INVITATION TO BID

PROPOSAL

BID NO. 12-0134-4

APACHE AVENUE BOAT RAMP IMPROVEMENTS

PREBID CONF: 2:00PM, JANUARY 9 , 2013

BID OPENING: 2:00PM, JANUARY 23, 2013

THE COMMISSIONERS OF CHATHAM COUNTY, GEORGIA

PETE LIAKAKIS, CHAIRMAN

COMMISSIONER HELEN J. STONE	COMMISSIONER TABITHA ODELL
COMMISSIONER JAMES J. HOLMES	COMMISSIONER DAVID M. GELLATLY
COMMISSIONER PATRICK O. SHAY	COMMISSIONER DEAN KICKLIGHTER
COMMISSIONER PATRICK J. FARRELL	COMMISSIONER PRISCILLA D. THOMAS

R. JONATHAN HART, COUNTY ATTORNEY

CHATHAM COUNTY, GEORGIA
DOCUMENT CHECK LIST

The following documents, when marked, are contained in and made a part of this Bid Package or are required to be submitted with the bid. It is the responsibility of the bidder to read, complete and sign, where indicated, and return these documents with his/her bid. **FAILURE TO DO SO MAY BE CAUSE FOR DISQUALIFYING THE BID.**

__X GENERAL INFORMATION AND INSTRUCTIONS TO BID WITH ATTACHMENTS

__X SURETY REQUIREMENTS (A Bid Bond of 5% with this ITB)

__X PROPOSAL

__PLANS/DRAWINGS - **Plans and specifications must be purchased at Clayton Digital Reprographics by logging into www.cdrepro.com. Login to DFS. New users must register. For technical support contact CDR at (912) 352-3880, fax (912) 352-3881 or email: cdrsouth@cdrepro.com.**

__X BID SCHEDULE

___PERFORMANCE BOND -**required at the time of contract**

___PAYMENT BOND - **required at the time of contract**

___CONTRACT

__X LEGAL NOTICE

__X ATTACHMENTS: A. DRUG FREE WORKPLACE; B. NONDISCRIMINATION STATEMENT; C. DISCLOSURE OF RESPONSIBILITY STATEMENT; D. CONTRACTOR/SUBCONTRACTOR AFFIDAVIT & AGREEMENT; E. DEBARMENT CERTIFICATION; F. CAP AGREEMENT; G. M/WBE PARTICIPATION COMPLIANCE REPORT; H. *SAVE* AFFIDAVIT.

____DOCUMENTATION OF ABILITY TO PERFORM BID REQUIREMENTS. THIS MAY BE REQUIRED OF BIDDERS AFTER SUBMISSION OF BIDS.

COUNTY TAX CERTIFICATE REQUIREMENT - Contractor must supply a copy of their Tax Certificate from their location in the State of Georgia, as proof of payment of the occupational tax where their office is located.

CURRENT TAX CERTIFICATE NUMBER
CITY_____
COUNTY_____
OTHER_____

The Chatham County of Commissioners have established goals to increase participation of minority and woman owned businesses. In order to accurately document participation, businesses submitting bids or proposals are encouraged to report ownership status. A minority or woman business is defined as a business with 51% or greater minority of woman ownership. Please check ownership status as applicable:

African-American _____ **Asian American** _____ **Hispanic** _____

Native American or Alaskan Indian _____ **Woman** _____

In the award of "Competitive Sealed Proposals", minority/woman participation may be one of several evaluation criteria used in the award process when specified as such in the Request for Proposal.

RECEIPT IS HEREBY ACKNOWLEDGED OF ADDENDA NUMBERS_____

The undersigned bidder certifies that he/she has received the above listed and marked documents and acknowledges that his/her failure to return each, completed and signed as required, may be cause for disqualifying his/her bid.

BY:_____
DATE

_____
SIGNATURE

TITLE:_____

COMPANY:_____

CHATHAM COUNTY, GEORGIA
OFFICE OF THE PURCHASING AGENT
1117 EISENHOWER DRIVE, SUITE C
SAVANNAH, GEORGIA 31406
(912) 790-1622

Date: December 3, 2012 **BID NO. 12-0134-4**

GENERAL INFORMATION FOR INVITATION FOR BID/PROPOSAL

This is an invitation to submit a bid or proposal to supply Chatham County with construction, equipment, supplies and/or services as indicated herein. Sealed bids or proposals will be received at the Office of the Purchasing Agent, **at The Chatham County Citizens Service Center, 1117 Eisenhower Drive, Suite C, Savannah, Georgia, up** to **2:00PM, JANUARY 23, 2013** at which time they will be opened and publicly read. **The County reserves the right to reject all bids or proposals for any bid or proposal that is non-responsive or not responsible.**

Instructions for preparation and submission of a bid or proposal are contained in this Invitation For Bid/Proposal package. Please note that specific forms for submission of a bid/proposal are required. Bids must be typed or printed in ink. If you do not submit a bid/proposal, return the signed bid invitation sheet and state the reason; otherwise, your name may be removed from our bidders list.

A **pre-bid conference** has been scheduled to be conducted **and held at The Chatham County Citizens Service Center, 1117 Eisenhower Drive, Suite C, Savannah, Georgia**, at **2:00PM, JANUARY 9, 2013** to discuss the specifications and resolve any questions and/or misunderstanding that may arise. **You are encouraged to attend.**

Any changes to the conditions and specifications must be in the form of a written addendum to be valid; therefore, the Purchasing Agent will issue a written addendum to document each approved change. Generally when addenda are required, the bid opening date will be changed.

Chatham County has an equal opportunity purchasing policy. Chatham County seeks to ensure that all segments of the business community have access to supplying the goods and services needed by County programs. The County affirmatively works to encourage utilization of disadvantaged and minority business enterprises in our procurement activities. The County provides equal opportunity for all businesses and does not discriminate against any persons or businesses regardless of race, color, religion, age, sex, national origin or handicap. The terms "disadvantaged business," "minority business enterprise," and "minority person" are more specifically defined and explained in the Chatham County Purchasing Ordinance and Procedures Manual, Article VII - Disadvantaged Business Enterprises Program.

This project is Special Purpose Local Option Sales Tax (SPLOST) Project. See paragraph 2.22 for MBE/WBE participation goals.

INSTRUCTIONS TO BIDDERS/PROPOSERS

1.1 **Purpose:** The purpose of this document is to provide general and specific information for use in submitting a bid or proposal to supply Chatham County with equipment, supplies, and/or services as described herein. All bids/proposals are governed by the Code of Chatham County, Chapter 4, Article IV, and the laws of the State of Georgia.

1.2 **How to Prepare Bid Proposals: All bid proposals shall be:**

a. Prepared on the forms enclosed herewith, unless otherwise prescribed, and **all documents must be submitted.**

b. Typewritten or completed with pen and ink, signed by the business owner or authorized representative, with all erasures or corrections initialed and dated by the official signing the proposal. ALL SIGNATURE SPACES MUST BE SIGNED.

Bidders are encouraged to review carefully all provisions and attachments of this document prior to submission. Each bid constitutes an offer and may not be withdrawn except as provided herein.

1.3 **How to Submit Bid Proposals:** All bid proposals shall be:

a. Submitted in sealed opaque envelopes, plainly marked with the bid number and title, date and time of bid opening, and company name.

b. Mailed or delivered as follows in sufficient time to ensure receipt by the Purchasing Agent on or before the time and date specified above.

1. Mailing Address: Purchasing Agent, 1117 Eisenhower Drive, Suite C, Savannah, Georgia 31416.

2. Hand Delivery: Purchasing Agent, Chatham County Citizens Service Center, 1117 Eisenhower Drive, Suite C, Savannah, Georgia.

BIDS NOT RECEIVED BY THE TIME AND DATE SPECIFIED WILL NOT BE OPENED OR CONSIDERED.

1.4 **How to Submit an Objection:** Objections from bidders to this invitation to bid and/or these specifications should be brought to the attention of the County Purchasing Agent in the following manner:

a. When a pre-bid conference is scheduled, bidders shall either present their oral objections at that time or submit their written objections at least two (2) days prior to the scheduled pre-bid conference.

b. When a pre-bid conference is not scheduled, the bidder shall submit any objections he may

have in writing not less than five (5) days prior to the opening of the bid.

c. The objections contemplated may pertain to form and/or substance of the invitation to bid documents. Failure to object in accordance with the above procedure will constitute a waiver on the part of the business to protest this invitation to bid.

1.5 **Failure to Bid:** If a bid is not submitted, the business should return this invitation to bid document, stating reason therefore, and indicate whether the business should be retained or removed from the County's bidders list.

1.6 **Errors in Bids:** Bidders or their authorized representatives are expected to fully inform themselves as to the conditions, requirements, and specifications before submitting bids. Failure to do so will be at the bidder's own risk. In case of error in extension of prices in the bid, the unit price will govern.

1.7 **Standards for Acceptance of Bid for Contract Award:** The County reserves the right to reject any or all bids and to waive any irregularities or technicalities in bids received whenever such rejection or waiver is in the best interest of the County. The County reserves the right to reject the bid of a bidder who has previously failed to perform properly or complete on time contracts of a similar nature, or a bid from a bidder whom investigation shows is not in a position to perform the contract.

1.8 **Bidder:** Whenever the term "bidder" is used it shall encompass the "person," "business," "contractor," "supplier," "vendor," or other party submitting a bid or proposal to Chatham County in such capacity before a contract has been entered into between such party and the County.

1.9 **Responsible / Responsive Bidder:** *Responsible Bidder* means a person or entity that has the capability in all respects to perform fully and reliably the contract requirements. *Responsive Bidder* means a person or entity that has submitted a bid or proposal that conforms in all material respects to the requirements set forth in the invitation for bids or request for proposals.

1.10 **Compliance with Laws:** The bidder and/or contractor shall obtain and maintain all licenses, permits, liability insurance, workman's compensation insurance and comply with any and all other standards or regulations required by federal, state or County stature, ordinances and rules during the performance of any contract between the contractor and the County. Any such requirement specifically set forth in any contract document between the contractor and the County shall be supplementary to this section and not in substitution thereof.

1.11 **Contractor:** Contractor or subcontractor means any person or business having a contract with Chatham County. The Contractor/Vendor of goods, material, equipment or services certifies that they will follow equal employment opportunity practices in connection with the awarded contract as more fully specified in the contract documents.

1.12 ***Local Preference:** On 27 March, 1998 the Board of Commissioners adopted a Local Vendor Preference Ordinance. This Ordinance does not apply to construction contracts. However, contractors are encouraged to apply the same method when awarding bids to local and local M/WBE businesses when ever possible in order to promote growth in Chatham County's economy. **NOTE:** Local Preference **does not apply to Public Works Construction contracts.**

1.13 **Debarred Firms and Pending Litigation:** Any potential proposer/firm listed on the Federal or State of Georgia Excluded Parties Listing (Barred from doing business) **will not** be considered for contract award. Proposers **shall disclose** any record of pending criminal violations (Indictment) and/or convictions, pending lawsuits, etc., and any actions that may be a conflict of interest occurring within the past five (5) years. Any proposer/firm previously defaulting or terminating a contract with the County will not be considered. Also, any contractor or subcontractor that has pending litigation with the County will not be considered for contract award.

** All bidders or proposers are to read and complete the Disclosure of Responsibility Statement enclosed as an Attachment to be returned with response. Failure to do so may result in your solicitation response being rejected as non-responsive.

Bidder acknowledges that in performing contract work for the Board, bidder shall not utilize any firms that have been a party to any of the above actions. If bidder has engaged any firm to work on this contract or project that is later debarred, Bidder shall sever its relationship with that firm with respect to Board contract.

1.14 **Performance Evaluation:** On April 11, 2008, the Chatham County Board of Commissioners approved a change to the County Purchasing Ordinance requiring Contractor/Consultant Performance Evaluations, as a minimum, annually, prior to contract anniversary date.

Should Contractor/Consultant performance be unsatisfactory, the appointed County Project Manager for the contract may prepare a Contractor/Consultant Complaint Form or a Performance Evaluation to the County Purchasing Agent.

1.15 **Payment of Taxes**: No contract shall be awarded unless all real and personal property taxes have been paid by the successful contractor and/or subcontractors as adopted by the Board of commissioners on April 8, 1994.

1.16 **State Licensing Board for General Contractors:** Pursuant to Georgia law, the following types of contractors **must obtain a license from the State Licensing Board of Residential and General Contractors by July 1, 2008:**

* **Residential - Basic Contractor** (Contractor work relative to detached one-family and two-family residences and one-family townhouses not over three stories in height).

* **Residential - Light Commercial Contractor** (Contractor work or activity related to multifamily and multiuse light commercial buildings and structures).

* **General Contractor** (Contractor work or activity that is unlimited in scope regarding any residential or commercial projects).

See *Checklist for Submitting Bid* (page 22) for the type of license required for this project.

GENERAL CONDITIONS

2.1 **Specifications:** Any obvious error or omission in specifications shall not inure to the benefit of the bidder but shall put the bidder on notice to inquire of or identify the same from the County. Whenever herein mention is made of any article, material or workmanship to be in accordance with laws, ordinances, building codes, underwriter's codes, A.S.T.M. regulations or similar expressions, the requirements of these laws, ordinances, etc., shall be construed to be the minimum requirements of these specifications.

2.2 **Multiple Bids:** No vendor will be allowed to submit more than one bid. Any alternate proposals must be brought to the Purchasing Agent's attention during the Pre-bid Conference or submitted in writing at least five (5) days preceding the bid opening date.

2.3 Not Used.

2.4 **Prices to be Firm:** Bidder warrants that bid prices, terms and conditions quoted in his bid will be firm for acceptance for a period of sixty (60) days from bid opening date, unless otherwise stated in the bid.

2.5 **Completeness:** All information required by Invitation for Bids/Proposals must be completed and submitted to constitute a proper bid or proposal.

2.6 **Quality:** All materials, or supplies used for the construction necessary to comply with this proposal shall be of the best quality, and of the highest standard of workmanship.

Workmanship employed in any construction, repair, or installation required by this proposal shall be of the highest quality and meet recognized standards within the respective trades, crafts and of the skills employed.

2.7 **Guarantee:** Unless otherwise specified by the County, the bidder shall unconditionally guarantee the materials and workmanship on all material and/or services. If, within the guarantee period any defects occur which are due to faulty material and or services, the contractor at his expense, shall repair or adjust the condition, or replace the material and/or services to the complete satisfaction of the County. These repairs, replacements or adjustments shall be made only at such time as will be designated by the County as being least detrimental to the operation of County business.

2.8 **Liability Provisions:** Where bidders are required to enter or go onto Chatham County property to take measurements or gather other information in order to prepare the bid or proposal as requested by the County, the bidder shall be liable for any injury, damage or loss occasioned by negligence of the bidder, his agent, or any person the bidder has designated to prepare the bid and shall indemnify and hold harmless Chatham County from any liability arising therefrom. The contract document specifies the liability provisions required of the successful bidder in order to be awarded a contract with Chatham County.

2.9 **Cancellation of Contract:** The contract may be canceled or suspended by Chatham County in whole or in part by written notice of default to the Contractor upon non-performance or violation of contract terms. An award may be made to the next low bidder, for articles and/or services specified or they may be purchased on the open market and the defaulting Contractor (or his surety) shall be liable to Chatham County for costs to the County in excess of the defaulted contract prices. See the contract documents for complete requirements.

2.10 **Patent Indemnity:** Except as otherwise provided, the successful bidder agrees to indemnify Chatham County and its officers, agents and employees against liability, including costs and expenses for infringement upon any letters patent of the United States arising out of the performance of this Contract or out of the use or disposal for the account of the County of supplies furnished or construction work performed hereunder.

2.11 **Certification of Independent Price Determination:** By submission of this bid, the bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, that in connection with this procurement:

(1) The prices in this bid have been arrived at independently, without consultation, communication, or agreement, for the purpose of restricting competition, as to any matter relating to such prices with any other bidder or with any competitor;

(2) Unless otherwise required by law, the prices which have been quoted in this bid have not been knowingly disclosed by the bidder and will not knowingly be disclosed by the bidder prior to opening, directly or indirectly to any other bidder or to any competitor; and

(3) No attempt has been made or will be made by the bidder to induce any other person or firm to submit or not be submit a bid for the purpose or restricting competition.

2.12 **Award of Contract:** The contract, if awarded, will be awarded to that responsible bidder whose bid/proposal will be most advantageous to Chatham County, price and other factors considered. The Board of Commissioners will make the determination as to which bid or proposal that serves as the best value to Chatham County.

2.13 **Procurement Protests:** Objections and protests to any portion of the procurement process or actions of the County staff may be filed with the Purchasing Agent for review and resolution. The Chatham County Purchasing Procedures Manual, Article IX - Appeals and Remedies shall govern the review and resolution of all protests.

2.14 **Qualification of Business (Responsible Bidder or Proposer):** A responsible bidder or proposer is defined as one who meets, or by the date of the bid acceptance can meet, certifications, all requirements for licensing, insurance, and registrations, or other documentation required by the Design Professional engaged to develop Scope of work, specifications and plans. These documents will be listed in the Special Conditions further on in this solicitation. Chatham County has the right to require any or all bidders to submit documentation of the ability to perform, provide, or carry out the service or provide the product requested.

Chatham County has the right to disqualify the bid or proposal of any bidder or proposer as being unresponsive or unresponsible whenever such bidder/proposer cannot document the ability to deliver the requested product.

2.15 **Chatham County Tax Certificate Requirement:** A current Chatham County Tax Certificate is required unless otherwise specified.

Please contact the Building Safety and Regulatory Services (912) 201-4300 for additional information.

2.16 Insurance Provisions, General: The selected CONTRACTOR shall be required to procure and maintain for the duration of the contract insurance against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the work hereunder by the Contractor, his agents, representatives, employees or subcontractors. The cost of such insurance shall be included in the Bid. It is every contractor's responsibility to provide the County Purchasing and Contracting Division current and up-to-date Certificates of Insurance for multiple year contracts before the end of each term. **Failure to do so may be cause for termination of contract.**

2.16.1 General Information that shall appear on a Certificate of Insurance:

I. Name of the Producer (Contractor's insurance Broker/Agent).
II. Companies affording coverage (there may be several).
III. Name and Address of the Insured (this should be the Company or Parent of the firm Chatham County is contracting with).
IV. A Summary of all current insurance for the insured (includes effective dates of coverage).
V. A brief description of the operations to be performed, the specific job to be performed, or contract number.
VI. Certificate Holder (This is to always include Chatham County).

Chatham County as an Additional Insured: Chatham County invokes the defense of sovereign immunity. In order not to jeopardize the use of this defense, the County **is not** to be included as an Additional Insured on insurance contracts.

2.16.2 **Minimum Limits of Insurance** to be maintained for the duration of the contract:

a. **Commercial General Liability:** Provides protection against bodily injury and property damage claims arising from operations of a Contractor or Tenant. This policy coverage includes: premises and operations, use of independent contractors, products/completed operations, personal injury, contractual, broad form property damage, and underground, explosion and collapse hazards. Minimum limits: $1,000,000 bodily injury and property damage per occurrence and annual aggregate.

b. **Worker's Compensation and Employer's Liability:** Provides statutory protection against bodily injury, sickness or disease sustained by employees of the Contractor while performing within the scope of their duties. Employer's Liability coverage is usually included in Worker's Compensation policies, and insures common law claims of injured employees made in lieu of or in addition to a Worker's Compensation claim. Minimum limits: $500,000 for each accident., disease policy limit, disease each employee and Statutory Worker's Compensation limit.

c. **Business Automobile Liability:** Coverage insures against liability claims arising out of the Contractor's use of automobiles. Minimum limit: $1,000,000 combined single limit per accident for bodily injury and property damage. Coverage should be written on an Any Auto basis.

2.16.3 Special Requirements:

a. **Claims-Made Coverage:** The limits of liability shall remain the same as the occurrence basis, however, the Retroactive date shall be prior to the coincident with the date of any contract, and the Certificate of Insurance shall state the coverage is claims-made. The Retroactive date shall also be specifically stated on the Certificate of Insurance.

b. **Extended Reporting Periods**: The Contractor shall provide the County with a notice of the election to initiate any Supplemental Extended Reporting Period and the reason(s) for invoking this option.

c. **Reporting Provisions:** Any failure to comply with reporting provisions of the policies shall not affect coverage provided in relation to this request.

d. **Cancellation:** Each insurance policy that applies to this request shall be endorsed to state that it shall not be suspended, voided, or canceled, except after thirty (30) days prior to written notice by certified mail, return receipt requested, has been given to the County.

e. **Proof of Insurance:** Chatham County shall be furnished with certificates of insurance and with original endorsements affecting coverage required by this request. The certificates and endorsements are to be signed by a person authorized by the insurer to bind coverage on its behalf. All certificates of insurance are to be submitted prior to, and approved by, the County before services are rendered. The Contractor mus ensure Certificate of Insurance are updated for the entire term of the County.

f. **Insurer Acceptability:** Insurance is to be placed with an insurer having an A.M. Best's rating of A and a five (5) year average financial rating of not less than V. If an insurer does not qualify for averaging on a five year basis, the current total Best's rating will be used to evaluate insurer acceptability.

g. **Lapse in Coverage:** A lapse in coverage shall constitute grounds for contract termination by the Chatham County Board of Commissioners.

h. **Deductibles and Self-Insured Retention**: Any deductibles or self-insured retention must be declared to, and approved by, the County. At the option of the County, either: the insurer shall reduce or eliminate such deductibles or self-insured retention as related to the County, its officials, officers, employees, and volunteers; or the Contractor shall procure a bond guaranteeing payment of related suits, losses, claims, and related investigation, claim administration and defense expenses.

2.16.4 **Additional Coverage for Specific Procurement Projects:**

a. **Professional Liability:** Insure errors or omission on behalf of architects, engineers, attorneys, medical professionals, and consultants.

Minimum Limits: $1 million per claim/occurrence
Coverage Requirement: If claims-made, retroactive date must precede or coincide with the contract effective date or the date of the Notice to Proceed. The professional must state if tail coverage has been purchased and the duration of the coverage.

b. **Builder's Risk: (For Construction or Installation Contracts)** Covers against insured perils while in the course of construction.
Minimum Limits: All-Risk coverage equal 100% of contract value
Coverage Requirements: Occupancy Clause - permits County to use the facility prior to issuance of Notice of Substantial Completion.

2.17 **Compliance with Specification - Terms and Conditions:** The Invitation to Bid, Legal Advertisement, General Conditions and Instructions to Bidders, Specifications, Special Conditions, Vendor's Bid, Addendum, and/or any other pertinent documents form a part of the bidders proposal or bid and by reference are made a part hereof.

2.18 **Signed Bid Considered Offer:** The signed bid shall be considered an offer on the part of the bidder, which offer shall be deemed accepted upon approval by the Chatham County Board of Commissioners, Purchasing Agent or his designee. In case of a default on the part of the bidder after such acceptance, Chatham County may take such action as it deems appropriate, including legal action for damages or lack of required performance.

2.19 **Notice to Proceed:** The successful bidder or proposer shall not commence work under this Invitation to Bid until a written contract is awarded and a Notice to Proceed is issued by the Purchasing Agent or his designee. If the successful bidder does commence any work or deliver items prior to receiving official notification, he does so at his own risk.

2.20 **Payment to Contractors:** Instructions for invoicing the County for products delivered to the County are specified in the contract document.

a. Questions regarding payment may be directed to the Finance Department at (912) 652-7905 or the County's Project Manager as specified in the contract documents.

b. Contractors will be paid the agreed upon compensation upon satisfactory delivery of the products or completion of the work as more fully described in the contract document.

c. Upon completion of the work or delivery of the products, the Contractor will provide the County or contractor with an affidavit certifying all suppliers, persons or businesses employed by the Contractor for the work performed for the County have been paid in full.

d. Chatham County is a tax exempt entity. Every contractor, vendor, business or person under contract with Chatham County is required by Georgia law to pay State sales or use taxes for products purchased in Georgia or transported into Georgia and sold to Chatham County by contract. Please consult the State of Georgia, Department of Revenue, Sales and Use Tax

Unit in Atlanta (404) 656-4065 for additional information.

2.21 **County's Rights Concerning Award:**

The County reserves the right, and sole and complete discretion to waive technicalities and informalities. The County further reserves the right, and sole and complete discretion to reject all bids and any bid that is not responsive or that is over the budget, as amended. In judging whether the bidder is responsible, the County will consider, but is not limited to consideration of, the following:

(a) Whether the bidder or principals are currently ineligible, debarred, suspended, or otherwise excluded from bidding or contracting by any state or federal agency, department, or authority;

(b) Whether the bidder or principals have been terminated for cause or are currently in default on a public works contract;

(c) Whether the bidder can demonstrate sufficient cash flow to undertake the project as evidenced by a Current Ratio of 1.0 or higher;

(d) Whether the bidder can demonstrate a commitment to safety with regard to Workers' Compensation by having an Experience Modification Rate (EMR) over the past three years not having exceeded an average of 1.2; and

(e) Whether the bidder's past work provides evidence of an ability to successfully complete public works projects within the established time, quality, or cost, or to comply with the bidder's contract obligations.

(f) Whether the bidder has made a **Good Faith Effort** to meet local participation goals as set forth herein in Paragraph 2.22.

2.22 The Chatham County Board of Commissioners has adopted an aggressive program that establishes goals for minority/female, small and disadvantaged business participation in construction, professional services, and general procurement.

a. The Chatham County Board of Commissioners under Georgia law may reject any bid as non-responsive if they feel a bidder did not exercise **"Good Faith Effort"** in obtaining the goal established for M/WBE participation.

b. The Chatham County Board of Commissioners adopted a policy establishing goals oriented to increase participation of minority and female owned businesses, through MBE/WBE certification and development. In order to accurately document participation, businesses submitting bids, quotes or proposals are encouraged to report ownership status. A bidder or vendor that is certified by any agency of the Federal Government or State of Georgia may submit a copy of their certification with their bid as proof of qualifications. Bidders that intend to engage in joint ventures or utilize subcontractors must submit to the County Contracts Administrator, a report on Minority/Woman Business Enterprise participation.

Goals established for this project is <u>30% MBE/ WBE combined</u>.

c. A Minority/Woman Business Enterprise (M/WBE) is a business concern that is at least 51% owned by one or more minority/female individuals (2) and whose daily business operations are managed and directed by one or more of the minority/female owners.

2.23 Bidders or proposers are required to make a **Good Faith Effort,** where subcontracting is to be utilized in performing the contract, to subcontract with or purchase supplies from qualified M/WBEs. Bidders or proposers are required to state if they intend to subcontract any part of the work. Goals will be established for each contract at the onset. **Forms** requiring the signatures of bidders or proposers are enclosed as **Attachments** and must be completed and returned with your bid response. If forms are not completed and submitted, the bid may be considered nonresponsive.

Each bidder or proposer is required to maintain records of such efforts in detail adequate to permit a determination of compliance with these requirements. All contracts will reflect **Good Faith Efforts** and reporting requirements for the term of the contract. The County particularly urges general contractors to give emphasis to subcontracting with local area firms. **For all questions regarding M/WBE participation and Good Faith Effort only,** contact : **Arneja Riley, Chatham County M/WBE Coordinator, 124 Bull Street, Suite 310 Savannah, Ga. 31401. Ph 912-652-7860; fax 912-652-7849; e-mail alriely@chathamcounty.org or http://purchasing.chathamcounty.org**

2.24 **GEORGIA OPEN RECORDS ACT** - The responses will become part of the County's official files without any obligation on the County's part. Ownership of all data, materials and documentation prepared for and submitted to Chatham County in response to a solicitation, regardless of type, shall belong exclusively to Chatham County and will be considered a record prepared and maintained or received in the course of operations of a public office or agency and subject to public inspection in accordance with the Georgia Open Records Act, Official Code of Georgia Annotated, Section 50-18-70, et. Seq., unless otherwise provided by law.

Responses to RFPs shall be held confidential from all parties other than the County until after the contract is awarded by the Board of Commissioners.

The vendor and their bid price in response to IFBs will be read allowed at public bid openings. After Bid Tabulations, the IFB shall be available for public viewing.

Chatham County shall not be held accountable if material from responses is obtained without the written consent of the vendor by parties other than the County, at any time during the solicitation evaluation process.

2.25 **GEORGIA TRADE SECRET ACT of 1990-** In the event a Bidder/Proposer submits trade secret information to the County, the information must be clearly labeled as a Trade Secret. The County will maintain the confidentiality of such trade secrets to the extent provided by law.

2.26 **CONTRACTOR RECORDS-**The Georgia Open Records Act is applicable to the records of all contractors and subcontractors under contract with the County. This applies to those specific contracts currently in effect and those which have been completed or closed for up th three (3) years following completion. Again, this is contract specific to the County contracts only.

2.27 **EXCEPTIONS**-All proceedings, records, contracts and other public records relating to procurement transactions shall be open to the inspection of any citizen, or any interested person, firm or corporation, in accordance with the Georgia Open Records Act except as provided below:

a. Cost estimates relating to a proposed procurement transaction prepared by or for a public body shall not be open to public inspection.

b. Any competitive sealed bidding bidder, upon request, shall be afforded the opportunity to inspect bid records within a reasonable time after the opening of all bids but prior to award, except in the event that the County decides not to accept any of the bids and to rebid the contract. Otherwise, bid records shall be open to public inspection only after award of the contract. Any competitive negotiation offeror, upon request, shall be afforded the opportunity to inspect proposal records within a reasonable time after the evaluation and negotiations of proposals are completed but prior to award except in the event that the County decides not to accept any of the proposals and to reopen the contract. Otherwise, proposal records shall be open to the public inspection only after award of the contract except as provided in paragraph "c" below. Any inspection of procurement transaction records under this section shall be subject to reasonable restrictions to ensure the security and integrity of the records.

c. Trade secrets or proprietary information submitted by a bidder, offeror or contractor in connection with a procurement transaction shall not be subject to public disclosure under the Georgia Open Records Act; however, the bidder, offeror or contractor must invoke the protections of this section prior to or upon submission of the data or other materials, and must identify the data or other materials to be protected and state the reasons why protection is necessary.

d. Nothing contained in this section shall be construed to require the County, when procuring by "competitive negotiation" (Request for Proposal), to furnish a statement of the reasons why a particular proposal was not deemed to be the most advantageous to the County.

2.28 **DEBARRED OR SUSPENDED SUBCONTRACTORS:** CONTRACTOR shall not subcontract, and shall ensure that no subcontracts are awarded at any tier, to any individual, firm, partnership, joint venture, or any other entity regardless of the form of business organization, that is on the Federal Excluded Parties List System (EPLS) at https://www.epls.gov or the State of Georgia, DOAS, State Purchasing Exclusion listing. Contractor shall immediately notify County in the event any subcontractor is added to either Federal or State listing after award of the subcontract.

2.29 **CONE OF SILENCE:**

Lobbying of Procurement Evaluation Committee members, County Government employees, and elected officials regarding this product or service solicitation, Invitation to Bid (ITB) or Request for Proposal (RFP) or contract by any member of a proposer's staff, or those people employed by any legal entity affiliated with an organization that is responding to the solicitation is strictly prohibited. Negative campaigning through the mass media about the current service delivery is strictly prohibited. Such actions may cause your proposal to be rejected.

2.30 **OWNER'S RIGHT TO NEGOTIATE WITH THE LOWEST BIDDER:**
In the event *all* responsive and responsible bids are in excess of the budget, the Owner, in its sole and absolute discretion and in addition to the rights set forth above, reserves the right either to (i) supplement the budget with additional funds to permit award to the lowest responsive and responsible bid, or (ii) to negotiate with the lowest responsive and responsible bidder (after taking all deductive alternates) only for the purpose of making changes to the Project that will result in a cost to the Owner that is within the budget, as it may be amended.

2.31 **REFERENCES - $500,000 or more:** On July 25, 2003 the Board of Commissioners directed that all construction projects with a bid of $500,000 or more, for bidders to be responsive each must provide information on the most recent five (5) projects with similar scope of work as well as other information to determine experience and qualifications as follows:

a. Project Name:_____
Location:_____
Owner:_____
Address:_____
City and State:_____
Contact:_____
Phone & Fax:_____
*Architect or Engineer:_____
Contact:_____
Phone & Fax:_____
Email:_____

b. The awarded bid amount and project start date.
c. Final cost of project and completion date.
d. Number of change orders.
e. Contracted project completion in days.
f. Project completed on time. Yes____ No____ Days exceeded_____.
g. List previous contracts your company performed for Chatham County by Project Title, date and awarded/final cost.
h. Has contractor ever failed to complete a project? If so, provide explanation.
i. Have any projects ever performed by contractor been the subject of a claim or lawsuit by or against the contractor? If yes, please identify the nature of such claim or lawsuit, the court in which the case was filed and the details of its resolution.

$499,000 and less: Provide references from owners of at least three (3) projects of various sizes for which contractor was the prime contractor. Include government owners if possible. If the contractor has performed any work for the Chatham County Board of Commissioners within the last five (5) years, at least one (1) of the three (3) owner references must be from the appropriate party within the Chatham County Government. provide in the format as in (a) above on the attached form.

Failure to provide the above information may result in your firm's bid being rejected and ruled as non-responsive.

NOTE: FORMS FOR YOU TO FILL OUT FOR YOUR REFERENCES ARE ATTACHED TO THE BACK OF THIS BID PACKAGE.

2.32 **CONSTRUCTION APPRENTICE PROGRAM HIRING**:

Chatham County has established a Construction Apprentice Program (CAP) to train area residents in the building trades. Successful Contractor shall be required to make a good faith effort to utilize labor from the CAP Program on this project when feasible. A Good Faith Effort will be demonstrated by documentation of inquiry into CAP labor available and resulting hiring of CAP labor or providing reasons for Contractor not utilizing any CAP labor. Form demonstrating Good Faith Effort is enclosed as Attachment F. Contractor shall complete the form and return with their first pay request. All questions regarding CAP student hiring should be directed to Construction Program Manager, Tara Sinclair at (912) 604-9574.

2.33 **SECURITY AND IMMIGRATION COMPLIANCE ACT AND SYSTEMATIC ALIEN VERIFICATION FOR ENTITLEMENTS (SAVE):**On July 1, 2008, the Georgia Security and Immigration Compliance Act (SB 529, Section 2) became effective. All contractors and subcontractors entering into a contract or performing work must sign an affidavit that he/she has used the E-Verify System. E- Verify is a no-cost federal employment verification system to insure employment eligibility. Affidavits are enclosed in this solicitation. You may download M-274 Handbook for Employers at http://www.dol.state.ga.us/spotlight/employment/rules.You may go to http://www.uscis.gov., to find the E-Verify information.

O.C.G.A. § 50-36-1, requires Georgia's counties to comply with the federal **Systematic Alien Verification for Entitlements (SAVE) Program**. SAVE is a federal program used to verify that applicants for certain "public benefits" are legally present in the United States. Contracts with the County are considered "public benefits." Therefore, the successful bidder will be required to provide the Affidavit Verifying Status for Chatham County Benefit Application prior to receiving any County contract. The affidavit is included as part of this bid package(Attachment H) but is only required of the successful bidder.

ADDITIONAL CONDITIONS

3.1 **Firm Fixed Price:** Contractor shall provide a firm fixed price which will be valid for acceptance within 90 days of receipt of bid

3.2. **METHOD OF COMPENSATION**. The compensation provided for herein shall include all claims by the CONTRACTOR for all costs incurred by the CONTRACTOR in the conduct of the Project as authorized by the approved Project Compensation Schedule and this amount shall be paid to the CONTRACTOR after receipt of the invoice and approval of the amount by the COUNTY. The COUNTY shall make payments to the CONTRACTOR within thirty (30) days from the date of receipt of the CONTRACTOR's acceptable statement on forms prepared by the CONTRACTOR and approved by the COUNTY.

Should the Project begin within any one month, the first invoice shall cover the partial period from the beginning date of the Project through the last day of the month (or on a mutually agreeable time) in which it began. The invoices shall be submitted each month until the Project is completed. Invoices shall be itemized to reflect actual expenses for each individual task; also refer to the requirements concerning changes, delays and termination of work under Sections I-8, 9, and 10 of the contract. Each invoice shall be accompanied by a summary progress report which outlines the work accomplished during the billing period and any problems that may be inhibiting the Project execution. The terms of this contract are intended to supersede all provisions of the Georgia Prompt Pay Act.

As long as the gross value of completed work is less than 50% of the total contract amount, or if the contractor is not maintaining his construction schedule to the satisfaction of the engineer, the County shall retain 10% of the gross value of the completed work as indicated by the current estimate approved by the engineer.

After the gross value of completed work becomes to or exceed 50% of the total contract amount within a time period satisfactory to the County, then the total amount to be retained may be reduced to 5% of the gross value of the completed work as indicated by the current estimate approved by the engineer, until all pay items are substantially completed.

When all work is completed and time charges have ceased, pending final acceptance and final payment the amount retained may be further reduced at the discretion of the County.

The CONTRACTOR may submit a final invoice to the County for the remaining retainage upon COUNTY'S acceptance of the Certificate of Substantial Completion. Final payment constituting the entire unpaid balance due shall be paid by the COUNTY to the CONTRACTOR when work has been fully completed and the contract fully performed, except for the responsibilities of the CONTRACTOR which survive final payment. The making of final payment shall constitute a waiver of all claims by Chatham County except those arising from unsettled liens, faulty or defective work appearing after substantial completion, failure of the work to comply with the requirements of the Contract Documents, or terms of any warranties required by the Contractor Documents or those items previously made in writing and identified by the COUNTY as unsettled at the time of final application for payment. Acceptance of

final payment shall constitute a waiver of all claims by the CONTRACTOR, except those previously made in writing and identified by the CONTRACTOR as unsettled at the time of final application for payment.

3.2.1. **FORCE ACCOUNT:** When no agreement is reached for additional work to be done at Lump Sum or Unit Prices, then such additional work shall be done based on the following Cost-Plus-Percentage basis of payment. The Georgia Department of Transportation specifications for the use of a force account will not be used.

a. For work performed by the prime contractor/general contractor, the contractor shall be reimbursed for actual cost incurred in doing the work, and an additional payment of 15% to cover overhead and profit.

b. For work performed by a sub-contractor, the sub-contractor shall be reimbursed for actual cost incurred in doing the work, and an additional payment of 10% to cover overhead and profit. The contractor shall be allowed an overhead and profit mark-up not to exceed 7% on the subcontractor's price. The County shall not recognize subcontractors of subcontractors.

c. The term "Actual Cost" shall include the cost of material and labor as follows:

i. Material cost - Direct cost of material, sales tax, freight and equipment rental.

ii. Labor cost - Man hour cost listed separately by trade, payroll costs including workman's compensation, social security, pension and retirement.

d. The term "Overhead and Profit" shall include bonds (Payment & Performance, Roof & Wall), insurance (Liability, Builders Risk), permits, supervision costs (cost of subcontractor to supervise own work, cost of contractor to supervise work of sub-contractor), proposal preparation and all administrative costs.

3.2.2. **LIQUIDATED DAMAGES:** Failure to complete the work within the duration plus any extension authorized in writing by the County Engineer shall entitle the County to deduct as "Liquidated Damages" from the monies due the Contractor the amount of **$500** for each calendar day in excess of the authorized construction time.

3.3 **SURETY REQUIREMENTS and Bonds:** (Check where applicable)

X A. **Such bidder shall post a bid bond, certified check or money order made payable to the Chatham County Finance Department in the amount of 5% of the bid price.**

X B. **Contractor(s) shall post a payment/performance bond, certified check or money order made payable to the Chatham County Finance Department in the amount of 100% of the bid price if awarded the purchase. Such bond(s) are due prior to contract execution as a guarantee that goods meet specifications and will be delivered per contract. Such bonds will also guarantee quality performance of services and timely payment of invoices to any subcontractors.**

X C. **Whenever a bond is provided, it shall be executed by a surety authorized to do business in the State of Georgia and approved by Chatham County.**

D. **Bidder acknowledges Chatham County's right to require a Performance and Payment Bond of a specific kind and origin. "Performance Bond" means a bond with good and sufficient surety or surities for the faithful performance of the contract and to indemnify the governmental entity for any damages occasioned by a failure to perform the same within the prescribed time. Such bond shall be payable to, in favor of, and for the protection of the governmental entity for which the work is to be done. "Payment Bond" means a bond with good and sufficient surety or sureties payable to the governmental entity for which the work is to be done and intended for the use and protection of all subcontractors and all persons supplying labor, materials, machinery, and equipment in the prosecution of the work provided for in the public works construction contract.**

X E. **Forfeit the amount of the Bid Bond if he/she fails to enter into a contract with Chatham County to do and/or furnish everything necessary to provide service and/or accomplish the work stated and/or specified in this bid proposal for the bid amount, and;**

3.4 **Warranty Requirements:** (Check where applicable):

a. Provisions of item 2.12 apply.

b. Warranty required.

X 1. Standard warranty shall be offered with bid.

2. Extended warranty shall be offered with bid. The cost of the extended warranty will be listed separately on the bid sheet.

3.5 **Terms of Contract:** (check where applicable):

a. Annual Contract

b. One-time Purchase

X c. Other **ONE TIME CONTRACT**

CONVERSATIONS OR CORRESPONDENCE REGARDING THIS SOLICITATION OR REPORT BETWEEN PROSPECTIVE OFFERORS AND PERSONS OUTSIDE THE CHATHAM COUNTY PURCHASING OFFICE WILL NOT BE CONSIDERED OFFICIAL OR BINDING UNLESS OTHERWISE SPECIFICALLY AUTHORIZED WITHIN THIS DOCUMENT.

The undersigned bidder or proposer certifies that he/she has carefully read the preceding list of instructions to bidders and all other data applicable hereto and made a part of this invitation; and, further certifies that the prices shown in his/her bid/proposal are in accordance with all documents contained in this Invitation for Bids/ Proposals package, and that any exception taken thereto may disqualify his/her bid/proposal.

This is to certify that I, the undersigned bidder, have read the instructions to bidder and agree to be bound by the provisions of the same.

This _____ day of _____ 20 ____.

BY _____

SIGNATURE

_____

TITLE

_____

COMPANY

_____

Phone / Fax No's.

CHECKLIST FOR SUBMITTING BID

Sign below and submit this sheet with Bid

NOTE: All of the following items must be submitted with your Bid to be considered "responsive".

1. ACKNOWLEDGMENT OF ANY/ALL ADDENDUMS (Page 3 of ITB)

2. ORIGINAL SURETY BOND (5% OF BID) ALONG WITH *SURETY REQUIREMENTS* SHEET FILLED OUT (page 23 of ITB)

3. BID SHEET COMPLETELY FILLED OUT AND SIGNED.

4. "LIST OF SUBCONTRACTORS" SHEET FILLED OUT WITH ALL SUBCONTRACTORS AND SUPPLIERS.

5. "% TO MBE SUBCONTRACTORS/SUPPLIERS" (ON ATTACHMENT G) SHOWING % OF PROJECT THAT IS PROJECTED TO GO TO M/WBE SUBCONTRACTORS / SUPPLIERS MUST BE COMPLETELY FILLED OUT.

6. SECTION 2.28 OF ITB (page 16) REFERENCES: Read this section and submit the correct number of "References" (based on total dollar amount of project) Note: Supply ALL the information that is requested for each Reference. NOTE: *Forms for Reference Information are attached to this Bid Package.*

7. COMPLETE AND SUBMIT ALL *ATTACHMENTS* TO THE ITB (Attachments A thru H).

_____

NAME / TITLE

_____

COMPANY

_____

ADDRESS

_____

PHONE / FAX NO'S.

CHATHAM COUNTY, GEORGIA

SURETY REQUIREMENTS

A Bid Bond for five percent (5%) of the amount of the bid **is** required to be submitted with each bid.

A Performance Bond for one hundred percent (100%) of the bid **will** be required of the successful bidder.

The Bidder certifies that he/she has examined all documents contained in this bid package, and is familiar with all aspects of the proposal and understands fully all that is required of the successful bidder. The Bidder further certifies that his/her bid shall not be withdrawn for thirty (30) days from the date on which his bid is publicly opened and read.

The Bidder agrees, if awarded this bid, he/she will:

A. Furnish, upon receipt of an authorized Chatham County Purchase Order, all items indicated thereon as specified in this bid proposal for the bid amount, or;

B. Enter a contract with Chatham County to do and/or furnish everything necessary to provide the service and/or accomplish the work as stated and/or specified in this bid proposal for the bid amount, and;

C. Furnish, if required, a Performance Bond, and acknowledges Chatham County's right to require a Performance Bond of a specific kind and origin, and;

D. Forfeit the amount of the Bid Bond as liquidated damages if he/she fails to enter a contract with Chatham County as stated in (B) above, within fifteen (15) days of the date on which he/she is awarded the bid, and/or;

E. Forfeit the amount of the Performance Bond as liquidated damages if he/she fails to execute and fulfill the terms of the contract entered. The amount of forfeiture shall be:

1. The difference between his/her bid and the next lowest, responsible bid that has not expired or been withdrawn, or;

2. The difference between his/her bid and the amount of the lowest, responsible bid received as a result of rebidding, including all costs related to rebidding.

_____ _____

COMPANY DATE

_____ _____

SIGNATURE TITLE

_____

TELEPHONE NUMBER

PROPOSAL

SPECIFICATIONS FOR:

APACHE AVENUE BOAT RAMP IMPROVEMENTS

BID NO. 12-0134-4

The Bell'S Landing Boat Ramp Facility is situated on the Forrest River within the limits of the City of Savannah. The site is located at the end of Apache Avenue.

The work will consist of furnishing all materials, labor and equipment for: making improvements to the existing Bell's Landing Boat Ramp parking area which includes the installation of pavement, signage and striping, drainage, erosion and sedimentation control best management practices and landscaping.

The project site is approximately 0.60 acre and the toal disturbed area is approximately 0.54 acre.Patching, placement of pavement fabric, and mill and inlay.

All work under this contract shall be done in accordance with the Technical Specifications and Drawings prepared by Wolverton & Associates, included in and made part of this Invitation to Bid package.

A location map, typical sections, construction plans and other details for the project are provided elsewhere in these contract documents.

Note: This shall be a unit price contract. Quantities are approximate and payment shall be for actual in-place work measurements.

COMMENCEMENT AND COMPLETION:

WORK SHALL BEGIN WITHIN 10 DAYS AFTER RECEIPT OF "NOTICE TO PROCEED". ALL WORK SHALL BE COMPLETED WITHIN 60 CALENDAR DAYS AFTER THE TEN DAY PERIOD.

APACHE AVENUE BOAT RAMP IMPROVEMENTS					
BID TAB					
ITEM NO.	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	EXTENSION
	SITE PREPARATION AND DEMOLITION				
1	REMOVE EXISTING PAVEMENT	SF	9894		
	EARTHWORK				
2	STOCKPILE AND REUSE TOPSOIL	CY	48		
3	EXPORT EXCESS SOIL OFFSITE	CY	339		
4	CUT AND FILL WITH SCRAPER	CY	43		
	EROSION AND SEDIMENT CONTROL				
5	EROSION CONTROL SYSTEM INSTALLATION AND MAINTENANCE	LS	1		
	LANDSCAPING				
6	TREES	EA	19		
7	SHRUBS	EA	40		
8	SHRUB AREAS	SY	121		
9	GROUND COVER (SEEDING, MULCHING, SOD, ETC.)	SY	253		
	STORM DRAINAGE				
10	CONCRETE ORIFICE STRUCTURE	EA	1		
	PAVING, SIGNAGE AND STRIPING				
11	STANDARD DUTY ASPHALT PAVEMENT INCL. STONE BASE	SY	663		
12	1-1/2" MILL AND INLAY	SY	46		
13	PERVIOUS PAVERS INCL. STONE BASE	SF	6900		
14	12" FLUSH HEADER CURB	LF	1050		
15	CONCRETE WHEEL STOP	EA	16		
16	R5-1 "DO NOT ENTER" SIGN	EA	3		
17	R1-1 "STOP" SIGN	EA	1		
18	THERMOPLASTIC 24" STOP BAR (WHITE)	EA	1		
19	DIRECTIONAL PAVEMENT ARROW	EA	3		
20	ACCESSIBLE SYMBOL	EA	1		
21	4" STRIPING	LF	581		
				Subtotal	$ -
				TOTAL:	$ -

NAME / TITLE

COMPANY

ADDRESS

PHONE / FAX NO'S.

EMAIL

LIST OF SUBCONTRACTORS

I do _____, do not _____, propose to subcontract some of the work on this project. I propose to subcontract work to the following subcontractors:

NAME AND ADDRESS	TYPE OF WORK

SIGNED: _____

CONTRACTOR

Wolverton & Associates

SITEWORK SPECIFICATIONS

For

APACHE AVENUE
BOAT RAMP IMPROVEMENTS
SAVANNAH, GA

W&A Project No. 12-500

October 26, 2012

Owner/Developer
Chatham County
Department of Engineering
124 Bull Street, Room 430
Savannah, GA 31401
Phone: (912) 652-7800

WOLVERTON & ASSOCIATES, INC.
7 EAST CONGRESS STREET
SUITE 306
SAVANNAH, GA 31401
(912) 721-6999 PHONE
(912) 721-6998 FAX
www.wolverton-assoc.com

SITEWORK SPECIFICATIONS TABLE OF CONTENTS

END OF TABLE OF CONTENTS

SEALS PAGE
PROJECT:

Name: Apache Avenue Boat Ramp Improvements
Location: Savannah, Georgia
Project Number: 12-500

CIVIL ENGINEERING CONSULTANT OF RECORD

Wolverton & Associates, Inc
7 East Congress Street
Suite 306
Savannah, GA 31401

10/26/12

Civil Engineering Consultant of Record Date

SECTION 02220 - SITE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Demolition of structures, paving, and utilities.
   2. Filling voids created as a result of removals or demolition.

B. Related Requirements:
   1. Section 02230 - Site Clearing: Clearing of trees and other plant vegetation
   2. Section 02200 - Earthwork: Placement of fill material
   3. Section 02270 - Erosion and Sedimentation Control (Including SWPPP): Erosion protection during demolition operations.

1.2 REGULATORY REQUIREMENTS

A. Conform to applicable State and local codes for demolition of structures, safety of adjacent structures, dust control, runoff control, and pollution prevention.

B. Obtain required permits and licenses from appropriate authorities. Pay associated fees including disposal charges.

C. Notify affected utility companies before starting work and comply with their requirements.

D. Do not close or obstruct public or private roadways, sidewalks, or fire hydrants without appropriate permits or written authorization.

E. If hazardous, contaminated materials or other environmental related conditions are discovered, stop work immediately and notify the Owner's Construction Manager for action to be taken. Do not resume work until specifically authorized by the Construction Manager.

F. Test soils around buried tanks for contamination. Coordinate notification for mobilization to site and required observation of tank removal with Owner's Civil Engineering Consultant.

1.3 SUBMITTALS

A. Project Record Documents: Accurately record actual locations of capped utilities and subsurface obstructions that will remain after demolition. Submit record as part of closeout submittals.

1.4 PROJECT CONDITIONS

A. Structures to be demolished will be discontinued in use and vacated prior to start of work.

B. Owner assumes no responsibility for condition of structures to be demolished.

C. Conditions existing at time of inspection for bidding purposes will be maintained by Owner as reasonably practical. Variations within structures may occur by Owner's removal and salvage operations prior to start of demolition work.

D. Unless otherwise indicated in Contract Documents or specified by the Owner, items of salvageable value to Contractor shall be removed from site and structures. Storage or sale of removed items on site will not be permitted and shall not interfere with other work specified.

E. Explosives shall not be brought to site or used without written consent of authorities having jurisdiction. Such written consent will not relieve Contractor of total responsibility for injury to persons or for damage to property due to blasting operations. Performance of required blasting shall comply with governing regulations.

PART 2 - PRODUCTS

2.1 FILL MATERIALS

A. Fill material shall be aggregate fill materials as specified in Section 02300.

PART 3 - EXECUTION

3.1 PREPARATION

A. Provide, erect, and maintain erosion control devices, temporary barriers, and security devices at locations indicated on Construction Drawings.

B. Protect existing landscaping materials, appurtenances, and structures, which are not to be demolished. Repair damage to existing items to remain caused by demolition operations.

C. Prevent movement or settlement of adjacent structures. Provide bracing and shoring as necessary.

D. Mark location of utilities. Protect and maintain in safe and operable condition utilities that are to remain. Prevent interruption of existing utility service to occupied or used facilities, except when authorized in writing by authorities having jurisdiction. Provide temporary services during interruptions to existing utilities as acceptable to governing authorities and Owner.

E. Notify adjacent property owners of work that may affect their property, potential noise, utility outages, or other disruptions. Obtain written permission from adjacent property owners when demolition equipment will traverse, infringe upon, or limit access to their property. Coordinate notice with Owner.

3.2 GENERAL DEMOLITION REQUIREMENTS

A. Conduct demolition to minimize interference with adjacent structures or pavements to remain.

B. Cease operations immediately if adjacent structures appear to be in danger. Notify authority having jurisdiction. Do not resume operations until directed by authority.

C. Conduct operations with minimum of interference to public or private access. Maintain ingress and egress at all times.

D. Sprinkle work with water to minimize dust. Provide hoses and water connections for this purpose.

E. Comply with governing regulations pertaining to environmental protection.

F. Clean adjacent structures and improvements of dust, dirt, and debris caused by demolition operations. Return adjacent areas to condition existing prior to start of work.

3.3 DEMOLITION

A. Demolish site improvements designated to be removed as shown on the drawings. Site improvements shall include but not be limited to structures, retaining walls, foundations, pavements, curbs and gutters, drainage structures, utilities, signage or landscaping.

B. Disconnect and cap or remove utilities to be abandoned as shown on the drawings.

C. Fill or remove underground tanks, piping, and appurtenances as shown.

D. Demolish buildings completely and remove from site using methods as required to complete work within limitations of governing regulations. Small structures may be removed intact when acceptable to Owner and authorities having jurisdiction.

E. Locate demolition equipment and remove materials to prevent excessive loading to supporting walls, floors, or framing.

F. Demolish concrete and masonry in small sections. Break up concrete slabs-on-grade that are 2-feet or more below proposed subgrade to permit moisture drainage. Remove slabs-on-grade and below grade construction within 2-feet of proposed subgrade.

3.4 FILLING BASEMENTS AND VOIDS

A. Completely fill below grade areas and voids resulting from demolition or removal of structures, underground fuel storage tanks, wells, cisterns, etc., using aggregate fill materials consisting of stone, gravel, or sand free from debris, trash, frozen materials, roots, and other organic matter.

B. Areas to be filled shall be free of standing water, frost, frozen or unsuitable material, trash, and debris prior to fill placement.

C. Place fill materials in accordance with Section 02200 unless subsequent excavation for new work is required.

D. Grade surface to match adjacent grades and to provide flow of surface drainage after fill placement and compaction.

3.5 DISPOSAL OF DEMOLISHED MATERIALS

A. Remove from site debris, rubbish, and other materials resulting from demolition operations. Leave areas of work in clean condition.

B. No burning of any material, debris, or trash on-site or off-site will be allowed except when allowed by appropriate governing authority and Owner. If allowed as stated above, burning shall be performed in manner prescribed by governing authority. Attend burning materials until fires have burned out and have been completely extinguished.

C. Transport materials removed from demolished structures with appropriate vehicles and dispose off-site to areas that are approved for disposal by governing authorities and appropriate property owners.

END OF SECTION

SECTION 02230 - SITE CLEARING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Cleaning site of debris, grass, trees, and other plant life in preparation for site or building earthwork.
   2. Protection of existing structures, trees, or vegetation indicated on the Construction Drawings to remain.

B. Related Requirements:
   1. Section 02220 – Site Demolition: Demolition and removal of structures, paving, utilities and other improvements.
   2. Section 02200 – Earthwork: Stripping and removal of topsoil.
   3. Section 02270 - Erosion And Sedimentation Control (Including SWPPP)

1.2 ENVIRONMENTAL REQUIREMENTS

A. Construct temporary erosion and sediment control systems as shown on Construction Drawings and as directed by the "Storm Water Pollution Prevention Plan" (SWPPP) to protect adjacent properties and water resources from erosion and sedimentation.

B. In event that sitework on this project will disturb one or more acres, starting work shall be strictly governed by the sequence of construction as specified in Section 02270 and SWPPP site maps. Contractor shall not begin construction without "National Pollution Discharge Elimination System" (NPDES) permit governing discharge of storm water from site for entire construction period. NPDES permit requires SWPPP to be in place during construction.

C. Clearing and grubbing shall commence in the proper sequence as stated in the Phase I of the Best Management Practice Sequence specified in Section 02270 and on the SWPPP site map and subsequent to the halt in construction for performance of the inspection and certification of BMPs as stated.

D. Contractor shall conduct storm water management practices in accordance with the project SWPPP and applicable NPDES permit and shall enforce action taken or imposed by Federal or State agencies, including cost of fines, construction delays, and remedial actions resulting from Contractor's failure to comply with provisions of NPDES permit.

1.3 PROJECT CONDITIONS

A. Conditions existing at time of inspection for bidding purposes will be maintained by Owner as reasonably practial.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

3.1 PREPARATION

A. Identify existing plant life that is to remain and verify clearing limits are clearly tagged, identified, and marked in such manner as to ensure their protection throughout construction operations.

3.2 PROTECTION

A. Locate, identify, and protect existing utilities that are to remain.

B. Protect trees, plant growth, and features designated to remain as part of final landscaping.

C. Conduct operations with minimum interference to public or private accesses and facilities. Maintain ingress and egress at all times and clean or sweep roadways daily as required by SWPPP or governing authority. Dust control shall be provided with sprinkling systems or equipment provided by Contractor.

D. Protect benchmarks, property corners, and other survey monuments from damage or displacement. If marker needs to be removed it shall be referenced by a licensed land surveyor and replaced, as necessary, in kind.

E. Provide traffic control as required, in accordance with the US Department of Transportation's "Manual on Uniform Traffic Control Devices" and applicable state highway department requirements.

3.3 EQUIPMENT

A. Material shall be transported to and from the project site using well-maintained and operating vehicles. Transporting vehicles operating on site shall stay on designated haul roads and shall not endanger improvements by rutting, overloading, or pumping.

3.4 CLEARING

A. Clear areas required for access to site and execution of work.

B. Unless otherwise indicated on Construction Drawings, remove trees, shrubs, grass, other vegetation, improvements, or obstructions interfering with installation of new construction. Removal includes digging out stumps and roots. Depressions caused by clearing and grubbing operations shall be filled to subgrade elevation to avoid ponding of water. Satisfactory fill material shall be placed in accordance with Section 02200.

C. Remove grass, trees, plant life, stumps, and other construction debris from site to dump site that is suitable for handling such material according to state laws and regulations.

D. Cut heavy growths of grass from areas before stripping and topsoil removal and remove cuttings with remainder of cleared vegetative material.

END OF SECTION

SECTION 02760 - PERMEABLE INTERLOCKING CONCRETE PAVERS

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes:
1. Concrete pavers
2. Bedding and void opening aggregates
3. Aggregate Base
4. Edge restraint

B. Related Requirements:
1. Section: 2200 – Earthwork
2. Section: 3300 – Cast-In-Place Concrete

1.2 REFERENCES

A. American Society of Testing and Materials (ASTM)
1. C 33 - Specification of Concrete Aggregates.
2. C 136 - Method for Sieve Analysis for Fine and Course Aggregate.
3. C 140 - Sampling and Testing Concrete Masonry Units.
4. C 144 - Standard Specifications for Aggregate for Masonry Mortar.
5. C 936 - Specifications for Solid Interlocking Concrete Paving Units.
6. C 979 - Specifications for Pigments for Integrated Colored Concrete.
7. D 698 - Test Methods for Moisture Density Relations of Soil and Soil Aggregate Mixtures Using a 5.5-lb (24.4 N) Rammer and 12 in. (305 mm) drop.
8. D1557 - Test Method for Moisture Density Relations of Soil and Soil Aggregate Mixtures Using a 10- lb (44.5 N) Rammer and 18 in. (457 mm) drop.
9. D 2940 - Graded Aggregate Material for Bases or Subbases for Highway or Airports.
10. C 29 - Bulk Density and Voids in Aggregate Materials.

1.3 QUALITY ASSURANCE

A. Installation shall be by a contractor and crew with at least one year of experience in placing interlocking concrete pavers on projects of similar nature or dollar costs.

B. The Contractor shall be in compliance with all local, state and federal licensing and bonding requirements.

1.4 SUBMITTALS

A. Shop or product drawings and product data shall be submitted.

B. Full size samples of the permeable concrete paving units shall be submitted to the Owner for approval prior to ordering job materials from the manufacturer.

C. Sieve analysis for grading of bedding and joint opening aggregates shall be submitted.

D. Testing from an independent testing laboratory for compliance of paving unit requirements to ASTM C 936 or other applicable requirements shall be submitted.

1.5 NOT USED.

1.6 DELIVERY, STORAGE AND HANDLING

A. Concrete pavers shall be delivered to the site in steel banded, plastic banded, or plastic wrapped cubes capable of transfer by fork lift or clamp lift.

B. Delivery and paving schedules shall be coordinated in order to minimize interference with normal use of buildings or adjacent paving.

1.7 ENVIRONMENTAL CONDITIONS

A. Do not install bedding aggregates or pavers during heavy rain or snowfall.

B. Do not install bedding aggregates or pavers over frozen base materials.

C. Do not install frozen bedding aggregates.

PART 2 – PRODUCTS

2.1 CONCRETE PAVERS

A. Paving stone units shall meet the minimum material and physical properties set forth in ASTM C 936, Standard Specification for Interlocking Concrete Paving Units. Efflorescence shall not be a cause for rejection.
1. Average compressive strength 8000 psi (55MPa) with no individual unit less than 7,200 psi (50 MPa).
2. Average absorption of 5% with no unit greater than 7% when tested according to ASTM C 140.
3. Resistance to 50 freeze-thaw cycles when tested according to ASTM C 67.

B. Pigment in concrete pavers shall conform to ASTM C 979. ACI Report No. 212.3R provides guidance on the use of pigments.

2.2 GRANULAR SUBBASE

A. The granular subbase material shall consist of granular material graded in accordance with ASTM D 2940. The subbase thickness and gradation shall be per the Drawings.

2.3 GRANULAR BASE

A. The granular base material shall be graded in accordance with the requirements of ASTM D 2940. The base thickness and gradation shall be per the Drawings.

2.4 BEDDING AND VOID OPENING AGGREGATES

A. The granular bedding material shall be graded in accordance with the requirements of ASTM D 2940, the typical bedding thickness and gradation shall be per the Drawings.

2.5 EDGE RESTRAINTS

A. The provision of suitable edge restraints is critical to the satisfactory performance of interlocking concrete block pavement. The pavers must abut tightly against the restraints to prevent rotation under load and any consequent spreading of joints. The restraints must be sufficiently stable that, in addition to providing suitable edge support for the paver units, they are able to withstand the impact of vehicular traffic and/or snow removal equipment.

B. Curbs, gutters or curbed gutter, constructed to the specified standards, are considered to be acceptable edge restraints for heavy duty installations.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Verify that subgrade preparation, compacted density and elevations conform to the specifications.

B. Verify that geotextiles have been placed according to manufacturer's recommendations

C. Verify that aggregate base materials, thickness, compaction, surface tolerances and elevations conform to the specifications. The aggregate base shall be spread and roller compacted in uniform layers not exceeding 6 in. thickness. Base surface tolerance shall be plus or minus 3/8 in. over a 10 ft straight edge.

D. Mechanical tampers (jumping jacks) must be used for compaction of soil subgrade and aggregate base around lamp standards, utility structures, building edges, curbs, tree wells and other protrusions. Areas not accessible to roller compaction equipment shall be compacted to the specified density with mechanical tampers. Care shall be taken around the perimeters of excavations, buildings, curbs, etc. These areas are especially prone to consolidation and settlement. Wedges of backfill shall not be placed in these areas.

E. Verify the proper installation of the concrete curbing, in terms of location, elevation, and adherence to the specifications.

F. Verify that the base is dry, uniform, even and ready to support aggregate, pavers and imposed loads.

3.2 SITE PREPARATION

A. The site must be stripped of all topsoil and other objectionable materials to the grades specified.

B. All subdrainage of underground services within the pavement area must be completed in conjunction with subgrade preparation and before the commencement of subbase construction.

C. After trimming to the grades specified, the subgrade is to be proof rolled iin accordance with Section 02200, with soft spots or localized pockets of objectionable material excavated and properly replaced with approved granular material.

D. The subgrade shall be trimmed to within 1/2 in. of the specified grades. The surface of the prepared subgrade shall not deviate by more than 1/2 in. from the bottom edge of a 10 ft. straight edge laid in any direction.

E. The Contractor shall insure that the prepared subgrade is protected from damage from intrusion of surface water. No traffic shall be allowed to cross the prepared subgrade. Repair of any damage resulting shall be the responsibility of the Contractor and shall be repaired.

3.3 GRANULAR SUBBASE AND BASE INSTALLATION

A. After proper construction of the concrete edge restraints for the interlocking pavement as per Section 3.4, and upon approval by the Owner, Agent or Consultant, aggregate subbase (is specified in design) and base shall be placed in uniform lifts not exceeding 6 in. loose thickness and roller compacted according to AASHTO guidelines for installing open graded aggregates.

B. The subbase shall be placed in uniform lifts not exceeding 6 inch loose thickness and roller compacted according to AASHTO guidelines for installing open graded aggregates.

C. The granular base, shall be trimmed to within 3/8 in. of the specified grade. The surface of the prepared base shall not deviate more than 3/8 in. from the bottom edge of a 10 ft. straight edge laid in any direction.

3.4 EDGE RESTRAINTS

A. Adequate edge restraint shall be provided along the perimeter of all paving as specified. The leading edge of the concrete restraint, where it contacts the paving stone shall be fit parallel along the edge of the paving units.

B. All concrete edge restraints shall be constructed to dimensions and profiles specified and shall be supported by a compacted subbase of not less than 6 in. thickness.

3.5 PAVER INSTALLATION

A. Spread the bedding aggregate evenly over the base course and screed to a nominal 1 ½ in. to 2 in. thickness. Use tracked equipment only and insure that the bedding aggregate are not to be disturbed. Place sufficient bedding aggregate to stay ahead of the laid pavers. Do not use the bedding aggregate to fill depressions in the base surface.

B. Pavers shall be free of foreign material before installation.

C. Pavers shall be inspected for color distribution and all chipped, damaged or discolored pavers shall be replaced.

D. The pavers shall be laid in pattern(s) as shown on the drawings.

E. Joints between the pavers shall be maintained according to the spacer bars.

F. Gaps at the edges of the paved area shall be filled with cut pavers.

G. Units cut no smaller than one-third of a whole paver are recommended along edges subject to vehicular traffic.

H. Pavers to be placed along the edge shall be cut with a double blade paver splitter or masonry saw.

I. The paver surface shall be swept clean of all debris before compacting, in order to avoid damage from point loads.

J. A low amplitude, high frequency plate compactor shall be used to compact the pavers into the bedding course. Minimum compactive force shall be 5,000 lb (22 kN).

K. The pavers shall be compacted and joint aggregate swept into the joints until the joints are full. This will require a least two or three passes with the compactor. Do not compact within 3 ft. of any unrestrained edges of the laid paving units.

L. All work to within 3 ft. of the laying face must be fully compacted and filled with joint aggregate at the completion of each day.

M. Excess joint aggregates shall be swept off when the job is complete.

N. The final surface elevations shall not deviate more than 3/8 in. under a 10 ft straight edge in any direction.

O. The surface elevation of pavers shall be 1/8 in. to 1/4 in. above adjacent drainage inlets, concrete collars or channels.

3.6 FIELD QUALITY CONTROL

A. Final elevations shall be checked for conformance to the drawings after removal of excess joint aggregate.

END OF SECTION

SECTION 02890 - TRAFFIC SIGNS AND SIGNALS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Traffic control signs.

1.2 REFERENCES

A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by the basic designation only.

B. ASTM International (ASTM):
   1. ASTM A53 - Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
   2. ASTM C94 - Ready Mix Concrete
   3. ASTM D4956 - Retroreflective Sheeting for Traffic Control.

C. US Department of Transportation, Federal Highway Administration:
   1. Manual on Uniform Traffic Control Devices (MUTCD).

PART 2 - PRODUCTS

2.1 SIGNS

A. Conform to US Department of Transportation MUTCD. Sign classification, type, size, and color shall be as shown on the drawings

B. Retroreflectivity: Microprismatic type sheeting conforming to ASTM D 4956, Type VIII, IX, or XI.

2.2 POSTS

A. Square Post: Square tubular steel sign post, galvanized, 12 ga, perforated full-length with 7/16 inch holes on four sides. Post size shall be as shown on the Drawings.

B. Steel Pipe: ASTM A 53, Type E (electric-resistance welded) or Type S (seamless), Grade B, Schedule 40, size as shown on the Drawings.

2.3 CONCRETE

A. Mix concrete and deliver in accordance with ASTM C 94.

B. Design mix to produce normal weight concrete consisting of Portland cement, aggregate, water-reducing admixture, air-entraining admixture, and water to produce following:
   1. Compressive Strength: 3,500 psi, minimum at 28 days, unless otherwise indicated on the Drawings.
   2. Slump Range: 1 to 3-inches at time of placement
   3. Air Entrainment: 5 to 8 percent

PART 3 - EXECUTION

3.1 PREPARATION

A. Field verify underground utilities prior to sign installation. Primary utilities of concern of shallow depths are lawn sprinkler systems, electric, telephone, fiber optic, cable and gas.

3.2 INSTALLATION

A. Install signs as shown on the Drawings and in accordance with MUTCD and manufacturer's instructions.

B. Install signs of the type and at locations shown on the Drawings.

C. Install posts of the type as shown on the drawing.

END OF SECTION

SECTION 02900 – PLANTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
1. Planting of native, drought tolerant trees, shrubs, lawns, sod, seed, groundcover planting, and associated materials.
2. Soil preparation, fine grading.
3. Protection and maintenance of planted areas until acceptance.

B. Related Requirements:
1. Section 02200 - Earthwork.
2. Section 02270 - Erosion and Sedimentation Control.
3. Section 02812 - Site Irrigation System.

1.2 REFERENCES

A. The publications listed below form a part of this specification to the extent referenced. Publications are referenced within the text by the basic designation only.

B. American National Standards Institute (ANSI):
1. ANSI Z60.1 - American Standard for Nursery Stock.

C. ASTM International (ASTM):
1. ASTM D5268 - Topsoil used for Landscaping Purposes.
2. ASTM C602 - Agricultural Liming Materials.

D. Erosion Control Technology Council (ECTC):
1. Standard Specification for Rolled Erosion Control Products.

1.3 SUBMITTALS

A. Provide required submittals to the Owner's Construction Manager or his designated representative in accordance with this section.

B. Submittals shall be available at all times to the Owner's Construction Manager.

C. Grower / Nursery Information: Submit name, address, phone number and contact person for each Grower / Nursery 10 days prior to plant material selection meeting.

D. Materials Test Reports: Submit topsoil borrow area test reports to Owner's Landscape Architect (LA) or Civil Engineering Consultant (CEC) a minimum of 10 days prior to delivery to site.
1. Provide location of topsoil borrow area.
2. Provide name of independent soil testing laboratory.
3. Provide date of sampling and testing.

E. Product Data:
1. Submit certification tags from trees, shrubs, sod, and seed verifying type and purity to Owner's LA or CEC.
2. <u>If requested by the Owner</u> the Contractor will submit photographs of each species of tree specified. Photographs shall be taken at grower's nursery prior to digging. Photographs shall contain tree with measuring rod in vertical position.

F. Quality Assurance Submittals:

1. Submit to Owner and Owner's LA or CEC a copy of the invoice for each shipment of plant materials to the Project site. Invoice shall include name and size of each type of plant material.
2. Tree Transplanting Contractor Qualifications:
   a. Provide statement of required qualifications of tree transplanting contractor.
   a. Provide Owner project names, addresses, project owner's names and phone numbers for completed projects of similar scope.
   b. Provide progress photographs of the tree transplanting process and final photographs taken at least 2 years after establishment.
   b. Provide evidence of the health of at least 10 trees transplanted 3 or more years ago on at least 3 different projects. Trees shall be of similar size, species, and conditions of the trees indicated on the Plans.

G. Closeout Submittals:
1. Submit Meetings and Inspections Log prior to Final Completion of the Project.
2. Certification of Conformance: Provide certificate of satisfactory performance of planting operations signed by the Contractor and Landscape Architect.

1.4 QUALITY ASSURANCE

A. Pre-Work Meeting: Convene a pre-work meeting minimum 30 days prior to commencing work on this Section. Review conditions of operations, procedures and coordination with related work. The pre-work meeting may be combined with the plant material selection trip.
1. Review planting schedule and maintenance.
2. Review required inspections, schedule of topsoil testing, and environmental procedures.

B. A Construction Testing Laboratory (CTL) selected and paid for by the Contractor, will be retained to perform testing and analysis on in-place topsoil.
1. The CTL shall prepare test reports that indicate test location and test results. Civil Engineering Consultant, and Contractor shall be provided with copies of reports as follows:
   a. Topsoil Analysis – within 10 calendar days of sampling date.
   b. Topsoil Depth Inspection – within 3 working days of test completion.
2. In event that test performed fails to meet Specifications, the (CTL) shall notify Owner and Contractor in writing immediately.
3. Contractor shall provide free access to site for testing activities.

C. Tree Transplanting Contractor Qualifications: Tree transplanting contractor shall meet the following qualifications:
1. Certified Arborist on staff.
2. Local representation and offices in the state or an adjoining state where the work is to be performed.
3. Minimum five years of experience transplanting and establishing trees of the same size, species, and quantity as shown on the plans.

D. Plant Material Selection:
1. Trees: Trees will be tagged by a landscape architect employed by the tree grower nursery prior to purchase and delivery to site.
2. Shrubs: Deliver representative samples of each shrub variety and size to the Project site for verification of specification compliance. Mark shrubs with size, genus, species, cultivar, and variety.
3. <u>If requested by the Owner</u> the Contractor will schedule and arrange meeting of landscape contractor and landscape architect for observation of plant material at the tree grower nursery. Tagging and observation will be based on compliance with requirements for genus, species, variety, cultivar, size, and quality.
4. Owner and landscape architect may observe trees and shrubs further for size and condition of balls and root systems, pests, disease symptoms, injuries, and latent defects.
5. Remove rejected trees or shrubs immediately from Project site.

E. Plant Measurements: Measure according to ANSI Z60.1. Spread, height, or container sizes shown on the drawings are minimum acceptable sizes. Do not prune to obtain required sizes. If range of sizes is given, no plant shall be less than minimum size, and at least 50 percent of plants shall be as large as upper half of range specified.

1. Trees and Shrubs: Measure with branches and trunks or canes in their normal position. Take height measurements from or near the top of the root flare for field-grown stock and container grown stock. Measure main body of tree or shrub for height and spread. Do not measure branches or roots tip to tip. Take caliper measurements 6 inches above the root flare for trees up to 4-inch caliper size, and 12 inches above the root flare for larger sizes.
2. Other Plants: Measure with stems, petioles, and foliage in their normal position.

F. Soil-Testing Laboratory Qualifications:
1. Topsoil Analysis: Independent soil testing laboratory employing a landscape or soil agronomist familiar with the final use of the material and construction practices for large earthwork sites.

G. Quality Assurance Inspections: Conduct the following inspections during the course of the work in the presence of the Landscape Architect or Civil Engineering Consultant to verify conformance to specification requirements. Correct noted deficiencies during each inspection prior to proceeding with subsequent work.
1. Final Inspection: Within 10 days of substantial completion date, convene a final inspection to observe that all work is completed as specified and shown on the drawings.
2. Warranty Inspections: Convene a warranty inspection 60 calendars days prior to expiration of warranty period specified in Part 1.7 herein.

H. Meeting and Inspection Log: Maintain log of required meetings and inspections. Record the date; time; weather conditions; and a brief summary of the discussions, decisions, agreements (or disagreements) reached. Provide log to CEC for signature and review by Landscape Architect at the conclusion of each meeting. Furnish copy of log to each party attending.

1.5 MEETING AND EVENT NOTIFICATIONS

A. Provide the following notifications to the Owner's Civil Engineering Consultant (CEC) within the time period listed below. CEC will notify Owner, landscape architect, and other necessary sub consultants:
1. Final Inspection: 7 calendar days prior to inspection date.
2. Warranty Inspection: 14 calendar days prior to inspection date.

B. Provide notifications by email or other written means to show proof of delivery.

1.6 PROJECT CONDITIONS

A. Perform work only during weather conditions favorable to landscape construction and to health and welfare of plants. Owner shall determine suitability of such weather conditions.

1.7 WARRANTY

A. Guarantee plant material for a period of 12months following the Substantial Completion Date.
1. A limit of one replacement of each plant shall be required, except for losses or replacements due to failure to comply with requirements.
2. Remove from site any plant that is dead or unsatisfactory to Owner, Jurisdiction having Authority, or Landscape Architect. Replace plants during normal planting season.

1.8 EXTENDED MAINTENANCE SERVICE –THE OWNER WILL BE RESPONSIBLE FOR MAINTENANCE FROM THE DATE OF ACCEPTANCE

PART 2 - PRODUCT

2.1 WOODY PLANT MATERIALS

A. Furnish nursery-grown trees and shrubs complying with ANSI Z60.1 and the following requirements:
1. Provide plants with healthy root systems developed by transplanting or root pruning.
2. Provide well-shaped, fully branched, healthy, vigorous stock free of disease, insects, eggs, larvae, and defects such as disfiguring knots, sun scald, injuries, abrasions, and disfigurement.

3. Provide selected specimen quality plants being exceptionally heavy, symmetrical, tight knit, so trained or favored in their development and appearance as to be superior in form, number of branches, compactness and symmetry.
4. Do not prune plants before delivery.
5. Trees with fresh cuts of limbs over 1 1/4-inch, which have not completely calloused, shall be rejected.
6. Provide plants typical of their species or variety and exhibiting a normal habit of growth and be legibly tagged with proper name. Provide plants grown under climatic conditions similar to those of site or have been acclimated to such condition for at least 2 years.
7. Root system of each plant shall be well-provided with fibrous roots. Parts shall be sound, healthy, vigorous, well-branched, and densely foliated when in leaf.
8. Plants designated ball and burlap shall be moved with root systems as solid units with balls of earth firmly wrapped with burlap and comply with the following:
   a. Diameter and depth of balls of earth shall be sufficient to encompass fibrous root feeding systems necessary for healthy development of plant.
   b. No plant shall be accepted when ball of earth surrounding its roots has been cracked or broken preparatory to or during process of planting. Balls shall remain intact during all operations.
   c. Heel-in plants that cannot be planted immediately by setting in ground and covering balls with soil or mulch and then watering.
   d. Hemp burlap and twine is preferable to treated. If treated burlap is used, twine shall be cut from around trunk and burlap shall be removed.
9. Provide single trunk trees growing from single unmutilated crown of roots. No part of trunk shall be conspicuously crooked as compared with normal trees of same variety.
10. Provide shrubs with thickness corresponding to trade classification "No.1". Single-stemmed or thin plants shall not be accepted. Side branches shall be generous, well-twigged, and plant as whole well-branched to ground. Plants shall be in moist condition, free from dead wood, bruises, or other root or branch injuries.

2.2 LAWN SEED

A. Provide fresh, clean, new crop lawn seed mixture. Furnish to Owner dealer's guaranteed statement of composition of mixture and percentage of purity and germination of each variety.

B. Seed Mixture: Provide seed of grass species and varieties, proportions by weight and minimum percentages of purity, germination, and maximum percentage of weed seed. Seed mixtures vary by region and season and shall comply with State DOT and Local Soil Conservation Service Standards for lawn turf.

2.3 SOD

A. Provide sod species suitable as lawn turf for the region. Sod shall be strongly rooted, weed, disease, pest free and uniform in thickness.

2.4 GROUNDCOVER

A. Provide groundcover established and well rooted in pots or similar containers and comply with ANSI Z60.1. Slopes steeper than a 3:1 shall receive one or more of the specific regional groundcovers listed below or as shown on the drawings.

1. SOUTHEAST

Coronilla varia	Crown Vetch
Euonymous fortunei	Wintercreeper
Vinca minor	Periwinkle

2.5 TOPSOIL

A. ASTM D5268, natural, friable, fertile, fine loamy soil possessing characteristics of representative topsoil in the vicinity that produces heavy growth. Topsoil shall have a pH range of 5.5 to 7.4 percent, free from subsoil, objectionable weeds, litter, sods, stiff clay, stones larger than 1-inch in diameter, stumps, roots, trash, herbicides, toxic

substances, or any other material which may be harmful to plant growth or hinder planting operations. Top soil shall contain a minimum of three percent organic material.

B. Topsoil shall be tested in accordance with part 3 below.

C. Salvaged or Existing Topsoil: Reuse suitable topsoil stockpiled on-site or existing topsoil undisturbed by grading or excavation operations. Clean topsoil of roots, plants, sod, stones, clay lumps, and other extraneous materials harmful to plant growth.

D. Verify amount of suitable topsoil stockpiled if any, and supply additional imported topsoil as needed.

E. Imported Topsoil: Supplement salvaged topsoil with imported topsoil from off-site sources when existing quantities are insufficient.
   1. Obtain topsoil displaced from naturally well-drained sites where topsoil occurs at least 6 inches deep; do not obtain from agricultural land, bogs, or marshes.
   2. Verify borrow and disposal sites are permitted as required by state and local regulations. Obtain written confirmation that permits are current and active.
   3. Obtain permits required by state and local regulations for transporting topsoil. Permits shall be current and active.

F. Amend existing and imported topsoil as indicated in part 3 below.

2.6 ORGANIC SOIL AMENDMENTS

A. 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.

B. Back to Nature Cotton Burr Compost or approved equivalent.

C. Compost: Decomposed organic material including leaf litter, manure, sawdust, plant trimmings and/or hay, mixed with soil.

D. Pecan Hulls: Composted pecan hulls for local source.

E. Biosolids: Use Grade 1 containing lower pathogen levels.

F. Worm Castings: Earthworms.

2.7 INORGANIC SOIL AMENDMENTS

A. Lime: ASTM C602, Class O agricultural limestone containing a minimum of 80 percent calcium carbonate equivalent with a minimum of 95 percent passing No. 8 sieve and minimum of 55 percent passing No. 60 sieve.

B. Sulfur: Granular, biodegradable, containing a minimum of 90 percent sulfur, with a minimum of 99 percent passing No. 6 sieve and a maximum of 10 percent passing No. 40 sieve.

C. Iron Sulfate: Granulated ferrous sulfate containing a minimum of 20 percent iron and 10 percent sulfur.

D. Agricultural Gypsum: Finely ground, containing a minimum of 90 percent calcium sulfate.

E. Sand: Clean, washed, natural or manufactured, free of toxic materials.

2.8 PLANTING ACCESSORIES

A. Non Selective Herbicide: Roundup-Pro, Finale or equivalent.

B. Selective Post Emergent Herbicide: EPA registered and approved, of type recommended by manufacturer for application.

C. Selective Pre-Emergent Herbicide: EPA registered and approved, of type recommended by manufacturer for application.

2.9 PLANTING SOIL MIX

A. Planting medium containing 75 percent specified topsoil mixed with 15 percent organic soil amendments and 10 percent sharp washed sand.

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 formaldehyde, phosphorous, and potassium.
   1. Composition: Nitrogen, phosphorous, and potassium in amount required to remedy deficiencies identified in the results of the existing topsoil and in-place topsoil test performed by the CTL.

B. Slow-Release Fertilizer: Use one of the following:
   1. Osmocote Standard Granular fertilizer by Scotts Company composed of 13 percent nitrogen, 13 percent phosphorous, and 13 percent potassium, by weight.
   2. Multi-Cote All Purpose by Schultz composed of 17 percent nitrogen, 17 percent phosphorous, and 17 percent potassium, by weight.

C. Deliver fertilizer, mixed as specified, in original unopened standard size bags showing weight, analysis and name of manufacturer. Containers shall bear manufacturer's guaranteed statement of analysis, or manufacturer's certificate of compliance covering analysis shall be furnished to Owner. Store fertilizer in such manner that it shall be kept dry.

2.11 MULCH

A. Straw Mulch: Straw mulch shall used for seeding purposes only and shall be air-dry, clean, mildew and seed free, salt hay or threshed straw of wheat, rye, oats, or barley.

B. Wood Mulch: Wood mulch shall be shredded hardwood or softwood mulch obtained from a local source harvested in a sustainable manner and salt free and free from deleterious materials and suitable as a top dressing of trees and shrubs. Mulch shall have the characteristics of retaining moisture, forming a mat not susceptible to spreading by wind or rain, and providing a suitable growth medium for plants and shall be free of soil, rocks, weeds, sawdust, dirt, garbage, or other debris.
   1. Hardwood Mulch: Shredded hardwood mulch shall consist of long fibrous interlocking strands.
   2. Softwood Mulch: Softwood mulch shall be medium sized softwood material 1/2 to 3 inches with fines of 1/2 inches and below produced from douglas fir, hemlock, or red cedar.
   3. Color: Natural.

C. Mineral Mulch: Mineral mulch shall consist of decomposed granite, crushed rock, or gravel. Mulch shall be hard, durable stone, washed free of loam, sand, clay, and other foreign substances.
   1. Where wood mulch is shown or specified, mineral mulch shall be used where regionally appropriate or where wood mulch is not readily available.
   2. Size Range: 3/4 inch maximum 1/4 inch minimum.
   3. Color: Readily available natural gravel color range.

D. Pine Bark or Pine Needle Mulch shall not be used.

2.12 TREE STAKING

A. Tomahawk Tree Stabilizer and Fertilization System manufactured by Border Concepts, Inc. (800)845-3343.

1. Part # 82100 – 42 inch Tomahawk
2. Part # 82101 – 32 inch Tomahawk

2.13 WATER

A. Potable water, hose, and other watering equipment.

2.14 WEED MAT

A. 4.1 oz., woven polypropylene, needle-punched fabric, weed barrier.

2.15 STEEL EDGING

A. 1/8-inch x 4-inch interlocking steel edging, staked with metal stakes sufficiently to hold in place.

2.16 EROSION CONTROL BLANKET

A. Rolled Erosion Control Products shall have current QDOR™ (Quality Data Oversight and Review) status issued by the Erosion Control Technology Council and shall meet state or agency specific requirements. Evidence of QDOR™ approval shall accompany the product shipped to the job site for ready identification by the contractor or an agency inspector.

PART 3 - EXECUTION

3.1 PREPARATION

A. If project completion date prohibits in-season planting, prepare for out-of-season seeding or sodding so that lawns shall be completed and ready for acceptance at time of project completion.

B. Unsuitable Subsoils: Locations containing unsuitable subsoil shall be treated by one or more of the following:
1. Where unsuitability is deemed by Owner to be due to excessive compaction caused by heavy equipment and where natural subsoil is other than AASHTO classification of A6 or A7, loosen such areas with spikes, discing, or other means to loosen soil to condition acceptable to Owner. Loosen soil to minimum depth of 12 inches with additional loosening as required to obtain adequate drainage. Contractor may introduce peat moss, sand, or organic matter into the subsoil to obtain adequate drainage. Such remedial measures shall be considered as incidental, without additional cost to Owner.
2. Where unsuitability is deemed by Owner to be due to presence of boards, mortar, concrete, or other construction materials in sub-grade and where natural subsoil is other than AASHTO classification of A6 or A7, remove debris and objectionable material. Such remedial measures shall be considered as incidental, without additional cost to Owner.
3. Where unsuitability is deemed by Owner to be because natural subsoil falls into AASHTO classification of A6 or A7 and contains moisture in excess of 30 percent, then installation of sub-drainage system or other means described elsewhere in Specifications shall be used. Where such conditions have not been known or revealed prior to planting time and they have not been recognized in preparation of The Drawings and Specifications, then Owner shall issue pricing order to install proper remedial measures.

C. Unsuitable Topsoil: Locations containing unsuitable topsoil shall be treated by one or more of the following:
1. Where unsuitability is deemed by Owner to be because of presence of objectionable weeds; litter; sods; stiff clay; toxic substances; herbicides or other material which may be harmful to plant growth, then topsoil shall be removed from the site and disposed of in a legal manner.
2. Where unsuitability is deemed by Owner to be because of presence of the stumps, roots; stones larger than 1 inch in diameter; less than 3 percent organic material; low or high pH range, remove objectionable material and amend topsoil to meet the requirements specified in part 2 above. Such remedial measures shall be considered as incidental, without additional cost to Owner.

D. Perform planting operations at steady rate of work unless weather conditions make it impossible to work. No plant material shall be planted in frozen ground.

E. Tree and Shrub Preparation

1. Dig bare-rooted shrubs with adequate fibrous roots. Cover roots with uniformly thick coating of mud by being puddled immediately after they are dug, or packed in moist straw or moss.
2. Dig ball and burlap plants with firm natural balls of earth of diameter and depth to include fibrous roots.
3. Protect roots or balls of plants at all times from sun and drying winds.
4. Ball and burlap plants which cannot be planted immediately upon delivery shall be set on ground and protected with soil, wet moss, or other acceptable material. Heel-in bare rooted plants that cannot be planted immediately upon delivery. All shall be kept moist.
5. Open and separate bundles of plants before roots are covered. Prevent air pockets among roots. During planting operations, cover bare roots with canvas, hay, or other suitable material. Plants shall not be bound with wire or rope which will result in damage to bark or branches.

F. Sod and Seed Bed Preparation

1. Newly Graded Subgrades:
   a. Do not place topsoil until subgrade has been approved in accordance with Section 02200.
   b. Before placing topsoil, rake subsoil surface clear of stones, debris, and roots. Disk, drag, harrow, or hand rake subgrade to depth of 4 inches and remove stones larger than 1-1/2 inches to provide bond for topsoil.
   c. Spread topsoil to a depth of 4 inches but not less than required to meet finish grades after light rolling and natural settlement. Adjust depth of topsoil in areas adjacent to paved surfaces or curbs to allow for the placement of sod or seed.
2. Unchanged Subgrades: If lawns are to be planted in areas unaltered or undisturbed by excavating, grading, or surface-soil stripping operations, prepare surface as follows:
   a. Remove existing grass, vegetation, and turf. Do not mix into surface soil.
   b. Disk, drag, or harrow surface soil to a depth of at least 6 inches.
   c. Remove stones larger that 1-1/2 inch in any dimension and sticks, roots, trash, and other extraneous matter.
   d. Legally dispose of waste material, including grass, vegetation, and turf.
   e. Adjust depth of topsoil in areas adjacent to paved surfaces or curbs to allow for the placement of sod or seed.
3. Incorporate soil amendments and commercial fertilizer into the top 4 inches of topsoil to achieve the specified topsoil requirements. Till soil to a homogenous mixture of fine texture.
4. Grade areas to finish grades, filling as needed or removing surplus topsoil. Float areas to smooth, uniform grade as indicated on the Drawings. Lawn areas shall slope to drain.
5. Where no grades are shown, areas shall have a smooth and continual grade between existing or fixed controls, such as walks, curbs, catch basin, steps, or buildings. Roll, scarify, rake, and level as necessary to obtain true, even lawn surfaces. Finish grades shall meet approval of Owner.
6. Sod and seed beds shall be firmed by rolling before seeding begins.

G. Groundcover Bed Preparation:

1. Grade areas to finish grades, filling as needed or removing surplus topsoil. Float areas to smooth, uniform grade as indicated on the Drawings.
2. Set out and space groundcover 12 inches apart maximum.
3. Dig holes large enough to allow spreading of roots, and backfill with planting soil.
4. Remove groundcover from pots.
5. Work soil around roots to eliminate air pockets and leave a slight saucer indention around plants to hold water.
6. Water thoroughly after planting taking care not to cover plant crowns with wet soil.
7. Protect plants from hot sun and wind; remove protection when plants show evidence of recovery from transplanting shock.

H. Island Preparation:

1. Excavate compacted soil to a depth of 24 inches.
2. Maintain required angles of repose of adjacent materials as shown on the Drawings. Do not excavate subgrades of adjacent paving, structures, hardscapes, or other new or existing improvements.
3. Scarify sides of excavation pit smeared or smoothed during excavation.
4. Subsoil or topsoil removed from islands shall not be used in planting soil mix.

5. Notify Owner's CEC if subsoil conditions evidence unexpected water seepage or retention within excavation area.
6. Backfill islands in 9 inch lifts with planting soil mix specified herein. Tamp each lift lightly to prevent settling.
7. Grade areas to finish grades, filling as needed to allow positive drainage. Float areas to a smooth, uniform grade as indicated on the Drawings.

I. Raised Planter Preparation:
1. Excavate compacted soil and construction debris within raised planter to minimum 12 inches below finish grade of adjacent sidewalk.
2. Notify Owner's CEC if subsoil conditions evidence unexpected water seepage or retention with the excavation area.
3. Scarify bottom of excavation and provide positive drainage to drainage pipe.
4. Install drainage pipe as shown in the drawings.
5. Backfill raised planter in 9 inch lifts with specified planting soil mix to within 1 inch of bottom edge of wall cap. Tamp each lift lightly to prevent settling. If settling occurs prior to planting add additional planting soil mix.
6. Grade areas to finish grades, filling as needed to allow positive drainage. Float areas to a smooth, uniform grade as indicated on the Drawings.

3.2 PROTECTION

A. Topsoil which must be transported across finished sidewalks shall be delivered in such manner that no damage will be done to sidewalks.

B. Before commencing work, trees and shrubs that are to be saved shall be protected from damage by placement of fencing flagged for visibility or some other suitable protective procedure approved by Owner.

C. Trucks or other equipment shall not be driven or parked within drip line of any tree unless tree overspreads paved area.

D. Use precautionary measures when performing work around trees, sidewalks, pavements, utilities, and other features either existing or previously installed.

E. Adjust depth of earthwork and topsoil when working immediately adjacent to aforementioned features in order to prevent disturbing tree roots, undermining sidewalks and pavements, and damage in general to other features either existing or previously installed.

F. Cover plants transported to project in open vehicles with tarpaulins or other suitable covers securely fastened to body of vehicle to prevent injury to plants. Closed vehicles shall be adequately ventilated to prevent overheating of plants. Evidence of inadequate protection following digging, carelessness while in transit, or improper handling or storage shall be cause for rejection. Plants shall be kept moist, fresh, and protected. Such protection shall encompass entire period during which plants are in transit, being handled, or are in temporary storage.

G. Plants shall not be delivered to the site more than seven days prior to planting. Plants not planted within 48 hours of delivery, shall be healed in (covered with sawdust, soil or mulch), and the containers or balls protected from wind and temperature and kept moist until planting.

H. Where excavation, fill, or grading is required within drip line of trees that are to remain, work shall be performed as follows:
1. Trenching: When trenching occurs around trees to remain, tree roots shall not be cut but trench shall be tunneled under or around roots by careful hand digging without injury to roots.
2. Raising Grades:
   a. Where fill not exceeding 16 inches is required, clean, washed gravel graded from 1 inch to 2 inches in size shall be placed directly around tree trunk. Extend gravel out from trunk on all sides minimum of 18 inches and finish approximately 2 inches above finished grade at tree. Install gravel be-

fore any earth fill is placed. New earth fill shall not be left in contact with trunks of trees requiring fill.

b. Where fill exceeding 16 inches is required, construct dry-laid tree well around trunk of tree. Tree well shall extend out from trunk on all sides minimum of 3 feet and to 3 inches above finish grade. Place coarse-graded rock directly around tree well extending out to drip line of tree. Place clean, washed gravel graded from 1 inch to 2 inches in size directly over coarse rock to depth of 3 inches. Place approved backfill material directly over washed gravel to desired finish grade.

3. Lowering Grades: Existing trees in areas where new finish grade is to be lowered shall have regrading work done by hand to elevation indicated on The Drawings. Roots as required shall be cut cleanly 3 inches below finished grade and scars covered with tree paint.

4. Trees marked for preservation that are more than 6 inches above proposed grades shall stand on broad rounded mounds and graded smoothly into lower level. Trees located more than 16 inches above proposed grades shall have dry-laid stone wall or other retaining structure as detailed on The Drawings constructed minimum of 5 feet from trunk. Exposed or broken roots shall be cut clean and covered with topsoil.

3.3 PLANTING BED ESTABLISHMENT

A. Prior to preparing planting beds, the area shall conform to the lines and grades shown on the plans and the condition of the subsoil shall be approved by the Owner.

B. Contractor shall verify the location of any underground utilities on site.

C. Planting beds where existing subsoil is determined by Owner to be unsuitable for plant growth in accordance paragraph Unsuitable Subsoil herein shall be excavated to a depth of 24 inches or as needed to provide adequate drainage. Replace excavated soil with planting soil mix.

D. Planting beds where existing subsoil is acceptable by Owner shall be prepared as follows:

1. Seven days prior to commencing establishment of the planting areas, apply non selective herbicide. Remove dead vegetation.
2. Loosen subsoil to a depth of 12 inches. Remove stones larger than 1 inch in any dimension, sticks, roots, rubbish, and other extraneous matter and legally dispose of them off site.
3. Spread 3 inches of soil conditioner over the surface of the planting area and incorporate into the top 12 inches of the soil. Prior to spreading soil conditioner, add or remove topsoil as needed to accommodate addition of soil conditioner and to achieve finish grade.
4. Till planting soil mix to a homogenous mixture of fine texture.
5. Float areas to smooth, uniform grade providing positive drainage out of planting beds and away from structures or as indicated on the Drawings.

E. Apply slow release fertilizer at a rate of 1-1/2 pounds per 100 square feet for beds areas or as recommended by manufacturer and incorporate into the top 8 inches.

3.4 TREE AND SHRUB PLANTING

A. Plants too large for 2 persons to lift in and out of holes shall be placed with sling. Do not rock trees in holes to raise.

B. If rock or other underground obstruction is encountered, Owner may require plant pits to be relocated, pits enlarged, or plants deleted from project.

C. Make adjustments in locations as directed. In event that pits or areas for planting are prepared and backfilled with planting soil mix or topsoil to grade prior to commencement of lawn operations, they shall be so marked that when planting proceeds, they can be readily located. In case underground obstructions such as ledges or utilities are encountered, change location under direction of Owner without charge.

D. Holes for trees shall be at least 2 feet greater in diameter than spread of root system and at least 6 inches deeper than root ball or as shown on the Drawings. Holes for shrubs shall be at least 2 feet greater in diameter than the

spread of root system and at least 2 feet deep or as shown on the Drawings. Holes for vines shall be at least 12 inches greater in diameter than the spread of rootball at least 12 inches deep.

E. Backfill tree holes and shrub beds with planting soil mix. Apply slow release fertilizer at a rate of 1/4 pounds per caliper inch for trees. Incorporate fertilizer into the planting soil mix.

F. Plants shall be planted at same depth as they had previously grown or as shown on the drawings. Backfill planting soil mix in layers of not more than 8 inches and each layer watered sufficiently to settle before next layer is placed. Tamp planting soil mix under edges of balled plants. Use enough planting soil mix to bring surfaces to finish grade when settled.
   1. Provide saucer around each plant as shown on The Drawings.
   2. Soak plants with water twice within first 24 hours after time of planting. Apply water with low pressure so as to soak in thoroughly without dislodging topsoil.

G. Tree Staking: Install Tomahawk Tree Stabilizer and Fertilization System as shown on the drawings. Use one size larger than required by manufacturer.

3.5 MISCELLANEOUS INSTALLATIONS

A. Weed Mat: Place weed mat under planting areas that will not be seeded and in any other locations as shown on the Drawings. Cover weed mat with 4 inches of mulch and secure in place with soil staples.

B. Mulch: Place 4 inches of mulch as a top dressing in planting beds. Mulch single trees or shrubs to outside edge of saucer.

C. Peg sodded slopes greater than 3:1 to hold in place.

D. Areas to be covered with erosion control blankets shall be properly prepared, fertilized, and seeded before blanket is applied. When blanket is unrolled, netting shall be on top and fibers in contact with soil. In ditches, apply blanket in direction of flow of water. On slopes, apply blankets vertically on slope. Overlap ends and sides 6 inches and staple per manufacturer's written instructions.

3.6 AREAS TO BE TURFED

A. Unless otherwise shown on the plans, disturbed areas including out-lots shall be permanently sodded and seeded.

B. Place 16-24 inch wide strip of solid slab sod adjacent to paved surfaces including sidewalks, curbs, walls, drainage structures, and vehicular pavement as shown on the drawings.

C. Continually seed remaining disturbed areas until fully turfed with no bare spots.

3.7 SOIL STABILIZATION

A. Provide one or more of the following techniques to prevent soil eroding from denuded areas and leaving the site. Refer to stabilization requirements in Section 02270.
   1. Temporary Seeding or Stabilization.
   2. Permanent Seeding, Sodding, or Mulching.

3.8 SEEDING

A. Do not perform seeding in windy conditions.

B. Seeding shall be dispersed in 2 directions at right angles to each other.

C. Permanently seed and mulch cut and fill slopes as construction proceeds to extent considered desirable and practical. In the event it is not practical to seed areas, slopes shall be stabilized with straw mulch and tackifier, bonded fiber matrix, netting, blankets or other means to reduce the erosive potential of the area.

D. Seed lawn areas by sowing evenly with approved mechanical seeder at rate of minimum of 3 pounds per 1,000 square feet. Culti-packer or approved similar equipment may be used to cover seed and to form seedbed in one operation. In areas inaccessible to culti-packer, lightly rake seeded ground with flexible rakes and roll with water ballast roller. After rolling mulch with straw mulch at the rate of 2 tons per acre.

E. Surface layer of soil for seeded areas shall be kept moist during germination period. Water seeded areas twice first week to minimum depth of 6 inches with fine spray and once per week thereafter as necessary to supplement natural rain to equivalent of 6 inches depth.

3.9 SODDING

A. Cut and lay sod on same day. Only healthy vigorous growing sod shall be laid.

B. Lay sod across slope and tightly together to result in solid coverage free of gaps.

C. Roll or firmly but lightly tamp new sod with suitable wooden or metal tamper sufficiently to set or press sod into underlying soil.

D. All finished sodding shall be smooth and free of lumps and depressions.

E. After sodding has been completed, clean up and thoroughly water newly-sodded areas.

3.10 MAINTENANCE DURING CONSTRUCTION

A. Begin maintenance operations immediately after each plant is planted and continue as required until acceptance. Water, mulch, weed, prune, spray, fertilize, cultivate, and otherwise maintain and protect plants. Reset settled plants to proper grade and position, restore planting saucers, and remove dead, diseased, or unhealthy plant material. Tighten and repair stakes and wires. Correct defective work as soon as possible after it becomes apparent and weather and season permit.

B. Upon completion of the planting operations, clean up landscaped areas to be free of stones, containers, trash, and other waste and debris to leave area in a neat and well groomed appearance.

C. Supplement rainfall as required to provide an equivalent of 1 inch of water per week until the plants have rooted and are established.

D. Maintain all plant material in a healthy, vigorous growing condition.

E. Make weekly inspections to determine moisture content of soil and adjust watering schedule established by irrigation system installer to fit conditions.

F. After grass growth has started, reseed or sod areas that fail to show uniform stand of grass in accordance with The Drawings and as specified herein. Continue Reseeding and sodding such areas repeatedly until areas are covered with satisfactory growth of grass. Perform removal and replacement or topsoil conditioning if required to facilitate establishment of grass.

G. Water in such manner and as frequently as is deemed necessary by Owner to assure continued growth of healthy grass. Water areas of site in such a manner as to prevent erosion due to excessive quantities applied over small areas and to avoid damage to finished surface due to watering equipment.

H. Provide water for execution and maintenance at no expense to Owner. Furnish portable tanks, pumps, hose, pipe, connections, nozzles, and any other equipment required to transport water from available outlets and apply it to seeded areas in approved manner.

I. Mowing:

1. Initiate mowing of turf grass areas when grass has attained height of 3 inches and roots are firmly established. Maintain turf grass height at 2 1/2 to 3 inches at subsequent cuttings depending on time of year. Remove no more than 1/3 of grass leaf at any cutting and cutting shall not occur more than 10 days apart.
2. Mow native grass areas no more than 3 times per year to a height of no less than 4 inches.

J. Remove heavy cuttings to prevent destruction of underlying turf. If weeds or other undesirable vegetation threaten to smother planted species, such vegetation shall be mowed or, in case of rank growths, shall be uprooted, raked and removed from area by methods approved by Owner.

K. Remove weeds and other undesirable vegetation by applying herbicides as recommended by the manufacturer or by uprooting. Rake and remove uprooted vegetation from area by methods approved by Owner.

L. Protect seeded area from pedestrian or vehicular trespassing while grass is germinating. Provide fences, signs, barriers, or other necessary temporary protective devices. Repair damage resulting from trespass, erosion, washout, settlement, or other causes.

M. Remove fences, signs, barriers, or other temporary protective devices after final acceptance.

N. Remove and replace diseased, distressed, dead, or rejected plants prior to Substantial Completion Date.

O. Replacements shall be plants of same variety and size specified on The Drawings. Furnish and plant as specified herein. Replacements resulting from removal, loss, or damage due to occupancy of project in any part, vandalism, physical damage by animals, vehicles, etc., and losses due to curtailment of water by local authorities will be approved and paid for by Owner.

P. Grassed areas damaged during process of work shall be restored or repaired to condition satisfactory to the Owner. Fill, grade, re-fertilize, replant, or mulch as required to restore to contract requirements.

3.11 QUALITY CONTROL

A. Construction Testing Laboratory Quality Control: A Construction Testing Laboratory (CTL) selected and paid for by the Contractor, will be retained to perform topsoil testing and analysis of <u>in-place topsoil</u> during topsoil placement operations.
   1. Topsoil Analysis: Collect 5 random representative samples from the in-place topsoil. Combine samples and test as a composite for percentages of organic matter; presence of herbicides, percentage of sand, silt, and clay content; deleterious material; pH; micro and macro nutrient content; and mineral and plant-nutrient content of topsoil.
   2. Topsoil Depth Inspection: Verify depth of topsoil placement as follows:
      a. Open Lawn Areas: 50 feet on center, minimum 1 inspection per area
      b. Parking Islands: One inspection per 200 square feet of sod and seed bed preparation area, minimum one per island.
   3. Submit test reports Owner and Owner's LA or CEC.

B. Contractor Quality Control: Retain an independent soil testing laboratory to sample and test <u>imported topsoil</u>.
   1. Topsoil Analysis: Collect 5 random samples from the topsoil borrow area or areas. Combine samples and test as a composite for percentages of organic matter; presence of herbicides; percentage of sand, silt, and clay content; deleterious material; pH; and mineral and plant-nutrient content of topsoil.
   2. Submit topsoil borrow area test reports to Owner and Owner's LA or Owner's Civil Engineering Consultant (CEC) minimum 6 weeks prior to delivery to site.

3.12 EXTENDED MAINTENANCE – THE OWNER WILL BE RESPONSIBLE FOR MAINTENANCE FROM THE DATE OF ACCEPTANCE

END OF SECTION

INDEX TO

SECTION 02200 - EARTHWORK

SECTION

EARTHWORK

PART 1 - PRODUCTS

1.01 MATERIALS:

A. General: Where the terms "approved", "suitable", "unsuitable" and similar designations are used in specifications section pertaining to earthwork, it means earth or material designated as being approved, suitable or unsuitable for their intended use by the soils technician of the Engineer.

B. Suitable Soil Materials are defined as those complying with ASTM D-2487 soil classification groups: GW, GP, GM, SM, SW, and SP.

C. Unsuitable Soil Materials are defined as those complying with ASTM D-2487 soil classification groups GC, SC, MH, ML, CL, CH, OL, OH, PT. Clays, silts, and organic soils will be considered as unsuitable materials. Excess water in materials will be a basis for establishing unsuitable material regardless of gradation.

D. Backfill and Fill Materials shall be suitable soil materials, free of clay, rock or gravel larger than 2" in any dimension, debris, waste, frozen materials, vegetable and other deleterious matter. Suitable materials for earth fill shall generally be composed of sands, clay-sand and silt-sand mixtures and shall be approved by the soils technician or the Engineer prior to being incorporated in fills.

E. Borrow shall consists of sand or sand clay soils capable of being readily shaped and compacted to the required densities, and shall be free of roots, trash and other deleterious material.

PART 2 - EXECUTION

2.01 TOP SOIL

A. Contractor shall strip and stockpile topsoil.

B. Topsoil shall be placed to a depth of 4" over all disturbed areas.

C. Any remaining topsoil will be hauled off site and disposed of at the Contractor's expense.

D. Additional topsoil shall meet Georgia Department of Transportation Specification 893.1. Any additional topsoil which is required to repair disturbed areas and complete the contract shall be provided by the Contractor at his expense.

2.02 EXCAVATION

A. Excavation is unclassified and includes excavation to subgrade elevations indicated, regardless of character of materials and obstructions encountered.

B. All excavation shall be in conformity with the lines, grades and cross sections shown on the Plans or established by the Engineer. All suitable material removed in the excavation shall be used as far as practicable in formation of embankment, subgrades and shoulders and at such other places as may be indicated on the Plans or directed by the Engineer.

C. Unauthorized Excavation consists of removal or loosening of materials beyond indicated subgrade elevations or dimensions without specific directions of the Engineer. Unauthorized excavation, as well as remedial work directed by Engineer, and as specified herein shall be at Contractor's expense.

Under footings, foundation bases, or retaining walls, fill unauthorized excavations by extending indicated bottom elevation of footing or base to the bottom of the excavation, without altering required top elevation.

Elsewhere, backfill and compact unauthorized walls, fill unauthorized excavations as specified for authorized excavations of same classification, unless otherwise directed by the Engineer.

D. Additional Excavation: When excavation has reached required subgrade elevations and unsuitable materials exist, carry excavations deeper and replace excavated materials as directed by the Engineer. Dispose of unsuitable material as directed by the Engineer.

The Contractor shall dispose of unsuitable and surplus materials except where the Engineer permits the use of such fill slopes, or unless specific disposal areas are shown on the Plans.

E. Dewatering: Prevent surface water and subsurface or ground water flowing into excavations and from flooding project site and surrounding area. Do not allow water to accumulate in excavations. Remove water to prevent softening of roadway subgrades and foundation bottoms, undercutting footings, and soil changes detrimental to stability of subgrades and foundations. Provide and maintain pumps, well points, sumps, suction and discharge lines, and other dewatering system components necessary to convey water away from excavations.

Establish and maintain temporary drainage ditches and other diversions outside excavation limits to convey rain water and water removed from excavations to collecting or run-off areas. Do not use trench excavations as temporary drainage ditches.

The Contractor will be responsible for all damage incurred in handling water conditions.

F. Material Storage: Stockpile satisfactory excavated materials where directed, until required for backfill or fill. Place, grade and shape stockpiles for proper drainage and to minimize erosion. Locate and retain soil materials away from edge of excavations. Do not store within drip-line of trees indicated to remain.

G. Excavation for Structures: Conform to elevations and dimensions shown within a tolerance of plus or minus 0.10', and extending of sufficient distance from footings and foundations to permit placing and removal of concrete framework, installations to permit placing and removal of concrete framework, installation of services, other constructions, and for inspection.

In excavating for footings and foundations, take care not to disturb bottom of excavation. Excavate by hand to final grade before concrete reinforcement is placed. Trim bottoms to required lines and grades to leave solid base to receive other work.

H. Proper drainage shall be maintained at all times.

I. Perform excavation within the critical root zones of large trees to remain by hand or by other approved means which will not result in twisting, tearing, breakage or other injury to roots remaining on the tree. Protect existing trees and shrubs at all times during earthwork operations. No trees shall be removed without prior approval of the Park and Tree Department.

2.03 BORROW

A. Shall be excavated and hauled by the Contractor from his own sources and shall meet the requirements as specified.

B. Borrow shall be procured by the Contractor.

C. Contractor shall bear all expenses in developing borrow sources including drying material, haul roads, excavation and hauling.

2.04 GROUND SURFACE PREPARATION FOR FILL

A. All vegetation such as roots, brush, heavy sods, heavy growth of grass, decayed vegetation matter, rubbish, and other unsuitable material within the areas to be filled shall be stripped and removed prior to beginning the fill operation.

B. Sloped ground surfaces steeper than 1 vertical to 4 horizontal, on which fill is to be placed shall be plowed, stepped, benched or broken up as directed, in such a manner that the fill material will bond with the existing surface.

C. Surfaces on which fill is to be placed and compacted shall be wetted or dried as may be required to obtain the specified compaction.

2.05 FILL

A. Shall be reasonably free from roots, organic material, trash and stones having maximum dimensions of 6 inches.

B. Shall be placed in successive horizontal layers of 8 inches (4 inches for hand tamped compaction) in loose depth for the full width of the cross-section and compacted as required with heavy compaction equipment.

2.06 FINISH GRADING

A. All areas covered by the project including excavated and filled sections and adjacent transition areas shall be smooth graded and free from irregular surface changes.

B. Degree of finish shall be that ordinarily obtainable from either blade-grader or scraper operations, supplemented with hand raking and finishing, except as otherwise specified.

C. The finished surface of unpaved areas shall be not more than 0.05' feet above or below the established grade or designed cross-section. Grading shall be done in order that no ponding will occur.

D. Ditches shall be finished smooth to reduce erosion and permit adequate drainage.

2.07 DISPOSAL OF WASTE MATERIAL

A. All vegetation, roots, brush, sod, broken pavements,curb and gutter, rubbish, and other unsuitable or surplus material stripped or removed from the limits of construction shall be disposed of by the Contractor.

2.08 PROTECTION

A. Protect existing trees and shrubs at all times during earthwork operations. No trees shall be removed without prior acceptance of the Owner.

B. The Contractor shall be responsible for protection of below grade utilities shown on the drawings or indicated to him by the Owner at all times during earthwork operations.

C. Graded areas shall be protected from traffic, erosion, settlement, or any washing away that may occur from any cause prior to acceptance.

D. Any repair or reestablishment of grades prior to final acceptance shall be at the Contractors expense.

PART 3 - TESTING

3.01 COMPACTION TESTING

A. General: Compaction of earth fill and all pavement subgrades shall be performed to the percentage of maximum standard of modified dry densities and to the depths as indicated below:

A. Roadway Subgrades: 100% Standard (ASTM Test D-698) Compact top 12" in Parking areas and top 15" in Driveways.

B. Subgrades under pavement removed and replaced for utility installations: 100% Standard (ASTM Test D-698) to 12 inch depth.

C. Structural Fill under all structures, slabs and steps: 98% Standard (ASTM Test D-698). Compact top 12 inches of subgrade and each layer of fill.

D. Subgrade below Sidewalks and Curb and Gutters: 97% Standard (ASTM Test D-698) Compact top 6 inches.

E. Unpaved Areas to be grassed, sodded or landscaped: 90% Standard (ASTM Test D-698) full depth.

All other areas not described above: as directed by the Engineer.

B. Moisture Control: All compaction shall be performed at material moisture contents within 3 percentage points, plus or minus, of optimum. Where subgrade or layer of soil material must be moisture conditioned before compaction, uniformly apply water to surface of subgrade, or layer of soil material, to prevent free water appearing on surface during or subsequent to compaction operations. Remove, and replace, or scarify and air dry, soil material that is too wet to permit compaction to specified density. Soil material that has been removed because it is too wet to permit compaction may be stockpiled or spread and allowed to dry. Assist drying by dicing, harrowing or pulverizing until moisture content to a satisfactory value.

C. Field Density Tests: Tests shall be made in accordance with ASTM Method D-1556 and/or ASTM 2922. Minimum testing frequency shall be based on the most stringent of the following requirements (as applicable). Additional tests may be required by the Engineer in areas he deems critical.

- One every layer of fill,
- One every 200 cubic yards of fill,
- One every 250 square yards of roadway subgrade of fill
- One every building subgrade
- Areas where degree of compaction is in question

If in opinion of Engineer, based on testing service reports and inspection, subgrade or fills which have been placed are below specified density, additional compaction and testing will be required.

D. Proof Rolling: Proof rolling of the subbase or subgrade of all areas of new road paving will be required. Equipment shall have a minimum axle load of 6,000 pounds and a maximum axle load of 15,000 pounds or as determined by the Engineer.

INDEX TO

SECTION 02270 - EROSION AND SEDIMENTATION CONTROL

PART 1 - PRODUCTS

1.01 CHEMICALS FOR DUST CONTROL:

A. Calcium Chloride, Anionic Asphalt Emulsion, Latex Emulsion or Resin-in-Water Emulsion may be used for dust control.

1.02 SILT FENCE FABRIC:

A. Silt fence fabric shall be a woven fabric certified to meet FHWA's Task Force 25 minimum roll average per ASTM-D-4354. The geotextile fabric shall be a woven sheet of plastic yarn, of a long chain synthetic polymer composed of at least 85% by weight propylene, ethylene, amide, ester, or vinylidene chloride, and shall contain stabilizer and/or inhibitors added to the base plastic to make the filaments resistant to deterioration due to ultra-violet and/or heat exposure. The fabric should be finished so that the filaments will retain their relative position with respect to each other. The fabric shall be free of defects, rips, holes, or flaws.

The fabric shall meet the following requirements:

Woven Fabrics

Grab Strength	90 lbs.
Mullen Burst Strength	250 lbs.
UV Resistance	90%
Permittivity	15 gal/min/sf.

Product shall be equivalent to EXXON GTF-180 Fabric or AMOCO Woven Construction Fabric No. 1380.

Silt fencing shall not be placed in waterways or areas of concentrated flow. Type "C" wire-reinforced silt fence shall be used where fill slopes exceed 3:1.

1.03 GABIONS:

A. Gabions shall be constructed of heavy galvanized steel wire mesh with a zinc coating of triple hexagon weave. The mesh wire diameter for the galvanized gabions shall be 2.2 mm (.0866") ± 2-1/2%; the mesh edge wire shall be not less than 2.7 mm - 2-1/2%. The lacing wire for binding the netting units together shall be 2.2 mm (.0866") + 2-1/2%.

Geotextiles are recommended to be used behind all gabion structures and shall be specified in accordance with AASHTO M288-96 Section 7.5, "Permanent Erosion Control Requirements."

1.04 HAY BALES:

A. Hay bales rectangular in shape shall be bound with wire or nylon to securely contain the material. Pine straw bales may be used in lieu of hay bales. Bales shall be placed in a single row, lengthwise, on the contour and embedded in the soil to a depth of four (4) inches. Bales must be securely anchored in place by stake or bars driven through the bales.

1.05 PLASTIC FILTER FABRIC:

A. Plastic filter fabric shall be a pervious sheet of plastic yarn, of a long chain synthetic polymer composed of at least 85% by weight propylene, ethylene, amide, ester, or vinylidene chloride, and shall contain stabilizers and/or inhibitors added to the base plastic to make the filaments resistant to deterioration due to ultra-violet and/or heat exposure. The cloth should be finished so that the filaments will retain their relative position with respect to each other. The cloth shall be free of defects, rips, holes, or flaws. During shipment and storage, the filter fabric shall be wrapped in a protective material. The fabric shall meet the following requirements.

Woven Fabrics:

Tensile Strength (any direction)	200 lbs.
Bursting Strength	400 psi
Elongation Before Breaking	15%
Permittiviy	4 gal/min/sf

Product shall be equivalent to EXXON GTF-400E or AMOCO Woven Construction Fabric No. 2002.

B. Seams - Fabric may be sewn together with thread of a material having the same chemical requirements as the material forming the fabric or shall be bonded by cementing or by heat. The strength of the seams shall be equal to that of the unaged fabric. Fabrics to be used under Rip-Rap are allowed to be bonded or sewn together forming sections not less than six feet wide.

1.06 SHEET PILING:

A. Sheet piling shall be treated timber (0.5 CCA), steel (minimum 3/8-inch thick), or other material accepted on a case by case basis by the Engineer for the site at which the piling is used.

1.07 STONE:

A. Stone shall be hard quarry, granite or field stone and shall be of such quality that the stone will not disintegrate on exposure to water or weather. The stone size, type and weight shall be as shown in conjunction with the structure with which it is associated. The stone shall be accepted by the Engineer prior to delivery.

1.08 TREATED TIMBERS:

A. Treated timbers (0.5 CCA) shall be a nominal 4" by 4" and of varying length to accommodate the size of the proposed structure.

1.09 RIP-RAP:

A. Rip-rap shall be hard quarry or field stone, and shall be of such quality that they will not disintegrate on exposure to water and weather. The stone shall range in weight from a minimum of 25 pounds to a maximum of 150 pounds. At least 50 percent of the stone pieces shall weigh more than 60 pounds. The stone pieces shall have a minimum plane dimension of 12 inches. The stone analysis, source and other pertinent data shall be submitted for review by the Engineer prior to delivery. The filter fabric for permanent Rip-rap shall be Mirafi 140N or equivalent. Rip Rap shall not be placed on slopes steeper than 1.5 horizontal to 1.0 vertical.

PART 2 - EXECUTION

2.01 GENERAL:

A. Every effort shall reasonably be employed by the Contractor to control erosion with the use of, but not limited to, terraces, grassing, and silt fencing during the project. All erosion and sedimentation control measures or facilities, whether temporary or permanent, shall be continuously maintained by the Contractor so as to be effective, or as ordered by the Owner.

2.02 BUFFER ZONE:

A. Buffer zone is an undisturbed zone or "green belt" surrounding the site, bordering streams or environmentally sensitive areas. Contractors shall not trespass on or in these areas unless he has prior acceptance by the Owner. Trespass in these areas will not be permitted unless there is no alternative method to accomplish the task. Cost shall not come into consideration in the evaluation of this type of request.

2.03 CONSTRUCTION EXIT:

A. Construction exits shall be located at the exits of the project to remove mud from the tires of all vehicles leaving the site. The construction exit shall consist of a minimum of six (6) inch thick pad of washed stone meeting Section AASHTO M288-96, Section 7.4, Stabilization Requirements. The aggregate size shall be in accordance with National Stone Association R-2 (1 ½"-3 ½" diameter in size and of the necessary length to accomplish the task for which it is intended. The pad may require periodic top dressing with 2" of similar stone. Geotextiles are required and a Separation/ Stabilization fabric to keep the aggregate stone from becoming contaminated with subgrade soils. The geotextile shall be based on AASHTO M288-96 Specifications. The entrance area must be excavated to a depth of 3 inches and be cleaned of all vegetation and roots. Geotextile underliner must be placed the full length and width of the entrance.

2.04 DISTURBED AREA STABILIZATION:

A. Vegetative cover will be placed on completed areas. This vegetative plan will be carried out on road cut and fill slopes, shoulders, and other critical areas created by construction. Plant grass seed as soon as construction in an area is completed. Planting will be made to control erosion, to reduce damage from sediment and runoff to downstream areas and to improve the safety and beauty of the development area.

Due to grading and construction, the areas to be treated are mainly subsoil and substrate. Fertility is low and the physical characteristics of the exposed material are unfavorable to all but the most hardy plants.

Conventional Seeding Equipment - Grade, shape and smooth where needed to provide for safe equipment operation at seeding time and for maintenance purposes. The lime and fertilizer in dry form will be spread uniformly over the area immediately before seedbed preparation. A seedbed will be prepared by scarifying to a depth of 1 to 4 inches as determined on site. The seedbed must be well pulverized, smoothed and firmed. Seeding will be by either a cultipacker-seeder, drill, rotary seeder, mechanical seeder, hand seeder or hydro-seeding. Seed will be distributed uniformly over a freshly prepared seedbed and covered lightly. Within 24 hours after seeding, with exception to hydro-seeding, straw or hay mulch will be spread uniformly over the area, leaving about 25 percent of the ground surface exposed. Mulch will be spread with blower-type mulch equipment or by hand and anchored immediately after it

is spread. A disk harrow with the disk set straight or a special packer disk may be used to press the mulch into the soil.

The per acre application rates are as follows using conventional seeding equipment on slopes less than 3:1:

Soil Treatment	Application Rate/Acre
Agricultural limestone	4000 #/acre
Fertilizer, 10-10-10 (with micro-nutrients)	1500 #/acre
Mulch, straw or hay	4000 #/acre

2.

Seed Species	Application Rates/Acre	Planting Dates
Hulled common bermuda grass	10 #	3/1 - 9/30
Rye grass	50 #	10/1 - 2/28
Hay mulch for temporary cover	4000 #	N/A

Top-dressing: Apply when plants are 2 to 4 inches tall

Fertilizer (Ammonium Nitrate 33.5%) at 300 #/acre

If the projects extends in to the second year, fertilizer shall be applied at the rate of 800 #/acre.

2.05 DUST CONTROL ON DISTURBED AREAS:

A. Dust raised from vehicular traffic will be controlled by wetting down the access road with water or by the use of a deliquescent chemical, such as calcium chloride, if the relative humidity is over 30%. Chemicals shall be applied in accordance with the manufacturer's recommendations. Calcium chloride, anionic asphalt emulsion, latex emulsion or resin-in-water emulsion may be used for dust control.

2.06 DOWNDRAIN STRUCTURE:

A. Downdrain structures shall be constructed where shown on the drawings and elsewhere as necessary to carry runoff down slopes to prevent the formation of rills or gullies. Downdrain structures shall be a paved chute, steel or plastic pipe, or sectional pipe at the discretion of the contractor. Outlets of downdrains shall outfall into stabilized areas only. Soil around the inlet shall be compacted to prevent the pipe from being washed out by seepage. Rock rip-rap or other suitable materials shall be placed at the outlet for stabilization.

2.07 GABIONS:

A. Gabions shall be of the size shown on the drawing and as dimensioned in the details on the plans. The gabions shall be laced together along the perimeter of all surfaces and filled with 4" to 8" diameter stone in 3 lifts, with two connecting wires placed between each lift. Care shall be taken to protect the vertical panels from being bent during filling.

2.08 SEDIMENT BARRIER:

A. Sediment barrier shall be constructed of hay bales (pine bales) anchored and embedded into the soil to prevent washout or water washing under the barrier. A minimum of two (2) re-bars, steel pickets or 2" x 2" stakes shall be used per bale and shall be long enough to extend through the bale and be driven into the ground a minimum of 1-1/2 feet. Where two (2) rows are called for, the bales shall be staggered. Bales shall be embedded in the soil to a depth of 4 inches.

Bales shall be placed in a single row, lengthwise, on the contour and embedded in the soil to a depth of four (4) inches. Bales must be securely anchored in place by stakes or bars driven through the bales.

2.09 SILT FENCE:

A. Silt fence shall be placed at the approximate location shown on the plans and installed in accordance with the Georgia Erosion and Sediment Control Manual recommendations. Type "C" wire-reinforced silt fence shall be used where fill slopes exceeds 3:1. Silt fence shall not placed in waterways or areas of concentrated flow.

2.10 STONE PLACEMENT:

A. The minimum thickness or depth of the stone layer shall be shown on the drawings or the detail with which the device is associated. When used with a plastic filter fabric, the stone placing shall begin in a trench at the bottom of the slope with the filter fabric wrapped in stone. The entire mass of stone shall be placed so as to be in conformance with the lines, grades, and thickness shown on the drawings.

2.11 RIP-RAP:

A. Rip-rap shall be placed in accordance with the notes on the drawings. Any rip rap that shall be permanent shall have an underlayment of filter fabric.

2.12 STORM DRAIN OUTLET PROTECTION:

A. Storm drain outlets shall be paved or have a rock or other energy dispersion device associated with it, as called for on the drawings. The length shall be a minimum of six (6) times the pipe diameter and placed on a 1% grade unless otherwise specified on the drawings.

To prevent undermining of the rip-rap apron a separation geotextile shall be used beneath the entire length of apron. The geotextile shall be specified in accordance with AASHTO M288-96, Section 7.5, "Permanent Erosion Control Requirements".

2.13 INLET SEDIMENT TRAP:

A. The Contractor shall erect silt fence or hay bales at and around inlets under construction. Existing inlets in paved areas shall be protected by the use of concrete blocks wrapped with filter fabric as per detail. Sufficient quantities of selected devices shall be utilized to completely protect the entire length of the inlet. Contractor may alternately construct a temporary baffle in the inlet on the effluent pipe per detail providing that accumulated sediment be removed after each erosion event.

2.14 SITE RESTORATION:

A. The site shall be restored in a manner suitable to accommodate the erosion control device or system of devices for the use which they are intended.

2.15 TOPSOIL:

A. If topsoil is stripped and stored on site to be used after construction, the stockpile side slopes shall be 2:1 or flatter. Stockpiled topsoil shall not obstruct natural drainage. Topsoil replacement shall be spread at minimum of 4" thickness.

2.16 SITE SAFETY:

A. The Contractor shall incorporate and utilize all necessary fencing and other safety barriers as necessary, or directed by Owner, to prevent trespassing into potentially dangerous areas of the erosion control area.

END OF SECTION

INDEX TO

SECTION 02485 - GRASSING

SECTION 02485

GRASSING

PART 1 - PRODUCTS

1.01 MATERIALS GENERAL:

A. The Contractor shall, at the time of delivery, furnish the Engineer invoices of all materials, received in order that the application rate of materials may be determined.

1.02 FERTILIZER:

A. 10-10-10, commercial fertilizer of accepted type, conforming to state fertilizer laws.

1.03 LIME:

A. Lime shall be agricultural grade, ground limestone and shall conform to the requirements of the Georgia Department of Agriculture. Lime to be added based on soil tests.

1.04 SEED:

A. All seed shall conform to all State Laws and to all requirements and regulations of the Georgia Department of Agriculture.

B. The several varieties of seed shall be individually packaged or bagged, and tagged to show name of seed, net weight, origin, germination, lot number, and other information required by the Department of Agriculture.

C. The Engineer reserves the right to test, reject, or accept all seed before seeding.

D. Mixtures of different types of seed called for in the seeding schedule shall be weighted and mixed in the proper proportions at the site of the work in the presence of the Engineer.

1.05 SEEDING SCHEDULE:

A. Hulled Bermuda Seeds are to be used at a rate of 40 pounds per acre, and at a depth of 1/4 to 1/8 inch. Pure line seed to be 82% by weight, with a maximum weed seed of 0.50%.

B. In shaded areas, or other areas as directed by the Owner or Engineer, the Contractor shall use a mixture of hulled Bermuda seed at a rate of 25 pounds per acre and carpet seed at a rate of 30 pounds per acre.

C. Temporary grassing shall consist of annual rye grass seed at a rate of 75 pounds per acre.

D. In areas where existing grasses are to be matched, the Contractor shall sow the seed at the rate recommended by the seed distributor.

1.06 STRAW MULCH:

A. Straw mulch material shall consist of straw or hay. Straw shall be stalks of wheat, rye, barley, oats, or other accepted straw. Hay shall consist of timothy, peavine, alfalfa, coastal bermuda or other grasses from accepted sources. These materials shall be reasonably dry and shall be reasonably free from mature seed-bearing stalks, roots, or bulblets or Johnson Grass, Nutgrass, Sandbur, Wild Garlic, Wild Onion, Wild Mustard, Crotolaria, Pigweed, Witchweed and Coclebur. The Contractor shall also comply with all State and Federal domestic plant quarantine regulations.

1.07 EXCELSIOR MULCH:

A. Excelsior mulch shall consist of wood fibers cut from sound, green timber. The average length of the fibers shall be 4 to 6 inches. The cut shall be made in such a manner as to provide maximum strength of fiber, but at a slight angle to the natural grain of the wood so as to cause splintering of the fibers when weathering in order to provide adherence to each other and to the soil.

1.08 WOOD CELLULOSE FIBER MULCH:

A. Wood cellulose fiber mulch shall be made from wood chips particles manufactured particularly for discharging uniformly on the ground surface when dispersed by a hydraulic water sprayer. It shall remain in uniform suspension in water under agitation and blend with grass seed and fertilizer to form a homogenous slurry. The mulch fibers shall intertwine physically to form a strong moisture holding mat on the ground surface and allow rainfall to percolate the underlying soil. The mulch shall be heat processed so as to contain no germination or growth-inhibiting factors. It shall be dyed (non-toxic) an appropriate color to facilitate metering of material.

B. Suppliers shall be prepared to certify that laboratory and field testing of their project has been accomplished, and that it meets all of the foregoing requirements based upon such testing.

C. Weight specifications for this material from suppliers and for all applications shall refer only to air dry weight of fiber material. Absolute air dry weight is based on the normal weight standard of the Technical Association of the Pulp and Paper Industry for wood cellulose and is considered equivalent to 10% moisture. Each package of the cellulose fiber shall be marked by the manufacturer to show the air dry weight content.

1.09 SOD:

A. Sod shall be densely rooted, good quality centipede grass, free from noxious weeds. The sod shall be obtained from areas where the soil is reasonably fertile. The sod shall be raked free of all debris and the grass mowed to two inches before cutting. The sod shall contain practically all of the dense root system and not be less than one (1) inch thick. Sod shall be cut in uniform strips not less than twelve (12) inches in width and not less than twenty-four (24) inches in length.

1.10 PRODUCT REVIEW:

A. The Contractor shall provide the Engineer with a complete description of all products before ordering. The Engineer will review all products before they are ordered.

PART 2 - EXECUTION

2.01 STAND OF GRASS:

A. Before acceptance of the seeding performed for the establishment of permanent vegetation, the Contractor will be required to produce a satisfactory stand of perennial grass whose root system shall be developed sufficiently to survive dry periods and the winter weather and be capable of re-establishment in the spring.

B. Before acceptance of the seeding performed for the establishment of temporary vegetation, the Contractor will be required to produce a stand of grass sufficient to control erosion for a given area and length of time before the next phase of construction or the establishment of permanent vegetation is to commence.

2.02 SEEDING DATES AND RATES OF APPLICATION:

A. Seeding shall be performed during the periods and at the rates specified in the seeding schedules. Seeding work may, at the discretion of the Contractor, be performed throughout the year using the schedule prescribed for the given period. Seeding work shall not be conducted when the ground is

frozen or excessively wet. The Contractor will be required to produce a satisfactory stand of grass regardless of the period of the year the work is performed.

2.03 PREPARATION:

A. The areas to be seeded or sodded shall be made smooth and uniform and shall conform with the finished grade and cross section shown on the plans or as otherwise designated. Minor shaping and smoothing of uneven and rough areas outside the graded section shall be performed as directed by the Engineer in order to provide for more effective erosion control and for ease of subsequent mowing operations.

B. The areas to be grassed, if not loose, shall be loosened to a minimum depth of 3 inches before agricultural lime, fertilizer, seed or sod is applied. The areas to be seeded shall be cleared of stones larger than 2-1/2-inches, in any dimension, roots, and other debris.

2.04 APPLYING LIME AND FERTILIZER:

A. Following advance preparation and placing selected material for shoulders and slopes when called for in the contract, lime if called for based on soil tests and fertilizer shall be spread uniformly over the designated areas and shall be thoroughly mixed with the soil to a depth of approximately 2 inches. Fertilizer shall be applied at the rate of 500 pounds per acre for the initial application, unless otherwise directed by the Engineer. Lime shall be applied at the rate determined by the soil test. Unless otherwise provided, lime will not be applied for temporary seeding. In all cases where practicable, acceptable mechanical spreaders shall be used for spreading fertilizer. On steep slopes subject to slides and inaccessible to power equipment, the slopes shall be adequately scarified. Fertilizer may be applied on steep slopes by hydraulic methods as a mixture of fertilizer and seed. When fertilizer is applied in combination seed and fertilizer drills, no further incorporation will be necessary. The fertilizer and seed shall be applied together when the method of seeding (Wood Cellulose Fiber Mulch) is used. Any stones larger than 2-1/2 inches in any dimension, larger clods, roots, or other debris brought to the surface shall be removed.

2.05 SEEDING:

A. Seed shall be sown within 24 hours following the application of fertilizer and lime and preparation of the seedbed as specified in Section 2.04. Seed shall be uniformly sown at the rate specified by the use of acceptable mechanical seed

drills. Rotary hand seeders, power sprayers or other satisfactory equipment may be used on steep slopes or on other areas that are inaccessible to seed drills.

B. The seeds shall be covered and lightly compacted by means of a cultipacker or light roller if the drill does not perform this operation. On slopes inaccessible to compaction equipment, the seed shall be covered by dragging spiked chains, by light harrowing or by other satisfactory methods.

C. Apply water with fine spray immediately after each area has been sown.

D. Do not sow seed when ground is too dry, during windy periods or immediately following a rain.

E. All seeded areas seeded with permanent grasses shall be uniformly mulched in a continuous blanket immediately following seeding and compacting operations, using at least 2 tons of straw per acre.

2.06 SEEDING (EXCELSIOR MULCH):

A. Seed shall be sown as specified in Section 2.05. Within 24 hours after the covering of seed, excelsior mulch shall be uniformly applied at the rate of 2 tons per acre. The mulch may be applied hydraulically or by other acceptable methods. Should the mulch be placed in a dry condition, it shall be thoroughly wetted immediately after placing. The Engineer may require light rolling of the mulch to form a tight mat.

2.07 SEEDING (WOOD CELLULOSE FIBER MULCH):

A. After the lime has been applied and ground prepared as specified in Section 2.04, wood cellulose fiber mulch shall be applied at the rate of 1,500 pounds per acre in a mixture of seed and fertilizer. Hydraulic equipment shall be used for the application of fertilizer, seed and slurry of the prepared wood pulp. This equipment shall have a built-in agitation system with an operating capacity sufficient to agitate, suspend, and homogeneously mix a slurry of the specified amount of fiber, fertilizer, seed and water. The slurry distribution lines shall be large enough to prevent stoppage. The discharge line shall be equipped with a set of hydraulic spray nozzles which will provide an even distribution of the slurry on the various areas to be seeded. The slurry tank shall have a minimum capacity of 1,000 gallons.

The seed, fertilizer, wood pulp mulch, and water shall all be combined into the slurry tank for distribution of all ingredients in one operation by the hydraulic seeding method

specified herein. The materials shall be combined in a manner recommended by the manufacturer. The slurry mixture shall be so regulated that the amounts and rates of application shall result in a uniform application of all materials at rates not less than the amount specified. Using the color of the wood pulp as a guide, the equipment operator shall spray the prepared seedbed with a uniform visible coat. The slurry shall be applied in a sweeping motion, in an arched stream so as to fall like rain, allowing the wood fibers to build upon each other until an even coat is achieved.

2.08 SODDING:

A. Sod shall be placed between March 1st and December 1st.

B. Sod shall be placed within 48 hours of cutting.

C. Sod shall be moist when laid and placed on moist ground. The sod shall be carefully placed by hand, beginning at the toe of slopes and working upwards. The length of the strips shall be at right angles to the flow of surface water. All joints shall be tightly butted and end joints shall be staggered at least 12 inches. The sod shall be immediately pressed firmly into the ground by tamping or rolling. Fill all joints between strips with fine screened soil. Sod on slopes shall be pegged with sod pegs to prevent movement. The sod shall be watered, mowed, weeded, repaired or otherwise maintained, to insure the establishment of a uniform healthy stand of grass until acceptance.

2.09 MAINTENANCE:

A. Maintain seeded and sodded surfaces until final acceptance.

B. Maintenance shall consist of providing protection against traffic, watering to ensure uniform seed germination and to keep surface of soil damp, and repairing any areas damaged as a result of construction operations or erosion.

2.10 ACCEPTANCE:

A. Before release of the performance bond on the seeding and sodding performed for the establishment of permanent vegetation, the Contractor will be required to produce a satisfactory stand of perennial grass whose root system shall be developed sufficiently to survive dry periods and the winter weather and be capable of reestablishment in the spring.

END OF SECTION

INDEX TO

SECTION 02600 - PAVEMENT

SECTION 02600

PAVEMENT

PART 1 - PRODUCTS

1.01 BASE COURSE:

The following base course alternates will be allowed as directed by the plans:

Compacted Thickness	Type
3"	Hot Mix Asphaltic Concrete (Collector & Arterial Streets)
8"	Graded Aggregate

A. Hot Mix Asphaltic Concrete - Shall consist of fine and coarse aggregate and mineral filler uniformly mixed with hot asphaltic cement in a central mixing plant. The gradations, asphalt content and stabilities shall be the following:

Square Sieve	% Passing by Weight
1"	100
3/4"	85 - 100
3/8"	55 - 75
No. 8	38 - 44
No. 200	4 - 7
Asphalt Cement	5 - 7%
Minimum Marshall Stability @ 50 Blows	1,500 lbs.

B. Graded Aggregate Base Course - The aggregate shall consist of processed and blended crushed granite stone. Aggregates shall be free from lumps and balls of clay, organic matter, objectionable coatings and other foreign material and shall be durable and sound. Aggregate shall meet the applicable requirements of Section 800, Coarse Aggregate, of the Georgia Highway Department Specifications. The material shall meet the following gradation and other requirements:

Sieve Size	% Passing by Weight
2"	100
1-1/2"	95 - 100
1"	70 - 100
½"	50 - 80
No. 4	30 - 55
No. 30	12 - 31
No. 200	6 - 15

	Percent
Clay	0 to 10
Volume Change	0 to 15
Liquid Limit	0 to 25
Plasticity Index	0 to 6

1.02 PRIME AND TACK COATS:

A. Prime Coat - The prime coat shall consist of spraying the base course with low viscosity liquid asphalt, such as RC-30 or RC-70, on the prepared surface of the base and allowing the asphalt to penetrate as far as possible.

B. Tack Coat - The tack coat shall consist of spraying the base course with AC-20 or AC-30, Asphalt Cement. When the temperature in the shade is 70° F or above an emulsion, such as CRS-2h or CRS-3, may be used.

1.03 SURFACE COURSE:

A. The surface course shall consist of fine and coarse aggregate and mineral filler uniformly mixed with hot asphalt cement in a central mixing plant. An antistripping agent shall be added to the asphalt-cement in the preparation of the hot-mix asphalt concrete when "hydrophilic" aggregates are used. The gradations, asphalt content and stabilities for "E" Mix shall be the following:

Square Sieve	% Passing by Weight
3/4"	100
½"	85 - 100
3/8"	70 - 85
No. 8	44 - 48
No. 50	10 - 25
No. 200	4 - 7
Asphalt Cement	5 - 7%
Minimum Marshall Stability @ 50 blows	1,500 lbs.

The gradations, asphaltic content and stabilities for "F" Mix shall be the following:

Square Sieve	% Passing by Weight
½	100
1/4	90-100
No. 4	55- 75
No. 8	44- 50
No. 50	14- 25
No. 200	4- 7
Asphalt Cement	5.25-7.50%
Minimum Marshall @ 50 Blows	1,500 lbs.

1.04 PAVEMENT FABRIC:

A. Fabric used for underlayment shall be equivalent to Phillip's Petromat.

1.05 TRAFFIC LINE PAINT:

A. Traffic Line Paint - Shall conform to Section 870.03 of the Standard Specifications for Road and Bridge Construction, Department of Transportation, State of Georgia. The color shall be at the direction of the Owner or as specified in the plans.

PART 2 - EXECUTION & TESTING

2.01 TESTS:

The following tests will be made in accordance with the DOT Specifications or other specified methods. Compaction tests shall be made at the Owner's direction and expense. Failed tests shall be rescheduled at the Owner's direction and retesting shall be paid for by the Contractor.

A. Subgrade Compaction - One (1) test per 250 square yards. 100% Standard (ASTM Test D-698).

B. Base - One (1) test each per 250 square yards.

1. Field Determination of Compaction.

C. Asphaltic Concrete - One (1) test each for 250 tons of asphaltic concrete. These tests shall conform to the Georgia Department of Transportation's Standards for roads and bridges.

1. Asphalt extraction and aggregate test; one set for each 250 tons of asphaltic concrete.

2. Marshall Stability Tests; stability not less than 1,500 lbs. for surface course. One test for each 250 tons of asphaltic concrete.

D. All design mixes heretofore specified.

2.02 PAVEMENT SYSTEM'S LOCATION, GRADE, AND ALLOWABLE TOLERANCES:

A. The locations and grades of pavement are shown on the drawings. The grade as given on the drawings is the finished pavement grade and allowance will be made for the thickness of pavement when preparing the subgrade.

B. Surfaces - The finished surfaces of pavements shall conform to the lines, grades and cross sections shown. The finished surfaces of pavement shall not vary more than 1/8 inch above or below the planned grade lines or elevations established at the job site. The finished surfaces of new abutting pavements shall coincide at their juncture. Where a new pavement abuts an existing pavement, a transition pavement strip shall be installed to the juncture of the new and existing pavement. The finished surface of pavements shall have no abrupt change of 1/8-inch or more and shall not deviate from the testing edge of an accepted 10-foot straightedge more than 1/8-inch.

C. Thickness -

1. Permissible Deviation - For asphaltic concrete wearing surfaces, will be up to 1/8-inch of the required thickness. Deviation in base courses will be up to 3/8-inch.

2. Pavements Deficient in Thickness - When measurement of any core indicates that the pavement is deficient in thickness, additional cores will be drilled at 25-foot intervals along the centerline of the lane on each side of the original deficient core until the cores indicate that the deficiency in thickness is less than 1/8-inch. Pavement areas deficient in thickness shall be removed and replaced with pavement of the indicated thickness. If the Contractor believes that the cores and measurements taken are not sufficient to indicate fairly the actual thickness of the pavement, additional cores and measurements will be taken, provided the Contractor will bear the extra cost of drilling the cores and filling the holes in the pavement as directed.

2.03 FIELD QUALITY CONTROL:

A. Equipment - All equipment, tools and machines, used in the performance of the work required by this section of the specifications shall be subject to the acceptance of the Owner and shall be maintained in satisfactory working condition at all times.

1. Bituminous Distributor - The distributor shall have pneumatic tires of such width and number that the load produced on the base surface shall not exceed 650 pounds per inch of tire width. It shall be so designed and equipped as to distribute the bituminous material uniformly at even heat in variable widths of surface at readily determined and controlled rates ranging from 0.05 to 2.0 gallons per square yard, with a pressure range of from 25 to 75 pounds per square inch and with

an allowable variation from any specified rate not exceeding ten percent (10%). Distributor equipment shall include an independently operated bitumen pump, tachometer, pressure gauges, volume measuring devices, a thermometer for reading the temperature of tank contents and a hose attachment suitable for applying bituminous material to spots missed by the distributor. The distributor shall be equipped for circulation and agitation of the bituminous material during the heating process.

2. Power Brooms and Power Blowers - Blowers and brooms shall be of the power type and shall be suitable for cleaning the surfaces to which the prime or tack coat is to be applied.

B. Weather Limitations - The prime or tack coat shall be applied only when the base course or pavement is dry or contains moisture not in excess of the amount that will permit uniform distribution and the desired penetration and when the temperature has not been below 35 degrees F. for 12 hours immediately prior to application. The prime or tack coat shall only be applied when the atmospheric temperature in the shade is 55 degrees F. or above.

C. Preparation of Surface - Immediately before applying the pavement course, if the underlying surface is sufficiently bonded, all loose material, dirt, clay or other objectionable material, shall be removed from the surface to be treated with a power broom or blower supplemented with hand brooms, as directed by the Engineer. After the cleaning operation and prior to the application of the pavement course, an observation of the area to be treated will be made by the Engineer to determine its fitness to receive the bituminous coating. That portion of the surface prepared for immediate treatment shall be dry and in satisfactory condition.

2.04 SEQUENCE OF CONSTRUCTION:

A. Prior to the placement of the base material the roadbanks/esplanade shall be stabilized to the satisfaction of the Engineer.

B. Prior to the placement of the finish surface (asphalt) the base material must be approved by the Engineer and:

1. Graded Aggregate: Shall be allowed to set for a period of at least forty-eight hours and no longer than ten days before the finish surface is applied.

2.05 PROOF ROLLING:

A. Shall be required on the subgrade of all streets where designated by the Engineer. Proof rolling shall be done after water lines have been lowered, house services installed and sewers backfilled. The operation shall be in accordance with methods described in Section 221 of the DOT Specifications.

2.06 GRADED AGGREGATE BASE COURSE:

A. Aggregate shall be placed with an accepted spreader in accordance with Georgia Department of Transportation Standard Specifications. (The spreader shall contain a hopper, an adjustable screed and be so designed that there will be a uniform, steady flow of material from the hopper. The spreader shall be capable of laying material without segregation across the full width of the lane to a uniform density.) Spreaders are not required on curb and gutter road sections.

The base or subbase aggregate shall be thoroughly wetted to optimum moisture ($\pm$ 1-1/2%) content as determined by ASTM D-698.

B. Excavation - The existing subgrade shall be leveled to the lines and grades shown on the plans.

1. Subgrade Preparation - Prior to constructing the graded aggregate base course, the subgrade shall be cleaned of all foreign substances. At the time of construction of the base course, the subgrade shall contain no frozen material. The surface of the subgrade shall be checked by the Owner or his representative for adequate compaction and surface tolerances. Ruts or soft yielding spots that may appear in areas of the subgrade course having inadequate compaction and areas not smooth or which vary in elevation more than ½-inch above or below the required grade established on the plans shall be corrected to the satisfaction of the Owner or his designated representative.

C. Compaction - While at Optimum moisture ($\pm$ 1-1/2%), the aggregate base shall be rolled with rollers capable of obtaining the desired density. The rolling shall continue until the base is compacted to a maximum laboratory dry density of 100% of ASTM D-698.

In-place density of the compacted base will be determined in accordance with the Sand Cone Method, ASTM D-1556 or Nuclear Method, ASTM D-2922. At the option of the Contractor, vibratory, flatwheel and other rollers accepted by the Engineer may be used to obtain the required compaction.

D. Surface Finish Tolerances - The surface of the completed base shall not show any deviation in excess of 1/4-inch when tested with a 10 foot straight edge. Deviation in thickness of the base shall be up to, but not including, 3/8-inch of the required thickness.

E. Maintenance - The base shall be maintained in a condition that will meet all specification requirements until the work is accepted.

2.07 PAVEMENT FABRIC:

A. Fabric shall be placed on the base where directed by the Engineer and installed in accordance with the manufacturer's recommendations.

2.08 BITUMINOUS PRIME/TACK COATS:

A. Bituminous Prime Coat - Bituminous material for the prime coat shall be applied in quantities of not less than 0.15 gallons nor more than 0.30 gallons per square yard of base course. Any prescribed application shall be divided, if necessary, into two (2) applications to avoid flowing off the surface. All irregularities in the base surface shall be corrected prior to application of the prime coat.

The prime shall only be applied when the base course is only slightly damp and when the temperature of the air in the shade is 55°F or above.

B. Bituminous Tack Coat - Bituminous material for the tack coat shall be applied in quantities of not less than 0.08 gallons nor more than 0.15 gallons per square yard of base course. The entire surface to be paved shall be coated with the tack coat.

The tack coat shall only be applied when the base is dry and when the temperature has not been below 35°F. for 12 hours immediately prior to application. The tack coat shall only be applied when the temperature of the air in the shade is 55°F. or above.

Work shall be planned so that no more tack coat than is necessary for the day's operation is placed on the surface. All traffic not essential to the work should be kept off the tack coat.

In places where the distributor bars cannot reach, it will be necessary to apply the tack coat with a hand spray attached to the distributor by a hose. When hand spray methods are used, care should be taken to give the surface a very light application of the asphalt.

2.09 ASPHALTIC CONCRETE BASE AND SURFACE COURSES:

A. Mixing Plants - Asphaltic Concrete shall be mixed in central plants conforming to the applicable requirements of Section 400 of the Standard Specifications of the Georgia State Highway Department.

B. Equipment -

1. Bituminous-Materials Spreaders - Shall be self-propelled type equipped with hoppers, tamping or vibrating devises, distributing screws, adjustable screeds, equipment for heating the screeds and equalizing devices. The spreader shall be capable of spreading hot bituminous mixtures without tearing, shoving or gouging, while producing a smooth finished surface, confining the edges of the strips to true lines without the use of stationary side forms and placing the course to the required thickness. Spreaders shall be designed to operate forward at variable speeds and in reverse at traveling speeds of not less than 100 feet per minute. The use of a spreader that leaves indented areas or other objectionable irregularities in the fresh-laid mix during operation will not be permitted.

2. Steel-Wheel Rollers - Shall be the self-propelled, three-wheel and tandem types, weighing not less than 20,000 pounds each. The three-wheel rollers shall have a minimum weight of 300 pounds per inch of width in the rear wheel. The wheels shall be equipped with adjustable scrapers, water tanks and sprinkling apparatus that will be used for keeping the wheels wet to prevent the bituminous mixture from sticking to the wheels. The rollers shall be capable of reversing without backlash and shall be free from worn parts. The roller wheels shall have no flat or pitted areas and no projections that will leave marks in the pavement. Three-axle tandems will be permitted in lieu of two-axle tandems if accepted by the Engineer.

3. Heavy Pneumatic-Tired Rollers - Shall be self-propelled and shall consist of two axles on which are mounted multiple pneumatic-tired wheels in such a manner that the rear group of wheels will not follow in the tracks of the forward group but will be so spaced as to give essentially uniform coverage with each pass.

   The axles shall be mounted in a rigid frame provided with a loading platform or body suitable for ballast loading. The tires shall be smooth and shall be capable of being inflated to a minimum pressure of 90

pounds per square inch. Construction of the roller shall be such that each wheel can be loaded to a minimum of 4,500 pounds.

4. Light Pneumatic-Tired Rollers - Shall consist of two axles on which are mounted not less than nine pneumatic-tired wheels in such manner that the rear group of tires will not follow in the tracks of the forward group but will be so spaced as to give essentially uniform coverage with each pass. The axles shall be mounted in a rigid frame provided with a loading platform or body suitable for ballast loading. The tires shall be uniformly inflated. The rollers shall be weighted with not less than 4.5 tons of ballast. The tractor and other towing equipment shall also be equipped with pneumatic tires. The tires on both rollers and towing equipment shall be smooth and of a type that will not leave tire prints in the surface being rolled. The use of a self-propelled roller meeting the above requirements will be permitted.

5. Blowers and Brooms - Shall be of the power type and shall be suitable for cleaning the surface to be paved.

6. Small Tools - Shall consist of rakes, lutes, shovels, tampers, smoothing irons, pavement cutters, portable heater for heating small tools, wood sandals, stilt sandals of standard type and other small tools, as may be required. A sufficient number of small tools shall be available at all times for use in constructing the bituminous pavements efficiently. The lutes shall be constructed of metal and shall consist of a plate or sheet, 36" by 4", attached to a handle properly braced and with sufficient strength to adequately compact the free edge of the surface course. Hand tampers shall weigh not less than 25 pounds and shall have a tamping face not larger than 50 square inches.

C. Weather Limitations - Bituminous courses shall be constructed only when the base course, binder course or the existing pavement is dry and when the weather is not rainy. Unless otherwise directed, asphaltic courses shall not be constructed when the air temperature in the shade is below 40 degrees F.

D. Preparation of Base - The surface of the base course will be checked by the Engineer for adequate compaction and surface tolerances as specified in applicable base course or subbase course sections. Any ruts or soft yielding spots that may appear in the base course, any areas having inadequate compaction or any deviations of the surface from the

requirements specified for the base course shall be corrected by loosening the affected areas, removing unsatisfactory material and adding accepted material where required, then by reshaping and recompacting to line and grade to the specified density requirements, as directed.

E. Grade Control - The lines and grades shown on the contract drawings for each pavement category of the contract shall be established and maintained by means of line and grade stakes placed at the site of the work by the Contractor.

F. Transportation of Bituminous Mixture - Transportation of bituminous mixture shall be from the paving plant to the site in trucks having tight, clean, smooth beds that have been coated with a minimum amount of a concentrated solution of hydrated lime and water to prevent adhesion of the mixture to the truck bodies. Each load shall be covered with canvas or other accepted material of ample size to protect the mixture from the weather and to prevent loss of heat. Deliveries shall be made so that the spreading and rolling of all mixture prepared for one day's run can be completed during daylight, unless adequate accepted artificial lighting is provided. The mixture shall be delivered to the area to be paved in such manner that the temperature at the time of dumping into the spreader will not be less than 235 degrees F. Any loads that are below minimum temperature, that have crusts of cold unworkable material or that have been wet excessively by rain will be rejected. Hauling over freshly laid material will not be permitted.

G. Placing -

1. Surface Preparation of Underlying Course - Prior to the laying of the surface course, the underlying base shall be cleared of all foreign or objectionable matter with power blowers, power brooms or handbrooms, as directed.

2. Spraying of Contact Surfaces of Structures - Contact surfaces or previously constructed base shall be sprayed with a tack coat.

3. Number of Courses - The surface course shall be laid in one course.

4. General Requirements for Use of Mechanical Spreader - Asphalt mixtures having temperatures less than 235 degrees F. when dumped into the mechanical spreader will be rejected. The mechanical spreader shall be adjusted and the speed regulated so that the surface of the course will be smooth and continuous without tears and pulling, and of such depth that, when compacted, the surface will conform with the cross section, grade,

and contour indicated. Unless otherwise directed, the placing shall begin along the centerline of areas to be paved on a crowned section or on the high side of areas with a one way slope, and shall be in the direction of the major traffic flow. The mixture shall be placed in consecutive adjacent strips having a minimum width of 10 feet, except where the edge lanes require strips less than 10 feet to complete the area. Each strip laid before a succeeding strip shall be of such a length that sufficient heat will be retained to make the strip readily compatible so that a joint can be obtained that will conform to the requirements for texture, density and smoothness.

5. Shoveling, Raking and Tamping After Machine Spreading - A sufficient number of shovelers and rakers shall follow the spreading machine adding or removing hot mixture and raking the mixture as required to obtain a course that when completed will conform to all requirements specified herein. Broadcasting or fanning of mixture over areas being compacted will not be permitted. When segregation occurs in the mixture during placing, the spreading operation shall be suspended until the cause is determined and corrected. Any irregularities in alignment left by the mechanical spreader shall be corrected by trimming directly behind the machine. Immediately after trimming, the edges of the course shall be thoroughly compacted by tamping liberally with the metal lute specified herein. Distortion of the course during tamping will not be permitted.

6. Hand Spreading in Lieu of Machine Spreading - In areas where the use of machine spreading is impractical, the mixture shall be spread by hand. The mixture shall be dumped on accepted dump boards or at an adjacent accepted area outside the area to be paved and shall be distributed into place from the dump boards or from the accepted area by means of hot shovels. The mixture shall be spread with hot rakes in a uniformly loose layer of a thickness that, when compacted, will conform to the required grade and thickness. During hand spreading, each shovelful of mixture shall be carefully placed by turning the shovel over in a manner that will prevent segregation. <u>In no case</u> shall the mixture be placed by throwing or broadcasting from a shovel. The loads shall not be dumped any faster than can be properly handled by the shovelers and rakers. Rakers not equipped with stilt sandals shall not be permitted to stand in the hot mixture while raking the course.

H. Compaction of Mixture - Compaction of mixture shall be effected by the three-wheel rollers, the tandem rollers, the light pneumatic-tired rollers and the heavy self-propelled pneumatic-tired rollers, specified hereinbefore. Rolling of the mixture shall begin as soon after placing as the mixture will bear the roller without undue displacement. Delays in rolling freshly spread mixture will not be tolerated. The rolling shall continue until the surface mixture is compacted to a minimum 100% density of AASHTO T-230. Compaction rolling shall be compacted before the surface temperature drops below 185 degrees F. Field density will be determined by AASHTO T-191 or T-238.

I. Patching Deficient Areas - Any mixture that becomes contaminated with foreign material or is in any way defective shall be removed. Skin patching of a area that has been rolled will not be permitted. Holes of the full thickness of the course shall be cut so that the sides are perpendicular and parallel to the direction of traffic and so that the edges are vertical. Edges shall be sprayed with tack coat bituminous materials. Fresh paving mixture shall be placed in the holes in sufficient quantity so that the finished surface will conform to grade and smoothness requirements. The paving mixture shall be compacted to the density specified herein. The Contractor shall provide competent workmen capable of performing all work incidental to correction of deficiencies and defects.

J. Joints -

1. General - The joints (paper joints) between successive days' work or joints that have become cold because of any delay, shall be carefully made in such a manner as to insure a continuous bond between old and new sections of the course. All joints shall present the same texture, density and smoothness as other sections of the course. All contact surfaces of previously constructed pavements that have become coated by dust, sand or other objectionable material shall be cleaned by brushing or shall be cut back with an acceptable power saw, as directed. All the surfaces against which the new material is to be placed shall be sprayed with a thin, uniform coat of bituminous material. The material shall be applied far enough in advance of placement of the fresh mixture to insure adequate curing. Care shall be taken to prevent damage or contamination of the sprayed surface.

2. Transverse Joints - The roller shall pass over the unprotected end of a strip of freshly laid material only when the laying is to be discontinued or when delivery of mixture is interrupted to the extent that the material in place may become cold. In all cases, the edge of the previously laid pavement shall be cut back to expose an even vertical surface for the full thickness of the course. In continuing the placement of the strip, the mechanical spreader shall be positioned on the transverse joint so that sufficient hot mixture will be spread to obtain a joint after rolling that will conform to the required density and smoothness specified herein. When required, the fresh mixture shall be raked against the joints, thoroughly tamped with hot tampers, smoothed with hot smoothers and followed by rolling. In all cases, the transverse joints in adjacent lanes shall be offset a minimum of two feet (2').

3. Longitudinal Joints - When the edges of the previously placed strip have become cooled, cold, irregular, honey combed, poorly compacted, damaged or otherwise defective, all unsatisfactory sections of joints shall be cut back to expose a clean sound surface for the full thickness of the course, as directed. When required, fresh mixture shall be raked against the joint, thoroughly tamped with hot tampers, smoothed with hot smoothers and then rolled.

K. Protection of Pavement - After final rolling, no vehicular traffic of any kind shall be permitted on the pavement until the pavement has cooled and hardened. In no case shall the non usage be less than six hours.

2.10 STONE STABILIZATION FOR STREETS:

A. Earth streets disturbed by the Contractor's operations shall be stabilized where required by the Engineer. This work will consist of placing graded aggregate at the rate of 250 pounds per square yard on compacted subgrade, and uniformly spreading and compacting the aggregate to an approximate depth of 3-inches. Placement shall conform to Section 310 of the Standard DOT Specifications, except that harrow and blade mixing will be permitted. The aggregate shall conform to the following (percent by weight):

Passing 1-1/2" Sieve	100%
Passing 3/4" Sieve	60 - 90%
Passing #10 Sieve	25 - 45%
Passing #60 Sieve	10 - 30%
Passing # 200 Sieve	0 - 15%

2.11 ADJUST EXISTING VALVES, INLETS AND MANHOLES:

A. Existing inlets, manholes, or valve boxes shall be adjusted by the Contractor to the new grade lines and elevations. All adjustments to structures in areas proposed for pavement shall be accomplished prior to construction of the surface course.

The existing castings shall be removed and, if suitable, reinstalled after adjustments to the structures. Other materials necessary for this work, such as mortar, grout, concrete, brick, and other approved materials, shall meet the requirements of these specifications for materials in new structures of the same type.

The Contractor shall furnish all materials and labor and perform all excavation and backfilling and other work necessary to complete the item.

1. Adjust Existing Frames - Adjustment to grade of existing frames shall include raising or lowering the upper portion of the structure, including any necessary sleeve extensions, adjustable manhole rings, gaskets, mortar, masonry or other approved material, to bring the frame to the required grade.

2.12 REMOVE AND REPLACE PAVEMENT:

A. Pavement removed and replaced shall be done in accordance with the latest specifications of the State Department of Transportation. Traffic shall be maintained and controlled by means of flagmen.

The edges of the pavement shall be cut to a neat straight line with a masonry saw. The backfill shall be compacted to 100% density and a concrete base course of 5,000 psi placed on the fill. The concrete base shall be placed within 24 hours after the utility line is installed. A temporary wearing surface may be used provided it presents a smooth surface. The final wearing surface shall be 1-1/2-inch asphaltic concrete, Type "F".

2.13 STRIPING OF PAVEMENT MARKINGS

A. Striping shall consist of furnishing and applying traffic markings with paint or thermoplastic in accordance with the contract drawings and specifications, and the requirements of the current Federal and State "Manual On Uniform Traffic Control Devices."

B. SPECIFICATIONS FOR PAVEMENT MARKINGS MARKED WITH PAINT

1. Equipment - The traveling traffic stripe painter shall be adaptable to traveling at a uniform, predetermined rate of speed both uphill and downhill in order to produce a uniform application of paint. The paint machine shall be of the spray type, capable of satisfactorily applying the paint under pressure with a uniformity of feed through nozzles spraying directly upon the pavement. Each machine shall be capable of applying three separate stripes, either solid or skip, in any specified pattern by utilizing 3 adjacent spray nozzles at the same time. Each paint tank shall be equipped with a mechanical agitator. Each nozzle shall be equipped with satisfactory cutoff valves which will apply broken or skip lines automatically. Each nozzle shall have a mechanical bead dispenser that will operate simultaneously with the spray nozzle and distribute the beads in a uniform pattern at the rate specified. Each nozzle shall also be equipped with suitable line guides consisting of metallic shrouds or air blasts.

   Hand painting equipment shall consist of suitable brushes, templates and guides necessary to produce satisfactory results.

   Cleaning equipment shall consist of the necessary brushes, brooms, scrapers, grinders, high pressure water jets and air blasters required to satisfactorily remove all foreign matter from the surfaces to be painted without damage to the underlying pavement.

   The traveling traffic striper painter shall also be equipped with paint meters which will indicate the amount of paint dispensed from each tank. Small, portable applicators or other special equipment may also be required.

2. Cleaning of Surface - All surfaces to be painted shall be thoroughly cleaned of dust, dirt, grease, oil and all other foreign matter before application of the paint.

3. Alignment - Traffic stripes shall be of the length, width and placement specified. On sections where no previously applied markings are present, the Contractor shall establish control points satisfactory to the Owner, spaced at intervals that will insure accurate locations of the stripe.

4. Application - Traffic stripe paint shall be applied by machine except for special areas and markings that are not adaptable to machine application, in which case hand application will be permitted.

   No paints shall be applied to areas of pavement when:

   (1) Any moisture or foreign matter is present on the surface;

   (2) The air temperature in the shade is below 50° F; or

   (3) Wind conditions are such as might cause dust to be deposited on the prepared areas or to prevent satisfactory application of the paint and beads.

   Painting shall be done only during daylight hours and all painted areas shall be dry enough before sunset to permit crossing by traffic. All protective devices shall be removed not later than sunset to allow free movement of traffic at night.

   Traffic stripe paint shall be thoroughly mixed in the shipping container before placing in the machine tank. The paint machine tanks, connections and spray nozzles shall be thoroughly cleaned with thinner before starting each day's work.

   The minimum wet film thickness for all painted areas shall be 15 mils.

5. Protective Measures - When painting is done under traffic, the Contractor shall furnish and place all warning and directional signs necessary to direct, control, and protect the traffic during the striping operations. Warning signs shall be set up before the beginning of each operation and extra signs shall be kept well ahead of the painting equipment. When necessary, a pilot car shall be used to protect both the traffic and the painting operation. The freshly painted stripe shall be protected by cones or other satisfactory devices. All stripes damaged by traffic, or pavement marked by traffic crossing wet paint, shall be repaired or corrected as specified below.

6. Tolerance and Appearance - No stripe shall be less than the specified width. No stripe shall exceed the specified width by more than ½ inch. The alignment of the stripe shall not deviate from the intended alignment by more than one inch on tangents and on curves up to and including one degree. On curves

exceeding one degree, the alignment of the stripe shall not deviate from the intended alignment by more than 2 inches.

Continued deviation from stated dimensions will be cause for stopping the work and removing the nonconforming stripe(s).

All stripes and segments of stripes shall present a clean cut, uniform and workmanlike appearance. All markings which fail to have a uniform, satisfactory appearance, in either day or night hours, shall be corrected by the Contractor at their expense.

7. Corrective Measures - All traffic stripes which fail to meet the Specifications, permissible tolerances, and appearance requirements, or are marred or damaged by traffic or from other causes, shall be corrected at the Contractor's expense. All missed areas, drip and spattered paint shall be removed to the satisfaction of the Owner. In all instances, when it is necessary to remove paint, it shall be done by means satisfactory to the Owner, which do not damage the underlying surface of the pavement. When necessary to correct a deviation which exceeds the permissible tolerance in alignment, that portion of the stripe so affected shall be removed, plus an additional 25 feet in each direction, and a new stripe then painted in accordance with these specifications.

8. Acceptance - All sections of painted stripe, words, and symbols which have dried to the extent that the paint will not be picked up or marred by the tires of vehicles, and which have been placed in reasonably close conformity with the Plans and Specifications, will be accepted and the Contractor will be relieved of the responsibility of maintenance on such sections.

C. SPECIFICATIONS FOR PAVEMENT MARKINGS MARKED WITH THERMOPLASTIC

1. Thermoplastic Plastic Stripe shall consist of solid or broken (skip) lines, words and/or symbols of the type, color and the location shown on the plans. It is the intent of these specifications that short lines which are defined to be crosswalks, stop bars, arrow symbols and crosshatching shall be extruded. All other lines, unless otherwise specified, shall be sprayed.

2. Equipment: The material shall be applied to the pavement by an extrusion method wherein one side of the shaping die is the pavement and the other three sides are contained by or are part of suitable equipment for heating and controlling the flow of material, or it shall be applied by spray techniques. Either method shall be applied as to assure continuous uniformity in the dimension of the stripe. The type of application at each location shall be designated by the Engineer.

Each spray application machine must be equipped with an automatic counting mechanism capable of recording the number of linear feet of material applied to the roadway surface with an accuracy of 0.50%.

The equipment shall be constructed to provide continuous mixing and agitation of the material. Conveying parts of the equipment between the main material reservoir and the shaping die or gun shall be constructed such as to prevent accumulation and clogging. All parts of the equipment which come in contact with the material shall be so constructed as to be easily accessible and exposable for cleaning and maintenance. The equipment shall be constructed so that all mixing and conveying parts up to and including the shaping die or gun maintain the material at the plastic temperature with heat transfer oil or electrical element controlled heat. No external source of direct heat will be allowed.

The equipment shall be so constructed as to insure continuous uniformity in the dimensions of the stripe. The applicator shall provide means for cleanly cutting off stripe ends squarely and shall provide a method of applying "skip" lines. The use of pans, aprons, or similar appliances which the die overruns will not be permitted under this Specification. The equipment shall also be capable of producing varying widths of traffic markings.

Glass spheres applied to the surface of the completed stripe shall be applied by an automatic bead dispenser attached to the striping machine in such a manner that the beads are dispensed almost instanteously upon the installed line. The glass sphere dispenser cutoff shall be

synchonized with the automatic cutoff of the thermoplastic material.

Special kettle(s) shall be provided for melting and heating the thermoplastic material. The kettle(s) must be equipped with automatic thermostatic control devices so as to provide positive temperature control and prevent overheating of the material. The applicator and kettle(s) must be so equipped and arranged as to satisfy the requirements of the National Fire Underwriters.

Applicators shall be mobile and maneuverable to the extent that straight lines can be followed and normal curves can be made in a true arc.

The applicator equipment to be used on roadway installations shall consist of either hand equipment or truck mounted units depending on the type of marking required.

The hand equipment shall have sufficient capacity to hold 150# of molten material and shall be sufficiently maneuverable to install crosswalks, lane, edge, and center lines; arrows and legends. The truck-mounted unit for lane, edge, and center lines shall consist of a mobile self-contained unit carrying its own material capable of operating at a minimum speed of 5 miles per hour while installing striping.

3. Application

Thermoplastic Traffic Stripe shall not be applied when the pavement temperature in the shade is 40°F or below.

For all extruded thermoplastic, and where directed by the Engineer for sprayed thermoplastic on old asphaltic concrete pavements where the aggregates are exposed, and on all Portland Cement Concrete pavement as directed by the City Traffic Engineer, to insure optimum adhesion, the Contractor shall apply a binder-sealer material prior to the actual thermoplastic installation. The binder-sealer material will form when applied with conventional mobile spray painting equipment, a continuous film over the pavement surface which will dry rapidly and mechanically adhere to the pavement surface. The

binder-sealer shall be that product currently in use and recommended by the thermoplastic material manufacturer as shown in the Qualified Products List. To insure optimum adhesion, the thermoplastic material shall be installed in a melted state at a temperature consistent with the manufacturer's recommendations, but less than 375°F.

The material, when formed into traffic strips, must be readily renewable by placing an overlay of new material directly over an old line of compatible material. Such new material shall bond itself to the old line in such a manner that no splitting or separation takes place.

Longitudinal lines shall be off-set at least two inches from construction joints of Portland Cement Concrete pavements.

Crosswalks, stop bars, and symbols shall have a minimum thickness of 3/32" at the edges and a maximum thickness of 3/16" at the center.

Minimum average film thickness of .090" **for lane lines and .060" **for edge lines shall be maintained on all markings unless otherwise noted on the Plans. This is to be computed on the basis of the amount of material used each. The glass sphere top coating must be must be applied by means of a pressure type spray gun designed specifically for this purpose, and which embed the spheres into the line surface to at least one-half their diameter. The glass spheres shall be applied at the rate of 14 pounds of spheres to each 100 square feet of compound. It shall be the responsibility of the Contractor to supply all of the necessary auxiliary vehicles required for this operation.

*Minimum Average Film Thickness (Inches) for 4" Wide Strip - Lane Line

$$= \frac{\text{Pound Used}}{\text{Total Linear Feet}} \times 0.270$$

**Minimum Average Film Thickness (Inches) For Edge Lines

$$= \frac{\text{Pounds Used}}{\text{Total Linear Feet}} \times 0.135$$

4. Cleaning: All pavement areas to be striped shall be thoroughly cleaned. Cleaning may be accomplished by the use of hand brooms, rotary brooms, air blasts, scrapers or other approved methods which leave the paving surface thoroughly clean and undamaged. Particular care shall be taken to remove all vegetation and road film from the area to be striped.

5. Acceptance: Segments of the Thermoplastic Traffic Stripe Project which have been placed in conformance with the Plans and Specifications may be accepted, if satisfactory, thirty (30) days after completion of all work required in that segment and the Contractor will be relieved of any further maintenance on such segments.

6. Certification: The producers of the Thermoplastic compound and glass spheres shall furnish to the City 6 copies of certified test reports showing results of all tests specified herein, and shall further certify that the materials meet all requirements of this Section. Final acceptance, however, will be contingent upon satisfactory test results of samples obtained after delivery.

7. Warranty: The Contractor shall transfer to the City the warranty on Thermoplastic materials issued by the Manufacturer. The Contractor shall also furnish the City the normal warranty for application. These warranties shall specify the guaranteed retainage of material for a stated period beginning with the application date.

PART 3 - PERVIOUS PAVEMENT

3.01 SCOPE OF WORK:

The work to be completed under this section includes the furnishing of all labor, materials, and equipment necessary for construction of the pervious concrete pavement subjected to light traffic loading as recommended by the Georgia Concrete and Products Association and the Georgia Department of Transportation (GDOT) Standard Specifications for Construction of Roads and Bridges.

3.02 TEST PANELS:

Contractor is to place, joint and cure two test panels, each to be a minimum of 225 sq. ft., at the required project thickness to demonstrate to the Engineer's satisfaction that in-place unit weights can be achieved and a satisfactory pavement can be installed at the site location.

D. Test panels may be placed at any of the specified portland cement pervious locations. Test panels shall be tested for thickness in accordance with ASTM C 42; void structure in accordance with ASTM C 138; and for core unit weight in accordance with ASTM C 140, paragraph 6.3.

E. Satisfactory performance of the test panels will be determined by:

1. Compacted thickness no less than 1/4" of specified thickness
2. Void Structure: 15% minimum, 21% maximum
3. Unit weight plus or minus 5 pcf of the design unit weight

F. If measured void structure falls below 15% or if measured thickness is greater than 1/4" less than the specified thickness or if measured weight falls less than 5 pcf design unit weight, the test panel shall be removed at the contractor's expense and disposed of in an approved landfill.

G. If the test panel meets the above mentioned requirements, it can be left in-place and included in the completed work.

3.03 CONCRETE MIX DESIGN:

Contractor shall furnish a proposed mix design with proportions of materials to Owner prior to commencement of work. The data shall include unit weights determined in accordance with ASTM C 29 Paragraph 11, "Jigging Procedure."

3.04 MATERIALS:

A. Cement: Portland Cement Type I or II conforming to ASTM C 150 or Portland Cement Type 1P or IS conforming to ASTM C 595.

B. Aggregate: Use Georgia Department of Transportation (GDOT) No. 89 coarse aggregate (3/8 to No. 50) per ASTM D 448. If other gradation of aggregate is to be used, submit data on proposed material to owner for approval.

C. Air Entraining Agent: Shall comply with ASTM C 260.

E. Admixtures:

Type A Water Reducing Admixtures - ASTM C 494
Type B Retarding - ASTM C 494
Type D Water Reducing/Retarding - ASTM C 494

Also, a hydration stabilizer can be utilized and is recommended in the design and production of pervious concrete. This stabilizer suspends cement hydration by forming a protective barrier around the cementitious particles, which delays the particles from achieving initial set. The admixture's primary function should be as a hydration stabilizer, however, it must also meet the requirements of ASTM C 494 Type B Retarding or Type D Water Reducing/Retarding admixtures.

3.05 PROPORTIONS:

A. **Cement Content:** For pavements subjected to vehicular traffic loading, the total cementitious material shall not be less than 600 lbs. per cu. yd.

B. **Aggregate Content:** The volume of aggregate per cu. yd. shall be equal to 27 cu. ft. when calculated as a function of the unit weight determined in accordance with ASTM C 29 "Jigging Procedure." Fine aggregate, if used, should not exceed 3 cu. ft. and shall be included in the total aggregate volume.

C. **Admixtures:** Shall be used in accordance with the manufacturer's instructions and recommendations.

D. **Mix Water:** Mix water shall be such that the cement paste displays a wet metallic sheen without causing the paste to flow from the aggregate. (Mix water yielding a cement paste with a dull-dry appearance has sufficient water for hydration.)

3.06 SUBGRADE PREPARATION AND FORMWORK:

A. **Subgrade Material:** The top 6 inches shall be composed of granular or gravely soil that is predominantly sandy with no more than a moderate amount of silt or clay.

B. **Subgrade Permeability:** Prior to placement of Portland Cement Pervious Pavement, the subgrade shall be tested for rate of permeability by double ring infiltrometer, or other suitable test of subgrade soil permeability. The tested permeability must reasonably compare to the design permeability.

C. Subgrade Support: The subgrade shall be compacted by a mechanical vibratory compactor to a minimum density of 92% of a maximum dry density as established by ASTM D 1557 or AASHTO T 180. Subgrade stabilization shall not be permitted. If fill material (embankment) is required to bring the subgrade to final elevation, it shall be clean and free of deleterious materials. It shall be placed in 8 inch maximum layers, and compacted by a mechanical vibratory compactor to a minimum density of 92% of a maximum dry density as established by ASTM D 1557 or AASHTO T 180.

3.06.4 Subgrade Support: The subgrade shall be compacted by a mechanical vibratory compactor to a minimum density of 92% of a maximum dry density as established by ASTM D 1557 or AASHTO T 180. Subgrade stabilization shall not be permitted. If fill material (embankment) is required to bring the subgrade to final elevation, it shall be clean and free of deleterious materials. It shall be placed in 8 inch maximum layers, and compacted by a mechanical vibratory compactor to a minimum density of 92% of a maximum dry density as established by ASTM D 1557 or AASHTO T 180.

3.07 MIXING, HAULING AND PLACING:

A. **Mix Time:** Truck mixers shall be operated at the speed designated as mixing speed by the manufacturer for 75 to 100 revolutions of the drum.

B. **Transportation:** The portland cement aggregate mixture may be transported or mixed on site and should be used within one (1) hour of the introduction of mix water, unless otherwise approved by an engineer. This time can be increased to 90 minutes when utilizing the hydration stabilizer specified in Section 205.

C. **Discharge:** Each mixer truck will be inspected for appearance of concrete uniformity according to Section 304. Water may be added to obtain the required mix consistency. A minimum of 20 revolutions at the manufacturer's designated mixing speed shall be required following any addition of water to the mix. Discharge shall be a continuous operation and shall be completed as quickly as possible. Concrete shall be deposited as close to its final position as practicable and such that fresh concrete enters the mass of previously placed concrete. The practice of discharging onto subgrade and pulling or shoveling to final placement is not allowed.

D. **Placing and Finishing Equipment:** Unless otherwise approved by the Owner in writing, the contractor shall provide mechanical equipment of either slipform or form riding with a following compactive unit that will provide a minimum of 10 psi vertical force. The pervious concrete pavement will be placed to the required cross section and shall not deviate more than ∓ 3/8 inch in 10 feet from profile grade. If placing equipment does not provide the minimum specified vertical force, a full width roller or other full width compaction device that provides sufficient compactive effort shall be used immediately following the strike-off operation. After mechanical or other approved strike-off and compaction operation, no other finishing operation will be allowed. If vibration, internal or surface applied, is used, it shall be shut off immediately when forward progress is halted for any reason. The contractor will be restricted to pavement placement widths of a maximum of fifteen (15')

feet unless the contractor can demonstrate competence to provide pavement placement widths greater than the maximum specified to the satisfaction of the Engineer.

E. **Curing:** Curing procedures shall begin within 20 minutes after the final placement operations. The pavement surface shall be covered with a minimum six (6) mil thick polyethylene sheet or other approved covering material. Prior to covering, a fog or light mist shall be sprayed above the surface when required due to ambient conditions (temperature, wind, and humidity). The cover shall overlap all exposed edges and shall be secured (without using dirt or stone) to prevent dislocation due to winds or adjacent traffic conditions.

Cure Time:

1. Portland Cement Type I, II or IS - 7 days minimum
2. Portland Cement Type I or Type 1P - 10 days minimum
3. No truck traffic shall allowed for 10 days (no passenger car/light trucks for 7 days).

F. **Jointing:** Transverse control (contraction) joints shall be installed at 20 foot intervals. They shall be installed at a depth of 1/4 the thickness of the pavement. Longitudinal control joints shall be installed at the mid-point if the constructed lane width exceeds 15 feet. These joints can be installed in the plastic concrete or saw cut. If saw cut, the procedure should begin as soon as the pavement has hardened sufficiently to prevent raveling and uncontrolled cracking (normally after curing). Transverse construction joints shall be installed whenever placing is suspended a sufficient length of time that concrete may begin to harden. In order to assure aggregate bond at construction joints, a bonding agent suitable for bonding fresh concrete to existing concrete shall be brushed, rolled, or sprayed on the existing pavement surface edge. Isolation (expansion) joints will not be used except when pavement is abutting slabs or other adjoining structures.

3.08 TESTING, INSPECTION AND ACCEPTANCE:

A. **Laboratory Testing:** The Owner will retain an independent testing laboratory. The testing laboratory shall conform to the applicable requirements of ASTM E 329, Standard Recommended Practice for Inspection and Testing Agencies for Concrete, Steel, and Bituminous Materials as Used in Construction, and ASTM C 1077, Standard Practice for Testing Concrete and Concrete Aggregates for Use in Construction, and Criteria for Laboratory Evaluation, and shall be inspected and accredited by the Concrete Advisory Board of Georgia, Inc. or by an equivalent recognized national authority.

The agent of the testing laboratory performing field sampling and testing for concrete shall be certified by the American Concrete Institute as a Concrete Field Testing Technician Grade I, or by a recognized state or national authority for an equivalent level of competence.

B. **Testing and Acceptance:** A minimum of one (1) gradation test of the subgrade is required every 5,000 square feet to determine percent passing the No. 200 sieve per ASTM C 117.

A minimum of one test for each day's placement of pervious concrete in accordance with ASTM C 172 and ASTM C 29 to verify unit weight shall be conducted. Delivered unit weights are to be determined in accordance with ASTM C 29 using a 0.25 cubic foot cylindrical metal measure. The measure is to be filled and compacted in accordance with ASTM C 29 Paragraph 11, "Jigging Procedure." The unit weight of the delivered concrete shall be ∓ 5 pcf of the design unit weight.

Test panels shall have two cores taken from each panel in accordance with ASTM C 42 at a minimum of seven (7) days after placement of the pervious concrete. The cores shall be measured for thickness, void structure, and unit weight. Untrimmed, hardened core samples shall be used to determine placement thickness. The average of all production cores shall not be less than the specified thickness with no individual core being more than 1/4 inch less than the specified thickness. After thickness determination, the cores shall be trimmed and measured for unit weight in the saturated condition as described in Paragraph 6.3.1 "Saturation" of ASTM C 140, "Standard Methods of Sampling and Testing Concrete Masonry Units." The trimmed cores shall be immersed in water for 24 hours, allowed to drain for one (1) minute, surface water removed with a damp cloth, then weighed immediately. Range of satisfactory unit weight values are ∓ 5 pcf of the design unit weight.

After a minimum of 7 days following each placement, three cores shall be taken in accordance with ASTM C 42. The cores shall be measured for thickness and unit weight determined as described above for test panels. Core holes shall be filled with concrete meeting the pervious mix design.

INDEX TO

SECTION 03300 - CAST-IN-PLACE CONCRETE

Section 03300 CAST-IN-PLACE CONCRETE

CHAPTER 1 - GENERAL

1.1-Scope

1.1.1-These specifications cover cast-in-place concrete for use in buildings, sidewalks, curb and gutters, foundations, and other related items.

1.1.2-The following subjects are considered outside of the scope of these specifications:

1. Recast concrete products.
2. Heavy duty paving concrete
3. Terrazzo
4. Insulating Concrete
5. Lightweight concrete

1.2-Americans with Disabilities Act

All concrete structures shall be designed and constructed to meet the requirements of the U.S. Department of Justice, Americans with Disabilities Act, Rev. July '97. This law requires that all new places of public accommodations and commercial facilities be designed for persons with disabilities. Required guidelines for curb ramps and other handicapped related structures shall be as specified in U.S. Department of Justice, ADA Design Guide.

1.3-Design of Concrete Structures shall be performed and stamped by a Professional Engineer registered in the State of Georgia.
In no instance shall a concrete sidewalk be less than 4" thick nor a driveway less than 6" thick. The Engineer shall refer to City of Savannah Standard Construction Details for minimum design requirements of various structures.

1.4-Construction Loads

Construction loads shall not exceed what the member is able to carry safely and without damage. The Contractor is responsible for providing all supplemental support necessary to protect the structure until the concrete has reached it's specified design strength.

1.5-Referenced Standards and Specifications

1.5.1-The most recent issue of each standard or specification shall be used. The following abbreviations may be used to reference the publishing organization:

ACI - American Concrete Institute, P.O. Box 19150, Detroit MI 48219-0150

ASTM - American Society for Testing and Materials, 1916 Race St. Philadelphia, PA 19103

AASHTO - American Association of State Highway and Transportation Officials 444 North Capital Street, N.W., Suite 225, Washington DC 20001

CRSI - Concrete Reinforcing Steel Institute, 933 North Plum Grove Road, Schaumburg, IL 60195

CHAPTER 2 - MATERIALS FOR CONCRETE

2.1-Cements

Portland cement shall conform to ASTM C 150. Portland blast furnace slag cement or portland pozzolan cement shall conform to ASTM C 595.

2.2-Admixtures

2.2.1-Admixtures to be used in concrete, when required or permitted, shall conform to the following appropriate specifications:

2.2.1.1-Air-entraining admixtures, ASTM C 260

2.2.1.2-Water-reducing, retarding, and accelerating admixtures, ASTM C494

2.2.1.3-Pozzolanic admixtures, ASTM C 618

2.2.1.4-Fiber reinforcement: fiber reinforcement shall be 1/2" or 3/4" collated, fibrillated polylpropylene fibers meeting the requirements of ASTM C 1116, para. 4.1.3, Type III.

2.2.1.5-Admixtures used in the work shall be of the same composition as those used in establishing the concrete proportions.

2.3- Water

Mixing water for concrete shall meet requirements of ASTM C 94.

2.4-Aggregates

2.4.1-Aggregates for normal weight concrete shall meet the requirements for ASTM C 33 unless otherwise specified.

2.4.2-Fine and coarse aggregates shall be regarded as separate ingredients. Each size of coarse aggregate, as well as the combination of sizes when two or more are used, shall meet the appropriate grading requirements of the applicable ASTM specifications.

CHAPTER 3 - PROPORTIONING

3.1- General

Concrete for all parts of the work shall be of the specified quality and capable of being placed without excessive segregation. When hardened, concrete shall develop all characteristics required by these specifications and the contract documents.

3.2-Strength
The specified compressive strength of the concrete **(f'c)** for each portion of sidewalks and curb and gutters shall be a minimum of 3000 psi unless a greater strength requirement is indicated on the contract drawings or herein. Driveway and road paving shall have a compressive strength of not less than 5000 psi. Strength requirements shall be based on 28-day compressive strength unless a different test age is specified. The compressive strength of the concrete shall be determined by ASTM C39.

3.3-Durability

3.3.1-Concrete shall be air entrained and shall conform to the air content limits of ACI 301 , Table 3.4.1.

3.3.2-The water-cement ratio shall not exceed 0.53 by weight.

3.3.3-For all concrete in which aluminum or galvanized metal is to be embedded, it shall be demonstrated by test that the mixing water of the concrete, including that contributed by the aggregates and any admixture used, will not contain a deleterious amount of chloride ion.

3.4-Slump
The concrete shall be proportioned and produced to have a slump of 4 inches or less. A tolerance of up to 1 inch above the maximum indicated shall be allowed for one batch in any five consecutive batches tested. The slump shall be determined by ASTM C 143.

3.5-Maximum size of coarse aggregate
The nominal size of the aggregate shall not be more than one-fifth of the narrowest dimension between sides of forms, one-third of the depth of slabs, nor three-fourths of the minimum clear spacing between reinforcing bars. See ASTM C 33 for tolerance on oversize for various nominal maximum size designations.

3.6- Admixtures

3.6.1-The amount of calcium chloride shall not exceed 2 percent by weight of cement. The amount of calcium chloride shall be determined by the method of described in AASHTO T260.

3.6.2-For all concrete which will remain in contact with aluminum or galvanized metal, the limitation of Section 3.3.3 shall apply unless protective measures acceptable to the Engineer are provided.

3.6.3-All admixtures shall be used in accordance with the manufacturer's instructions except as otherwise specified.

3.6.4-Where fiber reinforcement is called for, it shall be added to the concrete in the manner and rate recommended by the manufacturer. Unless otherwise prohibited by the manufacturer, the minimum rate of application shall be 1 lb. of polypropylene fibers per cubic yard of concrete.

3.6.5-In the Historic District, a color additive equal to Lambert #4685 shall be added to all concrete sidewalks at the rate of 2 ½ pounds per cubic yard in order to match the color of existing sidewalks.

3.7- Mix Design

The Contractor shall **submit** proposed concrete mix designs for each type of concrete in the project. Proposed concrete proportions shall be subject to acceptance by the Engineer based on demonstrated ability to produce concrete meeting all requirements of the specifications. Concrete proportions shall be established on the basis of previous field experience as specified in ACI 301, Section 3.9 with materials to be employed in the work; or by laboratory trial batches as specified in ACI 301, Section 3.10. Contractor is not authorized to batch any concrete for use in this project until mix design has been approved by the Engineer.

CHAPTER 4 - FORM WORK

4.1-Forms shall have sufficient strength to withstand the pressure resulting from placement and vibration of the concrete, and shall have sufficient rigidity to maintain specified tolerances. The design and engineering of the formwork, as well as its construction, shall be the responsibility of the **Contractor.**

4.2-Earth cuts shall not be used as forms for vertical surfaces unless specifically allowed by the Engineer. The Contractor is responsible for ensuring that all earth cuts meet OSHA trenching regulations.

4.3-Before placing the reinforcing steel or the concrete, the surfaces of the forms shall be covered with an acceptable coating material that will effectively prevent absorption of moisture, prevent bond with the concrete, and not stain the concrete surfaces.

4.4-Under no circumstances shall formwork be removed prior to 24 hours after placement of concrete.

4.5-Tolerances for formed surfaces shall be in compliance with ACI 301, Table 4.3.1.

4.6-Unless otherwise specified, formwork shall meet the requirements of ACI 301, Chapter 4.

CHAPTER 5 - REINFORCEMENT

5.1-Reinforcing Bars shall be deformed except spirals, which may be plain bars. Reinforcing bars shall be Grade 60 conforming to one of the following specifications: ASTM A 615, ASTM A 616(incl. supplementary reqmt. S1), ASTM A 617, ASTM A 706. If called for on plans, reinforcing bars shall be epoxy-coated in accordance with ASTM A775

5.2-Welded Wire Fabric shall be fabricated from smooth or deformed wire and shall conform to the wire size and wire spacing required or indicated on the contract drawings. Welded wire fabric shall conform to one of the following specifications:

- ASTM A 185, except welded intersections shall be spaced not farther apart than 12 inches in the direction of the principal reinforcement.

- ASTM A 497, except welded intersections shall be spaced not farther apart than 16 inches in the direction of the principal reinforcement.

5.3-Bar Supports

5.3.1-Wire bar supports shall be in accordance with Class 1, maximum protection, or Class 2, moderate protection in Chapter 3 of the CRSI Manual of Standard Practice.

5.3.2-Precast concrete brick bar supports may used to support rebar mats or welded wire mesh in slab-on-grade construction.

5.4-Welding of reinforcing bars or welded wire fabric is specifically **prohibited**.

5.5-Fabrication of reinforcing bars shall be in accordance with the standard fabricating tolerances in Fig. 4 and 5 of ACI 315.

5.6-Placing Reinforcement

5.6.1-Reinforcement shall be placed within the tolerances and guidelines specified in ACI 301,Chapter 5.6 and 5.7. Minimum concrete cover for reinforcement shall be as required in para. 5.7.1 of ACI 301.

5.6.2-Field bending of bars partially embedded in concrete shall not be permitted unless specifically accepted by the Engineer.

5.7-Sidewalks shall be reinforced by one of the following methods:

5.7.1-Welded wire mesh located 2" from the top surface of the concrete. Minimum size of mesh shall be 6"x6" - W2.9 x W2.9.

5.7.2-Concrete shall be fiber reinforced.

5.7.3-Deformed reinforcing bars providing no less than 0.25 square inches per foot (each way).

CHAPTER 6 - JOINTS AND EMBEDDED ITEMS

6.1-Construction Joints shall be located and detailed on the contract drawings. Unless otherwise indicated on the drawings, all reinforcement shall be continued across the joints.

6.2- Contraction Joints

6.2.1-Sawcut joints shall be located and detailed as indicated on the contract drawings. Cutting shall be timed properly with the set of concrete. Cutting shall be started as soon as the concrete has hardened sufficiently to prevent aggregates being dislodged by the saw. Cutting shall be completed before shrinkage stresses become sufficient to produce cracking.

6.2.2-Tooled Control Joints in sidewalks shall be provided at a spacing not greater than 10 feet on center or twice the width along it's length.

6.3-Expansion Joints

6.3.1-Expansion joints shall be located as shown on the contract drawings but shall be spaced no further apart than 80 feet along a sidewalk or curb and gutter.

6.3.2-Reinforcement or other embedded metal items bonded to the concrete (except dowels in floors bonded on only one side of joints) shall not be permitted to extend continuously through any expansion joint.

6.3.3-Premolded expansion joint filler shall conform to one of the following specification: ASTM D 994, ASTM D 1751, or ASTM D 1752.

6.4-Joint Sealant All expansion joints shall be sealed per detail on project drawings. Other joints to be sealed will be indicated on the project drawings. Joint sealant shall meet the requirements of ASTM C 920, Type S or M, Grade P, Class 25.

6.5-Curb and Gutter sections shall be constructed in sections of uniform length not to exceed 10 feet in length or be less than 5 feet in length. If slip-form or extruded construction is used, contraction joints shall be located at intervals no greater than 10 feet by sawing the hardened concrete at the proper time. The depth of the saw-cut shall be one-fourth of the thickness of the curb and gutter section. The maximum width of the cut shall be 1/4 inch and shall be sawed no later than 24 hours after the pour.

CHAPTER 7 - PRODUCTION OF CONCRETE

7.1-Ready-mixed concrete shall be batched, mixed and transported in accordance with ASTM C 94, except as otherwise provided in this chapter. Plant equipment and facilities shall conform to "Certification of Ready Mixed Concrete Production Facilities" of the National Ready Mixed Concrete Association.

7.2-Concrete produced by on-site volumetric batching and continuous mixing shall be batched and mixed in accordance with and shall conform to all requirements of ASTM C 685.

CHAPTER 8 - PLACING OF CONCRETE

8.1 Preparation

8.1.1-Form work shall be completed; snow, ice and water shall be removed; reinforcement shall be secured in place; expansion joint material, anchors, and other embedded items shall be positioned; and the entire preparation shall be accepted by the Engineer or his representative prior to placing concrete.

8.1.2-The subgrade shall be well drained and of adequate and uniform load bearing capacity. The minimum in-place density of the subgrade soils shall be as required in the specifications.
8.1.3-Concrete shall not be placed on frozen ground. The subgrade shall be free of frost before concrete placing begins. If the temperature inside a building where concrete is to be placed is below freezing it shall be raised and maintained above 50 F long enough to remove all frost from the subgrade.

8.1.4-Subgrades shall be moist at the time of concreting. If necessary, they shall be dampened with water in advance of concreting, but there shall be no standing water on the subgrade nor any muddy or soft spots when the concrete is placed.

8.2-Conveying and Placing

8.2.1-Concrete shall be handled from the mixer to the place of final deposit as rapidly as practicable by methods which will prevent segregation or loss of ingredients and in a manner which will assure that the required quality of the concrete is maintained.

8.2.2-The loss of slump in pumping or pneumatic conveying equipment shall not exceed 2 inches. Concrete shall not be conveyed through pipe made of aluminum or aluminum alloy.

8.2.3-Concrete shall be deposited continuously, or in layers of such thickness that no concrete will be deposited which has hardened sufficiently to cause the formation of seams or planes of weakness within the section. If a section cannot be placed continuously, construction joints shall be located as indicated on the contract documents or as permitted by the Engineer. Placing shall be carried on at such a rate that the concrete which is being integrated with fresh concrete is still plastic. Concrete which has partially hardened or has been contaminated by foreign materials shall not be deposited. Temporary spreaders in forms shall be removed which the concrete placing has reached an elevation rendering their service unnecessary. They may remain embedded in the concrete only if made of metal or concrete and if prior acceptance has been obtained by the Engineer.

8.2.4-Concrete shall be deposited as nearly as possible in its final position to avoid segregation due to rehandling or flowing. Concrete shall not be subjected to any procedure which will cause segregation.

8.2.5-All concrete shall be consolidated by vibration, spading, rodding or forking so that the concrete is thoroughly worked around the reinforcement, around embedded items, and into corners of forms, eliminating all air or stone pockets which may cause honeycombing, pitting, or planes of weakness. Use of vibrators to transport concrete within forms shall not be allowed. A spare vibrator shall be kept on the job site during all concrete placing operations.

8.2.6-Unless adequate protection is provided and acceptance is obtained from the Engineer, concrete shall not be placed during rain, sleet, or snow.

8.2.7-The temperature of the plastic concrete, as placed, shall be no lower than 55 F and no higher than 90 F. The air temperature shall be **at least 35 degrees F** and rising when concrete is mixed and placed.

CHAPTER 9 - REPAIR AND REPLACEMENT

9.1-Repair of Surface Defects: All honeycombed and other defective concrete shall be removed down to sound concrete and patched. When chipping away loose or defective material, no featheredging will be permitted.

9.2-Tie holes shall be plugged with patching mortar unless stainless steel, noncorrosive, or acceptably coated ties are used.

9.3-Where a portion of an existing concrete driveway or sidewalk is removed, the existing section shall be cut to a minimum depth of 4-inches with a suitable saw prior to breaking out pavement.

CHAPTER 10 - SURFACE FINISHES

10.1-Formed Surfaces of concrete shall be given the finishes specified below unless the contract documents specify otherwise:

Rough form finish - For all concrete surfaces not exposed to public view

Smooth form finish - For all concrete surfaces exposed to public view.

10.1.1-Rough form finish - No selected form facing materials shall be specified for rough form finish surfaces. Tie holes and defects shall be patched. Fins exceeding 1/4 in. in height shall be chipped off or rubbed off. Otherwise, surfaces shall be left with texture imparted by the forms.

10.1.2-Smooth form finish - The form facing material shall produce a smooth, hard, uniform texture on the concrete. The arrangement of the facing material shall be orderly and symmetrical, with the number of seams kept to the practical minimum. It shall be supported by studs or other backing capable of preventing excessive deflection. Materials with raised grain, torn surfaces, worn edges, patches, dents, or other defects which will impair the texture of the concrete surface shall not

be used. All fins shall be completely removed. No later than the day following form removal, the concrete surfaces shall be wetted and rubbed with carborundum brick or other abrasive until uniform color and texture are produced.

10.1.3-Tops of walls or buttresses, horizontal offsets, and similar unformed surfaces occurring adjacent to formed surfaces shall be struck smooth after concrete is placed and shall be floated to a texture reasonably consistent with that of the formed surfaces. Final treatment on formed surfaces shall continue uniformly across the unformed surfaces.

10.2-Slab Finishes

Unless otherwise specified on the contract documents, the following finishes shall be used as applicable:

Broom or belt finish - For sidewalks and garage floors and ramps.

Floated Finish - For surfaces intended to receive roofing, waterproofing membranes, or sand bed terrazzo.

Troweled finish - For floor intended as walking surfaces or for reception of floor coverings.

Nonslip finish - For exterior platforms, steps, and landings; and for exterior and interior pedestrian ramps.

10.2.1-Floated Finish: After the concrete has been placed, consolidated, struck off, and leveled, the concrete shall not be worked further until ready for floating. Floating with a hand float or with a bladed power trowel equipped with float shoes, or with a powered disc float shall begin when the water sheen has disappeared and when the surface has stiffened sufficiently to permit the operation. All high spots shall be cut down and all low spots filled during this procedure. The slab shall then be refloated immediately to a uniform sandy texture.

10.2.2-Troweled finish: The surface shall first be float-finished as specified in Section 10.2.1. It shall next be power troweled, and finally hand troweled. The first troweling after power floating shall produce a smooth surface which is relatively free of defects but which may still show some trowel marks. Additional trowelings shall be done by hand after the surface has hardened sufficiently. The final troweling shall be done when a ringing sound is produced as the trowel is moved over the surface. The surface shall be thoroughly consolidated by the hand troweling operations. The finished surface shall be essentially free of trowel marks, uniform in texture and appearance and shall be plane to required tolerances.

10.2.3-Broom or belt finish: Immediately after the concrete has received a float finish as specified in Section 10.2.1, it shall be given a coarse transverse scored texture by drawing a broom or burlap belt across the surface.

10.2.4-Nonslip finish: Crushed ceramically bonded aluminum oxide or other specified selected abrasive particles shall be blended with portland cement in the proportions recommended by the manufacturer of the aggregate. The surface shall be given a float finish in accordance with Section 10.2.1. Approximately two-thirds of the blended material for required coverage shall be applied to the surface by method that insures even coverage without segregation. Floating shall begin immediately after application of the first "dry shake". After this material has been embedded by floating, the remainder the blended material shall be applied to the surface at right angles to the previous application. A second floating shall follow immediately. The rate of application of such material shall be not less than 25 lb. per 100 square feet.

10.2.5-Slab finishing tolerances: Unless otherwise called out in the contract documents, finishes shall be true planes within 1/4 inch in 10 feet as determined by a 10-ft. straightedge placed anywhere on the slab in any direction. The maximum variation in elevation for a level slab shall not exceed 3/4 inches over the entire slab.

CHAPTER 11 - CURING AND PROTECTION

11.1-General:

Beginning immediately after placement, concrete shall be protected from premature drying, excessively hot or cold temperatures, and mechanical injury, and shall be maintained with minimal moisture loss at a relatively constant temperature for the period necessary for hydration of the cement and hardening of the concrete.

11.2-Preservation of Moisture

11.2.1-For concrete surfaces not in contact with forms, one of the following procedures shall be applied immediately after completion of placement and finishing:

11.2.1.1-Ponding or continuous sprinkling.

11.2.1.2-Application of absorptive mats of fabric kept continuously wet.

11.2.1.3-Application of waterproof sheet materials, conforming to ASTM C 171.

11.2.1.4-Application of a curing compound conforming to ASTM C309 in accordance with manufacturers recommendation. It shall not be used on any surface against which additional concrete or other material is to be bonded unless it is proven that the curing compound will not prevent bond.

11.2.2-Moisture loss from surfaces placed against wooden forms or metal forms exposed to heating by the sun shall be minimized by keeping the forms wet until they can be safely removed. After form removal the concrete shall be cured until the end of the time prescribed in Section 11.2.3 by one of the above methods.

11.2.3-Curing in accordance with the above requirements shall be continued for at least 7 days in the case of all concrete except high-early strength concrete for which the period shall be at least 3 days.

11.3-Temperature Control

When the mean daily outdoor temperature is less than 40 F, the temperature of the concrete shall be maintained between 50 and 70 F for the required curing period of Section 11.2.3. Combustion heaters shall not be used during the first 24 hours unless precautions are taken to prevent exposure of the concrete to exhaust gases which contain carbon dioxide.

CHAPTER 12 - TESTING

12.1-Field sampling and testing shall be performed by an independent testing lab hired and payed for by the Owner. Samples of concrete shall be taken at random locations and at such times to represent the quality of the materials and work throughout the project. The laboratory shall provide the necessary labor, materials, equipment, and facilities for sampling the concrete and for casting, handling and storing the concrete samples at the site of work. Sampling of plastic concrete will be in accordance with ASTM C172. Samples for pumped concrete shall be taken at the hose discharge point. Samples for other concrete shall be taken at the hopper of concreting equipment or transit mix truck.

12.2

The Contractor shall pay for the following services when required:

12.2.1-All testing, test results, or certifications required to verify that a proposed material item or mix design meets the requirements of the specifications.

12.2.2-Additional testing and inspection required because of changes in materials or proportions requested by the Contractor.

12.2.3-Additional testing of materials or concrete occasioned by their failure by test or inspection to meet specification requirements. For example, if compressive test results indicate concrete in place may not meet structural requirements, tests shall be made to determine if the structure or portion thereof is structurally sound. Tests may include, but not be limited to, cores in accordance with ASTM C 42 and any other load tests acceptable to the Engineer. Costs of such tests will be borne by the Contractor.

12.3
To facilitate testing and inspection, the Contractor shall advise the Owner and the designated testing agency sufficiently in advance of operations to allow for the assignment of personnel and for the completion of quality tests and inspection of forms.

12.4-STRENGTH TESTS

12.4.1-General: The strength of the concrete will be verified by the testing laboratory during placement of the concrete. Verification shall be accomplished by testing standard cylinders of concrete samples taken at the job site.

12.4.2-Frequency: As a minimum, one set of four standard cylinders shall be cast of each class of concrete based on the most stringent of the following requirements as applicable:

- for each 50 cubic yards or less
- for each 100 feet of sidewalk
- for each 200 feet of curb and gutter
- for each 4000 square feet of surface area
- for each day a pour is made

12.4.3-Lab testing: Testing of specimens for compressive strength shall be in accordance with ASTM C39. Tests shall be made at 7 and 28 days from time of casting. Two test cylinders from each group of four shall be tested at the end of 7 days and two shall be tested at the end of 28 days. Each strength test result shall be the average of the strengths of two test cylinders (cast from material taken from a single load of concrete) at 28 days.

12.4.4-Acceptance of Concrete Strength: The strength level of the concrete will be considered satisfactory so long as the average of all sets of three consecutive strength results equal or exceed the specified strength **f'c** and not more than 10% of the strength test results shall have values less then this value. No individual strength test shall be less than the specified strength **f'c** by more than 500 psi.

12.5-Slump Tests: The slump shall be as specified when measured in accordance with ASTM C 143. Samples for slump determination shall be taken from the concrete during placing. Tests shall be made at the beginning of concrete placing operations and at subsequent intervals to insure that the specification requirements are met. When concrete is pumped, slump tests shall be taken from concrete at the discharge end of the pump hose. Slump tests shall also be performed whenever standard cylinders are cast.

12.6-Temperature and Air Content Tests: Temperature tests shall be made at frequent intervals during hot or cold weather conditions until satisfactory temperature control is established. Whenever standard cylinders are cast, temperature tests shall be performed.
Air content tests shall be in accordance with ASTM C 231 and shall be measured whenever standard cylinders are cast.

CHAPTER 13 - FLOWABLE FILL

The mixture of dry material per cubic yard shall be 50 pounds cement, 600 pounds fly-ash, and 2,500 pounds sand. Depending on the slump requested for the specific job, water added shall be 65 gallons (541 pounds) for a 6-inch slump, to 55 gallons (458 pounds) for a 3-inch slump. One cubic yard of 6-inch slump will contain more than 27 cubic feet due to the additional water. Unconfined compressive strength will be 80 psi at 7 days and 150 psi at 28 days.

ATTACHMENT A

DRUG - FREE WORKPLACE CERTIFICATION

THE UNDERSIGNED CERTIFIES THAT THE PROVISIONS OF CODE SECTIONS 50-24-1 THROUGH 50-24-6 OF THE OFFICIAL CODE TO GEORGIA ANNOTATED, RELATED TO THE **DRUG-FREE WORKPLACE**, HAVE BEEN COMPLIED WITH IN FULL. THE UNDERSIGNED FURTHER CERTIFIES THAT:

1. A Drug-Free Workplace will be provided for the employees during the performance of the contract; and
2. Each sub-contractor under the direction of the Contractor shall secure the following written certification:

_____ (CONTRACTOR) certifies to Chatham County that a Drug-Free Workplace will be provided for the employees during the performance of this contract known as **Apache Avenue Boat Ramp Improvements.**
(PROJECT)

pursuant to paragraph (7) of subsection (B) of Code Section 50-24-3. Also, the undersigned further certifies that he/she will not engage in the unlawful manufacture, sale, distribution, possession, or use of a controlled substance or marijuana during the performance of the contract.

_____ _____
CONTRACTOR DATE

_____ _____
NOTARY DATE

ATTACHMENT B

PROMISE OF NON-DISCRIMINATION STATEMENT

Know All Men By These Presence, that I (We), _____,
Name
_____, _____ (herein after
"Company"),
Title Name of Bidder
in consideration of the privilege to bid/or propose on the following Chatham **County project procurement** **Apache Avenue Boat Ramp Improvements.** hereby consent, covenant and agree as follows:

(1) No person shall be excluded from participation in, denied the benefit of or otherwise discriminated against on the basis of race, color, national origin or gender in connection with the bid submitted to Chatham County or the performance of the contract resulting therefrom;

(2) That it is and shall be the policy of this Company to provide equal opportunity to all business persons seeking to contract or otherwise interested with the Company, including those companies owned and controlled by racial minorities, and women;

(3) In connection herewith, I (We) acknowledge and warrant that this Company has been made aware of, understands and agrees to take affirmative action to provide minority and women owned companies with the maximum practicable opportunities to do business with this Company on this contract;

(4) That the promises of non-discrimination as made and set forth herein shall be continuing throughout the duration of this contract with Chatham County;

(5) That the promises of non-discrimination as made and set forth herein shall be and are hereby deemed to be made a part of and incorporated by reference in the contract which this Company may be awarded;

(6) That the failure of this Company to satisfactorily discharge any of the promises of non-discrimination as made and set forth above may constitute a material breach of contract entitling the County to declare the contract in default and to exercise appropriate remedies including but not limited to termination of the contract.

_____ _____
Signature Date

Attachment C

DISCLOSURE OF RESPONSIBILITY STATEMENT

Failure to complete and return this information will result in your bid/offer/proposal being disqualified from further competition as non-responsive.

1. List any convictions of any person, subsidiary, or affiliate of the company, arising out of obtaining, or attempting to obtain a public or private contract or subcontract, or in the performance of such contract or subcontract.

_____

2. List any indictments or convictions of any person, subsidiary, or affiliate of this company for offenses such as embezzlement, theft, fraudulent schemes, etc. or any other offenses indicating a lack of business integrity or business honesty which affects the responsibility of the contractor.

_____

3. List any convictions or civil judgments under states or federal antitrust statutes.

_____

4. List any violations of contract provisions such as knowingly (without good cause) to perform, or unsatisfactory performance, in accordance with the specifications of a contract.

_____

5. List any prior suspensions or debarments by any governmental agency.

_____

6. List any contracts not completed on time.

_____

7. List any penalties imposed for time delays and/or quality of materials and workmanship.

_____

8. List any documented violations of federal or any state labor laws, regulations, or standards, occupational safety and health rules.

_____

I,_____, as _____
Name of individual Title & Authority

of _____, declare under oath that

Company Name _____

the above statements, including any supplemental responses attached hereto, are true.

_____
Signature

State of _____

County of _____

Subscribed and sworn to before me on this _____ day of _____

2008 by _____ representing him/herself to be

_____ of the company named herein.

_____
Notary Public

My Commission expires:

_____

Resident State:_____

DPC Form #45

Attachment D

CONTRACTOR AFFIDAVIT AND AGREEMENT

By executing this affidavit, the undersigned contractor verifies its compliance with O.C.G.A. 13-10-91, stating affirmatively that the individual, firm, or corporation which is contracting with (name of public employer) has registered with and is participating in a federal work authorization program* [any of the electronic verification of work authorization programs operated by the United States Department of Homeland Security or any equivalent federal work authorization program operated by the United States Department of Homeland Security to verify information of newly hired employees, pursuant to the Immigration Reform and Control Act of 1986 (IRCA), P.L. 99-603], in accordance with the applicability provisions and deadlines established in O.C.G.A. 13-10-91.

The undersigned further agrees that, should it employ or contract with any subcontractor(s) in connection with the physical performance of services pursuant to this contract with (name of public employer), contractor will secure from such subcontractor(s) similar verification of compliance with O.C.G.A. 13-10-91 on the Subcontractor Affidavit provided in Rule 300-10-01-.08 or a substantially similar form. Contractor further agrees to maintain records of such compliance and provide a copy of each such verification to the (name of the public employer) at the time the subcontractor(s) is retained to perform such service.

_____
EEV / Basic Pilot Program* User Identification Number

_____ _____
BY: Authorized Officer or Agent Date
(Contractor Name)

_____
Title of Authorized Officer or Agent of Contractor

_____
Printed Name of Authorized Officer or Agent

SUBSCRIBED AND SWORN
BEFORE ME ON THIS THE
_____ DAY OF _____, 200_

_____
Notary Public
My Commission Expires:

_____

* As of the effective date of O.C.G.A. 13-10-91, the applicable federal work authorization program is the "EEV / Basic Pilot
Program" operated by the U. S. Citizenship and Immigration Services Bureau of the U.S. Department of Homeland Security, in conjunction with the Social Security Administration (SSA).

SUBCONTRACTOR AFFIDAVIT

By executing this affidavit, the undersigned subcontractor verifies its compliance with O.C.G.A. 13-10-91, stating affirmatively that the individual, firm or corporation which is engaged in the physical performance of services under a contract with (name of contractor) on behalf of (name of public employer) has registered with and is participating in a federal work authorization program* [any of the electronic verification of work authorization programs operated by the United States Department of Homeland Security or any equivalent federal work authorization program operated by the United States Department of Homeland Security to verify information of newly hired employees, pursuant to the Immigration Reform and Control Act of 1986 (IRCA), P.L. 99-603], in accordance with the applicability provisions and deadlines established in O.C.G.A. 13-10-91.

_____
EEV / Basic Pilot Program* User Identification Number

_____ _____
BY: Authorized Officer or Agent Date
(Subcontractor Name)

_____
Title of Authorized Officer or Agent of Subcontractor

_____
Printed Name of Authorized Officer or Agent

SUBSCRIBED AND SWORN
BEFORE ME ON THIS THE
_____ DAY OF _____, 200_

_____
Notary Public
My Commission Expires:

_____
* As of the effective date of O.C.G.A. 13-10-91, the applicable federal work authorization program is the "EEV / Basic Pilot
Program" operated by the U. S. Citizenship and Immigration Services Bureau of the U.S. Department of Homeland Security, in conjunction with the Social Security Administration (SSA).

ATTACHMENT E

CHATHAM COUNTY, GEORGIA

BIDDER'S CERTIFICATION REGARDING DEBARMENT, SUSPENSION, INELIGIBILITY AND VOLUNTARY EXCLUSION

The undersigned certifies, by submission of this proposal or acceptance of this contract, that neither Contractor nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntary excluded from participation in this transaction by any Federal department or agency, State of Georgia, City of Savannah, Board of Education of local municipality. Bidder agrees that by submitting this proposal that Bidder will include this clause without modification in all lower tier transactions, solicitations, proposals, contracts, and subcontracts. Where the Bidder or any lower tier participant is unable to certify to this statement, that participant shall attach an explanation to this document.

Bidder must verify Sub-Tier Contractors and Suppliers are not debarred, suspended, ineligible, pending County litigation or pending actions from any of the above government entities.

Certification – the above information is true and complete to the best of my knowledge and belief.

_____

(Printed or typed Name of Signatory)

_____

(Signature)

_____

(Date)

NOTE: The penalty for making false statements in offers is prescribed in 18 U.S.C. 1001

END OF DOCUMENT Mod. CC P & C 6/2005

Attachment F

Construction Apprentice Program Documentation
(must be submitted to Arneja Riley County MWBE Coordinator with 1st Pay Request)

Contractor _____

Name of Project_____

Contract No. _____

1) Contractor has contacted CAP office to determine availability of specific labor classes which may be utilized for the project:

Date of Inquiry # of Available Participants

_____ _____

2) Anticipated number of CAP students that will be hired and related trade category:

#_____ Trade Category_____
#_____ Trade Category_____
#_____ Trade Category_____

3) If CAP students are not anticipated to be hired for this project, the contractor must briefly explain.

_____

_____

_____

_____

_____

Any questions regarding the Construction Apprentice Program and available participant labor should be directed to Tara Sinclair at (912) 604-9574.

Attachment G

Chatham County
Minority and Women Business Enterprise Program
Proposed MWBE Participation Report

Name of Bidder:_____

Name of Project:_____ Bid No:_____

M/WBE Firm	Type of Work	Contact Person/ Phone #	City, State	%	MBE or WBE

MBE Total_____% WBE Total_____% MWBE Combined_____%

The undersigned must enter into a formal agreement with M/WBE Contractor identified herein for work listed in this schedule conditioned upon execution of contract with the Chatham County Board of Commissioners.

Signature_____ Print_____

Phone (____)_____ Fax (____)_____

Attachment H

Systematic Alien Verification for Entitlements (SAVE)
Affidavit Verifying Status for Chatham County Benefit Application

By executing this affidavit under oath, as an applicant for a Chatham County, Georgia Business License or Occupation Tax Certificate, Alcohol License, Taxi Permit, Contract or other public benefit as reference in O.C.G.A. Section 50-36-1, I am stating the following with respect to my bid for a City of Savannah contract for _____. [Name of natural person applying on behalf of individual, business, corporation, partnership, or other private entity]

1.) _____ I am a citizen of the United States.

OR

2.) _____ I am a legal permanent resident 18 years of age or older.

OR

3.) _____ I am an otherwise qualified alien (8 § USC 1641) or non-immigrant under the Federal Immigration and Nationality Act (8 USC 1101 *et seq.*) 18 years of age or older and lawfully present in the United States.*

In making the above representation under oath, I understand that any person who knowingly and willfully makes a false, fictitious, or fraudulent statement or representation in an affidavit shall be guilty of a violation of Code Section 16-10-20 of the Official Code of Georgia.

Signature of Applicant: Date

_____ _____

Printed Name:

_____

*** _____**

Alien Registration number for non-citizens.

SUBSCRIBED AND SWORN

BEFORE ME ON THIS THE

_____DAY OF _____, 20___

Notary Public
My Commission Expires:

1

REFERENCE FORM

REFERENCES - $499,999 or less: On July 25, 2003 the Board of Commissioners directed that all construction projects with a bid of $499,999 or less, for bidders to be responsive each must provide information on the most recent three (3) projects with similar scope of work as well as other information to determine experience and qualifications as follows. If the contractor has performed any work for the Chatham County Board of Commissioners within the last five (5) years, at least one (1) of the three (3) owner references must be from the appropriate party within the Chatham County Government

a. Project Name:_____
   Location:_____
   Owner:_____
   Address:_____
   City and State:_____
   Contact:_____
   Phone & Fax:_____

   *Architect or Engineer:_____
   Contact:_____
   Phone & Fax:_____
   Email:_____

b. The awarded bid amount and project start date. _____
c. Final cost of project and completion date. _____
d. Number of change orders. _____
e. Contracted project completion in days. _____
f. Project completed on time. Yes____ No____ Days exceeded_____.
g. List previous contracts your company performed for Chatham County by Project Title, date and awarded/final cost.
h. Has contractor ever failed to complete a project?_____ If so, provide explanation.
i. Have any projects ever performed by contractor been the subject of a claim or lawsuit by or against the contractor? _____ If yes, please identify the nature of such claim or lawsuit, the court in which the case was filed and the details of its resolution.

2

REFERENCE FORM

REFERENCES - $499,999 or less: On July 25, 2003 the Board of Commissioners directed that all construction projects with a bid of $499,999 or less, for bidders to be responsive each must provide information on the most recent three (3) projects with similar scope of work as well as other information to determine experience and qualifications as follows. If the contractor has performed any work for the Chatham County Board of Commissioners within the last five (5) years, at least one (1) of the three (3) owner references must be from the appropriate party within the Chatham County Government

a. Project Name:_____
   Location:_____
   Owner:_____
   Address:_____
   City and State:_____
   Contact:_____
   Phone & Fax:_____

   *Architect or Engineer:_____
   Contact:_____
   Phone & Fax:_____
   Email:_____

b. The awarded bid amount and project start date. _____
c. Final cost of project and completion date. _____
d. Number of change orders. _____
e. Contracted project completion in days. _____
f. Project completed on time. Yes____ No____ Days exceeded_____.
g. List previous contracts your company performed for Chatham County by Project Title, date and awarded/final cost.
h. Has contractor ever failed to complete a project?_____ If so, provide explanation.
i. Have any projects ever performed by contractor been the subject of a claim or lawsuit by or against the contractor? _____ If yes, please identify the nature of such claim or lawsuit, the court in which the case was filed and the details of its resolution.

3

REFERENCE FORM

REFERENCES - $499,999 or less: On July 25, 2003 the Board of Commissioners directed that all construction projects with a bid of $499,999 or less, for bidders to be responsive each must provide information on the most recent three (3) projects with similar scope of work as well as other information to determine experience and qualifications as follows. If the contractor has performed any work for the Chatham County Board of Commissioners within the last five (5) years, at least one (1) of the three (3) owner references must be from the appropriate party within the Chatham County Government

a. Project Name:_____
Location:_____
Owner:_____
Address:_____
City and State:_____
Contact:_____
Phone & Fax:_____

*Architect or Engineer:_____
Contact:_____
Phone & Fax:_____
Email:_____

b. The awarded bid amount and project start date. _____
c. Final cost of project and completion date. _____
d. Number of change orders. _____
e. Contracted project completion in days. _____
f. Project completed on time. Yes____ No____ Days exceeded_____.
g. List previous contracts your company performed for Chatham County by Project Title, date and awarded/final cost.
h. Has contractor ever failed to complete a project?_____ If so, provide explanation.
i. Have any projects ever performed by contractor been the subject of a claim or lawsuit by or against the contractor? _____ If yes, please identify the nature of such claim or lawsuit, the court in which the case was filed and the details of its resolution.

LEGAL NOTICE
CC NO. **165385**
Invitation to Bid

Sealed Bids will be received until **2:00 P.M.** on **JANUARY 23, 2013** and publicly opened in **Chatham County Purchasing & Contracting Department, at The Chatham County Citizens Service Center, 1117 Eisenhower Drive, Suite C, Savannah, Georgia,** for: **BID NO : 12-0134-4 APACHE AVENUE BOAT RAMP IMPROVEMENTS**.

PRE-BID CONFERENCE: 2:00 P.M., JANUARY 9, 2013. A PreBid Conference will be held at the Chatham County Citizens Service Center, 1117 Eisenhower Drive, Suite C, Savannah, Georgia. You are encouraged to attend.

Bid Packages and Plan sheets are available and **must be purchased from Clayton Digital Reprographics (CDR) located at 1000-I Eisenhower Drive, Savannah, Georgia, 31406. CDR phone: 912-352-3880, fax 912-352-3881, e-mail:** cdrsouth@cdrepro.com

The Bid Package can be downloaded and printed from the County website http://purchasing.chathamcounty.org **Also, all firms requesting to do business with Chatham County must also register on-line at** website http://purchasing.chathamcounty.org

For any additional questions regarding this bid , please contact Robert Marshall, Senior Procurement Specialist, at 912-790-1622.or rmarshal@chathamcounty.org
Bid Bond shall be required at the time of bid. (5% of total bid)
Payment and Performance Bonds shall be required at the time of contract.

CHATHAM COUNTY HAS THE AUTHORITY TO REJECT ALL BIDS AND WAIVE MINOR FORMALITIES.

"CHATHAM COUNTY IS AN EQUAL OPPORTUNITY EMPLOYER, M/F/H, ALL BIDDERS ARE TO BE EQUAL OPPORTUNITY EMPLOYERS"

MARGARET H. JOYNER, PURCHASING AGENT

SAVANNAH NEWS/PRESS INSERT: Dec. 12, 2012
Please send affidavit to:
Chatham County Purchasing & Contracting Department
P.O. Box 15180
Savannah, Georgia 31416
(912) 790-1622