

Project Manual for
Structural Repairs and Pavement Replacement

Construction Document Set

Shelby County
Fire Station #62
4647 Forest Hill Irene Road
Memphis, TN 38125

RFP # 16-006-83

Owner
Shelby County Government
Shelby County, Tennessee

May 27, 2016

john pruetts architects

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SECTION 00 01 20
PROJECT DIRECTORY

OWNER: Support Services
Shelby County Government
584 Adams Avenue
Memphis, TN 38103
901.545.4427 phone
901.545.4487 fax
diep.tran@shelbycountyttn.gov
ATTN: Diep Tran

ARCHITECT: John Pruett Architects
1869 Madison Avenue
Memphis, TN 38104
901.721.9062 phone
901.721.9063 fax
pruettarchitects@bellsouth.net
ATTN: John Pruett, RA

STRUCTURAL: DPC Engineering
7975 Stage Hills Blvd, Suite 1
Memphis, TN 38133
901.377.9984 phone
901.290.0875 fax
dpcmemphis.com
ATTN: Eric Criswell, PE

GEOTECHNICAL: Mid Continent Laboratories, Inc.
1279 Jackson Avenue, P.O. Box 1521
Memphis, TN 38101-1521
901.725.1722 phone
donbritton@aol.com
ATTN: Don Britton

Geotechnology, Inc. 3312 Winbrook
Memphis, TN 38116
phone 901.353.1981
fax 901.353.2248
ATTN: John Henson, PE

SECTION 00 11 19
REQUEST FOR PROPOSAL

Attached herein:

Request for Proposal
Shelby County Government
Purchasing Department
160 N. Main, Suite 900
Memphis, TN 38103

Issued: June 7, 2016
Due: June 29, 2016 no later than 2:00 P.M. (Central Standard Time)

RFP # 16-006-83
STRUCTURAL REPAIRS AND PAVEMENT REPLACEMENT AT
SHELBY COUNTY FIRE STATION #62
4647 FOREST HILL IRENE ROAD
MEMPHIS, TN 38125



Shelby County Tennessee

Mark Luttrell, Jr. Mayor

Request for Proposal

Shelby County Government

Purchasing Department

160 N. Main, Suite 900
Memphis, TN 38103

Issued: June 7, 2016

Due: June 29, 2016 no later than 2:00 P.M. (Central Standard Time)

RFP # 16-006-83

Structural Repairs and Pavement Replacement

Shelby County Fire Station #62

Shelby County Government is soliciting proposals for the provisions of construction services to provide Structural Repairs and Pavement Replacement Shelby County Fire Station # 62. Information regarding this RFP is located on the County's website at www.shelbycountyttn.gov. At the top of the home page, click on the links "Department," "P" for the Purchasing Department and "Bids" to locate the name of the above-described RFP. Copies of the project manual and drawing are posted at this location and can be downloaded at no cost to prospective bidders.

A **Mandatory** pre-bid conference will be held on Wednesday June 15, 2016 at 9 :00AM at 584 Adams Ave., Memphis TN, 38103.

The proposal, as submitted, should include all estimated costs related to the services requested by the RFP specifications. If selected, your proposal will be the basis for negotiating a contract with Shelby County Government. Your proposal must be received in the Shelby County Purchasing Department **no later than 2:00 p.m. on Wednesday June 29, 2016.** Proposals should be addressed to:

**Tosha Davenport, Purchasing Specialist
Shelby County Government
Purchasing Department
160 N. Main St., Suite 900
Memphis, TN 38103**

The package containing an original (clearly identified as original) and five (5) copies of your proposal must be sealed and marked with the Proposer's name and "RFP 16-006-83 Structural Repairs and Pavement Replacement Shelby County Fire Station # 62. - noted on the outside.

Sincerely,

**Tosha Davenport, Purchasing Specialist
Shelby County Government
Purchasing Department**

Cc: Cliff Norville, Support Services

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Please download all of the additional information and attachments that accompany this RFP.

I. INTRODUCTION

Shelby County Government (the “County”), is seeking proposals from interested and qualified firms to provide the provisions for construction services to provide Structural Repairs and Pavement Replacement Shelby County Fire Station # 62. This Request for Proposal (“RFP”) is being released to invite interested and qualified firms to prepare and submit proposals in accordance with instructions provided where the successful candidate will be selected and invited to enter into a contractual relationship with Shelby County for the Services outlined in this RFP.

II. MINIMUM PROPOSERS REQUIREMENT

All Proposers must:

1. Must submit a Bid Bond in the amount of 5% of their bid. This bond must be submitted with your bid.
2. Have or obtain prior to the execution of the final contract all appropriate licenses and certifications required in the State of Tennessee for the performance of the Services in accordance with the provisions of this RFP.
3. The successful contractor must be able to submit a performance/labor material bond separate bonds each in the amount of 100% of the amount of the contract.
4. Firms located within the boundaries of Shelby County are required to have a current Shelby County Business License or be considered exempt from the license requirement by the Shelby County Clerks Office.
5. Also see Item # I, page 24 for forms to be submitted with your bid.
6. Prime and LOSB contractors must **apply** and **qualify** for an Equal Opportunity Compliance (EOC) certification number through our EOC Administration prior to submitting your response.
7. Independent contractors (sole proprietors) must adhere to State of Tennessee Public Chapter No. 436, know as the “Tennessee Lawful Employment Act (effective date of 1/1/2012). Proof and documentation of employment eligibility must be included with the proposal.

Please Note: As a part of doing business with Shelby County, each individual, company, or organization is required to obtain an “Equal Opportunity Compliance” certification number prior to submitting your response.

You can access the online applications to receive the numbers indicated above at www.shelbycountyttn.gov. To obtain a vendor number and an EOC number, please follow the instructions below:

Because of the length of time required to receive an EOC number , vendors who submit EOC applications prior to 2:00 pm, June 29, 2016 bid will be accepted pending EOC approval.

Vendor Number (Purchasing Department)

At the top of the home page, click on the links “Department”, “P” for the Purchasing Department and “Conducting Business with Shelby County”. The “Vendor Registration” link is at the bottom of the drop down box. Please download the application instructions and read thoroughly prior to accessing the application. *(Applications for a vendor number are accepted online only.)*

Equal Opportunity Compliance (EOC) Number (EOC Administration Office)

At the top of the home page, click on the links “Department”, “E” for the Equal Opportunity Compliance and “Contract Compliance Program”. The “Contract Compliance Packet” link is in the middle of the page. Please print the packet and mail or fax the completed packet to the EOC office. The mailing address is 160 N. Main Street, Suite 200, Memphis, TN 38103. The fax number is 901-222-1101.

If you have any questions regarding the application, you may contact Purchasing at (901)222-2250 or the EOC Administration at (901) 222-1100.

III. CORRESPONDENCE

All correspondence, proposals, and questions concerning the RFP are to be submitted to:

**Tosha Davenport, Purchasing Specialist
Shelby County Government
160 N. Main St. Suite 900
Memphis, TN. 38103**

Respondents requesting additional information or clarification are to contact Nelson Fowler in writing at tosha.davenport@shelbycountyttn.gov or at the address listed above. Questions should reference the section of the RFP to which the question pertains and all contact information for the person submitting the questions. ***IN ORDER TO PREVENT AN UNFAIR ADVANTAGE TO ANY RESPONDENT, VERBAL QUESTIONS WILL NOT BE ANSWERED. The deadline for submitting questions will be June 22, 2016 by 12:00 p.m. (CST).*** These guidelines for communication have been established to ensure a fair and equitable process for all respondents.

Note: Individual vendor questions will be answered by e-mail as received before the cut-off date. All written questions submitted by the deadline indicated above will be answered and posted on the County’s website at www.shelbycountyttn.gov within forty eight (48) hours of the above cut-off date.

Please be aware that contact with any other personnel (other than the person clearly identified in this document) within Shelby County regarding this RFP may disqualify your company from further consideration.

IV. PROPOSAL SUBMISSION & DEADLINE

All proposals must be received at the address listed above no later than **Wednesday June 29, 2016 @ 2:00 p.m. (CST)**. Facsimile or e-mailed proposals will not be accepted since they do not contain original signatures. Postmarks will not be accepted in lieu of actual receipt. Late or incomplete proposals may not be opened and considered.

V. PROPOSAL TIMELINE

Shelby County reserves the right to modify this timeline at any time. If the due date for proposals is changed, all prospective proposers shall be notified.

Request for Proposals Released	Tuesday, June 7, 2016
Pre-Bid Conference	Wednesday, June 15, 2016 at 9:00 A.M.
Questions	Wednesday, June 22, 2016 at 12:00 P.M.
Proposal Due Date	Wednesday, June 29, 2016 at 2:00 P.M.
Notification of Award	July 2016

The County may reproduce any of the proposer’s proposal and supporting documents for internal use or for any other purpose required by law.

VI. PROPOSAL CONDITIONS

a. Contingencies

This RFP does not commit the County to award a contract. The County reserves the right to accept or reject any or all proposals if the County determines it is in the best interest of the County to do so. The County will notify all proposers, in writing, if the County rejects all proposals.

b. Modifications

The County reserves the right to issue addenda or amendments to this RFP.

c. Proposal Submission

To be considered, all proposals must be submitted in the manner set forth in this RFP. It is the proposer’s responsibility to ensure that its proposals arrive on or before the specified time.

d. Incurred Costs

This RFP does not commit the County to pay any costs incurred in the preparation of a proposal in response to this RFP and Proposers agree that all costs incurred in developing this RFP are the Proposer’s responsibility.

e. Final Authority

The final authority to award a contract rests solely with the Shelby County Purchasing Department.

f. Proposal Validity

Proposals submitted hereunder will be firm for at least ninety (90) calendar days from the due date unless otherwise qualified.

g. Disclosure of Proposal Contents

Proposer understands and acknowledges that the County is a governmental entity subject to the laws of the State of Tennessee and that any reports, data, or other information supplied to the County is subject to being disclosed as a public record in accordance with the laws of the State of Tennessee. All proposals and other materials submitted become the property of Shelby County Government.

h. Non-Discrimination and Title VI

The contractor hereby agrees, warrants, and assures compliance with the provisions of Title VI and VII of the Civil Rights Act of 1964 and all other federal statutory laws which provide in whole or in part that no person shall be excluded from participation or be denied benefits of or be otherwise subjected to discrimination in the performance of this Contract or in the employment practices of the contractor on the grounds of handicap and/or disability, age, race, color, religion, sex, national origin, or any other classification protected by federal, Tennessee State Constitutional or statutory law. The contractor shall upon request show proof of such non-discrimination and shall post in conspicuous places available to all employees and applicants notices of non-discrimination.

Any recipient entity shall be subject to the requirements of Title VI of the Civil Rights Act of 1964, 42 U.S.C. 2000d et seq., and regulations promulgated pursuant thereto. It shall develop a Title VI implementation plan with participation by protected beneficiaries as may be required by such law or regulations. To the extent applicable, such plan shall include Title VI implementation plans sub recipients of federal funds through the entity. The contractor shall produce the plan upon request of Shelby County Government. Failure to provide same shall constitute a material breach of contract.

**SHELBY COUNTY GOVERNMENT
LOCALLY OWNED SMALL BUSINESS (LOSB) PROGRAM
STRUCTURAL REPAIR AND PAVEMENT REPLACEMENT SHELBY COUNTY
FIRE STATION # 62.**

General

Shelby County Government is committed to a policy of non-discrimination pursuant to the Equal Protection provisions of the United States Constitution. It is further the policy of Shelby County that it's purchasing and contracting practices encourage the use of Locally-Owned Small Businesses (LOSB's) in all solicitations. In furtherance of these policy objectives, Shelby County seeks to afford all citizens equal opportunities to do business on county contracts and to ensure that all bidders, proposers, or Contractors doing business with Shelby County provide to LOSB's, maximum practicable opportunities, commensurate with availability, price and capabilities required, to participate on contracts which are paid for, in whole or in part, with monetary appropriations from Shelby County.

Shelby County seeks to prevent discrimination against any person or business in pursuit of these opportunities on the basis of race or gender. Shelby County will conduct its contracting and purchasing programs so as to discourage any discrimination and will actively seek to resolve all claims of discrimination brought against Shelby County or any Contractors involved in such contracting and purchasing programs.

Shelby County has determined that 15% of the contract shall be contracted with LOSB's vendors. For assistance and information regarding LOSB participation, Bidders shall contact:

Ms. Carolyn Griffin
Office of Equal Opportunity Compliance
Board of Commissioners of Shelby County
160 North Main Street, Suite 200
Memphis, Tennessee 38103
Phone: 901-222-1100
Fax: 901-222-1101
E-mail: carolyn.griffin@shelbycountyttn.gov

Definitions

The definitions used in this document are as follows:

1. **“Bidder”** or **“Proposer”** means any person, firm, partnership, association, or joint venture seeking to be awarded a contract or subcontract to provide goods, commodities or services.
2. **“Certification”** or **“Certified”** means a Business that is certified by Shelby County Government under the LOSB program.
3. **“Commercially useful function”** means being responsible for the management and performance of a distinct element of the total work.
4. **“Contractor”** shall mean any person or business enterprise that submits a bid or proposal to provide labor, goods, or services to Shelby County by contract for profit in the area of construction or construction-related activities; and, any person or firm who supplies or provides labor, goods, or services to Shelby County by contract for profit.
5. **“Efforts to Achieve LOSB Participation”** means that the Contractor will solicit LOSB Participation with respect to the procurement and will consider all sub-bids and quotations received from LOSB’s. When a subcontract is not awarded to the LOSB, the Contractor must document the reason(s) the award was not made and substantiate that documentation in writing pursuant to the provisions of this Program.
6. **“Locally Owned Small Business (LOS B)”** means a business whose home office is located in Shelby County, whose annual revenues do not exceed \$3,000,000 and who has been certified by Shelby County Office of Equal Opportunity Compliance.
7. **“Non-LOS B”** means a business, which is not certified as a LOSB.
8. **“Unavailable”** means either that: (1) there is no LOSB providing goods or services requested; or, (2) no LOSB submitted a bid.

Requirements and Compliance

All firms or entities seeking to become Contractors as outlined herein are required to make good faith efforts to achieve LOSB participation when submitting a proposal or bidding on Shelby County procurements. Bidders and proposers shall not discriminate on the basis of race or gender when soliciting bids in the performance of Shelby County’s procurements. Discrimination complaints brought to the attention of Shelby County Office of Equal Opportunity Compliance (or its designee) will be reviewed and investigated to the extent necessary to determine the validity of such complaints and what actions, if any, should be taken by Shelby County.

Policies and Procedures

Shelby County may adopt policies and procedures as necessary to carry out and implement its powers and duties with regard to the LOSB Program. It is the goal of Shelby County to encourage participation by LOSB's and to adopt rules and regulations which achieve to the greatest extent possible a level of participation by LOSB's taking into account the total number of all Contractors and suppliers. Therefore, Shelby County will review each procurement request to determine the maximum potential for utilization of LOSB's. This review is based on the availability of qualified LOSB's providing goods or services as it relates to the scope of the bid or procurement process. The following procedures may be utilized during the procurement process.

1. Pre-Bid Activity

a. Bid Language

Shelby County may insert language into each bid specification describing the LOSB Program to assure that all prospective bidders are aware of the requirements to make efforts to utilize LOSB's.

b. Notification

Shelby County may provide written notification to Contractors and LOSB's regarding: pre-bid conferences; technical assistance to LOSB's; LOSB Program procedures and required documentation; and, provide a list of LOSB's who have expressed an interest in competing for the bid or in performing as a subcontractor.

2. Contractor's Responsibilities

a. Efforts to Achieve LOSB Participation

All entities seeking to become Contractors are required to make efforts to achieve maximum LOSB participation, as outlined in this LOSB Program, when submitting a response to a bid or negotiated proposal in response to a Shelby County procurement opportunity. Such Efforts should be documented on **LOS Form "A."**

b. Utilization

Contractors are required to utilize legitimate LOSB's in order to receive credit for the utilization of a LOSB. Contractors must document all LOSB's to be utilized, the percentage of utilization and the intended scope of work. Such information should be submitted on **LOS Form "B."** This documentation must be submitted with the bid or negotiated proposal document.

c. Commercially Useful Functions

All LOSB's identified on **LOS Form "C"** or **LOS Form "D"** shall perform a Commercially Useful Function.

- d. Unavailability
If a potential Contractor's efforts to obtain LOSB participation are unsuccessful due to the unavailability of a LOSB, the Contractor will submit a statement of unavailability. **LOSB Form "A."**
- e. Pre-Work Conference
Any Contractor who is the successful bidder shall be required to attend a conference with Shelby County prior to beginning the work. The primary purpose of this conference is to review the project scope and review LOSB participation as outlined in **LOSB Form "B."** Shelby County will also review the Statement of Intent to Perform as a Subcontractor or Provide Supplies or Services as documented on **LOSB Form "C."**
- f. Post-Award Change
Any Contractor who determines that a LOSB identified on **LOSB Form "B"** cannot perform shall request approval from Shelby County to contract with an alternate subcontractor pursuant to this LOSB Program. Such request will be reviewed and approved only after adequate documentation for the proposed change is presented.
- g. LOSB Certification
Each month the Contractor shall submit **LOSB Form "D"** certifying all payments made to LOSB's.

3. LOSB Responsibilities

- a. Commercially Useful Function
It is the responsibility of each LOSB providing subcontracted goods and/or services to submit **LOSB Form "C"** certifying that it is performing the work and that it is a Commercially Useful Function.

Written Agreement

Shelby County policies and procedures on LOSB participation are designed to create contractual relationships between Contractors and LOSB's. Therefore, a Contractor may utilize the services of a LOSB in estimating and satisfying the scope of work, provided that a written contract/agreement is executed between the Contractor and the LOSB.

Certification

To ensure that the ownership and control over decision-making and day-to-day operations of a Certified LOSB is legitimate, Shelby County reserves the right to verify the ownership and control of each LOSB utilized.

Monitoring LOSB Utilization

Shelby County intends to monitor and enforce this LOSB Program. Shelby County reserves the right to conduct random audits of each of its Contractor's LOSB's. Shelby County reserves the right to reevaluate a LOSB's certification at any time.

Efforts to Achieve LOSB Participation

The Contractor shall consider all bids and/or quotations received from LOSB's. When a subcontract is not awarded by a Contractor to any of the competing LOSB's, the Contractor must document the reason(s) the award was not made to the LOSB's. It is the responsibility of the Contractor to prove that it employed Efforts to Achieve LOSB participation. Evidence supporting the Contractor's Efforts must be documented on **LOS B Form "A,"** which must include, but is not limited to, the following:

1. Contractor must submit proof that it solicited LOSB participation through reasonable and available means including, but not limited to:
 - a. Written notices to LOSB's who have the capability to perform the work of the contract or provide the service;
 - b. Direct mailing, electronic mailing, facsimile or telephone requests.
2. Contractor must submit proof that it provided interested LOSB's with adequate information about plans, requirements and specifications of the contract in a timely manner to assist them in responding to a solicitation.
3. Contractor must submit proof that it made Efforts to Achieve LOSB Participation including, but not limited to, proof that it made opportunities available to LOSB suppliers and identified opportunities commensurate with opportunities made available and identified to Non LOSB's. Such proof will include the names of businesses, contact person(s), addresses, telephone numbers, and, a description of the specifications for the work selected for subcontracting.
4. Contractor must submit proof that it allowed LOSB's the opportunity to review bid specifications, blue prints and all other bid related items at no charge. The Contractor must allow sufficient time for review prior to the bid deadline.
5. Contractor must submit proof that it made Efforts to Achieve LOSB Participation by not rejecting a LOSB as unqualified or unacceptable without sound reasons based on a thorough investigation of their capabilities. Contractor must submit proof of the basis for rejecting any LOSB deemed unqualified or unacceptable by the Contractor. The Contractor will not impose unrealistic conditions of performance on LOSB's seeking subcontracting opportunities.

The Contractor must fully cooperate with Shelby County in its post-contract award LOSB Program audit and compliance efforts.

Substitution of LOSB's after Contract Award

In order to make a substitution of a LOSB, a Contractor must make a request to Shelby County. This request must be submitted in writing to Shelby County. Shelby County reserves the right to approve any substitution of a LOSB. The Contractor has the responsibility to provide Shelby County with a reasonable basis for the substitution. If the Contractor desires to substitute the LOSB with a Non-LOSB, then the Contractor must comply with the Effort to Achieve LOSB Participation provisions set forth herein.

Noncompliance with LOSB Program

Any of the following reasons, individually or collectively, may result in suspension from bidding, prohibition from contracting, or cancellation of contracts:

1. The failure to perform according to contract provisions relating to this LOSB Program;
2. Violation of, circumvention of, or failure to comply with the LOSB Program; and/or,
3. Other reasons deemed appropriate by Shelby County.

Questions and Information

Questions regarding this LOSB Program and requests for information should be directed to:

Ms. Carolyn Griffin
Office of Equal Opportunity Compliance
Board of Commissioners of Shelby County
160 North Main Street, Suite 200
Memphis, Tennessee 38103
Phone: 901-222-1100
Fax: 901-222-1101
E-mail: carolyn.griffin@shelbycountyttn.gov

Construction

This LOSB Program is consistent with Shelby County Policies and Procedures. Wherever conflicts exist, the provision in the Shelby County Policies and Procedures will prevail.

LOSB Program Forms Description

- **LOSB Form A -- Certification of Efforts**

Contractors are required to submit **LOSB Form "A"** with proposals as evidence and documentation of efforts that have been made to contact LOSB's for participation as subcontractors, joint venture partners, or suppliers of goods and services. Contractors are required to contact LOSB's and solicit quotes for goods and services. All responses to the Contractor's solicitation should be recorded and reported.

- **LOSB Form B -- LOSB Utilization Plan**

A Contractor is required to submit **LOSB Form "B"** with its Proposal in order to identify all LOSB's they propose to utilize in providing the goods and services included in the Proposal. Contractors may only include a proposed provider of goods or services on **LOSB Form "B,"** if the entity is a legitimate LOSB. Additionally, if such entity will provide services, Contractors may only list LOSB's on **LOSB Form "B"** if the entity will perform a Commercially Useful Function.

The Successful Contractor will be required to finalize and submit **LOS Form “B”** prior to award of a contract. **LOS Form “B”** will be incorporated into the contract and will become a contractual obligation of the Successful Contractor. **LOS Form “B”** shall not be changed or altered after award of a contract without approval from Shelby County. The Contractor is required to provide written notice describing the reasons for any proposed change to Shelby County and to obtain approval from Shelby County of any changes to **LOS Form “B.”**

- **LOS Form C –Statement of Intent to Perform as a Subcontractor or Provide Supplies or Services**

Contractors are required to have each subcontracted LOSB providing services complete **LOS Form “C”** certifying that it is performing the work and that it is a Commercially Useful Function.

- **LOS Form D – Statement of Payments to LOSB’s**

Contractors are required to record and maintain information regarding the utilization of LOSB’s and all other information during the performance of awarded contracts. This information shall be recorded and maintained on **LOS Form “D.”** The form is required to be submitted to Shelby County each month. **LOS Form “D”** must be completed in its entirety with information regarding the types of goods purchased from LOSB’s or the types of services rendered by LOSB’s and dollars amounts paid for their goods or services.

**Shelby County
 LOSB Program**

LOS B FORM A

CERTIFICATION OF EFFORTS TO ACHIEVE LOSB PARTICIPATION

(To Be Submitted with the Bid/Proposal)

Company Name: _____

Bid No.: _____

I certify that the following efforts were made to achieve LOSB participation:

YES

NO

A	Provided written notices to LOSB's who have the capability to perform the work of the contract or provide the service		
B	Direct mailing, electronic mailing, facsimile or telephone requests		
C	Provided interested LOSB's with adequate information about plans, requirements and specifications of the contract in a timely manner to assist them in responding to a solicitation		
D	Allowed LOSB's the opportunity to review bid specifications, blue prints and all other bid/RFP related items at no charge, and allowed sufficient time for review prior to the bid deadline		
E	Acted in good faith with interested LOSB's, and did not reject LOSB's as unqualified or unacceptable without sound reasons based on a thorough investigation of their capabilities		
F	Did not impose unrealistic conditions of performance on LOSB's seeking subcontracting opportunities		

Additionally, I contacted the referenced LOSB's and requested a bid/proposal. The responses I received were as follows:

Name and Address of LOSB	Type of Work And Contract Items, Supplies or Services to be Performed	Response	Reason for Not Accepting Bid/Proposal

(If additional space is required, this form maybe duplicated)

If applicable, please complete the following:

I hereby certify that LOSB's were "Unavailable" as defined in the LOSB Program to submit bids to provide goods and services for this RFP/Bid's purpose.

Reasons for the "Unavailability":

Submitted by:

Authorized Representative Signature

Title

Date

**Shelby County
LOSB Program**

LOSB FORM B

**LOSB UTILIZATION PLAN
(To Be Submitted with the Bid/Proposal)**

Company: _____
Bid No.: _____

I, _____, do certify that on the following procurement opportunity, _____ (Contractor), _____, the following LOSB's will be utilized as sub-contractors, suppliers, _____ (Opportunity) or to provide professional services:

Name	Description of Work	Contract Value	LOSB Number

(If additional space is needed this form may be duplicated)

TOTAL CONTRACT VALUE: _____
TOTAL % OF LOSB PARTICIPATION: _____

The successful bidder/proposer is required to finalize and submit this form prior to award of a contract. Joint Venture Agreements, partnering agreements and all pertinent information must be presented prior to contract award. This information will be incorporated into the contract and will become a contractual obligation of the successful bidder/proposer. The finalized LOSB Form B shall not be changed or altered after award of a contract without approval from Shelby County. The successful bidder/proposer is required to provide written notice describing the reasons for the change to Shelby County to obtain approval of any changes to LOSB Form B.

Submitted by:

Authorized Representative Signature

Title

Date

**Shelby County
LOS B Program
LOS B FORM C**

**STATEMENT OF INTENT TO PERFORM AS A SUBCONTRACTOR OR
PROVIDE SUPPLIES OR SERVICES
(To Be Submitted Prior to Contract Award)**

Company Name: _____
Bid No.: _____

I, _____, intend to provide supplies or services in connection with the
(Subcontractor/Provider)
above **bid/proposal** request as a LOSB.

I am prepared to perform a “**Commercially Useful Function**” in connection with the above project.

The following are the work items to be performed:

at the following price: \$ _____.

If applicable, please complete the following:

I have or will enter into a formal agreement with _____ for the above-
(Company)
described scope of work, supplies, or services conditioned upon the execution of a contract
with Shelby County.

I hereby certify that this statement is true and correct:

Business Information: _____ Submitted by: _____

Business: _____

Authorized Representative (Print)

Address: _____

Title _____

Authorized Representative’s Signature

Phone: _____

Date _____
Facsimile: _____

**Shelby County
 LOSB Program**

LOS B FORM D

STATEMENT OF PAYMENTS TO LOSB'S
 (To Be Submitted Monthly and with Final Payment Request)

Company Name: _____
Name/Contract No.: _____
Payment Request Number: _____

Name of Firm	Description of work	Total Amount Due This Month	Total Dollars Paid To Date	% of Contract Completed	Start Date of Contract	End Date of Contract

(If additional space is needed this form may be duplicated)

I hereby certify that this statement is true and that above payments have been made.

Business Information:

Submitted by:

Business: _____

 Authorized Representative (Print)

Address: _____

Title _____

Phone: _____

 Authorized Representative's Signature

Facsimile: _____

 Date

LOCALLY OWNED SMALL BUSINESS PURCHASING PROGRAM
RULES AND REGULATIONS:

(i) The Administrator of Purchasing in conjunction with the Administrator of EOC shall identify certain goods and services required by the County to be set aside for special purchasing procedures for locally owned small businesses.

(ii) Only certified locally owned small businesses will be allowed to submit competitive bids on the goods or services identified under paragraph (i) above.

(iii) The Administrator of Purchasing shall, in conjunction with the Administrator of EOC, annually review the Shelby County Capital Improvement Program to determine those projects with a construction cost of \$250,000 or more. Contracts amounting to at least ten (10%) of the construction costs of such project shall be awarded to locally owned small businesses as defined herein, except as set forth in sub-paragraph (vi) of this section, either as part of the conditions of the solicitation for general contractors bidding on these projects, or as separate bids issued by the County for subcontracts that may be assigned to general contractors.

(iv) After adhering to all other bidding and purchasing requirements of the County, not inconsistent with this part, if no bids are received from locally owned small businesses, then the County may solicit bids for the goods or services from all other sources.

(v) On all purchases and/or contracts entered into by the County, the Purchasing Administrator or his or her designee shall have the right to negotiate with any supplier of goods or services to the County for the inclusion of locally owned small business subcontractors and/or suppliers in the contract award.

(vi) Failure by a supplier or contractor to include locally owned small business sub-contractors or suppliers in its bid or contract may be grounds for rejection of said bid or contract unless the supplier or contractor can show documented evidence of good cause why none were included.

(vii) Any locally owned small business awarded a contract or purchase order under this section shall not sublet, subcontract, or assign any work or services awarded to it without the prior written consent of the Mayor or the Purchasing Administrator.

(viii) As to those purchases below the requirement for a formal bid solicitation (currently, under \$15,000) and not included in the locally owned small business set aside, the Administrator of Purchasing shall determine if any locally owned small business offers that product or service. If so, at least one such eligible locally owned small business should be included in the vendors contacted for an opportunity to bid, and the Administrator of Purchasing may, at his discretion, designate in a purchase order the purchase of such goods and services from the identified locally owned small business.

(ix) In those situations where a locally owned small business as defined herein, engages in open competitive bidding for County contracts, the Administrator of Purchasing shall provide for a preference for the locally owned small business where responsibility and quality are equal. Said preferences shall not exceed five percent (5%) of the lowest possible bidder meeting specifications. The preference shall be applied on a sliding scale in the following manner:

- a. A preference of up to five percent (5%) shall be allowed for contracts up to \$500,000.00;
- b. A preference of up to three and five-tenths percent (3.5%) shall be allowed for contracts up to \$750,000.00;
- c. A preference of two and one-half percent (2.5%) shall be allowed for contracts up to \$1,000,000.00;
- d. A preference of two percent (2%) shall be allowed for contracts that exceed \$1,000,000.00.

(x) For construction contracts over \$2,000,000.00, the Administrator of Purchasing shall provide for a preference of two percent (2%) to general contractors meeting the requirements of Section 1, Subparagraph B, if fifty percent (50%) or more of the total work comprising the bid has been or will be awarded to certified locally owned small businesses. The fifty percent subcontracting threshold must be met prior to contract execution.

(xi) The Administrator of Purchasing may divide a single bid package for any purchase of goods and services into two or more smaller bid packages in any case that the Administrator of Purchasing reasonably believes that the smaller bid packages will result in a greater number of bids by locally owned small businesses.

(xii) The Administrator of Purchasing, upon approval of the County Mayor, may establish special insurance and bonding requirements for certified locally owned small businesses so long as they are not in conflict with the laws of the State of Tennessee.

(xiii) The Administrator of Purchasing, with the approval of the County Mayor, shall adopt and promulgate, and may from time to time, amend rules and regulations not inconsistent with the provisions of this ordinance, governing the purchase of goods and services from locally owned small business concerns to effectuate and implement the Locally Owned Small Business Purchasing Program within the intent of this ordinance.

(xiv) The Administrator of EOC shall, in conjunction with the Administrator of Purchasing, provide a written quarterly report to the Mayor and Board of Commissioners which shall include a summary of the purchases selected for this program, a listing of the contracts awarded to locally owned small businesses for the period, and the dollar amounts of each such contract, and the percentage which such contracts bear to the total amount of purchases for the period.

k.

DRUG-FREE WORKPLACE AFFIDAVIT

STATE OF _____

COUNTY OF _____

The undersigned, principal officer of _____, an employer of five (5) or i employees contracting with _____ County government to provide construction services states under oath as follows:

1. The undersigned is a principal officer of _____ (hereinafter referred to as the “Company”), and is duly authorized to execute this Affidavit on behalf of the Company.
2. The Company submits this Affidavit pursuant to T.C.A. § 50-9-113, which requires each employer with no less than five (5) employees receiving pay who contracts with the state or any local government to provide construction services to submit an affidavit stating that such employer has a drug-free workplace program that complies with Title 50, Chapter 9, of the *Tennessee Code Annotated*.
3. The Company is in compliance with T.C.A.~ 50-9-113. Further affiant saith not.

Principal Officer

STATE OF _____

COUNTY OF _____

Before inc personally appeared _____ with whom I am personally acquainted (or proved to me on the basis of satisfactory evidence), and who acknowledged that such person executed the foregoing affidavit for the purposes therein contained.

Witness my hand and seal at office this _____ day of _____ 20

Notary Public

My commission expires:

1.

GRATUITY DISCLOSURE FORM

Shelby County Ethics Commission

INSTRUCTIONS: This form is for all persons receiving any Shelby County Government contract, land use approval or financial grant money to report any gratuity that has been given, directly or indirectly, to any elected official, employee or appointee (including their spouses and immediate family members) who is involved in the decision regarding the contract, land use approval, or financial grant of money.

1. **NAME**

2. **DATE OF GRATUITY**

3. **NATURE AND PURPOSE OF THE GRATUITY**

4. **NAME OF THE OFFICIAL, EMPLOYEE, APPOINTEE, OR FAMILY MEMBER WHO RECEIVED THE GRATUITY**

5. **NAME OF THE PERSON OR ENTITY THAT PROVIDED THE GRATUITY**

6. **ADDRESS OF THE PERSON OR ENTITY THAT PROVIDED THE GRATUITY**

7. DESCRIPTION OF THE GRATUITY

8. COST OF THE GRATUITY (If cost is unknown and not reasonably discernible by the person giving the gratuity, then the person giving the gratuity shall report a good faith estimate of the cost of the gratuity.)

9. The information contained in this Gratuity Disclosure Form, and any supporting documentation or materials referenced herein or submitted herewith, is true and correct to the best of my knowledge, information and belief and affirm that I have not given, directly or indirectly, any gratuity to any elected official, employee or appointee (including spouse and immediate family members) that has not been disclosed and I affirm that I have not violated the provisions of the Shelby County Government Code of Ethics.

Signature

Date

Print Name

FORMS TO BE SUBMITTED

LOSB FORM A: MUST BE COMPLETED AND SUBMITTED IN YOUR BID ENVELOPE

LOSB FORM B: MUST BE COMPLETED, SUBMITTED WITH YOUR BID DOCUMENTING ALL LOSB'S TO BE UTILIZED, THE PERCENTAGE OF UTILIZATION AND THE INTENDED SCOPE OF THE WORK.

DRUG FREE WORKPLACE AFFIDAVIT - MUST BE COMPLETED AND SUBMITTED WITH YOUR BID.

GRATUITY DISCLOSURE FORM - MUST BE COMPLETED AND SUBMITTED WITH YOUR BID.

BID BOND- ALL BIDS MUST BE ACCOMPANIED BY A BANK CERTIFIED CHECK OF BANK DRAFT, LETTER OF CREDIT ISSUED BY ANY NATIONAL BANK OR APPROVED BID BOND FOR NOT LESS THAN 5% (PERCENT) OF THE AMOUNT OF THE BID. ALL PROPOSAL GUARANTEES SHALL BE MADE OUT TO THE COUNTY OF SHELBY.

NOTE: LOSB FORM C AND D WILL BE SUBMITTED BY THE SUCCESSFUL CONTRACTOR.

LOSB FORM C- MUST BE COMPLETED AND SUBMITTED BY EACH LOSB PROVIDING SUBCONTRACTED GOODS AND OR SERVICES CERTIFYING THAT THEY ARE PERFORMING THE WORK AND THAT IT IS A COMMERCIALY USEFUL FUNCTION.

LOSB FORM D-MUST BE COMPLETED AND SUBMITTED BY THE SUCCESSFUL CONTRACTOR EACH MONTH CERTIFYING ALL PAYMENTS MADE TO LOSB'S.

FAILURE TO SUBMIT THE REQUIRED FORMS MAY RESULT IN YOUR BID BEING REJECTED AS BEING IN NON-COMPLIANCE WITH BID REQUIREMENTS.

VIII. AWARD OF CONTRACT

- a. Proposers are advised that the lowest cost proposal will not necessarily be awarded the contract, as the selection will be based upon qualification criteria as deemed by the County and as determined by the selection committee and the County Mayor.

- b. **Scope of Work**

The County wishes to engage in a contractual relationship with the lowest responsive Contractor selected through the bid process.

- c. **Project Time Frame**

The Provider must be prepared to begin immediately upon receipt of a Notice to Proceed.

- d. **Reservation of Rights**

The County reserves the right, for any reason to accept or reject any one more proposals, to negotiate the term and specifications for the services provided, to modify any part of the SEALED BID, or to issue a new SEALED BID.

- e. **Selection Criteria**

Contract(s) will be awarded based on the lowest responsive proposals received. The contents of the proposal of the successful Bidders will become contractual obligations and failure to accept these obligations in a contractual agreement may result in cancellation of the award.

- f. **Additional Information and References**

Any additional information that would be helpful to the County evaluating your proposal, including a list of current and former clients with a similar profile to Shelby County should be submitted.

IX. NOTICE TO BIDDERS

Time and Place of Opening of Bids:

Sealed bids for the improvements described herein will be received and opened at **THE OFFICE OF THE SHELBY COUNTY ADMINISTRATOR OF PURCHASING, SUITE 900, VASCO A. SMITH JR., ADMINISTRATION BUILDING, 160 NORTH MAIN, MEMPHIS, TENNESSEE 38103, at 2:00 PM (CST) Wednesday June 29, 2016**

NOTE: There will not be a public bid opening for this project.

Description of Work:

- a. The proposed work is officially known as: Structural Repairs and Pavement Replacement Shelby County Fire Station # 62.
- b.

Pre-Bid Meeting:

Bidders are encouraged to attend a **MANDATORY** pre-bid meeting to be held at 9:00 A.M, Wednesday June 15, 2016 at 584 Adams Ave., Memphis, Tennessee 38103.

Instruction to Bidders:

- (a) The RFP can be downloaded from The Shelby county Government website locates at www.shelbycountyttn.gov and click the link "Department" at the top, then P for the Purchasing Department, then click on the link "Bids."
- (b) All bids must be accompanied by a bank cashier's check or bank draft, letter of credit issued by any national bank or certificate of deposit therein, duly assigned, or certified check or approved bid bond for not less than five (5) percent of the amount of the bid. All proposal guarantees shall be made out to the COUNTY OF SHELBY.
- (c) All bidders must be licensed by the Tennessee State Board of Licensing
- (d) General Contractors Evidence of this license must appear on the title page of the Proposal in the space provided, and also on the exterior of the sealed envelope. The envelope enclosing each bid must show the Contractor's name, license number, expiration date thereof, and license classification of the contractor(s) bidding for the prime contract and for the masonry, electrical, plumbing, heating, ventilation, and air conditioning subcontracts in accordance with TCA 62-6-119. Lacking all of this information, the bid shall be rejected and returned to the bidder unopened.

EOC Requirements:

As a condition precedent to bidding, bidders shall have received a current “Equal Opportunity Compliance Eligibility Number” which must be attached to each bid submission. To receive an E.O.C. Eligibility Number, specific information must be received by the E.O.C. Department at least 48 hours prior to the bid opening. To verify your E.O.C. Number or to receive information for obtaining a number, contact the E.O.C. Department, **901-222-1100**.

Use of Locally Owned Small Business (LOSB) participation on County projects is mandatory.

Bidders are encouraged to contact County-certified LOSB firms from the listing that can be obtained from Shelby County EOC department. Bidders may also provide the names of firms they believe would qualify as LOSB firms, by notifying the E.O.C. Department and filing the required forms at least five (5) working days prior to the bid opening

A Locally Owned Small Business is defined as a sole proprietorship, corporation, partnership, or joint venture located within Shelby County and at least 51% owned, operated and managed by a Shelby County resident and having an average annual sale of \$5,000,000.00 or less over the past three (3) years.

Rejection of Bids:

The **COUNTY OF SHELBY** reserves the right to reject any and all proposals and to waive technicalities in any proposal.

BY ORDER OF: CLIFTON DAVIS

**PURCHASING ADMINISTRATOR
SHELBY COUNTY GOVERNMENT**

_____, 2016

DOCUMENT 00 41 13
BID FORM – STIPULATED SUM

To: Administrator of Purchasing
Shelby County Government
Suite 550
160 North Main St.
Memphis, TN 38103

Project: Structural Repairs and Pavement Replacement at Shelby County Fire Station #62
4647 Forest Hill Irene Road, Memphis, TN 38125

Date: _____

Submitted by:
(full name) _____

(full address) _____

1. OFFER

BASE BID - All Work not including the Additive Alternates listed on this bid form and not including the Contingency Allowance as indicated in the bid documents:

(\$ _____) State amount in both words and figures.

CONTINGENCY ALLOWANCE Ten percent (10%) of the Base Bid to the nearest whole dollar:

(\$ _____) State amount in both words and figures.

TOTAL BASE BID AMOUNT (Base Bid plus Contingency Allowance)

Having examined the Place of The Work and all matters referred to in the Instructions to Bidders and the Contract Documents prepared by John Pruet Architects for the above mentioned project, we, the undersigned, hereby offer to enter into a Contract to perform the Work for the Sum of:

_____ dollars,

(\$ _____) in lawful money of the United States of America.

We have included the security Bid Bond as required by the Notice to Bidders. All applicable federal taxes are included and State of Tennessee and City of Memphis taxes are included in the Bid Sum.

ADDITIVE ALTERNATE BID ITEM NO. 1

Removal and Replacement of Concrete parking areas North (approximately 548 SF) and West (approximately 1,870 SF) as indicated on drawings.

(\$ _____) State amount in both words and figures.

ADDITIVE ALTERNATE BID ITEM NO. 2

Removal and replacement of the North (1,894 SF) and South (2,732 SF) driveways connecting to Forest Hill Irene Road.

(\$ _____) State amount in both words and figures.

2. ACCEPTANCE

This offer shall be open to acceptance and is irrevocable for ninety days from the bid closing date.

If this bid is accepted by the Owner within the time period stated above, we will:

- Execute the Agreement within seven days of receipt of Notice of Award.
- Furnish the required bonds within seven days of receipt of Notice of Award. In the form described in Supplementary Conditions.
- Commence work within seven days after written Notice to Proceed.

If this bid is accepted within the time stated, and we fail to commence the Work or we fail to provide the required bonds, the security deposit shall be forfeited as damages to the Owner by reason of our failure, limited in amount to the lesser of the face value of the security deposit or the difference between this bid and the bid upon which a Contract is signed.

In the event our bid is not accepted within the time stated above, the required security deposit will be returned to the undersigned, in accordance with the provisions of the Instructions to Bidders; unless a mutually satisfactory arrangement is made for its retention and validity for an extended period of time.

3. CONTRACT TIME

If this Bid is accepted, we will: Complete the Work in ONE HUNDRED TWENTY (120) calendar days from Notice to Proceed. CONTRACTOR agrees to provide COUNTY an amount equal to 500 (\$) Dollars per day for liquidated damages for each consecutive calendar day required for the completion of the contract beyond the time stipulated.

4. ADDENDA

The following Addenda have been received. The modifications to the Bid Documents noted below have been considered and all costs are included in the Bid Sum.

- Addendum # _____ Dated _____

5. APPENDICES

The following documents are attached to and made a condition of the Bid:

- LOSB Subcontractor & Supplier List
- Drug-Free Workplace Affidavit
- Bid security in form of Bid Bond

6. 6. BID FORM SIGNATURES

The Corporate Seal of

(Bidder - print the full name of your firm)

was hereunto affixed in the presence of:

(Authorized signing officer Title)
(Seal)

(Authorized signing officer Title)
(Seal)

If the Bid is a joint venture or partnership, add additional forms of execution for each member of the joint venture in the appropriate form or forms as above.

END OF DOCUMENT

SECTION 00 50 00
CONTRACTING FORMS AND SUPPLEMENTS

Attached herein:

- BID BOND
- DRAFT COUNTY/CONTRACTOR AGREEMENT
- PERFORMANCE BOND
- LABOR AND MATERIAL PAYMENT BOND
- SHELBY COUNTY GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

END OF SECTION

THE AMERICAN INSTITUTE OF ARCHITECTS

AIA Document A310

Bid Bond

KNOW ALL MEN BY THESE PRESENTS, that we

(Here insert full name and address or legal title of Contractor>

as Principal, hereinafter called the Principal, and

(Here insert full name and address or legal title of Surety>

a corporation duly organized under the laws of the State of
as Surety, hereinafter called the Surety, are held and firmly bound unto

(Here insert full name and address or legal title of Owner)

as Obligee, hereinafter called the Obligee, in the sum of

Dollars (\$ _____),

for the payment of which sum well and truly to be made, the said Principal and the said Surety, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has submitted a bid for

(Here insert full name, address and description of project)

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

Signed and sealed this

day of

19

(Principal)

(Seal)

(Witness)

(Title)
(Surety)

(Seal)

(Witness)

(Title)

THE AMERICAN INSTITUTE OF ARCHITECTS

AIA Document A311

Performance Bond



KNOW ALL MEN BY THESE PRESENTS: that

(Here insert full name and address or legal title of Contractor)

as Principal, hereinafter called Contractor, and,

(Here insert full name and address or legal title of Surety)

as Surety, hereinafter called Surety, are held and firmly bound unto

(Here insert full name and address or legal title of Owner)

as Obligee, hereinafter called Owner, in the amount of

Dollars (\$ _____),

for the payment whereof Contractor and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS,

Contractor has by written agreement dated _____
(Here insert full name, address and description of project)

19 _____ entered into a contract with Owner for

in accordance with Drawings and Specifications prepared by

(Here insert full name and address or legal title of Architect)

which contract is by reference made a part hereof, and is hereinafter referred to as the Contract.

PERFORMANCE BOND

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that, if Contractor shall promptly and faithfully perform said Contract, then this obligation shall be null and void; otherwise it shall remain in full force and effect.

The Surety hereby waives notice of any alteration or extension of time made by the Owner.

Whenever Contractor shall be, and declared by Owner to be in default under the Contract, the Owner having performed Owner's obligations thereunder, the Surety may promptly remedy the default, or shall promptly

1) Complete the Contract in accordance with its terms and conditions, or

2) Obtain a bid or bids for completing the Contract in accordance with its terms and conditions, and upon determination by Surety of the lowest responsible bidder, or, if the Owner elects, upon determination by the Owner and the Surety jointly of the lowest responsible bidder, arrange for a contract between such bidder and Owner, and make available as Work progresses (even though there should be a default or a succession of

defaults under the contract or contracts of completion arranged under this paragraph) sufficient funds to pay the cost of completion less the balance of the contract price; but not exceeding, including other costs and damages for which the Surety may be liable hereunder, the amount set forth in the first paragraph hereof. The term "balance of the contract price," as used in this paragraph, shall mean the total amount payable by Owner to Contractor under the Contract and any amendments thereto, less the amount properly paid by Owner to Contractor.

Any suit under this bond must be instituted before the expiration of two (2) years from the date on which final payment under the Contract falls due.

No right of action shall accrue on this bond to or for the use of any person or corporation other than the Owner named herein or the heirs, executors, administrators or successors of the Owner.

Signed and sealed this

day of

20

**SHELBY COUNTY GENERAL CONDITIONS OF THE
CONTRACT FOR CONSTRUCTION**

Rev. 5/24/99

constcnd.doc

**GENERAL CONDITIONS OF THE
CONTRACT FOR CONSTRUCTION**

**ARTICLE I
CONTRACT DOCUMENTS**

1.1 Definitions

1.1.1 The Contract Documents

The Contract Documents consist of the Owner-Contractor Agreement, the conditions of the Contract (General, Supplementary and other conditions), the Drawings, the Specifications, and all Addenda issued prior to and all modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a written interpretation issued by the Architect pursuant to Subparagraph 2.2.8, or (4) a written order for a minor change in the Work issued by the Architect pursuant to Paragraph 12.3. The Contract Documents include Bidding Documents such as the Advertisement or invitation to Bid, the Instructions to Bidders, sample forms, the Contractor's Bid, or portions of Addenda relating to any of these, and other documents specifically enumerated in the Owner-Contractor Agreement.

1.1.2 The Contract

The Contract Documents form the Contract for Construction. This Contract represents the entire and integrated agreement between the parties hereto and supersedes all prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a Modification as defined in Subparagraph 1.1.1. The Contract Documents shall not be construed to create any contractual relationship of any kind between the Architect and the Contractor, but the Architect shall be entitled to performance of obligations intended for his benefit, and to enforcement thereof. Nothing contained in the Contract Documents shall create any contractual relationship between the Owner or the Architect or any Subcontractor or sub-subcontractor.

1.1.3 The Work

The Work comprises the completed construction required by the contract Documents and includes all labor necessary to produce such construction, and all materials and equipment incorporated or to be incorporated in such construction.

Initial _____

1.1.4 The Project

The Project is the total construction of which the Work performed under these Contract Documents may be the whole or a part.

1.2 Execution Correlation and Intent

1.2.1 The Contract Documents shall be signed in not less than four originals by the Owner and Contractor. If either Owner or Contractor or both do not sign the Conditions of the Contract, Drawings, Specifications, or any of the other Contract Documents, the Architect shall identify such Documents.

1.2.2 By executing the Contract, the Contractor represents that he has visited the site, familiarized himself with the local conditions under which the Work is to be performed, and correlated his observations with the requirements of the Contract Documents.

1.2.3 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work. The Contract Documents are complementary, and what is required by any one shall be as binding as if required by all. Work not specifically set forth in the Contract Documents will not be required unless it is consistent with work that is specifically set forth in the Contract Documents or is reasonably inferable from the Contract Documents as being necessary to produce the intended results. Words and abbreviations, which have well-known technical or trade meanings, are used in the Contract Documents in accordance with such recognized meanings.

1.2.4 The organization of the Specifications into divisions, sections, and articles, and the arrangement of Drawings shall not control the Contractor in dividing the Work among Sub-contractors or in establishing the extent of Work to be performed by any trade.

1.3 Ownership and Use of Documents

1.3.1 All Drawings, Specifications, and copies thereof furnished by the Architect are the property of the Owner. They are to be used only with respect to this Project and are not to be used on any other project. With the exception of one contract set for each party to the Contract, such documents are to be returned or suitably accounted for to the Architect on request at the completion of the Work. Submission or distribution to meet official regulatory requirements or for other purposes in connection with the Project is not to be construed as publication in derogation of the Architect's common law copyright or other reserved rights. The Architect will furnish, free of

charge, to

the Contractor sufficient sets of Contract Documents to ^{Initial} execute the Work not to exceed ten (10). The Contractor may purchase additional sets by paying reproduction costs.

ARTICLE II ARCHITECT

2.1 Definition

2.1.1 The Architect is the person lawfully licensed to practice Architecture, or any entity lawfully practicing Architecting identified as such in the Owner-Contractor Agreement, and is referred to throughout the Contract Documents as if singular in number and masculine in gender. The term Architect means the Architect or his authorized representative.

2.2 Administration of the Contract

2.2.1 The Architect will provide administration of the Contract as hereinafter described.

2.2.2 The Architect will be the Owner's representative during construction and until final payment is due. The Architect will advise and consult with the Owner. The Owner's instructions to the Contract shall be forwarded through the Architect. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents, unless otherwise modified by written instrument signed by the Owner.

2.2.3 The Architect will visit the site at intervals appropriate to the stage of construction to familiarize himself generally with the progress and quality of the Work and to determine in general if the Work is proceeding in accordance with the Contract Documents. On the basis of his on-site observations as an Architect, he will keep the Owner informed of the progress of the Work, and will endeavor to guard the Owner against defects and deficiencies in the Work of the Contractor.

2.2.4 The Architect will not be responsible for and will not have control or charge of construction means, methods, techniques or procedures, or for safety precautions and programs in connection with the Work, and he will not be responsible for the Contractor's failure to carry out the Work in accordance with the Contract Documents. The Architect will not be responsible for or have control or charge over the acts or omissions of the Contractor, Subcontractors, or any of their agents or employees, or any other persons performing any of the Work.

Initial _____

2.2.5 The Architect shall at all times have access to the Work wherever it is in preparation and progress. The Contractor shall provide facilities for such access so the Architect may perform his functions under the contract documents.

2.2.6 Based on the Architects observations and an evaluation of the Contractor's Applications for Payment, the Architect will determine the amounts owing to the Contractor and will issue Certificates for Payment in such amounts as provided in Paragraph 9.4.

2.2.7 The Architect will render interpretations necessary for the proper execution or progress of the Work, with reasonable promptness and in accordance with any time limit agreed upon so as to cause no delay the Project. Either party to the Contract may make written request to the Architect for such interpretations.

2.2.8 All interpretations and decisions of the Architect shall be consistent with the intent of and reasonably inferable from the Contract Documents and will be in writing or in the form of drawings.

2.2.9 The Architects decision in matters relating to artistic effect will be final if consistent with the intent of the Contract Documents. The Architect shall rule on all claims and disputes that relate to the interpretation of the Contract Documents.

2.2.10 The Architect will have authority to reject Work, which does not conform to the Contract Documents. Whenever, in his opinion, he considers it necessary or advisable for the implementation of the intent of the Contract Documents, he will have authority to require special inspection or testing of the Work in accordance with Subparagraph 7.7.2 whether or not such Work is then fabricated, installed or completed. In the event the Architect determines that any Work deleted by the Contractor should have been performed by the Contractor under the Contract Documents, he shall issue a final determination that the Contractor shall proceed with the Work as directed by the Architect, and the Contractor shall proceed with the Work even if he is in disagreement with the decision of the Architect.

2.2.11 The Architect will review and approve or take other appropriate action under Contractor's submittals such as Shop Drawings, Product Data, and Samples, but only for conformance with the design concept of the Work and with the information given in the Contract Documents. Such action shall be taken with reasonable promptness so as to cause no delay. The Architects

approval of a specific item shall not indicate approval of an assembly of which the item is a component.

Initial _____

2.2.12 The Architect will prepare Change Orders in accordance with Article 12 and will have the authority to order minor changes in the Work as provided in Subparagraph 12.3.

2.2.13 The Architect will conduct inspections to determine the dates of Substantial Completion and completion will receive and forward to the Owner for the Owner's review written warranties and related documents required by the Contract and assembled by the Contractor, and will issue a Final Certificate for Payment upon compliance with the requirements of Paragraph 9.8.

ARTICLE III **OWNER**

3.1 Definition

3.1.1 The Owner is the person or entity identified as such in the Owner-Contractor Agreement and is referred to throughout the Contract Documents as if singular in number and masculine in gender. The term Owner means the Owner, or his authorized representative.

3.2 Information and Services Required of the Owner

3.2.1 The Owner or Architect shall furnish all surveys describing the physical characteristics, legal limitations, and utility locations for the site of the Project, and a legal description of the site.

3.2.2 Except as provided in Subparagraph 4.7.1, the Owner shall secure and pay for necessary approvals, easements, assessments, and charges required for the construction, use, or occupancy of permanent structures or for permanent changes in existing facilities.

3.2.3 Information or services under the Owner control shall be furnished by the Owner with reasonable promptness to avoid delay in the orderly progress of the Work.

3.2.4 Unless otherwise provided in the Contract Documents, the Contractor will be furnished, free of charge, all copies of Drawings and Specifications reasonably necessary for the execution of the Work.

3.2.5 The foregoing are in addition to other duties and responsibilities of the Owner enumerated herein and especially those in respect to Work by Owner or by Separate Contractors, Payments and Completion and Insurance in Article 6, 9 and 11,

respectively.

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3.3 Owner's Right to Stop the Work

3.3.1 If the Contractor fails to correct defective Work as required by Paragraph 13.2 or persistently fails to carry out the Work in accordance with the Contract Documents, the Owner may order the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of the Owner to stop the Work shall not give rise to any duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity. Any such order to the Contractor shall be in writing.

3.4 Owner's Right to Carry Out the Work

3.4.1 If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within two (2) days after receipt of written notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to any other remedy it may have, make good and correct such deficiencies with its own forces or with the forces of another contractor. In such case, an appropriate Change Order shall be issued deducting from the payments then or thereafter due the Contractor the cost of correcting such deficiencies, including compensation for the Architect additional services made necessary by such default, neglect, or failure. If the payments then or thereafter due the Contractor are not sufficient to cover such amount, the Contractor shall pay the difference to the Owner.

3.4.2 The Owner shall have access to the Project at all times.

ARTICLE IV **CONTRACTOR**

4.1 Definition

4.1.1 The Contractor is the person or entity identified as such in the Owner-Contractor Agreement and is referred to throughout the Contract Documents as if singular in number and masculine in gender. The term Contractor means the Contractor or his authorized representative.

4.2 Review of Contract Documents

4.2.1 The Contractor shall carefully study and compare the Contract Documents and shall at once report to the Architect any

error, inconsistency or omission he may discover.

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4.3 Supervision and Construction Procedures

4.3.1 The Contractor shall supervise and direct the Work, using his best skill and attention. He shall be solely responsible for all construction means, methods, techniques, sequences, and procedures and for coordinating all portions of the Work under the Contract.

4.3.2 The Contractor shall be responsible to the Owner for the acts and omissions of his employees, Subcontractors and their agents and employees, and other persons performing any of the Work under a contract with the Contractor.

4.3.3 The Contractor shall not be relieved from his obligations to perform the Work in accordance with the Contract Documents by either the activities or duties of the Architect in his administration of the Contract, or by inspection, tests, or approvals required or performed under Paragraph 7.7 by persons other than the Contractor.

4.4 Labor and Materials

4.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for all labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for the proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

4.4.2 The Contractor shall at all times enforce strict discipline and good order among his employees and shall not employ on the Work any unfit person or anyone not skilled in the task assigned to him.

4.4.3 When a material, equipment, or system is specified or approved in an addendum, by the name of one or more manufacturers, such material, equipment, or system shall form the basis of the contract. If Contractor desires to use another material, equipment, or system in lieu thereof, he shall request approval in writing and shall submit samples and data as required for the Architect's consideration. The Architect and Owner will be the final judge for the acceptance or the substitution. No Substitution shall be made without authority in writing from the Architect.

4.4.4 By making requests for substitutions based on Subparagraph 4.4.3 above, the Contractor:

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- .1 represents that he has personally investigated the proposed substitute product and determined that it is equal or superior in all respects to that specified;
- .2 represents that he will provide the same warranty for the substitute that is required by the Contract Documents for that specified.
- .3 certifies that the cost data presented is complete and includes all related costs and excludes the Architect's redesign costs, and waives all claims for additional costs related to the substitution which subsequently became apparent; and
- .4 will coordinate the installation of the accepted substitute, making such changes at no additional cost to Owner as may be required for the Work to be complete in all respects.

4.4.5 The General Contractor shall disclose the existence and extent of financial interests, whether direct or indirect, he has in subcontractors and material suppliers, which he may propose for this Project.

4.5 **Warranty**

4.5.1 The Contractor warrants to the Owner and the Architect that all materials and equipment furnished under this Contract will be new unless otherwise specified, and all Work will be of good quality, free from faults and defects and in conformance with the Contract Documents. All Work not conforming to these requirements, including substitutions not properly approved and requirements including substitutions not properly approved and authorized, may be considered defective. If required by the Architect, the Contractor shall furnish satisfactory evidence. This warranty is not limited by the provisions of Paragraph 13.2.

4.6 **Taxes**

4.6.1 The Contractor shall pay all sales, consumer, use and other similar taxes for the Work or portions thereof provided by the Contractor, which are legally enacted at the time bids, are received, whether or not yet effective.

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4.7 Permits, Fees, and Notices

4.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit and for all other permits and governmental fees, licenses and inspections necessary for the proper execution of the Contract.

4.7.2 The Contractor shall give all notices and comply with all laws, ordinances, rules, regulations, and lawful orders of any public authority bearing on the performance of the Work.

4.7.3 If the Contractor performs any Work knowing it to be contrary to such laws, ordinances, rules and regulations, and without such notice to the Architect, he shall assume full responsibility therefore and shall bear all costs attributable thereto.

4.8 Allowances and Owner Furnished Equipment, Fixtures or Labor

4.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by these allowances shall be supplied for such amounts and by such persons as the Owner may direct, but the Contractor will not be required to employ persons against whom he makes a reasonable objection.

4.8.2 Unless otherwise provided in the Contract Documents:

- .1 these allowances shall cover the cost to the Contractor, less any applicable trade discount, of the materials and equipment required by the allowance delivered at the site, and applicable taxes;
- .2 the Contractor's costs for unloading and handling on the site, labor, installation costs, overhead, profit and other expenses contemplated for the original allowance shall be included in the Contract Sum and not in the allowance;
- .3 whenever the cost is more than or less than the allowance, the Contract Sum shall be adjusted accordingly by Change Order, the amount of which will recognize changes, if any, in handling costs on the site, labor, installation costs, overhead, profit and other expenses.

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4.8.3 The Owner may directly furnish any or all of the equipment, fixtures, or labor required for the Project. In the event the Owner elects to do so, the Contract Price for such equipment, fixtures, or labor will be reduced by the amount for equipment of labor being furnished by Owner. A Change Order reducing the Contract Price for that item of work shall be executed by Owner and Contractor to reflect a reduction in the Contract Price for that item, equipment, fixtures or work that the Owner is to furnish. The Contractor shall assume responsibility for and be fully responsible for the care, custody, and control of all Owner furnished equipment and/or fixtures once said equipment or fixtures arrive on the job site or in any approved off site storage facility.

4.9 **Superintendent**

4.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during the progress of the Work. The superintendent shall represent the Contractor and all communications given to the superintendent shall be as binding as if given to the Contractor and shall be confirmed in writing.

4.10 **Documents and Samples at the Site**

4.10.1 The Contractor shall maintain at the site for the Owner, one record copy of all Drawings, Specifications, Addenda, Change Orders, and other Modifications, in good order and marked currently to record all changes made during construction and approved Shop Drawings, Product Data and Samples. These shall be available to the Architect and shall be delivered to him for the Owner upon completion of the Work.

4.11 **Shop Drawings, Product Data, and Samples**

4.11.1 Shop Drawings are drawings, diagrams, schedules, and other data specifically prepared for the Work by the Contractor or any Subcontractor, manufacturer, supplier or distributor to illustrate some portion of the Work.

4.11.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by the Contractor to illustrate a material, product, or system for some portion of the Work.

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4.11.3 Samples are physical examples, which illustrate

materials, equipment, or workmanship and establish standards by which the Work will be judged.

4.11.4 The Contractor shall review, approve and submit, with reasonable promptness and in such sequence as to cause no delay in the Work or in the work of the Owner or any separate contractor, all Shop Drawings, Product Data and Samples required by the Contract Documents.

4.11.5 By approving and submitting Shop Drawings, Product Data and Samples, the Contractor represents that he has determined and verified all materials, field measurements, and field construction criteria related thereto, or will do so, and that he has checked and coordinated the information contained within such submittals with the requirements of the Work and the Contract Documents.

4.11.6 The Contractor shall not be relieved of responsibility for any deviation from the requirements of the Contract Documents by the Architects approval of Shop Drawings, Product Data or Samples under Subparagraph 2.2.11, unless the Contractor has specifically informed the Architect in writing of such deviation at the time of submission and the Architect has given written approval to the specific deviation. The Contractor shall not be relieved from responsibility for errors or omissions in the Shop Drawings, Product Data, or Samples by the Architect approval thereof.

4.11.7 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, or Samples, to revisions other than those requested by the Architect on previous submittals.

4.11.8 No portion of the Work requiring submission of a Shop Drawing, Product Data, or Sample shall be commenced until the submittal has been approved by the Architect as provided in Subparagraph 2.2.11. All such portions of the Work shall be in accordance with approved submittals.

4.12 **Use of Site**

4.12.1 The Contractor shall confine operations at the site to areas permitted by law, ordinance, permits and the Contract Documents and shall not unreasonably encumber the site with any materials or equipment.

4.13 **Cutting and Patching of Work**

4.13.1 The Contractor shall be responsible for all cutting,

Initial _____

fitting or patching that may be required to complete the Work or

to make its several parts fit together properly.

4.13.2 The Contractor shall not damage or endanger any portion of the Work or the work of the Owner or any separate contractors by cutting, patching or otherwise altering any work, or by excavation. The Contractor shall not cut or otherwise alter the work of the Owner or any separate contractor except with the written consent of the Owner. The Contractor shall not unreasonably withhold from the Owner his consent to cutting or otherwise altering the Work.

4.14 Cleaning Up

4.14.1 The Contractor at all times shall keep the premises free from accumulation of waste materials or rubbish caused by his operations. At the completion of the Work, he shall remove all his waste materials and rubbish from and about the project as well as all his tools, construction equipment, machinery and surplus materials.

4.14.2 If the Contractor fails to clean up at the completion of the Work, the Owner may do so as provided in Paragraph 3.4 and the cost thereof will be charged to the Contractor.

4.15 Royalties, Patents, and Records

4.15.1 The Contractor shall pay all royalties and license fees. He shall defend all suits and claims for infringement of any patent rights and shall save Owner and Architect harmless from loss on account thereof.

4.15.2 The Contractor shall not discriminate against any subcontractor, employee, or applicant for employment on the grounds of race, color, national origin, or sex.

4.15.3 The Contractor and all subcontractors under the general contract shall maintain copies of every sub-payroll period for the life of the construction contract and for a period of three (3) years after final release and payment is made by the Owner to the Contractor.

4.15.4 Each Contractor request for payment, including final payment and each partial payment, if permitted by the contract, shall contain a certification by the Contractor that performance by the Contractor and his subcontractor for the period of work covered by the payment request has been in accordance with the contract clauses and requirements with respect to nondiscrimination.

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4.15.5 Representatives of Shelby County, as designated by the Mayor, shall have the right to inspect the Contractor's facilities and payroll records during the term of the construction contract and for a period of three (3) years after final release and final payment by the Owner for the purposes of verifying nondiscrimination in employment.

4.15.6 The Contractor shall incorporate the same requirements set forth in Subparagraph 5.3.1 in all Subcontracts awarded by him with the further requirement that each Subcontract include identical requirements to be included in any lower tier Subcontracts together with the requirement to include it in any further subcontracts that might be made.

4.16 Indemnification

4.16.1 (a) By executing this Agreement, the Contractor assumes the entire responsibility and liability for any and all claims, damage or injury of any kind or nature (including death) to all persons, whether employees of the Contractor or otherwise, and to all property (including but not limited to the replacement cost and loss of use of property), caused by, resulting from, arising out of, or occurring in connection with the performance of the Work by the Contractor, its agents, servants, employees, or subcontractors or anyone directly or indirectly employed by any of them for whose acts any of them may be liable.

(b) If any claim is made against the Owner for any damage, injury, death, or loss, whether such claim is based upon the Contractor or its agents, servants, employees, or subcontractors alleged active or passive negligence or participation in the wrong, or upon any alleged active or passive negligence or participation in the wrong, or upon any alleged breach of any statutory duty or obligation on the part of the Contractor, its agents, servants, employees or subcontractors, or in any other instance for which the Contractor has assumed responsibility in this Agreement, the Contractor shall indemnify, defend, and hold harmless the Owner, its officers, directors, agents, servants and employees from and against any and all loss, expense, judgment, damage or injury (including attorney's fees and expenses) that the Owner or its officers, directors, agents, servants or employees may sustain as the result of any such claim. The Contractor shall assume on behalf of the Owner, its officers, directors, agents, servants and employees the defense of any action at law or in equity which may be brought against any of them upon any such claim, and shall pay on behalf of them the amount of any judgment with any costs or expenses incurred by any of them in connection with such claim.

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4.16.2 Labor Indemnity

4.16.2.1 The Contractor shall indemnify, defend and hold harmless the Owner from any and all administrative and judicial actions (including reasonable attorney's fees related to any such action) incurred by the Owner in connection with any labor related activity arising from the performance of the Work of the Contractor. As used in this Agreement, labor related activity includes, but is not limited to strikes, walkouts, informational or organizational picketing, use of placards, distribution of handouts, leaflets or in the vicinity of any facility where the Owner conducts business. The Owner shall advise the contractor if any labor related activity occurs and the Contractor shall arrange for the legal representation necessary to protect the Owner, provided such representation is previously approved by the Owner.

4.16.3 Attorney's Fees

4.16.3.1 In the event it becomes necessary for Owner to employ an attorney to enforce any provision of this Agreement, then the Contractor shall be liable for all attorney's fees and litigation expense of Owner.

4.17 Progress Schedule

4.17.1 The Contractor shall, within five (5) days from receipt of the Notice to Proceed, prepare and submit for the Owner and Architect an estimated project schedule for the Work. The Progress Schedule shall be updated each month to reflect actual progress made and to forecast future progress of the Work. The Progress Schedule shall be related to the entire Project as provided by the contract Documents and shall provide for expeditious and practicable execution of the Work. The Owner reserves the right to reasonably reschedule the Work or the sequence of activities of the contractor for no additional compensation should it deem rescheduling to be in its best interest.

ARTICLE V SUBCONTRACTORS

5.1 Definition

5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform any of the Work at the site. The term Subcontractor is referred to throughout the Contract Documents as if singular in number and masculine in gender and means a Subcontractor or his authorized representative. The term Subcontractor does not include any

separate contractor or his subcontractor.

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5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform any of the Work at the site. The term Sub-subcontractor is referred to throughout the Contract Documents as if singular in number and masculine in gender and means a Sub-subcontractor or an authorized representative thereof.

5.2 **Award of Subcontracts and Other Contracts for Portions of the Work**

5.2.1 Unless otherwise required by the Contract Documents or Bidding Documents, the Contractor, as soon as practicable after the award of the Contract, shall furnish to the Owner and the Architect in writing the names of the persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for each of the principal portions of the Work. The Architect will promptly reply to the Contractor in writing stating whether or not the Owner or the Architect, after due investigation, has reasonable objection to any such proposed person or entity. Failure of the Owner or Architect to reply promptly shall constitute notice of no reasonable objection. No work shall be commenced until approval of all such Subcontractors has been given in writing by the Owner. If required, the Contractor shall furnish evidence satisfactory to the Owner, showing each proposed Subcontractor is competent to execute the Work covered by the Subcontract.

5.2.2 The Contractor shall not contract with any such proposed person or entity to whom the Owner or the Architect has made reasonable objection under the provisions of Subparagraph 5.2.1. The Contractor shall not be required to contract with anyone to whom he has a reasonable objection.

5.2.3 If the Owner or the Architect has reasonable objection to any such proposed person or entity, the Contractor shall submit a substitute to whom the Owner or the Architect has no reasonable objection. Such substitution shall in no way affect the Contract Sum.

5.2.4 The Contractor shall make no substitution for any Subcontractor, person, or entity previously selected if the Owner or Architect makes reasonable objection to such substitution.

5.2.5 The Contractor shall submit a status report with regard to Subcontractors identified on Exhibit C, which forms a part of the Contract Documents, as to any change in the subcontractors identified thereon and the reasons for same, the dollars paid to the prior subcontractor and the amount of the new subcontract.

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THIS REPORT SHALL BE SUBMITTED TO CONTRACTS ADMINISTRATION OF SHELBY COUNTY GOVERNMENT, 160 N. Main St., Suite 1109, Memphis, Tennessee, 38103.

5.3 Subcontractual Relations

5.3.1 By an appropriate agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by the terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities which the Contractor, by these Documents, assumes toward the Owner and the Architect. Said agreement shall preserve and protect the rights of the Owner and the Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that the subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the Contractor-Subcontractor agreement, the benefit of all rights, remedies and redress against the Contractor that the Contractor, by these Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with his Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the Subcontract, copies of the Contract Documents to which the Subcontractor will be bound by the Paragraph 5.3, and identify to the Subcontractor any terms and conditions of the proposed subcontract which may be at variance with the Contract Documents. Each Subcontractor shall similarly make copies of such Documents available to any Sub-subcontractors.

ARTICLE VI WORK BY OWNER OR BY SEPARATE CONTRACTORS

6.1 Owner's Right to Perform Work and to Award Separate Contracts

6.1.1 The Owner reserves the right to perform work related to the Project with his own forces, and to award separate contracts in connection with other portions of the Project or other work on the site under these or similar Conditions of the Contract.

6.1.2 When separate contracts are awarded for different portions of the Project or other work on the site, the term Contractor in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

6.2 Mutual Responsibility

6.2.1 The Contractor shall afford the Owner and separate contractor's reasonable opportunity for the introduction and storage of their materials and equipment and the execution of their work, and shall connect and coordinate his Work with theirs as required by the Contract Documents.

6.2.2 If any part of the Contractor's Work depends on proper execution or results in the work of the Owner or any separate contractor, the Contractor shall, prior to proceeding with the Work, promptly report to the Architect any apparent discrepancies or defects in such other work that render it unsuitable for such proper execution and results. Failure of the Contractor to so report shall constitute an acceptance of the Owner's or separate contractor's work as fit and proper to receive his Work.

6.2.3 Should the Contractor wrongfully cause damage to the work or property of the Owner or to other work on the site, the Contractor shall promptly remedy such damage as provided in Subparagraph 10.2.5.

6.2.4 Should the Contractor wrongfully cause damage to the work or property of any separate contractor, the Contractor shall upon due notice promptly attempt to settle with such other contractor by agreement, or otherwise to resolve the dispute. If such separate contractor sues the Owner on account of any damage alleged to have been caused by the Contractor, the Owner shall notify the Contractor who shall defend such proceedings, and if any judgment or award against Owner arises there from, the Contractor shall pay or satisfy it and shall reimburse the Owner for all Attorney's fees and Court costs which the Owner has incurred.

6.3 Owner's Right to Clean Up

6.3.1 If a dispute arises between the Contractor and separate contractors as to their responsibility for cleaning up as required by Paragraph 4.14, the Owner may clean up and charge the cost thereof to the contractors responsible therefore as the Owner shall determine to be just.

**ARTICLE VII
MISCELLANEOUS PROVISIONS**

7.1 GENERAL COMPLIANCE WITH LAWS

7.1.1 If required, the Contractor certifies that it is

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qualified or will take steps necessary to qualify to do business in the State of Tennessee and that it will take such action as, from time to time, may be necessary to remain so qualified and it shall obtain, at its expense all licenses, permits, insurance, and governmental approvals, if any, necessary to the performance of its obligations under this Agreement.

7.1.2 The Contractor is assumed to be familiar with and agrees that at all times it will observe and comply with all federal, state, and local laws, ordinances, and regulations in any manner affecting the conduct of the work. The preceding shall include, but is not limited to, compliance with all Equal Employment Opportunity laws, the Fair Labor Standards Act, Occupational Safety, and Health Administration (OSHA) requirements, and the Americans with Disabilities Act (ADA).

7.1.3 This Contract will be interpreted in accordance with the laws of the State of Tennessee. By execution of this contract the Contractor agrees that all actions, whether sounding in contract or in tort, relating to the validity, construction, interpretation and enforcement of this contract will be instituted and litigated in the courts of the State of Tennessee, located in Shelby County, Tennessee, and in no other. In accordance herewith, the parties to this contract submit to the jurisdiction of the courts of the State of Tennessee located in Shelby County, Tennessee.

7.2 Successors and Assigns

7.2.1 This Agreement (including without limitation, all obligations imposed by the Contract Documents) shall be binding upon and shall inure to the benefit of the parties= successors, assigns, and legal representative. The Contract shall not be assigned or sublet in whole or in part by the Contractor without the written consent of the Owner, nor shall the Contractor assign any monies due or to become due to him hereunder, without the previous written consent of the Owner.

7.3 Written Notice

7.3.1 Written notice shall be deemed to have been duly served if delivered in person to the individual or member of the firm, entity or to an officer of the corporation for whom it was intended, or if delivered at or sent by registered or certified mail to the last business address known to him who gives the notice.

7.4 Claims for Damages

7.4.1 Should either party to the Contract suffer injury or damage to person or property because of any act or omission of the other party, or of any of his employees, agents or others for whose acts he is legally liable, claim shall be made in writing to such other party within a reasonable time after the first observance of such injury or damage.

7.5 Performance Bond and Labor and Material Payment Bond

7.5.1 The Contractor shall furnish and keep in force throughout the performance of the Work a separate performance bond and separate labor and material payment bond, each in the amount of the total of the Contract (as the same may be modified from time to time) conditioned upon the faithful performance of the Work by the Contractor and payment of all obligations arising in connection with the Work by the Contractor. Said bonds shall also guarantee to the Owner that the Work shall be free of all liens upon the property of the Owner. The bonds shall name the Owner as obligee and shall be with such Surety authorized to do business in the State of Tennessee and in such form and manner as approved by Owner. Said Bond shall be subject to final approval of the Shelby County Risk Management Department. Said bonds shall be furnished to the Owner prior to the commencement of the Work, or upon written request by Owner to Contractor after the Work has commenced.

7.6 Rights and Remedies

7.6.1 The duties and obligations imposed by the Contract Documents and the rights and remedies available there under shall be in addition to and not a limitation of any duties, obligations, rights and remedies otherwise imposed or available by law.

7.6.2 No action or failure to act by the Owner, Architect, or Contractor shall constitute a waiver of any right or duty afforded any of them under the Contract, nor shall any such action or failure to act constitute an approval of or acquiescence in any breach there under, except as may be specifically agreed in writing.

7.7 Tests

7.7.1 If the Contract Documents, laws, ordinances, rules, regulations or orders of any public authority having

jurisdiction require any portion of the Work to be inspected, tested or approved, the Contractor shall give the Architect timely notice of its readiness so the Architect may observe such inspection, testing

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or approval. The Contractor shall bear all costs of such inspections, tests, or approvals conducted by public authorities. Unless otherwise provided, the Owner shall bear all costs of other inspections or tests.

7.7.2 If the Architect determines that any Work requires special inspection, testing, or approval, which Subparagraph 7.7.1 does not include, he will, upon written authorization from the Owner, instruct the Contractor to order such special inspection, testing, or approval, and the Contractor shall give notice as provided in Subparagraph 7.7.1. If such special inspection or testing reveals a failure of the Work to comply with the requirements of the Contract Documents, the Contractor shall bear all costs thereof, including compensation for the Architect's additional services and/or correction of the defective Work made necessary by such a failure; otherwise, the Owner shall bear such costs, and an appropriate Change Order shall be issued.

7.7.3 Required certificates of inspection, testing, or approval shall be secured by the Contractor and promptly delivered by him to the Architect.

7.7.4 If the Architect is to observe the inspection, tests or approvals required by the Contract Documents, he will do so promptly where practicable, at the source of supply.

ARTICLE VIII **TIME**

8.1 Definitions

8.1.1 Unless otherwise provided, the Contract time is the period of time allotted in the Contract Documents for Substantial Completion of the Work as defined in Subparagraph 8.1.3, including authorized adjustments thereto.

8.1.2 The date of commencement of the Work is the date established in a notice to proceed. If there is no notice to proceed, it shall be the date of the Owner-Contractor Agreement or such other date as may be established therein.

8.1.3 The date of Substantial Completion of the Work or designated portion thereof is the Date certified by the Architect when construction is sufficiently complete, in

accordance with the contract Documents, so the Owner can occupy or utilize the Work or designated portion thereof for the use for which it is intended.

8.1.4 The term day as used in the Contract Documents ^{Initial} shall mean calendar day unless otherwise specifically designated.

8.2 Progress and Completion

8.2.1 All time limits stated in the Contract Documents are of the essence of the Contract.

8.2.2 The Contractor shall begin the Work on the date of commencement as defined in Subparagraph 8.1.2. He shall carry the work forward expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

8.3 Delays and Extensions of Time

8.3.1 The Contractor shall proceed with each and every part of this Agreement in a prompt and diligent manner. The Contractor, without additional compensation, shall perform the Work at such times, in such order and in such manner as the Owner may direct. The Contractor shall commence, continue, and complete its performance of the Project so as not to delay Owner or other separate contractors of the Owner or subcontractors= completion of the Work or any portions thereof, and so as to insure completion as directed by Owner. Any time specified for the completion of the Work, or portion thereof, is a material provision of this Agreement, and time is of the essence. The Contractor shall furnish sufficient forces to assure proper performance of its Work in strict compliance with all performance or progress schedules for the Project.

8.3.2 The Contractor shall, from time to time, on written demand of Owner, give adequate evidence to Owner to substantiate the planned performance and progress of the Work and the various parts thereof. The Contractor shall promptly increase its work force, accelerate its performance, work overtime, work Saturdays, Sundays and holidays, all without additional compensation, if in the opinion of the Owner, such work is necessary to maintain proper progress. The Contractor will fully cooperate and coordinate its work with any other separate contractors of Owner or subcontractors at the Project. The Contractor shall bear the costs of all damages done to other separate contractors of Owner or subcontractors and shall be responsible for any damages caused by or resulting from acts or omissions of the Contractor in failing to make proper progress. The liability of the Contractor shall not be deemed waived by any assent or acquiescence by Owner to the Contractor's

late performance. Owner shall be entitled to terminate this Agreement due to late or threatened late performance, upon seven (7) days notice to proceed and Contractors failure to do so.

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8.3.3 In the event any subcontractor should damage the Contractor, the Contractor shall neither seek nor be entitled to any compensation from Owner, but will seek its damages directly from such subcontractor. Should the Contractor's performance, in whole or part, be disrupted, interfered with or delayed, or be suspended in the commencement, prosecution or completion, for reasons beyond the Contractor's control and without its fault or negligence, the Contractor shall be entitled to an extension of time in which to complete its Work; but only if it shall have notified the Owner, in writing, of the cause of delay within five (5) days of the occurrence of the event. The Contractor and Owner agree that the Contractor shall not be entitled to any money damages regardless of fault as a result of any delay, acceleration, disruption, interference, suspension, or other event affecting the Contractor or the Contractor's performance.

ARTICLE IX

PAYMENTS AND COMPLETION

9.1 Contract Sum

9.1.1 The Contract Sum is stated in the Owner-Contractor Agreement and, including authorized adjustments thereto, is the total amount payable by the Owner to the Contractor for the performance of the Work under the Contract Documents.

9.2 Schedule of Values

9.2.1 Before the first Application for Payment, the Contractor shall submit to the Architect a schedule of values allocated to the various portions of the Work, prepared in such form, and supported by such data to substantiate its accuracy as the Architect may require. This schedule, unless objected to by the Architect, shall be used only as a basis for the Contractor's Applications for Payment.

9.3 Applications for Payment

9.3.1 At least ten days before the date of each progress payment established in the Owner-Contractor Agreement, the Contractor shall submit to the Architect an itemized Application for Payment, notarized if required, supported by such data substantiating the Contractor's right to payment as the Owner or the Architect may require, and reflecting retain age, if any, as provided elsewhere in the Contract Documents. The Contractor

shall indicate on each Application for Payment the dollar amount and percentage due Subcontractors.

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Progress payments (monthly) will be made based upon Applications for Payment submitted to the Architect by the Contractor and Certificates for Payment issued by the Architect as follows:

On or before the 10th day of each month, 95% of the proportion of the Contract Sum properly allocable to labor, materials and equipment incorporated in the Work, up to the first day of that month, less the aggregate of previous payments in each case. Payments will be less such retainage as the Architect shall determine for all incomplete work and unsettled claims.

9.3.1.1 Until final payment, the Owner will pay 95% of the amount due the Contractor on account of progress payments. If the manner of completion of the Work and its progress are and remain satisfactory to the Owner, it may, in its sole discretion, for each Work category shown to be 50% or more complete in the Application for Payment, without reduction of previous retainage, on presentation by the Contractor with Consent of Surety for each application, certify any remaining progress payments for each Work category to be paid in full.

9.3.1.2 The full Contract retainage may be reinstated at any time in the sole discretion of the Owner.

9.3.2 Unless otherwise provided in the Contract Documents, payments will be made on account of materials or equipment not incorporated in the Work but delivered and suitably stored at the site and, if approved in advance by the Owner, payments may similarly be made for materials or equipment suitably stored at some other location agreed upon in writing. Payments for materials or equipment stored on or off the site shall be conditioned upon submission by the Contractor of bills of sale or such other procedures satisfactory to the Owner to establish the Owner's title to such materials or equipment or otherwise protect the Owner's interest, including applicable insurance and transportation to the site for those materials and equipment stored off the site.

9.3.3 The Contractor warrants that title to all Work, materials and equipment covered by an Application for Payment will pass to the Owner either by incorporation in the construction or upon the receipt of payment by the Contractor, whichever occurs first, free and clear of all liens, claims, security interests or encumbrances, hereinafter referred to in the Article IX as Aliens; and that no Work, materials or equipment covered by an Application for Payment will have been acquired by the Contractor, or by any other persons performing Work at the site or furnishing materials and equipment for the Project, subject to an agreement under which an interest therein

or an encumbrance thereon is retained by the seller or otherwise imposed by the Contractor or such other person.

9.3.4 The Contractor shall submit a report with Initial each Application for Payment, which sets forth all subcontractors performing work during that reporting period, the dollar amount paid to the subcontractor, etc. on the form provided by Shelby County Government.

9.4 Certificate for Payment

9.4.1 The Architect will, within seven (7) days after the receipt of the Contractor's Application for Payment, issue a Certificate for Payment to the Owner for such amount as the Architect determines is properly due.

9.4.2 The issuance of a Certificate of Payment will constitute a representation by the Architect to the Owner, based on his observations at the site as provided in Subparagraph 2.2.3 and the data comprising the Application for Payment, that the Work has progressed to the point indicated; that, to the best of his knowledge, information and belief, the quality of the Work is in accordance with the Contract Documents (subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to the results of any subsequent tests required by or performed under the Contract Documents, to minor deviations from the Contract Documents correctable prior to completion, and any specific qualifications stated in his Certificate); and that the Contractor is entitled to payment in the amount certified.

9.5 Progress Payments

9.5.1 The Contractor shall promptly pay each Subcontractor, upon receipt of payment from the Owner, out of the amount paid to the Contractor on account of such Subcontractor's Work, the amount to which said Subcontractor is entitled, reflecting the percentage actually retained, if any, from payments to the Contractor on account of such Subcontractor's Work. The Contractor shall, by an appropriate agreement with each Subcontractor, require each Subcontractor to make payments to his Sub-subcontractors in similar manner.

9.6 Payments Withheld

9.6.1 The Architect may decline to certify payments and may withhold his Certificate in whole or in part, to the extent necessary to protect the Owner, if in his opinion he is unable to make representations to the Owner as provided in Subparagraph 9.4.2. The Architect may also decline to certify payment or,

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because of subsequently discovered evidence or subsequent observations, he may nullify the whole or any part of any Certificate for Payment previously issued, to such extent as may be necessary in his opinion to protect the Owner from loss because of:

- .1 defective Work not remedied;
- .2 third party claims filed or reasonable evidence indicating probable filing of such claims;
- .3 failure of the Contractor to make payments properly to Subcontractors or for labor, materials, or equipment;
- .4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
- .5 damage to the Owner or another contractor;
- .6 reasonable evidence that the Work will not be completed within the Contract Time; or
- .7 persistent failures to carry out the Work in accordance with the Contract Documents.

9.6.2 When the above grounds in Subparagraph 9.6.1 are removed, payment shall be made, without interest, for any amounts previously withheld.

9.7 Substantial Completion

9.7.1 When the Contractor considers that the Work, or a designated portion thereof which is acceptable to the Owner, is substantially complete as defined in Subparagraph 8.1.3, the Contractor shall prepare for submission to the Architect a list of items to be completed or corrected. The failure to include any items on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents. When the Architect on the basis of an inspection determines that the Work or designated portion thereof is substantially complete, he will then prepare a Certificate of Substantial Completion which shall establish the Date of Substantial Completion, shall state the responsibilities of the Owner and the Contractor for security, maintenance, heat, utilities, damage to the Work and insurance, and shall fix the time within which the Contractor shall complete the items listed therein. Warranties required by the Contract Documents shall

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commence on the Date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

9.7.2 Upon Substantial Completion of the Work or designated portion thereof and upon application by the Contractor and certification by the Architect, the Owner shall make payment, reflecting adjustment in retainage, if any, for such Work or portion thereof, as provided in the Contract Documents. Payment by the Owner upon application by the Contractor and certification by the Architect for Substantial Completion does not waive any claims the Owner may have against the Contractor.

9.8 Final Completion and Final Payment

9.8.1 Upon receipt of written notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection and, when he finds the Work acceptable under the Contract Documents and the Contract fully performed, he will promptly issue a final Certificate for Payment stating that to the best of his knowledge, information and belief, and on the basis of his observations and inspections, the Work has been completed in accordance with the terms and conditions of the Contract documents and that the entire balance found to be due the Contractor, and noted in said final Certificate, is due and payable. The Architect's final Certificate for Payment will constitute a further representation that the conditions precedent to the Contractor's being entitled to final payment as set forth in Subparagraph 9.7.2 have been fulfilled.

9.8.2 Neither the final payment nor the remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that all payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or his property might in any way be responsible, have been paid or otherwise satisfied, (2) consent of surety to final payment and (3) if required by the Owner, other data establishing payment or satisfaction of all such obligations, such as receipts, releases and waivers of claims, encumbrances and/or alleged liens arising out of the Contract, to the extent and in such form as may be designated by the Owner. If any Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify him against such lien. If any such lien remains unsatisfied after all payments are made, the Contractor shall refund to the Owner all monies that the latter may be compelled to pay in discharging such lien, including all costs and reasonable attorney's fees.

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9.8.3 The 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 the final Application for Payment.

ARTICLE X
PROTECTION OF PERSONS AND PROPERTY

10.1 Safety Precautions and Programs

10.1.1 The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work.

10.2 Safety of Persons and Property

10.2.1 The Contractor shall take all reasonable precautions for the safety of, and shall provide all reasonable protection to prevent damage, injury, or loss to:

- .1 all employees on the Work and all other persons who may be affected thereby;
- .2 all the Work and all materials and equipment to be incorporated therein, whether in storage on or off the site, under the care, custody or control of the Contractor or any of his Subcontractors or Sub-subcontractors; and
- .3 other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

10.2.2 The Contractor shall give all notices and comply with all applicable laws, ordinances, rules, regulations, and lawful orders of any public authority bearing on the safety of persons or property or their protection from damage, injury, or loss.

10.2.3 The Contractor shall erect and maintain, as required by existing conditions and progress of the Work, all reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations and notifying owners and users of adjacent utilities. Pavements, sidewalks, alleys, adjacent buildings not included in this Contract, which may be damaged, shall be repaired and/or replaced immediately and in a manner satisfactory to the Architect, Shelby County and/or other governing officials.

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10.2.4 When the use or storage of explosives or other hazardous materials or equipment is necessary for the execution of the Work, the Contractor shall exercise the utmost care and shall carry on such activities under the supervision of properly qualified personnel.

10.2.5 The Contractor shall promptly remedy all damage or loss (other than damage or loss insured under Paragraph 11.3) to any property referred to in Clauses 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, Subcontractor, or any Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts the Contractor may be liable or responsible. The foregoing obligations of the Contractor are in addition to his obligations under Paragraph 4.16.

10.2.6 The Contractor shall designate a responsible member of his organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner and the Architect.

10.2.7 The Contractor shall not load or permit any part of the Work to be loaded to endanger its safety.

10.3 Emergencies

10.3.1 In any emergency affecting the safety of persons or property, the Contractor shall act, at his discretion, to prevent threatened damage, injury, or loss. Any additional compensation or extension of time claimed by the Contractor on account of emergency work shall be determined as provided in Article XII for Changes in the Work.

10.3.2 Whenever the Contractor has not taken sufficient precautions for the safety of the public or the protection of work to be performed under this Project, or adjacent structures or property which may be injured by processes of construction, demolition and/or site clearance on account of such neglect, and whenever an emergency shall arise and immediate action shall be considered necessary in order to protect public or private, persons or property interest, then the Architect and/or the Owner shall so instruct the Contractor.

10.3.3 If correction is not made in due time or if conditions such as lack of time prevent instructions to Contractor, then the Owner, without notice to the Contractor, may provide reasonable, suitable protection by causing such Work to be done and material to be furnished and placed as the Architect and Owner may consider necessary and adequate. The cost and expense of such work and

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material so furnished shall be borne by the Contractor and, if the same shall not be paid on presentation of the bills thereof, such costs shall be deducted from any amounts due or to become due the Contractor. The performance of such emergency work under the direction of the Owner and/or Architect shall in no way relieve the Contractor of the responsibility for damages, which may occur during or after such performance.

10.3.4 None of the foregoing shall make the Owner and/or Architect responsible for foreseeing and protecting against emergency.

ARTICLE XI
INSURANCE

11.1 Contractor's Liability Insurance

11.1.1 The Contractor shall purchase and maintain, in a company or companies licensed to do business in the State of Tennessee, such insurance as will protect the Owner from claims set forth below which may arise out of or result from the Contractor's operations under the Contract, whether such operations be by himself or by any Subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts the Contractor or Subcontractor may be liable:

- .1 claims under workers= compensation, disability benefits, and other similar employee benefit acts;
- .2 claims for damages because of bodily injury, occupational sickness or disease, or death of his employees;
- .3 claims for damages because of bodily injury, sickness or disease, or death of any person other than his employees;
- .4 claims for damages insured by personal injury liability coverage, which are sustained (1) by any person as a result of an offense directly or indirectly related to the employment of such person by the Contractor, or (2) by any other person;
- .5 claims for damages, other than the Work itself, because of injury to or destruction of tangible property, including loss of use resulting there from; and
- .6 claims for damages because of bodily injury or death of any person or property damage arising

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out of the ownership, maintenance, or use of any motor vehicle.

11.1.2 The insurance required by Subparagraph 11.1.1 shall be written for not less than any limits of liability specified in the Contract Documents, section III, paragraph 31, or required by law, whichever is greater.

11.1.3 The insurance required by Subparagraph 11.1.1 shall include contractual liability insurance applicable to the Contractor's obligations under Paragraph 4.16.

11.1.4 All insurance policies maintained by the Contractor shall provide that insurance as applying to the Owner shall be primary and non-contributing irrespective of such insurance as the Owner may maintain in its own name and on its own behalf.

11.1.5 Certificates of Insurance acceptable to the Owner shall be filed with the Owner at the time of submittal of the Contract Documents to the Owner for execution. These certificates shall contain a provision that coverage's afforded under the policies will not be canceled until at least thirty-(30) days prior written notice has been given to the Owner. The Contractor shall immediately notify Shelby County Government, Contract Administration, 160 N. Main Street, Suite 550, Memphis, Tennessee 38103 of cancellation or changes in any of the insurance coverage required. Upon request of the Owner, certified copies of any of the required insurance policies may be requested from the Contractor or Contractor's insurance company, agency, or broker.

11.2 Owners Liability Insurance

11.2.1 The Owner shall at its discretion, purchase liability insurance or maintain a self-insured liability program.

11.3 Property Insurance

11.3.1 The General Contractor shall be responsible for all risk insurance for physical loss or damage for the project during construction until the project is accepted by the Owner at which time the Owner will provide the property coverage.

11.3.2 The Contractor shall pay each Subcontractor a just share of any insurance monies received by the Contractor, and by appropriate agreement, written where legally required for

validity, shall require such Subcontractor to make payments to his Sub-subcontractors in similar manner.

11.3.3 The Contractor or his insurance agent, broker or insurance company shall furnish to Owner a copy of all policies with the Contactor within five days of request.

11.3.4 If the Owner requests in writing that insurance for risks other than those described in Subparagraphs 11.3 and 11.3.2 or 11.3.3 or other special hazards to be included in the property insurance policy, the Contractor shall, if possible, include such insurance, and the cost thereof shall, if possible, include such insurance, and the cost thereof shall be charged to the Contractor by appropriate Change Order. Initial _____

ARTICLE XII
CHANGES IN THE WORK

12.1 **Change Orders**

12.1.1 A Change Order is a written order to the Contractor signed by the Owner issued after execution of the Contract, authorizing a change in the Work or an adjustment in the Contract Sum or the Contract Time. The Contract Sum and the Contract Time may be changed only by Change Order. A Change Order signed by the Contractor indicates his agreement therewith, including the adjustment in the Contract Sum or the Contract Time. The Contractor by execution of the Change Order waives any further claims or damages in any manner whatsoever for the changes set forth in the Change Order.

12.1.2 The Owner, without invalidating the Contract, may order changes in the Work within the general scope of the Contract consisting of additions, deletions or other revisions, the Contract Sum and the Contract Time being adjusted accordingly. All such changes in the Work shall be authorized by Change Order, and shall be performed under the applicable conditions of the Contract Documents.

12.1.3 The cost or credit to the Owner resulting from a change in the Work shall be determined in one or more of the following ways:

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- .1 by lump sum properly itemized on the form furnished by the Owner which shall show the actual verified cost of the work, plus ten percent overhead and five percent profit; if the work is performed by a Subcontractor, the General Contractor is allowed an additional five percent;
- .2 by unit prices stated in the Contract Documents or subsequently agreed upon;
- .3 by cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
- .4 by the method provided in Subparagraph 11.1.4.

12.1.4 If none of the methods set forth in Clauses 12.1.3.1,

12.1.3.2, or 12.1.3.3 is agreed upon, the Contractor, provided he receive a written order signed by the Owner, shall promptly proceed with the Work involved. The cost of such Work shall then be determined by the Architect on the basis of the reasonable expenditures and savings of those performing the Work attributable to the change, including, in the case of an increase in the Contract Sum, a reasonable allowance for overhead and profit, which shall be defined as ten percent overhead and five percent profit with an additional five percent going to the General Contractor when the work is performed by a Subcontractor. In such case, and also under Clauses 12.1.3.3 and 12.1.3.4 above, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data for inclusion in a Change Order. Unless otherwise provided in the Contract Documents, cost shall be limited to the following: cost of labor, including social security, old age and unemployment insurance and fringe benefits required by agreement or custom; workers= or workmen compensation insurance; bond premiums, rental value of equipment and machinery; and the additional costs of supervision and field office personnel directly attributable to the change. Pending final determination of cost to the Owner, payments on account shall be made on the Architect's Certificate for Payment. The amount of credit to be allowed by the Contractor to the Owner for any deletion or change which results in a net decrease in the Contract Sum will be the amount of the actual net cost as confirmed by the Architect. When both additions and credits covering related Work or substitutions are involved in any one change, the allowance for overhead and profit shall be figured on the basis of the net increase, if any, with respect to that change.

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12.2 Concealed Conditions

12.2.1 Should concealed conditions encountered in the performance of the Work below the surface of the ground or should concealed or unknown conditions in an existing structure be at variance with the conditions indicated by the Contract Documents, or should unknown physical conditions below the surface of the ground or should concealed or unknown conditions in an existing structure of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in this Contract, be encountered, Contractor, subject to approval by the Architect, shall be entitled to a time extension for only the period that the Contractor's performance is extended due to the unforeseen conditions.

12.3 Minor Changes in the Work

12.3.1 The Architect will have authority to order minor changes in the Work not involving an adjustment in the Contract Sum or an extension of the Contract Time and not inconsistent with the intent of the Contract Documents. Such Changes shall be effected by written order, and shall be binding on the Owner and the Contractor. The Contractor shall carry out such written orders promptly.

ARTICLE XIII
UNCOVERING AND CORRECTION OF WORK

13.1 Uncovering of Work

13.1.1 If any portion of the Work should be covered contrary to the request of the Architect or to requirements specifically expressed in the Contract Documents, it must, if required in writing by the Architect, be uncovered for his observation and shall be replaced at the Contractor's expense.

13.1.2 If any other portion of the Work has been covered which the Architect has not specifically requested to observe prior to being covered, the Architect may request to see such Work, and it shall be uncovered by the Contractor. If such Work is found in accordance with the Contract Documents, the cost of uncovering and replacement shall, by appropriate Change Order, be charged to the Owner. If such Work is found not in accordance with the Contract Documents, the Contractor shall pay such costs. If the Work to be uncovered by the Contractor should have been inspected by the Architect prior to being covered, and the Work is found to be in accordance with the Contract Documents, the cost of the uncovering and recovering of the Work shall be borne by the Architect.

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13.2 Correction of Work

13.2.1 The Contractor shall promptly correct all Work rejected by the Architect as defective or as failing to conform to the Contract Documents whether observed before or after Substantial Completion and whether or not fabricated, installed or completed. The Contractor shall bear all costs of correcting such rejected Work, including compensation for the Architect's additional services made necessary thereby.

13.2.2 If, within one year after the Date of Substantial Completion of the Work or designated portion thereof, within one year after acceptance by the Owner of designated equipment or within such longer period of time as may be prescribed by law or by the term of any applicable special warranty required by the Contract Documents, any of the Work is found to be defective or not in accordance with the Contract Documents, the Contractor shall correct it promptly after receipt of a written notice from

the Owner to do so. This obligation shall survive termination of the Contract. The Owner shall give such notice promptly after discovery of the condition.

13.2.3 The Contractor shall remove from the site all portions of the Work, which are defective or non-conforming, unless removal is waived by the Owner.

13.2.4 If the Contractor fails to correct defective or non-conforming Work as provided in Subparagraphs 4.5.1, 13.2.1, and 13.2.2, the Owner may correct it in accordance with Paragraph 3.4.

13.2.5 If the Contractor does not proceed with the correction of such defective or non-conforming Work within a reasonable time fixed by written notice from the Architect, the Owner may remove it and store the materials or equipment at the expense of the Contractor. If the Contractor does not pay the cost of such removal and storage within ten days thereafter, the Owner may, upon ten additional days= written notice, sell such Work at auction or a private sale and shall account for the net proceeds thereof, after deducting all the costs that should have been borne by the Contractor, including compensation for the Architect's additional services made necessary thereby. If such proceeds of sale do not cover all costs, which the Contractor should have borne, the difference shall be charged to the Contractor and an appropriate Change Order shall be issued. If the payments then or thereafter due the Contractor are not sufficient to cover such amount, the Contractor shall pay the difference to the Owner.

13.2.6 The Contractor shall bear the cost of making good all work of the Owner or separate contractors destroyed or damaged by such correction or removal.

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13.2.7 Nothing contained in Paragraph 13.2 shall be construed to establish a period of limitation with respect to any other obligation which the Contractor might have under the Contract Documents, including Paragraph 4.5 hereof. The establishment of the time period of one year after the Date of Substantial Completion or such longer period of time as may be prescribed by law or by the terms of any warranty required by the Contract Documents relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which his obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to his obligations other than specifically to correct the Work.

13.3 Acceptance of Defective or Non-Conforming Work

13.3.1 If the Owner prefers to accept defective or non-conforming Work, he may do so instead of requiring its removal and correction, in which case a Change Order will be issued to reflect a reduction in the Contract Sum where appropriate and equitable. Such adjustment shall be effective whether or not final payment has been made.

ARTICLE XIV
TERMINATION OF THE CONTRACT

14.1 Termination for Default

14.1.1 Should the Contractor fail to perform in strict accordance with this Agreement, where or as Owner may so direct, or should the Contractor become insolvent, unable to or fail to pay its obligations as they mature or, in any other respect fail in the opinion of the Owner, to properly prosecute and perform any part of its work, fail to exert its best performance efforts, be involved in labor disputes, or be terminated under any other contract with Owner, then the Contractor may be deemed by Owner to have materially breached and to have defaulted in its obligations under this Agreement. In case of a breach and default, the Owner, at its discretion, may terminate this Agreement, or any part thereof, by giving five (5) days written notice thereof to the Contractor. In case of such termination, Owner may use any and all materials, equipment, tools or chattels furnished by or belonging to the Contractor either at or for the Project.

14.1.2 The Contractor, on termination, will be deemed to have offered to Owner an assignment of all of its subcontracts and purchase orders relating to this Project. Owner may, at its discretion, do whatever is necessary to assure performance of any

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terminated work and to take such action, if necessary, in the Contractor's name. Owner may withhold from Contractor any monies due or to become due under this or any other contract between the Contractor and Owner, to offset the damages incurred or possibly incurred as a result of the breach and default by the Contractor. In case of a breach, or in the event Owner is required to retain the services of an attorney to enforce any provisions of this Agreement, then the Contractor and its surety company shall be liable to Owner for any and all additional costs, expenses, attorney's fees and other damages, both liquidated and unliquidated, which directly or indirectly result from the Contractor's breach, threatened breach, default or lack of performance of any term or condition of this Agreement.

14.1.3 If the unpaid balance of the Contract Sum exceeds the costs of finishing the Work, including compensation for the Architect's additional services made necessary thereby, such

excess shall be paid to the Contractor. If such costs exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or to the Owner, as the case may be, shall be certified by the Architect, upon application, in the manner provided in Paragraph 9.4, and this obligation for payment shall survive the termination of this Contract.

14.2 Termination for Convenience

14.2.1 Owner, by written notice, shall have the right to terminate and cancel this Agreement, without the Contractor being at fault, for any cause or for its own convenience, and require the Contractor to immediately stop work. In such event, Owner shall pay the Contractor for that Work actually performed and materials furnished in an amount proportionate to the Contract price. Owner shall not be liable to the Contractor for any other costs, including prospective profits on Work not performed.

ARTICLE XV RIGHT TO OCCUPY BY OWNER

15.1 Early Occupancy by Owner

15.1.1 The Owner has the right to occupy or use ahead of schedule all or any substantially completed or partially completed portion of the Work when such occupancy and use are in its best interest, notwithstanding the time of completion for all of the Work. If occupancy or use increases the cost of the Work (other than for corrections which are the responsibility of the Contractor) and/or as a result of the Owner exercising its rights

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herein, the contractor shall be entitled to extra costs and extensions of time, or both. Claims for such extra costs and extensions of time, to be valid, shall be made in writing to the Owner within seven (7) calendar days of the notification of Owner to the Contractor of its intent to so occupy or use.

15.2 Corrections after Occupancy

15.2.1 After the Owner has taken occupancy of all or any substantially completed portion of the Work, the Contractor shall not disrupt the use and occupancy of the Owner to make corrections in the Work but shall, at the discretion of the Owner, make such corrections at the expense of the Contractor after normal working hours.

15.3 Heating, Ventilating, and Air-Conditioning Systems

15.3.1 The Owner may require the use and operation of any completed heating, ventilating, and air-conditioning equipment at the time it occupies or uses any substantially completed portion of the Work. In such event, the Owner may require the Contractor to operate such equipment and will pay the Contractor the cost of such utilities required for the use and occupancy of the Owner, but the Contractor shall be responsible for such equipment and for its careful and proper operation. At any time, the Owner may assume the care and maintenance of any portion of the Work, which it is occupying and using for the operation of any such equipment, but in each case, the Contractor shall not be relieved of its responsibility for the full completion of the Work and the protection of its tools, materials, and equipment.

ARTICLE XVI
REGULATIONS

16.1 Nondiscrimination in Employment

16.1.1 During the performance of this Contractual Agreement, the contracting party agrees as follows: The CONTRACTOR agrees that no person on the grounds of handicap, age, race, color, religion, sex, or national origin, shall be excluded from participation in, or be denied benefits of, or be otherwise subject to discrimination in the performance of this contract, or in the employment practices of the CONTRACTOR. The CONTRACTOR shall upon request show proof of such non-discrimination, and shall post in conspicuous places available to all employees and applicants notices of non-discrimination.

16.2 [RESERVED]

Initial _____

16.3 Maintenance and Records

16.3.1 The Contractor and all Subcontractors under the General Contract shall maintain copies of every subcontract awarded and their own payrolls, for each weekly payroll period during the term of the Construction Contract and for a period of one (1) year after release and payment is made by Owner to the Contractor.

16.4 Owner's Right of Inspection

16.4.1 Representative of the Owner, as designated by the County Mayor, shall have the right to inspect the Contractor's facilities and payroll records during the life of the Construction Contract for a period of one (1) year after final

release and final payment by the Owner for the purpose of verifying nondiscrimination in employment.

**ARTICLE XVII
PROCEDURE FOR INSTALLATION OR
REMOVAL OF FIBERGLASS INSULATION**

The following procedures should be adhered to when disturbing, installing, or removing fiberglass insulation. These procedures are established to minimize employee exposure to the adverse health affects of fiberglass exposure.

The below procedures are the minimal requirements for handling fiberglass in Shelby County Facilities. Mandates by code or law must be adhered to.

**17.1 Installation, Removal, or Disturbance of
Fiberglass Insulation**

17.1.1 Install in well-ventilated areas and avoid breathing dust.

17.1.2 Wear loose, comfortable clothing and long-sleeved shirts to minimize skin contact.

17.1.3 Handle carefully to minimize airborne dust.

17.1.4 If high dust levels are anticipated during installation, such as with power tools, use appropriate NIOSH approved dust respirator.

17.1.5 All power cutting tools must be equipped with dust collectors.

Initial _____

17.2 Exposure

17.2.1 After use, wash with warm water and mild soap. Do not scratch or rub skin if it becomes irritated. Utilize running water.

17.2.2 Wash work clothes separately, and then rinses the washer.

17.2.3 Eye exposure: Flush with flowing water for at least 15 minutes. If symptoms persist, seek immediate medical attention.

17.3 Work Site Environment

17.3.1 Insure area is free of obvious partials through proper cleanup procedures. Use of vacuum with proper filters, or wet cleanup is acceptable. (This includes office furniture, floors, and walls.)

17.3.2 Initially there may be a potential adverse impact on indoor air quality within the general work area during the installation process. Notify building manager or other appropriate person that it will be necessary to establish and maintain adequate ventilation of the work area, without causing the entry of contaminants to other parts of the building. Persons who are sensitive to odors and/or chemicals should be advised to avoid the work area during this process.

17.3.3 Exposure to employees should be kept to a minimum.

17.3.4 Disturbance of ceiling tiles where fiberglass insulation exists requires the same procedures as if installation or removal was taking place.

BY THE SIGNING OF THIS DOCUMENT AND INITIALING EACH PAGE HEREOF, THE CONTRACTOR CERTIFIES THAT HE HAS READ AND UNDERSTANDS ALL OF THE ABOVE AND AGREES TO ABIDE BY THESE GENERAL CONSTRUCTION CONDITIONS.

CONTRACTOR

BY: _____

TITLE: _____

DATE: _____

THE AMERICAN INSTITUTE OF ARCHITECTS



AIA
Document
A311

Labor and Material Payment Bond

THIS BOND IS ISSUED SIMULTANEOUSLY WITH PERFORMANCE BOND IN FAVOR OF THE OWNER CONDITIONED ON THE FULL AND FAITHFUL PERFORMANCE OF THE CONTRACT

KNOW ALL MEN BY THESE PRESENTS: that (Here insert full name and address or legal title or contractor)

as Principal, hereinafter called Principal, and, (Here insert full name and address or legal title of Surety)

as Surety, hereinafter called Surety, are held and firmly bound unto (Here insert full name and address or legal title of Owner)

as Obligee, hereinafter called Owner, for the use and benefit of claimants as hereinbelow defined, in the

amount of (Here insert a sum equal to at least one-half of the contract price)

Dollars (\$

for the payment whereof Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS,

Principal has by written agreement dated 19 entered into a contract with Owner for (Here insert full name, address and description of project)

in accordance with Drawings and Specifications prepared by (Here insert full name and address or legal title of Architect)

which contract is by reference made a part hereof, and is hereinafter referred to as the Contract.

LABOR AND MATERIAL PAYMENT BOND

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS such that, if Principal shall promptly make payment to all claimants as hereinafter defined, for all labor and material used or reasonably required for use in the

AIA DOCUMENT A311 · PERFORMANCE BOND AND LABOR AND MATERIAL PAYMENT BOND · AIA ®

FEBRUARY 1970 ED. · THE AMERICAN INSTITUTE OF ARCHITECTS, 1735 N.Y. AVE., NW., WASHINGTON, D. C. 20006

performance of the Contract, then this obligation shall be void; otherwise it shall remain in full force and effect, subject, however, to the following conditions:

1. A claimant is defined as one having a direct contract with the Principal or with a Subcontractor of the Principal for labor, material, or both, used or reasonably required for use in the performance of the Contract, labor and material being construed to include that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental of equipment directly applicable to the Contract.

2. The above named Principal and Surety hereby jointly and severally agree with the Owner that every claimant as herein defined, who has not been paid in full before the expiration of a period of ninety (90) days after the date on which the last of such claimants work or labor was done or performed, or materials were furnished by such claimant, may sue on this bond for the use of such claimant, prosecute the suit to final judgment for such sum or sums as may be justly due claimant, and have execution thereon. The Owner shall not be liable for the payment of any costs or expenses of any such suit.

3. No suit or action shall be commenced hereunder by any claimant:

a) Unless claimant, other than one having a direct contract with the Principal, shall have given written notice to any two of the following: the Principal, the Owner, or the Surety above named, within ninety (90) days after such claimant did or performed the last of the work or labor, or furnished the last of the materials for which said claim is made, stating with substantial

Signed and sealed this

- (Winc-s)
(Vvilnss)

day of

accuracy the amount claimed and the name of the party to whom the materials were furnished, or for whom the work or labor was done or performed. Such notice shall be served by mailing the same by registered mail or certified mail, postage prepaid, in an envelope addressed to the Principal, Owner or Surety, at any place where an office is regularly maintained for the transaction of business, or served in any manner in which legal process may be served in the state in which the aforesaid project is located, save that such service need not be made by a public officer.

b) After the expiration of one (1) year following the date on which Principal ceased Work on said Contract, it being understood, however, that if any limitation embodied in this bond is prohibited by any law controlling the construction hereof such limitation shall be deemed to be amended so as to be equal to the minimum period of limitation permitted by such law.

c) Other than in a state court of competent jurisdiction in and for the county or other political subdivision of the state in which the Project, or any part thereof, is situated, or in the United States District Court for the district in which the Project, or any part thereof, is situated, and not elsewhere.

4. The amount of this bond shall be reduced by and to the extent of any payment or payments made in good faith hereunder, inclusive of the payment by Surety of mechanics' liens which may be filed of record against said improvement, whether or not claim for the amount of such lien be presented under and against this bond.

<i>(Principal)</i>	
<i>(Tilt)</i>	
<i>(Surt'ty)</i>	(Seal)

THIS IS A DRAFT ONLY!! ORIGINAL DOCUMENTS IN EXECUTED

FORM ARE REQUIRED PRIOR TO COUNTY SIGNATURE. IT IS A MANDATORY REQUIREMENT THAT ALL DOCUMENTS WHICH ARE REQUIRED TO BE ATTACHED TO THIS AGREEMENT BE ATTACHED BEFORE SUBMITTAL TO SHELBY COUNTY FOR SIGNATURE. IF NOT, THE AGREEMENT WILL BE RETURNED FOR COMPLETION.

COUNTY/CONTRACTOR AGREEMENT

OWNER: SHELBY COUNTY GOVERNMENT
160 N. MAIN ST.
MEMPHIS, TN 38103

CONTRACTOR:

**ARCHITECT\
ENGINEER:**

THIS CONTRACT made and entered into this _____ day of _____, 20__, by and between SHELBY COUNTY GOVERNMENT, through its governing body and authorized representative, party of the first part, hereinafter referred to as "COUNTY," and _____, party of the second part, hereinafter referred to as "CONTRACTOR."

WITNESSETH

WHEREAS, the COUNTY issued Sealed Bid No. _____ for _____, hereinafter in this Contract referred to as "PROJECT".

WHEREAS, the said CONTRACTOR submitted a bid/proposal in accordance with bid specifications, a copy of which is attached

hereto as Exhibit "A" and incorporated herein by reference, which bid was accepted by COUNTY.

NOW, THEREFORE, CONTRACTOR agrees and undertakes to (describe work to be done) in accordance with the Bid Specifications which are on file in the Shelby County Purchasing Department and which are incorporated herein by reference, and at the price quoted for said PROJECT by CONTRACTOR. Further, the parties agree that they will be governed by the Shelby County General Conditions of the Contract for work to be performed. The Contractor acknowledges that it has read and is familiar with the contents of said General Conditions, agrees to be bound thereby and has executed a copy of same at the place indicated thereon. A copy of said General Conditions is attached hereto as Exhibit "B" and incorporated fully herein by reference.

SECTION 1. CONTRACTOR'S RESPONSIBILITIES

1. CONTRACTOR shall perform all necessary work required by the contract documents for the satisfactory completion in full of the PROJECT.
2. CONTRACTOR shall coordinate all work with COUNTY through _____ . Work shall be scheduled on a regular basis in as timely and orderly a manner as possible.
3. The CONTRACTOR shall give a Performance Bond and Labor and Material Bond, each equal to 100% of the amount of the Contract, with surety to be approved by the COUNTY, conditioned upon the full and faithful performance of all the terms and conditions of the Contract with special reference to paying in full in lawful money of the United States, all just and valid claims for material and labor entered into for the said work covered by this Contract. That further, this Contract shall not take effect until these Bonds have been executed and approved by the County.
4. The CONTRACTOR further agrees to provide insurance coverage of the type and in the amounts as required in section III,

Specific Provision, paragraph 31.

5. The COUNTY shall pay the CONTRACTOR for the performance of the Contract _____ (\$)Dollars, subject to additions and deductions as provided in the contract documents.
6. The CONTRACTOR shall execute the entire work described in the Contract Documents, except to the extent specifically indicated in the Contract Documents to be the responsibility of others, within _____ (__) calendar days from the actual start date as specified in the written "Notice to Proceed."
7. All work by CONTRACTOR is to be performed in a manner satisfactory to COUNTY, and in accordance with the established customs, practices and procedures of COUNTY. CONTRACTOR is to periodically request sufficient conferences to insure that the work is being done by CONTRACTOR in a satisfactory manner in accordance with the wishes of COUNTY.

SECTION II. METHOD OF PAYMENT

1. CONTRACTOR shall provide an Application for Payment to be received by the Architect/Engineer not later than the 25th day of each month. COUNTY shall make payment to the CONTRACTOR not later than the 20th day of the following month. If an Application for Payment is received by the Architect/Engineer after the application date fixed above, payment shall be made by COUNTY not later than forty-five (45) days after receipt of the Application for Payment. If the CONTRACTOR submits an incorrect Application for Payment, payment date will be extended thirty (30) days from the date of correction.
2. Application for payment shall indicate the percentage of completion of each portion of the work as of the end of the period covered by the Application for Payment.
3. Subject to the provisions of the Contract Documents, the amount of each progress payment shall be computed as follows:
 - a. Take that portion of the contract sum properly allocable to completed work as determined by

multiplying the percentage completion of each portion of the work by the total Contract Sum less retainage of five (5%) percent;

- b. Add that portion of the Contract Sum properly allocable to materials and equipment delivered and suitably stored at the site for subsequent incorporation in the completed construction (or, if approved in advance by COUNTY, suitably stored off the site at a location agreed upon in writing), less retainage of five (5%) percent;
 - c. Subtract the aggregate of previous payments made by the COUNTY; and
 - d. Subtract amounts, if any, for which the Architect/Engineer has withheld or nullified a Certificate of Payment as provided in the General Conditions to Construction Contracts.
4. When all work embraced in this Contract has been fully and completely performed on the part of the CONTRACTOR, and accepted by the COUNTY, there shall be a statement by CONTRACTOR of the work done according to the terms herein, and the balance appearing to be due the CONTRACTOR out of funds applicable for payment for this work, excepting there from any sum that may be lawfully retained under the provisions of this Contract, Specifications, and General Conditions to Construction Contracts and all such funds as may be due the COUNTY.
5. The COUNTY shall have the right, at its option, to discharge the CONTRACTOR for any breach of any provision of this Contract, and such discharge shall not affect the right of the COUNTY against sureties on the Bonds provided.
6. It is further mutually agreed between the parties hereto that if at any time after the execution of this Contract and the Surety Bonds attached hereto for its faithful performance, the COUNTY shall deem the surety or sureties upon such bond inadequate to cover the performance of the work, the CONTRACTOR shall, at its expense, within five (5) days after the receipt of notice from the COUNTY so to do, furnish as additional bond or bonds, in satisfactory amount to the COUNTY. In such event, no further payment to the CONTRACTOR shall be deemed due under this Contract until such new or additional security for the faithful performance of the work shall be furnished in manner and

form satisfactory to the COUNTY.

7. CONTRACTOR further agrees to provide COUNTY an amount equal to _____ (\$) Dollars per day for liquidated damages for each consecutive calendar day required for the completion of the contract beyond the time stipulated. **(NOTE: If this paragraph is inapplicable, then N/A [not applicable] should be inserted in the applicable space.)**
8. Other contract provisions, including but not limited to insurance provisions may be required to enter into a contract with Shelby County Government.

SECTION III. SPECIFIC PROVISIONS

The parties further agree as follows:

1. CONTROL

All Services by the CONTRACTOR will be performed in a manner satisfactory to the COUNTY, and in accordance with the generally accepted business practices and procedures of the COUNTY.

2. CONTRACTOR'S PERSONNEL

The CONTRACTOR certifies that it presently has adequate qualified personnel to perform all Services required under this Contract. All work performed during the Term of this Contract will be supervised by the CONTRACTOR. The CONTRACTOR further certifies that all of its employees assigned to serve the COUNTY have such knowledge and experience as required to perform the duties assigned to them. Any employee of the CONTRACTOR who, in the opinion of the COUNTY, is incompetent, or whose conduct becomes detrimental to the work, shall immediately be removed from association with the Services under this Contract.

3. INDEPENDENT STATUS

- a. Nothing in this Contract shall be deemed to represent that the CONTRACTOR, or any of the Contractor's employees or agents, are the agents, representatives, or employees of the COUNTY. The CONTRACTOR will be an

independent CONTRACTOR over the details and means for performing the Services under this Contract. Anything in this Contract which may appear to give the COUNTY the right to direct the CONTRACTOR as to the details of the performance of the Services under this Contract or to exercise a measure of control over the CONTRACTOR is solely for purposes of compliance with local, state and federal regulations and means that the CONTRACTOR will follow the desires of the COUNTY only as to the intended results of the scope of this Contract.

- b. It is further expressly agreed and understood by CONTRACTOR that neither it nor its employees or agents are entitled to any benefits which normally accrue to employees of the COUNTY; that CONTRACTOR has been retained by the COUNTY to perform the Services specified herein (not hired) and that the remuneration specified herein is considered fees for the Services performed (not wages) and that invoices submitted to the COUNTY by CONTRACTOR for the Services performed shall be on the Contractor's letterhead.

4. REPORTS

CONTRACTOR shall prepare and submit quarterly reports of its activities, funded under this Contract, to the originating department and the Contract Administration Department of the COUNTY. The reports shall include an itemization of the use of County's funds, inclusive of specific Services delivered. Any such reports provided to the COUNTY shall be prepared with the understanding that the COUNTY may make such reports available to the public. The quarterly reports and all books of account and financial records that are specific to the work performed in accordance with this Contract may be subject to audit by the Director of the Division of Administration and Finance of the COUNTY. The COUNTY shall have the right to withhold future disbursement of funds under this Contract and any future Contracts until this provision has been met.

5. TERMINATION OR ABANDONMENT

- a. It shall be cause for the immediate termination of this Contract if, after its execution, the COUNTY determines that:
 - i) Either the CONTRACTOR or any of its principals,

partners or corporate officers, if a corporation, including the corporation itself, has plead nolo contendere, or has plead or been found guilty of a criminal violation, whether state or federal, involving, but not limited to, governmental sales or purchases, including but not limited to the rigging of bids, price fixing, or any other collusive and illegal activity pertaining to bidding and governmental contracting; or

ii) CONTRACTOR has subcontracted, assigned, delegated, transferred its rights, obligations or interests under this Contract without the County's consent or approval; or

iii) CONTRACTOR has filed bankruptcy, become insolvent or made an assignment for the benefit of creditors, or a receiver, or similar officer has been appointed to take charge of all or part of CONTRACTOR assets.

- b. The COUNTY may terminate the Contract upon five (5) days written notice by the COUNTY or its authorized agent to the CONTRACTOR for Contractor's failure to provide the Services specified under this Contract.
- c. This Contract may be terminated by either party by giving thirty (30) days written notice to the other, before the effective date of termination (the "Termination Date"). In the event of such termination, the CONTRACTOR shall be paid for all Services rendered prior to the Termination Date, provided the CONTRACTOR shall have delivered to COUNTY such statements, accounts, reports and other materials as required under this Contract; however, CONTRACTOR shall not be compensated for any anticipatory profits that have not been earned as of the date of the Termination Date. All Services completed by CONTRACTOR prior to the Termination Date shall be documented and tangible work documents shall be transferred to and become the sole property of the COUNTY prior to payment for the Services rendered.
- d. Notwithstanding the above or any section herein to the contrary, CONTRACTOR shall not be relieved of liability to the COUNTY for damages sustained by the COUNTY by virtue of any breach of the Contract by

CONTRACTOR and the COUNTY may withhold any payments to CONTRACTOR for the purpose of setoff until such time as the exact amount of damages due the COUNTY from CONTRACTOR is determined.

6. COMPENSATION FOR CORRECTIONS

No compensation shall be due or payable to CONTRACTOR pursuant to this Contract for any Contractor's Services performed by the CONTRACTOR in connection with effecting of corrections to the design of the Services, when such corrections are required as a direct result of negligence by the CONTRACTOR to properly fulfill any of his obligations as set forth in this Contract.

7. SUBCONTRACTING, ASSIGNMENT OR TRANSFER

a. Any subcontracting, assignment, delegation or transfer of all or part of the rights, responsibilities, or interest of either party to this Contract is prohibited unless by written consent of the other party. No subcontracting, assignment, delegation or transfer shall relieve the CONTRACTOR from performance of the Services under this Contract. The COUNTY shall not be responsible for the fulfillment of the Contractor's obligations to its transferors or subcontractors.

b. Upon the request of the other party, the subcontracting, assigning, delegating or transferring party shall provide all documents evidencing the subcontract, assignment, delegation or transfer.

8. CONFLICT OF INTEREST

The CONTRACTOR covenants that it has no public or private interest, and will not acquire directly or indirectly any interest, which would conflict in any manner with the performance of the Services. The CONTRACTOR warrants that no part of the total Contract Fee shall be paid directly or indirectly to any officer or employee of the COUNTY as wages, compensation, or gifts in exchange for acting as officer, agent, employee, subcontractor or consultant to the CONTRACTOR in connection with any work contemplated or performed relative to this Contract.

9. CONTINGENT FEES

The CONTRACTOR warrants that it has not employed or retained any company or person other than a bona fide employee working solely for the CONTRACTOR, to solicit or secure this Contract, and that it has not paid or agreed to pay any company or person, other than a bona fide employee working solely for the CONTRACTOR any fee, commission, percentage, brokerage fee, gift, or any other consideration contingent upon or resulting from the award or making of this Contract. For breach or violation of this warranty, the COUNTY will have the right to recover the full amount of such fee, commission, percentage, brokerage fee, gift, or other consideration.

10. EMPLOYMENT OF COUNTY WORKERS

The CONTRACTOR will not engage, on a full, part-time, or any other basis during the Term of the Contract, any professional or technical personnel who are or have been at any time during the Term of the Contract in the employ of the COUNTY.

11. ACCESS TO RECORDS

During all phases of the work and Services to be provided hereunder, CONTRACTOR agrees to permit duly authorized agents and employees of the COUNTY to enter Contractor's offices for the purpose of inspections, reviews, and audits during normal working hours. Reviews may also be accomplished at meetings that are arranged at mutually agreeable times and places. The CONTRACTOR will maintain all books, documents, papers, accounting records, and other evidence pertaining to the Fee paid under this Contract and make such materials available at their offices at all reasonable times during the Term of this Contract and for three (3) years from the date of payment under this Contract for inspection by the COUNTY or by any other governmental entity or agency participating in the funding of this Contract, or any authorized agents thereof. Copies of said records shall be furnished to the COUNTY upon request.

12. ARBITRATION

Any dispute concerning a question of fact in connection with the work not disposed of by agreement between the CONTRACTOR and the COUNTY will be referred to the Shelby County Contract Administrator or its duly authorized representative, whose decision regarding same will be final.

13. RESPONSIBILITIES FOR CLAIMS AND LIABILITIES

- a. CONTRACTOR shall indemnify, defend, save and hold harmless the COUNTY, and its elected officials, officers, employees, agents, assigns, and instrumentalities from and against any and all claims, liability, losses or damages—including but not limited to Title VII and 42 USC 1983 prohibited acts—arising out of or resulting from any conduct; whether actions or omissions; whether intentional, unintentional, or negligent; whether legal or illegal; or otherwise that occur in connection with or in breach of this Contract or in the performance of the Services hereunder, whether performed by the CONTRACTOR its subcontractors, agents, employees or assigns. This indemnification shall survive the termination or conclusion of this Contract.
- b. CONTRACTOR expressly understands and agrees that any insurance protection required by this Contract or otherwise provided by the CONTRACTOR shall in no way limit the responsibility to indemnify, defend, save and hold harmless the COUNTY or its elected officials, officers, employees, agents, assigns, and instrumentalities as herein provided.
- c. The COUNTY has no obligation to provide legal counsel or defense to CONTRACTOR or its subcontractors in the event that a suit, claim or action of any character is brought by any person not a party to this agreement against CONTRACTOR as a result of or relating to performance of the Services under this Contract.
- d. Except as expressly provided herein, the COUNTY has no obligation for the payment of any judgment or the settlement of any claims against CONTRACTOR as a result of or relating to performance of the Services under this Contract.
- e. CONTRACTOR shall immediately notify the COUNTY of any claim or suit made or filed against CONTRACTOR or its subcontractors regarding any matter resulting from or relating to Contractor's performance of the Services under this Contract and will cooperate, assist and consult with the COUNTY in the defense or investigation thereof.

14. GENERAL COMPLIANCE WITH LAWS

- a. The CONTRACTOR certifies that it is qualified or will take steps necessary to qualify to do business in the State of Tennessee and that it will take such action as, from time to time, may be necessary to remain so qualified and it shall obtain, at its expense all licenses, permits, insurance, and governmental approvals, if any, necessary to the performance of the Services under this Contract.
- b. The CONTRACTOR is assumed to be familiar with and agrees that at all times it will observe and comply with all federal, state, and local laws, ordinances, and regulations in any manner affecting the performance of the Services. The preceding shall include, but is not limited to, compliance with all Equal Employment Opportunity laws, the Fair Labor Standards Act, Occupational Safety and Health Administration (OSHA) requirements, and the Americans with Disabilities Act (ADA).
- c. This Contract will be interpreted in accordance with the laws of the State of Tennessee. By execution of this Contract, the CONTRACTOR agrees that all actions, whether sounding in contract or in tort, relating to the validity, construction, interpretation and enforcement of this Contract will be instituted and litigated in the courts of the State of Tennessee, located in Shelby County, Tennessee, and in no other. In accordance herewith, the parties to this Contract submit to the jurisdiction of the courts of the State of Tennessee located in Shelby County, Tennessee.

15. NON-DISCRIMINATION

The CONTRACTOR hereby agrees, warrants, and assures compliance with the provisions of Title VI and VII of the Civil Rights Act of 1964 and all other federal statutory laws which provide in whole or in part that no person shall be excluded from participation or be denied benefits of or be otherwise subjected to discrimination in the performance of this Contract or in the employment practices of the CONTRACTOR on the grounds of handicap and/or disability, age, race, color, religion, sex, national origin, or any other classification protected by federal, Tennessee State Constitutional or statutory law. The CONTRACTOR shall upon request show proof of such non-discrimination and shall post in conspicuous places available to all employees and

applicants notices of non-discrimination.

16. ENTIRE AGREEMENT

This Contract represents the entire and integrated agreement between the parties and supersedes all prior negotiations, representations or agreements, whether oral or written.

17. AMENDMENT

This Contract may be modified or amended only by written instrument signed by both parties.

18. SEVERABILITY

If any provision of this Contract is held to be unlawful, invalid or unenforceable under any present or future laws, such provision shall be fully severable; and this Contract shall then be construed and enforced as if such unlawful, invalid or unenforceable provision had not been a part hereof. The remaining provisions of this Contract shall remain in full force and effect and shall not be affected by such unlawful, invalid or unenforceable provision or by its severance here from. Furthermore, in lieu of such unlawful, invalid, or unenforceable provision, there shall be added automatically as a part of this Contract a legal, valid and enforceable provision as similar in terms to such unlawful, invalid or unenforceable provision as possible.

19. NO WAIVER OF CONTRACTUAL RIGHT

No waiver of any term, condition, default, or breach of this Contract, or of any document executed pursuant hereto, shall be effective unless in writing and executed by the party making such waiver; and no such waiver shall operate as a waiver of either (a) such term, condition, default, or breach on any other occasion or (b) any other term, condition, default, or breach of this Contract or of such document. No delay or failure to enforce any provision in this Contract or in any document executed pursuant hereto shall operate as a waiver of such provision or any other provision herein or in any document related hereto. The enforcement by any party of any right or remedy it may have under this Contract or applicable law shall not be deemed an election of remedies or otherwise prevent such party from enforcement of one or more other remedies at any time.

20. MATTER TO BE DISREGARDED

This title of the several sections, subsections, and paragraphs set forth in this Contract are inserted for convenience of reference only and shall be disregarded in construing or interpreting any of the provisions of this Contract.

21. SUBJECT TO FUNDING

This Contract is subject to annual appropriations of funds by the Shelby County Government. In the event sufficient funds for this Contract are not appropriated by Shelby County Government for any of its fiscal period during the Term hereof, then this Contract will be terminated. In the event of such termination, the CONTRACTOR shall be entitled to receive just and equitable compensation for any satisfactory work performed as of the Termination Date.

22. TRAVEL EXPENSES (If Applicable)

All travel expenses payable under this Contract shall be in accordance with the County Travel Policy and Procedures. This includes advance written travel authorization, submission of travel claims, documentation requirements, and reimbursement rates. No travel advances will be made by the County.

23. PERFORMANCE AND LABOR AND MATERIALS BONDS

CONTRACTOR will provide COUNTY within ten (10) days from inception date of this Contract a Performance and Labor and Materials Bond each in the amount of 100% of the Contract price for each year that this contract is in effect. Said Bonds may be pro-rated for the initial year in the event that this period of time is less than a full twelve (12) month period.

24. NON-LIABILITY FOR CONTRACTOR EMPLOYEE TAXES

Neither CONTRACTOR nor its personnel are County's employees, and COUNTY shall not take any action or provide Contractor's personnel with any benefits and shall have no liability for the following:

- a. Withholding FICA (Social Security) from Contractor's payments;

- b. Making state or federal unemployment insurance contributions on behalf of CONTRACTOR or its personnel;
- c. Withholding state and federal income tax from payment to CONTRACTOR;
- d. Making disability insurance contributions on behalf of CONTRACTOR;
- e. Obtaining workers' compensation insurance on behalf of CONTRACTOR or Contractor's personnel.

25. INCORPORATION OF OTHER DOCUMENTS

- a. CONTRACTOR shall provide Services pursuant to this Contract in accordance with the terms and conditions set forth within the Shelby County Request for Proposals/Bids as well as the Response of CONTRACTOR thereto, all of which are maintained on file within the Shelby County Purchasing Department and incorporated herein by reference.
- b. It is understood and agreed between the parties that in the event of a variance between the terms and conditions of this Contract and any amendment thereto and the terms and conditions contained either within the Request for Proposals/Bids or the Response thereto, the terms and conditions of this Contract as well as any amendment shall take precedence and control the relationship and understanding of the parties.

26. CONTRACTING WITH LOCALLY OWNED SMALL BUSINESSES

The CONTRACTOR shall take affirmative action to assure that Locally Owned Small Businesses that have been certified by the COUNTY are utilized when possible as sources of supplies and equipment, construction and services.

27. RIGHT TO REQUEST REMOVAL OF Contractor's EMPLOYEES

The COUNTY may interview the personnel CONTRACTOR assigns to County's work. COUNTY shall have the right, at any time, to request removal of any employee(s) of CONTRACTOR, whom COUNTY deems to be unsatisfactory for any reason. Upon such request, CONTRACTOR shall use all reasonable efforts to promptly replace such employee(s) with substitute employee(s) having appropriate skills and training.

28. INCORPORATION OF WHEREAS CLAUSES

The foregoing whereas clauses are hereby incorporated into this Contract and made a part hereof.

29. DISCLOSURE OF REPORTS, DATA OR OTHER INFORMATION

Notwithstanding anything to the contrary contained herein or within any other document supplied to COUNTY by CONTRACTOR, CONTRACTOR understands and acknowledges that COUNTY is a governmental entity subject to the laws of the State of Tennessee and that any reports, data or other information supplied to COUNTY by CONTRACTOR due to Services performed pursuant to this Contract is subject to being disclosed as a public record in accordance with the laws of the State of Tennessee.

30. ORGANIZATION STATUS AND AUTHORITY

- a. CONTRACTOR represents and warrants that it is a corporation, limited liability company, partnership, or other entity duly organized, validly existing and in good standing under the laws of the state of Tennessee; it has the power and authority to own its properties and assets and is duly qualified to carry on its business in every jurisdiction wherein such qualification is necessary.
- b. The execution, delivery and performance of this Contract by the CONTRACTOR has been duly authorized by all requisite action and will not violate any provision of law, any order of any court or other agency of government, the organizational documents of CONTRACTOR, any provision of any indenture, agreement or other instrument to which CONTRACTOR is a party, or by which Contractor's respective properties or assets are bound, or be in conflict with, result in a breach of, or constitute (with due notice or lapse of time or both) a default under any such indenture, agreement or other instrument, or result in the creation or imposition of any lien, charge or encumbrance of any nature whatsoever upon any of the properties or assets.

31. INSURANCE REQUIREMENTS

- a. The CONTRACTOR shall purchase and maintain, in a company or companies licensed to do business in the

State of Tennessee, such insurance as will protect the County from claims which may arise out of or result from the Contractor's operations under the Contract, whether such operations are performed by himself or by any subcontractors or by anyone directly or indirectly employed by any of them, or by anyone for whose acts the CONTRACTOR or subcontractor may be liable.

b. The insurance required shall be written for not less than any limits of liability specified or required by law, whichever is greater. Shelby County Government, its elected officials, appointees and employees will be named as additional insured. All policies will provide for thirty (30) days written notice to COUNTY of cancellation or material change in coverage provided. The Contractor shall immediately notify Shelby county Government, Contract Administration, 160 N. Main Street, Suite 550, Memphis, Tennessee of cancellation or changes in any of the insurance coverage required. The CONTRACTOR will maintain throughout the life of this Contract insurance, through insurers rated A- or better by A.M. Best, in the following minimum requirements:

i) Commercial General Liability Insurance- \$1,000,000.00 limit per occurrence for bodily injury and property damage/\$1,000,000.00 personal and advertising injury/\$2,000,000.00 General Aggregate/\$2,000,000.00 Products-Completed Operations Aggregate. Shelby County Government, its elected officials, appointees, employees, volunteers, and members of boards, agencies, and commissions will be listed as additional insured regarding operations under this program. The insurance shall include coverage for the following:

- a) Premises/Operations
- b) Products/Completed Operations
- c) Personal Injury
- d) XCU coverage, where applicable
- e) Contractual Liability
- f) Independent Contractors
- g) Broad Form Property Damage
- h) When contract is awarded, the Contractor will be required to provide the County with a

will

copy

of the additional insured endorsement.

- ii) Business Automobile Liability Insurance - \$1,000,000.00 each accident for bodily injury and property damage. Coverage is to be provided on all:
 - a) Owned/Leased Autos
 - b) Non-owned Autos
 - c) Hired Autos
- iii) Workers Compensation and Employer's liability Insurance - All owners, sole proprietors, partners, and officers will elect to be covered by workers compensation coverage, regardless of requirement by Tennessee state status. Policy is to be specifically endorsed to include these individuals for coverage. Coverage is to include:
 - a. Employers Liability Coverage for \$1,000,000 per accident;
 - b. Employers Liability Disease each employee \$1,000,000; and
 - c. Employers Liability Disease Policy Limit \$1,000,000

Note: The Contractor's workers compensation policy will include the following endorsement: WAIVER OF OUR RIGHT TO RECOVER FROM OTHERS ENDORSEMENT: (form WC 00 03 13) A completed copy of this form will be included in documents provided to Shelby County Government by Provider's insurance company.

- iv) Builders Risk Insurance or Installation Floater (as applicable) for project. - All risk coverage in the amount of replacement cost of the structure/equipment, which is to be built or installed.
- c. CONTRACTOR shall provide County with a current copy of the Certificate of Insurance at the time of contracting and shall maintain said insurance during the entire Contract period as well as provide renewal copies on each anniversary date. The certificate holder is to read:

Shelby County Government
Purchasing Department
160 N. Main, Suite 550
Memphis, TN 38103

d. Self insured retentions or deductibles of \$25,000 or over per loss or claims must be reviewed and agreed to by Shelby County Government prior to commencement of work under this program.

All policies will provide for 30 day written notice to Shelby County of cancellation of coverage provided. (10) days notice applicable to non-payment of premium. If insurer is not required by the policy terms and conditions to provide written notice of cancellation to Shelby County, the Contractor//Contractor will provide immediate notice to Shelby County.

32. NOTICE

Any notices required or permitted to be given under the provisions of this Contract shall be effective only if in writing and delivered either in person to the County's authorized agent or by First Class or U.S. Mail to the addresses set forth in the Contract, or to such other person or address as either party may designate in writing and deliver as herein provided.

33. HIPAA (If applicable)

CONTRACTOR warrants to the COUNTY and State that it is familiar with the requirements of the Health Insurance Portability and Accountability Act of 1996 (HIPAA) and its accompanying regulations, and will comply with all applicable HIPAA requirements in the course of this Contract. CONTRACTOR warrants that it will cooperate with the COUNTY and State in the course of performance of the Contract so that all parties will be in compliance with HIPAA, including cooperation and coordination with COUNTY and State privacy officials and other compliance officers required by HIPAA and its regulations. CONTRACTOR will sign any documents that are reasonably necessary to keep the State and the COUNTY in compliance with HIPAA, including, but not limited to, business associate agreements.

It is agreed that the following documents are made a part of and incorporated fully into this construction Contract:

1. Performance Bond
2. Labor and Material Bond
3. Insurance Certificate
4. Bid Specifications (SB #_____, _____)
5. Contractor's Bid/Proposal (Exhibit "A")
6. General Conditions to Contract (Exhibit "B")
7. List of subcontractors who will be performing work on project with attached required information per Exhibit "C"

NOTE: THE ABOVE DOCUMENTS MUST BE ATTACHED BEFORE EXECUTION OF THIS AGREEMENT BY SHELBY COUNTY.

SECTION 01 11 13
SUMMARY OF THE WORK

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Project Summary
- B. Contractor's Use of Site and Premises
- C. Owner Occupancy
- D. Contracts
- E. Additive Alternates

1.2 PROJECT SUMMARY

A. The "Project," of which the "Work" of this Contract is a part, is titled Structural Repairs and Pavement Replacement to Shelby County Fire Station #62. Work includes partial parking lot and drive apron repair and replacement, and construction of building structural repairs at Shelby County Fire Station Number 62, 4647 Forest Hill Irene Road, Memphis, TN 38125.

B. The "Work" of this Contract is defined in the Contract Documents to include the entire Project, inclusive of any Owner Selected Additive Alternates. The Shelby County General Conditions of the Contract for construction are made a part of this Project Manual as if fully included herein.

C. Locating and Protection of Existing Utilities - Make a personal inspection of all existing records showing locations of buried and underground utilities. Conduct a walking examination to physically verify locations of existing utilities and any conflicts with the proposed construction and the location of existing utilities.

1. Contractor is responsible for locating all utilities prior to construction at no cost to county; contact Tony Archibald, Shelby County Government at 901.361.3223

D. The Contractor shall repair/replace any underground utilities damaged as a result of the Work. Utility types and locations shown on the Drawings are approximate and must be verified by the Contractor.

E. Protection and/or Replacement Contiguous Items

- 1. All contiguous items and other items which are disturbed, broken, removed or otherwise damaged during the execution of this Contract shall be replaced with materials, methods and design of the original construction.
- 2. Protection and security of installed construction including equipment on site and scheduled for installation is the sole responsibility of the Contractor. The Owner shall not be responsible for vandalism.

F. Related work:

1. Documents affecting work of this Section include, but are not necessarily limited to, the Shelby County General Conditions of the Contract for construction, other Sections in Division 1 of these Specifications. It is the Contractors' responsibility to familiarize themselves with these documents prior to submitting a bid for the Work.

1.3 CONTRACTOR'S USE OF SITE AND PREMISES

A. Limit use of site and premises to allow:

1. Uninterrupted Owner occupancy and use of the facility. The existing building will be occupied and conducting "Business as usual" at all times during the demolition and construction operations.
2. Use of site and premises by the public.
3. Unobstructed public paths of egress connecting the building to parking areas.
4. Unobstructed fire lanes, fire hydrants, and emergency vehicle access ways.

B. Before beginning work, the contractor must secure approval from the Architect for the following:

1. Areas permitted for personnel parking.
2. Access to the site.
3. Areas permitted for storage of materials and debris.
4. Areas permitted for the location of cranes, hoists, etc, if required, for work related to the repairs to the building and site.

C. Interior spaces may not be used for any reason, except as authorized by the Architect.

D. The Contractor shall have all job related new items and building materials in hand before commencement of the demolition operations. Such items shall be stored on site or off site in a weatherproof, insured and bonded storage facility.

1.4 OWNER OCCUPANCY

A. The Owner will occupy the premises during the entire period of construction.

B. Cooperate with Owner to minimize conflict, and to facilitate Owner's operations. The Contractor shall coordinate and sequence all Work with any concurrent Work being performed by Others on the site to insure that no activities being performed by Others are interrupted or delayed. The Contractor shall stage and sequence the Work to insure that a minimum of one apparatus bay shall have complete, unobstructed access to the public street at all times. No exceptions will be allowed.

C. Schedule the Work to accommodate Owner occupancy.

D. Utilities may not be disrupted at any time during the project duration. At no time during the demolition and new construction process shall the fire stations be without full water, sewer, electric power, telephone, cable, or satellite service.

E. Exercise all measures to protect the safety of the building occupants and the general public on and off site.

1.5 CONTRACTS

A. Basis of the Contract for Construction will be Competitive Bid (Base Bid Amount with ten percent (10%) Construction Contingency in addition to the Base Bid amount for a total combined Lump Sum Amount).

B. Contractor Qualifications: The Prime Contractor will be a Tennessee licensed, bonded and insured General Contractor in good standing with a BC or BC-B Tennessee Contractor's license designation and can provide evidence of having successful experience with projects of similar scope, size and type within the past two years. Insurance and bonding requirements must meet Shelby County Purchasing requirements (Reference Section 00 50 00 "Contracting Forms and Supplements" of these Specifications.

1.6 ADDITIVE ALTERNATES

A. The Project scope includes [2] Additive Alternate Bid Items. Each Additive Alternate Bid Item should be listed on the Bid Form as a separate line item and not included in the Base Bid amount. Each Additive Alternate Bid Item should also list a separate ten percent (10%) Construction Contingency amount. In addition to the Base Bid scope of work, the Owner may choose to include one, all, or none of the Additive Alternate Bid Items.

The Additive Alternate Bid Items are as follows: (Refer to specific sections of this Project Manual and the Contract Document Drawings for additional information pertaining to these items.)

1. Additive Alternate Bid Item No. 1: Removal and Replacement of Concrete parking areas North (approximately 548 SF) and West (approximately 1,870 SF) as indicated on Drawings.
2. Additive Alternate Bid Item No. 2: Removal and replacement of the North (1,1894 SF) and South (2,732 SF) driveways connecting to Forest Hill Irene Road.

PART 2 – PRODUCTS (Not Used.)
PART 3 – EXECUTION(Not Used.)

END OF SECTION

SECTION 01 11 20

SHELBY COUNTY GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

1.01 GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

A. The Shelby County General Conditions of the Contract for Construction, are made a part of the Project Manual.

1. The Contractor, his employees, Subcontractors and their agents and employees, and other persons performing any of the Work under a contract with the Contractor shall be bound by these General Conditions as if repeated in each Section of this Project Manual.

2. The failure on the part of the Contractor to familiarize himself or examine these Documents will in no way relieve him or her of their responsibilities and conditions set forth herein.

END OF SECTION

SECTION 01 21 43
TIME ALLOWANCES (Weather Delays)

PART 1 GENERAL

1.1 EXTENSIONS OF CONTRACT TIME

A. The basis for an extension of time in accordance with the Shelby County General Conditions of the Contract for Construction, an extension of time may be granted only for the number of Weather Delay Days in excess of the number of days listed as the Standard for the Baseline for that month. Time extension(s) will be at the Owner's Discretion.

1.2 STANDARD BASELINE FOR AVERAGE CLIMATIC WEATHER

A. Time extensions may be granted for rain, wind, snow or other natural phenomena of normal intensity for the locality where the Work is performed. For the purpose of determining extent of delay attributable to unusual weather phenomena, a determination shall be made by comparing the weather for the contract period involved with the average of the preceding five (5) year climatic range during the same time interval based on the National Oceanic and Atmospheric Administration National Service statistics for the locality where Work is performed and on daily weather logs kept on the job site by the Contractor reflecting the effect of the weather on progress of the Work. Request for extension of time shall be made in writing within twenty (20) days following cause of delay. In case of continuing cause for delay, only one (1) claim is necessary. Time extension(s) will be at the Owner's Discretion.

1.3 ADVERSE WEATHER AND WEATHER DELAY DAYS

A. Adverse Weather is defined as the occurrence of one or more of the following conditions which prevent exterior construction activity or access to the site within twenty-four (24) hours:

1. Precipitation (rain, ice, snow) in excess of one-tenth inch (0.10") liquid measure.
2. Temperatures which do not rise above 32°F by 10:00 a.m.
3. Temperatures which do not rise above that specified for the day's construction activity by 10:00 a.m., if any specified.
4. Sustained wind in excess of twenty-five (25) mph
5. Standing snow in excess of one inch (1 ").

B. Adverse Weather may include, if appropriate, "dry-out" or "mud" days when all the following conditions are met:

1. For rain days above the standard baseline.
2. Only if there is a hindrance to the site access or site work.
3. At a rate no greater than 1 make-up day for each day of consecutive days of rain beyond the standard baseline that total 1.0 inch or more, liquid measure, unless specifically recommended otherwise by the Architect

C. A Weather Delay Day may be counted if adverse weather prevents work on the project for fifty percent (50%) or more of the Contractor's scheduled work day, including a weekend day or holiday if the contractor has scheduled construction activity that day.

1.4 DOCUMENTATION AND SUBMITTALS

- A. Submit daily jobsite logs showing which and to what extent construction activities have been affected by weather.
- B. Submit actual weather data to support claim for time extension, obtained from nearest NOAA Weather Station or other independently verified source approved by the Architect at the beginning of the project
- C. Use Standard Baseline data provided in this Section when documenting actual delays due to weather in excess of the average climatic range.
- D. Organize claim and documentation to facilitate evaluation on a basis of calendar month periods, and submit to the Architect for review in accordance with the Shelby County General Conditions of the Contract for Construction
- E. If an extension of time is appropriate, it shall be affected in accordance with the Owner's Approval and the provisions of the Shelby County General Conditions of the Contract for Construction.

END OF SECTION

SECTION 01 29 76
PROGRESS PAYMENT PROCEDURES

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Schedule of Values
- B. Applications for Payment
- C. Certificates for Payment
- D. Progress Payments
- E. Substantial Completion
- F. Final Completion and Final Payment

1.2 SCHEDULE OF VALUES

Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit to the Architect, before the first Application for Payment, a schedule of values allocating the entire Contract Sum to the various portions of the Work and prepared in such form and supported by such data to substantiate its accuracy as the Architect may require. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment.

1.3 APPLICATIONS FOR PAYMENT

1.3.1. At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with an updated version of the most recently approved schedule of values for completed portions of the Work. Such application shall be notarized, if required, notarized and supported by such data substantiating the Contractor's right to payment as the Owner or Architect may require, such as copies of requisitions from Subcontractors and material suppliers, and shall reflect retainage if provided for in the Contract Documents.

1.3.1.1 Such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Architect, but not yet included in Change Orders.

1.3.1.2. Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or material supplier, unless such Work has been performed by others whom the Contractor intends to pay.

1.3.1.3. Periodic Affidavits and Waivers of Liens. The Contractor shall submit with each Application for Payment, affidavits and waivers of lien conditioned on receipt of payment from the Contractor. Said affidavits and conditional waivers of lien shall be submitted for the Contractor and all Subcontractors, Sub-subcontractors, and material suppliers for the period of time of this Application for Payment. With this Application for Payment, the Contractor shall also submit copies of Final Release of Liens, canceled checks or other documentation as evidence of payment to the Subcontractors, Sub-subcontractors, and material suppliers for all previously submitted conditional waivers of liens

1.3.2. Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in

advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage and transportation to the site for such materials and equipment stored off the site.

1.3.3. The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information and belief, be free and clear of liens, claims, security interests or encumbrances in favor of the Contractor, Subcontractors, material suppliers, or other persons or entities making a claim by reason of having provided labor, materials and equipment relating to the Work.

1.4 CERTIFICATES FOR PAYMENT

1.4.1. The Architect will, within seven days after receipt of the Contractor's Application for Payment, either issue to the Owner a Certificate for Payment, with a copy to the Contractor, for such amount as the Architect determines is properly due, or notify the Contractor and Owner in writing of the Architect's reasons for withholding certification in whole or in part.

1.4.2. The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's evaluation of the Work and the data comprising the Application for Payment, that, to the best of the Architect's knowledge, information and belief, the Work has progressed to the point indicated and that the quality of the Work is in accordance with the Contract Documents. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion and to specific qualifications expressed by the Architect. The issuance of a Certificate for Payment will further constitute a representation that the Contractor is entitled to payment in the amount certified. However, the issuance of a Certificate for Payment will not be a representation that the Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work, (2) reviewed construction means, methods, techniques, sequences or procedures, (3) reviewed copies of requisitions received from Subcontractors and material suppliers and other data requested by the Owner to substantiate the Contractor's right to payment, or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

1.5 PROGRESS PAYMENTS

1.5.1. After the Architect has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Architect.

1.5.2. The Contractor shall pay each Subcontractor no later than seven days after receipt of payment from the Owner the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

1.5.3. The Architect will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Architect and Owner on account of portions of the Work done by such Subcontractor.

1.5.4. The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and material and equipment suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven days, the Owner shall have the right to contact Subcontractors to ascertain whether they have been properly paid. Neither the Owner nor Architect shall have an obligation to pay or to see to the payment of money to a Subcontractor, except as may otherwise be required by law.

1.5.5. Contractor payments to material and equipment suppliers shall be treated in a manner similar to that provided in Sections 1.5.2, 1.5.3 and 1.5.4.

1.5.6. A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

1.5.7. Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors and suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, shall create any fiduciary liability or tort liability on the part of the Contractor for breach of trust or shall entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

1.5.8. Contractor to Discharge Mechanic's Liens. If any mechanics' or material suppliers' liens shall at any time be asserted or filed against the Project as a result of the Contractor's construction activities or those of any Subcontractors, Sub-subcontractors or material suppliers, the Contractor, at the Contractor's expense, shall promptly take and diligently prosecute appropriate action to have the same discharged of record or bonded off within thirty (30) days after notice of filing thereof or such lesser period as shall be necessary to prevent judgment execution or foreclosure of such mechanic's lien or any adverse consequences for the Owner. Upon the Contractor's failure to do so, the Owner, in addition to any other right or remedy that the Owner may have, may take such action as may be reasonably necessary to protect the Owner's interest, including payment or settlement of the lien claim and the Contractor shall reimburse the Owner any amounts paid or incurred by the Owner in connection with such action. The Contractor shall indemnify and hold harmless the Owner with respect to any claims or liens asserted by the Contractor's Subcontractors or Sub-subcontractors at any level if the Contractor has been paid with respect to the work or materials for which the claim or lien is asserted.

1.6 SUBSTANTIAL COMPLETION

1.6.1. Substantial Completion is the stage in the progress of the Work when all required occupancy permits have been issued and the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use.

1.6.2. When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Architect a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

1.6.3. Upon receipt of the Contractor's list, the Architect will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Architect's inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion.

1.6.4. When the Work or designated portion thereof is substantially complete, the Architect will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion, shall establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance, and shall fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

1.6.5. The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in such Certificate. Upon such acceptance and consent of surety, if any, the Owner shall make payment of retainage applying to such Work or designated portion thereof. thereof within ninety (90) days. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

1.7 FINAL COMPLETION AND FINAL PAYMENT

1.7.1A. Upon receipt of the Contractor's written notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection and, when the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with terms and conditions of the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 1.7.2. as precedent to the Contractor's being entitled to final payment have been fulfilled.

1.7.2. Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect and will not be canceled or allowed to expire until at least 30 days' prior written notice has been given to the Owner, (3) a written statement that the Contractor knows of no substantial reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment and (5), if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts, releases and waivers of liens, claims, security interests or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien. If such lien remains unsatisfied after payments are made, the Contractor shall refund to the Owner all

money that the Owner may be compelled to pay in discharging such lien, including all costs and reasonable attorneys' fees.

1.7.3. If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Architect so confirms, the Owner shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

1.7.4. The making of final payment shall constitute a waiver of Claims by the Owner except those arising from

- .1 liens, Claims, security interests or encumbrances arising out of the Contract and unsettled;
- .2 failure of the Work to comply with the requirements of the Contract Documents; or
- .3 terms of special warranties required by the Contract Documents.
- .4 latent defects appearing during or beyond the warranty period.

1.7.5. Acceptance of final payment by the Contractor, a Subcontractor or material supplier shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

1.7.6. Final Affidavits and Waivers of Liens. The Contractor shall submit to the Architect and the Owner final affidavits and unconditional waivers of liens, in form and substance satisfactory to the Owner from the Contractor, Subcontractor, and Sub-subcontractor and material suppliers. On request of the Owner, the Contractor shall provide any additional information or documentation necessary under the then existing mechanic's lien laws.

1.7.7. Unless otherwise agreed to by the Owner, Final Completion of the Project shall be achieved no later than thirty (30) days following the date of Substantial Completion.

PART 2 – PRODUCTS

Not Used

PART 3 – EXECUTION

Not Used

END OF SECTION

SECTION 01 31 13
PROJECT COORDINATION

PART 1-GENERAL

1.1 SUMMARY

A. Includes coordination of the portion of the General Contractor's work with that of all subcontractors involved with any portion of the Project Scope of the Work, including all mechanical, electrical, and masonry work.

B. Related Sections

1. Section 01 11 13 - Summary of the Work
2. Section 01 31 19 – Project Meetings
3. Section 01 32 16 – Construction Progress Schedule
4. Section 01 33 23 – Submittals
5. Section 01 77 19 – Closeout Requirements

1.2 CONTRACTOR'S DUTIES

A. Work with trades associated with the Scope of the Work.

B. Coordinate the schedules of all trades, including mechanical and electrical and masonry subcontractors.

1. Verify timely deliveries of products for installation by all trades.
2. Verify that labor and materials are adequate to maintain schedules.

C. Conduct conferences among all subcontractors and other concerned parties, as necessary to:

1. Maintain coordination and schedules.
2. Resolve matters in dispute.

D. Participate in project meetings:

1. Report progress of each trade.
2. Recommend needed changes in schedules.
3. Transmit minutes of meetings to trades as appropriate.

E. Temporary Utilities:

1. Coordinate installation, operation and maintenance, to verify compliance with project requirements and with Contract Documents.
2. Verify adequacy of service at required locations.

F. Shop Drawings, Product Data and Samples - Submittals:

1. Prior to submittal, review for compliance with Contract Documents.
 - a. Check field dimensions, clearance dimensions and finish requirements.
 - b. Check relation to available space.
 - c. Check anchor bolt settings and setting of other embedded items.
 - d. Review the effect of any changes on the work of other contracts or trades.
 - e. Check items to receive field finish. Verify that item is suitable to receive such finish.
 - f. Check compatibility with mechanical and electrical equipment and work of other trades.

G. Coordination Drawings:

1. Prepare, as required to assure coordination of work of, or affected by trades or to resolve conflicts.
2. Contractor to review prior to transmitting to appropriate trades.
3. Reproduce and distribute Contractor approved copies to all concerned parties.

H. Observe required testing; maintain a record of tests:

1. Testing agency and name of inspector.
2. Subcontractor.
3. Manufacturer's Representative present.
4. Date and time of testing.
5. Type of product or equipment.
6. Type of test and results.
7. Retesting required.

I. Verify that subcontractors maintain accurate record of documents.

J. Substitution and Changes:

1. Review proposals and request:
 - a. Check for compliance with Contract Documents.
 - b. Verify with work and equipment of other trades.
2. Recommend action to concerned parties.

K. Observe work of all trades, including mechanical and electrical work for compliance with requirements of Contract Documents.

1. Maintain list of observed deficiencies.
2. Promptly report deficiencies or discrepancies to applicable parties.

L. Assemble documentation for handling of claims or disputes involving various trades.

M. Equipment Startup:

1. Check to assure that utilities and specified connections are complete and that equipment is in operable condition.
2. Observe test, adjust and balance.
3. Record results, including time and date of startup.

N. Inspection and Acceptance of Equipment:

1. Prior to inspection, check that equipment is clean, repainted as required, testes and operational.
2. Assist inspector; prepare list of items to be completed or corrected.
3. Should acceptance and operation of equipment constitute the beginning of the specified guarantee period, prepare and transmit written notice to Owner.

O. Assemble Record Documents for subcontractors; transmit to Architect for delivery to Owner.

1.3 COORDINATION SCHEDULE

A. The schedule designates areas of basic responsibility of contractors and subcontractors, including items of mechanical work and electrical power and control wiring for the project, but does not define scope.

B. Refer to respective Sections of Project Manual for detailed descriptions of work required.

C. Contractor Shall:

1. Maintain Schedule throughout construction period; record changes in responsibilities due to:

a. Modifications to Contract.

b. Field orders.

c. Substitutions.

2. Reproduce and distribute revised schedule promptly after each change to affected subcontractors, material suppliers and Owner.

END OF SECTION

SECTION 01 31 19
PROJECT MEETINGS

PART 1 GENERAL

1.1 SUMMARY

A. Work Included: To enable orderly review during progress of the Work, and to provide for systematic discussion of problems, the Architect will conduct project meetings throughout the construction period.

B. Related Work:

1. Documents affecting work of this Section include, but are not necessarily limited to, Shelby County General Conditions and Sections in Division 1 of these Specifications.
2. The Contractor's relations with his subcontractors and materials suppliers and discussions relative thereto are the Contractor's responsibility and normally are not part of project meetings content.

1.2 SUBMITTALS

A. Agenda Items: To the maximum extent practicable, advise the Architect at least 24 hours in advance of project meetings regarding items to be included on the agenda.

B. Minutes: The Architect will compile minutes of each project meeting and will furnish copies to the General Contractor and to the Owner. Recipients of copies may make and distribute such other copies as they wish.

1.3 QUALITY ASSURANCE.

A. For those persons designated by the Contractor to attend and participate in project meetings, provide required authority to commit the Contractor to solutions agreed upon in the project meetings.

PART 2 PRODUCTS

(Refer to Products within other Sections within this Project Specification.)

PART 3 EXECUTION

3.1 MEETING SCHEDULE:

A. Except as noted herein for Pre-construction Meeting, project meetings will be held bi-weekly. Coordinate as necessary to establish mutually acceptable schedule for meetings.

3.2 MEETING LOCATION:

A. The Architect will establish meeting location. To the maximum extent practicable, meetings will be held at the job site.

3.3. PRE-CONSTRUCTION MEETING.

A. Pre-Construction Meeting will be scheduled by the Architect. Provide attendance by authorized representatives of the Contractor and major subcontractors. The Architect will advise other interested parties, including the Owner, and request their attendance.

B. Minimum Agenda: Data will be distributed and discussed on at least the following items.

1. Organizational arrangement of Contractor's forces and personnel, and those of subcontractors, materials suppliers, and the Architect.
2. Channels and procedures for communication.
3. Construction schedule, including sequence of critical work.
4. Contract Documents, including distribution of required copies of original documents and revisions.

5. Processing of Shop Drawings and other data submitted to the Architect for review.
6. Processing of Bulletins, field decisions, and Change Directives.
7. Rules and regulations governing performance of the Work.
8. Procedures for safety and first aid, security, quality control, housekeeping, and related matters.

3.4 PROJECT MEETINGS

A. Attendance

1. To the maximum extent practicable, assign the same person or persons to represent the Contractor at project meetings throughout progress of the Work.
2. Subcontractors, materials suppliers, and others may be invited to attend those project meetings in which their aspect of the Work is involved.

B. Minimum Agenda

1. Review, revise as necessary, and approve minutes of previous meetings.
2. Review progress of the Work since last meeting, including status of submittals for approval.
3. Identify problems that impede planned progress.
4. Develop corrective measures and procedures to regain planned schedule.
5. Complete other current business.

C. Revisions to Minutes

1. Unless published minutes are challenged in writing prior to the next regularly scheduled progress meeting; they will be accepted as properly, stating the activities and decisions of the meeting.
2. Persons challenging published minutes shall reproduce and distribute copies of the challenge to all indicated recipients of the particular set of minutes.
3. Challenge to minutes shall be settled as priority portion of "old business" at the next regularly scheduled meeting.

END OF SECTION

SECTION 01 32 16
CONSTRUCTION PROGRESS SCHEDULE

PART 1 GENERAL

1.1. SUMMARY

A. The contractor shall provide a schedule to serve as a basis for a detailed construction sequence. The detailed construction schedule shall describe and document the construction sequence necessary to execute the scope of work.

1.2 DESCRIPTION

A. Utilize a computer generated schedule for the planning and scheduling of all work required under the Contract Documents. In addition to construction activities, detailed network activities shall include the submittal of shop drawings, catalog cut sheets, and materials samples, review and approval of these submittals, and fabrication and delivery of materials and equipment. Work by separate contractors and project close - out activities shall also be included to account for their effect on the overall sequencing of the project.

1.3. SCHEDULE STANDARDS

- A. The schedule shall demonstrate a logical succession of work from start to finish. Constrained start and finish dates shall be kept to a minimum, such that the schedule logic (activity relationships and durations) will determine the schedule start and finish of each activity.
- B. The durations indicated for each activity shall be in "work - days" and shall represent the required time for the activity considering the scope of work and resources planned for the activity including time for inclement weather and other predictable delays.
- C. Multiple calendars shall be utilized as required to allow for specific times of the week, month, or year when specific activities can or cannot be accomplished. Specific examples include, but are not necessarily limited to, Site Based activities which require limited noise and other site based activities which require considerations, such as building occupant morning and afternoon commuting arrival and departure times, consult with the Architect regarding additional time-frames which require Site Based activities to take priority over normal owner use of the site.

PART 2 PRODUCTS

1.1. Not Used

PART 3 EXECUTION

3.1. GENERAL

- A. Prepare a computer generated schedule of all construction related work required by this contract.
- B. Include the following information in the database for each activity:
1. Activity Description - should indicate type of work being performed and. general location or phase.
 2. Calendar - the standard calendar is a five day workweek.
 3. Duration - should indicate "work - days" required to accomplish the task.
 4. Schedule Dates - Early Start, Early. Finish, Late Start, and Late Finish for each activity will result from the

calculation of the schedule.

3.2 SUBMITTAL PROCEDURE

A. Time of Submittals:

1. Within Five (5) working days after Notice to Proceed, the Contractor shall submit its project schedule for review. The schedule produced and submitted shall indicate interim milestone and completion dates. The Architect will review the schedule within ten working days and state acceptance or rejection of the schedule.
2. Within ten working days after the conclusion of the Architect's review, the Contractor shall revise the schedule as required and resubmit. This schedule shall constitute the project Work schedule unless a revised schedule is required due to substantial changes in work or contract time, delinquency by the Contractor requiring a recovery schedule, or as otherwise provided.
3. Acceptance of the project schedule will be required prior to the processing of any application for payment.
4. Submit a copy of the schedule, clearly showing progress made during the previous month along with each Application for Payment.

B. Acceptance of Schedule:

1. The schedule will be acceptable when it provides a description of an orderly progression of the work to completion in accordance with the contract requirements, adequately defines the Contractor's work plan, and provides a workable arrangement for the processing of submittals in accordance with the requirements.
2. Review and acceptance of the Contractor's project schedule is for conformance to the requirements of the contract documents only. It does not relieve the Contractor of any responsibility for the accuracy or feasibility of the project schedule, or of the Contractor's ability to meet the interim milestone dates and contract completion date.

C. Submittal Items:

1. Initial submittals shall include the following:
 - a. Critical Path Graphic Report - include all activities for the entire project. Sort by early start, early finish, and total float; organize by submittal activities, construction activities, etc. Include activity ID, description, original duration, early start, early finish, and total float. Individual pages shall not exceed 11 inches by 17 inches.
 - b. Back-up digital file
 - e. Reports shall be submitted in triplicate plus any copies to be returned to the Contractor.
2. Monthly submittals to be included with Application for Payment shall include the following:
 - a. Project Narrative. Report - shall include a brief description of work that was accomplished during the previous month as well as work to be pursued during the upcoming month.
 - b. Critical Path Graphic Report - shall be a three-month look ahead schedule to include previous month's progress plus work to accomplish during the two months following the data date. Schedule bars shall be compared to the initial schedule as a baseline. Include the same activity information as in initial bar chart graphic report.
 - c. Back-up digital file
 - d. Reports shall be submitted in triplicate plus any copies to be returned to the Contractor.

D. Schedule Revisions:

1. No changes may be made in the sequence, duration, or relationship of any activity without the acceptance of the Architect. Requests for minor changes to the schedule may be submitted in the form similar to the schedule form identified herein. More substantial revisions will require re-submittal of the entire schedule.
2. If at any time the Architect considers the milestone or completion dates to be in jeopardy because of work activities behind schedule, the Contractor shall provide a revised Critical Path Work Schedule, including

resource requirements, to show how the Contractor intends to bring the project back on schedule. “Activities behind schedule” are any activities whose current schedule early dates are later than indicated in the initial schedule.

3. If a change directive has a schedule impact, that impact shall be submitted with the change directive request.

END OF SECTION

SECTION 01 33 23
SUBMITTALS

PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Submittal procedures.
- B. Proposed products list.
- C. Shop drawings.
- D. Product data.
- E. Samples.
- F. Manufacturers' instructions.
- G. Manufacturers' certificates.

1.2 SUBMITTAL PROCEDURES

- A. Transmit each submittal with Architect accepted form.
- B. Sequentially number the transmittal forms. Resubmittals to have original number with an alphabetic suffix.
- C. Identify Project, Contractor, Subcontractor or supplier; pertinent Drawing sheet and detail number(s), and specification Section number, as appropriate.
- D. Apply Contractor's stamp, signed or initialed certifying that review, verification of Products required, field dimensions, adjacent construction Work, and coordination of information, is in accordance with the requirements of the Work and Contract Documents.
- E. Schedule submittals to expedite the Project, and deliver to Architect at business address. Coordinate submission of related items.
- F. Identify variations from Contract Documents and Product or system limitations which may be detrimental to successful performance of the completed Work.
- G. Provide space for Contractor and Architect review stamps.
- H. Revise and resubmit submittals as required, identify all changes made since previous submittal.
- I. Distribute copies of reviewed submittals to concerned parties. Instruct parties to promptly report any inability to comply with provisions.

1.3 PROPOSED PRODUCTS LIST

- A. Within 15 days after date of Owner-Contractor Agreement, submit complete list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.
- B. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation, and reference standards.

1.4 SHOP DRAWINGS

- A. Submit the number of opaque reproductions which Contractor requires, plus two copies which will be retained by Architect.

1.5 PRODUCT DATA

- A. Submit the number of copies which the Contractor requires, plus two copies which will be retained by the Architect.
- B. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information unique to this Project.

1.6 SAMPLES

- A. Submit samples to illustrate functional and aesthetic characteristics of the Product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
- B. Submit samples of finishes from the full range of manufacturers' standard colors, textures, and patterns for Architect's selection.
- C. Include identification on each sample, with full Project information.
- D. Submit the number or samples specified in individual specification Sections; one of which will be retained by Architect.
- E. Reviewed samples which may be used in the Work are indicated in individual specification Sections.

1.7 MANUFACTURER'S INSTRUCTIONS

- A. When specified in individual specification Sections, submit manufacturers' printed instructions for delivery, storage, assembly, installation, adjusting, and finishing, in quantities specified for Product Data.
- B. Identify conflicts between manufacturers' instructions and Contract Documents.

1.8 MANUFACTURER'S CERTIFICATES

- A. When specified in individual specification Sections, submit manufacturer's certificate to Architect for review, in quantities specified for Product Data.
- B. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
- C. Certificates may be recent or previous test results on material or Product, but must be acceptable to Architect.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not used

END OF SECTION

SECTION 01 50 00
CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 GENERAL

1.1 SUMMARY

A. This Section describes construction facilities and temporary controls required for the Work.

B. Related work:

1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
2. Except that equipment furnished by subcontractors shall comply with requirements of pertinent safety regulations, such equipment normally furnished by the individual trades in execution of their own portions of the Work are not part of this Section.
3. Permanent installation and hookup of the various utility lines are described in other Sections and on the Contract Document Drawings where applicable.

1.2 REQUIREMENTS

A. Provide construction facilities and temporary controls needed for the Work including, but not necessarily limited to:

1. Temporary utilities such as water and electricity.
2. Sanitary facilities.
3. Enclosures such as tarpaulins, barricades, and canopies.
4. Emergency Preparedness supplies.

1.3 DELIVERY, STORAGE, AND HANDLING

A. Maintain temporary facilities and controls in proper and safe condition throughout progress of the Work.

PART 2 - PRODUCTS

2.1 UTILITIES

A. Water: At no cost to the Contractor, the Owner will furnish all necessary water for testing, sterilizing, flushing, and other construction purposes, subject to the following conditions:

1. Water will be available from existing water facilities, at locations designated by the Owner. The Contractor shall make all necessary arrangements and shall provide all necessary hoses, temporary pipework, portable tanks, and other equipment to convey the water to the usage locations.
2. Carefully conserve all water, and do not waste it unnecessarily.
3. Before each water delivery from the existing water facilities, obtain the Owner's prior approval of the time and duration of flow, approximate rate of flow, and approximate volume of water required.

B. Electricity: Owner will provide.

1. Electricity will be available from existing electrical facilities, at location approved by the Owner. The

Contractor shall make all necessary arrangements with local electrical utility company and shall provide all temporary wiring and temporary equipment required to convey the electricity to the usage locations.

2. Carefully conserve all electricity, and do not waste it unnecessarily.
3. Do not overload existing electrical facilities, and do not adversely affect the operation of any existing electrically operated equipment.
4. Remove all temporary electrical work promptly after it is no longer required.

2.2 SANITARY FACILITIES

- A. Provide temporary sanitary facilities in the quantity required for use by all personnel.
- B. Maintain in a sanitary condition at all times.

2.3 TEMPORARY CONSTRUCTION

A. Provide and maintain for the duration of construction all scaffolds, tarpaulins, canopies, warning signs, steps, platforms, bridges, chutes, and other temporary construction necessary for proper completion of the Work in compliance with pertinent safety and other regulations.

2.4 REMOVING AND REPLACING FENCES, SOD, ETC.

- A. Where required to install the Work, carefully remove and store all interfering fences, mailboxes, culverts, etc. After installation of work and backfilling, reinstall these items and restore them to at least the conditions which existed prior to the commencement of work, using materials and workmanship to match those of the original construction and installation.
- B. Carefully remove and store all interfering shrubbery, trees, sod, flowers, and other planting, sufficiently in advance of construction. After installation of work and backfilling, reset and restore these items to at least the conditions that existed prior to the commencement of work.
- C. Upon completion of the Work, restore all lawns to at least the conditions that existed prior to the commencement of the work.
- D. Site infrastructure damaged during the course of the Work will be replaced or repaired to at least the conditions that existed prior to the commencement of the work. These items include, though are not limited to, driveway and parking lot surfaces, sidewalks, curbs, and gutters.

2.5 EQUIPMENT AND MATERIALS STORAGE AND PROTECTION

- A. Equipment and Materials Which Will Be Installed Indoors: At all times prior to its installation within permanent facility buildings and structures which are sufficiently enclosed to provide adequate weather protection, store this equipment in dry weathertight warehouses or other shelters which will completely protect this equipment from damage by weather and other causes. Obtain Architect's prior approval of proposed storage facilities; plastic wrapping or covering alone will not be considered adequate protection.
 1. This includes but shall not be limited to all architectural finish materials and products.
- B. Equipment and Materials Which Will be Installed Outdoors: At all times prior to its installation, store this equipment and these materials on pallets, skids, runners, platforms, or other suitable supports which will hold all parts of this equipment and these materials at least six inches above ground; provide watertight coverings for those stored items which may be damaged by rain or snow; all as approved.
- C. Payment for Stored Materials and Equipment: No payment will be made for on-site or off-site stored

materials and equipment which is not stored as specified above.

D. At Contractor's expense, provide temporary weathertight storage for materials which may be damaged by storage exposed to weather.

2.6 TRAFFIC CONTROL

A. Schedule and perform all work to interfere as little as possible with vehicular traffic flow. Poor planning and gross inconsideration of traffic flow will be just cause for the Owner to stop the Contractor's work until the unsatisfactory conditions have been remedied. Blocking of service driveways and fire lanes is prohibited.

B. Provide safety precautions and warnings in accordance with Shelby County General Conditions of the Contract for Construction.

C. Use only site entrances that have been approved by the Owner for temporary use as Construction Entrances.

2.7 EMERGENCY SUPPLIES

A. First Aid Kit

B. (2) Portable Fire Extinguishers: 4A:20B:C rated

C. Tarps: Two (2) 20'x100' Plastic.

D. Water Pumps: Two (2) 30-gallon per minute capacity.

E. Hoses: Two (2) 25' foot hoses.

PART 3 - EXECUTION

3.1 MAINTENANCE AND REMOVAL

A. Maintain temporary facilities, controls, and emergency supplies as long as needed for safe and proper completion of the Work.

B. Remove such temporary facilities and controls as rapidly as progress of the Work will permit, or as directed by the Architect.

END OF SECTION

SECTION 01 66 00
DELIVERY, STORAGE AND HANDLING

1 GENERAL

1.1 SUMMARY

A. Protect products scheduled for use in the Work by means including, but not necessarily limited to, those described in this Section.

B. Related Work:

1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions and Sections in Division 1 of these Specifications.
2. Additional procedures also may be prescribed in other Sections of these Specifications.

1.2 QUALITY ASSURANCE

A. Include within the Contractor's quality assurance program such procedures as are required to assure full protection of work and materials.

1.3 MANUFACTURERS' RECOMMENDATIONS

A. Except as otherwise approved by the Architect, determine and comply with manufacturers' recommendations on product handling, storage, and protection.

1.4 PACKAGING

A. Deliver products to the job site in their manufacturer's original container, with labels intact and legible.

1. Maintain packaged materials with seals unbroken and labels intact until time of use.
2. Promptly remove damaged material and unsuitable items from the job site, and promptly replace with material meeting the specified requirements, at no additional cost to the Owner.

B. The Architect may reject as non-complying such material and products that do not bear identification satisfactory to the Architect as to manufacturer, grade, quality, and other pertinent information.

1.5 PROTECTION AND HANDLING

A. Maintain finished surfaces clean, unmarred, and suitably protected until accepted by the Owner.

1.6 REPAIRS AND REPLACEMENTS

A. In event of damage to the Owner's property or to work in progress, promptly make replacements and repairs to the approval of the Architect and at no additional cost to the Owner.

B. Additional time required to secure replacements and to make repairs will not be considered by the Architect to justify an extension in the Contract Time of Completion.

END OF SECTION

SECTION 01 74 23
CLEANING

PART 1 - GENERAL

1.1 SUMMARY

A. Throughout the construction period, maintain the buildings and site in a standard of cleanliness as described in this Section.

B. Related work:

1. Documents affecting work of this Section include, but are not necessarily limited to, General Conditions and Sections in Division 1 of these Specifications.
2. In addition to standards described in this Section, comply with requirements for cleaning as described in pertinent other Sections of these Specifications.

1.2 QUALITY ASSURANCE

A. Conduct daily inspection, and more often if necessary, to verify that requirements for cleanliness are being met.

B. In addition to the standards described in this Section, comply with pertinent requirements of governmental agencies having jurisdiction.

PART 2 - PRODUCTS

1.1 CLEANING MATERIALS AND EQUIPMENT

A. Provide required personnel, equipment, and materials needed to maintain the specified standard of cleanliness.

1.2 COMPATIBILITY

A. Use only the cleaning materials and equipment which are compatible with the surface being cleaned, as recommended by the manufacturer of the material.

PART 3 - EXECUTION

1.1 PROGRESS CLEANING

A. General:

1. Retain stored items in an orderly arrangement allowing maximum access, not impeding traffic or drainage, and providing required protection of materials.
2. Do not allow accumulation of scrap, debris, waste material, and other items not required for construction of this Work.
3. At least twice each month, and more often if necessary, completely remove all scrap, debris, and waste material from the job site.
4. Provide adequate storage for all items awaiting removal from the job site, observing requirements for fire protection and protection of the ecology.

B. Site:

1. Daily, and more often if necessary, inspect the site and pick up all scrap, debris, and waste material. Remove such items to the place designated for their storage.
2. Weekly, and more often if necessary, inspect all arrangements of materials stored on the site. Re-stack, tidy, or otherwise service arrangements to meet the requirements of subparagraph 3.1-A-1 above.
3. Maintain the site in a neat and orderly condition at all times.

C. Roof: Daily pick up all scrap, debris, material which may become air borne, and nails and other material which may damage roof if stepped on. Remove such items to the place designated for their storage.

1.2 FINAL CLEANING

A. "Clean," for the purpose of this section, and except as may be specifically provided otherwise, shall be interpreted as meaning the level of cleanliness generally provided by skilled cleaners using commercial quality building maintenance equipment and materials.

B. Prior to completion of the Work, remove from the job site all tools, surplus materials, equipment, scrap, debris, and waste. Conduct final progress cleaning as described in Article 3.1 above.

C. Site:

1. Unless otherwise specifically directed by the Architect, broom clean paved areas on the site and public paved areas adjacent to the site and completely remove resultant debris.
2. Remove all nails and other debris produced by the Work.

D. Roof: Remove all unused nails, scraps, debris, and other unused material.

E. Schedule final cleaning as approved by the Architect to enable the Owner to accept a completely clean Work.

1.3 CLEANING DURING OWNER'S OCCUPANCY

A. Should the Owner occupy the Work or any portion thereof prior to its completion by the Contractor and acceptance by the Owner, responsibilities for interim and final cleaning shall be as determined by the Architect in accordance with the General Conditions.

END OF SECTION

SECTION 01 77 19
CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

- A. Closeout Procedures
- B. Final Cleaning
- C. Project Record Documents
- D. Operation and Maintenance Data
- E. Warranties and Bonds

1.2 RELATED WORK

- A. Agreement Between Owner and Contractor.
- B. Section 01 11 13 - Summary of the Work.
- C. Section 01 33 23 – Submittals.
- D. Shelby County General Conditions of the Contract for Construction

1.3 CLOSEOUT PROCEDURES

- A. Comply with procedures stated in Section 01 29 76 Progress Payment Procedures for issuance of Certificate of Substantial Completion.
- B. When Contractor considers that the Work has reached final completion, submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with contract Documents and ready for the Architect's inspection.
- C. In addition to submittals required by the conditions of the Contract, provide submittals required by governing authorities, and submit a final statement of accounting giving total adjusted Contract Sum, previous payments, and sum remaining due.
- D. Architect will issue final Change Directive reflecting approved adjustments to Contract Sum not previously made by Change Directive.
- E. Submit all close-out documents and products to the Architect.

1.4 FINAL CLEANING

- A. Complete prior to final inspection.
- B. Clean interior and exterior surfaces exposed to view; remove ALL temporary labels, stains and foreign substances, clean equipment and fixtures to a sanitary condition, clean or replace filters of mechanical equipment.
- C. Thoroughly clean all exterior and interior finishes.
- D. Identify, remove and dispose of all debris and hazardous waste from site. Dispose of materials in compliance with current local, state and federal environmental requirements.

1.5 OPERATION AND MAINTENANCE DATA

- A. Provide names and addresses of manufacturers and suppliers of equipment and materials and general and subcontractors.

B. Provide data for:

1. Installed Roof System
2. Any other items specifically identified in individual specification sections of this Project Manual.

C. Submit four (4) sets prior to final inspection, bound in 8-1/2" x 11" three-ring side binders with durable plastic covers, tabbed with permanent tab markers and identified on face and spine.

1. Part 1: Directory, listing names, addresses and telephone numbers of Architect/Engineer and Contractor(s).
2. Part 2: Operation and maintenance instructions arranged by system. For each system give names, addresses, and telephone numbers of subcontractors and suppliers.

Provide:

- a. Appropriate design criteria.
- b. List of Equipment
- c. Maintenance instructions, identifying required cleaning materials and solutions for removals of (i.e. graffiti, marker ink, efflorescence, Etc.)
- d. Maintenance instructions, to protect finishes.
- e. Shop drawings and product data.
- f. Warranties.

1.6 ADDITIONAL DOCUMENTATION

A. Provide the following documentation in addition to that previously specified:

1. Consent of Surety to Final Payment
2. Contractor's Affidavit of Release of Liens
3. Contractor's Affidavit of Payment of Debts and Claims.
4. Lien Waiver from all Subcontractors.
5. Non-asbestos/lead Certification.

1.7 WARRANTIES AND BONDS

A. Provide duplicate, notarized copies. Execute Contractor's submittals and assemble documents executed by subcontractors, suppliers, and manufacturers. Provide table of contents and assemble in binder with durable plastic cover.

B. Submit material prior to final application for payment. For items of Work delayed materially beyond Date of Substantial Completion, provide updated submittal within ten days after acceptance, listing(s) of ALL Manufacturers Warranties, date(s) of acceptance as start and end of warranty period(s).

C. Manufacturers Warranties:

1. Reference ALL other related specification sections.

D. Contractor Warranties:

1. Provide all Contractor's and subcontractor's materials and workmanship warranties.

1.8 PRODUCTS

A. Provide ALL Products Data with ALL other related product information to the Architect to assist the Owner with the proper maintenance, repair, or replacement re-use of all Products utilized for this Project.

1.9 SPECIAL CERTIFICATION(S)

- A. Provide duplicate, notarized copies.
- B. Provide certification(s) that products and materials installed are free of asbestos and comply with current local, state and federal requirements regarding use of non-asbestos materials.
- C. Provide certification(s) that products and materials installed are free of lead and comply with current local, state and federal requirements regarding use of non-lead materials.
- D. Provide copies of all environmentally related permits required, and fee receipts for disposal of hazardous materials from the construction site (if applicable).

1.10 FINAL ACCEPTANCE AND PAYMENT

- A. Conform to Contract requirements for Final Completion and Final Payment, Section 01 29 76, Paragraph 1.7, "Progress Payment Procedures."

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

Not Used

END OF SECTION

**SECTION 02 10 00
SITE PREPARATION**

PART 1 GENERAL

1.01 DESCRIPTION

A. Perform site preparation work as shown and specified. The work includes:

1. Removing trees and other vegetation.
2. Installation of erosion and sedimentation control measures.
3. Removal of existing concrete paving.

B. Related Work:

1. Section 02 20 00: Earthwork.

1.02 QUALITY ASSURANCE

A. Comply with Section 02 00 00 requirements.

1.03 PROJECT CONDITIONS

A. Perform site preparation work before commencing site construction.

B. Locate, protect, and maintain active utilities and site improvements to remain.

C. Provide necessary barricades, coverings, and protection to prevent damage to existing improvements indicated to remain.

D. Contact Owner or Engineer if damage to adjacent properties is anticipated. Do not proceed in such areas until permission to continue has been received in writing.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Materials and equipment: As selected by the Contractor, except as indicated.

PART 3 EXECUTION

3.01 CLEARING

- A. Locate and identify improvements indicated to remain.
- B. Clear and grub areas within property boundary as illustrated on the plans and as required for site access and execution of the work.
- C. Remove trees, plant undergrowth, other vegetation, and debris, except items indicated to remain. Strip weeds and grass.
 - 1. Fell trees in a manner to prevent injury to adjacent facilities and to trees scheduled to remain.
 - 2. Remove stumps and roots to a clear depth of 36" below proposed subgrades. Remove stumps and roots to their full depth within 5'-0" of underground structures, utility lines, footings, and paved areas.

3.02 SITE IMPROVEMENTS

- A. Remove existing site improvements within contract limits/property boundary that conflict with improvements shown in the plans.
- B. Existing utilities:

1. Information on the drawings relating to existing utility lines and services is from the best sources presently available. All such information is furnished only for information and is not guaranteed. Excavate test pits as required to determine exact locations of existing utilities.
 2. Where the utility company has no jurisdiction, perform work and provide necessary materials to disconnect or relocate existing utilities as indicated. Record existing utility termination points before disconnecting.
 3. Contact utility company(ies) and Engineer if conflict with existing utilities exists. Proceed with work in immediate area when written notice to proceed is acquired from Engineer.
- C. Remove existing sidewalks, curbs, and paving, including all base material, as required to accommodate new construction. Cut existing sidewalks, curbs, and paving in neat, straight lines to provide uniform, even transition from new to adjacent existing work. Cut back existing paving a sufficient distance to permit forming and installation of new work.
- D. Remove, temporarily relocate during construction, and reinstall in final location street signs and other designated items. Coordinate the work with applicable governing authorities. Comply with all requirements concerning temporary installation and permanent reinstallation.

3.03 DISPOSAL OF WASTE MATERIALS

- A. Stockpile, haul from site, and legally dispose of waste materials and debris. Accumulation is not permitted.
- B. Maintain disposal routes clear, clean, and free of debris.
- C. On-site burning of materials is not allowed.

3.04 CLEANING

- A. Upon completion of site preparation work, clean areas within contract limits, remove tools, and equipment. Provide site clear, clean, and free of materials and debris and suitable for site work operations.

3.05 SALVAGED MATERIALS

- A. Materials, items, and equipment not scheduled for reinstallation or salvaged for the Owner's use are the property of the Contractor. Remove cleared materials from the site as the work progresses. Storage and sale of Contractor's salvage items on site is not permitted.

END OF SECTION

**SECTION 02 20 00
EARTHWORK**

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Includes removal and disposal of unsuitable material, drainage during and after construction, supplying suitable fill material obtained from the Contractor's borrow area, the placement and compaction of the fill material into place, and the finish grading. Also, includes fine grading of areas of the site disturbed by construction operations, material storage and staging operations. Leave such areas ready to receive seed and/or sod.

1.2 RELATED DOCUMENTS

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

1.3 QUALITY ASSURANCE

A. Laboratory Testing:

1. Retain the services and pay the cost of an independent testing laboratory for soil testing; refer to Section 01 43 25. The Architect shall meet with the testing laboratory and earthwork contractor prior to commencement of earthwork operations to discuss the particulars of the testing and to review the proposed plan of operation for the earthwork.
2. When the tests indicate that the density of any layer of fill or portion thereof is below the required density, the particular layer or portions shall be reworked until the required density has been obtained.
3. Laboratory testing and approval of subgrade is required for slabs and bearing of all footings; refer to Section 03 30 00.
4. Laboratory service is provided as an assurance to the Owner, and in no way relieves the Contractor of his responsibility for quality materials and workmanship required to meet this specification.

- B. Geotechnical Engineering Study: A Geotechnical Engineering Study has been prepared for this project and is bound herein, and is to be referred to during all phases of the earthwork operations and subgrade preparation for the building and paved areas.

1. Investigation: The Bidding Contractors shall visit the sites and become acquainted with existing site conditions, including but not limited to, existing subsurface utilities, structures, topography and visible subsurface utilities and structures. Prior to submitting his bid, the Bidder may make his own soil borings in order to verify existing subsurface conditions. Give Architect notice of such investigations.

- C. Retain the services and pay the cost of a licensed Geotechnical Engineer to monitor all earthwork

activities as referenced in the project Geotechnical Engineering Study.

- D. The soils at this site are low to moderately plastic material. These soils are considered to be susceptible to appreciable loss in shear strength due to higher moisture and disturbances. Both of these factors should be controlled carefully in the field during construction. The potential for disturbance of natural and filled subgrades, and the need for rehabilitation of such areas should be discussed with the contractor, and related construction criteria established prior to commencing the work.

1.4 SUBMITTALS

- A. Submit copies of technical data describing the materials shall be delivered to the Architect for review. Technical data shall include proctor test of each type of material, moisture density curves, compaction test, plasticity indexes.

1.5 JOB CONDITIONS

- A. Existing Utilities: Locate existing underground utilities in areas of work. If utilities are to remain in place, provide adequate means of support and protection during earthwork operations.
 - 1. Notify Owner for the purpose of making personal inspection of all records showing locations of buried and underground utilities. Conduct a walking examination to physically verify locations of existing utilities and any conflicts with the proposed construction and the location of existing utilities.
- B. Should uncharted, or incorrectly charted, piping or other utilities be encountered during excavation, consult utility owner immediately for directions.
- C. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies for shut-off or services if lines are active.
- D. Protection of Persons and Property: Barricade open excavations occurring as part of this work and post with warning lights. Operate warning lights as recommended by authorities having jurisdiction.
- E. Protect trees, structures, utilities, pavements, fencing and other appurtenances from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork operations. Restore damaged improvements to their original condition as acceptable to parties having jurisdiction.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Fill material shall consist of naturally occurring earth materials with a plasticity index of not more than 20%. It shall be free from organic matter and clay balls. In general, the material shall have an upper particle size diameter of 2.5 inches.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Prior to bidding, visit the job site and determine the conditions under which the Work will be performed.
- B. Communicate with all local utilities.

3.2 PROTECTION/DRAINAGE

- A. Maintain carefully all bench marks, monuments and other reference points; if disturbed or destroyed, replace as directed.
- B. During site preparation, drainage should be improved, and water should be prevented from ponding over any portion of the site. Once the vegetation is removed, significant increases in moisture content may occur if proper drainage is not maintained.

3.3 EARTHWORK OPERATIONS

- A. All topsoil, organic material and any miscellaneous fill, debris or undesirable soil shall be removed from the proposed pavement areas prior to building or placing any engineered fill on the site. Stockpile topsoil for future use. Following the stripping operations, the exposed surface shall be evaluated by the Geotechnical Engineer to determine the location of any loose or soft areas. This evaluation may include proofrolling with a loaded dump truck or similar pneumatic-tired equipment, however, hand-probing may be performed in lieu of proofrolling to avoid deterioration of the subgrade. The decision as to the most appropriate method of subgrade evaluation, and remedial action where problems are encountered, shall be made by the Geotechnical Engineer.
- B. Compact the top 6 inches of cleared subgrade to a minimum of 95% of optimum density as determined by the standard compaction test ASTM D-698 for fine-grained soils. If the subgrade is granular material, compact the top 6 inches to a minimum of 70% of relative density as determined by the relative density test ASTM D-4253 and D-4254.
- C. Bring the fill to grade using material specified, in lifts not to exceed 6 inches in the compacted state. Each lift shall be compacted to a minimum of 95% of optimum density as determined by the standard compaction test ASTM D-698 for fine-grained soils. Moisture content shall be controlled to within \pm 3% of optimum. If granular fill is used, compact each lift to a minimum of 70% of relative density as determined by ASTM D-4353 and D-4254.
- D. When the fill is used to found pavements, the top lift shall be compacted to a minimum of 100% of optimum density in the case of fine-grained soils or to a minimum of 75% of relative density in the case of granular soils.

- E. In the building areas, the fill shall extend a minimum of 5 feet beyond the exterior perimeter of the structure at the top of the fill. From that point, the fill may be sloped to meet the requirements set for maintaining a grass cover to prevent erosion. It is further recommended that the slope of the fill be no greater than 1 (v) to 3 (h).
- F. The moisture content of the soil being compacted not exceed optimum +3 percent during site preparation. If the moisture content exceeds optimum, vibrating compaction equipment shall not be employed. If pumping begins to occur, compaction efforts shall cease until the soil dries.
- G. Vehicles must not be allowed to operate uncontrolled over the subgrade when the moisture content approaches optimum moisture (ASTM D-698). If necessary, haul roads should be provided. A minimum buffer of 2 feet should be provided between wheel or track loads and the subgrade.
- H. Undercutting and replacement of the fine-grained soil with material less sensitive to changes in moisture content can be expected.
- I. If construction must proceed with moisture content greater than about 23 percent, some method of repair may be required. As an alternative to undercutting and replacement, Portland cement can be used as a drying/stabilizing agent if moisture contents are not too excessive. A sub-base of soil-cement approximately 6 inches in thickness may be used for stabilization of this nature. The soil-cementing operation should be the final step prior to paving. Random construction traffic will not be allowed to operate over the soil-cement during and after curing prior to paving. The soil cement base shall not be used as base material when the soil is Loess.

3.4 UNDERCUTTING

- A. Unsuitable material shall be undercut, reworked for use as compacted fill and/or disposed of as directed by the above referenced Geotechnical Engineer. Replace unsuitable undercut material with compacted material with approved borrow and/or reworked undercut material. Extent of undercutting (where required) is to be judged by the soils testing laboratory representative and the Geotechnical Engineer and shall be documented in their reports.
- B. In areas where cut will be required to bring the site to grade, the top 6 inches of the subgrade shall be compacted to a minimum of 95% of optimum density (ASTM D-698) where floors will be constructed. In areas where pavements will be constructed, the top 6 inches shall be compacted to a minimum of 100% of optimum density (ASTM D-698).

3.5 DISPOSAL OF UNSUITABLE MATERIAL

- A. All materials obtained from required excavations which is not suitable for use as fill or as topsoil shall be removed from the site.

3.6 EXCAVATION OUTSIDE OF BUILDING

- A. Excavate where and as necessary to obtain grade elevations as shown on the drawings or hereinafter specified. Do all filling, backfilling and grading required to bring the project area outside of buildings to subgrades as shown on drawings.

3.8 PAVEMENT AND SLAB SUBGRADE

- A. Preparation of the pavement subgrade should be prepared in accordance with the recommendations and shall include the removal of all unsuitable surface soil including topsoil, soil containing organic material and any old fill. The subgrade surface shall be uniformly sloped to facilitate drainage of any base material within the pavement system, and to avoid any ponding of water beneath the pavement.
- B. Floors shall be placed upon a prepared subgrade. In preparation to receive portland cement concrete floors, a minimum of 4 inches of granular material be placed upon the prepared subgrade. This material shall be naturally occurring earth material, fairly well-graded, with an upper particle size diameter of 2.5 inches. A minimum of 30% shall pass the number 10 sieve, and a maximum of 5% shall pass the number 200 sieve. This material shall be spread uniformly over the subgrade and tamped or rolled to provide a firm, true surface for placing concrete. Immediately prior to placing concrete, a moisture barrier shall be placed over the granular material.
- C. Refer to Paragraph 3.4 B for additional requirements.

3.9 CLEANUP

- A. Complete the grading operations after buildings have been finished, utilities installed, site improvement constructed, and all materials, rubbish and debris removed from the site. Leave subgrade for lawn areas clean at required grades.

END OF SECTION

**SECTION 02 27 00
EROSION, SEDIMENTATION, & DUST CONTROL**

PART 1 GENERAL

1.01 DESCRIPTION:

A. This work shall consist of control measures as specified or as shown on the plans during the life of the contract to control erosion, sedimentation, and dust.

1. The Contractor shall establish, construct, monitor, and maintain erosion and sediment control measures to prevent runoff sediments from entering waters of the State and to prevent stream damage. Siltation control devices shall be installed in the locations shown on the plans before construction begins. The erosion control structures shall be maintained until permanent ground cover is established. The Contractor, with the advice and consultation of the Engineer, shall endeavor to stop all sediment and erosion.
2. Temporary erosion and pollution control shall include all construction work, haul roads or equipment storage sites.
3. The erosion control features installed shall be effectively maintained by the Contractor.

B. Related Work:

1. Section 02 10 00: Site Preparation.
2. Section 02 20 00: Earthwork
3. Division 32 00 00: Exterior Improvements

1.02 QUALITY ASSURANCE

A. Comply with Section 02 00 00 requirements.

- B. Materials and methods of construction shall comply with the following standards:
 - 1. County of Shelby and City of Memphis Construction Code Enforcement.
 - 2. American Society for Testing and Materials, (ASTM).
 - 3. Tennessee Department of Environment and Conservation - Division of Water Pollution Control

1.03 SUBMITTALS

- A. Provide samples and certifications of all materials proposed for use.

1.04 PROJECT CONDITIONS

- A. Damage to a stream or other natural areas is herein defined as the addition of soil, rock or top soil, whether deposited by poor construction practice, sedimentation, wind or other means; vegetable matter such as whole trees or any part thereof, or remnants from burning or other clearing processes; waste construction materials such as concrete, broken pipe, etc.; waste from construction equipment such as petroleum product spills, oil cans, damaged equipment or parts thereof; or any other additions which can be classified as detrimental to said natural areas of soil, rock, topsoil, natural vegetation, or other natural features, whether by erosion, poor construction methods or other, which can be classified as detrimental to said areas. Damage will be specified either by the Owner, or the Engineer, by actual site inspections. If it is determined that damage has been caused by the Contractor through negligence, carelessness by intention or other, then the Contractor will act as directed by the Engineer to correct said damage as quickly as possible and to take steps to prevent further damage. Such corrections to damage will be at no extra costs to the Owner.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Siltation fences shall meet the following minimum requirements and be approved by the Engineer:
 - 1. Posts shall be metal "T" posts, or approved equal, placed at 6' on center.
 - 2. Sedimentation control fabric shall be Mirafi-100X, or approved equal, with wire backing.
 - 3. Hay bales and stakes shall be new and in good condition.

PART 3 EXECUTION

3.01 SILT FENCE

- A. Preparation:
 - 1. Mow and prepare areas requiring silt fence as shown on the project drawings prior to the commencement of any excavation activities.
- B. Locations:
 - 1. Silt Fence Type "C": Type "C" siltation fences shall be installed in the locations indicated on the plans and where required to prevent runoff sediments from entering waters of the State. Siltation fences shall be installed prior to clearing operations. Siltation fences shall be kept in good repair and maintained throughout construction. At a minimum, sediment shall be removed when the ponding capacity is reduced by one-half.
- B. Installation Procedures:
 - 1. Silt Fence Type "C":
 - a. Set posts firmly into soils at minimum 6' on center and excavate trench upslope along the line of the posts.

- b. Attach the sedimentation control fabric to the wire backing and posts, and extend 10" of fabric into trench to minimum 6" depth.
- c. Backfill and compact excavated soils.
- d. Place hay bales continuous and stake per plan.

C. Maintenance:

- 1. The Contractor shall maintain, repair, and replace all silt fence and erosion/sedimentation measures throughout the contract period as directed by the Engineer.

3.02 DUST CONTROL:

- A. The Contractor shall exercise precautionary measures to minimize dust emissions which will include, but shall not be limited to, periodic sprinkling or wetting of the site. The Contractor has the option of using a dust palliative.

3.03 CLEANING

- A. Upon completion of tree planting operations, clean areas within contract limits, remove tools, erosion control fencing, and equipment. Provide site clear, clean, free of debris, and suitable for intended use.

END OF SECTION

SECTION 02 30 00
SUB SURFACE INVESTIGATION REPORTS

Subsurface Exploration Reports Attached:

SUBSURFACE EXPLORATION SHELBY COUNTY
FIRE STATION #62
SHELBY COUNTY, TN
Prepared by Geotechnology, Inc.
Geotechnology Project No. J024794.01
July 31, 2015

and

GEOTECHNICAL INVESTIGATION REPORT
SHELBY COUNTY FIRE STATION #62
4647 FOREST HILL IRENE ROAD
MEMPHIS, TN
Prepared by Mid-Continent Laboratories, Inc.
Job No. CES-841
December 2015

END OF SECTION

**SUBSURFACE EXPLORATION
SHELBY COUNTY FIRE STATION #62
SHELBY COUNTY, TENNESSEE**

Prepared for:

JOHN PRUETT ARCHITECTS
Memphis, Tennessee

Prepared by:

GEOTECHNOLOGY, INC.
Memphis, Tennessee

Geotechnology Project No. J024794.01

July 31, 2015



July 31, 2015

J024797.01

Mr. John Pruett, AIA
John Pruett Architects
1869 Madison Avenue
Memphis, Tennessee 38104

SUBSURFACE EXPLORATION
SHELBY COUNTY FIRE STATION #62
SHELBY COUNTY, TENNESSEE

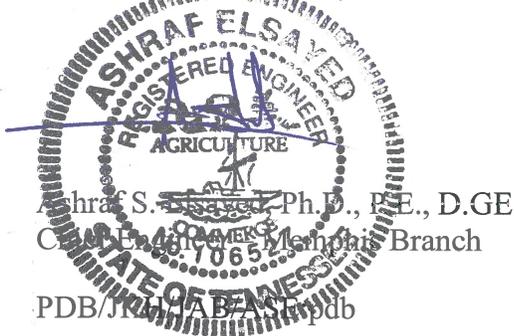
Dear Mr. Pruett:

Enclosed is the report of the subsurface exploration performed by Geotechnology, Inc. for the referenced project. The report includes our understanding of the project, observed site conditions, conclusions and/or recommendations, and support data as listed in the Table of Contents.

It has been our pleasure to provide these services to you, and we would welcome the opportunity to provide other services during the course of the project. Please contact us if you need further information or clarification about this document.

Very truly yours,

GEOTECHNOLOGY, INC.



Ashraf S. Elsayed, Ph.D., P.E., D.GE
Civil Engineer, Memphis Branch

PDB/JR/AB/AS/epdb

Copies submitted: (2) Hard copies
(1) PDF copy

SUBSURFACE EXPLORATION
SHELBY COUNTY FIRE STATION #62
SHELBY COUNTY, TENNESSEE

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SUBSURFACE EXPLORATION
SHELBY COUNTY FIRE STATION #62
SHELBY COUNTY, TENNESSEE

SECTION I – PROJECT INFORMATION

AUTHORIZATION

The services documented in this report were provided in accordance with the scope of services described in Geotechnology's Proposal No. P024797.01 dated July 2, 2015 and authorized by your signed acceptance of the proposal on July 8, 2015.

PURPOSE AND SCOPE OF SERVICES

The purpose of our services was to evaluate the subsurface conditions adjacent to and inside the existing fire station in an attempt to identify the possible causes of the observed distress as defined in the scope of services of the referenced proposal and present potential remedial measures. The services consisted of drilling four borings, laboratory testing, engineering analyses, and preparation of this report. Important Information prepared by The Geotechnical Business Council (GBC) of the Geoprofessional Business Association for studies of this type is presented in Appendix A for your review.

SITE AND PROJECT DESCRIPTION

Fire Station #62 is located at 4647 Forest Hill Irene Road, approximately 350 feet north of East Shelby Drive in Shelby County Tennessee as shown on Plate 1. The site around the existing structure is relatively flat and is covered with grass, parking lot and drive areas. An existing structure is located near the center of the site.

The existing fire station was constructed in 1991 and is an approximately 5000 square foot, slab-on-grade, single-story building with a brick façade. It is our understanding that sections of the south wall and interior walls of the apparatus bay and interior areas have settled.

REVIEW OF AVAILABLE INFORMATION

Geotechnology reviewed information included in a recent site observation report¹. The observation report includes a timeline of noted distress along with apparently related events. Of those areas with noted distress, the dayroom and the south exterior wall of the apparatus bay appeared to have settlement dating back shortly after the initial construction. Recently, wall cracking appears to have accelerated. In addition, recent settlement of the grass lawn and a concrete patio was determined to be caused by water seepage from a leaking underground cold water service connection. It was also noted that concrete pavement cracking has occurred around the site and that

¹ *Site Observation Pre Design Meeting Report, Shelby County Fire Station #62 – Structural Repairs, 4647 Forest Hill Irene Road, Memphis, Tennessee*, prepared for Shelby County Government by John Pruett Architects, dated June 25, 2015.

pavement joints near the areas of distress were open, possibly allowing water to penetrate below the slab.

SECTION II - FIELD EXPLORATION AND LABORATORY TESTING

FIELD EXPLORATION

The field exploration consisted of drilling four borings, designated as Borings B-1, B-2, HA-1 and HA-2, at the approximate locations shown on Plate 2. Borings B-1 and B-2 were located south of the existing structure in a drive area. Boring HA-1 was located in a courtyard west of the existing structure. Boring HA-2 was located inside the apparatus bay near the center of the southernmost wall. The borings were located in the field by Geotechnology personnel by referencing existing site features. The client should retain a registered land surveyor to establish exact boring locations and elevations if precise data are required.

Borings B-1 and B-2 were drilled to an approximate depth of 25 feet using a rotary drill rig (CME-550) and 3³/₄-inch inner diameter hollow stem augers. Borings HA-1 and HA-2 were drilled to an approximate depth of 10 feet using hand equipment. Standard Penetration Tests (SPT's) were performed using an automatic hammer, except in Borings HA-1 and HA-2, where a dynamic cone penetrometer (DCP) was used. Blow counts, or 'N'-values, were recorded and are presented on the boring logs. DCP results were converted to SPT N-values using the procedure from ASTM STP 399. Split-spoon samples, relatively undisturbed Shelby tube samples and grab samples were obtained in general conformance with applicable ASTM standards at the depths indicated on the boring logs. The collected samples were visually examined by the drill crew and transported to the laboratory for further testing and for examination by a geotechnical professional from Geotechnology. The boring logs are presented in Appendix B. An explanation of the terms and symbols used on the boring logs is also provided in Appendix B.

The boring logs represent conditions observed at the time of exploration and have been edited to incorporate results of the laboratory test data, as appropriate. Unless noted on the boring logs, the lines designating the changes between various strata represent approximate boundaries. The transition between materials could be gradual or could occur between recovered samples. The stratification given on the boring logs, or described herein, is for use by Geotechnology in its analyses and should not be used as the basis of design or construction cost estimates without realizing that there can be variation from that shown or described.

The boring logs and related information depict subsurface conditions only at the specific locations and times where sampling was conducted. The passage of time could result in changes in conditions, interpreted to exist, at or between the locations where sampling was conducted.

LABORATORY TESTING

Soil samples collected from the borings were visually examined in the laboratory and subsequently classified in general accordance with the Unified Soil Classification System (ASTM D 2487 and D 2488). Laboratory tests were performed on select soil samples to evaluate pertinent engineering and index properties. The testing consisted of moisture contents, Atterberg limits, standard Proctor compaction and unconsolidated-undrained triaxial compression (UU). Most of the laboratory test results are presented on the boring logs in Appendix B. The Atterberg limits, Proctor and UC test results are also included in Appendix C. The laboratory test and corresponding test method standard used are presented in the following table.

Summary of Laboratory Tests and Methods	
Laboratory Test	Test Method
Moisture Content	ASTM D 2216
Atterberg Limits	ASTM D 4318
Standard Proctor Compaction	ASTM D 698
Unconsolidated-Undrained Triaxial Compression	ASTM D 2850

SECTION III – GENERAL SUBSURFACE CONDITIONS

STRATIGRAPHY

The stratigraphy consisted of fill materials underlain by fine-grained soils underlain by coarse-grained soils to the maximum depth of exploration of 25 feet.

The fill materials consisted of clay and sandy clay (CL). The moisture contents of the tested samples ranged from approximately 15 to 29 percent. The liquid limits (LL) of the tested samples ranged from 32 to 38 percent and the plasticity indices (PI) ranged from 19 to 21 percent. The SPT N-values ranged from 3 to 7 blows per foot (bpf).

Soft soils were encountered within the upper 3 feet of Borings HA-1 and HA-2. The fine-grained soils were classified as silty clay (CL) and silt (ML). The moisture contents of the tested samples ranged from approximately 10 to 29 percent. The liquid limits (LL) of the tested samples ranged from 30 to 38 percent and the plasticity indices (PI) ranged from 8 to 19 percent. The SPT N-values ranged from 3 to more than 50 bpf. The standard Proctor test resulted in a maximum dry unit weight of 110.5 pounds per cubic foot (pcf) at an optimum moisture content of 15.7 percent. The UC test performed on a relatively undisturbed sample resulted in an undrained shear strength of approximately 1,370 pounds per square foot (psf). The results of the field and laboratory tests indicated soft to very stiff consistencies for the fine-grained soils.

The coarse-grained soils were classified as sand (SP) and silty sand (SM). The SPT N-values ranged from 13 to 39 bpf, indicating densities ranging from medium dense to dense.

GROUNDWATER

Groundwater was not encountered during drilling operations. Groundwater levels could vary significantly over time due to the effects of seasonal variation in precipitation, recharge, or other factors not evident at the time of this exploration.

SECTION IV – EVALUATIONS AND CONCLUSIONS

FILL ASSESSMENT

It is not known whether the fill encountered in the borings was placed as a part of the construction of the existing fire station, or if the fill was placed prior to the construction. The moisture contents, SPT data and materials of the fill strata were evaluated to determine possible causes of the observed distress.

A total of six moisture content tests were performed on samples of the fill. The results of the tests were compared to the standard Proctor test results. The moisture content were more than 3 percent above the optimum moisture content for four of the tested samples, with the highest moisture content being approximately 13 percent above optimum moisture. SPT values in the fill ranged from 3 to 7 bpf, indicating soft to medium stiff consistencies. Unsuitable material was encountered in Borings B-1, B-2 and HA-2. These materials included decaying organics and brick debris. Based on the findings in the borings and the test results, it is our professional opinion that the fill was not placed and compacted in a controlled manner.

PROBABLE CAUSES OF DISTRESS

Several variables have potentially contributed to the noted settlement. Based on the field tests, laboratory tests and site observations, the fill is susceptible to localized settlement. Unsuitable materials and poorly compacted materials were encountered in the fill. In addition, soft materials and debris were encountered in the fill. Since the distress appears to be the result of the foundation loading and occurred shortly after construction, it is our professional opinion that the distress is most likely a result of movement in the fill.

Due to the pavement cracking, the open joints and the recently repaired utility line, there is a potential for water infiltration into the fill. The leaking water main coupled with above average precipitation could have led to subgrade softening and loss of subgrade support, which may be contributing to the recent acceleration of cracking in the south apparatus bay wall.

REMEDIAL RECOMMENDATIONS

Micro-piles, helical piers or similar techniques are recommended to stabilize the existing foundations. Specialty contractors can design and install either of these systems using the subsurface exploration data provided in this report and specific details of loads and layouts for the

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Groundwater was not encountered during drilling operations. Groundwater levels could vary significantly over time due to the effects of seasonal variation in precipitation, recharge, or other factors not evident at the time of this exploration.

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Due to the pavement cracking, the open joints and the recently repaired utility line, there is a potential for water infiltration into the fill. The leaking water main coupled with above average precipitation could have led to subgrade softening and loss of subgrade support, which may be contributing to the recent acceleration of cracking in the south apparatus bay wall.

REMEDIAL RECOMMENDATIONS

Micro-piles, helical piers or similar techniques are recommended to stabilize the existing foundations. Specialty contractors can design and install either of these systems using the subsurface exploration data provided in this report and specific details of loads and layouts for the structure. The piles/piers should extend into the suitable bearing stratum approximately 20 feet

below ground surface. A waiting period may be required after the foundation underpinning is finished before cosmetic repairs are made.

SECTION V – LIMITATIONS OF REPORT

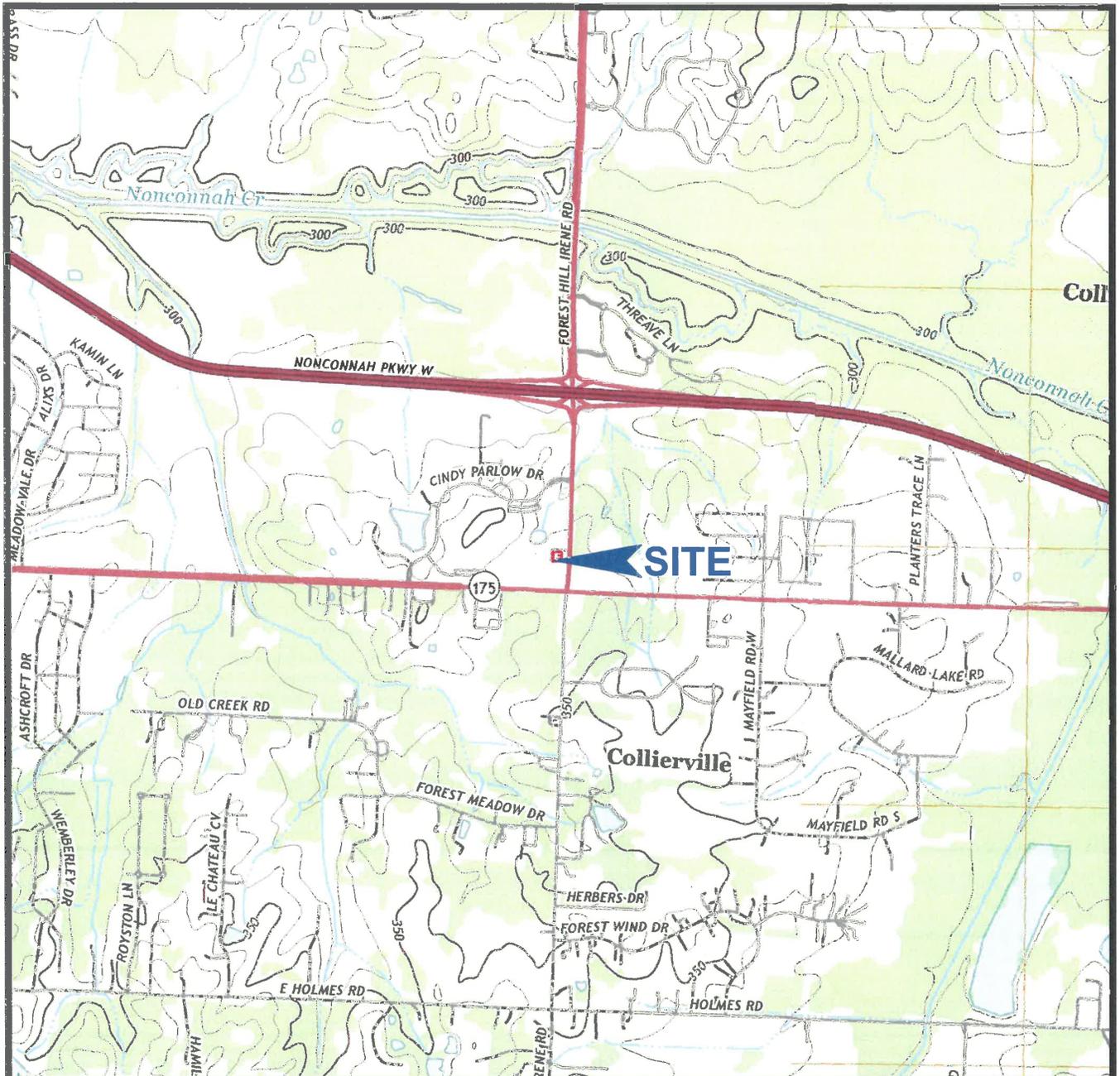
This report has been prepared on behalf of and for the exclusive use of the client for specific application to the named project as described herein. If this report is provided to prospective contractors, the client should make it clear that the information is provided for factual data only and not as a warranty of subsurface conditions included in this report. Unanticipated soil conditions could require the expenditure of additional funds to attain a properly constructed project. Therefore, some contingency fund is recommended to accommodate such potential extra costs.

Geotechnology has attempted to conduct the services reported herein in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality and under similar conditions. The recommendations and conclusions contained in this report are professional opinions. No other representation, expressed or implied, is included or intended.

Unless specifically stated in our proposal or this report, the scope of our services for this phase of the project did not include any environmental assessment or investigation for the presence or absence of wetlands or hazardous or toxic material in the soil, surface water, groundwater or air, on or below or around this site. Any statements in this report or on the boring logs regarding odors noted or unusual or suspicious items or conditions observed are strictly for the information of our client. Our scope did not include any services to investigate or detect the presence of mold or any other biological contaminants (such as spores, fungus, bacteria, viruses, and the by-products of such organisms) on and around the site, or any services designed or intended to prevent or lower the risk of the occurrence of an infestation of mold or other biological contaminants.

The analyses, conclusions, and recommendations contained in this report are based on the data obtained from the subsurface exploration. The field exploration methods used indicate subsurface conditions only at the specific locations where samples were obtained, only at the time they were obtained, and only to the depths penetrated. Discrete sampling cannot be relied on to accurately reflect natural variations in stratigraphy that could exist between sample locations and/or intervals. Unless specifically noted, the scope of our services did not include an assessment of the effects of flooding and natural erosion of adjacent creeks or rivers on the project site.

The recommendations included in this report have been based in part on assumptions about natural variations in site stratigraphy that can only be completely evaluated during earthwork and foundation construction. Accordingly, Geotechnology should be retained to perform construction observation and complete its geotechnical engineering service using observational methods. Geotechnology cannot assume liability for the adequacy of its recommendations when they are used in the field without Geotechnology being retained to observe construction.



NOTES

1. Plan adapted from 7.5 minute U.S.G.S. maps for Germantown and Colliersville, Tennessee quadrangles last revised in 2013.



Drawn By: WAH	CK'd By: PDB	App'vd By: JKH
Date: 7-21-15	Date: 7-22-15	Date: 7-27-15
<p>Shelby County Fire Station #62 4647 Forrest Hill Irene Road Shelby County, Tennessee</p> <p>SITE LOCATION AND TOPOGRAPHY</p>		
Project Number J024794.01		PLATE 1



NOTES

1. Plan adapted from an April 22, 2014 aerial photograph courtesy of Google Earth.
2. Borings were located in the field with reference to existing site features and are shown approximate only.

LEGEND

● Boring Location



Drawn By: WAH	Ck'd By: PDB	App'vd By: JKH
Date: 7-21-15	Date: 7-22-15	Date: 7-27-15
<p>Shelby County Fire Station #62 4647 Forrest Hill Irene Road Shelby County, Tennessee</p>		
<p>AERIAL PHOTOGRAPH OF SITE AND BORING LOCATIONS</p>		
Project Number J024794.01		<p>PLATE 2</p>

APPENDIX A

**IMPORTANT INFORMATION ABOUT
YOUR GEOTECHNICAL ENGINEERING REPORT**

Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical-engineering study conducted for a civil engineer may not fulfill the needs of a constructor — a construction contractor — or even another civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client. No one except you should rely on this geotechnical-engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you — should apply this report for any purpose or project except the one originally contemplated.*

Read the Full Report

Serious problems have occurred because those relying on a geotechnical-engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

Geotechnical Engineers Base Each Report on a Unique Set of Project-Specific Factors

Geotechnical engineers consider many unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk-management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical-engineering report that was:

- not prepared for you;
- not prepared for your project;
- not prepared for the specific site explored; or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical-engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light-industrial plant to a refrigerated warehouse;
- the elevation, configuration, location, orientation, or weight of the proposed structure;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an

assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical-engineering report is based on conditions that existed at the time the geotechnical engineer performed the study. *Do not rely on a geotechnical-engineering report whose adequacy may have been affected by: the passage of time; man-made events, such as construction on or adjacent to the site; or natural events, such as floods, droughts, earthquakes, or groundwater fluctuations. Contact the geotechnical engineer before applying this report to determine if it is still reliable.* A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ — sometimes significantly — from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide geotechnical-construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are Not Final

Do not overrely on the confirmation-dependent recommendations included in your report. *Confirmation-dependent recommendations are not final*, because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations *only* by observing actual subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's confirmation-dependent recommendations if that engineer does not perform the geotechnical-construction observation required to confirm the recommendations' applicability.*

A Geotechnical-Engineering Report Is Subject to Misinterpretation

Other design-team members' misinterpretation of geotechnical-engineering reports has resulted in costly

problems. Confront that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Constructors can also misinterpret a geotechnical-engineering report. Confront that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing geotechnical construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical-engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make constructors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give constructors the complete geotechnical-engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise constructors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure constructors have sufficient time* to perform additional study. Only then might you be in a position to give constructors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and constructors fail to recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help

others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Environmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform an *environmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical-engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk-management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold-prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, many mold-prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical-engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; *none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.*

Rely, on Your GBC-Member Geotechnical Engineer for Additional Assistance

Membership in the Geotechnical Business Council of the Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your GBC-Member geotechnical engineer for more information.



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APPENDIX B

LOGS OF BORINGS: BORINGS B-1 AND B-2, HA-1 AND HA-2

BORING LOG: TERMS AND SYMBOLS

Surface Elevation _____

Completion Date: 7/15/15

Datum MSL

SHEAR STRENGTH, tsf

△ - UU/2 ○ - QU/2 □ - SV

0.5 1.0 1.5 2.0 2.5

STANDARD PENETRATION RESISTANCE

(ASTM D 1586)

▲ N-VALUE (BLOWS PER FOOT)

WATER CONTENT, %

PLI |-----| LL
10 20 30 40 50

DEPTH
IN FEET

DESCRIPTION OF MATERIAL

GRAPHIC LOG

DRY UNIT WEIGHT (pcf)
SPT BLOW COUNTS
CORE RECOVERY/RQD

SAMPLES

CONCRETE: 6 inches

FILL: Red, brown and gray CLAY - CL

Stiff to hard, gray and brown, silty CLAY - CL

Medium dense, red-brown, silty SAND - SM

Medium dense, red SAND - SP

Boring terminated at 25 feet.

2-2-4 SS1

2-7-6 SS2

4-8-12 SS3

12-28-31 SS4

10-11-16 SS5

10-14-13 SS6

4-5-13 SS7

NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

LOG OF BORING: 2002_J024794.01.GPJ GTINC 0638301.GPJ 7/23/15

GROUNDWATER DATA

DRILLING DATA

FREE WATER NOT ENCOUNTERED DURING DRILLING

___ AUGER 3 3/4 HOLLOW STEM

WASHBORING FROM ___ FEET

MMH DRILLER JR LOGGER

CME 55 DRILL RIG

HAMMER TYPE Auto

REMARKS:

Drawn by: RTF

Ck'd. by: PDB

App'vd. by: JKH

Date: 7/15/15

Date: 7/23/15

Date: 7/27/15



GEOTECHNOLOGY, INC.
ENGINEERING AND ENVIRONMENTAL SERVICES
ST. LOUIS • COLLINSVILLE • KANSAS CITY

Fire Station #62
John Pruett Architects

LOG OF BORING: B-1

Project No. J024794.01

Surface Elevation _____

Completion Date: 7/15/15

Datum MSL

SHEAR STRENGTH, tsf

△ - UU/2 ○ - QU/2 □ - SV
0,5 1,0 1,5 2,0 2,5

STANDARD PENETRATION RESISTANCE

(ASTM D 1586)

▲ N-VALUE (BLOWS PER FOOT)

WATER CONTENT, %

PLI | 10 20 30 40 50 | LL

DEPTH
IN FEET

DESCRIPTION OF MATERIAL

GRAPHIC LOG

DRY UNIT WEIGHT (pcf)
SPT BLOW COUNTS
CORE RECOVERY/RQD

SAMPLES

CONCRETE: 6 inches
FILL: Red, brown and gray CLAY, trace decaying organics and brick fragments - CL

2-3-4 SS1

1-3-3 SS2

Medium stiff to stiff, gray to brown CLAY - (CL)

98 ST3

2-4-4 SS4

104 ST5

2-3-6 SS6

Medium dense to dense, red SAND - SP with silt

3-5-8 SS7

with gravel

10-18-21 SS8

Boring terminated at 25 feet.

NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

LOG OF BORING 2002_J024794.01.GPJ GTINC 0638301.GPJ 7/23/15

GROUNDWATER DATA

DRILLING DATA

FREE WATER NOT ENCOUNTERED DURING DRILLING

 AUGER 3 3/4 HOLLOW STEM

WASHBORING FROM FEET

MMH DRILLER JR LOGGER

CME 55 DRILL RIG

HAMMER TYPE Auto

REMARKS:

Drawn by: RTF Ck'd. by: PDB App'vd. by: JKH
Date: 7/15/15 Date: 7/23/15 Date: 7/27/15



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Fire Station #62
John Pruett Architects

LOG OF BORING: B-2

Project No. J024794.01

NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

Surface Elevation _____ Datum <u>MSL</u>		Completion Date: <u>7/15/15</u>		GRAPHIC LOG	DRY UNIT WEIGHT (pcf) SPT BLOW COUNTS CORE RECOVERY/RQD	SAMPLES	SHEAR STRENGTH, tsf		
DEPTH IN FEET	DESCRIPTION OF MATERIAL	△ - UU/2 ○ - QU/2 □ - SV 0,5 1,0 1,5 2,0 2,5							
		STANDARD PENETRATION RESISTANCE (ASTM D 1586) ▲ N-VALUE (BLOWS PER FOOT)							
			WATER CONTENT, % PL -----●----- LL 10 20 30 40 50						
5	Soft to medium stiff, brown to brown and gray, silty CLAY, trace organics - (CL)	4	HA1	●	-----				
		5	HA2	●					
		7	HA3	●					
		7	HA4	●					
		7	HA5	●					
10		8	HA6	●					
	Boring terminated at 10.5 feet.								
15									
20									
25									

LOG OF BORING 2002_J024794.01.GPJ GTINC.0638301.GPJ 7/23/15

GROUNDWATER DATA

FREE WATER NOT ENCOUNTERED DURING DRILLING

DRILLING DATA

AUGER HOLLOW STEM
 WASHBORING FROM _____ FEET
 DRILLER RTF LOGGER
 HAND AUGER DRILL RIG
 HAMMER TYPE Auto

REMARKS: Standard Penetration Tests (SPT's) were performed using a dynamic cone penetrometer (DCP). DCP results were converted to SPT N-values using the procedure from ASTM STP 399

Drawn by: RTF Ck'd. by: PDB App'vd. by: JKH
 Date: 7/15/15 Date: 7/23/15 Date: 7/27/15



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LOG OF BORING: HA-1

Project No. J024794.01

Surface Elevation _____

Completion Date: 7/15/15

Datum MSL

Shear Strength, tsf

Δ - UU/2 ○ - QU/2 □ - SV

0.5 1.0 1.5 2.0 2.5

STANDARD PENETRATION RESISTANCE

(ASTM D 1586)

▲ N-VALUE (BLOWS PER FOOT)

WATER CONTENT, %

PLI | 10 20 30 40 50 | LL

DEPTH
IN FEET

DESCRIPTION OF MATERIAL

GRAPHIC LOG

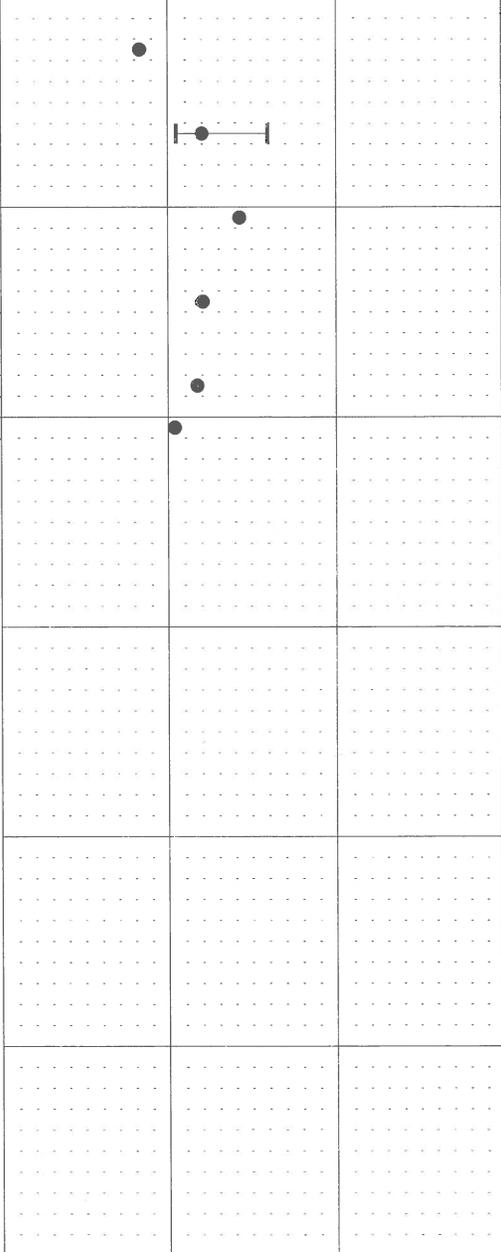
DRY UNIT WEIGHT (pcf)
SPT BLOW COUNTS
CORE RECOVERY/RQD

SAMPLES

CONCRETE: 6 inches
BASE: 3 inches, gravelly SAND
FILL: Red, brown and gray CLAY with decaying organics and apparent organic odor, trace gravel - (CL) sandy



5	HA1
3	HA2
5	HA3
8	HA4
9	HA5
11	HA6



Medium stiff to stiff, brown and tan, silty CLAY - CL

Boring terminated at 10.5 feet.

NOTE: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. GRAPHIC LOG FOR ILLUSTRATION PURPOSES ONLY.

LOG OF BORING 2002_J024794.01.GPJ GTINC.0638301.GPJ 7/23/15

GROUNDWATER DATA

DRILLING DATA

FREE WATER NOT ENCOUNTERED DURING DRILLING

AUGER HOLLOW STEM
WASHBORING FROM _____ FEET
 DRILLER RTF LOGGER
HAND AUGER DRILL RIG
HAMMER TYPE Auto

Drawn by: RTF Ck'd. by: PDB App'vd. by: JKH
Date: 7/15/15 Date: 7/23/15 Date: 7/27/15



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ENGINEERING AND ENVIRONMENTAL SERVICES
ST. LOUIS • COLLINSVILLE • KANSAS CITY

Fire Station #62
John Pruett Architects

REMARKS: Standard Penetration Tests (SPT's) were performed using a dynamic cone penetrometer (DCP). DCP results were converted to SPT N-values using the procedure from ASTM STP 399

LOG OF BORING: HA-2

Project No. J024794.01

BORING LOG: TERMS AND SYMBOLS

GENERAL NOTES

- Information on each boring log is a compilation of subsurface conditions based on soil or rock classifications obtained from the field as well as from laboratory testing of samples. The strata lines on the logs may be approximate or the transition between the strata may be gradual rather than distinct. Water level measurements refer only to those observed at the times and places indicated, and may vary with time, geologic condition or construction activity.
- Relative composition and Unified Soil Classification designations are based on visual estimates and are approximate only. If laboratory tests were performed to classify the soil, the unified designation is shown in parenthesis.
- Value given in Unit Dry Weight/SPT Column is either a unit dry weight in pounds per cubic foot, if adjacent to a ST sample designation, or blows per 6-inch increment if adjacent to a SS sample designation.

ABBREVIATIONS

- UU/2 Shear Strength from Unconsolidated – Undrained Triaxial Test (ASTM D2850)
 QU/2 Shear Strength from Unconfined Compression Test (ASTM D2166)
 SV Shear Strength from Field Vane (ASTM D2573)
 PL Plastic Limit (ASTM D4318)
 LL Liquid Limit (ASTM D4318)

LEGEND

CS	Continuous Sampler
GB	Grab Sample Taken From Auger Cuttings Or Wash Water Return
NX	NX Rock Core with Percent Recovery/R.Q.D. Given In Adjacent Column
$\frac{100}{42}$	
PST	Three Inch Diameter Piston Tube Sample
SS	Split Spoon Sample (Standard Penetration Test)
ST	Three Inch Diameter Shelby Tube Sample
*	Sample Not Recovered
SV	Field Vane Test

SPLIT – BARREL SAMPLER DRIVING RECORD

Blow Per Foot (N-Value)

25.....	25 blows drove sampler 12 inches after initial 6 inches of seating.
75/10".....	75 blows drove sampler 10 inches after initial 6 inches of seating.
50/S3".....	50 blows drove sampler 3 inches during initial 6 inch seating interval.

- NOTES: 1. To avoid damage to sampling tools, driving is limited to 50 blows during any six inch interval.
 2. N-Value (Blow Count) is the standard penetration resistance based on the total number of blows, using a 140-lb hammer with 30-inch free fall, required to drive a split spoon the last two of three, 6-inch drive increments. (Example: 4/7/9, N = 7 + 9 = 16). Values are shown as a summation on grid plot and may be shown as 4/7/9 in Unit Dry Weight – SPT column.

RELATIVE COMPOSITION

Trace.....0-10 %
 With/Some.....11-35 %
 Soil modifier such..... > 35 %
 As silty, clayey, sandy, etc.

DENSITY OF GRANULAR SOILS

Descriptive Term: **N-Value**
 Very Loose.....0 - 4
 Loose.....5 - 10
 Medium Dense.....11 - 30
 Dense.....31 - 50
 Very Dense.....> 50

STRENGTH OF COHESIVE SOILS

Consistency	Undrained Shear Strength Tons Per Sq. Ft.	Field Test	Approximate N-Value Range
Very Soft.....	less than 0.12	Thumb will penetrate soil more than 1" ..	0 - 1
Soft.....	0.13 to 0.25	Thumb will penetrate soil about 1"	2 - 4
Medium Stiff.....	0.26 to 0.50	Thumb will penetrate soil about ¼"	5 - 8
Stiff.....	0.51 to 1.00	Thumb hardly indents soil.....	9 - 15
Very Stiff.....	1.01 to 2.00	Thumb will not indent soil, but readily indented with thumbnail.....	16 - 30
Hard.....	greater than 2.00.....	Thumbnail will not indent soil.....	> 30

SOIL GRAIN SIZE

U.S. STANDARD SIEVE

12"	3"	¾"	4	10	40	200		
BOULDERS	COBBLES	GRAVEL		SAND			SILT	CLAY
		COARSE	FINE	COARSE	MEDIUM	FINE		
300	76.2	19.1	4.76	2.00	0.42	0.074	0.002	

SOIL GRAIN SIZE IN MILLIMETERS

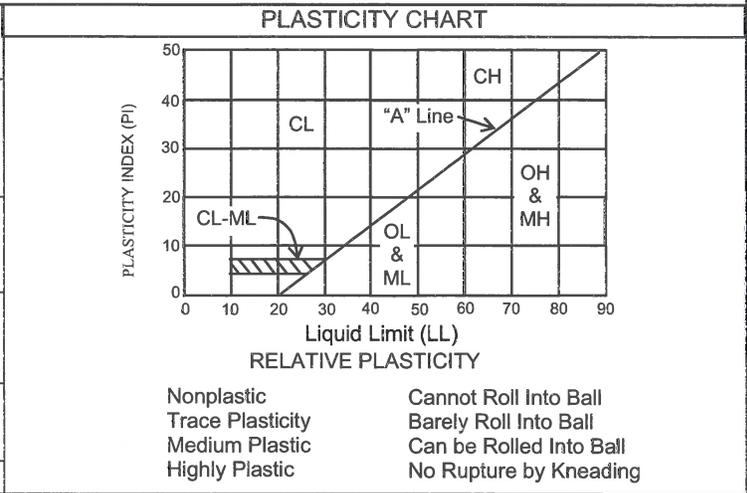
SOIL STRUCTURE

Calcareous – Having appreciable quantities of carbonate.
Fissured – Containing shrinkage or relief cracks, often filled with sand or silt; usually more or less vertical.
Slickensided – Having planes of weakness that appear slick and glossy. The degree of slickensidedness depends upon the spacing of slickensides and the ease of breaking along those planes.
Layer -- Inclusion greater than 3 inches thick.
Seam – Inclusion 1/8 inch to 3 inches thick extending through the sample

Parting – Inclusion less than 1/8 inch thick.
Pocket – Inclusion of material of different texture that is smaller than the diameter of the sample.
Interlayered – Soil samples composed of alternating layers of different soil types.
Intermixed – Soil samples composed of pockets of different soil types and a layered or laminated structure is not evident.
Laminated – Soil sample composed of alternating partings or seams of different soil type.

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS			SYM BOL	DESCRIPTION
Coarse-Grained Soils (More than 50% Larger than No. 200 Sieve Size)	Gravel and Gravelly Soils	Clean Gravels Little or no Fines	GW	Well-Graded Gravel, Gravel-Sand Mixture
			GP	Poorly-Graded Gravel, Gravel-Sand Mixture
		Gravels with Appreciable Fines	GM	Silty Gravel, Gravel-Sand-Silt Mixture
	Sand and Sandy Soils	Clean Sands Little or no Fines	SW	Well-Graded Sand, Gravelly Sand
			SP	Poorly Graded Sand, Gravelly Sand
		Sands with Appreciable Fines	SM	Silty Sand, Sand-Silt Mixture
		SC	Clayey Sand, Sand-Clay Mixture	
Fine-Grained Soils (More than 50% Smaller than No. 200 Sieve Size)	Silts and Clays	Liquid Limit Less Than 50	ML	Silt, Clayey Silt, Silty or Clayey Very Fine Sand, Slight Plasticity
			CL	Clay, Sandy Clay, Silty Clay, Low to Medium Plasticity
			OL	Organic Silts, or Silty Clays of Low Plasticity
	Silts and Clays	Liquid Limit More Than 50	MH	Silt, Fine Sandy or Silt Soil with High Plasticity
			CH	Clay, High Plasticity
			OH	Organic Clay of Medium to High Plasticity
Highly Organic Soils		PT	Peat, Humus, Swamp Soil	



VISUAL DESCRIPTION CRITERIA*

TABLE 1: CRITERIA FOR DESCRIBING ANGULARITY OF COARSE-GRAINED PARTICLES

Description	Criteria
Angular	Particles have sharp edges and relatively plane sides with unpolished surfaces
Subangular	Particles are similar to angular description but have rounded edges
Subrounded	Particles have nearly plane sides but have well-rounded corners and edges
Rounded	Particles have smoothly curved sides and no edges

TABLE 2: CRITERIA FOR DESCRIBING PARTICLE SHAPE

Description	Criteria
Flat	Particles with width/thickness X3
Elongated	Particles with length/width X3
Flat and Elongated	Particles meet criteria for both flat and elongated

TABLE 3: CRITERIA FOR DESCRIBING MOISTURE CONDITION

Description	Criteria
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp, but no visible water
Wet	Visible free water, usually soil is below the water table

TABLE 4: CRITERIA FOR DESCRIBING REACTION WITH HCL

Description	Criteria
None	No visible reaction
Weak	Some reaction, with bubbles forming slowly
Strong	Violent reaction, with bubbles forming rapidly

TABLE 6: CRITERIA FOR DESCRIBING CEMENTATION

Description	Criteria
Weak	Crumbles or breaks with handling or little finger pressure
Moderate	Crumbles or breaks with considerable finger pressure
Strong	Will not crumble or break with finger pressure

TABLE 8: CRITERIA FOR DESCRIBING DRY STRENGTH

Description	Criteria
None	The dry specimen crumbles into powder with mere pressure of handling
Low	The dry specimen crumbles into powder with some finger pressure
Medium	The dry specimen breaks into pieces or crumbles with considerable finger pressure
High	The dry specimen cannot be broken with finger pressure. Specimen will break into pieces between thumb and a hard surface.
Very High	The dry specimen cannot be broken between the thumb and a hard surface

TABLE 9: CRITERIA FOR DESCRIBING DILATANCY

Description	Criteria
None	No visible change in the specimen
Slow	Water appears slowly on the surface of the specimen during shaking and does not disappear or disappears slowly upon squeezing.
Rapid	Water appears quickly on the surface of the specimen during shaking and disappears quickly upon squeezing.

TABLE 10: CRITERIA FOR DESCRIBING TOUGHNESS

Description	Criteria
Low	Only slight pressure is required to roll the thread near the plastic limit. The thread and the lump are weak and soft.
Medium	Medium pressure is required to roll the thread to near the plastic limit. The thread and the lump have medium stiffness
High	Considerable pressure is required to roll the thread to near the plastic limit. The thread and the lump have very high stiffness

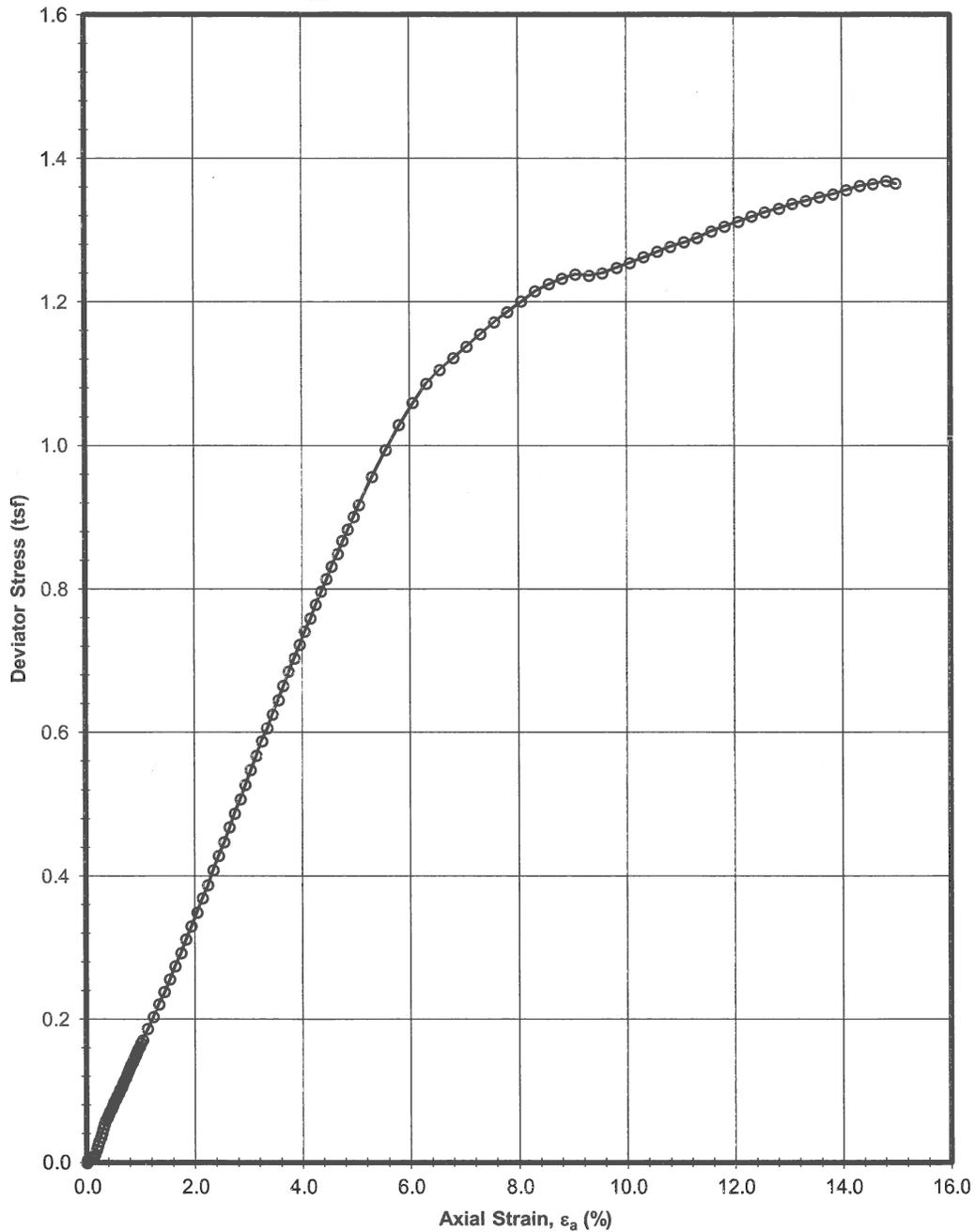
TABLE 12: IDENTIFICATION OF INORGANIC FINE-GRAINED SOILS FROM MANUAL TESTS

Soil Symbol	Dry Strength.	Dilatancy	Toughness
ML	None to low	Slow to rapid	Low or thread cannot be formed
CL	Medium to high	None to slow	Medium
MH	Low to medium	None to slow	Low to medium
CH	High to very high	none	High

*NOTES: 1. Tables adapted from ASTM D2488 "Description and identification of Soils" (Visual-Manual Procedure)
2. Tables 5, 7 and 11 incorporated into other information on this plate.

APPENDIX C

LABORATORY TEST RESULTS



UNCONSOLIDATED-UNDRAINED TRIAXIAL COMPRESSION TEST

ASTM D 2850

Project No.: J024794.01

Boring: B-2

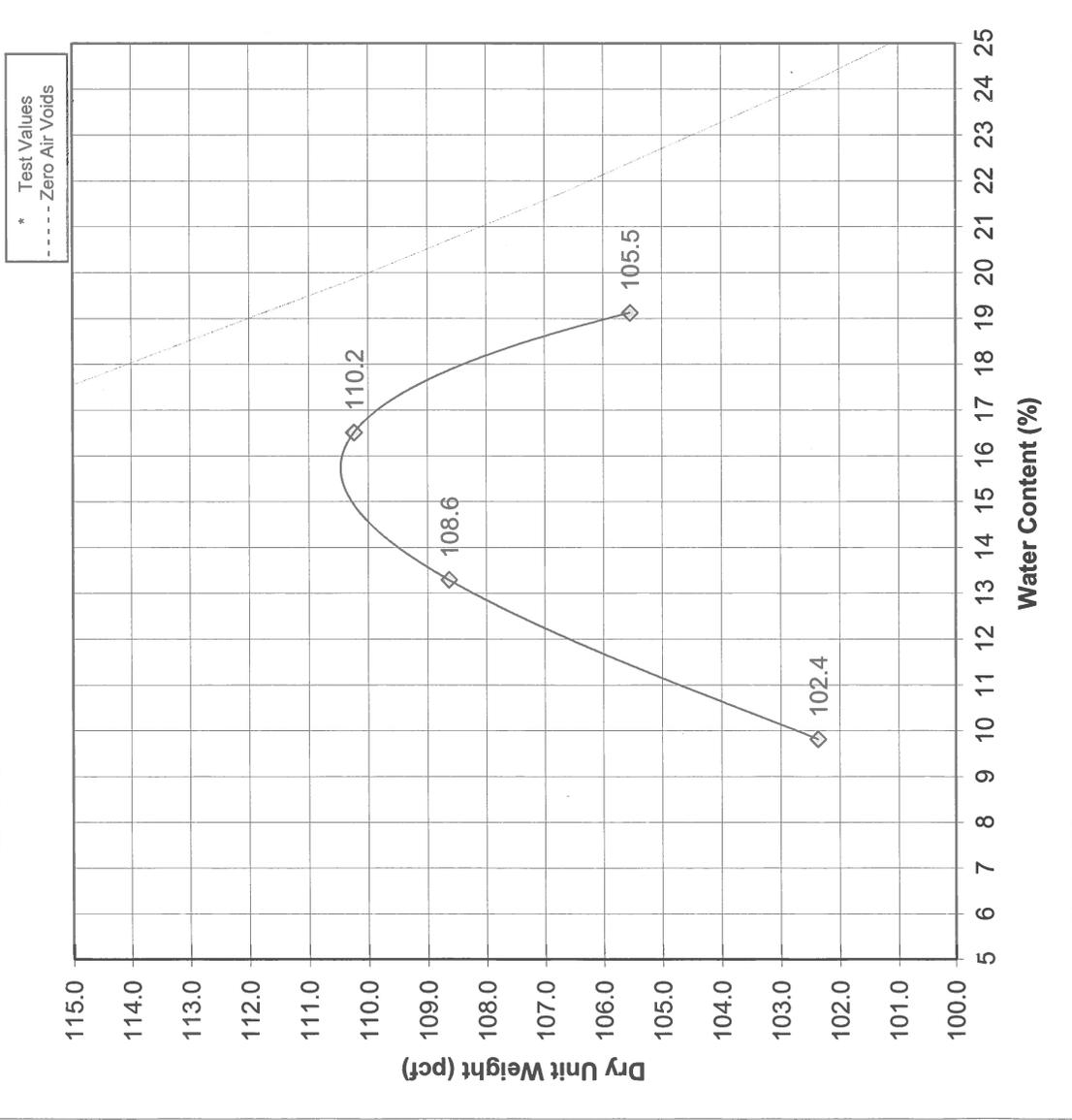
Sample: ST-3 - Depth: 5 ft.

3312 Winbrook Dr
 Memphis, TN 38116
 Ph: 901-353-1981
 Fax: 901-353-2248



Project: Fire Station #62
 Client: John Pruet Architects
 Sample Source: B-3
 Supplier:

LABORATORY COMPACTION TEST



Test Information	
Project No.:	J024794.01
Test Date:	07/18/15
Proctor No.:	1
Test Method:	ASTM D 698
Rammer Type:	Mechanical
Prep. Method:	Moist

Sample Description
0

Sample Properties	
Moisture Content	NA
Liquid Limit	38
Plastic Limit	19
Plasticity Index	19
Specific Gravity:	2.720 Estimated
Classification	CL

Test Results:	
Maximum Dry Unit Weight (pcf):	110.5
Optimum Water Content (%):	15.7
Oversize Correction Values:	
Maximum Dry Unit Weight (pcf):	--
Optimum Water Content (%):	--

Tested By: TA Input By: HP
 Date: 07/18/15 Date: 07/23/15
 Checked By: _____
 Date: _____

**GEOTECHNICAL INVESTIGATION REPORT
SHELBY COUNTY FIRE STATION #62
4647 FOREST HILL IRENE ROAD
MEMPHIS, TENNESSEE**

**Prepared For
Shelby County Fire Station
C/O Mr. John Pruett, Architect
1869 Madison
Memphis, Tennessee 38104**

**Prepared By
Mid-Continent, Laboratories, Inc.
1279 Jackson Avenue, P.O. Box 1521
Memphis, Tennessee 38101-1521**

**Job No. CES-841
December 2015**

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FIGURES

Figure 1 Boring Locations

APPENDICES

Appendix A Boring Logs
Appendix B Laboratory Test Summary

**GEOTECHNICAL INVESTIGATION REPORT
SHELBY COUNTY FIRE STATION #62
4647 FOREST HILL IRENE ROAD
MEMPHIS, TENNESSEE**

1.0 PURPOSE AND SCOPE

The purpose of this study was to determine the existing pavement thickness by coring and general subsurface conditions by drilling soil test borings and to evaluate these with respect to the damage apparent on the existing pavement . The related discussion and recommendations are mainly found in sections 4 and 5 of this report.

2.0 SITE INVESTIGATION

2.1 Field Investigation

Three (3) concrete cores were obtained and soil test borings were drilled at these locations at the subject site on November 12, 2015. Coring/Boring locations were spread over the pavement areas where damage in the form of cracks was apparent. All three borings were drilled to a depth of 15 feet. Boring locations are shown on the boring location plan attached with this report as **Figure 1**.

Borings were drilled with a truck-mounted drill rig. Split-spoon samples were obtained by the Standard Penetration Test (SPT) method in all of the borings. Samples were obtained at

an interval of one foot in the top ten feet and at an interval of 3.5 feet thereafter until completion of the borings. Additionally, one (1) relatively undisturbed (Shelby tube) sample was obtained from boring B-2 at 3 to 5 feet.

Logs of the borings with groundwater level observations have been included in **Appendix A** of this report. The logs show visual description of the soil strata encountered.

Definitions of the terms and symbols used on the logs and explanations of the Standard Penetration Test (SPT) procedure are included in **Appendix B**.

2.2 Laboratory Testing

Concrete cores from the pavement were measured for thickness.

The split-spoon samples from soil test borings were inspected and reclassified by a geotechnical engineer and the boring logs were edited as necessary.

To aid in classifying the soils and to determine general soil characteristics, natural moisture contents were determined for all the split-spoon samples and Atterberg limits tests were performed on two selected split-spoon samples. The Shelby tube sample was subjected to unit weights, unconfined compression strength (UCS), and Atterberg limits tests. The results of moisture content determination tests on split-spoon samples are included on the boring

logs and the results of the Atterberg Limits and UCS tests are presented on summary sheets in **Appendix B**.

3.0 SITE CONDITIONS

3.1 General

The site is an existing Fire Station. Pavement distress is apparent in some areas. Among these are the areas where underground utilities are apparently present.

3.2 Existing Pavement Thickness

All three concrete cores from the existing pavement were found to be 6 inches thick.

3.3 Soil Conditions

The soils investigated at this site consist of silty clays (CL) to the termination depth of the borings. Although all the soils investigated are classified herein as silty clays, locally these soils may classify as clayey silts (ML) or borderline silts/clays (CL-ML). Some of the soils investigated may be manmade fill materials, although without knowing the history of the site it would be difficult to delineate fill (if any present) from the natural soils strictly based on visual inspection. Symbols within the above parenthesis are as per the Unified Soil

Classification System. The classification is either based on actual tests or inferred from the sample inspection.

Blow counts from the standard penetration test of soil (SPT) ranged from 8 to 29 blows per foot, indicating stiff-to-very stiff consistencies in the soils investigated at this site. UCS test on the Shelby tube sample yielded a value indicative of a stiff consistency. Pocket Penetrometer Resistance (PPR) value from the same sample also exhibited a stiff consistency.

3.4 Groundwater

All three borings were dry during drilling as well as at completion of drilling. In general, water levels can be expected to fluctuate seasonally and with the variations in the stages of the nearby bodies of water. However, no groundwater seepage-related problems are anticipated in reconstruction of the pavement, if undertaken. Also, we do not expect water seepage-related problems even in making relatively deep excavations if needed to replace any existing fill or weak in place soils.

4.0 **DISCUSSION AND RECOMMENDATIONS**

4.1 Project Criteria

Distress in the form of cracks and local subsidence (conspicuously at joints) is apparent on

the pavement around the Fire Station facility. The current investigation is aimed at investigating the subsoils and to determine if there are any subgrade strength-related issues. Also, comments are made regarding the pavement thickness.

4.2 Comments Related to the Existing Surface and Subsurface Conditions

We observed that significant cracking has taken place around the underground utility areas. Elsewhere, sporadic cracking, subsidence (especially at joints), and some raveling was noted during our site visit for observation. During the course of investigation MCL cored through the existing concrete at the boring locations and found it to be six inches thick at each of the three coring locations.

As far as the soil subgrade is concerned, MCL's soil test borings indicate that, in general, the subgrade is satisfactory if a properly designed pavement is placed over it. While soil borings were not drilled very close to the underground utilities, the cracking in the vicinities suggests that fill around the underground utilities may not have been placed in a properly compacted form.

4.3 Probable Causes of Distress and Related Recommendations

Based on MCL's investigation the subsoils are generally considered as satisfactory to support a properly designed pavement. Thus, the existing soil conditions are generally not considered as responsible for the distress.

Based on our observations and investigation we infer following causes of distress:

- While the subsoils are generally indicated to be competent, cracking indicates that the fill around the underground utilities is apparently poorly compacted.
- Relatively thin pavement – All three cores obtained by MCL indicated 6” thick pavement. While an elaborate analysis could be performed based on the axle loads and traffic frequency, we consider an 8” thick concrete pavement as needed for a Fire Station facility given the heavy axle and wheel loads of fire trucks.
- Base Course – Presence of a base course was not indicated in any of the three soil test borings. We note that a base course underneath the pavement tends to enhance the pavement performance. At least a six-inch thick crushed stone base course would significantly improve the pavement performance.

4.4 Site Preparation and Earthwork

It is not known whether the entire pavement is planned to be replaced or only the areas where distress is apparent. Given the spread-out nature of distress, relatively small area involved, and practicality considerations, we anticipate that the entire pavement would be replaced. We present following general recommendations for site preparation after the existing pavement is removed:

All the soft, wet, loose, organics, and miscellaneous materials should be completely removed from the site. At the discretion of the project geotechnical engineer, the site should be proof-

rolled with a loaded dump truck to detect any weak areas. Any weak areas detected should be undercut to a firm ground and replaced with engineered fill as per the recommendations given below. As discussed above, we anticipate poorly compacted fill around the underground utilities.

Site should be brought to grade using a clean, select, non-expansive fill, free of wet material, organics, debris or other deleterious matter and having a plasticity index between 10 and 20 and a liquid limit less than 45.

Any fill needed for grading or replacement of undercut material should be placed at moisture contents within two to three percentage points of optimum in 6 to 9 inch thick lifts. Each lift should be compacted to a minimum dry density of 96 percent of the maximum dry density obtained in the Standard Moisture-Density relationship (ASTM D-698). The compaction obtained and soil materials provided for each lift should be inspected and approved by an engineering technician supervised by a geotechnical engineer before another lift is added. Backfill of utility and plumbing trenches should also comply with these recommendations.

4.5 Drainage

Good drainage should be provided for the pavement at all times.

5.0 PAVEMENT RECOMMENDATIONS

We recommend an 8-inch thick concrete pavement (using concrete with a 28-day modulus of rupture value of at least 600 psi) with at least a six-inch thick crushed stone base course.

All pavement materials, including base course and workmanship should be in accordance with applicable paragraphs of the latest edition of Tennessee Department of Transportation Bureau of Highways "Standard specifications for Road and Bridge Construction".

Quick surface water run-off should be provided so that no standing water will remain on the pavement surface.

6.0 LIMITATIONS

If design and construction plans alter from those described above, this office should be contacted so that appropriate measures can be recommended, if needed.

Subsurface conditions may vary between borings. If any changed conditions are noted during construction, this office should be informed so that adjustments can be made to accommodate the changed conditions.

This is a geotechnical investigation therefore no comments are made regarding any environmental liabilities of the site.

SECTION 02 41 19
SELECTIVE DEMOLITION

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. Demolition and removal of pavement materials, curbs, sidewalks, and subgrades in designated areas for subsequent installation by Contractor of replacement items as described in the Contract Document plans and specifications.

B. Demolition and removal of miscellaneous building construction components as may be required to implement the repairs outlined in the Contract Document plans and specifications, or as may be otherwise required as a condition of the Scope of the Work..

C. All demolition shall include the removal of demolished material debris from the site together with proper disposal with the exception of those items that are to be retained and properly stored for reinstallation by the Contractor.

1.2 RELATED SECTIONS

A. N/A

1.3 QUALITY ASSURANCE

A. Contractor Qualifications: Minimum of five years documented experience in this type of demolition.

B. Meet the requirements of the local regulatory agencies.

C. Permit for transporting and disposal of debris.

1.4 JOB CONDITIONS

A. Protection:

1. Erect barriers, fences, guard rails, enclosures, chutes, dust barriers and shoring to protect personnel, property, structures, and utilities remaining intact.

2. If required by governing authorities or to insure uninterrupted Owner use of the premises, provide alternate routes around closed or obstructed traffic ways.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Immediately remove demolished materials and debris from site.

B. Carefully remove, store, and protect for re-installation all materials and equipment that need to be temporarily disconnected to facilitate the demolition operations. Repair or replace using matching materials of equal quality, and at no cost to the Owner, all existing materials and construction that become damaged which are not designated for removal or that must be temporarily disconnected.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Demolish designated materials in an orderly and careful manner. Examine the site and building elements shown to be removed and verify the demolition requirements with the Architect prior to beginning the work.
- B. Notify the Shelby County Health Department prior to removal of any hazardous materials. After removal, notify the Owner that all hazardous materials have been removed and the work space conditions are certified safe by the Contractor's Hazardous Materials Abatement SubContractor.

3.2 PREPARATION

- A. The facility will be occupied during construction. Schedule times for operation of excessively loud or prolonged use of noisy or dust producing equipment with the Owner. Erect and maintain protective safety barriers at all times between building occupants and construction zones.
- B. Erect temporary weatherproof closures for exterior building envelope openings.
- C. Erect and maintain dustproof partitions and seals capable of preventing the spread of dust, fumes, and smoke to occupied portions of the building. Coordinate the temporary closing/sealing of all intake vents with the Architect in advance. Upon completion of the work, remove partitions and repair damaged surfaces to match adjacent existing surfaces.

3.3 DEMOLITION REQUIREMENTS

- A. Perform demolition in accordance with the requirements of applicable authorities having jurisdiction and in a manner consistent with preserving the safety of the Owner occupants and County property. Demolition operations must not interfere with the 24/7 operations of the Fire Station.
- B. Repair all demolition performed in excess of that required, at no cost to the Owner.
- C. Remove only non-structural elements. Do not cut or alter structural elements without specific authorization from the project Engineer of Record. At all times, and under all conditions, the Contractor is specifically and solely responsible for all shoring and bracing, or other necessary proactive measures, required to execute all procedures in a manner that ensures the safety of life and property.
- D. Perform all concrete and masonry cutting using power-driven saws to achieve straight, even surfaces. Power impact tools are prohibited from use.
- E. Burning of materials on site is not permitted.
- F. Remove from site contaminated, vermin infested or dangerous materials encountered and dispose of by safe means so as not to endanger health of workers and public.
- G. Carry out demolition work in a manner that will cause as little inconvenience as possible to adjacent occupied building areas and adjacent building construction.
- H. Remove demolished materials, tools, and equipment from active Owner work or living areas each day. Upon completion of work each day leave the site in a condition acceptable to the Owner.
- I. Erect and maintain weatherproof closures for exterior openings. Mechanical equipment, and other items to be removed or temporarily disconnected shall be put back in place, replaced, or their openings shall be made watertight by the end of each workday.
- J. Demolition procedures may not interfere with the ongoing 24/7 operations of the Fire Station at any time.
- K. Disconnect and reconnect plumbing, mechanical, and electrical items as required by properly licensed workers to prevent disruption of the operation of the facility. Provide for uninterrupted temporary utility services for 24/7 operating hours operations. Schedule all work in advance with the Owner.
- L. Upon final completion of demolition work, and prior to new construction commencement, all damaged conditions revealed after demolition materials are removed shall be repaired and made whole prior to installation

of any new construction materials.

3.4 CUTTING AND DRILLING

- A. Perform cutting with hand tools or with small power-driven tools. Cut holes and slots neatly to size required with the minimum disturbance to adjacent work.
- B. Where required, cut round holes in concrete slabs and masonry walls with core drills of required sizes. Saw cut rectangular holes with power-driven tools.
- C. Cover openings temporarily when not in use and patch openings as soon as new work is in place.

END OF SECTION

**SECTION 03 30 00
CAST-IN-PLACE CONCRETE**

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Includes materials and installation, finishing and curing of Cast-In-Place Concrete.

1.2 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Section 01 43 25 – Testing Laboratory Services: Concrete testing and inspection of placement of reinforcing steel. Testing of subgrades.
- C. Section 02 20 00 – Earthwork: Preparation of Subgrade for slabs, footings, and foundations. Backfill for foundations.
- D. Section 04 20 00 – Concrete Unit Masonry: Concrete footings and other concrete surfaces to receive concrete unit masonry. Grout requirements for concrete unit masonry.
- E. Section 05 50 00 – Metal Fabrications: Metal fabrications installed in conjunction with the concrete placement.
- F. Section 06 10 00 – Rough Carpentry: Treated wood elements attached to concrete substrate.
- G. Section 07 21 23 – Board Insulation: Coordinate of the placement of the concrete slab and foundation walls with the installation of the slab perimeter insulation.
- H. Section 31 31 16 – Termite Control: Application of soil treatment prior to placement of concrete footings and slabs-on-grade.

1.3 QUALITY ASSURANCE

- A. Standards: Where standards such as ACI, ASTM or other agency standards are referred to hereinafter, the editions in effect thirty (30) days prior to the date of bidding shall govern this project.
- B. Materials:
 - 1. Use ready mixed concrete only, conforming to ASTM C 94. Non-agitating type transportation equipment not acceptable.
 - 2. All concrete work exposed to freezing and thawing cycles shall be constructed of air-entrained concrete with cement conforming to ASTM C 175, minimum three (3) percent, maximum six (6) percent air content.

- C. Testing: All testing of concrete shall be at the Contractor's expense. The Contractor shall retain an independent testing laboratory and a licensed structural engineer for concrete testing and inspections. Such Engineer and testing laboratory shall be approved by the Owner and the Architect. Furnish test reports in duplicate to the Architect and one (1) copy to the Structural Engineer of Record.

1.4 REFERENCES

- A. Codes and Standards: Comply with provisions of the following codes, specifications and standards, except where more stringent requirements are shown or specified:
 - 1. ACI 301 "Specifications for Structural Concrete for Buildings" including Reference Standards included therein. Maintain a copy at the project site and conform thereto as appropriate except as modified by these Contract Documents. ACI SP-15-84 "Field Reference Manuals" contains ACI 301 and included reference standards.
 - 2. ACI 305 "Hot Weather Concreting".
 - 3. ACI 306 "Cold Weather Concreting".
 - 4. ACI 311.1 "Manual of Concrete Inspection".
 - 5. ACI 318 "Building Code Requirements for Reinforced Concrete".
 - 6. ACI 347 "Recommended Practice for Concrete Formwork".
 - 7. Concrete Reinforcing Steel Institute, "Manual of Standard Practice".

1.5 SUBMITTALS

- A. Prepare and submit for review preliminary mix design for each class of concrete specified and shop drawings, all as called for herein.
- B. Prepare shop drawings covering concrete work, including bending diagrams and steel order list to the Architect for approval prior to fabrication of reinforcing. Shop drawings must be approved by the Architect prior to fabrication.
 - 1. All reinforcing shall be detailed, ordered, and fabricated in accordance with the latest ACI Manual of Standard Practice for Detailing Concrete Structures and the CRSI Manual of Standard Practice.
 - 2. Shop drawings shall include one eighth (1/8) inch per foot plans, sections, details, and wall elevations of all reinforced concrete and masonry, as required for proper placement of the reinforcing.
 - 3. The Contract Documents may not be reproduced in whole or in part for use in preparation of the shop drawings.

1.6 STORAGE AND HANDLING

- A. Cement on the job shall be stored in weather tight sheds or bins, having floors off ground.

- B. Aggregates: Shall be handled and stored separately, in a manner to prevent segregation or intrusion of foreign matter, and in sufficient quantities to prevent fluctuations in moisture content.
- C. Reinforcement: When stored shall be raised off ground on timbers.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cement: Portland Cement – ASTM C 150, or air entering Portland Cement ASTM C175.
- B. Aggregate: ASTM C 33
 - 1. Fine: Natural Sand ASTM C 144
 - 2. Course: ASTM C 33, Table 2. Coarse aggregate in all three thousand (3,000) psi concrete shall be limestone. Coarse aggregate in all four thousand (4,000) psi concrete shall be pea gravel. Aggregate sizes shall not exceed:
 - a. Footings and Foundations..... One (1) inch.
 - b. Walls, Slabs, Beams, and Columns..... Three fourths (3/4) inch.
 - c. Masonry Grout and Fill.....Three eighths (3/8) inch.
- C. Water: Fresh, clean and potable. Maximum water to cement ratio shall be 0.5.
- D. Reinforcement:
 - 1. Deformed bars, ASTM A 615, $F_y = 60$ ksi.
 - 2. Welded wire fabric, ASTM A 185, 6 x 6 x W1.4 x W1.4, or 6 x 6 x W2.9 x W2.9, ASTM A815.
- E. Vapor Barrier: Dampproofing material below the building concrete slab-on-grade shall be equal to 11 mil Barrirebac, Product Number VB-250 as manufactured by Interplast Group of Livingston, New Jersey; 15 mil Griffolyn Green by Reef Industries, Inc.; or a 15 mil Moistop Ultra by Fortifiber Building Systems Group.
- F. Joint Material: Preformed plastic, or as approved by the Architect.
- G. Admixtures:
 - 1. Air-entraining: In accordance with ASTM C 260
 - 2. Water-Reducing: An approved water-reducing agent equal to those manufactured by Master Builders, W.R. Grace or Gifford Hill shall be added to the mixer with an accurate dispenser.
 - 3. Superplasticizer: In accordance with ASTM C 494, Type F or G, equal to those manufactured by Euclid Chemical Company, Master Builders, W.R. Grace or Gifford Hill, shall be added to all concrete walls and columns, all pumped concrete and all concrete or grout placed in spaces with widths equal or less than eight (8) inches.

4. Use admixtures, except air-entraining, only when authorized by the Architect.
5. Calcium chloride is not allowed.

H. Liquid Curing and Sealing Compounds:

1. Curing Compounds: Comply with ASTM C 309, Type 1, Class B.
 - a. Non-yellowing formulation where subject to ultraviolet light.
 - b. Curing and Sealing Compound: Where indicated, provide curing and sealing formulation with long-lasting finish that is resistant to chemicals, oil, grease, deicing salts, and abrasion. For surfaces to receive an architectural finish, provide and apply a dissipating type compound.
2. Curing and Hardening Compound: Free of waxes, resins, or oils; meet water retention requirements of ASTM C 309; penetrate concrete to change free lime to calcium silicate forming a permanently dense, hard, surface.

2.2 QUALITY AND PROPORTIONING

- A. It shall be the Contractors responsibly to furnish concrete which will conform to the quality and strength specified.
- B. All concrete exposed to weather shall have 4,000 psi (limestone) minimum 28-day strength. All other concrete, including lightweight concrete, shall have strengths and densities indicated on the drawings.
- C. Design mixes shall be established to produce average strengths higher than specified in accordance with ACI 318. Minimum cement for 3,000 psi concrete shall be 490#/yard; for 4,000 psi concrete, minimum cement shall be 587#/yard.
- D. No water shall be added on the job unless authorized by the Architect.

2.3 TESTING

- A. Test Air-entrained concrete when requested by Architect. Determine air content by ASTM C 231 pressure or C 173 volumetric method.
- B. Make slump test per ASTM Specifications. Slump at the point of placement shall be three (3) inches to five (5) inches.
- C. For each class of concrete, make four (4) cylinders on each one hundred (100) cubic yards of concrete or less placed each day per ASTM C 31.
- D. Evaluation of concrete shall be based on the average of two (2) 28-day tests in accordance with ACI 318. Retesting, additional evaluation, or placement is at the Contractor's expense.
 1. Should the strength indicated by the "Control" test cylinders fall below the nominal strength, the necessary changes in the design mix shall be made. Should the strength

indicated by the "Field" test cylinders fall below nominal strength, additional curing on those portions represented will be required. Concrete strength performance will be evaluated in accordance with the ASTM C 94. In the event that such additional curing does not give the strength required, or in other cases where, due to faulty workmanship the strength is in doubt, strength evaluation in accordance with Chapter 30 of the ACI Building Code 318, will be required to determine the adequacy of the members in question. Should these load tests show that the structure is inadequate, strengthening or replacement will be required. All of the above requirements shall be fulfilled at the Contractor's expense. Concrete strength tests are to conform to the ACI Building Code 318.

2.4 FORMWORK

- A. Design and Construction: Forms shall conform to the types, shapes, lines, and grades shown on the plans. Forms shall be securely tied and braced in position, and shored to support safely all construction loads, sufficiently tight to prevent appreciable leakage of mortar and be clean of all debris at time of concreting. Responsibility for the adequacy and safety shall be the Contractors, but design may be subject to approval. It is the intention that all exposed concrete surfaces except floors be rubbed finish.
- B. Form ties shall be such type that when forms are removed, no metal shall be left within one inch of any surface.
- C. Smooth surface forms shall be used for all exposed surfaces. The form facing material shall produce a smooth, hard, uniform texture on the concrete. Form facing shall be one of the following:
 - 1. Concrete Exterior from Plywood, resin overlay face on fir plywood back up with five (5) veneer plies, five-eighths (5/8) inch thick by four (4) feet x eight (8) feet sheet size, factory oiled and edges sealed. Minimize all joints between sheets and prevent bulging, or "pillowing" of large sheets by back-up lumber at open spaces with a maximum spacing between supports of eight (8) inches for vertical forming.
 - 2. Steel forms in good condition capable of producing the desired finish. Data on steel forms shall be submitted for review by the Architect prior to pouring concrete.
- D. Exterior exposed Concrete Forms must be treated as finished surfaces. Surface material shall be laid out in as large units as practicable and shall be laid in regular and symmetrical pattern as approved. Edges of units shall be tight butted together with clean, straight joints; any appreciable space at joints shall be filled. Maximum variation in alignment of surfaces at a joint to be one sixteenth (1/16) inch. There shall be no bulges or defects deeper or higher respectively than three sixteenth (3/16) inch in four (4) feet. Forms shall be designed for easy removal. Prying against the surface of the concrete shall not be allowed; only wooden wedges may be used.
- E. Unfinished Surface Forms may be used for all unexposed surfaces such as surfaces to be in contact with earth, in unfinished spaces, and such other locations as indicated on the plans. For these surfaces, wood No. 2 Common or Better lumber, metal or other type of form material may be used as sheathing. Earth forms may be substituted for side forms of footings where soil conditions are suitable and approved by the Architect.

2.5 MISCELLANEOUS REQUIREMENTS

- A. Form Release Agent:
 - 1. Biobased Content: Minimum eight five (85) percent soy-based oil or other biobased material.
 - 2. Toxicity/IEQ: Low VOC
- B. Form Liners: Form liner material shall be one eighth (1/8) inch thick, four (4) inches x twelve (12) inches sheets of tempered Masonite hardboard.
- C. Glue: Glue for adhering form liner to forms shall be contact cement type approved by Engineer.
- D. Waterstops: Acceptable manufacturers are Greenstreak Plastic Products Co. of St. Louis, Missouri, or W.R. Meadows, Inc. of Elgin, Illinois or approved equal. Refer to Drawings for waterstop configurations.
 - 1. Waterstop shall be rubber and shall be dense, homogenous, and uniform. Holes and imperfections shall be cause for rejection.
 - 2. Unless otherwise indicated on Drawings, waterstops for all below grade construction joints shall be equal to labyrinth type at slab-on-grade and keyed type with hollow center bulbs at wall construction joints; refer to plans. Multiple-rib type of waterstop is referred, if available.
 - 3. Provide prefabricated tees, crosses, and other configurations as required for all intersections of waterstop.

2.6 SEALER AND HARDENER

- A. L&M "Dress & Seal 30" or Master Builders "Masterseal 66" or approved equal.

PART 3 - EXECUTION

3.1 FORMS, WATERSTOPS AND REINFORCEMENT

- A. Forms:
 - 1. Bevel, Marker and Rustication Strips shall be applied in straight lines and well fastened to prevent displacement. Marker strips for exterior exposed surfaces shall be of cypress or white pine.
 - 2. Temporary openings shall be provided at the base of column and wall forms and at other necessary points to facilitate cleaning and inspecting before concreting.
 - 3. The contact face of forms shall be coated with non-staining mineral oil or other

approved coating, or in the case of wood forms, may be thoroughly wetted (except in freezing weather). Oil coating shall be applied and excess wiped off before placing reinforcing.

4. When removing forms, particular care should be taken to prevent damage to the concrete and marring or gouging of finished surfaces.
5. Forms and form lumber may be re-used if in good condition after being cleaned and reconditioned, if approved.

B. Waterstops: Install waterstops in formwork, true to line, plumb and level. Provide projections into and above concrete as recommended by waterstop manufacturer to provide an effective water barrier. Exercise care when removing form so as not to damage or displace waterstop material.

C. Reinforcement;

1. Inspection: Reinforcing placement shall be inspected and approved by the Testing Laboratory and Engineer before placement of concrete.
2. Fabrication: Bars shall be bent cold to the dimensions indicated on bending diagrams which shall conform to the bending specifications of the ACI Building Code. Beam stirrups and column ties shall not have dimension errors more than one bar diameter. Bars shall be bent or straightened in a manner that will not injure the materials. Bars with kinks or bends not called for on the plans, or with loose rust scale or other coatings shall not be used.
3. Placement: All reinforcing shall be accurately placed as shown on steel placing plans, tied, and shall be firmly supported in place by metal accessories. Before placement reinforcing shall be free of loose mill and rust scale and other coating that will reduce or destroy the bond. Wire mesh reinforcing for slabs on grade shall be placed approximately in center of slab.
4. Splicing: Where it is necessary to splice reinforcing at points other than shown on drawings, the character of the splices shall be determined by the Engineer. In such splices the bars shall be overlapped sufficient length in order to develop full strength of the bar by bond.

3.2 EMBEDDED ITEMS

- A. Give ample notice and opportunity to all trades whose work is related to or supported by the concrete to install and / or furnish embedded items before concrete is placed.
- B. Place all sleeves, inserts, anchors and embedded items required prior to concreting.
- C. Position embedded items accurately and support against displacement. Full or cover voids in sleeves, inserts, and anchor with readily removable material to prevent entry of concrete.

3.3 EXCAVATIONS

- A. All subgrades, slabs and footings shall be inspected and approved by the project Testing Laboratory or project Geotechnical Engineer prior to placement of concrete. Contractor shall bear the cost of such inspections.

3.4 CONVEYING AND PLACING

Structural Repairs and Pavement Replacement

Bid Documents

Memphis, Tennessee

Shelby County Fire Station #62

- A. Prior to placing, verify all under floor electrical and mechanical work, reinforcement, sleeves, pipes, inserts, conduits and vapor barrier are in place and approved.
- B. Convey concrete from mixer to the place of final placing by methods that will prevent separation or loss of materials, Equipment for chuting or conveying concrete are subject to approval of Architect.
- C. Place concrete as nearly as practicable in its final position to avoid segregation due to flowing or rehandling. Use of retempered or partially set concrete is not permitted. Mechanically vibrate all reinforced concrete.
- D. All concrete shall be placed in its final position within one and a half hour after the water has been added to the mix if the air temperature is below 85 degrees Fahrenheit, if above, limit is sixty (60) minutes.
- E. Depositing: Concrete shall be deposited as nearly as practicable in its final position and shall have the qualities required. Concrete shall be deposited continuously in layers or sections of such thickness that no concrete will be deposited on concrete which has hardened sufficiently to cause seams or planes or weakness.
- F. Compacting and Vibration: Concrete during and immediately after depositing shall be thoroughly compacted and worked around reinforcing and embedded fixtures, and into all parts of the forms by means of spades, rods, and / or approved mechanical vibrating or hammering the forms lightly. Care shall be taken so as not to work the concrete to the point where segregation occurs. Vibrators must be high frequency and of adequate size. Recommendations of ACI standard 309 "Recommended Practice for the Consolidation of Concrete" shall be followed.
- G. Cold Weather Placing: Protect Concrete work from physical damage or reduced strength which could be caused by frost, freezing actions, or low temperatures, in compliance with ACI 306.
 - 1. When air temperature has fallen to or is expected to fall below forty (40) degrees Fahrenheit, uniformly heat water and aggregates before mixing to obtain a concrete mixture of not less than fifty (50) degrees Fahrenheit, and not more than ninety (90) degrees Fahrenheit at point of placement.
 - 2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
 - 3. Do not use calcium chloride, salt or other materials containing antifreeze agents or chemical accelerators, unless otherwise accepted in mix designs.
- H. Hot Weather Placing: When hot weather conditions exist that would seriously impair quality or strength of concrete, place concrete in compliance with ACI 305.
 - 1. Cool ingredients before mixing to maintain concrete temperature at time of placement below ninety (90) degrees Fahrenheit. Mixing water may be chilled or chopped ice may be used to control temperature provided water equivalent of ice is calculated to total amount of mixing water. Use of liquid nitrogen to cool concrete is Contractor's option.

2. Cover reinforcing steel with water-soaked burlap if it becomes too hot, so that steel temperature will not exceed the ambient air temperature immediately before embedment in concrete.
3. Fog spray forms, reinforcing steel and subgrade just before concrete is placed.
4. Use water-reducing retarding admixture (Type D) when required by high temperatures, low humidity, or other adverse placing conditions.

- I. Approval of Architect is required to place concrete during rain, sleet, snow or freezing temperatures (below forty (40) degrees Fahrenheit) and falling). Concrete damaged by rain water or freezing shall be repaired or replaced at the Contractor's expense, and shall include cost of work embedded in concrete. Provide adequate protection.

3.5 FOOTINGS

- A. Excavate footings to elevations, to dimension and to levels shown on the drawings.
- B. All footings shall bear on adequate bearing soil. Footing subgrades shall be inspected by the project Geotechnical Engineer and approved prior to placement of any concrete. If soil conditions are not suitable for foundations at depths indicated on drawings, additional excavation and backfill shall be required and placed in accordance with Civil Engineering Drawings requirements and the requirements of the project Subsurface Investigation Report. Excavation below depths indicated, without specific authorization, shall be refilled to proper grade with concrete at the Contractor's expense.
- C. Footings shall be poured with form boards if sides of excavations are not vertical. Bottoms of trenches shall be level and cleaned of all loose dirt, muck, water, and debris immediately prior to placing of concrete. Dowel and key all construction joints in footings.
- D. The Contractor is responsible for the condition of all footing trenches. Provide and maintain all pumps, lines, etc. required to keep trenches free of standing water. Reinforce all footings as called for on the drawings.
- E. Excavate and build step footings where required and as indicated on the Plans. Provide dowels, where required, for anchoring reinforcement.
- F. Float finished surface to required grade. Steel trowel all exposed surfaces, as indicated on the drawings.
- G. Minimum depth of all footings shall be below the frost line as required by applicable local and state codes.

3.6 BUILDING SLABS

- A. Floor Slabs on Grade: The subgrade shall be well compacted and free of spongy or soft spots. Recompact all slab subgrades immediately prior to placing vapor barrier to repair any disturbance that may occur due to construction operation. Refer to Section 31 23 13 for subgrade preparation requirements.

1. The Testing Laboratory shall approve the fill material and its placement in accordance with Sections 01 40 00 and 02 30 00.

- B. Slab-Over-Grade Dampproofing: Install specified dampproofing membrane over thoroughly compacted fill. Lap vapor barrier over footings and seal to foundation walls as applicable. Seal all joints with manufacturer's printed instructions. Membrane shall be laid in widest practical widths, lapped at least 6 inches and mop sealed at all pipes, conduit, etc. Any damage to the membrane prior to pouring of concrete slab shall be repaired with a dampproofing patch, six (6) inches larger on all sides than the damaged area. Seal patch with manufacturer-supplied tape.
- C. Furnish and install wire mesh, reinforcement and expansion joint material where indicated on drawings.
- D. Thickened slab where indicated on the drawings. Excavate for thickened slab areas as required and reinforce as shown on drawings.
- E. Slab Surface tolerances:
 1. Achieve flat, level planes where grades are indicated. Slope uniformly to drains.
 2. Floated Finishes: Check and level surface plane to tolerances of at least F(f) 20 for flatness and F(1) 17 for levelness per ASTM E 1155.
 3. Troweled Finishes: Achieve level and flat surface plane, within the following tolerances per ASTM E 155:
 - a. Floor Flatness F(f): 20.
 - b. Floor Levelness F(1): 17.
- F. Grind all pour joints, trowel ripples and irregularities in the finished surface to a smooth uniform surface.
- G. Tolerance: Levelness of all building slabs shall not vary more than that specified herein. Correct slab variations exceeding specified tolerances by machine grinding or other methods approved by the Architect.

3.7 MISCELLANEOUS

- A. Mechanical Openings: Provide such framed openings as are required for installation of mechanical and electrical work which requires forming. Openings not shown on the drawings must be approved by the Engineer.
- B. Cutting Holes: Holes where necessary, may be cut where specifically approved through new concrete slabs or walls with a rotary type concrete drill in such a manner as not to be chipped

through the concrete one-half way from each side to avoid spalling and damaging the surrounding concrete.

- C. Concrete Foundations for Mechanical Equipment: Provide concrete pads required under all mechanical equipment. Set bolts, anchors, piping, etc., in concrete as required by manufacturer of equipment used. See Mechanical Drawings and details for size, design and location of equipment requiring concrete pads. The pads shall be steel trowel finish on all top exposed surfaces. Pads shall be reinforced with 1-#5 continuous at edges and with 6 x 6 – W2.9 x W2.9 wire mesh where not shown otherwise.

3.8 CONSTRUCTION JOINTS

- A. Columns: Joints in columns shall be made at the underside of lowest beam, capitals, or slab members, or as shown on plans. In general, columns shall be concreted and the forms adjacent cleaned before the beam or slab reinforcement for the next floor is placed. Not less than two (2) hours shall elapse between the concreting of columns and the floor or roof level over them. Any column or wall poured higher than the prescribed joint location shall be cut off without damaging column, wall, or reinforcement prior to placement of subsequent concrete. Horizontal construction joints in beams where allowed, shall be rough and clean.
- B. Floors: Construction joints in floor system shall be located at or near the middle of the span in structural slabs, beams, or girders or other locations approved. Construction joints, where necessary, shall be vertical and provided with keyways. Steel reinforcement shall continue through the joint and additional stubs shall be provided as required. Construction joints in slabs on grade shall be located as approved by the Design Engineer.

3.9 FINISHING

- A. Building Slabs: Screed and steel trowel to a smooth, dense surface all concrete surfaces under finish floor materials. Finished surface shall be suitable to received specified / scheduled finish.
- B. Exposed Interior Concrete Surfaces and Concrete Sills: Screed and steel trowel to a smooth, dense surface.

3.10 CURING AND PROTECTION

- A. All concrete shall be given adequate protection from injurious action by sun, rain, flowing water, frost, freezing, mechanical injury, and premature drying out.
- B. All concrete finishes shall be maintained in a moist condition for at least the first five (5) days after placing. This may be accomplished by one or more of the following methods, which method must be approved:
 - 1. Surface remaining in contact with forms.
 - 2. Covering with waterproof paper, (Sisalkraft, polyethylene film, or equal ASTM C171) lapped at the edges.
 - 3. Covering with one (1) inch layer of thoroughly wet sand or two (2) inches of non-

staining saw dust.

4. Covering with burlap or cotton mats kept continuously wet.
5. The surface of the slabs protected by ponding.
6. Slabs may be cured at the option of the Contractor by the use of white pigmented liquid chemical cure meeting the requirements of the specified treatments. Applied liquid chemical cure in two coats at right angles by spraying the cure onto the new floor by the use of the garden spray or mopping it on. Apply as soon after the last toweling as it is possible without defacing the floor. Chemical cure must be of a type that will not prevent resilient tile from bonding to concrete.

C. All concrete to be protected from too rapid drying for a curing period of at least seven (7) days.

D. Finish Formed Surfaces:

1. When forms are removed before the end of the curing periods, exposed vertical surfaces shall be covered and kept sufficiently damp at all times to prevent openings at the joints and drying of the concrete.
2. Protect all work from any mechanical injury, load stresses, shock, vibrations and damage to finished surfaces. All defective or damaged work shall be replaced at the Contractor's expense.

3.11 SEALER AND HARDENER

- A. Apply sealer / hardener compound at full rate as recommended by the manufacturer for the substrate involved, as soon as surface water glazing is gone. Apply an additional coating at one-half (1/2) rate at just prior to Date of Substantial Completion Inspection.

END OF SECTION

SECTION 04 05 00
MASONRY MORTARING

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Includes furnishing materials, mixing and application of mortar and masonry grout for masonry work required for the masonry construction.

1.2 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Section 03 30 00 – Cast-In-Place Concrete: Requirements for aggregate sizes for grout.
- C. Section 04 15 00 – Masonry Accessories and Reinforcement: Coordination of the placement / embedment of the masonry accessories and reinforcement with the placement of the mortar and grout.
- D. Section 042200 – Concrete Unit Masonry: Mortar and grout for erection of the concrete unit masonry.

1.3 QUALITY ASSURANCE

- A. Mix Design:
 - 1. Proposed mix designs shall be submitted to testing agency for approval prior to commencement of work.
 - 2. Tests of proposed mixes will be performed to ensure conformance with requirements stated herein.
 - 3. Where mortar and grout mixes do not conform with requirements stated herein, Contractor must re-submit for further testing, and pay all costs for required testing.
- B. Referenced Standards – Mortar and grout (materials, manufacturer and installation) shall comply with the following standards:
 - 1. ASTM C 150 – Portland Cement
 - 2. ATSM C 595 – Specifications for Blended Hydraulic Cements
 - 3. ATSM C 260 – Specifications for Air Entraining Admixtures for Concrete
 - 4. ASTM C 91 – Masonry Cement
 - 5. ASTM C 5 – Quicklime for Structural Purposes
 - 6. ASTM C 207 – Hydrated Lime for Masonry Purposes
 - 7. ASTM C 144 – Aggregate for Masonry Mortar
 - 8. ASTM C 387 – Packaged, Dry, Combined Materials for Mortar and Concrete
 - 9. ASTM C 476 – Grout for Masonry

10. ASTM C 270 – Mortar for Unit Masonry
11. ASTM C 404 – Aggregates for Masonry Grout
12. ASTM E 447 – Methods for Compression Strength of Masonry Prisms

- C. Copies of ASTM C 270 and ASTM C 476 shall be kept on the project site for ready reference.

1.4 SUBMITTALS

- A. Submit copies of technical data describing materials to be used for review in accordance with Section 01 62 32.

PART 2 - PRODUCTS

2.1 MORTAR MATERIALS – Conform to ASTM C 270 as specified herein.

- A. Mortar materials shall consist of following:

1. Portland Cement: ASTM C 150, normal-type, gray or white in color as required by project conditions. The free alkali content shall be 0.05 percent or less.
2. Masonry cement: ASTM C 91, for general and high strength uses. The free alkali content shall be .05 percent or less.
3. Aggregates (sand): ASTM C 144 standard masonry type clean, dry and protected against dampness, freezing and foreign matter.
4. Hydrated lime: ASTM C 207, Type S
5. Quicklime: ASTM C 5, non-hydraulic type.
6. Premixed mortar: ASTM C 387 commercially prepared type, mortar types M or S, using gray or white cement, as required by project conditions.
7. Water: Shall be potable.

- B. Admixtures:

1. Mortar color: Gray for concrete masonry units.
2. Plasticizers, accelerators, retardants, water repellent agents, or other admixtures shall not be used in mortar mixes unless otherwise stated in Paragraph C below, or specifically required by project conditions, and then only with approval of the Architect.
3. Under no circumstances will calcium chloride be added to any mortar.

- C. Mortar Mixes shall conform to ASTM C 270, using either the Propriety or Proportion Specifications:

- a. As required by project conditions, mixes may consist of any of the following combinations.
- b. Portland cement, lime and fine aggregate.
- c. Masonry cement and fine aggregate
- d. Portland cement and fine aggregate
- e. Commercially prepared premix mortar and fine aggregate

2. Provide Type S minimum 1,800 psi mortar for foundation masonry walls and for construction of site drainage structures.

2.2 GROUT MATERIALS

- A. Grout shall consist of a 3,000 psi concrete conforming to Section 03 30 00, Cast-In-Place Concrete, using pea gravel for the coarse aggregate.

PART 3 - EXECUTION

3.1 GENERAL

- A. Measurement of materials shall be such that the specified proportions are controlled and accurately maintained. Work ability or consistency of mortar on the board shall be such that the mortar is sufficiently wet to be worked under the trowel. Mortar which has begun to "set" or is not used within two and one-half (2-1/2) hours after initial mixing shall be discarded. Mortar which has stiffened due to evaporation within the two and one-half (2-1/2) hour period shall be retempered to restore its work ability.

3.2 MIXING AND PLACING

- A. Mortar and grout ingredients shall be thoroughly mixed, in quantities needed for immediate use.
- B. Mortar and grout ingredients shall be thoroughly mixed, in quantities needed for immediate use.
- C. For work requiring only small batches of mortar or grout and when specifically approved by the Architect, mortar may be mixed by hand in watertight mortar mixing boxes. Materials of each batch shall be well raked and turned over together before water is added, until it is an even color throughout mass after which water shall be gradually added until a thoroughly mixed mortar of required plasticity is obtained.
- D. Pointing mortar shall be as dry a consistency as will produce mortar sufficiently plastic to be worked into joints.
- E. All mixing boxes and equipment shall be kept clean. Mortar and grout shall be prepared in batches or volumes that will be used before initial set takes place, and in no case longer than forty-five (45) minutes before delivery to point of use. Mortar must be used within two (2) hours of mixing at temperatures over eighty (80) degrees Fahrenheit and two and one half hours at temperatures under fifty (50) degrees Fahrenheit. Re-tempering after initial set will not be permitted.

END OF SECTION

**SECTION 04 22 00
CONCRETE UNIT MASONRY**

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Includes materials, labor and equipment required for the masonry foundation construction.

1.2 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Section 03 30 00 – Cast-In-Place Concrete: Concrete footings for masonry walls.
- C. Section 04 05 00 – Masonry Mortaring: Mortar and grout for the erection of the concrete unit masonry.
- D. Section 04 11 50 – Masonry Parging: Parge coat applied over exposed insulating form system. Strike joints flush where parge coating is applied.
- E. Section 04 15 00 – Masonry Accessories and Reinforcement: Coordination of the placement of the anchorages and ties with the placement of the mortar and grout.
- F. Section 055000 – Metal Fabrications: Loose lintels, bearing plates, hangers, anchor bolts, sleeves, etc. which are anchored to, bear on, are built into masonry.

1.3 REFERENCE STANDARDS

- A. American Society of Testing and Materials (ASTM), Materials
- B. National Concrete Masonry Association (NCMA) TEK Bulletin Series.
 - 1. TEK 11 – Reinforced Concrete Masonry – An Established Structural System.
 - 2. TEK 20 – Mortars for Concrete Masonry.
 - 3. TEK 23 – Grouting for Concrete Masonry Walls.
 - 4. TEK 59 – Reinforced Concrete Masonry construction.
 - 5. NCMA-TR 75 B – “Specifications for Designing and Construction of Load Bearing Concrete Masonry”.
- C. Portland Cement Association (PCA)
 - 1. Specifications and Selection of Materials for Masonry Mortars and Grouts.
- D. Applicable Building Code.

- E. American Concrete Institute (ACI)
 - 1. ACI-530-02, "Building Code Requirements for Concrete Masonry Structures".
 - 2. ACI 530.1-02, "Specification for Masonry Structures".
- F. International Masonry Industry All-Weather council: Recommended Practices and Guides Specifications for Cold Weather Masonry Construction.
- G. In the event of conflict between documents referenced herein and other detail content of this specification, the detail content herein shall be considered a superseding requirement.

1.4 SUBMITTALS

- A. Submit copies of technical data to the Architect and samples of each type masonry specified to the Architect in accordance with Section 01 62 32.
- B. Furnish certificates from the manufacturer in triplicate prior to delivery of concrete masonry units to the job site. Each certificate shall be signed by an authorized officer of the manufacturing company and shall contain the name and address of the Contractor, the project location, and the quantities and date or dates of shipment or delivery to which the certificate applies. Units shall be certified for compliance with all section requirements.
- C. Test Data: Test shall be made from a random selection of ten (10) blocks from each five thousand (5,000) (or fraction thereof) delivered at the job site. Manufacturer of block shall notify the laboratory of delivers. Sampling and testing concrete masonry units shall be in accordance with the "standard Methods of Sampling and Testing Concrete Masonry Units", (ASTM Designation C 140). Laboratory shall submit copies of test data to Architect; one copy to Contractor and one copy to block manufacturer. Costs of tests shall be paid by the Contractor.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to the job site in undamaged condition. Store in a manner to exclude moisture and contaminants. Protect masonry units from spoiling prior to use.
- B. Stack masonry units on platforms or any other approved location that will protect them from contact with soil and exposure to water. Exercise care in handling units to avoid chipping and breakage. Locate storage piles or stacks to avoid being disturbed or barricade to protect the material from damage. During rainy weather cover all exposed units with a layer of 6 mil. Polyethylene. During non-rainy weather remove the cover from the masonry units. Wet or very damp concrete masonry units shall be thoroughly dried before being laid up.

1.6 JOB CONDITIONS

- A. Do not erect masonry when ambient temperature has dropped below forty-five (45) degrees Fahrenheit, unless it is rising and at no time when it has dropped below forty (40) degrees

Fahrenheit, except by written permission from the Architect. When masonry work is authorized during temperatures below forty (40) degrees Fahrenheit, make provisions for heating and drying materials. Post accurate thermometer directly adjacent to work in progress for temperature reference. Otherwise conform to International Masonry Industry All-Weather council "Recommended Practices and Guide Specifications"

- B. Job Layout
 - 1. Horizontal: Layout coursing horizontally and adjust vertical joints locations to best fit opening, expansion joint locations and offsets. Avoid block cuts less than four (4) inches wide.
 - 2. Vertical: Maintain story pole marked with courses and adjust to work with heads and sills of openings to maintain same jointing for all masonry surfaces of building.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Concrete Unit Masonry: Concrete block shall be structural lightweight aggregates (115/cf), two (2) core, without cracks, chips, splits or other defects. Blocks shall be in accordance with ASTM Designation ASTM C 90 Type 1, of the recommended grade (N or S) according to exposure. Lightweight aggregates used in the manufacturer of the concrete masonry units shall strictly comply with ASTM C 331 "Standard Specification for Lightweight Aggregates for Concrete Masonry Units". Normal weight aggregates shall comply with ASTM C33 "Standard Specification for Concrete Aggregates". Masonry units shall meet with the Architect's approval as to cleanness and soundness before being laid.
- B. Blocks shall be selected to provide a masonry assemblage strength of $f'_m=1,500$ psi as tested in accordance with ASTM C 1314 "Compressive Strength of Masonry Prisms" or by the unit strength method sing Table 1 in Section 1.4B of ACI 530-02. All CMU shall be uniform in color and texture. Those units that are exposed in place shall conform to an approved sample, consisting of not less than four units, representing the range of texture and color permitted. Moisture content shall not exceed eighteen (18) percent at the time of delivery and installation.
 - 1. Provide all necessary shapes to produce square ninety (90) degree corners, except where shown on drawings, and flush at all conditions and locations.

PART 3 - EXECUTION

3.1 GENERAL

- A. Requirements for construction Shall be as Follows:
 - 1. All units shall be laid with full mortar beds.
 - 2. End walls and cross webs forming cells to be filled shall be fullbedded in mortar to prevent leakage of grout unless the wall is to be poured solid.
 - 3. Bond shall be running bond provided by lapping units in successive vertical courses half

- way over course below keeping head joints of alternate courses in straight, vertical lines.
4. Vertical cells to be filled shall have vertical alignment sufficient to maintain a clear,
 5. Unobstructed continuous vertical cell measuring not less than four (4) inches x four (4) inches. If the walls are battered or if alignment is offset, the four (4) inches x four (4) inches clear opening shall be maintained as measured for course to course. Mortar fins in excess of one half (½) inch and any other obstructions shall be removed from the cells to be grouted.
 6. At the time of laying, all masonry units shall be free of excess dust and dirt.
 7. All cells containing reinforcement shall be filled solidly with grout. Grout shall be a workable mix suitable for pumping without segregation and shall be thoroughly mixed. Grout slump shall not be less than eight (8) inches nor more than eleven (11) inches. Grout shall be placed by pumping or by an approved alternate method and shall be placed before initial set or hardening occurs. Grout shall be consolidated after placement and reconsolidated after excess moisture has been absorbed but before workability is lost. The grouting of any section of a wall shall be completed in one day with no interruptions greater than one (1) hour.
 8. Where the grout pour exceeds five (5) feet in height, cleanouts shall be provided by suitable openings in the face shells in the bottom course of each cell to be grouted, or other approved locations. The cleanouts shall be sealed after inspection and before grouting.
 9. When the grouting is stopped for one hour or longer, horizontal construction joints shall be formed by stopping the pour of grout approximately one and one half (1-1/2) inches above or below a bed joint.
 10. Low-lift grouted construction – units may be laid to a height not to exceed six (6) feet. If the height exceeds four (4) feet, cleanouts must be used.
 11. Plumb masonry work within tolerance of more than +/- one fourth (¼) inch in ten (10) feet. Level courses within tolerance of +/- one fourth (¼) inch in ten (10) feet.
 12. Protect masonry surfaces not being worked on during construction work. At such times as rain or snow is eminent and work is discontinued, protect work with waterproof membrane well secured.
 13. Unless otherwise required, fill solidly with mortar or grout all spaces in and around metal door frames and other built-in items. Where possible, build in work required to be built in with masonry, including anchors, wall plugs and accessories, as erection progresses. All patching of masonry required to accommodate built-in items shall be done in a manner to match original work.
 14. A masonry saw with a minimum of two (2) spare blades shall remain on the job until all masonry work has been completed. All masonry units to be cut shall be cut true and straight so as to assure proper fit producing neat, workmanlike openings, coursings, etc.
 15. Step back unfinished work for jointing with new work. Tothing may be resorted to only when so approved. Before new work is started, remove loose mortar exposed joints, and wet thoroughly at least twelve (12) hours before laying new work.
 16. Where expansion joints are indicated on the drawings, build flat-end blocks tight against expansion material (one (1) inch inorganic insulation board) with edges of expansion wall. Install caulking and / or sealant in recess as specified in Section 07920.
 17. Exposed head and bed joints shall be concave tooled, three eighths (3/8) inch. Areas to receive parge coating shall have joints struck flush.

3.2 PLACING REINFORCEMENT

- A. Clean reinforcement of loose rust, mill scale, earth, ice or other materials which will reduce bond to mortar or grout. Do not use reinforcement bars with kinds or bends not shown on drawings, or bars with reduced cross-section due to excessive rusting or other causes.
- B. Position reinforcement accurately at the spacing shown. Support and secure vertical bars against displacement. Horizontal reinforcement may be placed as the masonry work progresses. Where vertical bars are shown in close proximity, provide a clear distance between bars of not less than nominal bar diameter or 1 inch, whichever is greater.
- C. Unless noted on drawings, lap bars thirty-six (36) bar diameters or eighteen (18) inches minimum at splices.

3.3 ERECTION OF REINFORCED CONCRETE UNIT MASONRY

A. General

- 1. Do not wet concrete masonry unit (CMU)
- 2. Lay CMU units with full-face shell mortar beds. Fill vertical head joints (end joints between units) solidly with mortar from face of units to a distance behind face equal to not less than the thickness of longitudinal face shells. Solidly bed cross-webs of starting courses in mortar. Maintain head and bed joints widths shown, or if not shown, provide three eighths (3/8) inch joints.
 - a. Where solid CMU units are shown, lay in full mortar head and bed joints.
- 3. Provide pilasters or other approved reinforcement in accordance with Code.
- 4. Strike joints flush where waterproof coating, dampproofing and exterior insulation and finish system are applied.

B. Foundation Walls

- 1. Lay CMU units in one half (1/2) running bond with vertical joints in each course centered on units in courses above and below, unless otherwise indicated. Bond and interlock each course at corners and intersections. Use special-shaped units where shown, and as required for corners, jambs, sash, control joints, bond beams and other special conditions.
- 2. Maintain vertical continuity of core of cell cavities, which are to be reinforced and grouted, to provide minimum clear dimensions indicated and to provide minimum clearance and grout coverage for vertical reinforcement bars. Keep cavities free of mortar. Solidly bed webs in mortar where adjacent to reinforced cores or cells.
- 3. Where horizontal reinforced beams (bond beams) are shown, use special units or modify regular units to allow for placement of continuous horizontal reinforcement bars. Place small mesh expanded metal lath or wire screening in mortar joints under bond beams courses over cores or cells of non-reinforced vertical cells, or provide units with solid bottoms.

C. Grouting

- 1. Use "Fine Grout" for filling spaces less than four (4) inches in both horizontal directions.

2. Use "Course Grout" for filling four (4) inches spaces or larger in both horizontal directions.
3. Use low-lift grouting techniques subject to the requirements which follow.

D. Low-Lift Grouting

1. Provide minimum clear dimensions of two (2) inches and clear area of eight (8) square inches in vertical cores to be grouted.
2. Place vertical reinforcement prior to grouting of CMU. Extend above elevation of maximum pour height as required to allow for splicing. Support in position at vertical intervals not exceeding 192 bar diameters nor eight (8) feet
3. Lay CMU to maximum pour height. Do not exceed six (6) feet height, or if bond beam occurs below six (6) feet height, stop pour at course below bond beam.
4. Pour grout using container with spout or by chute. Rod or vibrate grout during placing. Place grout continuously; do not interrupt pouring of grout for more than one (1) hour. Terminate grout pours one and one half (1-1/2) inches below top course of pour.
5. Do not stop grout in vertical cells below bond beam course. Provide hole in bond beam blocks for passage of vertical reinforcing as shown. Place horizontal reinforcement in bond beams; lap at corners and intersections as show. Place grout in bond beam course before filling vertical course above bond beam.

3.4 CLEANING

- A. Work in as clean as manner as possible; remove excess materials, mortar droppings daily. Remove mortar droppings on connection of adjoining work before its final set.
- B. At completion of work, point holes in joints of exposed masonry surfaces; completely fill with mortar; tool properly. After pointing has set hardened, clean concrete masonry units which remain exposed in finished work, with non-metallic brushes or other methods acceptable to the mortar and masonry unit manufacturers. Do not use cleaning acids.
- C. Remove, replace defective materials; correct defective workmanship; leave masonry clean.

END OF SECTION

**SECTION 04 90 10
MASONRY RESTORATION AND CLEANING / TUCKPOINTING**

PART 1 GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings, photos and general provisions of the Contract, apply to work of this section.

1.02 DESCRIPTION OF WORK

- A. Extent of masonry restoration work as indicated on drawings and photos.
- B. Masonry restoration work includes the following:
 - 1. Tuckpointing of masonry joints.
 - 2. Final cleaning of masonry.

1.03 QUALITY ASSURANCE

- A. Restoration Specialist: Work must be performed by a firm having not less than 5 years successful experience in comparable masonry restoration projects and employing personnel skilled in the restoration processes and operations indicated.
- B. Repointing: Prepare 2 separate sample areas of approximately 2 feet high by 2 feet wide for each type of repointing required, one for demonstrating methods and quality of workmanship expected in removal of mortar from joints and the other for demonstrating quality of materials and workmanship expected in pointing mortar joints appearance to adjacent existing joints. The intent of the new pointing work is to match cleaned existing mortar. Newly pointed areas should be consistent with existing adjacent mortar joints for color and texture.

1.04 SUBMITTALS

- A. Product Data: Submit manufacturer's technical data for each product indicated including recommendations for their applications and use. Includes test reports and certifications substantiating that products comply with requirements.
- B. Samples: Submit, for verification purposes, samples of the following:
 - 1. Each new exposed masonry mortar to be used for replacing existing materials. Include in each set of samples the full range of colors and textures to be expected in completed work.
 - 2. Each type of chemical cleaning material data.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to site in manufacturer's original and unopened containers and packaging bearing labels as to type and names of products and manufacturers.
- B. Protect masonry restoration materials during storage and construction from wetting by rain, snow or ground water, and from staining or intermixture with earth or other types of materials.

- C. Protect grout, mortar and other materials from deterioration by moisture and temperature. Store in a dry location or in waterproof containers. Keep containers tightly closed and away from open flames. Protect liquid components from freezing. Comply with manufacturer's recommendations for minimum and maximum temperature requirements for storage.

1.06 PROJECT CONDITIONS

- A. Do not repoint mortar joints or repair masonry unless air temperatures are between 40 deg.F and 90 deg.F and will remain so for at least 48 hours after completion of work.
- B. Prevent mortar used in repointing and repair work from staining faces of surrounding masonry and other surfaces.
- C. Protect sills, ledges, projections and pedestrians from mortar droppings.

1.07 SEQUENCING / SCHEDULING

- A. Perform masonry restoration work in the following sequence:
 - 1. Rake or cut out existing mortar joints from indicated to be repointed.
 - 2. Repoint existing mortar joints of masonry indicated to be restored.

PART 2 PRODUCTS

2.01 MASONRY MATERIALS

- A. Portland Cement: ASTM C 150, Type I or Type II.
- B. Hydrated Lime: ASTM C 207, Type S, Type N or Type O.
- C. Mortar Sand: ASTM C 144, unless otherwise indicated.
 - 1. Color: Provide natural sand; of color necessary to produce required mortar color.
 - 2. For the repointing mortar, provide sand with rounded edges.
 - 3. Match size, texture, and gradation of existing mortar sand as closely as possible. Blend several sands, if necessary, to achieve suitable match.
- D. Mortar Pigments: Natural and synthetic iron oxides, compounded for mortar mixes. Use only pigments with a record of satisfactory performance in masonry mortars.
- E. Water: Potable.

2.02 TUCKPOINT MORTAR MIXES

- A. General:
 - 1. Measurement and Mixing: Measure cementitious and aggregate material in a dry condition by volume or equivalent weight. Do not measure by shovel, use known measure. Mix materials in a clean mechanical mortar mixer. If color is required, mix in with dry material.
 - 2. Mixing Pointing Mortar: Thoroughly mix cementitious and aggregate, color if required, materials together before adding any water. Maintain mortar in the dampened condition for 1 to 2 hours. Add water in small portions until mortar of desired consistency is reached. Use mortar within 30 minutes of final mixing.

2.03 REPOINTING MASONRY

- A. Rake or grind out mortar joints as follows:
 - 1. Rake or grind out mortar joints not less than ½ inch in depth or less than that required to expose sound, unweathered mortar.
 - a. Contractor shall show a satisfactory Quality Control Program and demonstrated ability of operators to use tools without damage to masonry, or widening of joints. Quality Control Program shall include provisions for supervising performance and preventing damage due to worker fatigue.
- B. Rinse masonry joints as follows:
 - 1. Rinse masonry joint surfaces with water to remove dust and mortar particles. Time application of rinsing so that at time of pointing, joint surfaces are damp but free of standing water. For best practices, if rinse water has dried, dampen masonry joint surfaces before pointing.
- C. Tuckpoint mortar joints as follows:
 - 1. Tuckpoint mortar joints starting at one end and working away from starting area (this will ensure mortar joints are fully packed and no voids, air pockets are in mortar).
 - 2. Once area is complete, final tool (strike) mortar joints in opposite direction ensuring mortar joints are fully packed and tool (strike) to final appearance. Joints shall match existing joints as closely as possible. Unless otherwise directed by Architect or Owner.
 - 3. Take care not to spread mortar over edges onto exposed masonry surfaces or to featheredge mortar. Remove excess mortar from edge of joint by brushing.

2.04 FINAL CLEANING

- A. After mortar is fully hardened, thoroughly clean exposed masonry surfaces of excess mortar and foreign matter; use wood scrapers, stiff-nylon or fiber brushes, and clean water, spray applied at low pressure.
 - 1. Do not use metal scrapers.
 - 2. Use appropriate products by PROSOCO, Inc. or Diedrich Technologies.
- B. Wash adjacent woodwork and other non-masonry surfaces. Use detergent and soft brushes or cloths.
- C. Clean masonry debris from roof; remove debris from gutters and downspouts. Rinse off roof and flush gutters and downspouts.
- D. Sweep and rake adjacent pavement and grounds to remove masonry debris. Where necessary, pressure wash surfaces to remove mortar, dust, dirt and stains.

END OF SECTION

SECTION 06 10 53
MISCELLANEOUS ROUGH CARPENTRY

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the following:

1. Wood blocking, nailers, and miscellaneous wood rough carpentry.

1.3 DEFINITIONS

A. Dimension Lumber: Lumber of 1” inch nominal or greater in thickness but not greater than 12 inches nominal in width.

B. Lumber grading agencies, and the abbreviations used to reference them, include the following:

1. NeLMA: Northeastern Lumber Manufacturers' Association.
2. NHLA: National Hardwood Lumber Association.
3. NLGA: National Lumber Grades Authority.
4. SPIB: The Southern Pine Inspection Bureau.
5. WCLIB: West Coast Lumber Inspection Bureau.
6. WWPA: Western Wood Products Association.

1.4 SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.

1.5 QUALITY ASSURANCE

A. Forest Certification: For the following wood products, provide materials produced from wood obtained from forests certified by an FSC-accredited (Forest Stewardship Council) certification body to comply with FSC 1.2, "Principles and Criteria":

1. Miscellaneous lumber.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Stack lumber flat with spacers between each bundle to provide air circulation. Provide for air circulation around stacks and under coverings.

B. Deliver interior wood materials that are to be exposed to view only after building is enclosed and

weatherproof, wet work other than painting is dry, and HVAC system is operating and maintaining temperature and humidity at occupancy levels.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.

1. Factory mark each piece of lumber with grade stamp of grading agency.
2. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
3. Provide dressed lumber, S4S, unless otherwise indicated.

2.2 WOOD-PRESERVATIVE-TREATED MATERIALS

A. Preservative Treatment by Pressure Process: AWWA C2.

1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.
2. For exposed items indicated to receive a stained or natural finish, use chemical formulations that do not require incising, contain colorants, bleed through, or otherwise adversely affect finishes.

B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or does not comply with requirements for untreated material.

C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

D. Application: Treat items indicated on Drawings, and the following:

1. Wood blocking associated with new construction in contact with masonry and concrete or as otherwise may be required for the complete installation of building products and components forming a part of the Scope of the Work of this Project.

2.3 MISCELLANEOUS LUMBER

A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:

1. Blocking.
2. Nailers.

B. For items of dimension lumber size, provide Construction or No. 2 grade lumber with 15 percent maximum moisture content and any of the following species:

1. Hem-fir (north); NLGA.
2. Mixed southern pine; SPIB.
3. Spruce-pine-fir; NLGA.
4. Hem-fir; WCLIB, or WWPA.
5. Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.
6. Western woods; WCLIB or WWPA.

- 7. Northern species; NLGA.
- 8. Eastern softwoods; NeLMA.

C. For blocking not used for attachment of other construction Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.

D. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.

E. For furring strips for installing plywood or hardboard paneling, select boards with no knots capable of producing bent-over nails and damage to paneling.

2.4 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture.

1. Where carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M or of Type 304 stainless steel.

B. Nails, Brads, and Staples: ASTM F 1667.

C. Power-Driven Fasteners: NES NER-272.

D. Wood Screws: ASME B18.6.1.

E. Screws for Fastening to Cold-Formed Metal Framing: ASTM C 954, except with wafer heads and reamer wings, length as recommended by screw manufacturer for material being fastened.

F. Lag Bolts: ASME B18.2.1.

G. Bolts: Steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washers.

H. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to 6 times the load imposed when installed in unit masonry assemblies and equal to 4 times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing and inspecting agency.

1. Material: Carbon-steel components, zinc plated to comply with ASTM B 633, Class Fe/Zn 5.

2. Material: Stainless steel with bolts and nuts complying with ASTM F 593 and ASTM F 594, Alloy Group 1 or 2.

PART 3 – EXECUTION

3.1 INSTALLATION, GENERAL

A. Set carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit carpentry to

other construction; scribe and cope as needed for accurate fit. Locate nailers, blocking, and similar supports to comply with requirements for attaching other construction.

B. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.

C. Sort and select lumber so that natural characteristics will not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

D. Comply with AWPAC M4 for applying field treatment to cut surfaces of preservative-treated lumber.

1. Use inorganic boron for items that are continuously protected from liquid water.
2. Use copper naphthenate for items not continuously protected from liquid water.

E. Securely attach carpentry work to substrate by anchoring and fastening as indicated, complying with the following:

1. NES NER-272 for power-driven fasteners.
2. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.
3. Table 23-II-B-1, "Nailing Schedule," and Table 23-II-B-2, "Wood Structural Panel Roof Sheathing Nailing Schedule," in ICBO's Uniform Building Code.
4. Table 2305.2, "Fastening Schedule," in BOCA's BOCA National Building Code.
5. Table 2306.1, "Fastening Schedule," in SBCCI's Standard Building Code.

F. Use common wire nails, unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood; do not countersink nail heads, unless otherwise indicated.

3.2 WOOD BLOCKING, AND NAILER INSTALLATION

A. Install where indicated and/or where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.

B. Attach items to substrates to support applied loading in accordance with applicable building codes and/or product manufacturers specifications. Recess bolts and nuts flush with surfaces, unless otherwise indicated.

C. Provide permanent grounds of dressed, pressure-preservative-treated, key-beveled lumber not less than 1-1/2 inches wide and of thickness required to bring face of ground to exact thickness of finish material. Remove temporary grounds when no longer required.

D. Secure shims simultaneously with overlying solid wood nailer. Shim material must be continuous. Spaced shims are not acceptable.

3.3 PROTECTION

A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

B. Protect rough carpentry from weather. If, despite protection, rough carpentry becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA registered

label.

END OF SECTION

SECTION 07 90 05

JOINT SEALERS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Sealants and joint backing.
- B. Precompressed foam sealers.
- C. Hollow gaskets.

1.2 RELATED REQUIREMENTS

- A. Section 01 61 16 - Volatile Organic Compound (VOC) Content Restrictions.
- B. Section 07 84 00 - Firestopping: Firestopping sealants.
- C. Section 08 80 00 - Glazing: Glazing sealants and accessories.

1.3 REFERENCE STANDARDS

- A. ASTM C834 - Standard Specification for Latex Sealants; 2010.
- B. ASTM C 920 - Standard Specification for Elastomeric Joint Sealants; 2010.
- C. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2009.
- D. ASTM D1056 - Standard Specification for Flexible Cellular Materials--Sponge or Expanded Rubber; 2007.
- E. ASTM D 1667 - Standard Specification for Flexible Cellular Materials--Poly(Vinyl Chloride) Foam (Closed-Cell); 2005.
- F. ASTM D2628 - Standard Specification for Preformed Polychloroprene Elastomeric Joint Seals for concrete Pavements; 1991 (Reapproved 2005).

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate the work with other sections referencing this section.

1.5 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data indicating sealant chemical characteristics.
- C. Samples: Submit two samples, 2x2 inch in size illustrating sealant colors for selection.

1.6 QUALITY ASSURANCE

- A. Maintain one copy of each referenced document covering installation requirements on site.
- B. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum five years documented experience.

C. Applicator Qualifications: Company specializing in performing the work of this section with minimum five years experience.

1.7 FIELD CONDITIONS

A. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

1.8 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Correct defective work within a five year period after Date of Substantial Completion.

C. Warranty: Include coverage for installed sealants and accessories which fail to achieve airtight seal, exhibit loss of adhesion or cohesion, or do not cure.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Polyurethane Sealants:

1. Pecora Corporation; Product NR-200 (Dynatrol II (Type I - non-traffic bearing joints) and (Type 2 - NR-200 traffic bearing joints): www.pecora.com.
2. Substitutions: See Section 01 60 00 - Product Requirements.

B. Butyl Sealants:

1. Pecora Corporation; Product Type 3 - BC-158: www.pecora.com.
2. Substitutions: See Section 01 60 00 - Product Requirements.

C. Acrylic Emulsion Latex Sealants:

1. Pecora Corporation; Product Type 4 - AC-20: www.pecora.com.
2. Substitutions: See Section 01 60 00 - Product Requirements.

D. Preformed Compressible Foam Sealers:

1. Sandell Manufacturing Company, Inc: www.sandellmfg.com.
2. Dayton Superior Corporation: www.daytonsuperior.com.
3. Tremco Global Sealants: www.tremcosealants.com.
4. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 SEALANTS

A. Sealants and Primers - General: Provide products having volatile organic compound (VOC) content as specified in Section 01 61 16.

B. Type 1 - General Purpose Exterior Sealant: Polyurethane; ASTM C920, Grade NS, Class 25, Uses M, G, and A; single component.

1. Color: Match adjacent finished surfaces.

2. Applications: Use for:
 - a. Control, expansion, and soft joints in masonry.
 - b. Joints between concrete and other materials.
 - c. Joints between metal frames and other materials.
 - d. Other exterior joints for which no other sealant is indicated.
- C. Type 3 - Exterior Metal Lap Joint Sealant: Butyl or polyisobutylene, nondrying, nonskinning, noncuring.
 1. Applications: Use for:
 - a. Concealed sealant bead in sheet metal work.
 - b. Concealed sealant bead in siding overlaps.
- D. Type 4 - General Purpose Interior Sealant: Acrylic emulsion latex; ASTM C834, Type OP, Grade NF single component, paintable.
 1. Color: Match adjacent finished surfaces.
 2. Applications: Use for:
 - a. Interior wall and ceiling control joints.
 - b. Joints between door and window frames and wall surfaces.
 - c. Other interior joints for which no other type of sealant is indicated.
- E. Type 2 - Butyl Sealant: ASTM C920, Grade NS, Class 12-1/2, Uses NT, M, A, G, O; single component, solvent release, non-skinning, non-sagging.

2.3 ACCESSORIES

- A. Primer: Non-staining type, recommended by sealant manufacturer to suit application.
- B. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.
- C. Joint Backing: Round foam rod compatible with sealant; ASTM D 1667, closed cell PVC; oversized 30 to 50 percent larger than joint width.
- D. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that substrate surfaces are ready to receive work.
- B. Verify that joint backing and release tapes are compatible with sealant.

3.2 PREPARATION

- A. Remove loose materials and foreign matter that could impair adhesion of sealant.

- B. Clean and prime joints in accordance with manufacturer's instructions.
- C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.
- D. Protect elements surrounding the work of this section from damage or disfigurement.

3.3 INSTALLATION

- A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.
- B. Perform installation in accordance with ASTM C1193.
- C. Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer, except where specific dimensions are indicated.
- D. Install bond breaker where joint backing is not used.
- E. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.
- F. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.
- G. Tool joints concave.

3.4 CLEANING

- A. Clean adjacent soiled surfaces.

3.5 PROTECTION

- A. Protect sealants until cured.

END OF SECTION

SECTION 08 51 13
ALUMINUM WINDOWS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Extruded aluminum windows with fixed sash.
- B. Factory glazing.

1.02 RELATED REQUIREMENTS

- A. Not Used
- B. Not Used
- C. Section 06 10 53 - Miscellaneous Rough Carpentry: Wood perimeter shims.
- D. Not Used
- E. Section 07 90 05 - Joint Sealers: Perimeter sealant and back-up materials.
- F. Section 08 80 00 - Glazing.

1.03 REFERENCE STANDARDS

- A. AAMA/WDMA/CSA 101/I.S.2/A440 - Voluntary Specifications for Aluminum, Vinyl (PVC) and Wood Windows and Glass Doors; American Architectural Manufacturers Association; 2008.
- B. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum; American Architectural Manufacturers Association; 1998.
- C. AAMA 1503 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections; American Architectural Manufacturers Association; 2009.
- D. AAMA CW-10 - Care and Handling of Architectural Aluminum From Shop to Site; American Architectural Manufacturers Association; 2004.
- E. ASCE 7 - Minimum Design Loads for Buildings and Other Structures; American Society of Civil Engineers; 2010.
- F. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2007.
- G. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2008.
- H. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes [Metric]; 2007.
- I. ASTM E283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2004.
- J. ASTM E330 - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights Curtain Walls by Uniform Static Air Pressure Difference; 2002 (Reapproved 2010).
- K. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2009).
- L. ASTM E1105 - Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference; 2000 (Reapproved 2008).
- M. ASTM F588 - Standard Test Methods for Measuring the Forced Entry Resistance of Window Assemblies, Excluding Glazing Impact; 2007.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene one week before starting work of this section.

1.05 SUBMITTALS

- A. Not Used
- B. Product Data: Provide component dimensions, information on glass and glazing, internal drainage details, and descriptions of hardware and accessories.

- C. Shop Drawings: Indicate opening dimensions, elevations of different types, framed opening tolerances, method for achieving air and vapor barrier seal to adjacent construction, anchorage locations,, and installation requirements.
- D. Samples: Submit two samples, 12 x 12 inch in size illustrating typical corner construction, accessories, and finishes.
- E. Certificates: Certify that windows meet or exceed specified requirements.
- F. Manufacturer's Installation Instructions: Include complete preparation, installation, and cleaning requirements.

1.06 QUALITY ASSURANCE

- A. Manufacturer and Installer Qualifications: Company specializing in fabrication of commercial aluminum windows of types required, with not fewer than 10 years of experience.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Comply with requirements of AAMA CW-10.
- B. Protect finished surfaces with wrapping paper or strippable coating during installation. Do not use adhesive papers or sprayed coatings that bond to substrate when exposed to sunlight or weather.

1.08 FIELD CONDITIONS

- A. Do not install sealants when ambient temperature is less than 40 degrees F.
- B. Maintain this minimum temperature during and 24 hours after installation of sealants.

1.09 WARRANTY

- A. See Section 01 77 19 - Closeout Requirements, for additional warranty requirements.
- B. Correct defective Work within a five year period after Date of Substantial Completion.
- C. Provide five year manufacturer warranty against failure of glass seal on insulating glass units, including interpane dusting or misting. Include provision for replacement of failed units.
- D. Provide five year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Basis of Design: See below under description of products.
- B. Basis of Design: Kawneer; Product TRIFAB VG 451T.
- C. Aluminum Windows:
 - 1. YKK AP America Inc: www.ykkap.com.
 - 2. Peerless Products, Inc: www.peerlessproducts.com.
 - 3. Wausau Window and Wall Systems: www.wausauwindow.com.
 - 4. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 WINDOWS

- A. Windows: Tubular aluminum sections, factory fabricated, factory finished, thermally broken, vision glass, related flashings, anchorage and attachment devices.
 - 1. Frame Depth: 4 1/2".
 - 2. Air Infiltration: Limit air infiltration through assembly to .06 cu ft/min/sq ft of wall area, measured at a specified differential pressure across assembly in accordance with ASTM E283.
 - 3. Water Infiltration Test Pressure Differential: 8 pounds per square foot.
 - 4. Thermal Movement: Resists thermal movement caused by 180 degrees F surface temperature without buckling stress on glass, joint seal failure, damaging loads on structural elements, damaging loads on fasteners, reduction in performance or other detrimental effects.
 - 5. Condensation Resistance Factor: .69 minimum.
 - 6. Overall U-value, Including Glazing: .47, maximum.
 - 7. Acoustical Performance: ASTM E90 and E 1332; STC 31 and OITC 31 (fixed).
 - 8. Life Cycle Requirements: No damage to fasteners, hardware parts or other components that would

render operable windows in operable and not reduction in air and water infiltration resistance when tested according to AAMA 910.

- B. Performance Requirements:
 - 1. Design and size windows to withstand the following load requirements, when tested in accordance with ASTM E330 using test loads equal to 1.5 times the design wind loads with 10 second duration of maximum load:
 - a. Design Wind Loads: Comply with requirements of ASCE 7.
 - b. Positive Design Wind Load: 20 lbf/sq ft.
 - c. Negative Design Wind Load: 20 lbf/sq ft.
 - d. Member Deflection: Limit member deflection to flexure limit of glass in any direction, with full recovery of glazing materials.
 - 2. Movement: Accommodate movement between window and perimeter framing and deflection of lintel, without damage to components or deterioration of seals.
 - 3. Air Infiltration Test Pressure Differential: 6.24 pounds per square inch.
 - 4. Condensation Resistance Factor: Measured in accordance with AAMA 1503.
 - 5. Water Leakage: None, when measured in accordance with ASTM E331 and E 547.
 - 6. Air and Vapor Seal: Maintain continuous air barrier and vapor retarder throughout assembly.
 - 7. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, or migrating moisture occurring within system.
- C. Fixed, Non-Operable Type:
 - 1. Construction: Thermally broken.
 - 2. Glazing: Double; tinted (color TBD), insulated above ground floor, Double tinted (color TBD) laminated, insulated on ground floor.
 - 3. Exterior Finish: As selected by Architect
 - 4. Interior Finish: As selected by Architect
- 2.03 COMPONENTS
 - A. Frames: 2 inch wide x 4 1/2 inch deep profile, thermally broken with interior portion of frame insulated from exterior portion; flush glass stops of snap-on type.
 - B. Sills: extruded aluminum; sloped for positive wash; fit under sash leg to 1/2 inch beyond wall face; one piece full width of opening jamb angles to terminate sill end.
- 2.04 MATERIALS
 - A. Extruded Aluminum: ASTM B221 (ASTM B221M), 6063 alloy, T6 temper.
- 2.05 FABRICATION
 - A. Fabricate components with smallest possible clearances and shim spacing around perimeter of assembly that will enable window installation and dynamic movement of perimeter seal.
 - B. Accurately fit and secure joints and corners. Make joints flush, hairline, and weatherproof.
 - C. Prepare components to receive anchor devices.
 - D. Arrange fasteners and attachments to ensure concealment from view.
 - E. Provide steel internal reinforcement in mullions as required to meet loading requirements.
 - F. Provide internal drainage of glazing spaces to exterior through weep holes.
 - G. Factory glaze window units.
- 2.06 FINISHES
 - A. Class I Color Anodized Finish or Anodized Plus Color Anodized 2-step Finish:
 - 1. Class I Color Anodized Finish: AAMA 611 AA-M12C22A42 Integrally colored anodic coating not less than 0.7 mils thick; clear anodized.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that wall openings and adjoining air and vapor seal materials are ready to receive aluminum windows.
- 3.02 INSTALLATION
- A. Install windows in accordance with manufacturer's instructions.
 - B. Install window assembly in accordance with AAMA/WDMA/CSA 101/I.S.2/A440.
 - C. Attach window frame and shims to perimeter opening to accommodate construction tolerances and other irregularities.
 - D. Align window plumb and level, free of warp or twist. Maintain dimensional tolerances and alignment with adjacent work.
 - E. Install sill and sill end angles.
 - F. Provide thermal isolation where components penetrate or disrupt building insulation. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
 - G. Coordinate attachment and seal of perimeter air barrier and vapor retarder materials.
- 3.03 TOLERANCES
- A. Maximum Variation from Level or Plumb: 1/16 inches every 3 ft non-cumulative or 1/8 inches per 10 ft, whichever is less.
- 3.04 CLEANING
- A. Remove protective material from factory finished aluminum surfaces.
 - B. Wash surfaces by method recommended and acceptable to sealant and window manufacturer; rinse and wipe surfaces clean.
 - C. Remove excess sealant by moderate use of mineral spirits or other solvent acceptable to sealant and window manufacturer.

END OF SECTION

SECTION 08 80 00
GLAZING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Glass.
- B. Glazing compounds and accessories.

1.02 RELATED REQUIREMENTS

- A. Not Used
- B. Section 07 90 05 - Joint Sealers: Sealant and back-up material.
- C. Not Used
- D. Not Used
- E. Section 08 51 13 - Aluminum Windows: Glazed windows.

1.03 REFERENCE STANDARDS

- A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; current edition.
- B. ANSI Z97.1 - American National Standard for Safety Glazing Materials Used in Buildings, Safety Performance Specifications and Methods of Test; 2009.
- C. ASCE 7 - Minimum Design Loads for Buildings and Other Structures; 2010.
- D. ASTM C864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers; 2005.
- E. ASTM C 920 - Standard Specification for Elastomeric Joint Sealants; 2010.
- F. ASTM C1036 - Standard Specification for Flat Glass; 2006.
- G. ASTM C1048 - Standard Specification for Heat-Treated Flat Glass--Kind HS, Kind FT Coated and Uncoated Glass; 2004.
- H. ASTM C 1172 - Standard Specification for Laminated Architectural Flat Glass; 2009.
- I. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2009.
- J. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2010.
- K. ASTM E1300 - Standard Practice for Determining Load Resistance of Glass in Buildings; 2009a.
- L. ASTM E 2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation; 2008.
- M. GANA (GM) - GANA Glazing Manual; Glass Association of North America; 2009.
- N. GANA (SM) - FGMA Sealant Manual; Glass Association of North America; 2008.
- O. GANA (LGDG) - Laminated Glazing Reference Manual; Glass Association of North America; 2009.
- P. SIGMA TM-3000 - Glazing Guidelines for Sealed Insulating Glass Units; Sealed Insulating Glass Manufacturers Association; 2004.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by all affected installers.

1.05 SUBMITTALS

- A. Not Used
- B. Product Data on Glass Types: Provide structural, physical and environmental characteristics, size limitations, special handling or installation requirements.
- C. Product Data on Glazing Compounds: Provide chemical, functional, and environmental characteristics, limitations, special application requirements. Identify available colors.
- D. Samples: Submit two samples 12x12 inch in size of glass units, showing coloration and design.
- E. Certificates: Certify that products meet or exceed specified requirements.
- F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. See Section 01 77 19 - Closeout Requirements, for additional provisions.

1.06 QUALITY ASSURANCE

- A. Perform Work in accordance with GANA Glazing Manual and FGMA Sealant Manual for glazing installation methods.
- B. Installer Qualifications: Company specializing in performing the work of this section with minimum 5 years documented experience.
- 1.07 FIELD CONDITIONS
 - A. Do not install glazing when ambient temperature is less than 50 degrees F.
 - B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.
- 1.08 WARRANTY
 - A. See Section 01 77 19 - Closeout Requirements, for additional warranty requirements.
 - B. Sealed Insulating Glass Units: Provide a five (5) year warranty to include coverage for seal failure, interpane dusting or misting, including replacement of failed units.
 - C. Laminated Glass: Provide a five (5) year warranty to include coverage for delamination, including replacement of failed units.
- PART 2 PRODUCTS
- 2.01 Not Used
- 2.02 EXTERIOR GLAZING ASSEMBLIES
 - A. Not Used
 - B. 1" Tinted Insulated Glass
 - 1. Exterior: 1/4" Tinted
 - 2. Spacer: 1/2"
 - 3. Interior: 1/4" Clear
 - C. Structural Design Criteria: Select type and thickness to withstand dead loads and wind loads acting normal to plane of glass at design pressures calculated in accordance with IBC 2006 code.
 - 1. Use the procedure specified in ASTM E1300 to determine glass type and thickness.
 - 2. Limit glass deflection to 1/200 or flexure limit of glass, whichever is less, with full recovery of glazing materials.
 - 3. Thicknesses listed are minimum.
 - D. Air and Vapor Seals: Provide completed assemblies that maintain continuity of building enclosure vapor retarder and air barrier:
 - 1. In conjunction with vapor retarder and joint sealer materials described in other sections.
 - 2. To utilize the inner pane of multiple pane sealed units for the continuity of the air barrier and vapor retarder seal.
 - 3. To maintain a continuous air barrier and vapor retarder throughout the glazed assembly from glass pane to heel bead of glazing sealant.
- 2.03 GLASS MATERIALS
 - A. Float Glass Manufacturers:
 - 1. AGC Flat Glass North America, Inc: www.afgglass.com.
 - 2. Guardian Industries Corp: www.sunguardglass.com.
 - 3. Pilkington North America Inc: www.pilkington.com/na.
 - 4. PPG Industries, Inc: www.ppgglazing.com.
 - 5. Substitutions: Refer to Section 01 60 00 - Product Requirements.
 - B. Float Glass: All glazing is to be float glass unless otherwise indicated.
 - 1. Annealed Type: ASTM C1036, Type I, transparent flat, Class 1 clear, Quality Q3 (glazing select).
 - 2. Heat-Strengthened and Fully Tempered Types: ASTM C1048.
 - 3. Tinted Types: Color and performance characteristics as indicated.

4. Thicknesses: As indicated; for exterior glazing comply with specified requirements for wind load design regardless of specified thickness.

2.04 SEALED INSULATING GLASS UNITS

A. Manufacturers:

1. Any of the manufacturers specified for float glass.
2. Substitutions: Refer to Section 01 60 00 - Product Requirements.

B. Sealed Insulating Glass Units: Types as indicated.

1. Locations: Exterior, except as otherwise indicated.
2. Durability: Certified by an independent testing agency to comply with ASTM E2190.
3. Edge Spacers: Aluminum, bent and soldered corners.
4. Edge Seal: Glass to elastomer with supplementary silicone sealant.
5. Purge interpane space with dry hermetic air.

2.05 GLAZING COMPOUNDS

A. Manufacturers:

1. Bostik Inc: www.bostik-us.com.
2. Momentive Performance Materials, Inc (formerly GE Silicones): www.momentive.com.
3. Pecora Corporation: www.pecora.com.
4. BASF Construction Chemicals-Building Systems: www.chemrex.com.
5. Substitutions: Refer to Section 01 60 00 - Product Requirements.

B. Glazing Putty: Polymer modified latex recommended by manufacturer for outdoor use, knife grade consistency; TBD color.

C. Butyl Sealant: Single component; ASTM C 920, Grade NS, Class 12-1/2, Uses M and A; Shore A hardness of 10 to 20; submit manufacturer's color chart; non-skinning.

D. Acrylic Sealant: Single component, solvent curing, non-bleeding; ASTM C 920, Type S, Grade NS, Class 12-1/2, Uses M and A; cured Shore A hardness of 15 to 25; TBD color.

E. Silicone Sealant: Single component; neutral curing; capable of water immersion without loss of properties; non-bleeding, non-staining; ASTM C 920, Type S, Grade NS, Class 25, Uses M, A, and G; cured Shore A hardness of 15 to 25; TBD color.

2.06 GLAZING ACCESSORIES

A. Setting Blocks: Neoprene, 80 to 90 Shore A durometer hardness, ASTM C 864 Option I. Length of 0.1 inch for each square foot of glazing or minimum 4 inch x width of glazing rabbet space minus 1/16 inch x height to suit glazing method and pane weight and area.

B. Spacer Shims: Neoprene, 50 to 60 Shore A durometer hardness, ASTM C 864 Option I. Minimum 3 inch long x one half the height of the glazing stop x thickness to suit application, self adhesive on one face.

C. Glazing Gaskets: Resilient silicone extruded shape to suit glazing channel retaining slot; ASTM C 864 Option I; match window frame color.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that openings for glazing are correctly sized and within tolerance.
- B. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and ready to receive glazing.

3.02 PREPARATION

- A. Clean contact surfaces with solvent and wipe dry.
- B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.
- C. Prime surfaces scheduled to receive sealant.
- D. Install sealants in accordance with ASTM C1193 and FGMA Sealant Manual.
- E. Install sealant in accordance with manufacturer's instructions.

3.03 GLAZING METHODS

3.04 INSTALLATION - EXTERIOR/INTERIOR DRY METHOD (GASKET GLAZING)

- A. Place setting blocks at 1/4 points with edge block no more than 6 inches from corners.
- B. Rest glazing on setting blocks and push against fixed stop with sufficient pressure on gasket to attain full contact.
- C. Install removable stops without displacing glazing gasket; exert pressure for full continuous contact.

3.05 CLEANING

- A. Remove glazing materials from finish surfaces.
- B. Remove labels after Work is complete.
- C. Clean glass and adjacent surfaces.

3.06 PROTECTION

- A. After installation, mark pane with an 'X' by using removable plastic tape or paste; do not mark heat absorbing or reflective glass units.

END OF SECTION

SECTION 09 90 00
PAINTING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Surface preparation.
- B. Field application of paints, stains, and other coatings.

1.02 RELATED REQUIREMENTS

- A. Section 04 22 00 - Concrete Unit Masonry
- B. Section 05 50 00 - Metal Fabrications: Shop-primed items.
- C. Section 05 51 00 - Metal Stairs: Shop-primed items.
- D. Section 05 52 13 - Pipe and Tube Railings

1.03 DEFINITIONS

- A. Conform to ASTM D16 for interpretation of terms used in this section.

1.04 REFERENCE STANDARDS

- A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; current edition.
- B. ASTM D 16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications; 2003.
- C. ASTM D 4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Base Materials; 1992 (Reapproved 2003).

1.05 DEFINITIONS

- A. Conform to ASTM D 16 for interpretation of terms used in this section.

1.06 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on all finishing products, including VOC content.
- C. Samples: Submit two paper chip samples, 6 x 6 in size illustrating range of colors and textures available for each surface finishing product scheduled.

1.07 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years experience.
- B. Applicator Qualifications: Company specializing in performing the work of this section with minimum 3 years experience.

1.08 REGULATORY REQUIREMENTS

- A. Conform to applicable code for flame and smoke rating requirements for products and finishes.

1.09 MOCK-UP

- A. See Section 01 40 00 - Quality Requirements, for general requirements for mock-up.
- B. Provide panel, 4 feet long by 4 feet wide, illustrating coating color, texture, and finish.
- C. Provide door and frame assembly illustrating paint coating color, texture, and finish.
- D. Mock-up may remain as part of the Work.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.
- B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
- C. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

1.11 ENVIRONMENTAL REQUIREMENTS

- A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.
- B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.
- C. Do not apply exterior coatings during rain or snow, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.
- D. Minimum Application Temperatures for Latex Paints: 45 degrees F for interiors; 50 degrees F for exterior; unless required otherwise by manufacturer's instructions.
- E. Minimum Application Temperature for Varnish Finishes: 65 degrees F for interior or exterior, unless required otherwise by manufacturer's instructions.
- F. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

1.12 EXTRA MATERIALS

- A. See Section 01 60 00 - Product Requirements, for additional provisions.
- B. Supply 1 gallon of each color; store where directed.
- C. Label each container with color in addition to the manufacturer's label.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Provide all paint and coating products used in any individual system from the same manufacturer; no exceptions.
- B. Provide all paint and coating products from the same manufacturer.
- C. Listed Below
 - 1. Base Manufacturer: Porter Paints.
- D. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 PAINTS AND COATINGS - GENERAL

- A. Paints and Coatings: Ready mixed, except field-catalyzed coatings. Prepare pigments:
 - 1. To a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating.
- B. Volatile Organic Compound (VOC) Content:
 - 1. Provide coatings that comply with the most stringent requirements specified in the following:
 - a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
 - 2. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.

2.03 PAINT SYSTEMS - EXTERIOR

- A. Paint - Wood, Opaque, Latex, 3 Coat:
 - 1. One coat: Porter ACRI-PRO 100 Acrylic Primer 33
 - a. Pittsburgh Paints Speedhide Ext Acrylic Primer 6-609
 - b. Sherwin Williams A-100 Exterior Latex Wood Primer B42.
 - c. Benjamin Moore Moorcraft Super Spec 169.
 - d. Farrell Calhoun 100% Acrylic Exterior Latex Undercoater 235.
 - 2. Two coats: Porter ACRI-PRO 100 semi-gloss Acrylic 6029 Series.
 - a. Pittsburgh Paints Speedhide Ext. Semi-Gloss Latex 6-900
 - b. Sherwin Williams A-100 Exterior Latex Gloss A8W16.
 - c. Benjamin Moore Moorcraft Superspec Latex 170.

- d. Farrell Calhoun Wood Craft Satin House Paint 2200 Series.
- B. Paint - Masonry/Concrete, Latex, 3 Coat:
 - 1. One coat: Porter ACRI-FIL Acrylic Block Filler 896 Series.
 - a. Pittsburgh Paints Speedhide Acrylic Block Filler 6-15
 - b. Sherwin Williams Heavy Duty Block Filler B42W46.
 - c. Benjamin Moore Moorcraft Int./Ext. Filler 173
 - d. Farrell Calhoun Interior/Exterior High Solids Block Filler 470.
 - 2. Two coats: Porter ACRI-PRO 100 Semi-gloss Acrylic 6029 Series.
 - a. Pittsburgh Paints Speedhide Ext. Semi-Gloss Latex 6-900
 - b. Sherwin Williams A-100 Exterior Latex Gloss A8W16.
 - c. Benjamin Moore Moorcraft Superspec Latex 170.
 - d. Farrell Calhoun Wood Craft Satin House Paint 2200 Series.
- C. Paint - Gypsum Board Plaster, Latex, 3 Coat:
 - 1. One coat: Porter ACRI-PRO 100 Acrylic Primer 335
 - a. Pittsburgh Paints Speedhide Ext Acrylic Primer 6-609
 - 2. Two coats: Porter ACRI-PRO 100 Semi-gloss Acrylic 6029 Series
 - a. Pittsburgh Paints Speedhide Ext. Semi-Gloss Latex 6-900
 - b. Sherwin Williams A-100 Exterior Latex Gloss A8W16.
 - c. Benjamin Moore Moorcraft Superspec Latex 170.
 - d. Farrell Calhoun Wood Craft Satin House Paint 2200 Series.
- D. Paint - Ferrous Metals, Unprimed, Alkyd, 3 Coat:
 - 1. One coat: Porter Guard Alkyd Metal Primer 272/276 Series
 - a. Pittsburgh Paints Speedhide Alkyd Metal Primer 6-208
 - b. Sherwin Williams Kromik Metal Primer B50.
 - c. Benjamin Moore Ironclad Alkyd 163.
 - d. Farrell Calhoun Tuff Boy Rust Stop Metal Primer 1024.
 - 2. Two coats: Porter Guard Fast Dry Alkyd Enamel 2749 Series
 - a. Pittsburgh Paints Speedhide Alkyd Gloss Enamel 6-282
 - b. Sherwin Williams Industrial Enamel B54 Series.
 - c. Benjamin Moore Impervo Alkyd High Gloss 133.
 - d. Farrell Calhoun Tuff Boy Interior/Exterior Gloss Industrial Enamel 800 Line.
- E. Paint - Ferrous Metals, Primed, Alkyd, 2 Coat:
 - 1. Touch-up with one coat: Porter Guard Alkyd Metal Primer 272/276 Series
 - a. Pittsburgh Paints Speedhide Alkyd Metal Primer 6-208
 - b. Sherwin Williams Kromik Metal Primer B50.
 - c. Benjamin Moore Ironclad Alkyd 163.
 - d. Farrell Calhoun Tuff Boy Rust Stop Metal Primer 1024.
 - 2. Two Coats: Porter Guard Fast Dry Alkyd Enamel 2749 Series
 - a. Pittsburgh Paints Speedhide Alkyd Gloss Enamel
 - b. Sherwin Williams Industrial Enamel B54 Series.
 - c. Benjamin Moore Impervo Alkyd High Gloss 133.
 - d. Farrell Calhoun Tuff Boy Interior/Exterior Gloss Industrial Enamel 800 Line.
- F. Paint - Galvanized Metals, Alkyd, 3 Coat:
 - 1. One coat Porter Guard Galvanized Metal Primer 290 Series.
 - a. Pittsburgh Paints Speedhide Galvanized Metal Primer 6-209
 - b. Sherwin Williams Pro-Cryl B66 Series
 - c. Benjamin Moore Universal Metal Primer M07.

- d. Farrell Calhoun 100% Acrylic Latex Undercoater 699.
- 2. Two coats: Porter Guard Fast Dry Alkyd Enamel 2749 Series
 - a. Pittsburgh Paints Speedhide Alkyd Gloss Enamel 6-282
 - b. Sherwin Williams Industrial Enamel B54 Series.
 - c. Benjamin Moore Impervo Alkyd High Gloss 133.
 - d. Farrell Calhoun Tuff Boy Interior/Exterior Gloss Industrial Enamel 800 Line.
- G. Paint - Fiberglass, Alkyd, 2 Coat:
 - 1. Factory Primed
 - 2. Two coats: Porter Guard Fast Dry Alkyd Enamel 2749 Series
 - a. Pittsburgh Paints Speedhide Alkyd Gloss Enamel 6-282
 - b. Sherwin Williams Industrial Enamel B54 Series.
 - c. Benjamin Moore Impervo Alkyd High Gloss 133.
 - d. Farrell Calhoun Tuff Boy Interior/Exterior Gloss Industrial Enamel 800 Line.
- H. Paint - Pavement Marking Paint:
 - 1. Two coats: Porter Traffic Marking Paint 1418 Series[<>]
 - a. Pittsburgh Paints Speedhide Zone Marking Paints 11-3 Series
 - b. Sherwin Williams Setfast Alkyd A300.
 - c. Benjamin Moore Safety & Zone Marking Alkyd M56.
 - d. Farrell Calhoun Tuff Boy Zone Marking Paint 1031 LF.
- 2.04 PAINT SYSTEMS - INTERIOR
 - A. Paint - Wood, Opaque, Alkyd, 3 Coat:
 - 1. One coat: Porter Glyptex Alkyd Pigmented Sealer 135 Series
 - a. Pittsburgh Paints Seal Grip Alkyd Enamel Undercoater 17-956
 - b. Sherwin Williams ProBlock Alkyd Primer B49W820.
 - c. Benjamin Moore Fresh Start Alkyd Enamel Underbody 217.
 - d. Farrell Calhoun Enamel Undercoater 599.
 - 2. Two coats: Porter Glyptex Alkyd Enamel 439 Series
 - a. Pittsburgh Paints Manor Hall Interior Pearl Alkyd 28 Series
 - b. Sherwin Williams ProClassic Interior Alkyd Satin B33.
 - c. Benjamin Moore Dulamel Eggshell Enamel C305.
 - d. Farrell Calhoun Interior Semi-Gloss Alkyd 500 Line.
 - B. Paint - Wood, Transparent, Urethane Varnish, No Stain:
 - 1. Self Priming. Do not use sanding sealer.
 - 2. Two coats self priming; Porter Wood Guardian Satin Urethane Varnish 316
 - a. Pittsburgh Paints Rez Interior Satin Polyurethane 77-89
 - b. Sherwin Williams Wood Classics Polyurethane Varnish A67 Series.
 - c. Benjamin Moore Benwood Polyurethane Finish Low Lustre C435.
 - d. Farrell Calhoun Wood Kraft Polyurethane Varnish 1122.
 - C. Paint - Wood, Transparent, Urethane Varnish, Stain:
 - 1. Filler coat (for open grained wood only).
 - 2. Two coats; Porter Wood Guardian Interior Oil Stain 300 Series
 - a. Pittsburgh Paints Rez Interior Oil Stain 77-560
 - b. Sherwin Williams Wood Classics Interior Oil Stain A49 Series.
 - c. Benjamin Moore Benwood Penetrating Stain 234.
 - d. Farrell Calhoun Wood Kraft Penetrating Wiping Stains 1110/1400 Line.
 - 3. Two coats Porter Wood Guardian Satin 316;
 - a. Pittsburgh Paints Rez Interior Satin Polyurethane 77-89

- b. Sherwin Williams Wood Classics Polyurethane Varnish A67 Series.
- c. Benjamin Moore Benwood Polyurethane Finish Low Lustre C435.
- d. Farrell Calhoun Wood Kraft Polyurethane Varnish 1122.
- D. Paint - Concrete/Masonry, Latex, 3 Coat:
 - 1. One coat: Porter ACRI-FIL Acrylic Block Filler 896 Series
 - a. Pittsburgh Paints Speedhide Acrylic Block Filler 6-15
 - b. Sherwin Williams Heavy Duty Block Filler B42W46.
 - c. Benjamin Moore Moorcraft Int/Ext Filler 173.
 - d. Farrell Calhoun Interior/Exterior High Solids Block Filler 470.
 - 2. Two coats: Porter Silken Touch Eggshell 999 series
 - a. Pittsburgh Paints Manor Hall 89-6
 - b. Sherwin Williams Super Paint A87 Series.
 - c. Benjamin Moore Regal Eggshell Finish 319.
 - d. Farrell Calhoun Interior Premium Eggshell Latex 370 Series.
- E. Paint - Ferrous Metals, Unprimed, Alkyd, 3 Coat:
 - 1. One coat: Porter Guard Alkyd Metal Primer 272/276 Series
 - a. Pittsburgh Paints Speedhide Alkyd Metal Primer 6-208
 - b. Sherwin Williams Kromik Metal Primer B50
 - c. Benjamin Moore Ironclad Alkyd 163.
 - d. Farrell Calhoun Tuff Boy Rust Stop Metal Primer 1024.
 - 2. Two coats: Porter Glyptex Urethane Gloss Enamel 4139 Series
 - a. Pittsburgh Paints Speedhide Alkyd Gloss Enamel 6-282
 - b. Sherwin Williams All Surface Enamel A11 Series.
 - c. Benjamin Moore Urethane Alkyd Gloss M22.
 - d. Farrell Calhoun Interior High Gloss Alkyd Enamel 580 Series.
- F. Paint - Ferrous Metals, Primed, Alkyd, 2 Coat:
 - 1. Touch-up with One coat: Porter Guard Alkyd Metal Primer 272/276 Series.
 - a. Pittsburgh Paints Speedhide Alkyd Metal Primer 6-208
 - b. Sherwin Williams Kromik Metal Primer E41.
 - c. Benjamin Moore Ironclad Alkyd 163.
 - d. Farrell Calhoun Tuff Boy Rust Stop Metal Primer 1024.
 - 2. Two coats: Porter Glyptex Urethane Gloss Enamel 4139 Series
 - a. Pittsburgh Paints Speedhide Alkyd Gloss Enamel 6-282
 - b. Sherwin Williams All Surface Enamel A11 Series.
 - c. Benjamin Moore Urethane Alkyd Gloss M22.
 - d. Farrell Calhoun Interior High Gloss Alkyd Enamel 580 Series.
- G. Paint - Galvanized Metals, Alkyd, 3 Coat:
 - 1. One coat: Porter Guard Galvanized Metal Primer 290 Series.
 - a. Pittsburgh Paints Speedhide Galvanized Metal Primer 6-209
 - b. Sherwin Williams Galvite HS B50.
 - c. Benjamin Moore Universal Metal Primer M07.
 - d. Farrell Calhoun 100% Acrylic Latex Undercoater 699.
 - 2. Two coats: Porter Glyptex Urethane Gloss Enamel 4139 Series
 - a. Pittsburgh Paints Speedhide Alkyd Gloss Enamel 6-282
 - b. Sherwin Williams All Surface Enamel A11 Series.
 - c. Benjamin Moore Urethane Alkyd Gloss M22.
 - d. Farrell Calhoun Interior High Gloss Alkyd Enamel 580 Series.

- H. Paint - Gypsum Board/Plaster, Latex, 3 Coat: To be 100% Acrylic (Chapel, Dayroom, Dining Room, Classrooms, Conference, TV, Barber, Library and All Dorm Rooms)
 - 1. One Coat: Farrell Calhoun Perfik-Seal Interior Latex Primer/Sealer 380
 - 2. Two Coats: Farrell Calhoun Premium 100% Acrylic Interior 2K Latex SG Epoxy 1200-WB
- I. Paint - Gypsum Board/Plaster, Latex, 3 Coat: (All other walls except wet areas)
 - 1. One coat: Porter Blankit Primer 1129 Series
 - a. Pittsburgh Paints Speedhide Latex Primer 6-2
 - b. Sherwin Williams Prep-Rite Classic Primer B28.
 - c. Benjamin Moore SuperSpec Undercoater & Primer/Sealer 253.
 - d. Farrell Calhoun Waterborne 100% Acrylic Enamel Undercoater 699.
 - 2. Two coats; Porter Silken Touch Eggshell 999 series.
 - a. Pittsburgh Paints Manor Hall Eggshell 89-6
 - b. Sherwin Williams Super Paint A87 Series.
 - c. Benjamin Moore Regal Eggshell Finish 319.
 - d. Farrell Calhoun Interior Premium Eggshell Latex 370 Series.
- J. Paint - Gypsum Board/Plaster Latex 3 Coat (All ceilings except wet areas).
 - 1. One coat: Porter Blankit Primer 1129 Series
 - a. Pittsburgh Paints Speedhide Latex Primer 6-2
 - b. Sherwin Williams Prep-Rite Classic Primer B28.
 - c. Benjamin Moore SuperSpec Undercoater & Primer/Sealer 253.
 - d. Farrell Calhoun Waterborne 100% Acrylic Enamel Undercoater 699.
 - 2. Two coats: Porter Ceiling Paint 977 Series
 - a. Pittsburgh Paints Premium Ceiling Paint 17-45
 - b. Sherwin Williams Classic 99 Flat Ceiling Paint A27.
 - c. Benjamin Moore Muresco Ceiling White 258.
 - d. Farrell Calhoun Interior Premium Flat Latex Wall Paint 300 Line.
- K. Paint - Gypsum Board/Plaster, Latex, 3 coat, (Wet areas toilet room walls, kitchen, laundry, ceiling areas except Shower walls and ceilings).
 - 1. One coat: Porter Blankit Primer 1129 Series
 - a. Pittsburgh Paints Seal Grip Acrylic Primer 17-921
 - b. Sherwin Williams Prep-Rite Primer B28.
 - c. Benjamin Moore SuperSpec Undercoater & Primer/Sealer 253.
 - d. Farrell Calhoun Waterborne 100% Acrylic Enamel Undercoater 699.
 - 2. Two coats: Porterguard WB Acrylic Epoxy Semi-gloss 9549S
 - a. Pittsburgh Paints Pitt Glaze Acrylic Epoxy 16-551
 - b. Sherwin Williams Water-Based Catalyzed Epoxy B70 Series.
 - c. Benjamin Moore Moorecraft Super Spec Acrylic Epoxy 256.
 - d. Farrell Calhoun 100% Acrylic Waterborne Epoxy 1200 WB.
- L. Paint - Hollow Metal Doors and Frames
 - 1. One coat: Porter Guard Alkyd Metal Primer 272/276 Series
 - a. Pittsburgh Paints Speedhide Alkyd Metal Primer 6-208
 - b. Sherwin Williams Kromik Metal Primer B50.
 - c. Benjamin Moore Ironclad Alkyd 163.
 - d. Farrell Calhoun Tuff Boy Rust Stop Metal Primer 1024.
 - 2. Two coats: Porter Glyptex Alkyd Enamel 439 Series
 - a. Pittsburgh Paints Manor Hall Interior Pearl Alkyd 28 Series
 - b. Sherwin Williams Industrial Enamel B54 Series.

- c. Benjamin Moore Dulamel Eggshell Enamel C305.
- d. Farrell Calhoun Interior Semi-Gloss Alkyd 500 Line.
- M. Paint - Painted Concrete Floors
 - 1. Three Coats Porter Glyptex Urethane Gloss Enamel (Self-priming)
 - a. Pittsburgh Paints Speedhide Alkyd Gloss Enamel 6-282
 - b. Sherwin Williams Industrial Enamel B54 Series.
 - c. Benjamin Moore Urethane Alkyd Gloss M22.
 - d. Farrell Calhoun Tuff Boy Int/Ext Floor & Deck Gloss Enamel 700 Line.
- N. Sealer for Concrete floors (Only for areas not receiving any other finish).
 - 1. Approved Products to be installed in accordance with manufacturer's instructions.
 - a. Dur-a-flex "Cryl-a-Glaze G201" Acrylic sealer
 - b. Tamms Industries "Clear Seal 300" Acrylic sealer
 - c. Substitutions: See Section 01 60 00 - Product Requirements
- 2.05 Paint Systems - Showers
 - A. Manufacturers
 - 1. Dudick: www.dudick.com
 - 2. Dur-A-Flex, Inc.: 800-253-3539, 95 Goodwin St. East Hartford, CT 06108, www.dur-a-flex.com
 - B. Epoxy for Shower Floors and Integral Base
 - 1. Dudick Steri-Quartz B
 - a. 1/16" Seamless Floor with Standard Texture Coefficient of Friction Wet >1.0
 - b. Install per manufacturer's recommendations.
 - c. Color to be selected by Architect.
 - C. Epoxy for Shower Walls and Ceiling
 - 1. Dudick Steri-Seal HB
 - a. 30-40 mil 100% Solids high build chemically resistant epoxy coating
 - b. Install per manufacturer's recommendations.
 - c. Color to be selected by Architect.
- 2.06 ACCESSORY MATERIALS
 - A. Accessory Materials: Linseed oil, shellac, turpentine, paint thinners and other materials not specifically indicated but required to achieve the finishes specified; commercial quality.
 - B. Patching Material: Latex filler.
 - C. Fastener Head Cover Material: Latex filler.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Do not begin application of coatings until substrates have been properly prepared.
- B. Verify that surfaces are ready to receive Work as instructed by the product manufacturer.
- C. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.
- D. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- E. Test shop-applied primer for compatibility with subsequent cover materials.
- F. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
 - 1. Plaster and Gypsum Wallboard: 12 percent.

2. Plaster and Stucco: 12 percent.
 3. Masonry, Concrete, and Concrete Unit Masonry: 12 percent.
 4. Interior Wood: 15 percent, measured in accordance with ASTM D4442.
 5. Exterior Wood: 15 percent, measured in accordance with ASTM D4442.
 6. Concrete Floors: 8 percent.
- 3.02 PREPARATION
- A. Clean surfaces thoroughly and correct defects prior to coating application.
 - B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
 - C. Remove or repair existing coatings that exhibit surface defects.
 - D. Surface Appurtenances: Remove or mask electrical plates, hardware, light fixture trim, escutcheons, and fittings prior to preparing surfaces or finishing.
 - E. Surfaces: Correct defects and clean surfaces which affect work of this section. Remove or repair existing coatings that exhibit surface defects.
 - F. Marks: Seal with shellac those which may bleed through surface finishes.
 - G. Impervious Surfaces: Remove mildew by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.
 - H. Concrete and Unit Masonry Surfaces to be Painted: Remove dirt, loose mortar, scale, salt or alkali powder, and other foreign matter. Remove oil and grease with a solution of tri-sodium phosphate; rinse well and allow to dry. Remove stains caused by weathering of corroding metals with a solution of sodium metasilicate after thoroughly wetting with water. Allow to dry.
 - I. Gypsum Board Surfaces to be Painted: Fill minor defects with filler compound. Spot prime defects after repair.
 - J. Plaster Surfaces to be Painted: Fill hairline cracks, small holes, and imperfections with latex patching plaster. Make smooth and flush with adjacent surfaces. Wash and neutralize high alkali surfaces.
 - K. Asphalt, Creosote, or Bituminous Surfaces to be Painted: Remove foreign particles to permit adhesion of finishing materials. Apply latex based sealer or primer.
 - L. Insulated Coverings to be Painted: Remove dirt, grease, and oil from canvas and cotton.
 - M. Concrete Floors to be Painted: Remove contamination, acid etch, and rinse floors with clear water. Verify required acid-alkali balance is achieved. Allow to dry.
 - N. Aluminum Surfaces to be Painted: Remove surface contamination by steam or high pressure water. Remove oxidation with acid etch and solvent washing. Apply etching primer immediately following cleaning.
 - O. Copper Surfaces to be Painted: Remove contamination by steam, high pressure water, or solvent washing. Apply vinyl etch primer immediately following cleaning.
 - P. Galvanized Surfaces to be Painted: Remove surface contamination and oils and wash with solvent. Apply coat of etching primer.
 - Q. Corroded Steel and Iron Surfaces to be Painted: Prepare using at least SSPC-PC 2 (hand tool cleaning) or SSPC-SP 3 (power tool cleaning) followed by SSPC-SP 1 (solvent cleaning).
 - R. Uncoated Steel and Iron Surfaces to be Painted: Remove grease, mill scale, weld splatter, dirt, and rust. Where heavy coatings of scale are evident, remove by hand wire brushing or sandblasting; clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts, and nuts are similarly cleaned. Prime paint entire surface; spot prime after repairs.
 - S. Shop-Primed Steel Surfaces to be Finish Painted: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Re-prime entire shop-primed item.

- T. Interior Wood Items to Receive Opaque Finish: Wipe off dust and grit prior to priming. Seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after primer has dried; sand between coats. Back prime concealed surfaces before installation.
- U. Interior Wood Items to Receive Transparent Finish: Wipe off dust and grit prior to sealing, seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after sealer has dried; sand lightly between coats. Prime concealed surfaces with gloss varnish reduced 25 percent with thinner.
- V. Exterior Wood to Receive Opaque Finish: Remove dust, grit, and foreign matter. Seal knots, pitch streaks, and sappy sections. Fill nail holes with tinted exterior calking compound after prime coat has been applied. Back prime concealed surfaces before installation.
- W. Exterior Wood to Receive Transparent Finish: Remove dust, grit, and foreign matter; seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes with tinted exterior calking compound after sealer has been applied. Prime concealed surfaces.
- X. Glue-Laminated Beams: Prior to finishing, wash surfaces with solvent, remove grease and dirt.
- Y. Wood Doors to be Field-Finished: Seal wood door top and bottom edge surfaces with clear sealer.
- Z. Metal Doors to be Painted: Prime metal door top and bottom edge surfaces.
- 3.03 APPLICATION
 - A. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.
 - B. Exterior Wood to Receive Opaque Finish: If final painting must be delayed more than 2 weeks after installation of woodwork, apply primer within 2 weeks and final coating within 4 weeks.
 - C. Apply products in accordance with manufacturer's instructions.
 - D. Where adjacent sealant is to be painted, do not apply finish coats until sealant is applied.
 - E. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.
 - F. Apply each coat to uniform appearance. Apply each coat of paint slightly darker than preceding coat unless otherwise approved.
 - G. Dark Colors and Deep Clear Colors: Regardless of number of coats specified, apply as many coats as for complete hide.
 - H. Sand wood and metal surfaces lightly between coats to achieve required finish.
 - I. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.
 - J. Where clear finishes are required, tint fillers to match wood. Work fillers into the grain before set. Wipe excess from surface.
 - K. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.
- 3.04 FINISHING MECHANICAL AND ELECTRICAL EQUIPMENT
 - A. Refer to Section 22 05 53 and Section 26 05 53 for schedule of color coding of equipment, duct work, piping, and conduit.
 - B. Paint shop-primed equipment, where indicated.
 - C. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.
 - D. Finish equipment, piping, conduit, and exposed duct work in utility areas in colors according to the color coding scheme indicated.
 - E. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.
- 3.05 FIELD QUALITY CONTROL
 - A. See Section 01 40 00 - Quality Requirements, for general requirements for field inspection.

B. Contractor will provide field inspection.

3.06 CLEANING

A. Collect waste material which may constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.07 PROTECTION

A. Protect finished coatings until completion of project.

B. Touch-up damaged coatings after Substantial Completion.

3.08 SCHEDULE - SURFACES TO BE FINISHED

A. Do Not Paint or Finish the Following Items:

1. Items fully factory-finished unless specifically noted.

2. Fire rating labels, equipment serial number and capacity labels.

B. Paint the surfaces described below under Schedule - Paint Systems.

C. Mechanical and Electrical: Use paint systems defined for the substrates to be finished.

1. Paint all insulated and exposed pipes occurring in finished areas to match background surfaces, unless otherwise indicated.

2. Paint all equipment, including that which is factory-finished, exposed to weather or to view on the roof and outdoors.

3. Paint shop-primed items occurring in finished areas.

4. Paint interior surfaces of air ducts and convector and baseboard heating cabinets that are visible through grilles and louvers with one coat of flat black paint to visible surfaces.

5. Paint dampers exposed behind louvers, grilles, and convector and baseboard cabinets to match face panels.

D. Paint both sides and edges of plywood backboards for electrical and telephone equipment before installing equipment.

END OF SECTION

SECTION 31 66 15
HELICAL PILE FOUNDATIONS

1. GENERAL

1.1 Purpose of Specification

The purpose of this specification is to detail the furnishing of all materials, tools, equipment, labor supervision, and installation techniques necessary to install helical piles as detailed on the drawings, including connection details. This shall include provisions for load testing that may be part of the scope of work.

1.2 Scope of Work

This work consists of furnishing all necessary, supervision, labor, tools, materials, and equipment to perform all work necessary to install the helical piles, at <YOUR JOB NAME HERE> for the <OWNER NAME HERE> per the specifications described herein, and as shown on the drawings. The Contractor shall install a helical pile that will develop the load capacities as detailed on the drawings.

1.3 Qualifications of the Helical Pile Contractor

The helical pile Contractor shall be experienced in the installation of helical pile foundations and shall furnish all materials, labor, and supervision to perform the work. The Contractor shall provide names of on-site personnel materially involved with the work, including those who carry documented certification of helical pile training. At a minimum, these personnel shall include foreman, machine operator, and project engineer/manager.

The helical pile Contractor shall not sublet the whole or any part of the contract without the express written permission of the Owner.

1.4 Definitions

A partial list follows. *The Owner may wish to add other specific, project-related items.*

Design Load (DL):	Maximum anticipated service load applied to the helical anchor. Also known as the working load (WL).
Helical Extension:	Helical pile component installed immediately following the lead section, if required. This component consists of one or more helix plates welded to a central steel shaft of finite length.
Helix Plate:	Generally round steel plate formed into a ramped spiral. The helical shape provides the means to install the helical

tieback anchor, plus the plate transfers load to soil in end-bearing. Helix plates are available in various diameters and thicknesses.

Lead Section:	The first helical pile component installed into the soil, consisting of single or multiple helix plates welded to a central steel shaft. Helix plates provide end-bearing capacity.
Plain Extension:	Central steel shaft of finite length without helix plates. It is installed following the installation of the lead section or helical extension (if used). The units are connected with integral couplings and bolts. Plain extensions are used to extend the helix plates beyond the specified minimum depth and into competent load bearing stratum.
Safety Factor:	The ratio of the ultimate capacity to the working or design load of the helical pile.
Working Load (WL):	Equivalent term for Design Load.
Ultimate Capacity (UC):	Limit state based on the structural and/or geotechnical capacity of the ground anchor defined as the point at which no additional capacity can be justified.

1.5 Allowable Tolerances

1.5.1 Centerline of helical pile shall not be more than 3 inches from indicated plan location.

1.5.2 Helical pile plumbness shall be within 2° of design alignment.

1.5.3 Top elevation of helical pile shall be within +1 inch to -2 inches of the design vertical elevation.

1.6 Quality Assurance

1.6.1 The Contractor shall employ an adequate number of skilled workers who are experienced in the necessary crafts and who are familiar with the specified requirements and methods needed for proper performance of the work of this specification.

1.6.2 All helical piles shall be installed in the presence of a designated representative of the Owner unless said representative informs the Contractor otherwise. The designated representative shall have the right to access any and all field installation records and test reports.

1.6.3 Helical pile components as specified therein shall be manufactured by a facility whose quality systems comply with ISO (International Organization of Standards) 9001 requirements. Certificates of Registration denoting ISO Standards Number shall be presented upon request to the Owner or their representative.

1.7 Ground Conditions

The Geotechnical Report, including logs of soil borings as shown on the boring location plan, shall be considered to be representative of the in-situ subsurface conditions likely to be encountered on the project site. Said Geotechnical Report shall be used as the basis for helical pile foundation design using generally accepted engineering judgment and methods.

2. REFERENCED CODES AND STANDARDS

Standards listed by reference, including revisions by issuing authority, form a part of this specification section to the extent indicated. Standards listed are identified by issuing authority, authority abbreviation, designation number, title, or other designation established by issuing authority. Standards subsequently referenced herein are referred to by issuing authority abbreviation and standard designation. In case of conflict, the particular requirements of this specification shall prevail. The latest publication as of the issue of this specification shall govern, unless indicated otherwise.

2.1 American Society for Testing and Materials (ASTM):

1. ASTM A29/A29M Steel Bars, Carbon and Alloy, Hot-Wrought and Cold Finished.
2. ASTM A36/A36M Structural Steel.
3. ASTM A53 Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
4. ASTM A153 Zinc Coating (Hot Dip) on Iron and Steel Hardware.
5. ASTM A252 Welded and Seamless Steel Pipe Piles.
6. ASTM A775 Electrostatic Epoxy Coating
7. ASTM A193/A193M Alloy-Steel and Stainless Steel Bolting Materials for High Temperature Service.
8. ASTM A320/A320M Alloy-Steel Bolting Materials for Low Temperature Service.
9. ASTM A500 Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
10. ASTM A572 HSLA Columbium-Vanadium Steels of Structural Quality.
11. ASTM A618 Hot-Formed Welded and Seamless High-Strength Low-Alloy Structural Tubing.
12. ASTM A656 Hot-Rolled Structural Steel, High-Strength Low-Alloy Plate with Improved Formability.
13. ASTM A1018 Steel, Sheet and Strip, Heavy Thickness Coils, Hot Rolled, Carbon, Structural, High-Strength Low-Alloy, Columbium or Vanadium, and High-Strength Low-Alloy with Improved Formability.
14. ASTM D1143 Method of Testing Piles Under Static Axial Compressive Load.
15. ASTM D3689 Method of Testing Individual Piles Under Static Axial Tensile Load.

2.2 American Welding Society (AWS):

1. AWS D1.1 Structural Welding Code – Steel.

2. AWS D1.2 Structural Welding Code – Reinforcing Steel.

2.3 American Society of Civil Engineers (ASCE):

1. ASCE 20-96 Standard Guidelines for the Design and Installation of Pile Foundations.

2.4 Deep Foundations Institute (DFI):

1. *Guide to Drafting a Specification for High Capacity Drilled and Grouted Micropiles for Structural Support*, 1st Edition, Copyright 2001 by the Deep Foundation Institute (DFI).

2.5 Post Tensioning Institute (PTI):

1. *Recommendations for Prestressed Rock and Soil Anchors*, Third Edition, Copyright 1996 By the Post-Tensioning Institute.

2.6 Society of Automotive Engineers (SAE):

1. SAE J429 Mechanical and Material Requirements for Externally Threaded Fasteners.

3. SUBMITTALS

3.1 Construction Submittals

1. The Contractor shall submit a detailed description of the construction procedures proposed for use to the Owner for review. This shall include a list of major equipment to be used.
2. The technical submittal shall include the following:
 - a. Helical pile number, location and pattern by assigned identification number if not indicated on plans
 - b. Load required of each helical pile
 - c. Type and size of central steel shaft
 - d. Helix configuration (number and diameter of helix plates proposed)
 - e. Minimum effective installation torque
 - f. Minimum depth
 - g. Helical pile attachment to structure relative to grade beam, column pad, pile cap, etc.
3. The Contractor shall submit shop drawings for all helical pile components, including corrosion protection and pile top attachment to the Owner for review and approval. This includes helical pile lead and extension section identification (manufacturer's catalog numbers).
4. Work shall not begin until all the submittals have been received and approved by the

Owner.

3.2 Installation Records

The Contractor shall provide the Owner copies of helical pile installation records within 24 hours after each installation is completed. Formal copies shall be submitted on a weekly basis. These installation records shall include, but are not limited to, the following information.

1. Name of project and Contractor
2. Name of Contractor's supervisor during installation
3. Date and time of installation
4. Name and model of installation equipment
5. Type of torque indicator used
6. Location of helical pile by assigned identification number
7. Actual central steel shaft type and configuration – including lead section (number and size of helix plates), number and type of extension sections
8. Helical pile installation duration and observations
9. Total length of installed helical pile
10. Cut-off elevation
11. Inclination
12. Installation torque at one-foot intervals for the entire length
13. Comments pertaining to interruptions, obstructions, rate of advancement or other relevant information

4. PRODUCTS AND MATERIALS

4.1 Central Steel Shaft:

The central steel shaft, consisting of lead sections, helical extensions, and plain extensions, shall be **<Material Type Here – Solid Square Shaft, Pipe Shaft etc. > Type <XYZ Here>** as manufactured by A.B.Chance or approved equal.

1. *Solid Square Shaft Material (1.5"x1.5")*: Shall be hot rolled Round-Cornered-Square (RCS) solid steel bars meeting dimensional and workmanship requirements of ASTM A29. The bar shall be modified medium carbon steel grade (similar to AISI 1044) with improved strength due to fine grain size.
 - a. Torsional strength rating = 5,500 ft-lb
 - b. Minimum yield strength = 70 ksi
2. *Solid Square Shaft Material (1.5"x1.5")*: Shall be hot rolled Round-Cornered-Square (RCS) solid steel bars meeting the dimensional and workmanship requirements of ASTM A29. The bar shall be High Strength Low Alloy (HSLA), low to medium carbon

steel grade with improved strength due to fine grain size.

- a. Torsional strength rating = 7,000 ft-lb
 - b. Minimum yield strength = 90 ksi
3. *Solid Square Shaft Material (1.75"x1.75")*: Shall be hot rolled Round-Cornered-Square (RCS) solid steel bars meeting the dimensional and workmanship requirements of ASTM A29. The bar shall be High Strength Low Alloy (HSLA), low to medium carbon steel grade with improved strength due to fine grain size.
- a. Torsional strength rating: = 11,000 ft-lb
 - b. Minimum yield strength = 90 ksi
4. *Solid Square Shaft Material (2.0"x2.0")*: Shall be hot rolled Round-Cornered-Square (RCS) solid steel bars meeting the dimensional and workmanship requirements of ASTM A29. The bar shall be High Strength Low Alloy (HSLA), low to medium carbon steel grade with improved strength due to fine grain size.
- a. Torsional strength rating: = 16,000 ft-lb
 - b. Minimum yield strength = 90 ksi
5. *Solid Square Shaft Material (2.25"x2.25")*: Shall be hot rolled Round-Cornered-Square (RCS) solid steel bars meeting the dimensional and workmanship requirements of ASTM A29. The bar shall be High Strength Low Alloy (HSLA), low to medium carbon steel grade with improved strength due to fine grain size.
- a. Torsional strength rating: = 23,000 ft-lb
 - b. Minimum yield strength = 90 ksi
6. *Pipe Shaft Material (2.875" O.D.)*: Shall be structural steel tube or pipe, seamless or straight-seam welded, per ASTM A500 Grade B. Wall thickness is 0.203" (schedule 40).
- a. Torsional strength rating = 5,500 ft-lb
 - b. Minimum yield strength = 50 ksi
7. *Pipe Shaft Material (2.875" O.D.)*: Shall be structural steel tube or pipe, seamless or straight-seam welded, per ASTM A500 Grade B. Wall thickness is 0.276" (schedule 80).
- a. Torsional strength rating = 8,000 ft-lb
 - b. Minimum yield strength = 50 ksi

8. *Pipe Shaft Material (3.5" O.D.):* Shall be structural steel tube or pipe, seamless or straight-seam welded, ASTM A53, A252, A500, or A618. Wall thickness is 0.300" (schedule 80).
 - a. Torsional strength rating = 13,000 ft-lb
 - b. Minimum yield strength = 50 ksi

4.2 Helix Bearing Plate:

Helix plates material shall be hot rolled carbon steel sheet, strip, or plate formed on matching metal dies to true helical shape and uniform pitch. Bearing plate material shall conform to the following ASTM specifications.

1. *Solid Square Shaft Material (Torque $\leq 5,500$ ft-lb):* Per ASTM A572, or A1018, or A656 with minimum yield strength of 50 ksi. Plate thickness is 3/8".
2. *Solid Square Shaft Material (Torque $\geq 5,500$ ft-lb):* Hot rolled steel sheet, strip or plate per ASTM A656 or A936 with minimum yield strength of 80 ksi. Plate thickness is 3/8" or 1/2".
3. *Pipe Shaft Material (Torque $\leq 5,500$ ft-lb.):* Hot Rolled carbon steel, strip, or plate per ASTM A568 with minimum yield strength of 50 ksi. Alternate materials are A-36 or ASTM A572 Grade 50. Plate thickness is 3/8".
4. *Pipe Shaft Material (Torque $\geq 5,500$ ft-lb.):* Per ASTM A36, or A572, or A1018, or A656 depending on helix diameter, with minimum yield strength of 80 ksi. Plate thickness is 3/8" or 1/2".

4.3 Bolts:

The size and type of bolts used to connect the central steel shaft sections together shall conform to the following ASTM specifications.

1. *Solid Square Shaft Material (Torque $\leq 7,000$ ft-lb):* 3/4" diameter bolt per ASTM A320 Grade L7.
2. *Solid Square Shaft Material (Torque $\geq 7,000$ ft-lb):* 7/8" – 1-1/4" per ASTM A193 Grade B7
3. *Pipe Shaft Material (Torque $\leq 13,000$ ft-lb):* 3/4" diameter bolts (# of bolts per coupling depends on torque) per SAEJ429 Grade 5.
 - SAE J429 Grade 5: Sy (min) = 92 ksi, Su (min) = 120 ksi

4.4 Couplings:

Couplings shall be capable of transmitting both the maximum installation torque from the tool string to the helix plates, and the maximum axial load from the top of the pile to the helical bearing plates.

4.5 Plates, Shapes, or Pier Caps:

Structural steel plates and shapes for helical pile top attachments shall conform to ASTM A36 or ASTM A572 Grade 50.

4.6 Corrosion Protection

1. Galvanization: All helical pile material that is not encased in concrete shall be hot-dipped galvanized in accordance with ASTM A153 after fabrication.

5. EXECUTION

5.1 Site Conditions

1. Prior to commencing helical pile installation, the Contractor shall inspect the work of all other trades and verify that all said work is completed to the point where helical pile installation may commence without restriction.
2. The Contractor shall verify that all helical piles may be installed in accordance with all pertinent codes and regulations regarding such items as underground obstructions, right-of-way limitations, utilities, etc.
3. In the event of a discrepancy, the Contractor shall notify the Owner. The Contractor shall not proceed with helical pile installation in areas of discrepancies until said discrepancies have been resolved.

5.2 Installation Equipment

1. Shall be rotary type, hydraulic power driven torque motor with clockwise and counter-clockwise rotation capabilities. The torque motor shall be capable of continuous adjustment to revolutions per minute (RPM's) during installation. Percussion drilling equipment shall not be permitted. The torque motor shall have torque capacity 15% greater than the torsional strength rating of the central steel shaft to be installed.
2. Equipment shall be capable of applying adequate down pressure (crowd) and torque simultaneously to suit project soil conditions and load requirements. The equipment shall be capable of continuous position adjustment and swing capacity at maximum installation torque to maintain proper helical pile alignment during installation. The application of bending stress to the pile during installation will not be permitted.

5.3 Installation Tooling

1. Shall consist of a Kelly Bar Adapter (KBA) and drive tool as appropriate for the central shaft of the helical pile under maximum installation torque and used in accordance with

- the manufacturers written installation instructions.
2. Installation tooling should be maintained in good working order and safe to operate at all times. Flange bolts and nuts should be regularly inspected for proper tightening torque. Bolts, connecting pins, and retainers should be periodically inspected for wear and/or damage and replaced with identical items provided by the manufacturer. Heed all warning labels. Worn or damaged tooling should be replaced.
 3. A torque indicator shall be used during helical pile installation. The torque indicator shall be a device that directly measures torque and that is mounted in-line with the installation tooling. Devices that infer torque from hydraulic pressure will not be permitted.
 - a. Shall be capable of providing continuous measurement of applied torque throughout the installation.
 - b. Shall be capable of torque measurements in increments of 200 ft-lb or less.
 - c. Shall be re-calibrated, if in the opinion of the Owner and/or Contractor reasonable doubt exists as to the accuracy of the torque measurements.

5.4 Installation Procedures

1. The helical pile installation technique shall be such that it is consistent with the geotechnical, logistical, environmental, and load carrying conditions of the project.
2. The lead section shall be positioned at the location as shown on the working drawings. Battered helical piles can be positioned perpendicular to the ground to assist in initial advancement into the soil before the required batter angle shall be established. The helical pile sections shall be engaged and advanced into the soil in a smooth, continuous manner at a rate of rotation of not to exceed 16 RPM's. The extension sections shall be provided to obtain the required minimum overall length and installation torque as shown on the working drawings. Connect sections together using coupling bolt(s) and nut torqued to 40 ft-lb.
 - a. Sufficient down pressure shall be applied to uniformly advance the helical pile sections approximately 3 inches per revolution. The rate of rotation and magnitude of down pressure shall be adjusted for different soil conditions and depths.

5.5 Termination Criteria

1. The torque as measured during the installation shall not exceed the torsional strength rating of the central steel shaft.
2. The minimum installation torque and minimum overall length criteria as shown on the technical submittal shall be satisfied prior to terminating the helical pile foundation installation.
3. If the torsional strength rating of the central steel shaft and has been reached prior to

achieving the minimum overall length required, the Contractor shall have the following options:

- a. Terminate the installation at the depth obtained subject to the review and acceptance of the Owner, or:
 - b. Remove the existing helical pile and install a new one with fewer and/or smaller diameter helix plates. The new helix configuration shall be subject to review and acceptance of the Owner.
4. If the minimum installation torque as shown on the working drawings is not achieved at the minimum overall length, and there is no maximum length constraint, the Contractor shall have the following options:
- a. Install the helical pile deeper using additional extension sections, or:
 - b. Remove the existing helical pile and install a new one with additional and/or larger diameter helix plates.
 - c. De-rate the load capacity of the helical pile and install additional helical screw foundation(s). The de-rated capacity and additional helical screw foundation location shall be subject to the review and acceptance of the Owner.
5. If the helical pile is refused or deflected by a subsurface obstruction, the installation shall be terminated and the pile removed. The obstruction shall be removed, if feasible, and the helical pile re-installed. If the obstruction can't be removed, the helical pile shall be installed at an adjacent location, subject to review and acceptance of the Owner.
6. If the torsional strength rating of the central steel shaft and has been reached prior to proper positioning of the last plain extension section relative to the final elevation, the Contractor may remove the last plain extension and replace it with a shorter length extension. If it is not feasible to remove the last plain extension, the Contractor may cut said extension shaft to the correct elevation. The Contractor shall not reverse (back-out) the helical pile to facilitate extension removal.
7. The average torque for the last three feet of penetration shall be used as the basis of comparison with the minimum installation torque as shown on the working drawings. The average torque shall be defined as the average of the last three readings recorded at one-foot intervals.

END OF SECTION

**SECTION 32 13 13
CONCRETE PAVING**

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, apply to this Section.

1.2 SUMMARY

- A. This Section includes constructing exterior concrete paving on prepared subgrade or base course in accordance with these specifications. This work shall be in conformity with the lines, grades, thicknesses and typical cross-sections shown on the plans for the following:
 - 1. Driveways Aprons.
 - 2. Parking lots.
 - 3. Curbs and gutters.
 - 4. Sidewalks, steps, ramps.
 - 5. As detailed on the plans.

1.3 REFERENCES

- A. Shelby County Standard Specifications for Design and Construction, latest edition.

1.4 SUBMITTALS

- A. Product Data: For each type of manufactured material and product indicated.
- B. Design Mixes: For each concrete pavement mix, and includes alternate mix designs when characteristics of materials, project conditions, weather, test results, or other circumstances warrant adjustments.

- C. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated, based on comprehensive testing of current materials:
 - 1. Aggregates.
 - 2. Cement.
 - 3. Admixtures.
- D. Material Certificates: Signed by manufacturers certifying that each of the following materials used in the project complies with requirements:
 - 1. Cementitious materials and aggregates.
 - 2. Steel reinforcement and reinforcement accessories.
 - 3. Admixtures.
 - 4. Curing compounds.
 - 5. Applied finish materials.
 - 6. Bonding agent or adhesive.
 - 7. Joint fillers.
- E. Field quality-control test reports.
- F. Pavement Joint Layout Plan: Plan to show joint locations and typical dimensions for review and approval by engineer.
- G. Traffic Control Plan: For work in the public right-of-way.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who has completed pavement work similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

- B. Manufacturer Qualifications: Manufacturer of ready-mixed concrete products complying with ASTM C 94/C 94 M requirements for production facilities and equipment.
 - 1. Manufacturer must be certified according to the National Ready Mix Concrete Association's (NRMCA) Plant Certification Program.
- C. Testing Agency Qualifications: An independent agency qualified according to ASTM C1077 and ASTM E 329 for testing indicated, as documented according to ASTM E 548.
 - 1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-01 or an equivalent certification program.
- D. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant and each aggregate from one source.
- E. ACI Publications: Comply with ACI 301, "Specification for Structural Concrete," unless modified by the requirements of the Contract Documents.
- F. Concrete Testing Service: The Contractor will engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.
- G. Regulatory Requirements:
- H. Comply with City of Memphis standards for sidewalks, curbs, ramps, gutters, and driveway approaches or aprons, including standard dimensions, profiles, thicknesses, reinforcing, and compressive strength. In the event of conflict between the Contract Documents and the standards, the more stringent requirements will apply.
 - 1. Comply with applicable requirements of ADA Handbook, ANSI A117.1, and local and State codes and ordinances regarding walks, steps, ramps and curb ramps.

1.6 PROJECT CONDITIONS

- A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.
- B. Coordination and Scheduling: Coordinate with other trades and arrange scheduling to avoid damage to other work including grading, site utilities and piping, asphalt paving, landscaping and irrigation systems.
- C. Field Measurements: Verify dimensions and existing conditions shown on the drawings by taking field measurements prior to start of work. Report discrepancies to the Owner's Representative for clarification and make minor adjustments in layout as required by field conditions and as approved by the Owner's Representative, at no additional cost to the Owner.
- D. Environmental Requirements: Perform work only under suitable weather conditions. Comply with the environmental requirements of Section 3.6 for concrete placement.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
 - 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products specified.
 - 2. Products: Subject to compliance with requirements, provide one of the products specified.
 - 3. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.

4. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.2 FORMS

- A. Form Materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, smooth exposed surfaces.
 1. Use flexible or curved forms for curves of a radius 100 feet or less.
- B. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

2.3 STEEL REINFORCEMENT

- A. Plain-Steel Welded Wire Fabric: ASTM A 185, fabricated from as-drawn steel wire into flat sheets.
- B. Reinforcement Bars: ASTM A 615/A 615M, Grade 60, deformed. Cut bars true to length with ends square and free of burrs.
- C. Joint Dowel Bars: Plain steel bars, ASTM A 615/A 615M, Grade 60. Cut bars true to length with ends square and free of burrs.
- D. Tie Bars: ASTM A 615/A 615M, Grade 60, deformed.
- E. Supports for Reinforcement: Chairs, spacers, and other devices for spacing, supporting, and fastening reinforcement bars, welded wire fabric, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete or fiber-reinforced concrete of greater compressive strength than concrete, and as follows:

1. Equip wire bar supports with sand plates or horizontal runners where base material will not support chair legs.

2.4 EXPANSION JOINT FILLER

- A. Sealed Joints: Preformed, compressible fiber or cork filler material complying with ASTM D1751 or D1752, Type II, guaranteed compatible with expansion joint sealant materials, 3/4" thick unless otherwise indicated. Provide high-impact polystyrene removable "void cap" to create 1/2" deep reveal for installation of sealant.
- B. Self-Sealing Joints: Preformed, compressible asphalt fiber joint filler complying with ASTM D994, 3/4" thick unless otherwise indicated. Do not use asphalt fiber filler in joints to receive elastomeric joint sealants.

2.5 CONCRETE MATERIALS

- A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source throughout the Project:
 1. Portland Cement: ASTM C 150, Type I/II, gray.
 - a. Fly Ash: ASTM C 618, Class F.
 - b. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.
- B. Normal-Weight Aggregates: ASTM C 33, coarse aggregate, uniformly graded. Provide aggregates from a single source.
 1. Maximum Coarse-Aggregate Size: 3/4 inch nominal.
 2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
 3. Do not use fine or coarse aggregates containing substances that cause spalling.
- C. Water: ASTM C 94/C 94M potable.

2.6 ADMIXTURES

- A. General: Admixtures certified by manufacturer to contain not more than 0.1 percent water-soluble chloride ions by mass of cement and to be compatible with other admixtures.
- B. Air-Entraining Admixture: ASTM C 260.
- C. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material.
 - 1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
 - 2. Retarding Admixture: ASTM C 494/C 494M, Type B.
 - 3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
 - 4. Water-Reducing and Accelerating Admixture: ASTM C 494, Type E.
 - 5. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
 - 6. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
 - 7. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type I

2.7 CURING MATERIALS:

- A. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq.yd. (305 g/sq.m) dry.
- B. Moisture-Retaining Cover: ASTM C 171, waterproof paper, polyethylene film or white burlap- polyethylene sheet.
- C. Water: Potable.

- D. Evaporation Retarder: Waterborne, monomolecular film forming; manufactured for application to fresh concrete.
- E. Clear Waterborne Membrane-Forming Curing Compound: ASTM C 309, Type I, Class B.
 - 1. Provide material that has a maximum volatile organic compound (VOC) rating of 350 g/L.
- F. White Waterborne Membrane-Forming Curing Compound: ASTM C 309, Type II, Class B.
 - 1. Provide material that has a maximum volatile organic compound (VOC) rating of 350 g/L.
 - 2. Use a qualified independent testing agency for preparing and reporting proposed mix designs for the trial batch method.
 - 3. Do not use Owner's field quality-control testing agency as the independent testing agency.

2.8 CONCRETE MIXTURES

- A. Prepare design mixes, proportioned according to ACI 211.1 and ACI 301, for each type and strength of normal-weight concrete determined by either laboratory trial mixes or field experience.
 - 1. Use water-reducing or plasticizing admixture in concrete, as required, for placement and workability.
 - 2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
- B. Proportion mixes to provide concrete with the following properties:

1. Compressive Strength (28 Days): 4,000 psi (27.6 MPa)
 2. Maximum Water-Cementitious Materials Ratio at Point of Placement: 0.50
 3. Slump Limit: 4 inches (100 mm).
 4. Minimum 564 lb. Cement per cubic yard.
- C. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having an air content of 4.0 to 7.0 percent.
- D. Limit water-soluble, chloride-ion content in hardened concrete to 0.30 percent by weight of cement.
- E. Chemical Admixtures: Use admixtures according to manufacturer's written instructions.
- F. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement according to ACI 301 requirements for concrete exposed to deicing chemicals as follows:
1. Fly Ash: 20 - 30 percent Class F Fly Ash, Class P Concrete.

2.2 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M. Furnish batch certificates for each batch discharged and used in the Work.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine exposed subgrades and subbase surfaces for compliance with requirements for dimensional, grading, and elevation tolerances.

- B. Proof-roll prepared subbase surface below concrete pavements with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding.
 - 1. Completely proof-roll subbase in one direction. Limit vehicle speed to 3 mph (5 km/h).
 - 2. Proof-roll with a loaded 10-wheel tandem-axle dump truck weighing not less than 15 tons.
 - 3. Subbase with soft spots and areas of pumping or rutting exceeding depth of ½ inch require correction.
- C. Subgrade shall be tested by Geotechnical Engineer and pass required tests prior to concrete pavement placement.
- D. Proceed with concrete pavement operations only after non-conforming conditions have been corrected and subgrade is ready to receive pavement.

3.2 PREPARATION

- A. Remove loose material from compacted subbase surface immediately before placing concrete.

3.3 EDGE FORMS AND SCREED CONSTRUCTION

- A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides for pavement to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.
- B. Clean forms after each use and coat with form release agent to ensure separation from concrete without damage.

3.4 STEEL REINFORCEMENT

- A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating reinforcement and with recommendations in CRSI's "Placing Reinforcing Bars" for placing and supporting reinforcement.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, or other bond-reducing materials.
- C. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement. Maintain minimum cover to reinforcement.
- D. Install welded wire fabric in lengths as long as practicable. Lap adjoining pieces at least one full mesh, and lace splices with wire. Offset laps of adjoining widths to prevent continuous laps in either direction.
- E. Install fabricated bar mats in lengths as long as practicable. Handle units to keep them flat and free of distortions. Straighten bends, kinks, and other irregularities, or replace units as required before placement. Set mats for a minimum 12-inch (300-mm) overlap of adjacent mats.

3.5 JOINTS

- A. General: Construct/install cont, isolation, and contraction joints and tool edgings true to line with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline, unless otherwise indicated.
 - 1. When joining existing pavement, place transverse joints to align with previously placed joints, unless otherwise indicated.
 - 2. Contractor to provide plan of joint placement for the Engineers approval.
 - 3. The distance between joints shall not exceed in feet, twice the pavement thickness in inches. (i.e.: 8" pavement to utilize maximum 16-foot joint spacing.)

- B. Construction Joints: Set construction joints at side and end terminations of pavement and at locations where pavement operations are stopped for more than one-half hour, unless pavement terminates at expansion joints.
1. Contractor may utilize preformed galvanized steel or plastic keyway-section forms or bulkhead forms with keys, unless otherwise indicated. Embed keys at least 1-1/2 inches into concrete.
 2. Continue reinforcement across construction joints, unless otherwise indicated. Do not continue reinforcement through sides of pavement strips, unless otherwise indicated.
 3. Provide tie bars at sides of pavement strips where indicated.
 4. Keyed Joints: Provide preformed keyway-section forms or bulkhead forms with keys, unless otherwise indicated. Embed keys at least 1-1/2 inches (38 mm) into concrete.
- C. Expansion Joints: Form expansion joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, walks, other fixed objects, and where indicated.
1. Locate expansion joints in pavement where indicated on plans.
 2. Extend joint fillers full width and depth of joint.
 3. Terminate joint filler no less than 1/2 inch or no more than 1 inch below finished surface for joint sealant.
 4. Furnish joint fillers in one-piece lengths. Where more than one length is required, lace or clip joint-filler sections together.
 5. Protect top edge of joint filler during concrete placement with metal, plastic, or other temporary preformed cap. Remove protective cap after concrete has been placed on both sides of joint.
- D. Contraction/Control Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness, as follows:

1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint with groover tool to the indicated radius. Repeat grooving of contraction joints after applying surface finishes. Eliminate groover marks on concrete surfaces.
2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before developing random contraction cracks.
3. Tied Contraction Joints: Install deformed bars and support assemblies at joints where indicated.

3.6 CONCRETE PLACEMENT

- A. Inspection: Before placing concrete, inspect and complete formwork installation, reinforcement steel, and items to be embedded or cast in. Notify other trades to permit installation of their work.
- B. Remove snow, ice, or frost from subbase surface and reinforcement before placing concrete. Do not place concrete on frozen surfaces.
- C. Moisten subbase to provide a uniform dampened condition at the time concrete is placed. Do not place concrete around manholes or other structures until they are at the required finish elevation and alignment.
- D. Comply with ACI 301 and ACI 304R requirements and recommendations for measuring, mixing, transporting, and placing concrete.
- E. Do not add water to concrete during delivery to the project site.
- F. Do not add water to fresh concrete after testing.
- G. Do not add water to concrete surface during finishing operations.

- H. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.
- I. Consolidate concrete according to ACI 301 by mechanical vibrating equipment supplemented by hand spading, rodding, or tamping. Use equipment and procedures to consolidate concrete according to recommendations in ACI 309R.
 - 1. Consolidate concrete along face of forms and adjacent to transverse joints with an internal vibrator. Keep vibrator away from joint assemblies, reinforcement, or side forms. Use only square-faced shovels for hand-spreading and consolidation. Consolidate with care to prevent dislocating reinforcement, dowels, and joint devices.
- J. Screed pavement surfaces with a straightedge and strike off.
- K. Commence initial floating using bull floats or darbies to form an open textured and uniform surface plane before excess moisture or bleed water appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading dry-shake surface treatments.
- L. Paving: Minimum 8" thick unless otherwise indicated. Provide expansion joints as indicated on the drawings, and control/contraction joints at a minimum 16'-0" EWW. Place concrete paving over compacted subgrade. Provide minimum 1% slope for drainage unless otherwise indicated.
- M. Driveway Approaches: Minimum 8" thick, unless otherwise indicated or required by local public works standards or building codes. Construct to radius of flare indicated, and taper or warp into alignment with adjacent curbs, gutters, and walks. Place approaches over compacted subgrade. Refer to drawing and details for any reinforcing requirements.
- N. Slip-Form Pavers: When automatic machine placement is used for pavement, submit revised mix design and laboratory test results that meet or exceed requirements. Produce

- pavement to required thickness, lines, grades, finish, and jointing as required for formed pavement.
- O. Compact subbase and prepare subgrade of sufficient width to prevent displacement of paver machine during operations.
 - P. When adjoining pavement lanes are placed in separate pours, do not operate equipment on concrete until pavement has attained 85 percent of its 28-day compressive strength.
 - Q. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
 - 1. When air temperature has fallen to or is expected to fall below 40 deg F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F and not more than 80 deg F at point of placement.
 - 2. Do not use frozen materials or materials containing ice or snow.
 - 3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators, unless otherwise specified and approved in mix designs.
 - R. Hot-Weather Placement: Place concrete according to recommendations in ACI 305R and as follows when hot-weather conditions exist:
 - 1. Cool ingredients before mixing to maintain concrete temperature at time of placement below 90 deg F. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
 - 2. Cover reinforcement steel with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.
 - 3. Fog-spray forms, reinforcement steel, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

- S. Wet-Weather Placement: Do not begin to place concrete while rain, sleet, or snow is falling unless adequate protection is provided and, when required, acceptance of protection is obtained.

3.7 FLOAT FINISHING

- A. General: Do not add water to concrete surfaces during finishing operations.
- B. Edging: Tool edges of pavement, gutters, curbs, and joints in concrete after initial floating with an edging tool to a 1/4-inch (6-mm) radius. Repeat tooling of edges after applying surface finishes. Eliminate tool marks on concrete surfaces.
- C. Float Finish: Begin the second floating operation when bleed-water sheen has disappeared and the concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats, or by hand floating if area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots, and fill low spots. Refloat surface immediately to uniform granular texture.
 - 1. Medium-to-Fine-Textured Broom Finish: Draw a soft bristle broom across float-finished concrete surface perpendicular to line of traffic to provide a uniform, fine-line texture.

3.8 CONCRETE PROTECTION AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.
- B. Comply with ACI 306.1 for cold-weather protection and follow the recommendations of ACI 305R for hot-weather protection during curing.
- C. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing

operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

- D. Begin curing after finishing concrete, but not before free water has disappeared from concrete surface.
- E. Curing Methods: Cure concrete by moisture curing, moisture-retaining-cover curing, curing compound, or a combination of these as follows:
 - 1. Moist Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
 - a. Water.
 - b. Continuous water-fog spray.
 - c. Absorptive cover, water saturated and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.
 - 2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
 - 3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

3.9 PAVEMENT TOLERANCES

- A. Comply with tolerances of ACI 117 and as follows:
 - 1. Elevation: 1/4 inch.
 - 2. Thickness: Plus 3/8 inch, minus 1/4 inch.

3. Surface: Gap below 10-foot- long, unlevelled straightedge not to exceed 1/4 inch.
4. Lateral Alignment and Spacing of Tie Bars and Dowels: 1 inch.
5. Vertical Alignment of Tie Bars and Dowels: 1/4 inch.
6. Alignment of Tie-Bar End Relative to Line Perpendicular to Pavement Edge: 1/2 inch.
7. Alignment of Dowel-Bar End Relative to Line Perpendicular to Pavement Edge: Length of dowel 1/4 inch per 12 inches.
8. Joint Spacing: 3 inches.
9. Contraction Joint Depth: Plus 1/4 inch, no minus.
10. Joint Width: Plus 1/8 inch, no minus.

3.10 FIELD QUALITY CONTROL

- A. Testing Agency: Contractor will engage a qualified testing and inspection agency to sample materials, perform tests, and submit test reports during concrete placement.
- B. Testing Services: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:
 1. Testing Frequency: Obtain at least 1 composite sample for each 50 cu. yd. or fraction thereof of each concrete mix placed each day.
 - a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
 2. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each type of concrete mix. Perform additional tests when concrete consistency appears to change.
 3. Air Content: ASTM C 231, pressure method; one test for each composite strength test, but not less than one test for each day's pour of each type of concrete mix.

4. Concrete Temperature: ASTM C 1064; one test hourly when air temperature is 40 deg F and below and when 80 deg F and above, and one test for each set of composite strength specimens.
 5. Compression Test Specimens: ASTM C 31/C 31M; one set of four standard cylinders for each compressive-strength test, unless otherwise indicated. Cylinders shall be molded and stored for laboratory-cured test specimens unless field-cured test specimens are required.
 6. Compressive-Strength Tests: ASTM C 39; one set for each day's pour of each concrete class exceeding 5 cu. yd., but less than 25 cu. yd., provide at least two tests for every 100 cu.yd., (one set for each 50 cu. yd.). One specimen shall be tested at 7 days and two specimens at 28 days; one specimen shall be retained in reserve for later testing if required.
 7. When strength of field-cured cylinders is less than 85 percent of companion laboratory- cured cylinders, current operations shall be evaluated and corrective procedures shall be provided for protecting and curing in-place concrete.
- C. Strength of each concrete mix will be satisfactory if average of any 3 consecutive compressive- strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi (3.4 MPa).
- D. Test results shall be reported in writing to Owner's Representative, concrete manufacturer, and Contractor within 24 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, concrete type and class, location of concrete batch in pavement, design compressive strength at 28 days, concrete mix proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
- E. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Owner's Representative, but will not be used as the sole basis for approval or rejection.

- F. Additional Tests: Testing agency shall make additional tests of the concrete when test results indicate slump, air entrainment, concrete strengths, or other requirements have not been met, as directed by Owner's Representative. Testing agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42, or by other methods as directed.
- G. Remove and replace concrete pavement where test results indicate that it does not comply with specified requirements.
- H. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.11 REPAIRS AND PROTECTION

- A. Remove and replace concrete pavement that is broken, damaged, or defective, or does not meet requirements in this Section.
- B. Drill test cores where directed by Owner's Representative when necessary to determine magnitude of cracks or defective areas. Fill drilled core holes in satisfactory pavement areas with portland cement concrete bonded to pavement with epoxy adhesive.
- C. Protect concrete from damage. Exclude traffic from pavement for at least 14 days after placement. When construction traffic is permitted, maintain pavement as clean as possible by removing surface stains and spillage of materials as they occur.
- D. Maintain concrete pavement free of stains, discoloration, dirt, and other foreign material. Sweep concrete pavement not more than two days before date scheduled for Substantial Completion inspections.

END OF SECTION 32 13 13

SECTION 32 92 19
GRASS SEEDING

1.1 SECTION INCLUDES

1.A. Seed bed preparation - Topsoil placing and finish grading.

1.B. Seeded lawns.

1.2 RELATED SECTIONS

2.A. Not Used

2.B. Section 02 20 00: Earthwork.

1.3 SUBMITTALS - INFORMATIONAL

3.A. Planting Schedule: Indicate dates for each type of landscape work during normal seasons for each work in area site.

3.B. Soil Amendments: Results of soil testing and list of proposed amendments, including application rates.

3.C. Grass Seed Certification: Submit seed vendor's certification for each grass seed mixture required, stating botanical and common name, percentage by weight, and percentages of purity, germination, and weed seed for each grass seed species.

1.4 QUALITY ASSURANCE

4.A. Installer Qualifications: Single firm specializing in landscape work and which has completed projects similar in material, design, and size as required for this Project.

4.B. Soil Testing: Determine pH and other characteristics of topsoil and select soil amendments necessary to adjust pH level to between 6.5 and 7.0, and to correct deficiencies.

1.5 SEQUENCING AND SCHEDULING

5.A. Limit seeding to season or seasons that are normal for this work as determined by weather conditions and by accepted practices in locality and at such time as approved by Landscape Architect.

5.B. Summer Seed Mixture: April 15 through August 30.

5.C. Fall/Winter Seed Mixture: September 1 through April 14.

1.6 WARRANTY

6.A. Warrant seeding for one full growing season but not less than one year from date of acceptance of work specified in this Section.

6.B. Reseed damaged or bare areas without change to Contract Sum.

1.7 MAINTENANCE

7.A. Maintain seeded lawns until completion and acceptance of the entire project.

7.B. Maintain seeded lawn area, including watering, spot weeding, mowing, applications of herbicides, fungicides, insecticides, and reseeding until a full uniform stand of grass free of weeds, undesirable grass species, disease, and insects is achieved and accepted by the Landscape Architect.

7.C. Water as required to maintain adequate surface soil moisture for proper seed germination. Continue daily watering for not less than 30 days. Thereafter apply 1/2" of water twice weekly until acceptance.

7.C.1. Maintain grass lawns until there is complete coverage and soil erosion has ceased.

PART 2 - PRODUCTS

2.1 SEED

1.A. Lawn seed: Fresh, clean, and new crop seed mixture.

1.A.1. Mixed by a method approved by Landscape Architect.

1.A.2. Composed of the following varieties, mixed to the specified proportions by weight and tested to the minimum percentages of purity and germination. The grass seed percentages listed below indicate quantity by weight percent.

1.A.2.a. Fall/Winter seed mixture (September 1 - April 14). Seed mixture for fall and winter shall be 40% Kentucky 31 Fescue, 20% Annual Rye Grass, 30% unhulled Bermuda seed, and 10% White Clover at a rate of 90 pounds per acre.

1.A.2.b. Summer seed mixture (April 15 - August 30). Seed mixture for spring shall be 20% Kentucky 31 Fescue, 10% Annual Rye Grass, and 70% hulled Bermuda seed at a rate of 75 lbs. per acre.

2.2 SOIL NUTRIENTS

2.A. Fertilizer: Commercial grade, 13-13-13 formula conforming to U.S. Department of Agricultural standards delivered in original unopened containers bearing manufacturer's guaranteed analysis and mixture. Application rate, 10 lbs./1,000 square feet.

2.B. Topsoil: Natural friable, loamy and free from heavy clay, coarse sand, stones, Jumps, roots, sticks and other foreign materials. Reuse topsoil stripped from site to extent that it conforms to specified requirements. Non-conforming topsoil shall be removed from the Owner's property.

2.C. Sand: Clean, dry, sharp, pit sand and free of refuse (Use to level small areas as necessary).

2.D. Lime: Ground limestone consisting of not less than 85% total carbonates ground to a fineness that will allow 50% to pass I 00 mesh sieve and 90% to pass 20 mesh sieve.

2.E. Mulch: Clean, dry oat or wheat straw.

2.3 WATER

3.A. Water: Clean, fresh, and free of substances or matter that will inhibit vigorous growth of grass.

3.B. Contractor to supply water as required at no additional expense to the Owner.

PART 3 - EXECUTION

3.1 LAWN PREPARATION

1.A. Limit preparation to areas which will be planted promptly after preparation.

1.B. Do not bury construction debris beneath areas to be seeded. Remove sub-soil that has been contaminated with petroleum and other harmful products.

1.C. Disk or scarify subgrade about 3" deep and evenly distribute topsoil.

1.D. Remove sticks, stones over 1-1/2 inches in any dimension, roots, debris and rubbish.

1.E. Grade lawn areas to smooth, even surface with loose, uniformly fine texture. Roll and rake, remove ridges and fill depressions to meet finish grades.

1.F. Tolerance: Maximum 1/2 inch deviation from design elevation.

1.G. Apply fertilizer evenly at a rate 10 lbs./1000 square feet. Lightly water to aid breakdown of fertilizer. Apply fertilizer not more than 48 hours before seeding.

1.H. Moisten prepared lawn areas before planting if soil is dry. Water thoroughly and allow surface moisture to dry before planting lawns. Do not create muddy soil.

1.I. Restore prepared areas to specified condition if eroded or otherwise disturbed after fine grading and before planting.

3.2 SEEDING

2.A. Do not use wet seed or seed which is moldy or otherwise damaged in transit or storage.

- 2.B. Sow seed evenly in 2 directions at specified rate and lightly rake into topsoil. Protect seeded slopes exceeding 1:6 against erosion with fiber erosion control mesh installed and stapled per manufacturer recommendations.
- 2.C. Seed all areas disturbed as a result of construction operations and site clearing.
- 2.D. Perform seeding operations when the soil is dry and when winds do not exceed 5 miles per hour velocity.
- 2.E. Apply seed with a rotary or drop type distributor. Install seed evenly by sowing equal quantities in two directions, at right angles to each other.
- 2.F. Sow seed at a rate determined by seed mix and time of year as determined by the Landscape Architect.
- 2.G. After seeding, rake or drag surface of soil lightly to incorporate seed into top 1/8" of soil. Roll with light lawn roller.
- 2.H. Place straw mulch on seeded areas within 24 hours of seeding.
- 2.I. Place straw mulch uniformly in a continuous blanket at the rate of 2-1/2 tons per acre, or two 50 lb. bales per 1,000 sq. feet of area. A mechanical blower may be used for straw mulch application when acceptable to the Landscape Architect.
- 2.J. Crimp straw into soil by mechanical means.
- 2.K. Anchor straw mulch with asphaltic emulsion binder applied uniformly at a rate of not less than 100 gal. per acre.
- 2.L. Protect buildings, paving, plantings, and all nonseeded areas from asphaltic emulsion overspray.
- 2.M. Maintain mulch until growth is established.
- 2.N. Hydro Seeding/Mulching: Contractor may submit alternate seeding specification for hydromulching to Landscape Architect for review and approval. Hydromulching to use 2000 pounds per acre minimum of wood cellulose fiber.
- 2.O Provide straw bale checking in ditches or problem swales at intervals required to adequately slow water velocity and impede soil loss.

3.3 ACCEPTANCE

- 3.A. Inspection to determine acceptance of seeded lawns will be made by the Landscape Architect, upon Contractor's request. Provide notification at least 10 working days before required inspection date.
 - 3.A.1. Seeded areas will be acceptable provided all requirements, including maintenance, have been complied with, and a healthy, uniform, close stand of the specified is established free of weeds undesirable grass species, disease and insects.
 - 3.A.2. No individual lawn areas shall have bare spots or unacceptable cover totaling more than 2% of the individual areas, in areas requested to be inspected.
- 3.B. Upon acceptance, the Owner will assume lawn maintenance.

3.4 CLEANING

- 4.A. Perform cleaning during installation of the work and upon completion of the work. Remove from site all excess materials, debris, and equipment. Repair damage resulting from seeding operations.

END OF SECTION

SECTION 32 92 23
BERMUDA SOD

PART 1 - GENERAL

1.1 DESCRIPTION

A. Provide sodded lawns as shown. The work includes:

1. Soil preparation.
2. Sodding lawns and other indicated areas.
3. Maintenance.

B. Related work:

1. Section 32 92 19: Grass Seeding.

1.2 QUALITY ASSURANCE

A. Sod: Comply with American Sod Producers Association (ASPA) classes of sod materials.

B. Provide and pay for materials testing. Testing agency shall be acceptable to the Landscape Architect. Provide the following data:

1. Test representative materials samples proposed for use.
2. Topsoil:
 - a. pH factor.
 - b. Mechanical analysis.
 - c. Percentage of organic content.
 - d. Recommendations on type and quantity of additives required to establish satisfactory pH factor and supply of nutrients to bring nutrients to satisfactory level for planting.

1.3 SUBMITTALS

A. Submit sod growers certification of grass species. Identify source location.

B. Submit the following materials certification:

1. Fertilizer(s) analysis.

C. Submit materials test report.

D. Upon sodded lawn acceptance, submit written maintenance instructions recommending procedures for maintenance of sodded lawns.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Cut, deliver, and install sod within a 24-hour period.

1. Do not harvest or transport sod when moisture content may adversely affect sod survival.
2. Protect sod from sun, wind, and dehydration prior to installation.
3. Do not tear, stretch, or drop sod during handling and installation.

1.5 PROJECT CONDITIONS

A. Work notification: Notify Landscape Architect at least 7 working days prior to start of sodding operations.

B. Protect existing utilities, paving, and other facilities from damage caused by sodding operations.

C. Perform sodding work only after planting and other work affecting ground surface has been completed.

D. Restrict traffic from lawn areas until grass is established. Erect signs and barriers as required.

E. Provide hose and lawn-watering equipment as required.

1.6 WARRANTY

A. Provide a uniform stand of grass by watering, mowing, and maintaining lawn areas until final acceptance.

Re-sod areas, with specified materials, which fail to provide a uniform stand of grass until all affected areas are accepted by the Landscape Architect.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Sod: An "approved" nursery grown sod composed of the following grass species: Common Bermuda. Provide sod free of grassy or broadleaf weeds.

B. Provide well-rooted, healthy sod, free of diseases, nematodes and soil borne insects. Provide sod uniform in color, leaf texture, density, and free of weeds, undesirable grasses, stones, roots, thatch, and extraneous material; viable and capable of growth and development when planted.

1. Furnish sod machine stripped and of Supplier's standard width, length, and thickness: Uniformly 1" to 1-1/2" thick with clean cut edges. Mow sod before stripping.

C. Fertilizer:

1. Granular, non-burning product composed of not less than 50% organic slow acting, guaranteed analysis professional fertilizer.

- a. Type A: Starter fertilizer containing 13% nitrogen, 13% phosphoric acid, and 13% potash by weight or similar approved composition.

- b. Type B: Top dressing fertilizer containing 20% nitrogen, 10% phosphoric acid, and 10% potash by weight or similar approved composition.

D. Ground Limestone: Containing not less than 85% of total carbonates and ground to such fineness that 50% will pass through a 100 mesh sieve and 90% will pass through a 20 mesh sieve.

E. Stakes

1. Softwood, 3/4" dia. x 8" long or,

2. Steel, tee shaped pins, 4" head x 8" leg.

F. Water: Free of substance harmful to sod growth. Hoses or other methods of transportation furnished by Contractor.

PART 3 - EXECUTION

3.1 INSPECTION

A. Examine finish surfaces, grades, topsoil quality, and depth. Do not start sodding work until unsatisfactory conditions are corrected.

3.2 PREPARATION

A. Limit preparation to areas which will be immediately sodded.

B. Loosen topsoil of lawn areas to minimum depth of 4". Remove stones over 1" in any dimension and sticks, roots, rubbish, and extraneous matter.

C. Grade lawn areas to smooth, free draining and even surface with a loose, uniformly fine texture. Roll and rake; remove ridges and fill depressions as required to drain.

D. Apply limestone at rate determined by the soil test, to adjust pH of topsoil to not less than 6.0 nor more than 6.8. Distribute evenly by machine and incorporate thoroughly into topsoil.

E. Apply Type A fertilizer at the rate equal to 1.0 pound of actual nitrogen per 1,000 sq. ft. Apply fertilizer by mechanical rotary or drop type distributor, thoroughly and evenly incorporated with the soil to a depth of 3" by discing or other approved methods. Fertilize areas inaccessible to power equipment with hand tools and incorporate it into soil.

F. Dampen dry soil prior to sodding.

G. Restore prepared areas to specified condition if eroded, settled, or otherwise disturbed after fine grading and

prior to sodding.

3.3. INSTALLATION

A. Sodding:

1. Lay sod to form a solid mass with tightly-fitted joints. Butt ends and sides of sod strips. Do not overlay edges. Stagger strips to offset joints in adjacent courses. Remove excess sod to avoid smothering of adjacent grass. Provide sod pad top flush with adjacent curbs, sidewalks, drains, and seeded areas.
2. Do not lay dormant sod or install sod on saturated or frozen soil.
3. Install initial row of sod in a straight line, beginning at bottom of slopes, perpendicular to direction of the sloped area. Place subsequent rows parallel to and lightly against previously installed row.
4. Peg sod on slopes greater than 3 to 1 to prevent slippage at a rate of 2 stakes per square yd. of sod.
5. Water sod thoroughly with a fine spray immediately after laying.
6. Roll with light lawn roller to ensure contact with sub-grade.

B. Sod as indicated on plans.

3.4 MAINTENANCE

A. Maintain sodded lawn areas, including watering, spot weeding, mowing, application of herbicides, fungicides, insecticides and re-sodding until a full, uniform stand of grass free of weed, undesirable grass species, disease, and insects is achieved and accepted by the Owner.

1. Water sod thoroughly every 2 to 3 days, as required to establish proper rooting.
2. Repair, rework, and re-sod all areas that have washed out or are eroded. Replace undesirable or dead areas with new sod.
3. Mow lawn areas as soon as lawn top growth reaches a 3" height. Cut back to 2" height. Repeat mowing as required to maintain specified height. Not more than 40% of grass leaf shall be removed at any single mowing.
4. Apply Type B fertilizer to lawns approximately 30 days after sodding at a rate equal to 1.0 lb. of actual nitrogen per 1,000 sq. ft. Apply with a mechanical rotary or drop type distributor. Thoroughly water into soil.
5. Apply herbicides as required to control weed growth or undesirable grass species.
6. Apply fungicides and insecticides as required to control diseases and insects.
7. Remove sod pegs.

3.5 ACCEPTANCE

A. Inspection to determine acceptance of sodded lawns will be made by the Landscape Architect, upon Contractor's request. Provide notification at least 10 working days before requested inspection date.

1. Sodded areas will be acceptable provided all requirements, including maintenance, have been complied with, and a healthy, even colored viable lawn is established, free of weeds, undesirable grass species, disease, and insects.

B. Upon acceptance, the Owner will assume lawn maintenance.

3.6 CLEANING

A. Perform cleaning during installation of the work and upon completion of the work. Remove from site all excess materials, debris, and equipment. Repair damage resulting from sodding operations.

END OF SECTION