEEN PROPERLY STABILIZED, REMOVE ALL BAFFLE MATERIALS, AND UNSTABLE SEDIMENT DEPOSITS, BRING THE AREA TO GRADE, AND STABILIZE IT.

**SEDIMENT BASIN CONSTRUCTION SPECIFICATIONS:**

- SITE PREPARATIONS**
- CLEAR, GRUB, AND STRIP TOPSOIL FROM AREAS UNDER THE EMBANKMENT TO REMOVE TREES, VEGETATION, ROOTS, AND OTHER OBJECTIONABLE MATERIAL.
  - DELAY CLEARING THE POOL AREA UNTIL THE DAM IS COMPLETED AND THEN REMOVE BRUSH, TREES, AND OTHER OBJECTIONABLE MATERIALS TO FACILITATE SEDIMENT CLEANOUT.
  - STOCKPILE ALL TOPSOIL OR SOIL CONTAINING ORGANIC MATTER FOR USE ON THE OUTER SHELL OF THE EMBANKMENT TO FACILITATE VEGETATIVE ESTABLISHMENT.
  - PLACE TEMPORARY SEDIMENT CONTROL MEASURES BELOW THE BASIN AS NEEDED.
- CUT-OFF-TRENCH**
- EXCAVATE A CUT-OFF-TRENCH ALONG THE CENTER LINE OF THE EARTH FILL EMBANKMENT
  - CUT THE TRENCH TO STABILIZE SOIL MATERIAL, BUT IN NO CASE MAKE IT LESS THAN TWO (2) FEET DEEP
  - THE CUT-OFF-TRENCH MUST BE EXTENDED INTO BOTH ABUTMENTS TO AT LEAST THE ELEVATION OF THE RISER CREST.
  - MAKE THE MINIMUM BOTTOM WIDTH WIDE ENOUGH TO PERMIT OPERATION OF EXCAVATION AND COMPACTION EQUIPMENT, BUT IN NO CASE LESS THAN TWO (2) FEET.
  - MAKE SIDE SLOPES OF THE TRENCH NO STEEPER THAN 1:1.
  - COMPACTION REQUIREMENTS ARE THE SAME AS THOSE FOR THE EMBANKMENT.
  - KEEP THE TRENCH DRY DURING BACKFILLING AND COMPACTION OPERATIONS.

**EMBANKMENT**

- TAKE FILL MATERIAL FROM THE APPROVED AREAS SHOWN ON THE PLANS AND MAKE SURE IT IS FREE OF ROOTS, WOODY VEGETATION, ROCKS, AND OTHER OBJECTIONABLE MATERIAL.
  - SCOURY AREAS ON WHICH FILL IS TO BE PLACED BEFORE PLACING FILL.
  - THE FILL MUST CONTAIN SUFFICIENT MOISTURE SO THAT IT CAN BE FORMED BY HAND INTO A BALL WITHOUT CRUMBLING.
  - IF WATER CAN BE SQUEEZED OUT OF THE BALL, THEN THE SOIL IS TOO WET FOR COMPACTION.
  - PLACE THE FILL MATERIAL IN SIX (6) TO EIGHT (8) INCH CONTINUOUS LAYERS OVER THE ENTIRE LENGTH OF THE FILL AREA AND COMPACT IT.
  - COMPACTION MAY BE OBTAINED BY TOURING THE CONSTRUCTION HAULING EQUIPMENT OVER THE FILL, SO THAT THE ENTIRE SURFACE OF EACH LAYER IS TRAVERSED BY AT LEAST ONE WHEEL OR TREAD TRACK OF HEAVY EQUIPMENT, OR A COMPACTOR MAY BE USED.
  - CONSTRUCT THE EMBANKMENT TO AN ELEVATION TEN (10) PERCENT HIGHER THAN THE DESIGN ELEVATION TO ALLOW FOR SETTLING.
- CONDUIT SPILLWAYS**
- SECURELY ATTACH THE RISER TO THE BARREL OR BARREL STUB TO MAKE A WATERTIGHT STRUCTURAL CONNECTION.
  - SECURE ALL CONNECTIONS BETWEEN BARREL SECTIONS BY APPROVED WATERTIGHT ASSEMBLIES.
  - PLACE THE BARREL AND RISER ON A FIRM, SMOOTH FOUNDATION OF IMPERVIOUS SOIL.
  - DO NOT USE PERVIOUS MATER SUCH AS SAND, GRAVEL, OR CRUSHED STONE AS BACKFILL ROUND THE PIPE OR ANTI-SEEP COLLARS.
  - PLACE THE FILL MATERIAL AROUND THE PIPE SPILLWAY IN FOUR (4)-INCH LAYERS, AND COMPACT IT UNDER AND AROUND THE PIPE TO AT LEAST THE SAME DENSITY AS THE ADJACENT EMBANKMENT.
  - CARE MUST BE TAKEN NOT TO RAISE THE PIPE FROM THE FIRM CONTACT WITH ITS FOUNDATION WHEN COMPACTING UNDER THE PIPE HAUNCHES.
  - PLACE A MINIMUM DEPTH OF TWO (2) FEET OF COMPACTED BACKFILL OVER THE PIPE SPILLWAY BEFORE CROSSING IT WITH CONSTRUCTION EQUIPMENT.
  - ANCHOR THE RISER IN PLACE BY CONCRETE OR OTHER SATISFACTORY MEANS TO PREVENT FLOATAION.
  - IN NO CASE SHOULD THE PIPE CONDUIT BE INSTALLED BY CUTTING A TRENCH THROUGH THE DAM AFTER THE EMBANKMENT IS COMPLETE.

**EMERGENCY SPILLWAY**

- INSTALL THE EMERGENCY SPILLWAY IN UNDISTURBED SOIL.
  - CONSTRUCT EMERGENCY SPILLWAY TO THE PLANNED ELEVATIONS, GRADE, DESIGN WIDTH, AND ENTRANCE AND EXIT CHANNEL SLOPES AS SPECIFIED IN PLANS.
- INLETS**
- DISCHARGE WATER INTO THE BASIN IN A MANNER TO PREVENT EROSION.
  - USE DIVERSIONS WITH OUTLET PROTECTION TO DIVERT SEDIMENT-LADEN WATER TO THE UPPER END OF THE POOL TO IMPROVE TRAP EFFICIENCY.
- EROSION CONTROL**
- CONSTRUCT THE STRUCTURE SO THAT THE DISTURBED AREA IS MINIMIZED.
  - DIVERT SURFACE WATER AWAY FROM BARE AREAS.
  - COMPLETE THE EMBANKMENT AND ALL OTHER DISTURBED AREAS ABOVE THE CREST OF THE EMERGENCY SPILLWAY EMBANKMENT AND ALL OTHER DISTURBED AREAS ABOVE THE CREST OF THE PRINCIPAL SPILLWAY IMMEDIATELY AFTER CONSTRUCTION.
- BAFFLES**
- INSTALL POROUS BAFFLES AS SPECIFIED IN THE PLANS.

**SEDIMENT BASIN MAINTENANCE:**

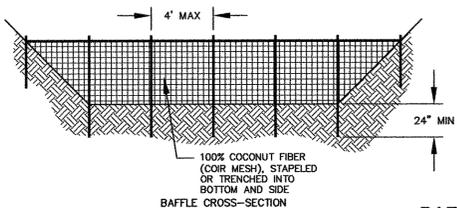
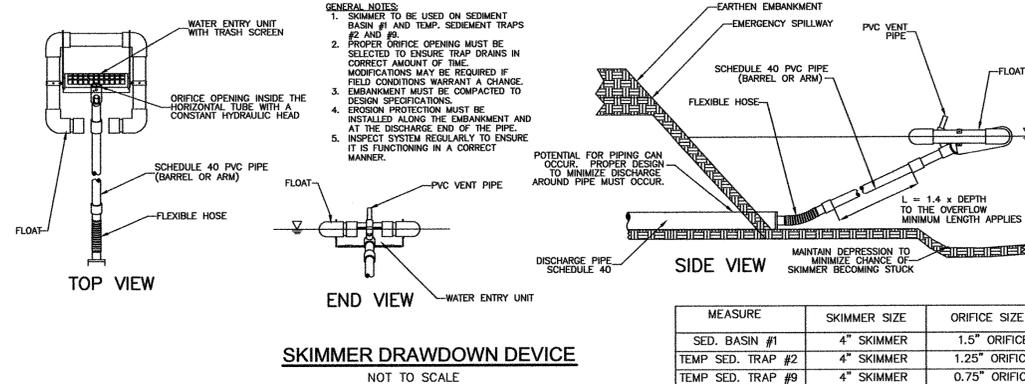
- INSPECT SEDIMENT BASINS AT LEAST WEEKLY AND AFTER EACH SIGNIFICANT (ONE-HALF (1/2) INCH OR GREATER) RAINFALL EVENT AND REPAIR IMMEDIATELY.
- REMOVE ALL SEDIMENT AND RESTORE THE BASIN TO ITS ORIGINAL DIMENSIONS WHEN IT ACCUMULATES TO ONE-HALF (1/2) THE DESIGN DEPTH.
- PLACE REMOVED SEDIMENT IN AN AREA WITH SEDIMENT CONTROLS.
- CHECK THE EMBANKMENT, SPILLWAYS, AND OUTLET FOR EROSION DAMAGE, AND INSPECT THE EMBANKMENT FOR PIPING AND SETTLEMENT.
- MAKE ALL NECESSARY REPAIRS IMMEDIATELY
- REMOVE ALL TRASH AND OTHER DEBRIS FROM THE RISER AND POOL AREA.

**TEMPORARY SEDIMENT TRAP CONSTRUCTION SPECIFICATIONS:**

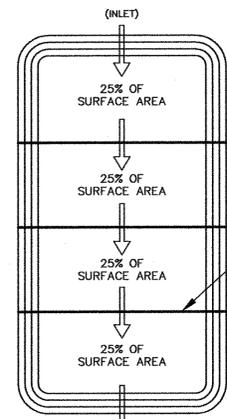
- CLEAR, GRUB, AND STRIP THE AREA UNDER THE EMBANKMENT OF ALL VEGETATION AND ROOT MAT. REMOVE ALL SURFACE SOIL CONTAINING HIGH AMOUNTS OF ORGANIC MATTER AND DISPOSE OF IT PROPERLY. HAUL ALL OBJECTIONABLE MATERIAL TO THE DESIGNATED DISPOSAL AREA.
- ENSURE THAT FILL MATERIAL FOR THE EMBANKMENT IS FREE OF ROOTS, WOODY VEGETATION ORGANIC MATTER, AND OTHER OBJECTIONABLE MATERIAL. PLACE THE FILL IN LIFTS NOT TO EXCEED NINE (9) INCHES AND MACHINE COMPACT IT. OVER FILL THE EMBANKMENT SIX (6) INCHES TO ALLOW FOR SETTLEMENT.
- CONSTRUCT THE OUTLET SECTION IN THE EMBANKMENT. PROTECT THE CONNECTION BETWEEN THE RIPRAP AND THE SOIL FROM PIPING BY USING FILTER FABRIC OR A KEYWAY CUTOFF TRENCH BETWEEN THE RIPRAP STRUCTURE AND THE SOIL.
- PLACE THE FILTER FABRIC BETWEEN THE RIPRAP AND SOIL. EXTEND THE FABRIC ACROSS THE SPILLWAY FOUNDATION AND SIDES TO THE TOP OF THE DAM OR; EXCAVATE A KEYWAY TRENCH ALONG THE CENTERLINE OF THE SPILLWAY FOUNDATION EXTENDING UP THE SIDES TO THE HEIGHT OF THE DAM. THE TRENCH SHOULD BE AT LEAST TWO (2) FEET DEEP AND TWO (2) FEET WIDE WITH 1:1 SIDE SLOPES.
- CLEAR THE POND AREA BELOW THE ELEVATION OF THE CREST OF THE SPILLWAY TO FACILITATE SEDIMENT CLEANOUT.
- ALL CUT AND FILL SLOPES SHOULD BE 2:1 OR FLATTER.
- ENSURE THAT THE STONE (DRAINAGE) SECTION OF THE EMBANKMENT HAS A MINIMUM BOTTOM WIDTH OF THREE (3) FEET AND MAXIMUM SIDE SLOPES OF 1:1 THAT EXTEND TO THE BOTTOM OF THE SPILLWAY SECTION.
- CONSTRUCT THE MINIMUM FINISHED STONE SPILLWAY BOTTOM WIDTH, AS SHOWN ON THE PLANS, WITH 2:1 SIDE SLOPES EXTENDING TO THE TOP OF THE OVER FILLED EMBANKMENT. KEEP THE THICKNESS OF THE SIDES OF THE SPILLWAY OUTLET STRUCTURE AT A MINIMUM OF TWENTY-ONE (21) INCHES. THE WEIR LEVEL MUST BE CONSTRUCTED TO GRADE TO ASSURE DESIGN CAPACITY.
- MATERIAL USED IN THE STONE SECTION SHOULD BE A WELL-GRADED MIXTURE OF STONE WITH A D50 SIZE OF NINE (9) INCHES (CLASS B EROSION CONTROL STONE IS RECOMMENDED) AND A MAXIMUM STONE SIZE OF FOURTEEN (14) INCHES. THE STONE MAY BE MACHINE PLACED AND THE SMALLER STONES WORKED INTO THE VOIDS OF THE LARGER ONES. THE STONE SHOULD BE HARD, ANGULAR AND HIGHLY WEATHER-RESISTANT.
- DISCHARGE INLET WATER INTO BASIN IN A MANNER TO PREVENT EROSION. USE TEMPORARY SLOPE DRAINS OR DIVERSIONS WITH OUTLET PROTECTION TO DIVERT SEDIMENT LADEN WATER TO THE UPPER END OF THE POOL AREA TO IMPROVE BASIN TRAP EFFICIENCY.
- ENSURE THAT THE STONE SPILLWAY OUTLET SECTION EXTENDS DOWNSTREAM PAST THE TOE OF THE EMBANKMENT UNTIL STABLE CONDITIONS ARE REACHED AND OUTLET FLOW IS ACCEPTABLE FOR THE RECEIVING WATER BODY. KEEP THE EDGES IF THE STONE OUTLET SECTION FLUSH WITH THE SURROUNDING GROUND AND SHAPE THE CENTER TO CONFINE THE OUTFLOW STREAM.
- DIRECT EMERGENCY BYPASS TO NATURAL, STABLE AREAS. LOCATE BYPASS OUTLETS SO THAT FLOW WILL NOT DAMAGE THE EMBANKMENT.
- STABILIZE THE EMBANKMENT AND ALL DISTURBED AREAS ABOVE THE SEDIMENT POOL AND DOWNSTREAM FROM THE TRAP IMMEDIATELY AFTER CONSTRUCTION.
- MARK THE DISTANCE FROM THE TOP OF THE SPILLWAY TO THE SEDIMENT CLEANOUT LEVEL (ONE HALF THE DESIGN DEPTH) IN THE FIELD.
- INSTALL POROUS BAFFLES AS SPECIFIED IN THE POROUS BAFFLE DETAIL.

**TEMPORARY SEDIMENT TRAP MAINTENANCE:**

- INSPECT TEMPORARY SEDIMENT TRAPS AFTER EACH PERIOD OF SIGNIFICANT RAINFALL.
- REMOVE SEDIMENT AND RESTORE THE TRAP TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO ONE-HALF THE DESIGN DEPTH OF THE TRAP.
- PLACE THE SEDIMENT THAT IS REMOVED IN THE DESIGNATED DISPOSAL AREA AND REPLACE THE CONTAMINATED PART OF THE GRAVEL FACING.
- CHECK THE STRUCTURE FOR DAMAGE FROM EROSION AND PIPING.
- PERIODICALLY CHECK THE DEPTH OF THE SPILLWAY TO ENSURE IT IS A MINIMUM OF 1.5 FEET BELOW THE LOW POINT OF THE EMBANKMENT.
- IMMEDIATELY FILL ANY SETTLEMENT OF THE EMBANKMENT TO SLIGHTLY ABOVE DESIGN GRADE.
- ANY RIPRAP DISPLACED MUST BE REPLACED IMMEDIATELY.
- AFTER ALL SEDIMENT-PRODUCING AREAS HAVE BEEN PERMANENTLY STABILIZED, REMOVE THE STRUCTURE AND ALL UNSTABLE SEDIMENT.
- SMOOTH THE AREA TO BLEND WITH THE ADJOINING AREAS AND STABILIZE PROPERLY.



**BAFFLE DETAIL**  
NOT TO SCALE



**SEDIMENT BASIN CONSTRUCTION SPECIFICATIONS:**

- SITE PREPARATIONS**
- CLEAR, GRUB, AND STRIP TOPSOIL FROM AREAS UNDER THE EMBANKMENT TO REMOVE TREES, VEGETATION, ROOTS, AND OTHER OBJECTIONABLE MATERIAL.
  - DELAY CLEARING THE POOL AREA UNTIL THE DAM IS COMPLETED AND THEN REMOVE BRUSH, TREES, AND OTHER OBJECTIONABLE MATERIALS TO FACILITATE SEDIMENT CLEANOUT.
  - STOCKPILE ALL TOPSOIL OR SOIL CONTAINING ORGANIC MATTER FOR USE ON THE OUTER SHELL OF THE EMBANKMENT TO FACILITATE VEGETATIVE ESTABLISHMENT.
  - PLACE TEMPORARY SEDIMENT CONTROL MEASURES BELOW THE BASIN AS NEEDED.
- CUT-OFF-TRENCH**
- EXCAVATE A CUT-OFF-TRENCH ALONG THE CENTER LINE OF THE EARTH FILL EMBANKMENT
  - CUT THE TRENCH TO STABILIZE SOIL MATERIAL, BUT IN NO CASE MAKE IT LESS THAN TWO (2) FEET DEEP
  - THE CUT-OFF-TRENCH MUST BE EXTENDED INTO BOTH ABUTMENTS TO AT LEAST THE ELEVATION OF THE RISER CREST.
  - MAKE THE MINIMUM BOTTOM WIDTH WIDE ENOUGH TO PERMIT OPERATION OF EXCAVATION AND COMPACTION EQUIPMENT, BUT IN NO CASE LESS THAN TWO (2) FEET.
  - MAKE SIDE SLOPES OF THE TRENCH NO STEEPER THAN 1:1.
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  - KEEP THE TRENCH DRY DURING BACKFILLING AND COMPACTION OPERATIONS.

**EMBANKMENT**

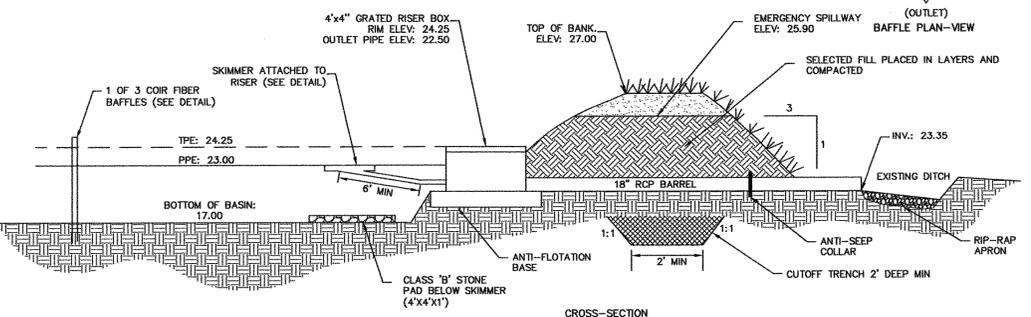
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  - CONSTRUCT THE EMBANKMENT TO AN ELEVATION TEN (10) PERCENT HIGHER THAN THE DESIGN ELEVATION TO ALLOW FOR SETTLING.
- CONDUIT SPILLWAYS**
- SECURELY ATTACH THE RISER TO THE BARREL OR BARREL STUB TO MAKE A WATERTIGHT STRUCTURAL CONNECTION.
  - SECURE ALL CONNECTIONS BETWEEN BARREL SECTIONS BY APPROVED WATERTIGHT ASSEMBLIES.
  - PLACE THE BARREL AND RISER ON A FIRM, SMOOTH FOUNDATION OF IMPERVIOUS SOIL.
  - DO NOT USE PERVIOUS MATER SUCH AS SAND, GRAVEL, OR CRUSHED STONE AS BACKFILL ROUND THE PIPE OR ANTI-SEEP COLLARS.
  - PLACE THE FILL MATERIAL AROUND THE PIPE SPILLWAY IN FOUR (4)-INCH LAYERS, AND COMPACT IT UNDER AND AROUND THE PIPE TO AT LEAST THE SAME DENSITY AS THE ADJACENT EMBANKMENT.
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  - ANCHOR THE RISER IN PLACE BY CONCRETE OR OTHER SATISFACTORY MEANS TO PREVENT FLOATAION.
  - IN NO CASE SHOULD THE PIPE CONDUIT BE INSTALLED BY CUTTING A TRENCH THROUGH THE DAM AFTER THE EMBANKMENT IS COMPLETE.

**EMERGENCY SPILLWAY**

- INSTALL THE EMERGENCY SPILLWAY IN UNDISTURBED SOIL.
  - CONSTRUCT EMERGENCY SPILLWAY TO THE PLANNED ELEVATIONS, GRADE, DESIGN WIDTH, AND ENTRANCE AND EXIT CHANNEL SLOPES AS SPECIFIED IN PLANS.
- INLETS**
- DISCHARGE WATER INTO THE BASIN IN A MANNER TO PREVENT EROSION.
  - USE DIVERSIONS WITH OUTLET PROTECTION TO DIVERT SEDIMENT-LADEN WATER TO THE UPPER END OF THE POOL TO IMPROVE TRAP EFFICIENCY.
- EROSION CONTROL**
- CONSTRUCT THE STRUCTURE SO THAT THE DISTURBED AREA IS MINIMIZED.
  - DIVERT SURFACE WATER AWAY FROM BARE AREAS.
  - COMPLETE THE EMBANKMENT AND ALL OTHER DISTURBED AREAS ABOVE THE CREST OF THE EMERGENCY SPILLWAY EMBANKMENT AND ALL OTHER DISTURBED AREAS ABOVE THE CREST OF THE PRINCIPAL SPILLWAY IMMEDIATELY AFTER CONSTRUCTION.
- BAFFLES**
- INSTALL POROUS BAFFLES AS SPECIFIED IN THE PLANS.

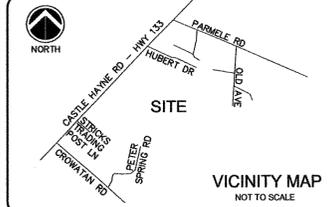
**SEDIMENT BASIN MAINTENANCE:**

- INSPECT SEDIMENT BASINS AT LEAST WEEKLY AND AFTER EACH SIGNIFICANT (ONE-HALF (1/2) INCH OR GREATER) RAINFALL EVENT AND REPAIR IMMEDIATELY.
- REMOVE ALL SEDIMENT AND RESTORE THE BASIN TO ITS ORIGINAL DIMENSIONS WHEN IT ACCUMULATES TO ONE-HALF (1/2) THE DESIGN DEPTH.
- PLACE REMOVED SEDIMENT IN AN AREA WITH SEDIMENT CONTROLS.
- CHECK THE EMBANKMENT, SPILLWAYS, AND OUTLET FOR EROSION DAMAGE, AND INSPECT THE EMBANKMENT FOR PIPING AND SETTLEMENT.
- MAKE ALL NECESSARY REPAIRS IMMEDIATELY
- REMOVE ALL TRASH AND OTHER DEBRIS FROM THE RISER AND POOL AREA.



**SEDIMENT BASIN DETAIL**  
NOT TO SCALE

Sediment Basin	Min. Surface Area (sf)	Surface Area Provided (sf)	Min. Storage Vol. (cf)	Storage Vol. Provided (cf)
SBI	3,211	6,105	12,402	13,521

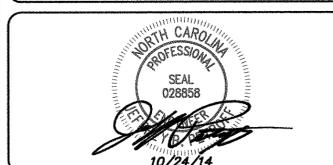


**LEGEND**

NO LEGEND CONTENT IS VISIBLE IN THE PROVIDED IMAGE.

**FINAL DRAWING - NOT RELEASED FOR CONSTRUCTION**

REV. #	DESCRIPTION	REV. BY	DATE
1	REVISE SED TRAP TABLE AND REVISE SKIMMER TABLE	JBP	8/21/14



OWNER:  
NEW HANOVER COUNTY  
230 GOVERNMENT CENTER DRIVE  
WILMINGTON, NC 28403

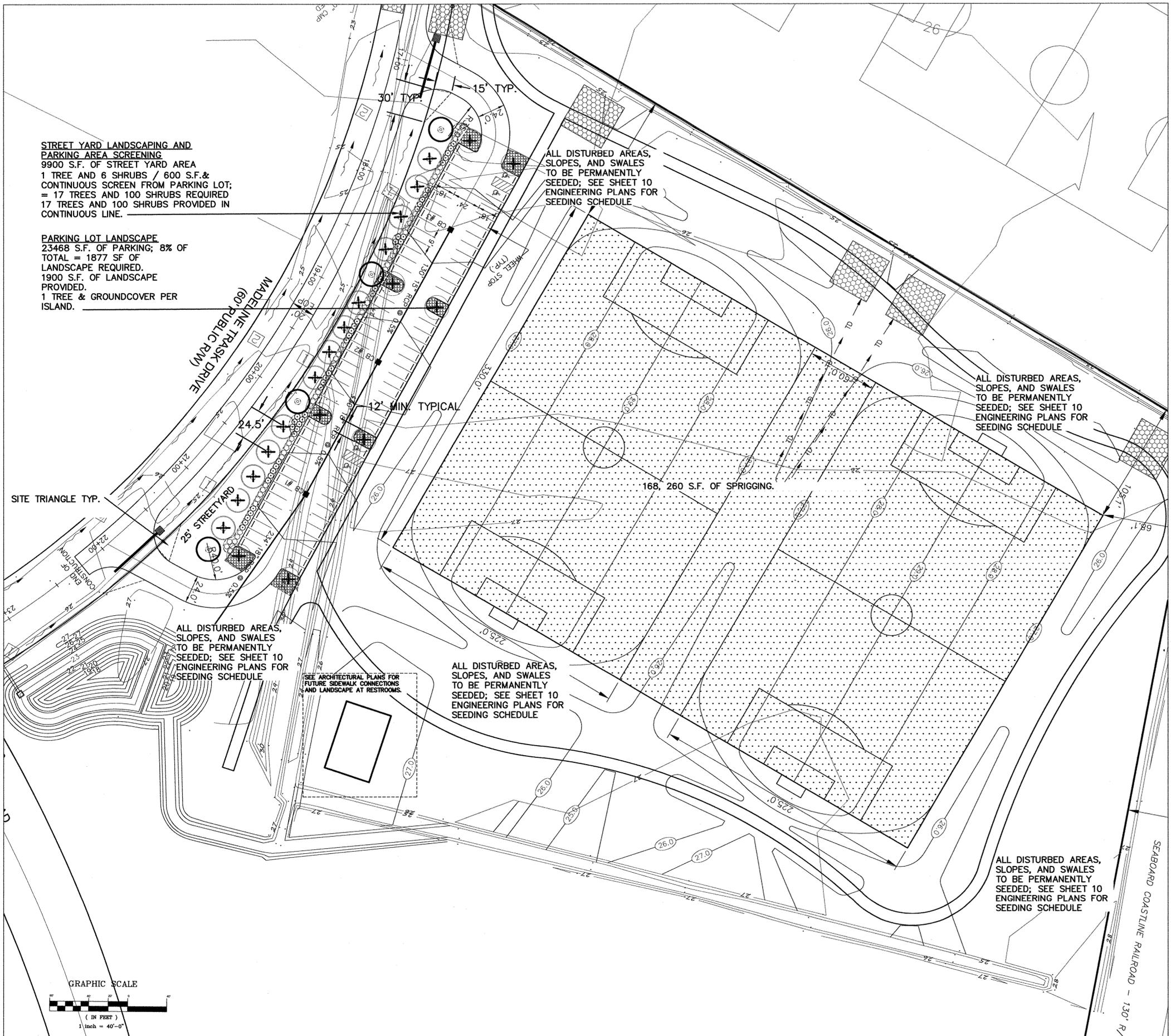
**Coastal Land Design, PLLC**  
Civil Engineering / Landscape Architecture  
Land Planning / Construction Management  
NCBELS Firm License No. P-0369  
P.O. Box 1172, Wilmington, NC 28402, www.cldeng.com, Phone: 910-254-8933, Fax: 910-254-8928

DRAWN BY	A. Mills	PROJECT NUMBER	110-01
DESIGN BY	A. Mills	SCALE	NTS
CHECK BY	J. Petroff	DATE	06 Sept 12
APPROVED BY	J. Petroff	FILE NAME	

**Castle Hayne Park**  
New Hanover County, NC

**Sediment and Erosion Control Details**

JOB NUMBER: 110-01  
SHEET NUMBER: 12



**STREET YARD LANDSCAPING AND PARKING AREA SCREENING**  
 9900 S.F. OF STREET YARD AREA  
 1 TREE AND 6 SHRUBS / 600 S.F. & CONTINUOUS SCREEN FROM PARKING LOT; = 17 TREES AND 100 SHRUBS REQUIRED  
 17 TREES AND 100 SHRUBS PROVIDED IN CONTINUOUS LINE.

**PARKING LOT LANDSCAPE**  
 23468 S.F. OF PARKING; 8% OF TOTAL = 1877 SF OF LANDSCAPE REQUIRED.  
 1900 S.F. OF LANDSCAPE PROVIDED.  
 1 TREE & GROUNDCOVER PER ISLAND.

ALL DISTURBED AREAS, SLOPES, AND SWALES TO BE PERMANENTLY SEEDED; SEE SHEET 10 ENGINEERING PLANS FOR SEEDING SCHEDULE

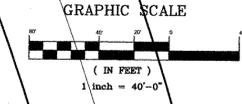
ALL DISTURBED AREAS, SLOPES, AND SWALES TO BE PERMANENTLY SEEDED; SEE SHEET 10 ENGINEERING PLANS FOR SEEDING SCHEDULE

ALL DISTURBED AREAS, SLOPES, AND SWALES TO BE PERMANENTLY SEEDED; SEE SHEET 10 ENGINEERING PLANS FOR SEEDING SCHEDULE

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ALL DISTURBED AREAS, SLOPES, AND SWALES TO BE PERMANENTLY SEEDED; SEE SHEET 10 ENGINEERING PLANS FOR SEEDING SCHEDULE

SEE ARCHITECTURAL PLANS FOR FUTURE SIDEWALK CONNECTIONS AND LANDSCAPE AT RESTROOMS.



**TREES**

- Bald Cypress  
*Taxodium distichum*  
2'-36" min. cal.  
Qty: 13
- High Rise Live Oak  
*Quercus virginiana 'high rise'*  
2'-24" min. cal.  
Qty: 8
- Ginkgo Tree (male only)  
*Ginkgo biloba*  
2'-24" min. cal.  
Qty: 4

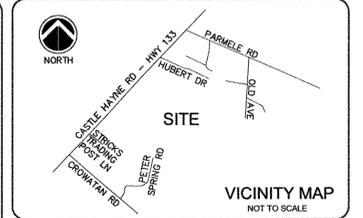
**SHRUBS**

- Carissa Holly  
*Ilex cornuta 'Carissa'*  
3 gal 15" Ht. x 15" Sp. Qty: 50
- Loropetalum  
*Loropetalum chinense*  
3 gal 12" Ht. x 12" Sp. Qty: 50

**GROUNDCOVERS AND MULCHES**

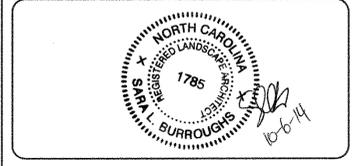
- Shredded Hardwood Mulch 3" deep  
Qty: 4440 s.f.
- Sports Fields  
Celebration Bermuda Grass  
Sprigged Qty: 168,260 sf
- Groundcover in parking islands  
Blue Gray Sedge  
*Carex glauca*  
15" O.C. Qty: 1180

See Sheet 10 for permanent seeding schedule for all disturbed areas outside of defined sports fields



**LEGEND**

REV. #	DESCRIPTION	REV. BY	DATE
REVISIONS			



OWNER:  
 NEW HANOVER COUNTY  
 230 GOVERNMENT CENTER DRIVE  
 WILMINGTON, NC 28403

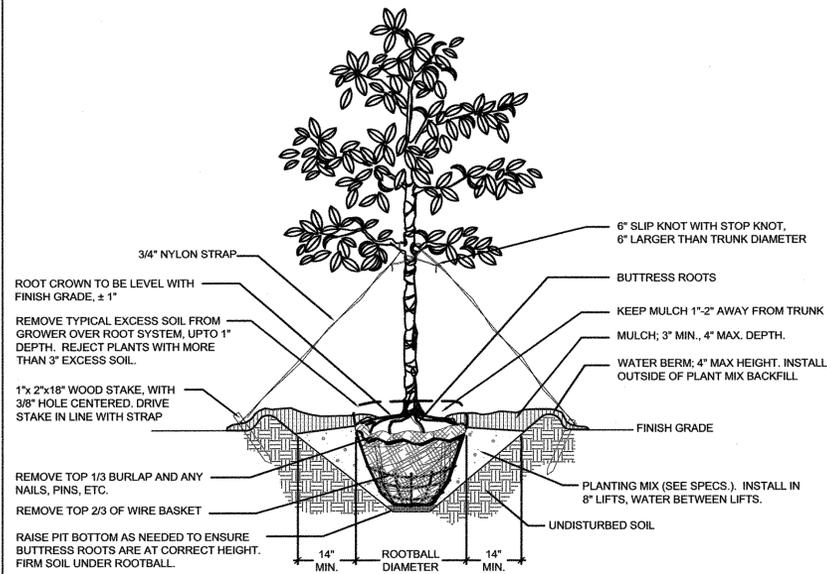
SageDesign PLLC  
 Sara Burroughs, RLA  
 228 North Front Street  
 Suite 202D  
 Wilmington, NC 28401  
 Ph. (910) 232-3878  
 sara@sagedesign.us

DRAWN : SLB	PROJECT : CH-CLD
DESIGN : SLB	NUMBER :
CHECK : SLB	SCALE : 1" = 40'
APPROVED : SLB	DATE : 06 Sept 12
FILE NAME :	

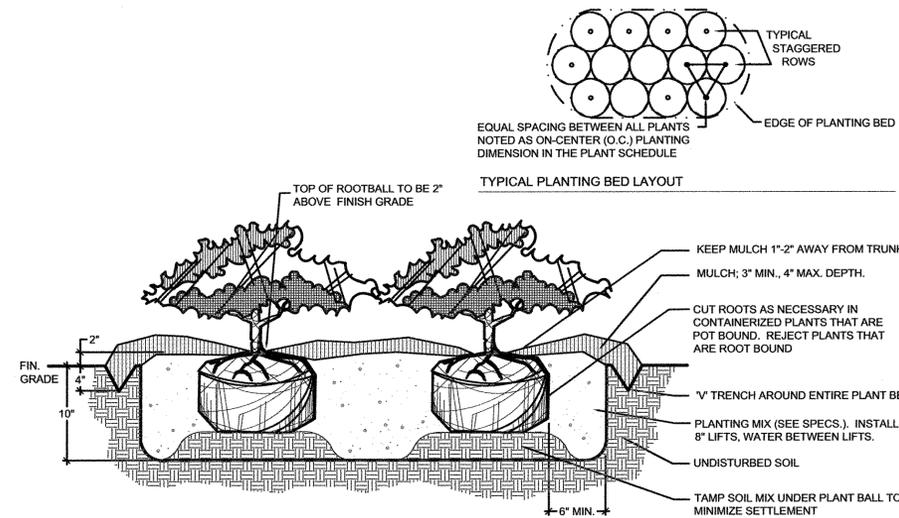
Castle Hayne Park  
 New Hanover County, NC

Landscape Plan

JOB NUMBER CH-CLD	SHEET NUMBER L-1.0
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**A** SINGLE STEM TREE INSTALLATION DETAIL  
SCALE: NTS



**B** SHRUB INSTALLATION DETAIL  
SCALE: NTS

**PLANT MATERIAL NOTES**

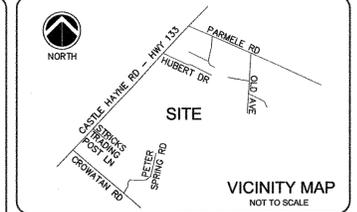
1. ALL PLANT MATERIAL SHALL CONFORM TO THE MOST CURRENT STANDARDS ESTABLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN.
2. CONTAINERIZED PLANTS SHALL HAVE A ROOT SYSTEM SUFFICIENT ENOUGH IN DEVELOPMENT TO HOLD THE SOIL INTACT WHEN REMOVED FROM THE CONTAINER. THE ROOT SYSTEM SHALL NOT BE ROOT BOUND, A CONDITION WHERE THE ROOT SYSTEM IS DENSE IN MASS, EXCESSIVELY INTERTWINED, AND HAS ESTABLISHED A CIRCULAR GROWTH PATTERN.
3. ALL PLANTS SHALL BE FRESHLY DUG, SOUND, HEALTHY, VIGOROUS, WELL-ROOTED PLANTS AND ESTABLISHED IN THE CONTAINER IN WHICH THEY ARE SOLD. THE PLANTS SHALL HAVE TOPS WHICH ARE GOOD QUALITY AND ARE IN A HEALTHY GROWING CONDITION.
4. PLANTS SHALL NOT BE PRUNED PRIOR TO DELIVERY UNLESS APPROVED BY THE LANDSCAPE ARCHITECT PRIOR TO SHIPMENT.
5. ALL TREE PITS, SHRUB BEDS AND PREPARED PLANTING BEDS ARE TO BE COMPLETELY EXCAVATED IN ACCORDANCE WITH THE PLANTING DETAILS.
6. TOPSOIL AMENDMENTS REQUIRED FOR SOIL MIXES SHALL BE PROVIDED BY CONTRACTOR AND APPROVED BY LANDSCAPE ARCHITECT PRIOR TO INSTALLATION. CONTRACTOR MUST LOAD, HAUL, MIX AND SPREAD ALL TOPSOIL AND OTHER SOIL ADDITIVES AS REQUIRED ON SITE.
7. CONTRACTOR SHALL VERIFY AND/ OR AMEND ALL PLANTING SOILS TO ENSURE PROPER SUITABILITY INCLUDING STATE RECOMMENDED QUANTITIES OF NITROGEN, PHOSPHORUS, AND POTASH NUTRIENTS AND SOIL AMENDMENTS TO BE ADDED TO PRODUCE QUALITY PLANTING SOIL FOR ALL PLANT MATERIAL TO SURVIVE.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT ALL PLANTING PITS PERCOLATE PROPERLY PRIOR TO PLANTING INSTALLATION.
9. SHRUBS, BULBS, AND GROUNDCOVERS SHALL BE TRIANGULARLY SPACED AT SPACING SHOWN ON PLANTING PLANS AND/OR IN THE PLANT SCHEDULE.
10. THE CONTRACTOR SHALL VERIFY EXTENT OF SEEDING OR SOD AREA WITH OWNER REPRESENTATIVE AND LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.

**TREE INSTALLATION NOTES**

1. ALL TREES SHALL MEET AMERICAN STANDARD FOR NURSERY STOCK (ANSI, 1990, PART 1, "SHADE AND FLOWERING TREES").
2. TREES SUPPLIED MUST HAVE BEEN PROPERLY PLANTED AND GROWN IN THE NURSERY. THE ROOT CROWN (ALSO CALLED THE TRUNK FLARE) SHALL BE EVIDENT NEAR THE TOP OF THE GROUND. ANY EXCESS SOIL, UP TO 3 INCHES COVERING THE CROWN WILL HAVE TO BE REMOVED CAREFULLY BY HAND, IN ORDER TO PREVENT ROOT SCRAPES. THE TREE IS THEN TO BE PLANTED WITH THE ROOT CROWN IN PROPER RELATION TO THE SURROUNDING GRADE. ANY TREES WITH MORE THAN 3 INCHES OF SOIL ON TOP OF THE ROOT CROWN WILL BE REJECTED. THE NURSERY OWNERS MAY DIG OVERSIZE BALLS AND REMOVE THE SOIL IN ORDER FOR THE ROOT SYSTEM DIAMETER (WHICH IS THE REQUIRED ROOT BALL DIAMETER) TO MEET THE SPECIFICATION FOR THE TRUNK CALIPER REQUIRED.
3. BALL AND BURLAPPED (B&B) PLANTS MUST HAVE FIRM, NATURAL BALLS OF EARTH, OF DIAMETER NOT LESS THAN RECOMMENDED IN THE "TREE AND SHRUB TRANSPLANTING MANUAL", AND BE OF SUFFICIENT DEPTH TO INCLUDE THE FIBROUS AND FEEDING ROOTS. PLANTS MOVED WITH A BALL WILL NOT BE ACCEPTED IF THE BALL IS DRY, CRACKED OR BROKEN BEFORE OR DURING PLANTING OPERATIONS.
4. REMOVE ALL TREATED OR PLASTIC-COATED BURLAP, STRAPPING, WIRE OR NYLON TWINE FROM ROOT BALL. AFTER SETTING IN HOLE, CUT AWAY 2/3 OF WIRE BASKET, IF ANY, AND TOP 1/3 OF BURLAP.
5. SOAK ROOT BALL AND PIT IMMEDIATELY AFTER INSTALLATION.
6. CONSTRUCT 4" HIGH SAUCER (WATER BERM) OUTSIDE OF PLANT MIX BACK FILL.
7. WHERE TREES ARE PLANTED IN ROWS, THEY SHALL BE UNIFORM IN SIZE AND SHAPE.
8. NO EXISTING TREES SHALL BE REMOVED WITHOUT WRITTEN AUTHORIZATION FROM THE OWNER REPRESENTATIVE EXCEPT WHERE NOTED ON PLANS. NO GRUBBING SHALL OCCUR WITHIN EXISTING TREE AREAS.
9. THE CONTRACTOR SHALL STAKE THE LOCATIONS OF ALL PROPOSED TREES AND OBTAIN APPROVAL FROM THE LANDSCAPE ARCHITECT AND OWNER REPRESENTATIVE PRIOR TO INSTALLATION.
10. ALL TREES SHALL BE STAKED AT TIME OF INSTALLATION IN ACCORDANCE WITH PLANTING DETAILS.
11. THE CONTRACTOR SHALL ENSURE THAT TREES REMAIN VERTICAL AND UPRIGHT FOR THE DURATION OF THE GUARANTEE PERIOD.
12. STAKES FOR TREE SUPPORT SHALL BE CONSTRUCTED OF 2"x2" x18' UNTREATED PINE. GUYING FABRIC SHALL BE ARBOR TAPE, AS MANUFACTURED BY NEPTCO, PAWTUCKET, RI (401) 722-5500 (OR APPROVED EQUAL). COLOR SHALL BE OLIVE DRAB.

**SHRUB INSTALLATION NOTES**

1. CUT ROOTS AS NECESSARY IN CONTAINERIZED PLANTS THAT ARE POT BOUND. REJECT PLANTS THAT HAVE GIRDLED ROOT OR ARE BOUND.
2. INSTALL TOP OF PLANT BALL 2" ABOVE ADJACENT GRADE.
3. TAMP PLANT SOIL MIX FIRMLY IN 8" LIFTS AROUND PLANT BALL.
4. SOAK PLANT BALL AND PIT IMMEDIATELY AFTER INSTALLATION.
5. PURSUANT TO LDC 18-483 A 3' BUFFER SHALL BE PROVIDED IN FRONT OF SPACES 35 AND 36; IF PROPOSED EVERGREEN SCREEN DOES NOT SURVIVE, OWNER SHALL PROVIDE A 3' HGT. 'GREEN SCREEN' WITH SCREEN AND EVERGREEN PLANT MATERIAL TO SATISFY THIS CODE REQUIREMENT.



**LEGEND**

REV. #	DESCRIPTION	REV. BY	DATE
REVISIONS			



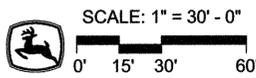
SageDesign PLLC  
Sara Burroughs, RLA  
228 North Front Street  
Suite 202D  
Wilmington, NC 28401  
Ph. (910) 232-3878  
sara@sagedesign.us

DRAWN : SLB	PROJECT : CH-CLD
DESIGN : SLB	NUMBER :
CHECK : SLB	SCALE : 1"= 40'
APPROVED : SLB	DATE : 06 Sept 12
FILE NAME :	

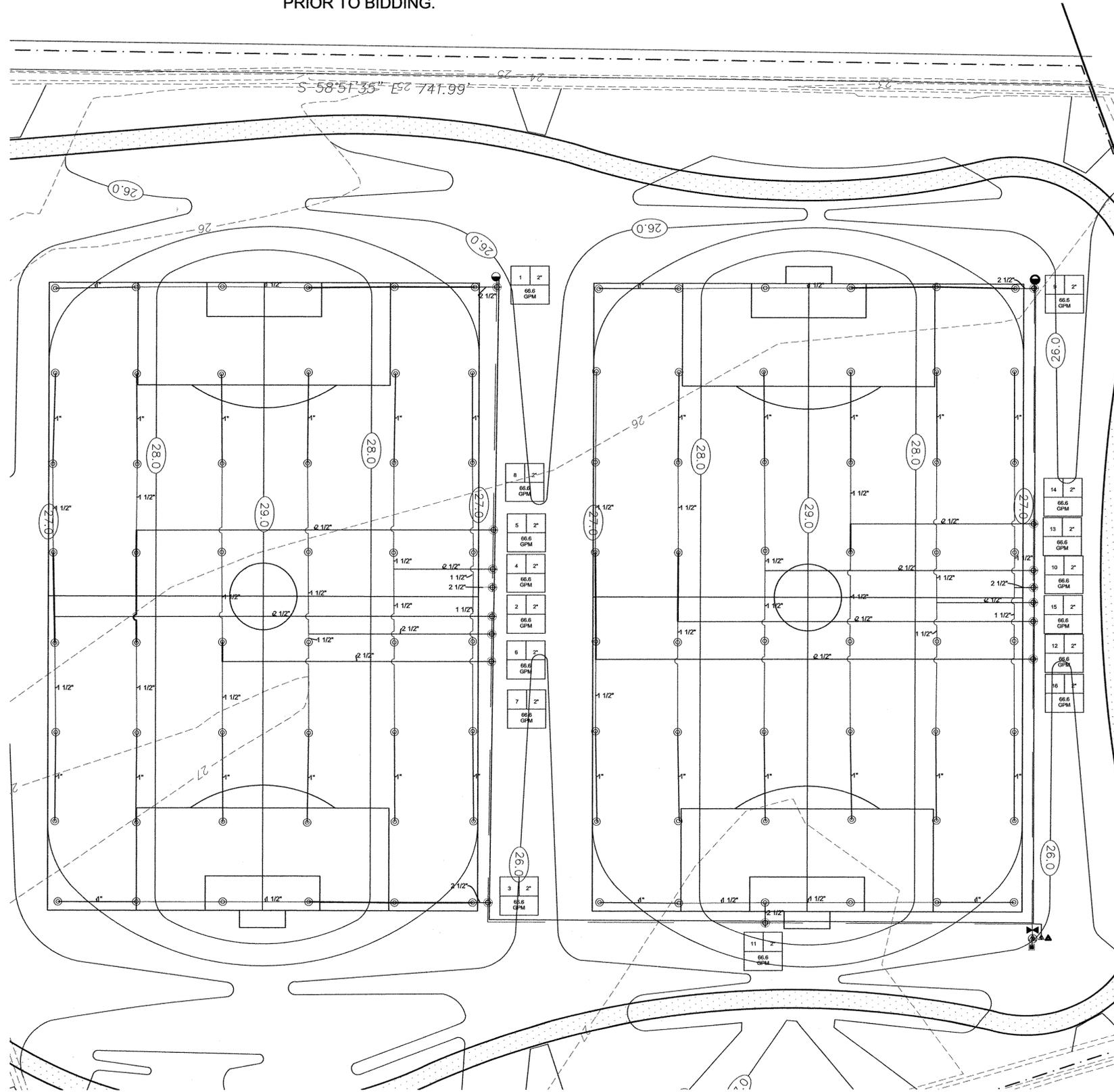
Castle Hayne Park  
New Hanover County, NC

Landscape Plan

JOB NUMBER CH-CLD	SHEET NUMBER L-2.0
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PAGE SCALED PER SCALE BAR AND  
VERIFIED WITH GIVEN DIMENSIONS  
FROM THIS SHEET - WB 09/08/14.  
CONTRACTOR SHALL VERIFY SCALE  
PRIOR TO BIDDING.



**Note:**

Contractor shall bid irrigation based upon performance specifications and irrigation layout provided by the County. If any changes or modifications are recommended, the selected contractor shall submit irrigation layout, design, and materials changes and recommendations to County staff for approval prior to purchase and installation. All design and installation shall follow submittals as outlined within specifications and coordination with primary project coordinator prior to execution and installation.

**Irrigation**

Qty	Symbol	Description
96	⊙	HUNTER, I-25 -SERIES, 4\"/>
1	⊕	FEBCO, 825Y SERIES,REDUCED PRESSURE BACKFLOW, 2.0\"/>
16	⊕	HUNTER, PGV-201G, ELECTRIC VALVE, 2.0\"/>
1	⊕	HUNTER, I-CORE SERIES, AUTOMATIC CONTROLLER
2	⊕	HUNTER, HQ-44RC SERIES, QUICK COUPLING VALVE, 1.0\"/>
1	⊕	ISOLATION GATE VALVE, MAINLINE SIZE
1	⊕	HUNTER, RAIN-CLIK, AUTOMATIC RAIN SENSOR
1	⊕	TAP LOCATION, 2.0\"/>
1980 (ft)	—	PVC LATERAL, CLASS 200, BE, SIZE 1.5\"/>
1300 (ft)	—	PVC LATERAL, CLASS 200, BE, SIZE 1.0\"/>
1480 (ft)	—	PVC LATERAL, CLASS 200, BE, SIZE 2.5\"/>
500 (ft)	—	PVC LATERAL, CLASS 200, BE, SIZE 2.0\"/>
980 (ft)	—	PVC MAINLINE, SCHEDULE 40, BE, SIZE 2.5\"/>
980(ft)	—	WIRE PATH

**IRRIGATION SPECIFICATIONS**

- IRRIGATION SYSTEM DESIGN BASED ON 67 GPM AT 70 PSI.
- IRRIGATION DESIGN IS FROM THE POINT OF CONNECTION(POC)ONLY. THE DESIGN IS BASED ON GALLONS PER MINUTE(GPM)AND POUNDS PER SQUARE INCH(PSI)FURNISHED BY OTHERS.
- IRRIGATION CONTRACTOR IS TO VERIFY POINT OF CONNECTION IN THE FIELD. INSTALLER IS TO CONFIRM THE MINIMUM DISCHARGE REQUIREMENTS OF THE POINT OF CONNECTION AS INDICATED ON THE LEGEND PRIOR TO INSTALLATION.
- THE PRESSURE REQUIREMENT AT THE POINT OF CONNECTION IS BASED ON NO MORE THAN 5 FEET OF ELEVATION CHANGE IN THE AREAS OF IRRIGATION.
- ALL PRODUCTS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND ACCORDING TO LOCAL BUILDING, ELECTRICAL, AND PLUMBING CODES.
- IRRIGATION CONTRACTOR WILL ARRANGE INSPECTIONS REQUIRED BY LOCAL AGENCIES AND ORDINANCES DURING THE COURSE OF CONSTRUCTION AS REQUIRED. ALL WIRING TO BE PER LOCAL CODE. BACKFLOW PREVENTION TO BE PER LOCAL CODE.
- LOCATION OF IRRIGATION COMPONENTS SHOWN ON DRAWING IS APPROXIMATE. ACTUAL PLACEMENT MAY VARY SLIGHTLY AS REQUIRED TO ACHIEVE FULL, EVEN COVERAGE.
- ALL SPRINKLER HEADS SHALL BE INSTALLED PERPENDICULAR TO FINISH GRADES. EXCEPT AS OTHERWISE INDICATED.
- INSTALL IRRIGATION MAINS WITH A MINIMUM 18\"/>
- PIPE LOCATIONS ARE DIAGRAMATIC. VALVES AND MAINLINE SHOWN IN PAVED AREAS ARE FOR GRAPHIC CLARITY ONLY.
- THE IRRIGATION CONTRACTOR SHALL COMPLY WITH PIPE SIZES AS INDICATED.
- ALL WIRE SPLICES OR CONNECTIONS SHALL BE MADE WITH APPROVED WATERPROOF WIRE CONNECTIONS AND BE IN A VALVE OR SPLICE BOX.
- ALL CONTROL WIRING DOWNSTREAM OF THE CONTROLLER IS TO BE 14 AWG, UL APPROVED DIRECT BURY.
- THE DESIGN IS BASED ON THE SITE INFORMATION AND/OR DRAWING SUPPLIED WITH THE DESIGN CRITERIA BEING SET(AREA TO BE IRRIGATED, EQUIPMENT MANUFACTURER AND MODEL TO BE USED, WATER SOURCE INFORMATION, ELECTRICAL POWER AVAILABILITY, ETC...). JOHN DEERE LANDSCAPES BEARS NO RESPONSIBILITY OR LIABILITY FOR ANY ERRORS IN DESIGN OR INSTALLATION THAT ARISE DUE TO INACCURACIES IN THE ABOVE REFERENCED INFORMATION SUPPLIED TO JOHN DEERE LANDSCAPES IN RELATION TO THIS PROJECT, UNLESS OTHERWISE NOTED.
- THE INSTALLING CONTRACTOR MUST HOLD A CURRENT , VALID NC IRRIGATION CONTRACTOR'S LICENSE.

**JOHN DEERE  
LANDSCAPES**



650 Stephenson Highway  
Troy, Michigan 48063  
Phone 248.588.2100  
Fax 248.588.3528  
www.JohnDeereLandscapes.com  
800.347.4272

Project Name:  
**SOCCER FIELDS**  
**WILMINGTON, NC, 28405**

Customer Name:

Design Date: 09/01/14

Drawn By: GREG GLAITTLI

**REVISIONS**

Description	Date
⊕	
⊕	
⊕	
⊕	
⊕	
⊕	

Drawing Title:

Irrigation Plan

Drawing Scale: 1\"/>

PROJECT SERVICES NUMBER: 63282

Sheet Number:

IR-1

STATE OF NORTH CAROLINA

COUNTY OF \_\_\_\_\_

**AFFIDAVIT of COMPLIANCE**  
**with N.C. E-Verify Statutes**

I, \_\_\_\_\_ (hereinafter the "Affiant"), duly authorized by and on behalf of \_\_\_\_\_ (hereinafter the "Employer") after being first duly sworn deposes and says as follows:

1. I am the \_\_\_\_\_ (President, Manager, CEO, etc.) of the Employer and possess the full authority to speak for and on behalf of the Employer identified above.
2. Employer understands that "E-Verify" means the federal E-Verify program operated by the United States Dept. of Homeland Security and other federal agencies, or any successor or equivalent program used to verify the work authorization of newly hired employees pursuant to federal law.
3. \_\_\_\_\_ Employer employs 25 or more employees in the State of North Carolina, and is in compliance with the provisions of N.C. Gen. Stat. §64-26. Employer has verified the work authorization of its employees through E-Verify and shall retain the records of verification for a period of at least one year.  
  
\_\_\_\_\_ Employer employs fewer than 25 Employees and is therefore not subject to the provisions of N.C. Gen. Stat. §64-26.
4. All subcontractors engaged by or to be engaged by Employer have or will have likewise complied with the provisions of N.C. Gen. Stat. §64-26.
5. Employer shall keep New Hanover County informed of any change in its status pursuant to Article 2 of Chapter 64 of the North Carolina General Statutes.

Further this affiant sayeth not.

This the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

\_\_\_\_\_  
Affiant

STATE OF NORTH CAROLINA  
COUNTY OF \_\_\_\_\_

Sworn to and subscribed before me, this the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

\_\_\_\_\_  
Notary Public

[SEAL]

My commission expires: \_\_\_\_\_

**FORM OF BID BOND**

KNOW ALL MEN BY THESE PRESENTS THAT \_\_\_\_\_  
\_\_\_\_\_ as  
principal, and \_\_\_\_\_, as surety, who  
is duly licensed to act as surety in North Carolina, are held and firmly bound unto New  
Hanover County as obligee, in the penal sum of \_\_\_\_\_  
DOLLARS, lawful money of the United States of America, for the payment of which, well  
and truly to be made, we bind ourselves, our heirs, executors, administrators, successors  
and assigns, jointly and severally, firmly by these presents.

Signed, sealed and dated this \_\_\_\_ day of \_\_\_\_ 20\_\_

WHEREAS, the said principal is herewith submitting proposal for and the principal  
desires to file this bid bond in lieu of making the cash deposit as required by G.S. 143-129.

NOW, THEREFORE, THE CONDITION OF THE ABOVE OBLIGATION is such, that  
if the principal shall be awarded the contract for which the bid is submitted and shall  
execute the contract and give bond for the faithful performance thereof within ten days  
after the award of same to the principal, then this obligation shall be null and void; but if the  
principal fails to so execute such contract and give performance bond as required by G.S.  
143-129, the surety shall, upon demand, forthwith pay to the obligee the amount set forth  
in the first paragraph hereof. Provided further, that the bid may be withdrawn as provided  
by G.S. 143-129.1

\_\_\_\_\_(SEAL)

\_\_\_\_\_(SEAL)

\_\_\_\_\_(SEAL)

\_\_\_\_\_(SEAL)

\_\_\_\_\_(SEAL)

## FORM OF PERFORMANCE BOND

Date of Contract: \_\_\_\_\_

Date of Execution: \_\_\_\_\_

Name of Principal: \_\_\_\_\_  
(Contractor)

Name of Surety: \_\_\_\_\_

Name of Contracting Body: NEW HANOVER COUNTY

Amount of Bond: \_\_\_\_\_

Project: PARTIAL DECONSTRUCTION OF FORMER WASTEC FACILITY-RFB-15-0129

KNOW ALL MEN BY THESE PRESENTS, that we, the principal and surety above named, are held and firmly bound unto the above named contracting body, hereinafter called the contracting body, in the penal sum of the amount stated above for the payment of which sum well and truly to be made, we bind, ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the principal entered into a certain contract with the contracting body, identified as shown above and hereto attached:

NOW, THEREFORE, if the principal shall well and truly perform and fulfill all the undertakings, covenants, terms, conditions and agreements of said contract during the original term of said contract and any extensions thereof that may be granted by the contracting body, with or without notice to the surety, and during the life of any guaranty required under the contract, and shall also well and truly perform and fulfill all the undertakings, covenants, terms, conditions and agreements of any and all duly authorized modifications of said contract that may hereafter be made, notice of which modifications to the surety being hereby waived, then, this obligation to be void; otherwise to remain in full force and virtue.

IN WITNESS WHEREOF, the above-bounden parties have executed this instrument under their several seals on the date indicated above, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

Executed in \_\_\_\_\_ counterparts.

Witness:

\_\_\_\_\_  
(Proprietorship or Partnership)

Attest: (Corporation)

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

Title: \_\_\_\_\_  
(Corp. Sec. or Asst. Sec. only)

(Corporate Seal)

\_\_\_\_\_  
Contractor: (Trade or Corporate Name)

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

Title: \_\_\_\_\_  
(Owner, Partner, or Corp. Pres. or Vice Pres. only)

\_\_\_\_\_  
(Surety Company)

Witness:

\_\_\_\_\_

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

Title: \_\_\_\_\_  
(Attorney in Fact)

Countersigned:

\_\_\_\_\_

(Surety Corporate Seal)

\_\_\_\_\_  
(N.C. Licensed Resident Agent)

\_\_\_\_\_

\_\_\_\_\_  
Name and Address-Surety Agency

\_\_\_\_\_

\_\_\_\_\_  
Surety Company Name and N.C.  
Regional or Branch Office Address

**FORM OF PAYMENT BOND**

Date of Contract: \_\_\_\_\_

Date of Execution: \_\_\_\_\_

Name of Principal: \_\_\_\_\_  
(Contractor)

Name of Surety: \_\_\_\_\_

Name of Contracting Body: NEW HANOVER COUNTY

Amount of Bond: \_\_\_\_\_

Project: PARTIAL DECONSTRUCTION OF FORMER WASTEC FACILITY-RFB-15-0129

KNOW ALL MEN BY THESE PRESENTS, that we, the principal and surety above named, are held and firmly bound unto the above named contracting body, hereinafter called the contracting body, in the penal sum of the amount stated above for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the principal entered into a certain contract with the contracting body identified as shown above and hereto attached:

NOW, THEREFORE, if the principal shall promptly make payment to all persons supplying labor/material in the prosecution of the work provided for in said contract, and any and all duly authorized modifications of said contract that may hereafter be made, notice of which modifications to the surety being hereby waived, then this obligation to be void; otherwise to remain in full force and virtue.

IN WITNESS WHEREOF, the above-bounden parties have executed this instrument under their several seals on the date indicated above, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

Executed in \_\_\_\_\_ counterparts.

Witness:

\_\_\_\_\_  
(Proprietorship or Partnership)

Attest: (Corporation)

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

Title: \_\_\_\_\_  
(Corp. Sec. or Asst. Sec., only)

(Corporate Seal)

Witness:

\_\_\_\_\_

Countersigned:

\_\_\_\_\_

\_\_\_\_\_  
(N.C. Licensed Resident Agent)

\_\_\_\_\_

\_\_\_\_\_  
Name and Address-Surety Agency

\_\_\_\_\_

\_\_\_\_\_  
Surety Company Name and N.C.  
Regional or Branch Office Address

\_\_\_\_\_  
Contractor: (Trade or Corporate Name)

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

Title \_\_\_\_\_  
(Owner, Partner, or Corp. Pres. or Vice  
Pres. only)

\_\_\_\_\_  
(Surety Company)

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

Title: \_\_\_\_\_  
(Attorney in Fact)

(Surety Corporate Seal)

New Hanover County  
Minority and/or Women Business Enterprise  
(M/WBE) Program



Construction Guidelines and Affidavits

These instructions shall be included with each bid solicitation.

New Hanover County  
Minority and/or Women Business Enterprise Program

Construction Guidelines for M/WBE Participants

Policy Statement

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

Goals and Good Faith Efforts

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

PROJECT	MBE	WBE
CASTLE HAYNE PARK IMPROVEMENTS	6%	4%

Bidders shall submit M/WBE information with their bids on the forms provided. This information will be subject to verification by the County prior to contract award. Firms qualifying as "M/WBE" for the County's goals must be certified by the NC Department of Historically Underutilized Businesses (NCHUB). Firms qualifying as "WBE" must be designated as "women-owned business and firms qualifying as "MBE" must be certified in one of the other categories (i.e.: Black, Hispanic, Asian American, American Indian, Disabled, or Socially and Economically Disadvantaged). Those firms who are certified as both a "WBE" and "MBE" may only satisfy the "MBE" requirement. A complete database of NC HUB certified firms may be found at <http://www.doa.nc.gov/hub/default.aspx>. The County shall accept only firms certified by NCDOT for federally funded projects.

**Please note: A contractor may utilize any firm desired; however, for participation purposes, all M/WBE vendors who wish to do business as a minority or female must be certified by NC HUB.**

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

The M/WBE's listed by the Contractor on the Identification of Minority/Women Business Participation which are determined by the County to be certified shall perform the work and supply the materials for which they are listed unless the Contractors receive prior authorization from the County to perform the work with other forces or to obtain materials from other sources. If a contractor is proposing to perform all elements of the work with his own forces, he must be prepared to document evidence satisfactory to the owner of similar government contracts where he has self-performed.

The Contractor shall enter into and supply copies of fully executed subcontracts with each M/WBE or supply signed Letter(s) of Intent to the Project Manager after award of contract and prior to Notice to Proceed. Any amendments to subcontracts shall be submitted to the Project Manager prior to execution.

## Instructions

The Bidder shall provide with the bid the following documentation:

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

OR

- Identification of Minority/Women Business Participation  
(if participation is zero, please mark zero—Blank forms will be considered nonresponsive)
- Affidavit B (if self-performing; must attest that bidder does not customarily subcontract work on this type of project—includes supplies and materials)

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

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

OR

- Affidavit D (if aspirational goals are not met)

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

- Letter(s) of Intent or Executed Contracts

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

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

### Minimum Compliance Requirements:

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



NEW HANOVER COUNTY AFFIDAVIT A – Listing of Good Faith Efforts

County of \_\_\_\_\_ (Name of Bidder)

Affidavit of \_\_\_\_\_

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

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

- 1 - (10 pts) Contacted minority businesses that reasonably could have been expected to submit a quote and that were known to the contractor, or available on State or local government maintained lists, at least 10 days before the bid date and notified them of the nature and scope of the work to be performed.
2 --(10 pts) Made the construction plans, specifications and requirements available for review by prospective minority businesses, or providing these documents to them at least 10 days before the bids are due.
3 - (15 pts) Broken down or combined elements of work into economically feasible units to facilitate minority participation.
4 - (10 pts) Worked with minority trade, community, or contractor organizations identified by the Office of Historically Underutilized Businesses and included in the bid documents that provide assistance in recruitment of minority businesses.
5 - (10 pts) Attended prebid meetings scheduled by the public owner.
6 - (20 pts) Provided assistance in getting required bonding or insurance or provided alternatives to bonding or insurance for subcontractors.
7 - (15 pts) Negotiated in good faith with interested minority businesses and did not reject them as unqualified without sound reasons based on their capabilities. Any rejection of a minority business based on lack of qualification should have the reasons documented in writing.
8 - (25 pts) Provided assistance to an otherwise qualified minority business in need of equipment, loan capital, lines of credit, or joint pay agreements to secure loans, supplies, or letters of credit, including waiving credit that is ordinarily required. Assisted minority businesses in obtaining the same unit pricing with the bidder's suppliers in order to help minority businesses in establishing credit.
9 - (20 pts) Negotiated joint venture and partnership arrangements with minority businesses in order to increase opportunities for minority business participation on a public construction or repair project when possible.
10 - (20 pts) Provided quick pay agreements and policies to enable minority contractors and suppliers to meet cash-flow demands.

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

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

Date: \_\_\_\_\_ Name of Authorized Officer: \_\_\_\_\_
Signature: \_\_\_\_\_
Title: \_\_\_\_\_



State of \_\_\_\_\_, County of \_\_\_\_\_
Subscribed and sworn to before me this \_\_\_\_\_ day of \_\_\_\_\_ 20\_\_\_\_
Notary Public \_\_\_\_\_
My commission expires \_\_\_\_\_

# NEW HANOVER COUNTY --AFFIDAVIT B-- Intent to Perform Contract with Own Workforce.

County of \_\_\_\_\_

Affidavit of \_\_\_\_\_

(Name of Bidder)

I hereby certify that it is our intent to perform 100% of the work required for the \_\_\_\_\_

\_\_\_\_\_ contract.

(Name of Project)

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

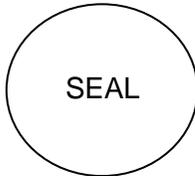
The Bidder agrees to provide any additional information or documentation requested by the owner in support of the above statement.

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

Date: \_\_\_\_\_ Name of Authorized Officer: \_\_\_\_\_

Signature: \_\_\_\_\_

Title: \_\_\_\_\_



State of \_\_\_\_\_, County of \_\_\_\_\_

Subscribed and sworn to before me this \_\_\_\_\_ day of \_\_\_\_\_ 20\_\_\_\_

Notary Public \_\_\_\_\_

My commission expires \_\_\_\_\_

Do not submit with bid    Do not submit with bid    Do not submit with bid    Do not submit with bid

**NEW HANOVER COUNTY - AFFIDAVIT C - Portion of the Work to be Performed by M/WBE Firms**

County of \_\_\_\_\_

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

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

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

\_\_\_\_\_  
 (Project Name)

Project ID# \_\_\_\_\_ Amount of Bid: \$ \_\_\_\_\_

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

Attach additional sheets, if needed

Name and Phone Number	*M/WBE Category	Work description	Dollar Value

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

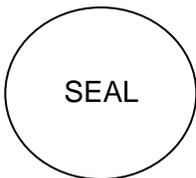
Pursuant to GS143-128.2(d), the undersigned will enter into a formal agreement with M/WBE Firms for work listed in this schedule conditional upon execution of a contract with the Owner. Failure to fulfill this commitment may constitute a breach of the contract.

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

Date: \_\_\_\_\_ Name of Authorized Officer: \_\_\_\_\_

Signature: \_\_\_\_\_

Title: \_\_\_\_\_



State of \_\_\_\_\_, County of \_\_\_\_\_  
 Subscribed and sworn to before me this \_\_\_\_\_ day of \_\_\_\_\_ 20\_\_\_\_  
 Notary Public \_\_\_\_\_  
 My commission expires \_\_\_\_\_

NEW HANOVER COUNTY AFFIDAVIT D – Good Faith Efforts

County of \_\_\_\_\_

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

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

Affidavit of \_\_\_\_\_ I do hereby certify  
that on the \_\_\_\_\_

(Name of Bidder)

\_\_\_\_\_  
(Project Name)

Project ID# \_\_\_\_\_ Amount of Bid \$ \_\_\_\_\_

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

(Attach additional sheets if needed)

Name and Phone Number	*M/WBE Category	Work description	Dollar Value

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

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

- A. Copies of solicitations for quotes to at least three (3) minority business firms from the source list provided by the State for each subcontract to be let under this contract (if 3 or more firms are shown on the source list). Each solicitation shall contain a specific description of the work to be subcontracted, location where bid documents can be reviewed, representative of the Prime Bidder to contact, and location, date and time when quotes must be received.
- B. Copies of quotes or responses received from each firm responding to the solicitation.
- C. A telephone log of follow-up calls to each firm sent a solicitation.
- D. For subcontracts where a minority business firm is not considered the lowest responsible sub-bidder, copies of quotes received from all firms submitting quotes for that particular subcontract.
- E. Documentation of any contacts or correspondence to minority business, community, or contractor organizations in an attempt to meet the goal.
- F. Copy of pre-bid roster.

G. Letter documenting efforts to provide assistance in obtaining required bonding or insurance for minority business.

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

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

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

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

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

Date: \_\_\_\_\_ Name of Authorized Officer: \_\_\_\_\_

Signature: \_\_\_\_\_

Title: \_\_\_\_\_



State of \_\_\_\_\_, County of \_\_\_\_\_

Subscribed and sworn to before me this \_\_\_\_\_ day of \_\_\_\_\_  
\_\_\_\_\_ 20\_\_\_\_\_

Notary Public \_\_\_\_\_

My commission expires \_\_\_\_\_

# LETTER OF INTENT

## M/WBE Subcontractor Performance

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

PROJECT: \_\_\_\_\_  
(Project Name)

TO: \_\_\_\_\_  
(Name of Prime Bidder/Architect)

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

\_\_\_\_ Minority Business Enterprise                      \_\_\_\_ Women Business Enterprise

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

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

Work/Materials/Service Provided	Dollar Amount of Contract	Projected Start Date	Projected End Date

\_\_\_\_\_  
(Date)

\_\_\_\_\_  
(Address)

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

\_\_\_\_\_  
(Name & Title of Authorized Representative of M/WBE)

\_\_\_\_\_  
(Signature of Authorized Representative of M/WBE)

## REQUEST TO CHANGE M/WBE PARTICIPATION

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

Project: \_\_\_\_\_

Bidder or Prime Contractor: \_\_\_\_\_

Name & Title of Authorized Representative: \_\_\_\_\_

Address: \_\_\_\_\_ Phone #: \_\_\_\_\_

\_\_\_\_\_ Email Address: \_\_\_\_\_

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

Name of subcontractor: \_\_\_\_\_

Good or service provided: \_\_\_\_\_

### Proposed Action:

Replace subcontractor

Perform work with own forces

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

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

The listed MBE/WBE is bankrupt or insolvent.

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

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

*If replacing subcontractor:*

Name of replacement subcontractor: \_\_\_\_\_

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

Dollar amount of original contract \$ \_\_\_\_\_

Dollar amount of amended contract \$ \_\_\_\_\_

**Other Proposed Action:**

Increase total dollar amount of work

Add additional subcontractor

Decrease total dollar amount of work

Other

Please describe reason for requested action: \_\_\_\_\_

\_\_\_\_\_

*If adding\* additional subcontractor:*

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

*\*Please attach Letter of Intent or executed contract document*

Dollar amount of original contract \$ \_\_\_\_\_

Dollar amount of amended contract \$ \_\_\_\_\_

**Interoffice Use Only:**  
**Approval**  Y  N  
**Date** \_\_\_\_\_  
**Signature** \_\_\_\_\_

<b>Pay Application No.</b> _____ <b>Purchase Order No.</b> _____
---

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

Project Name: \_\_\_\_\_

Prime Contractor: \_\_\_\_\_

Current Contract Amount (including change orders): \$\_\_\_\_\_

Requested Payment Amount for this Period: \$\_\_\_\_\_

Is this the final payment? \_\_\_Yes \_\_\_No

Firm Name	M/WBE Category*	Total Amount Paid from this Pay Request	Total Contract Amount (including changes)	Total Amount Remaining

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

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

Certified By: \_\_\_\_\_

Name

Title

Signature

NORTH CAROLINA

**AGREEMENT**

NEW HANOVER COUNTY

THIS CONTRACT made and entered into this \_\_\_\_ day of \_\_\_\_\_, 2014 by and between NEW HANOVER COUNTY a political subdivision of the State of North Carolina, hereinafter referred to as "County"; and \_\_\_\_\_, hereinafter referred to as "Contractor."

**WITNESSETH:**

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

**ARTICLE I**

**GENERAL PROVISIONS**

1.1 Performance. Contractor shall furnish all labor, materials and equipment and shall perform all work in the manner and form as provided by the specifications and documents, which are made a part hereof as if fully contained herein: **Agreement, Agreement, Modifications, Addenda, Special Conditions, Instructions to Bidders, General Conditions, Specifications and Drawings for Castle Hayne Park – New Park Entrance and Roadway Extension, Multi-Purpose Fields, Multi-Purpose Trail System, Basketball Court, and Parking Lot – New Hanover County, North Carolina, and all documents listed in the Table of Contents, attached hereto and incorporated herein.**

1.2. No Privity with Others. Nothing contained in this Contract shall create, or be interpreted to create, privity, or any other contractual agreement between the County and any person or entity other than the Contractor.

1.3 Successors and Assigns. The County and Contractor bind themselves, their successors, assigns, and legal representatives to the other party hereto and to successors, assigns and legal representatives of such other party with

respect to covenants, agreements, and obligations contained in this Contract. The Contractor shall not assign this Contract without written consent of the County and any surety to this contract.

1.4 The Contractor shall have a continuing duty to read, carefully examine, and compare each of the Contract Documents, the Shop Drawings and the Project Data and shall give written notice to the County of any inconsistency, ambiguity, error or omission which the Contractor may discover with respect to these documents before proceeding with the affected Work. The issuance or the express or implied approval by the County of the Contract Documents, Shop Drawings, or Project Data shall not relieve the Contractor of the continuing duties imposed hereby, nor shall any such approval be evidence of the Contractor's compliance with this contract. THE COUNTY MAKES NO REPRESENTATION OR WARRANTY OF ANY NATURE WHATSOEVER TO THE CONTRACTOR CONCERNING THE ACCURACY OR SUFFICIENCY OF SUCH DOCUMENTS. By the execution of the Contract, Contractor acknowledges and represents that it has received, reviewed and carefully examined such documents, has found them to be complete, accurate, adequate, consistent, coordinated and sufficient for construction, and that the Contractor has not, does not, and will not rely upon any representation or warranties by the County concerning such documents as no such representation or warranties have been or are hereby made.

1.5 Neither the organization of any of the Contract Documents into divisions, sections, paragraphs, articles, (or other categories), nor the organization or arrangement of the Design, shall control the Contractor in dividing the Work or in establishing the extent or scope of the Work to be performed.

1.6 Ownership of Contract Documents. The Contract Documents shall remain the property of the County. The Contractor shall have the right to keep one record set of the Contract Documents upon completion of the Project; provided, however, that in no event shall Contractor use, or permit to be used, any or all of such Contract Documents on other projects without the County's prior written authorization.

1.7 The Work. The Contractor shall perform all of the work required, implied, or reasonably inferable from, this Contract.

1.8 Work Defined. The term "Work" shall mean whatever is done by or required of the Contractor to perform and complete its duties under this Contract, including the following: all required licenses and permits; furnishing of any required surety bonds and insurance; the provision or furnishing of labor, supervision, services, materials, supplies, equipment, fixtures, appliances, facilities, tools, transportation, storage, power, fuel, heat, light, cooling and all other utilities as required by the County. The Work to be performed by the Contractor is generally described as follows:

Furnishing of labor and materials for expansion of existing park infrastructure and construction of two multi-purpose fields, multi-use trails, new park entrance and roadway, parking lot, basketball court, sidewalks, associated grading, drainage and landscape work. Any work specified as "By Others" on Documents and Drawings will be completed under a separate Contract. Project is located in New Hanover County, NC all work must be provided in accordance to the contract documents, specifications and drawings, attached hereto and incorporated herein and in the following order:

- A. Parcels cleared/athletic fields rough graded
- B. DUKE Energy-3 Phase power to athletic fields (by others)
- C. MUSCO Sports Lighting installed (by others)
- D. Athletic fields to final grade
- E. Athletic field fence installation
- F. Well/Pump installation followed by Irrigation installation
- G. Well/Pump Enclosure installation
- I. Sprigging of athletic fields

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

## ARTICLE II

### TIME AND LIQUIDATED DAMAGES

2.1 Contract Time. The Contractor shall commence the Work upon receipt of a Notice to Proceed and shall achieve Substantial Completion of the Work no later than two hundred ten (210) calendar days thereafter. The number of calendar days from the date on which the Work is permitted to proceed, through the date set forth for Substantial Completion, shall constitute the "Contract Time."

2.2 Substantial Completion Liquidated Damages. The Contractor shall pay the County the sum of Two Hundred (\$200) Dollars per day for each and every calendar day of unexcused delay in achieving Substantial Completion beyond the date set forth herein for Substantial Completion of the Work. Any sums due and payable hereunder by the Contractor shall be payable, not as a penalty, but as liquidated damages representing an estimate of delay damages likely to be sustained by the County, estimated at or before the date of executing this Contract. When the County reasonably believes that Substantial Completion will be inexcusably delayed, the County shall be entitled to withhold from any amounts due the Contractor an amount then believed by the County to be adequate to recover liquidated damages attributable to such delays. If or when the Contractor overcomes the delay in achieving Substantial Completion, or any part thereof, for which the County has withheld payment, the County shall promptly release to the Contractor those funds withheld as liquidated damages.

2.3 Substantial Completion. "Substantial Completion" shall mean that stage in the progression of the Work when the Work is sufficiently complete for the County to accept the Work.

2.4 Term of Contract. Contractor shall commence work upon Notice to Proceed and contract shall be finally completed, including any punch list, within Two Hundred Forty (240) calendar days from said Notice.

**ARTICLE III**  
**CONTRACT CHANGES**

3.1 Changes Permitted. Changes in the Work within the general scope of this Contract, consisting of additions, deletions, revisions, or any combination thereof, may be ordered without invalidating this Contract, by Change Order or by Field Order.

3.2 Changes in the Work shall be performed under applicable provisions of this Contract and the Contractor shall proceed promptly with such changes.

3.3 Change Order Defined. Change Order shall mean a written order to the Contractor executed by the County, issued after execution of this Contract, authorizing and directing a change in the Work or an adjustment in the Contract Price or the Contract Time, or any combination thereof. The Contract Price and the Contract Time may be changed only by Change Order.

3.4 Changes in the Contract Price. Any change in the Contract Price resulting from a Change Order shall be determined as follows: (a) by mutual agreement between the County and the Contractor as evidenced by (1) the change in the Contract Price being set forth in the Change Order, (2) such change in the Contract Price, together with any conditions or requirements related thereto, being initialed by both parties and (3) the Contractor's execution of the Change Order.

3.5 Unit Price. If unit prices are provided in the Contract, and if the quantities contemplated are so changed in a proposed Change Order that application of such unit prices to the quantities of Work proposed will cause substantial inequity to the County or to the Contractor, the applicable unit prices shall be equitably adjusted.

3.6 Effect of Executed Change Order. The execution of a Change Order by the Contractor shall constitute conclusive evidence of the Contractor's agreement to the ordered changes in the Work, the Contract Price, and the Contract Time. The Contractor, by executing the Change Order, waives and forever releases any claim against the County for additional time or compensation for matters relating to or arising out of or resulting from the Work included within or affected by the executed Change Order.

3.7 Minor Changes. The County or Agent may order minor changes in the Work not involving a change in the Contract Price or an extension of the Contract Time and not inconsistent with the intent of this Contract. Such minor changes shall be made by written Field Order. The Contractor shall promptly execute such written Field Orders.

3.8 Notification of Surety. The Contractor shall provide surety bonds whereby the Surety waives notice of any change, including changes of time, to the Contract or to related subcontracts, purchase orders, and other obligations.

#### ARTICLE IV

#### CONTRACT PRICE AND COMPLETION

4.1 The Contract Price. The County shall pay, and the Contractor shall accept, as full and complete payment for all of the Work required herein, \_\_\_\_\_ (**\$ \_\_\_\_\_**) **Dollars**. The sum set forth in this Paragraph shall constitute the maximum Contract Price that shall not be modified except by Change Order.

4.2. Schedule of Values. Within ten (10) calendar days, the Contractor shall submit to the County a Schedule of Values allocating the Contract Price to the various portions of the Work. The Contractor's Schedule of Values shall be prepared in a format and supported with data to allow the County to substantiate its accuracy. The Contractor shall not imbalance its Schedule of Values nor artificially inflate any element thereof. The violation of this provision by the Contractor shall constitute a material breach of this Contract. The Schedule of Values shall be used only as a basis for the Contractor's Applications for Payment and must be approved in writing by the County.

4.3 Payment Procedure. The County shall pay the Contract Price to the Contractor as provided below.

4.3. Progress Payments. Based upon the Contractor's Applications for Payment approved by the County, the County shall make appropriate progress payments to the Contractor toward the Contract Price.

4.4. Retainage. To ensure proper performance of the Contract, the County will retain five percent (5%) of the amount of each approved Pay Application until the Project is 50% complete provided that the Contractor continues to perform

satisfactorily and any non-conforming work identified in writing prior to that date has been corrected by the Contractor and accepted by the Project Manager. If the County determines the Contractor's performance is unsatisfactory, the County may reinstate retainage in the amount of five percent (5%) for each subsequent periodic Pay Application until the Contractors' performance becomes satisfactory. The Project shall be deemed fifty percent (50%) complete when the Contractor's gross project invoices, excluding the value of materials stored off-site, equal or exceed fifty percent (50%) of the value of the contract. The value of materials stored on-site shall not exceed twenty percent (20%) of the Contractor's gross project invoices for the purpose of determining whether the Project is fifty percent (50%) complete. Upon fifty percent (50%) completion of the Project, the County may also withhold additional retainage from any subsequent periodic payments, not to exceed five percent (5%), in order to allow the County to retain two and one half percent (2 ½%) total retainage through the completion of the Project. Within sixty (60) days after the submission of a final pay request, the County, with written consent of the Surety shall release to the Contractor all retainage on payments held by the County if (1) the County receives a certificate of substantial completion from the Contractor, Engineer, or Designer in charge of the Project; or (2) The County may release all retainage, less that sum County reasonably estimates necessary to complete all punch lists, when the County receives beneficial occupancy or the use of the Project that is substantially complete. Beneficial occupancy or the use of the Project that is substantially complete means that the building(s) have functional electric, plumbing, HVAC, are fully compliant with applicable building codes, are clean, tidy, and able to accommodate furnishings, and open for business. In all situations, the County may retain sufficient funds to secure completion of the Project or corrections on any work. If the County retains funds, the amount retained shall not exceed two and one half times the estimated value of the work to be completed or corrected. Any reduction in the amount of the retainage on payments shall be with the consent of the Contractor's surety. Retainer provisions contained within the Contractor's subcontracts may not exceed the terms and conditions for retainage provided herein. Contractor is further required to satisfy the retainage provisions of N.C.G.S. 143-134.1(b)(2) with regard to subcontracts for early finishing trades (structural steel, piling, caisson and demolition)

and to coordinate the release of retainage for such trades from the retainage held from the Contractor by the County. Nothing shall prevent the County from withholding payment to the Contractor in addition to the amounts identified herein for unsatisfactory job progress, defective construction, or remedied, disputed work or third-party claims filed against the County or reasonable evidence that a third-party claim will be filed. Payment for stored materials and equipment shall be conditioned upon the Contractor's satisfactory proof to the County that the County has title to such materials and equipment and shall include proof of required insurance. Such Application for Payment shall be signed by the Contractor and shall constitute the Contractor's representation that the Work has progressed to the level for which payment is requested in accordance with the Schedule of Values, that the Work has been properly installed or performed in full accordance with this Contract, and that the Contractor knows of no reason why payment should not be made as requested. Thereafter, the County will review the Application for Payment and may also review the Work at the Project site or elsewhere to determine whether the quantity and quality of the Work is as represented in the Application for Payment and is as required by this Contract. The County shall determine the amount properly owed to the Contractor. The County shall make partial payments of the Contract Price to the Contractor within thirty (30) days following the County's receipt of each Application for Payment. The amount of each partial payment shall be the amount certified for payment by the County less such amounts, if any, otherwise owed by the Contractor to the County or which the County shall have the right to withhold as authorized by this Contract.

4.5 Warranty of Title. The Contractor warrants that title to all Work covered by an Application for Payment will pass to the County no later than at the time of the last payment to Contractor. The Contractor further warrants that upon submittal of an Application for Payment, all Work for which payments have been received from the County shall be free and clear of liens, claims, security interests, or other encumbrances in favor of the Contractor or any other person or entity.

4.6 Subcontractor Payments. The Contractor shall promptly pay each Subcontractor out of the amount paid to the Contractor for such Subcontractor's Work, the amount to which such Subcontractor is entitled. In the event the County becomes

informed that the Contractor has not paid a subcontractor as herein provided, the County shall have the right, but not the duty, to issue future payments to the Contractor and or such subcontractor as joint payees. Such joint payment procedure shall create no rights in favor of any person or entity beyond the right of the named payees to payment of the check and shall not be deemed to create any rights in favor of Contractor or Subcontractors or to commit the County to repeat such payments in the future.

4.7 Acceptance Not Implied. No progress payment, nor any use or occupancy of the Project by the County, shall be interpreted to constitute a final acceptance of any Work that is not in full compliance with this Contract.

4.8 Withheld Payment. The County may decline to make payment, may withhold funds, and, if necessary, may demand the return of some or all of the amounts previously paid to the Contractor, to protect the County from loss because of:

- a) defective Work not remedied by the Contractor nor, in the opinion of the County, likely to be remedied by the Contractor;
- b) claims of third parties against the County or the County's property;
- c) failure by the Contractor to pay Subcontractors;
- d) evidence that the balance of the Work cannot be completed in accordance with the Contract for the unpaid balance of the Contract price;
- e) evidence that the Work will not be completed in the time required for substantial or Final Completion;
- f) persistent failure to carry out the Work in accordance with the Contract;
- g) damage to the County or a third party to whom the County is, or may be, liable.

In the event that the County makes written demand upon the Contractor for amounts previously paid by the County as contemplated in this subparagraph, the Contractor shall comply within thirty (30) business days of receipt of written demand.

4.9 Completion and Final Payment. When the Contractor certifies that the Work is finally complete, the Contractor shall submit to the Senior Project Manager or Agent a list of items completed or corrected. When the Senior Project Manager or Agent based on an inspection determines that the Work is in fact finally complete, a

Certificate of Final Completion will be prepared establishing the date of Final Completion. If the Work is complete in full accordance with this Contract and this Contract has been fully performed, the County may proceed with payment. Guarantees required by the Contract shall commence on the date of Final Completion of the Work. The Certificate of Final Completion shall be submitted to the County and the Contractor for their written acceptance of the responsibilities assigned to them in such certificate.

4.10 Final Completion Liquidated Damages. If the Contractor fails to achieve Final Completion within the time fixed therefore by the County in its Certificate of Substantial Completion, the Contractor shall pay the County the sum of Two Hundred (\$200) Dollars per day for each and every calendar day of unexcused delay in achieving Final Completion beyond the date set forth herein for Final Completion of the Work. Any sums due and payable by the Contractor shall be payable, not as a penalty, but as liquidated damages representing an estimate of delay damages likely to be sustained by the County, estimated at or before the time of executing this Contract. When the County reasonably believes that Final Completion will be unexcusably delayed, the County shall be entitled to withhold from any amounts due the Contractor an amount found by the County to be adequate to recover liquidated damages attributed to such delays. If and when the Contractor overcomes the delay in achieving Final Completion, or any part thereof, for which the County has withheld payment, the County shall promptly release to the Contractor those funds withheld as liquidated damages.

4.11 Final Payment Submittals. The Contractor shall not be entitled to final payment unless and until it submits to the County its affidavit that all payrolls, invoices for materials and equipment, and other liabilities connected with the Work have been fully paid, that releases and waivers of lien from all subcontractors of the have been paid, and that the consent of Surety has been obtained. If any third party fails or refuses to provide a release of claim or waiver of lien as required by the County, the Contractor shall furnish a bond or monies satisfactory to the County to discharge any such lien or indemnify the County from liability.

4.12 Final Payment Due. The County shall make final payment of all sums due the Contractor within ten (10) business days of the County's execution of a final Certificate for Payment.

4.13 Contractor Waiver. Acceptance of final payment shall constitute a waiver of all claims against the County by the Contractor except for documented Contractor's request for final payment.

## ARTICLE V

### COUNTY RIGHTS AND DUTIES

5.1 Information Provided by County. The County shall deliver to the Contractor, at the time of executing this Contract, any and all written and tangible materials in its possession concerning conditions below ground at the Project site. The County does not represent, warrant, or guarantee the accuracy of the information either in whole, or in part, implicitly, or explicitly and shall have no liability for such material. The County shall also furnish surveys, legal limitations and utility locations, if known, and a legal description of the Project site.

5.2 Excluding permits and fees normally the responsibility of the Contractor, the County shall obtain all approvals, easements, and the like required for construction and shall pay for necessary assessments and charges required for construction, use, or occupancy of permanent structures or for permanent changes in existing facilities.

5.3 The County shall furnish the Contractor, free of charge, four (4) copies of the Contract Documents for execution of the Work. The Contractor will be charged, and shall pay the County, \$50.00 per additional set of Contract Documents.

5.4 Right To Stop Work. If the Contractor persistently fails or refuses to perform the Work in accordance with this Contract, the County may order the Contractor to stop the Work immediately, or any described portion thereof, until the County orders that Work be resumed.

5.5 Owner's Right to Perform Work. If the Contractor's Work is stopped by the County, and the Contractor fails within seven (7) days of such stoppage to provide adequate assurance to the County that the cause of such stoppage will be eliminated or corrected, then the County may, without prejudice to any other rights or remedies the County may have against the Contractor, proceed to carry out the subject Work. The County shall issue an appropriate Change Order shall be issued deducting

from the Contract Price the cost of correcting the deficiencies. If the unpaid portion of the Contract Price is insufficient to cover the amount due the County, the Contractor shall pay the difference to the County within thirty (30) business days.

5.6 Correction of Defects. County shall give Contractor reasonably prompt notice of all observable defects. If Contractor fails to perform corrective work within a time determined by the County, the County may perform such work and charge Contractor for the costs incurred.

5.7 No Waiver of Legal Rights. Upon completion of the Work, County will promptly make final inspection and notify Contractor of final acceptance. However, final acceptance shall not preclude or estop County from correcting any measurement, estimate, or certificate made before or after completion of the work, nor shall County be precluded or estopped from recovering overpayments from Contractor, or its surety, or both. A waiver on the part of the County of any breach of any part of the Contract shall not be held to be a waiver of any other or subsequent breach.

5.8 County May Accept Defective or Nonconforming Work. If the County chooses to accept defective or nonconforming Work, the County may do so. In such event, the Contract Price shall be reduced by the greater of (a) the reasonable cost of removing and correcting the defective or nonconforming Work, and (b) the difference between the fair market value of the Project as constructed and the fair market value of the Project had it not been constructed in such a manner as to include defective or nonconforming Work. If the remaining portion of the unpaid Contract Price, if any, is insufficient to compensate the County for its acceptance of defective or nonconforming Work, the Contractor shall, upon written demand from the County, pay the County such remaining compensation for accepting defective or nonconforming Work within thirty (30) business days.

## **ARTICLE VI**

### **CONTRACTOR DUTIES**

6.1 Consistent with the Contractor's continuing duty set forth herein, the Contractor shall perform no part of the Work at any time without adequate Contract Documents or, as appropriate, approved Shop Drawings, Product Data, or Samples for such portion of the Work. If the Contractor performs any of the Work knowing it involves

a recognized error, inconsistency, or omission in the Contract Documents without such notice to the County, the Contractor shall bear responsibility for such performance and shall bear the cost of correction.

6.2 The Contractor shall perform the Work strictly in accordance with this Contract. The Contractor shall be responsible for verifying all permits have been obtained prior to beginning work.

6.3 The Contractor shall supervise and direct the Work using the Contractor's best skill, effort, and attention. The Contractor shall be responsible to the County for any and all acts or omissions of the Contractor, its employees and others engaged in the Work on behalf of the Contractor.

6.4 Warranty. The Contractor warrants to the County that all labor furnished to progress the Work under this Contract will be competent to perform the tasks undertaken, in a workmanlike manner, so as to meet the standards of workmanlike quality prevailing in North Carolina at the time of construction, that materials and equipment furnished will be of good quality and new unless otherwise permitted by this Contract, and that the Work will be of good quality, free from faults and defects and in strict conformance with this Contract. All Work not conforming to these requirements may be considered defective. Contractor shall be responsible for all costs, damages and expenses including, but not limited to, penalties, fines and fees, that the County may incur as a result of Contractor's failure to perform under this Contract.

6.5 Supervision. The Contractor shall employ and maintain at the Project site only competent supervisory personnel. Absent written instruction from the Contractor to the contrary, the superintendent shall be deemed the Contractor's authorized representative at the site and shall be authorized to receive and accept any and all communications from the County.

6.6 Time of Performance Schedule. The Contractor, within ten (10) days of award of Contract, shall submit to the County for its information, the Contractor's schedule for completing the Work. The Contractor's schedule shall be revised no less frequently than monthly, and updated with each pay application, (unless the parties otherwise agree in writing) and shall be revised to reflect unexpected conditions or occurrences related to the entire Project. Each such revision shall be furnished to the

County to consider for approval. Failure by the Contractor to strictly comply with the provisions of this Paragraph shall constitute a material breach of this Contract.

6.7 The Contractor shall continuously maintain at the site, for the benefit of the County, one copy of this Contract marked to record on a current basis changes, selections, and modifications made during construction. Additionally, the Contractor shall maintain at the site the approved Shop Drawings, Product Data, Samples, and other similar required submittals. Upon Final Completion of the Work, all record documents shall be delivered to the County.

6.8 The Contractor shall not perform any portion of the Work requiring submittal and review of Shop Drawings, Product Data, or Samples unless and until such submittal shall have been approved by the County. Approval by the County, however, shall not be evidence that Work installed pursuant thereto conforms to the requirements of this Contract.

6.9 Cleaning the Site and the Project. The Contractor shall keep the site reasonably clean during performance of the Work. Upon Final Completion of the Work, the Contractor shall clean the site and the Project and remove all waste, together with all of the Contractor's property.

6.10 Access to Work. The County shall have access to the Work at all times from commencement of the Work through Final Completion. The Contractor shall provide access when requested.

6.11 Permits and Licenses. Contractor shall procure all applicable permits and licenses, including permits and licenses required pursuant to applicable patent and copyright laws, shall pay all charges and fees, and shall give all notices necessary and incidental to the due and lawful prosecution to the work. There will be no charge for County building permits.

6.12. Indemnity. To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless County, its officers, officials, agents and employees from and against liability, claims, damages, losses and expenses, including attorneys' fees, arising out of or resulting from performance of the Work, provided that such liability, claims, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself)

including loss of use resulting therefrom, but only to the extent caused in whole or in part by negligent acts or omissions of the Contractor, anyone directly or indirectly employed by it or anyone for whose acts they may be liable, regardless of whether or not such liability, claim, damage, loss or expense is caused in part by County, its officers, officials, agents and employees.

## **ARTICLE VII**

### **INSURANCE**

7.1 Commercial General Liability. Contractor shall maintain Commercial General Liability (GCL) with a total limit of not less than \$5,000,000 each occurrence for bodily injury and property damage. If such CGL insurance contains a general aggregate limit, it shall apply separately to the Project or the general aggregate shall be twice the required limit. 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.

County, its officers, officials, agents, and employees are to be covered as additional insureds under the CGL by endorsement CG 20 10 and CG 20 37 or an endorsement providing equivalent coverage with respect 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 commercial umbrella, if required by County. The coverage shall contain no special limitations on the scope of protection afforded to County, its officers, officials, agents, and employees. The status of County as an additional insured under a CGL obtained in compliance with this Contract shall not restrict coverage under such CGL with respect to the escape or release of pollutants at or from the Project site. There shall be no endorsement or modification of the CGL or Umbrella Liability limiting the scope of coverage for liability arising from pollution, explosion, collapse, underground property damage, employment-related practices, or damage to the named insured's work. Contractor shall maintain CGL and, if necessary Commercial Umbrella Liability insurance, both applicable to liability arising out of Contractor's completed operations, with a limit of not less than

\$5,000,000 each occurrence for at least three (3) years following substantial completion of the Work. Contractor's CGL insurance shall be primary as to the County, its officers, officials, agents, and employees. Any other insurance or self-insurance maintained by County, its officers, officials, agents, and employees shall be excess of and not contribute toward Contractor's insurance.

7.2 The Workers' Compensation and Employer's Liability. Contractor shall maintain Workers' Compensation as required by the State of North Carolina and Employer's Liability Insurance. The Employer's Liability, and if necessary, Commercial Umbrella Liability insurance shall not be less than \$5,000,000 each accident for bodily injury by accident, \$5,000,000 each employee for bodily injury by disease, and \$5,000,000 policy limit. The Insurer shall agree to waive all rights of subrogation against the County, its officers, officials, agents, and employees for losses arising from the Work performed by Contractor for County.

7.3 Business Auto Liability. Contractor shall maintain Business Auto Liability and, if necessary, Commercial Umbrella Liability insurance with a limit of not less than \$5,000,000 combined single limit. Such insurance shall cover liability arising out of any auto, including owned, hired, and non-owned autos. 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. Contractor's Business Auto Liability insurance shall be primary as to County, its officers, officials, agents, and employees. Any other insurance or self-insurance maintained by County, its officers, officials, agents, and employees shall be excess of and not contribute with Contractor's insurance.

7.4 Surety Bond - Performance & Payment Bonds. Contractor shall furnish and deliver to County a Payment Bond and a Performance Bond covering the faithful performance and completion of work included in this Contract and payment for all materials and labor furnished or supplied in connection with work included in this Contract. All bonds shall be issued and furnished to County prior to, and as a condition precedent to, commencement of the Work of this Contract. The Payment Bond and Performance Bond shall be furnished on behalf of the Contractor, shall name County

obligee, and shall be one hundred percent (100%) of the amount of the guaranteed repair and maintenance costs. Such bond(s) shall be solely for the protection of County. The Payment Bond and the Performance Bond shall be issued by a surety of financial standing having a rating from A.M. Best Company equal to or better than A and must be included on the approved list of sureties issued by the United States Department of Treasury. The bond shall remain in effect at least one (1) year after the date when final payment is made. The surety bond must be in the form set forth in N.C.G.S. 44A-33, without any variations therefrom. The Contractor shall provide surety bond wherein Surety waives notice of any and all modifications, omissions, additions, changes and advance payments or deferred payments in or about the Contract, and agrees that the obligations undertaken by the Bond shall not be impaired in any manner by reason of any such modifications, omissions, additions, changes, and advance payments or deferred payments. The surety bond must set forth no requirement that suit be initiated prior to the time stipulated in applicable North Carolina Statutes of Limitation.

7.5 Deductibles and Self-Insured Retentions. Contractor shall be solely responsible for the payment of all deductibles to which such policies are subject, whether or not County is an insured under the policy.

7.6 Miscellaneous Insurance Provisions: The policies are to contain, or be endorsed to contain, the following provisions: 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. 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 New Hanover Risk Management, 230 Government Center Drive, Wilmington, North Carolina, 28403.

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.

7.7 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 specific approval has been granted by County.

7.8 Evidence of Insurance. Contractor shall furnish County with a certificate(s) of insurance, executed by a duly authorized representative of each insurer, showing compliance with the insurance requirements prior to commencing the Work, and thereafter upon renewal or replacement of each certified coverage until all the Work under this contract are deemed complete. Evidence of additional insured status shall be noted on the certificate of insurance as per requirements in this Contract. Insurance maintained after final payment 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 two-year period for which such insurance must be maintained.

7.9 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. CCL coverage shall include independent Contractors' coverage, and Contractor shall be responsible for assuring that all subcontractors are properly insured.

7.10 Conditions. The insurance required for this Contract must be on forms acceptable to County. County may, at its discretion, accept letters of credit or custodial accounts in lieu of specific insurance requirements. Contractor shall provide that the insurance contributing to satisfaction of insurance requirements in this Contract shall not be canceled, terminated, or modified by Contractor without prior written approval of County. Contractor shall promptly notify New Hanover County Parks and Gardens Department and New Hanover County Risk Management at (910) 798-7498 of any accidents arising in the course of operations under the Contract causing bodily injury or property damage.

County reserves the right to obtain complete, certified copies of all required insurance policies, at any time. 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. By requiring insurance herein, County does not represent that coverage and limits will necessarily 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. If Contractor fails to maintain the insurance as set forth herein, County shall have the right, but not the obligation, to purchase said insurance at Contractor's expense. County shall have the right, but not the obligation of prohibiting Contractor or any subcontractor from entering the Project site or withholding payment until such certificates or other evidence that insurance has been placed in complete compliance with these requirements is received and approved by County.

## **ARTICLE VIII**

### **CLAIMS**

8.1 Claims by the Contractor. All Contractor claims shall be initiated by written notice and claim to the County. Such written notice and claim must be furnished within seven (7) days after occurrence of the event, or the first appearance of the condition, giving rise to the claim.

8.2 Contractor's Duty to Continue Work. Pending final resolution of any claim of the Contractor, the Contractor shall diligently proceed with performance of this Contract. The resolution of any claim under this Paragraph shall be reflected by a Change Order executed by the County, and the Contractor.

8.3 Claims for Concealed and Unknown Conditions. Should concealed and unknown conditions encountered in the performance of the Work (a) below the surface of the ground or (b) in an existing structure be at variance with the conditions indicated by this Contract, or should unknown conditions of an unusual nature differing materially from those ordinarily encountered in the area and generally recognized as inherent in Work of the character provided for in this Contract, be encountered, the Contract Price shall be equitably adjusted by Change Order upon the written notice and claim by either party made within seven (7) days after the first observance of the condition. As a condition precedent to the County having any liability to the Contractor for concealed or unknown conditions, the Contractor must give the County written notice of, and an opportunity to observe, the condition prior to disturbing it. The failure by the Contractor to make the written notice and claim as provided in this subparagraph shall constitute a waiver by the Contractor of any claim arising out of or relating to such concealed or unknown condition.

8.4 Claims for Additional Costs. If the Contractor wishes to make a claim for an increase in the Contract Sum, he shall give the County written notice thereof within seven (7) days after the occurrence of the event giving rise to such claim. Such notice shall be given by the Contractor before proceeding to execute any additional or changed Work. The failure by the Contractor to give such notice and to give such notice prior to executing the Work shall constitute a waiver of any claim for additional compensation. No such claim shall be valid unless so made.

8.4.1 In connection with any claim by the Contractor against the County for compensation in excess of the Contract Price, any liability of the County for the Contractor's costs shall be strictly limited to direct costs incurred by the Contractor and shall in no event include indirect costs or consequential damages of the Contractor. The County shall not be liable to the Contractor for claims of third parties, including Subcontractors, unless and until liability of the Contractor has been established therefor in a court of competent jurisdiction.

8.5 Claims for Additional Time. If the Contractor is delayed in progressing any task which at the time of the delay is then critical or which during the delay becomes critical, as the sole result of any act or neglect to act by the County or someone acting in the County's behalf, or by changes ordered in the Work, unusual delay in transportation, unusually adverse weather conditions not reasonably anticipatable, fire or any causes beyond the Contractor's control, then the date for achieving Substantial Completion of the Work shall be extended upon the written notice and claim of the Contractor to the County, for such reasonable time as the County may determine by written change order. Any notice and claim for an extension of time by the Contractor shall be made not more than seven (7) days after the occurrence of the event or the first appearance of the condition giving rise to the claim and shall set forth in detail the Contractor's basis for requiring additional time in which to complete the Project. In the event the delay to the Contractor is a continuing one, only one notice and claim for additional time shall be necessary. If the Contractor fails to make such claim as required in this Subparagraph, any claim for extension of time shall be waived.

8.5.1 If the Contractor is delayed in the progress of the work for any reason, including any act or neglect of Owner, any of owner's employers or agents, or

any separate contractor employed by the Owner, an extension of time shall be the Contractor's exclusive remedy and the Contractor waives any right it may otherwise have to damages because of delays or disruptions of any nature whatsoever to all or any part of the Work including, that this provision in itself shall not preclude the Contractor from recovering damages for delays solely by acts of the Owner or its agent.

8.6 Conflict of Interest. No party hereto shall acquire or possess any interest, either direct or indirect, in any aspect of the subject property to be constructed or renovated hereunder.

**ARTICLE IX**  
**SUBCONTRACTORS**

9.1 Subcontractors. A Subcontractor is an entity, which has a direct contract with the Contractor to perform a portion of the Work.

9.2 Award of Subcontracts. Upon execution of the Contract, the Contractor shall furnish the County, in writing, the names of persons or entities proposed by the Contractor to act as a subcontractor on the Project. The County shall within ten (10) days reply to the Contractor, in writing, stating any objections the County may have to such proposed subcontractor. The Contractor shall not enter into a subcontract with a proposed subcontractor with reference to whom the County has made timely objection. The Contractor shall not be required to subcontract with any party to whom the Contractor has objection.

9.2.1 All subcontracts shall afford the Contractor rights against the subcontractor, which correspond to those rights afforded to the County against the Contractor herein, including those rights afforded to the County hereunder by the Subparagraphs captioned, Termination by County.

**ARTICLE X**  
**TERMINATION**

10.1 Termination by the Contractor. If the Work is stopped for a period of ninety (90) days by an order of any court or other public authority, or as a result of an act of the Government, through no fault of the Contractor or any person or entity working directly or indirectly for the Contractor, the Contractor may, upon ten (10) days' written notice to the County terminate performance under this Contract and recover

from the County payment for the actual reasonable expenditures of the Contractor for all Work executed and for materials, equipment, tools, construction equipment and machinery actually purchased or rented solely for the Work, less any salvage value of any such items.

10.1.1 If the County shall persistently or repeatedly fail to perform any material obligation to the Contractor for a period of fifteen (15) days after receiving written notice from the Contractor of its intent to terminate hereunder, the Contractor may terminate performance under this Contract by written notice to the County. In such event, the Contractor shall be entitled to recover from the County as though the County had terminated the Contractor's performance under this Contract for convenience pursuant to this agreement.

10.2 Termination by the County For Convenience. The County may for any reason whatsoever terminate performance under this Contract by the Contractor for convenience. The County shall give written notice of such termination to the Contractor specifying when termination becomes effective.

10.2.1 The Contractor shall incur no further obligations in connection with the Work and the Contractor shall stop Work when such termination becomes effective. The Contractor shall also terminate outstanding orders and subcontracts. The Contractor shall settle the liabilities and claims arising out of the termination of subcontracts and orders. The County may direct the Contractor to assign the Contractor's right, title, and interest under terminated orders or subcontracts to the County or its designee.

10.2.2 The Contractor shall transfer title and deliver to the County such completed or partially completed Work and materials, equipment, parts, fixtures, information and Contract rights Contractor controls or possesses.

10.2.3 (a) The Contractor shall submit a termination claim to the County specifying the amounts due because of the termination for convenience together with costs, pricing or other data required by the County. If the Contractor fails to file a termination claim within one (1) year from the effective date of termination, the County shall pay the Contractor, an amount derived in accordance with subparagraph [c] below.

(b) The County and the Contractor may agree to the compensation, if any, due to the Contractor hereunder.

(c) Absent agreement to the amount due to the Contractor, the County shall pay the Contractor the following amounts:

(i) Contract prices for labor, materials, equipment, and other services accepted under this Contract.

(ii) Reasonable costs incurred in preparing to perform and in performing the terminated portion of the Work, and in terminating the Contractor's performance, plus a fair and reasonable allowance for overhead and profit thereon (such profit shall not include anticipated profit or consequential damages); provided however, that if it appears that the Contractor would have not profited or would have sustained a loss if the entire Contract would have been completed, no profit shall be allowed or included and the amount of compensation shall be reduced to reflect the anticipated rate of loss, if any;

(iii) Reasonable costs of settling and paying claims arising out of the termination of subcontracts or orders pursuant hereto. These costs shall not include amounts paid in accordance with other provisions hereof.

10.3 Termination by the County For Cause. If the Contractor persistently or repeatedly refuses or fails to prosecute the Work in a timely and/or competent manner, supply enough properly skilled workers, supervisory personnel or proper equipment or materials, or if it fails to make prompt payment to Subcontractors or for materials or labor, or persistently disregards laws, ordinances, rules, regulations or orders of any public authority having jurisdiction, or otherwise is guilty of a substantial violation of a material provision of this Contract, then the County may by written notice to the Contractor, without prejudice to any other right or remedy, terminate the employment of the Contractor and take possession of the site and of all materials owned by the County and may finish the Work by whatever methods it may deem expedient. In such case the Contractor shall not be entitled to receive any further payment until the Work is finished.

10.3.1 If the unpaid balance of the Contract Price exceeds the cost of finishing the work, including compensation for the County's additional services and

expenses made necessary thereby, such excess shall be paid to the Contractor. If such cost exceeds the unpaid balance, the Contractor shall pay the difference to the County. This obligation for payment shall survive the termination of the Contract.

10.3.2 In the event the employment of the Contractor is terminated by the County for cause and it is subsequently determined by a Court of competent jurisdiction that such termination was without cause, such termination shall thereupon be deemed a Termination for Convenience, such termination shall thereupon be deemed a Termination for Convenience.

## **ARTICLE XI**

### **COMPLIANCE WITH LAWS**

11.1 Laws To Be Observed. Contractor shall observe and comply with all Federal and State laws, including Department of Labor Health and Safety Regulations, and all local laws, ordinances and regulations, which in any way affect the conduct of the contract work. Contractor shall have the duty to maintain safety on the job site. Any violations OSHA or other Federal, State or Local laws, rules or regulations pertaining to safety shall be the sole responsibility of the Contractor and not the County. The Contractor shall fully indemnify and hold owner harmless for any such safety violations assessed against owner.

11.2 Underground Damage Prevention. Contractor shall comply with N.C.G.S. Chapter 87, Article 8 and provide all notification required by statute and Contractor shall be responsible for cost of repair to all utilities damaged during construction.

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

11.4. Contractor Non-Discrimination. Contractor will take affirmative action not to discriminate against any employee or applicant for employment or

otherwise illegally deny any person participation in or the benefits of the activities that are the subject of this contract, because of race, creed, color, sex, age, disability, or national origin.

11.5 Goal for Participation by Minority Businesses. It is the policy of the County that minority businesses shall have the maximum opportunity to participate in the performance of contracts financed with public money including contracts awarded pursuant to the requirements of N.C.G.S Chapter 143, Article 8. County has adopted a ten percent (10%) verifiable goal for participation by minority businesses in the total value of work required by the terms and conditions of this Contract. Contractor covenants and agrees to comply with said policy of the County and the provisions of N.C.G.S. Chapter 143, Article 8 and shall follow County guidelines specifying the actions that Contractor must take to ensure a good faith effort in the recruitment and selection of minority businesses for participation in this Contract.

11.6 E-Verify Compliance. Pursuant to N.C.G.S. § 143-48.5 (Session Law 2014-418), Contractor shall fully comply and certify compliance of each of its subcontractors with Article 2 of Chapter 64 of the N.C. General Statutes, including the requirement for each employer with more than 25 employees in North Carolina to verify the work authorization of its employees through the federal E-Verify system. County shall be provided affidavits attesting to Contractor's and subcontractor's compliance or exemption. Violation of the provision, unless timely cured, shall constitute a breach of Contract.

## **ARTICLE XI**

### **INTERPRETATION**

12.1 Intent and Interpretation. The intent of this Contract is to require complete, correct, and timely execution of the Work. Any Work that may be required, implied, or inferred by the Contract Documents, or any one or more of them, as necessary to produce the intended result shall be provided by the Contractor for the contract price. The contract documents shall be given precedence in the following order: Agreement, Modifications, Addenda, Supplementary Conditions, Special Conditions, Instructions to Bidder, General Conditions, Specifications and Drawings.

12.2. Law Applied. All of the terms and conditions contained in the contract documents shall be interpreted in accordance with the laws of the State of North Carolina.

12.3 Entire Agreement. This Contract and the noted documents and specifications constitute the entire understanding of the parties. The contract documents shall be given precedence in the following order: Agreement, Modifications, Addenda, Supplementary Conditions, Special Conditions, Instructions to Bidders, General Conditions, Specifications and Drawings.

12.4 Shop Drawings, Product Data and Samples. Shop Drawings, Product Data, Samples, and other submittals from the Contractor do not constitute Contract Documents. Their purpose is merely to demonstrate the manner in which the Contractor intends to implement work in conformance with information received from the Contract Documents.

12.5 Interpretation and Construction. When a word, term or phrase is used in this Contract, it shall be interpreted or construed, first, as defined herein; second, if not defined, according to its generally accepted meaning in the construction industry; and third, if there is no generally accepted meaning in the construction industry, according to its common and customary usage. As between numbers and scaled measurements on the Drawings and in the Design, the numbers shall govern; as between larger scale and smaller scale drawings, the larger scale shall govern.

12.5.1 The words "include," "includes," or "including", as used in this contract, shall be deemed to be followed by the phrase, "without limitation".

12.5.2 Words or terms used as nouns in this Contract shall be inclusive of their singular and plural forms, unless the context of their usage clearly requires a contrary meaning.

12.5.3 The specification herein of any act, failure, refusal, omission, event, occurrence, or condition as constituting a material breach of this contract shall not imply that any other, non-specified act, failure, refusal, omission, event, occurrence, or condition shall be deemed not to constitute a material breach of this Contract.

12.6 Dispute Resolution. The County hereby adopts those dispute resolutions procedures promulgated by the State Building Commission, as amended

from time to time by the Commission or County. Said procedures shall be available to address any issues arising out of the contract or construction process wherein the matter in controversy exceeds Fifteen Thousand (\$15,000.00) Dollars. Should the Contractor herein utilize such dispute resolution procedures it must pay half of any administrative costs to be incurred by the County in conducting the dispute resolution.

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

12.8 County Non-Discrimination. The County covenants and agrees that no person shall be denied benefits of, or otherwise be subjected to discrimination in connection with the County's performance under this Contract on the grounds of race, religion, color, national origin, sex or handicap.

12.9 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 Parks and Gardens  
Attn: Tara Duckworth, Director  
230 Government Center Drive Ste. 120  
Wilmington, NC 28405

**To Contractor**

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

12.10 Contract Under Seal. The parties hereto expressly agree to create a contract under seal.

IN WITNESS WHEREOF, the parties have affixed their hands and seals and caused the execution of this instrument, by authority duly given and on the day and year first above written.

NEW HANOVER COUNTY

[SEAL]

\_\_\_\_\_  
Woody White, Chairman

ATTEST:

\_\_\_\_\_  
Clerk to the County

CONTRACTOR

[CORPORATE SEAL]

\_\_\_\_\_  
President

ATTEST:

\_\_\_\_\_  
Secretary

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

Approved as to form:

\_\_\_\_\_  
County Finance Director

\_\_\_\_\_  
County Attorney

NORTH CAROLINA

NEW HANOVER COUNTY

I, \_\_\_\_\_, a Notary Public of the State and County aforesaid, certify that Teresa P. Elmore personally came before me this day and acknowledged that she is Interim Clerk to the Board of County Commissioners of New Hanover County, and that by authority duly given and as the act of the Board, the foregoing instrument was signed in its name by Woody White, Chairman, sealed with its official seal and attested by herself as its Clerk.

WITNESS my hand and official seal, this \_\_\_\_ day of \_\_\_\_\_, 2014.

\_\_\_\_\_  
Notary Public

My commission expires: \_\_\_\_\_

STATE OF \_\_\_\_\_

COUNTY OF \_\_\_\_\_

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

WITNESS my hand and official seal, this \_\_\_\_ day of \_\_\_\_\_, 2014.

\_\_\_\_\_  
Notary Public

My commission expires: \_\_\_\_\_

STATE OF NORTH CAROLINA

AFFIDAVIT

COUNTY OF \_\_\_\_\_

\*\*\*\*\*

I, \_\_\_\_\_ (hereinafter Affiant), being duly authorized by and on behalf of \_\_\_\_\_ (hereinafter "Employer") after first being duly sworn hereby swears or affirms as follows:

1. Employer understands that E-Verify is the federal E-Verify program operated by the United States Department of Homeland Security and other federal agencies, or any successor or equivalent program used to verify the work authorization of newly hired employees pursuant to federal law in accordance with NCGS §64-25(5).
2. Employer understands that Employers Must Use E-Verify. Each employer, after hiring an employee to work in the United States, shall verify the work authorization of the employee through E-Verify in accordance with NCGS§64-26(a).
3. Employer is a person, business entity, or other organization that transacts business in this State and that employs 25 or more employees in this State. (mark Yes or No)
  - a. YES \_\_\_\_\_, or
  - b. NO \_\_\_\_\_
4. Employer's subcontractors must comply with E-Verify and Employer will ensure compliance with E-Verify by any subcontractors subsequently hired.

This \_\_\_\_ day of \_\_\_\_\_, 2014.

\_\_\_\_\_  
Signature of Affiant

Print or Type Name: \_\_\_\_\_

State of North Carolina County of \_\_\_\_\_

Signed and sworn to (or affirmed) before me, this the \_\_\_\_\_

day of \_\_\_\_\_, 2014.

My Commission Expires:

\_\_\_\_\_  
Notary Public

(Affix Official/Notarial Seal)